

# Simply Compresso



## **Pressure maintenance systems with compressors**

For heating systems up to 400 kW  
and cooling systems up to 600 kW

*Engineering  
GREAT Solutions*

# Simply Compresso

Simply Compresso is a precision pressurisation system with a compressor and integrated expansion vessels for heating, solar and chilled water systems. Especially suitable in situations where extreme compactness, plug&play installation and full pressure control are required. Simply Compresso is the latest addition to the Compresso Connect series intended for 3 bar safety valve installations up to 400 kW in heating capacity. The **BrainCube Connect** control panel ensures 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

- > **Improved design for easier and more comfortable operation**  
Resistant 3.5" TFT illuminated colour touch display. Intuitive and user friendly menu. Web based interface with remote control and live view. BrainCube Connect control panel integrated into TecBox.
- > **State-of-the-Art Connectivity**  
Standard connections (RS485, Ethernet, USB) available to BMS and remote devices, saving time during commissioning and maintenance and allowing for control of the unit.
- > **Plug & Play installation and start-up**  
Getting the Simply Compresso up and running only takes three easy steps.
- > **Pressure maintenance with ECO-night mode**  
Keeping compressor runtime to the absolute minimum.

## Technical description – Control unit TecBox

### Applications:

Heating, solar and chilled water systems. For systems according to EN 12828, SWKI 93-1, solar systems according to EN 12976, ENV 12977 with on-site excess temperature protection in case of power blackout.

### Pressure:

Min. admissible pressure, PSmin: 0 bar  
Max. admissible pressure, PS: 3 bar

### Temperature:

Max. admissible temperature, TS: 70°C  
Min. admissible temperature, TSmin: 5°C

### Ambient temperature:

Max. admissible ambient temperature, TA: 40°C  
Min. admissible ambient temperature, Tamin: 5°C

### Accuracy:

Precision pressure maintenance  $\pm 0,1$  bar.

### Supply voltage:

1 x 230V (-6% + 10%) / 50/60 Hz

### Electric load:

See Articles.

### Enclosure class:

IP 22 according to EN 60529

### Sound pressure level:

59 dB(A) /1bar

### Material:

Main materials include steel, brass, and bronze.

### Transportation and storage:

In frostless, dry places.

### Approvals:

CE-tested according to the requirements of European Directives 2004/108/EC and 2006/95/EC.

### Expansion vessel

Primary vessel included in TecBox. For more information see Technical description - Expansion vessels.

## Technical description – Expansion vessels

### Applications:

Primary vessel is part of the Control unit TecBox. Optional extension vessel only with Control unit TecBox. See Applications under Technical description - Control unit TecBox.

### Media:

Non-aggressive and non-toxic system media.  
Addition of antifreeze agent up to 50%.

### Pressure:

Min. admissible pressure, PSmin: 0 bar  
Max. admissible pressure, PS: 9 bar

### Temperature:

Max. admissible bag temperature, TB: 70°C  
Min. admissible bag temperature, TBmin: 5°C

*For PED purposes:*

Max. admissible temperature, TS: 120°C  
Min. admissible temperature, TSmin: -10°C

### Material:

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

### Transportation and storage:

In frostless, dry places.

### Approvals:

CE design-tested according to PED/DEP 2014/68/EU.

### Warranty:

Compresso CD, CD...E: 5-year warranty for the vessel.

## Function, Equipment, Features

### Plug & Play installation and start-up

Thanks to an integrated primary expansion vessel featuring a pre-calibrated level sensor, the improved start-up procedure is as easy as follows:

- Connect unit to the installation
- Plug in power supply
- Follow the instructions displayed on the BrainCube

### Control unit BrainCube Connect

- Intelligent, fully automatic, and safe system operation. Self-optimisation with memory function.
- Resistive 3.5" TFT illuminated colour touch display. User-friendly, operation-oriented, multilingual interface with slide and tap navigation, step-by-step start up guide, and direct help in pop-up windows. Plain text and/or graphic representation of all relevant parameters and status information.
- Data logging and system analysis, chronological message memory with prioritisation, remote control with live view, automatic self test.
- Primary vessel ready assembled and integrated as part of the control unit.

### Water make-up (Simply Compresso C 2.1 SWM)

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

### Pressure maintenance

- Precision pressure maintenance  $\pm 0.1$  bar
- ECO-night mode with programmable timer to help keep compressor runtime to the absolute minimum by using the available hysteresis between the maximum initial and the final system pressure at night. Before reaching the "night time" the system pressure will be adjusted to the max. value.
- Silent-run compressor

### Expansion vessels

- Airproof butyl bag.
- Including assembly kit for the air-side connection of the vessels and lock shield valve for the water-side connection with ball valve for fast draining (CD...E).
- Condensate drain at the bottom.
- Ready assembled as part of the TecBox (primary vessel CD).

## Calculation

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

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		<b>Vs = vs · Q</b>	vs	Specific water capacity, table 4.
			Vs= Known		System design, content calculation
				Q	Installed heat capacity
<b>Ve</b>	Expansion volume	EN 12828	<b>Ve = e · Vs</b>	e	Expansion coefficient for $ts_{max}$ , table 1
	heating:	SWKI 93-1	<b>Ve = e · Vs · X<sup>1)</sup></b>	e	Expansion coefficient for $(ts_{max} + tr)/2$ , table 1
	cooling:	SWKI 93-1	<b>Ve = e · Vs + Vwr</b>	e	Expansion coefficient for $ts_{max}$ , table 1
<b>Vwr</b>	Water reserve	EN 12828	<b>Vwr ≥ 0,005 · Vs ≥ 3 L</b>		
	heating:	SWKI 93-1	<b>Vwr is considered in Ve with the coefficient X</b>		
	cooling:	SWKI 93-1	<b>Vwr ≥ 0,005 · Vs ≥ 3 L</b>		
<b>p0</b>	Minimum pressure <sup>2)</sup>		<b>p0 = Hst/10 + 0,3 bar ≥ pz</b>	Hst	Static height
	Lower limit value for pressure maintenance			pz	Minimum required equipment pressure e.g. NPSH requirement for pumps or boilers
<b>pa</b>	Initial pressure		<b>pa ≥ p0 + 0,3 bar</b>		
	Lower threshold for optimum pressure maintenance				

#### Compresso

<b>pe</b>	Final pressure		<b>pe=pa+0,2</b>		
	Upper threshold for optimum pressure maintenance	EN 12828	<b>pe ≤ psvs - dpsvs<sub>c</sub></b>	psvs	Response pressure safety valve system
		SWKI 93-1	<b>pe ≤ psvs/1,3</b>	dpsvs <sub>c</sub>	Closing pressure tolerance of the safety valve
				dpsvs <sub>c</sub>	= 0,5 bar for psvs ≤ 5 bar <sup>4)</sup>
				dpsvs <sub>c</sub>	= 0,1 · PSV for psvs > 5 bar <sup>4)</sup>
<b>VN</b>	Nominal volume of the expansion vessel <sup>5)</sup>	EN 12828	<b>VN ≥ (Ve + Vwr + 2<sup>3)</sup>) · 1,1</b>		
		SWKI 93-1	<b>VN ≥ (Ve + 2<sup>3)</sup>) · 1,1</b>		

Our HySelect calculation software is based on an advanced calculation method and data base, therefore results may vary.

1) Q ≤ 30 kW: X = 3 | 30 kW < Q ≤ 150 kW: X = 2 | Q > 150 kW: X = 1,5

2) The formula for the 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.

3) Add 2 litres when a Vento is installed in the system.

4) The safety valves must operate within these limits.

5) Please select a vessel which has an equal or higher nominal content.

\*) SWKI 93-1: Applicable to Switzerland only

**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

## Temperatures

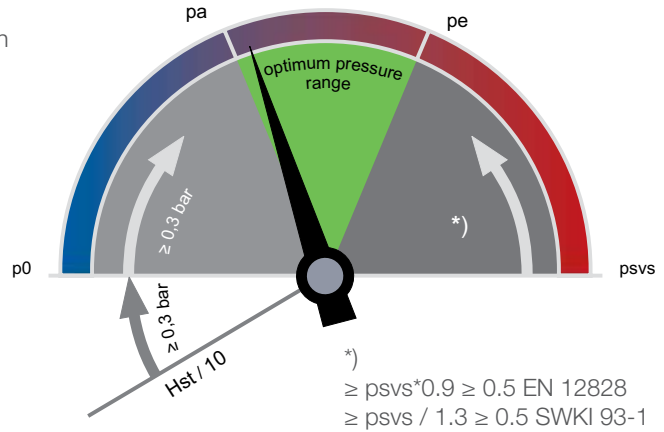
<b>ts<sub>max</sub></b>	<b>Maximum system temperature</b> Maximum temperature for the calculation of the volume expansion. For heating systems the dimensioned flow temperature at which a heating system is to be operated with the lowest outside temperature to be assumed (standard outside temperature according 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**

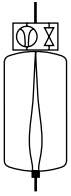
Air controlled Compresso minimize the pressure variations between  $p_a$  and  $p_e$ .  
 $\pm 0,1 \text{ bar}$

**ECO-night operation**

Special mode for pressure maintenance to keep compressor runtime to the absolute minimum by using the available hysteresis between maximum initial and final system pressure  
 $p_{a_{\min}} < p < p_{e_{\max}}$



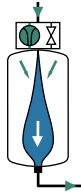
**p0 Minimum pressure**



**Compresso**

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

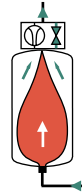
**pa Initial pressure**



**Compresso**

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

**pe Final pressure**



**Compresso**

If system pressure is  $> p_e$  the air relief valve opens.  
 $p_e = p_a + 0,2$

**Standard DNe value for expansion pipes with Simply Compresso: DN 20.**  
**In Switzerland, for systems above 300 kW, DN 25 is used.**

## Quick selection

Heating systems TAZ ≤ 100°C, without addition of antifreeze

Q [kW]	Static height Hst / m	TecBox and extension vessel			
		Radiators		Flat radiators	
		90   70	70   50	90   70	70   50
Nominal volume VN [liter]					
<b>EN12828</b>					
< 100	17	C 2.1-80	C 2.1-80	C 2.1-80	C 2.1-80
150	17	C 2.1-80 + CD 80E	C 2.1-80 + CD 80E	C 2.1-80	C 2.1-80
200	17	C 2.1-80 + CD 80E	C 2.1-80 + CD 80E	C 2.1-80	C 2.1-80
250	17	C 2.1-80 + CD 80E	C 2.1-80 + CD 80E	C 2.1-80 + CD 80E	C 2.1-80 + CD 80E
300	17	-	-	C 2.1-80 + CD 80E	C 2.1-80 + CD 80E
350	17	-	-	C 2.1-80 + CD 80E	C 2.1-80 + CD 80E
400	15.6	-	-	C 2.1-80 + CD 80E	C 2.1-80 + CD 80E
<b>SWKI 93-1</b>					
< 100	17	C 2.1-80 + CD 80E	C 2.1-80 + CD 80E	C 2.1-80	C 2.1-80
150	17	C 2.1-80 + CD 80E	C 2.1-80 + CD 80E	C 2.1-80	C 2.1-80
200	17	C 2.1-80 + CD 80E	C 2.1-80 + CD 80E	C 2.1-80 + CD 80E	C 2.1-80 + CD 80E
250	17	-	-	C 2.1-80 + CD 80E	C 2.1-80 + CD 80E
300	17	-	-	C 2.1-80 + CD 80E	C 2.1-80 + CD 80E
350	17	-	-	-	C 2.1-80 + CD 80E
400	15.6	-	-	-	-

### Examples

#### Example EN 12828

Q = 200 kW  
Flat radiators 70 | 50 °C  
Hst = 15 m  
psvs = 3.0 bar

*Selected:*

TecBox C 2.1-80 S  
Extension vessel: not necessary

*Check safety valve psvs:*

for TAZ = 100 °C  
EN 12828: psvs:  $15/10 + 0.8 + 0.5 = 2.8 \leq 3.0$  o.k.

#### Example SWKI 93-1

Q = 200 kW  
Flat radiators 70 | 50 °C  
Hst = 15 m  
psvs = 3.0 bar

*Selected:*

TecBox C 2.1-80 S  
Extension vessel: CD 80 E

*Check safety valve psvs:*

for TAZ = 100 °C  
SWKI 93-1: psvs:  $(15/10 + 0.8) * 1.3 = 2.99 \leq 3.0$  o.k.

## Equipment

### Expansion pipes

According to table 5.

### Lock shield valve DLV

Included with delivery.

### Zeparo

Air vent Zeparo ZUT or ZUP at each high point for venting while filling and/or draining. Separator for dirt and magnetite in each system in the main return to the heat generator. If no central degassing (Vento V Connect) is installed a microbubble separator can be added in the main flow, before the circulation pump where possible.

The static height (Hst<sub>m</sub> per the following table) above the microbubble separators must not be exceeded.

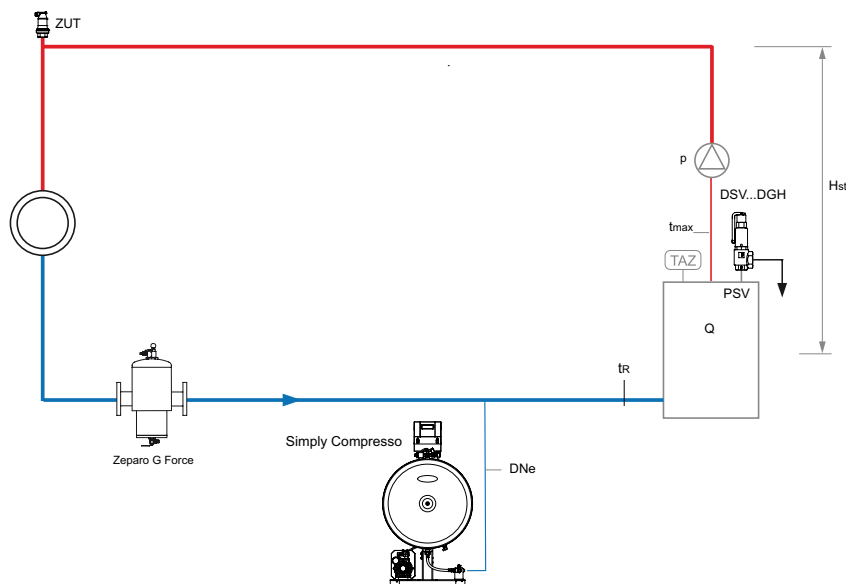
ts <sub>max</sub>   °C	90	80	70	60	50	40	30	20	10
Hst <sub>m</sub>   mWs	15,0	13,4	11,7	10,0	8,4	6,7	5,0	3,3	1,7

## Application examples

### Simply Compresso C 2.1-80 S

TecBox with one compressor and primary vessel, precision pressure maintenance  $\pm 0,1$  bar.

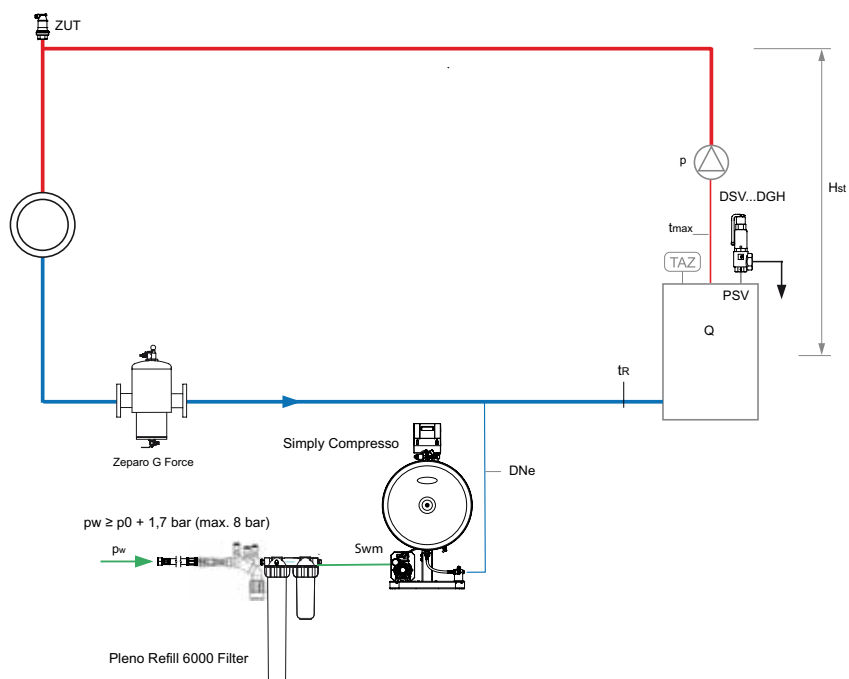
#### For heating systems without water make-up



### Simply Compresso C 2.1-80 SWM

TecBox with one compressor and primary vessel, precision pressure maintenance  $\pm 0,1$  bar, Pleno P BA4R for water make-up and Pleno Refill for water treatment.

#### For heating systems with water make-up



1. Simply Compresso C 2.1-80 SWM

2. Water make-up connection,  $p_w \geq p_0 + 1,7$  bar (max. 10 bar)

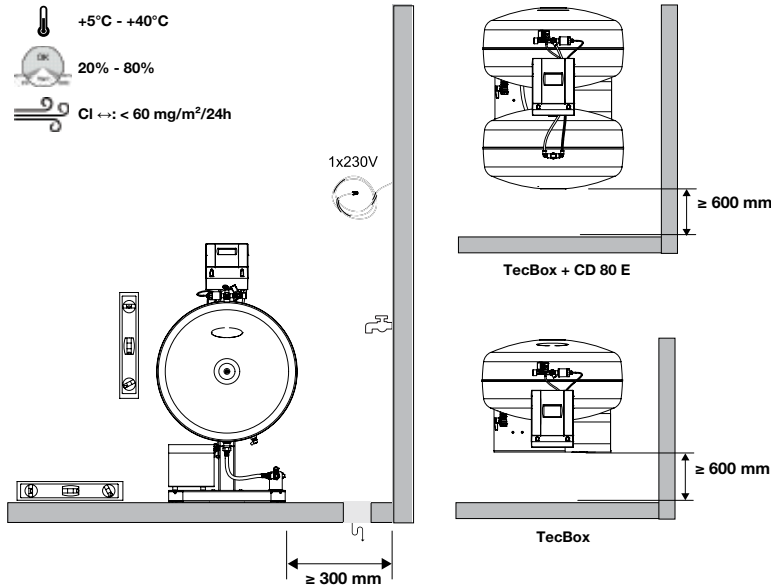
**Zeparo G-Force** cyclonic dirt separator with magnet ZGM in the return.

**Zeparo ZUT** for automatic venting while filling and/or draining.

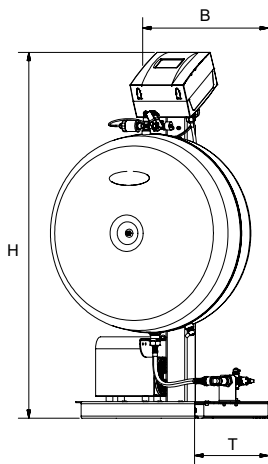
**Further accessories, product and selection details, see:** Datasheet *Pleno*, *Zeparo* and *Accessories*.



## Installation



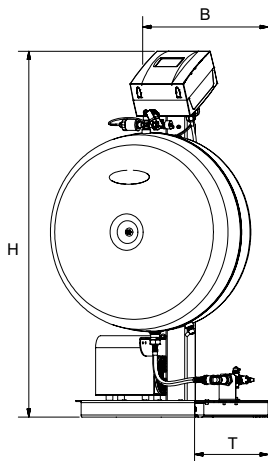
## Control unit TecBox, Simply Compresso C 2.1-80



### Simply Compresso C 2.1-80 S

Precision pressure maintenance  $\pm 0.1$  bar, ECO-night functionality.  
 1 compressor, 1 spill valve, 1 primary vessel.

Type	PS [bar]	VN [l]	B	H	T	m [kg]	Pel [kW]	EAN	Article No
C 2.1-80 S	3	80	603	1107	481	39	0,3	7640153570970	30102141001



### Simply Compresso C 2.1-80 SWM

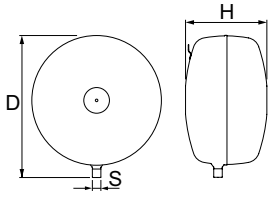
Precision pressure maintenance  $\pm 0.1$  bar, ECO-night functionality.  
 1 compressor, 1 spill valve, 1 primary vessel.

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

Type	PS [bar]	VN [l]	B	H	T	m [kg]	Pel [kW]	EAN	Article No
C 2.1-80 SWM	3	80	603	1107	481	41	0,3	7640161637443	30102141002

VN = Nominal volume

## Extension vessels



### Compresso CD...E

Secondary vessel. Including flex tube for the water-side with Simply Compresso TecBox, assembly kit for the air-side connection with Simply Compresso TecBox.

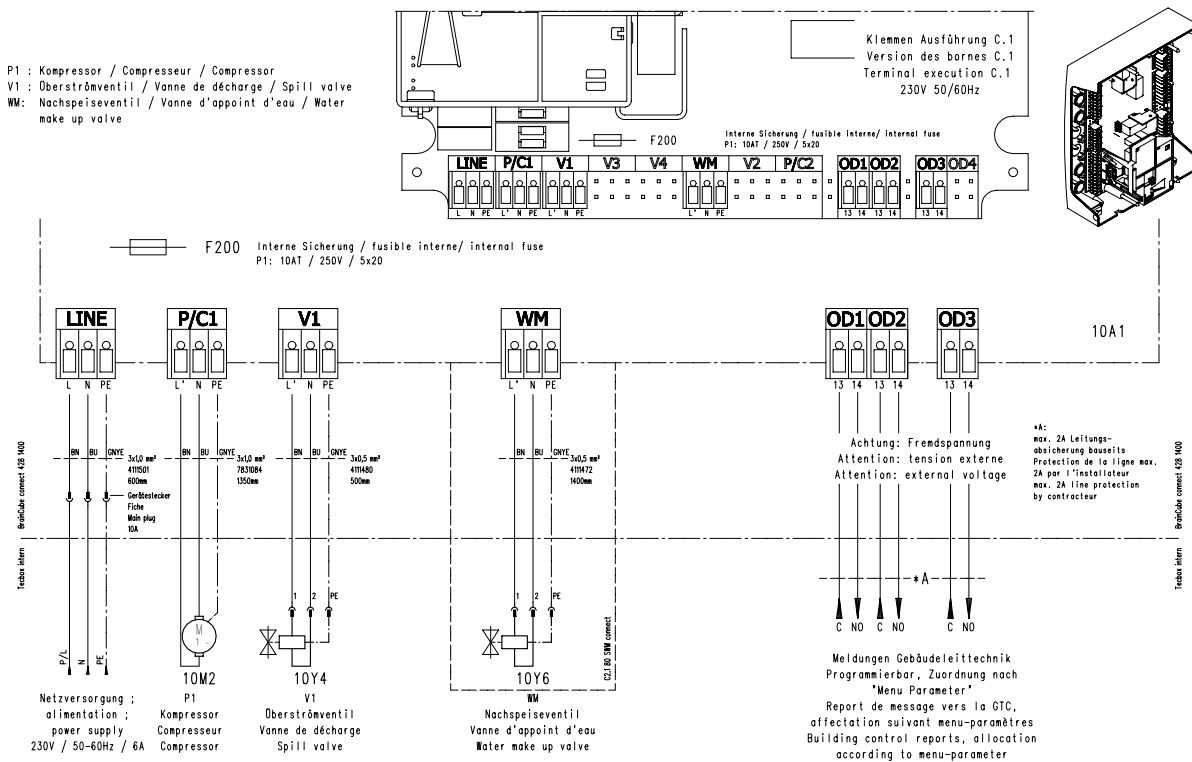
Type	VN [l]	D	H	m [kg]	S	EAN	Article No
<b>6 bar (PS)</b>							
CD 80.9 E	80	636	346 **)	16	R3/4	30102141103	30102141003

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

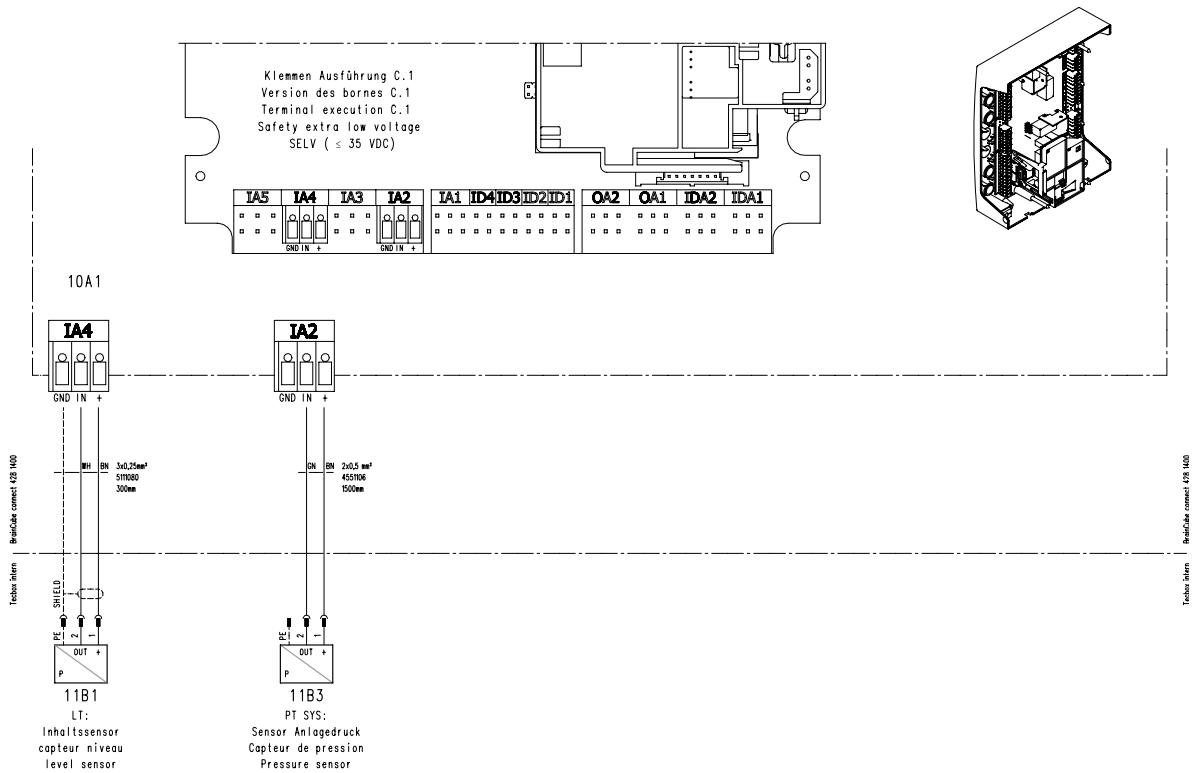
## Wiring diagrams

230 V / 50/60 Hz

### Power Supply Compresso C.1



## Safety Extra Low Voltage connections



## Communication

