Alfa Laval Pharma-line S

Alfa Laval Pharma-line S double tube sheet shell & tube heat exchanger

Applications
The Pharma-line S is used in pharmaceutical water systems; Water For Injection (WFI) and Purified Water (PW) and for heating or cooling of pharmaceutical products.

Working principles
The Pharma-line S is designed in line with ASME BPE, USP and cGMP requirements. In the Pharma-line the risk of mixing between the product and the heating or cooling (service) medium is eliminated as a result of the double tube sheet design. The product flows in the tubes while the service medium flows in a cross flow around the tubes, inside the shell. The service medium is sealed in the shell by the first tube sheet and the second tube sheet seals the product. In the event of a leak, the leakage of either fluid is easily visually detected.

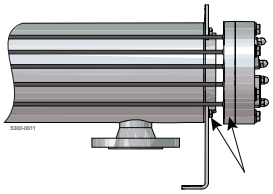


Fig. 1. Double tube sheets prevent cross contamination between the product and the heating/cooling medium.

PHYSICAL DATA

Product wetted steel parts:	316L (seamless tubes)
Gaskets:	PTFE (FDA compliance & USP class VI certified)
Connections:	NAC plate to connect to tri clamp on tube side and flanges on service side

Standard range
The Alfa Laval Pharma-line is a high quality double tube sheet shell & tube heat exchanger designed for use in the pharmaceutical and biotechnology industries. It is available in a number of standard sizes and meets the stringent hygiene standard imposed both by control authorities and industry.

The Pharma-line S is available in 21 models, all with U-tube designs that suit most applications.

Within the product range Pharma-line there are 2 series available:
Pharma-line S - Standard design
Pharma-line P - Standard design and a custom design available on request

Installation
The movable legs facilitate flexible positioning. The Pharma-line S can be installed either horizontally or vertically, depending on the specific demands. For an easy installation, lifting lugs are fastened on the units.

TECHNICAL DATA

Heat transfer area:	0.1 m^2 – 4 m^2
Design temperature:	-10°C -150°C
Design pressure:	FV/10 barg
Pressure vessel codes:	PED. Chinese TSG and manufacturing license available
Welding:	according to SS-EN-IOS 15614-1, EN 287-1, EN-1418 ASME IX
Surface finish product wetted parts:	Mechanically polished with Ra<0.5 µm. and Electropolish with Ra<0.4 µm

Options:
- Insulation Mineral wool (ASTM C795) with stainless steel 304 cladding

Hygienic design

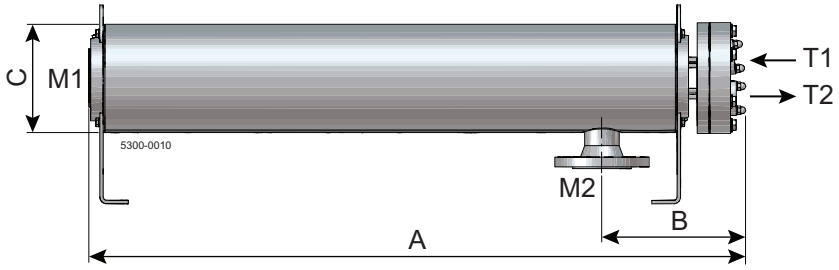
The Pharma-line S has no dead legs and is fully drainable on the product side. All product wetted parts in Pharma-line S are either mechanically or electropolished. The Pharma-line S tubes are seamless and U-tubes are bent to a larger radius than required in ASME BPE. The Pharma-line S is easy to clean and can be steam sterilized. Gaskets come with a USP class VI certificate and are in compliance with FDA.

Documentation

The Pharma-line is delivered along with Alfa Laval Q-Doc including:
- Approved drawings and calculations signed by Notified body
- List of welders, welding procedure and welder qualification
- 3.1 Material certificates, pressure and product wetted steel parts
- FDA compliance and USP class VI certificates, gaskets
- Liquid penetrant test report and procedure
- Surface roughness certificate
- Dimension control report
- Pressure test certificate, signed by Notified body
- Identification (technical sign)
- Quality system certificate
- CE-Documents

Standard units, measurements (approximate) [mm]

Type	Shell OD (mm)	Nozzles size Tube	Nozzle size flange	A	B	C
Pharma-line S 1 [mm]						
Pharma-line S 1 - 0.1	76	1"	DN50	1150	225	195
Pharma-line S 1 - 0.3	89	1"	DN50	1150	225	195
Pharma-line S 1 - 0.4	101	1"	DN50	1150	225	195
Pharma-line S 1 - 0.6	114	1 1/2"	DN50	1150	230	195
Pharma-line S 1 - 0.7	141	2"	DN80	1150	260	245
Pharma-line S 1 - 1.1	141	2"	DN80	1150	260	245
Pharma-line S 1 - 1.2	168	2"	DN80	1150	260	245
Pharma-line S 2 [mm]						
Pharma-line S 2 - 0.3	76	1"	DN50	2150	225	195
Pharma-line S 2 - 0.6	89	1"	DN50	2150	225	195
Pharma-line S 2 - 1.0	101	1"	DN50	2150	225	195
Pharma-line S 2 - 1.3	114	1 1/2"	DN50	2150	230	195
Pharma-line S 2 - 1.4	141	2"	DN80	2150	260	245
Pharma-line S 2 - 2.4	141	2"	DN80	2150	260	245
Pharma-line S 2 - 2.6	168	2"	DN80	2150	260	245
Pharma-line S 3 [mm]						
Pharma-line S 3 - 0.4	76	1"	DN50	3150	225	195
Pharma-line S 3 - 1.0	89	1"	DN50	3150	225	195
Pharma-line S 3 - 1.6	101	1"	DN50	3150	225	195
Pharma-line S 3 - 2.0	114	1 1/2"	DN50	3150	230	195
Pharma-line S 3 - 2.2	141	2"	DN80	3150	260	245
Pharma-line S 3 - 3.7	141	2"	DN80	3150	260	245
Pharma-line S 3 - 4.0	168	2"	DN80	3150	260	245



Nozzle schedule

Item	Service	Facing	Standard and dimension
T1	Tube inlet	NAC plate for Tri-clamp	Suitable for ASME BPE
T2	Tube outlet	NAC plate for Tri-clamp	Suitable for ASME BPE
M1	Shell inlet	Weld neck flange	DIN2635/EN1092-1
M2	Shell outlet	Weld neck flange	DIN2635/EN1092-1

Authorized Distributor

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