

Water softener Delta-p

Intended use

The water softeners Delta-p are have been developed for the continuous production of softened and partially softened water and can be used in these areas:

- Continuous soft water supply
- Softening and partial softening of
 - Well water
 - Process water
 - Boiler feed water
 - Cooling water
 - Air-conditioning water
 - Cold drinking water
 - Industrial water

The water softeners Delta-p **cannot** be used in these areas:

- Slow removal of water
- Widely diverging performance
- Load above nominal flow

Please also observe the information in the technical specifications.

Application limits

Refer to the table of performance data and the continuous flow curve.

Function

The water softeners Delta-p are triple systems for the continuous supply of soft water according to ion exchange technology.

Physical

The water softeners Delta-p are equipped with a central control valve for the three exchangers and are controlled depending on the quantity.

Regeneration is triggered when the next exchanger to be regenerated is exhausted or 50 % of the next but one exchanger to be regenerated is exhausted.

The water softener regenerates with raw water.

Chemical

The exchanger contains ion exchanger resin in the form of small resin beads. Sodium ions adhere to each resin bead. Hard water with a large proportion of calcium and magnesium ions flows through the exchanger.

The ion exchanger resin absorbs calcium and magnesium ions from the water in exchange for sodium ions. This reaction is called ion exchange. The calcium and magnesium ions are retained in the exchanger. Soft water without calcium and magnesium ions, but containing sodium ions, leaves the exchanger.

This process continues until no more sodium ions are available. The ion exchanger resin is exhausted.

The exchange can be reversed if a large amount of sodium ions is added.

The exchanger is rinsed with brine, water containing salt.

By their sheer number, sodium ions displace calcium and magnesium ions on the ion exchanger resin. This water containing calcium and magnesium ions is discharged to

the drain. The initial condition is restored.

The ion exchanger resin is regenerated, and thus ready for operation.

Design

- Three exchanger tanks
- Electronically controlled transfer, regeneration and blending valve
- Microprocessor control with RS 485 interface
- Signalling and fault signal contact
- Brine tank made of PE incl. sieve bottom

Scope of supply

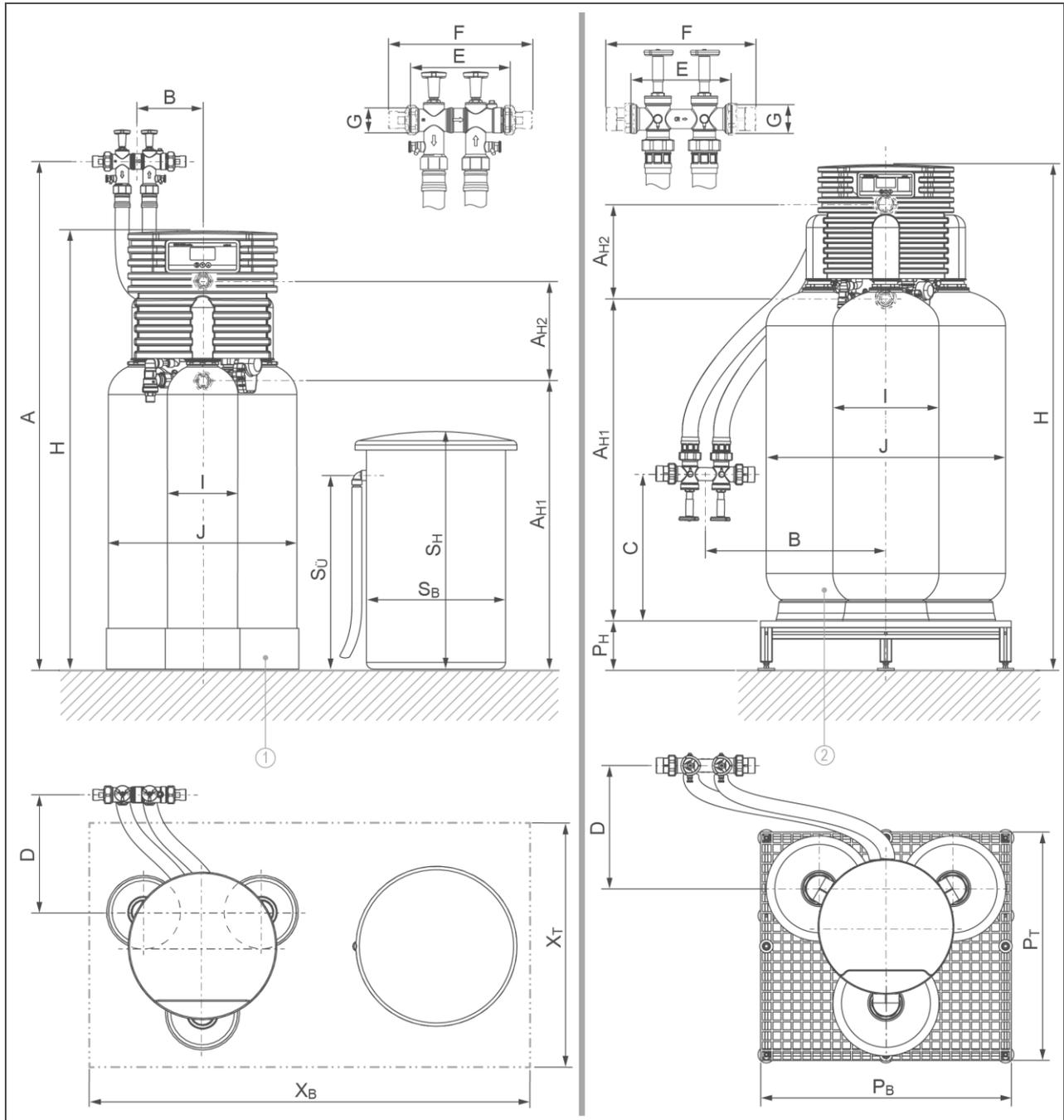
Delta-p/Delta-p-I

- Water softener in parts, complete
- Brine tank
- Water test kit "Total hardness"
- Operation manual

Delta-p/Delta-p-I with pedestal

- Water softener ready for connection mounted on a platform

Technical specifications I



Item	Designation	Item	Designation
1	Delta-p/Delta-p-I without platform (1", 1¼")	2	Delta-p/Delta-p-I with platform (1½", 2")

Technical specifications II

Water softener Delta-p/Delta-p-I		1"	1¼"	1½"	2"
Dimensions and weights					
A Connection height (high line)	[mm]	1000 – 2000		1550 – 2250	1700 – 2400
B Lateral offset	[mm]	350±20		600±20	
C Connection height (low line)	[mm]	0 – 1000		350 – 550	500 – 700
D Distance to wall	[mm]	200±20		550±20	
E Installation length without screw connections	[mm]	190		260	
F Installation length with screw connection	[mm]	xxx		xxx	
G External thread		1½"		2½"	
H System height (without/with platform)	[mm]	1300/1500		1640/1840	1760/1960
I Ø exchanger	[mm]	210	257	369	406
J System width	[mm]	580	630	900	960
AH1 Connection height of control valve (raw water)	[mm]	860		1125	1245
AH2 Distance height control valve (soft water)	[mm]	290		360	
SH Salt tank height (standard/accessories)	[mm]	670/860 (210 l)		860/1250 (750 l)	
SB Ø salt tank (standard/accessories)	[mm]	410/570 (210 l)		570/900 (750 l)	
Sü Safety overflow height (standard/accessories)	[mm]	575/785 (210 l)		785/1100 (750 l)	
PW x PD x PH Platform dimensions	[mm]	770 x 770 x 200		960 x 880 x 200	
XW x XD Foundation dimensions min. (recommended)	[mm]	1240 x 920	1400 x 1020	1770 x 1400	1850 x 1450
Operating weight, approx.	[kg]	255/ 403 (210 l)	322/ 471 (210 l)	745/ 1400 (750 l)	862/ 1270 (750 l)
Connection data					
Nominal connection diameter		DN 25 (1" male thread)	DN 32 (1¼" male thread)	DN 40 (1½" male thread)	DN 50 (2" male thread)
Min. drain connection.				DN 50	
Rated voltage range	[V]			230	
Rated frequency	[Hz]			50 – 60	
Max. rated load in operation	[W]	26			32
Power input in standby	[W]			19	
Protection/protection class				IP 54/⊕	
Performance data					
Nominal pressure				PN 10	
Min./max. operating pressure	[bar]			2/10	
Nominal flow (0 °dH, 0 °f, 0 mol/m³) acc. to DIN EN 14743 at a pressure loss of 1.0 bar (theoretical value)	[m³/h]	4.2	5.6	11.3	13.4
Nominal flow at a pressure loss of 1.0 bar acc. to DIN 19636-100 (raw water hardness 20 °dH (35.6 °f, 3.56 mol/m³), soft water hardness 8 °dH (14.2 °f, 1.42 mol/m³)) not with Delta-p-I	[m³/h]	5	8.3	13.3	20
Pressure loss at nominal flow	[bar]	0.5	0.8	0.5	0.8
Nominal flow (restricted by hard raw water from 20 °dH / 39.2 °f / 3.92 mol/m³)	[m³/h]	3	5	8	12

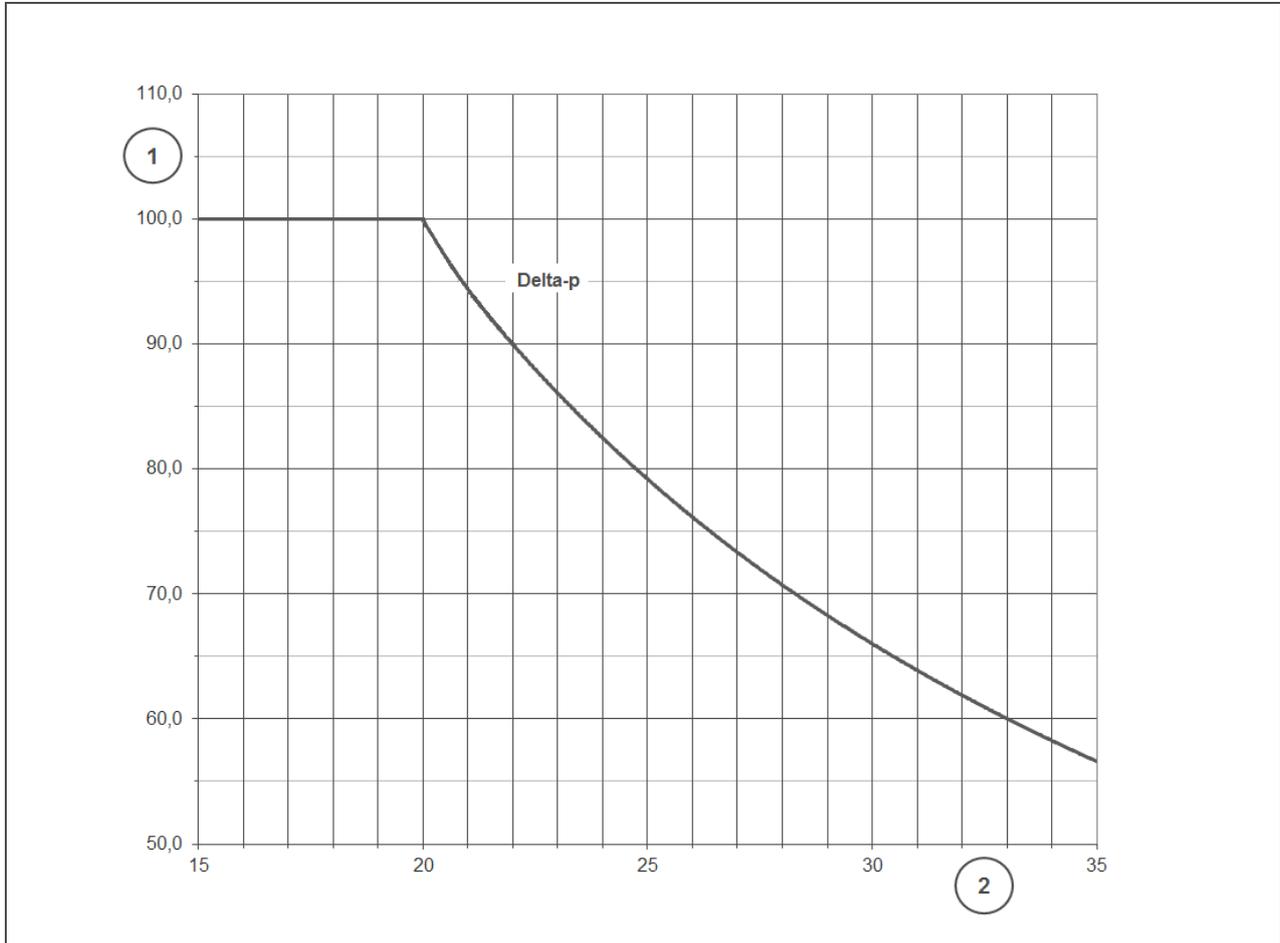
• **Product data sheet**

Water softener
Delta-p

Water softener Delta-p/Delta-p-I		1"	1¼"	1½"	2"
Performance data					
Continuous flow (Maximum value reduced by hard raw water from 20 °dH / 35.6 °f / 3.56 mol/m ³)		Dependence on raw water hardness refer to continuous flow curve			
Minimum quantity of water removed for system control (raw water hardness 0 °dH (0 °f, 0 mol/m ³)) Systems with a blending valve increase the minimum quantity according to the proportion of which is blended.	[l/h]	70		180	
	[m ³ x °dH]	48	79	165	229
Nominal capacity	[m ³ x °f]	58.4	140.6	293.7	407.6
	[mol]	8.2	13.2	27.8	38.6
Capacity per kg of regeneration salt	[mol/kg]	5.7			
Filling volumes and consumption data					
Resin volume (tank)	[l]	21	33	75	100
Freeboard (resin in form of sodium), approx.	[mm]	135	160	195	265
Salt consumption per regeneration, approx.	[kg]	1.5	2.5	5.2	7.2
Regenerating salt supply max. standard brine tank/accessories for brine tank	[kg]	65/180 (210 l)		180/630 (750 l)	
Salt consumption per m ³ and °dH	[kg/(m ³ x °dH)]	0.03			
per m ³ and °f	[kg/(m ³ x °f)]	0.018			
per m ³ and mol	[kg/mol]	0.18			
Max. rinsing water volume	[m ³ /h]	0.6	0.9	1.9	2.0
Total waste water volume per regeneration, approx.	[l]	68	110	235	315
Waste water volume per m ³ and °dH	[l/(m ³ x °dH)]	1.42			
per m ³ and °f	[l/(m ³ x °f)]	0.79			
per m ³ and mol	[l/mol]	7.8			
Operating water volume	[l]	4.2	6.9	14.4	20
General data					
Water temperature	[°C]	5 – 30			
Ambient temperature (drinking water)	[°C]	5 – 25			
Ambient temperature (technical application)	[°C]	5 – 40			
Max. humidity of air (non-condensing)	[%]	90			
Iron content in the raw water max.	[mg/l]	0.2			
Manganese content in the raw water max.	[mg/l]	0.05			
DVGW-registration number (not Delta-p-I)		NW-9151BU0049			
SVGW-certificate-number (not Delta-p-I)		1305-6162			
Data record in the control unit		CA31	CA32	CA35	CA36
Order no. Delta-p		185 100	185 110	185 120	185 130
Order no. Delta-p ready for connection on pedestal		185 105	185 115	185 125	185 135
Order no. Delta-p-I		185 200	185 210	185 220	185 230
Order no. Delta-p-I ready for connection on pedestal		185 205	185 215	185 225	185 235

Technical specifications III

Continuous flow curve Delta-p

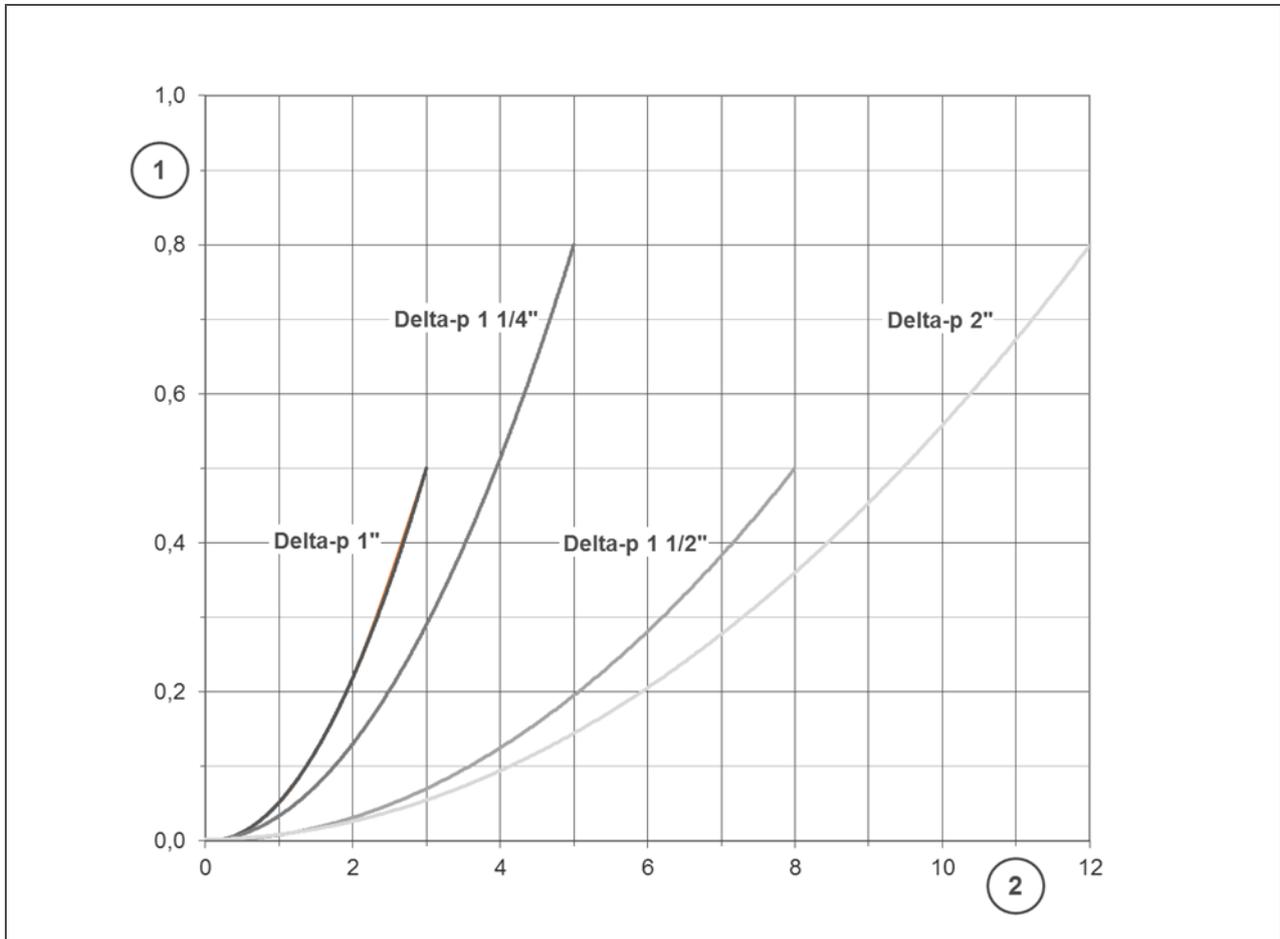


Item	Designation	Item	Designation
1	max. continuous flow in % of nominal flow rate at 0 °dH, 0 °f, 0 mol/m ³	2	Raw water hardness in °dH

Conversion table											
°dH	14	16	18	20	22	24	26	28	30	32	34
°f	24.9	28.5	32.0	35.6	39.2	42.7	46.3	49.8	53.4	57.0	60.5
mol/m ³	2.49	2.85	3.20	3.56	3.92	4.27	4.63	4.98	5.34	5.70	6.05

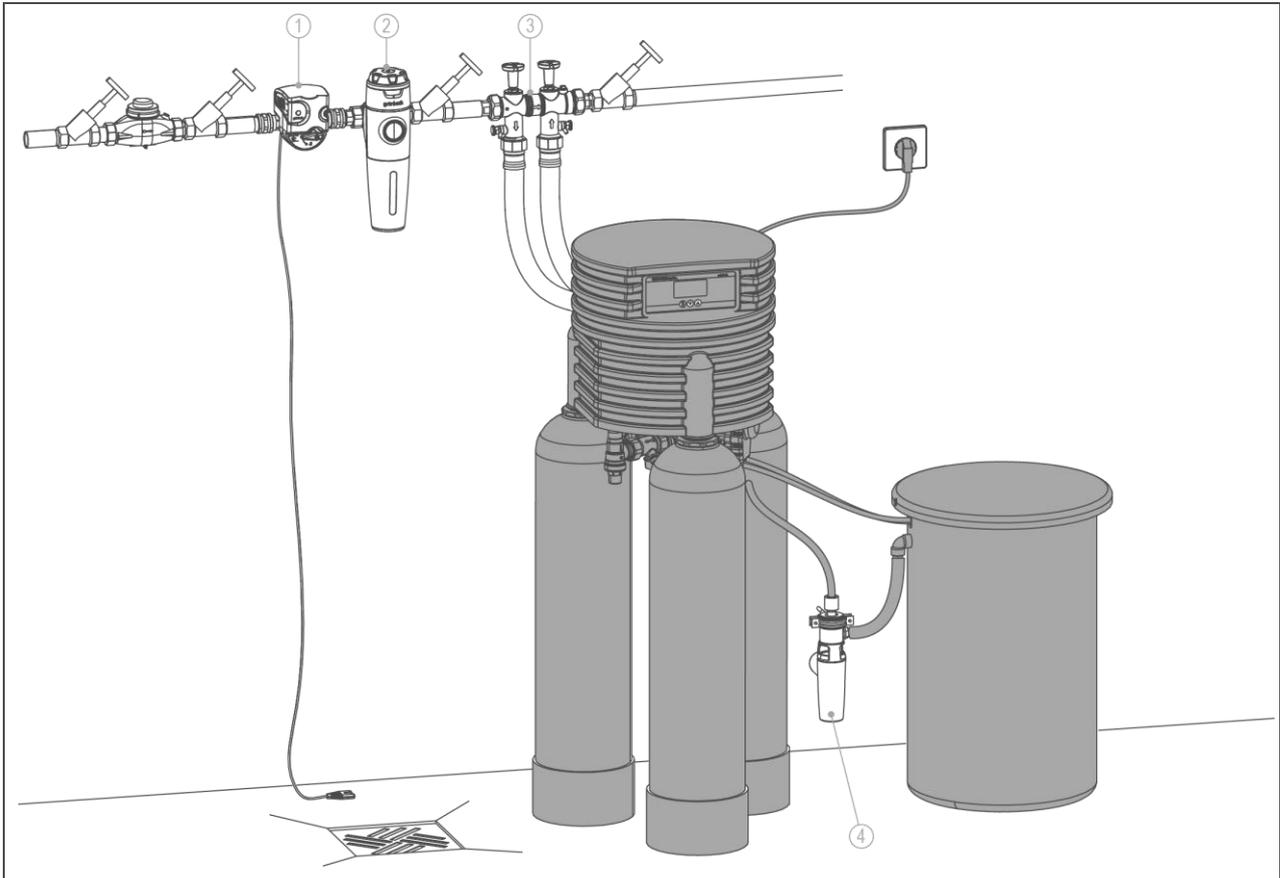
Technical specifications IV

Pressure loss curve Delta-p



Item	Designation	Item	Designation
1	Pressure loss in bar at 0 °dH, 0 °f, 0 mol/m³	2	Flow rate in m³/h

Installation example



Item	Designation	Item	Designation
1	Safety device protectliQ	2	Drinking water filter pureliQ:KD
3	Connection set Delta-p/Delta-p-I	4	Drain connection Delta-p, DN 50 acc. to DIN EN 1717

Installation requirements

Observe local installation directives, general guidelines and technical specifications. The installation site must be frost-proof and ensure the system's protection from chemicals, dyes, solvents and vapours.

If the softened water is intended for human consumption in the sense of the German Drinking Water Ordinance, the ambient temperature must not exceed 25 °C. For applications that are purely technical, the ambient temperature must not exceed 40 °C.

Always install a drinking water filter and, if required, a pressure reducer (e.g. fine filter pureliQ:KD) upstream of the product.

A shock-proof socket is required within a distance of approx. 1.2 m of the system. The socket requires a permanent power supply and must not be connected to light switches, emergency heating switches or similar devices.

A drain connection (DN 50) must be available to discharge the regeneration water.

The installation location must be provided with a floor drain. If this is not available, an appropriate safety device protectliQ or a protection device with water stop of the same quality must be installed to prevent water damage.

Ensure that lifting systems are resistant to salt water or use our regeneration water delivery pump.

There must be a water withdrawal point near the product.

• **Product data sheet**

Water softener
Delta-p

Accessories

Pedestal Delta-p

Size	Order no.
1" - 1¼"	
770x770x200 mm	185 820
1½" - 2"	
960x880x200 mm	185 825

Frame made of aluminium sections with adjustable feet and grating.

Pre-alarm salt supply

Order-no. 185 335

For monitoring the salt supply by means of light sensor on the brine tank cover.

Connection set

Size	Order no.
1" - 1¼"	185 807
1" - 1¼" - I	185 808
1½" - 2"	185 823
1½" - 2" - I	185 824

Compact valve block, built-in overflow valve (not with Delta-p I version), shut-off valves for hard and soft water, sample valves for raw and soft water (only with 1"-1¼"), 2 flexible, pressure-resistant connection hoses. (For Switzerland, connection hoses are not included in the scope of delivery. Install the fixed pipework on site.)

Connection screw fitting

Size	Order no.
1"	185 846
1¼"	185 847
1½"	185 848
2"	185 849

Water meter screw connections with seals for pre-installation of the connection block.

Brine tank

Size	Order no.
210 litres	185 510
750 litres	185 525

Disinfection set

Size	Order no.
1" - 1¼"	185 830
1½" - 2"	185 835

Disinfection of the water softener, e.g. after extremely long periods of stagnation or contamination. With GENO-perox, canister and personal protective equipment.

Parallel piping

Size	Order no.
2x 1" PVC	185 450
2x 1¼" PVC	185 455
2x 1½" PVC	185 460
2x 2" PVC	185 465
3x 2" PVC	185 470

2x 1" VA	185 400
2x 1¼" VA	185 405
2x 1½" VA	185 410
2x 2" VA	185 415
3x 2" VA	185 420

Parallel piping (Tichelmann-piping) of two or several triple water softeners, including all the necessary connection pieces and connection sets.

Cascade connection

Size	Order no.
1" - 1¼" – 2-fold	185 360
1½" - 2" – 2-fold	185 365
2" – 3-fold	185 370
2" – 4-fold	185 375

Cascade control for parallel-piped water softeners Delta-p. The cascade connection is required in connection with water softeners Delta-p in parallel connection.

M-bus measuring transducer

D-DAM, complete

Order no. 115 850

To transmit the flow rate and the meter reading as well as statistical values of the water meter by means of M-Bus (IEC 870).

Flow-dependent pulse output, analogue output and relay contact to Grünbeck control unit.

Communication module

DE200 Profibus

Order no. 185 890

Drain connection DN 50

Order no. 185 775

acc. to DIN EN 1717 including siphon for Delta-p.

Consumables

Regenerating salt 25 kg

Order no. 127 001

Regenerating salt in tablet form acc. to EN 973 Type A for the regeneration of ion exchangers.

Water test kit for total hardness

°dH and °f

1x	Order no. 170 187
10x	Order no. 170 100

Contact

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