POL-EKO-APARATURA
products

2018

Made in Poland. Established 1990.

WWW.POL-EKO.EU
Your partner in laboratory analysis and technological processes
POL-EKO-APARATURA has been present in the Polish market for 28 years.

Highest quality equipment and service we provide ensure your satisfaction. Our wide range of products and professional solutions will suit the most demanding customers.

We remain open to assist in choosing the right product for your needs, as well as to provide you with customized solutions.

We are your partner in lab analysis and technological processes.

Thank you for your confidence.

POL-EKO-APARATURA team
Table of contents

3

Product development history

4

THERMOSTATIC EQUIPMENT

5

Cooled incubators (ST)

9

Laboratory refrigerators

19

Laboratory freezers

27

Ultra-low freezers

33

Laboratory incubators

41

Cooled incubators (IL)

43

Peltier-cooled incubators

45

Drying ovens

49

Drying ovens with nitrogen blow

51

SIMPLE drying ovens

52

Laboratory sterilizers

54

Climatic chambers and climatic chambers with phytotron system

57

OPTIONS AND ACCESSORIES

67

Options and accessories

68

Features description

80

OTHER LABORATORY EQUIPMENT

81

RT 2014 data logger

83

Colony counter

87

Laboratory shakers

88

Stationary samplers

90

LABORATORY FURNITURE, FUME HOODS

91

Compact Lab furniture

92

Fume hoods

99

On-Line instruments

102

Protective antibacterial coating

103
Product development history

1996
Start of production

1996
New product launched:
thermostatic cabinet and laboratory refrigerator

2000
New product launched:
colony counter

2001
New product launched:
stationary sampler

2003
New product launched:
homogenizer

2004
New products launched:
drying oven, incubator and cooled incubator

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

2006
New product launched:
labortory sterilizer

2008
New products launched:
climatic chambers and climatic chambers with phytotron system

2009
New product launched:
laboratory shaker

2010
New products launched:
laboratory furniture and fume hoods

2010
Graphite revolution:
New design of POL-EKO-APARATURA equipment

2012
New product launched:
Pass - through drying oven

2014
New product launched:
Temperature and humidity data logger
RT 2014

2015
New product launched:
climatic chambers KKS

2015
New product launched:
HYDROMAT

2015
New product launched:
RT2014 WI-Fi

2017
New product launched:
Euro Drop station

2014
New product launched:
SL Simple

2015
New product launched:
Cooled incubators with Peltier element ILP

2015
New product launched:
Ultralow freezer
ZLN-UT

2015
New product launched:
stationsary sampler

2006
New products launched:
thermostatic cabinet and laboratory refrigerator

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

2008
New product launched:
laboratory shaker

2009
New products launched:
laboratory furniture and fume hoods

2010
Graphite revolution:
New design of POL-EKO-APARATURA equipment

2012
New product launched:
Pass - through drying oven

2014
New product launched:
Temperature and humidity data logger
RT 2014

2015
New product launched:
climatic chambers KKS

2015
New product launched:
HYDROMAT

2015
New product launched:
RT2014 WI-Fi

2017
New product launched:
Euro Drop station
Thermostatic equipment
## Thermostatic equipment

<table>
<thead>
<tr>
<th>Category</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooled incubators (ST), laboratory refrigerators</td>
<td>7</td>
</tr>
<tr>
<td>POL-EKO LAB</td>
<td>8</td>
</tr>
<tr>
<td>Cooled incubators (ST)</td>
<td>9</td>
</tr>
<tr>
<td>BASIC version, COMFORT version, PREMIUM version</td>
<td>10</td>
</tr>
<tr>
<td>PREMIUM TOP+ version</td>
<td>12</td>
</tr>
<tr>
<td>single chamber</td>
<td>14</td>
</tr>
<tr>
<td>double chamber</td>
<td>15</td>
</tr>
<tr>
<td>with photoperiodic system</td>
<td>17</td>
</tr>
<tr>
<td>with phytotron system</td>
<td>18</td>
</tr>
<tr>
<td>Laboratory refrigerators</td>
<td>19</td>
</tr>
<tr>
<td>BASIC version, COMFORT version, PREMIUM version</td>
<td>20</td>
</tr>
<tr>
<td>PREMIUM TOP+ version</td>
<td>22</td>
</tr>
<tr>
<td>single chamber</td>
<td>24</td>
</tr>
<tr>
<td>double chamber</td>
<td>25</td>
</tr>
<tr>
<td>Laboratory freezers</td>
<td>27</td>
</tr>
<tr>
<td>Ultra-low freezers</td>
<td>33</td>
</tr>
<tr>
<td>Drying ovens, incubators, cooled incubators</td>
<td>37</td>
</tr>
<tr>
<td>STD version</td>
<td>37</td>
</tr>
<tr>
<td>TOP+ version</td>
<td>39</td>
</tr>
<tr>
<td>Laboratory incubators</td>
<td>41</td>
</tr>
<tr>
<td>Cooled incubators (IL)</td>
<td>43</td>
</tr>
<tr>
<td>Peltier-cooled incubators</td>
<td>45</td>
</tr>
<tr>
<td>with photoperiodic system</td>
<td>47</td>
</tr>
<tr>
<td>with phytotron system</td>
<td>48</td>
</tr>
<tr>
<td>Laboratory drying ovens</td>
<td>49</td>
</tr>
<tr>
<td>drying ovens</td>
<td>50</td>
</tr>
<tr>
<td>with nitrogen blow</td>
<td>51</td>
</tr>
<tr>
<td>SIMPLE</td>
<td>52</td>
</tr>
<tr>
<td>Laboratory sterilizers</td>
<td>54</td>
</tr>
<tr>
<td>pass-through</td>
<td>56</td>
</tr>
<tr>
<td>Climatic chambers</td>
<td>57</td>
</tr>
<tr>
<td>Climatic chambers with phytotron system</td>
<td>60</td>
</tr>
<tr>
<td>Climatic chambers KK</td>
<td>63</td>
</tr>
<tr>
<td>Climatic chambers KKS</td>
<td>64</td>
</tr>
<tr>
<td>Software</td>
<td>66</td>
</tr>
</tbody>
</table>
There is wide selection of models depending on capacity, basic or more advanced controllers and material of construction. The following versions are available:

<table>
<thead>
<tr>
<th></th>
<th>interior</th>
<th>exterior</th>
<th>temperature protection</th>
<th>controller</th>
</tr>
</thead>
<tbody>
<tr>
<td>BASIC</td>
<td>aluminum</td>
<td>powder coated sheet</td>
<td>class 1.0</td>
<td>basic</td>
</tr>
<tr>
<td>COMFORT</td>
<td>stainless steel to DIN 1.4016</td>
<td>powder coated sheet</td>
<td>class 1.0</td>
<td>basic</td>
</tr>
<tr>
<td>COMFORT/S</td>
<td>stainless steel to DIN 1.4016</td>
<td>polished stainless steel</td>
<td>class 2.0</td>
<td>basic</td>
</tr>
<tr>
<td>PREMIUM</td>
<td>stainless steel to DIN 1.4301</td>
<td>powder coated sheet</td>
<td>class 3.3</td>
<td>TOP+</td>
</tr>
<tr>
<td>PREMIUM/S</td>
<td>stainless steel to DIN 1.4301</td>
<td>polished stainless steel</td>
<td>class 3.3</td>
<td>TOP+</td>
</tr>
<tr>
<td>PREMIUM TOP+</td>
<td>stainless steel to DIN 1.4301</td>
<td>powder coated sheet</td>
<td>class 3.3</td>
<td>TOP+</td>
</tr>
<tr>
<td>PREMIUM/S TOP+</td>
<td>stainless steel to DIN 1.4301</td>
<td>polished stainless steel</td>
<td>class 3.3</td>
<td>TOP+</td>
</tr>
</tbody>
</table>
Quick service at no extra charge

We provide accredited services in calibration range of:

- thermostatic and climatic chambers
- water baths
- thermoreactors
- lab furnaces
- chambers for steam sterilization (autoclaves)
- electric and electronic thermometers
- temperature data loggers
- thermohygrometers
- calipers
- external micrometers
- laboratory sieves

Calibration of **thermostatic and climatic chambers**, method temperature range: -25...+200°C

Calibration of **climatic chambers** in the range of relative humidity, method temperature range: +15...+40°C for humidity 40...98%

Calibration of **water baths and thermoreactors**, method temperature range: -25...+200°C

Calibration of **lab furnaces**, method temperature range: +100...+1000°C

Calibration of **chambers for steam sterilization (autoclaves)**, method temperature range: +60...+140°C

Calibration of **electric and electronic thermometers and data loggers** with an external sensor, method temperature range: -40...+1000°C

Calibration of **electric and electronic thermometers and data loggers** with an internal sensor, method temperature range: 0...+140°C

Calibration of **thermohygrometer**, method temperature range: +10...+60°C, method relative humidity range: 20...98%

After calibration the customer receives the calibration certificate.
Cooled incubators (ST)

Application

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

Cooled incubators (ST) can provide a stable temperature between +3...+70°C regardless of ambient conditions.

Calibration

All thermostatic equipment manufactured by POL-EKO-APARATURA can be provided with Calibration Certificate issued by accredited Measurement Laboratory. Detailed information on accreditation is available on website: www.pol-eko.eu.
The **BASIC, COMFORT, PREMIUM** models are equipped with a PID microprocessor controller with an LCD graphic display and illuminated touch buttons.

**Controller advantages**

- Six segment temperature-time profile
- Loop function up to 99 times or endless
- 3 user programs memory
- Adjustable start delay feature (from 1 min to 99:59 h)
- Adjustable hold at set point time for temperature and lighting (for ST/FDT) from 1 min to 31 days / 1 min to 99:59 h or continuous operating
- Recording of min, average and max temperature value for each segment
- Overview of set and current parameters while operating
- Audible and visual temperature alarm
- Operating with temperature priority mode
- Defrosting function
- Temperature sensor fail alarm
- Power failure control system (program continued after restoring power)
- Digital timer
- Real time clock
- Auto-diagnostic function
- Internal memory to store up to 2046 data records
- Forced air convection with optional fan speed control 50-100%
- Automatic fan shut-down after completing the program

**Detailed description of parameters on page 80.**
Control panel

- alarms or malfunction
- graphic LCD display
- scroll down button
- ENTER button
- stand-by button
- current temperature
- ESC button
- scroll up button

Standard features

- temperature range +3…+40°C
- quality control protocol (at +37°C)
- English instruction manual
- available menu languages: Czech, English, Estonian, German, Italian, Latvian, Polish, Portuguese, Russian, Spanish
- temperature protection 1.0 class for BASIC and COMFORT models and 2.0 for PREMIUM models to DIN 12880
- open door alarm
- wheels in standard for models ST 1200 and 1450

- RS 232 and USB ports for data transfer
- internal LED light
- access port: Ø30 mm
- door lock
- wire shelves for BASIC and stainless steel wire shelves for COMFORT and PREMIUM models
- solid door
**PREMIUM TOP+ version**

All the units in TOP+ version are equipped with PID microprocessor controller with a large (5,7") full colour touch screen, intuitive menu and user friendly software. They can be connected to Ethernet network for remote control from any computer, being one of the greatest advantages.

**Controller advantages**
- multi-segment temperature-time profile (up to 100)
- loop function up to 99 times or endless
- adjustable start delay feature (from 1 min to 99:59 h or date/time)
- access control via login
- 7-days programming
- adjustable hold at set point time for temperature and lighting (for ST/FIT) from 1 min to 999:59 h, or continuous operating
- adjustable ramps
- overview of set and current parameters while operating
- recording of min, average and max temperature value for each segment
- Administrator function to manage user accounts
- possibility of temperature calibration by the user
- audible and visual temperature alarm
- operating in temperature or time priority mode
- defrosting function
- temperature sensor fail alarm
- power failure control system (program continued after restoring power)
- digital timer
- real-time clock
- auto-diagnostic function
- forced air convection with fan speed control (50-100%)
- automatic fan shut-down after completing the program

Detailed description of parameters on page 80.

**GLP supporting functions**
- password protected settings
- 20 user programs memory
- internal memory to store up to 4100 data records for each user, possibility to overview the values on the display or a PC computer in a tabular or graphic form
- USB port to allow direct data recording or transfer to a USB mass storage device
- events registry

---

Cooled incubators (ST)

**TOP+ Control software included (see page 66).**

![Diagram showing temperature and time parameters](image)

- **Temp. [°C]**
  - T0 20°C
  - T1 50°C
  - T2 18°C
  - T3 70°C

- **Time [h]**
  - TIME 0/1...
  - TIME 1/2/3

- **Fan speed control**
  - 100% 50% 100% 50% 100% 50% off

- **Parameter set by the user**
  - adjustable start delay (1 min...99:59 h)

---

ST
**Control panel**

- operating status (cooling/heating)
- current temperature
- program name
- logged-in user
- USB flash drive plugged-in
- current date/time/weekday
- alarms
- door open info
- main menu
- overview of program parameter
- internal light switch

**Standard features**

- temperature range +3...+70°C
- Ethernet cable
- TOP+ Control software
- quality control protocol [at +37°C]
- English instruction manual
- available menu languages: Czech, English, Estonian, French, German, Hungarian, Italian, Latvian, Polish, Portuguese, Romanian, Russian, Spanish
- temperature protection 3.3 class to DIN 12880
- open door alarm
- wheels in standard for models ST 1200 and 1450

- door lock
- USB port to allow direct recording and data transfer to a USB mass storage device
- RS 232 port for data transfer
- LAN port for remote control
- internal LED light
- access port: Ø30 mm
- wire stainless steel shelves
- solid door
### Cooled incubators (ST)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>ST 1</th>
<th>ST 2</th>
<th>ST 3</th>
<th>ST 4</th>
<th>ST 5</th>
<th>ST 6</th>
<th>ST 500</th>
<th>ST 700</th>
<th>ST 1200</th>
<th>ST 1450</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Parameter</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>chamber capacity [l]</strong></td>
<td>70</td>
<td>150</td>
<td>200</td>
<td>250</td>
<td>300</td>
<td>400</td>
<td>500</td>
<td>625</td>
<td>1365</td>
<td>1540</td>
</tr>
<tr>
<td><strong>working capacity [l]</strong></td>
<td>55</td>
<td>122</td>
<td>183</td>
<td>203</td>
<td>243</td>
<td>324</td>
<td>411</td>
<td>499</td>
<td>1239</td>
<td>1376</td>
</tr>
<tr>
<td><strong>door type</strong></td>
<td>solid / glass or double (option)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>temperature range [°C]</strong></td>
<td>+3...+40 / up to +70 (option) / +3...+70 in PREM TOP+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>temperature resolution [°C]</strong></td>
<td>every 0.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>controller</strong></td>
<td>microprocessor with external LCD graphic display</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th><strong>ST 1</strong></th>
<th><strong>ST 2</strong></th>
<th><strong>ST 3</strong></th>
<th><strong>ST 4</strong></th>
<th><strong>ST 5</strong></th>
<th><strong>ST 6</strong></th>
<th><strong>ST 500</strong></th>
<th><strong>ST 700</strong></th>
<th><strong>ST 1200</strong></th>
<th><strong>ST 1450</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>overall dims [mm]</strong></td>
<td>570</td>
<td>620</td>
<td>620</td>
<td>620</td>
<td>620</td>
<td>650</td>
<td>740</td>
<td>1470</td>
<td>1450</td>
<td></td>
</tr>
<tr>
<td><strong>B height</strong></td>
<td>680</td>
<td>650</td>
<td>650</td>
<td>650</td>
<td>650</td>
<td>650</td>
<td>810</td>
<td>860</td>
<td>860</td>
<td>950</td>
</tr>
<tr>
<td><strong>C depth</strong></td>
<td>430</td>
<td>480</td>
<td>480</td>
<td>480</td>
<td>480</td>
<td>480</td>
<td>540</td>
<td>1270</td>
<td>1270</td>
<td></td>
</tr>
<tr>
<td><strong>D width</strong></td>
<td>470</td>
<td>520</td>
<td>520</td>
<td>520</td>
<td>520</td>
<td>520</td>
<td>510</td>
<td>600</td>
<td>1340</td>
<td>1340</td>
</tr>
<tr>
<td><strong>D' width</strong></td>
<td>430</td>
<td>660</td>
<td>860</td>
<td>1060</td>
<td>1260</td>
<td>1460</td>
<td>1510</td>
<td>1510</td>
<td>1510</td>
<td>1460</td>
</tr>
<tr>
<td><strong>E height</strong></td>
<td>470</td>
<td>520</td>
<td>520</td>
<td>520</td>
<td>520</td>
<td>520</td>
<td>510</td>
<td>600</td>
<td>1340</td>
<td>1340</td>
</tr>
<tr>
<td><strong>F depth</strong></td>
<td>300</td>
<td>420</td>
<td>420</td>
<td>420</td>
<td>420</td>
<td>420</td>
<td>630</td>
<td>680</td>
<td>680</td>
<td>790</td>
</tr>
<tr>
<td><strong>F' depth</strong></td>
<td>360</td>
<td>480</td>
<td>480</td>
<td>480</td>
<td>480</td>
<td>480</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>G depth</strong></td>
<td>-</td>
<td>320</td>
<td>320</td>
<td>320</td>
<td>320</td>
<td>320</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>H height</strong></td>
<td>-</td>
<td>440</td>
<td>640</td>
<td>840</td>
<td>1050</td>
<td>1440</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>I height</strong></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1360</td>
<td>1360</td>
<td>1360</td>
<td>1300</td>
</tr>
<tr>
<td><strong>max shelf workload [kg]</strong></td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>20</td>
<td>30</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td><strong>max unit workload [kg]</strong></td>
<td>-</td>
<td>20</td>
<td>30</td>
<td>40</td>
<td>50</td>
<td>60</td>
<td>100</td>
<td>150</td>
<td>300</td>
<td>300</td>
</tr>
<tr>
<td><strong>nominal power [W]</strong></td>
<td>250</td>
<td>250</td>
<td>250</td>
<td>250</td>
<td>350</td>
<td>350</td>
<td>450</td>
<td>450</td>
<td>550</td>
<td>950</td>
</tr>
<tr>
<td><strong>weight [kg]</strong></td>
<td>32</td>
<td>54</td>
<td>59</td>
<td>69</td>
<td>75</td>
<td>90</td>
<td>105</td>
<td>115</td>
<td>185</td>
<td>200</td>
</tr>
<tr>
<td><strong>over temperature protection</strong></td>
<td>class 1.0 to DIN 12880 / class 3.3 (option) / class 3.3 in PREM TOP+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>power supply</strong></td>
<td>230 V 50 Hz</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>warranty</strong></td>
<td>24 months</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>manufacturer</strong></td>
<td>POL-EKO-APARATURA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* also available: 230V 60Hz, 115V 60Hz
1 - additional internal glass door
2 - ST 1-6 in TOP+ version are 60 mm higher, depth doesn't include 50 mm of power cable
3 - dims of units with double door can be smaller
4 - on uniformly loaded surface
5 - reinforced shelf
6 - reinforced version
7 - for units in BASIC version with solid door, without optional equipment
8 - two columns with 3 shelves each

### Options and accessories (icon description see pages 78-79)
## Options and accessories (icon description see pages 78-79)

### Technical data

**Parameter**
- **Parameter**
- **Value**
  - **air convection**
  - **chamber capacity (l)**
    - **ST 1/1**
    - **ST 3/3**
    - **ST 2/2**
    - **ST 2/3**
    - **ST 2/4**
    - **ST 3/3**
  - **working capacity (l)**
  - **door type**
  - **temperature range (°C)**
  - **temperature resolution (°C)**
  - **controller**
  - **interior**
  - **housing**
  - **overall dims [mm]**
    - **A width**
    - **B height**
    - **C depth**
  - **internal dims [mm]**
    - **D width**
    - **D’ width**
    - **E height**
    - **F depth**
    - **F’ depth**
    - **G depth**
    - **H height**
  - **max shelf workload [kg]**
  - **max unit workload [kg]**
  - **nominal power [W]**
  - **weight [kg]**
  - **over temperature protection**
  - **power supply**
  - **shelves fitted/max**
  - **warranty**
  - **manufacturer**

**Note:**
- **all the above technical data refer to standard units (without optional accessories)**
- **+3...+40 / up to +70 (option) / +3...+70 in PREM TOP+**
- **50...100%**
- **1.0 to DIN 12880 / class 3.3 (option) / class 3.3 in PREM TOP+**
- **230 V 50 Hz**
- **see table for single chamber models**
- **POL-EKO-APARATURA**

### Options and accessories

**Option**
- **Value**
  - **1** - additional internal glass door
  - **2** - depth doesn’t include 50 mm of power cable
  - **3** - dims of units with double door can be smaller
  - **4** - on uniformly loaded surface
  - **5** - reinforced shelf
  - **6** - reinforced version
  - **7** - for units in BASIC version with solid door, without optional equipment

---

**Anchoring kit for double chamber units included.**
Cooled incubators (ST)

ST

ST 1

ST 2/3/4/5/6

ST 500/700/1200/1450
Cooled incubators (ST) with photoperiodic system

The photoperiodic (FOT) and phytotron (FIT) systems allow day and night simulation. The FOT option allows the lights to be turned on or off, while the FIT option features additional intensity control.

The BASIC, COMFORT and PREMIUM versions of cooled incubators (ST) can be equipped with the FOT option, while the PREMIUM TOP+ version (ST 500, 700, 1200, 1450) with the FIT system.

Program possibilities with FOT option

- day and night simulation software to control light (on/off), time and temperature separately for each segment
- temperature range for “night” simulation: +3 ... +50°C
- temperature range for “day” simulation: +10 ... +50°C
- lamps installed on side walls
- fluorescent lamp 840 type [daylight] as standard
- operating with time priority (see page 80)
- automatic defrosting function included

Photoperiodic system (*/FOT option) for single and double chamber cooled incubators (ST)**

<table>
<thead>
<tr>
<th>Option available for models</th>
<th>ST/FOT2</th>
<th>ST/FOT4</th>
<th>ST/FOT6</th>
<th>ST/FOT8</th>
<th>ST/FOT10</th>
<th>ST/FOT15</th>
</tr>
</thead>
<tbody>
<tr>
<td>ST 1/1</td>
<td>ST 2/2</td>
<td>ST 2/2</td>
<td>ST 3/3</td>
<td>ST 5</td>
<td>ST 500</td>
<td>ST 1200</td>
</tr>
<tr>
<td>ST 1/1/1</td>
<td></td>
<td></td>
<td></td>
<td>ST 6</td>
<td>ST 700</td>
<td>ST 1450</td>
</tr>
</tbody>
</table>

- temperature range with photoperiod ON [°C]: +10 ... +50
- number of lamps on walls: 2 (in ceiling) 4 6 8 10 15 (3 columns with 5 pieces)
- adjustable illumination intensity: no

** for ST models with */FOT option, inner dims can be narrower by 4 cm on each side. FOT option is factory preinstalled. There is no possibility to order it separately.
Cooled incubators (ST) with phytotron system

The PREMIUM TOP+ version of cooled incubators (ST 500, 700, 1200, 1450) can be equipped with the FIT system.

**Program possibilities with FIT option**
- day and night simulation software to control light intensity [%], time temperature and fan speed separately for each segment
- temperature range for „night“ simulation: +3...+60°C
- temperature range for „day“ simulation: +10...+50°C
- lamps installed in over-shelf panel (FIT P), side walls (FIT S), door (FIT D), door and side walls (FIT DS)
- fluorescent lamp 840 type (daylight) used as standard
- temperature or time priority program (see page 80)
- automatic defrosting function included

**Phytotron system (/FIT option) for cooled incubators (ST) (PREMIUM TOP+)**

<table>
<thead>
<tr>
<th>Option**</th>
<th>ST/500/700/FIT DS</th>
<th>ST/500/700/FIT P</th>
<th>ST/500/700/FIT S</th>
<th>ST/1200/FIT P</th>
<th>ST/1450/FIT P</th>
</tr>
</thead>
<tbody>
<tr>
<td>temperature range with phytotron ON [°C]</td>
<td>+10...+50°C</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>number of over-shelf panels with illumination std/max</td>
<td>-</td>
<td>1/3</td>
<td>-</td>
<td>1/3</td>
<td>1/3</td>
</tr>
<tr>
<td>lamps in door</td>
<td>yes</td>
<td>no</td>
<td>no</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>lamps in walls</td>
<td>yes</td>
<td>no</td>
<td>yes</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>adjustable illumination intensity</td>
<td>yes</td>
<td>no</td>
<td>no</td>
<td>no</td>
<td>no</td>
</tr>
</tbody>
</table>

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

Application

- storage of water and sewage samples, piezometer leachate
- storage of AAS, GC or HPLC calibration standards
- storage of reagents
- chemical storage
- storage of medicines and vaccines

Laboratory refrigerators are equipped with a cooling system and can provide a stable temperature between 0°C ... +15°C.

Calibration

All thermostatic equipment manufactured by POL-EKO-APARATURA can be provided with Calibration Certificate issued by accredited Measurement Laboratory. Detailed information on accreditation is available on website: www.pol-eko.eu.
The **BASIC, COMFORT, PREMIUM** models are equipped with a PID microprocessor controller with an LCD graphic display and illuminated touch buttons.

### Controller advantages

- temperature control
- adjustable start delay feature (1 min...99:59 h)
- operating with temperature priority mode
- overview of set and current parameters while operating
- recording of min, average and max temperature value for each segment
- defrosting function
- audible and visual temperature alarm
- temperature sensor fail alarm
- power failure control system (program continued after restoring power)
- real-time clock
- auto-diagnostic function
- internal memory to store up to 2046 data records
- forced air convection with optional fan speed control (50-100%)
- automatic fan shut-down after completing the program

Detailed description of parameters on page 80.
### Control panel

- **alarms or malfunction**
- **graphic LCD display**
- **scroll down button**
- **ENTER button**
- **stand-by button**
- **current temperature**
- **ESC button**
- **scroll up button**

### Standard features:

- Temperature range 0...+15°C
- Quality control protocol [at +4°C]
- Operation manual in English
- Available menu languages: Czech, English, Estonian, German, Italian, Latvian, Polish, Portuguese, Russian, Spanish
- Over temperature protection 1.0 class according to DIN 12880
- Open door alarm
- Wheels in standard for models CHL 1200 and 1450

- RS 232 and USB ports for data transfer
- Internal LED light
- Access port: Ø30 mm
- Wire shelves with slides set for BASIC and stainless steel
- Wire shelves for COMFORT and PREMIUM models
- Door lock
- Solid door
PREMIUM TOP+ version

All the units in TOP+ version are equipped with a PID microprocessor controller with a large (5.7") full colour touch screen, intuitive menu and user friendly software. They can be connected to Ethernet network for remote control from any computer, being one of the greatest advantages.

Controller advantages

- multi-segment temperature-time profile (up to 100)
- loop function up to 99 times or endless
- adjustable start delay feature (from 1 min to 99:59 h or date/time)
- Administrator function to manage User accounts
- adjustable hold at set point time for temperature from 1 min to 999:59 h or continuous operating
- access control via login
- 7-days programming
- temperature calibration
- adjustable ramps
- overview of set and current parameters while operating
- recording of min, average and max temperature value for each segment
- possibility of temperature calibration by the user
- audible and visual temperature alarm
- operating in temperature or time priority mode
- defrosting function
- temperature sensor fail alarm
- power failure control system (program continued after restoring power)
- digital timer
- real-time clock
- auto-diagnostic function
- forced air convection with fan speed control (50-100%)
- automatic fan shut-down after completing the program

Detailed description of parameters on page 80.

GLP supporting functions

- password protected settings
- 20 user programs memory
- internal memory to store up to 4100 data records for each user, possibility to overview the values on the display or a PC computer in a tabular or graphic form
- USB port to allow direct data recording or transfer to a USB mass storage device
- events registry

Detailed description of parameters on page 80.

Laboratory refrigerators

CHL

**TOP+ Control software included (see page 66).**
### Control panel

- **operating status**: (cooling/heating)
- **current temperature**
- **program name**
- **logged-in user**
- **USB flash drive plugged-in**
- **current date/time/weekday**
- **alarms**
- **door open info**
- **main menu**
- **overview of program parameter**
- **internal light switch**

### Standard features

- **temperature range**: 0...+15°C
- **Ethernet cable**
- **TOP+ Control software**
- **quality control protocol** (at +4°C)
- **English instruction manual**
- **available menu languages**: Czech, English, Estonian, French, German, Hungarian, Italian, Latvian, Polish, Portuguese, Romanian, Russian, Spanish
- **temperature protection**: 3.2 class to DIN 12880
- **open door alarm**
- **wheels in standard** for models CHL 1200 and 1450

- **door lock**
- **USB port to allow direct recording and data transfer to a USB mass storage device**
- **RS 232 port for data transfer**
- **LAN port for remote control**
- **internal LED light**
- **access port**: Ø30 mm
- **stainless steel wire shelves**
- **solid door**
## Laboratory refrigerators

### CHL

<table>
<thead>
<tr>
<th>Parameter</th>
<th>CHL 1</th>
<th>CHL 2</th>
<th>CHL 3</th>
<th>CHL 4</th>
<th>CHL 5</th>
<th>CHL 6</th>
<th>CHL 500</th>
<th>CHL 700</th>
<th>CHL 1200</th>
<th>CHL 1450</th>
</tr>
</thead>
<tbody>
<tr>
<td>air convection</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>forced</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>chamber capacity [l]</td>
<td>70 150 200 250 300 400 500 625 1385 1540</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>working capacity [l]</td>
<td>55 122 163 203 243 324 411 499 1239 1376</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>door type</td>
<td>solid / glass or double* (option)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>temperature range [°C]</td>
<td>0...+15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>temperature resolution [°C]</td>
<td>every 0.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>controller</td>
<td>microprocessor with external LCD graphic display</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Interior

- **BASIC**
  - stainless steel to DIN 1.4016
- **COMF**
  - stainless steel to DIN 1.4016
- **PREM** (TOP+)
  - acid-proof stainless steel to DIN 1.4301
- **PREM/S** (TOP+)
  - acid-proof stainless steel to DIN 1.4301

### Housing

- **BASIC**
  - powder coated sheet
- **COMF**
  - powder coated sheet
- **COMF/S**
  - polished stainless steel
- **PREM** (TOP+)
  - powder coated sheet
- **PREM/S** (TOP+)
  - polished stainless steel

### Overall dims [mm]

- A width: 570, 620, 620, 620, 620, 620, 650, 740, 1470, 1450
- C depth: 680, 650, 650, 650, 650, 650, 650, 610, 880, 860, 950
- D width: 430, 480, 480, 480, 480, 480, 480, 540, 1270, 1270
- D’ width: 470, 520, 520, 520, 520, 520, 510, 600, 1340, 1340
- E height: 430, 660, 860, 1060, 1260, 1660, 1510, 1510, 1510, 1460
- F depth: 300, 420, 420, 420, 420, 420, 630, 680, 680, 790
- G depth: 360, 480, 480, 480, 480, 480, - , - , - , -
- H height: 440, 640, 840, 1050, 1440, - , - , - , - , -
- I height: 570, 600, 680, 860, 1270, 1340, 1460, 790, - , -
- J height: 680, 860, 1270, 1340, 1460, 790, - , - , - , -
- K height: 790, - , - , - , - , - , - , - , - , -
- L height: 970, 1060, 1260, 1340, 1460, 790, - , - , - , -
- M height: 1060, 1260, 1340, 1460, 790, - , - , - , - , -
- N height: 1260, 1340, 1460, 790, - , - , - , - , - , -
- O height: 1340, 1460, 790, - , - , - , - , - , - , -
- P height: 1460, 790, - , - , - , - , - , - , - , -

### Internal dims [mm]

- A width: 570, 620, 620, 620, 620, 620, 650, 740, 1470, 1450
- B height: 600, 860, 1060, 1260, 1660, 1510, 1510, 1510, 1460
- C depth: 680, 650, 650, 650, 650, 650, 650, 610, 880, 860, 950
- D width: 430, 480, 480, 480, 480, 480, 480, 540, 1270, 1270
- D’ width: 470, 520, 520, 520, 520, 520, 510, 600, 1340, 1340
- E height: 430, 660, 860, 1060, 1260, 1660, 1510, 1510, 1510, 1460
- F depth: 300, 420, 420, 420, 420, 420, 630, 680, 680, 790
- G depth: 360, 480, 480, 480, 480, 480, - , - , - , -
- H height: 440, 640, 840, 1050, 1440, - , - , - , - , -
- I height: 570, 600, 680, 860, 1270, 1340, 1460, 790, - , -
- J height: 680, 860, 1270, 1340, 1460, 790, - , - , - , -
- K height: 790, - , - , - , - , - , - , - , -
- L height: 970, 1060, 1260, 1340, 1460, 790, - , - , - , -
- M height: 1060, 1260, 1340, 1460, 790, - , - , - , - , -
- N height: 1260, 1340, 1460, 790, - , - , - , - , - , -
- P height: 1340, 1460, 790, - , - , - , - , - , - , -
- Q height: 1460, 790, - , - , - , - , - , - , - , -

### Max shelf workload [kg]

<table>
<thead>
<tr>
<th>PW version</th>
<th>10</th>
<th>10</th>
<th>10</th>
<th>10</th>
<th>10</th>
<th>10</th>
<th>20</th>
<th>30</th>
<th>30</th>
<th>30</th>
</tr>
</thead>
<tbody>
<tr>
<td>W version</td>
<td>20</td>
<td>30</td>
<td>40</td>
<td>50</td>
<td>60</td>
<td>60</td>
<td>100</td>
<td>150</td>
<td>300</td>
<td>300</td>
</tr>
</tbody>
</table>

### Max unit workload [kg]

<table>
<thead>
<tr>
<th>PW version</th>
<th>10</th>
<th>10</th>
<th>10</th>
<th>10</th>
<th>10</th>
<th>10</th>
<th>20</th>
<th>30</th>
<th>30</th>
<th>30</th>
</tr>
</thead>
<tbody>
<tr>
<td>W version</td>
<td>20</td>
<td>30</td>
<td>40</td>
<td>50</td>
<td>60</td>
<td>60</td>
<td>100</td>
<td>150</td>
<td>300</td>
<td>300</td>
</tr>
</tbody>
</table>

### Nominal power [W]

| 250 | 250 | 250 | 250 | 350 | 350 | 450 | 450 | 550 | 950 |

### Weight [kg]

| 32 | 54 | 59 | 69 | 75 | 90 | 105 | 80 | 95 | 200 |

### Over temperature protection

- class 1.0 to DIN 12880 / class 3.2 (option) / class 3.2 in PREM TOP+

### Power supply

| 230 V 50 Hz |

### Shelves fitted/max


### Warranty

| 24 months |

### Manufacturer

POL-EKO-APARATURA

all the above technical data refer to standard units (without optional accessories)

* also available: 230V 60Hz, 115V 60Hz
1. additional internal glass door
2. CHL 1-6 in TOP+ version are 60 mm higher, depth doesn’t include 50 mm of power cable
3. dims of units with double door can be smaller
4. on uniformly loaded surface
5. - reinforced shelf
6. - reinforced version
7. - for units in BASIC version with solid door, without optional equipment
8. - two columns with 3 shelves each

## Options and accessories (icon description see pages 78-79)
<table>
<thead>
<tr>
<th>Parameter</th>
<th>CHL 1/1</th>
<th>CHL 1/1/1</th>
<th>CHL 2/2</th>
<th>CHL 2/3</th>
<th>CHL 2/4</th>
<th>CHL 3/3</th>
</tr>
</thead>
<tbody>
<tr>
<td>air convection</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>chamber capacity [l]</td>
<td>70/70</td>
<td>70/70/70</td>
<td>150/150</td>
<td>150/200</td>
<td>150/250</td>
<td>200/200</td>
</tr>
<tr>
<td>working capacity [l]</td>
<td>55/55</td>
<td>55/55/55</td>
<td>122/122</td>
<td>122/163</td>
<td>122/203</td>
<td>163/163</td>
</tr>
<tr>
<td>door type</td>
<td></td>
<td></td>
<td></td>
<td>solid / glass or double [option]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>temperature range [°C]</td>
<td></td>
<td></td>
<td></td>
<td>0...15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>temperature resolution [°C]</td>
<td></td>
<td></td>
<td></td>
<td>every 0.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>controller</td>
<td>microprocessor with external LCD graphic display</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>interior</td>
<td>BASIC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CMDF</td>
<td>stainless steel to DIN 1.4016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CMDF/S</td>
<td>stainless steel to DIN 1.4016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PREM (TOP+)</td>
<td>acid-proof stainless steel to DIN 1.4301</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PREM/S (TOP+)</td>
<td>acid-proof stainless steel to DIN 1.4301</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>housing</td>
<td>BASIC</td>
<td>powder coated sheet</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CMDF</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CMDF/S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PREM (TOP+)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PREM/S (TOP+)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>overall dims’ [mm]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A width</td>
<td>570</td>
<td>570</td>
<td>620</td>
<td>620</td>
<td>620</td>
<td>620</td>
</tr>
<tr>
<td>B height</td>
<td>1170</td>
<td>1740</td>
<td>1680</td>
<td>1870</td>
<td>2080</td>
<td>2080</td>
</tr>
<tr>
<td>C depth</td>
<td>680</td>
<td>680</td>
<td>650</td>
<td>650</td>
<td>650</td>
<td>650</td>
</tr>
<tr>
<td>D width</td>
<td>430</td>
<td>430</td>
<td>480</td>
<td>480</td>
<td>480</td>
<td>480</td>
</tr>
<tr>
<td>D’ width</td>
<td>470</td>
<td>470</td>
<td>520</td>
<td>520</td>
<td>520</td>
<td>520</td>
</tr>
<tr>
<td>E height</td>
<td>430</td>
<td>430</td>
<td>660</td>
<td>660/860</td>
<td>660/1060</td>
<td>860</td>
</tr>
<tr>
<td>F depth</td>
<td>300</td>
<td>300</td>
<td>420</td>
<td>420</td>
<td>420</td>
<td>420</td>
</tr>
<tr>
<td>F’ depth</td>
<td>360</td>
<td>360</td>
<td>480</td>
<td>480</td>
<td>480</td>
<td>480</td>
</tr>
<tr>
<td>G depth</td>
<td></td>
<td>-</td>
<td>320</td>
<td>320</td>
<td>320</td>
<td>320</td>
</tr>
<tr>
<td>H height</td>
<td></td>
<td>-</td>
<td>440</td>
<td>440/640</td>
<td>440/840</td>
<td>640</td>
</tr>
<tr>
<td>max shelf workload* [kg]</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>nominal power [W]</td>
<td>500</td>
<td>750</td>
<td>500</td>
<td>500</td>
<td>500</td>
<td>500</td>
</tr>
<tr>
<td>weight* [kg]</td>
<td>65</td>
<td>98</td>
<td>109</td>
<td>114</td>
<td>124</td>
<td>119</td>
</tr>
<tr>
<td>over temperature protection</td>
<td>class 1.0 to DIN 12880 / class 3.2 [option] / class 3.2 in PREM TOP+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>power supply*</td>
<td>230 V 50 Hz</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>shelves fitted/max</td>
<td>see table for single chamber models</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>warranty</td>
<td>24 months</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* all the above technical data refer to standard units (without optional accessories)

* also available: 230V 60Hz, 115V 60Hz
1 - additional internal glass door
2 - depth doesn’t include 50 mm of power cable
3 - dims of units with double door can be smaller
4 - on uniformly loaded surface
5 - reinforced shelf
6 - reinforced version
7 - for units in BASIC version with solid door, without optional equipment

Anchoring kit for double chamber units included.

Options and accessories (icon description see pages 78-79)
Laboratory refrigerators

CHL

CHL 1

CHL 2/3/4/5/6

CHL 500/700/1200/1450
Laboratory freezers

**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
- plasma storage

Laboratory freezers can freeze and store frozen samples.

**Calibration**

All thermostatic equipment manufactured by POL-EKO-APARATURA can be provided with Calibration Certificate issued by accredited Measurement Laboratory. Detailed information on accreditation is available on website: www.pol-eko.eu.
The COMFORT and PREMIUM models are equipped with a PID microprocessor controller with an LCD graphic display and illuminated touch buttons.

Controller advantages

- temperature control
- operating with temperature priority
- adjustable start delay feature (1 min…99:59 h)
- loop function up to 99 times or endless
- overview of set and current parameters while operating
- recording of min, average and max temperature value for each segment
- audible and visual temperature alarm
- temperature sensor fail alarm
- power failure control system (program continued after restoring power)
- digital timer
- real-time clock
- auto-diagnostic function
- internal memory to store up to 2046 data records
- natural (ZLN-T) or forced (ZLW-T) air convection

Detailed description of parameters on page 80.
Control panel

- alarms or malfunction
- graphic LCD display
- scroll down button
- ENTER button
- stand-by button
- current temperature
- ESC button
- scroll up button

Standard features

- temperature range -25...0°C for ZLN 85 and -40...0°C for ZL-T 125, 200, 300
- wire stainless steel shelves for ZLN 85, full shelves with a hole for ZLN-T 125, 200, 300 and perforated shelves for ZLW-T 200, 300
- quality control protocol (at -20°C)
- English instruction manual
- available menu languages: Czech, English, Estonian, German, Italian, Latvian, Polish, Portuguese, Russian, Spanish
- open door alarm

access port: Ø20 mm

door lock

solid door

RS 232 and USB ports for data transfer

internal memory to store up to 2046 data records

wheels in standard for ZL-T 300
### Laboratory Freezers

**ZLN 85** Laboratory freezer can be combined as a double chamber unit with ST cooled incubator or CHL refrigerator types 2 and 3.

#### Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>ZLN 85</th>
<th>ZLN-T 125</th>
<th>ZLN-T 200</th>
<th>ZLN-T 300</th>
<th>ZLW-T 200</th>
<th>ZLW-T 300</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Chamber Capacity [l]</strong></td>
<td>85</td>
<td>130</td>
<td>210</td>
<td>310</td>
<td>210</td>
<td>310</td>
</tr>
<tr>
<td><strong>Working Capacity [l]</strong></td>
<td>73</td>
<td>109</td>
<td>180</td>
<td>262</td>
<td>140</td>
<td>213</td>
</tr>
<tr>
<td><strong>Door Type</strong></td>
<td></td>
<td></td>
<td></td>
<td>solid</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Temperature Range [°C]</strong></td>
<td>-25...0</td>
<td>-40...0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Temperature Resolution [°C]</strong></td>
<td></td>
<td></td>
<td></td>
<td>every 0.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Controller</strong></td>
<td></td>
<td></td>
<td></td>
<td>microprocessor with external LCD graphic display</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Interior</strong></td>
<td>COMF</td>
<td>COMF/S</td>
<td>PREM</td>
<td>PREM/S</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>stainless steel to DIN 1.4016</td>
<td>acid-proof stainless steel to DIN 1.4301</td>
<td></td>
<td>acid-proof stainless steel to DIN 1.4301</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Housing</strong></td>
<td>COMF</td>
<td>COMF/S</td>
<td>PREM</td>
<td>PREM/S</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>powder coated sheet</td>
<td>polished stainless steel</td>
<td></td>
<td>polished stainless steel</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Overall Dims [mm]</strong></td>
<td>A width</td>
<td>610</td>
<td>660</td>
<td>760</td>
<td>760</td>
<td>760</td>
</tr>
<tr>
<td></td>
<td>B height</td>
<td>880</td>
<td>1190</td>
<td>1380</td>
<td>1730</td>
<td>1380</td>
</tr>
<tr>
<td></td>
<td>C depth</td>
<td>650</td>
<td>800</td>
<td>800</td>
<td>800</td>
<td>800</td>
</tr>
<tr>
<td><strong>Internal Dims [mm]</strong></td>
<td>D width</td>
<td>380</td>
<td>370</td>
<td>450</td>
<td>450</td>
<td>450</td>
</tr>
<tr>
<td></td>
<td>D' width</td>
<td>420</td>
<td>420</td>
<td>520</td>
<td>520</td>
<td>520</td>
</tr>
<tr>
<td></td>
<td>E height</td>
<td>590</td>
<td>600</td>
<td>770</td>
<td>1120</td>
<td>770</td>
</tr>
<tr>
<td></td>
<td>F depth</td>
<td>380</td>
<td>520</td>
<td>520</td>
<td>520</td>
<td>520</td>
</tr>
<tr>
<td></td>
<td>F' depth</td>
<td>400</td>
<td>530</td>
<td>530</td>
<td>530</td>
<td>530</td>
</tr>
<tr>
<td></td>
<td>G depth</td>
<td>230</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>H height</td>
<td>380</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Max Shelf Workload [kg]</strong></td>
<td>-</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td><strong>Max Unit Workload [kg]</strong></td>
<td>-</td>
<td>30</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td><strong>Nominal Power [W]</strong></td>
<td>-</td>
<td>300</td>
<td>450</td>
<td>470</td>
<td>470</td>
<td>500</td>
</tr>
<tr>
<td><strong>Weight [kg]</strong></td>
<td>-</td>
<td>60</td>
<td>90</td>
<td>120</td>
<td>185</td>
<td>120</td>
</tr>
<tr>
<td><strong>Power Supply</strong></td>
<td>-</td>
<td>230 V 50 Hz</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Shelves Fitted/Max</strong></td>
<td>2/4</td>
<td>2/3</td>
<td>2/4</td>
<td>3/6</td>
<td>2/4</td>
<td>3/6</td>
</tr>
<tr>
<td><strong>Warranty</strong></td>
<td>-</td>
<td>24 months</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Manufacturer</strong></td>
<td>-</td>
<td>POL-EKO-APARATURA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

*All the above technical data refer to standard units (without optional accessories).*

*Also available: 230V 60Hz, 115V 60Hz, 3P 230V 60Hz (according to model)*

1 - depth doesn’t include 50 mm of power cable
2 - on uniformly loaded surface
3 - reinforced shelf
4 - reinforced version

---

### Options and Accessories

(Icon description see pages 78-79)
ZLN 85

ZLW-T 200/300*

ZLN-T/125/200/300*

* Wheels in standard for ZL-T 300.
Freezers with forced air convection are “no frost” freezers. The basic principle of this system is to manage humidity inside the unit and prevent frost formation on the walls. The fan in the chamber forces mechanically the air circulation and ensures continuous air exchange. It blows continuously over the cooling element, the air is cooled down and gets into the chamber through special channels. Humid air converts into frost, but is directed to a special evaporator compartment and settles on the coldest element. The compressor periodically turns off, the frost layer melts down by a heating element and is drained outside as a condensate.

**Advantages**
- Uniform distribution of cool air through the chamber
- No need to defrost the unit
- Faster achieving set temperature even with a large filling of the chamber
- Stable operation of the unit (in case of natural air convection freezers - the bigger ice layer on the evaporator, the less efficient operation of the unit)

**Disadvantages in comparison to natural air convection unit**
- Due to continuous operation of the fan and dehumidification of the chamber air, the stored samples may dry up. This can be easily prevented by proper packing of material
- Louder operation unit (due to fan)
- Higher power consumption (due to fan operation)
Ultra-low freezers are used for deep freezing of biotechnological samples and other materials which should be stored at very low temperatures.

Calibration

All thermostatic equipment manufactured by POL-EKO-APARATURA can be provided with Calibration Certificate issued by accredited Measurement Laboratory. Detailed information on accreditation is available on website: www.pol-eko.eu.
### Standard features

- Temperature range: -86...-40°C
- Quality control protocol (at -80°C)
- English instruction manual
- Available menu languages: Czech, English, Estonian, French, German, Italian, Latvian, Polish, Portuguese, Russian, Spanish
- Access port: Ø20 mm
- Door lock
- External solid door and internal solid door for each chamber
- Wheels
- Controller spare batteries in case of power failure - alarm output
- Additional port for installation of CO₂ backup

### Options and accessories (icon description see pages 78-79)
Racks with drawers and boxes for test-tubes for ultra low freezers

- Racks with drawers
  - sturdy and heavy duty, made of stainless steel;
  - feature quick and easy access to all boxes;
  - 4 drawers (each for 3 boxes) per rack.

- Boxes
  - made of polypropylene (dimensions 133x133x50mm;
    each box suits 81 test-tubes of Ø 12.5mm)
  - or made of cardboard.

Boxes for test-tubes

<table>
<thead>
<tr>
<th>Model</th>
<th>compartments</th>
<th>racks per compartment</th>
<th>boxes per rack</th>
<th>boxes per compartment</th>
<th>boxes per unit</th>
<th>test-tubes per unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZLN-UT 200</td>
<td>3</td>
<td>3</td>
<td>12</td>
<td>36</td>
<td>108</td>
<td>8748</td>
</tr>
<tr>
<td>ZLN-UT 300</td>
<td>4</td>
<td>3</td>
<td>12</td>
<td>36</td>
<td>144</td>
<td>11664</td>
</tr>
</tbody>
</table>

Racks and boxes

<table>
<thead>
<tr>
<th>Model</th>
<th>description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZLN-UT/9R</td>
<td>set of 9 racks for 50 mm boxes, set for ZLN-UT 200 freezer</td>
</tr>
<tr>
<td>ZLN-UT/9RB</td>
<td>set of 9 racks for 50 mm boxes with cardboard boxes (108 pcs.)</td>
</tr>
<tr>
<td>ZLN-UT/12R</td>
<td>set of 12 racks for 50 mm boxes, set for ZLN-UT 300 freezer</td>
</tr>
<tr>
<td>ZLN-UT/12RB</td>
<td>set of 12 racks for 50 mm boxes with cardboard boxes (144 pcs.) for ZLN-UT 300 freezer, every box can fit 81 test-tubes d=12.2 mm or 100 test-tubes d=13.7 mm</td>
</tr>
</tbody>
</table>
Drying ovens, incubators, cooled incubators

All the units in the STD version are equipped with a PID microprocessor controller with an LCD graphic display and illuminated touch buttons.

### Controller advantages
- six-segment temperature-time profile
- loop function up to 99 times or endless
- 3 user programs memory
- adjustable start delay feature [from 1 min to 99:59 h]
- adjustable hold at set point time for temperature and lighting [for IL/FOT] from 1 min to 100 days, or continuous operating
- adjustable ramps
- overview of set and current parameters while operating
- recording of min, average and max temperature value for each segment
- possibility of temperature calibration by the user
- audible and visual temperature alarm
- operating with temperature priority
- temperature sensor fail alarm
- power failure control system (program continued after restoring power)
- digital timer
- real time clock
- auto-diagnostic function
- internal memory to store up to 2046 data records
- natural (SL/SR/CL) or forced (SL/SR/CL/IL) air convection with fan speed control [for CLW/SLW/SRW 15-115 0 ... 100%, CLW/SLW/SRW 180-1000 and ILW 10 ... 100%]
- automatic fan shut-down after completing the program
- automatic air-flap control [CL/SL/SR]

---

<table>
<thead>
<tr>
<th>Temp. [°C]</th>
<th>T0 20°C</th>
<th>T1 50°C</th>
<th>T2 15°C</th>
<th>T3 70°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time [h]</td>
<td>1h</td>
<td>2h</td>
<td>5h</td>
<td>1h 2h</td>
</tr>
<tr>
<td>Fan speed</td>
<td>off</td>
<td>100%</td>
<td>50%</td>
<td>0%</td>
</tr>
<tr>
<td></td>
<td>0%</td>
<td>100%</td>
<td>50%</td>
<td>0%</td>
</tr>
<tr>
<td></td>
<td>50%</td>
<td>0%</td>
<td>100%</td>
<td>0%</td>
</tr>
<tr>
<td></td>
<td>100%</td>
<td>50%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td></td>
<td>40%</td>
<td>40%</td>
<td>50%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>50%</td>
<td>100%</td>
<td>40%</td>
<td>50%</td>
</tr>
<tr>
<td></td>
<td>100%</td>
<td>50%</td>
<td>40%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>off</td>
<td>100%</td>
<td>50%</td>
<td>0%</td>
</tr>
</tbody>
</table>

---

37
Control panel

- active loop function
- current segment number
- alarms or malfunction
- stand-by button
- program name
- ESC button
- scroll down button
- operating status (heating/cooling)
- LCD graphic display
- current temperature
- set temperature
- current date/time
- ENTER button
- scroll up button

Standard features

- temperature range: SL (+5°C above ambient temp. ... +300°C), SR (+5°C above ambient temp. ... +250°C), CL (+5°C above ambient temp. ... +100°C), IL (0°C up to 70°C / optionally -10°C up to 70°C)
- quality control protocol (at +37°C for CL/IL, at +105°C for SL, at +170°C for SR)
- English instruction manual
- available menu languages: Czech, English, Estonian, French, German, Italian, Polish, Portuguese, Russian, Spanish
- temperature protection class 2.0 to DIN 12880
- open door alarm
- wheels in standard for models 400, 750, 1000
- air-flap diameter for CL/SL 15-180 - Ø40 mm, for CL/SL 240-1000 - Ø60 mm

RS 232 and USB ports for data transfer

- access port: Ø30 mm for models 53-1000 or Ø9 mm for models 15-32
- wire stainless steel shelves
- solid door, internal glass door for CL and IL
- door lock
TOP+ version

All the units in the TOP+ version are equipped with a PID microprocessor controller with a large (5.7") full colour touch screen, intuitive menu and user friendly software. They can be connected to Ethernet network for remote control from any computer, being one of the greatest advantages.

Controller advantages

- multi-segment temperature-time profile (up to 100)
- Administrator function to manage User accounts
- adjustable start delay feature (from 1 min to 99:59 h)
- access control via login
- 7 days programming
- loop function up to 99 times or endless
- adjustable hold at set point time for temperature and lighting (for IL/FIT) from 1 min to 999:59 h, or continuous operating
- adjustable ramps
- overview of set and current parameters while operating
- recording of min, average and max temperature value for each segment
- possibility of temperature calibration by the user
- audible and visual temperature alarm
- operating in temperature or time priority mode
- temperature sensor fail alarm
- power failure control system (program continued after restoring power)
- digital timer
- real time clock
- auto-diagnostic function
- natural (SL/CL) or forced (SL/CL/IL) air convection with fan speed control for CLW/SLW 53/115 0...100%; CLW/SLW 180-1000 and ILW 10...100%
- automatic fan shut-down after completing the program
- automatic air-flap control (CL/SL)

GLP supporting functions

- password protected settings
- 20 user programs memory
- internal memory to store up to 4100 data records for each user, possibility to overview the values on the display or a PC computer in a tabular or graphic form
- USB port to allow direct data recording or transfer to a USB mass storage device
- events registry

TOP+ Control software included (see page 66).
Control panel

- operating status (cooling/heating)
- current temperature
- program name
- logged-in user
- USB flash drive plugged-in
- current date/time/weekday
- alarms
- door open info
- main menu
- overview of program parameter
- internal light ON

Standard features

- temperature range: SL (+5°C above ambient temp. ... +300°C), CL (+5°C above ambient temp. ... +100°C), IL (0°C up to 100°C / optionally -10°C up to 100°C)
- Ethernet cable
- TOP+ Control software
- USB port to allow direct recording and data transfer onto a flash drive
- quality control protocol (at +37°C for CL/IL, at +105°C for SL)
- English instruction manual
- available menu languages: Czech, English, Estonian, French, German, Hungarian, Italian, Latvian, Polish, Portuguese, Romanian, Russian, Spanish
- temperature protection class 3.3 (IL), class 3.1 (CL/SL) to DIN 12880
- open door alarm
- wheels in standard for models 400, 750, 1000
- air-flap diameter for CL/SL 15-180 - Ø40 mm, for CL/SL 240-1000 - Ø60 mm

RS 232 port for data transfer
- LAN port for remote control
- access port: Ø30 mm
- wire stainless steel shelves
- solid door, internal glass door for CL and IL
- USB port to allow direct recording and data transfer to a USB mass storage device
- door lock
Laboratory incubators

Application

- incubation of samples for microbiological determinations
- analysis of thermal resistance of samples subjected to higher temperatures
- antibodies tests
- bacteria tests
- crystallization observations
- cultivation of thermophilic microorganisms
- pharma stability tests
- food industry denaturalizing tests

Laboratory incubators are perfect for incubation of samples at temperatures above ambient up to +100°C.

Calibration

All thermostatic equipment manufactured by POL-EKO-APARATURA can be provided with Calibration Certificate issued by accredited Measurement Laboratory. Detailed information on accreditation is available on website: www.pol-eko.eu.
## Laboratory incubators

### CL

### Parameter

<table>
<thead>
<tr>
<th>Parameter</th>
<th>CL 15</th>
<th>CL 32</th>
<th>CL 53</th>
<th>CL 115</th>
<th>CL 180</th>
<th>CL 240</th>
<th>CL 400</th>
<th>CL 750</th>
<th>CL 1000</th>
</tr>
</thead>
<tbody>
<tr>
<td>chamber capacity [l]</td>
<td>15</td>
<td>32</td>
<td>56</td>
<td>112</td>
<td>180</td>
<td>245</td>
<td>424</td>
<td>749</td>
<td>1005</td>
</tr>
<tr>
<td>air convection</td>
<td>natural (CLN) / forced (CLW)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>door type</td>
<td>double</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>temperature range</td>
<td>+5°C above ambient temperature +100°C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>temperature resolution [°C]</td>
<td>every 0.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>controller</td>
<td>microprocessor with external LCD graphic display</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>interior</td>
<td>acid-proof stainless steel to DIN 14301</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>housing</td>
<td>powder coated sheet</td>
<td>stainless steel linen finish</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>overall dims [mm]</td>
<td>A width 510</td>
<td>590</td>
<td>590</td>
<td>650</td>
<td>650</td>
<td>810</td>
<td>1010</td>
<td>1260</td>
<td>1260</td>
</tr>
<tr>
<td></td>
<td>B height 550</td>
<td>630</td>
<td>700</td>
<td>850</td>
<td>1030</td>
<td>1200</td>
<td>1430</td>
<td>1600</td>
<td>2000</td>
</tr>
<tr>
<td></td>
<td>C depth 470</td>
<td>520</td>
<td>620</td>
<td>710</td>
<td>820</td>
<td>770</td>
<td>780</td>
<td>870</td>
<td>880</td>
</tr>
<tr>
<td>internal dims [mm]</td>
<td>D width 320</td>
<td>400</td>
<td>400</td>
<td>460</td>
<td>470</td>
<td>600</td>
<td>800</td>
<td>1040</td>
<td>1610</td>
</tr>
<tr>
<td></td>
<td>E height 230</td>
<td>320</td>
<td>390</td>
<td>540</td>
<td>720</td>
<td>800</td>
<td>1040</td>
<td>1200</td>
<td>1200</td>
</tr>
<tr>
<td></td>
<td>F depth 200</td>
<td>250</td>
<td>360</td>
<td>450</td>
<td>560</td>
<td>510</td>
<td>600</td>
<td>600</td>
<td>600</td>
</tr>
<tr>
<td>max shelf workload [kg]</td>
<td>-</td>
<td>10</td>
<td>10</td>
<td>25</td>
<td>25</td>
<td>25</td>
<td>25</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>PW version</td>
<td>-</td>
<td>-</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>max unit workload [kg]</td>
<td>W version</td>
<td>-</td>
<td>-</td>
<td>80</td>
<td>120</td>
<td>120</td>
<td>300</td>
<td>300</td>
<td>300</td>
</tr>
<tr>
<td>nominal power [W]</td>
<td>350</td>
<td>350</td>
<td>450</td>
<td>450</td>
<td>650</td>
<td>850</td>
<td>1300</td>
<td>1900</td>
<td>1900</td>
</tr>
<tr>
<td>weight [kg]</td>
<td>-</td>
<td>27</td>
<td>35</td>
<td>50</td>
<td>65</td>
<td>94</td>
<td>126</td>
<td>174</td>
<td>260</td>
</tr>
<tr>
<td>over temperature protection</td>
<td>class 2.0 according to DIN 12880 / class 3.1 (option) / 3.1 in TOP+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>power supply*</td>
<td>230 V 50 Hz</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>shelves fitted/max</td>
<td>1/2</td>
<td>1/3</td>
<td>2/5</td>
<td>2/7</td>
<td>3/9</td>
<td>3/10</td>
<td>3/14</td>
<td>5/16</td>
<td>6/22</td>
</tr>
<tr>
<td>warranty</td>
<td>24 months</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>manufacturer</td>
<td>POL-EKO-APARATURA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* all the above technical data refer to standard units (without optional accessories)

* also available: 230V 60Hz, 115V 60Hz

1. - working capacity of chamber can be smaller
2. - depth doesn’t include 50 mm of power cable
3. - reinforced shelf
4. - reinforced version
5. - on uniformly loaded surface
6. - for units with double door without optional equipment

---

### Options and accessories (icon description see pages 78-79)
Cooled incubators

**Application**
- microbiological tests
- plant growing, microorganisms breeding at precisely controlled environment
- BOD determination
- incubation of samples at specified temperature

**Cooled incubators** are perfect for incubation of samples in a stable environment, regardless of ambient conditions, at temperatures from -10 up to +100°C.

**Calibration**

All thermostatic equipment manufactured by POL-EKÓ-APARATURA can be provided with Calibration Certificate issued by accredited Measurement Laboratory. Detailed information on accreditation is available on website: www.pol-eko.eu.
Cooled incubators

Options and accessories (icon description see pages 78-79)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>ILW 53</th>
<th>ILW 115</th>
<th>ILW 240</th>
<th>ILW 400</th>
<th>ILW 750</th>
</tr>
</thead>
<tbody>
<tr>
<td>air convection</td>
<td></td>
<td></td>
<td></td>
<td>forced</td>
<td></td>
</tr>
<tr>
<td>chamber capacity [l]</td>
<td>56</td>
<td>112</td>
<td>245</td>
<td>424</td>
<td>749</td>
</tr>
<tr>
<td>door type</td>
<td>double/door with viewing window [option]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>temperature range [°C]</td>
<td>-10 (option)/ 0...+70 (+100 for TOP+ version)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>temperature resolution [°C]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>controller</td>
<td>microprocessor with external LCD graphic display</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>interior</td>
<td>acid-proof stainless steel to DIN 1.4301</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>housing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>overall dims [mm]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A width</td>
<td>610</td>
<td>660</td>
<td>820</td>
<td>1040</td>
<td>1260</td>
</tr>
<tr>
<td>B height</td>
<td>960</td>
<td>1100</td>
<td>1430</td>
<td>1680</td>
<td>1910</td>
</tr>
<tr>
<td>C depth</td>
<td>630</td>
<td>720</td>
<td>780</td>
<td>780</td>
<td>880</td>
</tr>
<tr>
<td>internal dims [mm]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D width</td>
<td>400</td>
<td>460</td>
<td>600</td>
<td>800</td>
<td>1040</td>
</tr>
<tr>
<td>E height</td>
<td>390</td>
<td>540</td>
<td>800</td>
<td>1040</td>
<td>1200</td>
</tr>
<tr>
<td>F depth</td>
<td>360</td>
<td>450</td>
<td>510</td>
<td>510</td>
<td>600</td>
</tr>
<tr>
<td>max shelf workload [kg]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PW version</td>
<td>25</td>
<td>25</td>
<td>25</td>
<td>25</td>
<td>-</td>
</tr>
<tr>
<td>max unit workload [kg]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>W version</td>
<td>40</td>
<td>50</td>
<td>50</td>
<td>90</td>
<td>120</td>
</tr>
<tr>
<td>nominal power [W]</td>
<td>450</td>
<td>450</td>
<td>900</td>
<td>1300</td>
<td>1900</td>
</tr>
<tr>
<td>weight [kg]</td>
<td>69</td>
<td>90</td>
<td>140</td>
<td>185</td>
<td>275</td>
</tr>
<tr>
<td>over temperature protection</td>
<td>class 2.0 according to DIN 12880 / class 3.3 (option) / 3.3 in TOP+</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>power supply*</td>
<td>230 V 50 Hz</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>shelves fitted</td>
<td>2/5</td>
<td>2/7</td>
<td>3/10</td>
<td>3/14</td>
<td>5/16</td>
</tr>
<tr>
<td>warranty</td>
<td>24 months</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>manufacturer</td>
<td>POL-EKO-APARATURA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* also available: 230V 60Hz, 115V 60Hz
1 - working capacity of chamber can be smaller
2 - depth doesn’t include 50 mm of power cable
3 - reinforced shelf
4 - reinforced version
5 - on uniformly loaded surface
6 - for units with double door without optional equipment

all the above technical data refer to standard units (without optional accessories)
Innovative and ecological ILP
Peltier-cooled incubators

**Advantages of Peltier-cooled incubators**

**Quiet operation**
The noise generated by the unit has been limited significantly to create more comfortable working conditions in the laboratory.

**Environmentally friendly**
Elimination of compressor and refrigerants ensures environmental protection.

**Lighter and smaller**
The Peltier-element system has reduced the size and weight of the unit.

**Vibration-free**
With the introduction of the Peltier-element system, vibrations previously generated by the compressor have been eliminated.

**Perfect performance**
The cooling system based on the Peltier-element features excellent temperature stability and uniformity. It also improves the temperature recovery time (e.g., after door opening).

**Calibration**

All thermostatic equipment manufactured by POL-EKO-APARATURA can be provided with Calibration Certificate issued by accredited Measurement Laboratory. Detailed information on accreditation is available on website: www.pol-eko.eu.
## Options and accessories (icon description see pages 78-79)

- **INOX**
- **RS**
- **USBK**
- **IQ OQ PQ**
- **KAFKA**
- **1.2.3...**
- **%**
- **RS 422**
- **RS 485**

### Peltier-cooled incubators

**INOX**

- **RS 332**
- **RS 232**
- **RS 485**
- **USBK**

**112**

**ILP 53**

**ILP 115**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>ILP 53</th>
<th>ILP 115</th>
</tr>
</thead>
<tbody>
<tr>
<td>air convection</td>
<td>forced</td>
<td></td>
</tr>
<tr>
<td>chamber capacity [l]</td>
<td>56</td>
<td>112</td>
</tr>
<tr>
<td>door type</td>
<td>double / door with viewing window (option)</td>
<td></td>
</tr>
<tr>
<td>temperature range [°C]</td>
<td>0...70 (max 20°C below ambient temperature)</td>
<td></td>
</tr>
<tr>
<td>temperature resolution [°C]</td>
<td>every 0.1</td>
<td></td>
</tr>
<tr>
<td>controller</td>
<td>microprocessor with external LCD graphic display</td>
<td></td>
</tr>
<tr>
<td>interior</td>
<td>acid-proof stainless steel to DIN 1.4301</td>
<td></td>
</tr>
<tr>
<td>housing</td>
<td>powder coated sheet</td>
<td></td>
</tr>
<tr>
<td>overall dims [mm]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A width</td>
<td>590</td>
<td>650</td>
</tr>
<tr>
<td>B height</td>
<td>710</td>
<td>850</td>
</tr>
<tr>
<td>C depth</td>
<td>690</td>
<td>780</td>
</tr>
<tr>
<td>internal dims [mm]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D width</td>
<td>400</td>
<td>460</td>
</tr>
<tr>
<td>E height</td>
<td>390</td>
<td>540</td>
</tr>
<tr>
<td>F depth</td>
<td>360</td>
<td>450</td>
</tr>
<tr>
<td>max shelf workload [kg]</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>max unit workload [kg]</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>nominal power [W]</td>
<td>500</td>
<td>600</td>
</tr>
<tr>
<td>weight [kg]</td>
<td>69</td>
<td>90</td>
</tr>
<tr>
<td>over temperature protection</td>
<td>class 2.0 to DIN 12880 / class 3.3 (option) / class 3.3 in TOP+</td>
<td></td>
</tr>
<tr>
<td>power supply*</td>
<td>230 V 50 Hz</td>
<td></td>
</tr>
<tr>
<td>shelve fitted/max</td>
<td>2/5</td>
<td>2/7</td>
</tr>
<tr>
<td>warranty</td>
<td>24 months</td>
<td></td>
</tr>
<tr>
<td>manufacturer</td>
<td>POL-EKO-APARATURA</td>
<td></td>
</tr>
</tbody>
</table>

* all the above technical data refer to standard units (without optional accessories)

* also available: 230V 60Hz, 115V 60Hz

1 - on uniformly loaded surface

---

**A**

**B**

**C**

**D**

**E**

**F**
Cooled incubators (ILW) with photoperiodic system

The photoperiodic (FOT) and phytotron (FIT) systems allow day and night simulation. While the FOT option enables turning the light on and off in a program, the FIT option can additionally control the light intensity. The photoperiodic system is designed for cooled incubators in the STD version and the phytotron system for the TOP+ version.

Program possibilities with FOT option
- Day and night simulation software to control light (on/off), time, and temperature separately for each segment
- Temperature range for “night”: -10°C up to +60°C (with IL/T option)
- Temperature range for “day”: +10°C up to +50°C
- Lamps installed in the door or ceiling
- Fluorescent lamp 840 type (daylight) used as standard
- Operating with time priority (see page 80)
- Automatic defrosting function included

Photoperiodic system (* FOT option) for cooled incubators (ILW)**

<table>
<thead>
<tr>
<th>available for models</th>
<th>IL/FOT2S</th>
<th>IL/FOT3S</th>
<th>IL/FOT5D</th>
<th>IL/FOT6D</th>
<th>IL/FOT8D</th>
<th>IL/FOT10D</th>
</tr>
</thead>
<tbody>
<tr>
<td>ILW 53</td>
<td>ILW 115</td>
<td>ILW 53</td>
<td>ILW 115</td>
<td>ILW 240</td>
<td>ILW 400</td>
<td>ILW 750</td>
</tr>
<tr>
<td>ILW 115</td>
<td>ILW 240</td>
<td>ILW 750</td>
<td>ILW 750</td>
<td>ILW 750</td>
<td>ILW 750</td>
<td>ILW 750</td>
</tr>
<tr>
<td>temperature range with photoperiod [°C]</td>
<td>+10...+50°C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>number of lamps in door</td>
<td>-</td>
<td>-</td>
<td>5</td>
<td>6</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>number of lamps in ceiling</td>
<td>2</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>adjustable illumination intensity</td>
<td>no</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

** FOT option is factory preinstalled. There is no possibility to order it separately.
Cooled incubators ([ILW]) with phytotron system

The TOP+ version of cooled incubators (models ILW 115, 240, 400, 750) can be equipped with the FIT system.

Program possibilities with FIT option

- day and night simulation software to control light intensity [%], time, temperature and fan speed separately for each segment
- temperature range for "night": -10°C up to +60°C (with IL/T option)
- temperature range for "day": +10°C up to +50°C
- lamps installed in over-shelf panels [FIT P] or in the door [FIT D]
- fluorescent lamp 840 type (daylight) used as standard
- operating with temperature or time priority (see page 80)
- automatic defrosting function included

Phytotron system ([*/FIT option]) for cooled incubators ([ILW]) in TOP+ version.

<table>
<thead>
<tr>
<th>temperature range with phytotron ON [°C]</th>
<th>IL/115/FIT P</th>
<th>IL/240/FIT P</th>
<th>IL/400/FIT P</th>
<th>IL/750/FIT P</th>
</tr>
</thead>
<tbody>
<tr>
<td>+10 ... +50°C</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>number of over-shelf panels with illumination std/max</td>
<td>1/1</td>
<td>1/2</td>
<td>1/2</td>
<td>1/3</td>
</tr>
<tr>
<td>adjustable illumination intensity</td>
<td>yes</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Drying ovens

Application

- thermal resistance analysis of building materials, electronic and electro-technical components
- tests of properties of products subjected to high temperatures
- drying of wires of papermaking machines
- drying of laboratory glass
- general aging
- preheating
- digestion of proteins
- plant tissues drying
- drug metabolism
- paper drying

Drying ovens are designed to provide high temperatures up to 300°C.

Calibration

All thermostatic equipment manufactured by POL-EKO-APARATURA can be provided with Calibration Certificate issued by accredited Measurement Laboratory. Detailed information on accreditation is available on website: www.pol-eko.eu.
**Drying ovens**

**SL**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>SL 15</th>
<th>SL 32</th>
<th>SL 53</th>
<th>SL 75</th>
<th>SL 115</th>
<th>SL 180</th>
<th>SL 240</th>
<th>SL 400</th>
<th>SL 750</th>
<th>SL 1000</th>
</tr>
</thead>
<tbody>
<tr>
<td>air convection</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>chamber capacity [l]</td>
<td>15</td>
<td>32</td>
<td>56</td>
<td>76</td>
<td>112</td>
<td>180</td>
<td>245</td>
<td>424</td>
<td>749</td>
<td>1005</td>
</tr>
<tr>
<td>door type</td>
<td>solid</td>
<td>solid</td>
<td>door with viewing window (option)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>temperature range</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>temperature resolution [°C]</td>
<td>+5°C above ambient temperature</td>
<td>...-300°C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>controller</td>
<td>microprocessor with external LCD graphic display</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>interior</td>
<td>acid-proof stainless steel to DIN 1.4301</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>housing</td>
<td>INOX/G</td>
<td>powder coated sheet</td>
<td>stainless steel linen finish</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>overall dims [mm]</td>
<td>A width 510</td>
<td>590</td>
<td>590</td>
<td>580</td>
<td>650</td>
<td>650</td>
<td>810</td>
<td>1010</td>
<td>1260</td>
<td>1260</td>
</tr>
<tr>
<td></td>
<td>B height 550</td>
<td>630</td>
<td>700</td>
<td>850</td>
<td>850</td>
<td>1030</td>
<td>1200</td>
<td>1430</td>
<td>1600</td>
<td>2000</td>
</tr>
<tr>
<td></td>
<td>C depth 470</td>
<td>520</td>
<td>620</td>
<td>710</td>
<td>820</td>
<td>770</td>
<td>780</td>
<td>870</td>
<td>880</td>
<td></td>
</tr>
<tr>
<td>internal dims [mm]</td>
<td>D width 320</td>
<td>400</td>
<td>400</td>
<td>400</td>
<td>460</td>
<td>470</td>
<td>600</td>
<td>800</td>
<td>1040</td>
<td>1040</td>
</tr>
<tr>
<td></td>
<td>E height 230</td>
<td>320</td>
<td>390</td>
<td>530</td>
<td>540</td>
<td>720</td>
<td>800</td>
<td>1040</td>
<td>1200</td>
<td>1610</td>
</tr>
<tr>
<td></td>
<td>F depth 200</td>
<td>250</td>
<td>360</td>
<td>360</td>
<td>450</td>
<td>560</td>
<td>510</td>
<td>510</td>
<td>600</td>
<td>600</td>
</tr>
<tr>
<td>max unit workload [kg]</td>
<td>- 20</td>
<td>- 30</td>
<td>- 40</td>
<td>- 40</td>
<td>- 60</td>
<td>- 75</td>
<td>- 90</td>
<td>- 120</td>
<td>- 140</td>
<td>- 140</td>
</tr>
<tr>
<td>nominal power [W]</td>
<td>700</td>
<td>1200</td>
<td>1700</td>
<td>1700</td>
<td>2500</td>
<td>2800</td>
<td>3100</td>
<td>4000</td>
<td>5500</td>
<td>5500</td>
</tr>
<tr>
<td>weight [kg]</td>
<td>27</td>
<td>35</td>
<td>50</td>
<td>60</td>
<td>65</td>
<td>94</td>
<td>126</td>
<td>174</td>
<td>260</td>
<td>330</td>
</tr>
<tr>
<td>over temperature protection</td>
<td>class 2.0 according to DIN 12880 / class 3.1 (option) / 3.1 in TOP+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>power supply*</td>
<td>230 V 50 Hz</td>
<td>400 3/N</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>shelves fitted/max</td>
<td>1/2</td>
<td>1/3</td>
<td>2/5</td>
<td>2/5</td>
<td>2/7</td>
<td>3/9</td>
<td>3/10</td>
<td>3/14</td>
<td>5/16</td>
<td>6/22</td>
</tr>
<tr>
<td>warranty</td>
<td>24 months</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>manufacturer</td>
<td>POL-EKO-APARATURA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*all the above technical data refer to standard units (without optional accessories)*

* also available: 230V 60Hz, 115V 60Hz, 3P 230V 60Hz (according to model)
1 - working capacity of chamber can be smaller
2 - depth doesn't include 50 mm of power cable
3 - reinforced shelf
4 - reinforced version
5 - on uniformly loaded surface
6 - for units with solid door without optional equipment

**Options and accessories** (icon description see pages 78-79)
Drying ovens with nitrogen blow

The European norm ISO 589:2003 Hard Coal - Determination of Total Moisture ensures samples are dried between 105°C - 110°C in a drying oven featuring nitrogen blow possibility with flow equal to about 15x capacity of the oven per hour.

Available models

- SLWN1 - laboratory oven with dry nitrogen blow system of the chamber; the kit includes connections, valves and a laboratory rotameter (which can be calibrated)
- SLWN2 - laboratory oven with dry nitrogen blow system of the chamber; the kit includes connections, valves and a tech rotameter (which cannot be calibrated)

The nitrogen bottle is not supplied.

<table>
<thead>
<tr>
<th>SLWN1 15</th>
<th>SLWN2 15</th>
<th>SLWN1 32</th>
<th>SLWN2 32</th>
<th>SLWN1 53</th>
<th>SLWN2 53</th>
<th>SLWN1 115</th>
<th>SLWN2 115</th>
<th>SLWN1 240</th>
<th>SLWN2 240</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>32</td>
<td>56</td>
<td>112</td>
<td>245</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1 - working capacity of chamber can be smaller

For dimensions see page 50 (models SLW 15, 32, 53, 115, 240)

Calibration

- Calibration in air in 9 points [corners + geometrical center] of the chamber at 1 selected by the Customer temperature in accredited laboratory. Calibration is confirmed by 'Calibration certificate'.
- Calibration in nitrogen in 9 points [corners + geometrical center] of the chamber at 1 selected by the Customer temperature in accredited laboratory. Calibration is confirmed by 'Calibration certificate'.
- Calibration of laboratory rotameter in accredited laboratory. Calibration is confirmed by 'Calibration certificate'.
Simple in operation laboratory drying oven – convenient unit for customers who do not require advanced programming. Easy to use operation is based on a simple controller which allows to program temperature and time.

**Standard features**
- temperature range: +5°C above ambient temperature... +250°C
- quality control protocol [at +105°C]
- English instruction manual
- temperature protection 1.0 class to DIN 12880
- access port: Ø30 mm, right side
- stainless steel shelves
- solid door

**Controller advantages**
- adjustment temperature
- adjustable time 0-72h, or continuous operating
### Drying ovens

**SL SIMPLE**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>SLN 53 SIMPLE</th>
<th>SLW 53 SIMPLE</th>
<th>SLN 115 SIMPLE</th>
<th>SLW 115 SIMPLE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Parameter</strong></td>
<td>SLN 53 SIMPLE</td>
<td>SLW 53 SIMPLE</td>
<td>SLN 115 SIMPLE</td>
<td>SLW 115 SIMPLE</td>
</tr>
<tr>
<td>air convection</td>
<td>natural</td>
<td>forced</td>
<td>natural</td>
<td>forced</td>
</tr>
<tr>
<td>chamber capacity [l]</td>
<td>56</td>
<td>56</td>
<td>109</td>
<td>109</td>
</tr>
<tr>
<td>door type</td>
<td>solid</td>
<td>solid</td>
<td>solid</td>
<td>solid</td>
</tr>
<tr>
<td>temperature range</td>
<td>5°C above ambient temperature  ... +250°C</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>temperature resolution [°C]</td>
<td>every 0.1</td>
<td>every 0.1</td>
<td>every 0.1</td>
<td>every 0.1</td>
</tr>
<tr>
<td>controller</td>
<td>microprocessor with external LCD graphic display</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>interior</td>
<td>stainless steel to DIN 1.4016</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>housing</td>
<td>powder coated sheet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>overall dims [mm]</td>
<td>A width 660</td>
<td>660</td>
<td>720</td>
<td>720</td>
</tr>
<tr>
<td></td>
<td>B height 590</td>
<td>590</td>
<td>730</td>
<td>730</td>
</tr>
<tr>
<td></td>
<td>C depth 620</td>
<td>620</td>
<td>710</td>
<td>710</td>
</tr>
<tr>
<td>internal dims [mm]</td>
<td>D width 390</td>
<td>390</td>
<td>460</td>
<td>460</td>
</tr>
<tr>
<td></td>
<td>E height 390</td>
<td>390</td>
<td>540</td>
<td>540</td>
</tr>
<tr>
<td></td>
<td>F depth 350</td>
<td>350</td>
<td>440</td>
<td>440</td>
</tr>
<tr>
<td>max shelf workload [kg]</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>max unit workload [kg]</td>
<td>40</td>
<td>40</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>nominal power [W]</td>
<td>1700</td>
<td>1700</td>
<td>2500</td>
<td>2500</td>
</tr>
<tr>
<td>weight [kg]</td>
<td>50</td>
<td>50</td>
<td>65</td>
<td>65</td>
</tr>
<tr>
<td>over temperature protection</td>
<td>class 1.0 to DIN 12880</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>power supply*</td>
<td>230 V 50 Hz</td>
<td>230 V 50 Hz</td>
<td>230 V 50 Hz</td>
<td>230 V 50 Hz</td>
</tr>
<tr>
<td>shelves fitted/max</td>
<td>2/5</td>
<td>2/5</td>
<td>2/7</td>
<td>2/7</td>
</tr>
<tr>
<td>warranty</td>
<td>24 months</td>
<td>24 months</td>
<td>24 months</td>
<td>24 months</td>
</tr>
<tr>
<td>manufacturer</td>
<td>POL-EKO-APARATURA</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*all the above technical data refer to standard units (without optional accessories)*

* also available: 230V 60Hz, 115V 60Hz, 3P 230V 60Hz (according to model)

1 - depth doesn’t include 50 mm of power cable

---

### Options and accessories (icon description see pages 78-79)
Sterilizers

Application

- drying of laboratory glass
- hot-air sterilization

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

Calibration

All thermostatic equipment manufactured by POL-EKO-APARATURA can be provided with Calibration Certificate issued by accredited Measurement Laboratory. Detailed information on accreditation is available on website: www.pol-eko.eu.
### Sterilizers are equipped with the following features:

- Factory preset sterilizing programs
- Door locked automatically while sterilizing
- Air-flap closed automatically after launching the program
- 20 user programs memory

Sterilizers are available in the STD version only.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>SR 53</th>
<th>SR 115</th>
<th>SR 240</th>
<th>SR 400</th>
<th>SR 750</th>
<th>SR 1000</th>
</tr>
</thead>
<tbody>
<tr>
<td>air convection</td>
<td>natural (SRN) / forced (SRW)</td>
<td>forced (SRW)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>chamber capacity [l]</td>
<td>56</td>
<td>112</td>
<td>245</td>
<td>424</td>
<td>749</td>
<td>1005</td>
</tr>
<tr>
<td>door type</td>
<td>solid / door with viewing window (option)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>temperature range</td>
<td>5°C above ambient temperature ...+250°C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>temperature resolution [°C]</td>
<td>every 0.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>controller</td>
<td>microprocessor with external LCD graphic display</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>interior</td>
<td>acid-proof stainless steel to DIN 1.4301</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>housing</td>
<td>INOX/G powder coated sheet</td>
<td>stainless steel linen finish</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>overall dims² [mm]</td>
<td>A width</td>
<td>590</td>
<td>650</td>
<td>810</td>
<td>1010</td>
<td>1260</td>
</tr>
<tr>
<td></td>
<td>B height</td>
<td>700</td>
<td>850</td>
<td>1200</td>
<td>1430</td>
<td>1600</td>
</tr>
<tr>
<td></td>
<td>C depth</td>
<td>620</td>
<td>710</td>
<td>770</td>
<td>780</td>
<td>870</td>
</tr>
<tr>
<td>internal dims [mm]</td>
<td>D width</td>
<td>400</td>
<td>460</td>
<td>600</td>
<td>800</td>
<td>1040</td>
</tr>
<tr>
<td></td>
<td>E height</td>
<td>390</td>
<td>540</td>
<td>800</td>
<td>1040</td>
<td>1200</td>
</tr>
<tr>
<td></td>
<td>F depth</td>
<td>380</td>
<td>450</td>
<td>510</td>
<td>510</td>
<td>600</td>
</tr>
<tr>
<td>max shelf workload³ [kg]</td>
<td>-</td>
<td>25</td>
<td>25</td>
<td>25</td>
<td>25</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>PW version</td>
<td>50</td>
<td>50</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>max unit workload [kg]</td>
<td>-</td>
<td>40</td>
<td>60</td>
<td>90</td>
<td>120</td>
<td>140</td>
</tr>
<tr>
<td>nominal power [W]</td>
<td>1700</td>
<td>2500</td>
<td>3100</td>
<td>4000</td>
<td>5500</td>
<td>5500</td>
</tr>
<tr>
<td>weight [kg]</td>
<td>50</td>
<td>65</td>
<td>126</td>
<td>174</td>
<td>260</td>
<td>330</td>
</tr>
<tr>
<td>over temperature protection</td>
<td>class 2.0 to DIN 12880 / class 3.1 (option)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>power supply*</td>
<td>230 V 50 Hz</td>
<td>400 3/N</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>shelves fitted/max</td>
<td>2/5</td>
<td>2/7</td>
<td>3/10</td>
<td>3/14</td>
<td>5/16</td>
<td>6/22</td>
</tr>
<tr>
<td>warranty</td>
<td>24 months</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>manufacturer</td>
<td>POL-EKO-APARATURA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*all the above technical data refer to standard units (without optional accessories)

* also available: 230V 60Hz, 115V 60Hz, 3P 230V 60Hz (according to model)
1 - working capacity of chamber can be smaller
2 - depth doesn’t include 50 mm of power cable
3 - reinforced shelf
4 - on uniformly loaded surface
5 - for units with solid door without optional equipment

### Options and accessories (icon description see pages 78-79)
Pass-through sterilizers

**Application**

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

Standard and optional accessories are the same like for the SR range. Other capacities on request.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>SRWP 115</th>
<th>SRWP 240</th>
</tr>
</thead>
<tbody>
<tr>
<td>air convection</td>
<td>forced</td>
<td></td>
</tr>
<tr>
<td>chamber capacity [l]</td>
<td>105</td>
<td>240</td>
</tr>
<tr>
<td>door type</td>
<td>solid / door with viewing window [option]</td>
<td></td>
</tr>
<tr>
<td>temperature range [°C]</td>
<td>5°C above ambient temperature...+250°C</td>
<td></td>
</tr>
<tr>
<td>temperature resolution [°C]</td>
<td>every 0.1</td>
<td></td>
</tr>
<tr>
<td>controller</td>
<td>microprocessor with external LCD graphic display</td>
<td></td>
</tr>
<tr>
<td>interior</td>
<td>acid-proof stainless steel to DIN 14301</td>
<td></td>
</tr>
<tr>
<td>housing</td>
<td>powder coated sheet</td>
<td></td>
</tr>
<tr>
<td></td>
<td>INOX/G stainless steel linen finish</td>
<td></td>
</tr>
<tr>
<td>overall dims [mm]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>width</td>
<td>700</td>
<td>840</td>
</tr>
<tr>
<td>height</td>
<td>910</td>
<td>1180</td>
</tr>
<tr>
<td>depth</td>
<td>700</td>
<td>770</td>
</tr>
<tr>
<td>internal dims [mm]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>width</td>
<td>460</td>
<td>600</td>
</tr>
<tr>
<td>height</td>
<td>530</td>
<td>800</td>
</tr>
<tr>
<td>depth</td>
<td>430</td>
<td>500</td>
</tr>
<tr>
<td>max shelf workload [kg]</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>PW version</td>
<td>50</td>
<td>100</td>
</tr>
<tr>
<td>max unit workload [kg]</td>
<td>60</td>
<td>90</td>
</tr>
<tr>
<td>W version</td>
<td>120</td>
<td>300</td>
</tr>
<tr>
<td>nominal power [W]</td>
<td>2500</td>
<td>3100</td>
</tr>
<tr>
<td>weight [kg]</td>
<td>65</td>
<td>126</td>
</tr>
<tr>
<td>over temperature protection</td>
<td>class 2.0 to DIN 12880 / class 3.1 [option]</td>
<td></td>
</tr>
<tr>
<td>power supply*</td>
<td>230 V 50 Hz</td>
<td></td>
</tr>
<tr>
<td>shelves fitted/ max</td>
<td>2/7</td>
<td>3/10</td>
</tr>
<tr>
<td>warranty</td>
<td>24 months</td>
<td></td>
</tr>
<tr>
<td>manufacturer</td>
<td>POL-EKO-APARATURA</td>
<td></td>
</tr>
</tbody>
</table>

all the above technical data refer to standard units [without optional accessories]

* also available: 230V 60Hz, 115V 60Hz, 3P 230V 60Hz [according to model]
1 - working capacity of chamber can be smaller
2 - depth doesn’t include 50 mm of power cable
3 - reinforced shelf
4 - reinforced version
5 - on uniformly loaded surface
6 - for units with solid door without optional equipment
Climatic chambers

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

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

Calibration

All thermostatic equipment manufactured by POL-EKO-APARATURA can be provided with Calibration Certificate issued by accredited Measurement Laboratory. Detailed information on accreditation is available on website: www.pol-eko.eu.
**Control panel**

- operating status [cooling/heating]
- current humidity
- current temperature
- program name
- logged-in user
- USB flash drive plugged-in
- current date/time/weekday
- alarms
- door open info
- main menu
- overview of program parameter
- internal light switch

**Standard features**

- temperature range: -10°C ... 60°C (KK) and -10...+100°C (KKS); +10°C ... +50°C [FIT option with light on]
- Ethernet cable
- TOP+ Control software
- quality control protocol [at +25°C, 60%rH]
- English instruction manual
- available menu languages: Czech, English, Estonian, French, German, Hungarian, Italian, Latvian, Polish, Portuguese, Romanian, Russian, Spanish
- temperature protection class 3.3 to DIN 12880
- open door alarm
- automatic defrosting function
- deionized water container [for KK]

- RS 232 port for data transfer
- LAN port for remote control
- access port: Ø30 mm
- wire stainless steel shelves
- USB port to allow direct recording and data transfer to a USB mass storage device
- double door [external solid, internal glass]
- door lock
- wheels with brake
- waste water container [for KK]
Climatic chambers are equipped with a PID microprocessor temperature and humidity (optionally light - */FIT option) controller with a large (5,7’’) full colour touch screen, intuitive menu and user friendly software. They can be connected to Ethernet network for remote control from any computer, being one of their greatest advantages. Climatic chambers are available in the TOP+ version exclusively.

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

### GLP supporting functions
- password protected settings
- 20 user programs memory
- internal memory to store up to 4100 data records for each User, possibility to overview the values on the display or a PC computer in a tabular or graphic form
- USB port to allow direct data recording or transfer to a USB mass storage device
- events registry

### TOP+ Control software included (see page 66).

- parameter set by user
- adjustable start delay (1 min...99:59 h)
- day/night simulation with illumination intensity control (FIT option)
- set humidity
- fan speed control (10...100%)
- segment temperature
- segment time
- ramp time
Climatic chambers with phytotron system

Climatic chambers with phytotron system (*/FIT option) except KKS models

- temperature, humidity and light control
- day/night simulation with light intensity control:
  - lamps in door and side walls
  - lamps in side walls
  - lamps in door
  - lamps in over-shelf panels
- temperature range with light OFF: -10°C up to +60°C
- temperature range with light ON: +10°C up to +50°C
- light colour selection
- max light intensity 15000 LUX per panel [measured 25cm under the light source]

FIT D - Climatic chambers with lamps installed in door
FIT S - Climatic chambers with lamps installed in side walls
FIT DS - Climatic chambers with lamps installed in door and side walls

Climatic chambers equipped with phytotron system can control temperature and humidity, as well as light intensity to simulate day and night conditions. Standard light colour is 840 type and the tubes can be installed in the door, side walls or over-shelf panels.

There are also special LED panels designed for plant growing. As most plants use only a part of the sunlight emission, narrow spectrum and specific colours have been used. A and B chlorophyll absorbance maxima are blue and red colour. Chlorophyll absorbs most energy and strongly influences photosynthesis at blue colour spectrum which intensifies growth. Hyper and far red colours stimulate blooming and proliferation.

<table>
<thead>
<tr>
<th>KK 115</th>
<th>KK 240</th>
<th>KK 350</th>
<th>KK 400</th>
<th>KK 500</th>
<th>KK 700</th>
<th>KK 750</th>
<th>KK 1200</th>
<th>KK 1450</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIT P</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>FIT D</td>
<td>+</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FIT S</td>
<td></td>
<td></td>
<td>+</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FIT DS</td>
<td></td>
<td>+</td>
<td>+</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- far red LED
- hyper red LED
- deep blue LED
- white LED
- 840 daylight tube
Climatic chambers with phytotron system

FIT P version

Climatic chambers with over-shelf panels with light. Depending on the model, there can be between 1 and 3 panels inside the chamber (standard light colour: 840 daylight). The FIT P version includes 1 over-shelf panel and sockets to allow installation of extra panels if required (to be ordered separately). The FIT/R3 option allows to control the light intensity separately for each panel.

<table>
<thead>
<tr>
<th>KK 115</th>
<th>KK 240</th>
<th>KK 400</th>
<th>KK 500</th>
<th>KK 700</th>
<th>KK 750</th>
<th>KK 1200</th>
<th>KK 1450</th>
</tr>
</thead>
<tbody>
<tr>
<td>standard</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>max*</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>max light intensity on shelf</td>
<td>FIT P version</td>
<td>5000</td>
<td>10000</td>
<td>15000</td>
<td>15000</td>
<td>15000</td>
<td>15000</td>
</tr>
</tbody>
</table>

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

FIT P LED version

The user can choose the light colour and intensity for each program segment. The colour modules can be combined, e.g. far red with blue. Dimming allows to set the required level of intensity. This flexibility provides specific light selection for each plant. The LED modules are long-life – after 25000 operating hours they still feature 90% of the nominal efficiency. The unique optics ensures uniform light distribution for each plant. The LED technology also emits very little heat which helps maintain precise temperature inside the chamber.
Climatic chambers with an ultrasonic humidifier are professional and reliable equipment to guarantee stable and precise conditions. They can be used for seed germination, fungus and plant growing or food tests. Perfect climatic conditions allow you to perform stability tests of pharmaceuticals and cosmetics, as well as packaging and electronics.

The ultrasonic humidifier uses piezo-electric generators which convert electrical energy into mechanical vibrations energy. The generators are immersed in deionized water and smash it into very small drops which are consequently sprayed uniformly inside the chamber.

The KKS climatic chambers with a steam humidifier do not emit ultrasounds and therefore allow insects breeding (e.g. Drosophila melanogaster). Compared to the KK chambers, they feature an extended temperature and humidity range and can be used for tests of electronics, plastic or building materials.

The steam humidifier (steam generator) is a closed boiler that produces steam with higher pressure than atmospheric. The heat required to produce steam is obtained by a heater placed in a boiler. Much higher temperature and humidity range is used in more applications in comparison to KK units.

The KK and KKS climatic chambers can be used for pharmaceutical stability tests according to ICH Q1A.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Climatic chamber KK with ultrasonic humidifier</th>
<th>Climatic chamber KKS with steam humidifier</th>
</tr>
</thead>
<tbody>
<tr>
<td>temperature range</td>
<td>-10°C...+60°C</td>
<td>-10°C...+100°C</td>
</tr>
<tr>
<td>relative humidity range</td>
<td>field &quot;A&quot;</td>
<td>field &quot;A+B&quot;</td>
</tr>
<tr>
<td>water supply (conductivity)</td>
<td>deionized (+1 µS/cm)</td>
<td>tap water (125-1250 µS/cm)</td>
</tr>
<tr>
<td>water source</td>
<td>• deionized water container (included)</td>
<td>• water supply system</td>
</tr>
<tr>
<td></td>
<td>• deionizer</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• internal deionized water network</td>
<td></td>
</tr>
<tr>
<td>outflow</td>
<td>• container (included)</td>
<td>• drain system</td>
</tr>
<tr>
<td></td>
<td>• drain system</td>
<td></td>
</tr>
<tr>
<td>power supply</td>
<td>230 V 50 Hz</td>
<td>400 V 50 Hz</td>
</tr>
</tbody>
</table>

working temperature and humidity range for KK and KKS
[the ability to control temperature and humidity]

KK: field A
KKS: field A+B
short-term work area (max. 24h)
## Climatic chambers with ultrasonic humidifier

<table>
<thead>
<tr>
<th>Parameter</th>
<th>KK 115</th>
<th>KK 240</th>
<th>KK 350</th>
<th>KK 400</th>
<th>KK 500</th>
<th>KK 700</th>
<th>KK 750</th>
<th>KK 1200</th>
<th>KK 1450</th>
</tr>
</thead>
<tbody>
<tr>
<td>air convection</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>forced</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>chamber capacity [l]</td>
<td>109</td>
<td>240</td>
<td>322</td>
<td>416</td>
<td>470</td>
<td>600</td>
<td>749</td>
<td>1330</td>
<td>1485</td>
</tr>
<tr>
<td>working capacity [l]</td>
<td>109</td>
<td>240</td>
<td>283</td>
<td>416</td>
<td>392</td>
<td>485</td>
<td>749</td>
<td>1132</td>
<td>1264</td>
</tr>
<tr>
<td>door type</td>
<td>double (external solid, internal glass) / external glass (option)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>temperature range [°C]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FIT version</td>
<td>-0...+60</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>temperature resolution [°C]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>relative humidity range [%]</td>
<td>30...90</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>humidity resolution [%]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>controller</td>
<td>microprocessor with external LCD graphic display</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>interior</td>
<td>acid-proof stainless steel to DIN 1.4301</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>housing</td>
<td>INDIX/G</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-</td>
<td>powder coated sheet</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>stainless steel linen finish</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>overall dims [mm]</td>
<td>A width 650</td>
<td>810</td>
<td>640</td>
<td>1020</td>
<td>650</td>
<td>740</td>
<td>1250</td>
<td>1470</td>
<td>1450</td>
</tr>
<tr>
<td></td>
<td>C depth 960</td>
<td>1020</td>
<td>980</td>
<td>1040</td>
<td>1040</td>
<td>1070</td>
<td>1140</td>
<td>1070</td>
<td>1170</td>
</tr>
<tr>
<td>internal dims [mm]</td>
<td>D width 460</td>
<td>600</td>
<td>480</td>
<td>800</td>
<td>480</td>
<td>540</td>
<td>1040</td>
<td>1270</td>
<td>1270</td>
</tr>
<tr>
<td></td>
<td>D' width -</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>510</td>
<td>600</td>
<td>-</td>
<td>1340</td>
<td>1340</td>
</tr>
<tr>
<td></td>
<td>E height 540</td>
<td>800</td>
<td>1340</td>
<td>1040</td>
<td>1510</td>
<td>1510</td>
<td>1200</td>
<td>1510</td>
<td>1460</td>
</tr>
<tr>
<td></td>
<td>F depth 440</td>
<td>500</td>
<td>500</td>
<td>500</td>
<td>600</td>
<td>660</td>
<td>660</td>
<td>660</td>
<td>760</td>
</tr>
<tr>
<td></td>
<td>I height -</td>
<td>-</td>
<td>1180</td>
<td>-</td>
<td>1360</td>
<td>1360</td>
<td>-</td>
<td>1360</td>
<td>1310</td>
</tr>
<tr>
<td>max shelf workload [kg]</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>20</td>
<td>30</td>
<td>-</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>PW version</td>
<td>50</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>max unit workload [kg]</td>
<td>60</td>
<td>90</td>
<td>100</td>
<td>120</td>
<td>100</td>
<td>150</td>
<td>140</td>
<td>300</td>
<td>300</td>
</tr>
<tr>
<td>nominal power [W]</td>
<td>1350</td>
<td>1550</td>
<td>1850</td>
<td>2250</td>
<td>1850</td>
<td>1850</td>
<td>2850</td>
<td>3450</td>
<td>3450</td>
</tr>
<tr>
<td>weight [kg]</td>
<td>90</td>
<td>140</td>
<td>125</td>
<td>185</td>
<td>130</td>
<td>170</td>
<td>275</td>
<td>220</td>
<td>230</td>
</tr>
<tr>
<td>over temperature protection</td>
<td>class 3.3 to DIN 12880</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>power supply*</td>
<td>230 V 50 Hz</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>warranty</td>
<td>24 months</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>manufacturer</td>
<td>POL-EKO-APARATURA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* all the above technical data refer to standard units (without optional accessories)

* also available: 230V 60Hz, 115V 60Hz, 3P 230V 60Hz (according to model); 400V 50Hz for KK 1200/1450 with phytotron system

1 - external dimensions for units without FIT option, depth doesn’t include 50 mm of power cable

2 - on uniformly loaded surface

3 - reinforced shelf

---

### Options and accessories (icon description see pages 78-79)
Climatic chambers with steam humidifier

<table>
<thead>
<tr>
<th>Parameter</th>
<th>KKS 115</th>
<th>KKS 240</th>
<th>KKS 400</th>
<th>KKS 750</th>
</tr>
</thead>
<tbody>
<tr>
<td>air convection</td>
<td>forced</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>chamber capacity [l]</td>
<td>109</td>
<td>240</td>
<td>416</td>
<td>749</td>
</tr>
<tr>
<td>working capacity [l]</td>
<td>109</td>
<td>240</td>
<td>416</td>
<td>749</td>
</tr>
<tr>
<td>door type</td>
<td>double (external solid, internal glass) / external glass (option)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>temperature range [°C]</td>
<td>10...100</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>temperature resolution [°C]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>relative humidity range [%]</td>
<td>10...90</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>humidity resolution [%]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>controller</td>
<td>microprocessor with external LCD graphic display</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>interior</td>
<td>acid-proof stainless steel to DIN 1.4301</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>housing</td>
<td>-</td>
<td>powder coated sheet</td>
<td>stainless steel linen finish</td>
<td></td>
</tr>
<tr>
<td>overall dims [mm]</td>
<td>A width 640</td>
<td>810</td>
<td>1020</td>
<td>1250</td>
</tr>
<tr>
<td></td>
<td>B height 1440</td>
<td>1600</td>
<td>1850</td>
<td>2000</td>
</tr>
<tr>
<td></td>
<td>C’ depth 830</td>
<td>890</td>
<td>890</td>
<td>1030</td>
</tr>
<tr>
<td>internal dims [mm]</td>
<td>D width 460</td>
<td>600</td>
<td>800</td>
<td>1040</td>
</tr>
<tr>
<td></td>
<td>E height 540</td>
<td>800</td>
<td>1040</td>
<td>1200</td>
</tr>
<tr>
<td></td>
<td>F depth 440</td>
<td>500</td>
<td>500</td>
<td>600</td>
</tr>
<tr>
<td>max shelf workload [kg]</td>
<td>-</td>
<td>10</td>
<td>10</td>
<td>-</td>
</tr>
<tr>
<td>PW version</td>
<td>50</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>max unit workload [kg]</td>
<td>60</td>
<td>90</td>
<td>120</td>
<td>140</td>
</tr>
<tr>
<td>nominal power [W]</td>
<td>2850</td>
<td>3050</td>
<td>3700</td>
<td>4350</td>
</tr>
<tr>
<td>weight [kg]</td>
<td>103</td>
<td>140</td>
<td>185</td>
<td>275</td>
</tr>
<tr>
<td>over temperature protection</td>
<td>class 3.3 to DIN 12880</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>power supply*</td>
<td>400V 60 Hz also available</td>
<td>400 3/N</td>
<td></td>
<td></td>
</tr>
<tr>
<td>shelves fitted/max</td>
<td>2/7</td>
<td>3/10</td>
<td>3/14</td>
<td>5/16</td>
</tr>
<tr>
<td>warranty</td>
<td>24 months</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>manufacturer</td>
<td>POL-EKO-APARATURA</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

all the above technical data refer to standard units (without optional accessories)

* 400V 60 Hz also available  
1 - on uniformly loaded surface  
2 - reinforced shelf

Reverse osmosis system included.

Options and accessories (icon description see pages 78-79)
Software

EasyLab Basic

Using EasyLab Basic software the User can easily download data saved in the unit’s internal memory to the PC. Basic version of EasyLab is available free of charge [download from the website www.pol-eko.com.pl]. In order to keep constant data registration to the PC, create charts or statistical reports, EasyLab Professional version must be purchased.

TOP+ Control software

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!

EasyLab Professional

EasyLab Professional 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 Pt100 temperature sensor, the EasyLab Professional software enables simultaneous recording. Additionally EasyLab Professional software enables programming of devices in TOP+ version, thanks to integrated TOP+ Control application. Available languages: Czech, English, Estonian, French, German, Hungarian, Latvian, Polish, Portuguese, Romanian, Russian, Spanish.

EasyLab Professional features high quality tools for chart making and approximation.

Standard features of EasyLab Professional software:
- report creator
- import data from USB mass storage device
- tabular and graphic form to present data
Thermostatic equipment options and accessories parameters description
Options and accessories

**Internal glass door**
This is standard equipment in CL/IL/KK ranges. This is an additional option available for ST/CHL ranges.
*Order number: */C (factory fitted).*

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

**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 (factory fitted).*

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/KK ranges. In case of CL/IL maximum temperature is reduced to +70°C.
*Order number: GNZ (factory fitted).*

Internal socket allows to plug in additional equipment inside the chamber, e.g. laboratory shaker.
Max socket peak load 300 W.

**Interior lighting**
This is standard equipment in ST/CHL ranges. This is an additional option available for ZL/IL/CL/SL/SR ranges.
*Order number: OWW/OWW LED (factory fitted).*

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). Max working temperature of the unit is reduced to +70°C, for SL/SR ranges to +250°C.
Wire shelf

This is standard equipment in ST/CHL BASIC models. This is an additional option available for ST/CHL BASIC models.
Order number: */P.
Wire shelf is made of steel and covered with plastic. It is provided with slides.

Perforated shelf

This is standard equipment in ZLW-T models. This is an additional option available for ST/CHL/CL/IL/SL/SR/KK ranges and ZLN 85 model.
Order number: */PP.
Perforated shelf is provided with slides. Different depths of the shelf on request.

Full shelf with hole

This is standard equipment in ZLN-T models.
Order number: */PO.
Shelf is provided with slides.

Stainless steel wire shelf INOX

This is standard equipment in CL/IL/SL/SR/KK ranges, ZLN 85 model and in ST/CHL COMF and PREM models. This is an additional option for products mentioned above.
Order number: */P INOX.
INOX wire shelf is made of stainless steel. It is provided with slides.

Reinforced shelf

This is standard equipment in 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/ST/CHL/KK ranges and ZLN-T models.
Order number: */PW.
Reinforced shelf is provided with slides. Maximum shelf workloads and maximum unit workloads can be found in the tables with parameters for certain product ranges.
Options and accessories

**Reinforced version**

This is a standard feature of CL/SL 1000 models. This is an additional option available for CL/IL/SL ranges and ZLN-T 200, 300 models.

**Order number:** */W (factory fitted).

Reinforced version of products 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. Maximum shelf workloads and maximum unit workloads can be found in the tables with parameters for certain product ranges. When a unit in reinforced version is purchased, the reinforced shelves are supplied instead of wire shelves.

**Aluminum drawer with powder coated slides**

This is an additional option available for ST/CHL ranges.

**Order number:** ST/CHL SWP ALU.

The drawer is aluminum, 6 cm deep, provided with pull out powder coated slides set, with 2 compartments longways + 2 across in each section.

**Stainless steel drawer with powder coated slides**

This is an additional option available for ST/CHL ranges.

**Order number:** ST/CHL SWP INOX.

The drawer is stainless steel, 6 cm deep, provided with pull out powder coated slides set, with 2 compartments longways + 2 across in each section.

**Stainless steel drawer with stainless steel slides**

This is an additional option available for ST/CHL ranges.

**Order number:** ST/CHL SWPN INOX.

The drawer is stainless steel, 6 cm deep, provided with pull out stainless steel slides set, with 2 compartments longways + 2 across in each section.

**Pharma organizer**

This is an additional option for ST/CHL 2/3/4/5/6. Consists of 4 drawers.

**Order number:** ORG-FARM.
Stainless steel cuvettes
This is an additional option available for all products ranges.
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 BASIC, COMF, PREM models and ILW STD version.
Order number: */FOT (factory fitted).
Photoperiodic system allows day and night simulation.
See pages 17 and 47 for more details.

Phytotron system
This is an additional option for the KK range, IL TOP+ version and ST 500-1450 PREM TOP+ models
Order number: */FIT (factory fitted).
Phytotron system allows day and night simulation
with smooth illumination control (each 1%) See pages 18, 48 and 60-61 for more details.

Additional Pt 100 temperature sensor
This is an additional option available for CL/IL/SL/SR/KK ranges and ST/CHL PREM TOP+ version.
Order number: Pt 100 (factory fitted).
This option consists of an additional temperature sensor and a sensor’s socket. The additional temperature values can be shown in the display. The user can set the master and slave sensor. This way unit can work according to the sample temperature in which additional Pt 100 sensor is placed.
The sensor may be supplied with a calibration certificate.

Wheels
This is standard equipment in ZLN-T 300, ST/CHL 1200, 1450, CL/IL/SL/SR 400, 750, 1000, and KK range.
This is an additional option available for all product ranges.
Order number: QLK* (factory fitted).
Options and accessories

Table with wheels
This is an additional option available for ST/CHL 1-3, ZLN 85, CL/SL 15, 32, CL/L/SL/SR 53-240 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.

EasyLab Professional software
This is an additional option available for all product ranges. 
Order number: EasyLab Professional. 
All the thermostatic products manufactured by POL-EKO-APARATURA are equipped with an RS 232 port and a USB port and can be connected to a PC. 
The EasyLab Professional software allows to record temperature and/or humidity values. The data (day, time, temperature/humidity values) can be transferred to a PC and displayed in a tabular form which can be also used to generate charts and statistical reports. It can be further stored or exported to the .xls format. See page 66 for more details.

HEPA-fresh air filter
This is an additional option available for CL/SL/SR ranges. 
Order number: HEPA (factory fitted). 
HEPA filter is installed at the air inlet to the chamber.

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. It is necessary to purchase RSK (PC and printer connection cable).

Thermal printer
This is an additional option available for all product ranges. 
Order number: KAFKA. 
Thermal printer enables current temperature, time and date printing. Printing interval is to be set in the unit’s menu. It is necessary to purchase RSK (PC and printer connection cable).

EasyLab Professional software
This is an additional option available for all product ranges. 
Order number: EasyLab Professional. 
All the thermostatic products manufactured by POL-EKO-APARATURA are equipped with an RS 232 port and a USB port and can be connected to a PC. 
The EasyLab Professional software allows to record temperature and/or humidity values. The data (day, time, temperature/humidity values) can be transferred to a PC and displayed in a tabular form which can be also used to generate charts and statistical reports. It can be further stored or exported to the .xls format. See page 66 for more details.

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. It is necessary to purchase RSK (PC and printer connection cable).

Thermal printer
This is an additional option available for all product ranges. 
Order number: KAFKA. 
Thermal printer enables current temperature, time and date printing. Printing interval is to be set in the unit’s menu. It is necessary to purchase RSK (PC and printer connection cable).

HEPA-fresh air filter
This is an additional option available for CL/SL/SR ranges. 
Order number: HEPA (factory fitted). 
HEPA filter is installed at the air inlet to the chamber.
Base on castors
This is an additional option for ST/CHL 1, 2, 3; ZLN 85, CL/SL 15, 32; CL/IL/SL/SR 53-240 models.
Order number: */ST, */ST INOX.
Height and dimensions can be customized.

RS 232 / RS 422 / RS 485 cable
This is an additional option available for all product ranges.
Order number: RSK.
RS 232 cable is a connection cable for a PC or a printer.
RS 422 is a connection cable for a PC.
This cable is indispensable in order to connect PC to the unit equipped with RS 485 interface.
Standard cable length: 5m.

USB cable
This is an additional option available for all product ranges except TOP+ version.
Order number: USBK.
This cable is required to connect a PC to the unit via USB port. Standard cable length: 5m.

RS 422 port / RS 485 port
These are additional options available for all product ranges.
Order number: RS422 or RS485 (factory fitted).
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 to PC.

Container for waste water
This is standard equipment in KK range.
This is an additional option available for KK range.
Order number: KK/K.
This is a plastic container for waste water coming from the chamber. The container is indispensable when it is not possible to connect the unit directly to a drain system.
Options and accessories

Container for deionized water
This is standard equipment in KK range. This is an additional option available for KK range.
Order number: KK/Z.
This plastic container is for deionized water which is indispensable for a proper KK performance. The container is not necessary in case the chamber is plugged directly to a deionizer.

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

Chart recorder
This is an additional option available for ST/CHL 500, 700, 1200, 1450 models.
Order number: */RK (factory fitted).
The built-in chart recorder with constant temperature registration is equipped with a battery back-up, therefore it keeps temperature registration even in case of power shortage. It comes with 100 pieces of registration papers as a start kit.

Magnetic door lock
This is an additional option available for ST/CHL 500, 700, 1200, 1450 models.
Order number: */ZKM (factory fitted).
The magnetic door lock comes with the set of access cards – 5 pcs. RFID card reader enables quick access to the chamber (the reader must be touched with the card in order to open the door). The access is reserved only for authorized Users (card holders).
**FIT panels independent control**

This is an additional option available for the units equipped with FIT option – at least two (2) over-shelf illumination panels.

*Order number: FIT/R3 (factory fitted).*

It allows to control the light intensity independently for each of 2 or 3 over-shelf panels.

---

**Automatic defrosting function**

This is a standard feature of KK range.

This is an additional option available for ST/CHL 500/700/1200/1450 and IL ranges.

*Order number: *PLUS (factory fitted).*

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 the door opening).

---

**Extended temperature range ST/70**

This is a standard feature of ST PREM TOP+ models.

This is an additional option available for ST BASIC, COMF and PREM version.

*Order number: ST/70 (factory fitted).*

This is an extended temperature range up to +70°C (standard temperature range in ST BASIC, COMF and PREM: +3°C...+40°C).

---

**Low temperature version**

This is an additional option available for CHL 500, 700, 1200, 1450 models and IL range.

*Order number: */T (factory fitted).*

It extends temperature range down to -10°C (standard temperature range starts from 0°C).

---

**Calibration of the chamber**

This is an additional option available for all product ranges.

*Order numbers: BRT/9/L, BRT/1P/L, BRT/2P/L, IQ, OQ, PQ (factory fitted).*

Measurements are performed at 9 points of the chamber (corners + geometric center) or at 5 points on the shelf (corners + geometric center) at the temperature selected by the user.

IQ, OQ, PQ qualifications are available too (see page 10 for more details).

---

**Humidity measurement**

This is an additional option available for CL/IL ranges and ST/CHL PREM TOP+ models.

*Order number: PHR (factory fitted).*

This option is not humidity control but humidity measurement. The user can browse humidity values in the unit's display. Maximum temperature of the unit is reduced to +70°C.

---

**Fan speed control**

This is a standard feature of ST/CHL PREM TOP+

This is an additional option available for ST/CHL BASIC, COMF, PREM models.

*Order number: ST/CHL WENT (factory fitted).*

It allows to control the fan speed in the range of 50% to 100%. Different fan speed can be set for each program segment separately.

---

**Non-standard access port**

This is an additional option available for all product ranges.

*Order number: OCZ/N (factory fitted).*

Available diameters: 20 mm, 60 mm, 100 mm.
Over temperature protection class 1.0 and class 2.0 according to DIN 12880

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 ST PREM models.

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 operation, 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 3.1 to DIN 12880 is a standard function for the CL/SL equipment in the TOP+ version, and optional for the CL/SL/SR ranges in the STD version.

Order number: */3.1 (factory fitted).

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 operation automatically.
**Under temperature protection class 3.2 according to DIN 12880**

Under temperature protection class 3.2 to DIN 12880 is a standard function for CHL PREM TOP+ version and optional for CHL BASIC, COMF, PREM, ZL COMF and PREM models.

*Order number: */3.2 (factory fitted).*

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 back above the set limit, the unit will resume operation automatically.

**Over/under temperature protection class 3.3 according to DIN 12880**

Over/under temperature protection class 3.3 to DIN 12880 is a standard function for the KK, ST PREM TOP+ and IL in the TOP+ version. It is an additional option for ST BASIC, COMF, PREM and IL in the STD version.

*Order number: */3.3 (factory fitted).*

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 the compressor. When the temperature goes back to the permitted range, the unit will resume operation automatically.
<table>
<thead>
<tr>
<th>Options and accessories</th>
<th>ST</th>
<th>CHL</th>
<th>ZL</th>
<th>ZL-UT</th>
<th>CL</th>
<th>IL</th>
<th>SL</th>
<th>SR</th>
<th>KK</th>
<th>KKS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Options and accessories</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internal glass door</td>
<td></td>
<td></td>
<td>P</td>
<td>TOP+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Order number: */C</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>External glass door</td>
<td></td>
<td></td>
<td>P</td>
<td>TOP+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Order number: */A</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Door with viewing window</td>
<td></td>
<td></td>
<td>P</td>
<td>TOP+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Order number: */A</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wire shelf</td>
<td></td>
<td></td>
<td>P</td>
<td>TOP+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Order number: */INOX</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stainless steel wire shelf</td>
<td></td>
<td></td>
<td>P</td>
<td>TOP+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Order number: */INOX</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perforated shelf</td>
<td></td>
<td></td>
<td>P</td>
<td>TOP+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Order number: */PP</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full shelf with hole</td>
<td></td>
<td></td>
<td>P</td>
<td>TOP+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Order number: */P</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reinforced shelf</td>
<td></td>
<td></td>
<td>P</td>
<td>TOP+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Order number: */PW</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stainless steel cuvettes</td>
<td></td>
<td></td>
<td>P</td>
<td>TOP+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Order number: KUW SN*/</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aluminum drawer with powder coated slides</td>
<td></td>
<td></td>
<td>P</td>
<td>TOP+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Order number: ST/CHL/SPW ALU</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stainless steel drawer with powder coated slides</td>
<td></td>
<td></td>
<td>P</td>
<td>TOP+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Order number: ST/CHL/SPW INOX</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stainless steel drawer with stainless steel slides</td>
<td></td>
<td></td>
<td>P</td>
<td>TOP+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Order number: ST/CHL/SPW INOX</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pharma organizer</td>
<td></td>
<td></td>
<td>P</td>
<td>TOP+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Order number: ORG-FARM</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wheels</td>
<td></td>
<td></td>
<td>P</td>
<td>TOP+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Order number: QLK*</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Table with wheels</td>
<td></td>
<td></td>
<td>P</td>
<td>TOP+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Order number: */S or */S INOX</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Base on castors</td>
<td></td>
<td></td>
<td>P</td>
<td>TOP+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Order number: */ST or */ST INOX</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Automatic defrosting function</td>
<td></td>
<td></td>
<td>P</td>
<td>TOP+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Order number: *PLUS</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low temperature version</td>
<td></td>
<td></td>
<td>P</td>
<td>TOP+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Order number: */T</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extended temperature range to 70°C</td>
<td></td>
<td></td>
<td>P</td>
<td>TOP+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Order number: ST/70</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reinforced version</td>
<td></td>
<td></td>
<td>P</td>
<td>TOP+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Order number: */W</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interior lighting</td>
<td></td>
<td></td>
<td>P</td>
<td>TOP+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Order number: OWW/OWW LED</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fan speed control</td>
<td></td>
<td></td>
<td>P</td>
<td>TOP+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Order number: ST/CHL WENT</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phytotron system</td>
<td></td>
<td></td>
<td>P</td>
<td>TOP+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Order number: */FIT</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Photoperiodic system</td>
<td></td>
<td></td>
<td>P</td>
<td>TOP+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Order number: */FIT</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FIT panels independent control</td>
<td></td>
<td></td>
<td>P</td>
<td>TOP+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Order number: FIT/R3</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Door opening counter</td>
<td></td>
<td></td>
<td>P</td>
<td>TOP+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Order number: LOD</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Options and accessories

<table>
<thead>
<tr>
<th></th>
<th>ST</th>
<th>CHL</th>
<th>ZL</th>
<th>ZL-UT</th>
<th>CL</th>
<th>IL</th>
<th>SL</th>
<th>SR</th>
<th>KK</th>
<th>KKS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>P</strong></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>TOP+</strong></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>P</strong></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>TOP+</strong></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>P</strong></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>STD</strong></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>TOP+</strong></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>STDTOP+</strong></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>STD</strong></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>TOP+</strong></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>STDTOP+</strong></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>STD</strong></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>TOP+</strong></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

- **✓** - available
- **-** - unavailable
- **S** - standard equipment
- **P** - BASIC, COMFORT, PREMIUM

- **RS 232 cable**
  - Order number: RSK
- **Order number: Kafka** thermal printer
  - Order number: KAFKA
- **Dot printer**
  - Order number: EPSON
- **EasyLab - Professional software**
  - Order number: EasyLab Professional
- **Calibration and IQ, OQ, PQ qualification**
  - Order number: BRT/*L or IQ/OQ/PQ
- **Over temperature protection 3.1 class according to DIN 12880**
  - Order number: */3.1
- **Over temperature protection 3.2 class according to DIN 12880**
  - Order number: */3.2
- **Over temperature protection 3.3 class according to DIN 12880**
  - Order number: */3.3
- **Chart recorder**
  - Order number: */RK
- **Magnetic door lock**
  - Order number: */ZKM
- **HEPA - fresh air filter**
  - Order number: HEPA
- **Humidity measurement**
  - Order number: PHR
- **Non-standard access port for external sensor**
  - Order number: OCZ/N
- **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
- **Low temperature protection 3.1 class according to DIN 12880**
  - Order number: */3.1
- **Low temperature protection 3.2 class according to DIN 12880**
  - Order number: */3.2
- **Chart recorder**
  - Order number: */RK
- **Magnetic door lock**
  - Order number: */ZKM
- **RS 422 cable**
  - Order number: RSK/422
- **RS 485 cable**
  - Order number: RSK/485
- **USB cable**
  - Order number: USBK
Features description

Defrosting function
Defrosting is performed automatically but it has to be launched manually by the user at the most suitable time [e.g. when there are no samples in the chamber]. Temperature increase in the chamber by about 20-30°C, therefore it cannot be turned on during regular work (so not to disturb temperature stability 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 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.

E-mail info
This is a standard feature of all products in TOP+ version. These are e-mail notifications on set temperature (and humidity in KK) values exceeding, sent to max 2 e-mail addresses. Internet connection is necessary in order to use this feature.

Ethernet connection and remote control via Internet
This is standard feature of all products in TOP+ version. The units can be both controlled and monitored via Internet. It is also possible to connect several units at the same time and control them from one PC.

Test results memory
All the products except SL SIMPLE ovens are equipped with test results memory. It features memory module that allows to store 2046 data records (in case of TOP+ version: 4100 for each User) and send it to a PC at any time [EasyLab Basic, TOP+ Control or EasyLab Professional software are necessary along with RSK or USBK cables].

Access port for external sensor
All the products are equipped with a standard access port. It is placed in the left side of the chamber (in case of SL SIMPLE – in the right). Access port can be used to insert an external temperature sensor, which has been secured with a silicon cup.

Door lock
All the products except SL SIMPLE ovens are equipped with the door lock.

Temperature program priority
Equipment which features temperature program priority work according to the following rule: the unit achieves set temperature first and then starts time countdown. In this case primary parameter is temperature.

Time program priority
Equipment which features time program priority work according to the following rule: the unit starts the process of achieving set temperature simultaneously with time being countdown. In this case primary parameter is time.

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

Administrator function
This is a standard feature of all products in TOP+ version. It allows to manage user accounts and supports GLP.

7 days programming
This is a standard feature of all products in TOP+ version. It allows user to set independent program for each day of the week [e.g. Monday, 9.00-15.00, at 37°C].

Open door alarm
All the products are equipped with an open door alarm. After the door is being opened the alarm goes off (sound alarm and message appears on the display) according to the set by the user alarm delay.

RS 232 / USB port (N/A TOP+)
All the products are equipped with RS 232 and USB ports. This feature enables on-going data transmit to the PC and its registration, e.g. temperature and/or humidity values. For this reason, it is necessary to purchase a connection cable (RSK or USBK) and EasyLab Professional software. Only TOP+ version products feature direct data saving facility to a USB mass storage device.

Temperature (and humidity in KK) calibration
This is a standard feature of all products in TOP+ version and CL/IL/SL in STD version. Thanks to this feature the user has got a possibility to calibrate the temperature (and humidity in KK).
03

Other laboratory equipment
Other laboratory equipment

- RT 2014 data logger 83
- Colony counter 87
- Laboratory shakers 88
- Stationary samplers 90
RT 2014 data logger

The new generation of RT data loggers enables continuous measurement of temperature and/or humidity values in thermostatic equipment (thermostatic chambers, incubators, refrigerators, freezers, etc...), as well as in the air. In case of temperature increases beyond acceptable range (set by the user) or in case of power failures, the RT 2014 logger can send SMS notifications to selected phone numbers. The following notifications are available:

- alarm on temperature fluctuations (high/low) with possibility of alarm notification delay
- alarm on 230V power shortage with possibility of alarm notification delay
- automatic reports at certain time of the day or on request

Data logger models

**RT 2014_1T** - temperature or humidity data logger with GSM, single channel model dedicated to temperature or humidity measurements in the thermostatic chamber (single channel for one Pt 100 sensor or for one humidity sensor); internal memory (stored data can be downloaded to a PC with EasyLab Professional software); GSM (sends SMS alarms for 5 phone numbers).

**RT 2014_2T** - temperature and/or humidity data logger with GSM module, double channel model dedicated to temperature and/or humidity measurements in the thermostatic chamber (double channel for two Pt 100 sensors or one Pt 100 and one humidity sensor); internal memory (stored data can be downloaded to a PC with EasyLab Professional software); GSM (sends SMS alarms for 5 phone numbers).

**RT 2014_1T_WIFI** - temperature or humidity data logger with Wi-Fi single channel model dedicated to temperature or humidity measurements in the thermostatic chamber (single channel for one Pt 100 sensor or for one humidity sensor); internal memory (stored data can be downloaded to a PC with EasyLab Professional software).

**RT 2014_2T_WIFI** - temperature or humidity data logger with Wi-Fi, double channel model dedicated to temperature or humidity measurements in the thermostatic chamber (double channel for two Pt 100 sensors or one Pt 100 and one humidity sensor); internal memory (stored data can be downloaded to a PC with EasyLab Professional software).
The data logger logged in to the GSM network has the option of sending out alarms to 5 recipients in the form of SMS, ringing or both forms simultaneously. There is possibility to check the recorder status by initiating a connection with the phone number of the logger. It is required to have active SIM card of the selected GSM network operator.

**Accessories**

<table>
<thead>
<tr>
<th>Model</th>
<th>Photo</th>
<th>Description</th>
<th>Measuring range</th>
<th>Cable length</th>
</tr>
</thead>
<tbody>
<tr>
<td>PT 100 H</td>
<td></td>
<td>temperature sensor for RT 2014 data logger, for high temperatures (recommended for CL/SL)</td>
<td>temp.: 0...+400°C</td>
<td>length 2.5 m</td>
</tr>
<tr>
<td>PT 100 S</td>
<td></td>
<td>standard temperature sensor for RT 2014 data logger (recommended for ST/CHL/IL/KK)</td>
<td>temp.: -40...-180°C</td>
<td>length 2.5 m</td>
</tr>
<tr>
<td>PT 100 L</td>
<td></td>
<td>temperature sensor for RT 2014 data logger, for low temperatures (recommended for ZL)</td>
<td>temp.: -110...-120°C</td>
<td>length 2.5 m</td>
</tr>
<tr>
<td>RH_STD</td>
<td></td>
<td>humidity and temperature sensor for RT 2014 data logger (recommended for ST/IL)</td>
<td>rH: 0...80% temp.: 0...60°C</td>
<td>length 2.5 m</td>
</tr>
<tr>
<td>RH_PREM</td>
<td></td>
<td>humidity and temperature sensor for RT 2014 data logger (recommended for KK)</td>
<td>rH: 0...100% temp.: -50...100°C</td>
<td>length 2.5 m</td>
</tr>
<tr>
<td>Software</td>
<td></td>
<td>software for making settings and downloading data</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>FIT</td>
<td></td>
<td>fitting</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
RT 2014 Wi-Fi data logger

RT 2014 monitoring system complies with requirements of Sanitary-Epidemiological Stations on vaccines storage conditions.

All available alarms ensure safe and proper storage of significant value vaccines in refrigerators. Temperature fluctuations beyond acceptable range not only can cause financial losses, but also health and life threat for people who undergo vaccinations.

- GSM logger available
- Notifications on alarms via SMS, Flash message or incoming call
- Status control via phone call

RT 2014 app allows communication between data logger and smartphone (available for download in Google Play)

- Direct data transfer to RT Wi-Fi app

in case of malfunction, real-time monitoring is still possible

- LAN operating
- Fulfils security restrictions

Go to website
All thermostatic equipment manufactured by POL-EKO-APARATURA can be provided with Calibration Certificate issued by accredited Measurement Laboratory. Detailed information on accreditation is available on website: www.pol-eko.eu.
Colony counter

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

Standard features

- 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 unit featuring quick and precise counting.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>counting field diameter [mm]</td>
<td>120</td>
</tr>
<tr>
<td>display</td>
<td>LED (0...999)</td>
</tr>
<tr>
<td>magnifying glass</td>
<td>2.5 X</td>
</tr>
<tr>
<td>illumination</td>
<td>20 W ringlight</td>
</tr>
<tr>
<td>dims [mm]</td>
<td>width x depth x height</td>
</tr>
<tr>
<td></td>
<td>300 x 325 x 90</td>
</tr>
<tr>
<td>weight [kg]</td>
<td>4.9</td>
</tr>
<tr>
<td>nominal power [W]</td>
<td>22</td>
</tr>
<tr>
<td>voltage 50/60 Hz [V]</td>
<td>230</td>
</tr>
<tr>
<td>warranty</td>
<td>24 months</td>
</tr>
<tr>
<td>manufacturer</td>
<td>POL-EKO-APARATURA</td>
</tr>
</tbody>
</table>

* 115V 60Hz also available
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...500 rpm
- shaking mode: from 1 min to 99 h, or continuous operation
- 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
- Anti-skid mat

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>LS 280</th>
<th>LS 350</th>
<th>LS 500</th>
<th>LS 700</th>
</tr>
</thead>
<tbody>
<tr>
<td>movement</td>
<td>orbital</td>
<td>orbital</td>
<td>orbital</td>
<td>orbital</td>
</tr>
<tr>
<td>controller</td>
<td>microprocessor</td>
<td>microprocessor</td>
<td>microprocessor</td>
<td>microprocessor</td>
</tr>
<tr>
<td>display</td>
<td>LCD display</td>
<td>LCD display</td>
<td>LCD display</td>
<td>LCD display</td>
</tr>
<tr>
<td>speed range [rpm]</td>
<td>30 ... 500</td>
<td>30 ... 300</td>
<td>30 ... 300</td>
<td>30 ... 300</td>
</tr>
<tr>
<td>accuracy [rpm]</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>amplitude [mm]</td>
<td>5</td>
<td>5</td>
<td>5 or 10</td>
<td>5 or 10</td>
</tr>
<tr>
<td>max load capacity [kg]</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>shaking mode</td>
<td>1 min ... 99 h or continuous operation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>dimensions without / with shaking table [mm]</td>
<td>width</td>
<td>height</td>
<td>depth</td>
<td>width</td>
</tr>
<tr>
<td></td>
<td>320</td>
<td>120 / 220</td>
<td>330</td>
<td>390</td>
</tr>
<tr>
<td>fits to cooled incubator</td>
<td>ILW 53</td>
<td>ILW 115</td>
<td>ILW 240</td>
<td>ILW 400</td>
</tr>
<tr>
<td>nominal power [W]</td>
<td>60</td>
<td>60</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>weight with shaking table [kg]</td>
<td>10</td>
<td>15</td>
<td>22</td>
<td>25</td>
</tr>
<tr>
<td>ambient temperature [°C]</td>
<td></td>
<td></td>
<td></td>
<td>+10...+40</td>
</tr>
<tr>
<td>humidity [%]</td>
<td></td>
<td></td>
<td></td>
<td>up to 70</td>
</tr>
<tr>
<td>voltage 50/60Hz [V]</td>
<td></td>
<td></td>
<td></td>
<td>230</td>
</tr>
<tr>
<td>warranty</td>
<td></td>
<td></td>
<td></td>
<td>24 months</td>
</tr>
<tr>
<td>manufacturer</td>
<td></td>
<td></td>
<td></td>
<td>PDL-EKO-APARATURA</td>
</tr>
</tbody>
</table>
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, suitable for flasks of the following capacities: 25ml, 50ml, 100ml, 250ml, 500ml, the handles shall be ordered separately.

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

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.
- sampler viewer program (for samplers equipped with SD card)

Representative sample taking according to PN-ISO 5667 directive.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>PP 2002+</th>
<th>PP 2002E</th>
<th>PP 2002M</th>
</tr>
</thead>
<tbody>
<tr>
<td>sampling system</td>
<td>vacuum system</td>
<td>peristaltic pump</td>
<td>peristaltic pump / vacuum system</td>
</tr>
<tr>
<td>sample storing</td>
<td>stable temperature +4°C regardless of ambient conditions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>menu language</td>
<td>English, French, Polish, Czech, Romanian, Lithuanian, Italian</td>
<td></td>
<td></td>
</tr>
<tr>
<td>medium</td>
<td>liquid media of min conductivity 20 µS/cm and max temp. 60°C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>hose blowing</td>
<td>before and after sample taking</td>
<td></td>
<td></td>
</tr>
<tr>
<td>sampling mode</td>
<td>automatic time proportional, flow proportional, event or manual</td>
<td></td>
<td></td>
</tr>
<tr>
<td>sampling height [m]</td>
<td>max 8 / up to 30 [option]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>sample volume [ml]</td>
<td>regulated 30...250/500</td>
<td>regulated 10...9990</td>
<td>regulated 30...250/500 or 10...9990</td>
</tr>
<tr>
<td>hose length [m]</td>
<td>8 standard</td>
<td></td>
<td></td>
</tr>
<tr>
<td>hose diameter [mm]</td>
<td>12</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>distributor</td>
<td>round</td>
<td></td>
<td></td>
</tr>
<tr>
<td>number of bottles x capacity [l]</td>
<td>24 x 1; 12 x 2.8; 4 x 10; 1 x 25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>overall dims [mm]</td>
<td>width</td>
<td>630</td>
<td>630</td>
</tr>
<tr>
<td></td>
<td>height</td>
<td>1070</td>
<td>1325</td>
</tr>
<tr>
<td></td>
<td>depth</td>
<td>660</td>
<td>660</td>
</tr>
<tr>
<td>weight [kg]</td>
<td>90</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>housing</td>
<td>acid-proof stainless steel with 40 mm insulation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ambient temperature [°C]</td>
<td>-20…+45</td>
<td></td>
<td></td>
</tr>
<tr>
<td>nominal power [W]</td>
<td>350</td>
<td>450</td>
<td></td>
</tr>
<tr>
<td>controller</td>
<td>microprocessor, graphic display</td>
<td></td>
<td></td>
</tr>
<tr>
<td>programming</td>
<td>5 programs, 8 tasks each</td>
<td></td>
<td></td>
</tr>
<tr>
<td>data logging</td>
<td>SD card (option)</td>
<td></td>
<td>SD card</td>
</tr>
<tr>
<td>input signals</td>
<td>8 analogue, 4 binary</td>
<td></td>
<td></td>
</tr>
<tr>
<td>output signals</td>
<td>4 binary</td>
<td></td>
<td></td>
</tr>
<tr>
<td>communication</td>
<td>RS 485, MODBUS RTU / options: MODBUS TCP, PROFIBUS, modem GSM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>installation site</td>
<td>indoor or outdoor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>power supply</td>
<td>230 V 50 Hz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>warranty</td>
<td>24 months</td>
<td></td>
<td></td>
</tr>
<tr>
<td>manufacturer</td>
<td>POL-EKO-APARATURA</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Laboratory furniture
Compact Lab
Fume hoods
Compact Lab 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 based on A, C, D - type frames or pedestal covered by chemically resistant epoxy paint, featuring easy leveling, plastic feet;
- Module system – possibility of extension in the future
- Wide selection of worktops
- Possibility to choose height of stands: 900 mm (standing work) or 750 mm (sitting work)
- Cabinets made of galvanized steel, covered by chemically resistant epoxy powder paint on light grey colour (RAL 7035)
- Various configuration of cabinets: right/left doors, drawer and door, drawers
- Self-closing hinges and slides
- Possibility to place door lock for drawers and doors
- Wide range of additional accessories – sinks, armature, drains, eye-washers, emergency showers, top sections with different length shelves, bridges, electrical sockets, gas valves
- Safety of work guaranteed by compliance with PN-EN 13150 and PN-EN14727 norm
- Consulting, projects and visualizations

Conformity certificate for Compact Lab furniture
Suspended bridge
Island with suspended bridge for media with various configurations of metal underbench cabinets.

Shelf with marine edges
Pull-out shelf with marine edges in metal underbench cabinet with double door and ½ drawer.

Cabinet on wheels
Cabinet (container) on wheels, with lock. Height 480 mm and 630 mm (without wheels), width 450 mm and 600 mm. Possible variants with single door, single door and drawer, with 3 or 4 drawers.

Pharmacy racks
Pharmacy racks with lockable cabinets. Standard shelf workload is 20kg, reinforced shelf workload is 140kg (with 120 cm cabinet width).

Steel columns with shelves
Steel columns with shelves for media: water, electricity, gas; designed for wall tables and islands.

Frames
Supporting frames made of steel profile type A, C, Ø, covered by chemically resistant epoxy paint, completed with adjustable, plastic feet with levelling and adjusting of height; possible realization of cabinets on plinths - without using frames.
Weighing table

Weighing table, the structure of which is supported on two separate frames. The first is made of powder coated sheet and is a form of aesthetic housing, on the second anti-vibration granite slab with dimensions of 400 x 400 mm is placed. Depending on the width, it may have one or two granite slabs.

Wall table

Wall table, L-shaped with the position to wash. Construction is based on C-frame type, made of high-grade steel with rectangular, closed profile. Worktop made of 20 mm phenolic resin. Under the worktop are placed underbench cabinets, including installation cabinet under sink.

Drawers with organizer

Free-standing cabinet [rack] having in the lower part drawers with organizer, equipped with silent closing system and full pull-out.

Island table

Island table with the position to wash and steel columns with shelves in which electrical sockets and water installation are installed. Laboratory fittings are covered by chemically resistant polyamide coating. Worktops and sinks are made of epoxy resin in grey colour. Under worktop are placed underbench metal cabinets with various configurations of door and drawers.

Transfer window

Transfer window with stainless steel worktop and wall hood. Solution often used in clean rooms.

Visualizations

Together with the offer, we can prepare project and visualization in 3DVIA program customized to the individual customer needs.
ACID PROOF STAINLESS STEEL – worktop made of steel grade ØH18N9 (AISI 304, DIN 1.4301). High mechanical and thermal resistance. Possibility to order worktop with marine edge.

DURCON – worktop made of epoxy resin. This material has monolithic and ideally homogenous structure on the whole thickness. It characterizes very low permeability, high resistance on high temperature, hardness comparable with stone and without stratification or fractures. DURCON is highly resistant to most acid and other chemical compounds and used in laboratory works as well as discoloration which is the result of pigment. Available thickness: 19 or 25 mm with or without marine edge.

QUARTZ-GRANITE CONGLOMERATE – worktop made of quartz-granite conglomerate with polyester resin. This kind of worktop characterizes high mechanical resistance and smooth surface. Possibility to order also marine edge worktop. Thickness: 20 mm.

MAX RESISTANCE – laboratory worktop made of pressure laminate. It consists of hard black core (manufactured as a result of pressing of cellulose fibres in high pressure and temperature) which is covered both sided with layer of special paper and melamine resin. This material is non-flammable and does not absorb moisture. Surface is resistant on many chemical substances. Thickness: 4-20 mm.

LAMINATE – worktop made of chipboard covered on the outside with layer of HPL laminate. Because of its limited chemical and physical resistance, laminate worktops are applicable mainly as tables under apparatus, subsidiary tables or laboratory desks.

SOLID CERAMIC – this worktop is homogenous in the whole section, glazed with very chemically and mechanically resistant surface. Possibility to order flat or with marine edge.
### Chemical resistance table of selected worktops - comparison test

<table>
<thead>
<tr>
<th>Worktops</th>
<th>Epoxy resin (Durcon)</th>
<th>Quartz-granite conglomerate (Quarella)</th>
<th>Phenolic resin (Max resistance)</th>
<th>Solid ceramic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical environment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Acetone</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Acetonitrile</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Alizarin</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Ethyl alcohol 50%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Ethyl alcohol 95%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Ammonia 25%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Giemsa’s Stain</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Wright’s Stain</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Benzene</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Acetic oxide</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Aniline blue</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Methylene blue</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. 2-Butane</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. Sodium chloride 10%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. Ferric chloride</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. Potassium dichromate solution in sulfuric acid</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. Carbon tetrachloride</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18. Congo red</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19. 1,2-Dichloroethane</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20. Dichloroethane</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21. Potassium dichromate</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22. N, N-Dimethylformamide</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23. 1,4-Dioxane</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24. Eosin</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25. Diethyl ether</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26. Phenol</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27. Crystal violet</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28. Methyl violet</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29. Formaldehyde 37%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30. Carboxic fuchsin</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>31. Alkaline fuchsin</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>32. Furfural</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>33. Ethylene glycol</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>34. N-Hexane</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>35. Heptane</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>36. Izooctane</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>37. Crystalline iodine</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>38. Potassium iodide 10%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>39. Carmine</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40. Xylene</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>41. Nitric acid 10%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**The conditions of the test:**
In the case of non-volatile substances, the reagent of app. 1/2 cm³ was placed on the tested sample of the material. Used in further tests chemicals were covered on the surface of the tested sample of the material with the glazed surface to slow down the evaporation process. In the case of volatile reagents, soaked cotton was placed on the tested sample of the material and it was covered with the glass lid. The test had run for 16 hours; then the surface of the tested sample of the material was washed with water and the soap, then dried. The above table shows the test results.
Chemical resistance table of selected worktops

<table>
<thead>
<tr>
<th>Chemical environment</th>
<th>No effect</th>
<th>Slight discoloration</th>
<th>Discoloration</th>
</tr>
</thead>
<tbody>
<tr>
<td>42. Nitric acid 65%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>43. Chromic acid 40%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>44. Citric acid 10%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>45. Hydrofluoric 48%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>46. Phosphoric acid 85%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>47. Acetic acid 5%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>48. Crystal acetic acid</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>49. Oleic acid</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50. Sulphuric acid 33%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>51. Sulphuric acid 60%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>52. Sulphuric acid 96%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>53. Potassium permanganate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>54. Kerosene</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>55. Butyl acetate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>56. Ethyl acetate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>57. Aniline oil</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>58. Cotton oil</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>59. Mineral oil</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>60. Transformer oil</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>61. Olive oil</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>62. Acridine orange</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>63. Sodium hypochlorite 5%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>64. Soap solution 1%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>65. Safranin</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>66. Copper(II) sulfate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>67. Sudan III</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>68. Turpentine</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>69. Tetrahydrofuran</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>70. Trichloroethylene</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>71. Chromium oxide</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>72. Toluene</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>73. Sodium carbonate 2%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>74. Sodium carbonate 20%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>75. Distilled water</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>76. Boiled water (5 min.)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>77. Hydrogen peroxide 3%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>78. Hydrogen peroxide 20%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>79. Ammonium hydroxide 28%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>80. Sodium hydroxide 10%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>81. Sodium hydroxide 50%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>82. Malachite green</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The conditions of the test:
In the case of non-volatile substances, the reagent of app. 1/2cm³ was placed on the tested sample of the material. Used in further tests chemicals were covered on the surface of the tested sample of the material with the glazed surface to slow down the evaporation process. In the case of volatile reagents, soaked cotton was placed on the tested sample of the material and it was covered with the glass lid. The test had ran for 16 hours; then the surface of the tested sample of the material was washed with water and the soap, then dried. The above table shows the test results.
### Chemical resistance table of selected worktops

<table>
<thead>
<tr>
<th>Chemical environment</th>
<th>temperature [°C]</th>
<th>1.4301</th>
<th>1.4404</th>
<th>1.4539</th>
</tr>
</thead>
<tbody>
<tr>
<td>dry chlorine</td>
<td>140% 70</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>chlorinated water</td>
<td>saturated 20</td>
<td></td>
<td>p.</td>
<td>p.</td>
</tr>
<tr>
<td></td>
<td>1/10mg/l 20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ammonia</td>
<td>boiling</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>sodium base</td>
<td>20% 50</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1/4% 200</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1/10% 100</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>phosphoric acid</td>
<td>20% boiling</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>40%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>85% 95</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>nitric acid</td>
<td>30% boiling</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>50%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>65% 80</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>65% boiling</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>hydrochloric acid</td>
<td>0.50% 20</td>
<td>p.</td>
<td>p.</td>
<td>p.</td>
</tr>
<tr>
<td></td>
<td>0.50% boiling</td>
<td>p.</td>
<td>p.</td>
<td>p.</td>
</tr>
<tr>
<td></td>
<td>20%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>sulphuric acid</td>
<td>1/4% 200</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5% 20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5% boiling</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1/40% 20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1/10% boiling</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>20-90% 20-100</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>citric acid</td>
<td>25% boiling</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>lactic acid</td>
<td>50% 20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1/40% 20-140</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>formic acid</td>
<td>5-1/4% 20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1/40% 80</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>50% 24-40</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>acetic acid</td>
<td>50% boiling</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ammonium chloride</td>
<td>20% boiling</td>
<td>s.p.</td>
<td>s.p.</td>
<td>s.p.</td>
</tr>
</tbody>
</table>

Based on the Outokumpu Steel Professional Tool

**Corrosion rate [mm/year] resistance:**
- s. - risk of stress corrosion
- p. - risk of pitting corrosion

**Resistance levels:**
- total < 0,1
- partial 0,1-0,2
- none > 0,2
Fume hoods

General advantages
- construction entirely made of steel
- conformity with EN 14175
- wide range configurations of worktop materials, working chamber, additional options

TROX - Basic controller
- Easy installation, expansion and commissioning due to plug connections
- Sockets for the most important connections are located on the outside of the casing
- Monitoring hardware can be expanded with modules
- Adaptable control panels for fume hoods
- Innovative operation to support bespoke project requirements
- Control input signal for fans
- Configurable monitoring functions and alarm signalling
- Easy installation due to interactive EasyConnect configuration software
- Power supply unit for supply voltage 90 - 250 V AC
- 2 control panels can be connected, e.g. for fume hoods with sash windows on two sides

TROX - Advanced controller
- Signalling of the safety-related functions of fume hoods according to EN 14175
- Display of actual values, setpoint values and status messages
- OLED display for face velocity, volume flow rate and system information
- Push buttons for the operating mode default setting and for specific functions
- Project-specific range of functions with configurable push buttons
- Two control panels can be used simultaneously for each fume hood controller
- Integral service socket for configuration and diagnosis
- Casing suitable for flush mounting or surface mounting to the fume hood side frame

Q-Flow - controller
- controlling functions with alarm status indicated by visual and acoustic signals in case of decreased air flow
- alarm indicating that the sash window exceeds the maximum opening height
- display showing current airflow
- controlled and indicated alarm status
- recognition and optical signaling power failure
- continuous work even after power failure - build-in battery
- control of fume cupboard illumination
Fume hoods

S_S variant
worktop – solid ceramics th. 35 - 37 mm, with marine edges, in the worktop is placed ceramic sink dims. 280 x 80 mm – under top mounted; internal chamber side walls made of steel covered; by chemically resistant epoxy paint

LC/CR_S variant
worktop – solid ceramics th. 35 - 37 mm, with marine edges, in the worktop is placed ceramic sink dims. 280 x 80 mm – under top mounted; internal chamber side walls made of 8mm Buchtal ceramic

LPP_S variant
worktop – solid ceramics th. 35 - 37 mm, with marine edges, in the worktop is placed ceramic sink dims. 280 x 80 mm – under top mounted; internal chamber side walls made of polypropylene

LM_S variant
worktop – solid ceramics th. 35 - 37 mm, with marine edges, in the worktop is placed ceramic sink dims. 280 x 80 mm – under top mounted; internal chamber side walls made of Max Resistance phenolic resin composite

Standard equipment for fume hoods:
- 2 x 230V electrical sockets
- 2 x water taps with valves in the front panel
- ventilated underbench cabinet made of steel covered by chemically resistant epoxy paint, connected to the ventilation system of fume hood, designed for short-term storage of reagents, PP cuvette, door lock
- illumination of working chamber
- air-flow sensor

Optional equipment:
- additional media:
  - gas valves (technical gases and flammable gases)
  - electrical sockets
- explosion-proof equipment (illumination, electric sockets with plug adapters)
- glazed side walls 700x500 mm, made of tempered safety glass 4 mm
- scaffolding on the back wall made of stainless steel
- possibility of placing safety cabinet under the fume hood instead of standard cabinet
### Fume hoods

<table>
<thead>
<tr>
<th>Parameter</th>
<th>DSM 1200</th>
<th>DSM 1500</th>
<th>DSM 1800</th>
</tr>
</thead>
<tbody>
<tr>
<td>overall dims [mm]</td>
<td>A width</td>
<td>B height</td>
<td>C depth</td>
</tr>
<tr>
<td></td>
<td>1280</td>
<td>2325-2575</td>
<td>945</td>
</tr>
<tr>
<td>working space dims [mm]</td>
<td>D width</td>
<td>E height</td>
<td>F' depth</td>
</tr>
<tr>
<td></td>
<td>1270</td>
<td>1220</td>
<td>640</td>
</tr>
<tr>
<td>maximum power consumption [kW]</td>
<td></td>
<td></td>
<td>3.5</td>
</tr>
<tr>
<td>power supply</td>
<td></td>
<td>230V 50Hz*</td>
<td></td>
</tr>
<tr>
<td>extract sub pipe diameter [mm]</td>
<td>Ø 160</td>
<td>Ø 200</td>
<td>Ø 200</td>
</tr>
<tr>
<td>water supply</td>
<td>G 1/2&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>sewage connection diameter [mm]</td>
<td></td>
<td>Ø 50</td>
<td></td>
</tr>
<tr>
<td>standard airflow sensor Q-Flow type</td>
<td></td>
<td></td>
<td>conformity with standards EN 14 175-2</td>
</tr>
<tr>
<td>standard equipment</td>
<td></td>
<td>2x electrical socket 230V (IP44)</td>
<td></td>
</tr>
<tr>
<td>electrical insulation class</td>
<td></td>
<td>2x cold water tap</td>
<td></td>
</tr>
<tr>
<td>permissible worktop load [kPa]</td>
<td>2</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>warranty</td>
<td></td>
<td>24 months</td>
<td></td>
</tr>
<tr>
<td>manufacturer</td>
<td></td>
<td>POL-EKO-APARATURA</td>
<td></td>
</tr>
</tbody>
</table>
* also available 115V, 60Hz

---

![Diagram of Fume Hoods](image.png)
**EuroDrop station**

The Eurodrop stations in standard model are equipped with a flushing function, which allows to empty the chemical WC tank, as well as the “grey water” tank. In addition, the Eurodrop stations provide access to drinking water which can be taken to the tank in a coach or camper. What’s more, the station has two models of electrical outlets which fit most camper vans.

**Standard equipment:**
- outdoor LED lighting controlled by astronomical clock
- chemical WC emptying point
- “grey water” emptying point (optional)
- 2 power outlets 1000W and 2000W (optional up to 3680W)
- 2 drinking water nozzles
- ½ non-drinking water nozzle (for flushing chemical WC tank)
- 2 flushing nozzles (for flushing both chemical WC and “grey water” emptying points)

**HYDROMAT water dispenser**

HYDR0MAT is a station for the automatic dispensing of water, recommended for municipalities with water shortage and lack of water supply system. Water can be taken from a large distributor using the DN80 fire-fighting connector [for large tanks, barrels] or from a small distributor [tap].

**Standard equipment:**
- backlit and clear LCD display
- control buttons
- RFID proximity card reader
- water meters
- photovoltaic panels (optional)
- coin acceptor (optional)

**FEKO+ waste water receipt station**

FEKO+ is a waste water receipt station intended to work at waste water treatment plants and sewage pumping stations. It can identify the origin of the sewage, as well as each carrier. Moreover, it is able to measure the volume and various parameters of the disposed sewage, such as pH, temperature and conductivity to ensure full monitoring of the waste water.

The control system includes a stainless steel board equipped with:
- full colour touchscreen (7”)
- IO module (enter/exit) with MODBUS RTU/TCP interface
- stainless steel keyboard
- thermal printer for receipts
- RFID reader
- USB slot for data transfer and for manual programming
- Ethernet port
- carrier identification module
- sewage identification module: municipal, industrial, sludge
NanoSterile is an antimicrobial spray coating that forms a protective layer of titanium dioxide and silver nanoparticles that are capable of destroying bacteria, viruses, mould, dust, odours and volatile organic compounds.

**HOW DOES NANOSTERILE WORK?**

1. After an authorized application partner prepares the surface, he evenly sprays NANOSTERILE® reacting mixture on the surface. After 15 minutes of drying the protective layer is formed and lab equipment is ready to use.

2. In our surroundings, undesirable microorganisms, causing various diseases or other health complications, are our constant companions. In spite of not being dangerous in low amount, under certain conditions, their growth can be very quick and cause health problems. The NANOSTERILE® protective layer creates an environment that prevents their growth and continually lowers their occurrence.

3. The removal of harmful bacteria, viruses and fungi is based on the principle of the photocatalytic reaction and on the effect of silver ions. Photocatalysis is activated by light falling on the treated surface, causing strong oxidation of the surface. Silver ions disrupt bacteria DNA, prevent cell division, block cell metabolism, prevent transport of nutrients and inhibit their breathing. Microorganisms that come into contact with this active area are killed and decomposed into CO₂ and H₂O.

4. The effectiveness of silver ions does not depend on the intensity of sunlight.

99.999% efficiency

NANOSTERILE coating provides antimicrobial efficacy in a temperature range of 0°C... 90°C. It can be applied inside and on the outside laboratory equipment without affecting its properties.
POL-EKO-APARATURA

manufacturer of controlled environment equipment for laboratory analysis and technological processes, distributor in Poland of: KNICK, THERMO SCIENTIFIC, WTW

POL-EKO-APARATURA sp.j.
ul. Kokoszycka 172C
44 - 300 Wodzisław Śląski
POLAND
Tel: +48 32 453 91 70
Fax: +48 32 453 91 85
E-mail: export@pol-eko.com.pl
www.pol-eko.eu

While we make every effort to provide accurate technical data, inconsistencies may occur. We reserve the right to change technical specifications without notice. All dimensions are given exact to ±5 %.