



# “PIPE IN TANK” COMBINED CYLINDERS

Translation of original instructions



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# 1-GENERAL INFORMATION

## PROPER DEVICE USE

Caution, this manual contains instructions for the sole use of professionally qualified fitters and/or servicemen, in accordance with the applicable laws in force.

The user is NOT permitted to service this device.

The manufacturer cannot be held liable for personal injury, harm to animals or property damage resulting from failure to observe the instructions contained in the manuals supplied with the cylinder.

## GENERAL INFORMATION

### SYMBOLS USED IN THIS MANUAL

When reading this manual, pay particular attention to the parts marked with symbols. These symbols are used to give the following warnings:



**DANGER!**  
*SERIOUS RISK TO SAFETY AND TO LIFE*



**CAUTION!**  
*POTENTIALLY HAZARDOUS SITUATION FOR THE  
PRODUCT AND THE ENVIRONMENT*



**NOTE!**  
*RECOMMENDATIONS FOR USERS*

## PROPER DEVICE USE

The instruction manual is an integral and essential part of the product and must be kept by the user or system manager.

Read the warnings contained in the manual carefully as they provide important information about safe installation, use and maintenance. Keep the manual in a safe place for future reference.

Installation and maintenance must be performed in compliance with the applicable regulations, according to the manufacturer's instructions and by qualified personnel trained in accordance with the law.

Professionally qualified personnel includes anyone with the specific technical skills required in the industry, spanning components for civil heating systems, domestic hot water production and the maintenance thereof. Such personnel must have the qualifications envisaged by the applicable laws in force.

Incorrect installation or improper maintenance may cause personal injury, harm to animals or property damage. The manufacturer cannot be held liable for these damages.

Before carrying out any cleaning or maintenance operations, disconnect the device from the mains power supply using the system switch and/or the relevant external components.

If the device has a fault and/ or is not operating correctly, deactivate the device and do not make any attempt to repair it or service it directly. Contact only legally qualified staff. Any repairs to products must be carried out only by staff authorised by RED, using only original parts. Failure to observe the above recommendations may compromise the safety of the device.

To guarantee the efficiency of the device ensure that it functions correctly, it is vital that qualified personnel performs annual maintenance. Should you decide not to use the device, make safe any parts likely to cause potential sources of hazards.

If the device is sold or transferred to a new owner or the owner moves, leaving the device in situ, always ensure that the manual is kept with the device so that it can be consulted by the new owner and/ or installer.

For all devices with optionals or kits (including electrical kits) use only original accessories.

This device must be used only for the use expressly intended. Any other use is to be considered incorrect and therefore dangerous.

## 1-GENERAL INFORMATION



*The device has been built according to the latest technologies and in accordance with the applicable technical safety regulations.*

*Nonetheless, incorrect use of the device may result in hazards for users and other persons or may damage the device or other objects.*

*The device is intended for the operation of hot water heating systems and domestic hot water production.*

*Any other use is considered incorrect.*

*RED cannot be held in any way liable for any damage ensuing from incorrect device use. The user is fully responsible for such cases.*

*Device use in accordance with the envisaged purposes includes scrupulous observance of the instructions provided in this manual.*

### INFORMATION TO BE PROVIDED TO THE USER

Before installing the device, you are advised to wash all of the system pipes thoroughly to remove any residues that may impede the device from operating correctly. During installation, you must inform the user that:

- in the event of water leaks, they must shut off the water supply and advise the technical assistance department as soon as possible.



#### **CAUTION!**

Installation, adjustment and maintenance of the device must be performed by professionally qualified staff in accordance with the standards and provisions in force. Incorrect installation may cause damage to persons, animals and property for which the manufacturer cannot be held liable.



#### **DANGER!**

*NEVER attempt to carry out maintenance work or repairs on the device on your own initiative. All servicing must be carried out by professionally qualified staff. You are advised to take out a maintenance contract. Deficient or incorrect maintenance may compromise the operating safety of the device and cause damage to persons, animals and property. The manufacturer cannot be held liable for these damages.*



#### **Modifications to parts connected to the device**

Do not modify the following parts:

- the boiler.
- Air, water and electrical current lines.
- The flue, safety valve and heating water outlet pipe.
- The structural elements that influence the operating safety of the device.



#### **CAUTION!**

Only use suitable fork wrenches (open-ended wrenches) to tighten and loosen the screw joints. Improper use and/ or unsuitable tools may cause damages (e.g. water leaks).

# 1-GENERAL INFORMATION

## TECHNICAL DATA LABEL



### **CAUTION!**

The label is positioned on the top of the cylinder, near to the connection outlets.

## WATER TREATMENT

To prevent hazardous corrosion of the heating device and the formation of scaling and deposits, it is of the highest importance to wash the system prior to installation, in accordance with standard UNI-CTI 8065, using appropriate products such as Sentinel X300 (new systems), X400 and X800 (old systems) or Fernox Cleaner F3.

Full instructions are provided with the product. However, for further details contact the manufacturer directly; SENTINEL PERFORMANCE SOLUTIONS LTD or FERNOX COOKSON ELECTRONICS.

After washing the system, you are advised to use inhibitors such as Sentinel X100 or Fernox Protector F1 to protect the system from corrosion and deposits.

Is it important to check the concentration of the inhibitor after each modification to the system and each maintenance check, according to the specifications provided by the manufacturers.

The outlet from the safety valve must be connected to a collection funnel to channel any discharge if servicing is carried out. If the heating system is at a higher level than the boiler, you must install cut-off cocks on the system flow/ return pipes. These cocks are provided in the optional kits.



### **Caution!**

***Failure to wash the heating system and add a suitable inhibitor shall invalidate the device guarantee.***

## PACKAGING

RED boilers are supplied fully assembled.

After removing the device from the packaging, ensure that the product supplied is complete and undamaged.

The packaging elements (straps, plastic bags etc) must be kept out of reach of children as they present potential sources of danger.

RED declines all responsibility for damages to persons, animals or property caused by failure to observe the warnings indicated in this manual.

In addition to the device, the packaging includes:

- an instruction manual for installation, use and maintenance.
- A guarantee certificate.

## 2-GUARANTEE TERMS

The manufacturer guarantees the product, with the exception of parts subject to normal wear specified below, for five years from the date of purchase, provided that proof of purchase is supplied in a document specifying the name of the retailer and the date the sale was made and that the completed guarantee certificate was sent within 8 days of said purchase. The product must also be installed and tested by a specialised fitter and in accordance with the detailed instructions provided in the instruction manual that accompanies the product. The guarantee covers the replacement or free repair of parts recognised as being faulty at source due to manufacturing defects.

### WARNINGS

Installation, electrical connection, functional check and maintenance of this device must only be performed by qualified or authorised personnel.

### EXCLUSION

The guarantee does not cover any parts found to be faulty due to negligence or inappropriate use, incorrect maintenance, or installation not performed in compliance with the manufacturer's instructions. The manufacturer will not be held liable for any damage which may - either directly or indirectly - be caused to persons, animals or property resulting from failure to observe all the instructions provided in this manual and, specifically, concerning the warnings regarding installation, use and maintenance of the device.

1. The terms for the guarantee application were not observed.
2. Installation was not performed in accordance with the applicable standards in force and the instructions provided in the use, maintenance and installation manual.
3. Damage caused by atmospheric agents, chemicals, electrochemicals, incorrect product use, natural disasters, electrical discharges, fires, faults in the electrical system, modifications to or tampering with the product, and/ or other causes not ensuing from the product manufacturing
4. Incorrect or negligent use.
5. In any event of damage caused by transport, you are advised to check the goods carefully upon receipt and notify your retailer immediately of any damage, writing the details on the delivery note and on the copy that travels with the carrier.
6. Please contact your retailer and/ or local importer in the event of product failure.

RED cannot be held liable for any damage which may - either directly or indirectly - be caused to persons, property or animals resulting from failure to observe the instructions provided in this manual and the applicable regulations in force regarding installation and maintenance of the device.

The parts replaced will be guaranteed for the remaining guarantee cover period starting from the original date of purchase of the product.

### LIABILITY

RED will not pay any compensation for direct or indirect damage caused by or dependent upon the product.

### COURT WITH JURISDICTION

In the event of any controversy, the court with jurisdiction is the Court of Pordenone (Italy).

### DISPOSAL

Dispose of the product in compliance with the regulations in force in the relevant place, region or country.

## 2-GUARANTEE TERMS

### LIABILITY EXCLUSION

The manufacturer is unable to supervise the observance of the instructions provided in this manual, nor the conditions and methods of installation, operation, use and maintenance of the product. Incorrect installation may cause damage and, therefore, endanger persons. Consequently, we cannot be held in any way liable for losses, damage or costs ensuing from incorrect installation, incorrect functioning and improper use and maintenance or in any way connected to the latter.

The Manufacturer reserves the right to make any changes to the product, technical specifications or to the manual without notice. If hazard-free operation is no longer possible (for instance, due to visible damage), turn off the device immediately.

### SERVICE CALL

The service call must be made to the retailer, who will forward the call to the technical support department.

The manufacturer cannot be held liable if the product and any of its accessories are used incorrectly or modified without authorisation. Only original spare parts must be used for replacements.

## 3-TECHNICAL SPECIFICATIONS AND DIMENSIONS

### TECHNICAL SPECIFICATIONS

RED vertical cylinders are used to produce and store hot water. They must be connected to a heating system and water distribution network.

The cylinder comprises a pressurised vessel into which coils are inserted.

RED cylinders must be installed with all safety devices and with standards checked.

#### Overview of models:

MODEL	CAPACITY
HSK 500	Cylinder with 500 litre capacity
HSK 800	Cylinder with 800 litre capacity
HSK 1000	Cylinder with 1000 litre capacity
HSK 1250	Cylinder with 1250 litre capacity
HSK 1500	Cylinder with 1500 litre capacity
HSK 2200	Cylinder with 2200 litre capacity

#### Description of components and characteristics.

- Enamelled carbon steel coil, compliant with DIN 4753 two-handed with elliptical section including a large exchange surface.
- Inspection flange Ø 180/120mm (Ø 290/220 for SC 1000).
- Insulation entirely in hard (500) and soft (800-1000) expanded polyurethane.
- 1 thermostat/ thermometer well.
- Electrical resistance connection.

#### Advantages of the “pipe in tank” combined cylinder.

- Several connection options.
- Perfect heat distribution.
- Special soft insulation (sp. 120 mm from HSK 800 and later versions).
- High quality steel.
- Two solar coils with large exchange surface in a smooth pipe with oval section.
- ACS preparation in accordance with anti-legionella safety.
- Tank tube for DHW in corrugated, covered, stainless steel (1.4404 material made in Germany and DVGW certification).
- High DHW production.
- Tanks with a capacity of up to 2200 litres.
- Can be used either by individual family users or by hotel facilities.
- Option to install an electrical resistance.



### 3-TECHNICAL SPECIFICATIONS AND DIMENSIONS

#### DIMENSIONS HSK 500/800/1000/1250/1500/2200

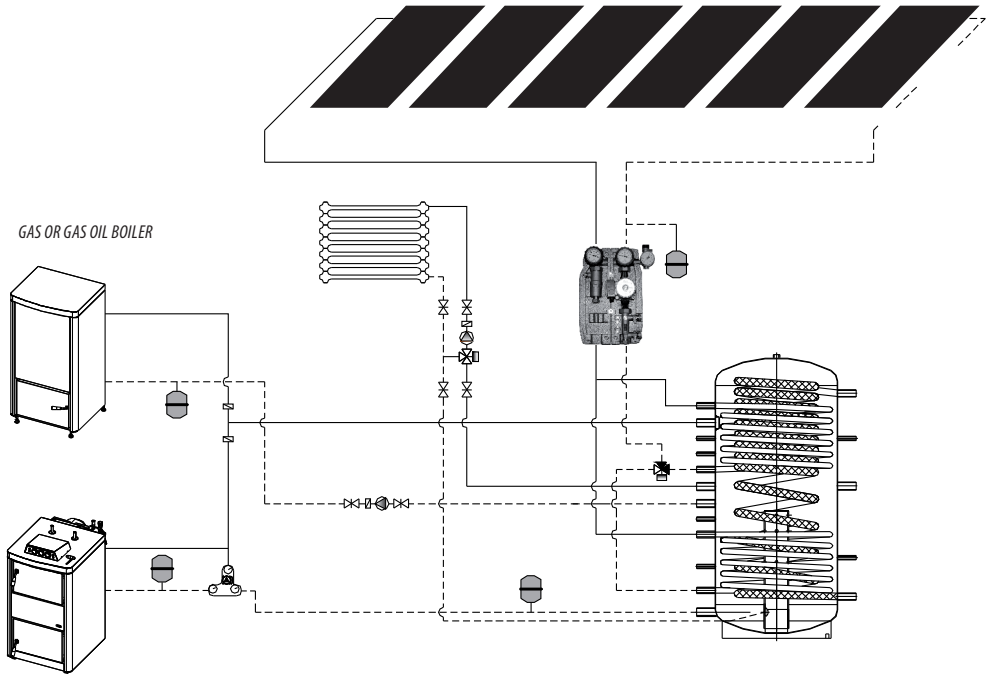
Technical specifications		HSK 500	HSK 800	HSK 1000	HSK 1250	HSK 1500	HSK 2200
Heating water capacity	L	442	723	923	1173	1408	2108
Diameter without insulation	mm	650	790	790	900	1000	1250
Diameter with insulation	mm	850	1030	1030	1140	1240	1490
Height without insulation	mm	1670	1860	2040	2030	2170	2180
Height with insulation	mm	1720	1930	2110	2100	2240	2250
Diagonal	mm	1700	1950	2150	2230	2250	2300
Soft PU insulation (external PVC casing)	mm	100	120	120	120	120	120
Approx. weight	Kg	140	242	265	309	336	413
Max. puffer operating pressure (external tank)	bar	6	6	6	6	6	6
Max. puffer operating temperature (external tank)	°C	95	95	95	95	95	95
Internal heat distribution system	mm	170	185	185	200	200	210
DHW volume	L	58	77	77	77	92	92
Continuous 10/45 output at 17kW and tank temperature of 65°C	L/h	408	430	430	430	440	440
Continuous 10/45 output at 27kW and tank temperature of 65°C	L/h	630	680	680	680	700	700
Continuous 10/45 output at 50kW and tank temperature of 65°C	L/h	1010	1240	1240	1240	1290	1290
Max. DHW operating pressure (internal pipe)	bar	6	6	6	6	6	6
Max. DHW operating temperature (internal pipe)	°C	95	95	95	95	95	95
Exchange surface of corrugated DHW pipe	m <sup>2</sup>	6,4	9,3	9,3	9,3	11,0	11,0
Exchange surface of upper solar coil	m <sup>2</sup>	----	2,0	3,0	3,2	3,5	4,2
Exchange surface of lower solar coil	m <sup>2</sup>	2,3	3,0	3,5	3,8	4,0	5,5
Capacity of upper solar coil	L	----	8,0	12,0	12,8	14,0	16,8
Capacity of lower solar coil	L	10,4	12,0	14,0	15,2	16,0	22,0
Max. operating pressure of solar coils	bar	10	10	10	10	10	10
Max. operating temperature of solar coils	°C	110	110	110	110	110	110
Recommended minimum surface for solar collectors	m <sup>2</sup>	8	12	14	18	22	28
Max. power of electrical resistance (optional)	kW	4,5	6,0	6,0	6,0	9,0	9,0

### 3-TECHNICAL SPECIFICATIONS AND DIMENSIONS

Technical specifications	Ref.			HSK 500	HSK 800	HSK 1000	HSK 1250	HSK 1500	HSK 2200
Venting	1	1"IG	----	upper	upper	upper	upper	Upper	Upper
Upper solar flow pipe	2	1"IG	mm	----	1500	1680	1615	1745	1800
Boiler flow pipe	3	1 ½"IG	mm	1400	1390	1520	1725	1635	1700
Upper solar sensor	4	½"IG	mm	----	1290	1450	1515	1525	1610
Upper DHW sensor	5	½"IG	mm	1150	1190	1330	1415	1415	1520
Connection from HSK 1250 litre	5/6	1 ½"IG	mm	----	----	----	1305	1305	1430
Upper solar return pipe	6	1"IG	mm	----	1090	1210	1195	1195	1320
Heating flow pipe	7	1 ½"IG	mm	1020	990	1060	1035	1085	1220
Free connection	8	1 ½"IG	mm	910	870	950	925	975	1100
Boiler sensor/ free	9	½"IG	mm	800	770	840	815	875	1020
Lower solar flow pipe	10	1"IG	mm	700	670	730	705	765	930
Lower solar sensor	11	½"IG	mm	490	465	495	495	520	565
Lower solar return pipe	12	1"IG	mm	280	310	310	335	375	365
Boiler return pipe	13	1 ½"IG	mm	150	170	170	195	235	280
Heating return pipe/ altered by 30°	14	1 ½"IG	mm	150	170	170	195	235	280
Domestic cold water inlet	15	1 ½"IG	mm	240	270	270	295	335	280
Sensor	16	½"IG	mm	440	570	580	600	600	650
Electrical resistance	17	1 ½"IG	mm	820	920	1130	1090	1130	1200
Sensor	18	½"IG	mm	1150	1290	1500	1350	1500	1430/1660
DHW outlet	19	1 ½"IG	mm	1420	1580	1760	1725	1825	1890

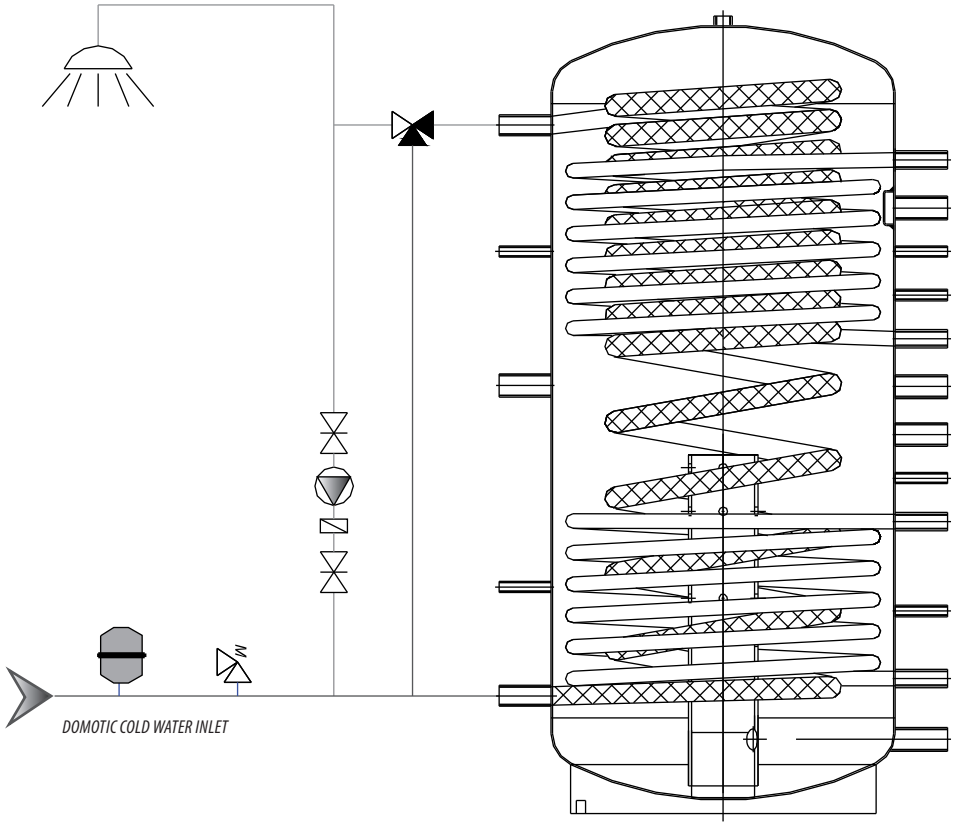
### 3-TECHNICAL SPECIFICATIONS AND DIMENSIONS

#### CONNECTION DIAGRAM



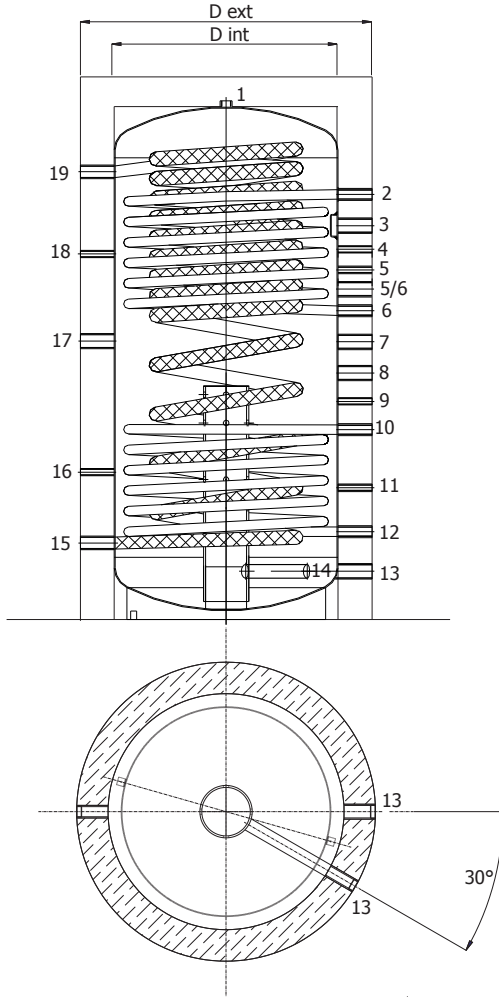
### 3-TECHNICAL SPECIFICATIONS AND DIMENSIONS

#### DOMESTIC HOT WATER CONNECTION DIAGRAM



# 3-TECHNICAL SPECIFICATIONS AND DIMENSIONS

## DESCRIPTION OF CONNECTIONS



## 4-POSITIONING

When choosing where to install the device, adhere to the following safety indications:

- Position the device in a place that children can be prevented access to as the device presents potential sources of danger for their safety.
- Position the device in areas protected from frost
- Check that the lower support surface is suitable, taking into account the weight of the cylinder when full
- Leave a distance of 500 mm on each side of the device and a distance of 500 mm on top to aid maintenance operations.
- **You are advised to install the cylinder as close as possible to the boiler and to insulate the connection pipes to reduce heat loss.**

## 5-PRELIMINARY OPERATIONS

Before connecting the cylinder to the system, clean the pipes thoroughly with a suitable product to remove metal residues from manufacturing and welding as well as oil and grease that may be present and, upon reaching the cylinder, may alter its function. Do not use solvents to wash the system as this may damage the system and/ or its components. Failure to observe the instructions in this manual may cause damages to persons, animals and property for which RED cannot be held liable.



### **Caution!!!**

**All pipes, collectors, exchangers and hydraulic devices must undergo hydraulic seal testing.**

**The first time the device is put into operation, this must be done by qualified personnel. RED cannot be held liable for personal injury, harm to animals or property damage resulting from failure to observe the instructions contained in this manual.**

Before putting the device into operation, check that the domestic heating system and solar connection is equipped with an automatic safety discharge valve, storage drain-off tap and expansion vessel. These components are OBLIGATORY.

- Treat the water as necessary.
- If the pressure in the system is greater than 4 bar, use a pressure reducing valve.
- Use a thermostatic or electric mixer valve to optimise the outlet temperature of the DHW.
- Check that the outlet of the safety valve is connected to an outlet system with a siphoning funnel that can be checked visually.
- Never exceed the maximum storage temperature of the cylinder in the DHW cylinder of the heating system.
- If the cylinder is used with a solar heating system: the expansion vessel of the heating system must be able to withstand high temperatures and the diaphragm must be suited to contact with a water/ glycol mixture a thermostatic mixer valve **MUST** be installed for the DHW supply.
- A non-return valve must be inserted to avoid triggering natural circulation.
- Never exceed the maximum temperature storage temperature of the heating circuit.

**Fill first the DHW tank and then the heating tank with water. This prevents the pressure of the water from causing deformations.**

## THERMAL INSULATION

The thermal insulation must be assembled before making the connections. Do not perform welding or initiate flaming close to the insulation. Risk of fire.

### Technical description.

Soft, flexible, PU sponge insulation		100 mm (120mm from HSK 800)
External casing with hinge		0.8mm PVC layer + 5mm soft sponge
Casing colour		Silver
Foam density	Kg/m <sup>3</sup>	14,1 (± 5%)
Crushing strength 40%	KPa	2,1 (± 5%)
Initial thermal conductivity	W/mK	0,039 (± 5%)
Loss of density	%	5 Max
Elasticity	%	45 (± 5%)
porosity	no. of cml cells	17 (± 5%)

## 5-PRELIMINARY OPERATIONS



### **Caution!!**

**Only install insulation when the temperature in the room or in thermal power plant is approximately 25°C or above!**

Pre-heat the insulation for at least 24 hours in a heated room and install it on the tank while it is still hot!

When the insulation is cold the soft, flexible insulation and PE casing become too rigid and appear tight. This gives the appearance that they are incorrectly sized.

Never use tongs or other tools to tighten the insulation on the tank! This may impair and ruin the insulation. **This damage is not covered by the guarantee.**

### **CONNECTION**

The tank must be connected as shown in the diagram. Connections must be made according to the current standards in force and correct practice guidelines.

The safety valve must have a diameter of at least DN 20-3/4".

Pay careful attention to electrochemical reactions that can occur between the various installation materials (mixed installation).

You are advised, in general, to limit the domestic water temperature to 60°C using a mixer valve! This is obligatory if a solar system is connected.

The main connection components must be designed for the temperature planned. Otherwise, limit the temperature.

### **OPERATING PRESSURE**

Refer to chap. 3 for the permitted operating pressures. Exceeding the permitted operating pressures may cause leaks and destruction of the tank!

### **PRESSURE REDUCING VALVE**

You are advised to install a pressure reducing valve. This **MUST** be installed when the domestic water supply is at a higher pressure.

The operating pressure of the pipes must be set to 3.5 bar to reduce noise caused by the circulating water flow,

### **PORTABLE WATER FILTER**

The chemical/ physical characteristics of the water in the system are fundamental for the correct operation and safety of the cylinder.

You are advised to install a potable water filter as floating microparticles may obstruct connections etc and may cause passages to corrode.

### **SAFETY DEVICE**

The tank must be equipped with a non-excludable safety valve. The expansion vessel must also be suitable for the capacity of the tank and must have a control and non-return valve.

A potable water mixer valve must also be installed for anti-scald protection, in accordance with standards in force.

A label with the following wording must be installed near to or (better) on the safety valve:

“Water dripping from the valve during heating for safety reasons. Do not close”.



## 5-PRELIMINARY OPERATIONS

### OUTLET/DISCHARGE

The tank must be installed in such a way that it can be emptied without being dismantled. Hot water may be discharged while the tank is being emptied and this may cause damage.

The upper bushing is installed for discharge from the cylinder. You are advised not to use an automatic discharge valve.

### ELECTRIC HEATING DEVICE (OPTIONAL)

The cylinder can be fitted with an electric heating device (optional). If this device is fitted, the instructions and regulations of the relevant local authorities must be respected.

Electric heating devices on cylinders must be insulated. Insulation is the only way to ensure that the product is protected from corrosion. An electric heating device (electrical resistance) with an integrated safety temperature regulator and temperature limit switch is available on the price list.



**Caution!**

***if the components of the electric heating system are installed without insulation, the cylinder guarantee shall no longer be valid.***

### LOADING

Cylinder connections that are not used and connected must be thoroughly shut off with seal plugs.

Wash and rinse the ducts and cylinder well after assembly. Fill the cylinder and system with water and bleed them.

## 6-INSPECTION AND MAINTENANCE

Inspection and maintenance, carried out to the highest standard at regular intervals and using only original parts, are of primary importance for fault-free operation and lengthy duration of the product. The guarantee is valid if the device has been maintained correctly. Failure to carry out inspection and maintenance may cause damage to materials, property or persons.

For this reason, you are advised to take out an inspection and maintenance contract.

Inspection is necessary to determine the state of a device and to compare it with an optimal state. This is carried out through measurements, checks and observations.

Maintenance is necessary to eliminate any inconsistencies between the actual state of the device and the optimal state. This is carried out through standard cleaning as well as configuring and (if necessary) replacing individual components subject to wear.

Maintenance intervals are determined by the specialist, based on the state of the device ascertained during inspection.

Inspection and maintenance are carried out in the order shown in the table.

To clean the outside of the cylinder you are advised to use a cloth with water and neutral detergents. Avoid solvents and abrasive products.



**Warning!**

***When performing cleaning operations, take care not to damage the enamelling.  
Fill the solar tank and check its seal.***



**Danger of burns from boiling water!**

***The outlet pipe of the safety valve, fitted on the hot water tank, must always be kept open.  
If it is closed, it is possible that the tank may become damaged!***





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