Vertical Multistage Centrifugal Pumps

APPLICATIONS

LVR(S) series, vertical multistage centrifugal pump, is suitable for transferring liquids of low viscosity, non-inflammable and non-explosive, not containing solid particles or fibers.

- Water supply: water supply & drainage for high-rise buildings, filtration and transfer at waterworks, pressure boosting in main pipe
- Industry: Washing and cleaning systems, boiler feeding, cooling water circulation, water treatment systems, auxiliary system, support equipment
- Water treatment: ultra-filtration systems, reverse-osmosis systems, distillation systems, separators, swimming pools
- Agricultural irrigation: sprinkler irrigation, drip-feed irrigation
- Food & beverage industry
- Fire-fighting system

FEATURES

- Compact, nice appearance, efficient, low noise, reliable seal, easy to use and maintain

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: -15℃+120℃
- Flow ranges: 0.7-85m³/h
- pH: 3~9
- Max. ambient temperature: +40℃
- Max. operation pressure: 33bar
- Altitude: up to 1000m

MOTOR

- Totally enclosed & fan-cooled motor
- Protection class: IP 55
- Standard voltage: 50Hz 1×220V/3×380V

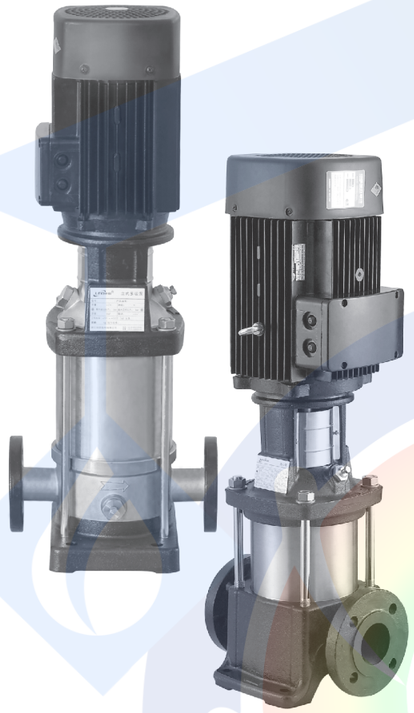
IDENTIFICATION CODES

LVS 45-10-2-B-F

- F: Pipeline port code (Omitted for DIN flange)
- B: AISI316 stainless steel material (Omitted for AISI304)
- 2: Small impeller stages
- 10: Impeller stage
- 45: Rated flow(m³/h)
- LVS: LVS,LVR Vertical multistage pump series

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

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



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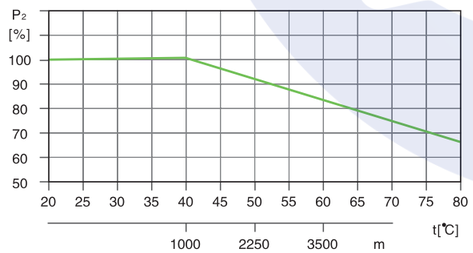
AMBIENT TEMPERATURE

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%.

MINIMUM INLET PRESSURE-NPSH

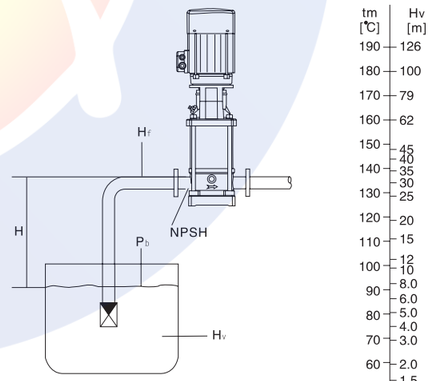
Calculation of the inlet pressure “H” is recommended in these situations:

- 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.



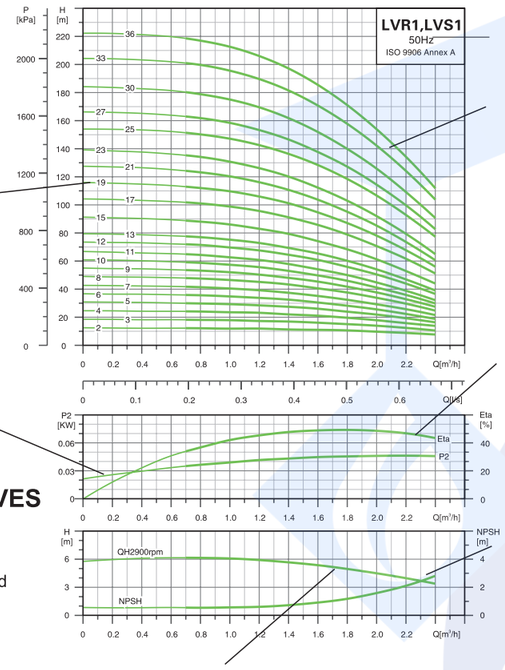
Note: To avoid cavitation, never select a pump with a duty point too far to the right on the NPSH curve.
Always check the NPSH value of the pump at the highest possible flow.

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 — 2–11	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 — 4–10	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

HOW TO READ THE CURVE CHARTS



- Pump type, frequency and ISO standard.
- QH curve for the individual pump. The bold curves indicate the recommended duty range for best efficiency.
- Number of Stages
- The power curves indicate pump input per stage.
- The eta curve shows the efficiency of the pump. The eta curve is an average curve of all the pump types shown in the chart.
- The NPSH curve is an average curve for all the variants shown. When choosing the pump, add a safety margin of at least 0.5m.
- QH curve for each individual impeller. Curves for standard impellers are shown.

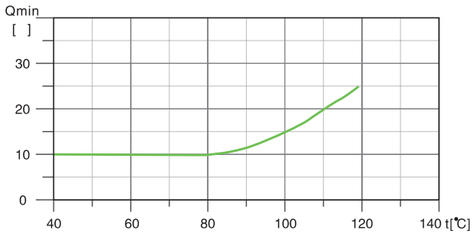
GUIDELINES TO PERFORMANCE CURVES

- 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.

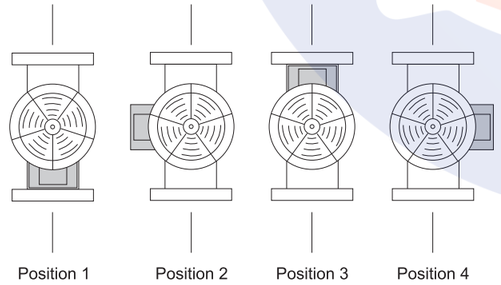
Air cooling apparatus



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

TERMINAL BOX POSITIONS

(Note: set to position 1 before delivery)



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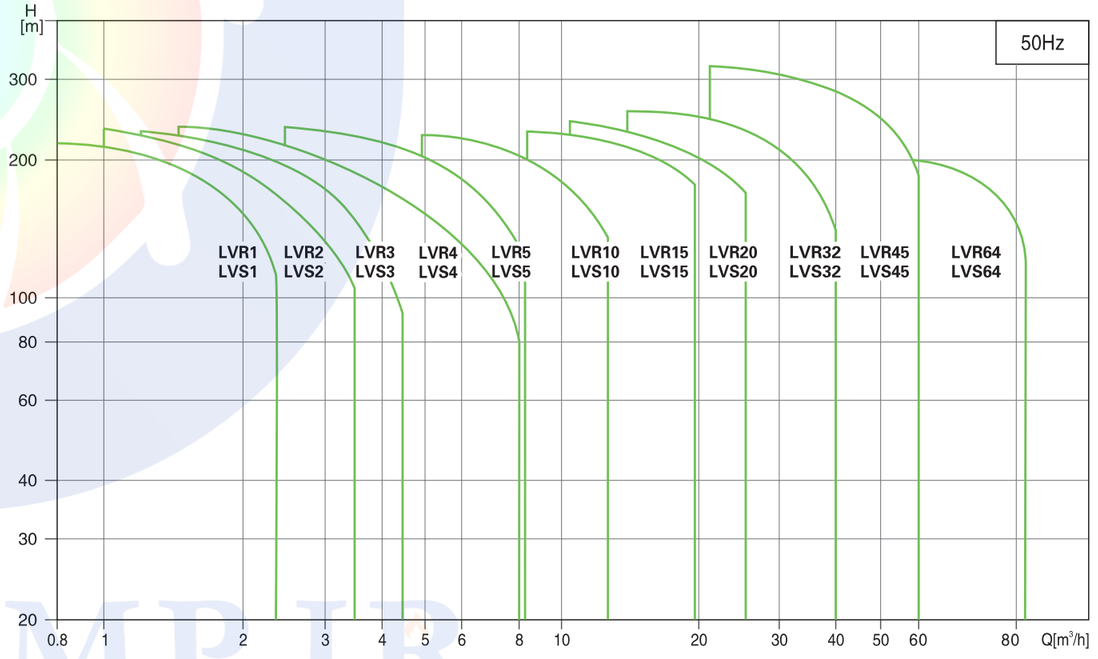
PRODUCT RANGE

MODEL / DESCRIPTION	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
Rated flow [m³/h]	1	2	3	4	5	10	15	20	32	45	64
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
Max. pressure [bar]	22	23	24	21	24	22	23	25	28	33	22
Motor power [kW]	0.37–2.2	0.37–3	0.37–3	0.37–4	0.37–4	0.37–7.5	1.1–15	1.1–18.5	1.5–30	3–45	4–45
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
Pipe connection-LVR											
Oval flange	G1	G1	G1	G1 1/4	G1 1/4	–	–	–	–	–	–
DIN flange	–	–	–	–	–	DN 42	DN 50	DN 50	DN65	DN80	DN100
Flange structure	○	○	○	○	○	○	○	○	●	●	●
Pipe connection-LVS											
Oval flange	–	–	–	–	–	–	–	–	–	–	–
DIN flange	DN 32	DN 32	DN 32	DN 32	DN 32	DN 42	DN 50	DN 50	DN65	DN80	DN100
Clamp connector	ϕ42	ϕ42	ϕ42	ϕ42	ϕ42	–	–	–	–	–	–
Threaded connector	G1 1/4	G1 1/4	G1 1/4	G1 1/4	G1 1/4	–	–	–	–	–	–
Flange structure	●	●	●	●	●	●	●	●	●	●	●

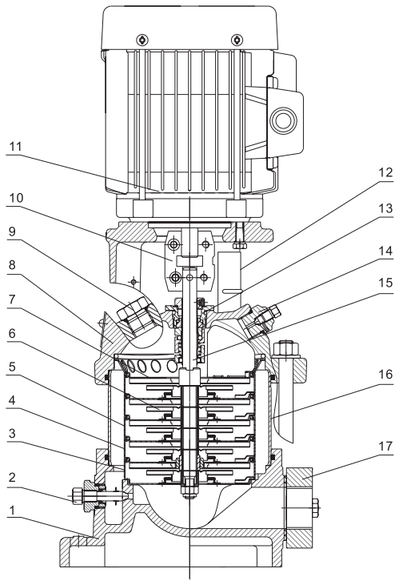
Note: ○ It means stationary flange structure , ● It means dynamic flange structure

SCOPE OF PERFORMANCE-LVR,LVS



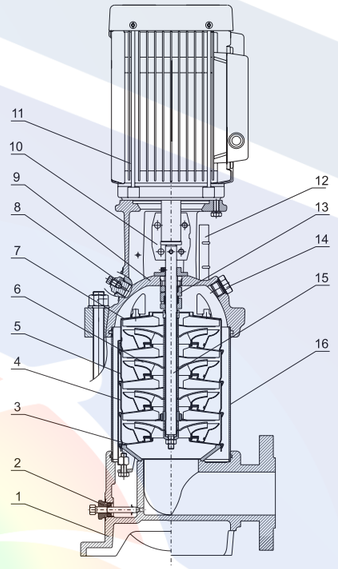
Vertical Multistage Centrifugal Pumps

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 diffuser	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



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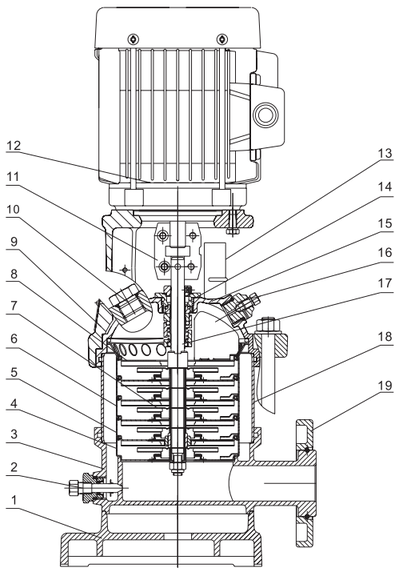
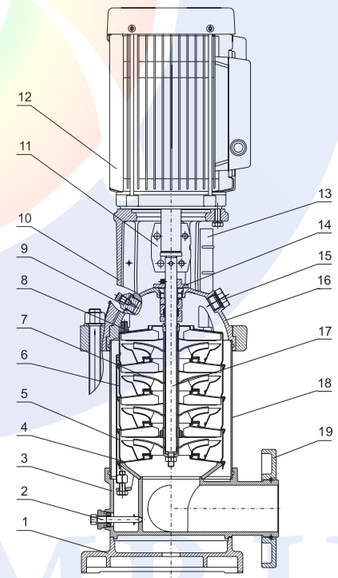
MODEL: LVR10(15,20)

	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 diffuser	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: 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 diffuser	AISI304	AISI316
9	Motor base	HT200	
10	Filling plug	AISI304	AISI316
11	Coupling	Iron based powder metallurgy	
12	Motor		
13	Guarding plate	AISI304	
14	Catridge 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	

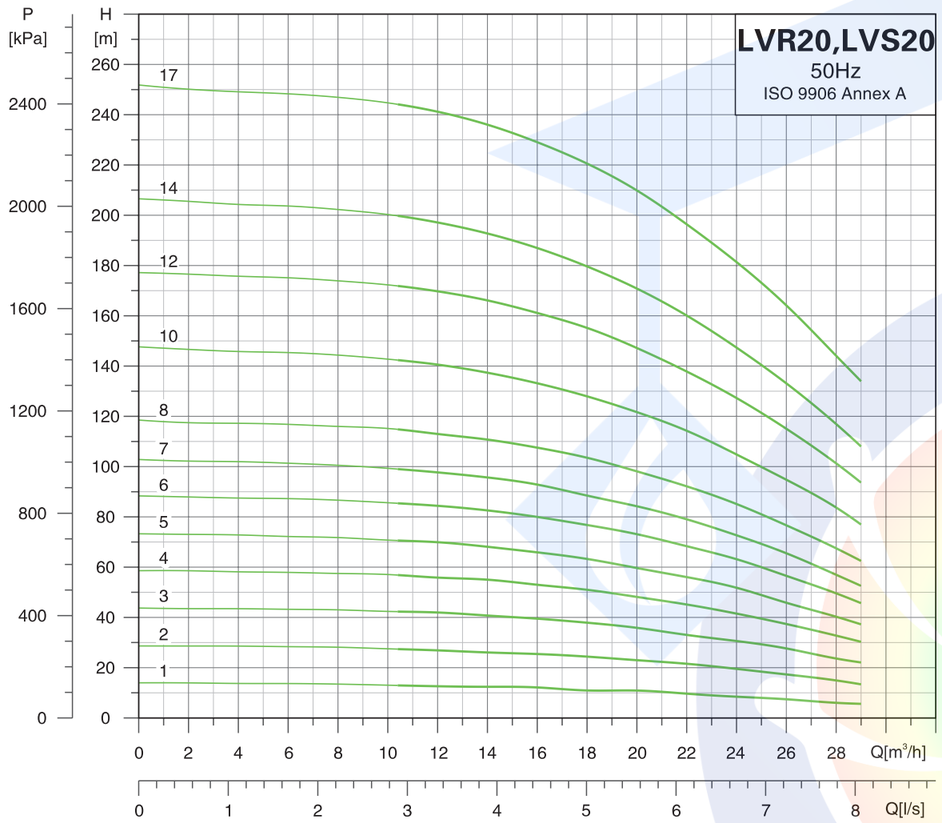


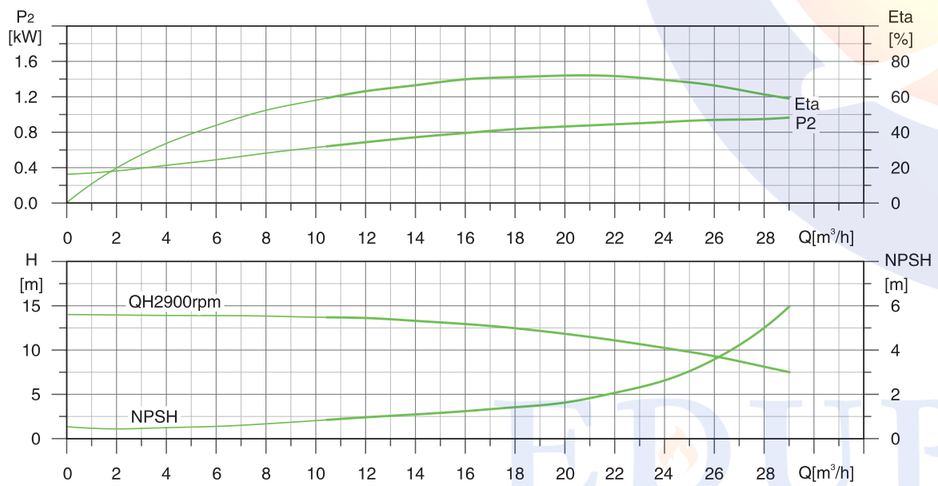
MODEL: LVS10(15,20)

	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 diffuser	AISI304	AISI316
9	Filling plug	AISI304	AISI316
10	Motor base	HT200	
11	Coupling	Iron based powder metallurgy	
12	Motor		
13	Guarding plate	AISI304	
14	Catridge 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	

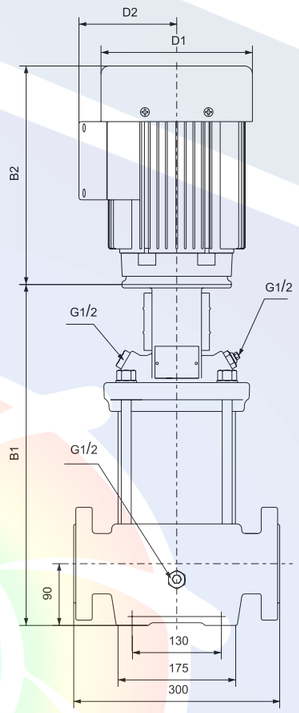
Vertical Multistage Centrifugal Pumps

HYDRAULIC PERFORMANCE CURVES

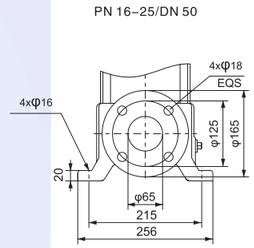




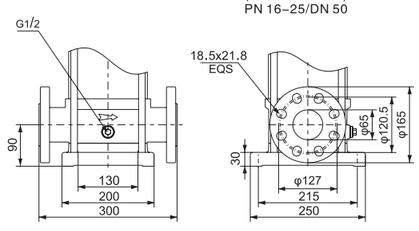
DIMENSION DRAWING



MODEL	DIN FLANGE(LVR)		DIN FLANGE(LVS)		D1	D2
	B1	B1+B2	B1	B1+B2		
20–1	354	604	352	602	155	124
20–2	415	725	413	723	175	137
20–3	465	822	463	820	219	169
20–4	542	940	540	938	258	188
20–5	587	985	585	983	258	188
20–6	632	1030	630	1028	258	188
20–7	677	1075	675	1073	258	188
20–8	799	1298	797	1296	315	242
20–10	889	1388	887	1386	315	242
20–12	979	1478	977	1476	315	242
20–14	1069	1568	1067	1566	315	242
20–17	1204	1747	1202	1745	315	242



DIN FLANGE(LVR)/F



DIN FLANGE(LVS)/F

MODEL	POWER[kW]	Q[m³/h]	4	8	12	16	20	24	28
20–1	1.1		13	13	13	12	11	9	6.5
20–2	2.2		28	28	27	25	23	19	15
20–3	4.0		43	43	42	39	36	30	23
20–4	5.5		58	57	56	53	48	41	32
20–5	5.5		73	72	70	66	59	52	40
20–6	7.5		87	83	84	80	73	62	49
20–7	7.5	H(m)	102	100	97	93	84	72	57
20–8	11.0		117	116	113	107	98	85	67
20–10	11.0		146	144	140	132	121	105	83
20–12	15.0		175	174	169	161	147	127	101
20–14	15.0		204	202	197	187	171	147	117
20–17	18.5		249	247	241	229	210	181	144

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در حوزه‌های :

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معدن

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درکلاس‌های S1 - S2 - S3
مورد تایید سازمان آتش‌نشانی تهران

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بدون محدودیت برند

مشاوره - طراحی - اجراء

تاسیسات مکانیکی (موتورخانه - استخر)
تهویه و تخلیه دود
سیستم‌های پمپاژ
ایمنی معماری
اعلام حریق
اطفاء حریق

آمـــــوزش

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سرمایش و گرمایش موتورخانه
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تهـــران، سعـدی شمـالـی، خیـابان مـرادی نور، پـلاک ۳۱
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