WEBECO

Manual for
Installation & Operation
of

Vertical Steam Sterilizer

Model B - C - H

No. 1610e

VERTICAL AUTOCLAVES MODEL B-C-H

Description of Apparatus and Instructions for Use

INSTALLATION AND ELECTRIC CONNECTION

1. Mains Supply

First of all check rating plate of apparatus with your mains voltage (if necessary, reaf from meter).

		220/380 V	220 V
Model B - 2.7 kW	fused	3 x 6 A	16
Model C - 4.5 kW	fused	3 x 10 A	25
Model H -.7.5 kW	fused	3 x 15 A	40

2. Water Connection for Units with Water Jet Pump or with Water Operated Exhaust Steam Condenser

A cold water connection with stop valve must be laid to the installation site.

Model B R 1/2"
Model C + H R 3/4".

The connection takes place by means of a pressure-resistant hose or pipe.
For a proper operation of the water jet pump, a water pressure of 3 atm.abs. (minimum) is necessary, when the pump is running.

3. Water Drain

The waste water from the water jet pump or exhaust steam condenser must be led to a gully of 1 1/2" to 2" width. The drain hose or drain pipe must have a minimum clearance of 19 mms. for autoclave B and of 24 mms. for autoclaves C and H respectively. The hose or pipe fastend to the water jet pump or exhaust steam condenser must not dip into the water of the drain in order to avoid re-sucking of waste water.

FUNCTION OF AUTOCLAVE

1. Filling Distilled Water

Before operation, shut off drain valve (11) and de-aeration valve (18). Now pour distilled water into the inner jacket (12). Use distilled water only; ordinary water would cause deposits and harm the apparatus and the materials to be sterilized.
The distilled water poured into the inner jacket flows through the perforated inner bottom (15) into the boiler bottom and covers the heating elements (21) and the low water cut-off (22). Pour in distilled water up to the water level mark at the gauge (10). Now open de-aeration valve (18) completely.

2. Loading and Heating-up

Load the unit, close the lid (4), tighten the locking clamps (7) and shut off the aeration valve (6) arranged on the lid. Bring heating switch (24) into position III and press push-button (25). Working of the heating is indicated by means of the pilot lamp (26).
If the autoclave is gas or kerosene heated, light the burner and adjust it to a big flame. Gradually the water begins to boil and the steam streams through the bore-holes (13) into the capacity space. The heavy cold air is pushed downwards into the exhaust steam piping (20) passing thermometer (17) and the opened de-aeration valve (18). When the majority of the air has escaped, practically pure steam passes the thermometer which then indicates 100 °C.
The thermometer reading of 100 °C means the end of the de-aeration phase. Shut off de-aeration valve (18) immediately. Otherwise a loss of steam and consequently a loss of distilled water would occur.

Attention! If the sterilizer is equipped with an automatic de-aeration and temperature control device, the de-aeration valve must always be opened.

Only after sterilization of solutions lock de-aeration valve according to item 6.

3. Pressure Rise

After having shut off de-aeration valve (18), steam can no longer escape, thus causing a pressure rise in the boiler which is indicated at the pressure gauge (5). As de-aeration valve (18) and safety valve (19) are shut-off, condensate and residual air are gathered in the de-aeration pipe (16) and at thermometer (17) so that temperature increase only slowly.

At the moment when the pressure set by the weight of the safety valve (19) is attained, the safety valve begins to control. The steam in excess is released and pushes out condensate and residual air gathered at thermometer (17) and safety valve (19) into the exhaust steam piping (20). Now the thermometer reading increases very quickly to the sterilization temperature corresponding to the pressure. When the temperature needed for sterilization has been attained, the heating switch may be brought into position II. Thus not too much steam will be released through the safety valve.
With gas or kerosene heated autoclave, throttle the flame a little bit.

4. Sterilization Phase

When the temperature needed for sterilization has been attained, the actual sterilization phase starts.

The relevant duration is stated in the operating instructions. During this phase, the steam penetrates the material and the sterilization temperature has been achieved everywhere.
Therefore, for sterilization of textile fabrics, dressings, rubber gloves, etc. use only drums in good condition with lid and bottom perforation. Textile fabrics and especially rubber gloves have to be placed vertically and not horizontally in the drums.
Avoid too tight packing, so that the steam streaming through the drum from top to bottom penetrates the material equally and pushes out any residual air through the bottom.
At the end of sterilization phase, sterilization is terminated and the heating has to switched of immediately.
If the autoclave is gas or keronsene heated, turn off the flame.

5. Drying of Goods to be Sterilized (except solutions)

If the autoclave is equipped with a water jet pump (27-33), water valve (31) has to be opened completely after sterilization, so that the pump begins to suck. Now open vacuum valve (29), so that first any residual water and then the steam are sucked out of the boiler. The pressure gauge (5) indicates the negative pressure. At the end of the sucking period required for drying, shut off first vacuum valve (29) and then water valve (31). Vacuum in the boiler is compensated by opening the pressure equalizing valve (6). In its seat filter is incorporated. When pressure gauge (5) indicates "zero" loosen the locking clamps (7) and open lid (4).

5.1 If the autoclave is not equipped with a water jet pump, open de-aeration valve (18). Now steam pressure escapes through the exhaust steam piping (20). When the pressure gauge (5) indicates "zero", open the pressure equalizing valve (6) and loosen the locking clamps (7). In order to use the heat in the boiler for drying the material, drain the residual water by opening valve (11) and put a piece of wood of finger's breadth between lid and boiler rim.

6. Cooling of Solutions after Sterilization

After sterilization shut off all valves so that solutions do not boil over and bottles cannot burst. Now the pressure decreases gradually corresponding to the cooling-down of the apparatus. When pressure gauge (5) indicates "zero", open the pressure equalizing valve (6) and loosen the locking clamps (7). To cool down completely, the solutions should be left in the opened autoclave for some time.

7. Setting the Sterilization Pressure

Pressure and thus the temperature for sterilization are controlled by means of the weight in the body of the safety valve. As standard supply, the autoclave is equipped with a valve weight for a working pressure of 2.1 atm.abs. = 134°C. On request, there are available:

weights for 1.0 atm.abs. = 120 °C
weights for 0,5 atm.abs. = 110 °C.

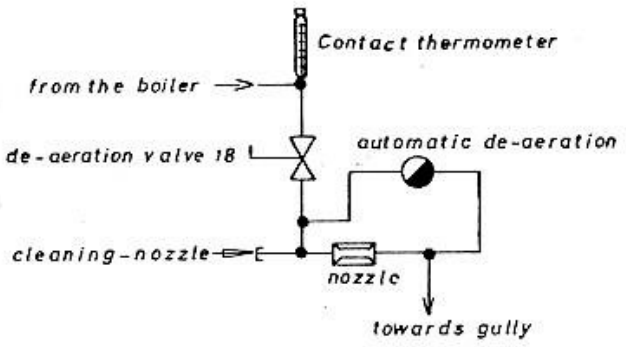
The requisite sterilization temperatures (refer to table) are automatically kept constant by using the corresponding safety valve weights.

Attention!
If the sterilizer is equipped with a temperature control device the requisite temperature must be set at the contact thermometer (37).

The requisite temperature must be set at the contact thermometer. Set the moving magnet for the requisite temperature. The top of the thermometer scale shows the choosen temperature. Reading on the top of the setting mark.

Timer (36) serves for automatical control of the sterilizing temperature. The timer begins to run, when the adjusted sterilization temperature has been attained.

Diagram of the Automatic De-aeration Device



If during the operating period, the temperature is not reached at the contact thermometer, then the flow nozzle of the device (see diagram) has to be cleansed. After the plug has been unscrewed, this nozzle of 1.0 mms. in Ø should be pushed through with a cannula or a corresponding wire. If necessary, the nozzle can also be unscrewed with a screwdriver.
After having been cleansed thoroughly, the nozzle must be reinserted and tightened. The unit does not operate without this nozzle.

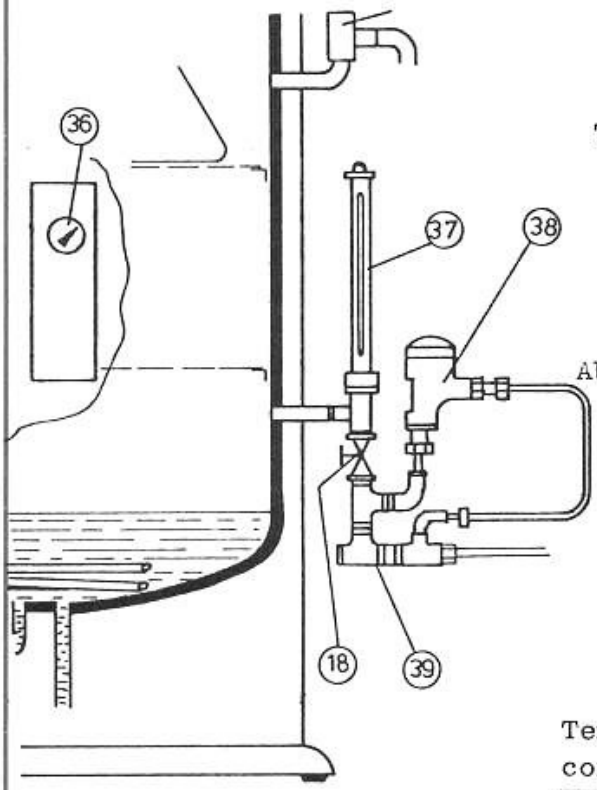


DIAGRAM
OF
TEMPERATURE CONTROL DEVICE
WITH
CONTACT THERMOMETER
AND
AUTOMATIC DE-AERATION DEVICE

Temperature control by means of contact thermometer

The de-aeration valve (18) must never be shut, it remains always opened until the end of the sterilization phase. The residual air in the capacity space escapes via the de-aerator (38) and the flow nozzle (39).
When temperature of abt. 100 °C has been attained, the de-aerator (38) shut off automatically and the steam escapes only via the flow nozzle (39).

When the set temperature at contact thermometer (37) has been attained, the timer (36) runs down and the contact thermometer (37) regulates the heating of the unit automatically.

The steam escapes via the nozzle (39) into the water jet pump and must be drained by means of a hose or piping.

ATTENTION! By the sterilization of solutions shut-off de-aeration valve (18) at once after steriliaztion, so that the solutions do not boil over.

MAINTENANCE AND OPERATION

Maintenance of the Boiler

If after sterilization the residual water is drained under pressure according to the operating instructions, deposits can hardly be formed at the boiler bottom. If the residual water must not be drained under pressure, e.g. in the case of sterilization of liquids, then it should be drained by opening the drain valve (11) in order to flush out any deposits. If during the sterilizing cycle an ampoule with solutions will burst, a thorough cleansing of the boiler after unloading of the material is indispensable.

Lid

A threaded holt with square head and slit stands out of the lid hinge. This bolt serves for the adjustment of the preload of the lid. The tension of the lid is right, if a gap of about 3 mm remains in the front between loose laying on lid and packing ring. If the packing ring relaxes somewhat after a longer working period, the bolt has to be tightened by right turn so that the lid lifts to a gap of 3 mm in the front. The fuse valve, which blows off in case of inadmissible pressure, is inside the lid below the hinge. The valve is accessible after screwing off the inner lid and has to be replaced in case of leakage.

Cleansing of the Boiler - Removal of Boiler Scale Deposits

Untighten the srew at the bottom of the inner jacket and remove the inner jacket. With single-walled units remove the perforated bottom plate. Now the boiler bottom is accessible and can be thoroughly rinsed and cleansed.

STERILIZATION

1. Insert the valve weight for the requisite temperature (see table). Set contact thermometer (37) and timer (36).

2. Shut off drain valve (11) arranged beneath water gauge and de-aeration valve (18) beneath thermometer
If the sterilizer is equipped with a temperature control device, the valve remains open.

3. Pour distilled water into the boiler up to the red mark at the water gauge. Requisite water quantity for:

   autoclave model B (290 mms. in Ø) approx. 3.5 litres
   autoclave model C (400 mms. in Ø) approx. 5 litres
   autoclave model H (500 mms. in Ø) approx. 16 litres

4. Load drums with goods to be sterilized and shut lid and pressure equalizing valve (6).

5. Start the apparatus by bringing switch (24) into position III and by pressing the push-button (25). Glow lamp lights up.

6. Open de-aeration valve (18) arranged beneath thermometer (17). It remains open until the thermometer indicates 100°C or until the water begins to boil, so that the air can escape out of the boiler.

7. When the thermometer indicates 100°C or when the water begins to boil, shut off de-aeration valve (18).(If the sterilizer is equipped with a temperature control device, valve (18) is opened). Now the pressure increase is indicated at the pressure gauge (5). The temperature increases slowly.

8. When the set values have been attained, pressure and temperature are controlled automatically by means of the safety valve (19) or the contact thermometer (37). After the temperature is reached at the thermometer, the actual sterilization phase starts, the duration of which is stated in the table. In order to condense any escaping steam, open valve (31) of the water jet pump or of the exhaus steam condenser. At the end of the sterilization phase, switch off the apparatus at once. If the working pressure is 1 or 0.5 atm.abs., set the heating switch to position II after having reached the values set. Otherwise too much steam would be wasted.

9. After the apparatus has been switched off, open valve (31) of the water jet pump (30) completely. Then open vacuum valve (29). First the residual water then the steam escape via the pump. A vacuum of about 0,8 atm.abs. is produced.
After having sucked for about 8 minutes, shut off first vacuum valve (29) and then water valve (31). Pay attention to this sequence.
In order to open the lid, pressure equalizing valve (6) must be opened first. This valve has a filter to purify the air steaming in.

10. If no vacuum drying is needed, please operate the unit according to items 5 and 6 of the detailed technical description.

Attention!

Sterilization of solutions:
After having finished sterilization, de-aeration valve (18) must be closed.

11. Daily after last sterilization, the residual water must be drained out of the boiler via the drain-valve (11).
A promptly drainage is also requisite, when solutions have been boilt over or bursted.

STERILIZATION TABLE for autoclaves model B, C, H

Material to be sterilized	°C	atm.abs.	minutes
glassware, instruments	134	2.1	10
textile fabrics, dressings	134	2.1	25
rubber gloves	120	1	30
solutions free from spores in pre-sterilized receptacles	120	1	20 - 30
solutions in not pre-sterilized receptacles	120	1	50 - 60
solutions sensitive to heat (all glucose solutions)	110	0.5	60
gelatine (open de-aeration valve completey)	100	0	60

Overheating protection

In case of lack of distilled water in the chamber, the overheating protection automatically switches off the unit.

The pilot lamp extinguishes.
Switch off the unit and fill up distilled water when the apparatus is without pressure. Re-set the green button of the overheating protection EMF 544 before.

The overheating protection is placed behind the electric covering in front of the autoclave.

Nomber-index for schematic diagram

Standard Unit

1 outer jacket
2 boiler
3 cover hinge
4 lid
5 mano-vacuummeter
6 aeration-valve
7 locking clamps
8 lid gasket
9 drain pipe
10 water gauge glass
11 drain valve
12 inner jacket
13 bore holes
14 filling pipe
15 perforated inner bottom
16 de-aeration pipe
17 thermometer
18 de-aeration valve
19 safety valve
20 exhaust steam line
21 heating element
22 water protection
23 threaded bolt
24 switch
25 push button
26 pilot lamp

Unit with water jet pump:

27 suction line
28 non return valve (air)
29 vacuum valve
30 water jet pump
31 water valve
32 non return valve (water)
33 dirt trap

Unit with exhaust steam condensing device:

31 water valve
32 non return valve (water)
33 dirt trap
34 water supply line
35 exhaust steam condensing device

Unit with temperature control device and contact thermometer:

36 timer
37 contact thermometer
38 automatic de-aerator
39 flow nozzle

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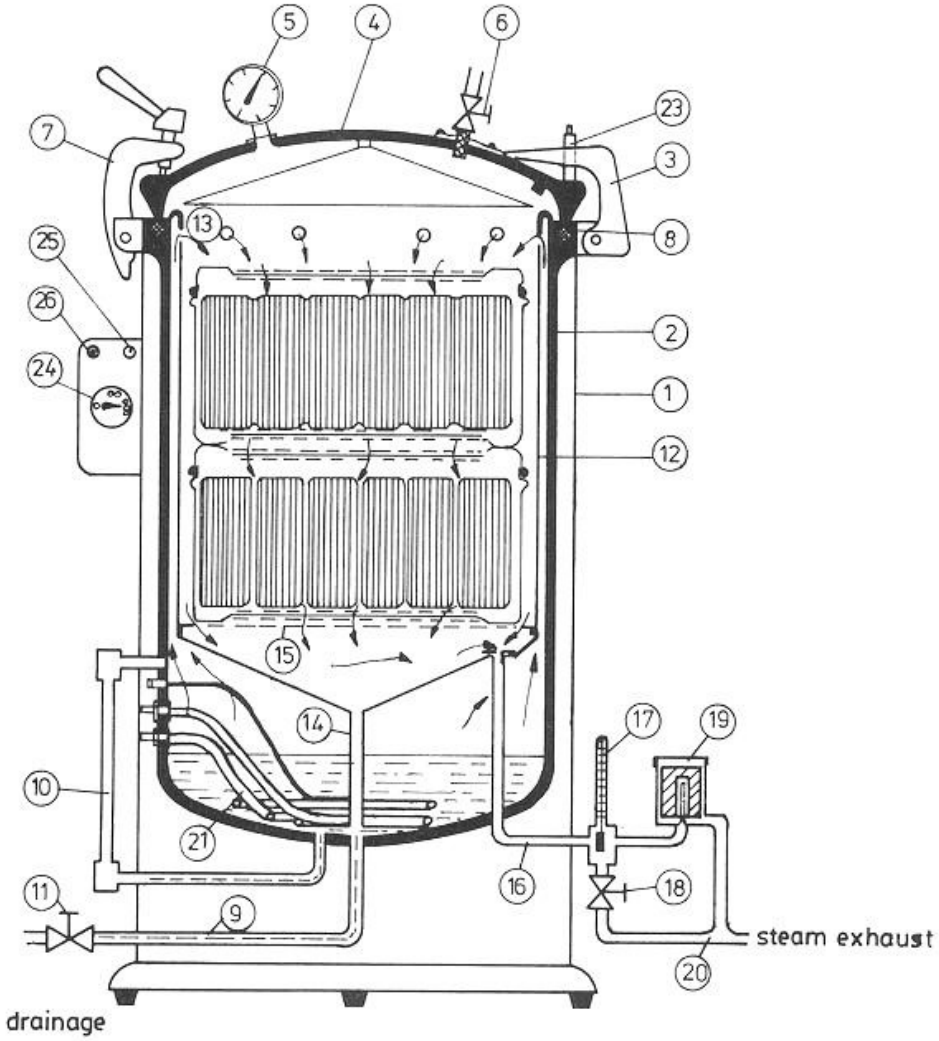

Schematic diagram

Webeco vertical steam sterilizer Model B-C-H

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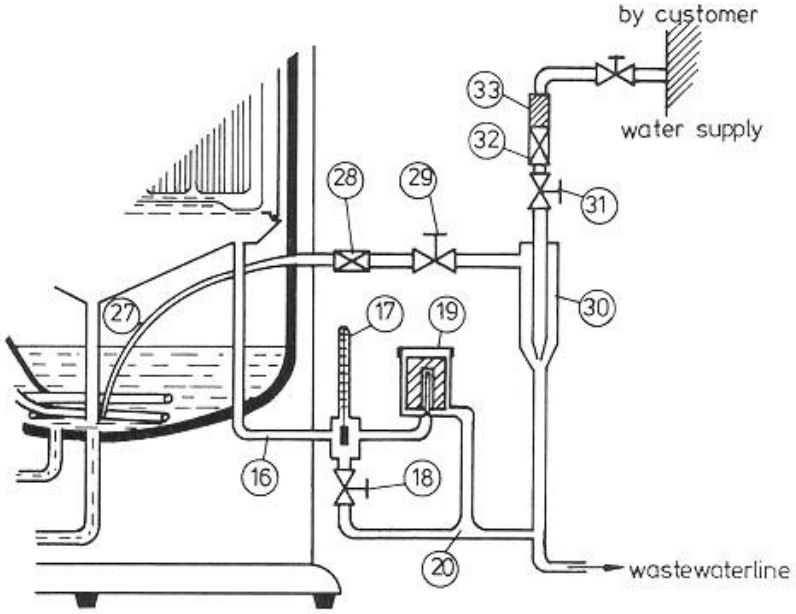
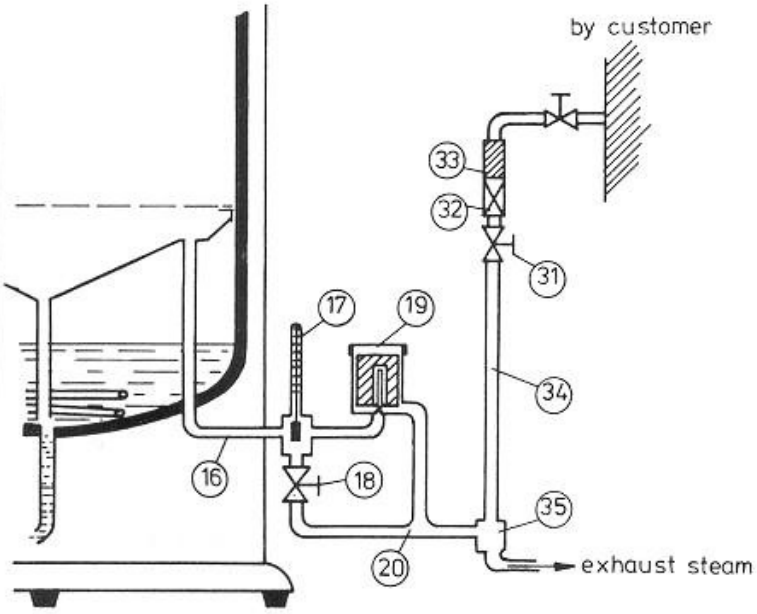
Model B-C-H

with

Water jet pump

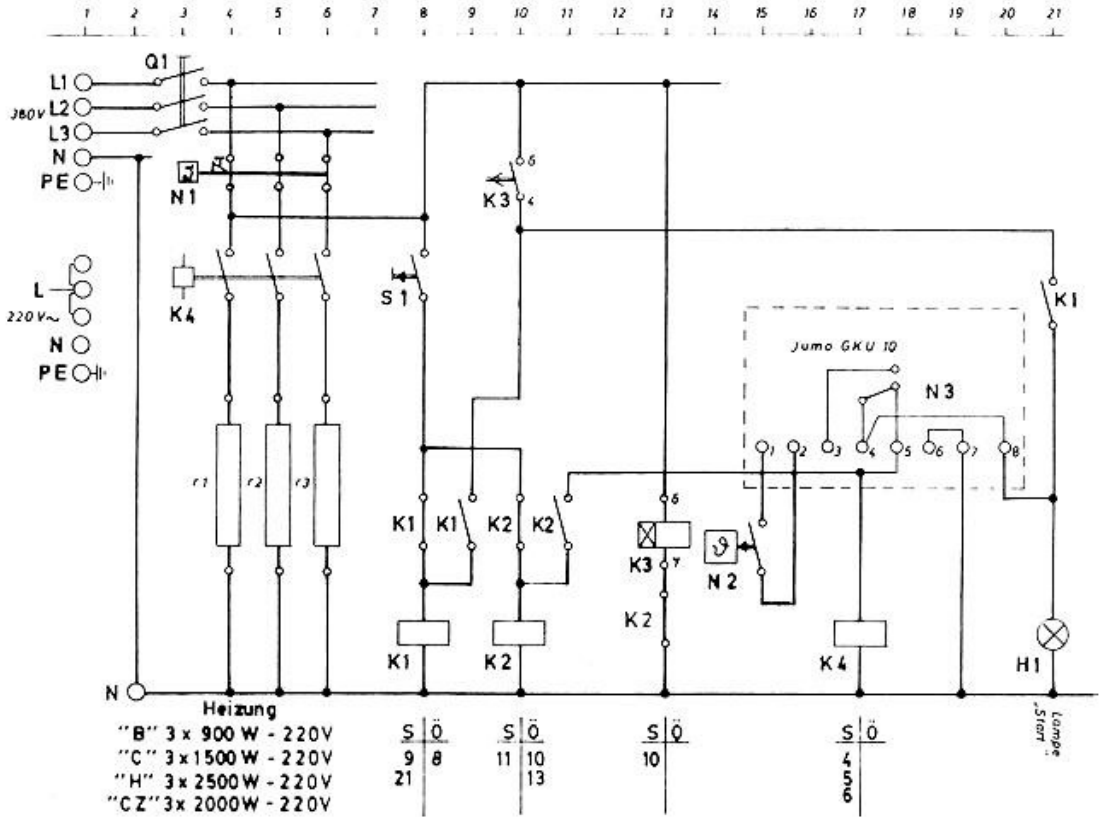




Model B-C-H

with

exhaust steam condensation device

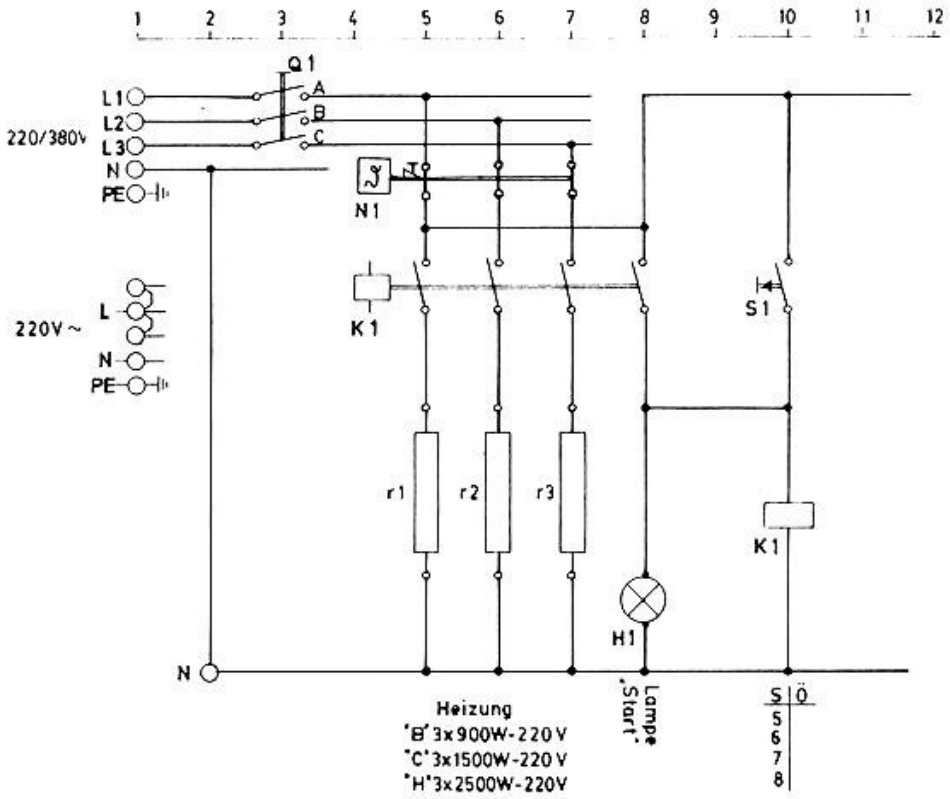


LEGEND

		Art.Nr.:
Q 1	three-stage switch	No. 6 5403 1614
S 1	button START	No. 6 5801 1012
K 4	heating contactor	No. 6 6102 0463
K 1	control contactor	No. 6 6101 4261
K 2	control contactor	No. 6 6101 4261
N 3	control relay	No. 6 5904 0101
N 2	contact thermometer	No. 6 6302 2202
N 1	overheating protection	No. 6 6205 1544
H 1	control lamp	No. 6 7104 2200
r 1-3	heating elements 2700 W, 4500 W, 7500 W, 220 V	
K 3	el. timer	No. 6 5204 0263

wiring diagram for autoclaves Model B-C-H
with contact thermometer and timer

No.
15055-0-1/7-4



LEGEND

Q 1	three-stage switch	No. 6 5403 1614
S 1	button START	No. 6 5801 0102
H 1	control lamp	No. 6 7104 2200
K 1	heating contactor	No. 6 6102 0561
N 1	overheating protection	No. 6 6205 1544
r 1-3	heating element B 2700 W	No. 6 0205 3090
	C 4500 W	No. 6 0206 3150
	H 7500 W	No. 6 0208 3250

wiring diagram for autoclares B-C-H in standard design — No. 15054-0-1/7-4

Spare Parts for WEBECO Model B-C-H Standard

Pos.	Qty.	Description	No.
1.	1	lid gasket B 10x11, C 15x15, H 20x20	
2.	1	manometer Ø 63,0 - 4 bar, R 1/4"	5 1826 3043
3.	1	thermometer, glass 512/513	
4.	1	overheating protection EMF 544	6 6205 1544
5.	1	water level glass Ø 14	
6.	2	gasket for dito, silicon 14 x 8 x 10	5 5300 1401
7.	1	set heating element, B 3x900 W,	6 0205 3090
		C 3x1500 W	6 0206 3150
		H 3x2500 W	6 0208 3250
8.	1	three-stage switch Telux E16, size 14	6 5403 1614
9.	1	contactor KL04/10E 220 V/50 Hz	6 6102 0463
10.	1	press button 1.10102.001/02 white	6 5801 0102
11.	1	glow lamp E10, 220 Volts	6 7104 2200
12.	1	glow lamp socket, RAFI 1.60502.102 green	6 7405 1015
13.	1	safety valve 851 1/2" 2,5 bar	

Additional Spare Parts vor Model B-C-H with compact thermometer/Timer

14.	1	relay GKU 10 220 V	6 5904 0101
15.	1	contactor DSL 4-22 220 V	6 6101 4261
16.	1	timer 0-60 min	6 5204 0263
17.	1	contact thermometer FW 22 0-150	6 6302 2202