

Wasserdestillierapparate Water Stills

2002 - 2012



**Operating
Instructions**

1. Before installation

The information given in the present manual must **by all means** be carefully read and observed. Only then can a perfect functioning of the Water Still be guaranteed.

**Vital information within the manual are emphasized in bold letters.
Safety precautions are additionally marked with the following symbols**



Warning of hot liquids and steam



Warning of hot surfaces



Warning of dangerous electrical voltage

A free of charge guarantee repair cannot be granted for defects due to improper installation or handling.

In order to protect the Water Stills during transport, all free openings are covered with tape. These transport protections have to be removed before installation.

2. Location of the Water Still

The unit is suitable for both bench and wall mounting. It is only suitable for **indoor** use.

If the unit is to be placed on a bench, place on solid, even and level surfaces only.

If the unit is to be mounted on a wall, check the carrying capacity of the wall in connection with the total weight of the unit (appliance plus water filling, see technical data).

There are two keyholes for wall mounting at the back of the water still. Place two fastening screws in the wall in the distance of the two keyholes and nest the still on the keyholes.

Model / Distance of screws

2002 / 40 cm	2004 / 48 cm
2008 / 64 cm	2012 / 64 cm

The unit is **not** suitable for use in explosion endangered surroundings, eg during anaesthesia with inflammable gas or steam types!

3. Voltage

Main switch of the water still must be in **OFF** position.

Mains voltage and voltage stated on the name plate at the left-hand side of the unit must be identical.

If this applies, unit can be connected.



The water still must only be installed connected to a properly installed power connection with neuter (PE), according to the local regulations. It must be secured that power can be cut all-pole (switch or socket).

Please also refer to item 10 of these operating instructions "Examples for power connections".

4. Water connections

All water connections of the water still, excepting the distillate withdrawal tap on the front, are at the right-hand side of the unit.

Hoses for water inlet and outlet are not supplied, but have to be procured by the users.

4.1 Distillate withdrawal (1)

Distillate is withdrawn via the black plastic tap (1) on the front of the unit. The tap can be opened in continuous or in interval positions. A laboratory hose with an inner diameter of approx 15 mm can be fixed to the distillate withdrawal tap. The hose must be secured with a hose clip.



Caution!
Distilled water leaves the water still with a temperature of more than 50°C.
Danger of scaldings!

4.2 Inlet separate water supply (2) (accessory, article no 2901)

The water inlet for the separate water supply (2) supplies the boiler of the water still with pretreated water through a hose connection with built-in flow reducer (0.5 l/min). Use a **pressure hose** (½", inner Ø 12.7 mm) with blockable water connection (7, hand stop valve) to connect the hose connection with the water mains for pretreated water.

Inflow of pretreated water will not be automatically switched off when the unit is switched off or when the storage tank is full.

4.3 Outlet separate water supply (3) (accessory, article no 2901)

Connect a ¾" hose (inner Ø 19 mm) to the outlet connection of the separate water supply (3) and lead it to a drain on a lower level. The hose must have a slope on the complete length of the hose, the water must flow out without back draughts.

4.4 Draining the boiler (4)

Connect a ½" hose to drain the boiler in case of cleaning and/or maintenance works



Caution!
Distilled water leaves the water still with a temperature of up to 100°C.
Danger of scaldings!

4.5 Cooling water outlet (5)

Connect a ¾" heat-resistant hose to the cooling water outlet. It must not be longer than 1.5 m. The hose has to be led to a drain on a lower level and must have a slope on the complete length of the hose. **The cooling water must be allowed to flow off without back draughts.**

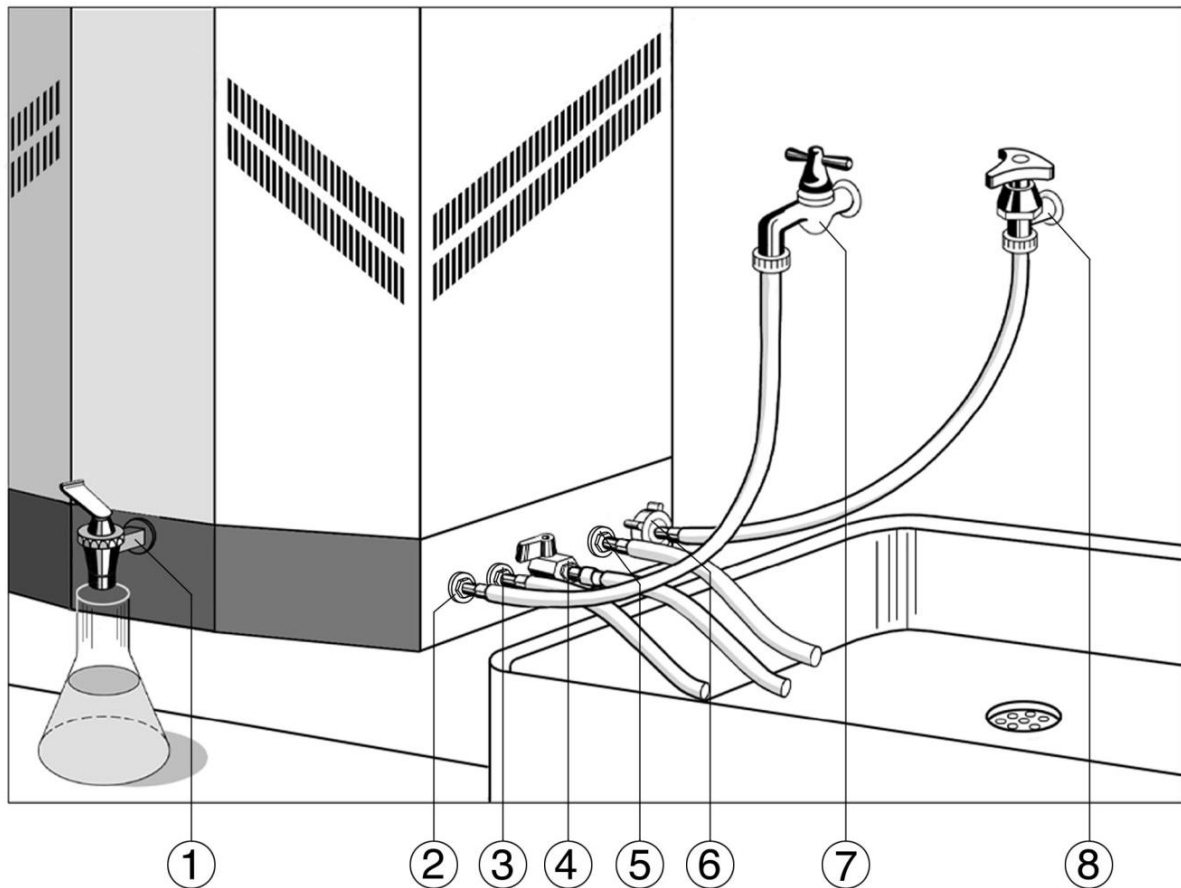


Caution!
Cooling water leaves the still with a temperature
of up to 70°C.
Danger of scaldings!

4.6 Tap water inlet (6)

The tap water inlet supplies water to the water still through a solenoid valve. Use a ½" pressure hose and a blockable water connection (8, hand stop valve) to connect the hose connection with the water mains.

By all means use hose clips to secure both hose connections!



5. Initiation

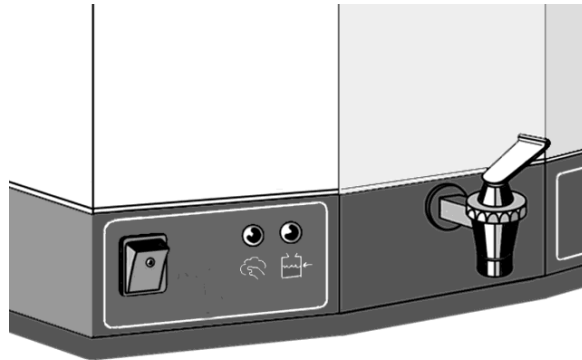
5.1 Before initial starting

Before initial starting, the water still has to be hand-filled with water. To fill with water, remove the outer and the left inner lids and the deflector below the inner lid. **Caution, when working on the deflector, observe the correct position of the wire electrode in the container.** It must neither be bent nor come into contact with the housing. Fill water into the boiler (left-hand chamber) until the heating elements at the bottom of the container are below water level. Replace the deflector and the two lids before starting the unit.

5.2 Initiation

After assembly of all power and water connections open the stop valves of the water supply (7, 8) and switch on the main switch to start operation.

During non-operation of the water still, the stop valves of the water supply should always be closed.



6. Functional description

6.1 Water stills

GFL Water Stills 2002, 2004, 2008 and 2012 are operated fully automatic.

After switching the unit on via the main switch, the green pilot lamp in the main switch and the yellow operation pilot lamp will glow.

The built-in solenoid valve is opened. Water flows through the cooling coil in the storage tank and a mechanical water level regulator that controls the water level in the boiler. Water that is not used for evaporation, flows off through the cooling water outlet.

The heating elements are switched on and bring the water in the boiler to the boil. A thermostatic **low water cut-off** protects the heating elements against running dry. The produced steam is led through a steam tube to the cooling coil, condenses, and the resulting distillate drips into the storage tank.

The water level in the storage tank (right-hand chamber) is controlled by a wire electrode. When the tank is full, an electronic regulator switches the water still off. The solenoid valve cuts off the inflow of cooling water, the heating elements are switched off and the yellow operation pilot lamp is extinguished.

Distillate can be withdrawn through the black plastic tap on the front of the unit.

After withdrawal of distillate, the unit is switched back on automatically, and the storage tank will be refilled.

Carbon dioxide is degassed through a vent on top of the unit.

6.2 Water stills with separate water supply

(Accessory that should be built into the unit in GFL's plant in Burgwedel)

The separate water supply serves to feed pretreated water to the boiler and at the same time feeding phosphatised or normal tap water to the cooling coil.

Before initial starting, the right-hand chamber must be hand-filled with pretreated water, as described in 5.1. To operate the unit, open both valves of the water supply (7 + 8).

The feed rate will be limited to 0.5 litres per minute by a quantity reducer. Unused water flows off through the outlet separate water supply (3).

The inflow of pretreated water is not automatically cut-off if the storage tank is full and/or if the unit is switched off. It must be cut off with the stop valve (7).

7. Servicing and Maintenance



Caution!
Before servicing and maintenance always let the water still cool down!
Danger of scaldings!

7.1 Descaling

Depending on the degree of hardness of the tap water, the water still must be cleaned regularly of scale formations. First remove the inner and outer lids, then unscrew the deflector and remove it, too.

A suitable descaling agent is a mixture of 10% formic acid, 10% acetic acid and 80% distilled water. Commercial descaling agents can also be used (e.g. "tin-be" by Messrs Dr Otto Hartmann, 71665 Vaihingen/Enz, Germany). Please **do not use** any products containing hydrochloric acid!

Fill the solvent into the boiler to cover the topmost scale formations and heat up to approx 70°C. Close valves (7 + 8) and switch the water still on until the temperature is reached. After approx 30 minutes let the solvent and scale mixture drain off through the drain cock "drain boiler (4)" and rinse the boiler with water several times.

Restart the unit as described in **5. Initiation**.

After descalings, the first few litres of distilled water should not be used as it might contain traces of evaporated descaling agent.

7.2 Pilot lamp Clean

Depending on the degree of impurities in the inflowing water and on the degree of impurities in the boiler caused by the distillation process, the water will foam up when boiling. If the foam gets into contact with the electrode in the boiler, an electronic impurity detector will switch off the unit and **the red pilot lamp Clean** will glow.

The boiler must be drained through the tap "drain boiler" (4) and rinsed with clear water several times.

The cut-off function Clean is cleared by switching the unit off and on again using the main switch.

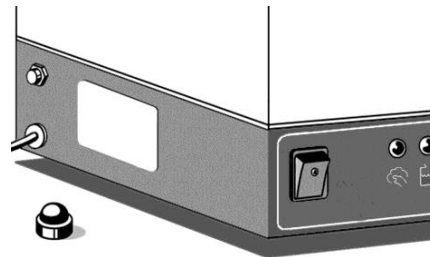
Restart the unit as described in **5. Initiation**.

7.3 Restarting after low water

A low water cut-off (thermostatic over-temperature cut-out) protects the heating elements against running dry.

In case of low water the water still is switched off by the low water cut-off. In order to restart the unit, the unit must be allowed to cool down. Then fill in water to cover the heating elements as described in **5. Initiation**.

The triggered low water cut-off has to be released. Loosen the black cap nut at the bottom right-hand side of the water still. Inside the thread a small white plastic pin can be seen that has to be pressed inside (e.g. with a pencil), until a clicking sound can be heard.



GFL Water Stills are produced with first class materials and are made to withstand even rough service conditions. Nevertheless, the units should only be subjected to rough conditions within sensible limits.



Caution!
Before opening and cleaning the water still
always cut off power!
(Pull the plug or switch off main switch)
Danger of electrical shocks!

Please make sure that no fluids come into contact with cable connections or the electrical parts of the inside unit!

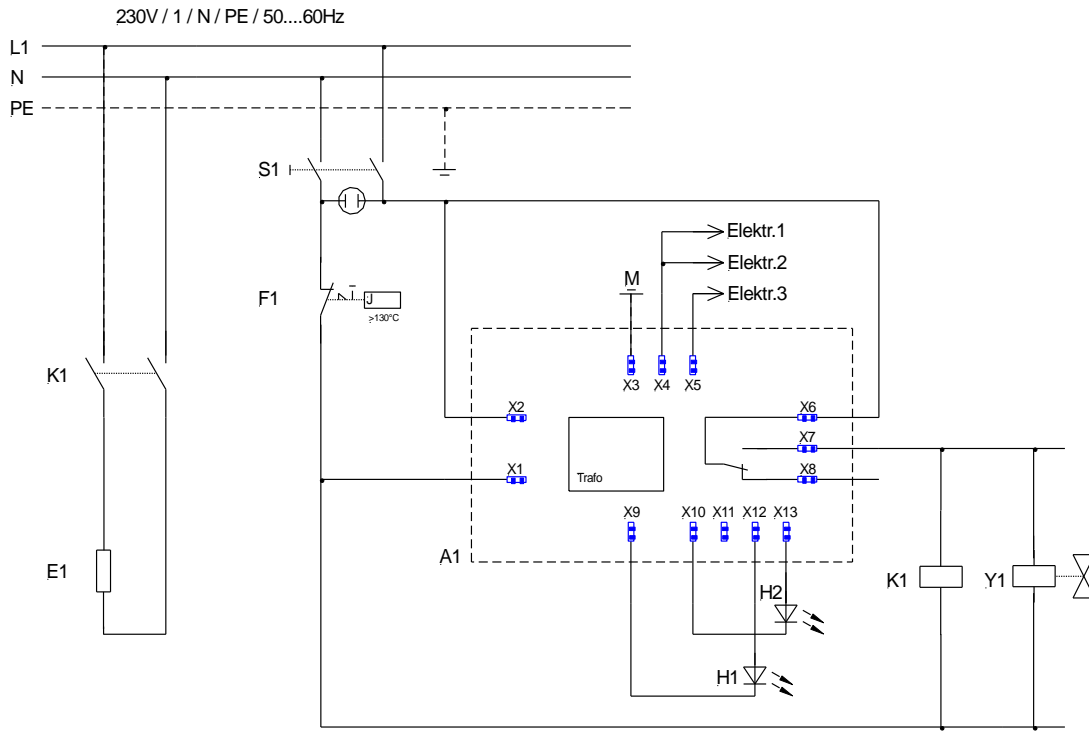
The pulver-coated surfaces of the unit can be cleaned with mild detergents, if necessary.

Servicings, repairs or modifications must be carried out according to the commonly recognised Technical Rules and Regulations by competent electricians only.

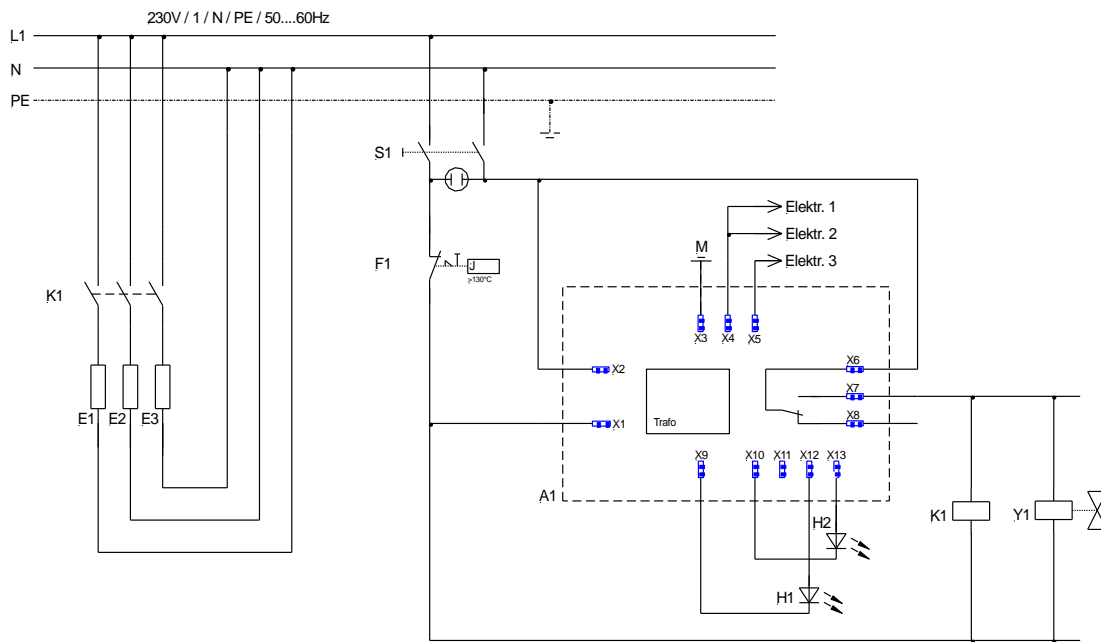
Only original spare parts must be used. Always demand a detailed confirmation of the carried out tasks by the person in charge (company, date, signature).

8. Technical Data

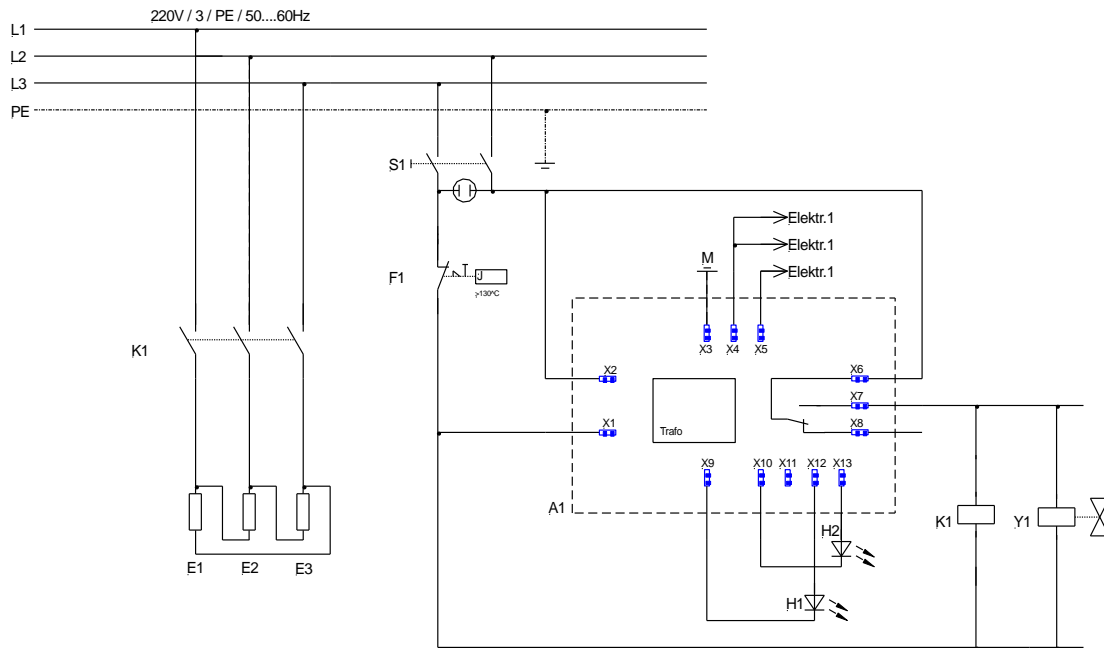
Exterior dimensions (W x D x H)	Model 2002- 540 x 290 x 420mm Model 2004- 620 x 330 x 460mm	Model 2008- 780 x 410 x 540mm Model 2012- 780 x 410 x 670mm
Storage tank	Model 2002- 4 litres distillate Model 2004- 8 litres distillate	Model 2008- 16 litres destillate Model 2012- 24 litres destillate
Distillation capacity	Model 2002- 2 litres / hour Model 2004- 4 litres / hour	Model 2008- 8 / h litres / hour Model 2012- 12 / h litres / hour
Distillate quality		in conformity wity DAB, bacteria and pyrogen free, low gas content.
Conductivity		approx 2,3µS/cm at 20°C
Cooling water required	Model 2002- approx 30 litres / hour Model 2004- approx 48 liters / hour	Model 2008- approx 72 litres / hour Model 2012- approx 198 litres / hour
Water pressure min / max		> 3 bar / 7 bar
Electrical connection / mains connection	Model 2002- 230V +/-10%, 50...60Hz, 1,5kW shock proof plug Model 2004- 230V +/-10%, 50...60Hz, 3,0kW shock proof plug	Model 2008- 230V, 220V / 3 / PE or 400V / 3 / N / PE +/-10% 50...60Hz, 6,0kW Mains connection cable without plug Model 2012- 220V / 3 / PE or 400V / 3 / N / PE +/-10% 50...60Hz, 9,0kW Mains connection cable without plug
Caution! Mains voltage deviations, even within the mentioned limits, influence the quantity of distillate produced!		
Protection type / - class		I / IP20
Surrounding conditions		Only inside buildings (not in explosion endangered surroundings) up to 2000m MSL +10 °C to +40 °C max 80% rel humidity to 31°C, decreasing to 40% rel humidity at 40°C.
Height Ambient temperature Humidity		
Weight (net/with water filling)	Model 2002- 18kg / 28kg Model 2004- 22kg / 34kg	Model 2008- 36kg / 60kg Model 2012- 43kg / 73kg



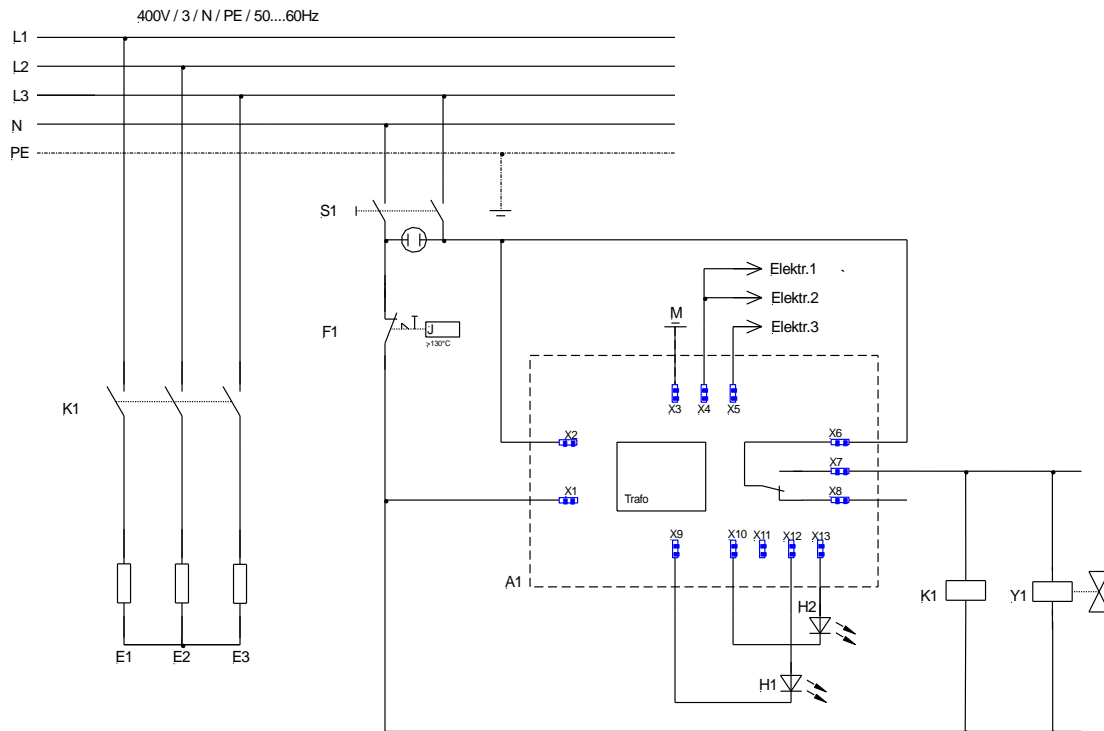
**9.3 Typ 2008 Ausführung 230 / 1 (s. Typenschild) –
Model 2008 – version 230 / 1 (see nameplate)**



**9.4 Typ 2008 und 2012 Ausführung 220 / 3 (s. Typenschild)
Models 2008 and 2012 – version 220 / 3 (see nameplate)**



**9.5 Typ 2008 und 2012 Ausführung 400 / 3 (s. Typenschild)
Models 2008 and 2012 – version 400 / 3 (see nameplate)**



10. Beispiele für den Netzanschluss - Examples for connection to the mains supply

Bauteile – Components

B1 Schutzkontakt Steckdose bauseits

Earthing contact socket (by customers)

B2	Schutzkontakt Stecker am Gerät montiert	Earthing contact plug (mounted on the unit)
F2	Netzsicherung bauseits	Mains fuse (by customers)
F3	Netzsicherung bauseits	Mains fuse (by customers)
F4	Netzsicherung bauseits	Mains fuse (by customers)
S4	Netzschalter bauseits	Main switch (by customers)

Farbkennzeichnung der Einzeladern des Anschlusskabels Typ 2008 und Typ 2012
Colour decoding of the individual leads of the mains connection cables for models 2008 and 2012

Farbkennung - Colour decoding	Stromnetz - Mains supply 220V / 3 / PE 50/60Hz	Stromnetz - Mains supply 400V / 3 / N / PE 50/60Hz
ge/gr – gelb/grün - yellow/green	PE	PE
bl – blau - blue	L1	N
sw – schwarz - black	L2	L1
sw – schwarz - black		L2
br – braun - brown	L3	L3

Wasserdestillierapparate können in unterschiedlichen Ausführungen zum Anschluss an verschiedene Netzspannungen geliefert werden.

Typ 2002 und 2004 in der **Ausführung 230V** (s. Typenschildangabe) können **an alle Stromnetze mit 220V oder 230V Spannung** angeschlossen werden.

Typ 2008 und 2012 in der **Ausführung 220/3** (s. Typenschildangabe) sind **nur zum Anschluss an Stromnetze mit 220V / 3 / PE** Netzspannung geeignet.

Typ 2008 und 2012 in der **Ausführung 400/3** (s. Typenschildangabe) sind **nur zum Anschluß an Stromnetze mit 400V / 3 / N / PE** Netzspannung geeignet.

Water Stills can be supplied in different versions for connection to different mains supplies.

Models 2002 and 2004 **for connection to 230V** (see nameplate) can be connected **to all mains supplies with 220V or 230V.**

Models 2008 and 2012 **for connection to 220/3** (see nameplate) can **only** be connected to mains supplies with **220V / 3 / PE.**

Models 2008 and 2012 **for connection to 400/3** (see nameplate) can **only** be connected to mains supplies with **400V / 3 / N / PE.**

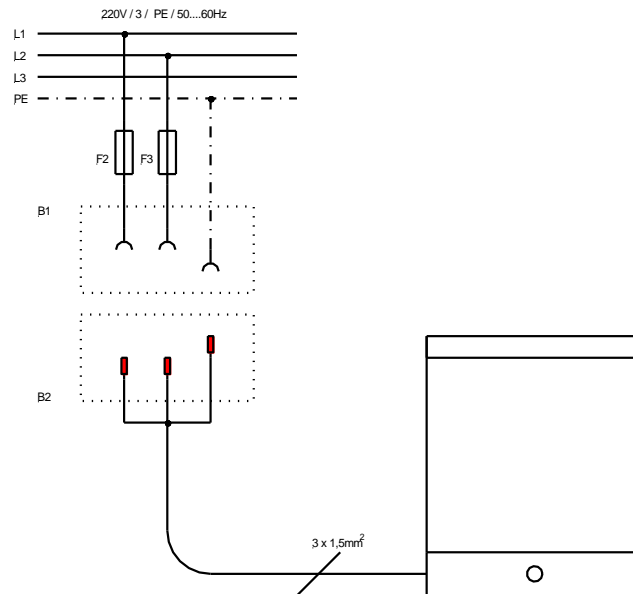
10.1 Elektrische Sicherungen - Electrical fuses

Typ Model	Leistung Power	Stromaufnahme bei Netzspannung * Power consumption at mains voltage*	Netzsicherung (F2–F4) Mains fuse (F2–F4)
2002	1,5 kW	6,5 A. bei 230V 6,5 Amp at 230 V	10 A / Amp
2004	3,0 kW	13,0 A. bei 230V 13,0 Amp at 230 V	16 A / Amp
2008	6,0 kW	26.1 A. bei 230V 26,1 Amp at 230 V	35 A / Amp
	6,0 kW	15.8 A. bei 220V / 3 / PE	16 A / Amp

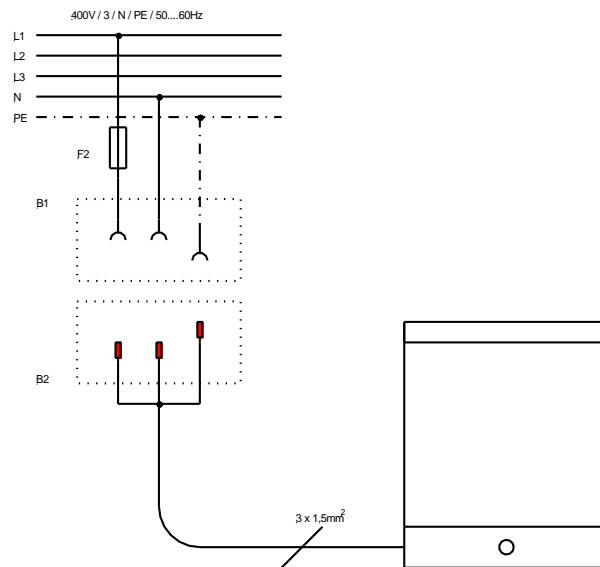
	6,0 kW	15.8 Amp at 220V / 3 / PE 8,7 A. bei 400V / 3 / N / PE	10 A / Amp
2012	9,0 kW	8,7 Amp at 400V / 3 / N / PE 23,6 A. bei 220V / 3 / PE	25 A / Amp
	9,0 kW	23,6 Amp at 220V / 3 / PE 13,0 A. bei 400V / 3 / N / PE	16 A / Amp
		13,0 Amp at 400V / 3 / N / PE	

* s. Typenschild - * see nameplate

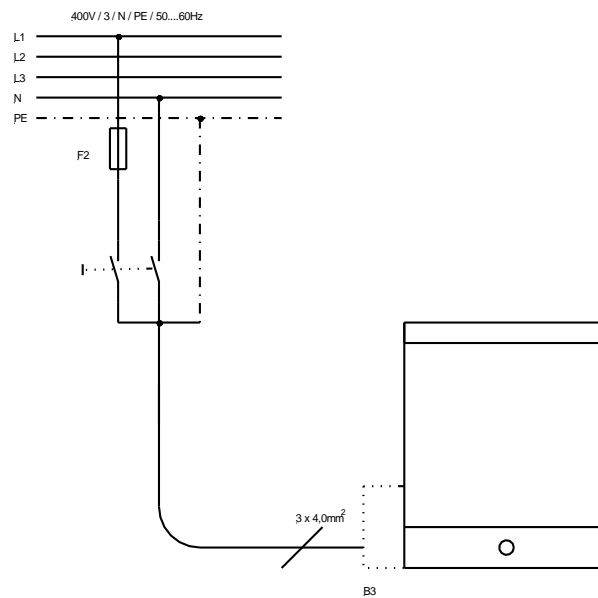
Typ 2002 und 2004 in 230V (s. Typenschild)
an ein Stromnetz 220V / 3 / PE / 50...60Hz
Models 2002 and 2004 for 230V (see nameplate)
for a mains supply of 220V / 3 / PE / 50...60 Hz



Typ 2002 und 2004 in 230V (s. Typenschild)
an ein Stromnetz 400V / 3 / N / PE / 50...60Hz
Models 2002 and 2004 for 230V (see nameplate)
for a mains supply of 400V / 3 / N / PE / 50...60 Hz

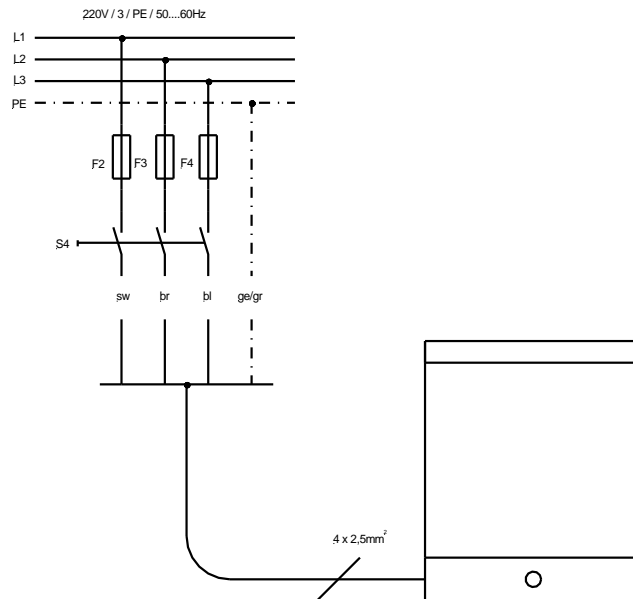


Typ 2008 in 230/1 (s. Typenschild)
an ein Stromnetz 400V / 3 / N / PE / 50...60Hz
Models 2008 for 230V (see nameplate)
for a mains supply of 400V / 3 / N / PE / 50...60 Hz

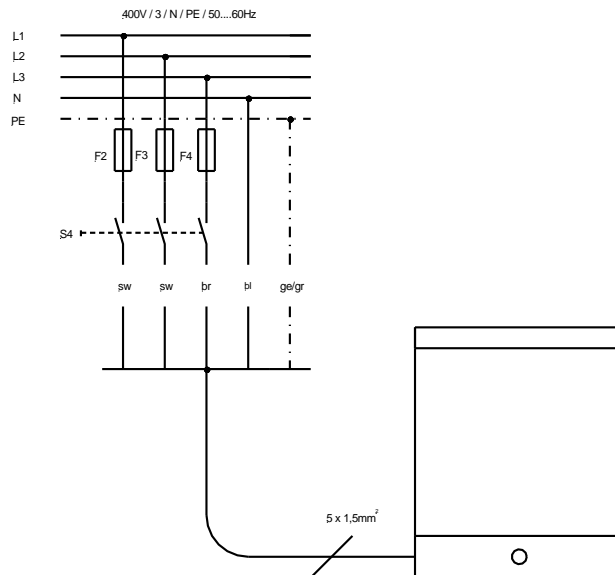


Typ 2008 und 2012 in 220/3 (s. Typenschild)
Stromnetz 220V / 3 / PE / 50...60Hz

**Models 2008 and 2012 for 220/3 (see nameplate)
for a mains supply of 220V / 3 / PE / 50...60 Hz**



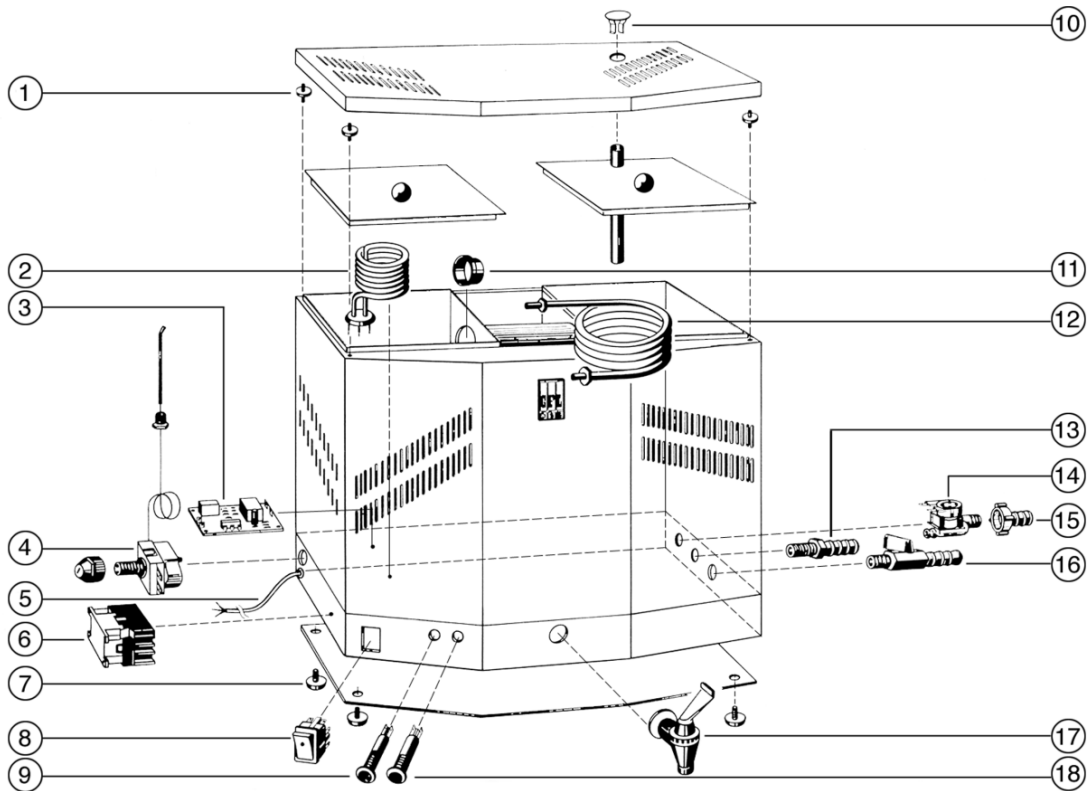
**Typ 2008 und 2012 in 400/3 (s. Typenschild)
an ein Stromnetz 400V / 3 / N / PE / 50....60Hz
Models 2008 and 2012 for 400/3 (see nameplate)
for a mains supply of 400V / 3 / N / PE / 50...60 Hz**



11. Ersatzteilliste - List of spare parts

Pos. Nr.	Bestell-Nr.	Artikel	Article
1	25.517	Deckelführung	Lid pin
	25.437	Sicherungsring	Securing ring

2	12.227	Rohrheizkörper 1500W / 230V (für GFL-2002)	Heating element 1500W / 230V (for GFL-2002)
	12.245	Rohrheizkörper 2000W / 230V (für GFL-2008)	Heating element 2000W / 230V (for GFL-2008)
	12.247	Rohrheizkörper 3000W / 230V (für GFL-2004 / 2012)	Heating element 3000W / 230V (for GFL-2004 / 2012)
3	13.755	Elektronischer Niveauregler	Electronic level switch
4	13.415	Wassermangelsicherung	Low water cut-off
5	12.311	Netzkabel (für GFL-2002/2004)	Mains connection cable (for GFL-2002/2004)
	30.029	Netzkabel (für GFL-2008/2012 400/3/N/PE)	Mains connection cable (for GFL-2008/2012 400/3/N/PE)
	12.304	Netzkabel (für GFL-2008/2012 220/3//PE)	Mains connection cable (for GFL-2008/2012 220/3/PE)
6	12.520	Schalterschütz	Contacteur
7	14.313	Gehäusefuß	Stand
8	12.426	Hauptschalter	Main switch
9	12.629	LED Signallampe rot	LED pilot lamp, red
10		Staubschutzabdeckung	Dust guard shield
11	17.427	Profildichtschnur aus Silikon	Profiled silicon sealing
12	16.214	Kühlschlange (für GFL-2002)	Cooling coil (for GFL-2002)
	16.209	Kühlschlange (für GFL-2004)	Cooling coil (for GFL-2004)
	16.215	Kühlschlange (für GFL-2008)	Cooling coil (for GFL-2008)
	16.205	Kühlschlange (für GFL-2012)	Cooling coil (for GFL-2012)
	25.232	Mutter	Nut
	17.339	Dichtung	Seal
13	15.115	Schlauchtülle für Kühlwasser	Hose spout for cooling water outlet
	15.116	Mutter	Nut
	17.316	Dichtung	Seal
14	12.505	Magnetventil	Solenoid valve
	14.212	Mengenregler 0,5 l/min (für GFL-2002)	Quantity regulator 0.5 l/min (for GFL-2002)
	14.213	Mengenregler 0,8 l/min (für GFL-2004)	Quantity regulator 0.8 l/min (for GFL-2004)
	14.215	Mengenregler 1,3 l/min (für GFL-2008)	Quantity regulator 1.3 l/min (for GFL-2008)
	14.207	Mengenregler 3,3 l/min (für GFL-2012)	Quantity regulator 3.3 l/min (for GFL-2012)
15	15.112	Verschraubung	Screwing
16	14.101	Schlauchhahn ¼ "	Hose tap ¼ "
	15.511	Sechskantmuffe ¼ "	Hexagon bushing ¼ "
	15.101	Schlauchtülle ¼ "	Hose spout ¼ "
	17.309	Dichtung	Seal
17	14.117	Destillatauslauf	Distillate outlet tap
18	12.630	LED Signallampe gelb	LED pilot lamp, yellow



Geben Sie bitte bei Ersatzteilbestellungen grundsätzlich **immer Typ und Seriennummer** des Wasserdestillierapparates an.
 Please **always state model and serial no** of the water still when placing an order for spare parts!

12. Zusatzeinrichtungen - Accessories

Dechloritfilter beseitigt die von den Wasserwerken zugesetzten Chloranteile im Leitungswasser. Mit Anschlüssen für Druckschlauch ½ Zoll, einschließlich Erstfüllung.

Ersatzfüllung für Dechloritfilter.

Dechlorite Filter eliminates chlorine particles in tap water added by the local waterworks. Complete with connection for pressure hose ½ inch, with first filling.

Spare filling for dechlorite filter.

Dechloritfilter
Bestell Nr. 2904

Dechlorite Filter
Order no 2904



Ersatzfüllung
Bestell Nr. 2905

Spare filling
Order no 2905



Phosphatschleuse verhindert das Auskristallisieren von Härtebildnern im Kondensator durch Phosphatieren des Leitungswassers. Einsetzbar bei Wasserhärten von 4 – 15°dH. Mit Anschlüssen für Druckschlauch ½ Zoll, einschließlich Erstfüllung.

Ersatzfüllung für Phosphatschleuse.

Phosphate cartridge prevents scale formation in the condenser by phosphating of tap water. Complete with connection for pressure hose ½ inch, with first filling.

Spare filling for phosphate cartridge.

Phosphatschleuse
Bestell Nr. 2906

Phosphate cartridge
Order no 2906



Ersatzfüllung
Bestell Nr. 2907

Spare filling
Order no 2907



Getrennte Wasserzufuhr, Bestell Nr. 2901, Beschreibung siehe Pkt. 6.2, ohne Abbildung.
Separate Water Supply, Order no. 2901, description see item 6.2, not illustrated.

13. Garantie

Wir gewähren auf das Gerät 1 Jahr Garantie ab unserem Verkaufsdatum.

Voraussetzung ist, dass das Gerät nach den Vorschriften dieser Bedienungsanleitung betrieben wird.

Die Garantieleistung umfasst die Behebung aller in der Garantiezeit auftretenden Schäden und Mängel, die nachweislich auf Fertigungs- und Materialfehlern beruhen.

Die Garantieleistung **entfällt** bei

- nicht vorschriftsgemäßem Anschluss,
- nicht bestimmungsgemäßer Verwendung,
- Nichtverwendung von Original-Ersatzteilen.

Das beanstandete Gerät senden Sie bitte sorgsam verpackt,
nach vorheriger telefonischer Klärung an

GFL Gesellschaft für Labortechnik mbH
Schulze-Delitzsch-Straße 4 D-30938 Burgwedel

**Bitte denken Sie daran, die Art des Fehlers zu beschreiben und Ihre vollständige
Anschrift anzugeben.**

13. Garantie

We grant one year (12 months) guarantee from the date of our invoice, providing that the unit is operated according to the instructions in this operation manual.

The guarantee comprises removal of all damages that arise during the guarantee period and that are proven to be due to faulty material or poor workmanship.

We **do not** grant guarantee if

the unit is not properly connected to the mains,
the unit is not used according to its purposes,
no original spare parts are used.

Before returning a defective unit, please contact your dealer or us.

Please do not return the unit before consulting us!!

If we agree to the unit being returned, arrange for careful packing and send the unit to

GFL Gesellschaft für Labortechnik mbH
Schulze-Delitzsch-Strasse 4
D – 30938 Burgwedel
Federal Republic of Germany

Please remember to describe the kind of fault and to state your complete address.

Gesellschaft für Labortechnik mbH
Postfach / P.O. Box 1152 · D-30927 Burgwedel
Schulze-Delitzsch-Straße 4 · D-30938 Burgwedel
Telefon ++49 5139 9958 0 · Telefax ++49 5139 9958 21
E-Mail: info@GFL.de
Internet: <http://www.GFL.de>