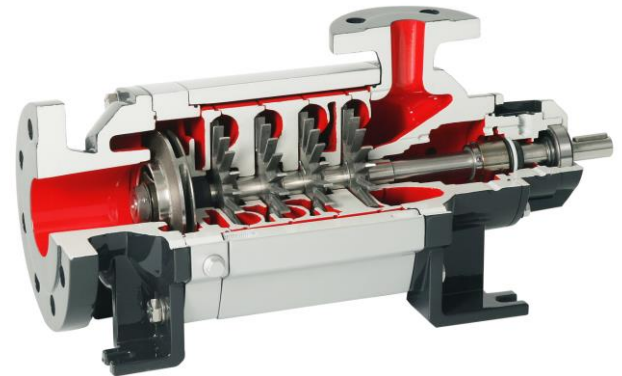


CEH-X 1201 ... 3608

TECHICAL DATA

Capacity:	from 0.4 up to 7.5 m ³ /h
Delivery head:	from 10 up to 322 m
Speed:	1450 rpm (max. 1800 rpm)
Temperature:	max. 120 °C max. 180 °C for high temperature design (higher temperatures on request)
Casing pressure:	PN 40
Shaft sealing:	mechanical seal
Flange connections:	DIN 2501 / PN 40
Direction of rotation:	anti-clockwise (when seen from the drive end)
Protection classification:	Ex II2 Gc T1-T5



APPLICATION

The Sterling SIHI CEH-X pump is a self-priming side channel pump capable of handling gas along with the medium and operates at a low noise level.

The CEH-X pumps are used for problem-free pumping of clean liquids at unfavourable suction side conditions. They are also very suitable for positive suction heads below 0.5 m.

Different material possibilities with uniform dimensions and performance characteristics as well as the standard exchangeable components are used for the construction.

The CEH-X pumps are particularly recommendable for applications in the pharmaceutical, chemical or petrochemical market as well as in the plastic or oil industry. Because of its low NPSH and positive suction head the CEH-X is very suitable for the pumping of liquefied gases and liquids under vapour pressure like condensate, refrigerant, boiler feed or LPG.

The CEH-X pumps have a retaining stage, combined with the low NPSH stage, to avoid the dry running by controlling the liquid level in the pump. This design is especially developed for the handling of liquids under vapour pressure or when pumping from underground tanks. The CEH-X pumps are used for bottom off-loading of liquids under vapour pressure.

DESIGN

The pumps of the SIHI^{prime} range are side channel pumps having segmental type construction. The construction of the CEH-X pump is a centrifugal combined system. This combination pump is suited with a centrifugal stage in serial connection before the side channel stages to obtain a more favourable NPSH.

The program comprises, currently, 3 sizes (1200, 3100 and 3600) each with 1-8 stages. The existing material design allows an optimum rating for the respectively desired performance range and the pumping medium.

The applied hydraulic components are from our modular side channel system (interchangeability of parts).

CONSTRUCTION

Casing pressure

Maximum 40 bar from -40 °C up to +120 °C. Maximum 32 bar from +120 °C up to +180 °C.

Pressure stages for temperature as per DIN EN 1333.

Please observe

Technical rules and safety regulations:

Casing pressure = inlet pressure + delivery head at minimum pump capacity.

Position of branches

Axial suction branch, discharge branch points radially upwards.

Flanges

Flanges in accordance with DIN EN 1092-2 / PN 40.

Flange design as per DIN 2512 with groove or drilled according to ANSI 150 or 300 lbs is basically possible.

Bearing

One grease lubricated, greased for life, ball bearing according to DIN 625 and one liquid surrounded sleeve bearing.

Rotation direction

Anti-clockwise, when looking from the drive end.

Shaft sealing

The shaft is sealed by a mechanical seal according to DIN EN 12756, with quench connection.

The shaft sealing is also available in a design suitable for heating or cooling of the mechanical seal and a double mechanical seal (back-to-back as well as tandem) design is possible on request.

CEH-X

Material design

		Material design		
		GS Cast Iron/ GL Cast Iron		Stainless steel
Pos.	Components	TM	TN	4B
2350	Vane wheel impeller	G-X 3 CrNiMoCuN 26 6 3 3	CuZn40Al2	G-X 3 CrNiMoCuN 26 6 3 3
1060	Suction casing	EN-GJS-400-18-LT		G-X5 CrNiMoNb 18 10
1070	Discharge casing			
1080	Low NPSH stage			
1510	Shell casing			
1090	First suction intermediate	EN-GJL-250		
1140	Side channel intermediate			
1141	Last discharge intermediate			
2310	Centrifugal impeller	X 20 Cr 13		X 5 CrNiMo 17 12 2
2100	Shaft			
4410	Mechanical seal casing			
4420	Cooling insert			
3600	Bearing cover	EN-GJS-400-18-LT		
0241	Bearing bush	CY 10 C / Antimony Carbon*		

* Bearing bush in Antimony Carbon is only used in high temperature design

Casing seal

The casing sealing is done by o-ring gaskets compatible with the handled medium.

Drive

By electric motor, type of construction IM B3. According to the area of usage, we can supply motors of any kind of protection (EExe, EExd).

General comments

Side Channel pumps with the same hydraulic construction are manufactured in series as:

- AOHA** Low duty pump with oval flanges, PN 10
- AKH-X** Medium duty pump, PN 25
- CEBA** Vertical pump, PN 25 with magnetic coupling
- AEH-X** High duty pump, PN 40

CEH pumps are available in magnetic coupling design.

Note: For hydraulic sizes from 4101 to 6108 please see catalogue **CEH PIII/11** (133.51301.58.01 E).

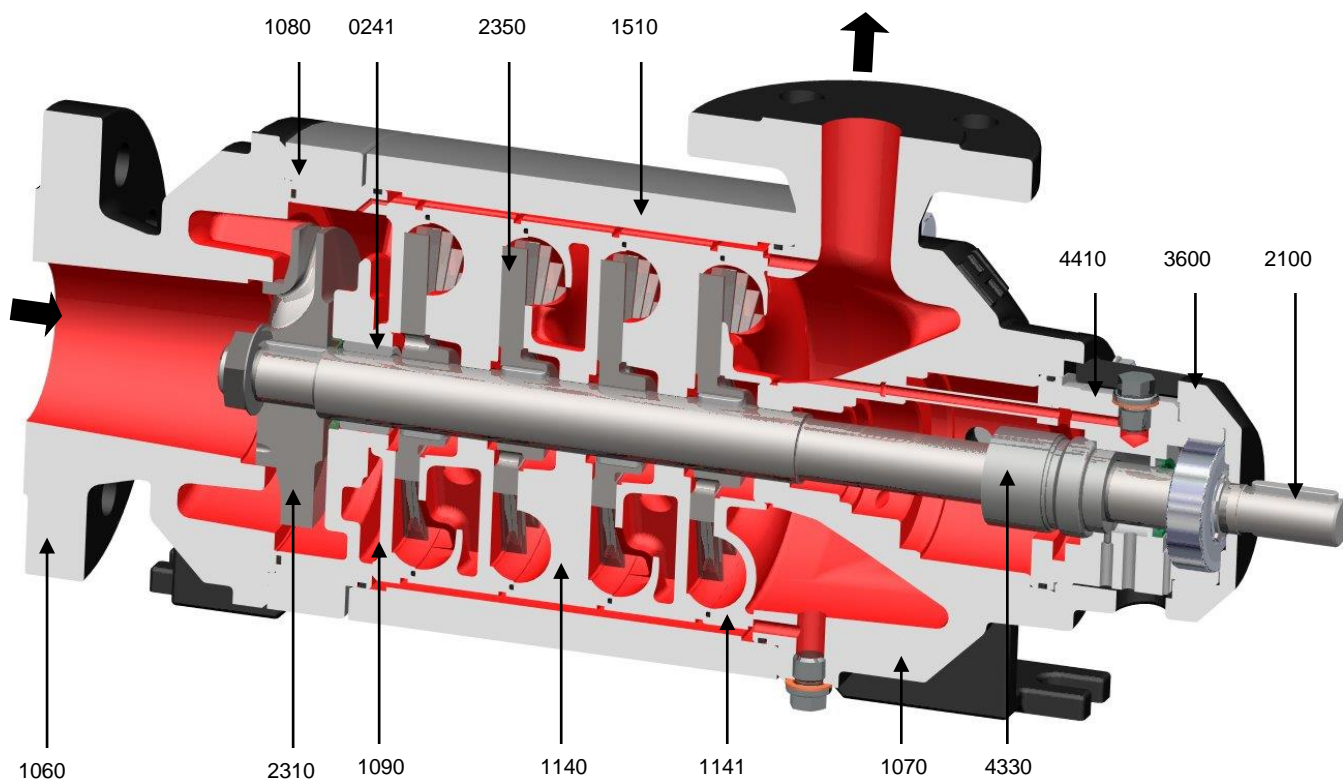
Technical documents about these pumps will be readily supplied on request

Sensor for Condition Monitoring

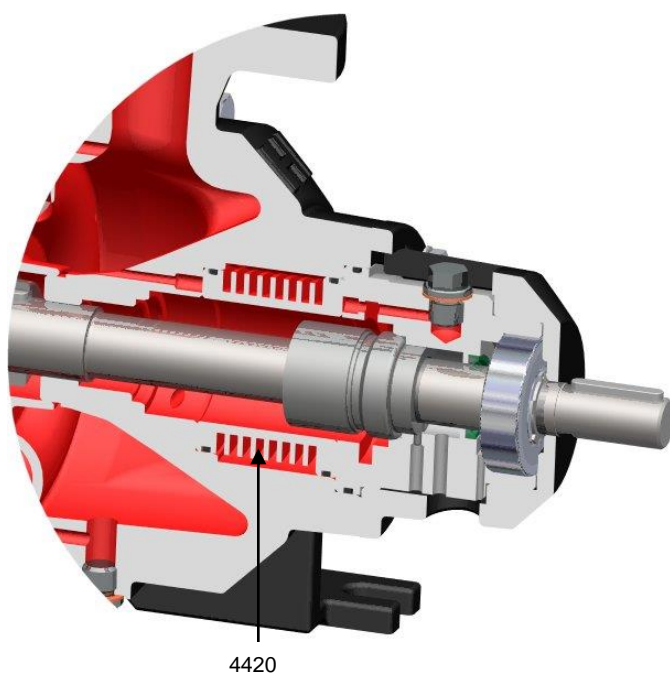
The **SIHI^{detect}** sensor is the ideal solution for **vibration velocity** measuring and for pump **condition monitoring** for example to detect bearing wear, unbalance, misalignment, unacceptable pipeline forces, cavitation, etc. This sensor is suitable for all liquid and vacuum pumps and the main features are:

- Simple to connect
- Universal use
- Visual check via LED display
- Easy Installation
- Also available as non Ex version

Sectional drawing and parts list



Pos.	Components
0241	Bearing bush
1060	Suction casing
1070	Discharge casing
1080	Low NPSH stage
1090	First suction intermediate
1140	Side channel intermediate
1141	Last discharge intermediate
1510	Shell casing
2100	Shaft
2310	Centrifugal impeller
2350	Vane wheel impeller
3600	Bearing cover
4330	Mechanical seal
4410	Mechanical seal casing
4420	Cooling insert



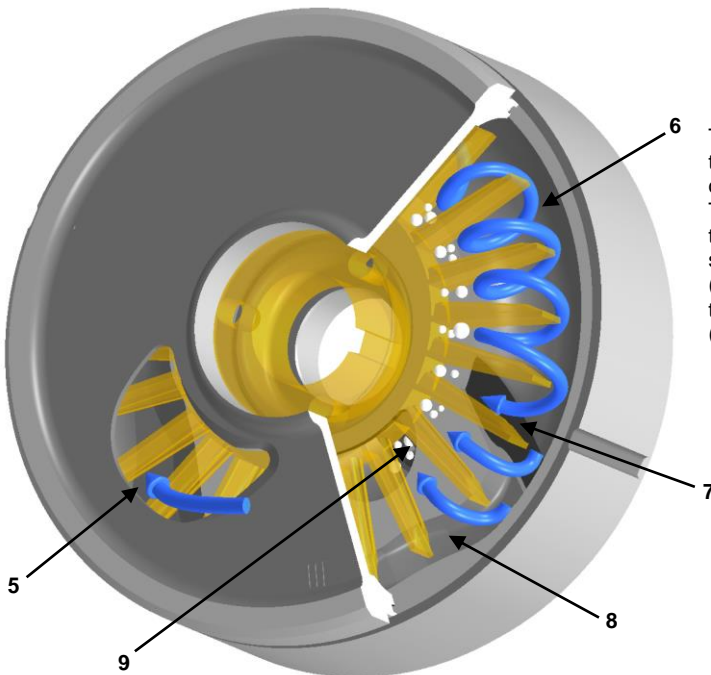
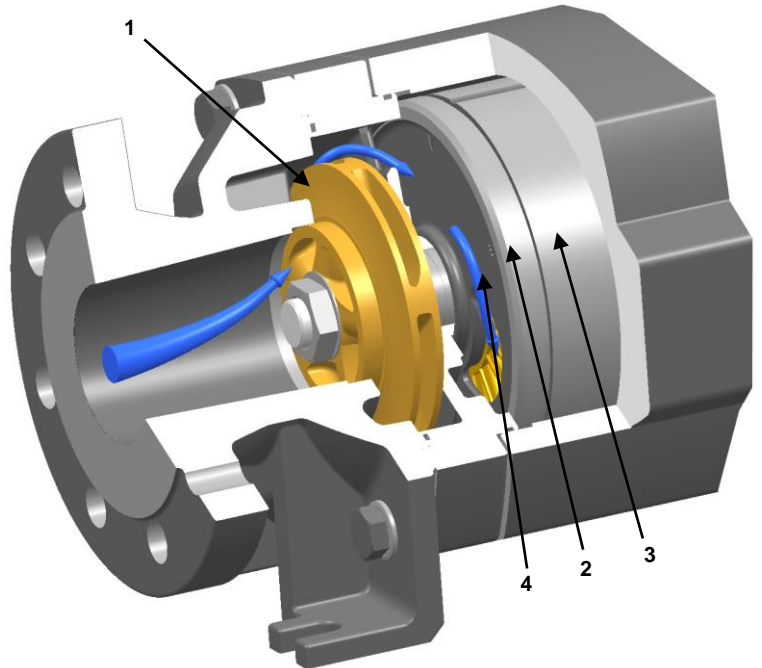
CEH-X

Operating principle

The CEH-X pump is a combined system side channel pump. It is suited with a low NPSH centrifugal impeller (1) placed before the side channel stages. This NPSH inducer stage delivers enough pressure to overcome the entrance pressure loss of the first side channel stage or the required NPSH.

A side channel stage consists of:

- A suction intermediate (2),
- A discharge intermediate including the side channel (3),
- A vane wheel impeller located between the 2 intermediates (4).



The fluid entrance goes through the suction hole (5). The turning of the vane wheel impeller creates an under pressure at the beginning of the side channel and the liquid (with or without gas) is drawn in. The pressure generating is obtained by the repetitive re-entering of the liquid in the side channel (6). The liquid goes then to the next stage through the discharge hole (7). The air displacement channel (8) provokes a positive displacement effect so the gas remaining at the root of the vane wheel impeller is forced out through the gas slot (9).

A side channel pump can de-aerate and degas the suction line by itself and is thus very suitable for suction lift operation. A side channel pump can handle large quantities of (entrained) gas. Mixtures up to a gas share of 50% are possible. The ability for self-priming and the handling of large amounts of (entrained) gas will guarantee continuous operation even in case of evaporation and therefore contribute to a higher level of safety in industrial processes.

To avoid cavitation the distance between the liquid level and the entrance at the suction side of the pump is restricted. This distance is related to the NPSH or Net Positive Suction Head. The NPSH for CEH-X pumps is very low due to its special construction. The axial and large diameter entrance leads to less flow disturbance and lower friction losses. Together with the low NPSH of the centrifugal impeller the CEH-X can handle a positive suction head of less than 0.5 m. This makes the CEH-X very suitable for pumping liquids near their boiling point at reasonable economic expenses and the low NPSH guarantees also full output capacity because of operation without cavitation

Performance range

General conditions

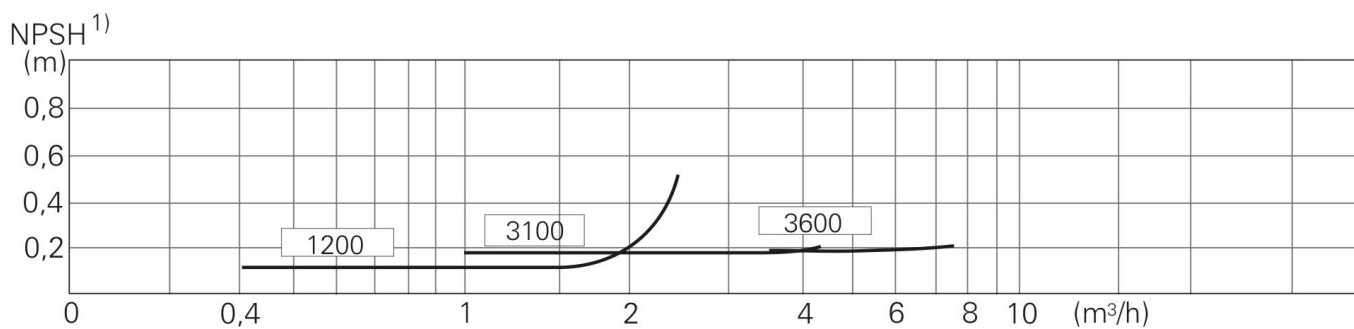
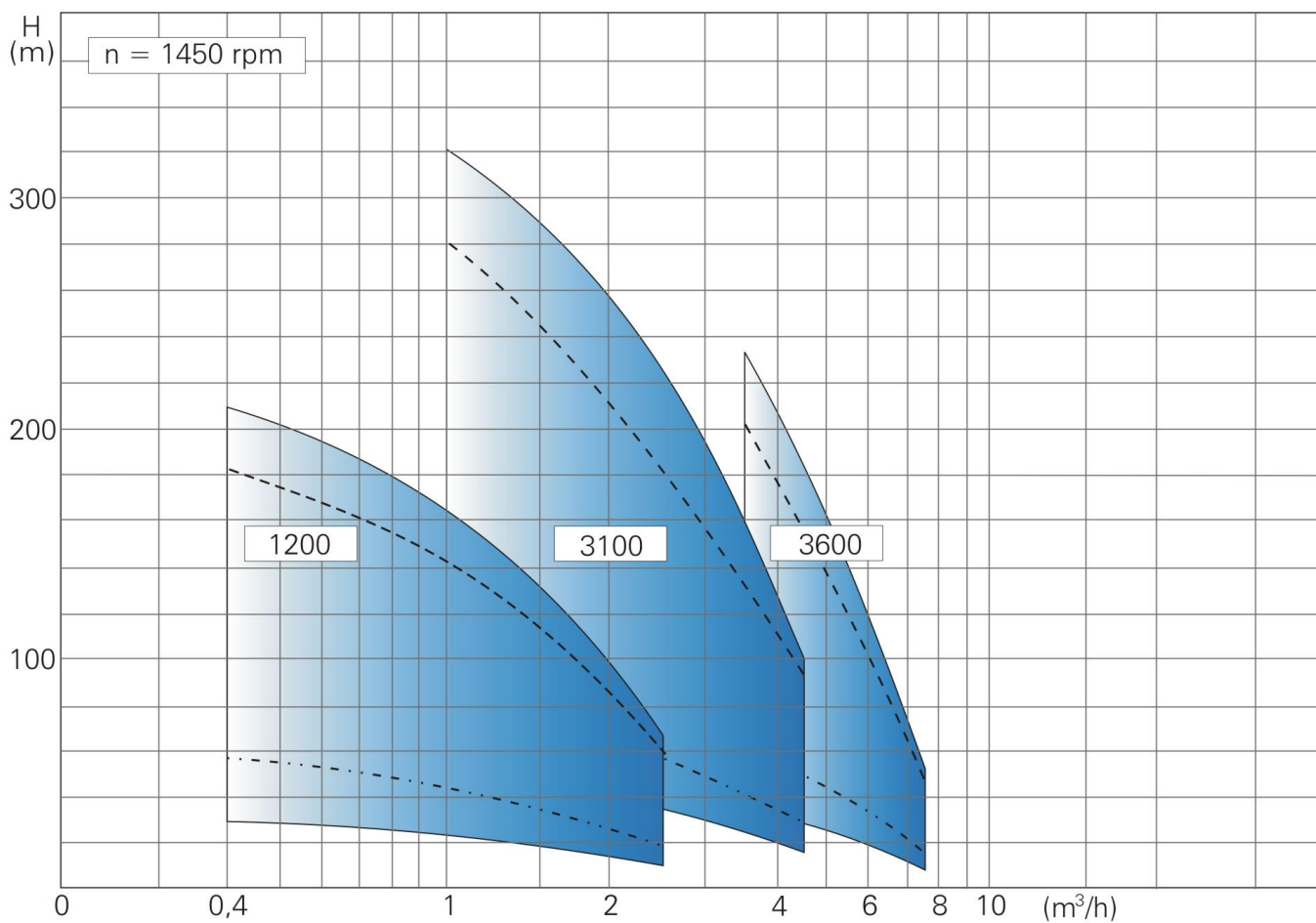
Liquid: Water
 Density: 1 kg/dm³
 Viscosity: 1 cSt
 Temperature: 20 °C
 Atmospheric pressure: 1013 mbar

Characteristic tolerances

The Side Channel pumps are not submitted to any normalized test tolerances. Here under are our acceptance values:
 Capacity ± 9% - Delivery head ± 7% - Power + 10%.

Measuring standard

According to ISO 5198.

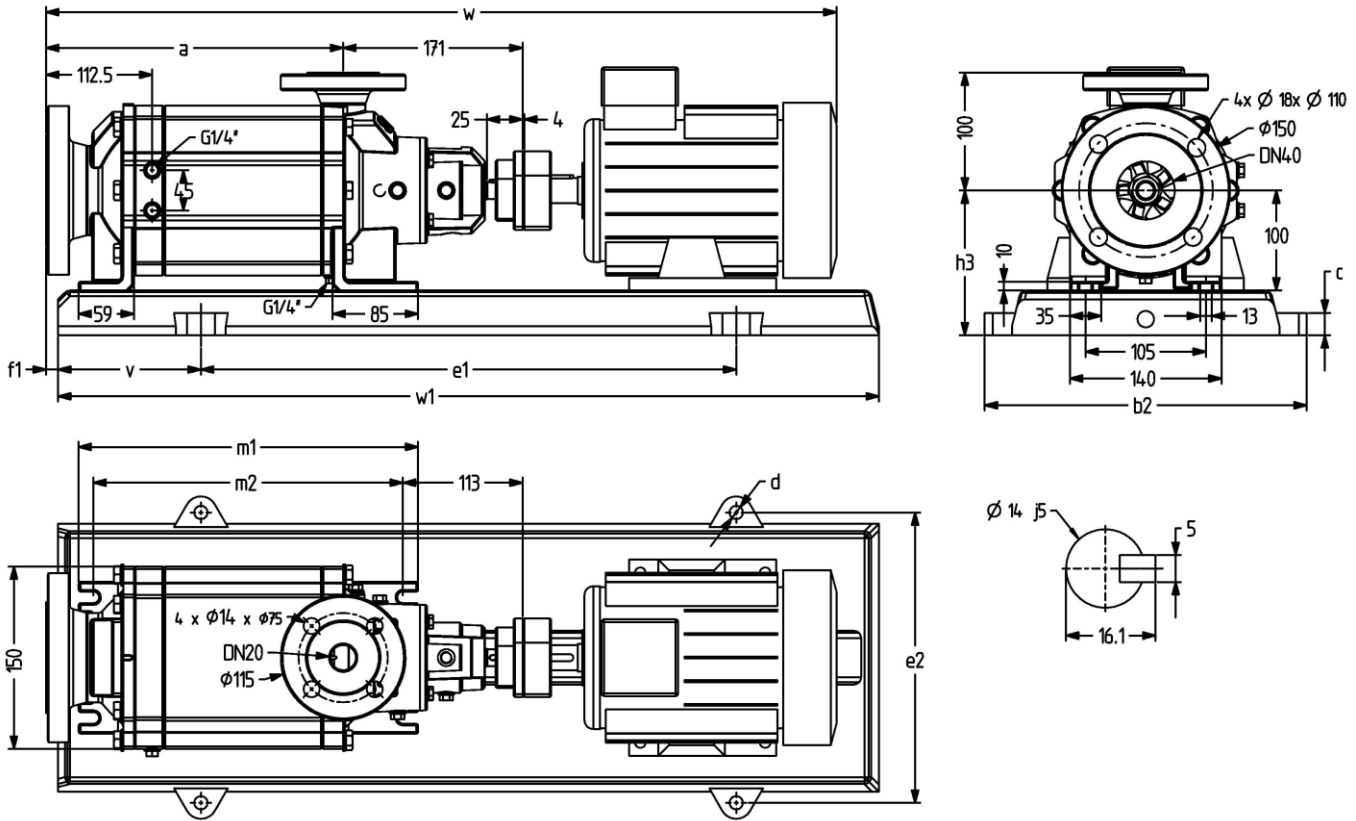


Note: ¹⁾ When using a liquid containing gas, a safety margin has to be added.

CEH-X

Dimension chart and pump set drawing

CEH-X 1201 ... 1208



Pump size	Motor			Base plate	Coupling		Weight		a	b2	c	d	e1	e2	v	f1	h3	m1	m2	w ³⁾	w1
	kW	kW ¹⁾	size		B	BDS ²⁾	Pump	set													
1201	0,37	0,37	71	P007	68	76	18	39	195	317	20	15	350	285	110	-9	135	238	204	609	570
	0,55	0,55	80	P008				45					297	400	265		120			140	643
1202	0,55	0,55	80	P008	68	76	20	47	229	297	20	15	400	265	120	-9	140	272	238	677	640
	0,75	0,75	80					48					330	25	19		480			290	125
1203	1,1	1	90S	P241	68	76	22	56	263	300	25	19	420	260	115	-9	165	306	272	711	650
	0,75	0,75	80	P210				52					330	480	290		125			165	769
1204	1,1	1	90S	P241	68	76	24	62	297	330	25	19	480	290	125	-9	165	340	306	803	730
	1,5	1,35	90L					60					360	480	290		125			165	844
1205	2,2	2	100L	P272	80	88	26	75	331	360	25	19	540	320	140	-9	165	374	340	837	820
	1,1	1	90S	68	76	66		70					540	320	140		165			878	
1206	1,5	1,35	90L	P272	68	76	28	77	365	360	25	15	540	320	140	-9	165	408	374	871	820
	2,2	2	100L	80	88	72		361					600	325	160		150			912	920
1207	3	2,5	100L	P015	68	76	30	85	399	361	25	15	600	325	160	-9	150	442	408	912	920
	1,5	1,35	90L					74					86	905	905						
1208	2,2	2	100L	P015	80	88	32	87	433	361	25	15	600	325	160	-9	150	476	442	946	920
	3	2,5	100L					88					89	980	920						

The weight of the pump will be approximately 6% higher when using stainless steel.

General: Values are valid for water $\rho = 1 \text{ kg/dm}^3$ and $u = 1 \text{ cSt}$.

Design tolerances: Capacity $\pm 9\%$ - Delivery head $\pm 7\%$ - Power + 10%.

Notes:

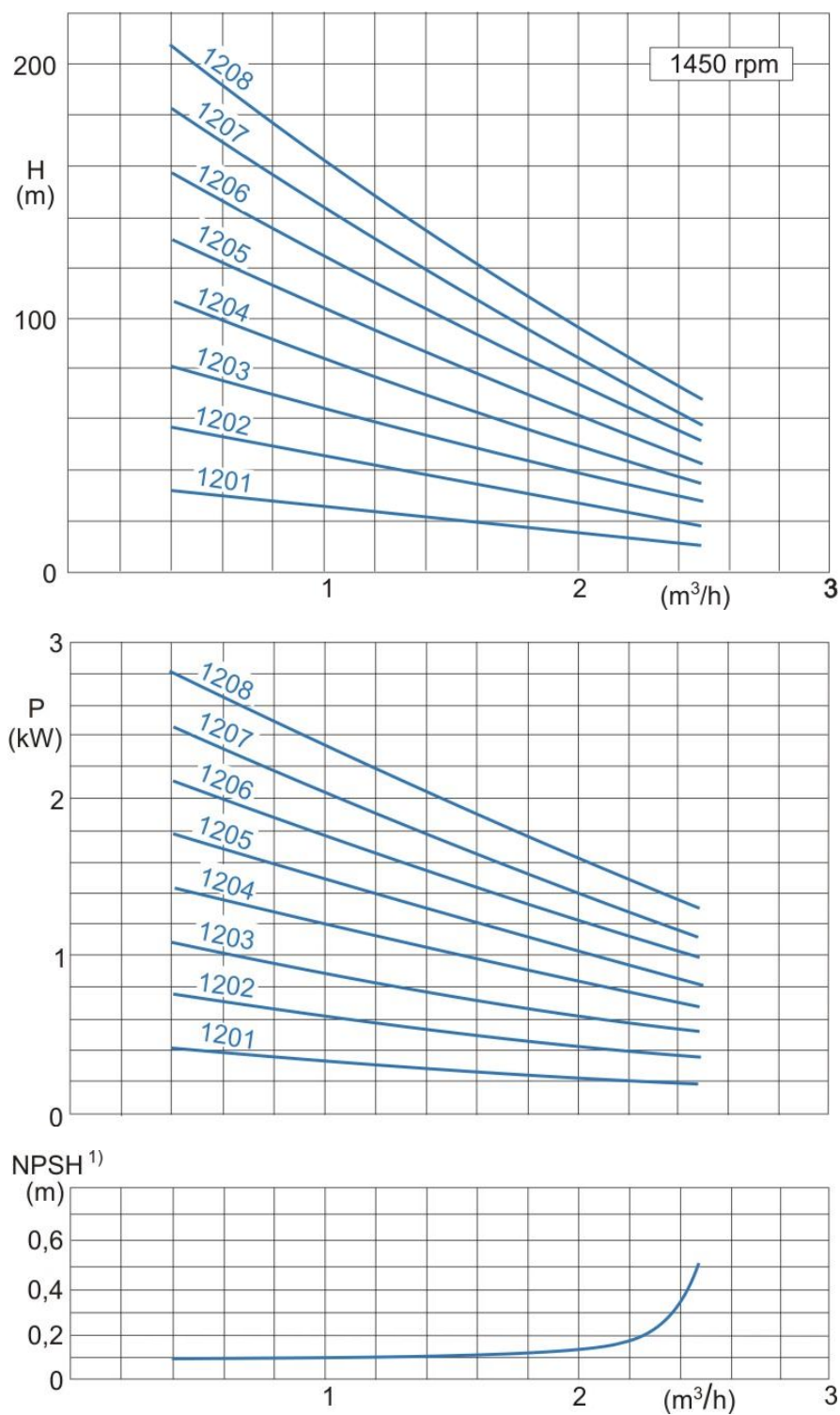
¹⁾ For EExe II T3 motors.

²⁾ For every pump set in ATEX area.

³⁾ Dimensions are depending on the used motor trade mark.

Performance curves

CEH-X 1201 ... 1208

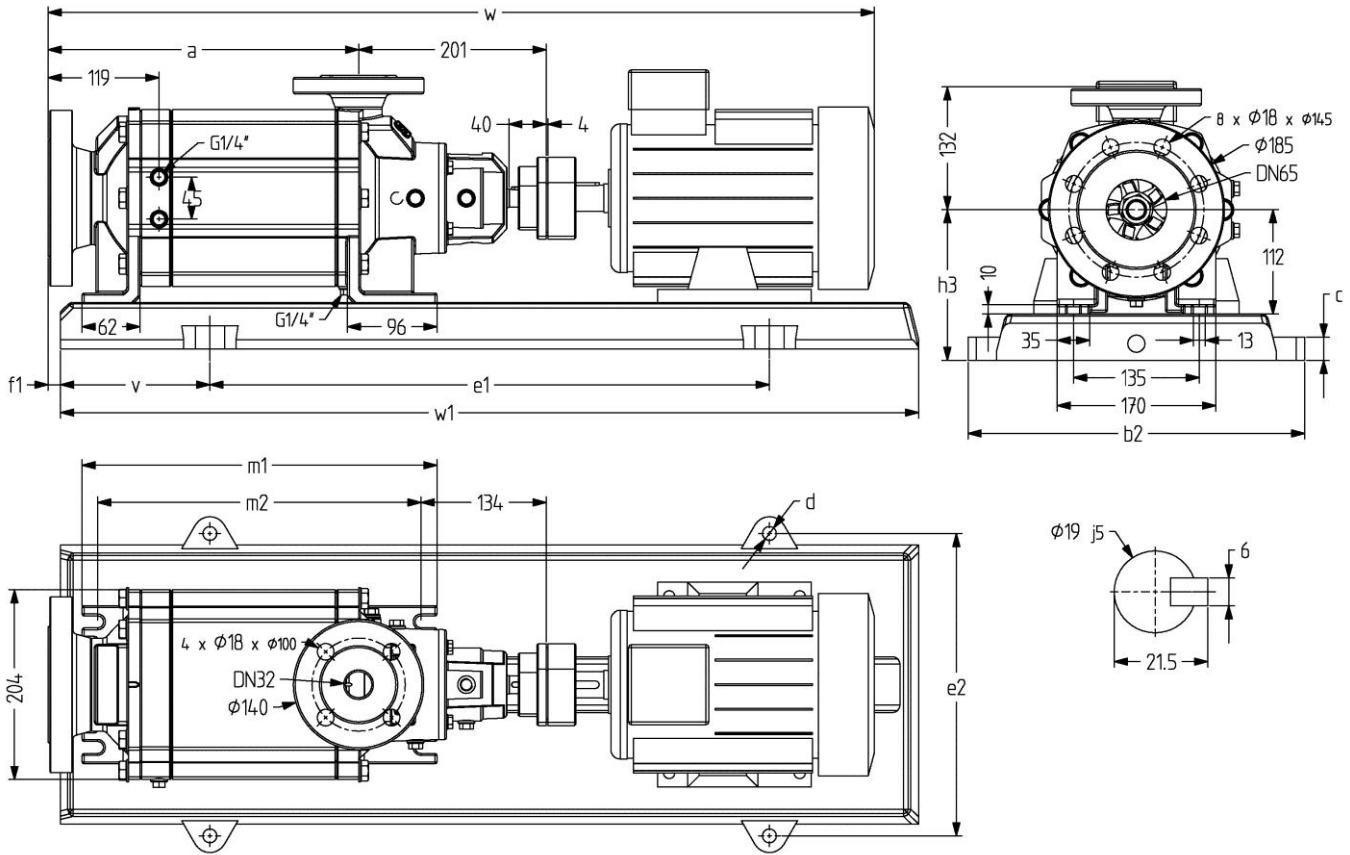


Note: ¹⁾ An additional safety head must be added when handling a liquid containing gas.

CEH-X

Dimension chart and pump set drawing

CEH-X 3101 ... 3108



Pump size	Motor			Base plate	Coupling		Weight		a	b2	c	d	e1	e2	v	f1	h3	m1	m2	w ³⁾	w1
	kW	kW ¹⁾	size		B	BDS ²⁾	Pump	set													
3101	0,75	0,75	80	P008	68	76	31	60	213	297	20	15	400	265	120	-13	152	261	227	691	640
	1,1	1,1	90S	P241				67												330	25
3102	1,1	1	90S	P241	68	76	34	72	253	330	25	19	480	290	125	-13	177	301	267	789	730
	1,5	1,35	90L					74												360	81
3103	2,2	2	100L	P272	80	88	38	89	293	360	25	19	540	320	140	-13	177	341	307	870	820
	3	2,5	100L					90												117	15
3104	2,2	2	100L	P272	80	88	42	93	333	360	25	19	540	320	140	-13	177	381	347	910	820
	3	2,5	100L					94												361	15
3105	3	2,5	100L	P015	80	88	45	102	373	361	25	15	600	325	160	-13	162	421	387	950	920
	4	3,6	112M					120												700	200
3106	5,5	5	132S	P017	95	103	48	123	413	361	25	15	600	325	160	-13	162	461	427	1011	920
	4	3,6	112M					123												700	200
3107	7,5	6,8	132M	P017	80	88	52	161	453	361	25	15	700	325	200	-13	172	501	467	1051	1100
	5,5	5	132S					171												205	192
3108	4	3,6	112M	P017	95	103	55	143	493	361	25	15	700	325	200	-13	192	541	507	1127	1100
	5,5	5	132S					165												208	192
3108	7,5	6,8	132M	P436	95	103	55	198	493	540	30	24	840	490	215	-13	240	541	507	1167	1100
	11	10	160M					208												253	240

The weight of the pump will be approximately 6% higher when using stainless steel.

General: Values are valid for water $\rho = 1 \text{ kg/dm}^3$ and $u = 1 \text{ cSt}$.

Design tolerances: Capacity $\pm 9\%$ - Delivery head $\pm 7\%$ - Power + 10%.

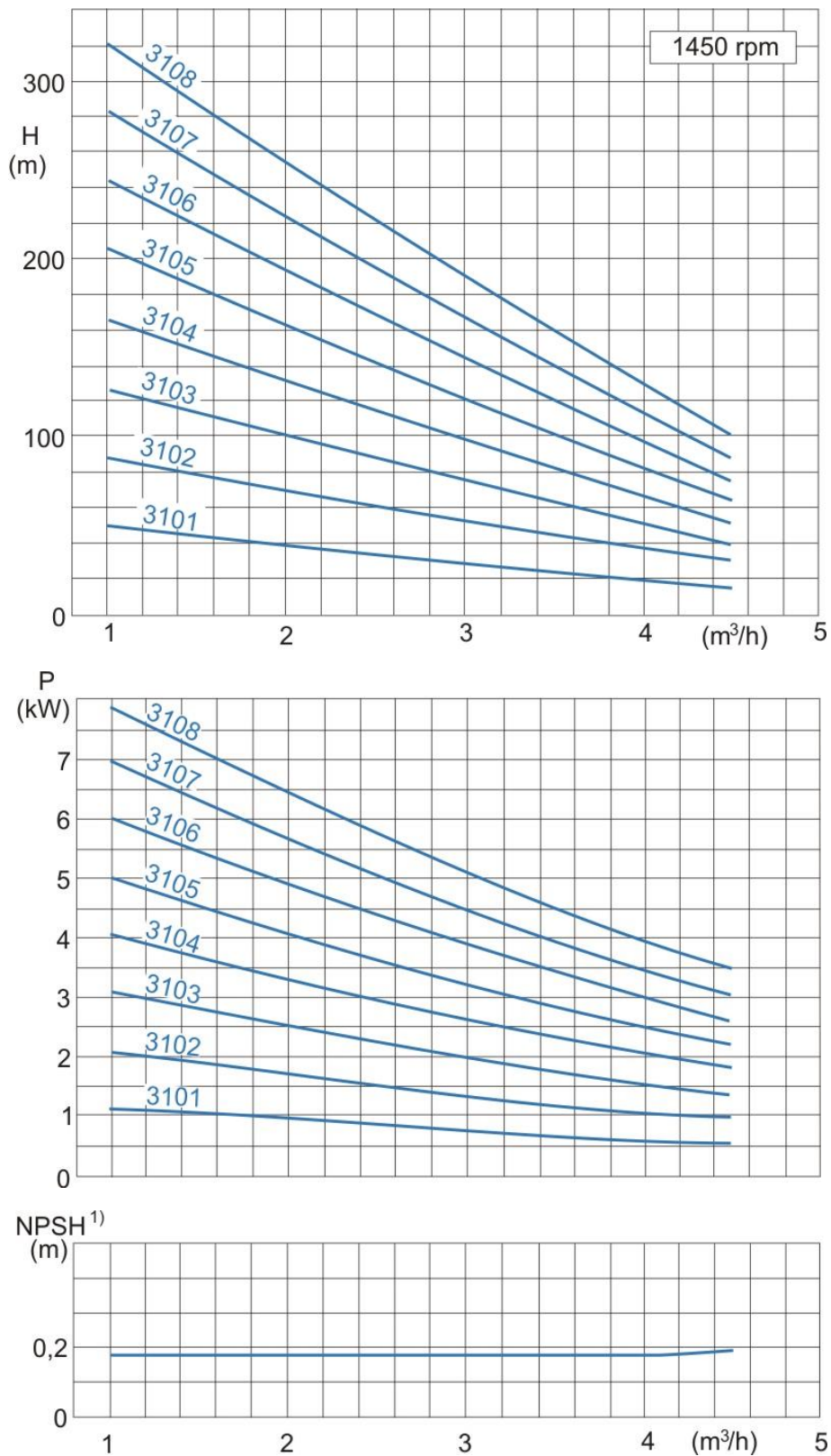
Notes: 1) For EExe II T3 motors.

2) For every pump set in ATEX area.

3) Dimensions are depending on the used motor trade mark.

Performance curves

CEH-X 3101 ... 3108

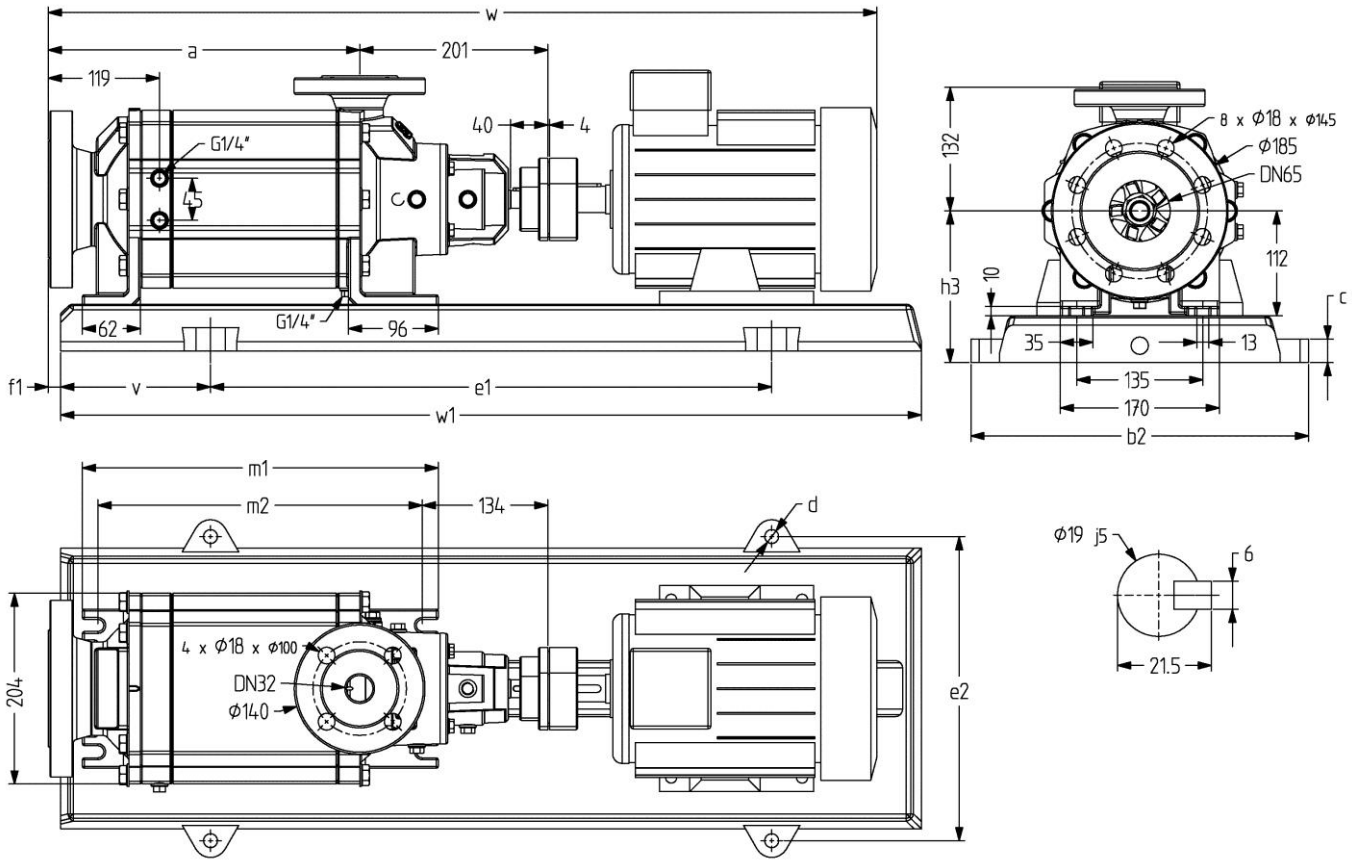


Note: ¹⁾ A safety margin has to be added when using a liquid containing gas.

CEH-X

Dimension chart and pump set drawing

CEH-X 3601 ... 3608



Pump size	Motor			Base plate	Coupling		Weight		a	b2	c	d	e1	e2	v	f1	h3	m1	m2	w ³⁾	w1								
	kW	kW ¹⁾	size		B	BDS ²⁾	Pump	set																					
3601	0,75	0,75	80	P008	68	76	31	55	213	297	20	15	400	265	120	-13	152	261	227	691	640								
	1,1	1,1	90S	67				330														25	19	480	290	125	177	749	730
	1,5	1,5	90L	74																									
3602	1,5	1,35	90L	P241	68	76	34	74	253	330	25	19	480	290	125	-13	177	301	267	789	730								
	2,2	2	100L	P272	80	88		89														360	320	140	830	820			
3603	2,2	2	100L	P272	80	88	38	89	293	360	25	19	540	320	140	-13	177	341	307	870	820								
	3	2,5						101																					
	4	3,6	112M					119																					
3604	3	2,5	100L	P272	80	88	42	105	333	360	25	19	540	320	140	-13	177	381	347	910	820								
	4	3,6	112M	117																									
	5,5	5	132S	P015	95	103		152	361	15	600	325	160	162	182	1007	920												
	3	2,5	100L	P015	80	88		102	373	361	25	15	600	325	160	-13	162	421	387	950	920								
4	3,6	112M	120																										
5,5	5	132S	P017	95	103	171	700	200														192	1047	1100					
3605	3	2,5	100L	P015	80	88	45	123	413	361	25	15	600	325	160	-13	162	461	427	1011	920								
	4	3,6	112M	161																									
	5,5	5	132S	P017	95	103		171														700	325	200	192	1087	1113	1100	
3606	4	3,6	112M	P015	80	88	48	123	413	361	25	15	600	325	160	-13	162	461	427	1011	920								
	5,5	5	132S	P017	95	103		161														700	325	200	192	1087	1113	1100	
3607	7,5	6,8	132M	P017	95	103	52	171	453	361	25	15	700	325	200	-13	192	501	467	1127	1100								
	5,5	5	132S	P017	95	103		165														700	325	200	192	1153	1100		
3608	5,5	5	132S	P017	95	103	55	161	493	361	25	15	700	325	200	-13	192	541	507	1167	1100								
	7,5	6,8	132M					171																					
	5,5	5	132S	161																									
	11	10	160M	P436				254														540	30	24	840	490	215	240	1285

The weight of the pump will be approximately 6% higher when using stainless steel.

General: Values are valid for water $\rho = 1 \text{ kg/dm}^3$ and $u = 1 \text{ cSt}$.

Design tolerances: Capacity $\pm 9\%$ - Delivery head $\pm 7\%$ - Power $+ 10\%$.

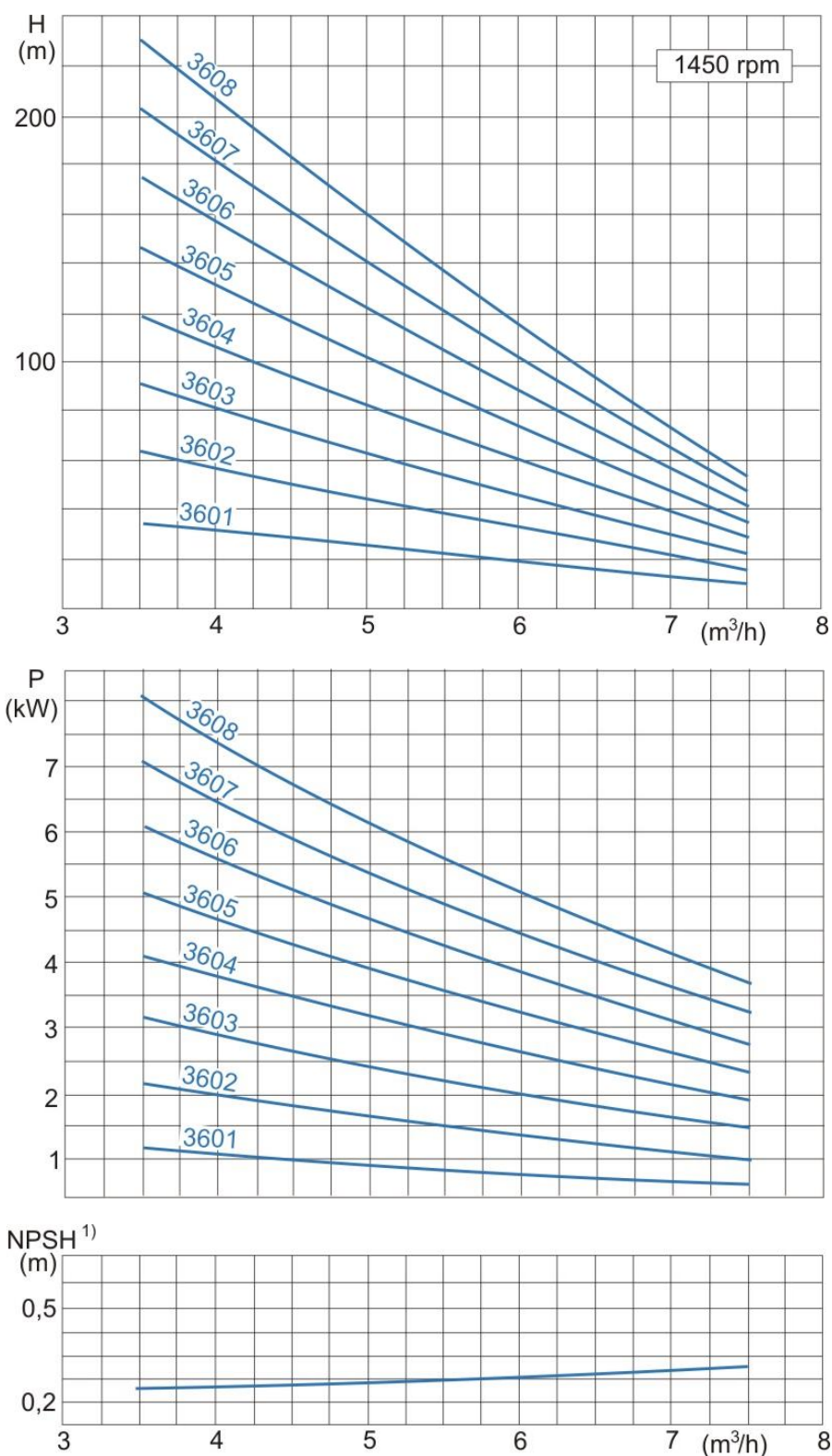
Notes: ¹⁾ For EExe II T3 motors.

²⁾ For every pump set in ATEX area.

³⁾ Dimensions are depending on the used motor trade mark.

Performance curves

CEH-X 3601 ... 3608



Note: ¹⁾ A safety margin has to be added when using a liquid containing gas.

CEH-X