



VEP and VES Turflow Heat Exchangers

Description

The Turflow heat exchanger range is a shell & tube design consisting of straight corrugated tubes within a shell. The tubes are secured at either end of the shell by fixed tube sheets. The corrugated tube design promotes increased turbulent flow conditions to provide the Turflow's high heat transfer efficiency. The shell incorporates a bellows type expansion joint that ensures thermal stress does not damage the heat exchanger. The shell is also fitted with drain and vent connections. The heat exchanger is a gasket free design constructed wholly from stainless steel. Normally the heated fluid will flow through the tubes and the heating medium will be in the shell; both countercurrent and concurrent flow paths can be accommodated, inclusive of horizontal or vertical installation.



Standards

Turflow type heat exchangers fully comply with the requirements of the Pressure Equipment Directive 2014/68/EU and carry the **CE** mark when so required. All units are supplied with a Declaration of Conformity.

Certification

A manufacturer's Hydraulic Test Report and Material Certification documentation is available on request.

Note: All certification/inspection requirements must be stated at the time of order placement.

Pressure/temperature limits

PMA Shell/Tube side	-10 °C to 200 °C	12 bar g
	200 °C to 300 °C This option is to be specified at the time of order placement.	6 bar g
TMA Shell/Tube side	12 bar g	-10 °C to 200 °C
	6 bar g This option is to be specified at the time of order placement.	200 °C to 300 °C
Cold hydraulic test pressure		21 bar g with design limit to 12 bar g
		10,5 bar g with design limit to 6 bar g

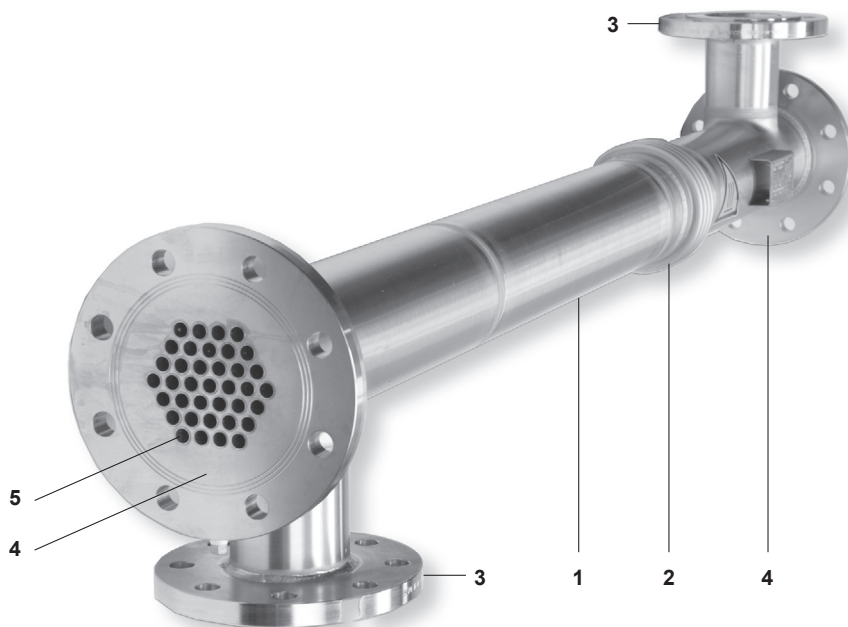
Turflow type heat exchangers

The **VEP** design is fitted with small diameter tubes.

The **VES** design is fitted with large diameter tubes.

Please contact Spirax Sarco for advice regarding selection – The most suitable unit will be selected by Spirax Sarco and will be specific for the given application.

Materials



No.	Part	Material		
1	Shell		Stainless steel	ASTM A312 – TP304
2	Expansion joint		Stainless steel	ASTM A240 – TP321
3	Shell side flanges		Stainless steel	ASTM A182 F304
4	Tube sheets/tube side flanges (Different options available according to the specific model)	SX	Stainless steel 316	ASTM A182 F316
		SS	Stainless steel 304	ASTM A182 F304
5	Corrugated tubes (Different options available according to the specific model)	SX	Stainless steel 316	ASTM A249-TP316L
		SS	Stainless steel 304	ASTM A249-TP304

Sizes and end connections

Type	Shell length (metres)	Shell Ø	Connections
VEP	0.6, 1, 1.5 and 2 *	1½", 2", 3" 4", 5", 6", 8" and 10"	Flanged EN 1092 PN16 or ASME B16.5 Class 150
VES	1, 2 and 3	2", 3" 4", 5", 6", 8" and 10"	Flanged EN 1092 PN16 or ASME B16.5 Class 150

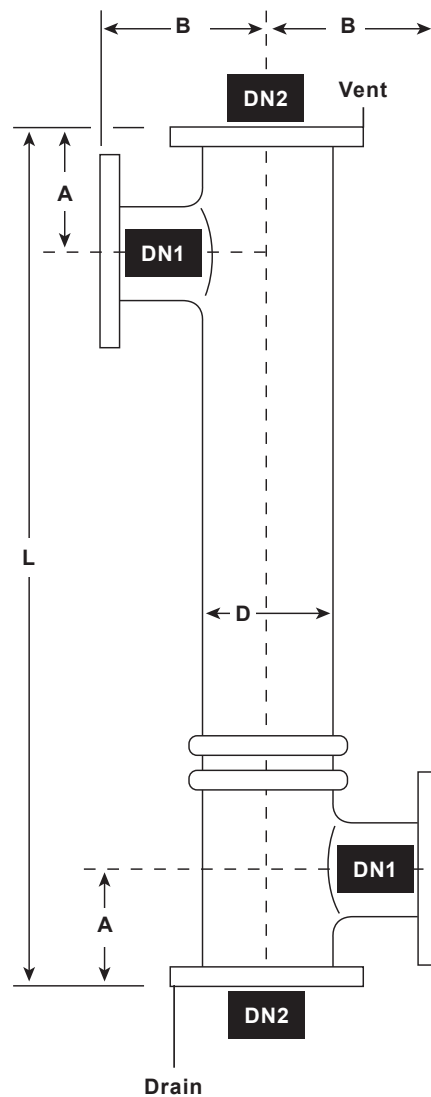
* **Note** 0.6 and 1.5 shell lengths are not available for shell diameters 5" to 10".

Dimensions for shell size 1½" and 2" (approximate) in mm

							VEP				VES			
Shell Ø	Flange		Dimensions				Weight	Volume		PED Cat.	Weight	Volume		PED Cat.
	DN1	DN2	A	B	D	L		Tube	Shell			Tube	Shell	
1½"	DN32	DN40	94	140	48.3	600	11.2	0.21	0.84	SEP	-	-	-	-
						1000	12.4	0.35	1.28	SEP	-	-	-	-
						1500	14	0.53	1.85	SEP	-	-	-	-
						2000	15.5	0.71	2.42	SEP	-	-	-	-
2"	DN40	DN50	90	140	60.3	600	13.9	0.46	1.18	SEP	-	-	-	-
						1000	15.8	0.76	1.81	SEP	15	0.85	1.86	SEP
						1500	18.2	1.15	2.59	SEP	-	-	-	-
						2000	20.5	1.53	3.88	SEP	19	1.69	3.42	SEP
						3000	-	-	-	-	22.9	2.54	4.98	I

Table notes:

- Dimension tolerance:
 A = ± 3 mm,
 B = ± 3 mm,
 L = ± 6 mm,
 Flange rotation = ± 1°,
 Connection alignment = ± 3 mm.
- Flange sizes according to EN 1092-1 rating PN16, optional equivalent diameter according to ASME B16.5 rating 150 lb.
- PED categorisation Group 2 according to the classification as per the Pressure Equipment Directive 2014/68/EU.

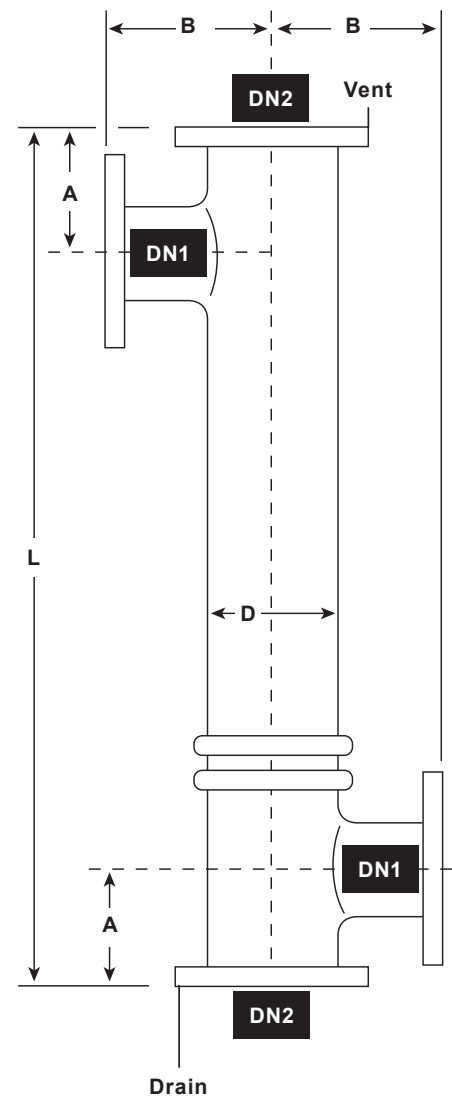


Dimensions for shell size 3" and 4" (approximate) in mm

							VEP				VES			
Shell Ø	Flange		Dimensions				Weight	Volume		PED Cat.	Weight	Volume		PED Cat.
	DN1	DN2	A	B	D	L		Tube	Shell			Tube	Shell	
3"	DN65	DN80	110	160	88.9	600	19.7	1.07	2.63	SEP	-	-	-	-
						1000	22.5	1.79	3.95	SEP	23.9	2.0	4.3	I
						1500	25.9	2.67	5.63	I	-	-	-	-
						2000	29.3	3.57	7.24	I	32.1	3.9	7.7	I
						3000	-	-	-	-	40.3	5.9	11.1	I
4"	DN80	DN100	125	180	114.3	600	28.3	1.88	4.15	SEP	-	-	-	-
						1000	35.3	3.14	6.25	I	32.3	3.7	6.4	I
						1500	44.1	4.71	8.88	I	-	-	-	-
						2000	52.8	6.28	10.5	I	46.9	7.4	11.4	I
						3000	-	-	-	-	61.5	11.1	16.4	I

Table notes:

- Dimension tolerance:
 A = ± 3 mm,
 B = ± 3 mm,
 L = ± 6 mm,
 Flange rotation = ± 1°,
 Connection alignment = ± 3 mm.
- Flange sizes according to EN 1092-1 rating PN16, optional equivalent diameter according to ASME B16.5 rating 150 lb.
- PED categorisation assuming a 'not dangerous fluid', Group 2 according to the classification as per the Pressure Equipment Directive 2014/68/EU.

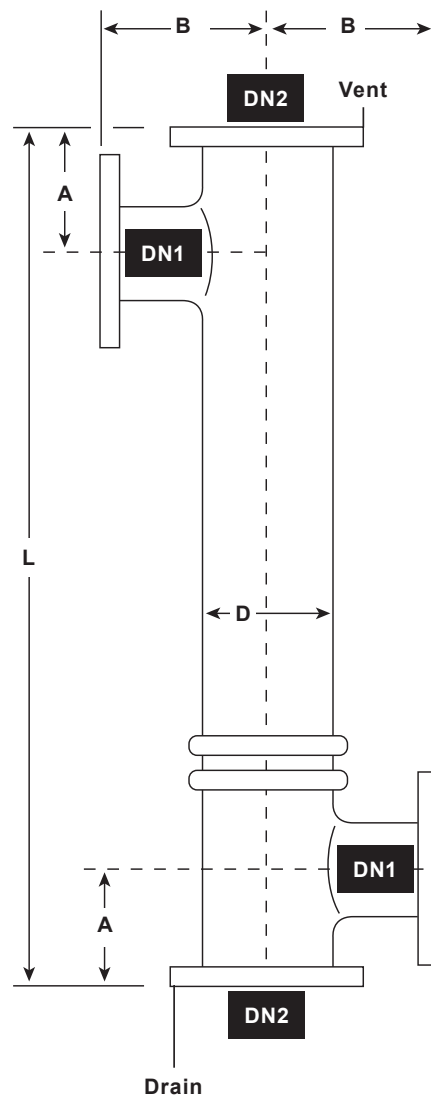


Dimensions for shell size 5" to 10" (approximate) in mm

							VEP				VES				
Shell Ø	Flange		Dimensions				Weight	Volume		PED Cat.	Weight	Volume		PED Cat.	
	DN1	DN2	A	B	D	L		Tube	Shell			Tube	Shell		
5"	DN80	DN125	125	200	141.3	1000	49	5.18	8.5	I	43.7	5.9	9.0	I	
							2000	77.6	10.36	16.07	I	67	11.7	16.6	I
							3000	-	-	-	-	90.3	17.6	24.2	II
6"	DN100	DN150	140	220	168.3	1000	67.7	7.73	11.88	I	58.7	8.1	13.4	I	
						2000	106.9	15.45	22.06	II	88.6	16.1	24.5	II	
						3000	-	-	-	-	118.5	24.1	35.6	II	
8"	DN125	DN200	160	250	219.1	1000	103.3	12.7	18.74	II	86	13.3	23.2	II	
						2000	168.9	25.6	35.5	II	132	26.5	42.8	II	
						3000	-	-	-	-	178.4	39.7	62.5	II	
10"	DN150	DN250	180	280	273.0	1000	171	20.2	29.1	II	142.2	19.3	35.6	II	
						2000	270.5	40.5	55	II	209.5	38.5	67.5	II	
						3000	-	-	-	-	276.7	57.7	99.3	III	

Table notes:

- Dimension tolerance:
 A = ± 3 mm,
 B = ± 3 mm,
 L = ± 6 mm,
 Flange rotation = ± 1°,
 Connection alignment = ± 3 mm.
- Flange sizes according to EN 1092-1 rating PN16, optional equivalent diameter according to ASME B16.5 rating 150 lb.
- PED categorisation assuming a 'not dangerous fluid', Group 2 according to the classification as per the Pressure Equipment Directive 2014/68/EU.



Product nomenclature

Turflow type	VEP = Small diameter tubes	VES
	VES = Large diameter tubes	
Shell diameter	1½", 2", 3", 4", 5", 6", 8", 10" = VEP range in inches	2"
	2", 3", 4", 5", 6", 8", 10" = VES range in inches	
Tube and tube sheet material	SS = Stainless steel AISI 304	SX
	SX = Stainless steel AISI 316	
Tube length	0.6, 1, 1.5, 2 = VEP range in metres	3
	1, 2, 3 = VES range in metres	
Connection type	F = UNI 2278/2229 PN16 flanges	FE
	FE = EN1092-1 PN16 flanges	
	FA = ASME B16.5 Classe 150 flanges	
Mechanical code	Empty = VSR	E
	E = EN13445	
	A* = ASME VIII Div.1	
Shell design pressure	V = 12 barg	V
	Empty* = Other	
Tube to tube sheet coupling	Empty = Expanding	S
	S = Welding	
PED category	Empty = CE marking not supplied	CI
	CI = Category I	
	CII = Category II	
	CIII = Category III	

* Option not standard - available on request

Product selection example	VES	2"	SX	3	FE	E	V	S	CI
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How to order

Contact your local Spirax Sarco office with your application details - We will provide the correct product selection, and quotation for the Turflow exchanger that will provide optimum performance for your application.