1.4

Pharma-X

Sanitary tube-in-tube heat exchanger

In the pharmaceutical industry today there is a requirement for a high quality sanitary heat exchanger for point of use cooling with no risk of contamination between the product and the cooling media. Our Pharma-X tube in tube heat exchanger has been developed especially to meet this need.

Areas of application
There are many areas of application for the Pharma-X heat exchanger including:

- Point of use cooling on WFI (Water For Injection) ring mains.
- Cooling/heating of pure water in pharmaceutical industry.
- Cooling/heating of distilled water/WFI for processing equipment.

No risk of contamination
The design of the Pharma-X heat exchanger is such that it completely overcomes the possibility of cross contamination between the product and the cooling/heating media associated with conventional heat exchangers.

Another advantage of the Pharma-X heat exchanger is that there are no parallel flow channels on the product side, and there are no dead legs. This gives you full control over the flow of the product. The heat exchanger can be considered as part of a distribution system. In the stand-by mode the product can be kept circulating through the heat exchanger thus avoiding contamination when not in use.

Unique tube-in-tube design
The Pharma-X heat exchanger is made up of three tubes placed within each other. The product is in the centre tube with the heating or cooling media in the inner and outer tube. The three tubes are bent as one through 180 degrees to form a “U” bend. This provides a compact design with optimum space utilisation.

The thermal expansion is taken up by the bend, which makes this heat exchanger very suitable for extreme temperature differences in heating and cooling applications and for steam sterilisation.

A unique spiral is used to aid uniform spacing of the tubes, eliminate laminar flow of the fluid and increase the efficiency of the heat exchanger.

The Pharma-X heat exchanger is available in four standard sizes with 1.0 and 1.5 m total length which gives an effective tube length of 2 and 3 m and with single or double tube configuration. Non-standard sizes can be made depending on application and flow rates.

Low cost of operation and maintenance
In the Pharma-X heat exchanger, heat transfer is extremely efficient due to the product cooling/heating on both sides. This increases the speed of heat transfer and it has been found that the time delay for the temperature to stabilise can be as little as 15 seconds.

The Pharma-X heat exchanger is virtually maintenance free with no gaskets to renew thus saving valuable downtime of the system.

Special features

- No internal welds.
- Fully pressure tested on all channels.
- Complete protection against cooling/heating media leaking into the product.
- Easy to steam in place.
- Drainable on product side.
- Low maintenance costs.
- Insulation and stainless steel cladding can be provided.

Optional equipment

Complete module including insulation, cladding, valves and pitot tube arrangement.

Fig 2. Installation of a Pharma-X module as a point of use cooler at AstraZeneca, Södertälje, Sweden.

Technical data

Max flow rate	1,8 m^3/h
Connections	Tri-clamp, metric or ANSI dimensions
Material	316 L stainless steel
Surface finish, product wetted parts	Ra < 0,5 µm
Welding according to EN 287/EN 288	

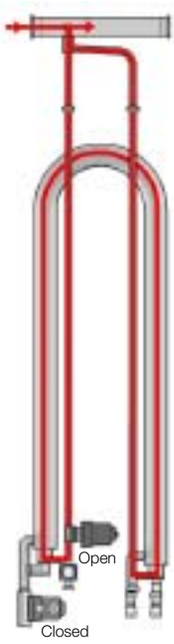

Fig 2. No cooling
The product flows continuously through the heat exchanger to prevent bacterial growth.

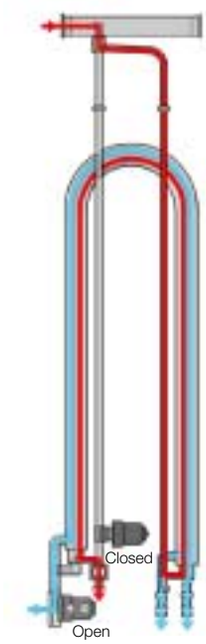

Fig 3. Cooling
When the valve is closed, the product is forced in the opposite direction thus preventing cold product coming out in the loop.

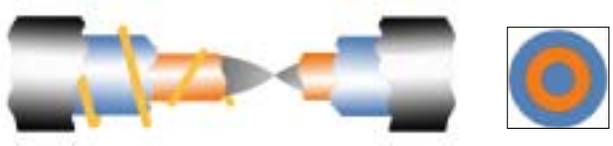

Fig 4. The unique tube-in-tube design.The orange areas show the product flow channel. These surfaces are electropolished.

Fig 5. Pitot tube for the connection to the water ring main.