SIHI*prime* - Side Channel Pumps

Self-priming, segmental type

AKH-X 1201 … 3606

FLOWSERVE
SIHI® Pumps

TECHICAL DATA

Capacity:	from 0.4 up to 7.5 m³/h
Delivery head:	from 10 up to 242 m
Speed:	1450 rpm (max. 1800 rpm)
Temperature:	max. 120 °C (higher temperatures on request)
Casing pressure:	PN 25
Shaft sealing:	mechanical seal or stuffing box
Flange connections:	DIN 2501 / PN 25
Direction of rotation:	clockwise (when seen from the drive end)
Protection classification:	Ex II2 Gc T1-T5



APPLICATION

The Sterling SIHI AKH-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 AKH-X pumps are used for problem-free pumping of clean liquids at unfavourable suction side conditions.

Their Head-Flow curves are allowing an accurate pressure regulation for a small flow variation.

Different material possibilities with uniform dimensions and performance characteristics as well as the standard exchangeable components are used for the construction. The AKH-X pumps are particularly recommendable in a wide application range in many sectors such as:

- Chemical industry,
- Petro-Chemical industry,
- Oil industry,
- Machines and automotive industries,
- Food industry,
- Building construction,
- Plastic and rubber industry,
- Surface treatment,
- Shipyards

DESIGN

The pumps of the SIHI*prime* range are side channel pumps having segmental type construction.

The program comprises, currently, 3 sizes each with 1-6 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 25 bar from -40 °C up to +120 °C.
Please observe
Technical rules and safety regulations:
Casing pressure = inlet pressure + delivery head at minimum pump capacity.

Position of branches

Suction and discharge branch point radially upwards.

Flanges

Flanges in accordance with DIN EN 1092-2 / PN 25.
Flange design as per DIN 2512 with groove or drilled according to ANSI 150 or 300 lbs is basically possible.

Bearing

Either by a ball bearing and a liquid surrounded sleeve bearing (design A) or by two ball bearings (design B). The ball bearings are according to DIN 625 and greased for life.

Rotation direction

Clockwise, when looking at the pump from the drive end.
Anti-clockwise is possible.

Shaft sealing

The shaft is sealed by a mechanical seal according to DIN EN 12756 or by stuffing box.

AKH-X

Material design

Cast Iron and mix Bronze/Cast Iron

Pos.	Components	Material design		
		0A	0B	2H*
2350	Vane wheel impeller	CuZn40Al2	G-X3 CrNiMoCuN 26 6 3 3	G-Cu Sn chromé
1060	Suction casing	EN-GJL-250		EN-GJL-250
1070	Discharge casing			
1090	First suction intermediate			G-Sn Bz 16
1140	Side Channel intermediate			
1141	Last discharge intermediate			
1600	Cover plate (design A)	X 20 Cr 13		
2100	Shaft	X 20 Cr13		X 5 CrNiMo 17 12 2
3600	Open bearing cover	EN-GJL-250		
3610	Closed bearing cover (design B)			
5451	Bearing bush (design A)	EK 2203		

Stainless steel and Bronze

Pos.	Components	Material design	
		3B	4B
2350	Vane wheel impeller	G-Cu Sn chromé	G-X 3 CrNiMoCuN 26 6 3 3
1060	Suction casing	GC-Cu Sn 12	G-X 5 CrNiMoNb 18 10
1070	Discharge casing		
1090	First suction intermediate	G-Sn Bz 16	
1140	Side Channel intermediate		
1141	Last discharge intermediate		
1600	Cover plate (design A)		
2100	Shaft	X 5 CrNiMo 17 12 2	
3600	Open bearing cover	EN-GJL-250	
3610	Closed bearing cover (design B)		
5451	Bearing bush (design A)	EK 2203	

* The dimensions of the AKH-X pump with Bronze intermediate parts (code **2H**) are the same than those of the AKH-X pump with cast iron intermediate parts (code **0A**) - (see page 3 / 12 "AKH-X sectional drawing and parts list").

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
AEH-X High duty pump, PN 40
CEBA Vertical pump, PN 25 with magnetic coupling
CEH-X High duty pump combined with a low NPSH stage, PN 40

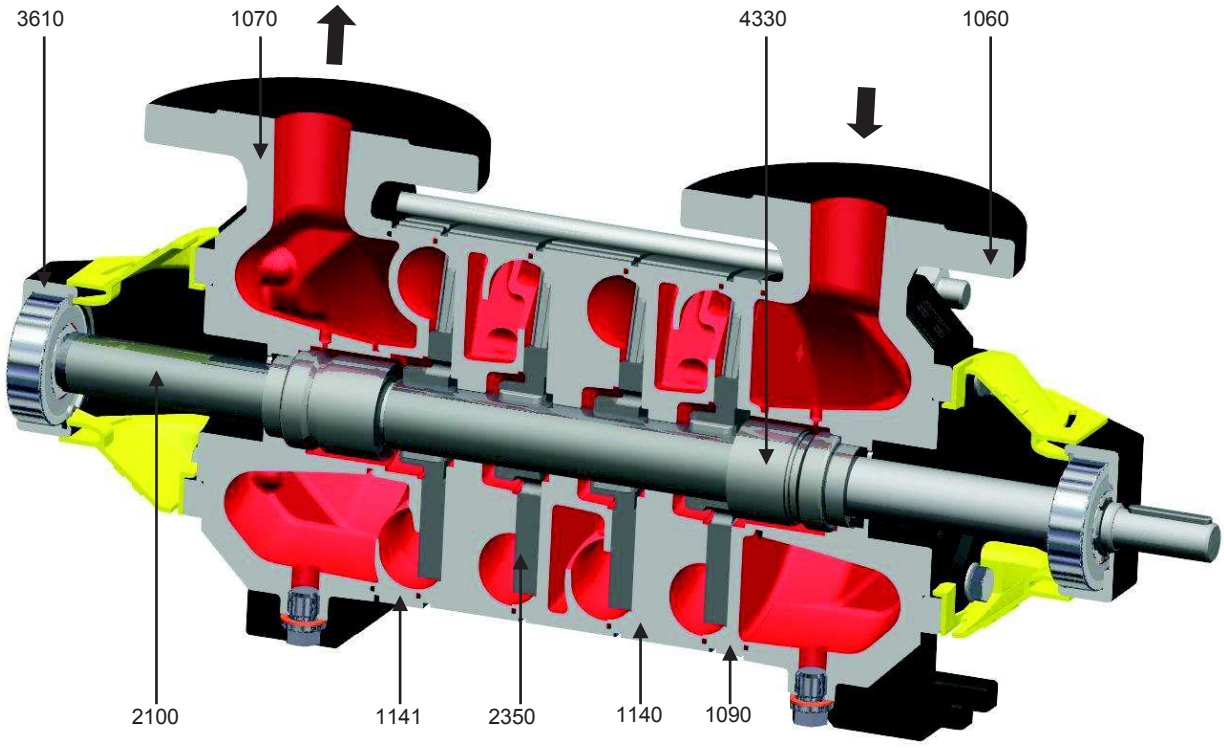
Note: For hydraulic sizes from 4101 to 6108 please see catalogue **AKH PII/3** (133.41201.58.01 E).

Technical documents about these pumps will be readily supplied on request

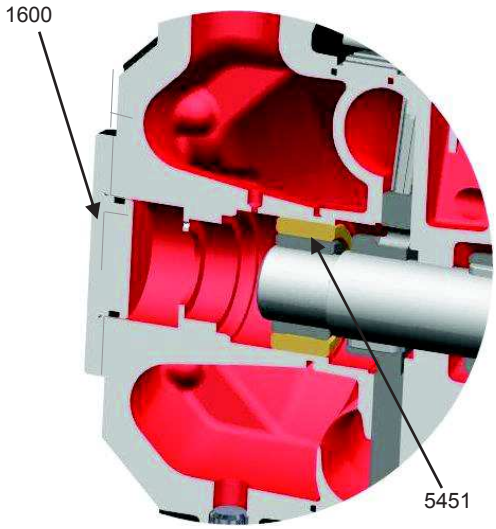
Sensor for Condition Monitoring

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

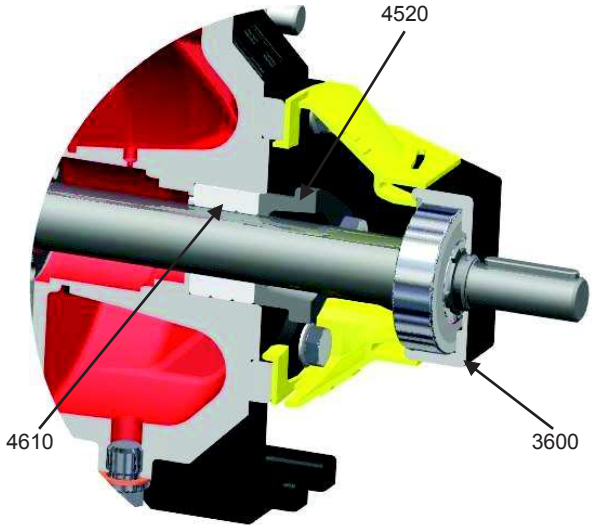
Sectional drawing and parts list



Design B
Mechanical seal



Design A



Stuffing box

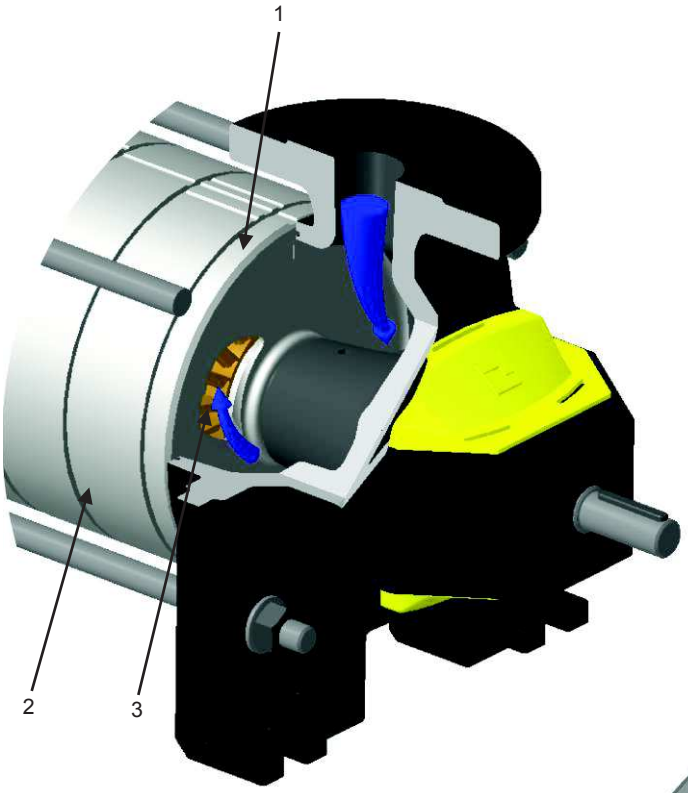
Pos.	Components
1060	Suction casing
1070	Discharge casing
1090	First suction intermediate
1140	Side Channel intermediate
1141	Last discharge intermediate
1600	Cover plate (design A)
2100	Shaft
2350	Vane wheel impeller

Pos.	Components
3600	Open bearing cover
3610	Closed bearing cover (design B
4330	Mechanical seal
4520	Gland
4610	Gland packing ring
5451	Bearing bush (design A)

AKH-X

Operating principle

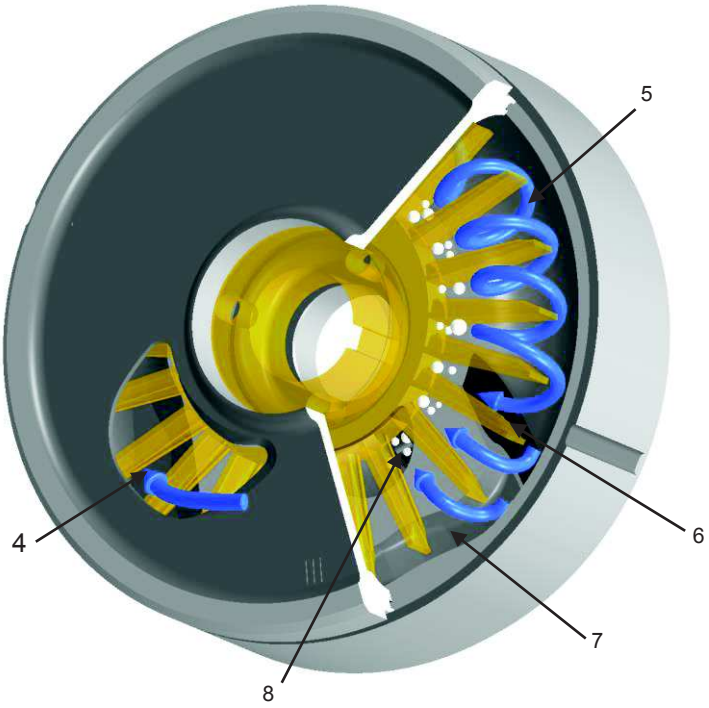
The AKH-X pump is a Side Channel system, self priming, segmental type.



A Side Channel stage consists of:

- A suction intermediate part (1),
- A discharge intermediate part including the Side Channel (2),
- A vane wheel impeller located between the 2 intermediate parts (3).

The fluid entrance goes through the suction hole (4). 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 (5). The liquid goes then to the next stage through the discharge hole (6). The air displacement channel (7) provokes a positive displacement effect so the gas remaining at the root of the vane wheel impeller is forced out through the gas slot (8).



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. This makes the AKH-X very suitable for pumping liquids near their boiling point at reasonable economic expenses.

Performance range

General conditions

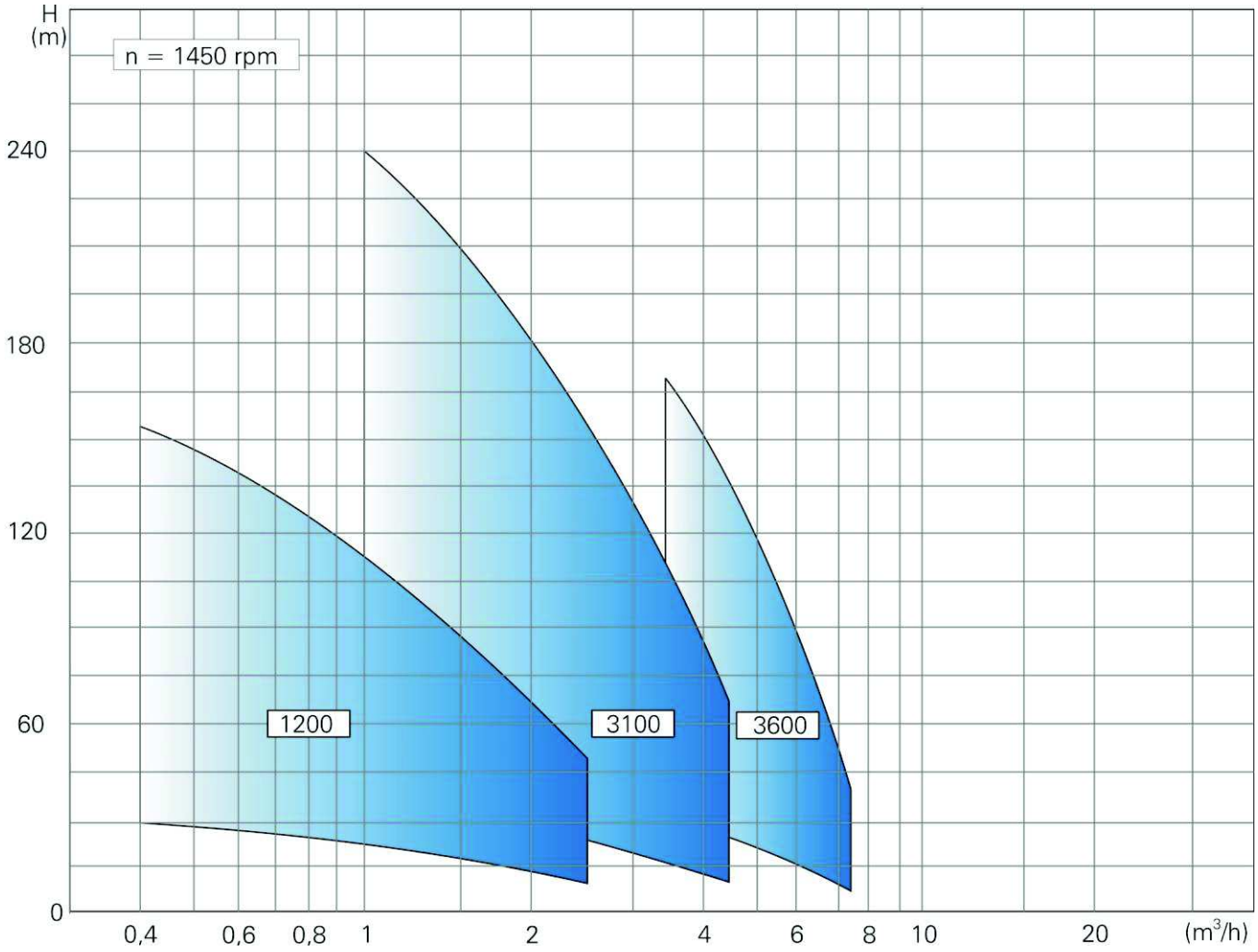
Liquid:	Water
Density:	1 kg/dm^3
Viscosity:	1 cSt
Temperature:	20 °C
Atmospheric pressure:	1013 mbar

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 + 9%.

Measuring standard

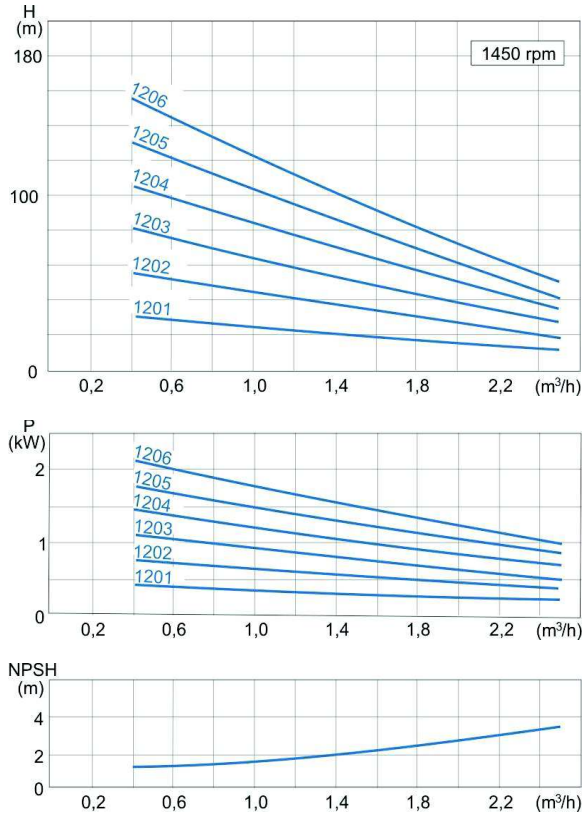
According to ISO 5198.



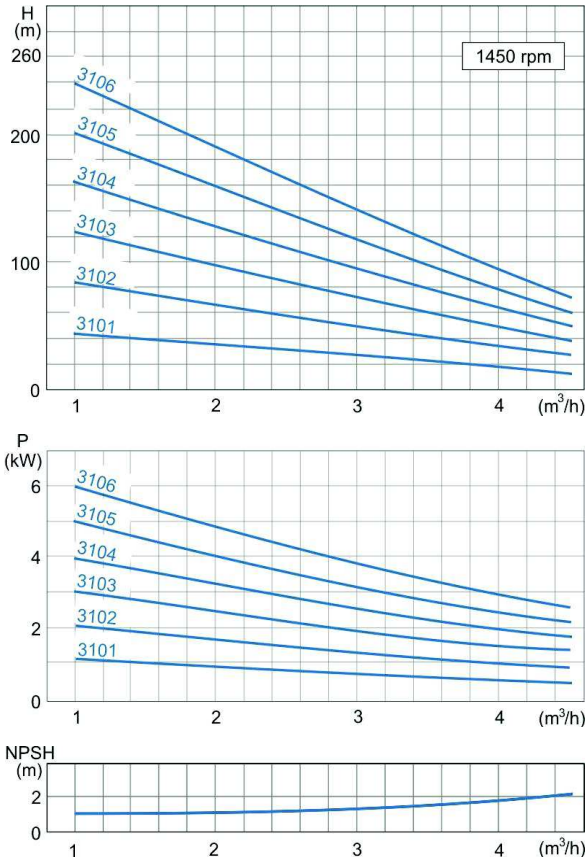
AKH-X

Performance curves

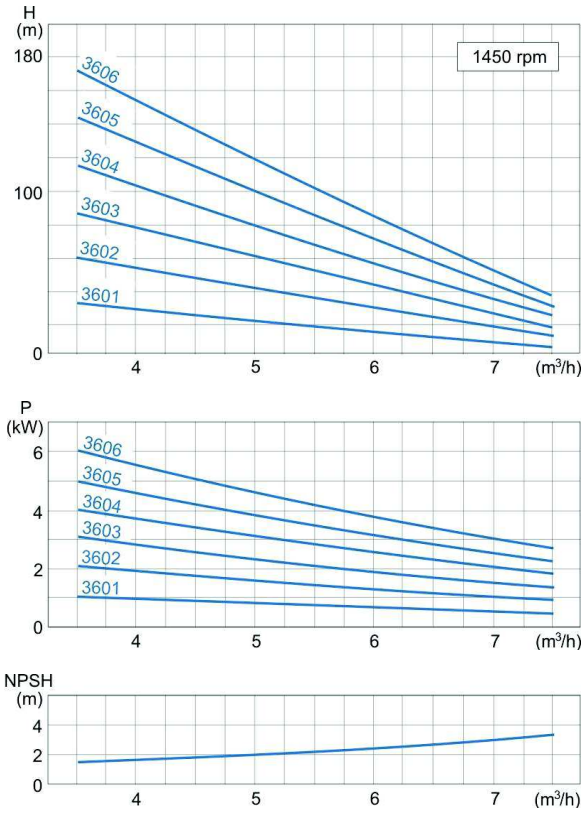
AKH-X 1201 ... 1206



AKH-X 3101 ... 3106



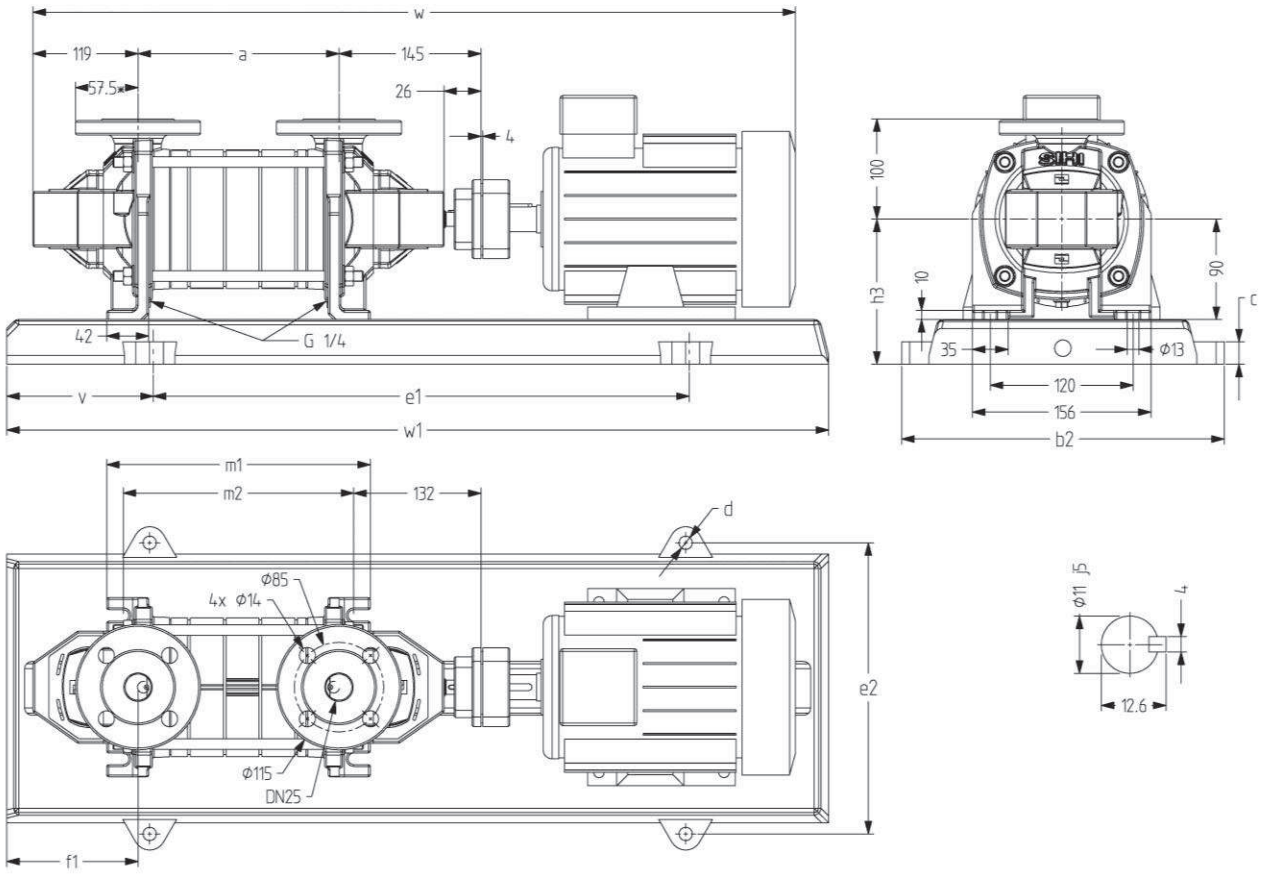
AKH-X 3601 ... 3606



General: Values are valid for water ρ = 1 kg/dm³ et υ = 1 cSt.
Design tolerances: Capacity ± 9% - Delivery head ± 7% - Power + 9%.

Dimension chart and pump set drawing

AKH-X 1201 … 1206 Cast Iron and mix Bronze/Cast Iron (0A, 0B, 2H)



* Design A (1 ball bearing, 1 sleeve bearing)

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	18,5	45	120	317	20	15	350	285	110	53	125	184	146	627	570
	0,55	0,55	80					48												661	
1202	0,55	0,55	80	P007	68	76	20,5	50	120	317	20	15	350	285	110	53	125	184	146	661	570
	0,75	0,75																			
	1,1	1	90S	P210				80		300	25	19	420	260	115		155			719	650
1203	0,75	0,75	80	P008	68	76	22,5	54	154	297	20	15	400	265	120	53	130	218	180	695	640
	1,1	1	90S					72												753	
	1,5	1,35	90L	P210				86		300	25	19	420	260	115		155				650
1204	1,1	1	90S	P210	68	76	25	84	188	300	25	19	420	260	115	53	155	252	214	787	650
	1,5	1,35	90L	P241				92		330			480	290	125						730
	2,2	2	100L		80	88		95												839	
1205	1,1	1	90S	P241	68	76	27,5	91	222	330	25	19	480	290	125	53	155	286	248	821	730
	1,5	1,35	90L					95													
	2,2	2	100L	P272	80	88		102		360			540	320	140					873	820
1206	1,5	1,35	90L	P241	68	76	29,5	97	256	330	25	19	480	290	125	53	155	320	282	855	730
	2,2	2	100L	P272	80	88		104		360			540	320	140					907	820
	3	2.5						108													

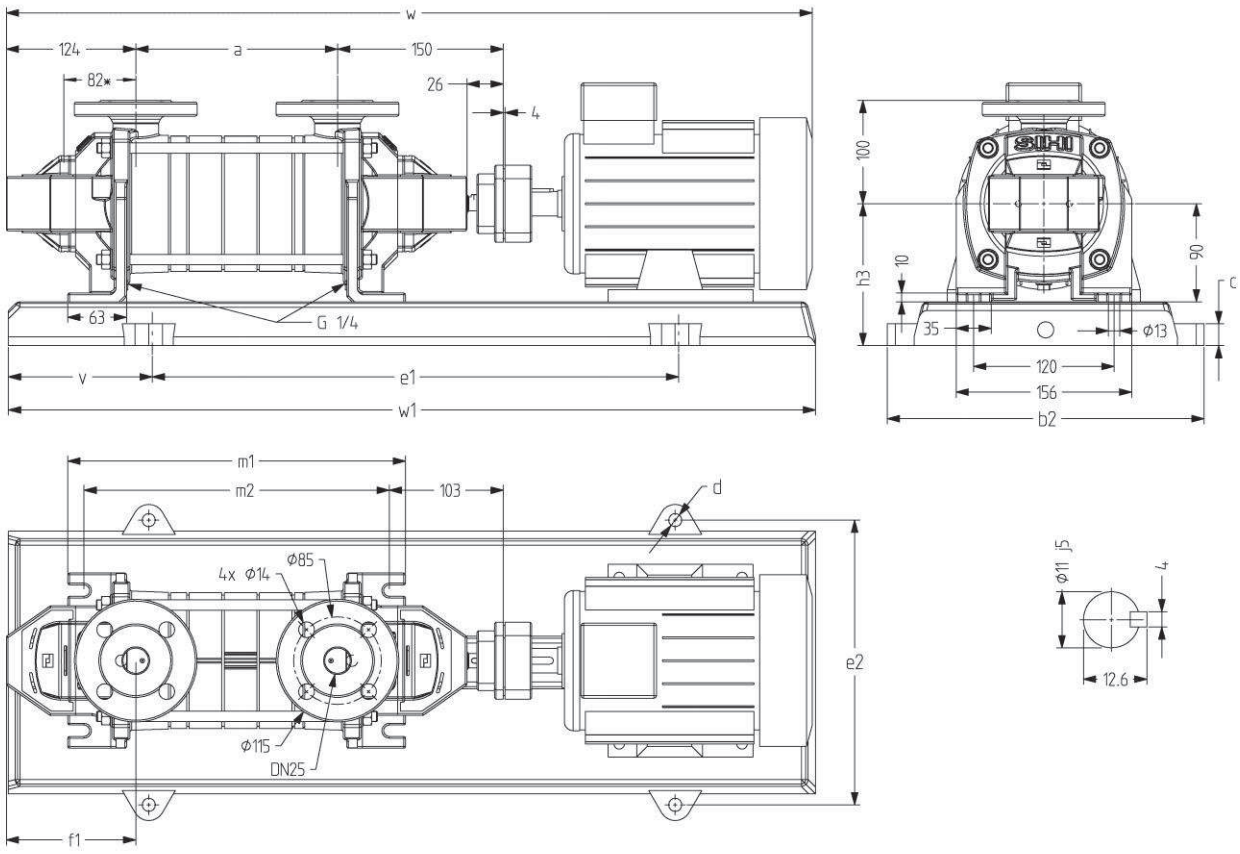
Notes :

[1] For EExe II T3 motors.
[2] For every pump set in ATEX area.
[3] Dimensions are depending on the used motor trade mark (indicated values correspond to design B).

AKH-X

Dimension chart and pump set drawing

AKH-X 1201 ...1206 Stainless steel and Bronze (3B, 4B)



* Design A (1 ball bearing, 1 sleeve bearing)

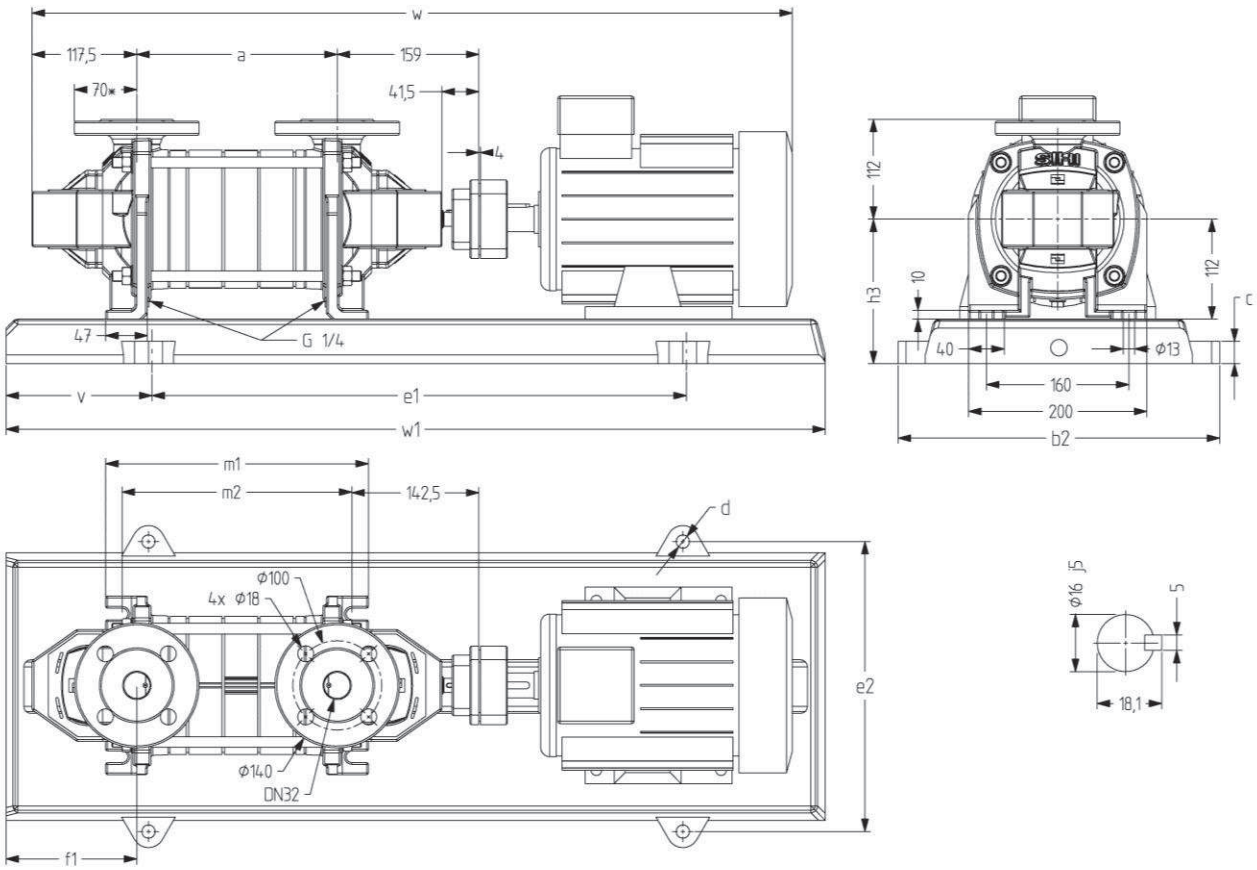
Pump size	Motor			Base plate	Coupling		Weight		a	b2	c	d	e1	e2	v	f1	h3	m1	m2	w[3]	w1
	kW	kW[1]	size		B	BDS[2]	Pump	set													
1201	0,37	0,37	71	P007	68	76	20	46	120	317	20	15	350	285	110	87	125	240	214	637	570
	0,55	0,55	80	P008				51		297			400	265	120		130			709	640
1202	0,55	0,55	80	P008	68	76	22,5	54	120	297	20	15	400	265	120	87	130	240	214	709	640
	0,75	0,75																			
	1,1	1	90S	P210				79		300	25	19	420	260	115		155			744	650
1203	0,75	0,75	80	P008	68	76	25	56	154	297	20	15	400	265	120	87	130	274	248	743	640
	1,1	1	90S	P241				88		330	25	19	480	290	125		155			778	730
	1,5	1,35	90L					92													
1204	1,1	1	90S	P241	68	76	27	90	188	330	25	19	480	290	125	87	155	308	282	812	730
	1,5	1,35	90L					94													
	2,2	2	100L	P272	80	88		101		360			540	320	140					830	820
1205	1,1	1	90S	P272	68	76	29,5	97	222	360	25	19	540	320	140	87	155	342	316	846	820
	1,5	1,35	90L					101													
	2,2	2	100L		80	88		104												864	
1206	1,5	1,35	90L	P272	68	76	32	103	256	360	25	19	540	320	140	87	155	376	350	880	820
	2,2	2	100L		80	88		106												898	
	3	2,5						110													

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 (indicated values correspond to design B).

Dimension chart and pump set drawing

AKH-X 3101 … 3106 Cast Iron and mix Bronze/Cast Iron (0A, 0B, 2H)



* Design A (1 ball bearing, 1 sleeve bearing)

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	25	56	145	297	20	15	400	265	120	56	152	215	178	737	640
	1,1	1	90S					74												772	
3102	1,1	1	90S	P008	68	76	30	79	145	297	20	15	400	265	120	56	152	215	178	772	640
	1,5	1,35	90L					83													
	2,2	2	100L	P241	80	88		100		330	25	19	480	290	125		177			824	730
3103	2,2	2	100L	P241	80	88	33	103	185	330	25	19	480	290	125	56	177	255	218	864	730
	3	2,5						107													
3104	2,2	2	100L	P272	80	88	38	112	225	360	25	19	540	320	140	56	177	295	258	904	820
	3	2,5						116													
	4	3,6	112M					125												912	
3105	3	2,5	100L	P272	80	88	41,5	120	265	360	25	19	540	320	140	56	177	335	298	944	820
	4	3,6	112M	P303				135		390			600	350	160		177			952	920
	5,5	5	132S		95	103		168												1064	
3106	4	3,6	112M	P303	80	88	45,5	139	305	390	25	19	600	350	160	56	177	365	338	992	920
	5,5	5	132S	P344	95	103		182		450	30	24	660	400	180		192			1104	1020
	7,5	6,8	132M					189													

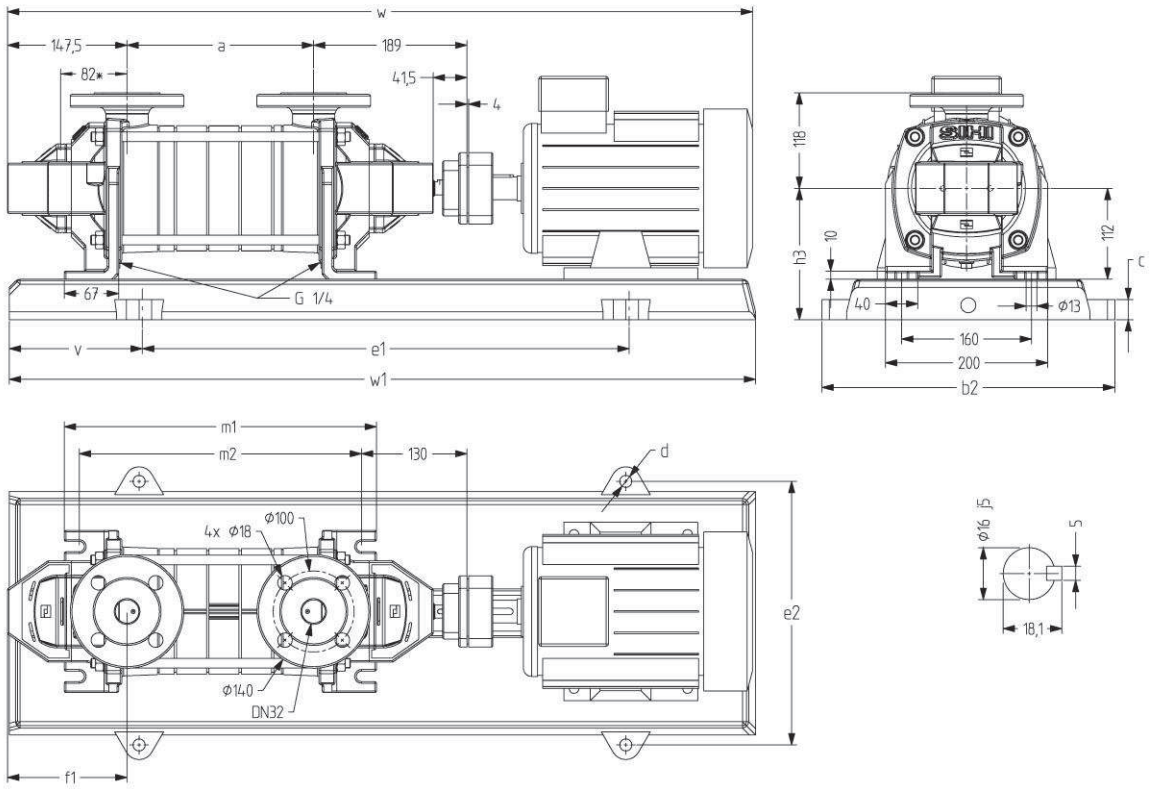
Notes :

[1] For EExe II T3 motors.
[2] For every pump set in ATEX area.
[3] Dimensions are depending on the used motor trade mark (indicated values correspond to design B).

AKH-X

Dimension chart and pump set drawing

AKH-X 3101 ...3106 Stainless steel and Bronze (3B, 4B)



* Design A (1 ball bearing, 1 sleeve bearing)

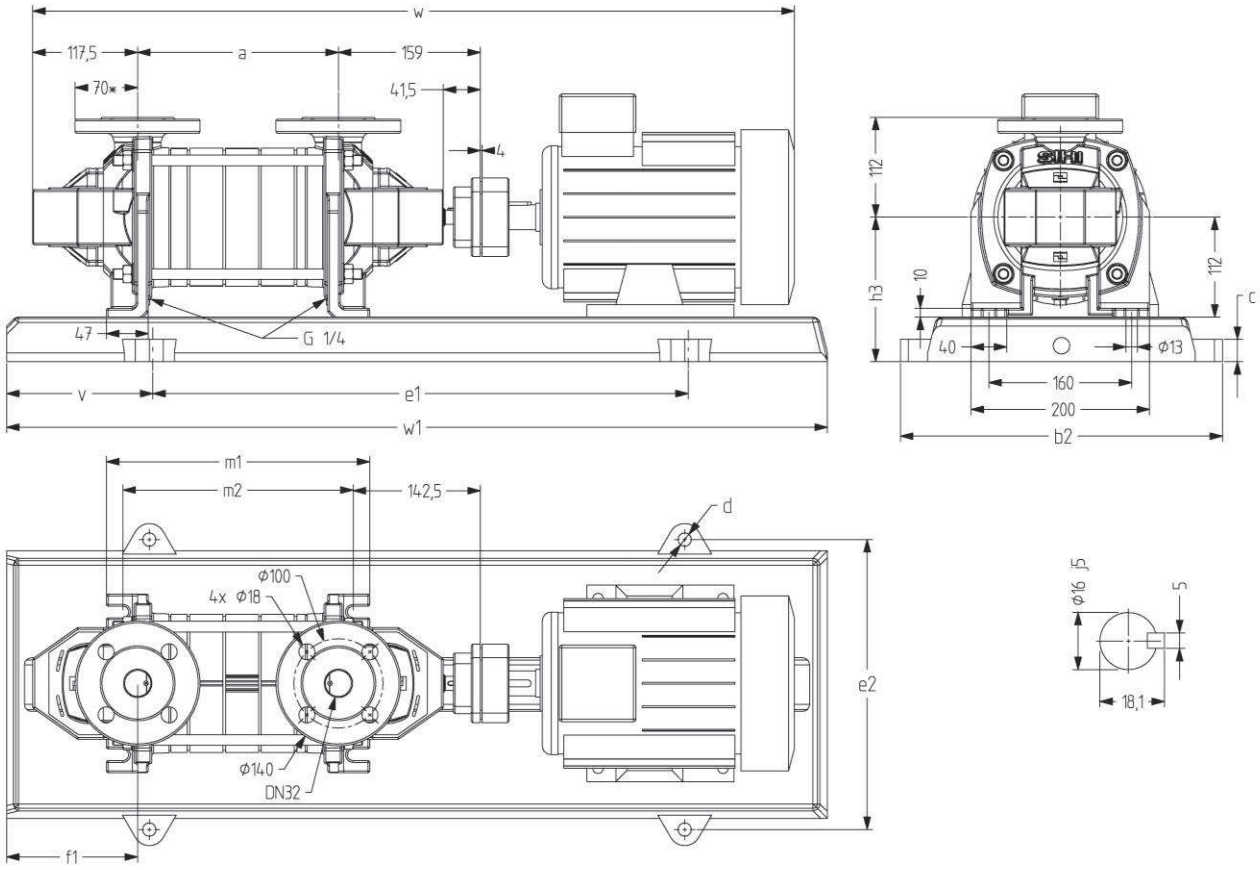
Pump size	Motor			Base plate	Coupling		Weight		a	b2	c	d	e1	e2	v	f1	h3	m1	m2	w[3]	w1
	kW	kW[1]	size		B	BDS[2]	Pump	set													
3101	0,75	0,75	80	P241	68	76	33	78	150	330	25	19	480	290	125	99	177	305	268	762	730
	1,1	1	90S					96												820	
3102	1,1	1	90S	P241	68	76	37	101	150	330	25	19	480	290	125	99	177	305	268	820	730
	1,5	1,35	90L					104													
	2,2	2	100L	P272	80	88		111		360			540	320	140					861	820
3103	2,2	2	100L	P272	80	76	40,5	112	190	360	25	19	540	320	140	99	177	345	308	901	820
	3	2,5						119													
3104	2,2	2	100L	P272	80	88	45,5	120	230	360	25	19	540	320	140	99	177	385	348	941	820
	3	2,5						124													
	4	3,6	112M	P015				131		361		15	600	325	160		172			962	920
3105	3	2,5	100L	P015	80	88	49	125	270	361	25	15	600	325	160	99	172	425	388	981	920
	4	3,6	112M					134												1002	
	5,5	5	132S	P344	95	103		185		450	30	24	660	400	180		192			1114	1020
3106	4	3,6	112M	P344	80	88	53	156	310	450	30	24	660	400	180	99	192	465	428	1042	1020
	5,5	5	132S		95	103		189												1154	
	7,5	6,8	132M					196													

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 (indicated values correspond to design B).

Dimension chart and pump set drawing

AKH-X 3601 … 3606 Cast Iron and mix Bronze/Cast Iron (0A, 0B, 2H)



* Design A (1 ball bearing, 1 sleeve bearing)

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	25	56	145	297	20	15	400	265	120	56	152	215	178	737	640
	1,1	1	90S					74												772	
3602	1,5	1,35	90L	P008	68	76	29	82	145	297	20	15	400	265	120	56	152	215	178	772	640
	2,2	2	100L	P241	80	88		99		330	25	19	480	290	125		177			824	730
3603	2,2	2	100L	P241	80	88	32,5	103	185	330	25	19	480	290	125	56	177	255	218	864	730
	3	2,5						107													
	4	3,6	112M					116												872	
3604	3	2,5	100L	P272	80	88	36,5	115	225	360	25	19	540	320	140	56	177	295	258	904	820
	4	3,6	112M					124												912	
	5,5	5	132S	P015	95	103		155		361		15	600	325	160		172			1024	920
3605	3	2,5	100L	P272	80	88	40	118	265	360	25	19	540	320	140	56	177	335	298	944	820
	4	3,6	112M	P303				133		390			600	350	160					952	920
	5,5	5	132S		95	103		166												1064	
3606	4	3,6	112M	P303	80	88	44	137	375	390	25	19	600	350	160	56	177	375	338	992	920
	5,5	5	132S	P344	95	103		180		450	30	24	660	400	180		192			1104	1020
	7,5	6,8	132M					187													

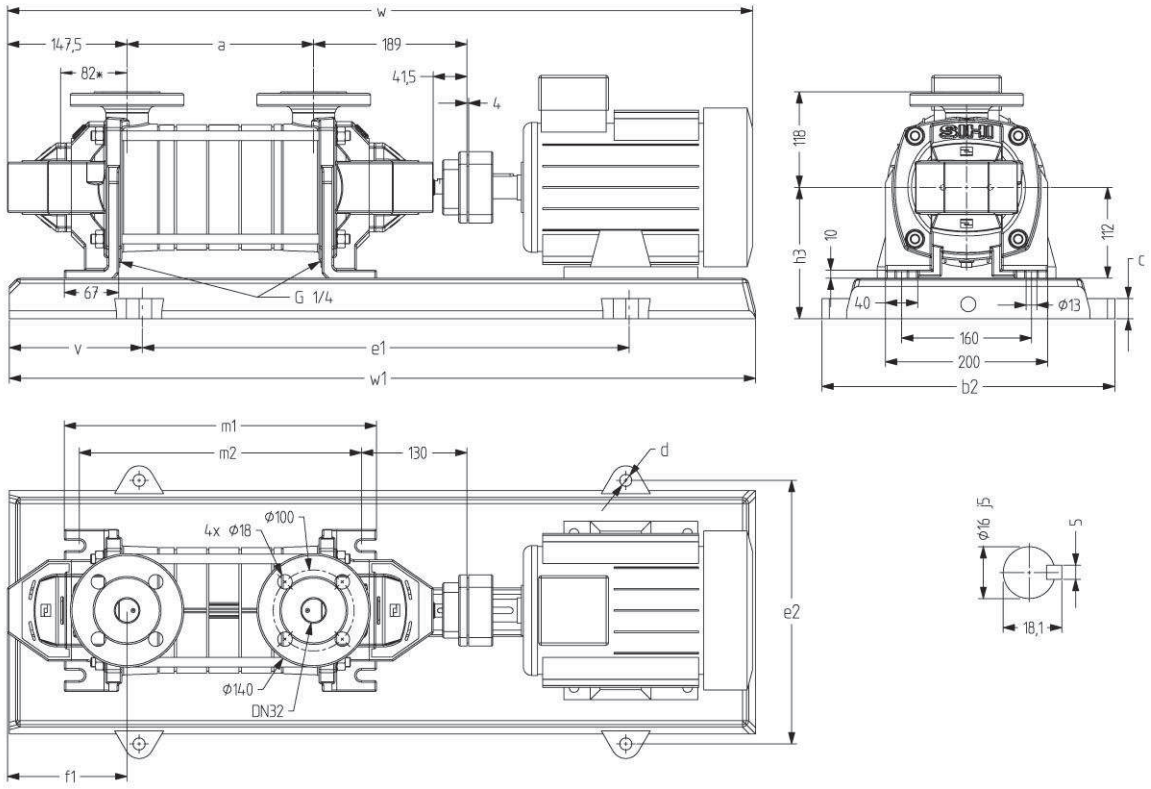
Notes :

[1] For EExe II T3 motors.
[2] For every pump set in ATEX area.
[3] Dimensions are depending on the used motor trade mark (indicated values correspond to design B).

AKH-X

Dimension chart and pump set drawing

AKH-X 3601 ...3606 Stainless steel and Bronze (3B, 4B)



* Design A (1 ball bearing, 1 sleeve bearing)

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	P241	68	76	32,5	76	150	330	25	19	480	290	125	99	177	305	268	762	730
	1,1	1	90S					96												820	
3602	1,5	1,35	90L	P241	68	76	36,5	104	150	330	25	19	480	290	125	99	177	305	268	820	730
	2,2	2	100L	P272	80	88		111		360			540	320	140					861	820
3603	2,2	2	100L	P272	80	88	40	115	190	360	25	19	540	320	140	99	177	345	308	901	820
	3	2,5						118													
	4	3,6	112M					127												922	
3604	3	2,5	100L	P272	80	88	44	122	230	360	25	19	540	320	140	99	177	385	348	941	820
	4	3,6	112M	P015				129		361		15	600	325	160		172			962	920
	5,5	5	132S		95	103		162												1074	
3605	3	2,5	100L	P015	80	88	47,5	124	270	361	25	15	600	325	160	99	172	425	388	981	920
	4	3,6	112M					133												1002	
	5,5	5	132S	S344	95	103		182		450	30	24	660	400	180		192			1114	1020
3606	4	3,6	112M	S344	80	88	51,5	155	310	450	30	24	660	400	180	99	192	465	428	1042	1020
	5,5	5	132S		95	103		188												1154	
	7,5	6,8	132M					195													

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 (indicated values correspond to design B).

Sterling SIHI GmbH
Lindenstraße 170, 25524 Itzehoe, Germany
Telefon +49 (0) 48 21 / 7 71 - 01, Telefax +49 (0) 48 21 / 77 12 74
www.sihi.com