

Hygienic
Stainless Steel
Mirror Finish Surface
Helical Coil
Heat Exchangers
Solar Heat Transfer
Pool Heat Exchangers
Hygienic Hot Water Heating



CE PED



Installation and Operation Manual

- Solarico Heat Exchanger SHE-310U
- Solarico Heat Exchanger SHE-310D
- Solarico Heat Exchanger SHE-440U
- Solarico Heat Exchanger SHE-440D

CONTENTS

Introduction.....	3
General Informations.....	4-5
Installation and assembly.....	6-7
Operation.....	8
Drawings and dimensions.....	9
Warranty	10-11

INTRODUCTION

Important

Dear customer,

We strongly believe that the products bought from us will contribute the comfort at your homes and increase it's energy efficiency.

Read and understand the Installation and Operating Guide carefully before attempting installation, start-up, operation, or service. Installation and service must be performed only by an experienced, skilled installer or service agency.

This booklet contains important information about correct installing and operating of this heat exchanger.

It is integral part of this product, store it close to the device, and keep it available for the reference for it's service life.

Please contact the manufacturer's customer service department or the local representative of the manufacturer with any questions or other issues.

Safety Related Symbols

Safety-related information and instructions have been provided in this guide and on the heat exchanger to warn any person(s) of potential hazards.



This is safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.



Danger

Indicates an imminent hazardous situation which, if not avoided, could result in injury or death.



Warning

Indicates a potential hazardous situation which, if not avoided, could result in injury or death.



Caution

Indicates an imminent hazardous situation which, if not avoided, may result in minor or moderate injury.



Note

Important information

All safety messages will refer to a potential hazard. Follow the instructions in this manual exactly to avoid the risk of injury.

Quality of the water

Lime scale effects

Chemical imbalance of the water supply may cause decreased heat transfer efficiency to the heat exchanger and associated equipment. Solarico recommends having water quality professionally analyzed to determine whether it is necessary to install a water softener. It is important that the water chemistry be checked before installing the heat exchanger, as water quality will affect the reliability of the system. In addition, operating temperatures above 57° C will further accelerate the build-up of lime scale and may shorten the service life of the heat exchanger. According to a rule of thumb a lime scale layer with a thickness of 1 mm will result in a loss in efficiency of 10%. In extreme cases lime scale layers can damage the heat exchangers.

Corrosion effects

pH values of water above 11 may cause damage to rubber seals, and very low pH values below 6, may cause damage to stainless steel heat exchangers. Depending on the materials used in the heating system, Solarico recommends that pH value should lie between 8,2 and 10.

GENERAL INFORMATION

Materials used

Solarico Heat Exchangers are made of different types of stainless steel:

- Stainless steel Inox 316L - the inner corrugated pipe of the heat exchanger
- Stainless steel Inox 304 - the shell of the heat exchanger

Models and Usage

Solarico Heat Exchangers are available as:

- SHE-310U
- SHE-310D
- SHE-440U
- SHE-440D

Solarico Heat Exchangers are intended to be used in central hot water heating systems and solar thermal systems. Examples:

- Storage for pellet heating systems, heat pumps, solar (all heating systems)
- For heating drinking water, circuit water and swimming-pool water

Each model must be installed and used the way this booklet describe, and in accordance with the conditions detailed on the rating plate.



NOTE: The equipment shall be installed in accordance with those installation regulations required in the area where the installation is to be made. These regulations shall be carefully followed in all cases. Authorities having jurisdiction shall be consulted before installations are made.



WARNING: Use this heat exchanger only in hydronic heating systems. The installer must comply with all plumbing codes. Do not operate above the temperature or pressure specified on the rating plate. Failure to comply may result in personal injury, property damage, or death.

Disclaimer

Solarico is not liable for damage resulting from any but the device's intended use.

Solarico is not liable in case of:

- Installing or operating the device or its components contrary to the instructions contained in this booklet.
- Improper installing or operating the device or its components.
- Installing or operating the device or its components the way that is not described in this booklet, and the way which is not specifically approved by manufacturer in writing.
- Modifying, converting or removing the device or its parts when it is not approved by manufacturer in writing.
- Incorrectly executed repair work
- Normal wear and tear

Solarico assumes no liability for the following situations:

- Bodily injury
- Material damages
- Economic losses

Maintenance

INSPECTION

At regular intervals and as frequently as experience indicates, an examination should be made of the interior and exterior condition of the unit. Neglect in keeping all tubes clean may result in decreased performance of the heat exchanger.

FOULING

Heat exchangers are subject to fouling or scaling which should be cleaned periodically. A light sludge or scale coating on the tube greatly reduces its thermal efficiency not only on the product side but the media side as well. An increase in pressure drop and/or reduction in performance usually indicate that cleaning is necessary.

CLEANING

Solarico heat exchangers are designed to be chemically cleaned in place. Cleaning in place is a function of the process and adequate time, temperature, flow and concentrations are needed for satisfactory cleaning.



CAUTION: Chemicals used for cleaning must be compatible with materials of construction. Before disassembly the user must assure that the unit has been locked out, de-pressurized, ambient temperature and drained.

LEAKS

-External leaks: Solarico heat exchangers are designed so that an rubber sealings failure will leak to the ground. Identify the leaking elastomer and follow disassembly/assembly procedures to replace the elastomer.

-Internal leaks: Internal leakage can cause intermixing of fluids and will not be visible. Solarico heat exchangers used in sanitary applications should be tested regularly.



WARNING: If the heat exchangers are cleaned, then it is important the full characteristics of the fouling material and chemical cleaning agent be known, and care exercised in handling them according to the instructions. Use eye protection to prevent damage to your eyes. Wear a respirator when required.



CAUTION: Do not exceed a design conditions of the heat exchanger during maintenance.



NOTE: Check that cleaning chemical agents are compatible with the materials of the heat exchanger. Contact the manufacturer of cleaning products to determining a suitable cleaning agent for your type of scaling problem.



CAUTION: Since one fluid in the heat exchanger is at a higher temperature, any leaks may cause burns.

INSTALLATION AND ASSEMBLY

Instructions to installer

During installation and operation, the country specific requirements and regulations must be observed:

- Regulations and norms concerning the fitting of the installation with safety devices.
- Safety during installation - personal protective equipment.



WARNING: The preparation, installation and commissioning must be performed by an authorized professional installer / service.



CAUTION: Local construction regulations on installation of heat exchanger must be observed; weight of the heat exchanger must comply with the stability of the floor or walls of the room where it will be installed.

Shipping and packaging

We recommend delivering your heat exchanger directly to the installation site on the pallet and in the original packaging.

During transport and installation, depending on the weight, appropriate safety equipment must be used in accordance with Directive 2006/42/EC.

When transporting items weighing more than 30 kg, the use of pallet jack, fork truck or other hoisting devices is a must.

Assembly

Solarico heat exchangers are delivered assembled.

INSTALLATION AND ASSEMBLY

Installation instructions

1. Upon receipt of the exchanger, inspect for shipping damage, especially to the connections. If damage is extensive, notify the carrier immediately. Finally, check the heat exchanger against proper drawings and spec sheets to make sure everything is as expected.
2. Before piping up, inspect all openings in the heat exchanger for foreign material. Remove all plugs and shipping covers immediately prior to installing. Make sure it is thoroughly cleaned to remove all preservation materials, if any were used, unless the material is soluble in the system fluid.
3. For single phase fluids, the heat exchanger can be piped and mounted in any orientation that is convenient.
4. If you are going to heat exchange with a vapor, then the vapor side should be connected at E and F connectors, i.e. at the shell connection points.
The liquid side should be connected at I and J, i.e. at the corrugated tube connection points.
5. Provide air vent valves for the heat exchanger so that it can be purged to prevent or relieve vapor or gas binding.
6. Install proper relief valves and temperature alarms to insure the heat exchanger isn't subject to conditions beyond the intended design.
6. Don not weld or braze brackets or attachments directly to body of heat exchanger.
7. For soldering type connections braze with minimum 45% silver solder and at a maximum 1200° F. For welded type connections use TIG or MIG welding. Avoid overheating. A wet cloth or rag should be placed around the base of the connection. A nitrogen purge should be used to avoid internal oxidation. Braze or weld with exchanger in the vertical position.
8. The corrugated pipe connections are designed for normal torque force and damage may occur if over tightened. The use of pipe sealant materials compatible with the system fluids is recommended for threaded type connections.

OPERATION

General

The heat exchanger must not be operated at conditions, which exceed those specified on the data plate.



CAUTION: If the heat exchanger surface temperature is expected to be hot or there are local regulations related to surface temperature, it is the users' responsibility to either insulate the unit or take precautions by labeling the unit with a warning about the hot surface temperature to avoid risk of personnel injuries.

Special Instructions

Before placing the heat exchanger in operation, reference should be made to the as built documentation for any special instruction.

Regulations

Local safety and health regulations must be considered.

Improper start-up or shutdown sequences may cause leaking of tube-to-tube and/or floating joints. It is the customer's responsibility to carefully pay attention and ensure a proper start-up and operation when running media with a higher risk for damages on the heat exchanger.

Startup

During start-up all vent valves should be opened and left open until all passages have been purged of air and are completely filled with fluid. Fluid must be introduced in a manner to minimize differential expansion between the tubes.



CAUTION: Adjustments of flow rates should be made slowly to avoid the risk of pressure surge or water hammer. Water hammer is a short-lasting pressure peak that can appear during start-up or shut-down of a system, causing liquids to travel along a pipe as a wave at the speed of sound. This can cause considerable damage to the equipment.

Shutdown operation

The heat exchanger must be shut down in a manner that minimizes different expansions between tubes. When shutting down the system, the heat exchanger should be drained completely.

Temperature shocks

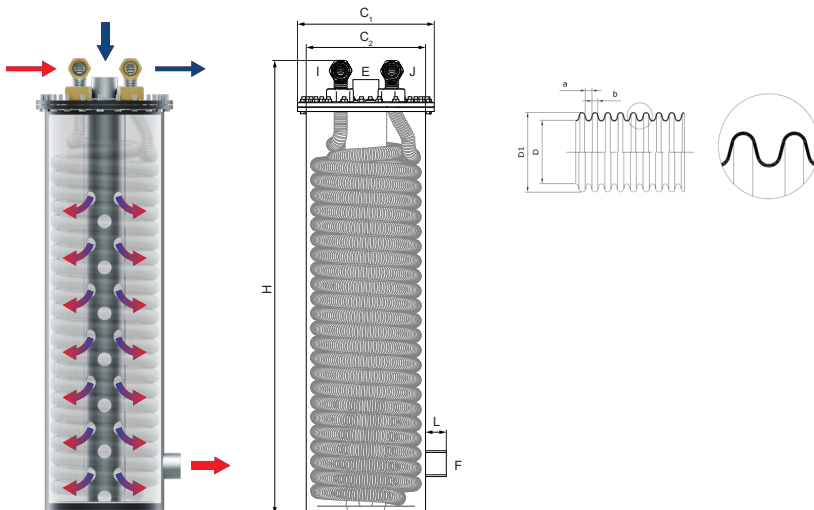
The heat exchanger should not be subjected to abrupt temperature fluctuations. Hot fluid must not be suddenly introduced when the unit is cold nor cold fluid suddenly introduced when the unit is hot.

Joints

The heat exchanger is pressure tested before leaving the manufacturers shop in accordance with various standards. However, normal relaxing of the gasketed joints may occur in the interval between testing in the manufacturer's shop and installation at the job site. Therefore, all external joints may require retightening after installation and, if necessary, after the heat exchanger has reached operating temperature.

DRAWINGS AND DIMENSIONS

SOLARICO HEAT EXCHANGERS - SHE					
Corrugated pipe					
D	(mm)	25,20			
D1	(mm)	31,60			
a	(mm)	3,20			
b	(mm)	2,00			
Tolerance		±0,30			
Operating pressure	(bar)	11			
Surface area per meter	(m ² /m)	0,164			
Min. section area	(mm ²)	498,76			
Volume	(m ³ /m)	0,6335			
Material		Inox 316L			
Heat exchanger		310U	310D	440U	440D
C ₁ (diameter)	(mm)	300	300	300	300
C ₂ (diameter)	(mm)	250	250	250	250
H (height)	(mm)	910	380	1140	600
L (length)	(mm)	40	40	40	40
Total surface area	(m ²)	3,8	1,20	5,00	2,00
Total pipe length	(m)	23,17	7,32	30,49	12,20
Total volume	(lit.)	14,68	4,64	19,31	7,73
Approx. weight	(kg)	39	22	46	29
Connector (E, F)		6/4"			
Connector material (E, F)		Stainless steel			
Connector (I, J)		5/4"			
Connector material (I, J)		Brass			



WARRANTY

Manufacturing defects and materials guarantee

▪ Manufacturer expressly guarantees that the products it manufactures shall be free from defects in materials and workmanship which can prevent from normal operation under proper and normal use, installation and maintenance for the intended functions of the products, for a period set out in the warranty certificate of the respective water heater model you have bought. The warranty period begins from the date indicated in the purchase invoice. If a product or any component there of is determined to be defective in manufacture or materials, Manufacturer will repair or replace the defective component or product

Exclusions and limitations of Warranty Coverage

▪ The customer can claim warranty during warranty period of respective product immediately after any defects have been determined, except for in case of noticeable defects at the moment of purchase, in which case the customer must make the claim at the shop immediately after noticing the defect as it is provided for in the general conditions of sale.

1. Accidents, installation on movable structures, negligence, improper care or nonconformity.
2. Failure to observe the installation, use and maintenance instructions set forth in the installation manual of respective product.
3. Improper installation and use as well as changes, especially if they are not made by authorized after-sale service personnel of Manufacturer.
4. Testing and operation pressures greater than values established by Manufacturer and set forth in product manuals, or use of water with characteristic values exceeding: Dissolvable salts – 500 mg/l; Calcium carbonate – 200 mg/l; Free carbon dioxide – 50 mg/l; ph content – minimum 6 and maximum 11; Freeze, flood, natural disasters or third party actions as well as any interventions into normal functioning conditions of water heaters and the control of Manufacturer.
5. Service trips to your home to teach you how to install, use, or maintain this heat exchanger or to bring the heat exchanger installation into compliance with local building codes and regulations.
6. Performance problems caused by improper sizing of the heat exchanger.
7. Damages, malfunctions, or failures caused by abuse, accident, fire, flood, freeze, lightning, and the like.
8. Damages, malfunctions, or failures caused by operating the unit at water temperatures exceeding the maximum setting of the operating, or high limit, control.
9. Heat exchanger failures caused by operating the heat exchanger when it is not supplied with working fluid, free to circulate at all times.
10. Damages, malfunctions or failures caused by subjecting the heat exchanger to pressures greater than those shown on the rating label.
11. Damages, malfunctions or failures resulting from the use of any attachment, including any energy saving device, not authorized by Manufacturer.
12. Units that have had their rating labels removed. A heat exchanger should not be operated if the rating label is removed.

▪ The warranty certificate is considered void for heat exchangers whose serial identification number has been modified, removed or blurred, or can not be expressly attested.

▪ Damages in the appearance of products shall not be considered as defects except for those ones which cause losses during operation or change technical characteristics of heat exchangers set forth in brochures.

▪ Manufacturer preserves the right, in case of replacement, to deliver another model of heat exchanger in order to fulfill approved warranty claims when the original model is not being manufactured.

WARRANTY

Labor, shipping, and processing costs

This Limited Warranty does not cover any labor expenses for service, repairs, reinstallation, permits, or removal and disposal of the failed heat exchanger, or defective component part(s). All such expenses are your responsibility.

Euroterm d.o.o. is not liable to pay any transportation costs for an "in-warranty" replacement heat exchanger, or "in-warranty" replacement component part(s).

Euroterm d.o.o. does not authorize, recommend, or receive any benefit from any claims processing or similar fees charged by others to process warranty claims for any Euroterm d.o.o. heat exchanger or component part(s). Euroterm d.o.o. will not reimburse any party for these, or any other, fees not specifically covered in this Limited Warranty document.

Claiming warranty

Every customer who has purchased a heat exchanger from Manufacturer and who has good reasons to lay a warranty claim, shall proceed as follows:

- Immediately notify in writing: The installer, or the company that has sold the heat exchanger to him, or the distributor firm, or the commercial representative of Manufacturer in the region.

For this purpose the claimant shall fill out a claim form; the letter shall be accompanied by the document proving the purchase of the heat exchanger (invoice) with the date of purchase in it.

- After receiving the claim form, Manufacturer considers it and makes decision whether the claim has grounds, and whether the defect is within the scope of the warranty set forth in this certificate for limited warranty; after which informs the customer as to its decision and the steps he shall do.

- The return of a product cannot be done without written authorization issued by the Quality Department. The return procedure shall be according to RMA (Return Material Authorization).

- If on customer's request, and when there is reason for urgency, the customer demands immediate replacement of the product he has claimed warranty for, before making the decision as to the claim, said request shall be accompanied by a Purchase requisition from the Commercial Department. After decision for satisfaction of the claim has been made, the Purchase requisition mentioned above will be annulled by issuing a receipt for returned goods; with this receipt the customer can purchase another product with the same price in case the claim has proved grounded.

- Manufacturer reserves the right to make in situ reports from the claims they have received for the purpose of checking every aspect that might be useful for better consideration of warranty claims; for this reason the customer shall not make any changes in installation conditions which are reasons for the claim without prior written consent of the Technical Department.

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Limitation of liability

- Manufacturer is not liable before the customer, neither directly nor indirectly, for any non-fulfillment or delay at applying the warranty obligations which might originate from external pressure of other circumstances outside Manufacturer.

- The liability of Manufacturer under this Warranty Certificate is limited to the abovementioned obligations and up to the sum in accordance with the purchase receipt of the product to be claimed; excluded is any liability for indirect damages such as loss of data at information applications, loss of production, thermal variations at the service, etc. which do not violate the applicable regulations of any country concerning product liability.

- Above mentioned warranty limitations will be applied in any cases, and when they do not violate the regulations in any country concerning product liability. If this circumstance annuls some of preceding clauses, annulment will refer only to this clause, while the others will remain valid. In conclusion, excluded is application of any Regulation pointed out in this Warranty which violates the Law 23/July 10, 2003 and Directive 1999/44/EU concerning water heaters and their use on the territory of the EU.

- Any other warranty right that is not mentioned in this Warranty Certificate is excluded

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GUARANTEE

Type

Serial number

Guarantee

**Stainless steel corrugated pipe:
10 years**

Manufacturing date

Signature

Solarico[®]

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