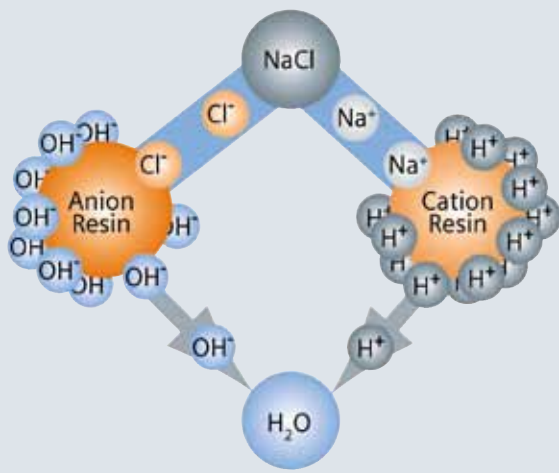




DEIONIZED WATER

**LATEST TECHNOLOGY, HIGHEST QUALITY,
ENVIRONMENTALLY FRIENDLY**

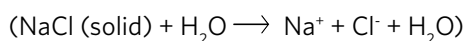


SCHEMATICAL PRINCIPLE OF ION EXCHANGE

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.

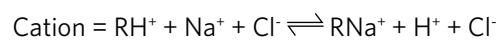


These and other unwanted ions may be removed by ion exchange.

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

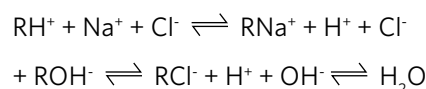
(ROH⁻). As water containing sodium chloride passes through and around the cation and anion resins, sodium is exchanged for hydrogen and chlorides are exchanged for hydroxide ions. This can be illustrated for the individual resins as:



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:

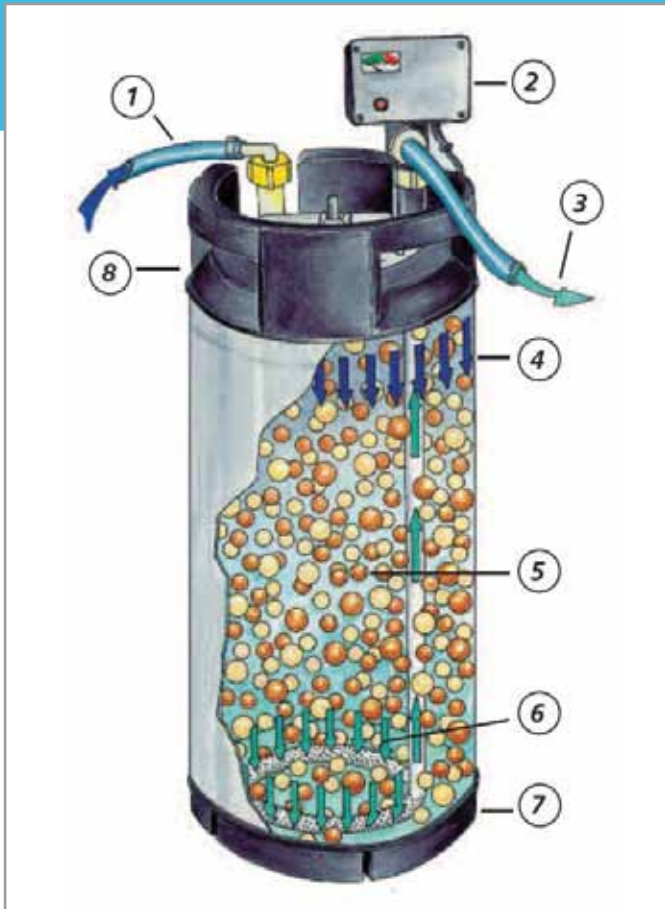


The most efficient way to apply cation and anion resins for high purity water applications is to proportionally mix the two resins together into a single bed. Since cation resins have a higher capacity per unit volume than anion resins, the proportions are typically about 40 % cation and 60 % anion by 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 application. Resins may be classified

TYPICAL APPLICATIONS

- Feed for ultrapure water systems
- general laboratory work
- laboratory washing machines
- water for autoclaves and environmental chambers
- buffer preparation
- polishing of RO water



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

as nuclear or semiconductor grade. As the grade names imply, nuclear grade resins are designed to meet specification requirements for nuclear power generation. Semiconductor grade resins are designed for the microelectronics industry. Semiconductor grade resins should be used in lab reagent gradewater systems due to the high purity capability with very low leachable organic carbon.

The product spectrum ranges from the SG-2000 system 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.



SG-2000 TO
SG-6200 AND
SG-7000 TO
SG-15000

FIELDS OF USE

- Microbiology
- Electronics
- Optics
- Semiconductor
- Pharmaceutical
- Chemistry
- Clinical
- Power plants
- Glass industry
- Plating industry
- Food service

DEIONIZERS

WITH QUICK-CONNECT COUPLERS OR THREADED CONNECTION INCLUDING HOSE SETS

DEIONIZERS WITH SK QUICK-COUPLERS

Type SG ...SK		2000 SK	2800 SK	4500 SK	6200 SK	7000 SK	11000SK	15000 SK
Capacity *	l	2000	2800	4500	6200	7000	11000	15000
Performance max.	l/h	450	800	1000	1000	1500	1500	1500
Pressure max.	bar	10	10	10	10	10	10	10
Dimensions:								
Diameter	mm	230	230	230	230	360	360	360
Container height	mm	410	570	785	1025	660	860	1111
Container height incl. meter	mm	515	675	886	1125	780	980	1230
Shipping weight complete	kg	18	24	34	48	52	68	92
Shipping weight cartridge**	kg	16	22	32	46	50	66	90
Catalog Number		W3T199735	W3T199172	W3T199736	W3T198029	W3T199173	W3T198027	W3T199789

DEIONIZERS WITH THREADED COUPLERS

Type SG ...		2000	2800	4500	6200	7000	11000	15000
Capacity *	l	2000	2800	4500	6200	7000	11000	15000
Performance max.	l/h	450	800	1000	1000	1500	1500	1500
Pressure max.	bar	10	10	10	10	10	10	10
Dimensions:								
Diameter	mm	230	230	230	230	360	360	360
Container height	mm	410	570	785	1025	660	860	1111
Container height incl. meter	mm	530	690	900	1140	710	910	1160
Shipping weight complete	kg	18	24	34	48	53	69	93
Shipping weight cartridge**	kg	16	22	32	46	50	66	90
Catalog Number		W3T199409	W3T198640	W3T198639	W3T198638	W3T199061	W3T197829	W3T198437

* 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.

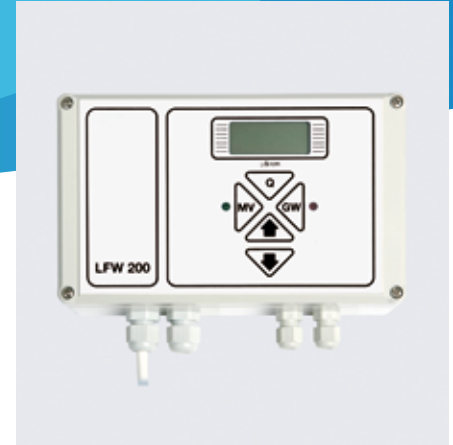
** For the first installation a cartridge, a hose set and a conductivity meter is needed.



P2/30 WITH 3/4"-CONNECTION.
CATALOG NUMBER: W3T198373



P1/50. CATALOG NUMBER: W3T197840



LFW200. CATALOG NUMBER: W3T199245

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. Siemens Water Technologies has optimized the water flow to ensure that the resin bed can be used to its full capacity. The deionizers are available with the proven 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 stainless steel quick-fit input and output connectors.

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 2000 – 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.

P1/50: The analog conductivity meter for wall mounting with connectors for c = 0.2 electrodes. The device includes a variable alarm setting and is equipped with a voltage-free switching contact. It can be used in combination with all mixed-bed deionizers. Metering range: 0.1 to 50 µS/cm (230V/50 Hz).

LFW200: 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 I: 0.06 - 19.99 µS/cm (230 V/ 50 Hz), metering range II: 20 - 199.99 µS/cm (230 V/ 50 Hz).

CAPACITY PER REGENERATION FOR TAP WATER

°d GSG µS/cm	5 150	10 300	15 450	20 600	25 750	30 900	Kap in Val. *
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

* per regeneration

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



ACCESSORIES FOR ION EXCHANGERS

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.

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.

Additional accessories:

- 1. Hose set
SG 2000 – SG 15000 SK, with electrode
Cat.-No. W3T199289
- 2. Hose set
SG 2000 – SG 6200 SK, without electrode
Cat.-No. W3T199302
- 3. Screw-in electrodes, 1/2", c = 0.2 / TC
for P1/50 or LFW200
Cat.-No. W3T199290
only for LFW200
Cat.-No. W2T525642
- 4. Floating switch
Cat.-No. W3T204904
- 5. Solenoid valve
Cat.-No. W3T197588



DISPENSER. CAT. NO.:
W3T198015



TANKS:
15 L (CAT. NO.: W2T523835),
30 L (CAT. NO.: W2T523836),
50 L (CAT. NO.: W2T523833).



QUICK CONNECTORS.
CAT. NO.: W3T198259



TABLE OF ACCESSORIES FOR ION EXCHANGERS

Article	Specification	Cat. No.
Conductivity meter P2/30SK	0,1 - 20 µS/cm, analogue, quick-coupler	W3T198266
Conductivity meter P2/30	0,1 - 20 µS/cm, analogue, 3/4" thread connector	W3T198373
Conductivity indicator P1/50WA with switch contact	0,1 - 50 µS/cm, analogue, wall-mounted	W3T197840
Conductivity indicator LFW200 with switch contact	0,06 - 200 µS/cm, digital, wall-mounted	W3T199245
Leak detector with sensor	3/4" thread connector	W2T808004
Leak detector with sensor	1" thread connector	W2T808003
Solenoid valve	3/4" thread connector, currentless closed	W3T197588
Float switch	level control with electrical contact	W3T204904
Conductivity electrode	3 m cable R 1/2", electrode (c = 0.2) for P1/50 or LFW200 connection	W3T199290
Conductivity electrode, temperature compensated	3 m cable R 1/2", electrode (c = 0.2) only for LFW200 connection	W2T525642
Quick-coupler adapter for deionizer and hose (SG2000 - 6200)	Male and female connector, 3/4" thread connector to quick-coupler (VA)	W3T198259
Quick-coupler adapter only for deionizer (SG2000 - 6200)	Male connector, 3/4" thread connector to quick-coupler (VA)	W3T197586
Storage tank for Pure Water	15 l volume, PE, with tap	W2T523835
Storage tank for Pure Water	30 l volume, PE, with tap	W2T523836
Storage tank for Pure Water	50 l volume, PE, with tap	W2T523833
Storage tank for Pure Water	80 l volume, PE, with tap	W2T523831
Storage tank for Pure Water	125 l volume, PE, with tap	W2T523832
Distribution block II	1 x 3/4" thread inlet, 2 x shut-off hose valve	W3T197655
Distribution block III	1 x 3/4" thread inlet, 3 x shut-off hose valve	W3T199552
Distribution block IV	1 x 3/4" thread inlet, 4 x shut-off hose valve	W3T199157
Dispenser for Pure Water	3/4" internal thread connector	W3T198015
Set of hoses with SK quick-couplers for:		
SG2000-SG15000SK	2 x 1.5m, quick-coupler only for P2/30 connection	W3T199302
SG2000-SG15000SK with conductivity sensor	2 x 1.5m, quick-coupler, electrode (c = 0,2) for P1/50 or LFW200 connection	W3T199289
SG2000-SG15000SK with temperature compensated sensor	2 x 1.5m, quick-coupler, electrode (c = 0,2) only for LFW200 connection	W3T199288
Set of hoses with threaded connectors for:		
SG2000-SG6200	2 x 1.5m, 3/4" external thread only for P2/30 connection	W3T198103
SG2000-SG6200 with conductivity sensor	2 x 1.5m, 3/4" external thread, electrode (c = 0,2) for P1/50, LFW200 connection	W3T197682
SG2000-SG6200 with temperature compensated sensor	2 x 1.5m, 3/4" external thread, electrode (c = 0,2) only for LFW200 connection	W3T198041
SG2000-SG6200 with conductivity sensor	2 x 1.5m, 3/4" external thread, electrode (c = 0,2) only for LFW200 connection	W3T199714
SG7000-SG15000 with conductivity sensor	2 x 1.5m, 1 1/4" external thread, electrode (c = 0,2) for P1/50 , LFW200 connection	W3T199844
SG7000-SG15000 with temperature compensated sensor	2 x 1.5m, 1 1/4" external thread, electrode (c = 0,2) only for LFW200 connection	W3T198267

Other sets of hoses – also for serial connection – and additional accessories upon request



ION EXCHANGE RESINS

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 water 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.



ACTIVATED CARBON, ANIONS, MIXED BED AND CATION EXCHANGE RESINS (FROM LEFT TO RIGHT)



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