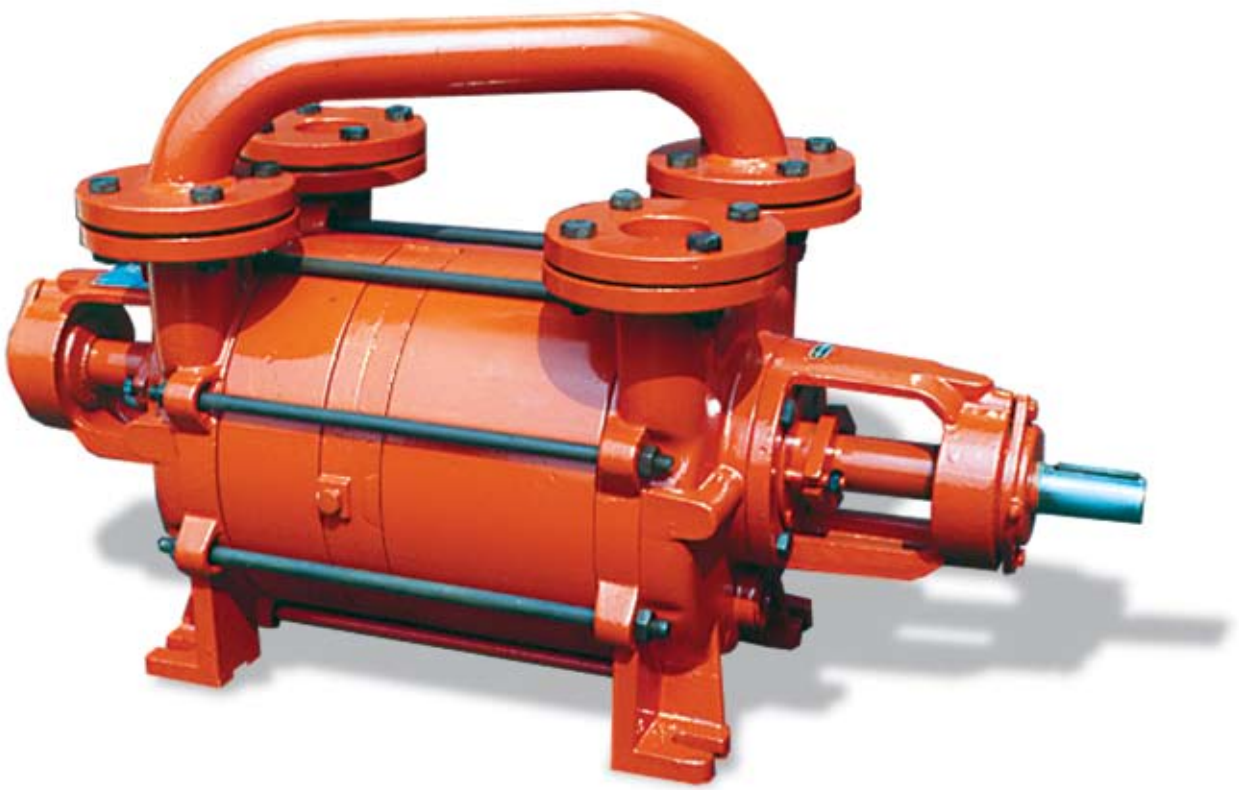
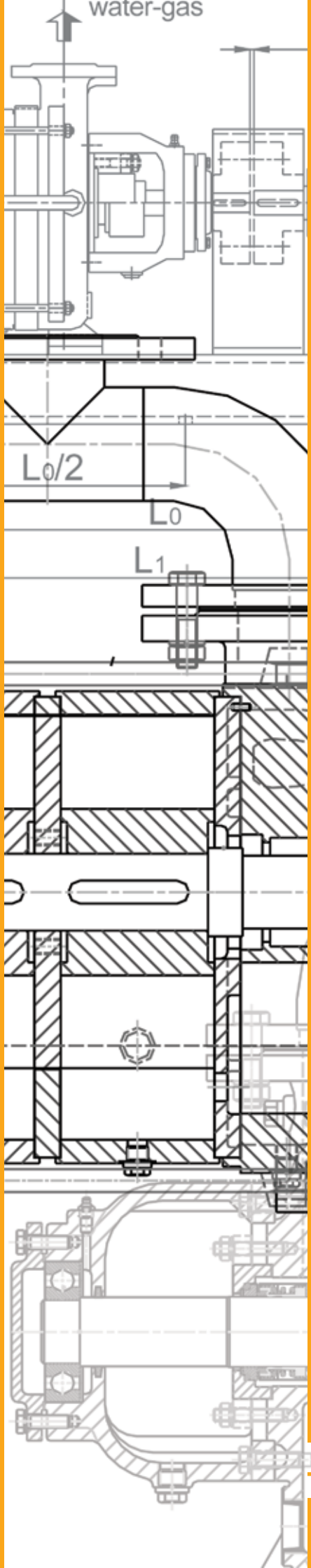
MZT PUMPI

CEL,CEH,KVP,RVP - VACUUM PUMPS



PUMP YOUR WAY TO SUCCESS

Catalog 2008



MZT Pumpi a.d is one of the leading manufacturers of industrial pumps in the region of South-East Europe. With its extensive experience of more than 60 years, justified with existence of broad product range, it continuously strives to satisfy the utmost needs of the customer.

The key elements to survive in this globalized market are flexibility towards market changes and ability to innovate-both in product designs as well as business processes. By following the worldwide development in the pump industry, our staff constantly faces with the growing challenge to keep abreast of the numerous innovations in pump designs and this is justified by having a separate R&D department.

The basic objective of MZT Pumpi is expanding the business partnerships and building the brand name of our products worldwide. All of our employees live up to our motto: ”Pump your way to success”.

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GENERAL DATA

Technical data:

Capacity: up to 1000 (m³/h)
Vacuum: up to 730 (mmHg)

Pump type key

Example: CEL - 520 – MZ

CE - Rotary liquid, ring vacuum pump,
L - Single-stage (H-for double-stage),
5 - 100 times increased nominal flow of rarified gas in m3/h (in the example (Q=500 m3/h)
20 - Length (width) of the impeller in cm (as to the double-stage pumps, the length of the bigger impeller,),
MZ - Shaft sealing with mechanical seal (S-soft packing)
KVP - 4
KVP - Type
4 - Nominal flow Q (dm3/s)

Design:

Water ring vacuum pumps CEL (single stage) and CEH (two-stages) are rotary pumps, with star type impeller eccentrically placed in the cylindrical body. The principle of operation is based upon the rotation of the impeller eccentrically placed in the cylindrical body, so that the auxiliary liquid forms “liquid ring”. During the rotation, a part of the water ring enters and emerges among the blades of the impeller, so discharging (sucking part) of the operating gas (air), forms appropriate vacuum. The direction of rotation is signed with an arrow on the pump itself.

Except the impeller, the pump has no other movable parts, so that there is no need of any additional lubrication (except bearings) and the sealing between the impeller and the side plates is realizes with the auxiliary liquid. Therefore, they have a relatively long life in relation to the other types of vacuum pumps. The water ring also absorbs the whole water vapor that enters with the working gas, thus absorbing the impurities and taking off the heat of the gas. The service liquid is usually water with optimal working temperature of +15°C (max. 45°C).

If the evaporating temperature of the auxiliary liquid at fixed temperature is higher than the pressure at which the working is sucked, it is necessary to decrease the service liquid temperature or to change the liquid appropriate lower evaporating pressure.

Applications:

CEL - single-stage pumps with maximum vacuum of 610 (mmHg) can be used in:

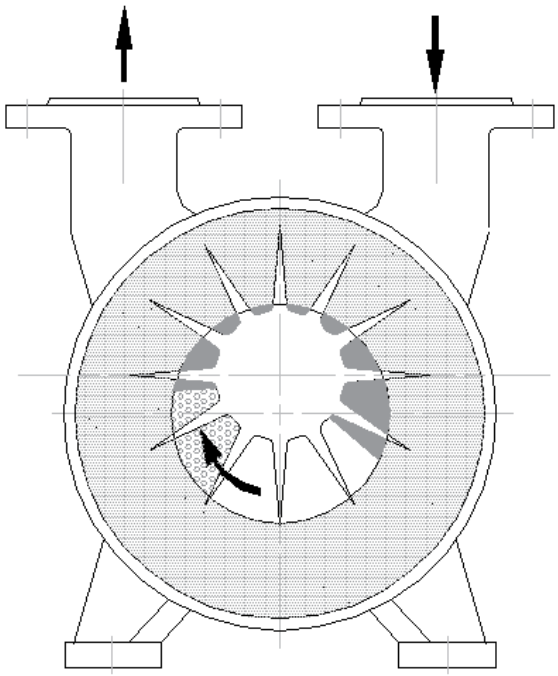
- Pumps, pipelines and vacuum sets air-free,
- Liquids air free,
- Paper and cellulose industry,
- Milking sets
- Absorption of vapors in ironing units
- Filter purification
- Humidity absorption of the fabric in textile industry,

CEH – double-stage pumps with maximum vacuum of 735 (mmHg):

- formation and maintenance of the vacuum in the vacuum plants,
- in chemical and pharmaceutical industry,
- in food industry,
- desalination plants,
- in impregnating equipment,

Used as compressors with low compression ration these pumps can be also applied for:

- filters purification for drinkable water,
- CO2 compression in the sugar factory,
- In the spinning mill for air moistening,



GENERAL DATA – DESIGN

Standard material executions:

The design depends upon the aggressiveness of the working gas and the auxiliary fluid. Usually, for “airwater” service medium or similar one, we recommend standard design i.e. suction body, discharge body, side and mid plates made of gray castings, impellers of nodular castings and the shaft of high-quality stainless steel. For any other combination of service it is recommended to contact the producer.

Bearing assembly with shaft:

The shaft bears upon two rolling bearings lubricated with hard grease.

Shaft sealing:

Sealing of the shaft is carried out by means of a soft packing or mechanical seals, according to the customer’s requirement. The mechanical seal can be replaced with soft packing or opposite, in a very simple way i.e. the gland is turned for 180°C without addition or removal of some other parts (except the gasket themselves). Regarding the gaskets cooling, no special water supply is necessary since it is provided in terms of the water of the water ring.

Operating Characteristic:

The enclose operating features of the rarefied gas flow (m³/h), vacuum (mmHg) and power absorption (kW) refer to the following conditions:

- barometer pressure: 1 bar (760 mmHg)
- auxiliary water temperature: 15°C
- auxiliary water density : ρ=1000 kg/m3
- viscosity: 10-6 m²/sec (10E)

If the discharge pressure is higher than 1 bar or the water temperature exceeds 15°C, the flow of gas is decreasing.

The auxiliary liquid flow refers to a case without a recirculation tank. But, if there is such one, then, the water demand is decreasing for 30% with the largest pumps, and for 50% with the smallest ones.

Design recommendations:

Beside the standard designing terms for vacuum pumps, we recommend the following ones:

- the connecting air and water lines must not be smaller than those of the pump
- in case of impurities, please provide appropriate filter on the suction side.

The auxiliary liquid supply is to be performed from the open water-tank (under atmospheric pressure). The water level in the tank must be in the height of the pump axis.
As to the possible ways of vacuum pumps operation with auxiliary water, please find the corresponding schedules.

- Schedule 1 – most unfavourable case when the supply is directly from the pipeline

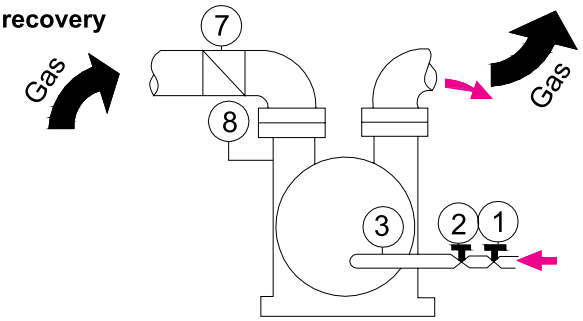
-large water demand, the pressure must be steady and not exceed 1 bar.

- Schedule 2 – most suitable way is minimal water demand and the pressure of the water in the pump inlet is about zero.

- Schedule 3 – Whenever the auxiliary fluid must not be taken to the sewerage or its quantity is limited. A cooler for service water cooling is also required.

Typical service liquid supply, recovery and cooling systems

1. No recovery

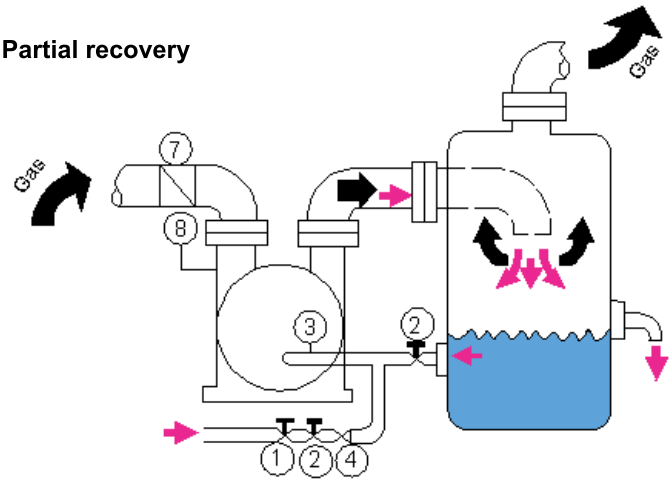


a) Fluid supply – direct from the pipeline
b) No fluid return
c) No fluid cooling
d) Discharge of the fluid - to the gas line.

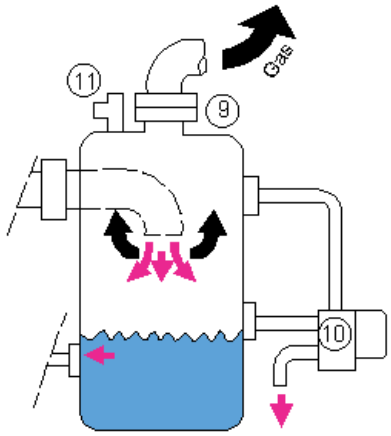
Legend:
1. Retaining valve
2. Adjusting valve
3. Manovacuumeter
4. Retaining valve for the fluid
5. Cooling plant
6. Circulating pump
7. Retaining valve for the gas
8. Vacuumeter
9. Manometer
10. Relief valve
11. Brine valve

GENERAL DATA

2. Partial recovery



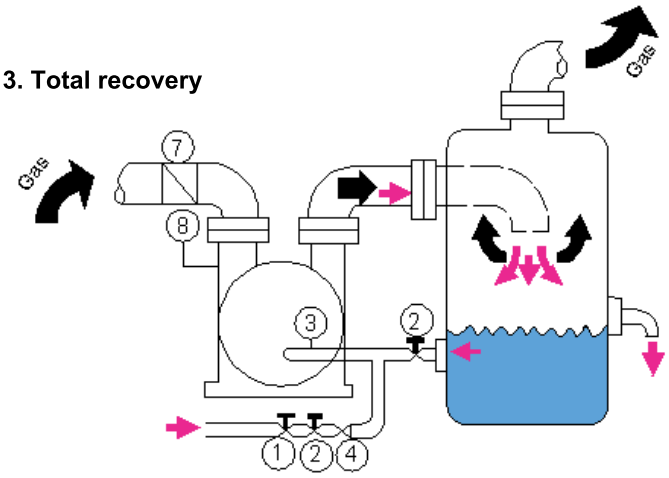
Vacuum pump set



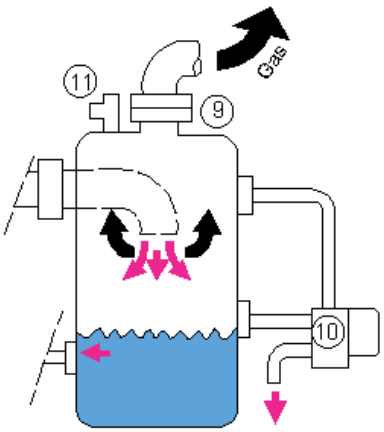
Compressor set

a) Fluid supply – directly from the pipeline
b) Return of the fluid – through a separator
c) Cooling of the fluid – by mixing of the new and return fluid as well as by separator's radiation
d) Recirculation – part of the separator's fluidreturns in the pump.
e) Discharge of the fluid – part of the fluid overflows through the discharge line of the separator.

3. Total recovery



Vacuum pump set



Compressor set

a) Fluid supply - only for cooling of the operating fluid in the cooling plant
b) Return of the fluid - through the separator
c) Cooling of the fluid - in the cooling plant between the separator and the pump
d) Recirculation - by a circulating pump
e) No fluid discharge if the gas consists of a fluid (vapor), there might be necessary a valve for relieving the fluid separated from the gas.

GENERAL DATA – DESIGN

Shaft sealing

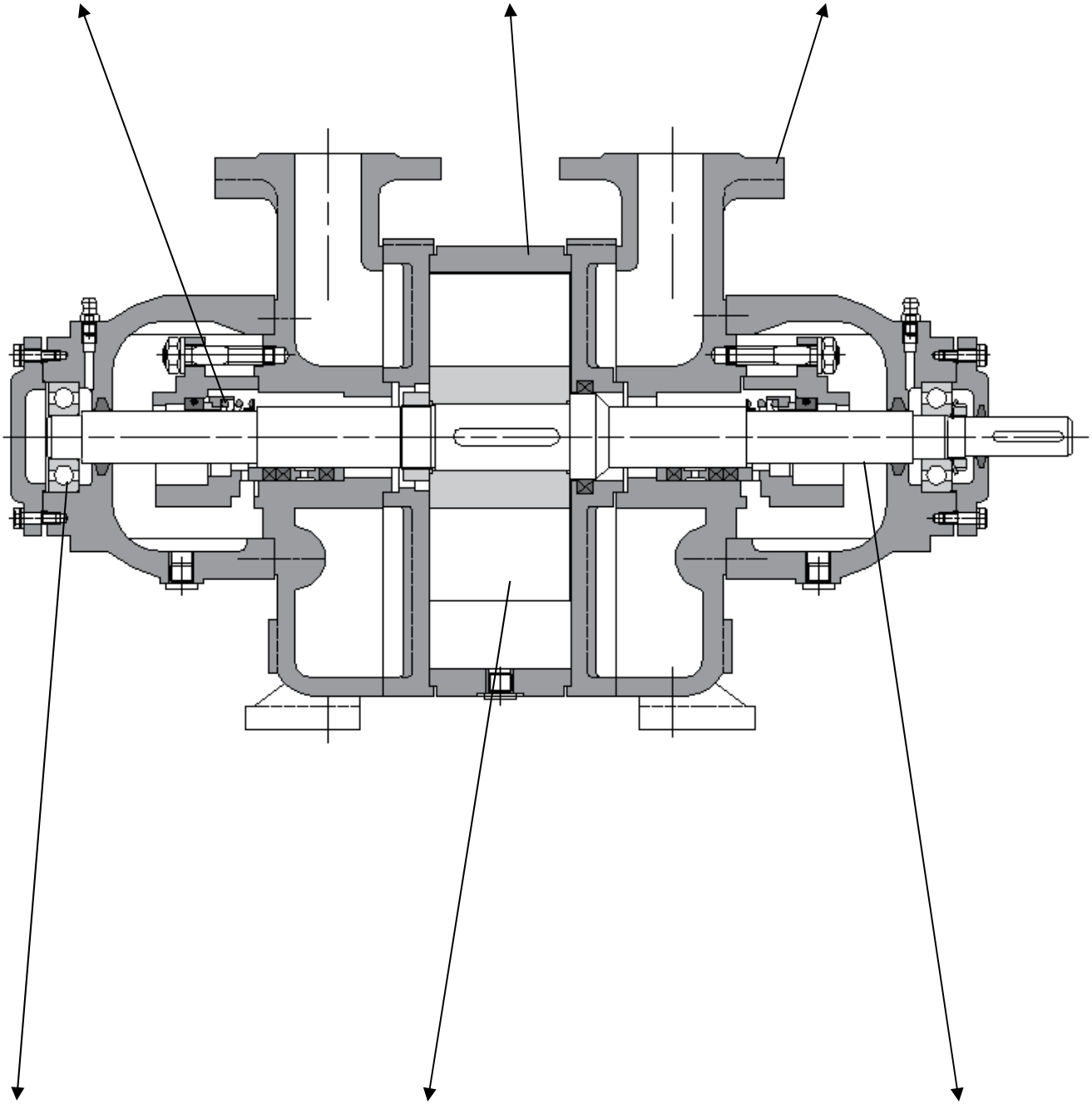
Sealing of the shaft is carried out by means of a soft packing or mechanical seals

Pump case

Pump casing made of Cast iron as standard , other material combination as option

Flanges

Suction and discharge flanges designed according DIN standard



Bearing

The shaft bears upon two ball bearings lubricated with hard grease

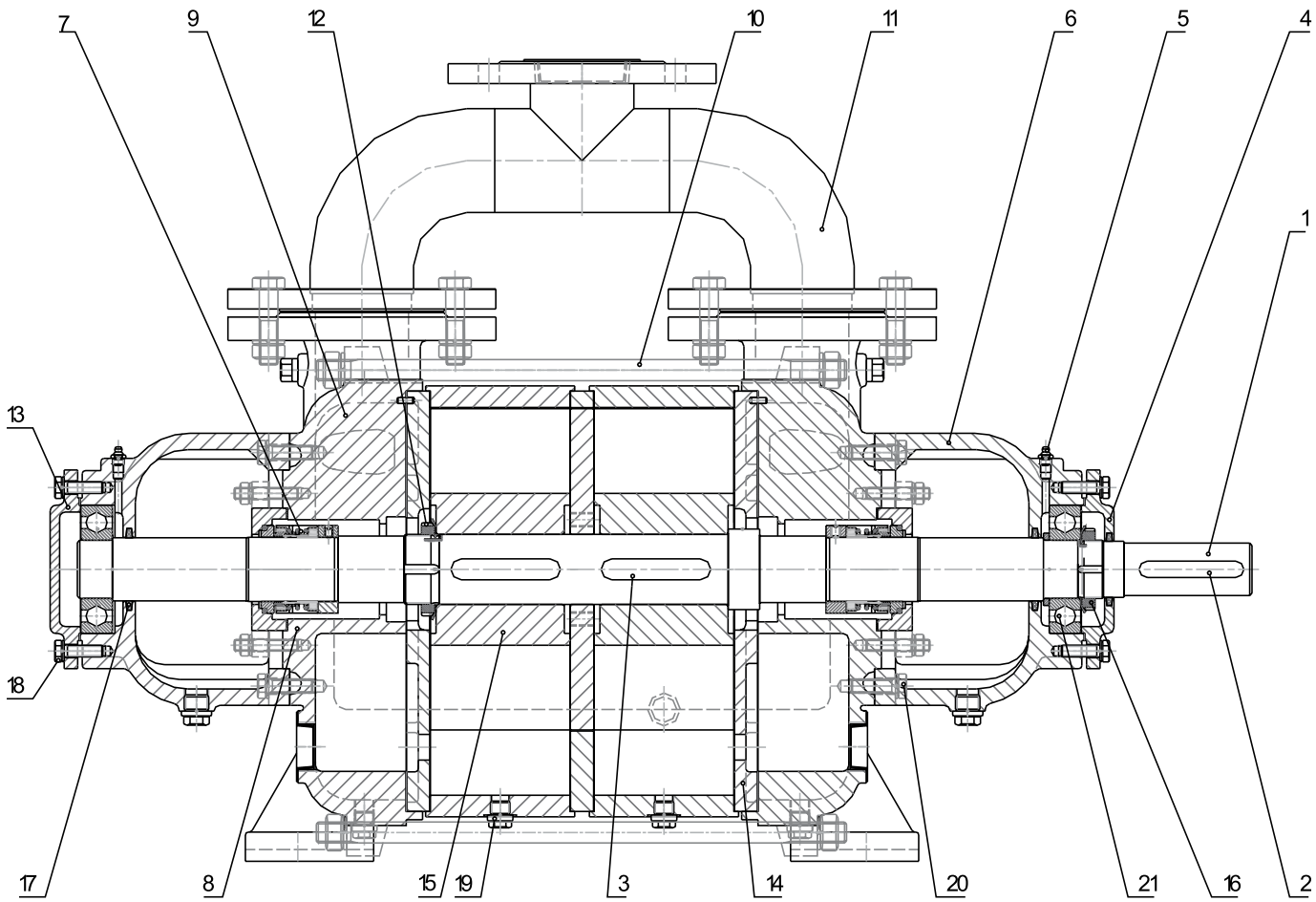
Impeller

Star type impeller eccentrically placed in cylindrical body

Pump shaft

High quality stainless steel shaft

TEHNICAL DATA - Sectional drawing



Pos.	Description	Pos.	Description
1.	Shaft	12.	Impeller lock nut
2.	Key coupling	13.	Bearing cover
3.	Key	14.	Inter suction plate
4.	Bearing cover	15.	Impeller
5.	Greaser	16.	Lock nut
6.	Bearing housing	17.	Cord
7.	Mechanical seal	18.	Flathead screw
8.	Mechanical seal housing	19.	Plug
9.	Casing	20.	Hex head screw
10.	Tie bolt	21.	Ball bearing
11.	Double elbow		

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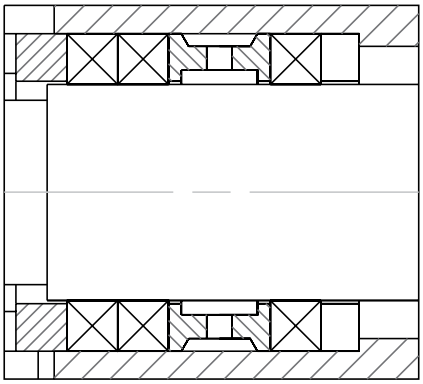
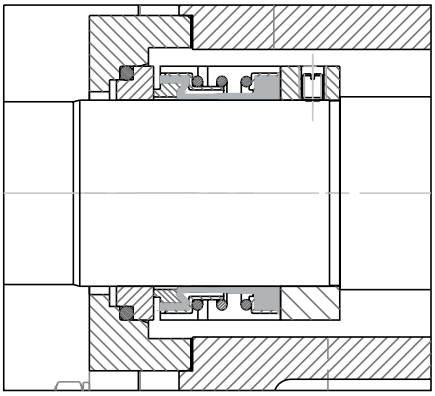
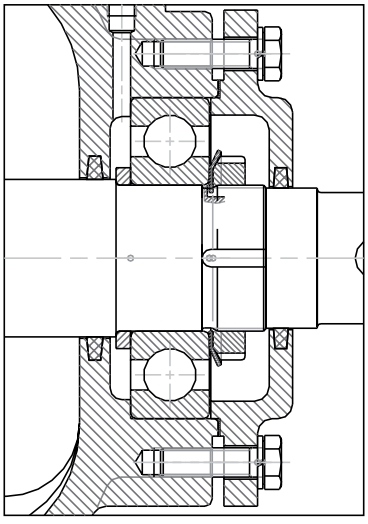
TEHNICAL DATA

Shaft sealing





- Sealing of the shaft is carried out by means of a soft packing or mechanical seals, according to the customer's requirement. Regarding the gaskets cooling, no special water supply is necessary since it is provided in terms of the water of the liquid ring.



Bearing Bracket

- The shaft bears upon two ball bearings lubricated with hard grease

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TEHNICAL DATA – Hydraulic characteristic

vacuum (mmHg)				305		406		508		560		584		610		service liquid
pump size	size	rpm	kW	m^3/h	kW	m^3/h	kW	m^3/h	kW	m^3/h	kW	m^3/h	kW	m^3/h	kW	l/min
CEL-304	1 ½'	1450	2.2	54	1.47	54	1.7	53	1.8	49	1.8	46	1.8	43	1.9	7
CEL-308			4	102	2.8	102	3	100	3	95	3.2	92	3.2	88	3.3	8
CEL-312			5.5	146	4.2	148	4.5	144	4.6	136	4.7	125	4.7	115	4.7	9
CEL-508	2"		7.5	174	5.5	174	6.2	166	6.5	160	6.7	153	6.7	149	6.8	21
CEL-512			11	254	6.7	254	8.2	247	8.6	234	9.2	210	9.5	190	9.9	30
CEL-516			15	340	10.7	340	11	329	11.4	312	11.8	292	12.1	272	12.5	34
CEL-520			15	421	12.9	421	13.2	397	13.5	360	14.1	333	14.4	299	14.8	37
CEL-524			18.5	489	14.7	489	16.1	486	17.6	462	18	448	18.2	435	18.3	45
CEL-624	3"		22	816	17.6	816	19.1	782	20.2	688	20.5	654	20.9	620	21.3	57
CEL-632			30	986	22.8	986	24	926	25.4	841	25.7	773	25.7	697	25.7	68

vacuum (mmHg)				584		635		686		711		729		737		service liquid
pump size	size	rpm	kW	m^3/h	kW	m^3/h	kW	m^3/h	kW	m^3/h	kW	m^3/h	kW	m^3/h	kW	l/min
CEH-304	1 ½'	1450	3	57	2.7	56	2.7	49	2.7	39	2.8	27	2.8	21	2.8	11
CEH-308			4	102	3.7	100	3.5	88	3.4	73	3.3	54	3.3	47	3.3	15
CEH-412			5.5	130	4.7	142	4.8	145	4.4	138	4.1	115	4.1	104	4.1	20
CEH-416			7.5	152	5.9	163	5.8	174	5.7	166	5.6	129	5.5	108	5.5	23
CEH-512	2"		11	270	10	276	9.9	255	9.6	228	9.3	190	9.2	170	9.1	35
CEH-516			15	333	12.1	346	11.4	333	10.7	285	10.3	217	10	176	10	39
CEH-520			15	415	14	428	13.6	408	12.8	356	12.7	255	12.5	197	12.3	45
CEH-616			22	544	18.1	552	17.6	510	17.4	425	17.3	314	17.2	-	-	68
CEH-624			30	778	26.6	785	26.2	748	24.8	608	24.3	404	24	-	-	83

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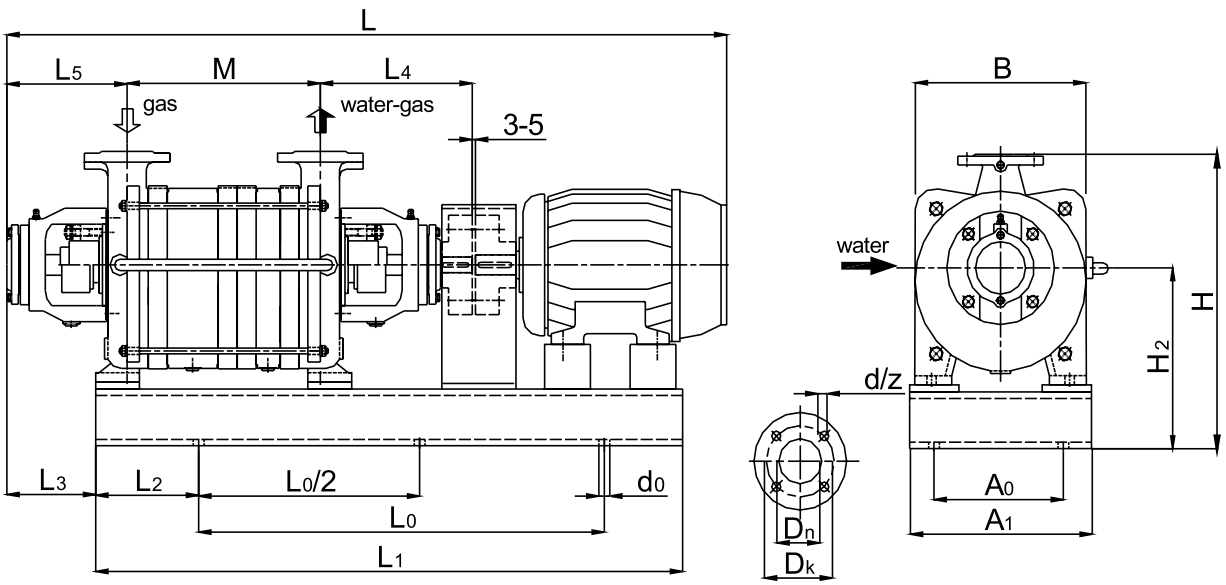
TEHNICAL DATA – Main dimensions



PUMP TYPE	rpm	kW	L	L0	L1	L2	L3	L4	L5	M	A0	A1	B	H	H2	d0	Dn	Dk	Rd	d/z	G(kg)	
																					pump	pump unit
CEL-304	1450	2.2	940	460	675	125	130	230	180	155	230	270	255	415	255	14	40	100	½-14NPT	14/4	55	110
CEH-304		3	1030	510	765	170				247											75	123
CEL-308		4	990	480	720	145				195											63	119
CEH-308			1080	510	810	210				287											82	141
CEL-312		5.5	1090	540	800	165				235											70	153

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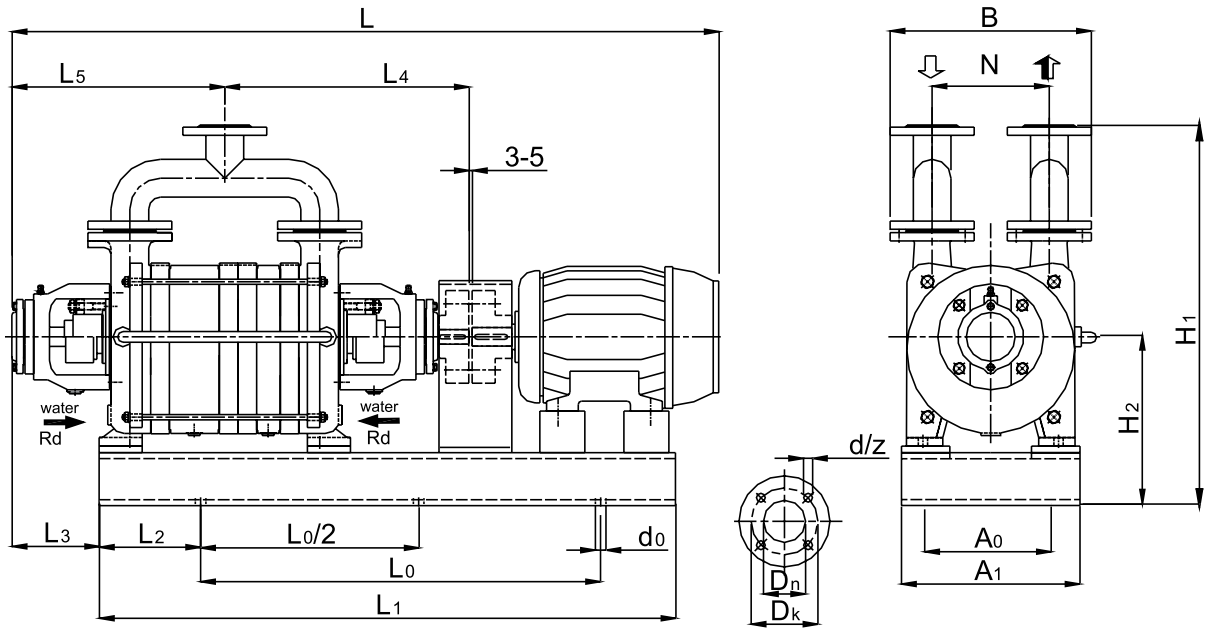
TEHNICAL DATA – Main dimensions



PUMP TYPE	rpm	kW	L	L0	L1	L2	L3	L4	L5	A0	A1	B	N	H1	H2	d0	Dn	Dk	Rd	d/z	G(kg)	
																					pump	pump unit
CEL-516	1450	15	1470	805	1140	183	190	455	375	280	320	395	230	720	343	18	50	125	1"	18/4	130	303
CEL-520			1510	825	1180	203		475	395												135	308
CEL-524		18.5	1565	850	1225	223		495	415	320	360										145	368
CEL-624		22	1725	970	1385	290	210	576	456	400	450	520	290	855	420		80	160	11/4	18/8	300	550
CEL-632		30	1870	1070	1515	330		616	496												330	677

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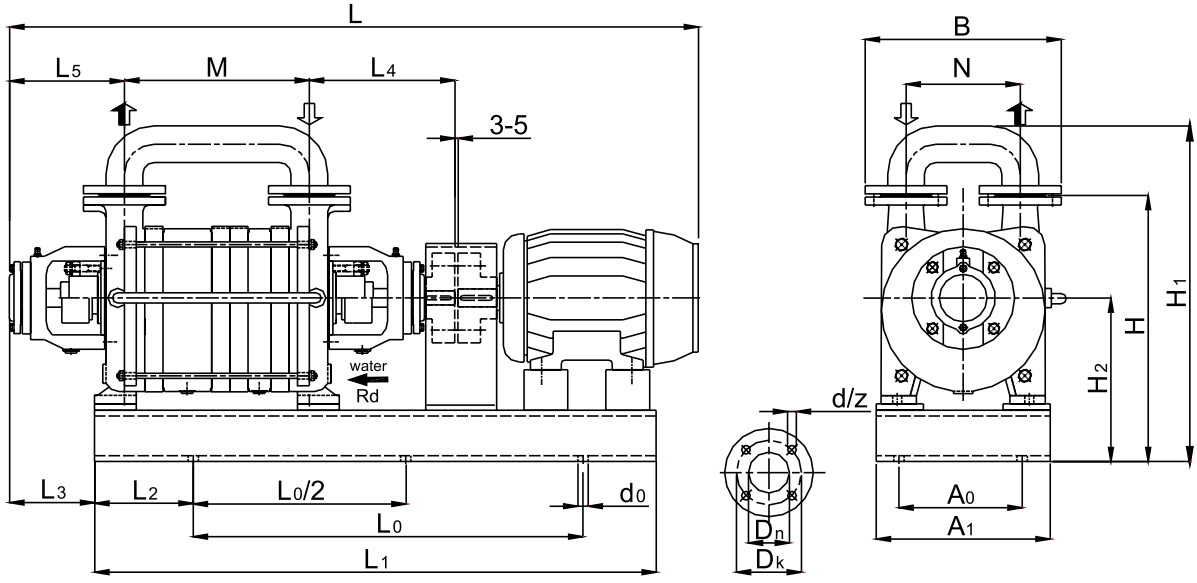
TEHNICAL DATA – Main dimensions



PUMP TYPE	rpm	k W	L	L_0	L_1	L_2	L_3	L_4	L_5	M	A_0	A_1	B	N	H	H_1	H_2	d_0	D_n	D_k	R_d	d/z	G(kg) pump	G(kg) pump unit
CEH-412	1450	5.5	1150	615	905	195	130	238	190	277	225	275	300	160	440	504	285	16	40	100	1/2"	14/4	86	195
CEH-416		7.5	1245	670	995	216				337													94	215
CEH-512		11	1485	770	1115	215	190	326	248	318	280	320	395	230	520	630	343	18	50	125	1"	18/4	175	316
CEH-516		15	1590	870	1265	245				378													185	409
CEH-520			1635	880	1300	265				418													194	420
CEH-618		22	1770	970	1450	310	167	386	267	416	400	450	520	290	640	760	420		80	160	1 1/4"	18/8	219	619
CEH-624		30	1950	1100	1620	370				536													330	766

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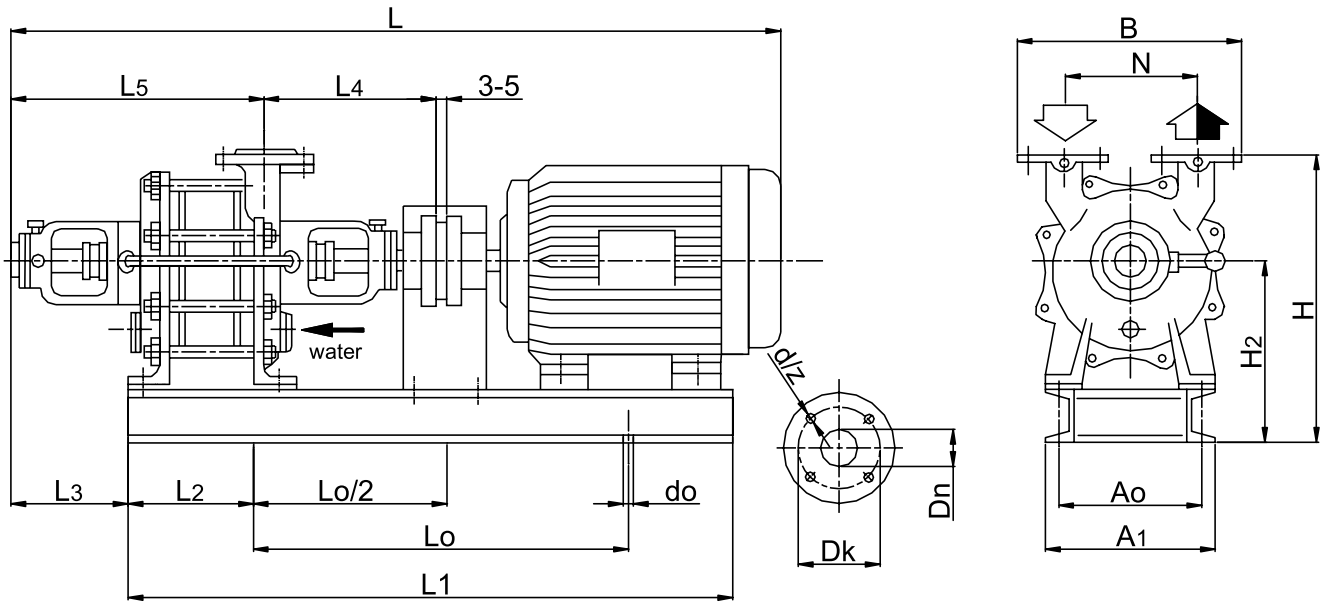
TEHNICAL DATA – Main dimensions



PUMP TYPE	rpm	kW	L	L_0	L_1	L_2	L_3	L_4	L_5	A_0	A_1	B	N	H	H_2	d_0	D_n	D_k	R_d	d/z	G(kg)	
																					pump	pump unit
CEL- 508	1450	7.5	1225	670	920	135	190	325	405	280	320	395	230	520	343	18	50	125	1'-11.5 NPT	18/4	135	230
CEL-512		11	1330	790	1040	155			445												100	328

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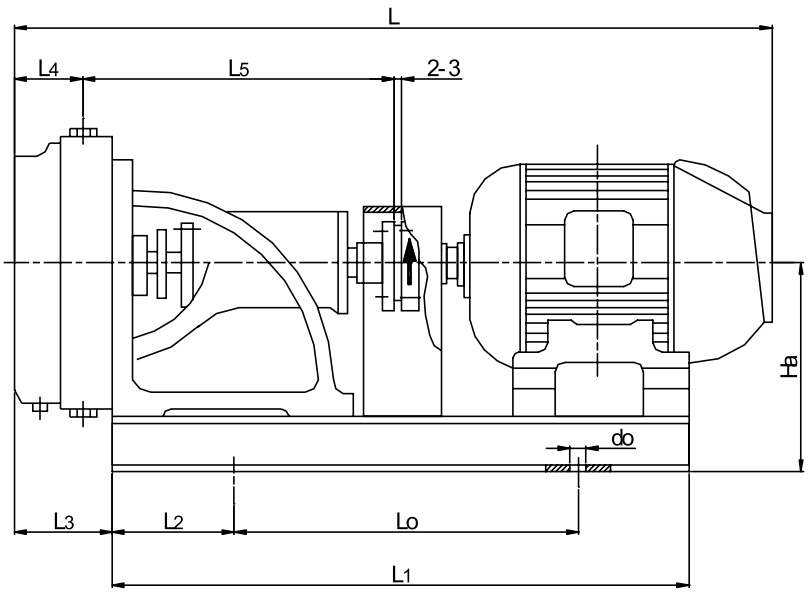
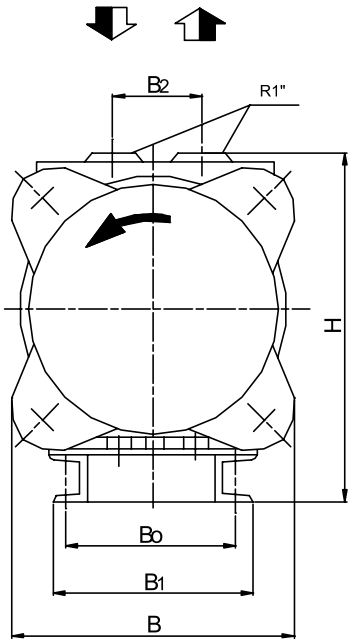
TEHNICAL DATA – Main dimensions





PUMP TYPE	rpm	kW	L	L_0	L_1	L_2	L_3	L_4	L_5	B	Bo	B_1	B_2	H	Ha	do
KVP - 4	1450	1.5	720	355	555	120	91	68	325	260	150	190	105	345	230	14
KVP - 8		3	795	375	585		116	93			170	210				

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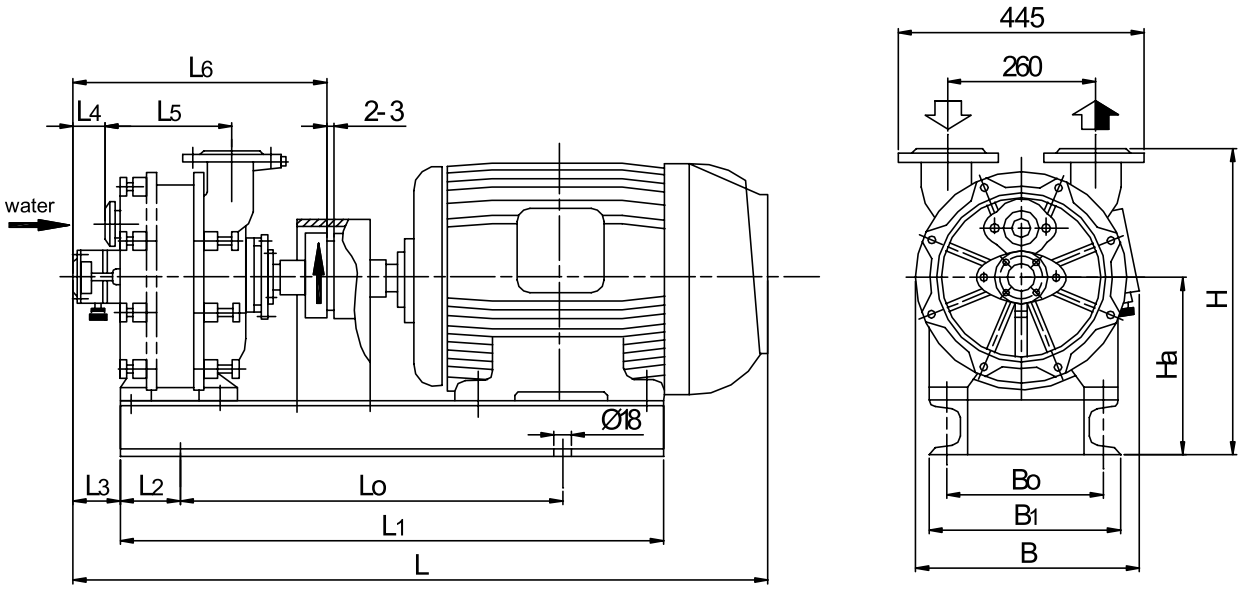
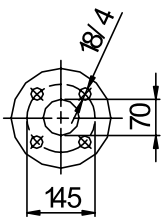
TEHNICAL DATA – Main dimensions

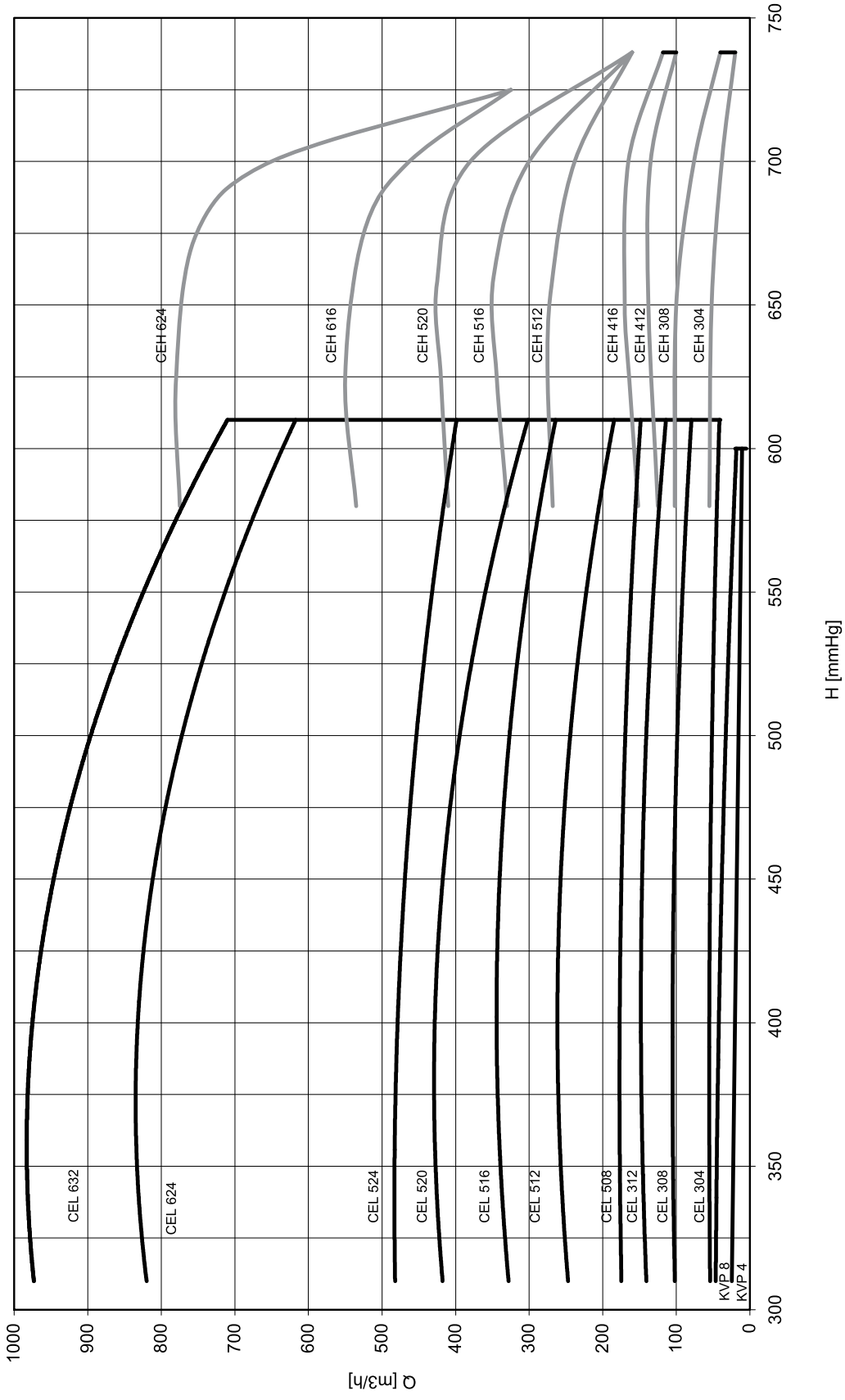




PUMP TYPE	rpm	kW	L	Lo	L_1	L_2	L_3	L_4	L_5	L_6	B	Bo	B_1	H	Ha
RVP-81	1450	11	1030	595	830	105	45	74	202	435	380	305	345	540	320

MZT Pumpi reserves all rights to make changes without prior notice

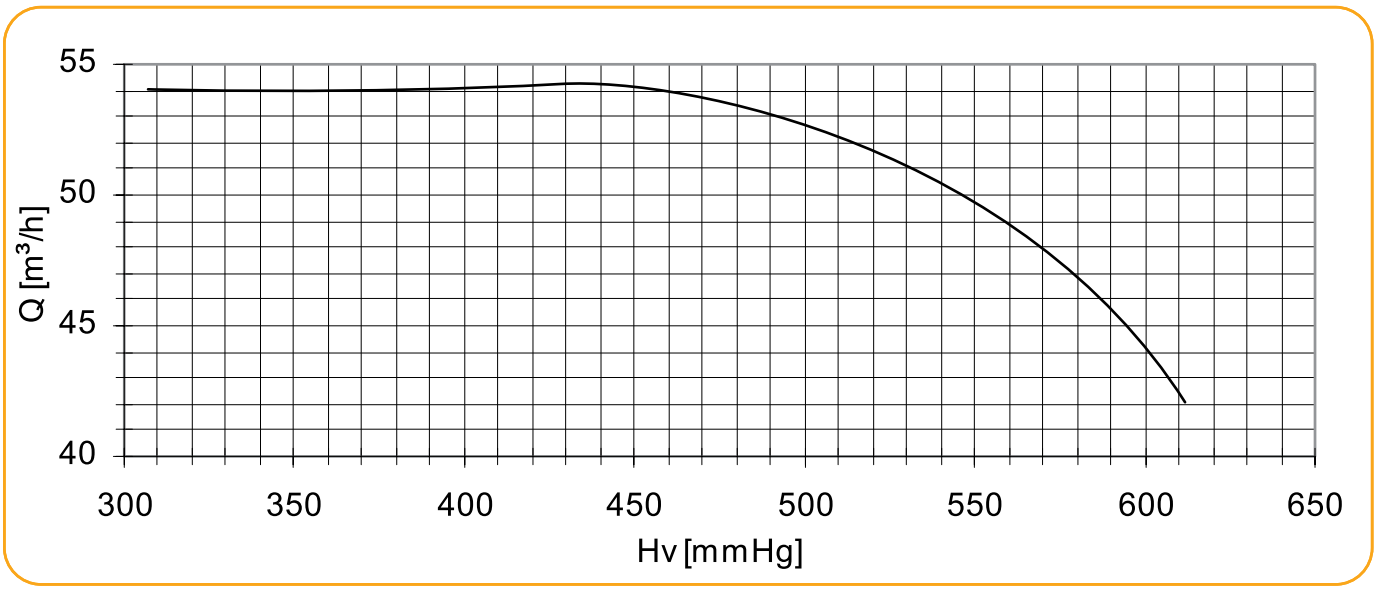
Range of performance curves



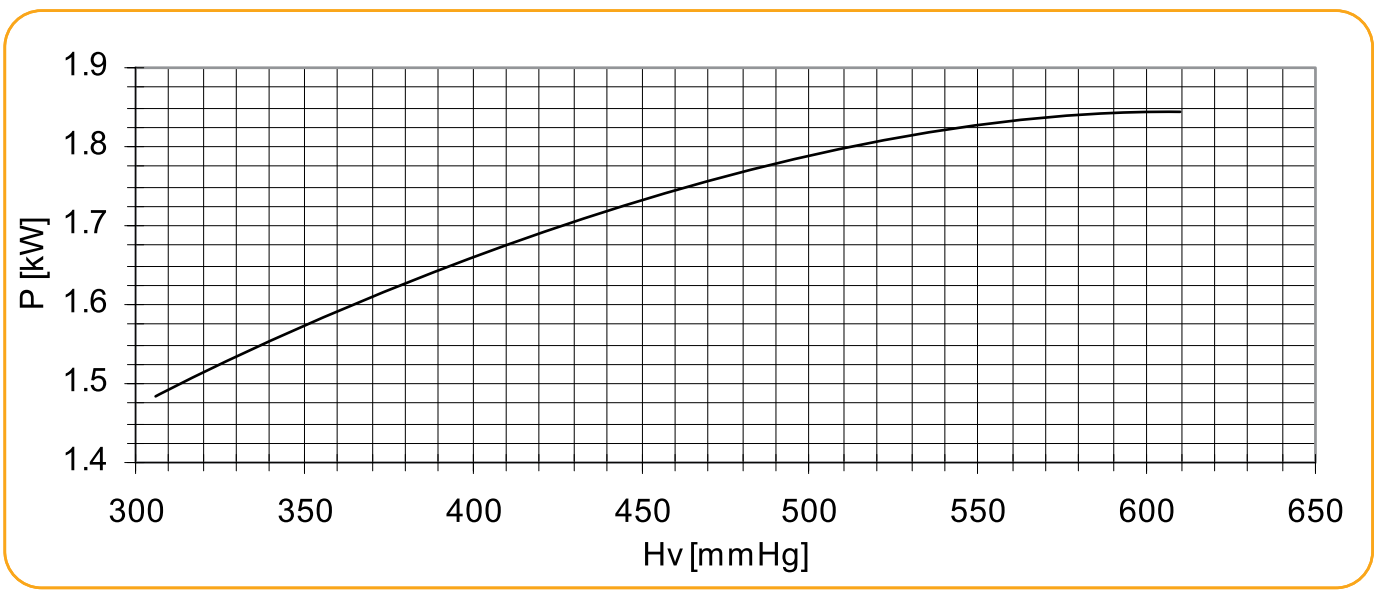
Pump performance curves

CEL 304
n =1450 (rpm)

Total Differential Head



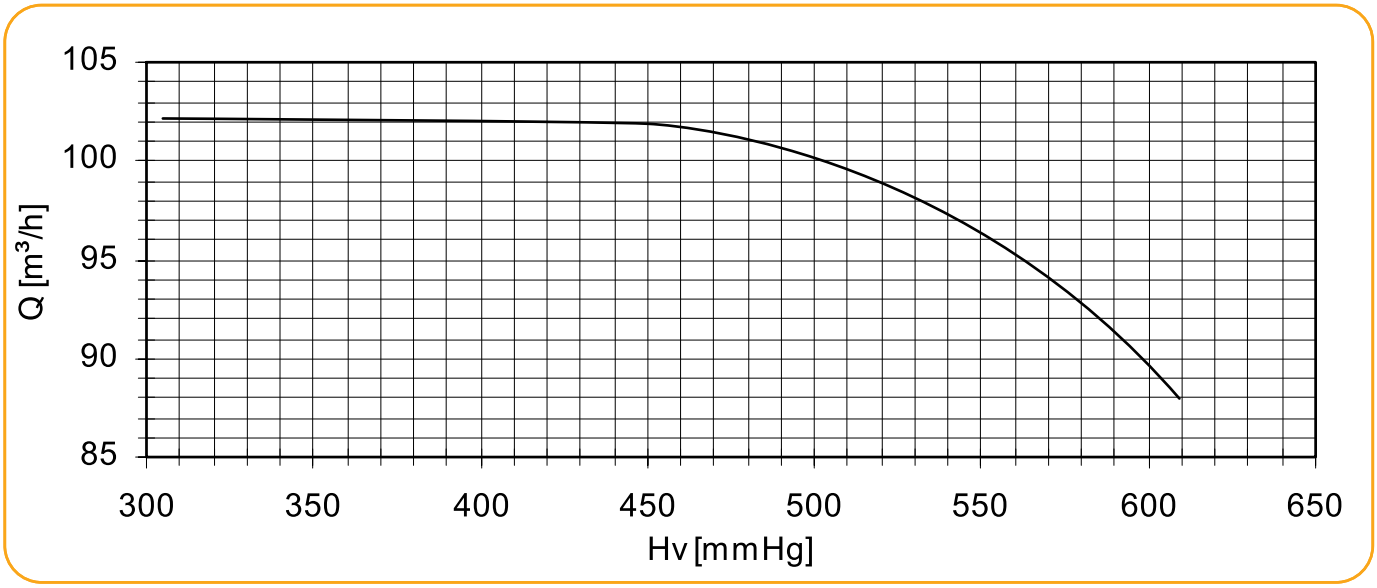
Power Input



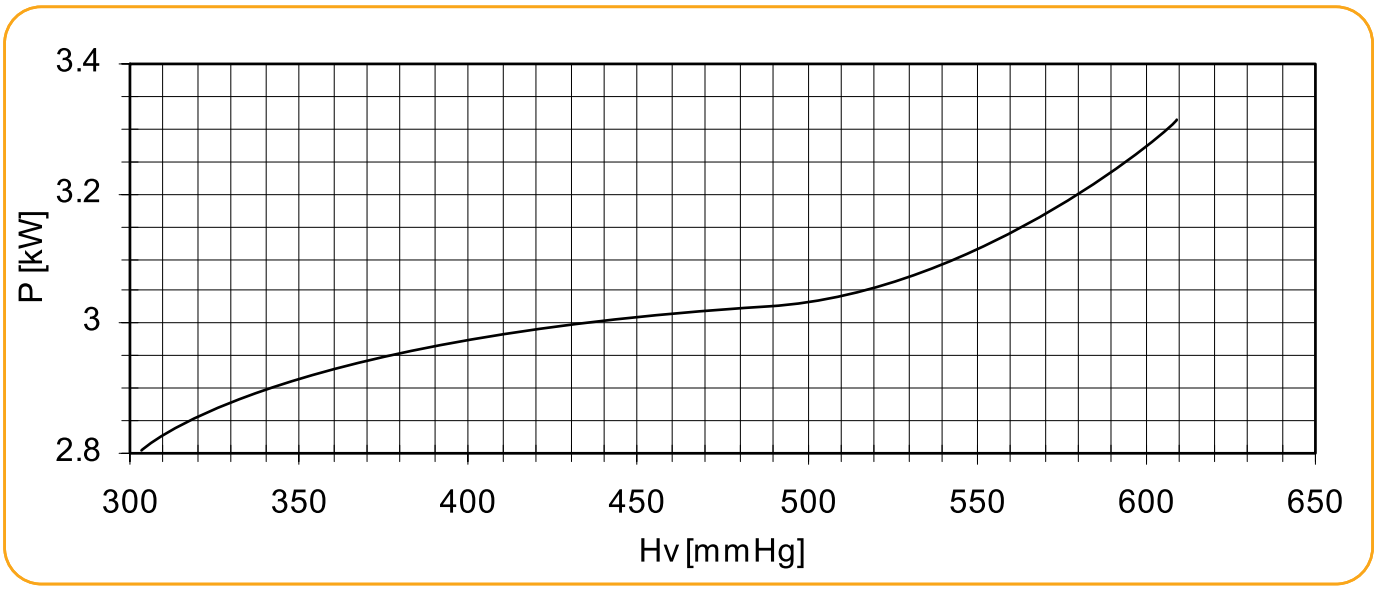
Range of performance curves

CEL 308
n =1450 (rpm)

Total Differential Head



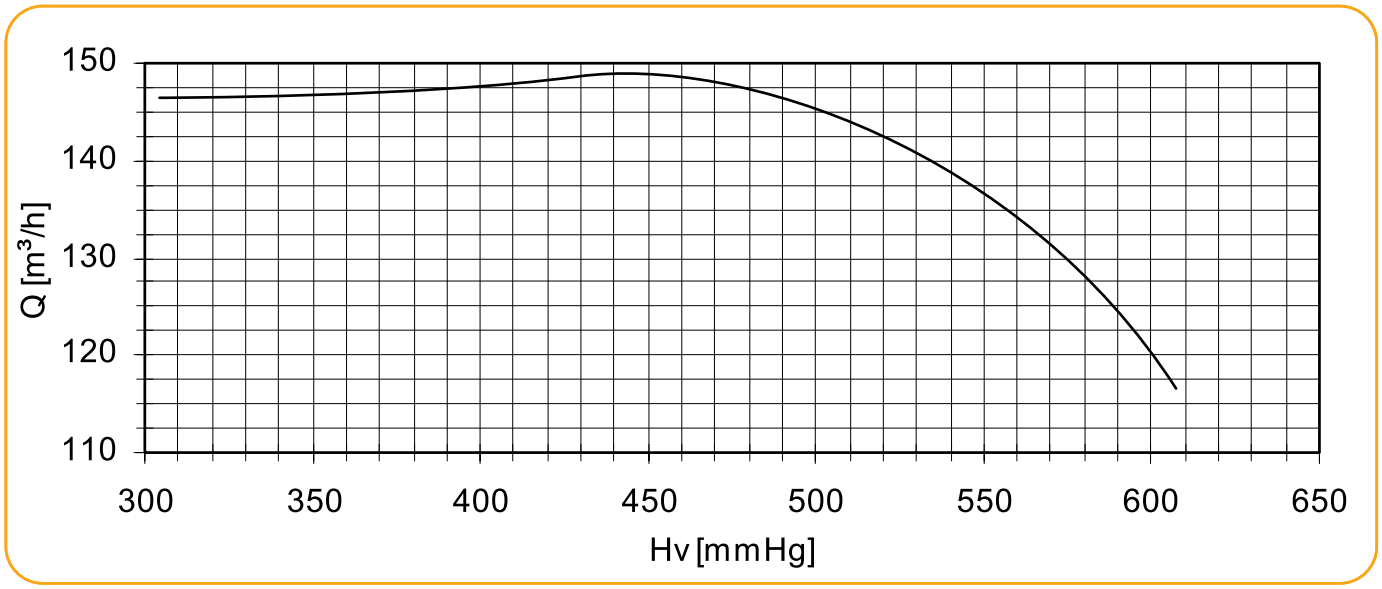
Power Input



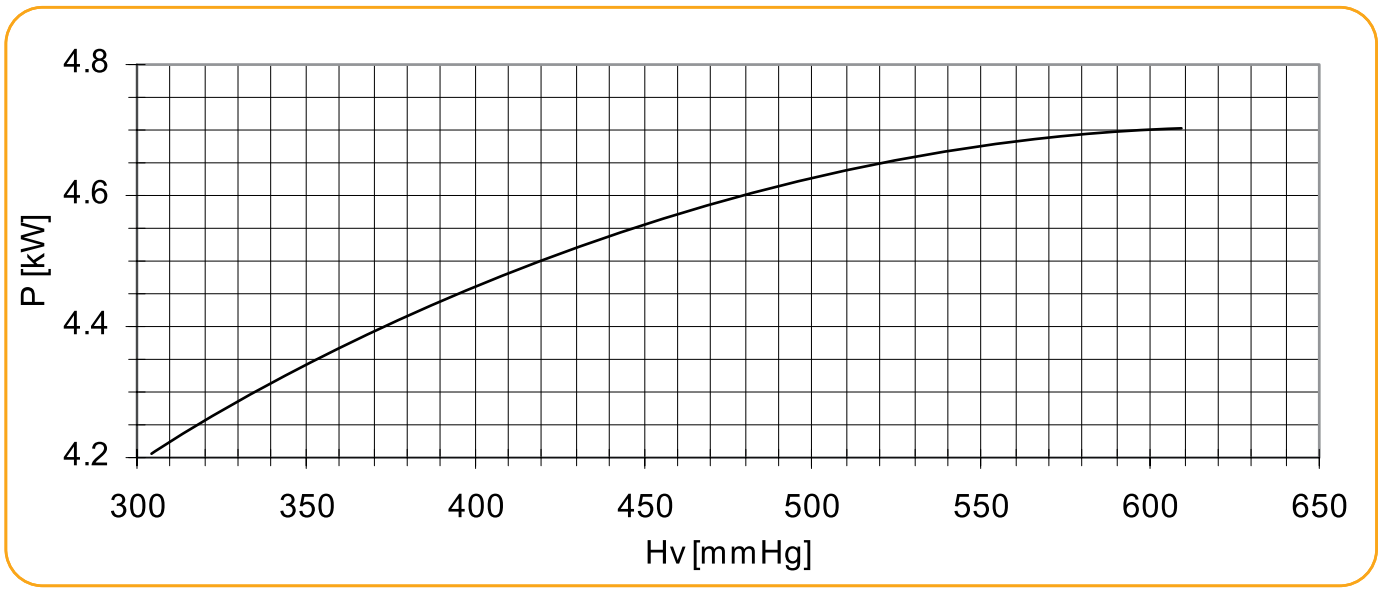
Pump performance curves

CEL 312
n =1450 (rpm)

Total Differential Head



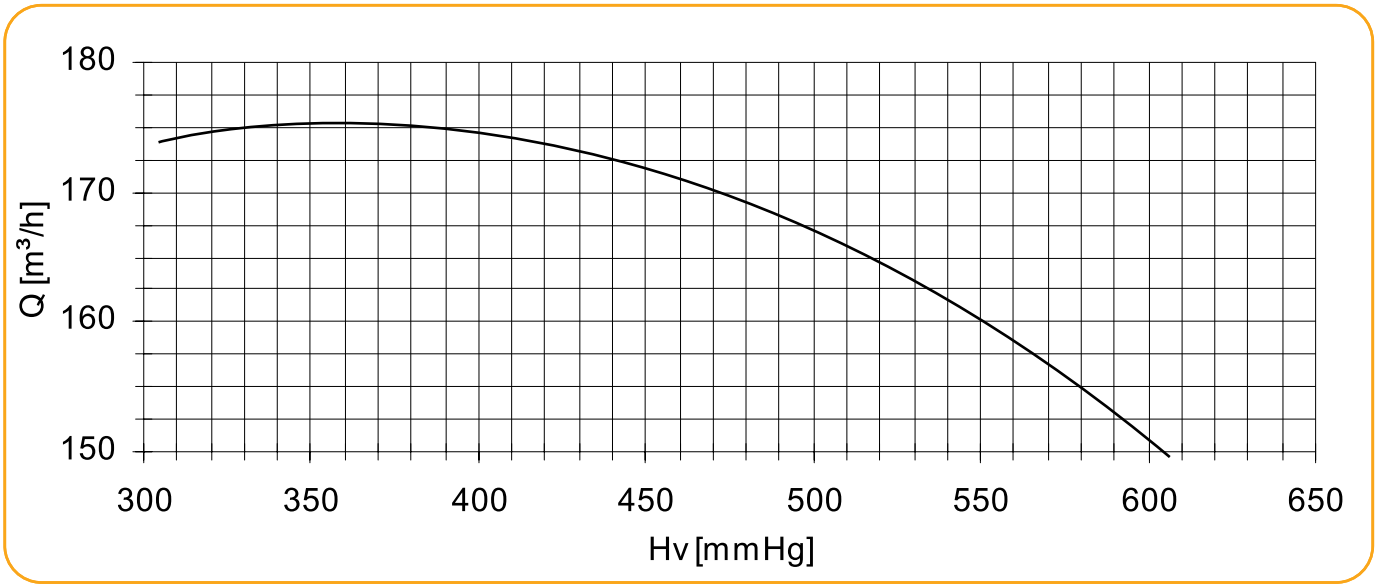
Power Input



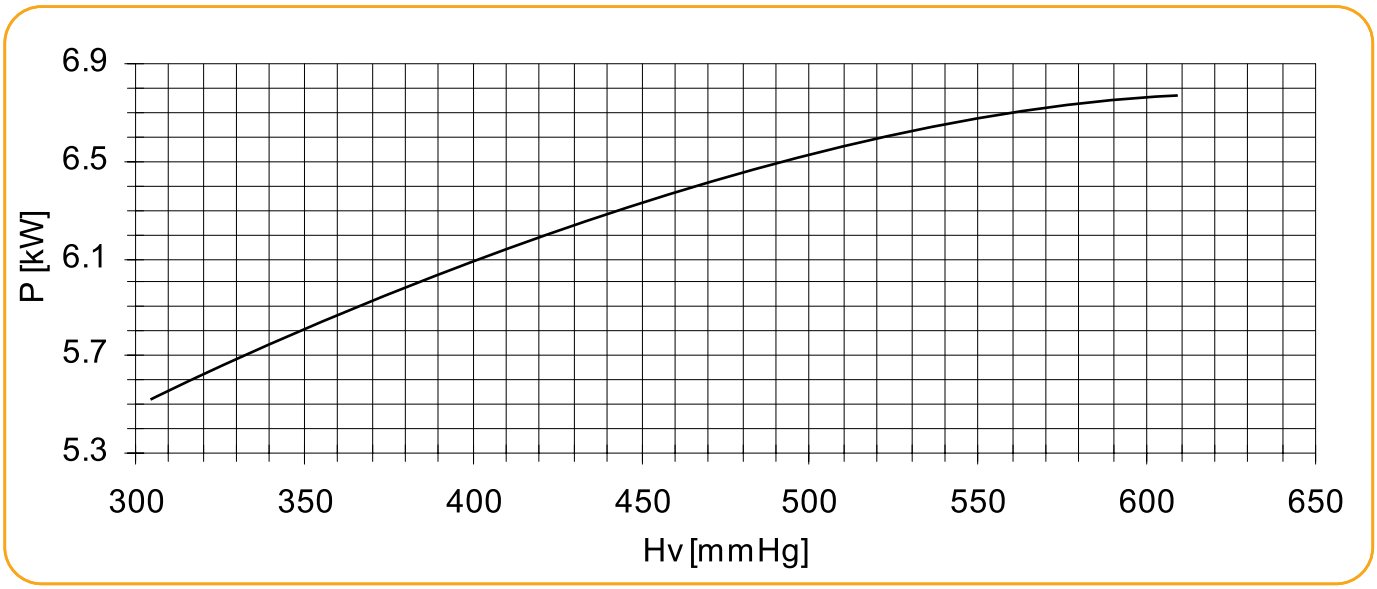
Range of performance curves

CEL 508
n =1450 (rpm)

Total Differential Head



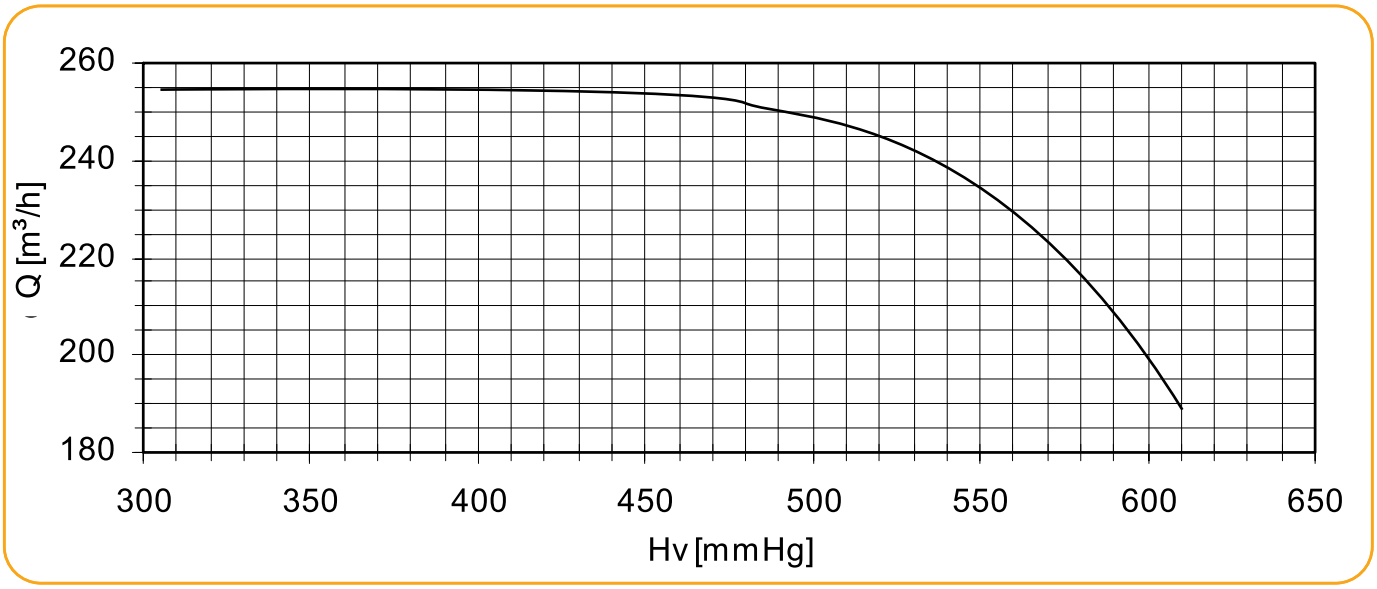
Power Input



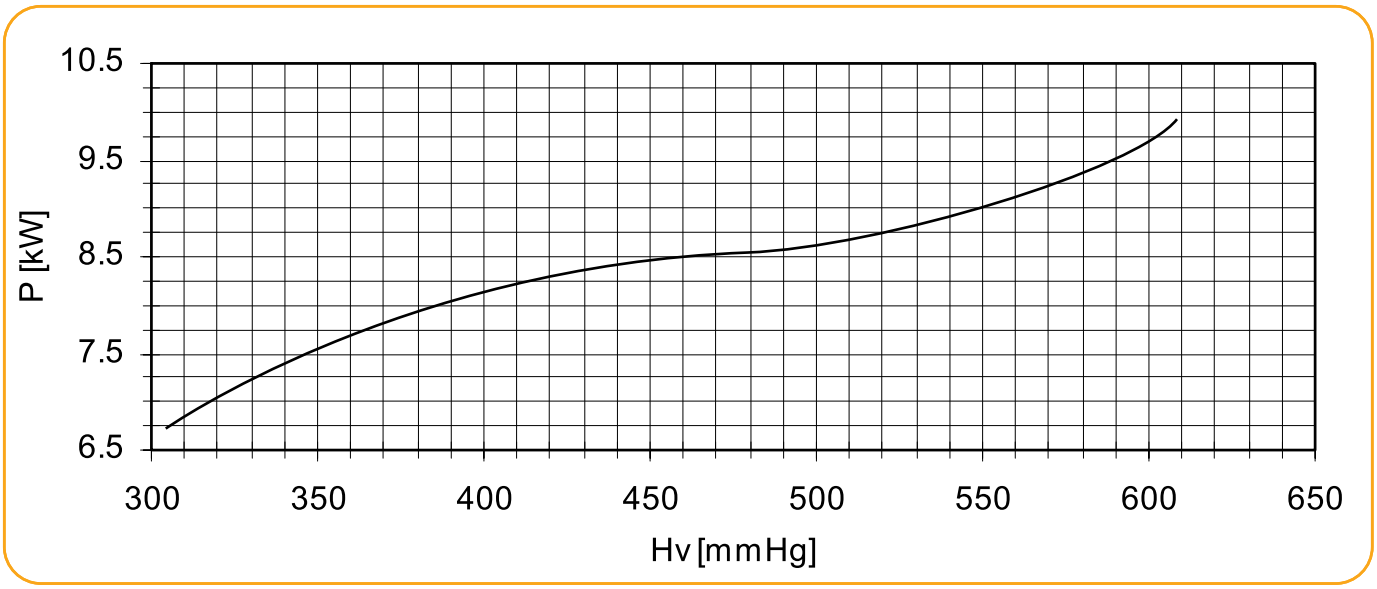
Pump performance curves

CEL 512
n =1450 (rpm)

Total Differential Head



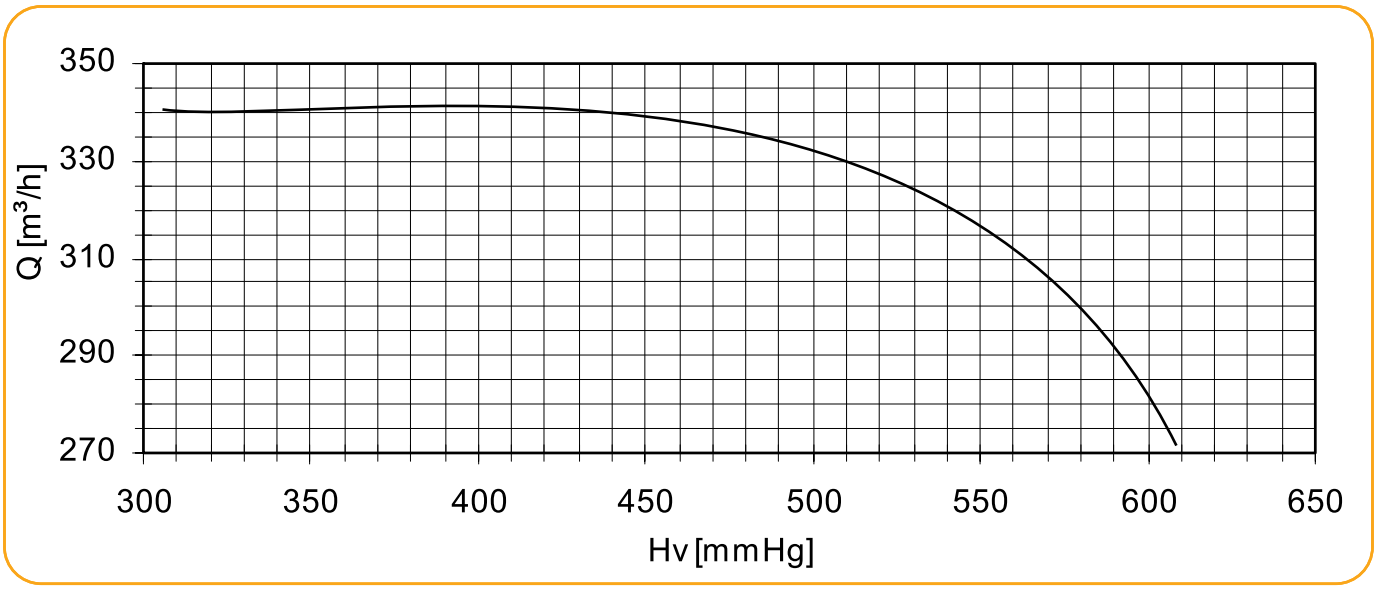
Power Input



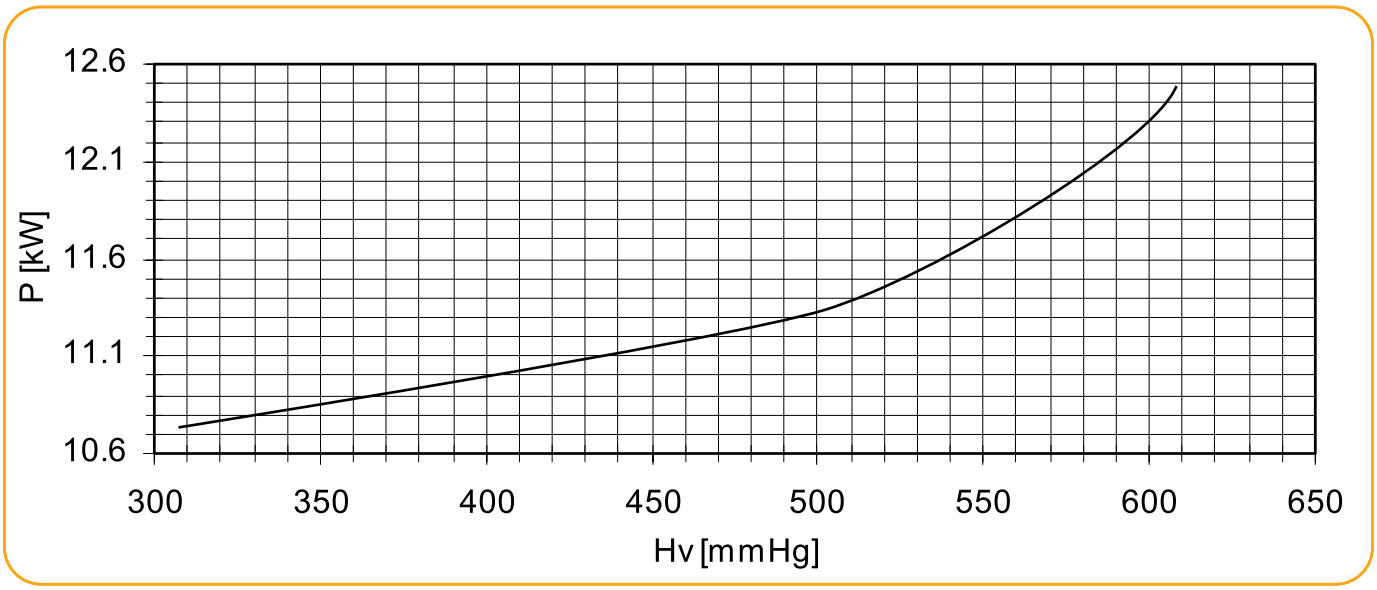
Range of performance curves

CEL 516
n =1450 (rpm)

Total Differential Head



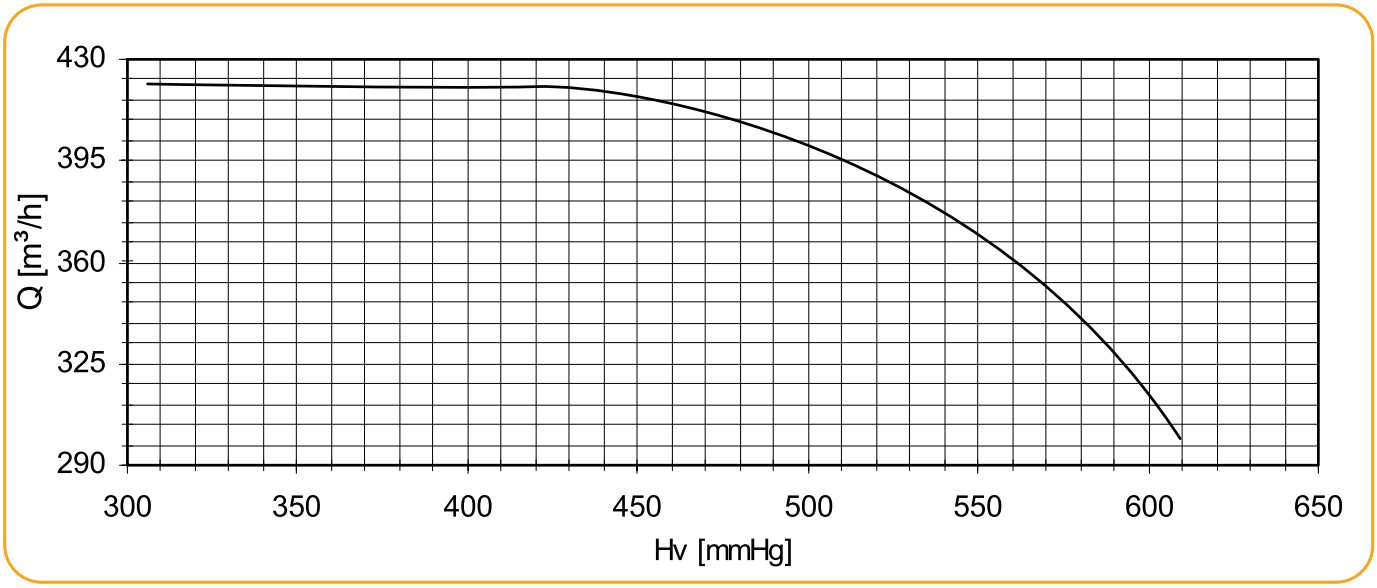
Power Input



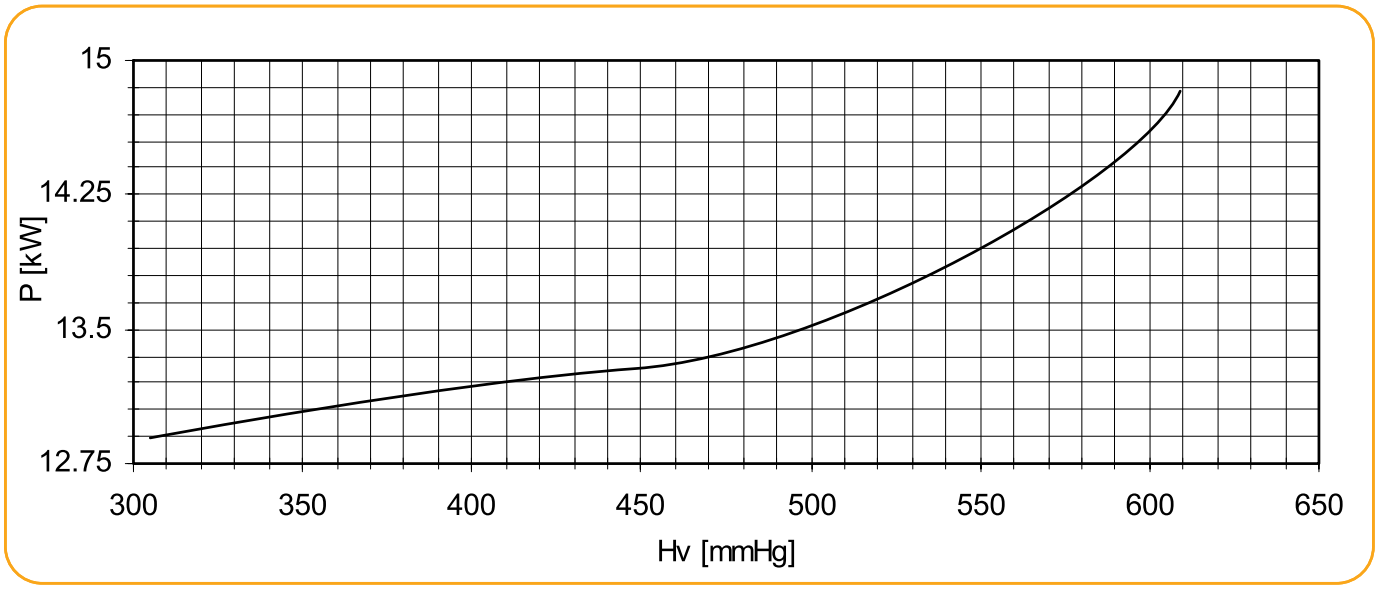
Pump performance curves

CEL 520
n =1450 (rpm)

Total Differential Head



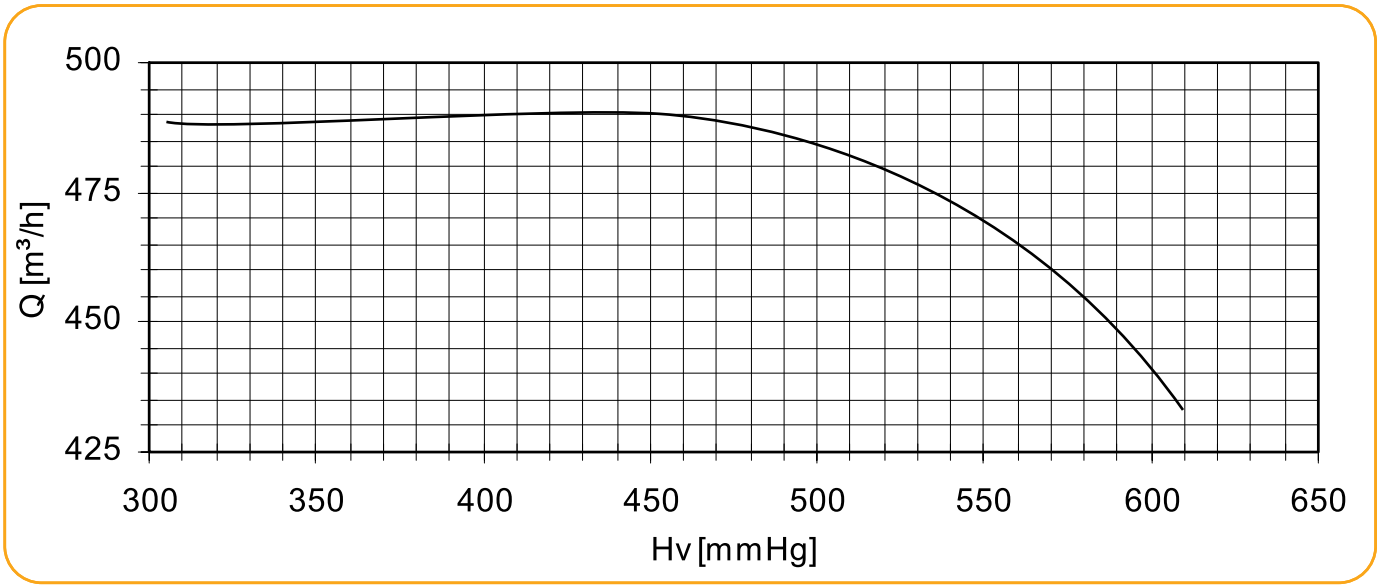
Power Input



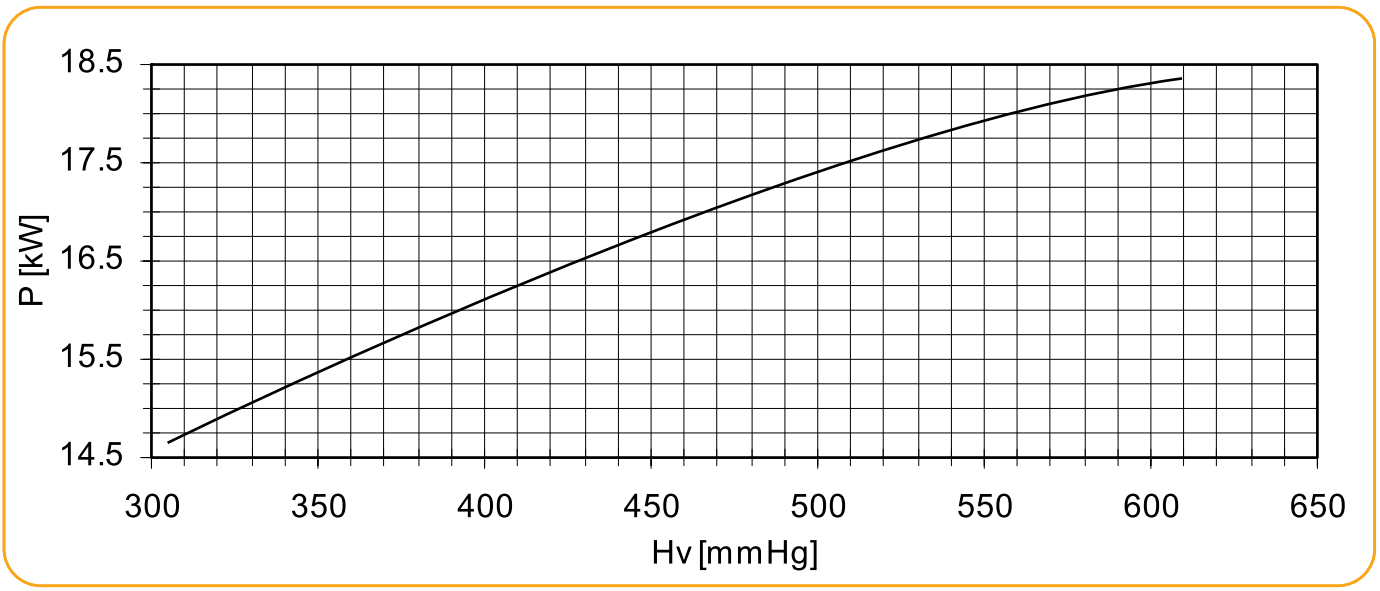
Range of performance curves

CEL 524
n =1450 (rpm)

Total Differential Head



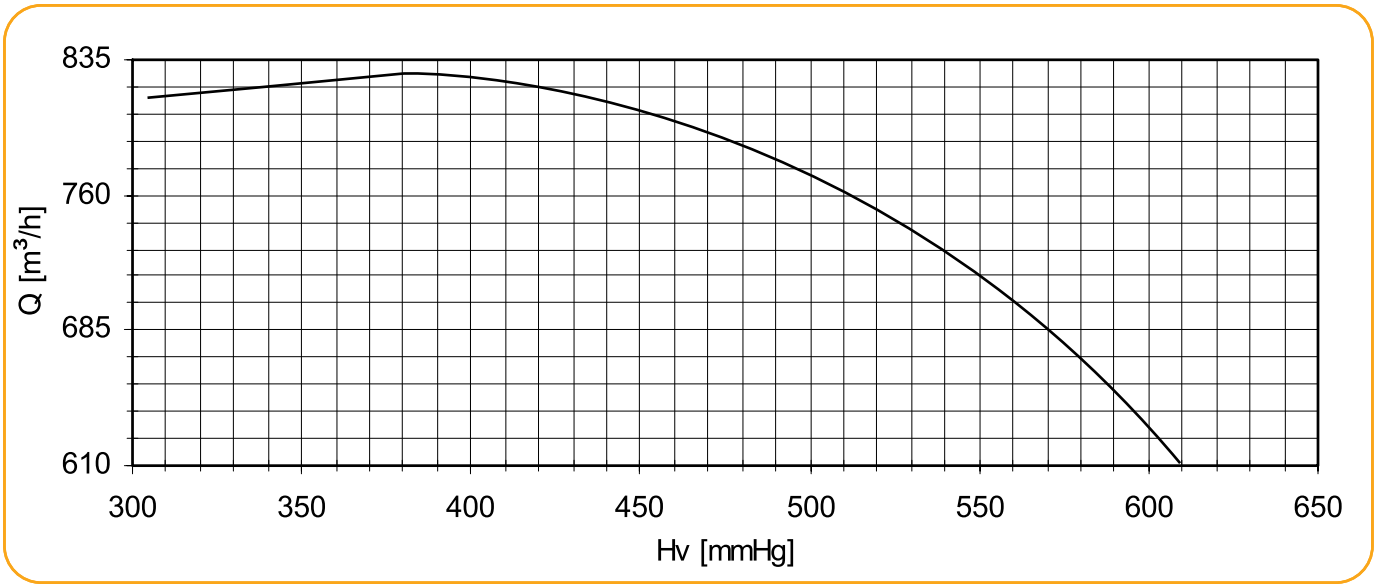
Power Input



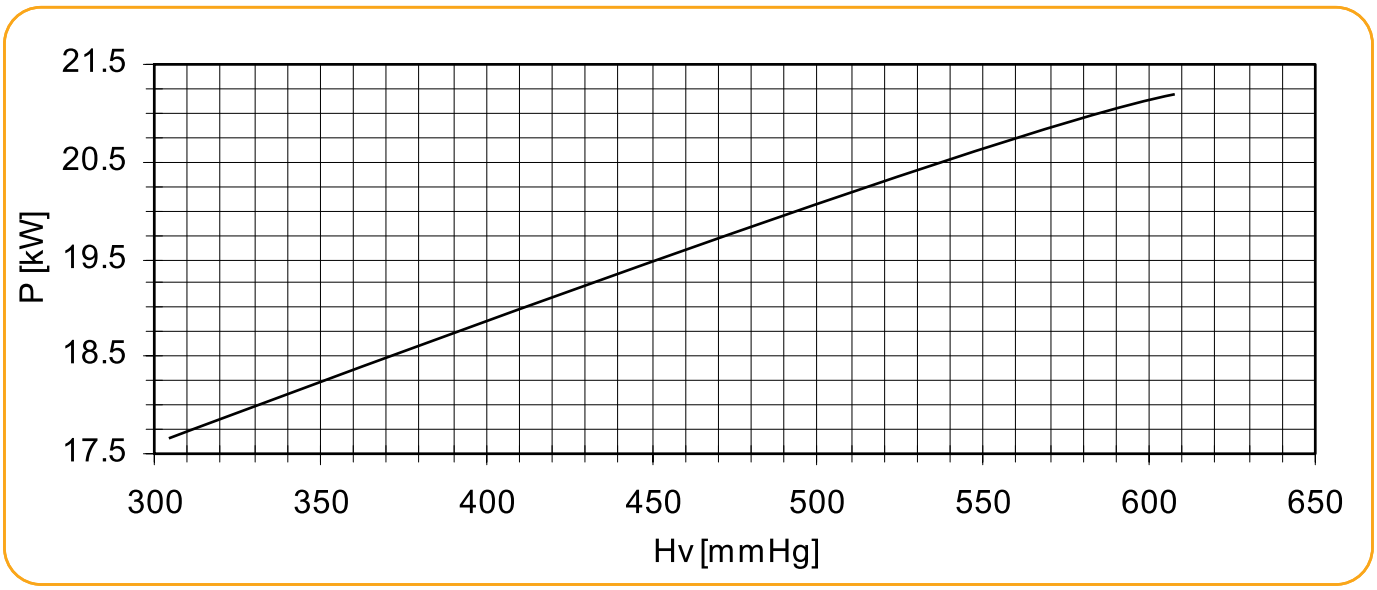
Pump performance curves

CEL 624
n =1450 (rpm)

Total Differential Head



Power Input

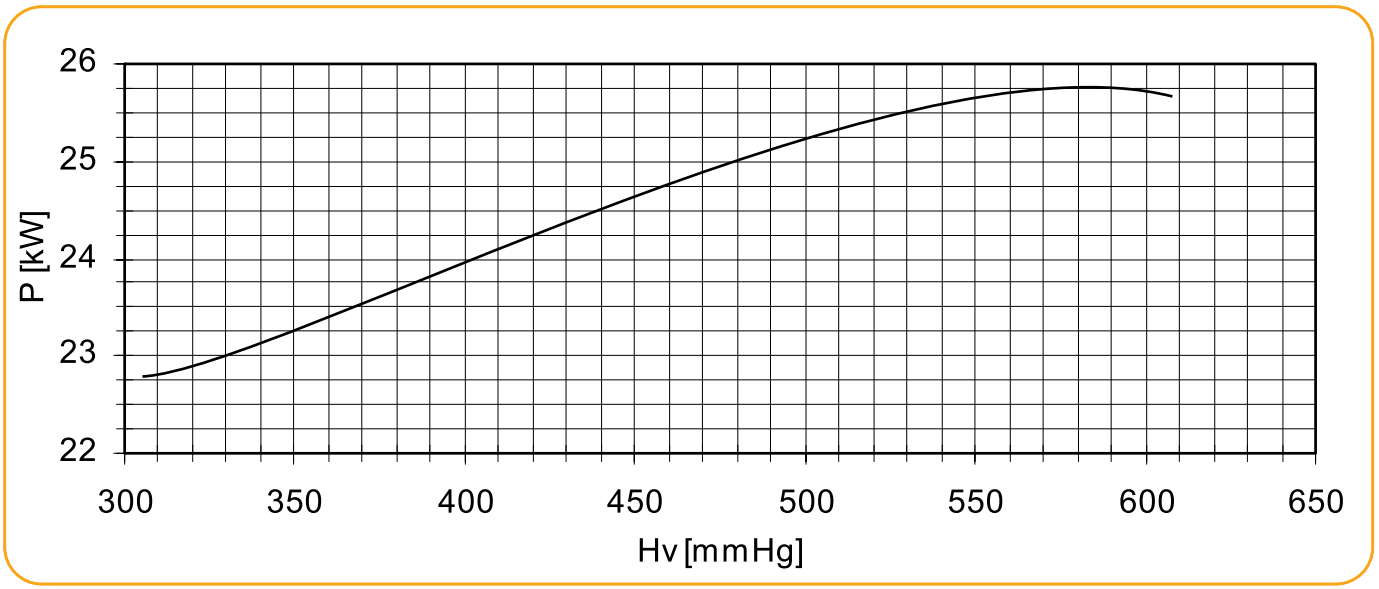


Range of performance curves

CEL 632
n =1450 (rpm)

Total Differential Head

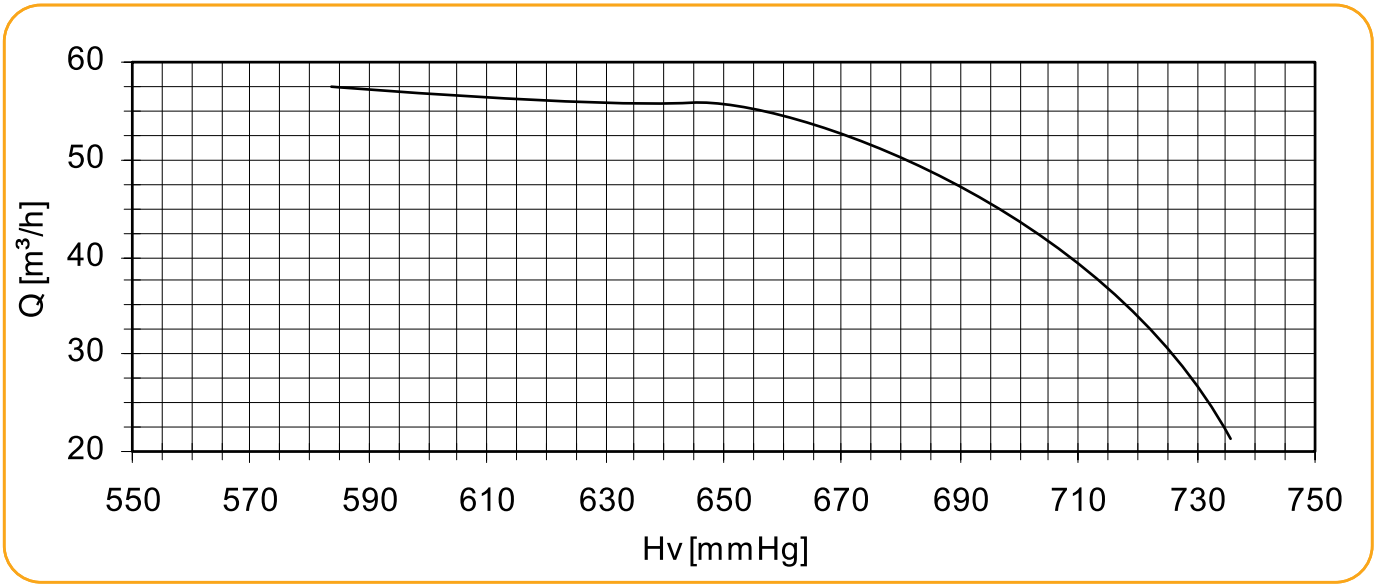
Power Input



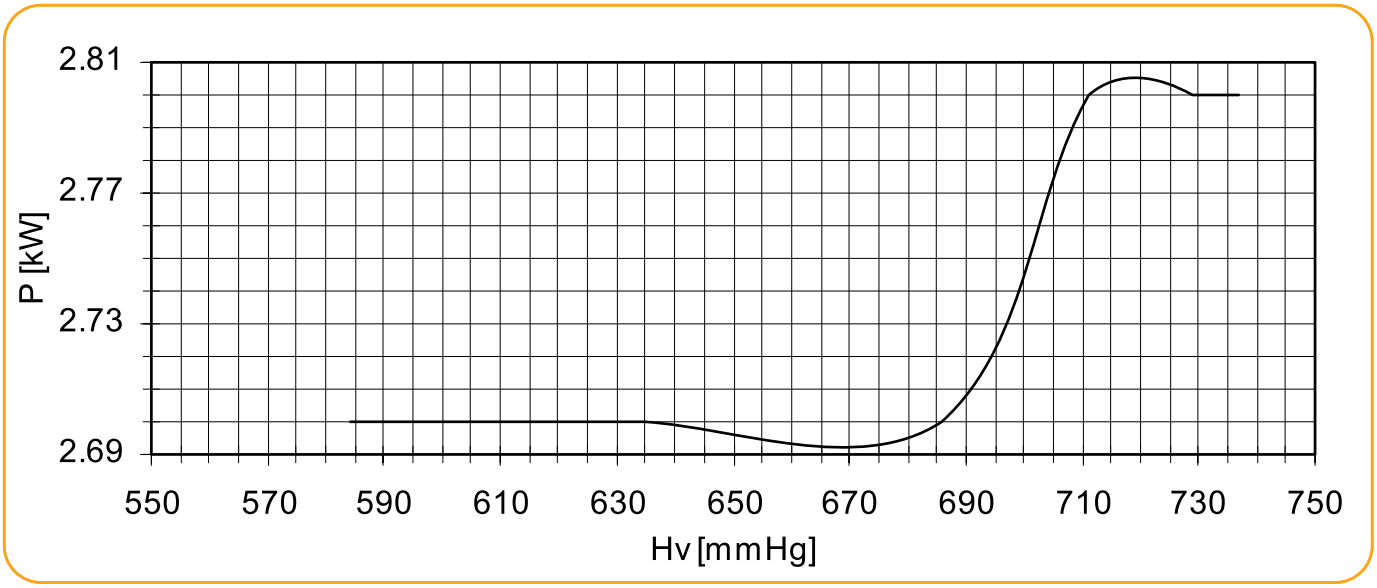
Pump performance curves

CEH 304
n =1450 (rpm)

Total Differential Head



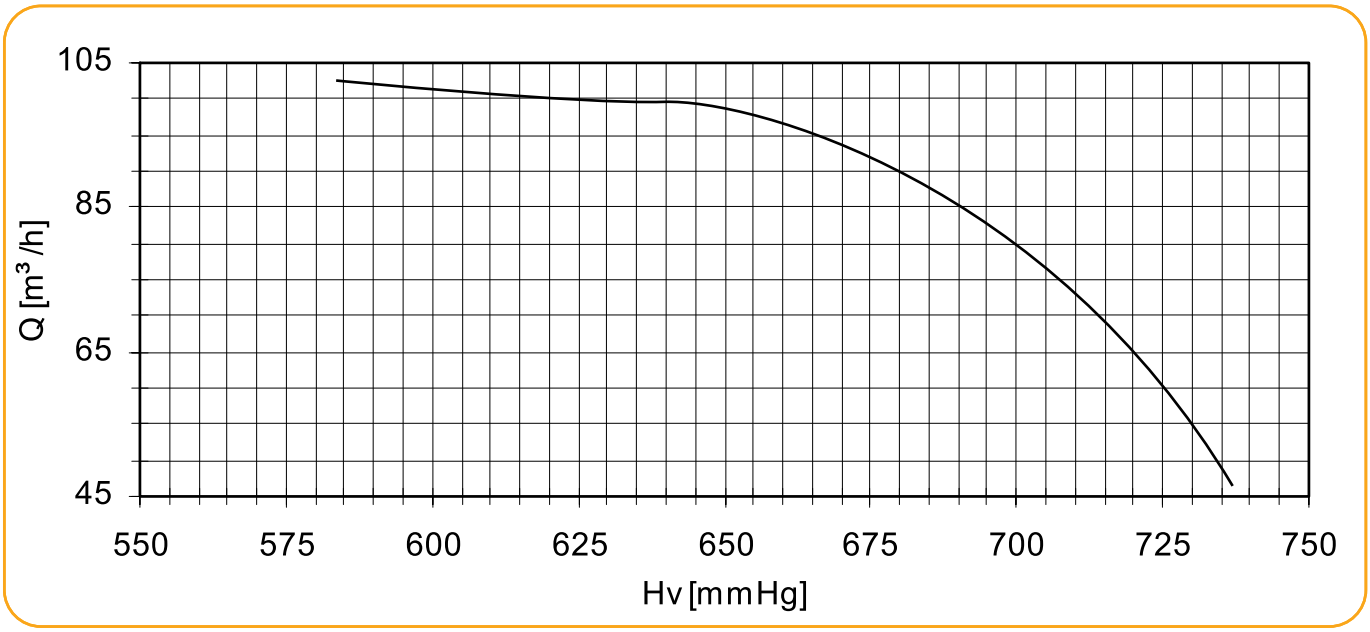
Power Input



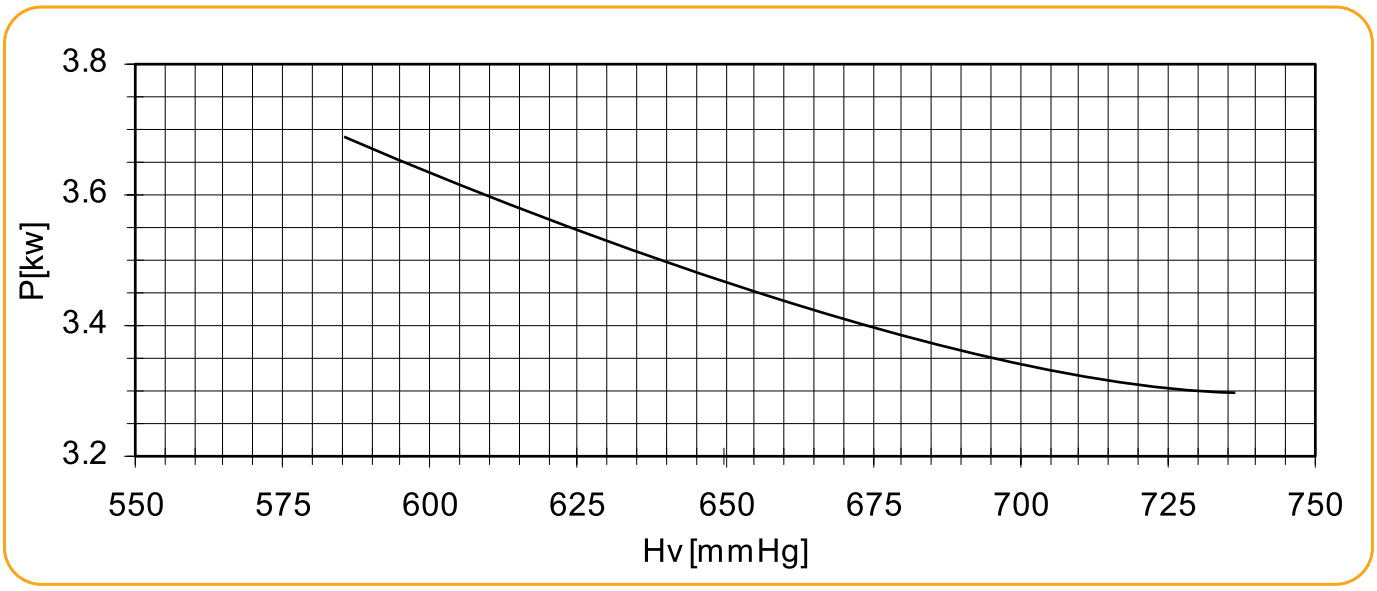
Range of performance curves

CEH 308
n =1450 (rpm)

Total Differential Head



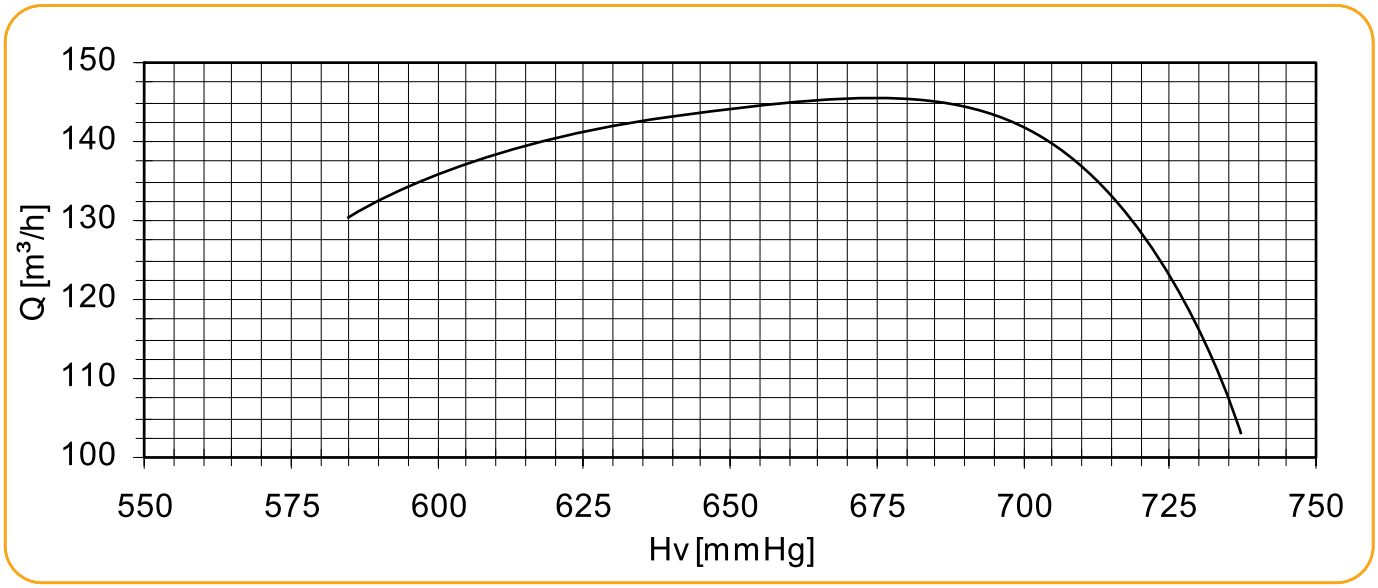
Power Input



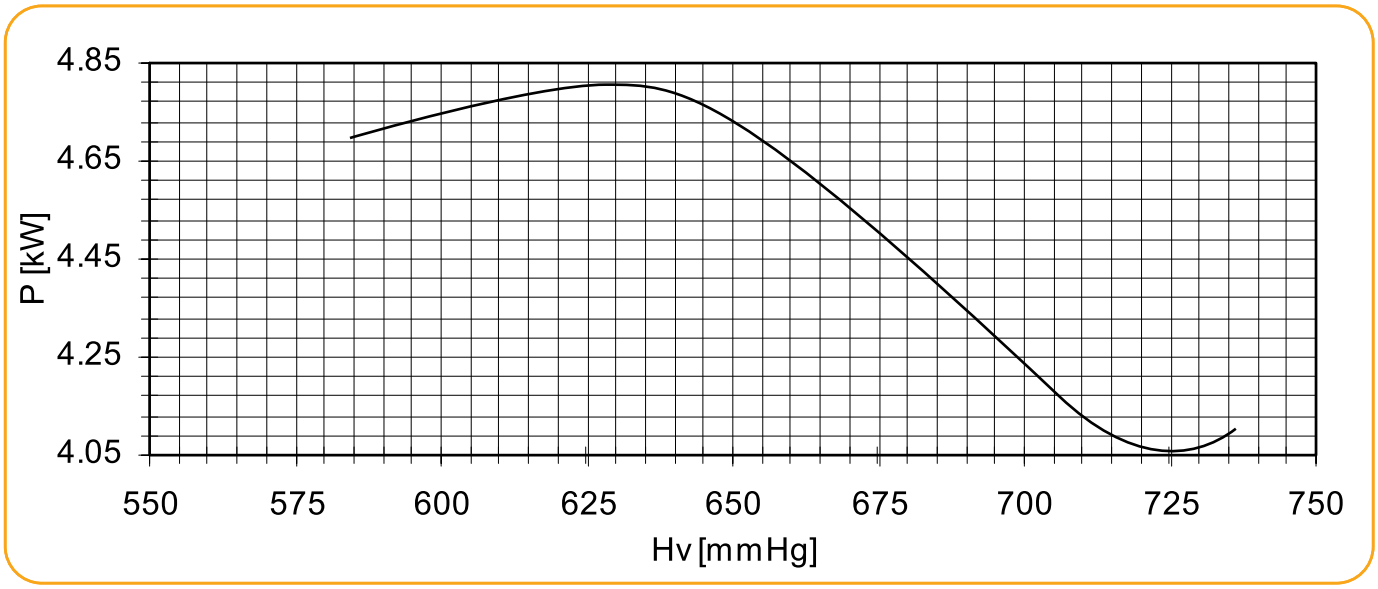
Pump performance curves

CEH 412
n =1450 (rpm)

Total Differential Head



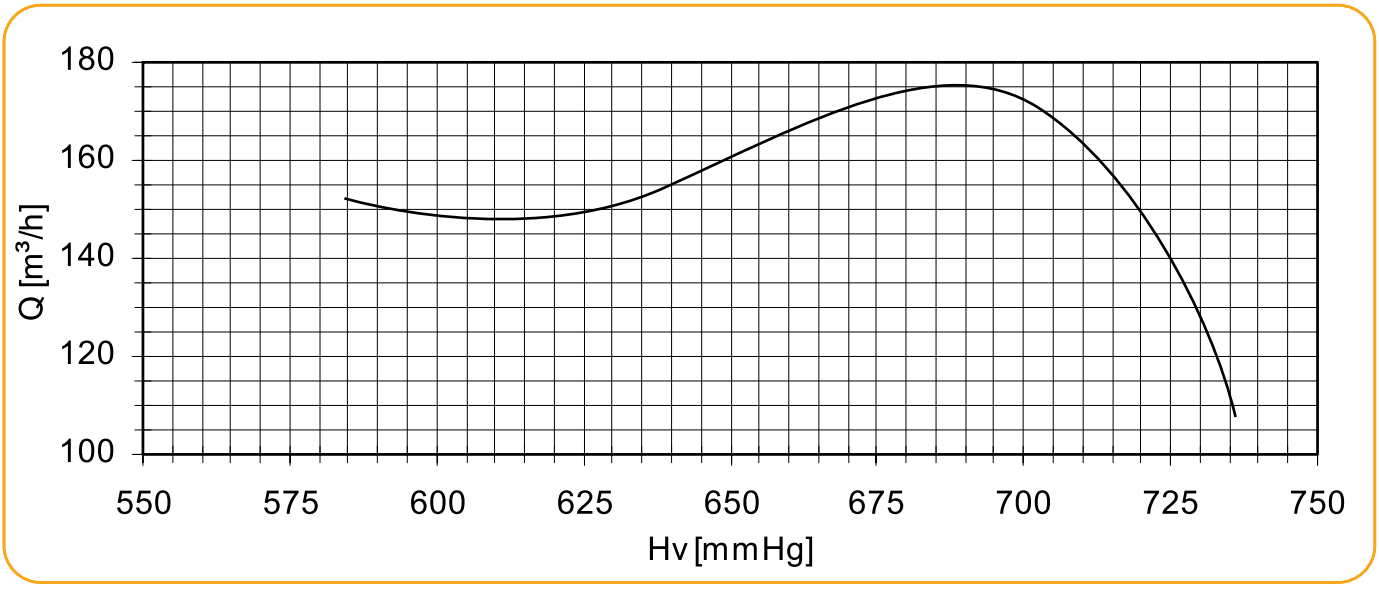
Power Input



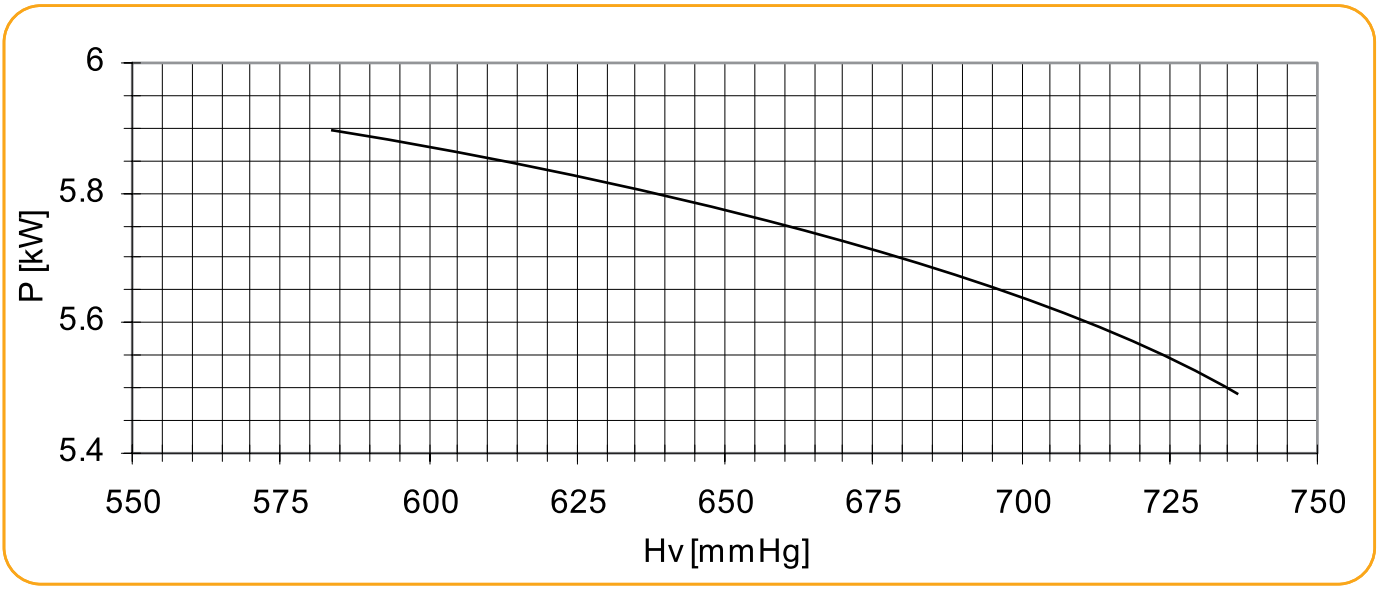
Range of performance curves

CEH 416
n =1450 (rpm)

Total Differential Head



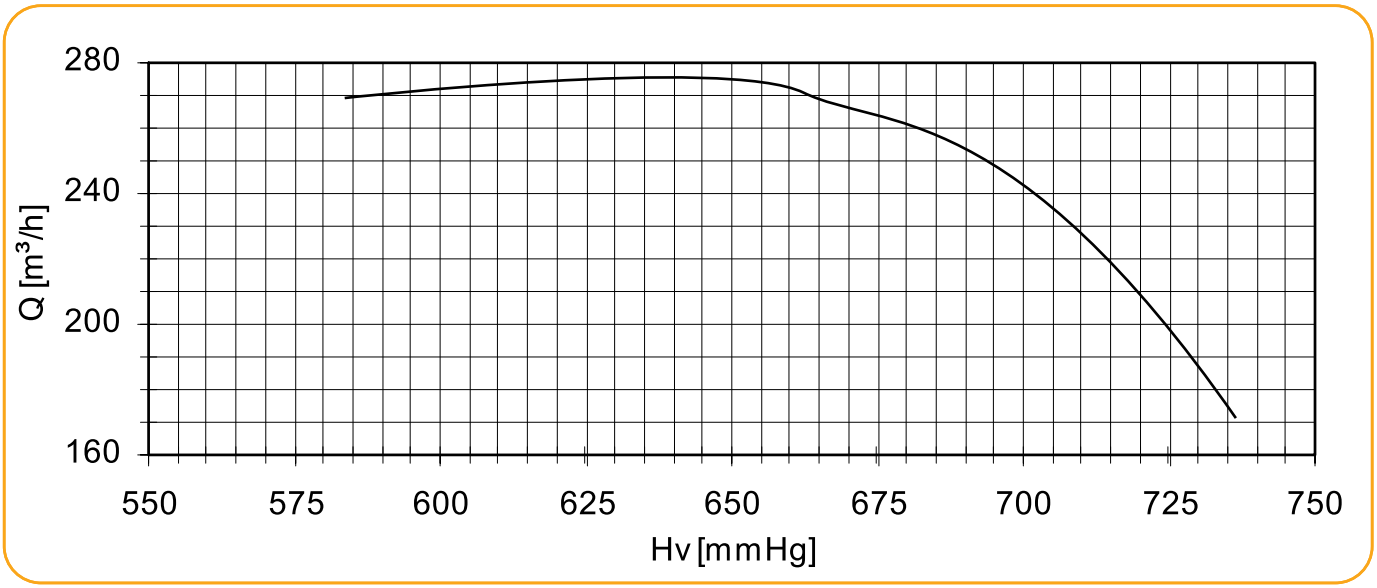
Power Input



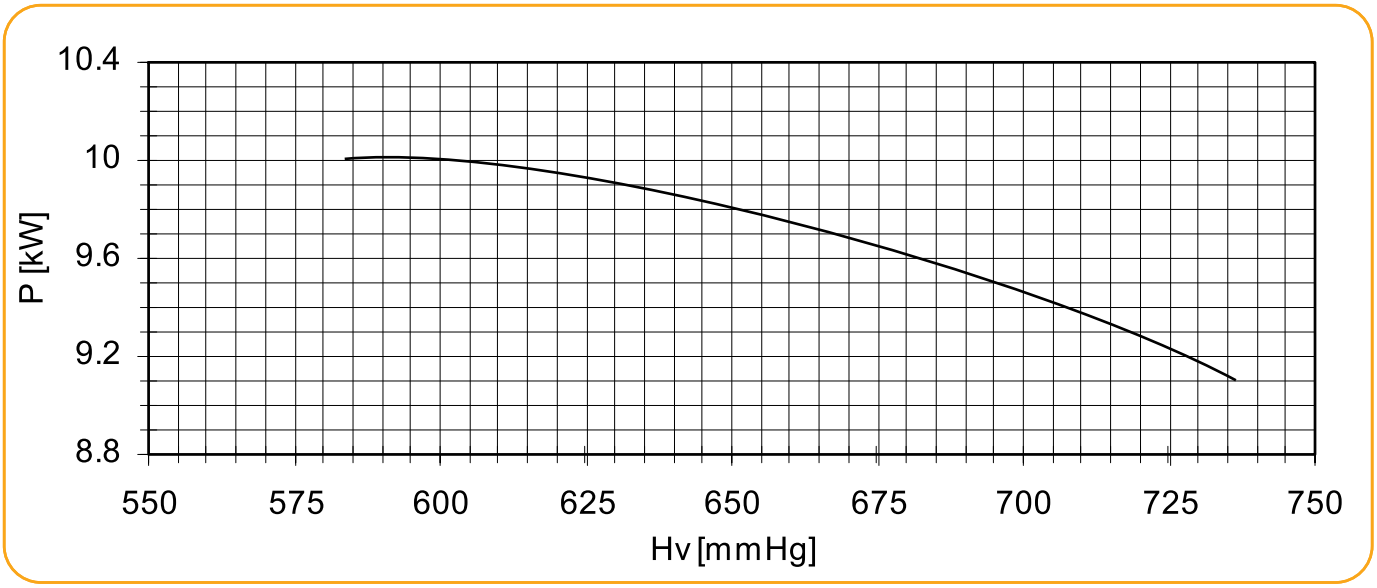
Pump performance curves

CEH 512
n =1450 (rpm)

Total Differential Head



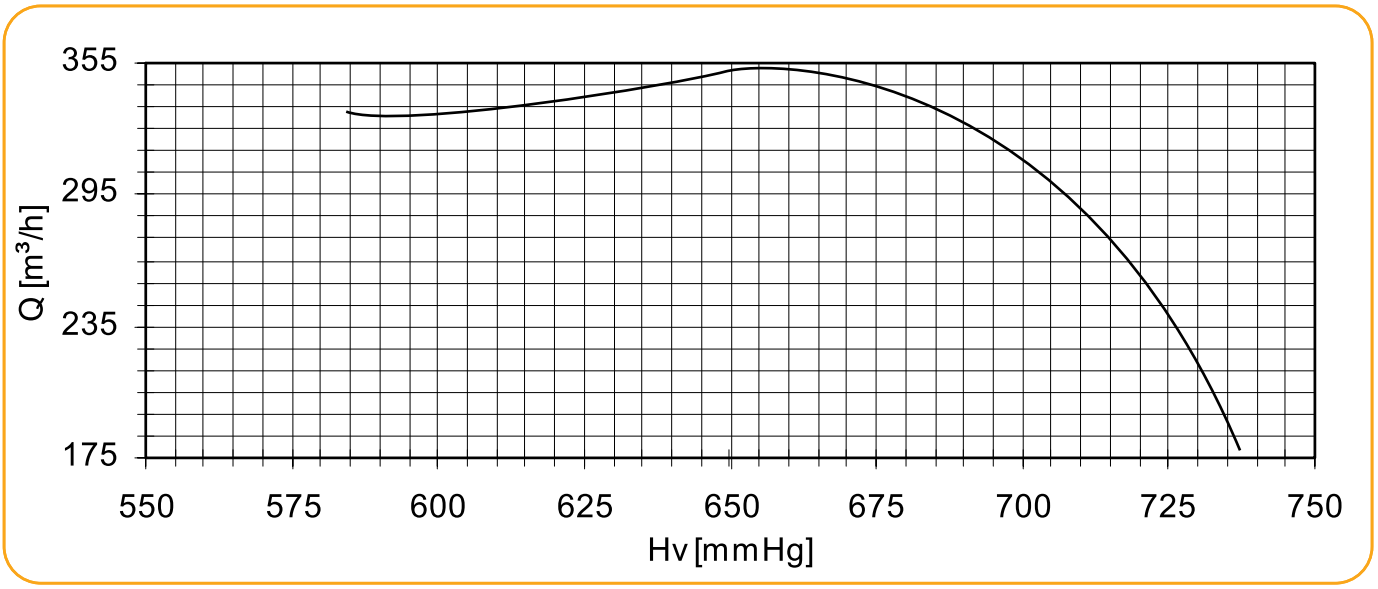
Power Input



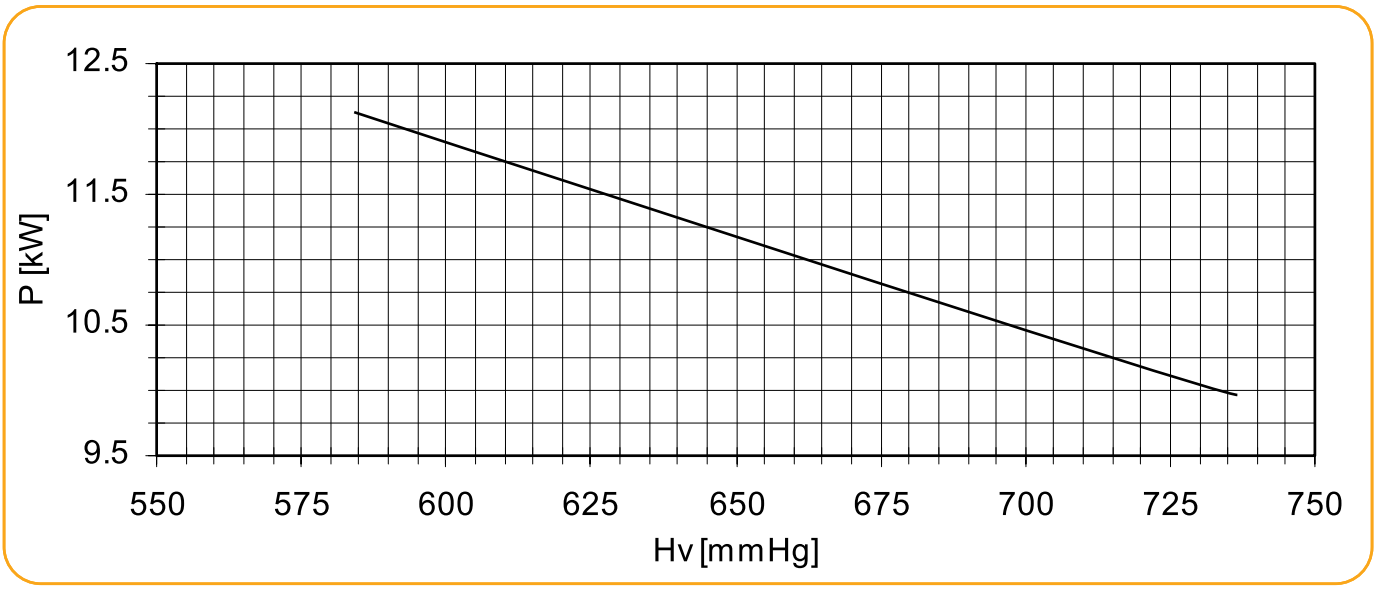
Range of performance curves

CEH 516
n =1450 (rpm)

Total Differential Head



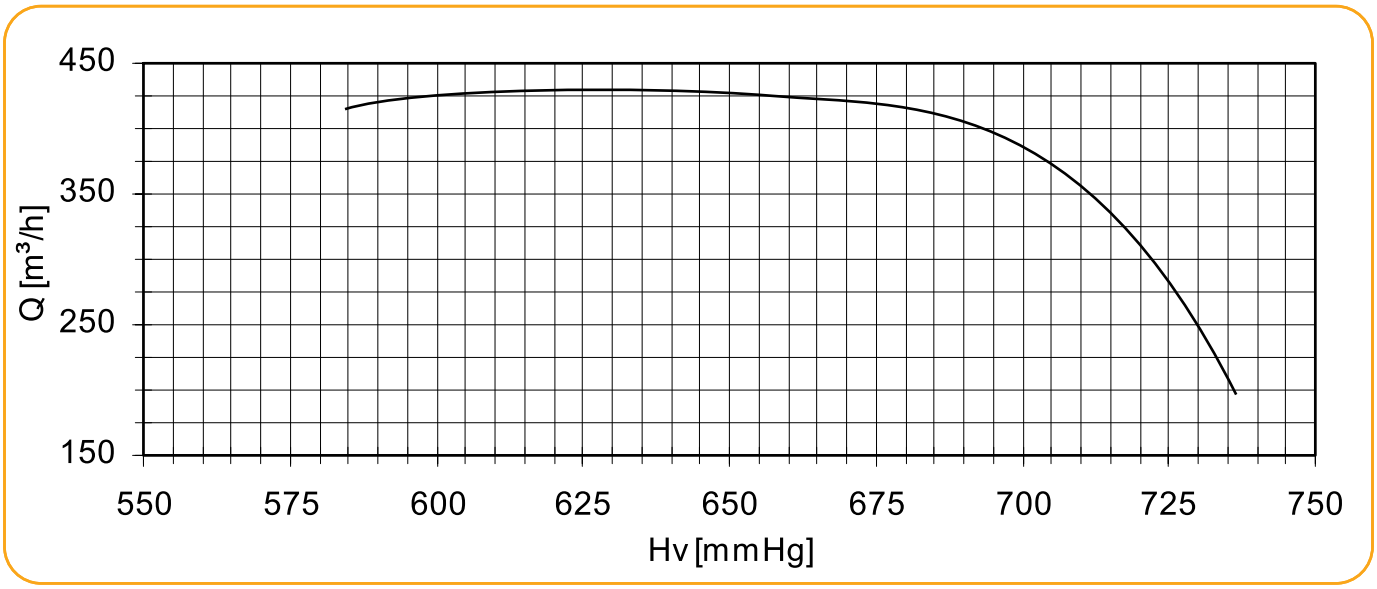
Power Input



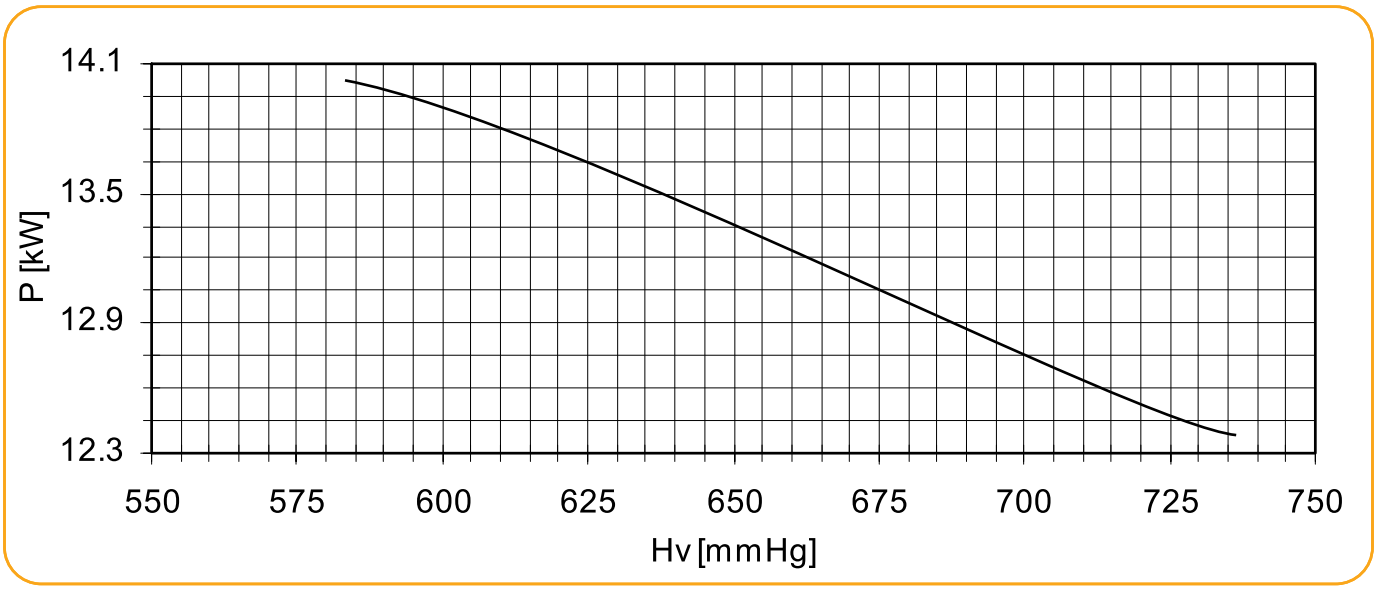
Pump performance curves

CEH 520
n =1450 (rpm)

Total Differential Head



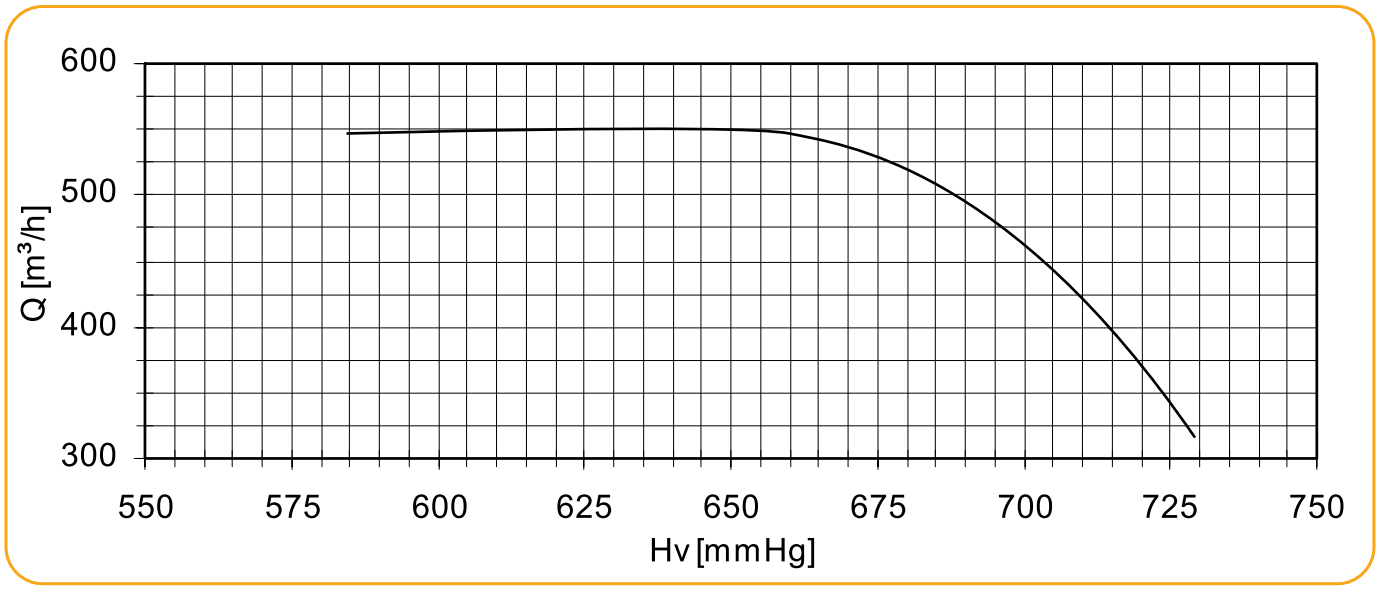
Power Input



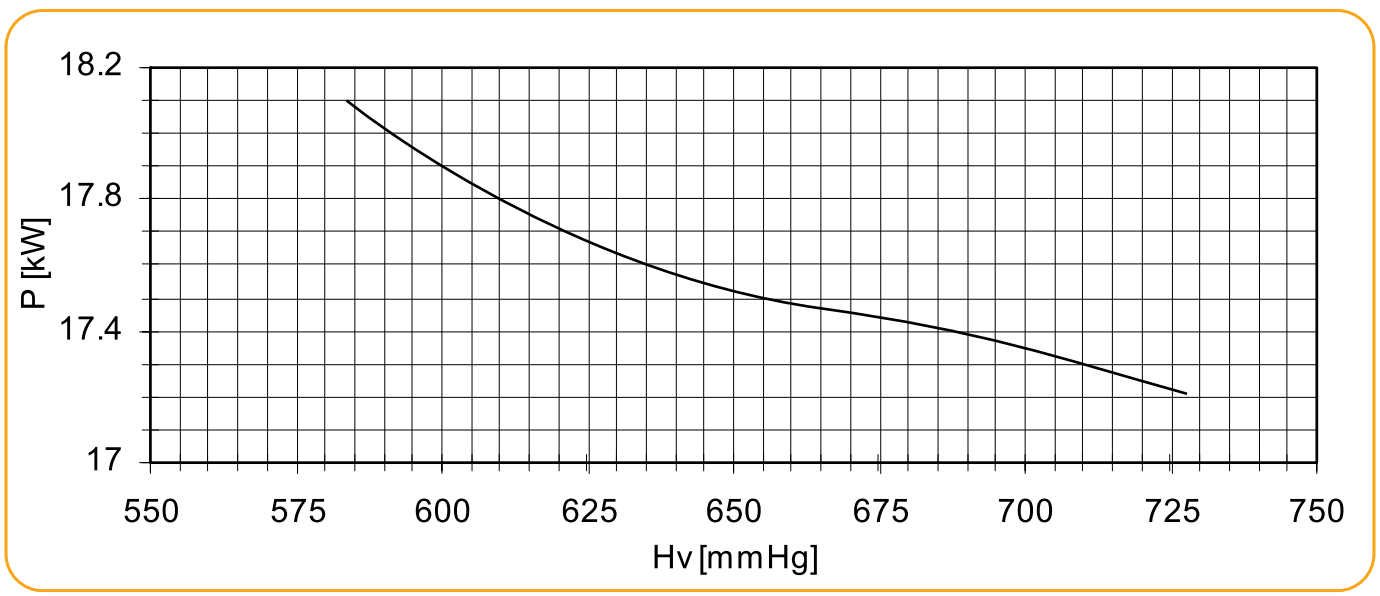
Range of performance curves

CEH 616
n =1450 (rpm)

Total Differential Head



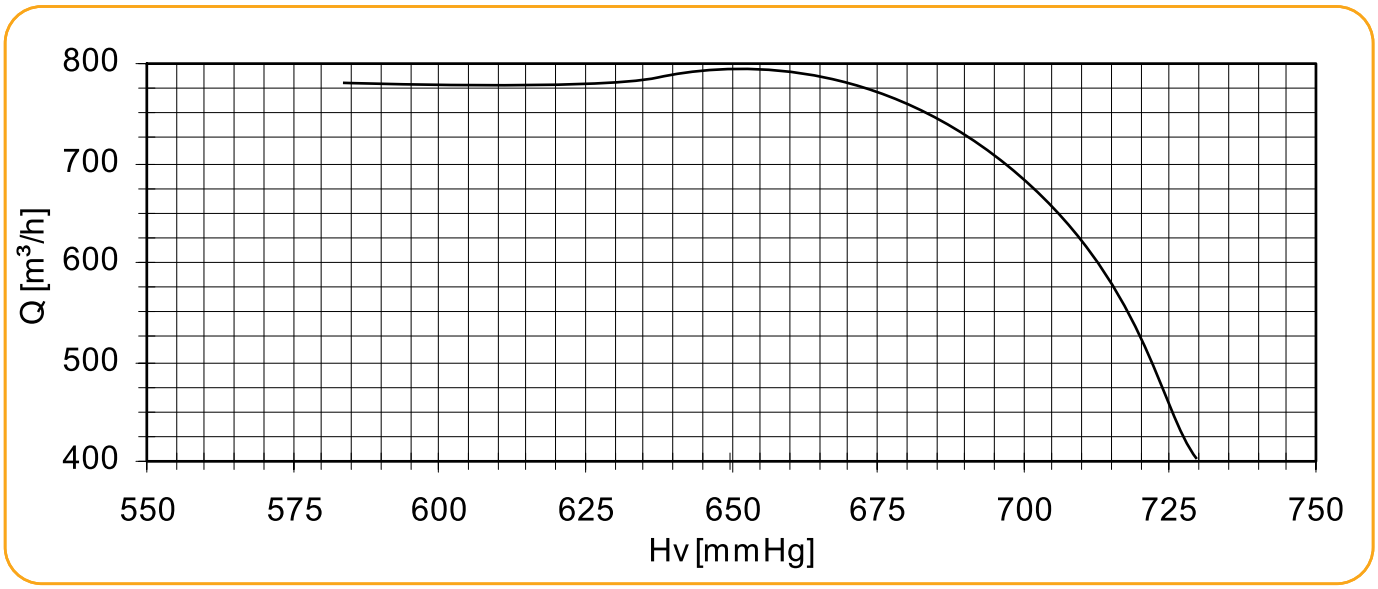
Power Input



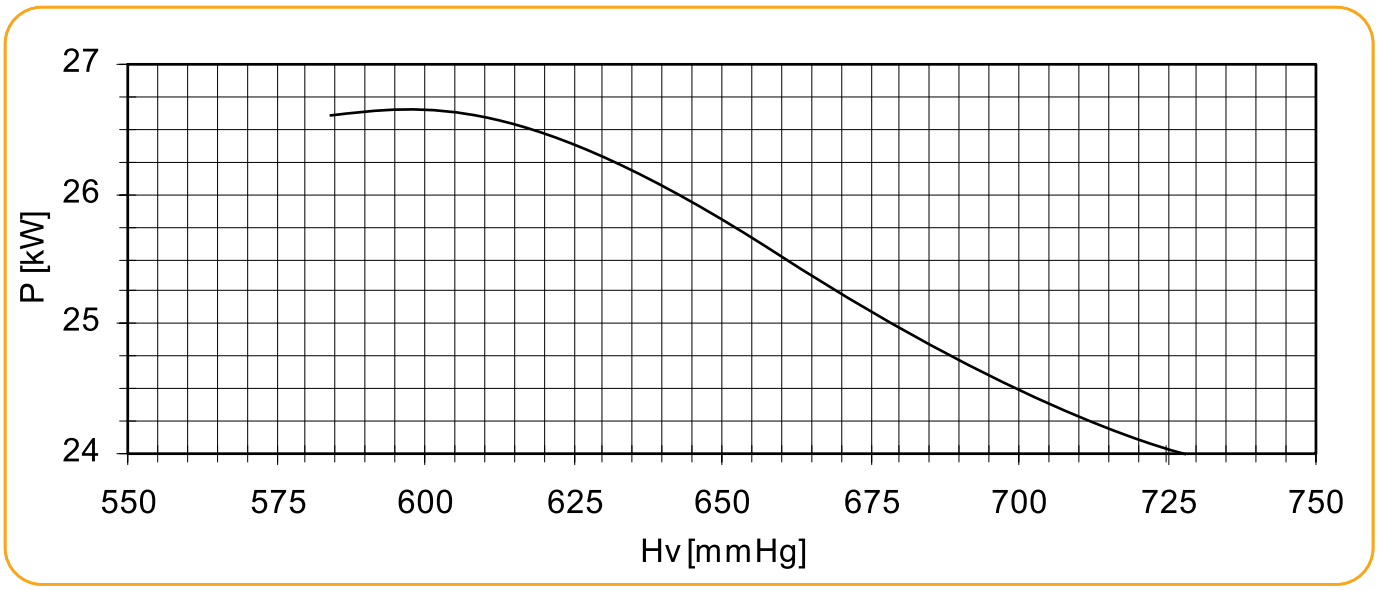
Pump performance curves

CEH 624
n =1450 (rpm)

Total Differential Head



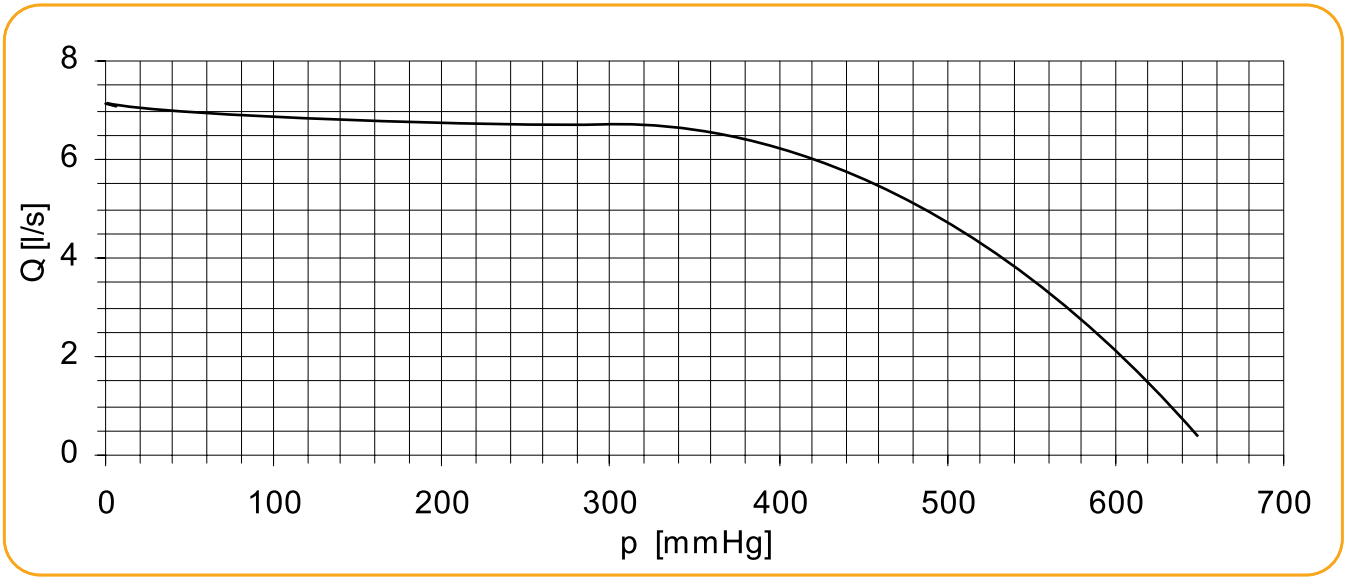
Power Input



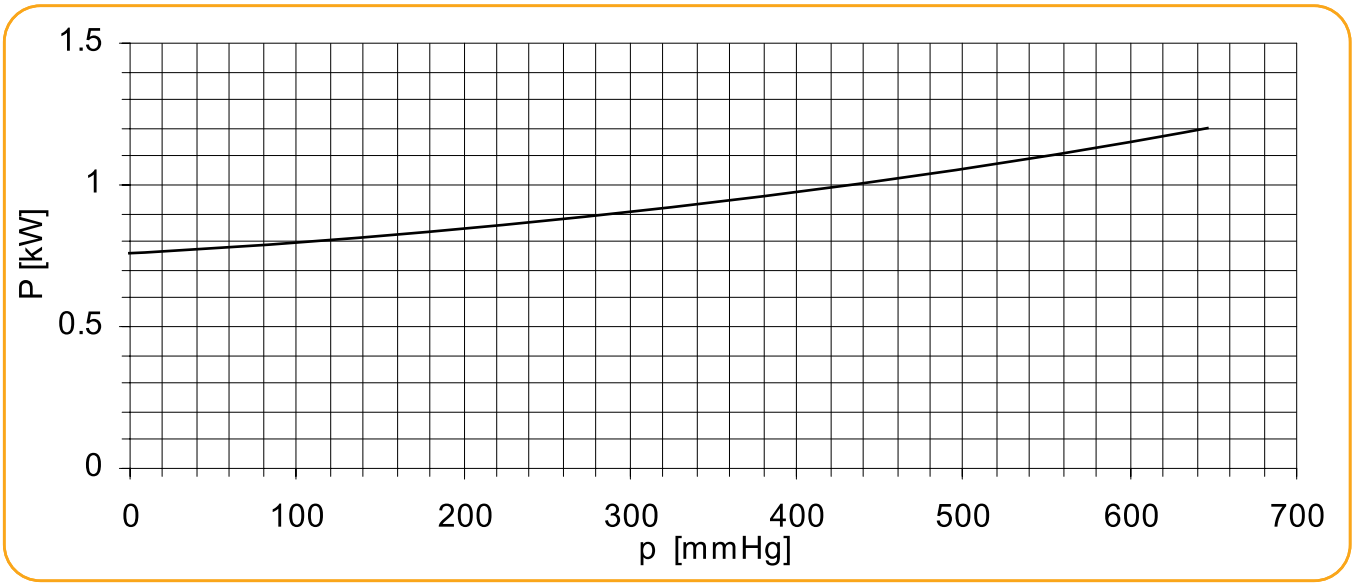
Range of performance curves

KVP 4
n =1450 (rpm)

Total Differential Head



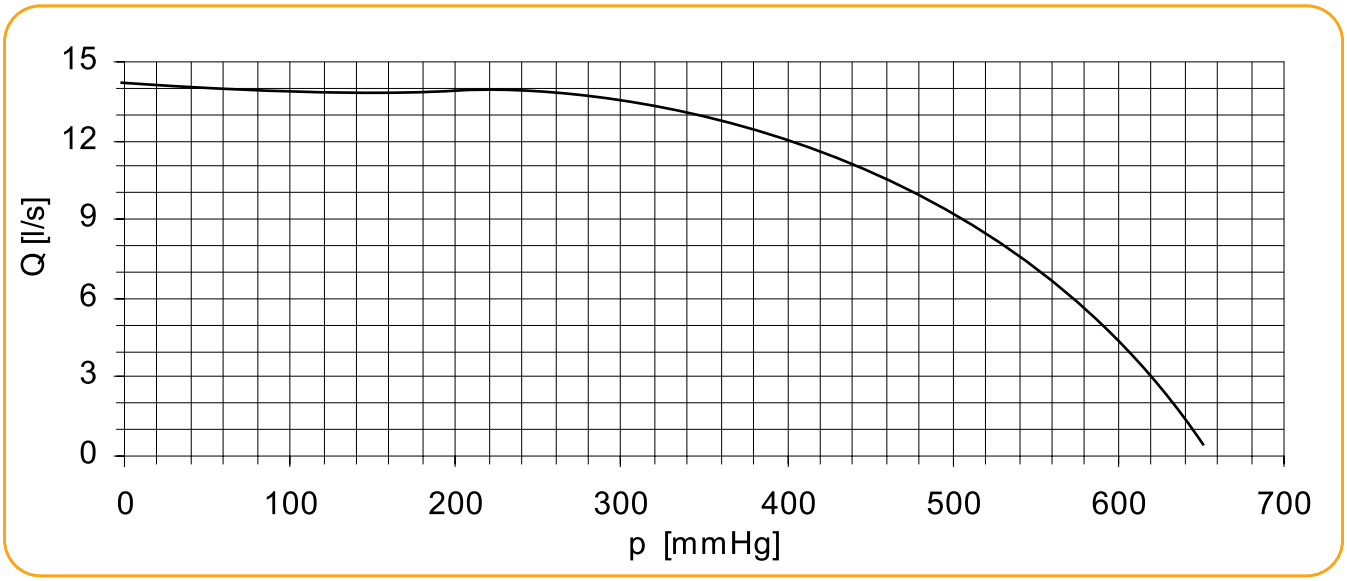
Power Input



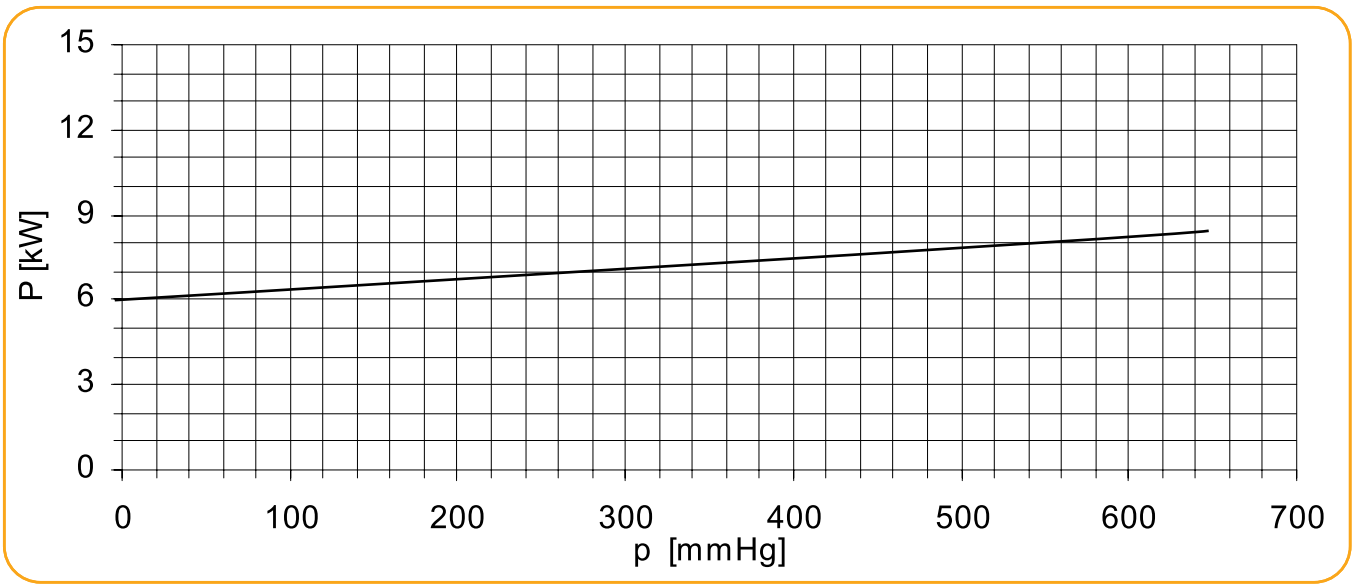
Pump performance curves

KVP 8
n =1450 (rpm)

Total Differential Head



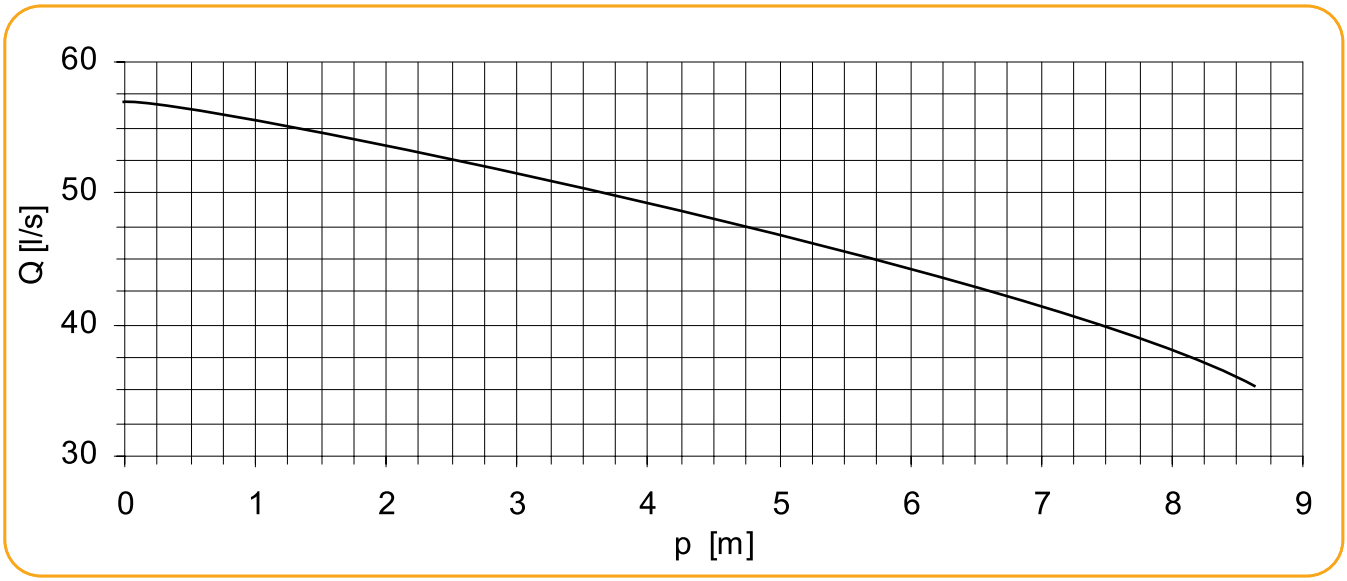
Power Input



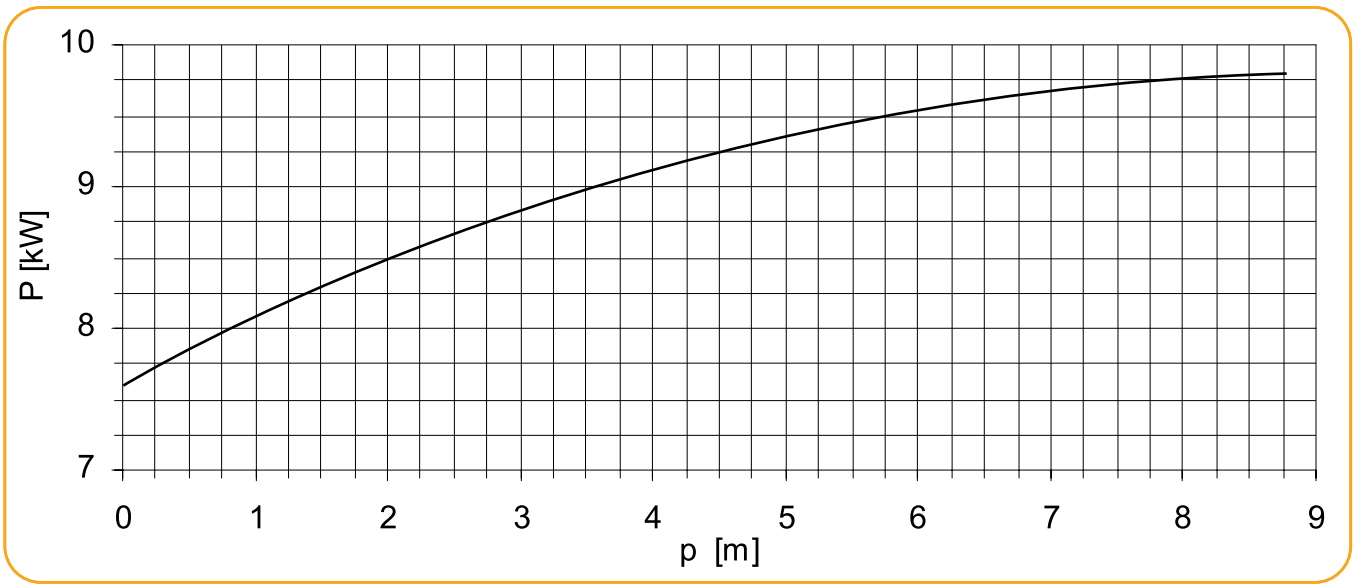
Range of performance curves

RVP 81
n =1450 (rpm)

Total Differential Head



Power Input



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