

# Pleno Refill



## **Pressure control and water make-up system**

Softening and demineralisation modules for make-up water

*Engineering  
GREAT Solutions*

# Pleno Refill

Modules for softening or demineralisation of the make-up water according to VDI 2035 Bl. 1 / ÖNORM H5195-1 to protect heat generators and waterborne heating systems without aluminium components from calcium deposits. For systems with aluminium components a version with full demineralisation is available. Premounted unit which consists of a softening device, filled with a high grade ion exchange resin and a 25 µm fine filter.



## Key features

- > **Easy installation**  
Compact pre-mounted unit for the use with all types of Transfero and Vento Connect TecBoxes. The unit can be connected quickly to a back flow preventer and to the TecBox with flexible hoses. The unit can be exchanged easily when the lifetime has expired.
- > **Energy savings due to reduction of calcium deposits**  
Avoids scale deposits which mainly deposit on the hottest surfaces (boiler or exchanger) of the heating system, increasing boiler efficiency and leading to lower energy consumption.
- > **Make-up water limitation**  
Automatic limitation of make-up water with the help of the PNEUMATEX BrainCube Connect control unit.
- > **Filter with transparent cover for optical control**  
Visible filter with 25 µm grid size avoids dirt and resin to be washed in the system.

## Technical description

### Application:

Softening of the make-up water in cold and warm water systems without aluminium components or full demineralisation.

### Functions:

Softening/demineralisation of the make-up water and filtering.

### Dimensions:

Demin 2000: DN 15  
Refill 6000: DN 15  
All other DN 20

### Connection:

Inlet:  
3/4" swivelling nut, flat gasket  
Outlet:  
external thread, flat gasket  
Demin 2000/4000, Refill 6000/12000:  
1/2"  
All other: 3/4"

### Pressure:

Nominal pressure: PN 8  
Max. pressure of supply water: 8 bar  
Min. pressure of supply water: 2 bar  
(above system pressure)

### Temperature:

Max. admissible temperature, TS: 45°C  
Min. admissible temperature, TSmin: 5°C

### Max. flow:

Demin 2000/4000, Refill 6000/12000:  
240 l/h limited by orifice  
Refill 16000 = 1500 l/h  
Refill 36000 = 1900 l/h  
Refill 48000 = 2800 l/h  
Refill Demin 13500 = 1000 l/h  
Refill Demin 18000 = 1800 l/h

### Material:

Body: Reinforced PP  
Screw socket: Brass  
Filter: PET

### Capacity of the cartridge:

Softening:  
6000 l x °dH  
12000 l x °dH  
16000 l x °dH  
36000 l x °dH  
48000 l x °dH  
Demineralisation:  
2000 l x °dH  
4000 l x °dH  
13500 l x °dH  
18000 l x °dH

### Marking:

IMI Pneumatex Pleno Refill

### Colour:

Body: blue  
Cartridge cover: transparent

### Standard

Fulfills VDI 2035 Bl. 1 and ÖNORM H5195-1.

## Dimensioning Pleno Refill softening modules

According to VDI 2035 Bl. 1 the max. hardness of the heating water is determined in relation to the power and the specific volume of the system.

### Total hardness [°dH] in relation to specified system volume vA (system volume/smallest boiler power)

Group	Total heat load	Total hardness [°dH]			
		< 20 l/kW	≥ 20 l/kW / < 50 l/kW	≥ 50 l/kW	
1	<50 kW	≤ 16.8 °dH *	≤ 11.2 °dH	≤ 0.11 °dH	
2	50 - 200 kW	≤ 11.2 °dH	≤ 8.4 °dH	≤ 0.11 °dH	
3	200 - 600 kW	≤ 8.4 °dH	≤ 0.11 °dH	≤ 0.11 °dH	
4	> 600 kW	≤ 0.11 °dH	≤ 0.11 °dH	≤ 0.11 °dH	

\*) For circulatory type water heaters and electric heaters.

The softening modules Refill deliver the following max. amount of make-up water [l] at different hardness of the supply water. It is necessary to replace the cartridge when the limit is reached.  
Water hardness in °dH or ppm CaCO<sub>3</sub>.

°dH	ppm CaCO <sub>3</sub>	≤ 16.8 °dH					≤ 11.2 °dH					≤ 8.4 °dH					≤ 0.11 °dH				
		Refill 6000	Refill 12000	Refill 16000	Refill 36000	Refill 48000	Refill 6000	Refill 12000	Refill 16000	Refill 36000	Refill 48000	Refill 6000	Refill 12000	Refill 16000	Refill 36000	Refill 48000	Refill 6000	Refill 12000	Refill 16000	Refill 36000	Refill 48000
10	178											3750	7500	10000	22500	30000	607	1213	1618	3640	4853
12	214						7500	15000	20000	45000	60000	1667	3333	4444	10000	13333	505	1009	1346	3028	4037
14	249						2143	4286	5714	12857	17143	1071	2143	2857	6429	8571	432	864	1152	2592	3456
16	285						1250	2500	3333	7500	10000	789	1579	2105	4737	6316	378	755	1007	2266	3021
18	320	5000	10000	13333	30000	40000	882	1765	2353	5294	7059	625	1250	1667	3750	5000	335	671	894	2012	2683
20	356	1875	3750	5000	11250	15000	682	1364	1818	4091	5455	517	1034	1379	3103	4138	302	603	804	1810	2413
22	392	1154	2308	3077	6923	9231	556	1111	1481	3333	4444	441	882	1176	2647	3529	274	548	731	1645	2193
24	427	833	1667	2222	5000	6667	469	938	1250	2813	3750	385	769	1026	2308	3077	251	502	670	1507	2009
26	463	652	1304	1739	3913	5217	405	811	1081	2432	3243	341	682	909	2045	2727	232	463	618	1390	1854
28	498	536	1071	1429	3214	4286	357	714	952	2143	2857	306	612	816	1837	2449	215	430	574	1291	1721
30	534	455	909	1212	2727	3636	319	638	851	1915	2553	278	556	741	1667	2222	201	401	535	1204	1606
32	570	395	789	1053	2368	3158	288	577	769	1731	2308	254	508	678	1525	2034	188	376	502	1129	1505
34	605	349	698	930	2093	2791	263	526	702	1579	2105	234	469	625	1406	1875	177	354	472	1062	1416
36	641	313	625	833	1875	2500	242	484	645	1452	1935	217	435	580	1304	1739	167	334	446	1003	1337

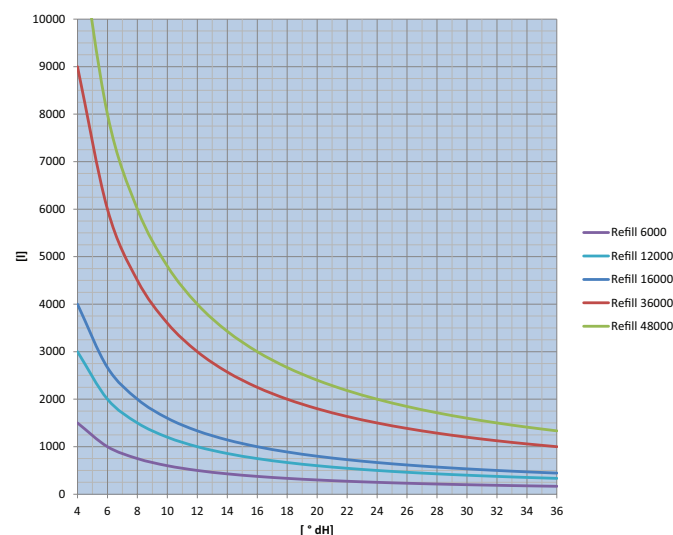
**Amount of make-up water = Capacity of module / Supply water hardness**

#### Example:

Given a supply water hardness of 20 °dH it is possible to decalcify the following amount of make-up water with the help of a Pleno Refill 16000:

$$16000 \text{ [l} \times \text{°dH]} / 20 \text{ °dH} = 800 \text{ l}$$

**Max. amount of make-up water [l] with 0 °dH**  
**Hardness of the supply water [°dH]**



## Dimensioning Pleno Refill demineralisation modules

Systems with a demand of water hardness below 0.11 °dH require demineralised make-up water. All corresponding requirements and instructions for systems filled with demineralised water must be strictly followed. The system must be completely degassed with the help of a vacuum pressure

step degasser e.g. Vento Connect. The pH value must be checked and if necessary corrected. The Refill demineralisation modules are only designed for the make-up water, not for the initial filling of the system. A primary filling is not possible.

**Amount of make-up water = Capacity of module / Supply water hardness**

Water hardness					
°dH	ppm CaCO <sub>3</sub>	Refill Demin 2000	Refill Demin 4000	Refill Demin 13500	Refill Demin 18000
4	70	500	1000	3375	4500
6	106	333	667	2250	3000
8	142	250	500	1688	2250
10	178	200	400	1350	1800
12	214	167	333	1125	1500
14	249	143	286	964	1286
16	285	125	250	844	1125
18	320	111	222	750	1000
20	356	100	200	675	900
22	392	91	182	614	818
24	427	83	167	563	750
26	463	77	154	519	692
28	498	71	143	482	643
30	534	67	133	450	600
32	570	63	125	422	563
34	605	59	118	397	529
36	641	56	111	375	500

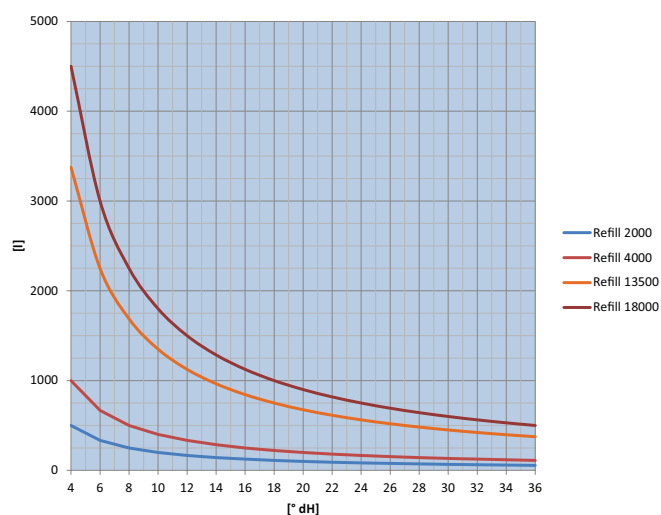
One cartridge is able to demineralise the following content of make-up water:

### Example:

Given a supply water hardness of 15 °dH it is possible to decalcify the following amount of make-up water with the help of a Pleno Refill Demin 13500:

$$13500 \text{ [l} \times \text{°dH]} / 15 \text{ °dH} = 900 \text{ l}$$

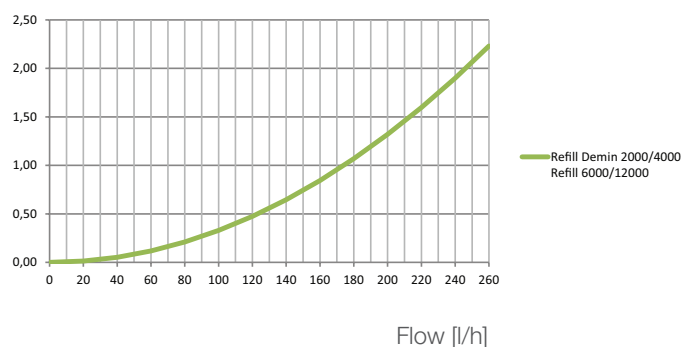
### Amount of make-up water with one cartridge [l] Hardness [ppm CaCO<sub>3</sub>]



## Pressure drop and maximum flow curves Pleno Refill incl. filter

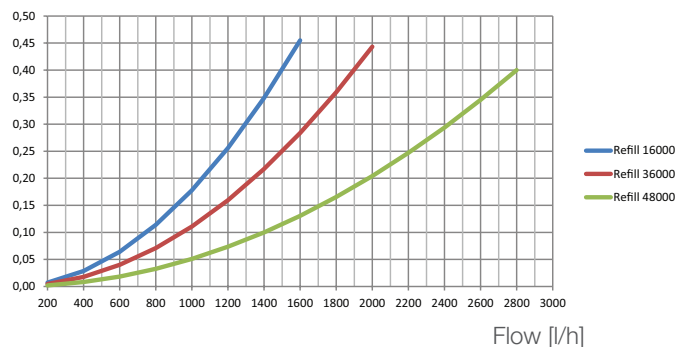
### Refill Demin 2000/4000 / Refill 6000/12000

Pressure drop [bar]



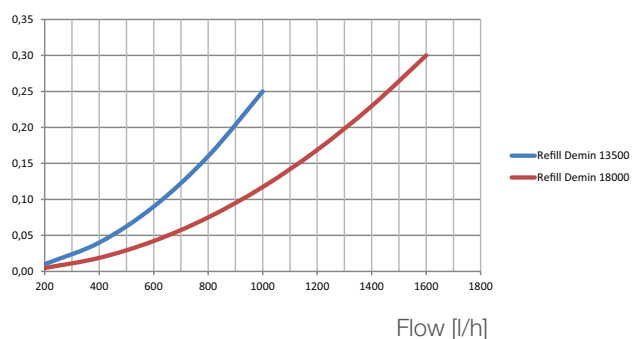
### Refill 13500/16000/18000/36000/48000

Pressure drop [bar]



### Refill Demin 13500/18000

Pressure drop [bar]



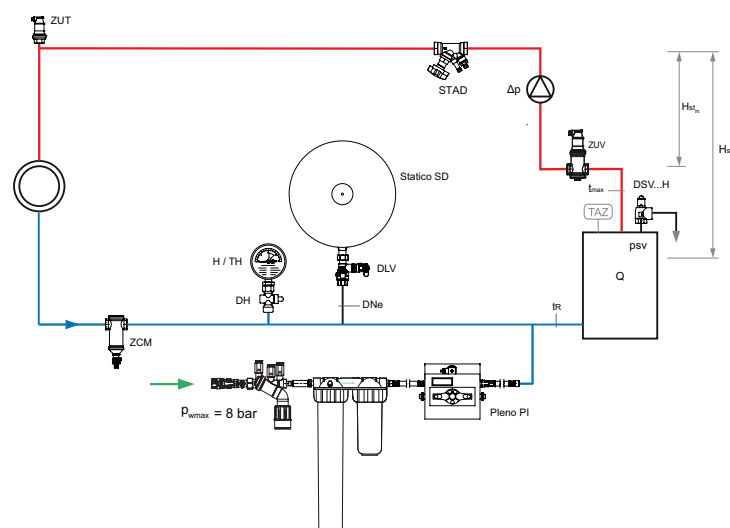
## Application examples

### Pleno Refill 6000 with filter

water treatment with Statico pressurisation and Pleno PI water make-up unit

For heating system up to approx. 100 kW

(May require changes to meet local legislation)



Pleno PI water make-up as pressure maintenance monitoring device according to EN 12828.

Zeparo ZUV for the central separation of micro bubbles.

Zeparo Cyclone ZCDM cyclonic dirt separator with thermal insulation shells and magnets for the central capture of sludge and magnetite.

Zeparo ZUT for automatic venting during filling and during draining.

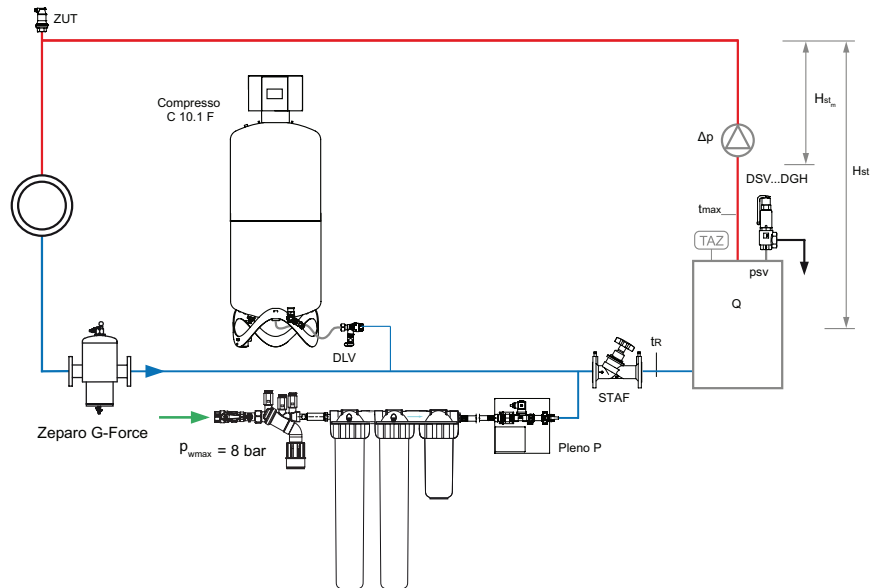
Further accessories, product and selection details: Datasheets Pleno, Zeparo and Accessories.

### Pleno Refill 12000 with filter

water treatment with Compresso C10.1F pressurisation and Pleno P R water make-up unit

### For heating systems up to approx. 2 000 kW

(May require changes to meet local legislation)



**Zeparo G-Force** for the central separation of sludge.

**Zeparo ZUT** for automatic venting during filling and during draining.

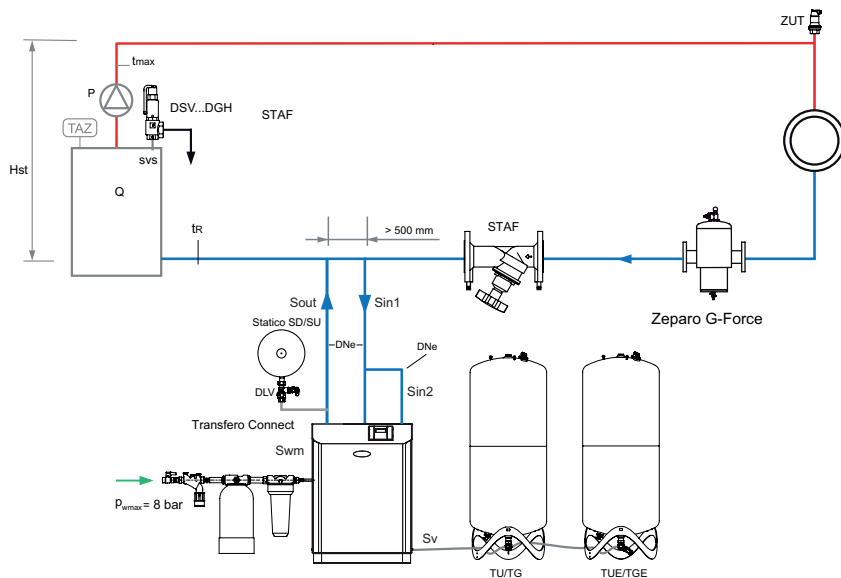
**Further accessories, product and selection details, see:** Datasheet *Pleno*, *Zeparo* and *Accessories*.

### Pleno Refill 48000 with filter

water treatment with Transero TV.2 EH Connect pressurisation and Pleno P BA4R water make-up unit

### Example for heating systems up to approx. 10 000 kW

(May require changes to meet local legislation)



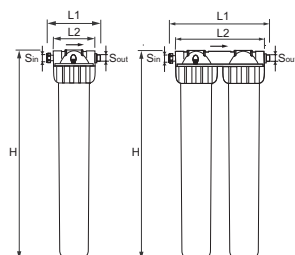
**Zeparo G-Force** for the central separation of sludge.

**Zeparo ZUT** for automatic venting during filling and during draining.

**Further accessories, product and selection details, see:** Datasheet *Pleno*, *Zeparo* and *Accessories*.

## Pleno Refill 6000, 12000 / Pleno Refill Demin 2000, 4000

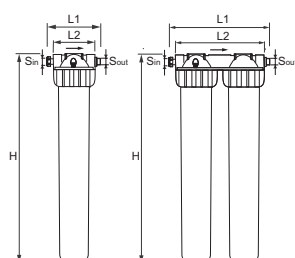
Units for use in all kind of installations except Transfero Connect and Vento Connect



### Softening unit with wall mounting bracket, without filter

3/4" swivelling nut, 1/2" external thread suitable for flat gasket, with flow limiter.

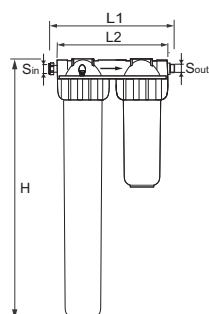
Type	Capacity l x °dH	S <sub>in</sub>	S <sub>out</sub>	H	L1	L2	m [kg]	EAN	Article No
Refill 6000	6000	G3/4	G1/2	571	163	133	3,2	7640153570826	813 3000
Refill 12000	12000	G3/4	G1/2	571	305	275	6,2	5902276895883	813 3001



### Demineralisation unit with wall mounting bracket, without filter

3/4" swivelling nut, 1/2" external thread suitable for flat gasket, with flow limiter.

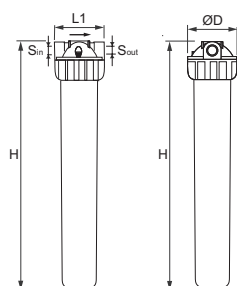
Type	Capacity l x °dH	S <sub>in</sub>	S <sub>out</sub>	H	L1	L2	m [kg]	EAN	Article No
Refill Demin 2000	2000	G3/4	G1/2	571	163	133	3,2	7640153570840	813 3005
Refill Demin 4000	4000	G3/4	G1/2	571	305	275	6,2	7640153570857	813 3006



### Softening unit with wall mounting bracket and filter

3/4" swivelling nut, 1/2" external thread suitable for flat gasket, with flow limiter.

Type	Capacity l x °dH	S <sub>in</sub>	S <sub>out</sub>	H	L1	L2	m [kg]	EAN	Article No
Refill 6000 filter	6000	G3/4	G1/2	571	305	275	4,1	7640153570864	813 3010
Refill 12000 filter	12000	G3/4	G3/4	571	450	420	7,8	7640161631946	813 3011



### Module and filter as single parts

without flow limiter and connection nipples.

Type	Mesh size	S <sub>in</sub>	S <sub>out</sub>	H	L1	D	m [kg]	EAN	Article No
Refill Filter	25 µm	R1	R1	315	163	133	1,2	5902276895876	813 3110

→ = Flow direction

## Pleno Refill 16000, 36000, 48000 / Pleno Refill Demin 13500, 18000

Units for use in all type of installations including Transfero Connect and Vento Connect

### Pleno Refill

Hydraulic unit for water softening together with Vento/Transfero Connect Tec Boxes. Filter with 25 µm mesh size to protect the hydronic system. Softening bottle filled with high grade resin. Designed for plug&play mounting together with Transfero/Vento Connect.

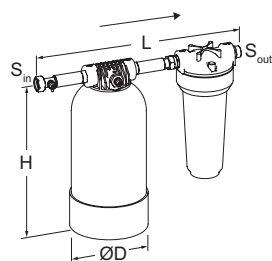
### Softening unit

3/4" swivelling nut, 3/4" external thread suitable for flat gasket.

Nominal pressure: PN 8

Max. working temperature: 45°C

Min. working temperature: > 4°C



Type	Capacity l x °dH	S <sub>in</sub>	S <sub>out</sub>	H	L	D	m [kg]	EAN	Article No
Refill 16000	16000	G3/4	G3/4	383	475	195	8,6	7640161630475	813 3210
Refill 36000	36000	G3/4	G3/4	466	475	220	12,5	7640161630482	813 3220
Refill 48000	48000	G3/4	G3/4	458	475	270	15,7	7640161630499	813 3230

### Pleno Refill Demin

Hydraulic unit for water demineralisation together with Vento/Transfero Connect Tec Boxes. Filter with 25 µm mesh size to protect the hydronic system. Desalination bottle filled with high grade resin.

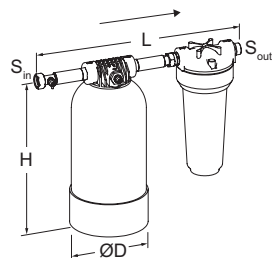
### Demineralisation unit

3/4" swivelling nut, 3/4" external thread suitable for flat gasket.

Nominal pressure: PN 8

Max. working temperature: 45°C

Min. working temperature: > 4°C



Type	Capacity l x °dH	S <sub>in</sub>	S <sub>out</sub>	H	L	D	m [kg]	EAN	Article No
Refill Demin 13500	13500	G3/4	G3/4	466	475	220	12,5	7640161630505	813 3260
Refill Demin 18000	18000	G3/4	G3/4	458	475	270	15,7	7640161630512	813 3270

→ = Flow direction

## Pleno P/PI for Pleno Refill

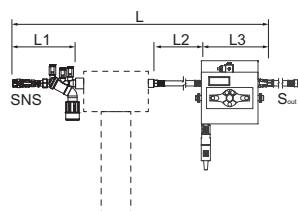
Pleno P water make up module for static expansion vessels i.e. Statico

### Pleno PI for direct mounting on Refill modules

Automatic water make-up for systems with expansion vessels with fixed gas cushion like Statico, without pump.

Connection out (S<sub>out</sub>): G1/2

Connection water make-up (S<sub>in</sub>): G1/2



Type	PS [bar]	H	L	L1	L2	L3	m [kg]	Kvs	EAN	Article No
Pleno PI	10	220	1700	240	500	220	4,0	0,5	7640148632171	813 1010

**Pleno PI** consist of two modules and a flexible connection. Module A consists of a ball valve, a drain valve and the backflow preventer BA. Module B consists of a contact water meter, a solenoid valve a pressure sensor and a ball valve.

T = Depth of the unit 280 mm

For further information on Pleno P/PI, see separate leaflet.



## Pleno P water make up modules for Transfero Connect and Vento Connect

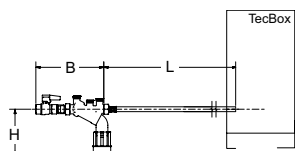
### Pleno P BA4 R

Hydraulic unit for water make-up operation with Vento/Transfero Connect.

Consists of a shut-off valve, check valve, filter and back flow preventer type BA (protection class 4) according to EN 1717.

With connection for Pleno Refill modules.

Connection (S<sub>wm</sub>): G1/2

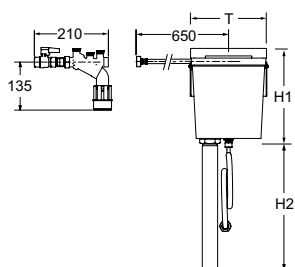


Type	PS [bar]	B	L	H	m [kg]	[l/h]	EAN	Article No
BA4 R	10	210	1300	135	1,1	350	7640161630147	813 3310

### Pleno P AB5 R

Hydraulic unit for water make-up operation with Vento/Transfero Connect.

Consists of Pleno P BA4 R back flow preventer and Pleno P AB5 modules, with protection class 5 according to EN 1717



Type	PS [bar]	T	H1	H2	m [kg]	qwm [l/h]	EAN	Article No
AB5 R	10	220	280	1000	3,8	250	7640161630161	813 3330

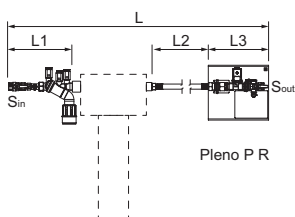
## Pleno P water make up modules for Compresso

### Pleno P for direct mounting on Refill modules

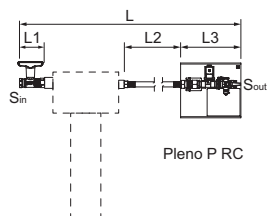
Hydraulic unit. Water make-up without pumps. For the use with Compresso pressurisation units.

Connection out (S<sub>out</sub>): G1/2

Connection water make-up (S<sub>wm</sub>): G1/2



Type	PS [bar]	H	L	L1	L2	L3	m [kg]	Kvs	Article No
Pleno P R	10	200	1700	240	500	220	3,2	0,5	813 1001
Pleno P RC	10	200	1700	75	500	220	2,0	0,5	813 1002

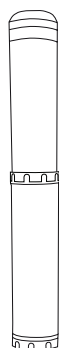


**Pleno P R** consists of ball valve, backflow preventer BA, contact water meter, solenoid valve and flexible connection hose. Can be wall-mounted.

**Pleno P RC** consists of a Globo D ball valve, a flexible hose and a contact water meter, a solenoid valve and a ball valve with sampling drain mounted on a base plate.

T = Depth of the unit 125 mm

## Spare cartridges for replacement

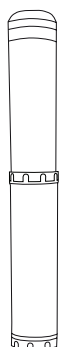


### Spare cartridge for softening module 6000/12000

for the units of the type 12000 2 cartridges are necessary.

Function: Softening

Type	Length	EAN	Article No
6000	510	7640153570895	813 3101

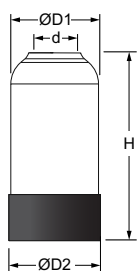


### Spare cartridge for demineralisation module 2000/4000

for the units of the type 4000 2 cartridges are necessary.

Function: Demineralisation

Type	Length	EAN	Article No
2000 Demin	510	7640153570901	813 3102

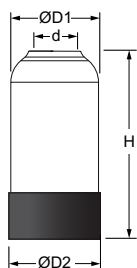


### Spare cartridge for softening module 16000/36000/48000

For the exchange of the softening cartridge when the capacity limit is reached or after 2 years.

Function: Softening

Type	Capacity l x °dH	d	D1	D2	H	m [kg]	EAN	Article No
Refill 16000	16000	G2 1/2	188	195	346	6,7	7640161630567	813 3211
Refill 36000	36000	G2 1/2	212	220	442	10,6	7640161630574	813 3221
Refill 48000	48000	G2 1/2	264	270	428	13,8	7640161630604	813 3231



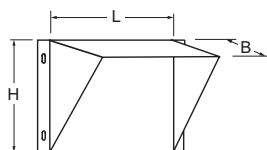
### Cartridge for full demineralisation for modules 13500/18000

For the exchange of the demineralisation cartridge when the capacity limit is reached or after 2 years.

Function: Demineralisation

Type	Capacity l x °dH	d	D1	D2	H	m [kg]	EAN	Article No
Refill 13500	13500	G2 1/2	212	220	442	10,6	7640161630611	813 3261
Refill 18000	18000	G2 1/2	264	270	428	13,8	7640161630550	813 3271

## Accessories



### Console for wall mounting

Type	L	H	B	m [kg]	EAN	Article No
CW	300	200	300	1,3	7640161631823	813 3113



### Spare filter cartridge

Function: Filtering

Type	Mesh size	Length	EAN	Article No
25	25 µm	250	7640161631809	813 3111

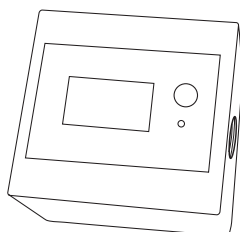


### Total hardness measuring equipment

for app. 100 measurements.

Function: Determination of the water hardness in °dH.

Type	EAN	Article No
GH 100	7640153570932	813 3120



### Electronic water meter with countdown function for manual make up

The meter counts from the set value down to 0. Having reached this value the display starts to flash and a warning beep sounds. In the version WM 24V a 24V signal can be transferred to a BMS system. The power supply can be external or with the help of the power supply unit NG (type WM 24V). The meter is also able to display negative values.

Setting range: 0 - 99999 l

Flow range: 2 - 15 l/min

Type	Voltage	Connection	EAN	Article No
WM 24 V	24 V DC	3/8"	7640153570949	813 3121
WM Batterie	2x1,5 V AAA	3/8"	7640153570956	813 3122

### Power supply 230V, 24V DC

Type	Input	Output	Power	EAN	Article No
NG	230 V AC	24 V DC	15 Watt	7640153570963	813 3123

### Manual make-up with electronic water meter

The ball valve must be opened manually when the pressure in the system decreases beyond the minimum value. The max. make-up volume of the cartridge must be entered into the water meter. When the max. make-up water amount is reached an alarm signal can be heard and the display starts to flash, at which point it is necessary to exchange the cartridge.

