



Technical Catalogue



FDF Series

Liquid ring vacuum pumps

With motor carrier design FDL

Liquid ring vacuum pumps

In close coupled design FDF

FDF 25, 50, 90, 125, 150, 250, 325, 425

Rev2.0

PRESSURE RANGE: 33 – 1013 mbar

SUCTION VOLUME: 24 - 470 m³/h



FDF

CONSTRUCTION TYPE

FDF liquid ring vacuum pumps are displacement pumps of uncomplicated and robust construction with the following particular features:

- nearly isothermal compression
- oil-free, as no lubrication in the working chamber therefore non-polluting
- Capable of handling of nearly all gases and vapours
- small quantities of entrained liquid can be handled
- easy maintenance and reliable operation
- low noise and nearly free from vibration
- wide choice of materials, therefore applicable nearly everywhere
- shaft not in contact with the medium
- protection against cavitation as standard
- incorporated dirt drain
- no metallic contact of the rotating parts
- FDF liquid ring vacuum pumps are single-stage

NOTE

During operation the pump must be supplied continuously with service liquid, normally water, in order to eliminate the heat resulting from the gas compression and to replenish the liquid ring, because part of the liquid is leaving the pump together with the gas. This liquid can be separated from the gas in a liquid separator (see last page) and reused.

The pumps are equipped with a connection through which the contaminated service liquid can be drained continuously during operation (dirt drain), if necessary.

The direction of rotation is clockwise, when looking from the motor towards the pump.

APPLICATION

Handling and exhausting of dry and humid gases; entrained liquid can be handled during normal duty. The pumps are applied in all fields where a pressure of 33 to 900 mbar must be generated.

GENERAL TECHNICAL DATA

Pump type		Unit	FDF25	FDF50	FDF90	FDF125	FDF150	FDF250	FDF325	FDF425
Synchronous speed	50 Hz 60 HZ	rpm	3000 3500		1500 1750					
Max. compression over atmospheric pressure		bar	0.3							
Max. admissible pressure difference		bar	1.1							
Test pressure above atmospheric pressure		bar	1		3					
Moment of inertia of the rotating pump parts and water filling		kg· m²	0.003	0.0095	0.035	0.053	0.069	0.097	0.14	0.21
Noise level at a suction pressure of 80 mbar		dB (A)	68	69	72				76	78
Max. gas temperature	Dry gas	°C	200							
	Saturated gas	°C	100							
Service liquid max. recommended temperature for water as working liquid		°C	40							
max. admissible temperature for other suitable working liquids		°C	80							
max. kinematic viscosity		mm²/s	4							
max. density		kg/m³	1200							
volume up to shaft level		liter	0.3	0.4	2.4	2.8	3.2	4.0	4.2	4.7

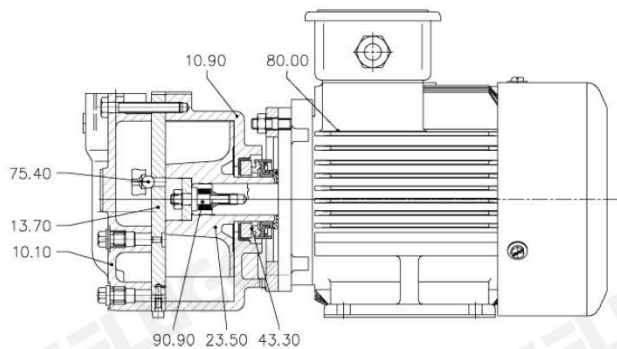
The combination of several limiting values is not admissible.

Material design

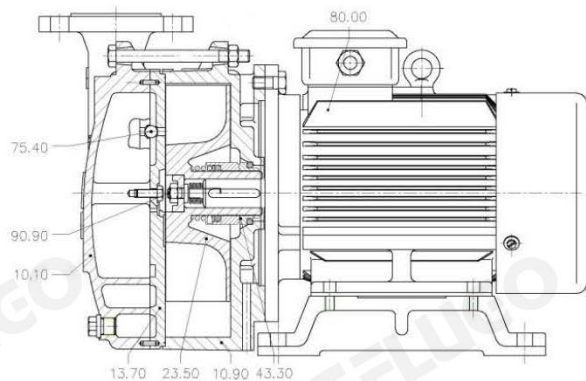
Material Design		C250S304SM	S304S304SM	S316S316SM
Pump Type	FDF25,50	√	√	√
	FDF90,125,150	√	√	√
	FDF250	√	√	√
	FDF325,425	√	√	√
Item	Component	Material		
10.10	Casing	HT200	HT200	316
10.90	Central body	HT250	HT250	316
13.70	Guide disc	HT200	HT200	316
23.50	Vane wheel impeller	304	304	316
43.30	Mechanical seal	Moving ring material: Standard A-graphite Static ring material: Standard S-silicon carbide Rubber material: Standard F-fluororubber Springs and other metal material: Standard S304		
		Optional material F1-fluorine rubber wrapped with polytetrafluoroethylene Optional material S316		

Sectional drawings

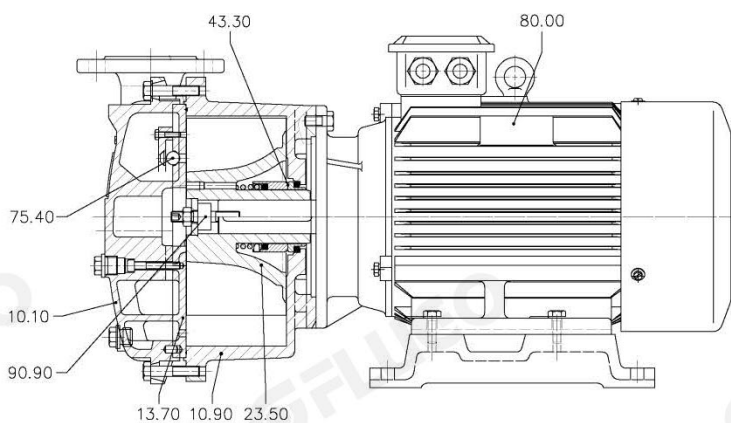
FDF 25, FDF 50



FDF 90, FDF 125, FDF 150



FDF 250



10.10	Casing
13.70	Guide disc
10.90	Central body
23.50	Vane wheel impeller
80.00	Motor
43.30	Mechanical seal
75.40	Valve balls
90.90	Adjust screw

FDF 325, FDF 425

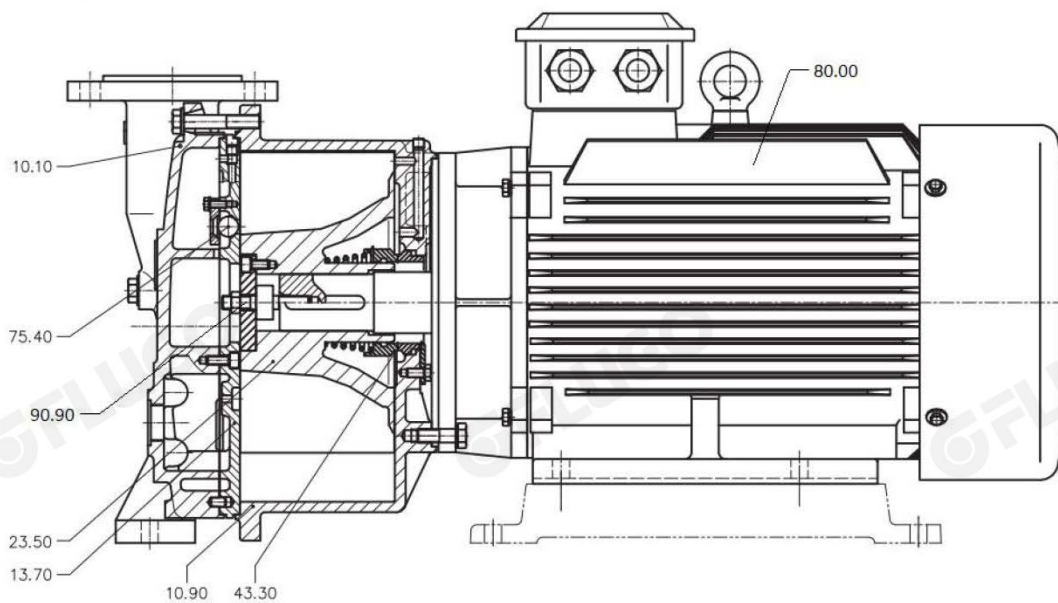
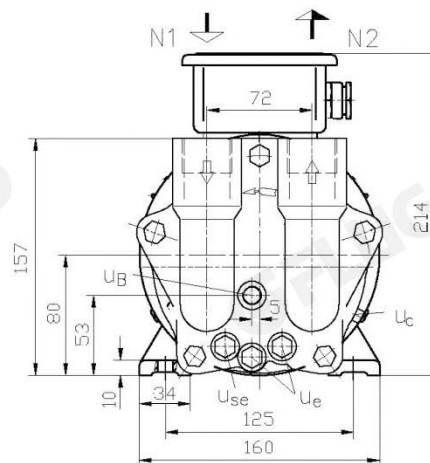
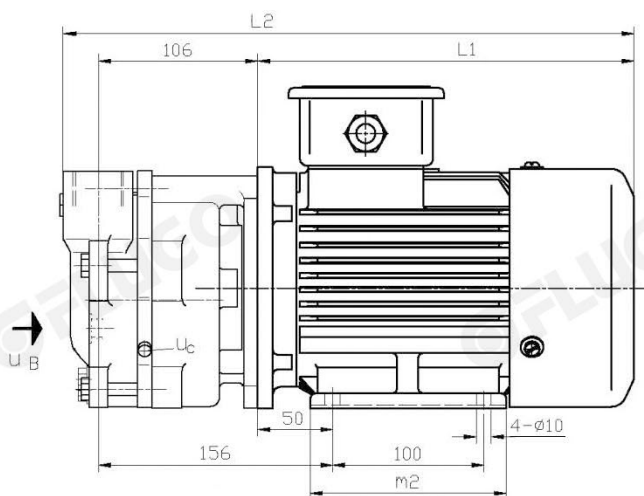


Table of Dimensions and weights

Dimensions and weights are valid for standard motors

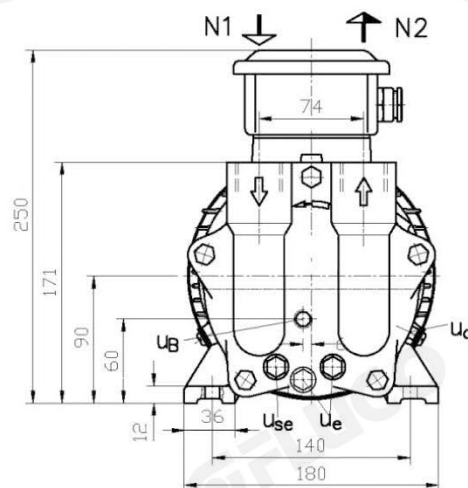
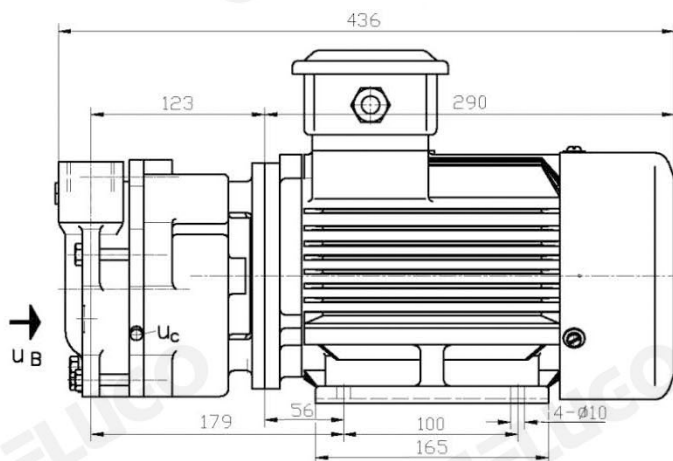
FDF25



Pump	Electric motor IP55,2P		L1	L2	m2	Approx weight Kg	
	size	Kw				Motor	Pump+ Motor
FDF25	80M1	0.75	251	380	130	14	23.5
	80M2	1.1	265	395	130	15	24.5

- N 1 = gas inlet G 1
- N 2 = gas outlet G 1
- U_B = connection for service liquid G ¼
- U_c = connection for protection against cavitation M5
- U_e = drain connection G ¼
- U_{se} = connection for dirt drain G ¼

FDF50

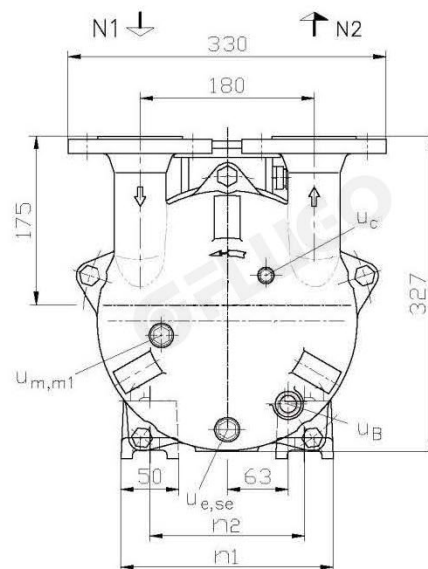
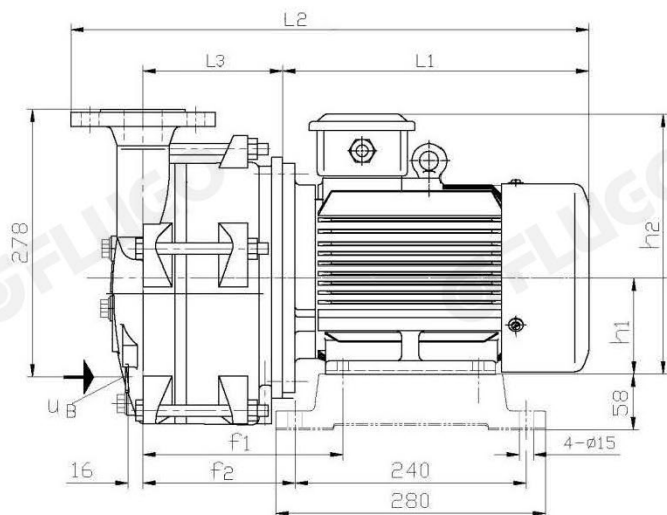


Pump	Electric motor IP55,2P		Motor	Pump+ Motor
	size	Kw		
FDF 50	90S-2	1.5	20	30
	90L-2	2.2	23	33

- N 1 = gas inlet G 1
- N 2 = gas outlet G 1
- U_B = connection for service liquid G ¼
- U_c = connection for protection against cavitation M5
- U_e = drain connection G ¼
- U_{se} = connection for dirt drain G

Table of Dimensions and weights

Dimensions and weights are valid for standard motors used by eifel Pumps (Fuzhou)

FDF90, FDF125, FDF150


N 1 = gas inlet DN 40

N 2 = gas outlet DN 40

u_B = connection for service liquid G $\frac{1}{2}$

u_c = connection for protection against cavitation G $\frac{1}{4}$

u_e = drain connection G $\frac{3}{8}$

u_{se} = Connection for dirt drain G $\frac{3}{8}$

u_m = connection for pressure gauge G $\frac{3}{8}$

u_{m1} = connection for drain valve G $\frac{3}{8}$

Pump	motor IP55,50Hz,4P		h1	h2	f1	f2	n1	n2	L1	L2	L3	Approx weight Kg	
	Size	Kw										Motor	Pump+ Motor
FDF 90	100L1	2.2	100	270	199	149	210	160	318	529	136	31	70.2
	100L2	3.0	100	270	199	149	210	160	318	529	136	36	75.4
FDF 125	100L2	3.0	100	270	208	158	210	160	318	538	145	36	78.2
	112M	4.0	112	295	225	165	236	190	340	560	145	41	84.8
FDF 150	112M	4.0	112	295	225	175	236	190	340	577	162	41	89
	112M	4.8	112	295	225	175	236	190	340	577	162	43	91

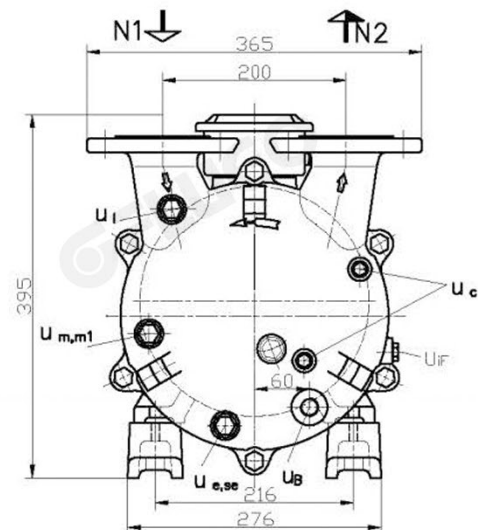
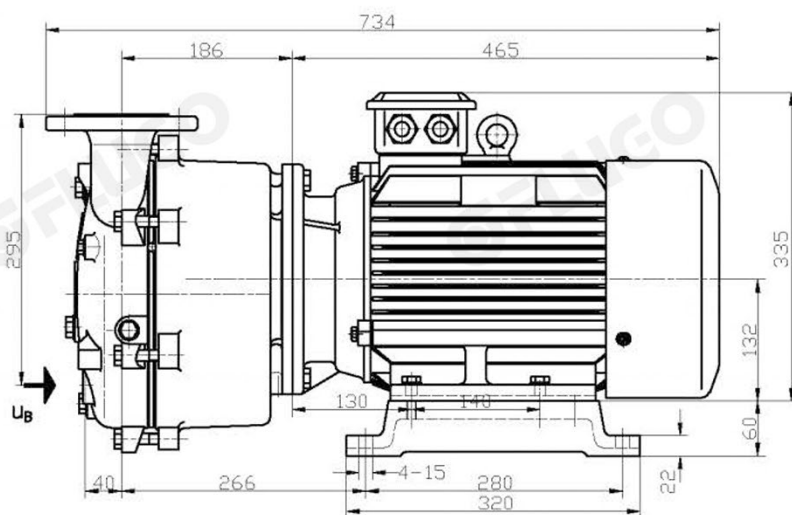
Pump	motor IP55,60Hz,4P		h1	h2	f1	f2	n1	n2	L1	L2	L3	Approx weight Kg	
	Size	Kw										Motor	Pump+ Motor
FDF 90	100L2	3.3	100	270	199	149	210	160	318	529	136	36	77.3
	112M	4.8	112	295	208	158	236	190	340	551	136	41	80.7
FDF 125	112M	4.8	112	295	215	165	236	160	340	560	145	41	82.3
	112M	6.0	112	295	215	165	236	190	340	560	145	43	86.1
FDF 150	112M	6.0	112	295	300	182	236	190	340	577	162	43	91

Motor feet are part of the standard supply of FDF 90-150

Table of Dimensions and weights

Motors on request

FDF 250



N 1 = gas inlet DN 50

N 2 = gas outlet DN 50

u_B = connection for service liquid G ½

u_c = connection for protection against cavitation G ¼

U_{if} = adjusting screw for internal liquid return G ¾

u_e = drain connection G ¾

u_{se} = connection for dirt drain G ¾

u_m = connection for pressure gauge G ¾

u_{m1} = connection for drain valve G ¾

u_l = Connection for relief valve G ¾

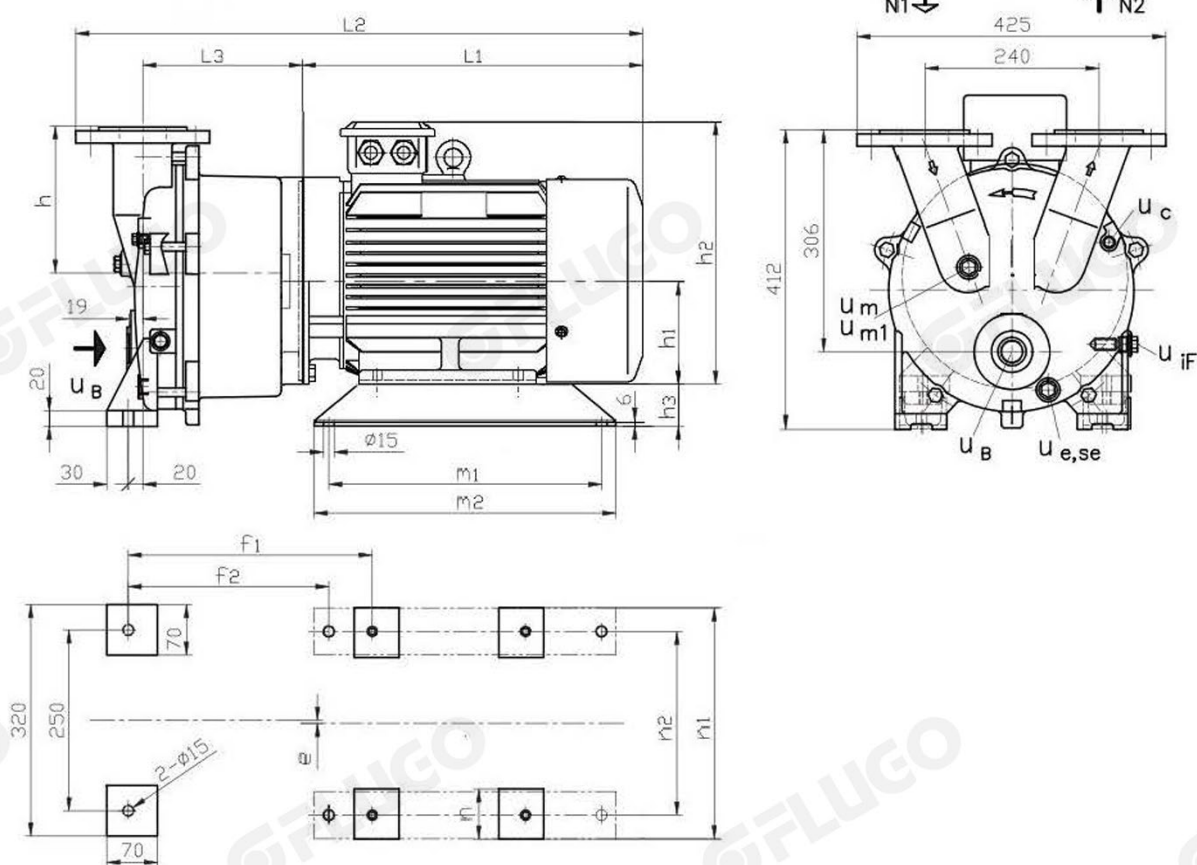
Pump	Electric motor IP55,4P			Approx. weight Kg	
	size	Kw		Motor	Pump+ Motor
		50HZ	60HZ		
FDF 250	132S	5.5		60	117.65
	132S		8	70	127.65

Motor feet are part of the standard supply of FDF 250

Table of Dimensions and weights

Motors on request

FDF325 FDF425



N 1 = gas inlet DN 65

N 2 = gas outlet DN 65

UB = connection for service liquid G 1

UC = connection for protection against cavitation G 1/4

UE = drain connection G 1/2

Use = connection for dirt drain G 1/2

Um = connection for pressure gauge G 1/2

Um1 = connection for drain valve G 1/2

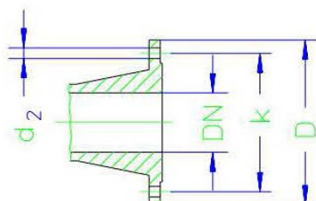
UF = adjusting screw for internal liquid return

Ul = Connection for relief valve G 1/4

Pump	Electric motor IP55,4P			e	f1	f2	m1	m2	h	h1	h2	h3	n	n1	n2	L1	L2	L3	Approx.weight Kg	
	Size	Kw																	Motor	Pump+ Motor
		50HZ	60HZ																	
FDF325	132 M	7.5		4	324	269	310	370	202	132	335	78	43	260	216	457	771	219	74	153
	160M		13.2	4	338	289	375	415	202	160	415	50	70	334	254	550	863	219	108	185
FDF425	160 M	11		6	363	303	375	415	200	160	415	52	70	334	254	550	877	233	108	187
	160M		18	6	363	303	375	415	200	160	415	52	70	334	254	550	877	233	128	207

Motor feet are part of the standard supply of FDF325 and FDF425

Flange Connections to DIN 2501 PN10



flange connections to DIN 2501 PN 10				
DN	40	50	65	80
K	110	125	145	160
D	150	165	185	200
Number x d2	4x18	4x18	4x18	8x18

Water flow requirements

Inlet Pressure (mbar)		33				120				200				400			
Pump	Speed	KB			FB	KB			FB	KB			FB	KB			FB
		Temperature difference [°C]				Temperature difference [°C]				Temperature difference [°C]				Temperature difference [°C]			
	[rpm]	10	5	2	10	5	2	10	5	2	10	5	2				
FDF25	2800	0.04	0.06	0.12	0.26	0.05	0.08	0.13	0.26	0.05	0.08	0.14	0.26	0.05	0.08	0.12	0.2
	3500	0.05	0.09	0.15		0.06	0.10	0.16		0.07	0.11	0.16		0.06	0.10	0.14	
FDF50	2800	0.07	0.13	0.23	0.5	0.09	0.15	0.25	0.48	0.09	0.15	0.25	0.45	0.09	0.14	0.22	0.35
	3500	0.11	0.18	0.29		0.12	0.20	0.31		0.13	0.20	0.30		0.12	0.18	0.25	
FDF90	1450	0.12	0.22	0.41	1.0	0.14	0.24	0.44	0.95	0.14	0.25	0.44	0.9	0.15	0.24	0.41	0.75
	1750	0.18	0.30	0.52		0.19	0.32	0.53		0.20	0.33	0.53		0.19	0.31	0.47	
FDF125	1450	0.17	0.28	0.50	1.0	0.19	0.31	0.52	0.95	0.19	0.31	0.51	0.9	0.18	0.29	0.46	0.75
	1750	0.22	0.36	0.59		0.24	0.39	0.60		0.26	0.40	0.60		0.24	0.37	0.53	
FDF150	1450	0.19	0.32	0.54	1.0	0.22	0.36	0.58	0.95	0.23	0.37	0.57	0.9	0.23	0.35	0.51	0.75
	1750	0.26	0.41	0.63		0.29	0.44	0.65		0.30	0.45	0.64		0.29	0.41	0.57	
FDF250	1450	0.22	0.37	0.63	1.2	0.29	0.45	0.70	1.1	0.30	0.46	0.68	1.0	0.28	0.42	0.59	0.8
	1750	0.32	0.50	0.77		0.37	0.55	0.79		0.38	0.55	0.75		0.35	0.49	0.64	
FDF325	1460	0.31	0.52	0.88	1.6	0.40	0.63	0.97	1.5	0.42	0.65	0.96	1.4	0.40	0.60	0.84	1.15
	1750	0.42	0.67	1.03		0.50	0.75	1.07		0.52	0.76	1.05		0.49	0.69	0.91	
FDF425	1460	0.46	0.74	1.19	2.0	0.56	0.85	1.23	1.75	0.57	0.84	1.18	1.6	0.54	0.76	1.01	1.3
	1750	0.64	0.97	1.40		0.69	0.99	1.34		0.70	0.97	1.27		0.64	0.85	1.06	

FB [m³/h] = fresh water service

KB [m³/h] = combined liquid service with service water 10 °C, 5 °C, 2 °C warmer than the fresh water.

Data regarding the pump size

Order notes

Series + Size	Shaft Sealing	Material Design
	Standard mechanical seal ASF O-rings Viton Special mechanical seal ASF1 O-rings Viton encapsulated with Teflon	Main parts HT250 C250S304SM Impeller 304 Main parts from 304 S304S304SM Impeller 304 Main parts from 316 S316S316SM Impeller 316
FDF 25 50	ASF ASF1	C250S304SM 、 S304S304SM 、 S316S316SM
FDF 90 125 150	ASF ASF1	C250S304SM 、 S304S304SM 、 S316S316SM
FDF 250 325 425	ASF ASF1	C250S304SM 、 S304S304SM 、 S316S316SM

Motor data

Series+size	Motor enclosure IP 55 50 Hz			Motor enclosure IP 55 60 Hz		
	Y-Δ voltage +/- 5%	Power Kw	Size	Y-Δ voltage +/-10%	Power Kw	Size
FDF25	380/220	0.75	80M1-2	440/220	1.1	80M2-2
FDF50	380/220	1.5	90 S-2	440/220	2.2	90 S - 2
FDF90	380/220	2.2	100 L1- 4	440/220	3.3	100 L2- 4
		3	100 L2- 4		4.8	112 M -4
FDF125	380/220	3	100 L2- 4	440/220	4.8	112 M -4
		4	112 M- 4		6	112 M -4
FDF150	660/380	4	112 M- 4	720/440	6	112 M -4
		4.8	112 M- 4			
FDF250	660/380	5.5	132 S- 4	720/440	8	132 S - 4
FDF325	660/380	7.5	132M- 4	720/440	13.2	160 M - 4
FDF425	660/380	11	160M- 4	720/440	18	160 M - 4



Liquid ring vacuum pumps

Authorized Distributor