

Water Stills

GFL®



■ The result of decades of experience and technical innovation: four individually applicable product ranges with 14 different models.



Quality built on Tradition

Users in research labs, standard and special labs for medicine, science and industry throughout the world have been profiting from the precision and dependability of our products for almost 40 years, all of which comply with valid European standards and bear the CE mark.

In the future, the success of a product spectrum of laboratory devices that meet the toughest demands on material, functioning and design will continue to be ensured by experience of every-day use in detail, ongoing technical advances and an excellent quality approach.

The phrase „Quality built on Tradition“ encompasses more than just the sum of impressive product innovations. It is also an expression of our corporate policy, which includes a high degree of ready-and-waiting service as our primary customer-friendly service goal.

This applies to all of the GFL laboratory products that are produced exclusively at our plant in Germany - Deep Freezers, Shakers, Shaking Water Baths, Water Baths, Incubators or Water Stills alike.



Secure future

A vested quality demand in accordance with international standards is documented for all GFL laboratory products with the certification to DIN EN ISO 9001:2000, promoting more trust in the permanent high quality level of our products.

In addition to the continuous optimisation of ongoing production processes, the ISO obligation also calls for the commitment to quality awareness of our employees and the continuous development and rapid implementation of preventive measures to ensure quality assurance at a high level.

Strong partners on a high level



Decades of experience and technical innovation have set the standards: GFL Water Stills produce ultra-pure, low-gas, bacteria and pyrogen free distillate with a very low conductivity. It is in conformity with DAB requirements and international pharmacopoeia regulations.

The conductivities for each model stated in this brochure are average values, determined by Institute

Fresenius, for use with tap water, and are to be understood as approximate values. Depending on the quality of tap water, the conductivity obtained might easily be improved.

All over the world, four highly efficient GFL Water Still ranges are offered, comprising 14 different models with capacities of 2 – 12 litres per hour. The distillate is used in research and development, for instance in bacteriological and medical preparation of samples and for the preparation of cell and tissue cultures. It is also used for cleaning and sterilisation processes,

for buffer solutions and for microbiological and analytical applications, especially for HPLC.

By distilling the heated cooling water, all units operate highly economically. They are reliable, maintenance-free, user and service friendly and have the CE mark.

Accessories shown in this brochure are not part of the standard scope of supply of the units. The right of constructional modifications remains reserved. Special makes are available.

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Water. The Origin of All life

- Water is the origin of all life, an indispensable and irreplaceable natural product for man, beast and plant. Not only is water our most important food, it also possesses the highest solubility of all known substances, a discovery that led to the production of pure water through distillation (lat. *destillare* / drip down) probably as early as 5,000 years ago.

Pure water. On the art of distillation.

Distillation is the most effective and reliable way of producing pure water, the exceptional quality being that the only additive required is energy. Compared to other additives, such as e.g. adsorbents or solvents, energy can easily be added to and extracted from a system. Furthermore, Water Stills require very little maintenance. Apart from regular cleaning intervals they are completely maintenance-free.

The distillation process means the phase transformation of liquids (raw water: spring water, tap water or pretreated water) into steam and back to liquids. The transformation of liquids to steam separates effectively water from impurities having a higher boiling point than water. They remain as sediments in the condenser chamber (evaporator). The steam and some very few substances that have a lower or the same boiling point as water are brought to condensation.

Steam condensation produces distilled water, also called *Aquadest* (lat. *aqua destillata*). This "pure water" has a purity degree of approx. 99.5% regarding salts, organic substances, micro-organisms, pyrogens and bacteria. The pH value of the produced distillate turns slightly acidic when carbon dioxide from the environmental air dissolves in the distillate. Carbon dioxide is absorbed until a dynamic balance between water and environmental air develops. Pure water should, therefore, be used up quickly or stored under airtight conditions.

The conductivity of distillate mainly depends on the quality of raw water and the construction of the Water Still. By connecting a second distillation stage (bi distillation), respectively by using special materials in the Water Still (glass) the purity of the distillate can be further increased.



Alambic with water cooling around the distillation helmet.

In the developmental history of distillation equipment, this unconventional model disposes of a cooling basin shaped like an oriental turban.

2001/2 - 2001/4

■ Compact and efficient

Product range 2001/2 and 2001/4 comprises two mono water stills without storage tank, for bench mounting, that produce two and four litres of distillate per hour.

Their easy handling makes them an indispensable help in producing high-quality distillate.



2001/4 Mono Water Still 4 l/h, for bench mounting

Specifications and Features

- ▶ good distillate quality, conductivity approx. 2.3 $\mu\text{s} / \text{cm}$ at 20 °C
- ▶ for drainage and cleaning, evaporator is easily accessible by lifting the condenser. Material: stainless steel, material no. 1.4301
- ▶ condenser (cooler) with baffle. Material: stainless steel, material no. 1.4301
- ▶ heating element made of stainless steel, material no. 1.4876
- ▶ thermostatic low water cut-off, to protect the heating element in case of low water
- ▶ thermometer to display the temperature of the cooling water
- ▶ energy-saving through distillation of the heated cooling water
- ▶ distillate withdrawal through drain tube on the front of the unit
- ▶ cooling water inlet and outlet on the right-hand side of the unit*
- ▶ water connection: cooling water inlet 1/2 inch (inner \varnothing 12.7 mm), cooling water outlet 1/2 inch (inner \varnothing 12.7 mm)*
- ▶ degassing of carbon dioxide through vent in the condenser
- ▶ main switch with pilot lamp on the front of the unit
- ▶ housing electrostatically powder-coated with epoxy resin
- ▶ power connection through mains connection cable with German shock-proof type (Schuko) plug

Technical data

Model Order No.	Capacity l / h	Cooling water requirement l / h approx.	Exterior dimensions mm approx.			Electrical connection*	Weight kg approx.		Packing volume approx. m ³
			Width	Depth	Height		net	gross cardboard box	
2001/2	2	20	280	250	490	230 V / 50...60Hz / 2.0 kW	7.5	10	0.10
2001/4	4	40	280	250	490	230 V / 50...60Hz / 3.0 kW	7.5	10	0.10

* Special voltages available on request

* Tubes for water inlet and outlet can be supplied as accessories.

2002 - 2012

■ Comfortable and reliable

Models 2002 – 2012 with automatic operation supply two, four, eight and twelve litres of distillate per hour, depending on the model type.

The built-in distillate storage tank accepts double the hourly capacity of the Water Still. All models have successfully proved in every-day laboratory routine. They dispose of an electronic monitoring function which ensures a continuous production of distillate.

Specifications and Features

- ▶ good distillate quality, conductivity approx. $2.3 \mu\text{s} / \text{cm}$ at $20 \text{ }^\circ\text{C}$
- ▶ heating element made of stainless steel, material no. 1.4876
- ▶ thermostatic low water cut-off, to protect the heating element in case of low water
- ▶ energy-saving through distillation of the heated cooling water



2004 Mono Water Still 4 l / h with built-in storage tank 8 l, for bench and wall mounting

- ▶ degassing of carbon dioxide through vent in the top
- ▶ evaporator with baffle is easily accessible by lifting the lids. Material: stainless steel, material no. 1.4301
- ▶ storage tank for distillate accepts double the hourly capacity of the unit. Material: stainless steel, material no. 1.4301
- ▶ condenser (cooling coil) in the storage tank, easily exchangeable. Material: stainless steel, material no. 1.4301
- ▶ water supply through a built-in solenoid valve with connection for water pressure hose 1/2 inch (inner Ø 12.7 mm) •
- ▶ cooling water pressure required: > 3 bar to max. 7 bar. After switching on the main switch the solenoid valve opens the water supply and closes it once the storage tank is full, thus avoiding unnecessary waste of water
- ▶ cooling water outlet with hose connection 1/2 inch (inner Ø 19 mm). Water that has not been condensed flows off through the cooling water outlet •
- ▶ distillate withdrawal through the drain cock on the front of the unit. The drain cock can be opened in either continuous or touch position
- ▶ an electronic level switch switches the still off when the storage tank is full and restarts it automatically when distillate is withdrawn
- ▶ an electronic impurity detector switches the unit off in case of high degree impurities in the evaporator, the red pilot lamp "Clean" will glow
- ▶ drainage of the evaporator through drain cock on the right-hand side of the unit
- ▶ main switch and pilot lamps (red pilot lamp for operation and red pilot lamp for cleaning) are on the front of the unit
- ▶ double-walled housing. Housing is made of electrolytically galvanized sheet steel, electrostatically powder-coated with epoxy resin
- ▶ power connection through connection cable, 2 and 4 litre units have German shock-proof type (Schuko) plug

Technical data

Model Order No.	Capacity	Storage tank	Cooling water requirement	Exterior dimensions mm approx.			Electrical connection*	Weight kg approx.		Packing volume approx. m ³
	l / h	Contents / l	l / h	Width	Depth	Height		net	gross cardboard box	
2002	2	4	30	540	290	420	230 V / 50...60Hz / 1.5 kW	15.4	18.5	0.16
2004	4	8	48	620	330	460	230 V / 50...60Hz / 3.0 kW	20.2	24.0	0.16
2008	8	16	72	780	410	540	400 V / 3 / N / PE / 50...60Hz / 6.0 kW three-phase current	30.7	41.0	0.34
2012	12	24	198	780	410	670	400 V / 3 / N / PE / 50...60Hz / 9.0 kW three-phase current	43.0	47.0	0.48

* Special voltages available on request

• Tubes for water inlet and outlet can be supplied as accessories.

2102 - 2108

■ Operation and Service Friendly

Double Distillers 2102 – 2108 are produced of a material combination of stainless steel / glass, without storage tank. Operating fully automatic, they produce two, four or eight litres of distillate per hour, depending on the model.



A stop valve made of Duran glass D 50 enables mono distillate to be withdrawn

2104 Double Distiller 4 l / h,
for bench and wall mounting

Control panel with clear symbols for easy monitoring of operation



Specifications and Features

- ▶ excellent distillate quality, conductivity of mono distillate approx. 2.2 $\mu\text{s} / \text{cm}$ at 20 °C; conductivity of bi-distillate approx. 1.6 $\mu\text{s} / \text{cm}$ at 20 °C
- ▶ evaporator and baffle of the mono stage are easily accessible by lifting the condensers. Material: stainless steel, material no. 1.4301
- ▶ condensers (coolers): 1st stage made of stainless steel, material no. 1.4301; 2nd stage including baffle made of Duran glass D 50
- ▶ heating elements made of stainless steel, material no. 1.4876
- ▶ water supply through built-in solenoid valve with connection for water pressure hose 1/2 inch (inner \varnothing 12.7 mm) •
- ▶ required cooling water pressure: > 3 bar to max. 7 bar. After switching on the main switch the solenoid valve opens the water supply
- ▶ cooling water outlet with hose connection 3/4 inch (inner \varnothing 19 mm). Water that has not been condensed flows off through the cooling water outlet •
- ▶ energy-saving through distillation of the heated cooling water
- ▶ distillate withdrawal: stop valve made of Duran glass D 50 with Teflon plunger for mono distillate, outlet with dust guard shield made of Duran glass D 50 for bi-distillate
- ▶ low water cut-off: float switch and thermostatic over-temperature cut-out
- ▶ an electronic impurity detector switches the unit off in case of high degree impurities in the 1st stage evaporator, the red pilot lamp "Clean" will glow
- ▶ degassing of carbon dioxide through vent on the condensers
- ▶ main switch and pilot lamps to monitor both distillation stages are on the front of the unit
- ▶ two-part housing made of electrolytically galvanized sheet steel, electrostatically powder-coated with epoxy resin; upper part easily removable through quick-release catches
- ▶ power connection through connection cable

Technical data

Model Order No.	Capacity l / h	Cooling water requirement l / h approx.	Exterior dimensions mm approx.			Electrical connection*	Weight kg approx.		Packing volume approx. m ³
			Width	Depth	Height		net	gross cardboard box	
2102	2	72	500	260	470	230 V / 50...60Hz / 3.5 kW	18	26	0.26
2104	4	120	550	280	570	400 V / 3 / N / PE / 50...60Hz / 6.5 kW three-phase current	23	35	0.34
2108	8	198	700	390	700	400 V / 3 / N / PE / 50...60Hz / 11.5 kW three-phase current	39	55	0.62

* Special voltages available on request

• Tubes for water inlet and outlet can be supplied as accessories.

2202 - 2304

■ Excellent Quality and Technology

Due to their extremely low content of metal ions in the distillate our Glass Water Stills count among the top-end products in the market. GFL produces a range of five fully automatic models.

Three models produce mono distillate of two, four and eight litres / hour. For bi-distillation, we offer two models with capacities of two and four litres per hour.

Specifications and Features

- ▶ excellent distillate quality, conductivity of mono distillate approx. 2.2 $\mu\text{s} / \text{cm}$ at 20 °C; conductivity of bi-distillate approx. 1.6 $\mu\text{s} / \text{cm}$ at 20 °C
- ▶ evaporator, condenser and overflow made of Duran glass D 50. Condenser with dribble guard
- ▶ water supply through built-in solenoid valve with connection for water pressure hose 1/2 inch (inner \varnothing 12.7 mm) •
- ▶ required cooling water pressure: > 3 bar to max. 7 bar. After switching on the main switch the solenoid valve opens the water supply
- ▶ cooling water outlet with hose connection 1/2 inch (inner \varnothing 12.7 mm)
- ▶ Water that has not been condensed flows off through the cooling water outlet •
- ▶ energy-saving through distillation of the heated cooling water
- ▶ heating element with quartz sheathing
- ▶ sterilisation of the condensers by steam
- ▶ electronic level control during the whole distillation process
- ▶ water level control in the condenser with automatic power cut-off in case of water shortage
- ▶ electronic impurity detector induces automatic water change to rinse and clean the condenser
- ▶ degassing of carbon dioxide through vents on the condenser
- ▶ main and function switches as well as pilot lamps for monitoring are on the front of the unit
- ▶ distillate withdrawal at the right-hand side of the unit through hose connection •
- ▶ visible distillation process through easily removable, unbreakable front screen that does not steam up
- ▶ housing made of electrolytically galvanized sheet steel, electrostatically powder-coated with epoxy resin
- ▶ power connection through connection cable (models 2202, 2204 and 2302 with German shock-proof Schuko plug)

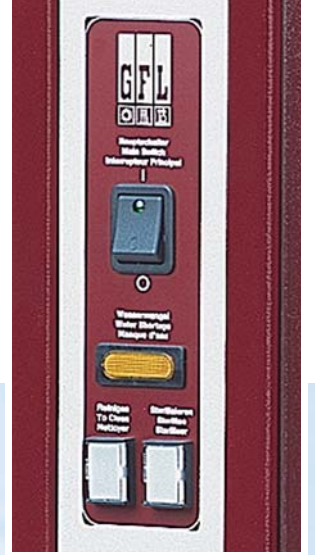
Technical data

Model Order No.	Capacity l / h	Cooling water requirement l / h approx.	Exterior dimensions mm approx.			Electrical connection*	Weight kg approx.		Packing volume approx. m ³
			Width	Depth	Height		net	gross cardboard box	
2202 Mono	2	48	650	200	390	230 V / 50...60Hz / 1.5 kW	16	22.0	0.34
2204 Mono	4	96	650	200	390	230 V / 50...60Hz / 3.0 kW	17	22.0	0.34
2208 Mono	8	144	650	365	390	400 V / 3 / N / PE / 50...60Hz / 6.0 kW three-phase current	24	30.0	0.34
2302 Bi	2	96	650	365	390	230 V / 50...60Hz / 2.9 kW	24	30.5	0.34
2304 Bi	4	144	650	365	390	400 V / 3 / N / PE / 50...60Hz / 5.8 kW three-phase current	24	31.5	0.34

* Special voltages available on request

• Tubes for water inlet and outlet can be supplied as accessories.

The fully automatic functions "Clean" and "Sterilising" can be induced manually on the control panel



2304 Glass Bi-Distiller 4 l / h,
for bench and wall mounting



2202 Glass Mono Distiller 2 l / h,
for bench and wall mounting

Accessories / Pretreatment

Pretreatment for all GFL Water Stills 2001/2 -2001/4, 2002-2012, 2102-2108, 2202-2304



Order No. 2904

Dechlorite Filter

eliminates chlorine particles in the tap water added by the local water works. Complete with connections for pressure hose 1/2 inch * (inner Ø 12.7 mm), including first filling. The filling should be exchanged every six months.

* Tubes for water inlet and outlet are not included in the standard scope of supply

Spare Filling

for Dechlorite Filter

Order No. 2905



Order No. 2906

Phosphate Cartridge

prevents scale formation in the condenser by phosphatising the tap water. Can be used from 4-15°dH (German hardness). Complete with connections for pressure hose 1/2 inch * (inner Ø 12.7 mm), including first filling. The filling should be replaced according to the consumption.

* Tubes for water inlet and outlet are not included in the standard scope of supply

Spare Filling

for Phosphate Cartridge

Order No. 2907



Order No. 2912

Pre-Filter 1 µm

for pre-cleaning the tap water, and to protect the unit from premature contamination. Food safe according to FDA regulations. Complete with connections for pressure hose 1/2 inch * (inner Ø 12.7 mm), including filter candle. The candle should be replaced every six months.

* Tubes for water inlet and outlet are not included in the standard scope of supply

Spare Candle

for Pre-Filter

Order No. 2913

Accessories for Order Nos. 2904, 2906, 2912



Order No. 2921

Wall Bracket

for one filter, with screws to fix the filter to the wall bracket



Order No. 2922

Wall Bracket

for two filters, with one sleeve to connect the filters and screws to fix the filters to the wall bracket



Order No. 2923

Wall Bracket

for three filters, with two sleeves to connect the filters and screws to fix the filters to the wall bracket



Order No. 2924

Spanner for Filters

for trouble-free opening and closing of the filters

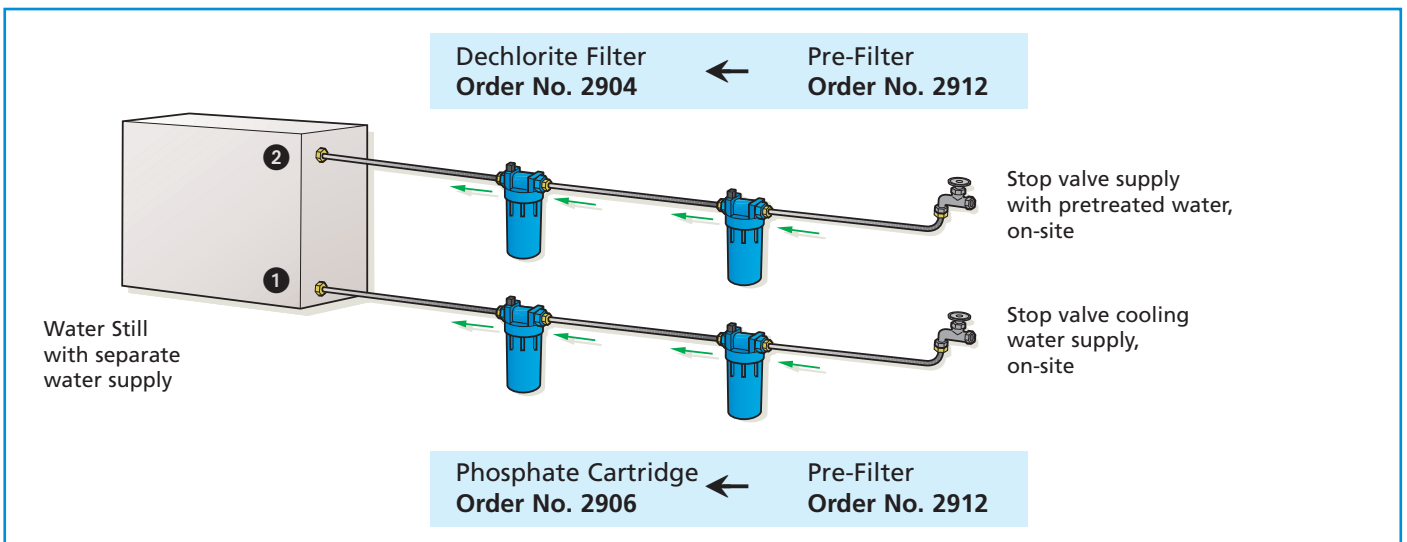
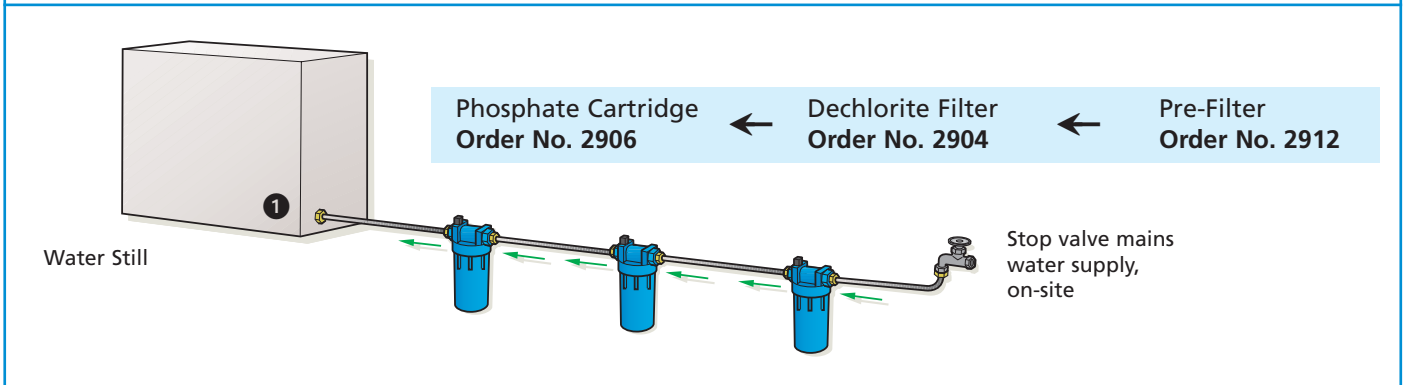
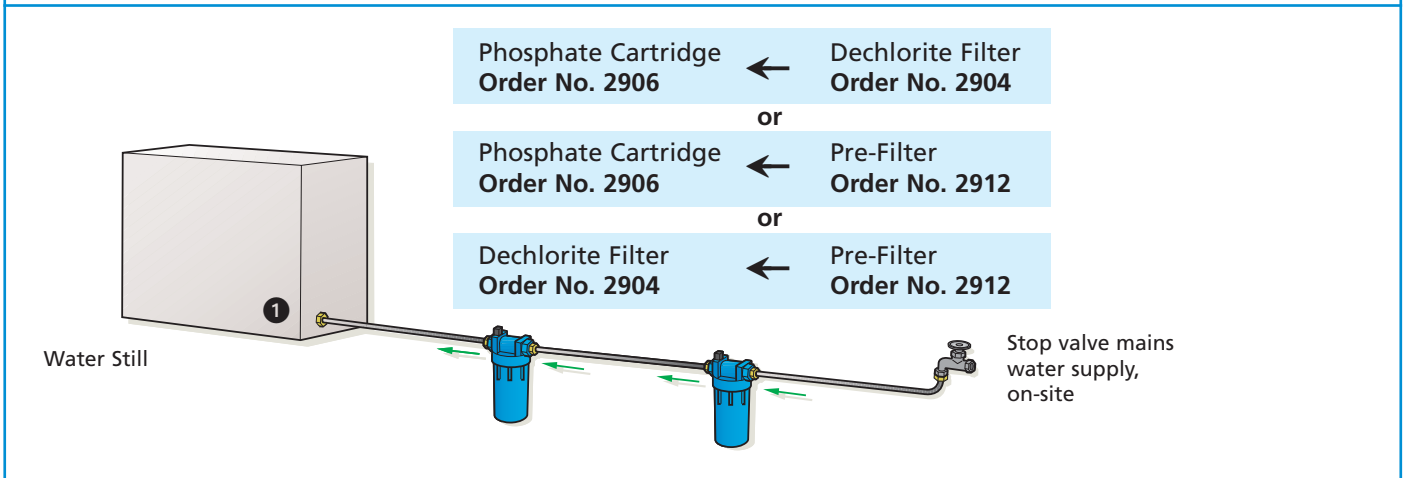
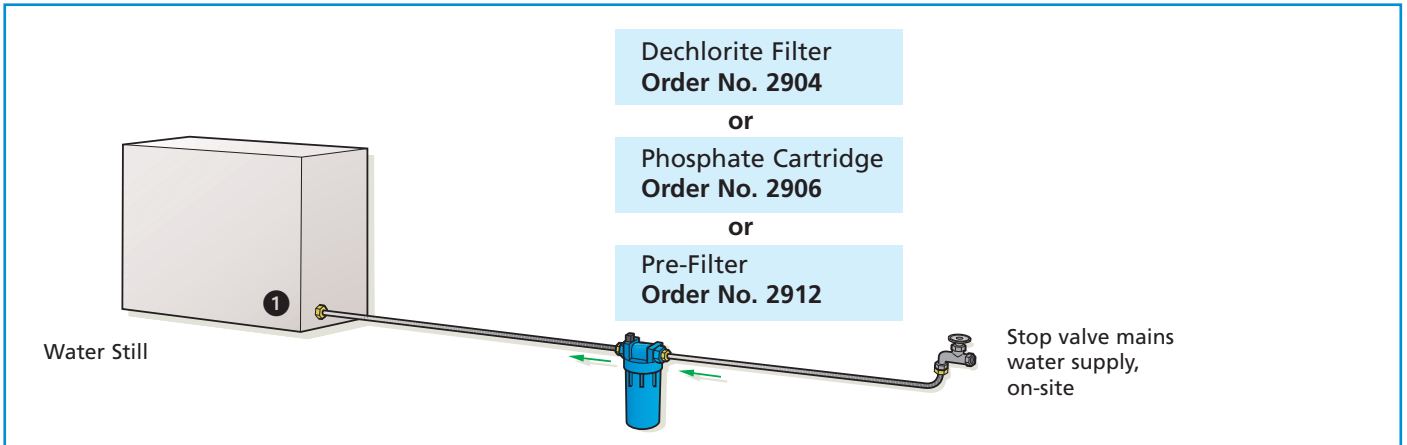


Order No. 2925

Sleeve Connector

for direct connection of two filters

Connection Variants for Pre-Filter, Dechlorite Filter and Phosphate Cartridge



1 Tap water supply 2 Inlet separate water supply The connection sequence must by all means be observed

Accessories



2001/2 - 2001/4



Hose Set

consisting of hoses for water inlet and outlet (1.5 m) and hose clips

Order No. 2940



2002

Separate Water Supply

to feed the evaporator with softened or desalinated water (pressure > 1 bar) and the cooling coil (pressure > 3 bar) with phosphate-treated or normal tap water.

Efficiency of the still is reduced by approx. 10 – 15 %

Order No. 2901



Hose Set

consisting of hoses for water inlet and outlet (1.5 m) and hose clips

Order No. 2941



Hose Set

consisting of hoses for water inlet and outlet (1.5 m) and hose clips, in connection with Separate Water Supply 2901

Order No. 2946



2004

Separate Water Supply

to feed the evaporator with softened or desalinated water (pressure > 1 bar) and the cooling coil (pressure > 3 bar) with phosphate-treated or normal tap water.

Efficiency of the still is reduced by approx. 10 – 15 %

Order No. 2901

Separate Water Supply with Solenoid Valve

to feed the evaporator with softened or desalinated water (pressure > 1 bar) and the cooling coil (pressure > 3 bar) with phosphate-treated or normal tap water. The solenoid valve switches the pretreated water off when the storage tank is full.

Efficiency of the still is reduced by approx. 10 – 15 %

Order No. 2909



Level Control Switch for an External Storage Tank

to switch off power and water when the external storage tank is full (not included in the standard scope of supply)

Order No. 2910



Hose Set

consisting of hoses for water inlet and outlet (1.5 m) and hose clips

Order No. 2941



Hose Set

consisting of hoses for water inlet and outlet (1.5 m) and hose clips, in connection with Separate Water Supply 2901 or 2909

Order No. 2946

Accessories



2008 - 2012

Separate Water Supply

to feed the evaporator with softened or desalinated water (pressure > 1 bar) and the cooling coil (pressure > 3 bar) with phosphate-treated or normal tap water.

Efficiency of the still is reduced by approx. 10 – 15 %

Order No. 2901

Separate Water Supply with Solenoid Valve

to feed the evaporator with softened or desalinated water (pressure > 1 bar) and the cooling coil (pressure > 3 bar) with phosphate-treated or normal tap water. The solenoid valve switches the pretreated water off when the storage tank is full.

Efficiency of the still is reduced by approx. 10 – 15 %

Order No. 2909

Level Control Switch for an External Storage Tank

to switch off power and water when the external storage tank is full (not included in the standard scope of supply) pict. see page 15

Order No. 2910

Heating with Thermostat for the Internal Storage Tank

to maintain sterility of the distillate

Order No. 2911



Hose Set

consisting of hoses for water inlet and outlet (1.5 m) and hose clips

Order No. 2941



Hose Set

consisting of hoses for water inlet and outlet (1.5 m) and hose clips, in connection with Separate Water Supply 2901 or 2909

Order No. 2946



2102 - 2108

Separate Water Supply

to feed the evaporator with softened or desalinated water (pressure > 1 bar) and the cooling coil (pressure > 3 bar) with phosphate-treated or normal tap water.

Efficiency of the still is reduced by approx. 10 – 15 %

Order No. 2903

Level Control Switch for an External Storage Tank

to switch off power and water when the external storage tank is full (not included in the standard scope of supply) pict. see page 15

Order No. 2910



Hose Set

consisting of hoses for water inlet and outlet (1.5 m) and hose clips

Order No. 2941



Hose Set

consisting of hoses for water inlet and outlet (1.5 m) and hose clips, in connection with Separate Water Supply 2903

Order No. 2947



2202 - 2208

Separate Water Supply

to feed the evaporator with softened or desalinated water (pressure > 1 bar) and the cooling coil (pressure > 3 bar) with phosphate-treated or normal tap water.

Efficiency of the still is reduced by approx. 10 – 15 %

Order No. 2902



2302 - 2304

Separate Water Supply

to feed the evaporator with softened or desalinated water (pressure > 1 bar) and the cooling coil (pressure > 3 bar) with phosphate-treated or normal tap water.

Efficiency of the still is reduced by approx. 10 – 15 %

Order No. 2902



Level Control Switch for an External Storage Tank

to switch off power and water when the external storage tank is full (not included in the standard scope of supply)

Order No. 2908



Level Control Switch for an External Storage Tank

to switch off power and water when the external storage tank is full (not included in the standard scope of supply)

Order No. 2908



Hose Set

consisting of hoses for water inlet and outlet (1.5 / 1.0 m), distillate withdrawal (0.5 m) and hose clips

Order No. 2943



Hose Set

consisting of hoses for water inlet and outlet (1.5 / 1.0 m), distillate withdrawal (0.5 m) and hose clips

Order No. 2944



Hose Set

consisting of hoses for water inlet and outlet (1.5 / 1.0 m) , distillate withdrawal (0.5 m) and hose clips, in connection with Separate Water Supply 2902

Order No. 2948



Hose Set

consisting of hoses for water inlet and outlet (1.5 / 1.0 m), distillate withdrawal (0.5 m) and hose clips, in connection with Separate Water Supply 2902

Order No. 2949

Summary Range of Laboratory Products



■ Chest Freezers

■ Upright Freezers



■ Water Baths

■ Tissue Float Bath



■ Shaking Water Baths

■ THERMOLAB®

■ Water Stills



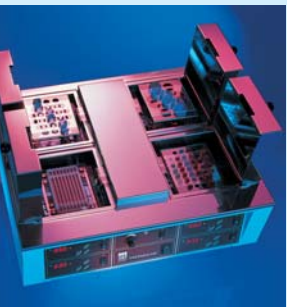
■ Shaking Incubators

■ Hybridisation Incubator



■ Mini Incubator

■ Mini Tube Roller Incubator



■ Shakers

■ Test Tube Rotator



■ Rotating Shaker



Would you like detailed information on our range of products?

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