

Fields of use

Microbiology
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Glass industry
Plating industry
Food service

Deionized water

Series Ion Exchange

Deionized Water

latest technology · highest quality · environmentally friendly



Manufactured by SG Water, Germany
for Whitewater Ireland

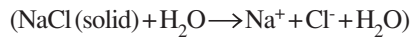
WHITewater

quality in purity

Ion exchange

Environmentally friendly way to deionize water

When inorganic salts dissolve in water they disassociate into positively charged cations and negatively charged anions. Common table salt, sodium chloride (NaCl), disassociates to form positively charged sodium and negatively charged chloride.

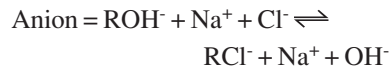
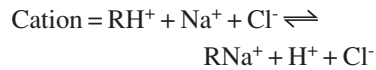


These and other unwanted ions may be removed by ion exchange.

Ion exchange is the reversible exchange of unwanted ions for wanted ions between a solid and liquid phase. In most ultrapure or reagent grade water applications, the solid materials are ion exchange resins made of styrene-divinylbenzene copolymers. Strong acid cation exchange resin is used to exchange cations such as sodium. Strong base anion resin is used to remove anions such as chloride. Ion exchange resins are typically produced as small bead shaped materials exhibiting a gel or porous appearance. The styrene-divinylbenzene copolymer resins contain multiple sulfonic groups or sites for cation exchange and quaternary amine groups for anion exchange throughout the resin structure. Liquid will pass over and through the resin bead. Since the exchange sites are distributed throughout the structure of the resin bead, there is high surface area availability for efficient ion exchange.

The ion exchange sites on the resin structure have an affinity toward ions based on molecular weight and valence or charge. Monovalent ions of higher molecular weight are held more strongly to the resin exchange site. Divalent or multivalent ions are held more strongly than lower charge ions. Cation exchange resins used for ultrapure water are provided in the hydrogen (RH⁺) form

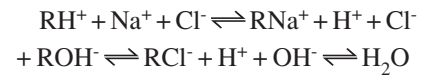
and anion resins are provided in the hydroxide form (ROH⁻). As water containing sodium chloride passes through and around the cation and anion resins, sodium is exchanged for hydrogen and chlorides are exchanged for hydroxide ions. This can be illustrated for the individual resins as:



Note that the above reactions are illustrated as reversible. Concentrated acid can be used to regenerate exhausted cation resin and concentrated caustic can be used to regenerate anion resin.

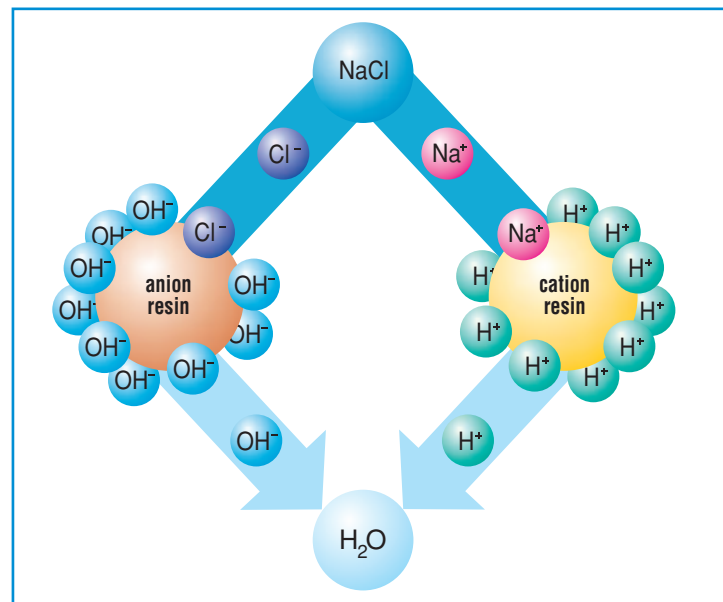
In practice, the cation resin is placed in front of the anion resin in a two bed system. This would eliminate the sodium (most) prior to the anion exchange reaction. The hydrogen and hydroxide

ions then combine to form water molecules. Thus, the reaction becomes:



The most efficient way to apply cation and anion resins for high purity water applications is to proportionally mix the two resins together into a single bed. Since cation resins have a higher capacity per unit volume than anion resins, the proportions are typically about 40% cation and 60% anion by volume. Mixing the resins basically creates many two-bed systems inside one bed of resin and allows for virtually complete removal of ions. Mixed bed resins can produce water purities of 18.2 MΩ-cm (0.055 μS/cm) at 25°C. Two-bed systems may struggle to reach 10 MΩ-cm due to competing ions causing sodium leakage.

Ion exchange resins come in various qualities based on the intended appli-



Schematic principle of ion exchange .

cation. Resins may be classified as nuclear or semiconductor grade. As the grade names imply, nuclear grade resins are designed to meet specification re-

quirements for nuclear power generation. Semiconductor grade resins are designed for the microelectronics industry. Semiconductor grade resins should

be used in lab reagent grade water systems due to the high purity capability with very low leachable organic carbon.

Deionizers: The Facts

Resins, water flow and capacity...

Since SG was founded, one of its main fields of business has been the development and production of deionizers.

The product spectrum ranges from the non-pressurized SG-700 system contained in plastic housing to the SG-15000 with a pressure-resistant stainless steel container. If one starts with 10° dH water, the resin is only regenerated once the numerical value in liters stated on each model is reached.

Customization

...our systems are tailored to meet the exact needs of your applications; our mass-produced deionizers are of the highest quality.

Best possible technology

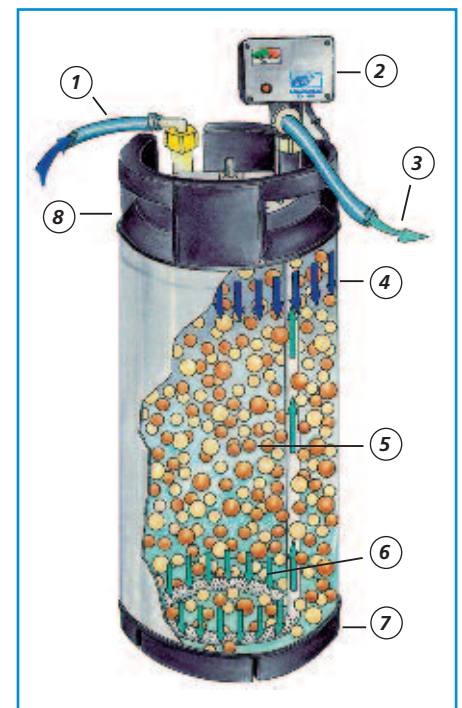
Many years of experience with deionizers has led to the development of technical details such as the ingenious flow path that reaches into every corner of the container. This ensures a maximum wa-

ter production rate with minimum resin consumption – a highly efficient use of the resins.

We have spent a great deal of time and resources optimizing the resin composition and its regeneration process to produce high quality resins, maximize capacity, exchange velocity and mechanical stability.

Environmentally friendly

Their favorable properties mean that our resins can be regenerated almost infinitely. And we do far more than that to protect the environment: our regeneration station is one of the most environmentally friendly on the market. Our specially developed process keeps the amount of chemicals to a minimum while ensuring the greatest possible capacity.



1. Feed water inlet
2. Conductivity meter
3. Deionized product water
4. Inlet water distribution
5. Mixed bed resin
6. Product water distribution
7. Hard-rubber base
8. Hard-rubber collar with support handles

All types:

Feed for ultrapure water systems

General laboratory work

Laboratory washing machines

Water for autoclaves and environmental chambers

Buffer preparation

Deionizers

With quick-connect couplers or threaded connection including hose sets

SG-700

This mixed-bed ion deionizer with plastic housing is only intended for non pressurized operation and for small daily quantities. The complete device includes a conductivity meter and a hose set. For this inexpensive version of the SG deionizer a wallbracket is available .



conductivity meter and hose set. The deionizers are available with the proven SG stainless steel quick-fit couplers or with 3/4" threaded connectors. The quick-fit couplers are, of course, available for conversion or retrofitting to an existing system.

SG-7000 to SG-15000

These deionizers are designed to meet larger demands for deionized water as it is often the case in industrial applications. The water distribution has been optimized to ensure full use of the resin bed; the typical compressive resistance of up to 10 bar is standard.

One can order the system either with 1 1/4" threaded input and output connectors or the practical SG stainless steel quick-fit input and output connectors. The complete version includes a conductivity electrode, conductivity meter and hose set.



SG-2000 to SG-6200

These high quality 1.4404 stainless steel deionizers can be operated at pressures of up to 10 bar. They are significantly more resistant to mechanical stress than conventional glass fiber reinforced plastic cartridges. SG has optimized the water flow to ensure that the resin bed can be used to its full capacity. The complete system includes the deionizer (ready for connection), a



Deionizers with SK quick-couplers

Type SG ...SK		2000 SK	2800 SK	4500 SK	6200 SK	7000 SK	11000SK	15000 SK
Capacity *	<i>l</i>	2000	2800	4500	6200	7000	11000	15000
Performance max.	<i>l/h</i>	450	800	1000	1000	1500	1500	1500
Pressure max.	<i>bar</i>	10	10	10	10	10	10	10
Dimensions:								
Diameter	<i>mm</i>	230	230	230	230	360	360	360
Container height	<i>mm</i>	410	570	785	1025	660	860	1111
Container height <i>incl. meter</i>	<i>mm</i>	515	675	886	1125	780	980	1230
Shipping weight <i>complete unit</i>	<i>kg</i>	18	24	34	48	52	68	92
Shipping weight <i>2. cartridge</i>	<i>kg</i>	16	22	32	46	50	66	90
Catalogue Number <i>complete unit</i>		1000	1020	1040	1060	1080	1100	1120
Catalogue Number <i>second cartridge</i>		1001	1021	1041	1061	1081	1101	1121

4 *Basis capacity per regeneration with a total salt content of 1.79 mol/m³, which is equivalent to 10°d GSG. 1°d GSG has a conductivity of 30 µS/cm.

Deionizers with threaded couplers

Type SG ...		700	2000	2800	4500	6200	7000	11000	15000
Capacity *	<i>l</i>	700	2000	2800	4500	6200	7000	11000	15000
Performance max.	<i>l/h</i>	80	450	800	1000	1000	2000	2500	3000
Pressure max.	<i>bar</i>	0.5	10	10	10	10	10	10	10
Dimensions:									
Diameter	<i>mm</i>	170	230	230	230	230	360	360	360
Container height	<i>mm</i>	370	410	570	785	1025	660	860	1111
Container height <i>incl. meter</i>	<i>mm</i>	490	530	690	900	1140	710	910	1160
Shipping weight <i>complete unit</i>	<i>kg</i>	7	18	24	34	48	53	69	93
Shipping weight <i>2. cartridge</i>	<i>kg</i>	6	16	22	32	46	50	66	90
Catalogue Number <i>complete unit</i>		1400	10090	10070	10050	10030	10012	10220	10240
Catalogue Number <i>second cartridge</i>		1401	10100	10080	10060	10040	10022	10230	10250

*Basis capacity per regeneration with a total salt content of 1.79 mol/m³, which is equivalent to 10°d GSG. 1°d GSG has a conductivity of 30 µS/cm.

Capacity per regeneration for tap water

°d GSG µS/cm	5 150	10 300	15 450	20 600	25 750	30 900	capacity in Val. *
Type SG-700	1400 l	700 l	465 l	350 l	280 l	230 l	2.5
Type SG-2000	4000 l	2000 l	1330 l	1000 l	800 l	660 l	7.00
Type SG-2800	5600 l	2800 l	1850 l	1400 l	1120 l	930 l	10.00
Type SG-4500	9000 l	4500 l	3000 l	2250 l	1800 l	1500 l	16.00
Type SG-6200	12400 l	6200 l	4150 l	3100 l	2480 l	2070 l	22.00
Type SG-7000	14000 l	7000 l	4650 l	3500 l	2800 l	2330 l	25.00
Type SG-11000	22000 l	11000 l	7350 l	5500 l	4400 l	3670 l	40.00
Type SG-15000	30000 l	15000 l	10000 l	7500 l	6000 l	5000 l	54.00

The table shows you an overview of our different deionizer, providing a better comparability of the products. It shows the performances of the deionizer in liters with different total salt contents of the inlet water to the point of exhaustion at 20 µS/cm.

* per regeneration

Accessories:

P2/30

The pressure-resistant conductivity meter with its integrated electrode can be connected directly to our deionizers. It fits the pure water output on all SG 700 – 6200 models and all SK versions. Metering range: 0.1 to 20 µS/cm (230 V/50 Hz). Available with plug-in connectors (SK) or with 3/4" threaded connectors.



P2/30 with 3/4"-connection.
Catalogue Number: 10510

P1/50

The analog conductivity meter for wall-mounting with connectors for c = 0.2 electrodes. The device includes an variable alarm setting and is equipped with a voltage-free switching contact. It can be used in combination with all SG mixed-bed deionizers. Metering range: 0.1 to 50 µS/cm (230 V/50 Hz).



P1/50.
Catalogue Number: 10540

LFW 200

This wall-mounted digital conductivity meter has impressively clear functions. It is equipped with connection points for electrodes with or without temperature compensation, for solenoid valves and floating switches. The system is also equipped with an variable limit function (for example to control a solenoid valve), an acoustic alarm and voltage-free contact. Metering range: 0.1 to 199.9 µS/cm (230 V/50 Hz).



LFW 200.
Catalogue Number: 1605

LFH 200

A mobile digital conductivity meter for hand held operation or wall-mounting. Equipped with an electrode connector and a main cable, it can be used almost anywhere.

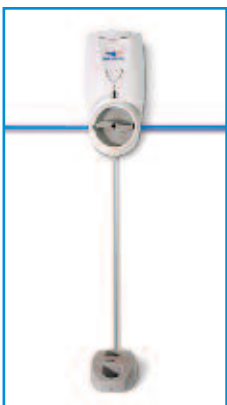
The device is equipped with temperature compensation, a variable conductivity alarm setting and acoustic alarm. Optional: LFH 200 with a main supply unit to operate a 230 Volt contact to control a solenoid valve. Metering range: 0.1 to 199.9 $\mu\text{S}/\text{cm}$ reversible 18.18 to 0.01 MOhm (230 V/50 Hz).



LFH 200
Catalogue Numbers: 1603 and 1604.

Leak detector

For monitoring equipment and piping installations. If a failure causes water to leak, the water monitor detects a change in the conductivity between the sensor contacts and cuts off the water supply to prevent flooding or damage.



1/4" Leak detector, battery-operated.
Catalogue Number: 2084

Distribution blocks

These distribution blocks can be wall-mounted and control the pure water distribution via two, three or four valves. The robust design is available with shut-off ball valves and/or 3/4" threaded connection at outlet points.



Distribution block.
Catalogue Number: 1714



Additional accessories:	Cat. No.
1. Hose set SG 2000 – SG 15000 SK with electrode,	1610
2. Hose set SG 2000 – SG 6200 SK without electrode	1690
3. Screw-in electrodes, 1/2", c = 0.2 / TC for P1/50 or LFW 200 only for LFW 200	1670 1671 1631
4. Connection tube for series connection	1755
5. Floating switch	1750
6. Solenoid valve	



SG quick-connectors.
Catalogue Number: 1640



Tanks: 15 l (Cat. No.: 05198),
30 l (Cat. No.: 05188), 50 l (Cat. No.: 05189).



Dispenser.
Catalogue Number: 1731

Accessories

Article	Specification	Cat. No.
Conductivity meter P2/305K	0 – 20 µS/cm, analogue, quick-coupler	1600
Conductivity meter P2/30	0 – 20 µS/cm, analogue, 3/4" thread connector	10510
Conductivity indicator P1/50 WA with switch contact	0 – 50 µS/cm, analogue, wall-mounted	10540
Conductivity indicator LFH 200 with switch contact	0 – 200 µS/cm, digital, portable, wall bracket	1603
Conductivity indicator LFH 200	0 – 200 µS/cm, digital, portable, wall bracket	1604
Conductivity indicator LFW 200 with switch contact	0 – 200 µS/cm, digital, wall-mounted	1605
Leak detector with sensor	3/4" thread connector	00029
Leak detector with sensor	1" thread connector	00038
Leak detector with sensor	1/4" thread connector, battery supply	2084
Solenoid valve	3/4" thread connector, currentless closed	1750
Float switch	level control with electrical contact	1755
Conductivity electrode	3 m, 3/4" thread connector, electrode (c = 0,2) for P1/50 or LFW200 connection	1670
Conductivity electrode, temperature compensated	3 m, 3/4" thread connector, electrode (c = 0,2) only for LFW200 connection	1671
Quick-coupler adapter for deionizer and hose (SG2000 – 6200)	Male and female connector, 3/4" thread connector to quick-coupler (VA)	1640
Quick-coupler adapter only for deionizer (SG2000 – 6200)	Male connector, 3/4" thread connector to quick-coupler (VA)	1641
Storage tank for Pure Water	15 l volume, PE, with tap	05198
Storage tank for Pure Water	30 l volume, PE, with tap	05188
Storage tank for Pure Water	50 l volume, PE, with tap	05189
Storage tank for Pure Water	80 l volume, PE, with tap	05190
Storage tank for Pure Water	125 l volume, PE, with tap	05234
Distribution block VBII	1 x 3/4" thread inlet, 2 x shut-off hose valve	1702
Distribution block VBIII	1 x 3/4" thread inlet, 3 x shut-off hose valve	1703
Distribution block VBIV	1 x 3/4" thread inlet, 4 x shut-off hose valve	1704
Distribution block VBII	1 x 3/4" thread inlet, 1 x 3/4" thread outlet, 1 x shut-off hose valve	1712
Distribution block VBIII	1 x 3/4" thread inlet, 2 x 3/4" thread outlet, 1 x shut-off hose valve	1713
Distribution block VBIV	1 x 3/4" thread inlet, 3 x 3/4" thread outlet, 1 x shut-off hose valve	1714
Shut-off hose valve	for distribution blocks 1712...1714	1715
Wallbracket for SG700 deionizer		1410
Dispenser for Pure Water	3/4" internal thread connector	1731
Set of hoses with threaded connectors for:		
SG2000-SG6200	2 x 1.5 m, 3/4" external thread only for P2/30 connection	10400
SG2000-SG6200 with conductivity sensor	2 x 1.5 m, 3/4" external thread, electrode (c = 0,2) for P1/50, LFW200 connection	1615
SG2000-SG6200 with temperature compensated sensor	2 x 1.5 m, 3/4" external thread, electrode (c = 0,2) only for LFW200 connection	1616
SG2000-SG6200 with conductivity sensor	2 x 1.5 m, 3/4" external thread, electrode (c = 0,2) only for LFH200 connection	1646
SG7000-SG15000 with conductivity sensor	2 x 1.5 m, 1 1/4" external thread, electrode (c = 0,2) for P1/50, LFW200 connection	1613
SG7000-SG15000 with temperature compensated sensor	2 x 1.5 m, 1 1/4" external thread, electrode (c = 0,2) only for LFW200 connection	1614
SG7000-SG15000 with conductivity sensor	2 x 1.5 m, 1 1/4" external thread, electrode (c = 0,2) only for LFH200 connection	1647
Set of hoses with threaded connectors for a serial connection of two deionizers:		
of SG2000-SG6200	2 x 1.5 m, 3/4" external thread 1 x 0.5 m, 3/4" external thread only for P2/30 connection	1634
of SG2000-SG6200 with conductivity sensor	2 x 1.5 m, 3/4" external thread 1 x 0.5 m, 3/4" external thread, electrode (c = 0,2) for P1/50 or LFW200	1635
of SG2000-SG6200 with temperature compensated sensor	2 x 1.5 m, 3/4" external thread 1 x 0.5 m, 3/4" external thread, electrode (c = 0,2) only for LFW200 connection	1636
of SG2000-SG6200 with conductivity sensor	2 x 1.5 m, 3/4" external thread 1 x 0.5 m, 3/4" external thread, electrode (c = 0,2) only for LFH200 connection	1649
of SG7000-SG15000 with conductivity sensor	2 x 1.5 m, 1 1/4" external thread, 1 x 0.5 m, 1 1/4" external thread, electrode (c = 0,2) for P1/50 or LFW200	1637
of SG7000-SG15000 with temperature compensated sensor	2 x 1.5 m, 1 1/4" external thread, 1 x 0.5 m, 1 1/4" external thread, electrode (c = 0,2) only for LFW200 connection	1638
of SG7000-SG15000 with conductivity sensor	2 x 1.5 m, 1 1/4" external thread, 1 x 0.5 m, 1 1/4" external thread, electrode (c = 0,2) only for LFH200 connection	1650
Set of hoses with SK quick-couplers for:		
SG2000-SG15000SK	2 x 1.5 m, quick-coupler only for P2/30 connection	1690
SG2000-SG15000SK with conductivity sensor	2 x 1.5 m, quick-coupler, electrode (c = 0,2) for P1/50 or LFW200 connection	1610
SG2000-SG15000SK with temperature compensated sensor	2 x 1.5 m, quick-coupler, electrode (c = 0,2) only for LFW200 connection	1611
SG2000-SG15000SK with conductivity sensor	2 x 1.5 m, quick-coupler, electrode (c = 0,2) only for LFH200 connection	1645
Set of hoses with SK quick-couplers for a serial connection of two deionizers:		
of SG2000-SG15000SK	2 x 1.5 m with quick-couplers, 1 x 0.5 m with thread connector only for P2/30 connection	1627
of SG2000-SG15000SK with conductivity sensor	2 x 1.5 m, quick-couplers, 1 x 0.5 m, quick-coupler and thread connector, electrode (c = 0,2) for P1/50 or LFW200	1628
of SG2000-SG15000SK with temperature compensated sensor	2 x 1.5 m, quick-couplers, 1 x 0.5 m, quick-coupler and thread connector, electrode (c = 0,2) only for LFW200 connection	1629
of SG2000-SG15000SK with conductivity sensor	2 x 1.5 m, quick-couplers, 1 x 0.5 m, quick-coupler and thread connector, electrode (c = 0,2) only for LFH200 connection	1648
Hose with a threaded and a quick-coupler for a serial connection	0.5 m, with 3/4" thread and quick-coupler	1631

WHITEWATER

quality in purity

Customer Service and Maintenance Programmes

Customer service is the key to our business. Our commitment to customer satisfaction is supported by a superior level of project management, engineering design and technical service expertise.

Our qualified and experienced engineers are part of the largest service team in Ireland. We also offer a 24 hour on-call emergency service for customers who take out our 12 month service contracts and whose systems are regularly maintained by Whitewater.

www.whitewaterireland.ie

WHITEWATER

quality in purity

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