



# INSTALLATION AND MAINTENANCE INSTRUCTIONS ADCATHERM STH / STV SHELL & TUBE HEAT EXCHANGERS

## GENERAL

- These instructions must be carefully read before any work involving products supplied by VALSTEAM ADCA ENGINEERING S.A. is undertaken.
- The installation procedure is a critical stage in the life of equipment, so care should be taken to avoid any damage.
- The heat exchanger is the main component in any steam to water heating system. The hot fluid (steam) is connected to the tube bundle and while condensing transfers the latent heat to the cold fluid (water) which runs in the shell. So, there is no direct contact between the heating fluid and the fluid to be heated.

### Note:

- Current regional safety regulations should be taken into account and followed, while doing the installation and maintenance work.
- Handling, installation and maintenance work must be carried out by trained personnel. A supervisor must follow and check all activities.
- For the problems that cannot be solved with the help of these instructions, please contact the supplier or the manufacturer.
- The manufacturer reserves the right to change the design and material of this product without notice.
- If necessary to perform hydrostatic test on the equipment/installation be aware of the limits according to the table below.

GROUP 2 GASES CATEGORY			
RATING	MODEL	CATEGORY Tube side	CATEGORY Shell side
EN PN16	STH/STV 4.075 to 4.150	1	SEP
	STH/STV 5.075 to 5.150	1	SEP
	STH/STV 6.705 to 6.150	1	SEP
	STH/STV 8.075 to 8.150	2	SEP
	STH/STV 10.075 to 10.150	2	SEP

PRESSURE TEST [bar] 20°C		
RATING	STH/S and STV/S	STHSS and STV/SS
PN 16	22 bar	26 bar

### CE Marking:

This product has been designed for use on water and steam which are in group 2 of the PED-Pressure Equipment Directive 97/23/EC and comply with those requirements.

The product carries the CE mark.

LIMITING CONDITIONS **					
STH / STV					
Rating	Press. bar	Temp. °C	Rating	Press. bar	Temp. °C
PN16	16	50	ANSI Cl.150 lbs	16	50
	14	100		14	100
	13 *	195		13 *	195
	12	250		-	-

\*PMO-Max.operating pressure for saturated steam.

Minimum operating temp.: -10°C. Design code: AD-Merkblatt

\*\* Rating according to EN1092:2007.

LIMITING CONDITIONS		
RATING	Pressure bar	Related Temp. °C
EN PN16	16	120
	a) 14	198
	13	250
ANSI150#	16	120
	a) 14	198

a) PMO - Maximum operating pressure.  
 Minimum operating temperature: -10°C  
 Design code: AD - Merkblatt



ATTENTION

- If malfunction of any other equipment or system operation failure may result in a dangerous overpressure, overtemperature or even vacuum condition, a safety device must be included in the system to prevent such situations .A safety valve socket connection is provided on the shell side. If the selection of safety valve recommends the use of a valve connection bigger than that included on the vessel, then we recommend its installation in the pipe connection providing that no stop valve is installed in between.
- Do not touch the equipment without appropriate protection during working operation because it may conduct heat if the used fluid is at high temperature.
- Before starting maintenance be sure that the equipment is not pressurized or hot.
- If any of the socket connections is not being used, it must be closed with an appropriate material plug.
- Do not remove the nameplate attached to the equipment. Serial number and other useful information is stamped on it.
- Before installing or starting maintenance be sure to have sufficient space to work in and also the correct lifting gear and qualified staff.

## TRANSPORT AND STORAGE



ATTENTION

- Handling and lifting of materials should be made with adequate equipments.
- Do not damage the paint job. It protects against corrosion during transportation and storage.
- The heat exchanger and equipments should be protected from impacts and forces during transportation and storage.
- The manufacturer doesn't assume the responsibility of damaged equipments due to inappropriate handling during the transportation and storage.

## INSTALLATION



### ATTENTION

- Prior to installation check that the product is suitable for the intended application: materials and pressure/temperature ratings.
- Before to installation remove plastic covers placed on flanges or connection ends. The equipment has an arrow or Inlet/ Outlet designations. Be sure that it will be installed on the appropriate flow direction.
- External stresses that may be induced by the system doing to pipe expansion, etc, can affect this product. The necessary precautions are recommended during the system design and equipment assembly.
- The heat exchanger must be installed on horizontal or vertical position according to the design (STH/STV) with the condensate connection pointing to the ground. A float and thermostatic steam trap is recommended to automatically discharge the condensate. For detailed system design please consult factory and assembling instructions AS STH.20 and AS STV.20.
- It is recommended to install a "Y" filter (our IS series) on both inlet tube side and shell side. Connection pipes must be provided to manual stop valves, to permit periodical maintenance
- Make sure there is sufficient space on the tube side, equal to the length of the heat exchanger, to extract the tubes.
- After installation it is recommended the thermal insulation of the equipment with suitable material for the temperatures in use.

### Installation area requirements:

- The installation area should have easy access and provide enough space for maintenance and removing operations.
- The pipework before and after the heat exchanger, must be sized in order to avoid that the max flow speed recommended, for the fluid in question, is exceeded.
- In order to allow installation and maintenance work without emptying the system, stop valves should be installed upstream and downstream of the heat exchanger.
- If the system cannot be stopped for maintenance it is recommended that isolating valves are installed upstream and downstream of the heat exchanger together with a by-pass manual regulating valve. The process can be then controlled manually during the heat exchanger maintenance/changing. The by-pass must be kept close during the normal operation.
- The installation area should have the necessary firing system to prevent damage of the equipment due to over temperature/pressure cause by fire.

### Start-up

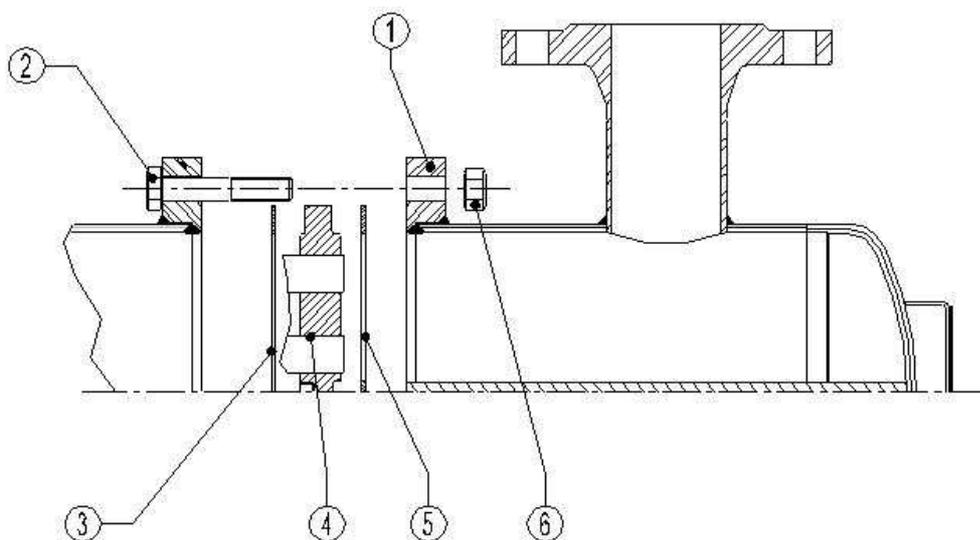
- In the first hour of operation check the screws between tube side and shell side.
- Always apply the mentioned torques, see torques table when maintenance operations are carried out.
- In the first hour of operation check and clean the strainers.

## MAINTENANCE

- The Adcatherm heat exchangers don't need any specific type of maintenance. Regular inspection may be recommended by local authorities according to specific or general pipe and/or vessels assembly procedures. Estimated lifetime under satisfactory working conditions: 3 years; after this period we recommend the wall thickness examination using appropriated inspection equipment. Poor quality water or corrosive fluids will reduce this period.
- If poor quality water or steam is used, it is recommended to inspect the tube bundle in shorter periods. If the

output and temperatures of the cold fluid start to decrease this can be a signal that one or both of the fluids involved in the process are not in the ideal conditions. It is then recommended to contact the water treatment supplier.

- Inside and outside tubes may be cleaned with a solution of water with 5% of Na<sub>2</sub>CO<sub>3</sub>
- Gasket replacement: Unscrew the bolts (2) and relative nuts (6), remove the head (1), then the gasket (5), the complete tubesheet (4) and the circular gasket (3). Clean the casing thoroughly to get rid of any foreign material. For reassembly reverse the procedure.



**Warning!**

- Always use original spare parts supplied by ADCA;
- Always apply the torques mentioned in the Table 1 when maintenance operations are undertaken.

**Recommended tightening torques STH/STV:**

HEAT EXCHANGER TYPE	THREAD	QTY	TOOL	TORQUE N.m
STH/STV 4.075 to 4.150	M12	8	19	30-35
STH/STV 5.075 to 5.150	M12	8	19	30-35
STH/STV 6.075 to 6.150	M12	10	19	35-40
STH/STV 8.075 to 8.150	M14	12	22	45-50
STH/STV 10.075 to 10.150	M14	16	22	80-90



**ATTENTION**

- **LOSS OF WARRANTY:** Total or partial disregard of above instructions involves loss of any right to warranty.