

## 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

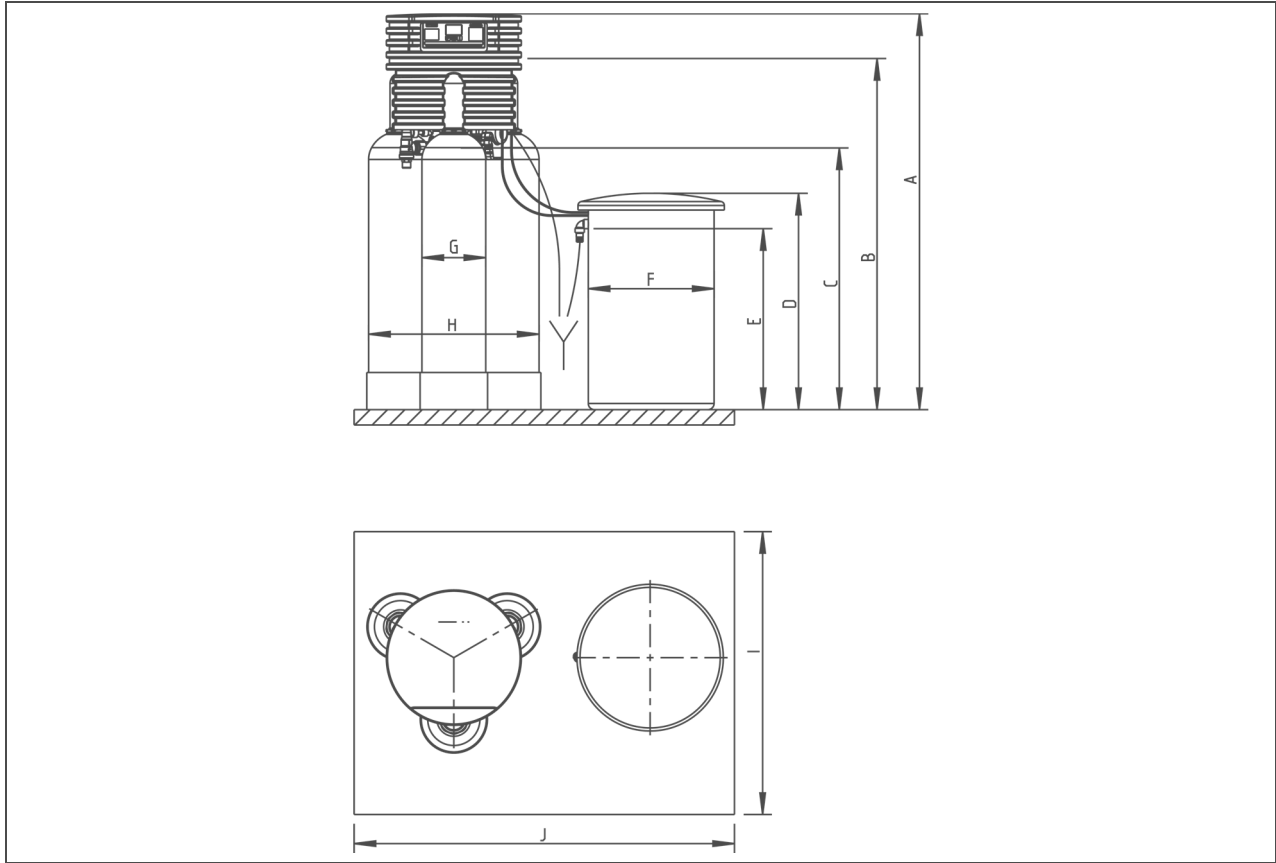
Water softeners Delta-p

- 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

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

## Technical specifications I



Water softener Delta-p			1"	1¼"	1½"	2"
<b>Dimensions and weights</b>						
A	Total height	[mm]	1300/1500		1640/1840	1760/1960
B	Connection height of control valve, soft water	[mm]	1155/1255		1485/1684	1605/1805
C	Connection height of control valve, raw water	[mm]	860/1060		1125/1325	1245/1545
D	Height	without pedestal / with pedestal	Standard-brine tank		860/1060	
	Accessories for brine tank		860/1060 (210 l)		1250/1450 (750 l)	
E	Height safety overflow	without pedestal / with pedestal	Standard-brine tank		785/985	
	Accessories for brine tank		785/985 (210 l)		1100/1300 (750 l)	
F	Ø	[mm]	Standard brine tank		570	
	Accessories for brine tank		570 (210 l)		900 (750 l)	
G	Ø	[mm]	210	257	369	406
H	Width of water softener	[mm]	580	630	900	960
I	Recommended foundation depth min. with standard-brine tank	[mm]	920	1020	1400	1450
J	Recommended foundation width min. with standard-brine tank	[mm]	1240	1400	1770	1850
Operating weight, approx.		[kg]	255 / 403 (210 l)	322 / 471 (210 l)	745 / 1400 (750 l)	862 / 1270 (750 l)

## Technical specifications II

Water softener Delta-p		1"	1¼"	1½"	2"
<b>Connection data</b>					
Nominal 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		DN 70	
Power supply	[V]/[Hz]	230/50-60 (operation of water softener with safety extra-low voltage 24/50-60)			
Connected load Operation = max./Standby	[VA]	26/19		32/19	
Protection/Protection class		IP 54/⊕			
<b>Performance data</b>					
Nominal pressure		PN 10			
Min./max. operating pressure	[bar]	2/10			
Nominal flow (restricted by hard raw water from 20 °dH / 39.2 °f / 3.92 mmol/l)	[m³/h]	3	5	8	12
Nominal flow rate of soft water with blending, raw water hardness 20 °dH (35.6 °f, 3.56 mmol/l) soft water hardness 8 °dH (14.2 °f, 1.42 mmol/l); not Delta-p-I	[m³/h]	5	8.3	13.3	20
Pressure loss	[bar]	0.5	0.8	0.5	0.8
Nominal flow rate according to DIN EN 14743 or kv-value at pressure loss 1.0 bar (theoretical reference value)	[m³/h]	4.2	5.6	11.3	13.4
Continuous flow (Maximum value reduced by hard raw water from 20 °dH / 35.6 °f / 3.56 mmol/l)		Dependence on raw water hardness refer to continuous flow curve			
Minimum quantity of water removed for perfect system control, raw water hardness 0 °dH (0 °f, 0 mmol/l) Systems with a blending valve increase the minimum quantity according to the proportion of which is blended.	[l/h]	70		180	
Nominal capacity	[mol]	8.2	13.2	27.8	38.6
	[m³ x °dH]	48	79	165	229
	[m³ x °f]	58.4	140.6	293.7	407.6
Capacity per kg of regeneration salt	[mol/kg]	5.7			

## Technical specifications III

Water softener Delta-p		1"	1¼"	1½"	2"
<b>Filling volumes and consumption data</b>					
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 <sup>3</sup> and °dH	[kg/m <sup>3</sup> x °dH]			0.03	
Salt consumption per m <sup>3</sup> and °f	[kg/m <sup>3</sup> x °f]			0.018	
Salt consumption per m <sup>3</sup> and mol	[kg/mol]			0.18	
Max. rinsing water volume	[m <sup>3</sup> /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 <sup>3</sup> and °dH	[l/m <sup>3</sup> x °dH]			1.42	
Waste water volume per m <sup>3</sup> and °f	[l/m <sup>3</sup> x °f]			0.79	
Waste water volume per m <sup>3</sup> and mol	[l/mol]			7.8	
Operating water volume	[l]	4.2	6.9	14.4	20
<b>General</b>					
Max. water temperature	[°C]			30	
Max. ambient temperature	[°C]			40	
Max. ambient temperature in line with the German Drinking Water Ordinance	[°C]			25	
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-l)		NW-9151BU0049			
SVGW-certificate-number (not Delta-p-l)		1305-6162			
Data record in the control unit		CA31	CA32	CA35	CA36
Order-no. Delta-p		<b>185 100</b>	<b>185 110</b>	<b>185 120</b>	<b>185 130</b>
Order-no. Delta-p ready for connection on pedestal		<b>185 105</b>	<b>185 115</b>	<b>185 125</b>	<b>185 135</b>
Order-no. Delta-p-l		<b>185 200</b>	<b>185 210</b>	<b>185 220</b>	<b>185 230</b>
Order-no. Delta-p-l ready for connection on pedestal		<b>185 205</b>	<b>185 215</b>	<b>185 225</b>	<b>185 235</b>

## Technical specifications IV

### Continuous flow curve Delta-p

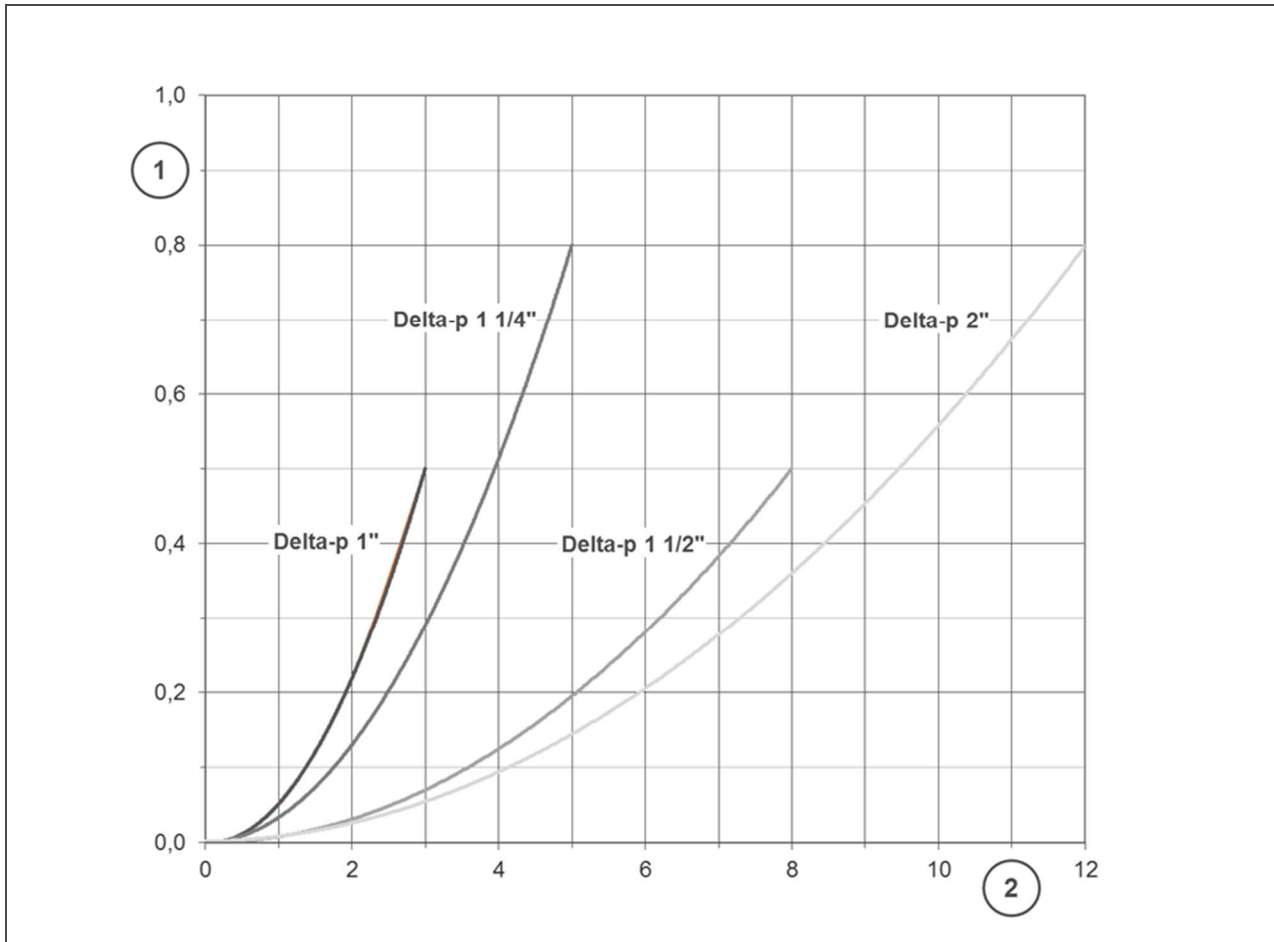


No.	Designation	No.	Designation
1	max. continuous flow in % of nominal flow rate at 0 °dH, 0 °f, 0 mmol/l	2	Raw water hardness in °dH

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
mmol/l	2.49	2.85	3.20	3.56	3.92	4.27	4.63	4.98	5.34	5.70	6.05

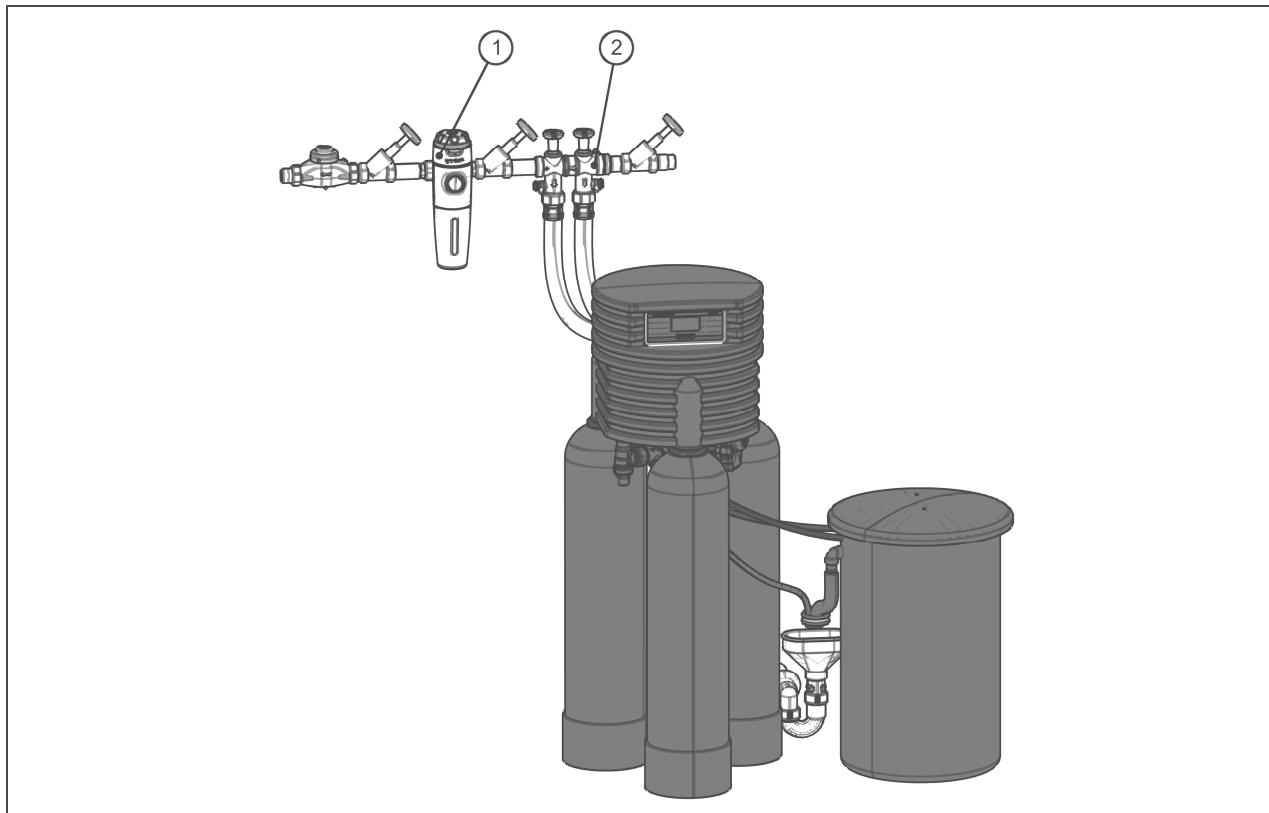
## Technical specifications V

### Pressure loss curve Delta-p



No.	Designation	No.	Designation
1	Pressure loss in bar at 0 °dH, 0 °f, 0 mmol/l	2	Flow in l/h

## Installation example



No.	Designation	No.	Designation
1	Filter	2	Connection-set

### Requirements with regard to the installation site

Please observe local installation directives, general guidelines and technical specifications.

### Requirements with regard to the water connection

- Fine filter in front of the system
- Drain connection for drainage of flushing water
- Floor drain or a corresponding safety device
- Existing lifting system salt water-resistant
- Clean water side of the system made of corrosion-resistant material or use anticorrosive agent

### Requirements on the electrical wiring

- Push socket with earthing contact within approx. 1.2 m of the control unit.
- Push socket with earthing contact must carry continuous voltage.

### Install the product where it is not exposed to:

- Powerful heat radiation
- Frost
- Direct sunlight
- Chemicals, dyes, solvents and their vapours

## Accessories

**Pedestal Delta-p 1"-1¼"**  
770x770x200 mm  
Order-no. 185 820

**Pedestal Delta-p 1½"-2"**  
960x960x200 mm  
Order-no. 185 825

**Pre-alarm salt supply**  
Order-no. 185 335

Infrared light sensor to detect the minimum quantity of salt in the brine tank. Signal via control unit.

### Connection set

Compact valve block, built-in overflow valve (not with Delta-pl 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 set 1"-1¼"**  
Order-no. 185 807

**Connection set 1"-1¼-I"**  
Order-no. 185 808

**Connection set 1½"-2"**  
Order-no. 185 823

**Connection set 1½"-2"-I**  
Order-no. 185 824

**Brine tank 210 litres**  
Order no. 185 510

**Brine tank 750 litres**  
Order-no. 185 525

### Parallel piping Delta-p

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

**Parallel piping Delta-p 2x1" PVC**  
Order-no. 185 450

**Parallel piping Delta-p 2x1¼" PVC**  
Order-no. 185 455

**Parallel piping Delta-p 2x1½" PVC**  
Order-no. 185 460

**Parallel piping Delta-p 2x2" PVC**  
Order-no. 185 465

**Parallel piping Delta-p 3x2" PVC**  
Order-no. 185 470

**Parallel piping Delta-p 2x1" VA**  
Order-no. 185 400

**Parallel piping Delta-p 2x1¼" VA**  
Order-no. 185 405

**Parallel piping Delta-p 2x1½" VA**  
Order-no. 185 410

**Parallel piping Delta-p 2x2" VA**  
Order-no. 185 415

**Parallel piping Delta-p 3x2" VA**  
Order-no. 185 420

### Cascade connection

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

**Cascade connection  
Delta-p 1"-1¼" - 2-way**  
Order no. 185 360

**Cascade connection  
Delta-p 1½"-2" - 2-way**  
Order no. 185 365

**Cascade connection  
Delta-p 2" - 3-way**  
Order no. 185 370

**Cascade connection  
Delta-p 2" - 4-way**  
Order no. 185 370

### Disinfection set

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

**Disinfection set Delta-p 1"-1¼"**  
Order-no. 185 830

**Disinfection set Delta-p 1½"-2"**  
Order-no. 185 835

## Measuring transducer

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.

**M-Bus-measuring transducer  
D-DAM complete.**  
Order-no. 115 850

**Communication module  
DE-200-Profibus**  
Order-no. 185 890

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## Contact

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