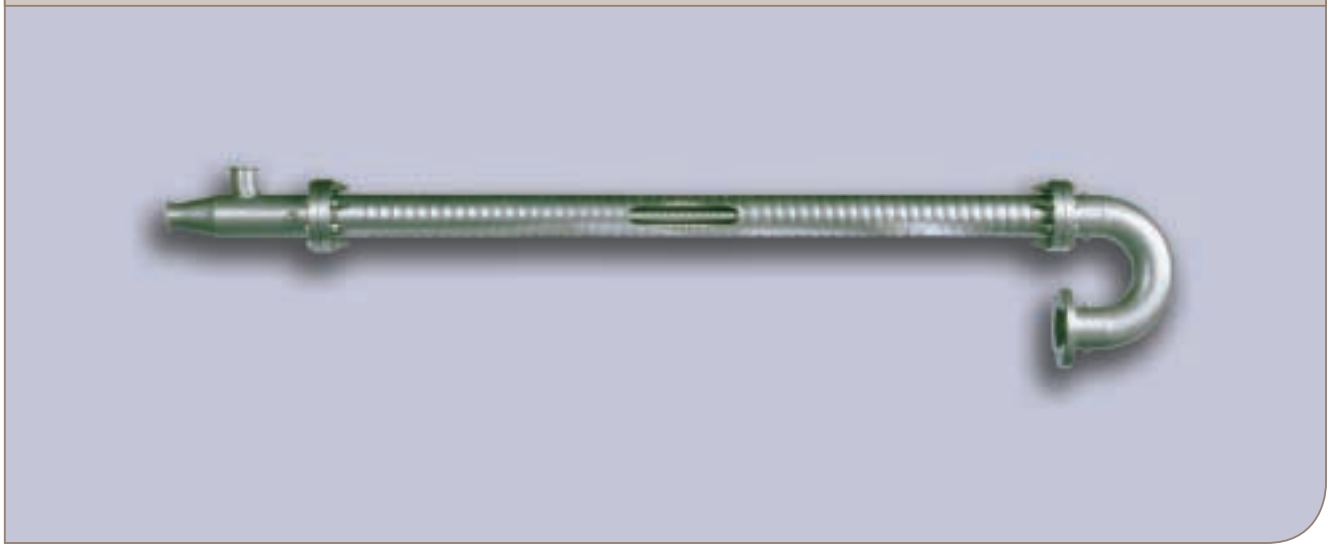
ViscoLine™ Regenerator Unit

The tubular heat exchanger series from Alfa Laval



ViscoLine Regenerator with open sectional view

Applications

The ViscoLine™ Regenerator unit is designed for product-to-product heat exchange (recovery). This regenerator is ideal for the heating, cooling and pasteurisation of products with low viscosity, and products that contain fibres and small particulates.

These units are most commonly used for low viscous products such as fruit juices.

Standard design

The ViscoLine Regenerator unit consists of a removable bundle of tubes mounted inside an outer shell, and welded onto tube plates at both ends. The sterilized product flows inside the bundled tubes, and the non-sterilized product outside, in counter-current flow. All tubes are connected in parallel.

The ViscoLine Regenerator unit is provided with specially designed double 180° elbows for processing pulpy juices. The tube plates have a conical tube hole to ease the flow of the product inside the tubes. Tubes are welded and roller expanded into the tube sheets. If required, these product tubes can feature a corrugated surface, either hard or dimpled. The service media shell is hard corrugated.

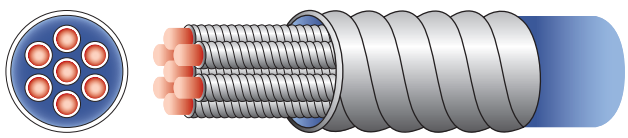
ViscoLine Regenerator modules are normally connected in series and grouped on a common frame.

The only spare parts needed are the O-rings in the header.

Standard materials

Product side (tubes)	Stainless steel AISI 316L or SMO254
Product side (shell)	Stainless steel AISI 316L or SMO254
Frame	Stainless steel AISI 304 (units can be angled for self-draining on request)

Other materials are available on request.



Graphic representation of the flow pattern in the ViscoLine Regenerator Unit.

Technical data

Mechanical design pressure
The ViscoLine Regenerator unit was designed for a pressure of 16 bar (232 PSI), depending on the connection. The unit can, however, accommodate higher-pressure ratings, depending on component thickness and connection type.

The ViscoLine Regenerator unit complies with the European Pressure Equipment Directive (PED), and is entitled to bear the CE mark, though depending on the design of the connections.

It is designed to operate at a temperature of 140°C (284°F).

Connections
ISO clamps, aseptic ISO clamps, sterile flanges, TRI-Clamps and ANSI flanges. The regenerator is in compliance with DIN 11851.
Other connections are available on request.

Tube plate
The tube plate was specially designed to minimize any clogging that might arise due to the processing of products that contain fibres, particles and particulates.

Tubes are welded and roller expanded into the tube plates

Options
A number of additional features are available for use with the ViscoLine Regenerator unit:
- Seamless inner tubes
- Protection sheets
- Thermal insulation

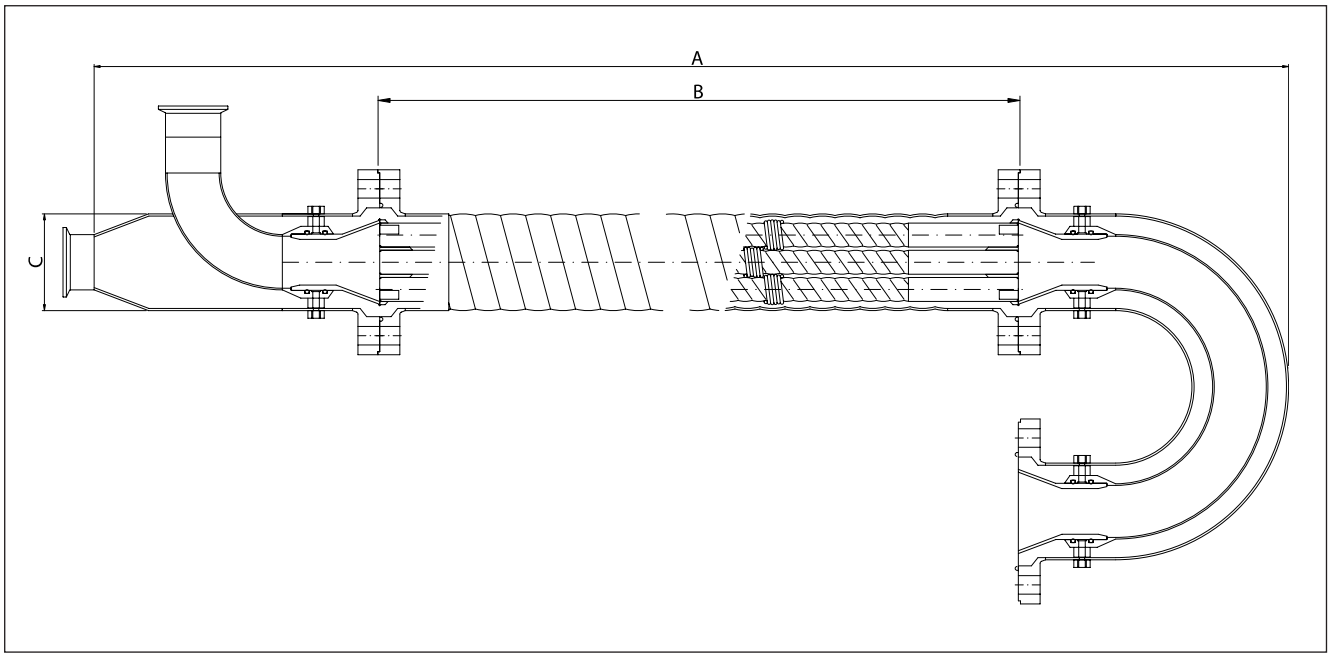
Designation
VLR12x25/140-6.0-316L/316L-H or D

VLR:	ViscoLine Regenerator
12:	number of product tubes
25:	outer diameter of product tubes
140:	outer diameter of product shell
6.0:	module length (m)
316L:	material product side (tube)
316L:	material product side (shell)
H:	tubes are hard corrugated
D:	tubes are dimple corrugated

Type	No. of tubes	Tube Ø mm	(inches)	Shell Ø mm	(inches)	Module length m	(inches)	Volume tubes litres	(US gallons)	Heat transfer area m^2	(ft^2)
VLR3x20/63-3,0	3	20	(0.79)	63	(2.5)	3.0	(118)	2.3	(0.61)	0.57	(6.10)
VLR3x20/63-6,0	3	20	(0.79)	63	(2.5)	6.0	(236)	4.6	(1.21)	1.13	(12.2)
VLR4x18/63-3,0	4	18	(0.71)	63	(2.5)	3.0	(118)	2.4	(0.63)	0.68	(7.33)
VLR4x18/63-6,0	4	18	(0.71)	63	(2.5)	6.0	(236)	4.8	(1.27)	1.36	(14.6)
VLR4x22/76-3,0	4	22	(0.87)	76	(3.0)	3.0	(118)	3.7	(0.98)	0.83	(8.95)
VLR4x22/76-6,0	4	22	(0.87)	76	(3.0)	6.0	(236)	7.5	(1.98)	1.66	(17.9)
VLR7x16/76-3,0	7	16	(0.63)	76	(3.0)	3.0	(118)	3.2	(0.84)	1.06	(11.4)
VLR7x16/76-6,0	7	16	(0.63)	76	(3.0)	6.0	(236)	6.4	(1.69)	2.11	(22.8)
VLR4x25/89-3,0	4	25	(0.98)	89	(3.5)	3.0	(118)	5.0	(1.32)	0.94	(10.2)
VLR4x25/89-6,0	4	25	(0.98)	89	(3.5)	6.0	(236)	10.0	(2.64)	1.89	(20.4)
VLR7x20/89-3,0	7	20	(0.79)	89	(3.5)	3.0	(118)	5.3	(1.40)	1.32	(14.2)
VLR7x20/89-6,0	7	20	(0.79)	89	(3.5)	6.0	(236)	10.6	(2.80)	2.64	(28.5)
VLR3x33/104-3,0	3	33	(1.30)	104	(4.1)	3.0	(118)	6.8	(1.80)	0.93	(10.1)
VLR3x33/104-6,0	3	33	(1.30)	104	(4.1)	6.0	(236)	13.6	(3.59)	1.87	(20.2)
VLR7x25/104-3,0	7	25	(0.98)	104	(4.1)	3.0	(118)	8.7	(2.30)	1.65	(17.8)
VLR7x25/104-6,0	7	25	(0.98)	104	(4.1)	6.0	(236)	17.4	(4.59)	3.30	(35.6)
VLR4x33/114-3,0	4	33	(1.30)	114	(4.5)	3.0	(118)	9.0	(2.38)	1.24	(13.4)
VLR4x33/114-6,0	4	33	(1.30)	114	(4.5)	6.0	(236)	18.1	(4.78)	2.49	(26.9)
VLR7x28/114-3,0	7	28	(1.10)	114	(4.5)	3.0	(118)	10.3	(2.72)	1.85	(19.9)
VLR7x28/114-6,0	7	28	(1.10)	114	(4.5)	6.0	(236)	20.6	(5.44)	3.69	(39.9)
VLR7x33/129-3,0	7	33	(1.30)	129	(5.1)	3.0	(118)	14.8	(3.91)	2.18	(23.5)
VLR7x33/129-6,0	7	33	(1.30)	129	(5.1)	6.0	(236)	29.6	(7.81)	4.35	(47.0)
VLR12x22/129-3,0	12	22	(0.87)	129	(5.1)	3.0	(118)	11.3	(2.98)	2.49	(26.9)
VLR12x22/129-6,0	12	22	(0.87)	129	(5.1)	6.0	(236)	22.6	(5.97)	4.98	(53.7)
VLR12x25/140-3,0	12	25	(0.98)	140	(5.5)	3.0	(118)	14.9	(3.93)	2.83	(30.5)
VLR12x25/140-6,0	12	25	(0.98)	140	(5.5)	6.0	(236)	29.8	(7.87)	5.65	(61.1)
VLR12x28/154-3,0	12	28	(1.10)	154	(6.1)	3.0	(118)	19.1	(5.04)	3.17	(34.2)
VLR12x28/154-6,0	12	28	(1.10)	154	(6.1)	6.0	(236)	38.2	(10.08)	6.33	(68.4)

Measurements in mm (inches)

	A		B		C	
Type	mm	(inches)	mm	(inches)	mm	(inches)
VLR3x20/63-3,0	3065	(120,7)	2925	(115,2)	63.5	(2,50)
VLR3x20/63-6,0	6065	(238,8)	5925	(233,3)	63.5	(2,50)
VLR4x18/63-3,0	3065	(120,7)	2925	(115,2)	63.5	(2,50)
VLR4x18/63-6,0	6065	(238,8)	5925	(233,3)	63.5	(2,50)
VLR4x22/76-3,0	3065	(120,7)	2925	(115,2)	76.2	(3,00)
VLR4x22/76-6,0	6065	(238,8)	5925	(233,3)	76.2	(3,00)
VLR7x16/76-3,0	3065	(120,7)	2925	(115,2)	76.2	(3,00)
VLR7x16/76-6,0	6065	(238,8)	5925	(233,3)	76.2	(3,00)
VLR4x25/89-3,0	3065	(120,7)	2925	(115,2)	88.9	(3,50)
VLR4x25/89-6,0	6065	(238,8)	5925	(233,3)	88.9	(3,50)
VLR7x20/89-3,0	3065	(120,7)	2925	(115,2)	88.9	(3,50)
VLR7x20/89-6,0	6065	(238,8)	5925	(233,3)	88.9	(3,50)
VLR3x33/104-3,0	3065	(120,7)	2925	(115,2)	104.0	(4,09)
VLR3x33/104-6,0	6065	(238,8)	5925	(233,3)	104.0	(4,09)
VLR7x25/104-3,0	3065	(120,7)	2925	(115,2)	104.0	(4,09)
VLR7x25/104-6,0	6065	(238,8)	5925	(233,3)	104.0	(4,09)
VLR4x33/114-3,0	3065	(120,7)	2925	(115,2)	114.3	(4,50)
VLR4x33/114-6,0	6065	(238,8)	5925	(233,3)	114.3	(4,50)
VLR7x28/114-3,0	3065	(120,7)	2925	(115,2)	114.3	(4,50)
VLR7x28/114-6,0	6065	(238,8)	5925	(233,3)	114.3	(4,50)
VLR7x33/129-3,0	3065	(120,7)	2925	(115,2)	129.0	(5,08)
VLR7x33/129-6,0	6065	(238,8)	5925	(233,3)	129.0	(5,08)
VLR12x22/129-3,0	3065	(120,7)	2925	(115,2)	129.0	(5,08)
VLR12x22/129-6,0	6065	(238,8)	5925	(233,3)	129.0	(5,08)
VLR12x25/140-3,0	3065	(120,7)	2925	(115,2)	139.7	(5,50)
VLR12x25/140-6,0	6065	(238,8)	5925	(233,3)	139.7	(5,50)
VLR12x28/154-3,0	3065	(120,7)	2925	(115,2)	154.0	(6,06)
VLR12x28/154-6,0	6065	(238,8)	5925	(233,3)	154.0	(6,06)



How to contact Alfa Laval
Up-to-date Alfa Laval contact details for all countries are always available on our website at www.alfalaval.com