LVS/LVR

Stainless Steel Vertical Multistage Pump

Application

- Suitable for transferring liquids of low viscosity, non-inflammable and non-explosive, not containing solid particles or fibers
- Water supply & drainage for high-rise buildings, filtration and transfer at waterworks, pressure boosting in main pipe
- Washing and cleaning systems, boiler feeding, cooling water circulation, water treatment systems, auxiliary system, support equipment
- Ultra-filtration systems, reverse-osmosis systems, distillation systems, separators, swimming pools
- Agricultural irrigation: sprinkler irrigation, drip-feed irrigation
- Food & beverage industry
- Fire-fighting system

Operating Conditions

- Low viscosity, non-inflammable and non-explosive liquids not containing solid particles or fibers. The liquids must not chemically attack the pump materials. When pumping liquids with a density or viscosity is higher than that of water, a motor with a higher output power rating shall be used.
- Liquid temperature: -20℃~+120℃
- Flow ranges: 0.7-240 m^3/h
- Liquid pH value: 4 - 10
- Max. ambient temperature: +40℃
- Max. operation pressure: 33 bar
- Altitude: up to 1000 m

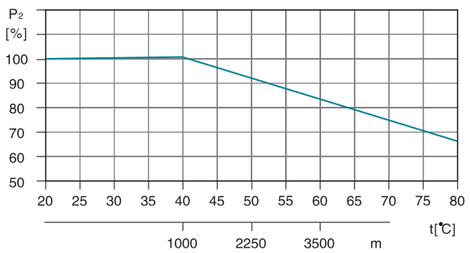
Motor

- IE 2 motor (IE 3 motor optional)
- Totally enclosed & fan-cooled
- Protection class: IP55
- Standard voltage: 50Hz 1 × 220V/3 × 380V

Ambient Temperature

Max. ambient temperature: + 40℃. Ambient temperature above 40℃ or installation at altitude of more than 1000 meters above sea level require the use of an oversize motor. Because of low air density and poor cooling effects, the motor output power P_2 will be decreased. See the picture.

In such cases, it may be necessary to use a motor with a higher output power rating.



For example, when the pump is installed at altitude of more than 3500 meters above sea level, P_2 will be decreased to 88%. When the ambient temperature is 70℃, P_2 will be decreased to 78%.

Identification Codes

LVS 45 – 10 – 2 – B – K

- K: Pipeline Port Code (Omitted for DIN flange)
- B: AISI316 Stainless Steel Material (Omitted for AISI304)
- 2: Small Impeller Stages
- 10: Impeller Stages
- 45: Rated Flow (m^3/h)
- LVS,LVR Vertical Multistage Pump Series

LVS 200 – 3 – C – D

- D: One small impeller D
- C: One small impeller C
- 3: Impeller Stages
- 200: Rated Flow(m^3/h)
- LVS,LVR Vertical Multistage Pump Series

LVS: Stainless steel wetted parts
LVR: Cast iron base & pump cover

Identifications codes of flange structure
A: Oval flange; K: Clamp connector ;
G: Threaded connector

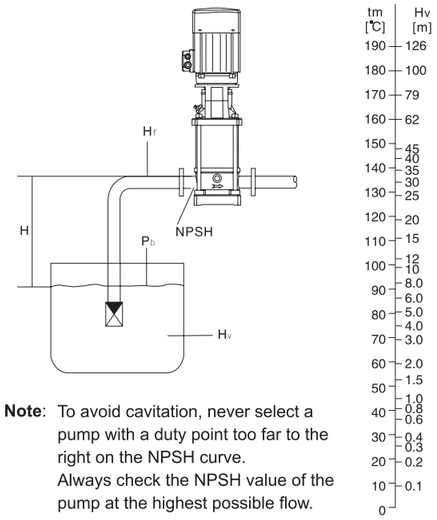
Minimum Inlet Pressure–Npsh

Calculation of the inlet pressure “H” is recommended in these situations:
The liquid temperature is high.
The flow is significantly higher than the rated flow.
Water is drawn from depths.
Water is drawn through long pipes.
Inlet conditions are poor.

To avoid cavitation, make sure that there is a minimum pressure on the suction side of the pump. The maximum suction lift “H” in meters head can be calculated as follows:

H	=	$P_b \times 10.2 - NPSH - H_f - H_v - H_s$
P_b	=	Barometric pressure in bar. (Barometric pressure can be set to 1 bar). In closed systems, P_b indicates the system pressure in bar.
NPSH	=	Net Positive Suction Head in meters head. (To be read from the NPSH curve at the highest flow the pump will be delivering.)
H_f	=	Friction loss in suction pipe in meters head. (At the highest flow the pump will be delivering.)
H_v	=	Vapor pressure in meters head. (To be read from the vapor pressure scale. “H_v” depends on the liquid temperature “tm”)
H_s	=	Safety margin=minimum 0.5 meters head.

If the “H” calculated is positive, the pump can operate at a suction lift of maximum “H” meters head.
If the “H” calculated is negative, an inlet pressure of minimum “H” meters head is required.



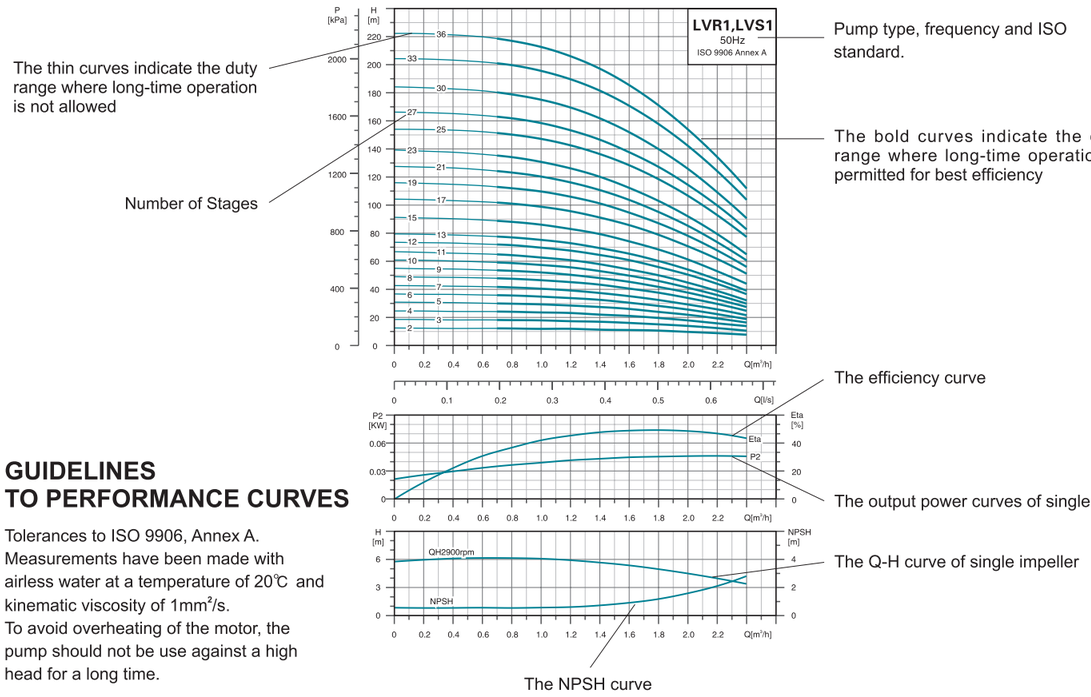
Note: To avoid cavitation, never select a pump with a duty point too far to the right on the NPSH curve.
Always check the NPSH value of the pump at the highest possible flow.

Maximum Inlet Pressure

The following table shows the maximum permissible inlet pressure. However, the current inlet pressure + the pressure against a closed valve must always be lower than the Max. permissible operating pressure.
If the maximum permissible operating pressure is exceeded, the bearing in the motor may be damaged and the life of the shaft seal reduced.

Pump Type	Maximum Inlet Pressure [bar]
LVR1,LVS1	
1-2 — 1-36	10
LVR2,LVS2	
2-2	6
2-3 — 2-12	10
2-13 — 2-26	15
LVR3,LVS3	
3-2 — 3-29	10
3-31 — 3-26	15
LVR4,LVS4	
4-2	6
4-3 — 4-11	10
4-12 — 4-22	15
LVR5,LVS5	
5-2 — 5-16	10
5-18 — 5-29	15
LVR10,LVS10	
10-1 — 10-6	8
10-7 — 10-22	10
LVR15,LVS15	
15-1 — 15-3	8
15-4 — 15-17	10
LVR20,LVS20	
20-1 — 20-3	8
20-4 — 20-17	10
LVR32,LVS32	
32-1-1 — 32-4	4
32-5-2 — 32-10	10
32-11 — 32-14	15
LVR45,LVS45	
45-1-1 — 45-2	4
45-3-2 — 45-5	10
45-6-2 — 45-13-2	15
LVR64,LVS64	
64-1-1 — 64-2-2	4
64-2-1 — 64-4-2	10
64-4-1 — 64-8-1	15
LVR90,LVS90	
90-1-1 — 90-1	4
90-2-2 — 90-3-2	10
90-3 — 90-6	15
LVR90,LVS90	
120-1 — 120-2-1	10
120-2 — 120-5-1	15
120-5 — 120-7	20
LVR150,LVS150	
150-1-1 — 150-2-2	10
150-2-1 — 150-4-1	15
150-4 — 150-6	20
LVR200,LVS200	
200-1-D	10
200-1-C — 200-2-2C	15
200-2-C — 200-4	20

How To Read The Curve Charts



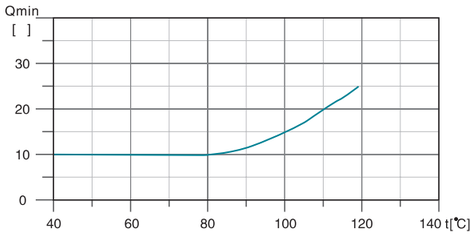
GUIDELINES TO PERFORMANCE CURVES

Tolerances to ISO 9906, Annex A.
Measurements have been made with airless water at a temperature of 20℃ and kinematic viscosity of 1mm²/s.
To avoid overheating of the motor, the pump should not be use against a high head for a long time.

Minimum Flow Rate

Due to the risk of overheating, the pump should not be used at a flow below the minimum flow rate. The curve below shows the minimum flow rate as a percentage of the nominal flow rate in relation to the liquid temperature.

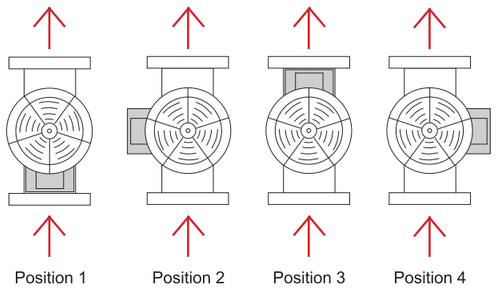
Air cooling apparatus



Note: The outlet valve must be opened when the pump is in operation.

Terminal Box Positions

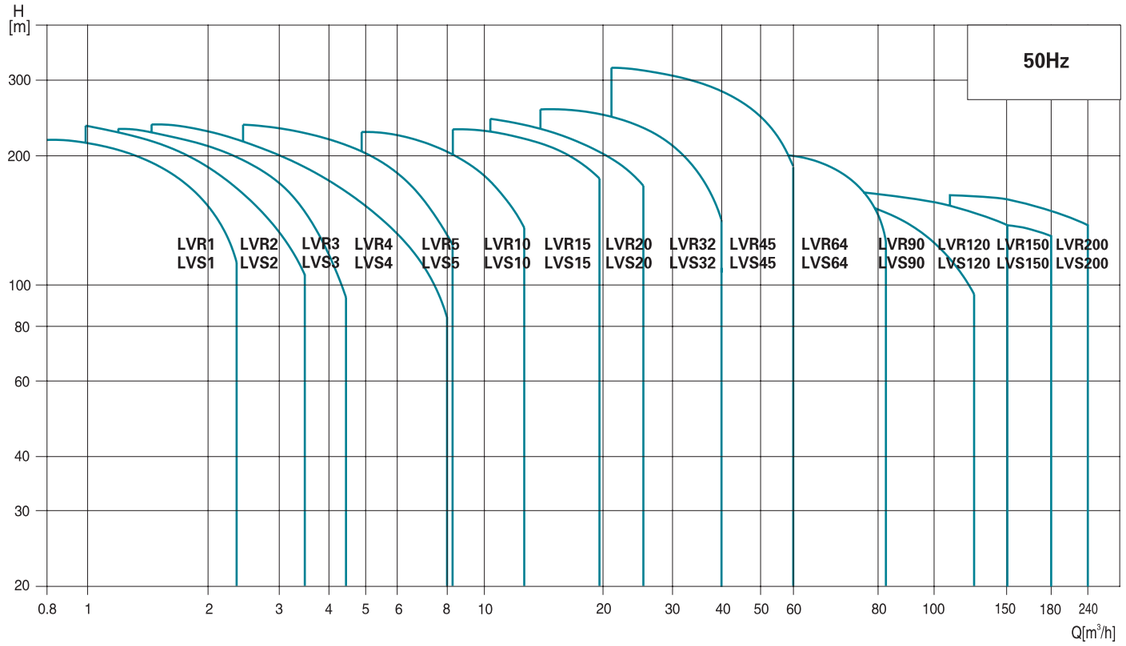
(Note: set to position 1 before delivery)



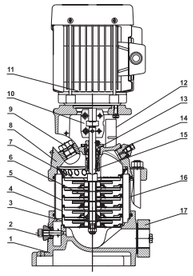
Product Range

DESCRIPTION \ MODEL	LVR(S)1	LVR(S)2	LVR(S)3	LVR(S)4	LVR(S)5	LVR(S)10	LVR(S)15	LVR(S)20	LVR(S)32	LVR(S)45	LVR(S)64	LVR(S)90	LVR(S)120	LVR(S)150	LVR(S)200
Rated flow [m³/h]	1	2	3	4	5	10	15	20	32	45	64	90	120	150	200
Flow range [m³/h]	0.7–2.4	1.0–3.5	1.2–4.5	1.5–8	2.5–8.5	5–13	8–23	10.5–29	15–40	22–58	30–85	45–120	60–150	80–180	100–240
Max. pressure [bar]	22	23	24	21	24	22	23	25	28	33	22	20	16	16	16
Motor power [kW]	0.37–2.2	0.37–3	0.37–3	0.37–4	0.37–4	1.1–7.5	1.1–15	1.1–18.5	1.5–30	3–45	4–45	5.5–45	11–75	11–75	18.5–110
Temperature Range [℃]	–20℃~+120℃ (Note: Both the Max. permissible pressure and liquid temperature range refer to the pump capacity.)														
Max. pump efficiency [%]	45	46	55	59	60	65	70	72	78	79	80	81	74	73	79
Pipe connection-LVR															
Oval flange	G1	G1	G1	G1 1/4	G1 1/4	–	–	–	–	–	–	–	–	–	–
DIN flange	DN25	DN25	DN25	DN32	DN32	DN40	DN50	DN50	DN65	DN80	DN100	DN100	DN125	DN125	DN150
Pipe connection-LVS															
Oval flange	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DIN flange	DN32	DN32	DN32	DN32	DN32	DN40	DN50	DN50	DN65	DN80	DN100	DN100	DN125	DN125	DN150
Clamp connector	ϕ42	ϕ42	ϕ42	ϕ42	ϕ42	–	–	–	–	–	–	–	–	–	–
Threaded connector	G1 1/4	G1 1/4	G1 1/4	G1 1/4	G1 1/4	–	–	–	–	–	–	–	–	–	–

Scope Of Performance–LVR,LVS

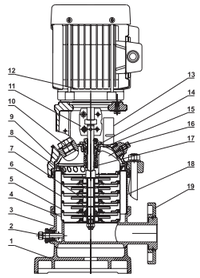


Cross Section



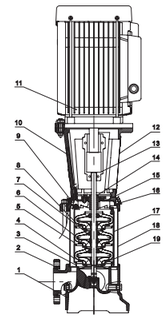
MODEL:LVR1(2,3,4,5)

	Part	Material
1	Base	HT200
2	Drainage plug assembly	AISI304
3	Primary diffuser	AISI304
4	Diffuser with bearing	AISI304
5	Medium diffuser	AISI304
6	Impeller	AISI304
7	Final volute	AISI304
8	Motor base	HT200
9	Filling plug	AISI304
10	Coupling	Iron based powder metallurgy
11	Motor	
12	Guarding plate	AISI304
13	Cartridge seal	
14	Vent plug assembly	AISI304
15	Pump shaft	AISI304
16	Pump barrel	AISI304
17	Oval flange	HT200



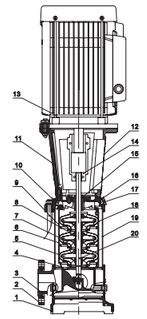
MODEL:LVS1(2,3,4,5)

	Part	Material	Optional Material
1	Base plate	HT200	
2	Drainage plug assembly	AISI304	AISI316
3	Chasis	ZG304	ZG316
4	Primary diffuser	AISI304	AISI316
5	Diffuser with bearing	AISI304	AISI316
6	Medium diffuser	AISI304	AISI316
7	Impeller	AISI304	AISI316
8	Final volute	AISI304	AISI316
9	Motor base	HT200	
10	Filling plug	AISI304	AISI316
11	Coupling	Iron based powder metallurgy	
12	Motor		
13	Guarding plate	AISI304	
14	Cartridge seal		
15	Pump cover	ZG304	ZG316
16	Vent plug assembly	AISI304	AISI316
17	Pump shaft	AISI304	AISI316
18	Pump barrel	AISI304	AISI316
19	Flange	ZG35	



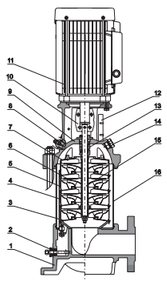
MODEL:LVR32(46,64,90)

	Part	Material
1	Base plate	HT200
2	Flange	ZG35
3	Primary diffuser	AISI304
4	Medium diffuser	AISI304
5	Diffuser with bearing	AISI304
6	Impeller	AISI304
7	Shaft sleeve assembly	
8	Final diffuser	AISI304
9	Vent plug assembly	AISI304
10	Motor base	HT200
11	Motor	
12	Guarding plate	AISI304
13	Coupling	QT400
14	Cartridge seal	
15	HT200 Pump head	HT200
16	Filling plug	AISI304
17	Tension plate	AISI304
18	Pump barrel	AISI304
19	Pump shaft	AISI304



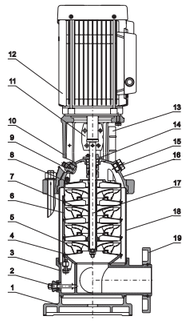
MODEL:LVS32(46,64,90)

	Part	Material	Optional Material
1	Base plate	HT200	
2	Flange	ZG35	
3	Chasis	ZG304	ZG316
4	Primary diffuser	AISI304	AISI316
5	Medium diffuser	AISI304	AISI316
6	Diffuser with bearing	AISI304	AISI316
7	Impeller	AISI304	AISI316
8	Shaft sleeve assembly		
9	Final diffuser	AISI304	AISI316
10	Vent plug assembly	AISI304	AISI316
11	Motor base	HT200	
12	Motor		
13	Guarding plate	AISI304	
14	Coupling	QT400	
15	Cartridge seal		
16	Pump head	ZG304	ZG316
17	Filling plug	AISI304	AISI316
18	Tension plate	AISI304	AISI316
19	Pump barrel	AISI304	AISI316
20	Pump shaft	AISI304	AISI316



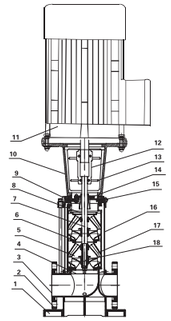
MODEL:LVR10(15,20)

	Part	Material
1	Base	HT200
2	Drainage plug assembly	AISI304
3	Primary diffuser	AISI304
4	Diffuser with bearing	AISI304
5	Medium diffuser	AISI304
6	Impeller	AISI304
7	Final volute	AISI304
8	Filling plug	AISI304
9	Motor base	HT200
10	Coupling	Iron based powder metallurgy
11	Motor	
12	Guarding plate	AISI304
13	Cartridge seal	
14	Vent plug assembly	AISI304
15	Pump shaft	AISI304
16	Pump barrel	AISI304



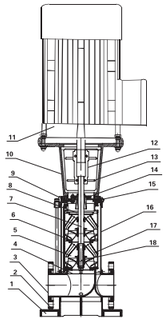
MODEL:LVS10(15,20)

	Part	Material	Optional Material
1	Base plate	HT200	
2	Drainage plug assembly	AISI304	AISI316
3	Chasis	ZG304	ZG316
4	Primary diffuser	AISI304	AISI316
5	Diffuser with bearing	AISI304	AISI316
6	Medium diffuser	AISI304	AISI316
7	Impeller	AISI304	AISI316
8	Final volute	AISI304	AISI316
9	Filling plug	AISI304	AISI316
10	Motor base	HT200	
11	Coupling	Iron based powder metallurgy	
12	Motor		
13	Guarding plate	AISI304	
14	Cartridge seal		
15	Vent plug assembly	AISI304	AISI316
16	Pump cover	ZG304	AISI316
17	Pump shaft	AISI304	AISI316
18	Pump barrel	AISI304	AISI316
19	Flange	ZG35	



MODEL:LVR120(150,200)

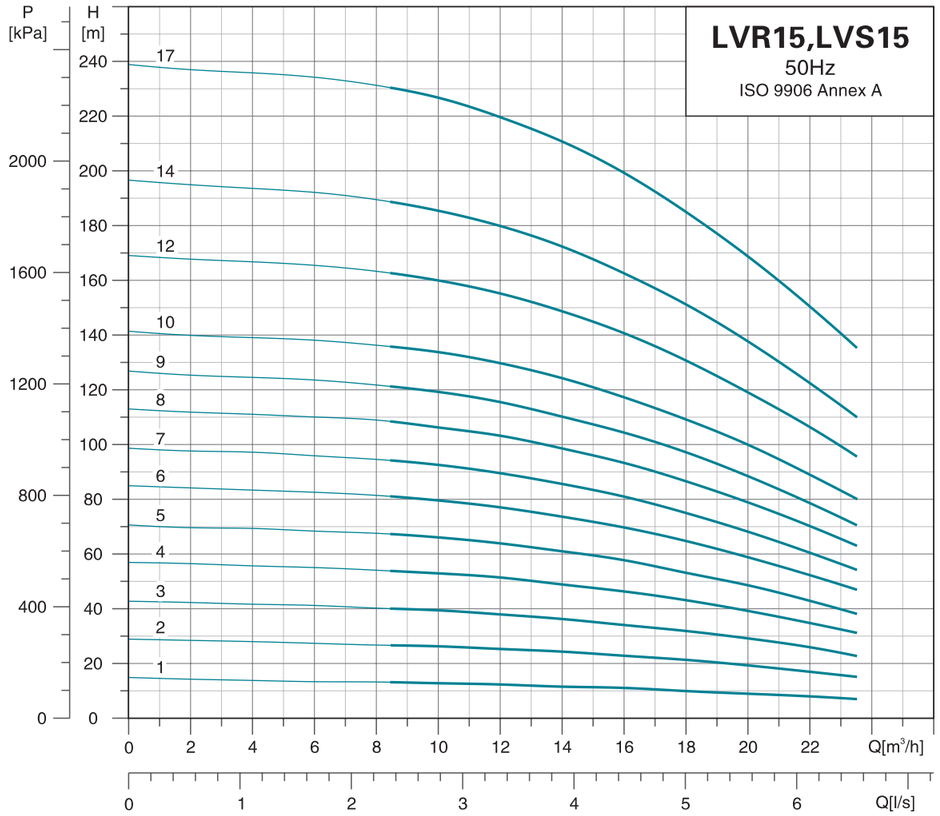
	Part	Material
1	Base plate	HT200
2	Flange	ZG35
3	Base	HT200
4	Primary diffuser	AISI304
5	Medium diffuser	AISI304
6	Diffuser with bearing	AISI304
7	Impeller	AISI304
8	Final diffuser	AISI304
9	Pump head	HT200
10	Motor base	HT200
11	Motor	
12	Coupling	QT400
13	Guarding plate	AISI304
14	Cartridge seal	
15	Filling plug	AISI304
16	Tension plate	AISI304
17	Pump barrel	AISI304
18	Pump shaft	AISI304

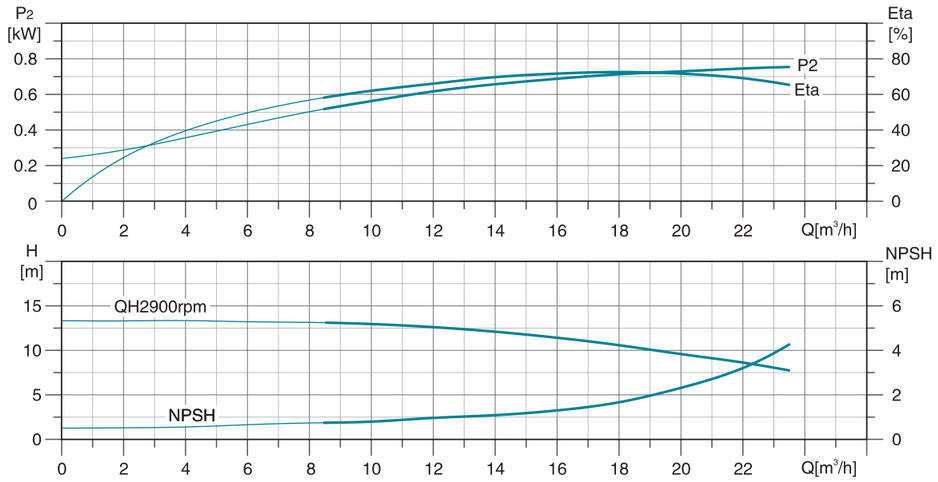


MODEL:LVS120(150,200)

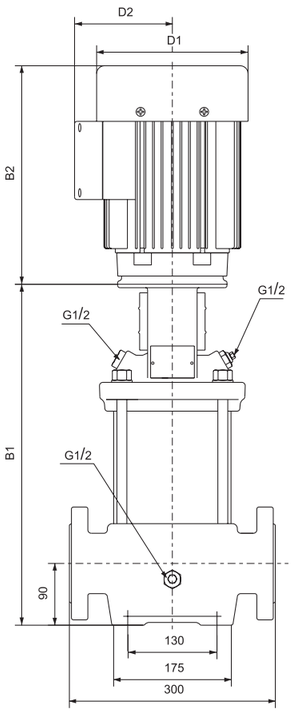
	Part	Material	Optional Material
1	Base plate	HT200	
2	Flange	ZG35	
3	Chasis	ZG304	ZG316
4	Primary diffuser	AISI304	AISI316
5	Medium diffuser	AISI304	AISI316
6	Diffuser with bearing	AISI304	AISI316
7	Impeller	AISI304	AISI316
8	Final diffuser	AISI304	AISI316
9	Pump head	ZG304	ZG316
10	Motor base	HT200	
11	Motor		
12	Coupling	QT400	
13	Guarding plate	AISI304	
14	Cartridge seal		
15	Filling plug	AISI304	AISI316
16	Tension plate	AISI304	AISI316
17	Pump barrel	AISI304	AISI316
18	Pump shaft	AISI304	AISI316

Hydraulic Performance Curves

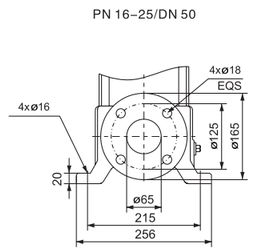




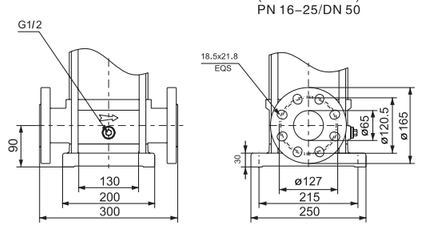
Dimension Drawing



DIN FLANGE(LVR)/F



PN 16–25/DN 50



(DIN–ANSI–JIS)
PN 16–25/DN 50

DIN FLANGE(LVS)/F

MODEL	DIN FLANGE(LVR)		DIN FLANGE(LVS)		D1	D2
	B1	B1+B2	B1	B1+B2		
15–1	354	604	352	602	155	124
15–2	415	725	413	723	175	137
15–3	465	795	463	793	195	151
15–4	510	867	508	865	219	169
15–5	555	912	553	910	219	169
15–6	632	1030	630	1028	258	188
15–7	677	1075	675	1073	258	188
15–8	722	1120	720	1118	258	188
15–9	767	1165	765	1163	258	188
15–10	889	1388	887	1386	315	242
15–12	979	1478	977	1476	315	242
15–14	1071	1570	1067	1566	315	242
15–17	1204	1703	1202	1701	315	242

MODEL	POWER[kW]	Q[m³/h]	3	6	9	12	15	18	21
15–1	1.1	H(m)	15	13	13	12	11	10	9
15–2	2.2		28	27	26	25	23	21	18
15–3	3.0		42	41	40	38	35	32	28
15–4	4.0		58	55	55	51	47	43	38
15–5	4.0		70	68	66	64	58	53	48
15–6	5.5		83	82	80	77	71	64	58
15–7	5.5		98	96	94	89	83	75	65
15–8	7.5		112	110	108	103	96	86	75
15–9	7.5		125	123	120	115	108	97	84
15–10	11.0		140	138	136	129	120	109	95
15–12	11.0		168	165	162	155	142	130	114
15–14	11.0		194	192	188	180	166	151	130
15–17	15.0		237	234	230	219	205	185	160