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 x 220V/3 x 380V

Identification Codes

LVS 45 - 10 - 2 - B - K

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

LVS 200 - 3 - C - D

- Small impeller D
- Small impeller C
- Impeller Stages
- Rated Flow(m^3/h)
- LVS, LVR Vertical Multistage Pump

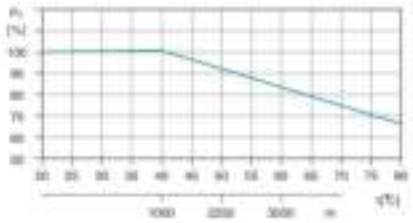
LVS: Stainless steel wetted parts
LVR: Cast iron base & pump cover

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

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 2500 meters above sea level, P_2 will be decreased to 88%. When the ambient temperature is 70℃, P_2 will be decreased to 78%.

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 + 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.

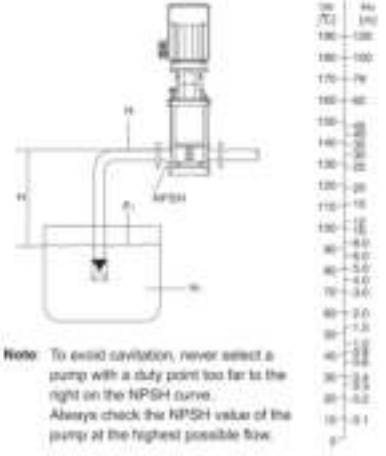
NPSH = Net Positive Suction Head in meters head. (To be read from the NPSH curve at the highest flow the pump will be delivering.)

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.



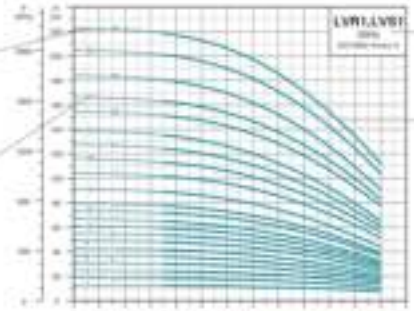
Note: To avoid cavitation, never select a pump with a duty point too far to the right on the NPSH curve.
Always check the NPSH value of the pump at the highest possible flow.

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.

Model			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	—	3-36	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	6
10-7	—	10-22	10
LVR15, LVS15			
15-1	—	15-3	6
15-4	—	15-17	10
LVR20, LVS20			
20-1	—	20-3	6
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
LVR120, LVS120			
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

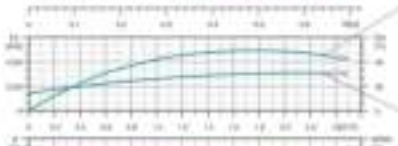


The thin curves indicate the duty range where long-time operation is not allowed

Number of Stages

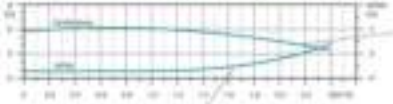
Pump type, frequency and ISO standard

The bold curves indicate the duty range where long-time operation is permitted for best efficiency



The efficiency curve

The output power curves of single impeller



The Q-H curve of single impeller

The NPSH curve

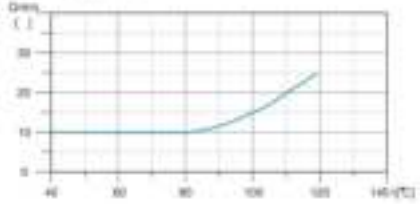
Guidelines to Performance Curves

Tolerances to ISO 9906, Annex A.
Measurements have been made with airless water at a temperature of 20°C 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.

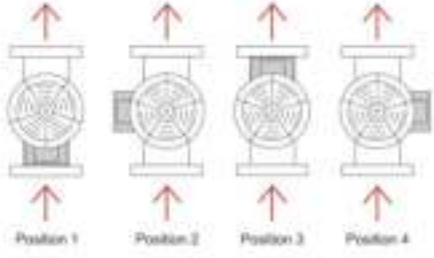
Air cooling apparatus



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

Terminal Box Positions

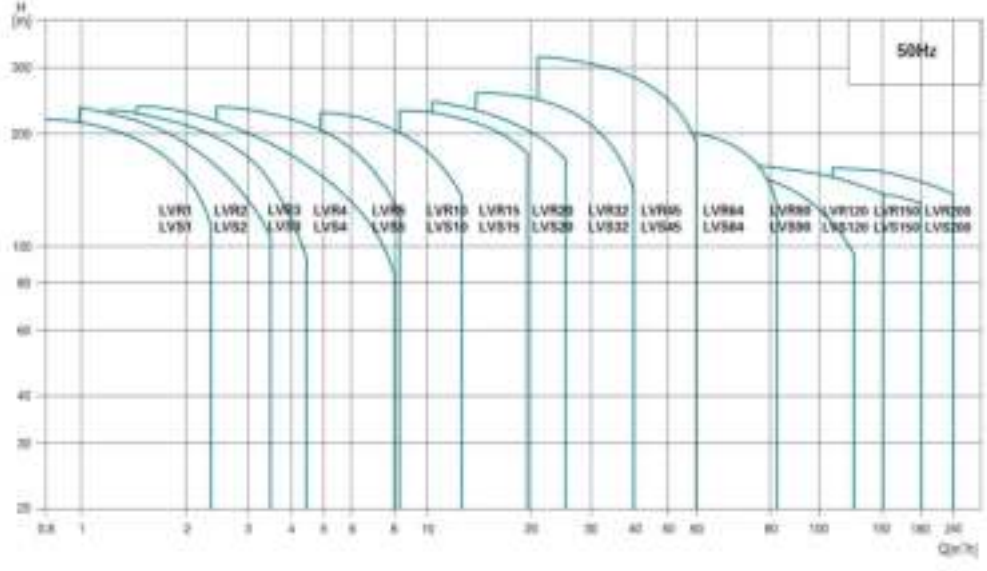
(Note: set to position 1 before delivery)



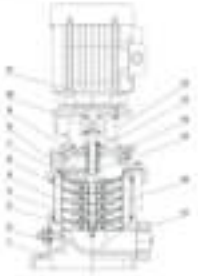
Product Range

MODEL / DESCRIPTION	LVR1/1	LVR2/2	LVR3/2	LVR4/4	LVR5/5	LVR8/10	LVR8/15	LVR8/20	LVR8/32	LVR8/45	LVR8/64	LVR8/90	LVR8/120	LVR8/150	LVR8/200
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	1.6–3.5	1.2–4.8	1.5–6	2.5–8.5	5–15	8–23	10.5–29	15–46	22–68	30–85	45–130	60–160	80–180	100–240
Max. pressure [bar]	20	20	24	21	24	20	20	20	20	20	20	20	16	16	16
Motor power [kW]	0.37–0.2	0.37–0	0.37–0	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 [°C]	–20°C~+120°C (Note: Both the Max. permissible pressure and liquid temperature range refer to the pump capacity.)														
Max. pump efficiency [%]	45	48	55	58	60	60	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

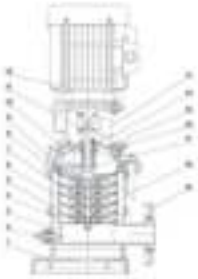


Cross Section



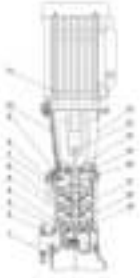
MODEL : LVR1 (2,3,4,5)

	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	Inlet flange	HT200



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

	Part	Material	Optional Material
1	Base plate	HT200	
2	Drainage plug assembly	AISI304	AISI316
3	Chaser	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	

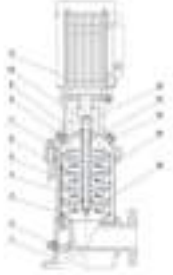


MODEL : LVR32 (45,64,90)

	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	GT400
14	Cartridge seal	
15	HT200 Pump head	HT200
16	Filling plug	AISI304
17	Tension plate	AISI304
18	Pump barrel	AISI304
19	Pump shaft	AISI304

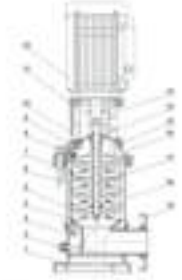
MODEL : LVS32 (45,64,90)

	Part	Material	Optional Material
1	Base plate	HT200	
2	Flange	ZG35	
3	Chaser	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	GT400	
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



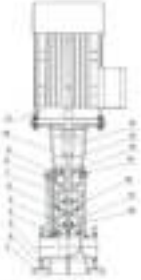
MODEL : LVR10 (10,20)

	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



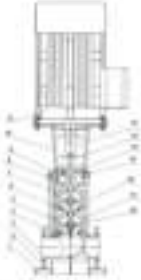
MODEL : LVS10 (10,20)

	Part	Material	Optional Material
1	Base plate	HT200	
2	Drainage plug assembly	AISI304	AISI316
3	Chaser	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)

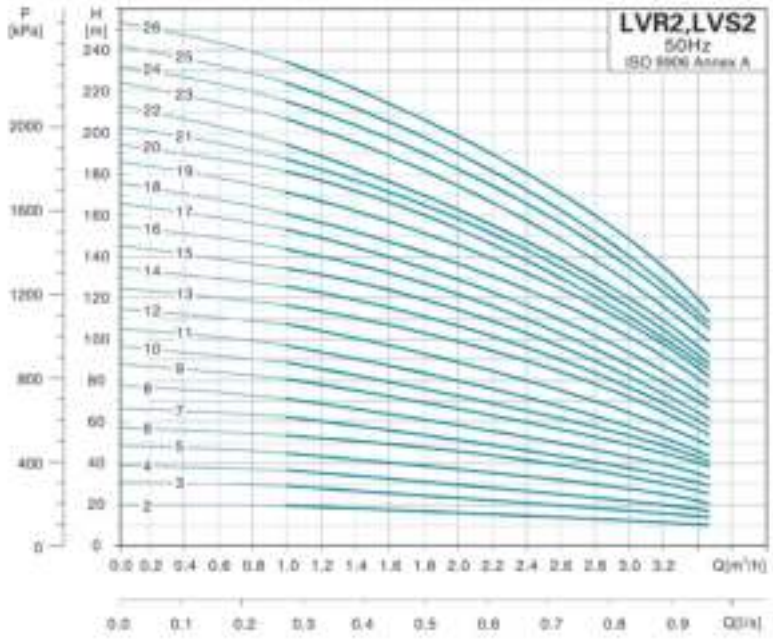
	Part	Material
1	Base plate	HT200
2	Flange	ZG35
3	Base	HT200
4	Primary diffuser	AISI304
5	Medium diffuser	AISI304
6	Diffuser with bearing	AISI304
7	Impeller	AISI304
8	Final diffuser	AISI304
9	Pump head	HT200
10	Motor base	HT200
11	Motor	
12	Coupling	GT400
13	Guarding plate	AISI304
14	Cartridge seal	
15	Filling plug	AISI304
16	Tension plate	AISI304
17	Pump barrel	AISI304
18	Pump shaft	AISI304

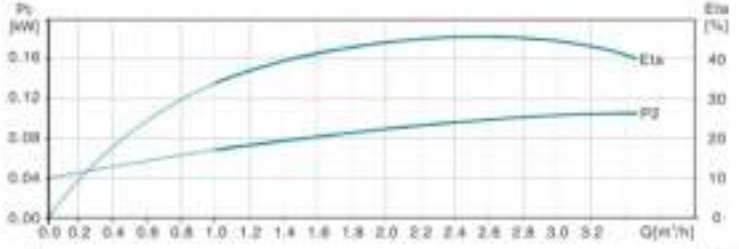


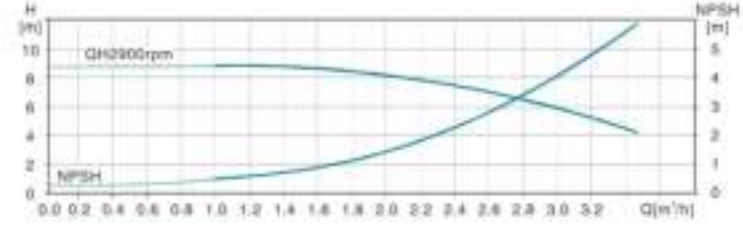
MODEL : LVS120 (150,200)

	Part	Material	Optional Material
1	Base plate	HT200	
2	Flange	ZG35	
3	Chaser	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	GT400	
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

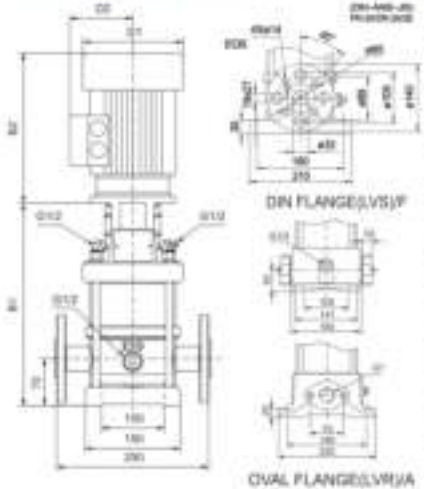
Hydraulic Performance Curves





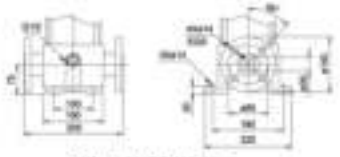


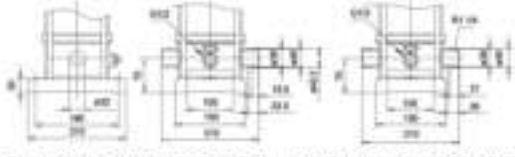
Dimension Drawing



MODEL	OVAL FLANGE(LVR)		DIN FLANGE(LVS)		D1	D2
	B1	B1+B2	B1	B1+B2		
2-2	220	440	245	465	140	110
2-3	238	458	263	483	140	110
2-4	256	476	281	501	140	110
2-5	274	494	299	519	140	110
2-6	297	547	322	572	160	125
2-7	315	565	340	590	160	125
2-8	333	583	358	608	160	125
2-9	351	601	376	626	160	125
2-10	369	619	394	644	160	125
2-11	387	637	412	662	160	125
2-12	422	712	447	737	180	125
2-13	440	730	465	755	180	125
2-14	458	748	483	773	180	125
2-15	476	766	501	791	180	125
2-16	494	784	519	809	180	125
2-17	512	802	537	827	180	125
2-18	530	820	555	845	180	125
2-19	548	838	573	863	180	125
2-20	566	856	591	881	180	125
2-21	584	874	609	899	180	125
2-22	602	892	627	917	180	125
2-23	626	958	653	983	190	140
2-24	646	976	671	1001	190	140
2-25	664	994	689	1019	190	140
2-26	682	1012	707	1037	190	140

Note: B1 and B1+B2 of clamp connector and threaded connector are in compliance with that of DIN flange.





MODEL	POWER(kW)	Q(m³/h)	1.6	1.2	1.6	2.0	2.5	2.8	3.2	3.5
2-2	0.37	H(m)	18	17	16	15.5	13.5	12	10	8
2-3	0.37		27	26	24	22.5	19.5	18	15	12
2-4	0.55		36	35	33	30.5	27	24	17	16
2-5	0.55		45	43	40	37	32.5	30	24	20
2-6	0.75		53	52	50	45.5	40	36	30	24
2-7	0.75		63	61	57	52	45.5	41	35	28
2-8	1.1		71	69	65	59	51	47	40	33
2-9	1.1		80	78	73	66.5	58	54	45	37
2-10	1.1		89	86	81	74	65	59	49	40
2-11	1.1		98	95	89	82	71.5	64	54	44
2-12	1.5		107	103	97	90	78	71	59	47
2-13	1.5		116	114	108	98	86.5	78	65	52
2-14	1.5		125	122	114	105	92	84	69	57
2-15	1.5		134	130	123	112	98	90	73	60
2-16	2.2		143	139	131	120	104	96	79	66
2-17	2.2		152	148	139	128	111	102	85	70
2-18	2.2		161	157	148	136	122	108	91	76
2-19	2.2		170	165	156	143	128	113	95	81
2-20	2.2		179	174	164	150	134	119	100	85
2-21	2.2		188	183	172	157	140	124	105	88
2-22	2.2		197	192	180	165	145	130	110	90
2-23	3.0		205	201	188	173	153	137	105	97
2-24	3.0		214	210	197	181	160	144	120	105
2-25	3.0		223	219	205	188	166	151	125	107
2-26	3.0		232	228	214	196	176	158	130	110