

dal 1968



SCAMBIATORI - BOLLITORI - SERBATOI

**VT-G / VT-Z / VT-X / VTS / VTP**

**Chilled water buffer vessels**



***USER AND MAINTENANCE  
MANUAL***

Chilled water buffer vessels  
**VT-G / VT-Z / VT-X / VTS / VTP**



	Open buffer vessels VT-G / VT-Z / VT-X	Buffer vessels with perforated central divider plate / multiple flow dividers VT-S / VT-P
<b>Vessel material</b>	<ul style="list-style-type: none"> <li>• VT-G / VT-Z → Mild carbon steel</li> <li>• VT-X → Stainless steel 316</li> </ul>	VTS / VTP → Mild carbon steel
<b>Inside coating</b>	<ul style="list-style-type: none"> <li>• VT-G → None</li> <li>• VT-Z → Dip hot galvanizing</li> <li>• VT-X → Pickling</li> </ul>	VTS / VTP → None
<b>Outside coating</b>	<ul style="list-style-type: none"> <li>• VT-G → Anti rust primer</li> <li>• VT-Z → Dip hot galvanizing</li> <li>• VT-X → Pickling</li> </ul>	VTS / VTP → Anti rust primer

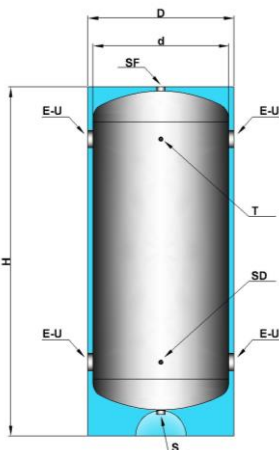
Characteristics	STANDARD SUPPLY	UPON REQUEST
Capacity	100 ÷ 5000 litre	> 5000 litre
Version	Vertical	Horizontal <sup>(1)</sup>
Connections	Threaded type	Flanged type
<b>Insulation</b>	<b>VERTICAL version</b>	
	<ul style="list-style-type: none"> <li>• VT-G / VT-Z:                             <ul style="list-style-type: none"> <li>▪ 30 mm hard foam PU → 100÷1000 l</li> <li>▪ 20 mm closed cell elastomer → 1500÷5000 l</li> </ul> </li> <li>• VT-S / VT-P / VT-X:                             <ul style="list-style-type: none"> <li>▪ 20 mm closed cell elastomer → 300÷5000 l</li> </ul> </li> </ul>	
	<b>HORIZONTAL version and OUT OF STANDARD</b>	
	<ul style="list-style-type: none"> <li>• VT-G / VT-Z / VT-X:                             <ul style="list-style-type: none"> <li>▪ 20 mm closed cell elastomer → 100÷5000 l</li> </ul> </li> </ul>	
Cladding	<ul style="list-style-type: none"> <li>▪ Coloured PVC with zipper fastening</li> <li>▪ Embossed aluminium 0.4 mm</li> </ul>	

VESSELS STANDARD WORKING CONDITIONS <sup>(3)</sup>			
Model	Max temperature	Max pressure	
<b>Mild steel vessels</b>	-10°C/+50°C	≤ 1000 l	8 bar
		≥ 1500 l	6 bar
<b>Stainless steel vessels</b>	-10°C/+50°C	≤ 300 l	10 bar
		500÷2500 l	8 bar
		≥ 3000 l	6 bar

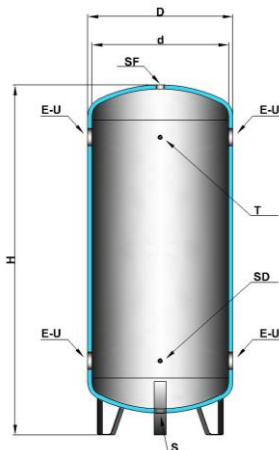
- Connections**  
 E-U Inlet / Outlet  
 T Thermometer  
 SD Sensor  
 SF Vent  
 S Drain

**Dimensions**

**VERTICAL OPEN BUFFER VESSELS**

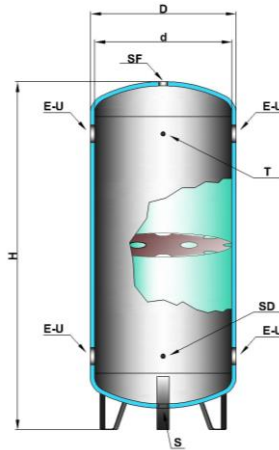


**VT-G / VT-Z / VT-X**  
 30 mm hard foam PU insulation  
 100÷1000 l



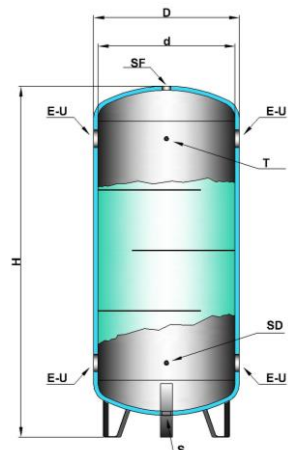
**VT-G / VT-Z / VT-X**  
 20 mm closed cell elastomer insulation  
 1500÷5000 l

**VERTICAL BUFFER VESSELS WITH PERFORATED CENTRAL DIVIDER PLATE**



**VT-S**  
 20 mm closed cell elastomer insulation  
 300÷2000 l

**VERTICAL BUFFER VESSELS WITH MULTIPLE FLOW DIVIDERS**

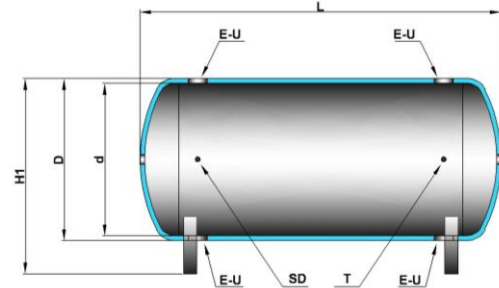


**VT-P**  
 20 mm closed cell elastomer insulation  
 300÷2000 l

Mild steel vessels VT-G / VT-Z / VTS / VTP						
Capacity	Dimensions (±5%) *					
	D	d	H	L	H1	
Litre	mm	mm	mm	mm	mm	mm
100	460	400	1070	940	590	
200	510	450	1460	1340	640	
300	610	550	1500	1390	800	
500	710	650	1790	1690	890	
800	860	800	1870	1770	1040	
1000	860	800	2120	2020	1040	
1500	1000	950	2430	2290	1180	
2000	1150	1100	2480	2360	1330	
2500	1250	1200	2560	2430	1480	
3000	1300	1250	2760	2640	1540	
4000	1450	1400	2840	2730	1680	
5000	1650	1600	2930	2790	1870	

Stainless steel vessels VT-X						
Capacity	Dimensions (±5%) *					
	D	d	H	L	H1	
Litre	mm	mm	mm	mm	mm	mm
100	460	400	1090	940	610	
200	510	450	1480	1340	660	
300	610	550	1520	1390	800	
500	710	650	1810	1690	890	
800	860	800	1890	1790	1040	
1000	860	800	2140	2040	1040	
1500	1050	1000	2180	2050	1240	
2000	1250	1200	2250	2140	1430	
2500	1250	1200	2580	2450	1480	
3000	1300	1250	2780	2660	1540	
4000	1450	1400	2860	2750	1680	
5000	1650	1600	2950	2810	1870	

**HORIZONTAL OPEN BUFFER VESSELS**



**VT-G / VT-Z / VT-X**  
 20 mm closed cell elastomer insulation  
 100÷5000 l

\* Dimensions may change in case of bespoke solutions

CAPACITY	WEIGHT (*)	CONNECTIONS Ø		
		E-U	T / SD	SF / S
litres	kg	inches	inches	inches
100	25	1"¼	½"	1"¼
200	40	2"	½"	1"¼
300	50	2"½	½"	1"¼
500	70	3"	½"	1"¼
800	90	3"	½"	1"¼
1000	105	3"	½"	1"¼
1500	200	3"	½"	1"¼
2000	240	3"	½"	1"¼
2500	280	3"	½"	1"¼
3000	300	4"	½"	1"¼
4000	450	4"	½"	1"¼
5000	530	4"	½"	1"¼

(\*) Indicative value, valid only for transportation and handling purposes

### Description

The Pacetti VT series of chilled water vessels are utilised to store chilled water produced by an external chiller or chilled source. There are 5 models with 2 of the models fitted with flow dividers or a perforated plate to avoid flow paths. All models are provided as standard with threaded connections, but may be also equipped with flanged connections on request. These chilled vessels are available both in black carbon or galvanized steel and stainless steel. The black carbon steel tanks are used in case of indoor installation, therefore it is not required any kind of coating against corrosion. The galvanized steel tanks can be also used in case of outdoor installation, when it is necessary to ensure corrosion and weather protection. The stainless steel tanks are treated with pickling process and are suitable for indoor or outdoor installations. All models can be manufactured in vertical or horizontal arrangement.

### Protection coating against corrosion

#### HOT DIP GALVANIZING

This kind of coating is performed on carbon steel vessels by immersion of the tank in a molten zinc bath at 450°C according to UNI EN ISO 1461.

#### METAL PICKLING

It's a metal surface treatment used to remove impurities after manufacturing processes. The tank is dipped into a solution called pickle liquor which contains strong acids able to remove contaminants.

### Thermal insulation against condensation

#### HARD FOAM POLYURETHANE

##### Hard foam polyurethane injected

Made of hard foam polyurethane 30mm thick, density of 40 to 42 kg/m<sup>3</sup>, average conductivity of 0.024 W/mK. CFC and HCFC free.

##### Closed cell elastomer foam

Made of closed cell elastomer foam sheets 20mm thick, density of 30 kg/m<sup>3</sup>, average conductivity of 0.034 W/mK. CFC and HCFC free.

Insulation	Tank capacity	Density	Thermal conductivity coefficient
Hard foam polyurethane injected 30 mm	100 ÷ 1000 l	40÷42 kg/m <sup>3</sup>	λ = 0,024 W/mK
Closed-cell elastomer foam 20 mm	1500 ÷ 5000 l	30 kg/m <sup>3</sup>	λ = 0,034 W/mK

External cladding is available in coloured PVC with zipper fastening or embossed aluminium 0.4mm thick for outdoor installations.

### Operation

The Pacetti VT series of chilled water vessels are used in air conditioning and cooling systems when the water content of the plant is reduced. When installed between user and chillers, these tanks can limit frequent compressor starts and allow a regular functioning of the plant at a constant temperature, avoiding timer intervention.

### Models

The Pacetti VT series of chilled water vessels are available in different models:

- VT-G → Black carbon steel
- VT-Z → Galvanized steel
- VT-X → Stainless steel 316
- VTS → Black carbon steel with perforated central divider plate
- VTP → Black carbon steel with multiple flow dividers

### Conformity

The Pacetti VT series of chilled water vessels are made with automatic welding processes.

All manufacturing processes are guaranteed by the Quality Management System of the Company, certified to ISO 9001.

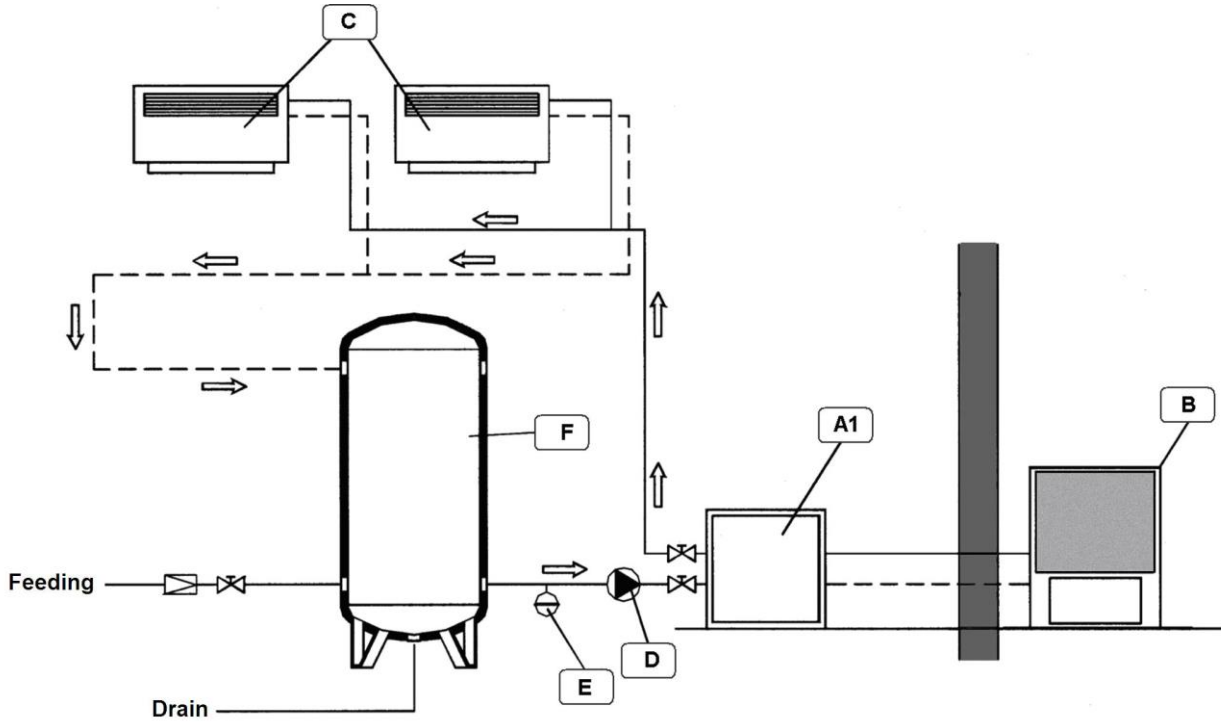
All Pacetti products are subject to hydraulic tests at 1.5 \* maximum working pressure and comply with the following standard:

**European Pressure Equipment Directive 97/23/CE – Art.3.3** (pressure vessels) - excluded from CE mark.

Chilled water buffer vessels  
**VT-G / VT-Z / VT-X / VTS / VTP**

**INSTALLATION EXAMPLE**

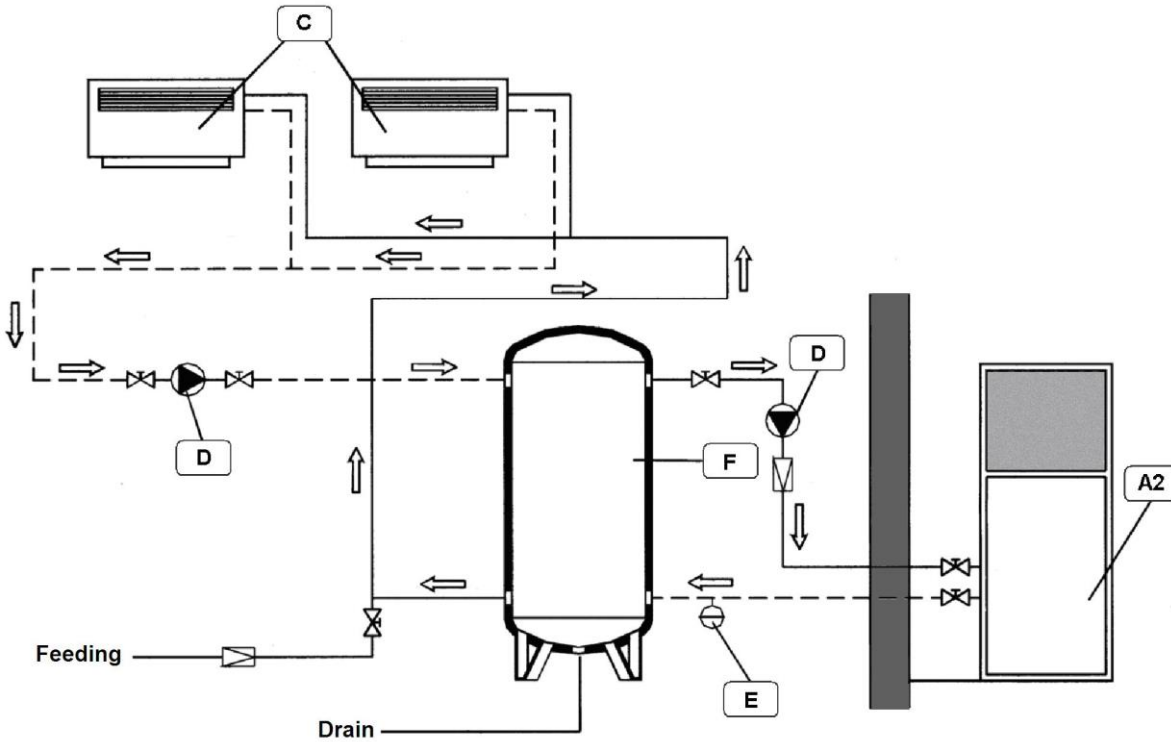
**Closed circuit plant with chilled water storage tank installed on return**



**Description**

- A1 Heat pump /air conditioner (split system)
- A2 Heat pump/air conditioner (monoblock)
- B External unit
- C Fan coil unit
- D Pump
- E Expansion vessel
- F Storage tank

**Installation in a double circuit plant**



## **WARNINGS**

This instruction manual is an essential part of the product and must be given to the final user.

Carefully read the suggestions contained in this manual, as they provide important information about installation, use and maintenance of the product.

Keep this manual for future reference.

The installation must be made in accordance with current regulations, according to the manufacturer's instructions and must be carried out by qualified personnel only, in order to keep warranty valid.

A wrong installation can cause damages to people, animals and things.

The manufacturer will not be responsible for any damage caused by a wrong installation.

The use of the product for purposes other than those specified in this manual is forbidden.

The manufacturer will not be responsible for any damage caused by misuse, incorrect or unreasonable use.

The packaging must be disposed according to local regulations.

Disconnect the unit from any power source before carrying out any assistance or maintenance operation.

In case of malfunction should shut off the unit and ask for the intervention of the installer.

## **1. INSTALLATION**

**THIS OPERATION MUST BE MADE SOLELY BY QUALIFIED PERSONNEL, PENALTY THE LOSS OF WARRANTY.**

### **1.1. FIRST CHECK**

This vessel has been designed, manufactured and tested for the storage of chilled water within the limits of temperature and pressure indicated above and on the id label applied on the product itself. Any use beyond the allowed limits should be considered dangerous and not suitable.

### **1.2. PLACEMENT**

- install the vessel as close as possible to the primary source
- install the vessel on a flat surface of suitable strength, able to support the weight of the product once filled with water
- check that there is enough space around the tank in order to perform future maintenance
- verify that the room where the tank is placed has openings of a size to allow the free passage of the vessel, in case it's necessary to bring it out, in order to avoid any demolition.

### **1.3. START**

- The connection diagram shown in this document is purely indicative and not binding. it's up to the designer of the system to give the best connection scheme for the required application, in accordance either with the applicable regulations and with the limits imposed by the data declared by the manufacturer.
- provide the system of an expansion vessel including a relief valve (of counterweight or spring type) having a diameter not less than  $\sqrt{V/5mm}$  where V is the volume in litre of the vessel, with a minimum of 15mm. The valve must be set at a pressure not exceeding the maximum working pressure of the tank
- make sure that the volume and the pre-charge pressure of the expansion vessel of the secondary circuit are suitable for the installation
- in case impurities are contained in the water coming from mains, install a suitable filter
- make sure that the pumps have enough flow and head and work correctly
- make sure that the thermometer and thermostat sensors are positioned correctly
- always perform the grounding of the tank
- the insulation of the connecting pipes is always recommended in order to avoid unnecessary heat loss
- The connection to the water mains must be done through a safety hydraulic kit including:
  - 1 shut-off valve
  - 1 check valve
  - 1 safety valve
  - 1 stop device of water supplyall the above accessories are necessary to make the tank installation safe from dangers
- if the sanitary water system exceeds the maximum pressure allowed for the cylinder, install a pressure reducer as far away as possible from the storage tank

### **1.4. OPERATION**

- the operation must be performed by qualified personnel
- open a tap to let the air out while filling the vessel with water

## 2. MAINTENANCE

- Always disconnect the power supply before carrying out any operation on the unit
- frequently check that all the regulation and control devices work correctly

### 2.1. EXPANSION VESSEL

- frequently check the pre-charge pressure of the expansion vessel; the same value established during the system installation must be always maintained
- restore the air cushion to the initial valued in order to ensure an efficient protection of the installation from overpressure

### 2.2. CLEANING

- To clean the exterior of the vessel, use a cloth dampened with a proper cleaner
- The use of abrasive, solvents, gasoline or alcohol is not recommended

## 3. DEFECTS AND FAILURES

PROBLEM	CAUSE	SOLUTION
Excessive pressure inside the tank	<ul style="list-style-type: none"> <li>• Expansion vessel lack or malfunctioning</li> <li>• The pressure of the expansion vessel air cushion is not enough</li> </ul>	Verify that the system is equipped with an expansion vessel. If the expansion vessel is present, check that the precharge pressure is set correctly (it must be restored to the initial valued, slightly less than the one of the pressure reducer)

## 4. FINAL DISPOSAL

At the end of its life cycle, this product must not be treated as household waste.  
 The metallic components should be sold to operators authorized to the collection of materials for recycling.  
 The non-metallic components should be transferred to operators authorized to their disposal.