

# Transfero TVI Connect



**Pressure maintenance system with pumps and integrated *cyclonic* vacuum degassing**

For higher pressures in heating systems up to 8 MW and cooling systems up to 13 MW

# Transero TVI Connect

The Transero TVI Connect is a precision pressure maintenance device for higher pressures in heating and solar systems up to 8 MW, and chilled water systems up to 13 MW. Its use is particularly recommended where high performance, compact design and precision are required. The new **BrainCube Connect** control panel allows a new level of connectivity, enabling communication with the BMS system and other BrainCubes, as well as remote operation of the pressurisation system through live viewing.

## Key features

- > **2 in 1**  
The only pressurisation unit with integrated *cyclonic* vacuum degassing
- > **Higher Efficiency Cyclonic vacuum degassing**  
At least 50% higher efficiency than most other vacuum degassing systems.
- > **Easy Commissioning, Remote Access and Trouble-shooting**  
Automatic calibration and integrated standard connections to our IMI Webserver and to BMS.



## Technical description – Control unit TecBox

### Applications:

Heating, solar and chilled water systems. For systems according to EN 12828, SWKI HE301-01, solar systems according to EN 12976, ENV 12977 with on-site excess temperature protection in case of power outage.

### Media:

Non-aggressive and non-toxic system media.  
Ethylene or propylene glycol-based antifreeze up to 50%.

### Pressure:

Min. admissible pressure, PSmin: -1 bar  
Max. admissible pressure, PS: 25 bar

### Temperature:

Max. admissible temperature,  
 $t_{Smax}$ : 90°C  
Min. admissible temperature,  
 $t_{Smin}$ : 0°C  
Max. admissible ambient temperature,  
 $t_{Amax}$ : 40°C  
Min. admissible ambient temperature,  
 $t_{Amin}$ : 5°C

### Accuracy:

Precision pressure maintenance  $\pm 0,2$  bar.

### Supply voltage:

Main voltage: 3x400V ( $\pm 10\%$ ) / 50Hz (3P+PE)  
Control voltage: 230V ( $\pm 10\%$ ) / 50Hz (P+N+PE)

### Electrical connections:

Onsite fuses according to power demand and local norms  
4 potential free outputs (NO) for external alarm indication (230V max. 2A)  
1 RS 485 In/Output  
1 Ethernet RJ45 plug socket  
1 USB Hub plug socket  
Terminal strip in PowerCube for direct wiring

### Enclosure class:

IP54 according to EN 60529

### Mechanical connections:

Sin1/Sin2: inlet from the system G3/4"  
Sout: outlet to the system G3/4"  
Swm: inlet water make-up G3/4"  
Sv: connection of the vessel G1 1/4"

### Material:

Metal components with medium contact: carbon steel, cast iron, stainless steel, AMETAL®, brass, gun metal.

### Transportation and storage:

In frostless, dry places.

### Standard:

Constructed according to MD 2006/42/EC, Annex II 1.A  
EMC-D. 2014/30/EU

## Technical description – Expansion vessels

### Applications:

Only together with TecBox Control Unit.  
See *Applications* under Technical description - TecBox Control Unit.

### Media:

Non-aggressive and non-toxic system media.  
Ethylene or propylene glycol-based antifreeze up to 50%.

### Pressure:

Min. admissible pressure, PSmin: 0 bar  
Max. admissible pressure, PS: 2 bar

### Temperature:

Max. admissible bag temperature,  $t_{Bmax}$ : 70°C  
Min. admissible bag temperature,  $t_{Bmin}$ : 5°C

For PED purposes:

Max. admissible temperature,  $t_{Smax}$ : 120°C  
Min. admissible temperature,  $t_{Smin}$ : -10°C

### Material:

Steel. Color beryllium.  
Airproof butyl bag according to EN 13831.

### Transportation and storage:

In frostless, dry places.

### Standard:

Constructed according to PED 2014/68/EU.

### Warranty:

Transfero TU, TU...E: 5-year warranty for the vessel.  
Transfero TG, TG...E: 5-year warranty for the airproof butyl bag.

## Function, Equipment, Features

### Control unit BrainCube Connect

- BrainCube Connect control for an intelligent, fully automatic, safe system operation. Self-optimising with memory function.
- Resistive 3.5" TFT illuminated colour touch display. Web-based interface with remote control and live view. User-friendly, operation-orientated menu layout with slide and tap operation, step-by-step start up procedure guide and direct help in pop-up windows. Representation of all relevant parameters and operation status in plain text and/or graphical, multilingual.
- Standardised integrated connections (Ethernet, RS 485) to the IMI webserver and BMS (Modbus and IMI Pneumatex protocol).
- Software updates and data logging possible via USB connection
- Data logging and system analysis, chronological message memory with prioritisation, remotely controllable with live view, periodical automatic self-test.
- High quality metal cover.
- Variable installation next to the primary vessel.

### Pressure maintenance

- Dynaflax operation.
- Protected isolating valves to the system. 2 bar safety valve and ball valve for fast draining of primary vessel
- Precision pressure maintenance  $\pm 0.2$ bar

### Vacuum Degassing

- About 1000 l/h flow capacity for system degassing.
- Vacusplit: Degassing programs for permanent operation with cyclonic technology. Gas under saturation of *system water* of nearly 100%. Eco automatic operation when no air is detected, savings on electricity consumption of the pump.
- Oxystop degassing: Direct degassing of make-up water. Significant oxygen reduction in the make-up water. Safely degasses both system and make-up water in a specially designed cyclone vessel (inside the Tecbox), with the advantage of low keeping temperature of the expansion vessel, without the need to insulate the vessel. Protects the system against corrosion.

### Water make-up

- Fillsafe: water-make up monitoring and control with integrated contact water flow meter and solenoid valve.
- Connection for optional Pleno P BA4R/AB5(R) water make-up devices for tap water protection following EN 1717.
- Softsafe monitoring and control for an optional refill water treatment device.

### Expansion vessels

- Bag can be vented at the top, condensate drain at the bottom.
- Sinus ring for upright assembly (TU, TU...E). Feet for upright assembly (TG, TG...E).
- Corrosion-protected internal coating for minimum bag wear (TG, TG...E).
- Airproof butyl bag (TU, TU...E, TG, TG...E), exchangeable (TG, TG...E).
- Endoscopic inspection opening for internal inspections (TU, TU...E). Two flange openings for internal inspections (TG, TG...E).

## Calculation

### Pressure maintenance for systems TAZ ≤ 100°C

Calculation following EN 12828, SWKI HE301-01 \*).

For all special applications such as solar systems, district heating systems, systems with temperatures above 100°C or cooling systems with temperatures below 5°C please use HySelect software or contact us.

### General equations

<b>Vs</b>	Water capacity of the system	Heating	<b>Vs = vs · Q</b>	vs Q	Specific water capacity, table 4 Installed heat capacity
			Vs= Known		System design, content calculation
		Cooling	Vs= Known		System design, content calculation
<b>Ve</b>	Expansion volume	EN 12828	<b>Ve = e · (Vs+Vhs)</b>	e, ehs	Expansion coefficient for $ts_{max}$ , table 1
		Cooling	Ve = e · (Vs+Vhs)	e, ehs	Expansion coefficient for $ts_{max}$ , table 1 <sup>7)</sup>
		SWKI HE301-01 heating	Ve = e · Vs · X <sup>1)</sup> + ehs · Vhs	e ehs	Expansion coefficient for $(ts_{max} + tr)/2$ , table 1 Expansion coefficient for $ts_{max}$ , table 1
		SWKI HE301-01 cooling	Ve = e · Vs · X <sup>1)</sup> + ehs · Vhs	e, ehs	Expansion coefficient for $ts_{max}$ , table 1 <sup>7)</sup>
<b>Vwr</b>	Water reserve	EN 12828, cooling	<b>Vwr ≥ 0,005 · Vs ≥ 3 L</b>		
		SWKI HE301-01	Vwr is considered in Ve with the coefficient X		
<b>p0</b>	Minimum pressure <sup>2)</sup> Lower limit value for the pressure maintenance	EN 12828, cooling	<b>p0 = Hst/10 + 0,2 bar ≥ pz</b>	Hst	Static height
		SWKI HE301-01	p0 = Hst/10 + 0,3 bar ≥ pz	pz	Minimum required equipment pressure for pumps or boilers
<b>pa</b>	Initial pressure Lower threshold for an optimum pressure maintenance		<b>pa ≥ p0 + 0,3 bar</b>		
<b>pe</b>	Final pressure			psvs dpsvs <sub>c</sub>	Response pressure safety valve system Closing pressure tolerance of the safety valve
		EN 12828	<b>pe ≤ psvs - dpsvs<sub>c</sub></b>	dpsvs <sub>c</sub> = dpsvs <sub>c</sub> =	0,5 bar for psvs ≤ 5 bar <sup>4)</sup> 0,1 · psvs for psvs > 5 bar <sup>4)</sup>
		Cooling	<b>pe ≤ psvs - dpsvs<sub>c</sub></b>	dpsvs <sub>c</sub> = dpsvs <sub>c</sub> =	0,6 bar for psvs ≤ 3 bar <sup>4)</sup> 0,2 · psvs for psvs > 3 bar <sup>4)</sup>
		SWKI HE301-01 heating	<b>pe ≤ psvs/1,15 and pe ≤ psvs - 0,3 bar</b>		psvs <sup>4)</sup>
		SWKI HE301-01 cooling, solar, heat pump	<b>pe ≤ psvs/1,3 and pe ≤ psvs - 0,6 bar</b>		psvs <sup>4)</sup>

### Transfero

<b>pe</b>	Final pressure Upper threshold for an optimum pressure maintenance.		<b>pe = pa + 0,4</b>		
<b>VN</b>	Nominal volume of the expansion vessel <sup>5)</sup>	EN 12828, cooling	<b>VN ≥ (Ve + Vwr) · 1,1</b>		
		SWKI HE301-01	<b>VN ≥ Ve · 1,1</b>		
<b>TecBox</b>			<b>Q = f(Hst)</b>	>> Quick selection Transfero	

- 1) Heating, Cooling, Solar: Q ≤ 10 kW: X = 3 | 10 kW < Q ≤ 150 kW: X = (87-0,3 · Q)/28 | Q > 150 kW: X = 1,5  
Geothermal probe systems: X = 2,5
- 2) The formula for minimum pressure p0 applies to the installation of the pressure maintenance on the suction side of the circulation pump. In case of a pressure-side installation p0 is to be increased by the pump pressure Δp.
- 4) The safety valves must operate within these limits. Use component tested and certified safety valves of type H and DGH for heating systems, type F and DGF for cooling systems. For systems according to SWKI HE301-01, only safety valves of the approval type DGF and DGH are to be used.
- 5) Please select a vessel which has an equal or higher nominal content.
- 7) Max. system standstill temperature, usually 40°C for cooling applications and geothermal probes with ground regeneration, 20°C for other geothermal probes
- \*) SWKI HE301-01: Valid for Switzerland

HySelect calculation software is based on an advanced calculation method and database. Results may vary.

**Table 1: e expansion coefficient**

t (TAZ, ts <sub>max</sub> , tr, ts <sub>min</sub> ), °C	20	30	40	50	60	70	80	90	100	105	110
<b>e Water</b> = 0 °C	0,0016	0,0041	0,0077	0,0119	0,0169	0,0226	0,0288	0,0357	0,0433	0,0472	0,0513
<b>e % weight MEG*</b>											
30 % = -14,5 °C	0,0093	0,0129	0,0169	0,0224	0,0286	0,0352	0,0422	0,0497	0,0577	0,0620	0,0663
40 % = -23,9 °C	0,0144	0,0189	0,0240	0,0300	0,0363	0,0432	0,0505	0,0582	0,0663	0,0706	0,0750
50 % = -35,6 °C	0,0198	0,0251	0,0307	0,0370	0,0437	0,0507	0,0581	0,0660	0,0742	0,0786	0,0830
<b>e % weight MPG**</b>											
30 % = -12,9 °C	0,0151	0,0207	0,0267	0,0333	0,0401	0,0476	0,0554	0,0639	0,0727	0,0774	0,0823
40 % = -20,9 °C	0,0211	0,0272	0,0338	0,0408	0,0481	0,0561	0,0644	0,0731	0,0826	0,0873	0,0924
50 % = -33,2 °C	0,0288	0,0355	0,0425	0,0500	0,0577	0,0660	0,0747	0,0839	0,0935	0,0985	0,1036

**Table 4: vs approx. water capacity \*\*\* of central heatings referred to the installed heat capacity Q**

ts <sub>max</sub>   tr	°C	90   70	80   60	70   55	70   50	60   40	50   40	40   30	35   28
Radiators	vs liter/kW	14,0	16,5	20,1	20,6	27,9	36,6	-	-
Flat radiators	vs liter/kW	9,0	10,1	12,1	11,9	15,1	20,1	-	-
Convectors	vs liter/kW	6,5	7,0	8,4	7,9	9,6	13,4	-	-
Air handlers	vs liter/kW	5,8	6,1	7,2	6,6	7,6	10,8	-	-
Floor heating	vs liter/kW	10,3	11,4	13,3	13,1	15,8	20,3	29,1	37,8

\*) MEG = Mono-Ethylene Glycol

\*\*) MPG = Mono-Propylene Glycol

\*\*\*) Water capacity = heat generator + distribution net + heat emitters

**Table 6: DNe standard values for expansion pipes with Transfero TVI\_\***

		TVI_19.1 EH	TVI_19.2 EH	TVI_25.1 EH	TVI_25.2 EH
Length up to approx. 5 m	<b>DNe</b>	32	50/40	32	50/40
	Hst   m	all	<128 / ≥ 128	all	< 182 / ≥ 182
	<b>DNd</b>	25	25	25	25
	Hst   m	all	all	all	all
Length up to approx. 10 m	<b>DNe</b>	40/32	65/50	40/32	65/50
	Hst   m	< 88 / ≥ 88	< 87 / ≥ 87	< 136 / ≥ 136	< 136 / ≥ 136
	<b>DNd</b>	25	25	25	25
	Hst   m	all	all	all	all
Length up to approx. 30 m	<b>DNe</b>	50/40	65/50	50/40	65/50
	Hst   m	< 101 / ≥ 101	< 134 / ≥ 134	< 150 / ≥ 150	< 188 / ≥ 188
	<b>DNd</b>	32	32	32	32
	Hst   m	all	all	all	all

\*)

For proper operation of the devices, the specified DNe values cannot fall below.

TVI.1 EH, TVI.2 EH for tr < 5 °C or tr > 70 °C: 2 expansion pipes DNe, 1 connection pipe DNd due to degassing

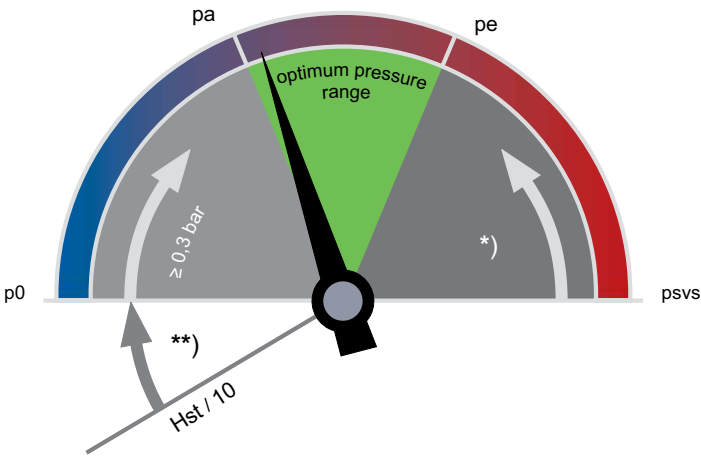
TVI.1 EH, TVI.2 EH for 5 °C ≤ tr ≤ 70 °C: 1 expansion pipes DNe, 1 connection pipe DNd due to degassing

## Temperatures

<b>ts<sub>max</sub></b>	<b>Maximum system temperature</b> Maximum temperature for the calculation of the volume expansion. For heating systems the dimensioned flow temperature at which a heating system is to be operated with the lowest outside temperature to be assumed (standard outside temperature according to EN 12828). For cooling systems the max. temperature that is achieved due to the operation mode or standstill, for solar systems the temperature up to which an evaporation is to be avoided.
<b>ts<sub>min</sub></b>	<b>Lowest system temperature</b> Lowest temperature for calculating expansion volumes. The lowest system temperature is equal to the freezing point. It is dependant on the percentage of antifreeze additives. For water without additives ts <sub>min</sub> = 0.
<b>tr</b>	<b>Return temperature</b> Return temperature of the heating system with the lowest outside temperature to be assumed (standard outside temperature according to EN 12828).
<b>TAZ</b>	<b>Safety temperature limiter   Safety temperature controller   Temperature limit</b> Safety device according to EN 12828 for the temperature protection of heat generators. If the set temperature limit is exceeded the heating is turned off. Limiters are locked, controllers automatically release the heat supply if the set temperature falls short. Setting value for systems according to EN 12828 ≤ 110 °C.

**Precision pressure maintenance**

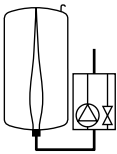
Transfero minimizes the pressure variations between  $p_a$  and  $p_e$ .  
Transfero  $\pm 0,2$  bar



\*\*) EN 12828, Solar, Cooling:  $\geq 0,2$  bar  
SWKI HE301-0:  $\geq 0,3$  bar

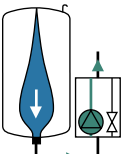
\*) EN 12828:  $\geq p_{svs} \cdot 0,1 \geq 0,5$  bar  
Solar, Cooling:  $\geq p_{svs} \cdot 0,2 \geq 0,6$  bar  
SWKI HE301-01 Heating  $\geq p_{svs} \cdot (1-1/1,15) \geq 0,3$  bar  
SWKI HE301-01 Cooling, Solar, Heat Pumps  $\geq p_{svs} \cdot (1-1/1,3) \geq 0,6$  bar

**p0 Minimum pressure**



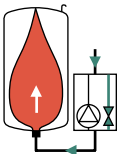
**Transfero**  
 $p_0$  and the switching points are calculated by the BrainCube.

**pa Initial pressure**



**Transfero**  
If the system pressure is  $< p_a$ , the pump starts.  
 $p_a = p_0 + 0,3$

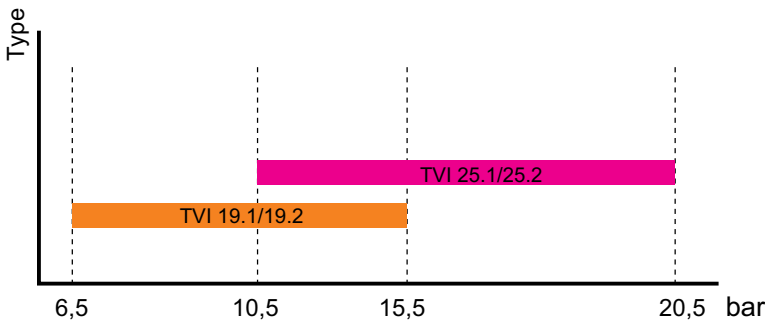
**pe Final pressure**



**Transfero**  
If system pressure is  $> p_e$ , the relief valve opens.  
 $p_e = p_a + 0,4$

**Quick selection**

Operation range dpu



dpu

		TVI_19	TVI_25
dpu min	bar	6,5	10,5
dpu max	bar	15,5	20,5

## Quick selection

Heating systems TAZ ≤ 100°C, without addition of antifreeze, EN 12828, SWKI HE301-01.

For exact calculations please use HySelect software.

Q [kW]	TecBox				Primary vessel			
	1 pump, high flow		2 pumps *, high flow		Radiators		Flat radiators	
	TVI 19.1 EH	TVI 25.1 EH	TVI 19.2 EH	TVI 25.5 EH	90   70	70   50	90   70	70   50
	Static height Hst [m] **		Static height Hst [m] **		Nominal volume VN [liter]			
	min-max		min-max					
≤ 300	58-149	98-199	58-149	98-199	200	200	200	200
400	58-149	98-199	58-149	98-199	300	300	200	200
500	58-149	98-199	58-149	98-199	300	300	200	200
600	58-149	98-199	58-149	98-199	400	400	300	300
700	58-149	98-199	58-149	98-199	500	500	300	300
800	58-149	98-199	58-149	98-199	500	500	400	300
900	58-149	98-199	58-149	98-199	600	600	400	400
1000	58-149	98-199	58-149	98-199	600	600	400	400
1100	58-149	98-199	58-149	98-199	800	800	500	500
1200	58-149	98-199	58-149	98-199	800	800	500	500
1300	58-149	98-199	58-149	98-199	800	800	500	500
1400	58-149	98-199	58-149	98-199	1000	1000	600	600
1500	58-149	98-199	58-149	98-199	1000	1000	600	600
1600	58-149	98-199	58-149	98-199	1000	1000	800	800
1700	58-149	98-199	58-149	98-199	1500	1500	800	800
1800	58-149	98-199	58-149	98-199	1500	1500	800	800
1900	58-149	98-199	58-149	98-199	1500	1500	800	800
2000	58-149	98-199	58-149	98-199	1500	1500	800	800
2100	58-149	98-199	58-149	98-199	1500	1500	1000	1000
2200	58-149	98-199	58-149	98-199	1500	1500	1000	1000
2500	58-147	98-199	58-149	98-199	1500	1500	1000	1000
3000	58-132	98-186	58-149	98-199	2000	2000	1500	1500
3500	58-115	98-166	58-149	98-199	3000	3000	1500	1500
4000	58-94	98-143	58-149	98-199	3000	3000	2000	2000
4500	58-70	98-117	58-149	98-199	3000	3000	2000	2000
5000			58-144	98-199	3000	3000	2000	2000
5500			58-137	98-192	4000	4000	3000	3000
6000			58-128	98-183	4000	4000	3000	3000
6500			58-119	98-173	4000	4000	3000	3000
7000			58-109	98-162	5000	5000	3000	3000
7500			58-98	98-149	5000	5000	3000	3000
8000			58-86	98-136	5000	5000	4000	4000

\*) 50% output per pump, full redundancy in the framed area.

\*\*) The value decreases with

TAZ = 105 °C by 2 m

TAZ = 110 °C by 4 m

SWKI HE301-01 by another 1m

### Example

Q = 3300 kW

Flat radiators 90 | 70 °C

TAZ = 105 °C

Hst = 110 m

psv = 16 bar

Selected:

TecBox TVI 19.1 EH

Primary vessel TG 1500

Setting of BrainCube:

Hst = 110 m

TAZ = 105 °C

Check psv:

for TAZ = 105 °C

EN 12828 psv:  $(110/10 + 0,9 + 0,2) \cdot 1,11 = 12,32 \leq 16$  o.k.

SWKI HE301-01 psv:  $(110/10 + 1,0 + 0,2) \cdot 1,15 = 12,88 \leq 16$  o.k.

Check Hst:

for TAZ = 105 °C

Hst:  $115 - 2 = 113 \geq 110$

### Transféro

= TecBox + Primary vessel + Extension vessel (optional)

### Extension vessel

The nominal volume can be allocated to multiple vessels of the same size.

Setting values

For TAZ, Hst and psv in the “Parameter” menu of the BrainCube.

		TAZ = 100 °C		TAZ = 105 °C		TAZ = 110 °C	
EN 12828	Check psv:	for psv ≤ 5 bar	$psv \geq 0,1 \cdot Hst + 1,4$	$psv \geq 0,1 \cdot Hst + 1,6$	$psv \geq 0,1 \cdot Hst + 1,8$		
		for psv > 5 bar	$psv \geq (0,1 \cdot Hst + 0,9) \cdot 1,11$	$psv \geq (0,1 \cdot Hst + 1,1) \cdot 1,11$	$psv \geq (0,1 \cdot Hst + 1,3) \cdot 1,11$		
SWKI HE301-01		for psv ≤ 3 bar	$psv \geq (0,1 \cdot Hst + 1,0) \cdot 1,3$	$psv \geq (0,1 \cdot Hst + 1,2) \cdot 1,3$	$psv \geq (0,1 \cdot Hst + 1,4) \cdot 1,3$		
		for psv > 3 bar	$psv \geq (0,1 \cdot Hst + 1,0) \cdot 1,15$	$psv \geq (0,1 \cdot Hst + 1,2) \cdot 1,15$	$psv \geq (0,1 \cdot Hst + 1,4) \cdot 1,15$		

The BrainCube determines the switching points and the minimum pressure p0.

Equipment

Expansion pipes

Transero TVI\_: table 6

Buffer vessels

At least one Statico SH 150.25 is required for operation when system pressure  $p \leq 10$  bar, and one Statico SH 300.25 for operation when system pressure  $p > 10$  bar.

Lock shield valve DLV

for Statico SH 150/300 buffer vessels.

Pleno

Water make-up modules in combination with Transero TVI Connect. Controlled via the BrainCube of the Transero TecBox. Connected water softening units must have a minimum flow rate of 1300 l/h for direct connection. If the water treatment unit has a lower flow rate a flow limiter in the inlet of the water meter must be used (a 240 l/h flow limiter is enclosed with the Transero).

Pleno Refill

Water softening and demineralization modules in combination with Transero TVI Connect. Controlled via the BrainCube of the Transero TecBox.

Intermediate vessel

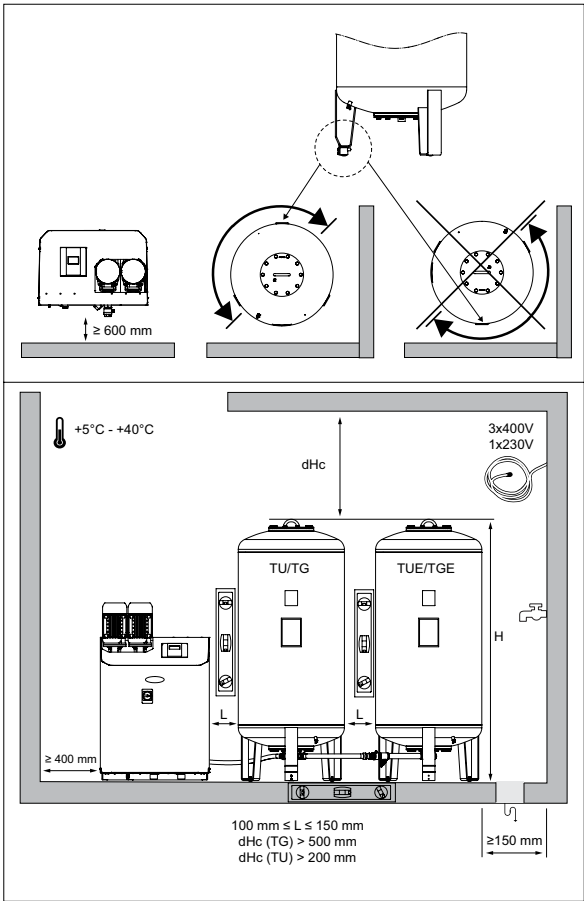
An intermediate vessel is required for return temperatures higher than 70°C respectively lower than 5°C.

Zeparo

Air vent Zeparo ZUT or ZUP at each high point for venting during the filling and during the draining process. Separator for sludge and magnetite in each system in the main return to the heat generator.

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

Installation

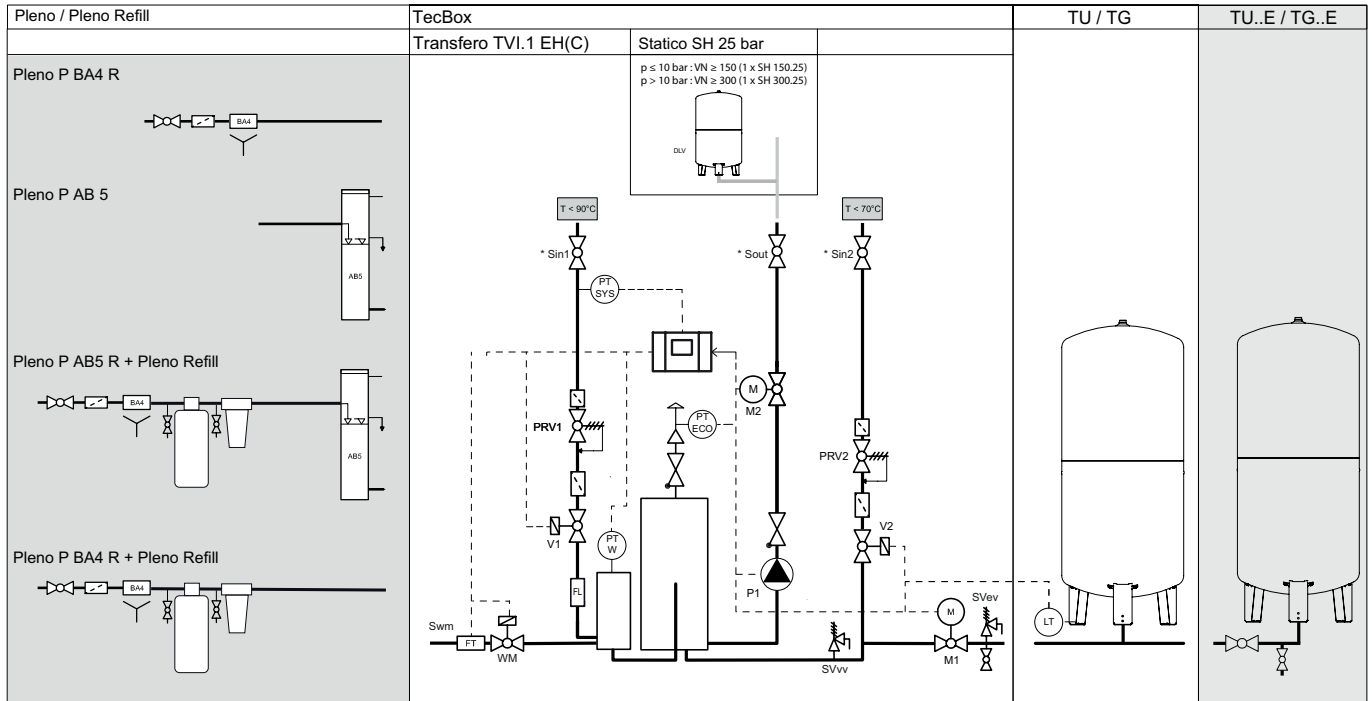




## Principle scheme

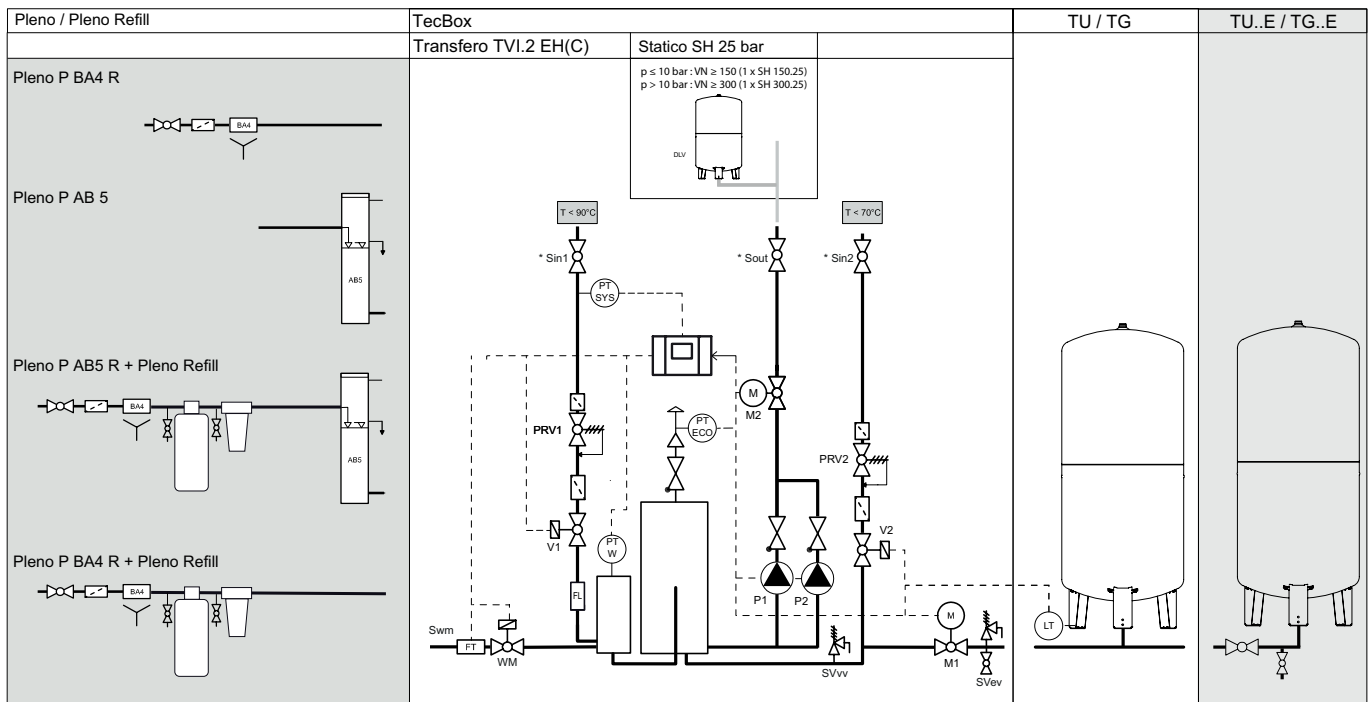
### Transfero TVI.1 EH Connect

Grey area is optional



### Transfero TVI.2 EH Connect

Grey area is optional



\* When connecting to rigid piping, it is essential to ensure that there is no axial, vertical or horizontal tension. The connections must not be loaded with any additional weights. Maximum tightening torques must be observed where specified. If tightening torques are not specified, the state of the art for the respective connection must be observed. A flexible connection is preferable to a rigid connection.

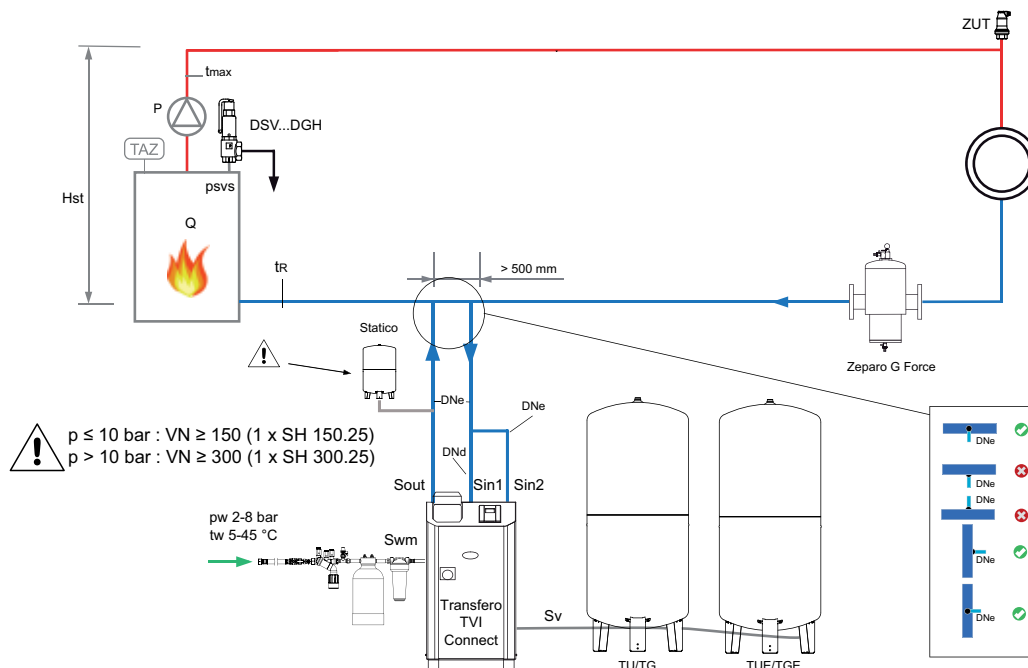
## Application examples

### Transfero TVI.1 EH Connect

TecBox with 1 pump, precision pressure maintenance  $\pm 0,2$  bar with cyclonic vacuum degassing, Pleno P BA4R for water make-up.

#### Example for heating systems, return temperature $t_r \leq 70^\circ\text{C}$

(May require changes to meet local legislation)



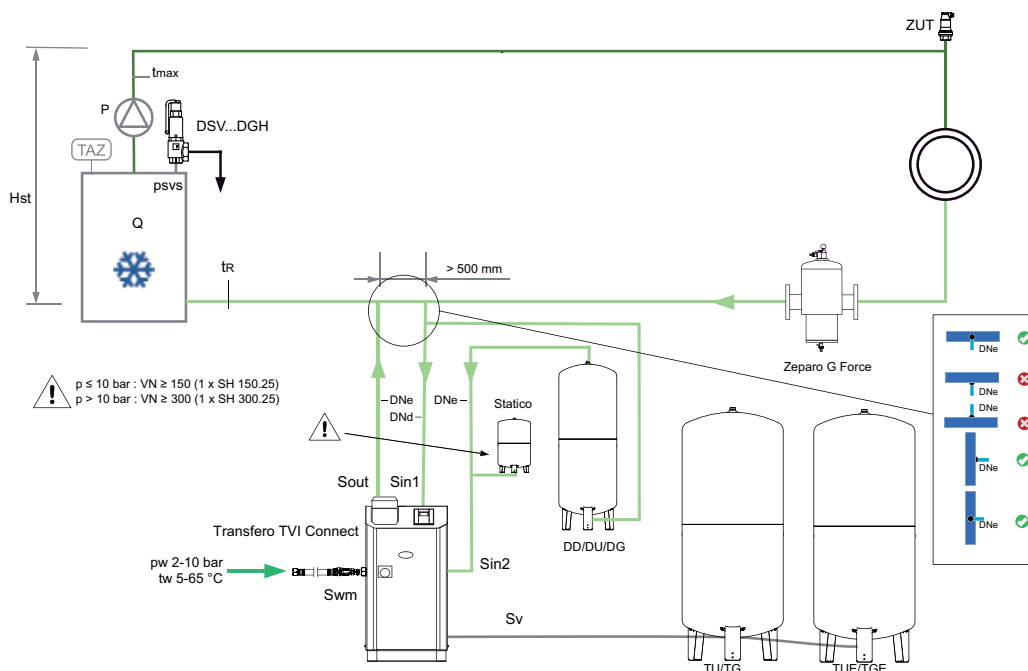
### Transfero TVI.2 EHC Connect

TecBox with 2 pumps, precision pressure maintenance  $\pm 0,2$  bar with cyclonic vacuum degassing. Pleno P AB5 for water make-up.

#### Example for cooling systems, return temperature $0^\circ\text{C} < t_r \leq 5^\circ\text{C}$

(May require changes to meet local legislation)

Scheme is also valid for Transfero TVI.1 EHC



**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 Connect*, *Zeparo* and *Accessories*.

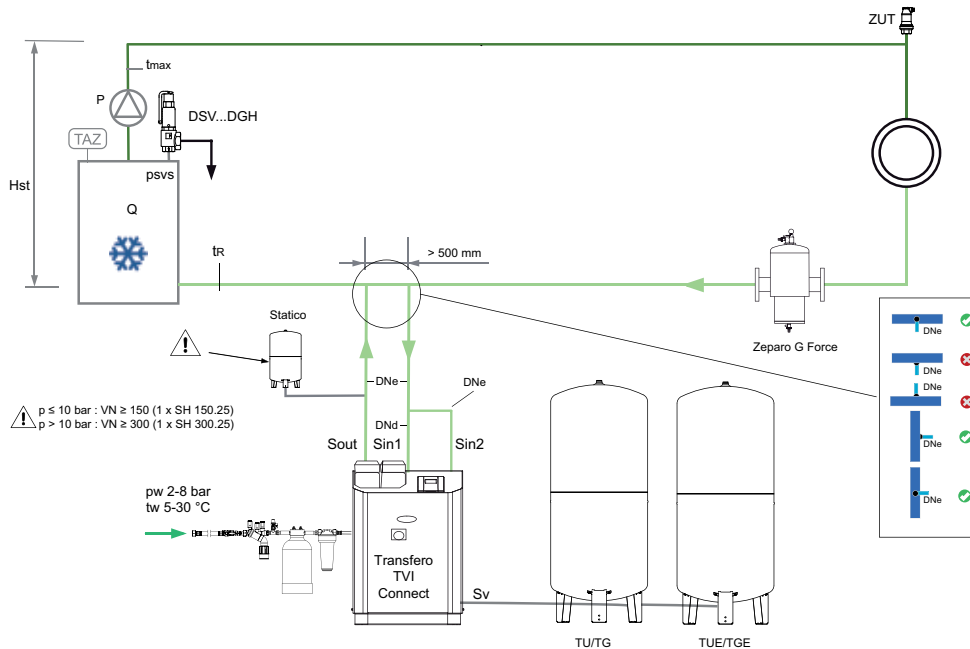
### Transfero TVI.2 EH Connect

TecBox with 2 pumps, precision pressure maintenance  $\pm 0,2$  bar with cyclonic vacuum degassing, Pleno P AB5 R for the water make-up and Pleno Refill for water treatment.

#### Example for heating systems, return temperature $tr \leq 70^{\circ}\text{C}$

(May require changes to meet local legislation)

Scheme is also valid for Transfero TVI.1 EH



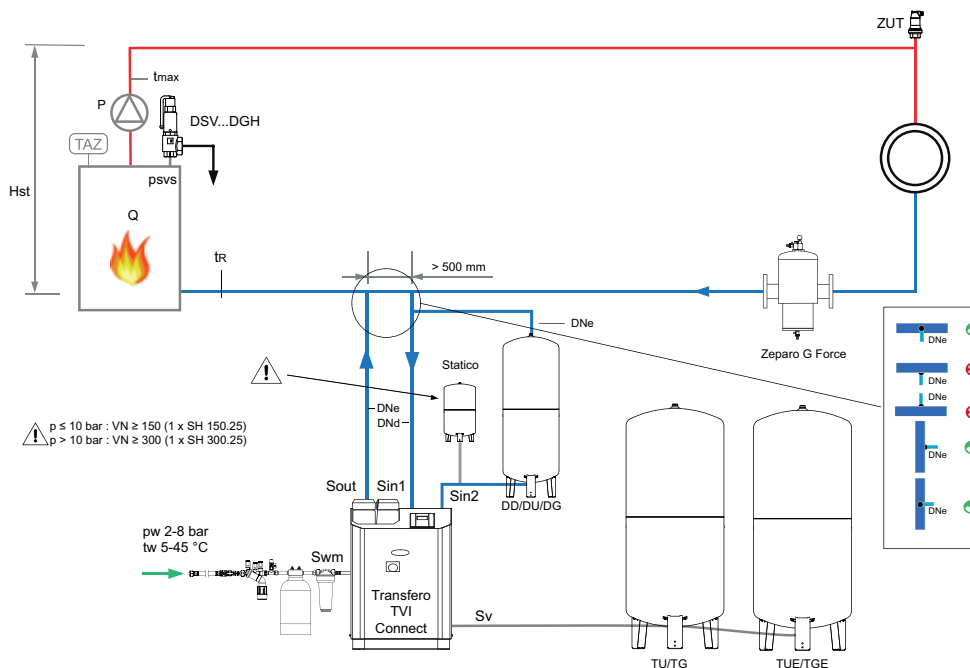
### Transfero TVI.2 EH Connect

TecBox with 2 pumps, precision pressure maintenance  $\pm 0,2$  bar with cyclonic vacuum degassing, Pleno P AB5 R for the water make-up and Pleno Refill for water treatment.

#### Example for heating systems, return temperature $70^{\circ}\text{C} < tr \leq 90^{\circ}\text{C}$

(May require changes to meet local legislation)

Scheme is also valid for Transfero TVI.1 EH

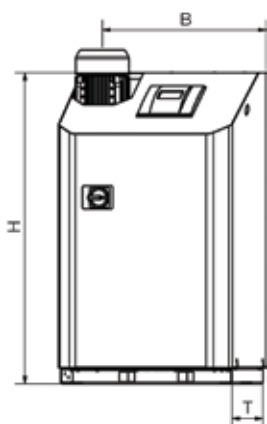


**Zeparo G-Force** for the central separation of sludge.

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

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

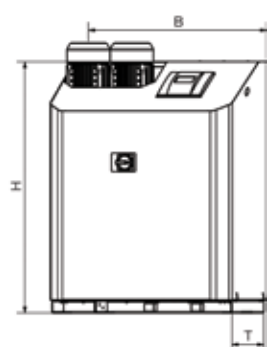
## Control unit TecBox, Transero TVI Connect Heating



### Transero TVI.1 EH Connect

Precision pressure maintenance  $\pm 0,2$  bar. 1 pump. 1 spill valve and two motor driven valves for degassing and pressurisation. 1 spill valve for peak load pressurisation. 1 solenoid valve and 1 water meter for water make-up.

Type	B	H	T	m [kg]	Pel [kW]	dpu [bar]	SPL [dB(A)]	EAN	Article No
TVI 19.1 EH	570	1086	601	85	2,6	6,5-15,5	~60*	7640161636767	301032-80600
TVI 25.1 EH	570	1258	601	94	3,4	10,5-20,5	~60*	7640161636712	301032-80700



### Transero TVI.2 EH Connect

Precision pressure maintenance  $\pm 0,2$  bar. 2 pumps. 1 spill valve and two motor driven valves for degassing and pressurisation. 1 spill valve for peak load pressurisation. 1 solenoid valve and 1 water meter for water make-up.

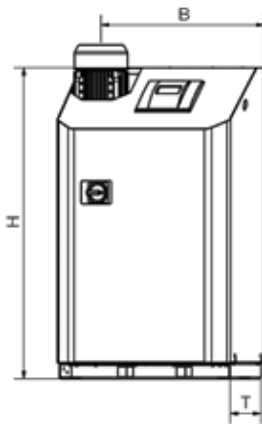
Type	B	H	T	m [kg]	Pel [kW]	dpu [bar]	SPL [dB(A)]	EAN	Article No
TVI 19.2 EH	751	1086	601	132	5,2	6,5-15,5	~60*	7640161636927	301032-90600
TVI 25.2 EH	751	1258	601	150	6,8	10,5-20,5	~60*	7640161636729	301032-90700

T = Depth of the device

dpu = Working pressure range

\*) Pump operation

## Control unit TecBox, Transero TVI Connect Cooling



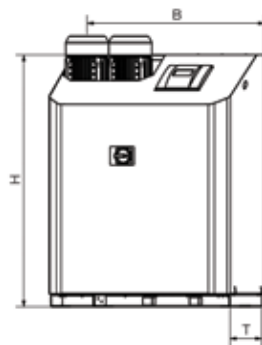
### Transero TVI.1 EHC Connect

Precision pressure maintenance  $\pm 0,2$  bar. 1 pump. 1 spill valve and two motor driven valves for degassing and pressurisation. 1 spill valve for peak load pressurisation.

1 solenoid valve and 1 water meter for water make-up.

Cooling insulation with condensation water protection.

Type	B	H	T	m [kg]	Pel [kW]	dpu [bar]	SPL [dB(A)]	EAN	Article No
TVI 19.1 EHC	570	1086	601	87	2,6	6,5-15,5	~60*	7640161636736	301033-00600
TVI 25.1 EHC	570	1258	601	96	3,4	10,5-20,5	~60*	7640161636743	301033-00700



### Transero TVI.2 EHC Connect

Precision pressure maintenance  $\pm 0,2$  bar. 2 pumps. 1 spill valve and two motor driven valves for degassing and pressurisation. 1 spill valve for peak load pressurisation.

1 solenoid valve and 1 water meter for water make-up.

Cooling insulation with condensation water protection.

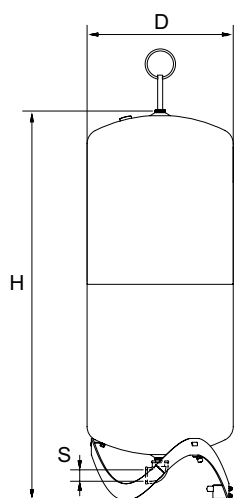
Type	B	H	T	m [kg]	Pel [kW]	dpu [bar]	SPL [dB(A)]	EAN	Article No
TVI 19.2 EHC	751	1086	601	135	5,2	6,5-15,5	~60*	7640161636750	301033-10600
TVI 25.2 EHC	751	1258	601	153	6,8	10,5-20,5	~60*	7640161636934	301033-10700

T = Depth of the device

dpu = Working pressure range

\*) Pump operation

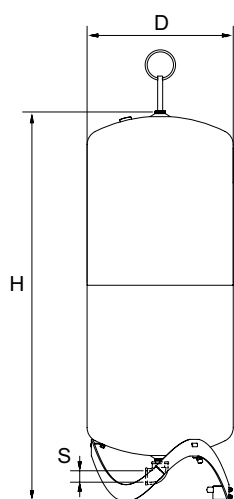
## Expansion vessels, Transfero TU/TU...E



### Transfero TU

Primary vessel. Measuring foot for content measurement. Including assembly kit for the water-side connection.

Type	VN [l]	D	H	H***	m [kg]	S	EAN	Article No
<b>2 bar (PS)</b>								
TU 200	200	500	1339	1565	36	Rp 1 1/4	7640148631594	713 1000
TU 300	300	560	1469	1690	41	Rp 1 1/4	7640148631600	713 1001
TU 400	400	620	1532	1760	58	Rp 1 1/4	7640148631617	713 1002
TU 500	500	680	1627	1858	68	Rp 1 1/4	7640148631624	713 1003
TU 600	600	740	1638	1873	78	Rp 1 1/4	7640148631631	713 1004
TU 800	800	740	2132	2360	99	Rp 1 1/4	7640148631648	713 1005



### Transfero TU...E

Secondary vessel.

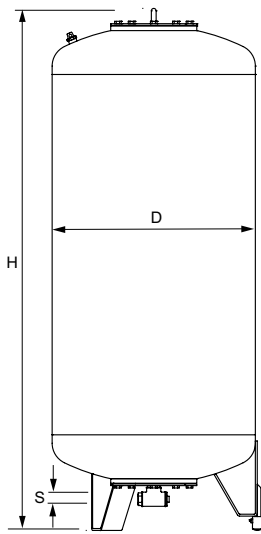
Including assembly kit for the water-side connection, flexible hose and lock shield valve with ball valve for fast draining.

Type	VN [l]	D	H	H***	m [kg]	S	EAN	Article No
<b>2 bar (PS)</b>								
TU 200 E	200	500	1339	1565	35	Rp 1 1/4	7640148631655	713 2000
TU 300 E	300	560	1469	1690	40	Rp 1 1/4	7640148631662	713 2001
TU 400 E	400	620	1532	1760	57	Rp 1 1/4	7640148631679	713 2002
TU 500 E	500	680	1627	1868	67	Rp 1 1/4	7640148631686	713 2003
TU 600 E	600	740	1638	1873	75	Rp 1 1/4	7640148631693	713 2004
TU 800 E	800	740	2132	2360	98	Rp 1 1/4	7640148631709	713 2005

VN = Nominal volume

\*\*\*) Max. height when vessel is tilted

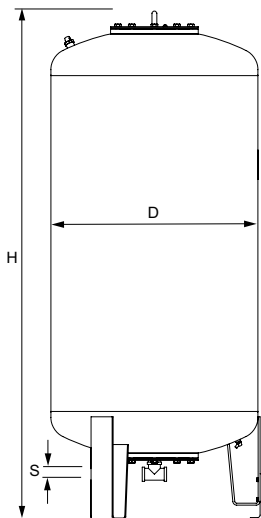
## Expansion vessels, Transfero TG/TG...E



### Transfero TG

Primary vessel. Measuring foot for content measurement. Including assembly kit for the water-side connection.

Type *	VN [l]	D	H	H***	m [kg]	S	EAN	Article No
<b>2 bar (PS)</b>								
TG 1000	1000	850	2199	2210	280	Rp 1 1/4	7640148631716	713 1006
TG 1500	1500	1016	2351	2381	360	Rp 1 1/4	7640148631723	713 1007
TG 2000	2000	1016	2848	2876	640	Rp 1 1/4	7640148631730	713 1012
TG 3000	3000	1300	2951	3016	800	Rp 1 1/4	7640148631747	713 1009
TG 4000	4000	1300	3592	3633	910	Rp 1 1/4	7640148631754	713 1010
TG 5000	5000	1300	4216	4275	1010	Rp 1 1/4	7640148631761	713 1011



### Transfero TG...E

Secondary vessel.

Including flexible hose for the water-side connection and lock shield valve with ball valve for fast draining.

Type *	VN [l]	D	H	H***	m [kg]	S	Sw	EAN	Article No
<b>2 bar (PS)</b>									
TG 1000 E	1000	850	2199	2210	280	Rp 1 1/4	G3/4	7640148631778	713 2006
TG 1500 E	1500	1016	2351	2381	360	Rp 1 1/4	G3/4	7640148631785	713 2007
TG 2000 E	2000	1016	2848	2876	640	Rp 1 1/4	G3/4	7640148631792	713 2012
TG 3000 E	3000	1300	2951	3016	800	Rp 1 1/4	G3/4	7640148631808	713 2009
TG 4000 E	4000	1300	3592	3633	910	Rp 1 1/4	G3/4	7640148631815	713 2010
TG 5000 E	5000	1300	4216	4275	1010	Rp 1 1/4	G3/4	7640148631822	713 2011

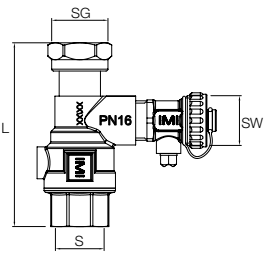
VN = Nominal volume

SW = Draining

\*) Special vessel upon request.

\*\*\*) Max. height when vessel is tilted. Tolerance 0 /-100.

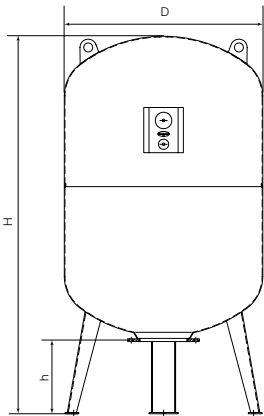
Lock shield valve for buffer vessel



Lock shield valve DLV									
Female thread on both sides, flat sealing union for direct connection to all suitable expansion vessels.									
Type	PS [bar]	L	m [kg]	S	SG	SW	EAN	Article No	
DLV 25	16	100	0,54	Rp1	G1	G3/4	7640148638586	535 1436	

\* for PS 25 applications use the IMI TA-BAV range for shut-off and drain valves.

Buffer Vessel

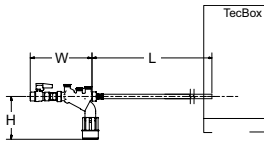


Statico SH								
Cylindrical shape								
Type	VN [l]	p0 [bar]	D	H	m [kg]	S	EAN	Article No
25 bar (PS), 100°C (TS)								
SH 150.25	150	4	500	1070	71	R1 1/4	7640161636989	301012-01300
SH 300.25	300	4	640	1323	126	R1 1/4	7640161637160	301012-01600

VN = Nominal volume  
\*\*) Tolerance 0 /+35



## Pleno P water make-up modules



### Pleno P BA4 R

Hydraulic unit for water make-up operation with Vento/Transféro Connect, Pleno PX/PIX, Simply Compresso C 2.1-80 SWM, and in combination with Pleno Refill modules. Features a shut off valve, check valve, filter and a type BA backflow preventer (protection class 4) according to EN 1717. Connection (SWM): G1/2

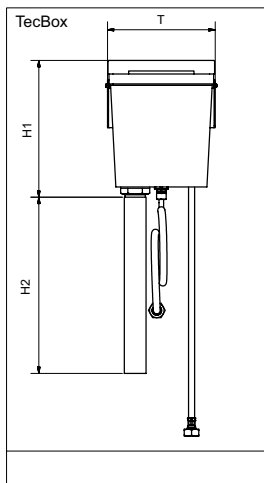
Type	PS [bar]	B	L	H	m [kg]	qwm [l/h]	EAN	Article No
BA4 R	10	210	1300	135	1,1	350* 250** 50*** q(pw-pout) ****	7640161630147	813 3310

\* maximum average value for make-up water degassing with Vento V/VI and Transféro TV/TVI

\*\* maximum average value for make-up water degassing with Vento Compact

\*\*\* when using flow limiter for operation with low flow water treatment cartridges

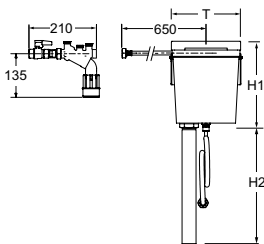
\*\*\*\* for combination with Pleno PX/PIX see q(pw-pout) diagram in Pleno Connect datasheet



### Pleno P AB5

Hydraulic unit for water make up operation with Vento/Transféro Connect. Consists of a breaktank type AB (protection class 5) according to EN 1717. For installation on the back of each unit. Can be used for 3rd party softening modules which do not fulfil the requirement of qwm min 1300 l/h and therefore cannot be directly connected.

Type	PS [bar]	T	H1	H2	m [kg]	qwm [l/h]	EAN	Article No
AB5	10	220	280	1000	1,83	200	7640161630154	813 3320



### Pleno P AB5 R

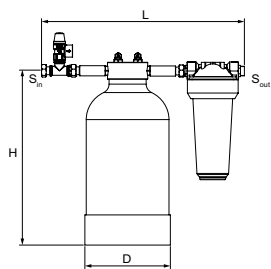
Hydraulic unit for water make up operation with Vento/Transféro Connect. Consists of Pleno P BA4 R back flow preventer and Pleno P AB5 modules, with protection class 5 according to EN 1717.

Type	PS [bar]	T	H1	H2	m [kg]	qwm [l/h]	EAN	Article No
AB5 R	10	220	280	1000	3,8	200	7640161630161	813 3330

qwm = make-up water flow

T = Depth of the device

## Pleno Refill



### Pleno Refill

Hydraulic unit for water softening together with Vento/Transero Connect TecBoxes. Filter with 25 µm mesh size to protect the hydronic system. Softening bottle filled with high grade resin.

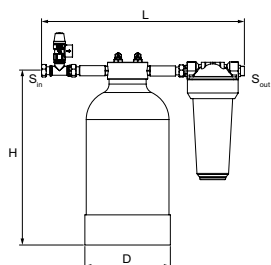
3/4" swivelling nut, 3/4" external thread suitable for flat gasket.

Nominal pressure: PS 8

Max. working temperature: 45°C

Min. working temperature: > 4°C

Type	Capacity l x °dH	S <sub>in</sub>	S <sub>out</sub>	D	H	L	m [kg]	EAN	Article No
Refill 16000	16000	G3/4	G3/4	195	383	455	9,1	7640161630475	813 3210
Refill 36000	36000	G3/4	G3/4	220	466	455	13	7640161630482	813 3220
Refill 48000	48000	G3/4	G3/4	270	458	455	16,2	7640161630499	813 3230



### Pleno Refill Demin

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

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

Nominal pressure: PS 8

Max. working temperature: 45°C

Min. working temperature: > 4°C

Type	Capacity l x °dH	S <sub>in</sub>	S <sub>out</sub>	D	H	L	m [kg]	EAN	Article No
Refill Demin 13500	13500	G3/4	G3/4	220	466	455	13	7640161630505	813 3260
Refill Demin 18000	18000	G3/4	G3/4	270	458	455	16,2	7640161630512	813 3270

### Additional information:

**System design:** Datasheet *Planning and calculation*.

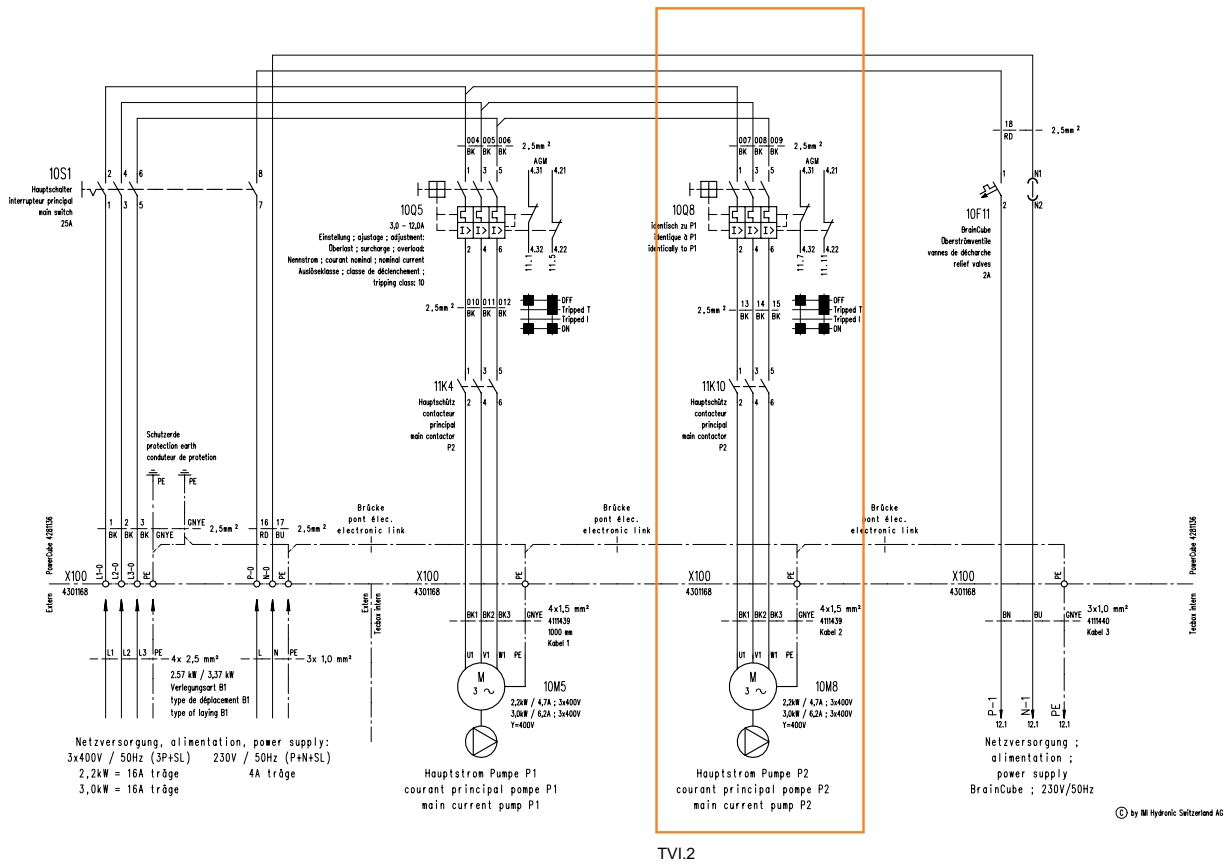
**Calculation:** Software HySelect

**Abbreviations and terminology:** Datasheet *Planning and calculation*.

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

## Wiring diagrams

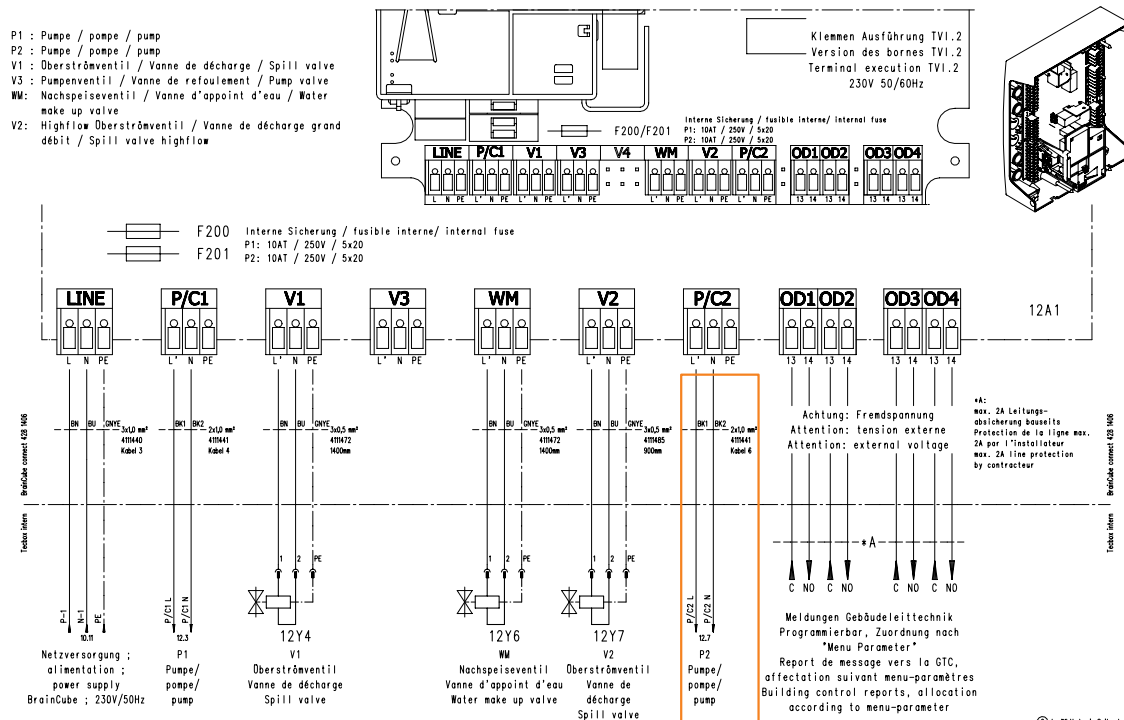
### Power supply Transfervo TVI at PowerCube PCI



TVI.2

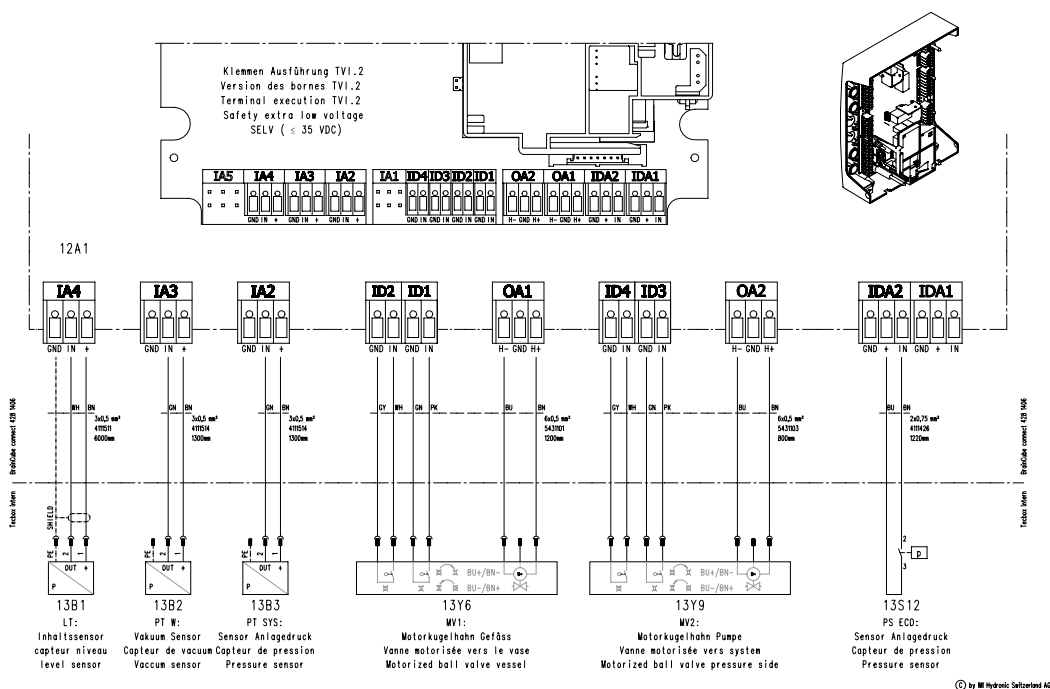
### 230V Section of the BrainCube

- P1: Pumpe / pompe / pump  
P2: Pumpe / pompe / pump  
V1: Überströmventil / Vanne de décharge / Spill valve  
V3: Pumpenventil / Vanne de refoulement / Pump valve  
WM: Nachspeiseventil / Vanne d'appoint d'eau / Water make up valve  
V2: Highflow Überströmventil / Vanne de décharge grand débit / Spill valve highflow

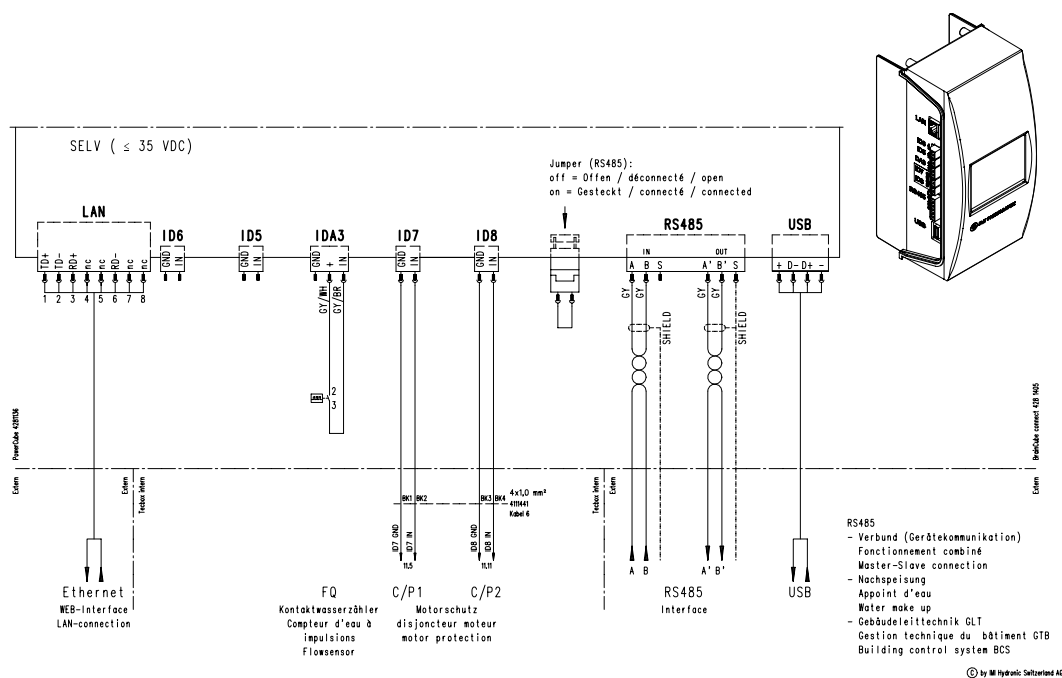


TVI.2

## Safety Extra Low Voltage connections at the BrainCube



## Communication



The products, texts, photographs, graphics and diagrams in this document may be subject to alteration by IMI Hydronic Engineering without prior notice or reasons being given. For the most up to date information about our products and specifications, please visit [www.imi-hydronic.com](http://www.imi-hydronic.com).