

## Application

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

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



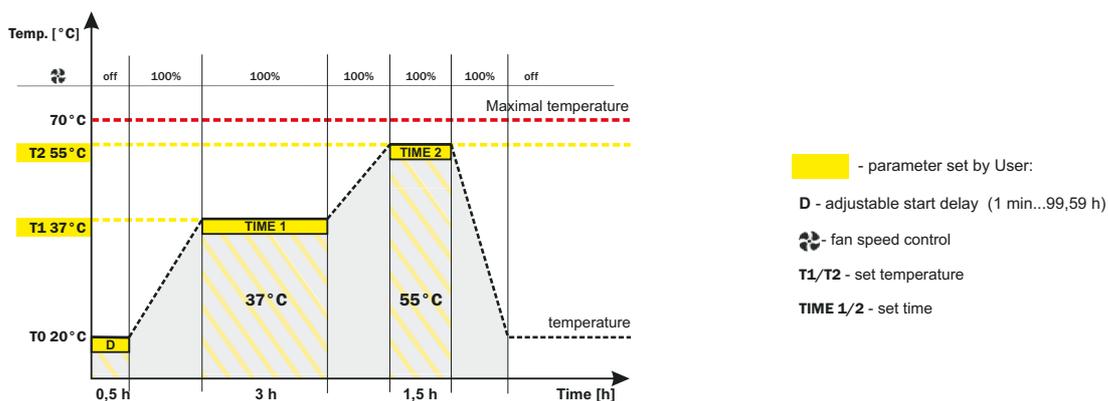
## Advantages

- available in two versions - basic and TOP+
- single or double chamber versions (possibility of combination ST/CHL 2+, 3+, 4+ 5+, ZLN 85+)
- capacity from 68 to 1460 liters
- aluminum or stainless steel interior (depending on model)
- housing: powder coated sheet, stainless steel linen finish (**INOX/G**) or polished (**INOX/S**) (depending on model)
- thermal insulation - polyurethane foam
- solid, glass (**ST\*/A option**) or double (**ST\*/C option**) door type
- forced air convection (optional fan speed control)
- heating and cooling systems to hold set temperature regardless of ambient conditions
- defrosting function
- wheels in ST 1200 and 1450 model
- two temperature ranges available
  - +3...+40°C
  - +3...+70°C (**ST/70 option**) **New!**
- LCD graphic display **New!**
- illuminated touch buttons **New!**
- microprocessor temperature controller
- temperature sensor fail alarm
- power failure control system
- real time clock
- sound alarm
- self-check function (auto control)
- automatic fan shut down after completing the program
- test results memory

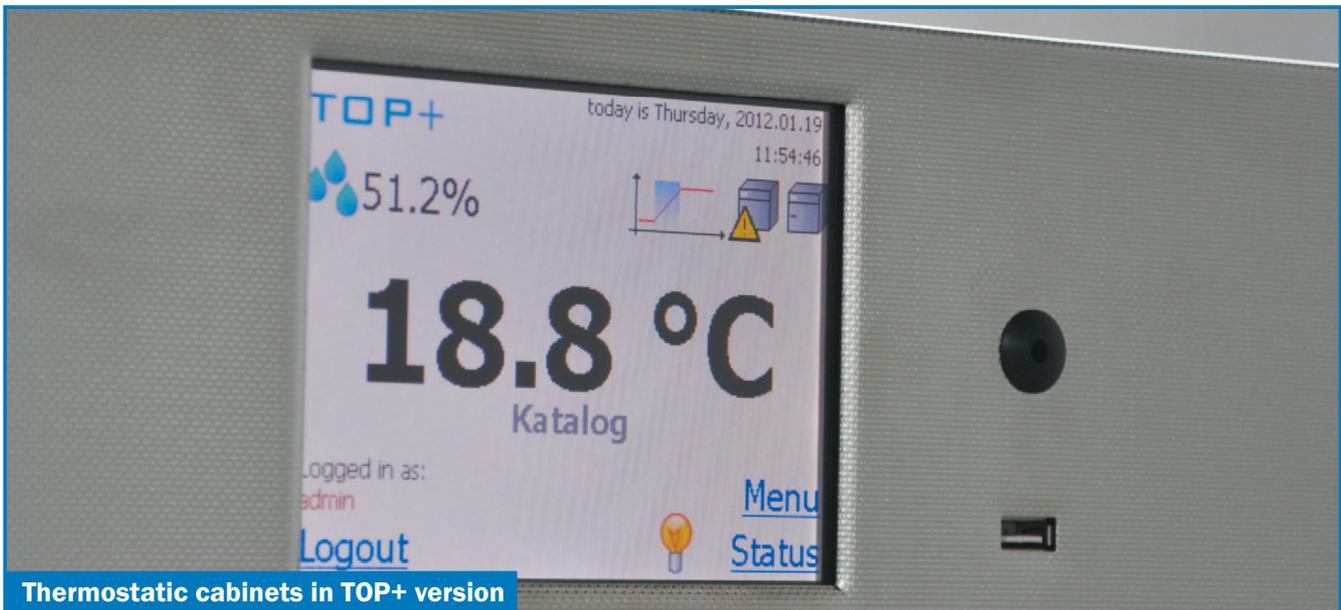
## Program possibilities in basic version

- six segment temperature-time profile
- cycle run of the program
- 3 user programs memory
- adjustable start delay feature (from 1 min to 99:59 h)
- adjustable hold at set temperature point from 1 min to 31 days / 1 min to 99:59 h or continuous operating
- recording min, average and max temperature value separately for each segment
- overview of set parameters during operating time
- over/under temperature sound alarm
- temperature program priority; temperature or time program priority with FOT option

### Program possibilities in TOP+.



All POL-EKO-APARATURA products can be supplied with a calibration certificate issued by an accredited Measurement Laboratory. Further information is available on our website [www.polekolab.com](http://www.polekolab.com)



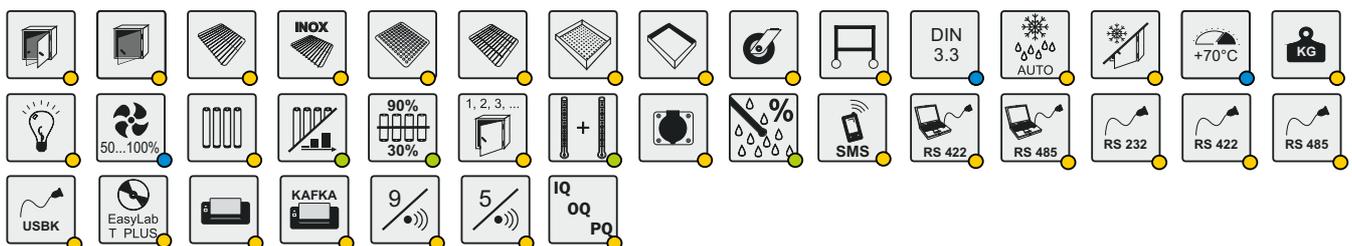
Thermostatic cabinets in TOP+ version

The ST thermostatic cabinets are available in the TOP+ professional version too. The TOP+ version features a full colour 5,7" touch screen. These are the only thermostatic cabinets which can be controlled from a PC, as they can be connected to an Ethernet network that enables the user to program the equipment virtually from any place in the world.

## Standard equipment

- solid door
- temperature range +3...+40 °C (+3...+70 °C in TOP+ version)
- RS 232 interface and USB port **New!**; RS 232 or USB cable must be purchased additionally (RSK or USBK)
- wire shelves (with slides set) in case of aluminum interior and stainless steel wire shelves in case of stainless steel interior
- manufacturer's test certificate at +37 °C
- operation manual in English and English menu (other languages on request)
- over temperature protection 1.0 class according to DIN 12880
- door lock
- open door alarm
- access port for external sensor (diameter: 30 mm)
- TOP+ standard equipment

## Options and accesories



● for basic version only

● for basic version and TOP+

● for TOP+ only



## Available options :

**ST/70** - extended temperature range up to +70 °C

**ST\*/C** - internal glass door

**ST\*/A** - external glass door

**PLUS** - automatic defrosting during operating

**FOT** - photoperiodic system

Thermostatic chambers are available with photoperiod option,

## ST 2+ with ST/FOT 6 option

Parameter		Model	ST 1+	ST 2+	ST 3+	ST 4+	ST 5+	ST 500	ST 700	ST 1200	ST 1450
air convection		forced									
chamber capacity <sup>1</sup>	[l]	68	150	200	250	300	493	625	1365	1460	
	[cu ft]	2,4	5,2	7,0	8,8	10,5	17,4	22,0	48,2	51,6	
door type		solid / glass or double <sup>2</sup> (option)									
temperature range	[°C]	+3...+40 / up to +70 (option) / +3...+70 in TOP+ version									
	[°F]	+37...+104 / up to +158 (option) / +37...+158 in TOP+ version									
controller		microprocessor with external LCD graphic display									
interior		aluminum / stainless steel									
housing		powder coated sheet / stainless steel linen finish INOX/G or polished INOX/S									
overall dims [mm]**	width	570	620	620	620	620	645	735	1440	1450	
	height	600	860	1060	1260	1460	2025	2025	2045	1970	
	depth	670	640	640	640	640	820	870	860	950	
internal dims <sup>3</sup> [mm]	width	470	520	520	520	520	510	600	1310	1340	
	height	430	660	860	1060	1260	1510	1510	1510	1460	
	depth	300	420	420	420	420	640	690	690	750	
max shelf workload [kg]*	-	10	10	10	10	10	20	30	30	30	
	PW version	on request					100	100	100	100	
max unit workload [kg]	-	20	30	40	50	60	100	150	300	300	
	W version	on request									
nominal power [W]		160	170	170	330	330	400	400	550	550	
weight [kg]		30	48	52	61	66	105	115	195	200	
temperature resolution [°C]		every 0,1									
temperature fluctuation <sup>4</sup> at +37 °C [°C]		±0,2	±0,2	±0,3	±0,3	±0,3	±0,2	±0,2	±0,3	±0,3	
over/under temperature protection		class 1.0 according to DIN 12880 / class 3.3 (option) / class 3.3 in TOP+ version									
voltage 50/60 Hz [V]		115/230									
shelves fitted / max <sup>6</sup>		2/2	3/4	3/4	4/6	4/7	3/11	3/11	2 x 3/11 <sup>5</sup>	2 x 3/11 <sup>5</sup>	
warranty		24 months									
manufacturer		POL-EKO-APARATURA									

\* - at even surface workload

\*\* - ST 1-5 in TOP+ version are 60 mm higher  
dims of power cable (50 mm) not included

1 - working capacity of chamber can be smaller

2 - additional internal glass door

3 - dims of units with double door can be smaller

4 - fluctuation measured in centre of the chamber

5 - two columns with 3 shelves each

6 - "fitted" number of shelves fitted, included in price

"max" number of shelves which can be fitted



### Available options for each chamber

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

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

**ST 2/2+ with additional options**

### Example of configuration

To configure a double-chamber thermostatic cabinet, e.g.:

- upper chamber equipped with solid door and temperature up to +70 °C
- lower chamber equipped with double door and temperature up to +40 °C, you select:

for ST 1/1+: ST 1/1+ and ST/70 option for upper chamber + ST 1+/C option for lower chamber

Parameter		Model	ST 1/1+	ST 1/1/1+	ST 2/2+	ST 2/3+	ST 2/4+	ST 3/3+	ST 350/350
									
air convection			forced						
chamber capacity <sup>1</sup>	[l]		68/68	68/68/68	150/150	150/200	150/250	200/200	294/294
	[cu ft]		2,4/2,4	2,4/2,4/2,4	5,2/5,2	5,2/7,0	5,2/8,5	7,0/7,0	10,3/10,3
door type			solid / glass or double <sup>2</sup> (option)						
temperature range	[°C]		+3...+40 / up to +70 (option) / +3...+70 in TOP+ version						
	[°F]		+37...+104 / up to +158 (option) / +37...+158 in TOP+ version						
controller			microprocessor with external LCD graphic display						
interior			aluminum / stainless steel						
housing			powder coated sheet / stainless steel linen finish INOX/G or polished INOX/S						
overall dims [mm]**	width		570	570	620	620	620	620	720
	height		1170	1740	1680	1875	2080	2080	2045
	depth		670	670	640	640	640	640	860
internal dims <sup>3</sup> [mm]	width		470	470	520	520	520	520	600
	height		430	430	660	660/860	660/1060	860	700
	depth		300	300	420	420	420	420	700
max shelf workload [kg]*	-		10	10	10	10	10	10	30
	PW version		on request						
max unit workload [kg]	-		20/20	20/20/20	30/30	30/40	30/50	40/40	75/75
	W version		on request						
nominal power [W]			320	480	350	350	350	350	800
weight [kg]			65	100	100	105	110	115	162
temperature resolution [°C]			every 0,1						
temperature fluctuation <sup>4</sup> at +37 °C [°C]			±0,2	±0,2	±0,3	±0,3	±0,3	±0,3	±0,5
over/under temperature protection			class 1.0 according to DIN 12880 / class 3.3 (option) / class 3.3 in TOP+ version						
voltage 50/60 Hz [V]			115/230						
shelves fitted / max <sup>5</sup>			2/2/2/2	2/2/2/2/2/2	3/4/3/4	3/4/3/4	3/4/4/6	3/4/3/4	2/6/2/6
warranty			24 months						
manufacturer			POL-EKO-APARATURA						

\* - at even surface workload

\*\* - dims of power cable (50 mm) not included

1 - working capacity of chamber can be smaller

2 - additional internal glass door

3 - dims of units with double door can be smaller

4 - fluctuation measured in centre of the chamber

5 - "fitted" number of shelves fitted, included in price

"max" number of shelves which can be fitted

Features		
interior	plastic (ZLN 75, 145, 180)	1.
	aluminum	2.
	stainless steel (ST/CHL INOX; ZLN 85+; ZLN-T)	3.
housing	powder coated sheet	4.
	stainless steel (ST/CHL INOX; ZLN 85+, ZLN-T INOX)	5.
air convection	natural	6.
	forced	7.
fan speed control	0...100% (CL/SL 15...240, SR 53...240)	8.
	10...100% (CL/SL/SR 400-1000)	9.
automatic fan shut down after completing the program		10.
automatic air-flap control (adjustable)		11.
system	heating	12.
	cooling	13.
defrosting function		14.
automatic defrosting function		15.
external display	graphic LCD	16.
	5.7" LCD touch screen	17.
microprocessor temperature (humidity in KK; light with FIT and FOT options) controller		18.
temperature-time profile (humidity in KK; light with FIT and FOT options)	1 segment	19.
	6 segment	20.
	multi-segment (max 10 000)	21.
program priority	temperature	22.
	time (ST and IL in STD with FOT/FIT option)	23.
cycle run of the program		24.
user programs memory	1	25.
	3	26.
	20	27.
start delay	1 min...99:59 h	28.
	date/time	29.
adjustable heating up time	1 min...99:59 h	30.
adjustable hold at set point (temperature; humidity in KK; light with FIT and FOT options)	1 min...99:59 h	31.
	1 min...999:59 h	32.
	1 min...31 days	33.
overview of set parameters during operating time		34.
recording min, average and max temperature (and humidity in KK) value for each segment (unavailable for ZLN 75, 145, 180)		35.
over/under temperature and humidity sound alarm (and humidity in KK)		36.
over/under temperature protection class according to DIN 12880		37.
temperature sensor fail alarm (and humidity sensor fail alarm in KK)		38.
power failure control system		39.
real time clock		40.
sound alarm		41.
test results memory		42.
access port for external sensor (diameter: 30 mm) (option for ZLN 75, 145, 180)		43.
door lock (option for ZLN 75, 145, 180)		44.
open door alarm		45.
interface / port	RS 232	46.
	USB	47.
Ethernet connection and remote control via Internet		48.
self-check function (auto control)		49.
Administrator function		50.
access control via login		51.
e-mail info		52.
manufacturer's test certificate (for: <b>ZL</b> at -10 °C; <b>CHL</b> at +4 °C; <b>KK</b> at +25 °C and 60% rH; <b>ST, CL, IL</b> at +37 °C; <b>SL</b> at +105 °C; <b>SR</b> at +170 °C)		53.
24 months warranty		54.
CE mark		55.
manufacturer's certificate PN-EN ISO 9001		56.

	ST		CHL		ZL	CL		IL		SL		SR STD	KK TOP+
	P*	TOP+	P*	TOP+		STD	TOP+	STD	TOP+	STD	TOP+		
1.					•								
2.	•	•	•	•									
3.	•	•	•	•	•	•	•	•	•	•	•	•	•
4.	•	•	•	•	•	•	•	•	•	•	•	•	•
5.	•	•	•	•	•	•	•	•	•	•	•	•	•
6.					•	•	•			•	•	•	
7.	•	•	•	•		•	•	•	•	•	•	•	•
8.						•	•			•	•	•	
9.	o	•	o	•		•	•	•	•	•	•	•	•
10.	•	•	•	•		•	•	•	•	•	•	•	•
11.						•	•			•	•	•	
12.	•	•				•	•	•	•	•	•	•	•
13.	•	•	•	•	•			•	•				•
14.	•	•	•	•									
15.	o	o	o	o				o	o				•
16.	•		•		•	•		•		•		•	
17.		•		•			•		•		•		•
18.	•	•	•	•	•	•	•	•	•	•	•	•	•
19.			•		•								
20.	•					•		•		•		•	
21.		•		•			•		•		•		•
22.	•	•	•	•	•	•	•	•	•	•	•	•	•
23.	•	•		•			•	•	•		•		•
24.	•	•		•		•	•	•	•	•	•	•	•
25.			•		•								
26.	•					•		•		•			
27.		•		•			•		•		•		•
28.	•	•	•	•	•	•	•	•	•	•	•	•	•
29.		•		•		•	•	•	•	•	•	•	•
30.		•		•		•	•	•	•	•	•	•	•
31.	•	•	•	•	•	•	•	•	•	•	•	•	•
32.		•		•		•	•	•	•	•	•	•	•
33.	•		•										
34.	•	•	•	•	•	•	•	•	•	•	•	•	•
35.	•	•	•	•	•	•	•	•	•	•	•	•	•
36.	•	•	•	•	•	•	•	•	•	•	•	•	•
37.	1.0	3.3	1.0	3.2		2.0	3.1	2.0	3.3	2.0	3.1	2.0	3.3
38.	•	•	•	•	•	•	•	•	•	•	•	•	•
39.	•	•	•	•	•	•	•	•	•	•	•	•	•
40.	•	•	•	•	•	•	•	•	•	•	•	•	•
41.	•	•	•	•	•	•	•	•	•	•	•	•	•
42.	•	•	•	•	•	•	•	•	•	•	•	•	•
43.	•	•	•	•	•	•	•	•	•	•	•	•	•
44.	•	•	•	•	•	o	o	o	o	o	o	o	o
45.	•	•	•	•	•	•	•	•	•	•	•	•	•
46.	•	•	•	•	•	•	•	•	•	•	•	•	•
47.	•	•	•	•	•	•	•	•	•	•	•	•	•
48.		•		•			•		•		•		•
49.	•	•	•	•	•	•	•	•	•	•	•	•	•
50.		•		•			•		•		•		•
51.		•		•			•		•		•		•
52.		•		•			•		•		•		•
53.	•	•	•	•	•	•	•	•	•	•	•	•	•
54.	•	•	•	•	•	•	•	•	•	•	•	•	•
55.	•	•	•	•	•	•	•	•	•	•	•	•	•
56.	•	•	•	•	•	•	•	•	•	•	•	•	•

• - standard equipment  
o - option  
\* - basic version of thermostatic cabinets and laboratory refrigerators

Options and accessories	ST		CHL		ZL	CL		IL		SL		SR	KK	Order no.
	P <sup>6</sup>	TOP+	P <sup>6</sup>	TOP+		STD	TOP+	STD	TOP+	STD	TOP+	STD	TOP+	
internal glass door <sup>1,5</sup>	•	•	•	•		•	•	•	•				<b>s</b>	*/C
external glass door <sup>1,8</sup>	•	•	•	•									•	*/A
door with viewing window <sup>4,7</sup>						•	•	•	•	•	•	•	•	*/A
internal socket <sup>1,5</sup>	•	•	•	•		•	•	•	•					GNZ
interior lighting <sup>1,4,5</sup>	•	•	•	•	•	•	•	•	•	•	•	•	•	OWW
door lock <sup>1,12</sup>	<b>s</b>	<b>s</b>	<b>s</b>	<b>s</b>	<b>s</b>	•	•	•	•	•	•	•	•	ZKL
wire shelf <sup>1</sup>	•	•	•	•										*/P
stainless steel wire shelf <sup>1,9</sup>	•	•	•	•	•	•	•	•	•	•	•	•	•	*/P INOX
perforated shelf <sup>1</sup>	•	•	•	•	•	•	•	•	•	•	•	•	•	*/PP
glass shelf <sup>3</sup>					•									*/PS
reinforced shelf	•	•	•	•	•	•	•	•	•	•	•	•	•	*/PW
extended temperature range to +70 °C <sup>1</sup>	•													ST/70
reinforced version <sup>12</sup>					•	•	•	•	•	•	•	•		*/W
low temperature version <sup>1,10</sup>			•					•	•					*/T
photoperiodic system - FOT <sup>1</sup>	•							•	•					*/FOT
phytotron system - FIT <sup>11</sup>		•						•					•	*/FIT
automatic defrosting function	•	•	•	•				•	•				<b>s</b>	*PLUS
over temperature protection system according to DIN 12880 <sup>1</sup>	3.3	<b>s</b> (3.3)	3.2	<b>s</b> (3.2)		3.1	<b>s</b> (3.1)	3.3	<b>s</b> (3.3)	3.1	<b>s</b> (3.1)	3.1	<b>s</b> (3.3)	*/**
stainless steel cuvettes	•	•	•	•	•	•	•	•	•	•	•	•	•	KUW GN */*
stainless steel drawers	•	•	•	•	•	•	•	•	•	•	•	•	•	*/SW
humidity measurement <sup>5</sup>		•		•		•	•	•	•					PHR
door openings counter <sup>1</sup>	•	•	•	•	•	•	•	•	•	•	•	•	•	LOD
fan speed control	•	<b>s</b>	•	<b>s</b>		<b>s</b>	<b>s</b>	<b>s</b>	<b>s</b>	<b>s</b>	<b>s</b>	<b>s</b>	<b>s</b>	ST/CHL WENT
additional Pt 100 temperature sensor		•		•		•	•	•	•	•	•	•	•	PT100
HEPA - fresh air filter						•	•			•	•	•		HEPA
RS 422 interface (instead of RS 232) <sup>1</sup>	•	•	•	•	•	•	•	•	•	•	•	•	•	RS422
RS 485 interface (instead of RS 232) <sup>1</sup>	•	•	•	•	•	•	•	•	•	•	•	•	•	RS485
wheels	•	•	•	•	•	•	•	•	•	•	•	•	•	QLK*
table with wheels <sup>2</sup>	•	•	•	•	•	•	•	•	•	•	•	•	•	*/S, */INOX
RS 232 cable <sup>1</sup>	•	•	•	•	•	•	•	•	•	•	•	•	•	RSK
RS 422 cable <sup>1</sup>	•	•	•	•	•	•	•	•	•	•	•	•	•	RSK/422
RS 485 cable <sup>1</sup>	•	•	•	•	•	•	•	•	•	•	•	•	•	RSK/485
USB cable <sup>1</sup>	•	•	•	•	•	•	•	•	•	•	•	•	•	USBK
EasyLab-T PLUS software	•	•	•	•	•	•	•	•	•	•	•	•	•	EasyLab-T PLUS
dot printer	•	•	•	•	•	•	•	•	•	•	•	•	•	EPSON
"Kafka" thermal printer	•	•	•	•	•	•	•	•	•	•	•	•	•	KAFKA
calibration at 9 points <sup>1</sup>	•	•	•	•	•	•	•	•	•	•	•	•	•	BRT/9/L
chamber calibration at 5 points on 1 shelf <sup>1</sup>	•	•	•	•	•	•	•	•	•	•	•	•	•	BRT/5/L
IQ, OQ, PQ qualification <sup>1</sup>	•	•	•	•	•	•	•	•	•	•	•	•	•	IQ/OQ/PQ
SMS Info <sup>1,12</sup>	•	•	•	•	•	•	•	•	•	•	•	•	•	SMS INFO
container for deionised water													•	KK/Z
container for waste water													•	KK/K
water level sensor													•	KK/CP
FIT panels independent control <sup>11</sup>		•						•					•	FIT/R3

\* - model (e.g. ST 1+, IL 53, ZL 75)

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

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

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

3 - only for ZL 75, 145, 180

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

option unavailable for CL/SL 15/32

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

6 - basic version of thermostatic and laboratory refrigerators

7 - for KK 115, 240, 400, 750

8 - for KK 500, 700, 1200

9 - for ZLN 85+

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

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

12 - except ZL 75, 145, 180

**s** - standard equipment

• - available option