



NAFFCO
PASSION TO PROTECT

VERTICAL MULTISTAGE PUMPS





AN INTRODUCTION TO NAFFCO

NAFFCO was founded in Dubai, UAE to become the world's leading producer and supplier of life safety solutions. By recognizing the importance and convenience of having easy access to multiple safety services, we became specialized by offering complete solutions under one roof for all types of high quality firefighting equipment, fire protection systems, fire alarms, addressable emergency systems, security systems, custom-made vehicles such as fire trucks, ambulances, mobile hospitals and airport rescue firefighting vehicles (ARFF).

With the most talented and dedicated employees from around the world, NAFFCO has over 500 passionate engineers and over 4 million square feet of manufacturing facilities. We are currently exporting to over 100 countries worldwide.

Our products have been consistently certified by UL, FM, BSI, LPCB and Global Mark according to the latest International Quality Standard for their strict adherence to ISO 9001 quality management system and certified for ISO 14001 environmental management systems and BS OHSAS 18001 for occupational safety by UL DQS.

Our success is driven by our passion to protect; our vision is to become the world's number one provider of innovative solutions in protecting life, environment and property.



NAFFCO VERTICAL MULTISTAGE PUMPS

NF-VL / NF-VLS is a vertical multistage in-line pump series with all wetted parts made of stainless steel. It is suitable for a variety of different applications involving various liquids from potable water to industrial effluent and cover a wide range of flow and pressure requirements.

The major features of this series pumps are efficient operation, low noise, compact structure, light weight, easy to service, good seal performance etc. Its high head low capacity performance range makes it especially suit-

able for using as a pressure maintenance pump (Jockey Pump) in firefighting applications and it meets NFPA 20 requirements for Jockey Pumps. Each pump set is tested in our factory, prior to dispatch, to confirm that the performance is achieved per the specified requirements.

FEATURES

- Reliable Performance
- Easy to Service
- Efficient Operation
- Stringent Tests
- Quality Materials
- Longer Service Life

READING THE MODEL NAME

Example: NF-VL 4-120

NF - NAFFCO

VL - Vertical Multistage

4 - Nominal Capacity in m³/hr

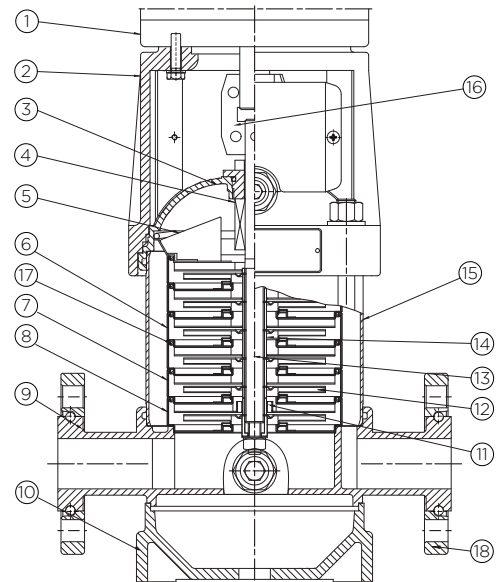
120 - Number of Stages x 10

Note: Letter 'S' will be added to 'VL' for the models that are designed for 60 Hz operation.

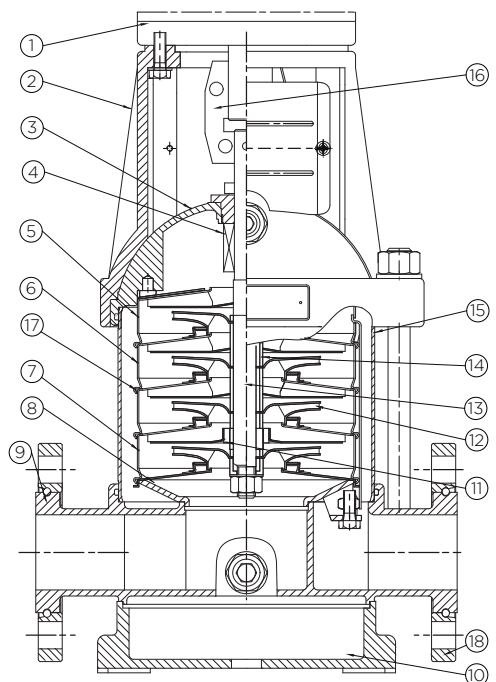
SL. NO.	PART NAME	MATERIAL	STANDARD
1	Electric Motor	Aluminum Frame	
2	Driver Pedestal (Motor Base)	Cast iron	ASTM A48 Class 25 B
3	Seal Base	Stainless Steel	AISI 304
4	Mechanical Seal	Tungsten Carbide / Graphite	
5	Top Diffuser	Stainless Steel	AISI 304
6	Diffuser	Stainless Steel	AISI 304
7	Support Diffuser	Stainless Steel	AISI 304
8	Inducer	Stainless Steel	AISI 304
9	Suction & Discharge Chamber	Stainless Steel	AISI 304
10	Pump Base Plate	Cast Iron	ASTM A48 Class 25 B
11	Bearing	Tungsten Carbide	
12	Impeller	Stainless Steel	AISI 304
13	Shaft	Stainless Steel	AISI 304
14	Impeller Sleeve	Stainless Steel	AISI 304
15	Outer Sleeve (Cylinder)	Stainless Steel	AISI 304
16	Coupling	Carbon Steel	AISI 1040
17	O ring	FPM	
18	Flanges	Cast Iron	ASTM A48 Class 35 B

Table 1

CROSS SECTIONAL DRAWINGS



NF-VL(S) 4



NF-VL(S) 8, 16

SPECIFICATIONS

LIQUID DATA

Pumped Liquid Type	: Thin, clean and non-aggressive, non-explosive liquids, not containing solid particles or fibers.
Liquid pH range	: pH 5-9
Temperature Range	
Standard Design	: -15°C to +90°C
Hot water Design	: -15°C to +120°C

ELECTRIC MOTOR DATA

Enclosure	: V18 ("C" Type Face at Drive End) < 4 kW V1 ("D" Type Flange at Drive End) > 5.5 kW Shaft Down, No Feet
Standard	: IEC 60034
Voltage	: 380-415 V 460 V
Phase	: 3
Frequency	: 50 / 60 Hz
Insulation Class	: F
Enclosure IP Rating	: IP55
Efficiency Class	: Eff. 2
Noise Level	: 85 dB(A) @ 1 m.
Ambient Temperature	: Standard: 40°C High: 50°C with 0.95 & 55°C with 0.92 derating factors
Altitude	: Standard: 1000 m High: 2250 m with 0.95 & 3500 m with 0.88 derating factors
Motor Coupling	: Rigid Coupled to Pump

PUMP DATA

Pump Design Test Standard	: ISO 9906
Nozzle Connections	: Flanged
Nozzle Connection Design Standard	: EN 1092-2
Flange Rating and Type	: Refer Table of Dimensions
ANSI/HI 2.1-2.2 Designation	: Vertical in-line casing diffuser pump (VS8)
Pump Bearing Lubrication	: Pumped Liquid
Shaft Shape (for securing impeller on to the shaft)	: Double-D
Mechanical Seal	: Cartridge Type
Minimum Suction Pressure Required	: Refer the NPSH Curve of the corresponding Pump Model
Maximum Suction Pressure	: Please refer the below Table No. 2
Maximum Working Pressure	: Please refer the below Table No. 3

Pump Model	Maximum Suction Pressure (bar)
50 Hz	
NF-VL 4-10 – NF-VL 4-20	6
NF-VL 4-30 – NF-VL 4-100	10
NF-VL 4-110 – NF-VL 4-220	15
NF-VL 8-10 – NF-VL 8-70	6
NF-VL 8-80 – NF-VL 8-200	10
NF-VL 16-20 – NF-VL 16-30	6
NF-VL 16-40 – NF-VL 16-160	10
60 Hz	
NF-VLS 4-20	6
NF-VLS 4-30 – NF-VLS 4-80	10
NF-VLS 4-100 – NF-VLS 4-160	15
NF-VLS 8-10 – NF-VLS 8-50	6
NF-VLS 8-60 – NF-VLS 8-140	10
NF-VLS 16-10 – NF-VLS 16-20	6
NF-VLS 16-30 – NF-VLS 16-100	10
<i>Table 2</i>	

MAXIMUM WORKING PRESSURE

Pump Model	Maximum Working Pressure (bar)
50 Hz	
NF-VL 4-10 – NF-VL 4-140	16 bar @ 120 °C
NF-VL 4-150 – NF-VL 4-220	21 bar @ 120°C (25 bar @ 40°C)
NF-VL 8-10 – NF-VL 8-120	16 bar @ 120 °C
NF-VL 8-130 – NF-VL 8-200	23 bar @ 120°C (25 bar @ 80°C)
NF-VL 16-20 – NF-VL 16-80	16 bar @ 120 °C
NF-VL 16-90 – NF-VL 16-160	23 bar @ 120°C (25 bar @ 80°C)

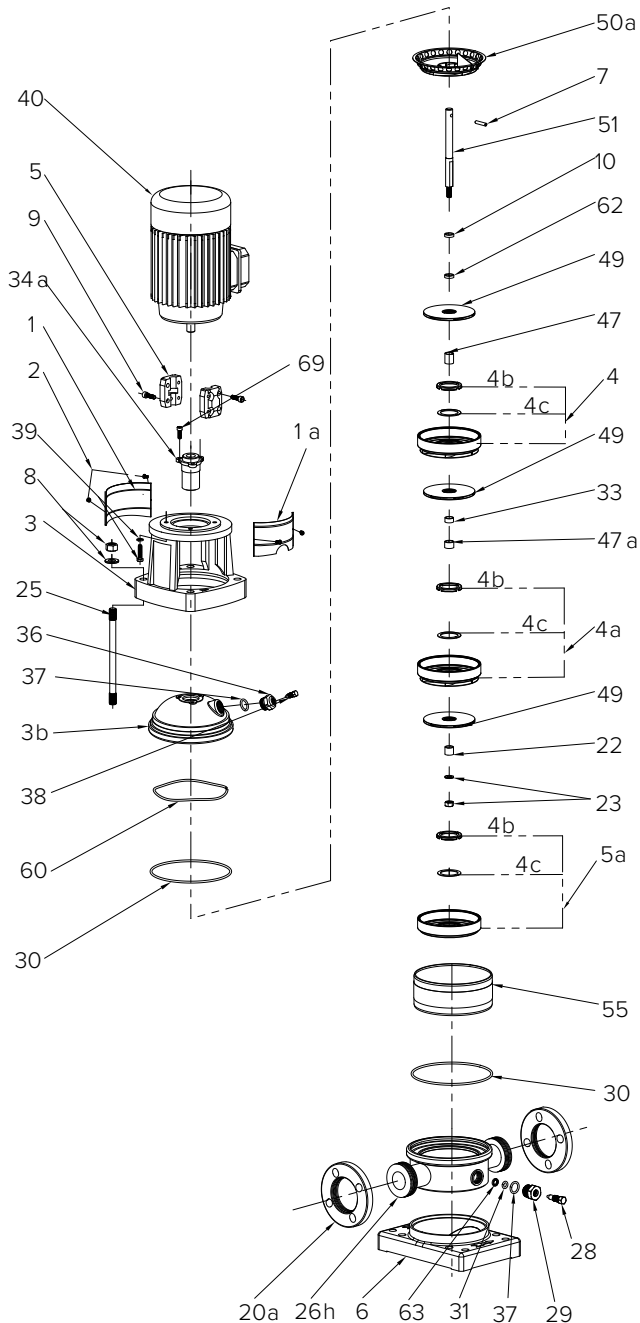
Table 3

Pump Model	Maximum Working Pressure (bar)
60 Hz	
NF-VLS 4-20 – NF-VLS 4-100	16 bar @ 120 °C
NF-VLS 4-120 – NF-VLS 4-160	21 bar @ 120°C (25 bar @ 40°C)
NF-VLS 8-10 – NF-VLS 8-80	16 bar @ 120 °C
NF-VLS 8-100 – NF-VLS 8-140	23 bar @ 120°C (25 bar @ 80°C)
NF-VLS 16-10 – NF-VLS 16-60	16 bar @ 120 °C
NF-VLS 16-70 – NF-VLS 16-100	23 bar @ 120°C (25 bar @ 80°C)

Table 3

THE QUALITY PARTS

EXPLODED VIEW - NF-VL (S) 4

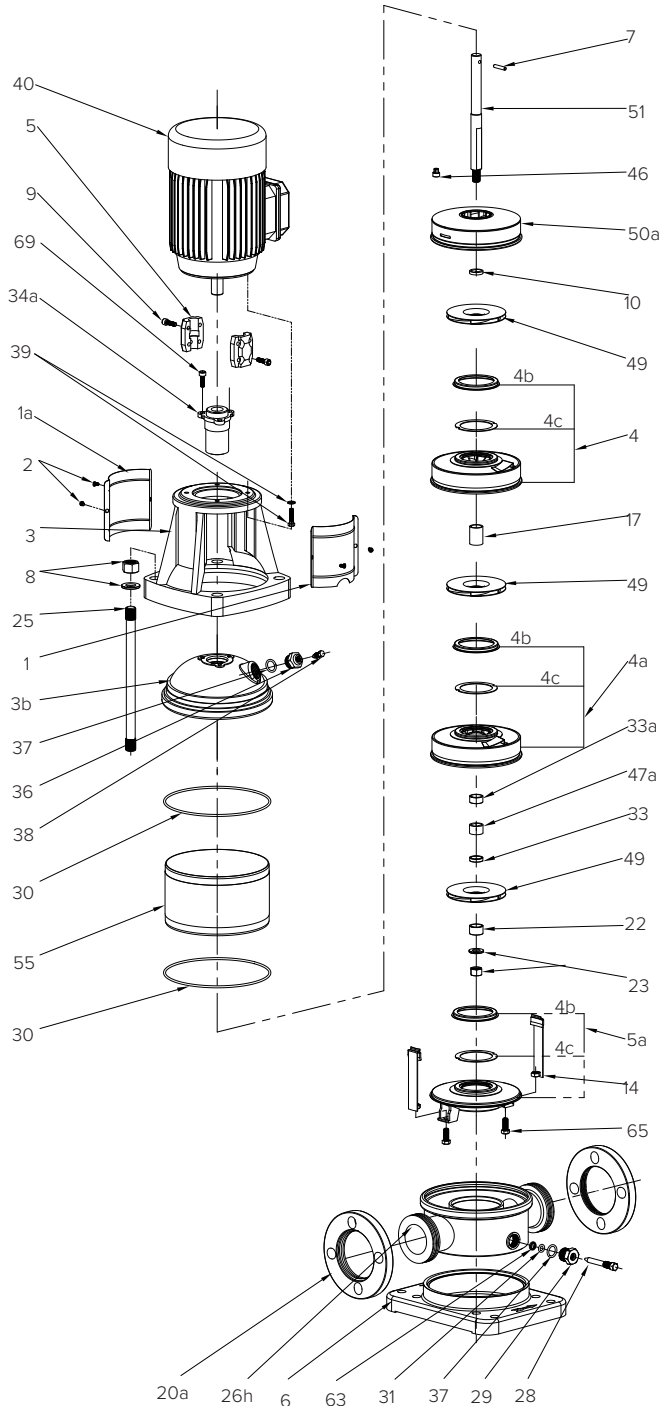


PARTS LIST

PART NO.	PART DESCRIPTION	PART NO.	PART DESCRIPTION
1	Coupling guard (No nick)	28	Drainage screw M10
1a	Coupling guard	29	Drainage nut
2	Screw M4*8	30	O ring 136.5*3.3
3	Pump head	31	O ring 8*2.65
3b	Lining	33	Impeller sleeve (S)
4	Diffuser	34a	Mechanical seal
4a	Support diffuser	36	Air vent nut
4b	Neck ring cover	37	O ring
4c	Neck ring	38	Air vent screw
5	Coupling	39	Screw, washer
5a	Inducer	40	Motor
6	Flange type base plate	47	Impeller sleeve
7	Shaft pin	47a	Bearing
8	Nut M12, Washer 12	49	Impeller
9	Hexagon socket head screw	50a	Top diffuser
10	Circlip cover	51	Shaft
20a	Flange	55	Cylinder
22	First impeller cover	60	Corrugated spring
23	Nut M8, Washer 8	62	Seal sleeve
25	Stay bolt	63	O ring retainer
26h	Flange type Inlet & outlet chamber	69	Screw

THE QUALITY PARTS

EXPLODED VIEW - NF-VL (S) 8, 16

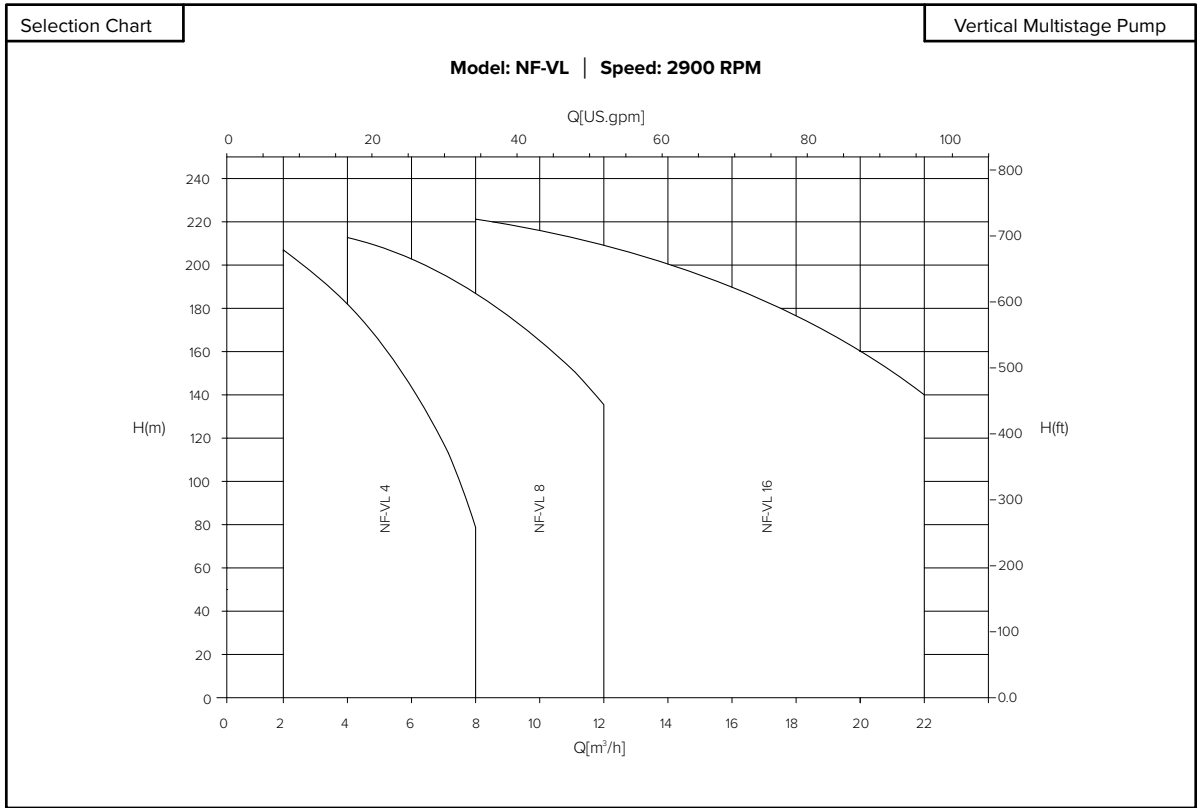


PARTS LIST

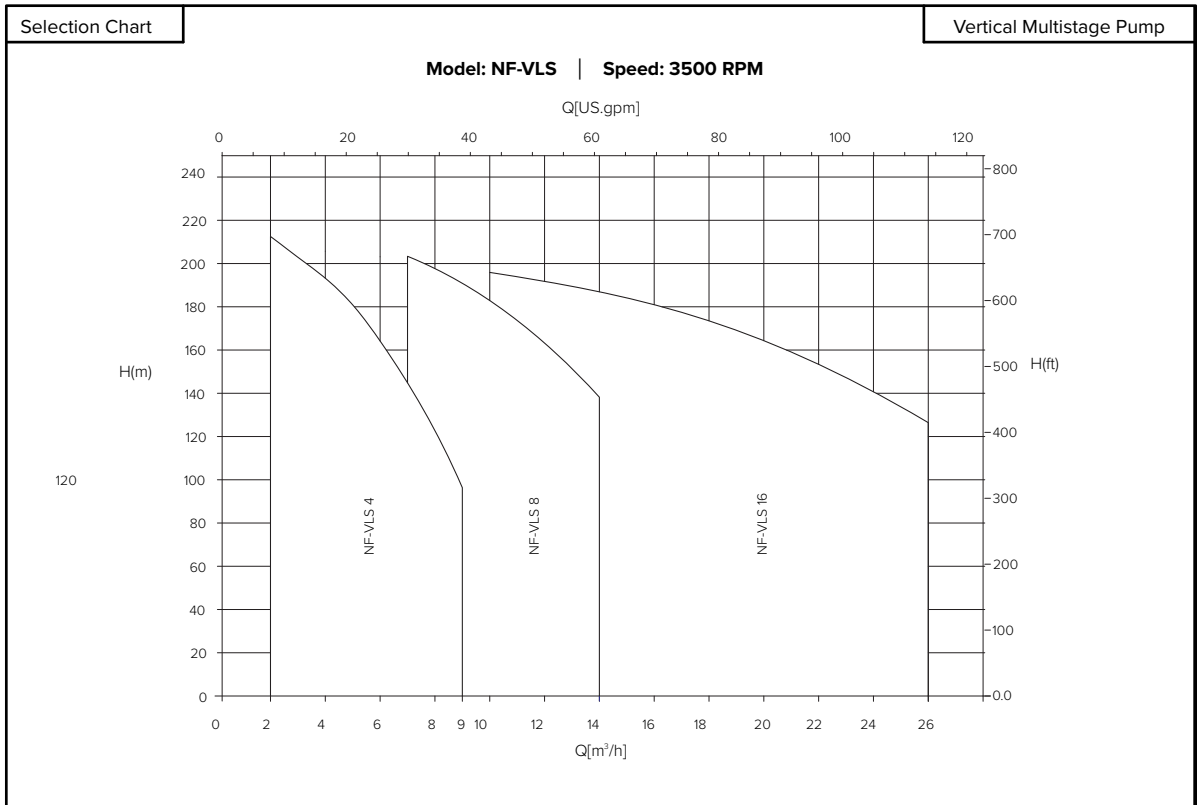
PART NO.	PART DESCRIPTION	PART NO.	PART DESCRIPTION
1	Coupling guard	26h	Flange type Inlet & outlet chamber
1a	Coupling guard (No nick)	28	Drainage screw M10
2	Screw M4*8	29	Drainage nut
3	Pump head	30	O ring 169*3.3
3b	Lining	31	O ring 8*2.65
4	Diffuser	33	Impeller sleeve (S)
4a	Support diffuser	33a	Impeller sleeve (L)
4b	Neck ring cover	34a	Mechanical seal
4c	Neck ring	36	Air vent nut
5	Coupling	37	O ring
5a	Inducer	38	Air vent screw
6	Base plate	39	Screw, washer
7	Shaft pin	40	Motor
8	Nut M16, Washer 16	46	Adjusting rubber
9	Hexagon socket head screw	47a	Bearing
10	Circlip cover	49	Impeller
14	Strap	50a	Top diffuser
17	Impeller sleeve	51	Shaft
20a	Flange	55	Cylinder
22	First impeller cover	63	O ring retainer
23	Nut M12, Washer 12	65	Bolt M 8*20
25	Stay bolt	69	Screw

PUMP SELECTION CHARTS

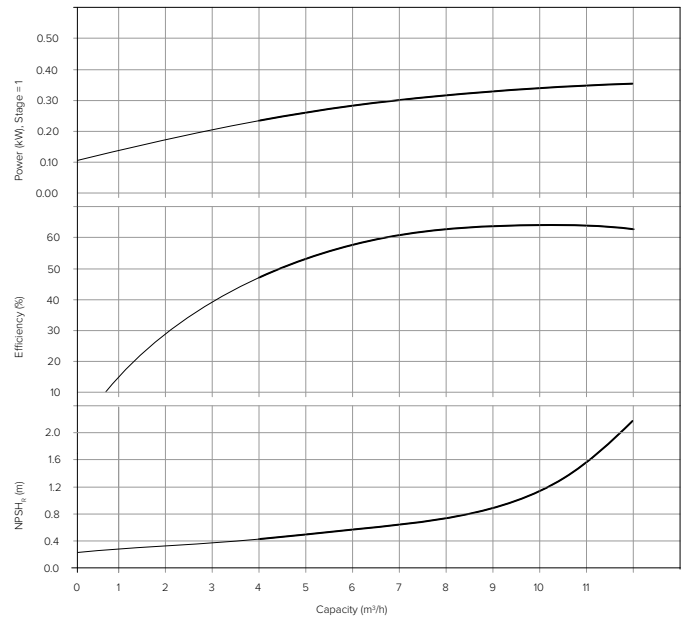
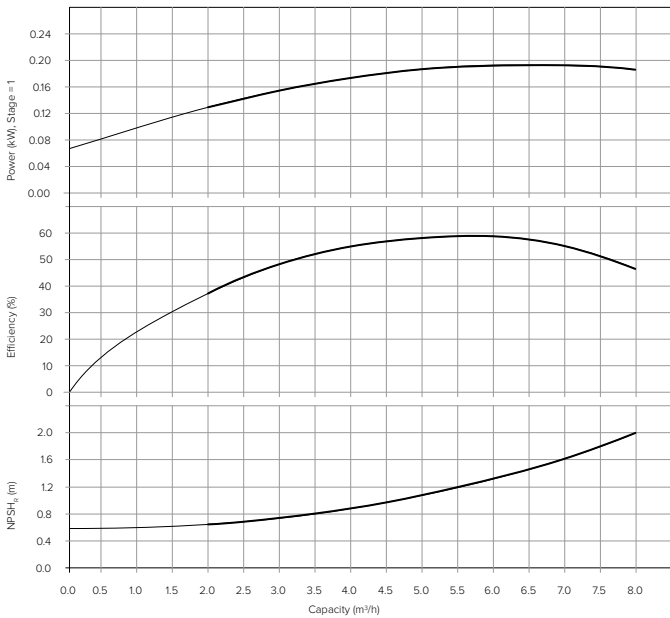
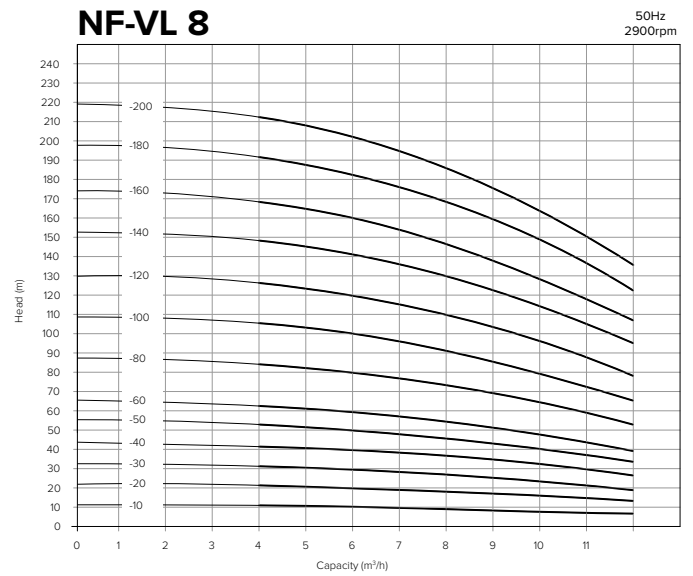
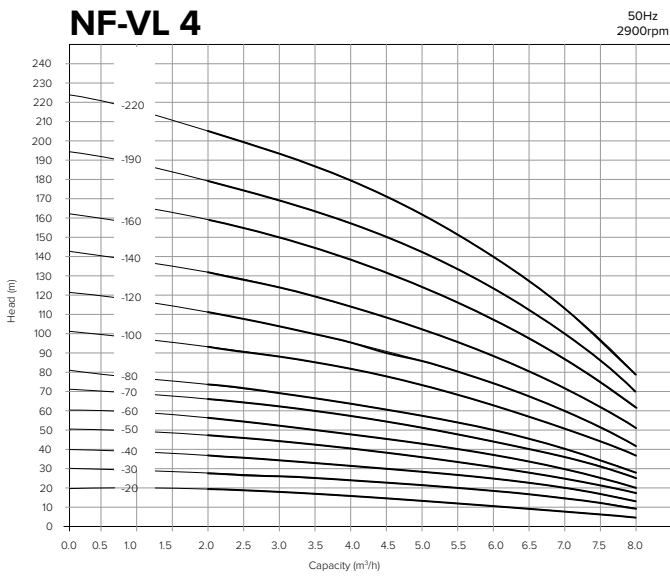
50 Hz



60 Hz



PERFORMANCE CURVES



Electric Motor Power Rating

NF-VL 4

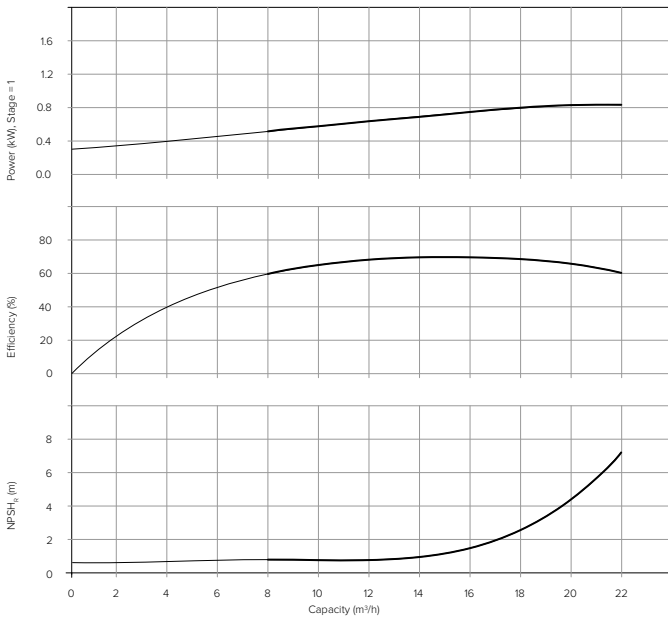
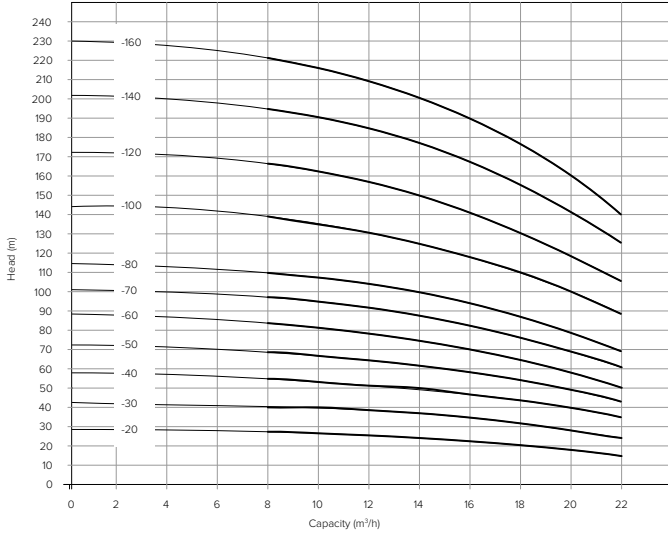
Pump Model	Motor Power (kW)
NF-VL 4-20	0.37
NF-VL 4-30	0.55
NF-VL 4-40	0.75
NF-VL 4-50	1.10
NF-VL 4-60	1.10
NF-VL 4-70	1.50
NF-VL 4-80	1.50
NF-VL 4-100	2.20
NF-VL 4-120	2.20
NF-VL 4-140	3.00
NF-VL 4-160	3.00
NF-VL 4-190	4.00
NF-VL 4-220	4.00

NF-VL 8

Pump Model	Motor Power (kW)
NF-VL 8-10	0.75
NF-VL 8-20	0.75
NF-VL 8-30	1.10
NF-VL 8-40	1.50
NF-VL 8-50	2.20
NF-VL 8-60	2.20
NF-VL 8-80	3.00
NF-VL 8-100	4.00
NF-VL 8-120	4.00
NF-VL 8-140	5.50
NF-VL 8-160	5.50
NF-VL 8-180	7.50
NF-VL 8-200	7.50

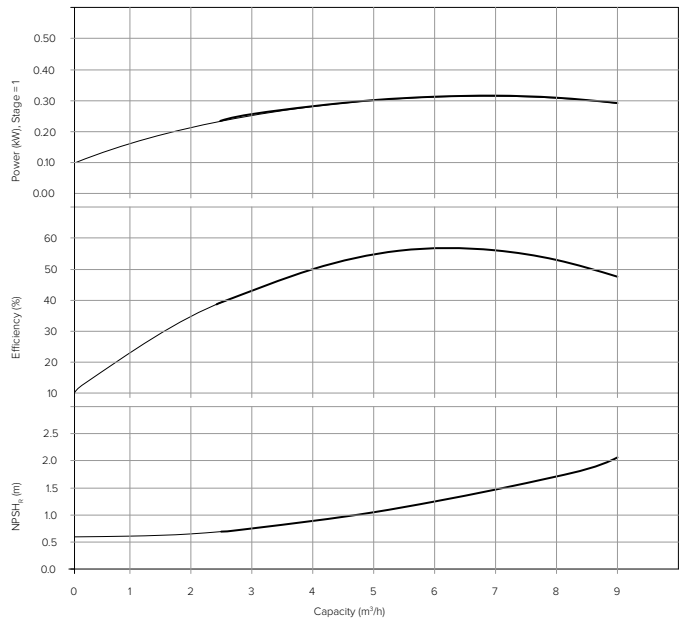
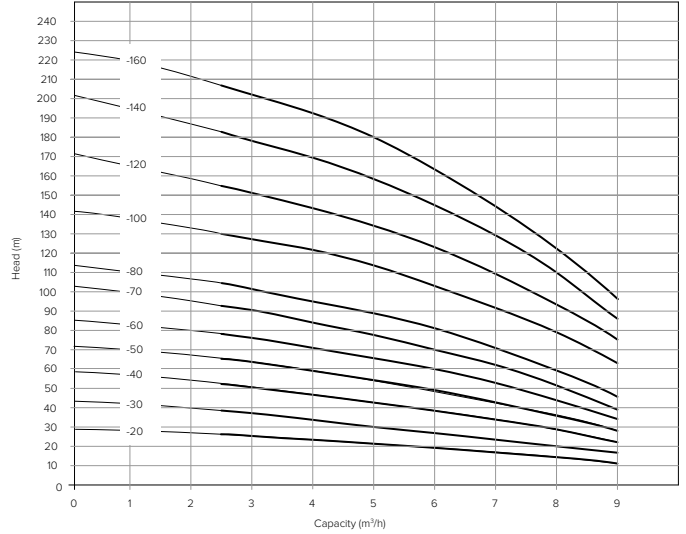
NF-VL 16

50Hz
2900rpm



NF-VLS 4

60Hz
3500rpm



Electric Motor Power Rating

NF-VL 16

Pump Model	Motor Power (kW)
NF-VL 16-20	2.2
NF-VL 16-30	3
NF-VL 16-40	4
NF-VL 16-50	5.5
NF-VL 16-60	5.5
NF-VL 16-70	7.5
NF-VL 16-80	7.5
NF-VL 16-100	11
NF-VL 16-120	11
NF-VL 16-140	15
NF-VL 16-160	15
NF-VL 8-180	7.50
NF-VL 8-200	7.50

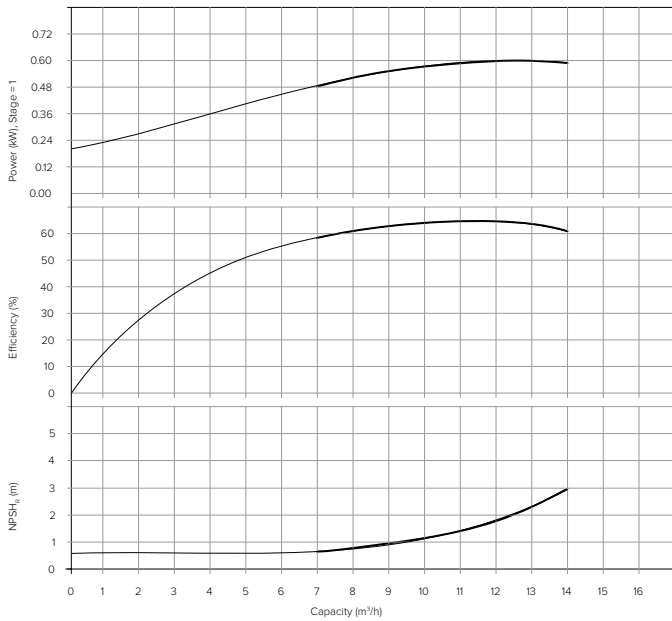
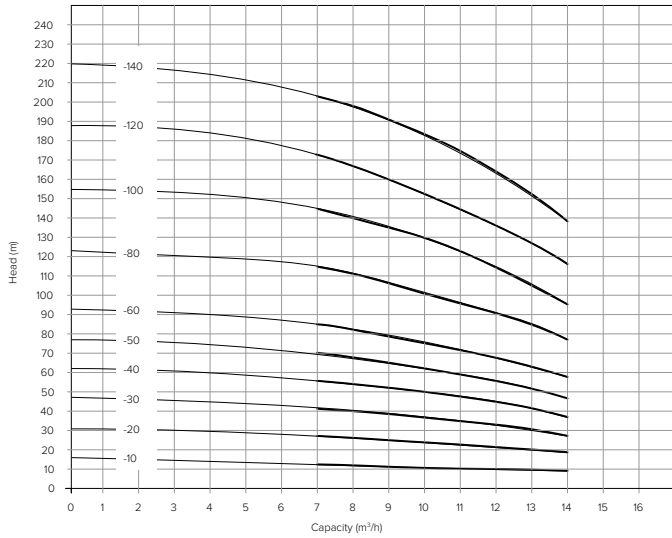
NF-VLS 4

Pump Model	Motor Power (kW)
NF-VLS 4-20	0.75
NF-VLS 4-30	11
NF-VLS 4-40	1.5
NF-VLS 4-50	2.2
NF-VLS 4-60	2.2
NF-VLS 4-70	3
NF-VLS 4-80	3
NF-VLS 4-100	4
NF-VLS 4-120	4
NF-VLS 4-140	5.5
NF-VLS 4-160	5.5

PERFORMANCE CURVES

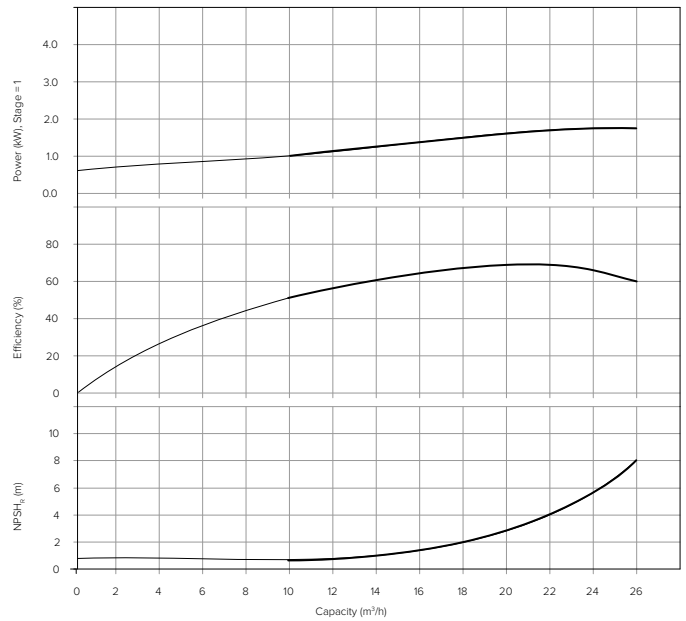
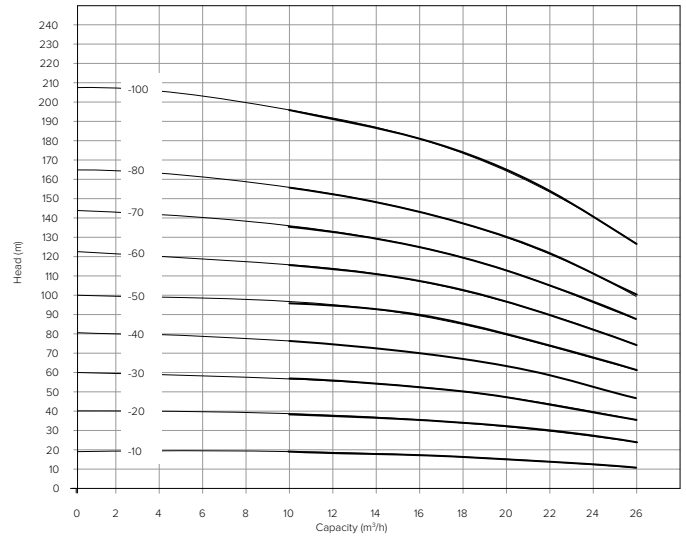
NF-VLS 8

60Hz
3500rpm



NF-VLS 16

60Hz
3500rpm



Electric Motor Power Rating

NF-VLS 8

Pump Model	Motor Power (kW)
NF-VLS 8-10	0.75
NF-VLS 8-20	1.5
NF-VLS 8-30	2.2
NF-VLS 8-40	3
NF-VLS 8-50	3
NF-VLS 8-60	4
NF-VLS 8-80	5.5
NF-VLS 8-100	7.5
NF-VLS 8-120	7.5
NF-VLS 8-140	11

NF-VLS 16

Pump Model	Motor Power (kW)
NF-VLS 16-10	2.2
NF-VLS 16-20	4
NF-VLS 16-30	5.5
NF-VLS 16-40	7.5
NF-VLS 16-50	11
NF-VLS 16-60	11
NF-VLS 16-70	15
NF-VLS 16-80	15
NF-VLS 16-100	18.5

ELECTRIC PERFORMANCE DATA

Power Input (kW)	Cable Connection	Input Current (A)	Cable Spec (mm ²)	Circuit Breaker (A)	Thermal Protector (A)
0.37	Y	1	0.75	5	1.2
0.55	Y	1.4	0.75	5	1.7
0.75	Y	1.8	0.75	5	2.2
1.1	Y	2.6	1	5	3.1
1.5	Y	3.5	1	10	4.2
2.2	Y	4.9	1.5	10	5.9
3	Y	6.3	1.5	10	7.6
4	Y	8.2	2.5	20	9.8
5.5	Δ	11	2.5	20	13.2
7.5	Δ	15	4	20	18.0
11	Δ	21	4	25	25.2
15	Δ	29	6	32	34.8
18.5	Δ	35	10	40	42.0

DIMENSIONS

Dimensional Drawing

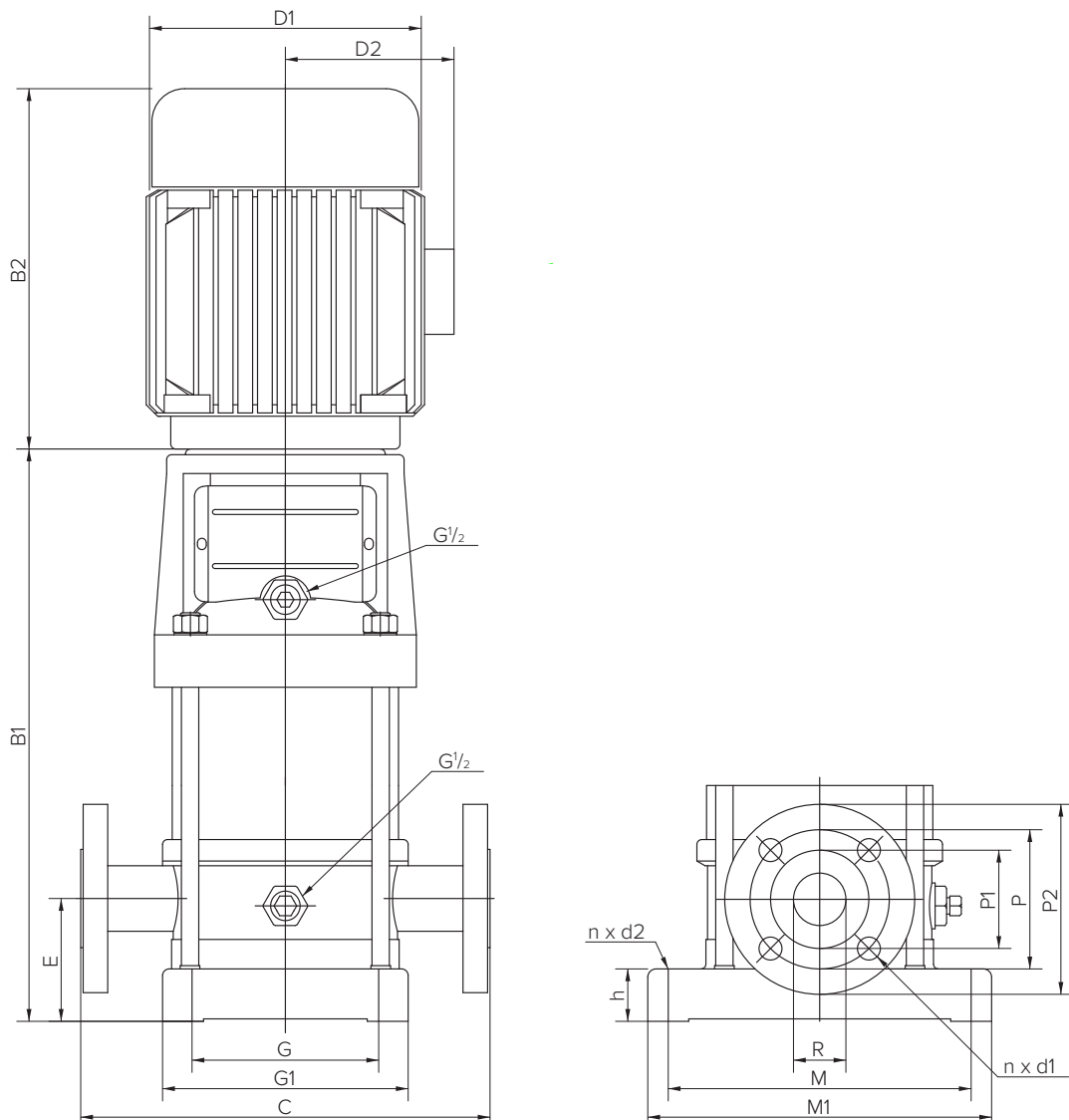


TABLE OF DIMENSIONS

Flanges and Footer

Pump Model	Flange Nominal Pressure Rating	Flange Type	Dimensions (mm)												
			R	P1	P	P2	n x d1	C	E	h	G	G1	M	M1	n x d2
NF-VL 4 & NF-VLS 4	PN25	DN32	32	60	100	140	4 x Ø18	250	75	32	100	150	180	210	4 x Ø13
NF-VL 8 & NF-VLS 8	PN25	DN40	50	80	110	145	4 x Ø18	280	80	25	130	199	215	247	4 x Ø14
NF-VL 16 & NF-VLS 16	PN25	DN50	50	80	125	160	4 x Ø18	300	90	35	130	199	215	247	4 x Ø14

HEIGHT, MOTOR SIZE, AND WEIGHT

NF-VL 4

Pump Model	Dimensions (mm)					Weight (kg)
	B1	B2	B1+B2	D1	D2	
NF-VL 4-20	276	210	486	148	117	20
NF-VL 4-30	303	210	513	148	117	20
NF-VL 4-40	340	245	585	170	142	20
NF-VL 4-50	367	245	612	170	142	25
NF-VL 4-60	394	245	639	170	142	25
NF-VL 4-70	431	290	721	190	155	30
NF-VL 4-80	458	290	748	190	155	30
NF-VL 4-100	512	290	802	190	155	30
NF-VL 4-120	566	290	856	190	155	35
NF-VL 4-140	630	315	945	197	165	35
NF-VL 4-160	684	315	999	197	165	40
NF-VL 4-190	765	335	1100	230	188	45
NF-VL 4-220	846	335	1181	230	188	50

NF-VL 8

Pump Model	Dimensions (mm)					Weight (kg)
	B1	B2	B1+B2	D1	D2	
NF-VL 8-10	347	245	592	170	142	22
NF-VL 8-20	347	245	592	170	142	22
NF-VL 8-30	377	245	622	170	142	32
NF-VL 8-40	417	290	707	190	155	32
NF-VL 8-50	447	290	737	190	155	42
NF-VL 8-60	477	290	767	190	155	42
NF-VL 8-80	547	315	862	197	165	47
NF-VL 8-100	607	335	942	230	188	57
NF-VL 8-120	667	335	1002	230	188	57
NF-VL 8-140	747	430	1177	260	208	82
NF-VL 8-160	807	430	1237	260	208	82
NF-VL 8-180	867	430	1297	260	208	92
NF-VL 8-200	927	430	1357	260	208	92

NF-VL 16

Pump Model	Dimensions (mm)					Weight (kg)
	B1	B2	B1+B2	D1	D2	
NF-VL 16-20	397	290	687	190	155	42
NF-VL 16-30	452	315	767	197	165	52
NF-VL 16-40	497	335	832	230	188	57
NF-VL 16-50	562	430	992	260	208	72
NF-VL 16-60	607	430	1037	260	208	77
NF-VL 16-70	652	430	1082	260	208	82
NF-VL 16-80	697	430	1127	260	208	82
NF-VL 16-100	875	490	1365	330	255	142
NF-VL 16-120	965	490	1455	330	255	147
NF-VL 16-140	1055	490	1545	330	255	162
NF-VL 16-160	1145	490	1635	330	255	167

NF-VLS 4

Pump Model	Dimensions (mm)					Weight (kg)
	B1	B2	B1+B2	D1	D2	
NF-VLS 4-20	241	225	466	170	142	20
NF-VLS 4-30	271	245	516	170	142	20
NF-VLS 4-40	312	245	557	190	155	25
NF-VLS 4-50	340	265	605	190	155	30
NF-VLS 4-60	367	265	632	190	155	35
NF-VLS 4-70	402	290	692	197	165	40
NF-VLS 4-80	429	290	719	197	165	40
NF-VLS 4-100	482	325	807	230	188	45
NF-VLS 4-120	536	325	861	230	188	45
NF-VLS 4-140	611	380	991	260	208	70
NF-VLS 4-160	665	380	1045	260	208	70

NF-VLS 8

Pump Model	Dimensions (mm)					Weight (kg)
	B1	B2	B1+B2	D1	D2	
NF-VLS 8-10	350	225	575	170	142	25
NF-VLS 8-20	360	245	605	190	155	30
NF-VLS 8-30	390	265	655	192	155	35
NF-VLS 8-40	430	290	720	197	165	40
NF-VLS 8-50	460	290	750	197	165	45
NF-VLS 8-60	490	325	815	230	188	50
NF-VLS 8-80	570	380	950	230	188	75
NF-VLS 8-100	630	380	1010	260	208	85
NF-VLS 8-120	690	380	1070	260	208	85
NF-VLS 8-140	780	490	1270	330	255	130

NF-VLS 16

Pump Model	Dimensions (mm)					Weight (kg)
	B1	B2	B1+B2	D1	D2	
NF-VLS 16-10	400	290	690	190	155	40
NF-VLS 16-20	410	325	735	230	188	50
NF-VLS 16-30	475	430	905	260	208	70
NF-VLS 16-40	520	430	950	260	208	80
NF-VLS 16-50	595	490	1085	330	255	140
NF-VLS 16-60	640	490	1130	330	255	145
NF-VLS 16-70	685	490	1175	330	255	160
NF-VLS 16-80	730	490	1220	330	255	160
NF-VLS 16-100	820	550	1370	330	255	190



Serving Over 100 Countries Worldwide

NAFFCO

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In line with NAFFCO policy for continuous product development,
NAFFCO has the right to change specifications without prior notice.