Self-priming side channel pumps with reduced anti-cavitation surplus for pumping liquid hydrocarbons (including LPG) – type SKC, SKD

ISO 9001
ISO 14001
PN-N-18001

PCA
Polskie Centrum Akredytacji
Certyfikacja Systemów Zarządzania

Świadectwo Czystszej Produkcji

EDYCJA•III•2001
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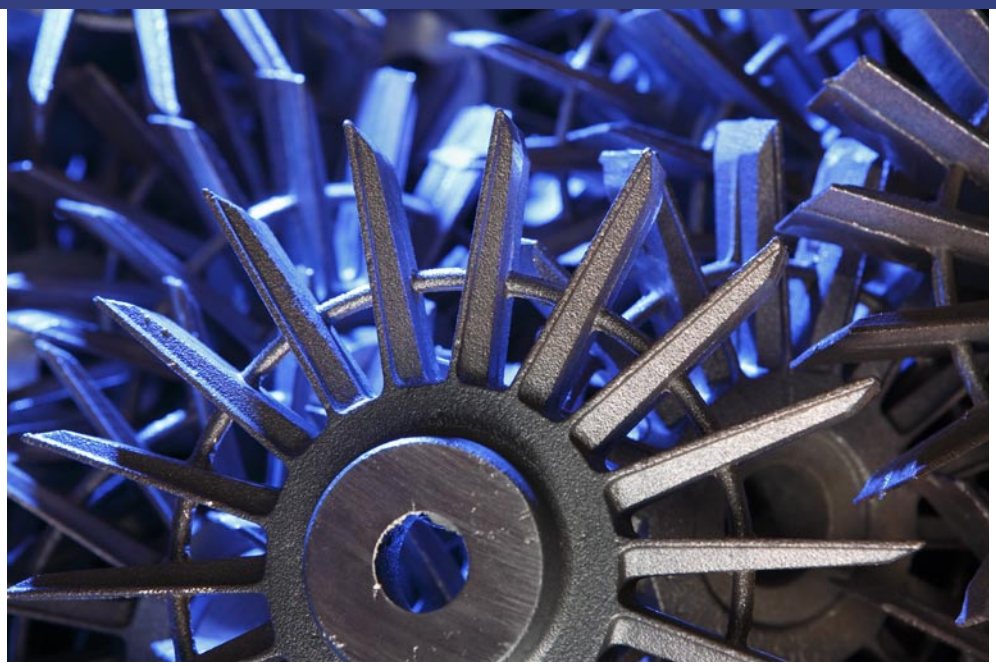
HYDRO-VACUUM® S.A.
1862



Hydro–Vacuum S.A. *is the biggest Polish manufacturer of the broad range of pumps and pumping systems and it is also perceived as a member of European market of pump manufacturers.*

The company has long-lasting tradition and many achievements. It was established in 1862, and started producing pumps in the thirties of the XX century basing on the license bought from world- famous companies manufacturing pumps. Today, the modern plant releases 70000 pumps and pumping systems every year, which are gladly welcome by European markets and win more and more world markets.

Good quality of pumps manufactured by Hydro–Vacuum S.A. is ensured by:

- Highly qualified staff,
- Modern technologies applied,
- Production processes management methods based on Integrated Quality, Environment and Occupational Health and Safety Management System compliant with such norms like **ISO 9001, 14001 and PN-N-18001**, which was confirmed by certificates obtained from notified auditing companies,
- Conformity of our products with directives of EU standards and particularly, conformity of pumps used in explosion hazard environment with the norm **ATEX 100a**,
- permanent modernisation and new designs.

Broad assortment, unlimited capabilities

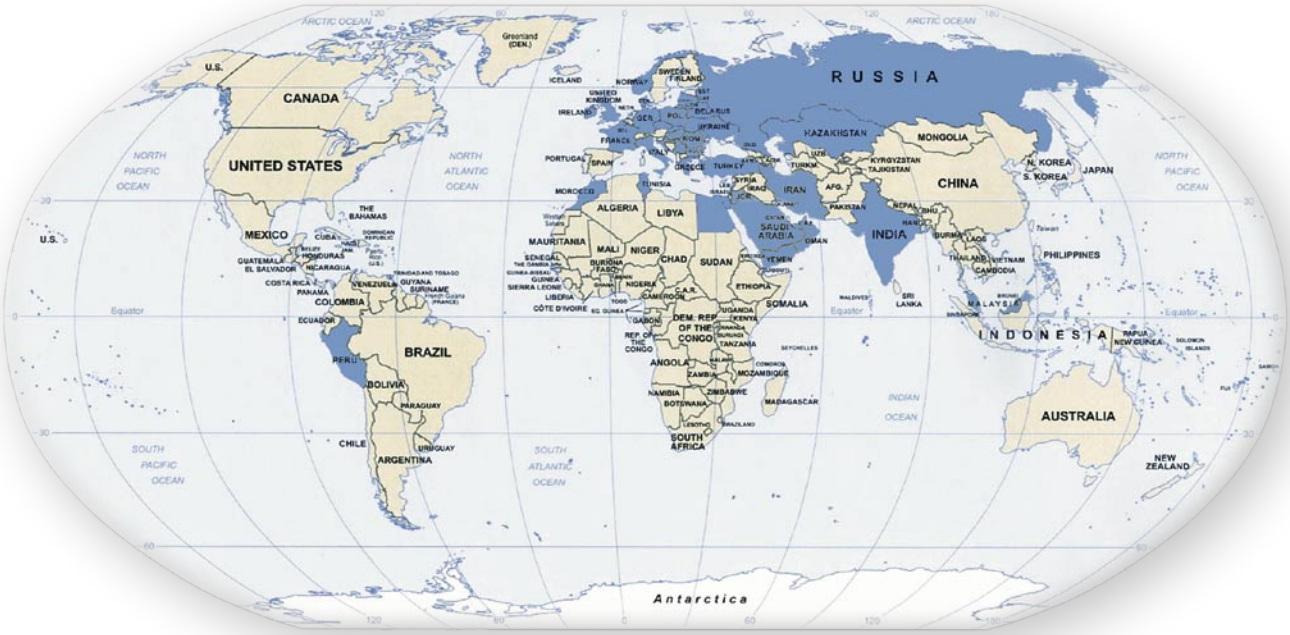
The scope of Hydro–Vacuum S.A. production includes:

- Borehole pumps,
- Self-priming side-channel pumps,
- Vacuum pumps and blowers with liquid ring,
- Centrifugal pumps for chemicals and pumps compliant with PN-EN 733 norm,
- Vertical pumps „in line" and pressure increase systems based on them,
- Submersible pumps,
- Electronic protection systems and pump control systems,
- Intermediate sewage pumping stations.

One of the biggest group of pumps manufactured by **Hydro–Vacuum S.A.** are impeller self-priming side-channel pumps. They are produced in numerous design types as well as in many material-type versions, starting from grey cast iron, through nodular cast iron, bronze, to cast carbon steel and cast austenitic steel. These pumps are broadly used for pumping neutral agents, but first of all chemically aggressive substances, petrol, oils, fuel, including mixture of liquid propane and butane (LPG) and other agents requiring reduced anti-cavitation reserve.

Major markets of Hydro–Vacuum S.A products

During last several years, when Poland and Central Europe have become more and more interested in application of propane and butane mixture, especially as fuel for vehicles (today Poland is the second largest consumer of LPG in Europe), **Hydro–Vacuum S.A.** has become the predominant supplier of pumps designed for pumping LPG in this region. These are SKC and SKD type rotodynamic, liquid ring pumps with side channel and centrifugal impeller at the first pumping stage, with special structure of suction housing, which guarantees low pressure losses.



Hydro–Vacuum S.A. sells several thousand pumps of SKC and SKD type every year, 70% of which are exported. SKC and SKD pumps manufactured by **Hydro–Vacuum S.A.** successfully compete both in Poland and in foreign markets with similar products of other world-famous manufacturers.

Main foreign markets for our products are countries of Central and Eastern Europe. However, lately, these pumps have been increasingly used in Western Europe, whereas first preliminary series have been also sold to Peru, India, Great Britain, Tunisia, Iran and Afghanistan.

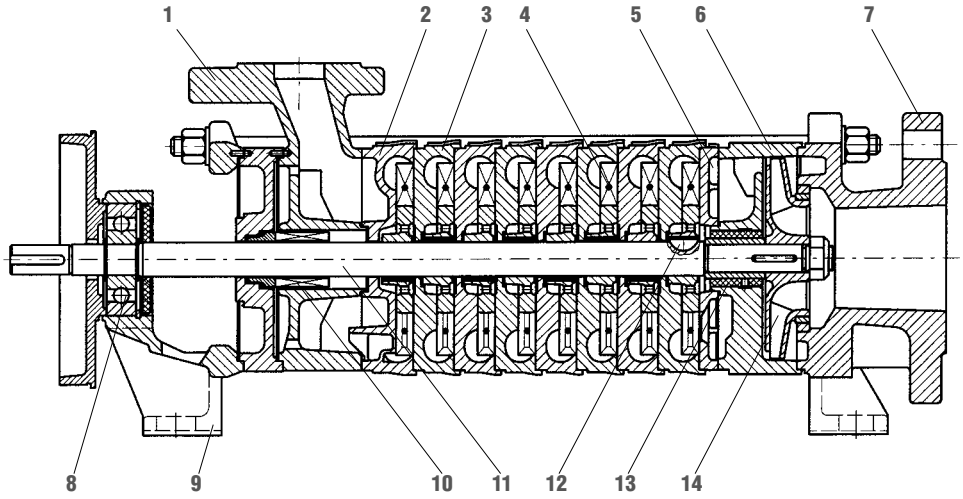
APPLICATION

Rotodynamic, liquid ring SKC and SKD pumps with side channels, open impellers and centrifugal impeller on the first stage have been designed to pump liquids within the range of corrosion resistance of pump components. The SKC pump is designed as for operation with inflow or as conventionally sucking pump, after prior installation of a check valve on the suction pipeline and complete filling of the pump and suction pipeline.

The SKD pump is self-priming, i.e. it does require only filling up of the pump with no need for filling the suction pipeline.

The SKC pumps are able to pump liquids with minimal pressure surplus over boiling point. Low anti-cavitation reserve NPSHr and very good self-priming abilities are special advantages of these pumps.

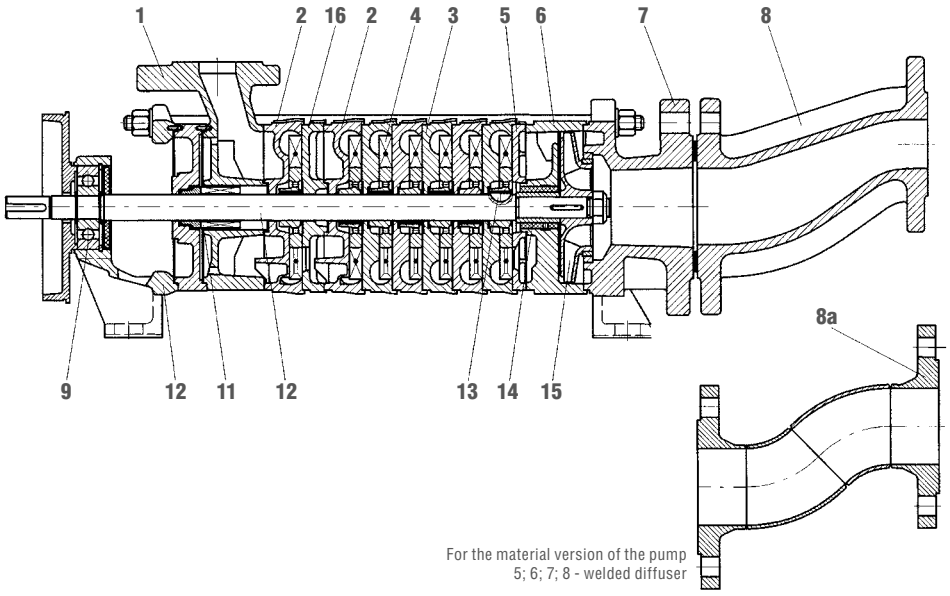
Cross-section of the pump, type SKC



TYPE SKC

1. *Discharge housing*
2. *Discharge module*
3. *Suction - discharge module*
4. *Impeller*
5. *Suction module*
6. *Stator*
7. *Suction housing*
8. *Ball bearing*
9. *Bearing housing*
10. *Shaft sealing*
11. *Shaft*
12. *Disk key*
13. *Slide bearing*
14. *Centrifugal impeller*

Cross-section of the pump, type SKD



For the material version of the pump
5; 6; 7; 8 - welded diffuser

TYPE SKD

1. *Discharge housing*
2. *Discharge module*
3. *Suction - discharge module*
4. *Impeller*
5. *Suction module*
6. *Stator*
7. *Suction housing*
8. *Diffuser*

8a. *Welded diffuser*

9. *Ball bearing*
10. *Bearing housing*
11. *Shaft sealing*
12. *Shaft*
13. *Disk key*
14. *Slide bearing*
15. *Centrifugal impeller*
16. *Suction module (special)*

Basic technical data

Capacity Q:	max. 30 m³/h
Delivery head Hmax:	max. 310 m
Temperature:	-40° ÷ +180 °C
Liquid density:	up to 1,3 kg/dm³
Liquid viscosity:	up to 150 mm²/s

Solid, non-abrasive particles of the size up to 0,5 mm are permissible in vestigial amount. For hot liquids (from +70 °C to +180 °C), the delivery head of the pump should be decreased by 10-20 % comparing to pumping water at t=20 °C. Pump characteristics are valid for water at t=20 °C temperature and motor rotating speed n=1450 rpm.

Construction materials of SKC and SKD pumps

Materials applied in SKC and SKD pumps

Part name	Construction materials „d"						
	1	2	3	4	5,6**	7	8
Housings	grey cast iron	tin bronze	grey cast iron	grey cast iron	nodular cast iron	cast carbon steel	cast austenitic steel
Modules	grey cast iron	chromium cast iron	grey cast iron	chromium cast iron	nodular cast iron	cast carbon steel	cast austenitic steel
Impellers	tin bronze	tin bronze	nodular cast iron	tin bronze	tin bronze	tin bronze	cast austenitic steel
Shaft	Stainless steel	acid resistant steel	Stainless steel	acid resistant steel	stainless steel	stainless steel	acid resistant steel
Shaft seal	soft-cord seal* face mechanical***						

* - *The selection of the seal material type depends on the type of the liquid*

** - *Minimal operation temperature – 40 °C*

*** - *There is possibility to produce pumps made of other materials (high-nickel cast irons, cast steel), but it requires separate technical and business arrangements*

Design variants of SKC and SKD pumps

Variant no	Variant name	SKC2	SKD2	SKC3	SKD3	SKC4	SKD4	SKC5	SKD5	SKC6	SKD6	SKC7	SKD7	SKC8	SKD8
1030	Pump with cord packing with liquid chamber of temperature -30 °C ÷ +70 °C	x	x	x	x	x	x	x	x	x	x	x	x	x	x
1110	Pump with single end-face packing of V type for liquid of temperature -30 °C ÷ +70 °C	x	x	x	x	x	x	x	x	x	x	x	x	x	x
1130	Pump with single end-face packing of US type for liquid of temperature -30 °C ÷ +70 °C			x	x	x	x	x	x	x	x	x	x	x	x
1140	Pump with single end-face packing of VB type for liquid of temperature -30 °C ÷ +70 °C			x	x	x	x	x	x	x	x	x	x	x	x
1160	Pump with single end-face packing of 502 type for liquid of temperature -40 °C	x	x	x	x	x	x	x	x	x	x	x	x	x	x
1360	Pump with single end-face packing of V Quenching type for liquid of temperature -30 °C ÷ +70 °C	x	x	x	x	x	x	x	x	x	x	x	x	x	x
1380	Pump with single end-face packing of US Quenching type for liquid of temperature -30 °C ÷ +70 °C			x	x	x	x	x	x	x	x	x	x	x	x
1390	Pump with single end-face packing of YB Quenching type for liquid of temperature -30 °C ÷ +70 °C			x	x	x	x	x	x	x	x	x	x	x	x
1400	Pump with single end-face packing of 502 Quenching type for liquid of temperature -30 °C ÷ +70 °C	x	x	x	x	x	x	x	x	x	x	x	x	x	x
1600	Pump with double end-face packing, BACK TO BACK alignment of V+V type with barrage liquid for liquid of temperature -30 °C ÷ +70 °C	x	x	x	x	x	x	x	x	x	x	x	x	x	x
1610	Pump with double end-face packing, BACK TO BACK alignment of V+VB type with barrage liquid for liquid of temperature -30 °C ÷ +70 °C			x	x	x	x	x	x	x	x	x	x	x	x
1630	Pump with double end-face packing, BACK TO BACK alignment of U+US type with barrage liquid for liquid of temperature -30 °C ÷ +70 °C			x	x	x	x					x	x	x	x
1640	Pump with double end-face packing of BED type for liquid of temperature -30 °C ÷ +70 °C			x	x	x	x	x	x	x	x	x	x	x	x
1650	Pump with double end-face packing of BED type with installation of buffer fluid for liquid of temperature -30 °C ÷ +70 °C			x	x	x	x	x	x	x	x	x	x	x	x
3040	Pump with cord packing with liquid chamber of temperature +70 °C ÷ +180 °C	x		x		x		x		x		x		x	
3110	Pump with single end-face packing of V type for liquid of temperature +70 °C ÷ +180 °C	x		x		x		x		x		x		x	
3130	Pump with single end-face packing of US type for liquid of temperature +70 °C ÷ +180 °C			x		x		x		x		x		x	
3140	Pump with single end-face packing of VB type for liquid of temperature +70 °C ÷ +180 °C			x		x		x		x		x		x	
3160	Pump with single end-face packing of 502 type for liquid of temperature +70 °C ÷ +180 °C	x		x		x		x		x		x		x	
3360	Pump with single end-face packing of V Quenching type for liquid of temperature +70 °C ÷ +180 °C	x		x		x		x		x		x		x	
3380	Pump with single end-face packing of US Quenching type for liquid of temperature +70 °C ÷ +180 °C			x		x		x		x		x		x	
3390	Pump with single end-face packing of YB Quenching type for liquid of temperature +70 °C ÷ +180 °C			x		x		x		x		x		x	
3400	Pump with single end-face packing of 502 Quenching type for liquid of temperature +70 °C ÷ +180 °C			x		x		x		x		x		x	
3600	Pump with double end-face packing, BACK TO BACK alignment of V+V type with barrage fluid for liquid of temperature +70 °C ÷ +180 °C			x		x		x		x		x		x	
3610	Pump with double end-face packing, BACK TO BACK alignment of V+VB type with barrage fluid for liquid of temperature +70 °C ÷ +180 °C			x		x		x		x		x		x	
3630	Pump with double end-face packing, BACK TO BACK alignment of U+US type with barrage fluid for liquid of temperature +70 °C ÷ +180 °C			x		x		x		x		x		x	
3640	Pump with double end-face packing of BED type for liquid of temperature +70 °C ÷ +180 °C			x	x	x	x	x	x	x	x	x	x	x	x
3650	Pump with double end-face packing of BED type with installation of buffer fluid for liquid of temperature +70 °C ÷ +180 °C			x	x	x	x	x	x	x	x	x	x	x	x

Depending on customer's needs as well as due to requirements resulting from regulations regarding their usage, SKC/SKD pumps can be produced with mechanical sealing of different type, including:

- single,
- double, in the „back to back" arrangement with barrage or buffer liquid installation,
- double, in the „tandem" arrangement with buffer liquid installation.

The standard mechanical sealing used by **Hydro–Vacuum S.A.** in the mentioned pumps is the single mechanical sealing, manufactured by Polish company Anga or by British company John Crane. It is also possible to equip pumps with mechanical sealing of other manufacturers, but this requires individual technical and commercial arrangements.

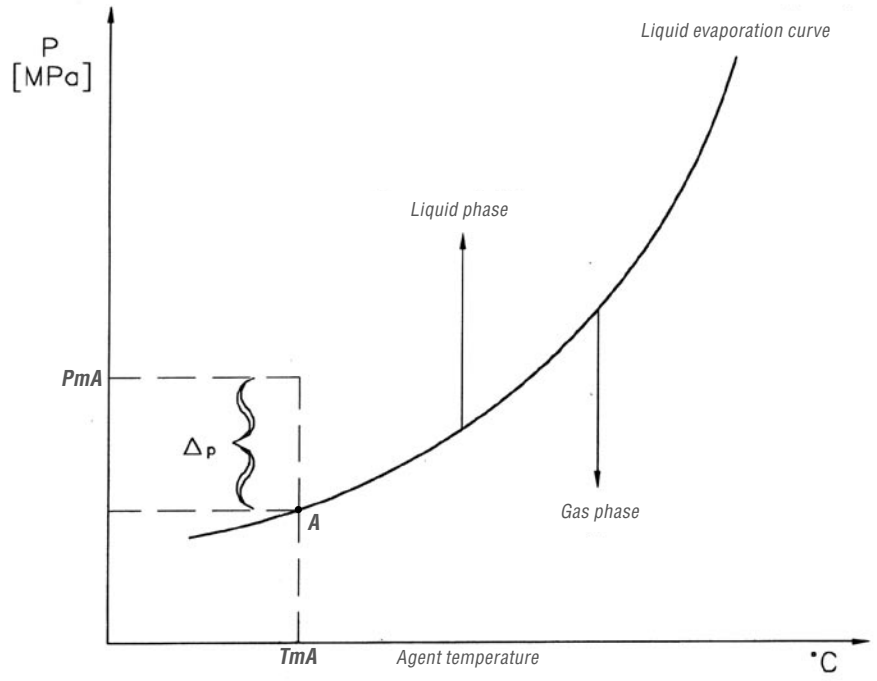
SKC/SKD pumps can be manufactured of grey cast iron, nodular cast iron, austenitic cast steel of the class G-X5CrNiMo19 11 2 or G-X25CrNiMo 25 9 3 and of cast carbon steel 200-400, as well as of special sort of nodular cast iron class 350.22 L, that retains plasticity in very low temperatures, which allows the pumps manufactured of this material to work at ambient temperatures below –40°C.

Technical requirements of hydraulic system in the liquid hydrocarbons pumping process (liquid propane-butane gas)

Certain physical rights are in force for liquid compounds such as propane-butane mixture and others. Liquid gas propane-butane is a mixture of higher saturated hydrocarbons characterised by high pressure of vapours dependant on ambient temperature. In normal physical conditions (1013hPa, 20°C), they are gases which are heavier than the air (higher density than that for the air). And in case of non-controlled outflow of the gas, they trail over ground filling all the pits. Gaseous phase of that gas is flammable and while mixed with the air, it makes very dangerous explosive mixture.

Liquid phase of that gas is lighter than water and its vapours remain over the water surface. Turning from liquid to gas in the free space starts at the temperature of –30°C (propane-butane mixture at the ratio of 50/50).

To keep the propane-butane mixture in liquid state during the whole distribution process, especially during the inflow to the impeller of the first stage of the pump, the pressure of the liquid has to have some surplus pressure Δp in comparison to the value determined from the liquid evaporation curve.



Working conditions of the pumps

Hydro–Vacuum S.A. adapted SKC/SKD pumps to pump LPG also from underground tanks (with obligatory usage of check valve in the suction pipeline) by application of adequate constructional changes and selection of proper equipment. Maximum suction height for the agent such as LPG is about 4 m. Both versions are widely applied in LPG stations (see application diagrams attached). On customer request, pumps can be delivered with the following equipment manufactured by the plant: diffuser, gas phase separator as well as a check valve ZZG.

Note:

Diffuser should be mounted to the flow normalizing pipeline (l= ~20d) – NOT TO THE PUMP!!!

Working in heavy conditions, SKC/SKD pumps are distinguished by: failure-free operation (pumping millions of LPG litres without need for any repairs), relatively high efficiency, long-life and high quality.

In order to keep the pumping process and the pump operation undisturbed, there must be met the primary condition described by the following equation:

$$H_{zs} \cong -(NPSH_r + \Delta h_s)\ [m]$$

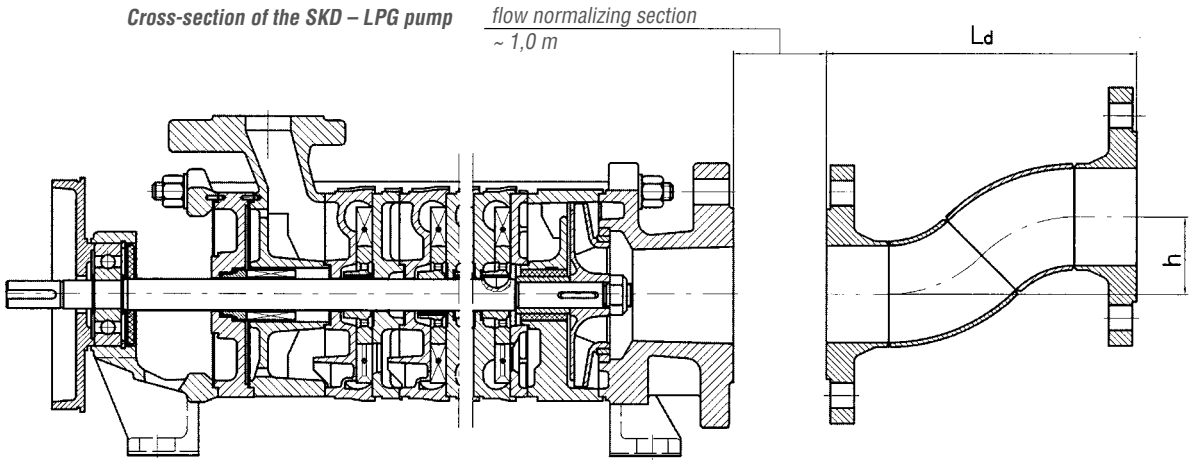
Δh_s - value of hydraulic losses in the suction pipeline

H_{zs} - geometrical height of the inflow (n)

$NPSH_r$ - required anti-cavitation reserve, determined by the manufacturer and guaranteeing correct operation of the pump (m).

$NPSH_{av}$ - available anti-cavitation reserve, existing in the pumping system (m).

Cross-section of the SKD – LPG pump



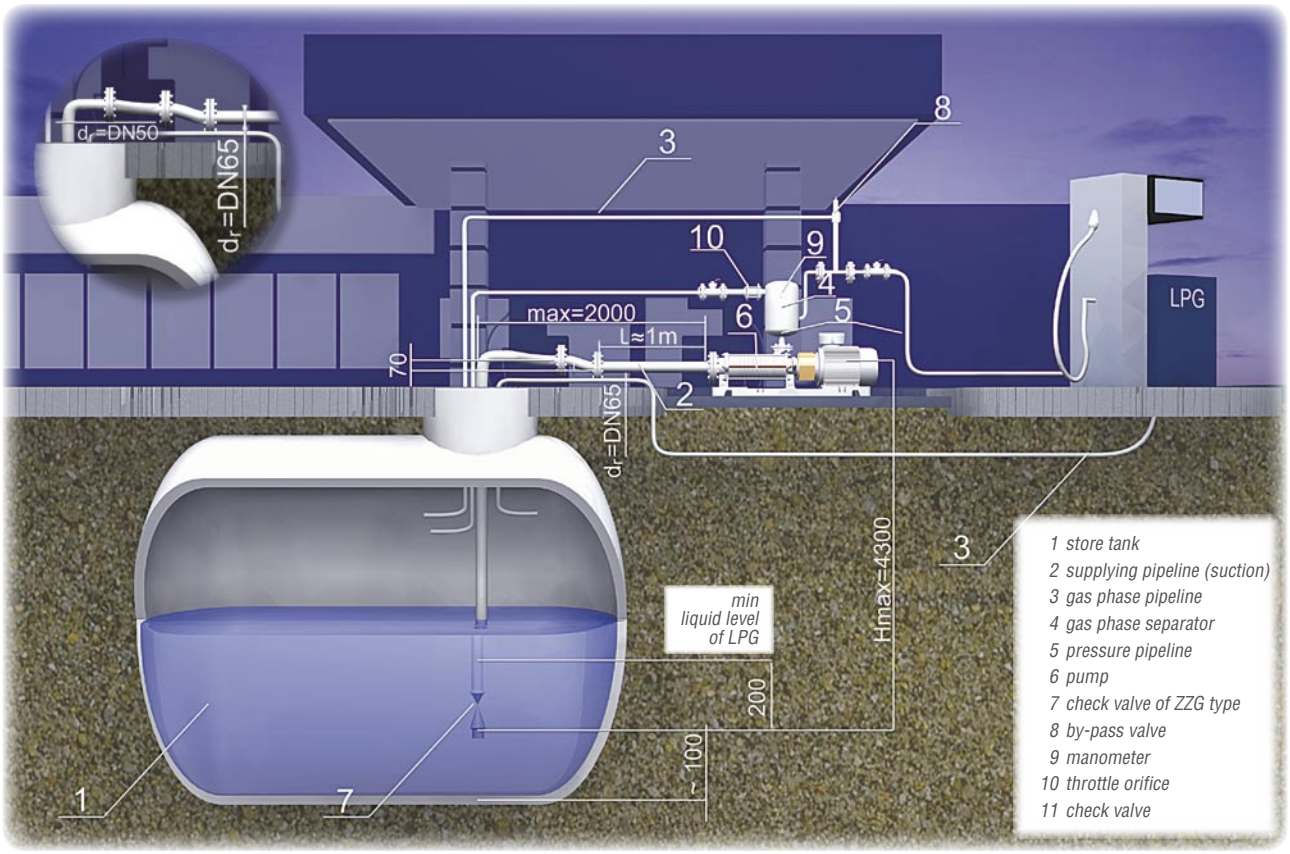
When the required Hzs value, determined during the calculation of the facility (LPG station) project is not met, as a consequence it would lead to pump destruction, especially regarding mechanical end-face sealing at the pump shaft, slide bearing of the pump and the entire hydraulic system (impellers and modules). Correctly designed pumping system should meet the following condition:

$$NPSH_{av} > NPSH_r\ [m]$$

One may minimise the height of inflow H_{zs} by decreasing the hydraulic losses Δh_s in the suction pipeline (inflow) and this is the only parameter that we can adjust.

Pump	L_d (Length of diffuser)	h
SKD2 - LPG	202	44
SKD3 - 4 - LPG	224	55
SKD5-6-LPG	270	70
SKD7-8-LPG	316	88

Example diagram of SKD pump application for distribution of propane-butane mixture in co-operation with the underground tank

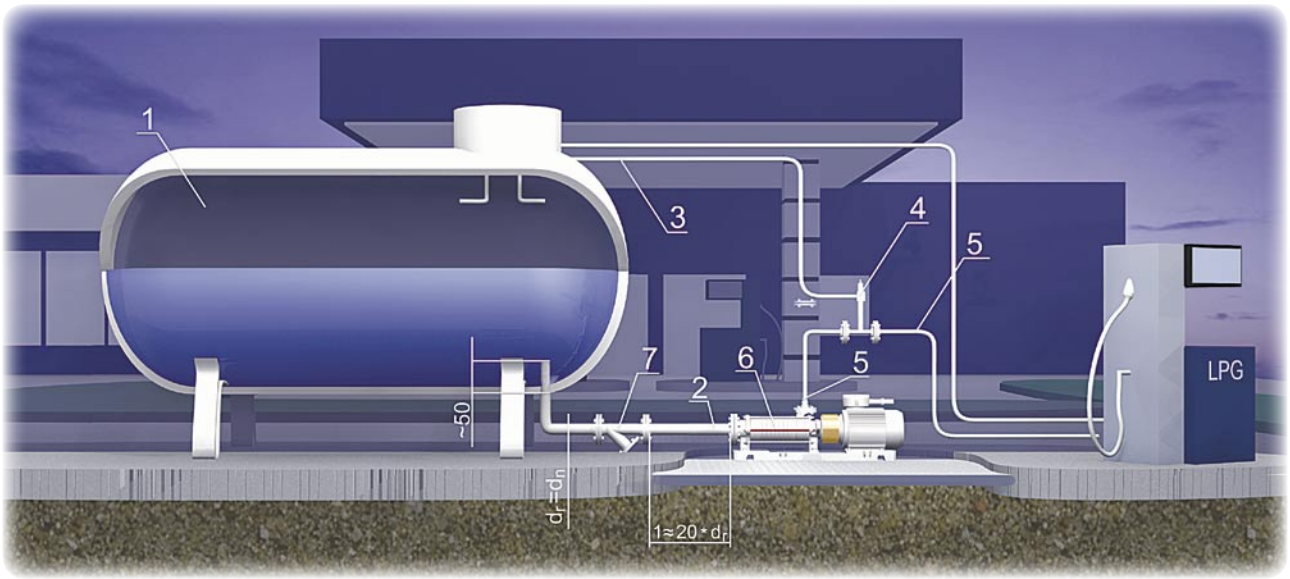


Note:

Protect the suction pipeline from sunshine. For maximum suction depth, pressure losses on the suction pipeline may not exceed 0,035 bar.

***ds** – diameter of the pump suction connector pipe.*

Example diagram of SKC pump application for distribution of propane-butane mixture in co-operation with the ground tank

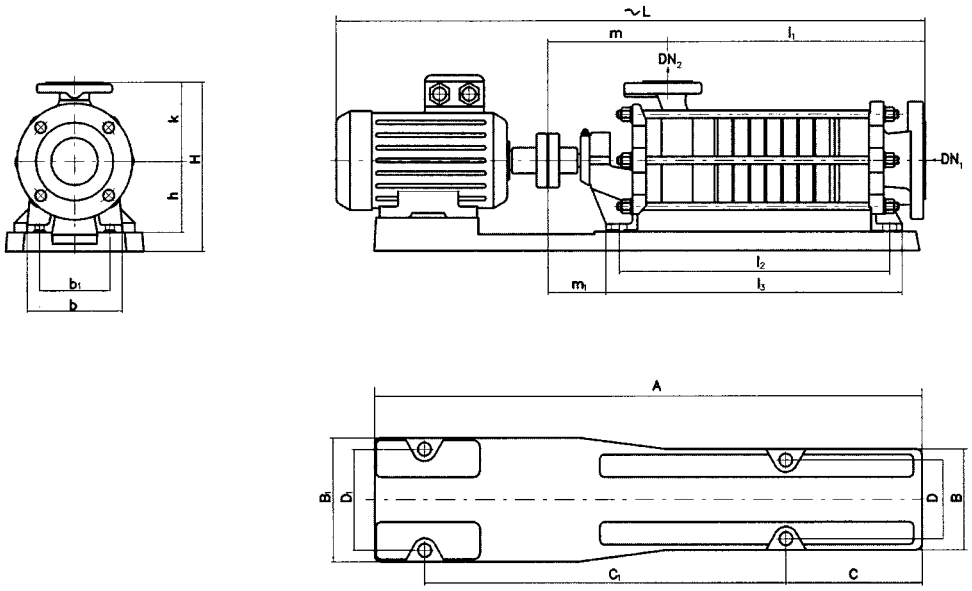


Note:

Protect the suction pipe from sunshine.

***ds** - diameter of the pump suction connector pipe*

Dimensions of the SKC pump



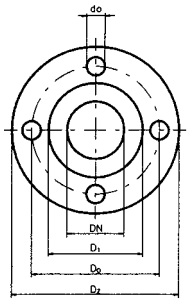
SKC Pressure side

Pump type dimension	DN_2	D_1	D_2	D_0	d_0	i
SKC.2	25	68	115	85	14	4
SKC.3	32	78	140	100	18	4
SKC.4	32	78	140	100	18	4
SKC.5	40	88	145	110	18	4
SKC.6	40	88	145	110	18	4
SKC.7	50	102	160	125	18	4
SKC.8	65	122	185	145	18	8

Suction side

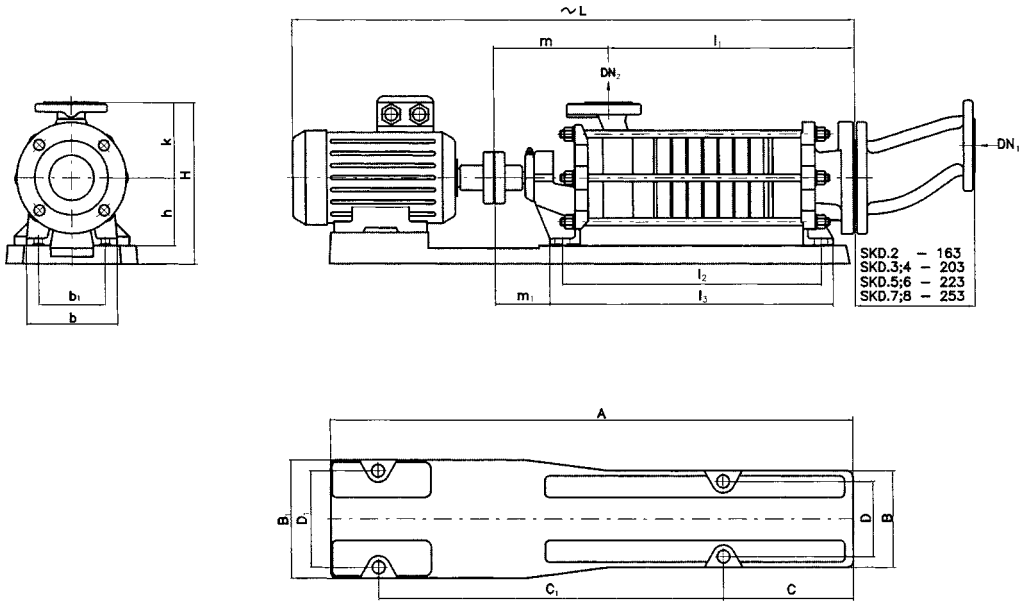
Pump type dimension	DN_1	D_1	D_2	D_0	d_0	i
SKC.2	50	102	165	125	18	4
SKC.3	65	122	185	145	18	8
SKC.4	65	122	185	145	18	8
SKC.5	80	138	200	160	18	8
SKC.6	80	138	200	160	18	8
SKC.7	100	158	235	190	22	8
SKC.8	100	158	235	190	22	8

Collar sizes



i - number of holes

Dimensions of the SKD pump



SKD Pressure side

Pump type dimension	DN_2	D_1	D_2	D_0	d_0	i
SKD.2	25	68	115	85	14	4
SKD.3	32	78	140	100	18	4
SKD.4	32	78	140	100	18	4
SKD.5	40	88	145	110	18	4
SKD.6	40	88	145	110	18	4
SKD.7	50	102	160	125	18	4
SKD.8	65	122	185	145	18	8

*Suction side**

Pump type dimension	DN_1	D_1	D_2	D_0	d_0	i
SKD.2	32	78	140	100	18	4
SKD.3	42	88	150	110	18	4
SKD.4	42	88	150	110	18	4
SKD.5	50	102	165	125	18	4
SKD.6	50	102	165	125	18	4
SKD.7	65	122	185	145	18	4
SKD.8	65	122	185	145	18	4

* for SKD pumps of material type 5; 6; 7; and 8, the collar sizes the same as for SKC pumps

The dimensions of 1-stage SKC and SKD pumps are identical – they are marked as SKC pumps

Selection and dimensions of pumps sets of SKC.2 and SKD.2 types

Pump type dimension	Completeness 1 with free shaft end	Completeness 2 with coupling	Completeness 3 with coupling and plate	Completeness 5 with coupling, motor and plate	Coupling	Motor		Foundation plate		Overall dimensions of the pump set																	
						Mechanical size	Power	Plate	Block	H	b_1	~L	h	k	b	m	m_1	l_1	l_2	l_3	A	C	C_1	D	B	B_1	D_1
	kg				type	-	kW																					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
SKC.2.01	13,0	14,0	28,2	33,0	EZ1	714A	0,25	60.59.01.1	68.40.25.1	215	90	593	90	90	120	175	77	177	212	252	740	72	560	-	122	215	178
				34,7		714B	0,37					615															
SKC.2.02	15,3	16,3	30,5	35,3	EZ1	714A	0,25	60.59.01.1	68.40.25.1	215	90	613	90	90	120	175	77	197	232	272	740	72	560	-	122	215	178
				36,4		714B	0,37					635															
				38,0		804A	0,55		68.40.03.1			656															
				39,3		804B	0,75					668															
SKC.2.03 SKD.2.02	16,6	17,6	31,8	37,7	EZ1	714B	0,37	60.59.01.1	68.40.25.1	215	90	633	90	90	120	175	77	217	252	292	740	72	560	-	122	215	178
				39,3		804A	0,55		68.40.03.1			676															
				40,6		804B	0,75					688															
SKC.2.04 SKD.2.03	17,9	18,9	33,1	40,6	EZ1	804A	0,55	60.59.01.1	68.40.03.1	215	90	696	90	90	120	175	77	237	272	312	740	72	560	-	122	215	178
				41,9		804B	0,75					708															
				47,1		90S4	1,10		-			735															
SKC.2.05 SKD.2.04	19,2	20,2	34,4	41,9	EZ1	804A	0,55	60.59.01.1	68.40.03.1	215	90	716	90	90	120	175	77	257	292	332	740	72	560	-	122	215	178
				43,2		804B	0,75					728															
				48,4		90S4	1,10		-			755															
				50,9		90L4	1,50					780															
SKC.2.06 SKD.2.05	20,5	21,5	35,7	43,2	EZ1	804A	0,55	60.59.01.1	68.40.03.1	215	90	736	90	90	120	175	77	277	312	352	740	72	560	-	122	215	178
				44,5		804B	0,75					748															
				49,7		90S4	1,10		-			775															
				52,2		90L4	1,50					800															
SKC.2.07 SKD.2.06	21,8	22,8	37,0	44,5	EZ1	804A	0,55	60.59.01.1	68.40.03.1	215	90	756	90	90	120	175	77	297	332	372	740	72	560	-	122	215	178
				45,8		804B	0,75					768															
				51,0		90S4	1,10		-			795															
				53,5		90L4	1,50					820															
SKC.2.08 SKD.2.07	23,1	24,1	38,3	47,1	EZ1	804B	0,75	60.59.01.1	68.40.03.1	215	90	788	90	90	120	175	77	317	352	392	740	72	560	-	122	215	178
				52,3		90S4	1,10		-			815															
				54,8		90L4	1,50					840															
SKD.2.08	24,4	25,4	39,6	48,4	EZ1	804B	0,75	60.59.01.1	68.40.03.1	215	90	808	90	90	120	175	77	337	372	412	740	72	560	-	122	215	178
				53,6		90S4	1,10		-			835															
				56,1		90L4	1,50					860															

Selection and dimensions of pumps sets of SKC.3 and SKD.3 types

Pump type dimension	Completeness 1 with free shaft end	Completeness 2 with coupling	Completeness 3 with coupling and plate	Completeness 5 with coupling, motor and plate	Coupling	Motor		Foundation plate		Overall dimensions of the pump set																	
						Mechanical size	Power	Plate	Block	H	b_1	~L	h	k	b	m	m_1	l_1	l_2	l_3	A	C	C_1	D	B	B_1	D_1
	kg				type	-	kW																					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
SKC.3.01	26	27	49	63	EZ1	90S4	1,1	60.45.01.1	68.40.16.1	297	112	735	112	125	152	185	84	227	249	288	755	25	620	-	155	250	226
				65,5		90L4	1,5					760															
SKC.3.02	28	29	51	65	EZ1	90S4	1,1	60.45.01.1	68.40.16.1	297	112	758	112	125	152	185	84	250	272	311	755	25	620	-	155	250	226
				67,5		90L4	1,5					783															
				76		100L4A	2,2		68.40.17.1			829															
SKC.3.03 SKD.3.02	30	31	53	67	EZ1	90S4	1,1	60.45.01.1	68.40.16.1	297	112	781	112	125	152	185	84	273	295	334	755	25	620	-	155	250	226
				69,5		90L4	1,5					806															
				78		100L4A	2,2		68.40.17.1			852															
				79		100L4B	3,0		-																		
SKC.3.04 SKD.3.03	32	33	55	69	EZ1	90S4	1,1	60.45.01.1	68.40.16.1	297	112	804	112	125	152	185	84	296	318	357	755	25	620	-	155	250	226
				71,5		90L4	1,5					829															
				80		100L4A	2,2		68.40.17.1			875															
				81		100L4B	3,0																				
				89		112M4	4,0		-			883															
SKC.3.05 SKD.3.04	34,5	35,5	57,5	74	EZ1	90L4	1,5	60.45.01.1	68.40.16.1	297	112	852	112	125	152	185	84	319	341	380	755	25	620	-	155	250	226
				82,5		100L4A	2,2		68.40.17.1			898															
				83,5		100L4B	3,0																				
				91,5		112M4	4,0	60.46.01.1	-	292		906									965	260	545	131	155	285	261
SKC.3.06 SKD.3.05	36,5	37,5	65,5	82	EZ1	90L4	1,5	60.46.01.1	68.40.16.1	292	112	875	112	125	152	185	84	342	364	403	965	260	545	131	155	285	261
				90,5		100L4A	2,2		68.40.17.1			921															
				91,5		100L4B	3,0																				
				99,5		112M4	4,0		-			929															
		39	67	129	EZ3	132S4	5,5		68.40.18.1	312		1012															
SKC.3.07 SKD.3.06	38,5	39,5	67,5	92,5	EZ1	100L4A	2,2	60.46.01.1	68.40.17.1	292	112	944	112	125	152	185	84	365	387	426	965	260	545	131	155	285	261
				93,5		100L4B	3,0																				
				101,5		112M4	4,0		-			952															
		41	69	131	EZ3	132S4	5,5		68.40.18.1	312		1035															
SKC.3.08 SKD.3.07	40,5	41,5	69,5	94,5	EZ1	100L4A	2,2	60.46.01.1	68.40.17.1	292	112	967	112	125	152	185	84	388	410	449	965	260	545	131	155	285	261
				95,5		100L4B	3,0																				
				103,5		112M4	4,0		-			975															
		43	71	133	EZ3	132S4	5,5		68.40.18.1	312		1058															
				144		132M4	7,5					1096															
SKD.3.08	42,5	41,5	69,5	94,5	EZ1	100L4A	2,2	60.46.01.1	68.40.17.1	292	112	990	112	125	152	185	84	411	433	472	965	260	545	131	155	285	261
				95,5		100L4B	3,0																				
				103,5		112M4	4,0		-			998															
		45	73	135	EZ3	132S4	5,5		68.40.18.1	312		1081															
				146		132M4	7,5					1119															

Selection and dimensions of pumps sets of SKC.4 and SKD.4 types

Pump type dimension	Completeness 1 with free shaft end	Completeness 2 with coupling	Completeness 3 with coupling and plate	Completeness 5 with coupling, motor and plate	Coupling	Motor Mechanical size	Motor Power	Foundation plate Plate	Foundation plate Block	H	b_1	~L	h	k	b	m	m_1	l_1	l_2	l_3	A	C	C_1	D	B	B_1	D_1
	kg				type	-	kW																					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
SKC.4.01	26	27	49	63	EZ1	90S4	1,1	60.45.01.1	68.40.16.1	297	112	738	112	125	152	185	84	230	252	291	755	25	620	-	155	250	226
				65,5		90L4	1,5					763															
SKC.4.02	28	29	51	65	EZ1	90S4	1,1	60.45.01.1	68.40.16.1	297	112	764	112	125	152	185	84	256	278	317	755	25	620	-	155	250	226
				67,5		90L4	1,5					789															
				76		100L4A	2,2		68.40.17.1			835															
				77		100L4B	3,0																				
SKC.4.03 SKD.4.02	30	31	53	69,5	EZ1	90L4	1,5	60.45.01.1	68.40.16.1	297	112	815	112	125	152	185	84	282	304	343	755	25	620	-	155	250	226
				78		100L4A	2,2		68.40.17.1			861															
				79		100L4B	3,0																				
				87		112M4	4,0		-			866															
SKC.4.04 SKD.4.03	32,5	33,5	55,5	80,5	EZ1	100L4A	2,2	60.45.01.1	68.40.17.1	297	112	891	112	125	152	185	84	308	330	369	755	25	620	-	155	250	226
				81,5		100L4B	3,0																				
				89,5		112M4	4,0		-			899															
		35	63	125	EZ3	132S4	5,5	60.46.01.1	68.40.18.1	312		978									965	260	545	131	155	285	261
SKC.4.05 SKD.4.04	35	36	64	89	EZ1	100L4A	2,2	60.46.01.1	68.40.17.1	292	112	913	112	125	152	185	84	334	356	395	965	260	545	131	155	285	261
				90		100L4B	3,0																				
				98		112M4	4,0		-			921															
		37,5	65,5	127,5	EZ3	132S4	5,5		68.40.18.1	312		1004															
SKC.4.06 SKD.4.05	37,5	38,5	66,5	91,5	EZ1	100L4A	2,2	60.46.01.1	68.40.17.1	292	112	939	112	125	152	185	84	360	382	421	965	260	545	131	155	285	261
				92,5		100L4B	3,0																				
				100,5		112M4	4,0		-			947															
		40	68	130	EZ3	132S4	5,5		68.40.18.1	312		1030															
SKC.4.07 SKD.4.06	40	41	69	94	EZ1	100L4B	3,0	60.46.01.1	68.40.17.1	292	112	965	112	125	152	185	84	386	408	447	965	260	545	131	155	285	261
				103		112M4	4,0		-			973															
		42,5	70,5	132,5	EZ3	132S4	5,5		68.40.18.1	312		1056															
				143,5		132M4	7,5					1094															
SKC.4.08 SKD.4.07	42	43	71	96	EZ1	100L4B	3,0	60.46.01.1	68.40.17.1	292	112	991	112	125	152	185	84	412	434	473	965	260	545	131	155	285	261
				105		112M4	4,0		-			999															
		44,5	72,5	134,5	EZ3	132S4	5,5		68.40.18.1	312		1082															
				145,5		132M4	7,5					1120															
SKD.4.08	44	45	73	98	EZ1	100L4B	3,0	60.46.01.1	68.40.17.1	292	112	1017	112	125	152	185	84	438	460	499	965	260	545	131	155	285	261
				107		112M4	4,0		-			1025															
		46,5	74,5	136,5	EZ3	132S4	5,5		68.40.18.1	312		1108															
				147,5		132M4	7,5					1146															

Selection and dimensions of pumps sets of SKC.5 and SKD.5 types

Pump type dimension	Completeness 1 with free shaft end	Completeness 2 with coupling	Completeness 3 with coupling and plate	Completeness 5 with coupling, motor and plate	Coupling	Motor Mechanical size	Motor Power	Foundation plate Plate	Foundation plate Block	H	b_1	~L	h	k	b	m	m_1	l_1	l_2	l_3	A	C	C_1	D	B	B_1	D_1
	kg				type	-	kW																					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
SKC.5.01	40	41	67	81	EZ1	90S4	1,1	60.48.01.1	68.40.07.1	332	145	789	132	140	185	211	82	255	287	332	810	180	505	162	186	284	260
				83,5		90L4	1,5					814															
				92		100L4A	2,2	60.48.03.1	-			860															
SKC.5.02	44	45	71	87,5	EZ1	90L4	1,5	60.48.01.1	68.40.07.1	332	145	844	132	140	185	211	82	285	317	362	810	180	505	162	186	284	260
				96		100L4A	2,2	60.48.03.1	-			890															
				97		100L4B	3,0					890															
				105		112M4	4,0	60.48.02.1	-			898															
SKC.5.03 SKD.5.02	48	49	80	114	EZ1	112M4	4,0	60.49.01.1	68.40.05.1	332	145	928	132	140	185	211	82	315	347	392	945	200	610	162	186	325	300
		50,5	81,5	143,5	EZ3	132S4	5,5		-			1011															
SKC.5.04 SKD.5.03	52	54,5	85,5	119,5	EZ3	112M4	4,0	60.49.01.1	68.40.05.1	332	145	962	132	140	185	211	82	345	377	422	945	200	610	162	186	325	300
				147,5		132S4	5,5		-			1041															
				158,5		132M4	7,5					1079															
SKC.5.05 SKD.5.04	56	57	88	122	EZ1	112M4	4,0	60.49.01.1	68.40.05.1	332	145	988	132	140	185	211	82	375	407	452	945	200	610	162	186	325	300
		58,5	89,5	151,5	EZ3	132S4	5,5		-			1071															
				162,5		132M4	7,5					1109															
				194,5		160M4	11,0	60.50.02.1		360		1220									1090	220	710	162	186	325	300
SKC.5.06 SKD.5.05	60	61	92	126	EZ1	112M4	4,0	60.50.01.1	68.40.05.1	332	145	1018	132	140	185	211	82	405	437	482	1090	220	710	162	186	325	300
		62,5	93,5	155,5	EZ3	132S4	5,5		-			1101															
				166,5		132M4	7,5					1139															
				198,5		160M4	11,0	60.50.02.1	-	360		1250															
SKC.5.07 SKD.5.06	64	65	96	130	EZ1	112M4	4,0	60.50.01.1	68.40.05.1	332	145	1048	132	140	185	211	82	435	467	512	1090	220	710	162	186	325	300
		66,5	97,5	159,5	EZ3	132S4	5,5		-			1131															
				170,5		132M4	7,5					1169															
				202,5		160M4	11,0	60.50.02.1		360		1280															
				222,5		160L4	15,0	60.51.01.1				1324									1205	250	750	162	186	360	336
SKC.5.08 SKD.5.07	68	69	100	134	EZ1	112M4	4,0	60.50.01.1	68.40.05.1	332	145	1078	132	140	185	211	82	465	497	542	1090	220	710	162	186	325	300
		70,5	101,5	163,5	EZ3	132S4	5,5		-			1161															
				174,5		132M4	7,5					1199															
				206,5		160M4	11,0	60.51.01.1		360		1310									1205	250	750	162	186	360	336
				226,5		160L4	15,0					1354															
SKD.5.08	72	73	104	138	EZ1	112M4	4,0	60.50.01.1	68.40.05.1	332	145	1108	132	140	185	211	82	495	527	572	1090	220	710	162	186	325	300
		74,5	105,5	167,5	EZ3	132S4	5,5		-			1191															
				178,5		132M4	7,5					1229															
				210,5		160M4	11,0	60.51.01.1		360		1340									1205	250	750	162	186	360	336
				230,5		160L4	15,0					1384															

Selection and dimensions of pumps sets of SKC.6 and SKD.6 types

Pump type dimension	Completeness 1	Completeness 2	Completeness 3	Completeness 5	Coupling	Motor		Foundation plate		Overall dimensions of the pump set																	
	with free shaft end	with coupling	with coupling and plate	with coupling, motor and plate		Mechanical size	Power	Plate	Block	H	b_1	~L	h	k	b	m	m_1	l_1	l_2	l_3	A	C	C_1	D	B	B_1	D_1
	kg				type	-	kW																				
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
SKC.6.01	38,5	39,5	65,5	90,5	EZ1	100L4A	2,2	60.48.03.1	-	332	145	860	132	140	185	211	82	255	287	332	810	180	501	162	186	284	260
				91,5		100L4B	3,0					860															
SKC.6.02	42,5	43,5	69,5	94,5	EZ1	100L4A	2,2	60.48.03.1	-	332	145	890	132	140	185	211	82	285	317	362	810	180	501	162	186	284	260
				95,5		100L4B	3,0					890															
				103,5		112M4	4,0	60.48.02.1				898															
		45	71	133	EZ3	132S4	5,5	60.48.01.1				977															
SKC.6.03	46,5	47,5	78,5	109,5	EZ1	112M4	4,0	60.49.01.1	68.40.05.1	332	145	928	132	140	185	211	82	315	347	392	945	200	610	162	186	325	300
SKD.6.02		49	80	142	EZ3	132S4	5,5		-			1011															
				153		132M4	7,5					1049															
SKC.6.04	50,5	51,5	82,5	116,5	EZ1	112M4	4,0	60.49.01.1	68.40.05.1	332	145	962	132	140	185	211	82	345	377	422	945	200	610	162	186	325	300
SKD.6.03		53	84	146	EZ3	132S4	5,5		-			1041															
				157		132M4	7,5					1079															
SKC.6.05	54,5	55,5	86,5	120,5	EZ1	112M4	4,0	60.50.01.1	68.40.05.1	332	145	992	132	140	185	211	82	375	407	452	1090	220	710	162	186	325	300
SKD.6.04		57	88	150	EZ3	132S4	5,5		-			1071															
				161		132M4	7,5					1109															
				193		160M4	11,0	60.50.02.1		360		1220															
SKC.6.06	58,5	61	92	154	EZ3	132S4	5,5	60.50.01.1	-	332	145	1101	132	140	185	211	82	405	437	482	1090	220	710	162	186	325	300
SKD.6.05				165		132M4	7,5					1139															
				197		160M4	11,0	60.50.02.1		360		1250															
				217		160L4	15,0	60.51.01.1		332		1294									1205	250	750	162	186	360	336
SKC.6.07	62,5	63,5	94,5	128,5	EZ1	112M4	4,0	60.50.01.1	68.40.05.1	332	145	1052	132	140	185	211	82	435	467	512	1090	220	710	162	186	325	300
SKD.6.06		65	96	158	EZ3	132S4	5,5		-			1131															
				169		132M4	7,5	60.51.01.1	68.40.20.1	360		1169									1205	250	750	162	186	360	336
				201		160M4	11,0		-			1280															
SKC.6.08	66,5	69	100	162	EZ3	132S4	5,5	60.50.01.1	-	332	145	1161	132	140	185	211	82	465	497	542	1090	220	710	162	186	325	300
SKD.6.07				173		132M4	7,5					1199															
				205		160M4	11,0	60.51.01.1		360		1310									1205	250	750	162	186	360	336
				225		160L4	15,0					1354															
SKD.6.08	70,5	73	104	166	EZ3	132S4	5,5	60.50.01.1	-	332	145	1191	132	140	185	211	82	495	527	572	1090	220	710	162	186	325	300
				177		132M4	7,5					1229															
				209		160M4	11,0	60.51.01.1		360		1340									1205	250	750	162	186	360	336
				229		160L4	15,0					1384															

Selection and dimensions of pumps sets of SKC.7 and SKD.7 types

Pump type dimension	Completeness 1	Completeness 2	Completeness 3	Completeness 5	Coupling	Motor		Foundation plate		Overall dimensions of the pump set																	
	with free shaft end	with coupling	with coupling and plate	with coupling, motor and plate		Mechanical size	Power	Plate	Block	H	b_1	~L	h	k	b	m	m_1	l_1	l_2	l_3	A	C	C_1	D	B	B_1	D_1
	kg				type	-	kW																				
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
SKC.7.01	56	57	88	113	EZ1	100L4B	3,0	60.52.01.1	68.40.15.1	395	150	933	160	165	200	249	105	290	335	385	950	210	580	176	200	270	252
				122		112M4	4,0		68.40.05.1			941															
		58,5	90	152	EZ3	132S4	5,5		-			1023															
				163		132M4	7,5					1061															
SKC.7.02	63	64	95	121	EZ1	100L4B	3,0	60.52.01.1	68.40.15.1	395	150	979	160	165	200	249	105	332	377	427	950	210	580	176	200	270	252
				130		112M4	4,0		68.40.05.1			987															
		65,5	97	159	EZ3	132S4	5,5		-			1066															
				170		132M4	7,5					1104															
			98	203		160M4	11,0	60.53.01.1				1215									1065	210	685	176	200	310	286
SKC.7.03	70	71	102	136	EZ1	112M4	4,0	60.52.01.1	68.40.05.1	395	150	1029	160	165	200	249	105	374	419	469	950	210	580	176	200	270	252
SKD.7.02		72,5	104	166	EZ3	132S4	5,5		-			1107															
				177		132M4	7,5					1145															
			112	174		160M4	11,0	60.55.01.1	68.40.05.1	415		1256									1245	240	820	176	200	350	326
				185		160L4	15,0					1300															
SKC.7.04	77	78	110	144	EZ1	112M4	4,0	60.54.01.1	68.40.05.1	395	150	1071	160	165	200	249	105	416	461	511	1110	240	720	176	200	270	252
SKD.7.03		79,5	112	174	EZ3	132S4	5,5		-			1109															
				185		132M4	7,5					1147															
			119	224		160M4	11,0	60.55.01.1	68.40.05.1	415		1258									1245	240	820	176	200	350	326
				244		160L4	15,0					1302															
		82,5	142	307	EZ7	180M4	18,5	60.57.01.1	68.40.09.1	435		1356									1580	360	890	176	200	400	376
SKC.7.05	84	85	117	151	EZ1	112M4	4,0	60.54.01.1	68.40.05.1	395	150	1113	160	165	200	249	105	458	503	553	1110	240	720	176	200	270	252
SKD.7.04		86,5	119	181	EZ3	132S4	5,5		-			1191															
				192		132M4	7,5					1229															
			126	231		160M4	11,0	60.55.01.1	68.40.05.1	415		1340									1245	240	820	176	200	350	326
				251		160L4	15,0					1384															
		89,5	149	314	EZ7	180M4	18,5	60.57.01.1	68.40.09.1	435		1438									1580	360	890	176	200	400	376
SKC.7.06	91	93,5	126	188	EZ3	132S4	5,5	60.54.01.1	-	395	150	1234	160	165	200	249	105	500	545	595	1110	240	720	176	200	270	252
SKD.7.05				199		132M4	7,5					1272															
			136	241		160M4	11,0	60.56.01.1				1383									1280	250	820	176	200	310	286
				261		160L4	15,0					1427															
		96,5	156	321	EZ7	180M4	18,5	60.57.01.1	68.40.09.1	435		1476									1580	360	890	176	200	400	376
				331		180L4	22,0		-			1476															
				425		200L4	30,0					1596															
SKC.7.07	98	100,5	143	205	EZ3	132S4	5,5	60.56.01.1	68.40.20.1	395	150	1276	160	165	200	249	105	542	587	637	1280	250	820	176	200	310	286
SKD.7.06				216		132M4	7,5					1314															
				248		160M4	11,0		-			1425															
				268		160L4	15,0					1469															
		103,5	163	328	EZ7	180M4	18,5	60.57.01.1	68.40.09.1	435		1518									1580	360	890	176	200	400	376
				338		180L4	22,0					1518															
				428		200L4	30,0		-			1638															
SKC.7.08	105	107,5	167	229	EZ3	132M4	7,5	60.57.02.1	68.40.14.1	435	150	1356	160	165	200	249	105	584	629	679	1580	360	890	176	200	400	376
SKD.7.07				272		160M4	11,0		68.40.08.1			1467															
				292		160L4	15,0					1511															
		110,5	170	335	EZ7	180M4	18,5		68.40.09.1			1560															
				345		180L4	22,0					1560															
				435		200L4	30,0		-			1685															
SKD.7.08	112	115,5	175	237	EZ3	132M4	7,5	60.57.02.1	68.40.14.1	435	150	1403	160	165	200	249	105	626	671	721	1580	360	890	176	200	400	376
				280		160M4	11,0		68.40.08.1			1514															
				300		160L4	15,0					1558															
		117,5	177	342	EZ7	180M4	18,5		68.40.09.1			1607															
				352		180L4	22,0					1607															
				442		200L4	30,0		-			1727															

Selection and dimensions of pumps sets of SKC.8 and SKD.8 types

Pump type dimension	Completeness 1 with free shaft end	Completeness 2 with coupling	Completeness 3 with coupling and plate	Completeness 5 with coupling, motor and plate	Coupling	Motor Mechanical size	Motor Power	Foundation plate Plate	Foundation plate Block	H	b_1	~L	h	k	b	m	m_1	l_1	l_2	l_3	A	C	C_1	D	B	B_1	D_1
	kg				type	-	kW																				
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
SKC.8.01	68	69	100	126	EZ1	100L4B	3.0	60.52.01.1	68.40.15.1	390	150	961	160	160	200	257	105	306	359	409	950	210	580	176	200	270	252
				134		112M4	4.0		68.40.05.1			969														
		71	102	164	EZ3	132S4	5.5		-			1047														
				175		132M4	7.5					1085														
SKC.8.02	75	76	107	133	EZ1	100L4B	3.0	60.52.01.1	68.40.15.1	390	150	1010	160	160	200	257	105	355	408	458	950	210	580	176	200	270	252
				141		112M4	4.0		68.40.05.1			1018														
		78	109	171	EZ3	132S4	5.5		-			1096														
				182		132M4	7.5					1134														
			110	215		160M4	11.0	60.53.01.1				1245										1065	210	685	176	200	310	286
				235		160L4	15.0					1289														
SKC.8.03 SKD.8.02	82	83	115	149	EZ1	112M4	4.0	60.54.01.1	68.40.05.1	390	150	1067	160	160	200	257	105	404	457	507	1110	240	720	176	200	270	252
		85	117	188	EZ3	132S4	5.5		-			1145														
				199		132M4	7.5					1183														
			124	229		160M4	11.0	60.55.01.1	68.40.05.1	410		1294										1245	240	820	176	200	350	326
				249		160L4	15.0					1338														
		88	127	292	EZ7	180M4	18.5		-			1392														
SKC.8.04 SKD.8.03	89	90	122	156	EZ1	112M4	4.0	60.54.01.1	68.40.05.1	390	150	1116	160	160	200	257	105	453	506	556	1110	240	720	176	200	270	252
		92	124	186	EZ3	132S4	5.5		-			1194														
				197		132M4	7.5					1232														
			131	235		160M4	11.0	60.55.01.1	68.40.05.1	410		1343										1245	240	820	176	200	350	326
				256		160L4	15.0					1387														
		95	134	299	EZ7	180M4	18.5		-			1441														
				309		180L4	22.0					1441														
SKC.8.05 SKD.8.04	96	99	141	245	EZ3	160M4	11.0	60.56.01.1	-	390	150	1393	160	160	200	257	105	502	555	605	1280	250	820	176	200	310	286
				266		160L4	15.0					1437														
		101	160	325	EZ7	180M4	18.5	60.57.01.1	68.40.09.1	430		1491										1580	360	890	176	200	400	376
				335		180L4	22.0					1491														
				425		200L4	30.0		-			1611														
SKC.8.06 SKD.8.05	103	106	148	253	EZ3	160M4	11.0	60.56.01.1	-	390	150	1442	160	160	200	257	105	551	604	654	1280	250	820	176	200	310	286
				273		160L4	15.0					1486														
		109	168	333	EZ7	180M4	18.5	60.57.01.1	68.40.09.1	430		1540										1580	360	890	176	200	400	376
				343		180L4	22.0					1540														
				433		200L4	30.0		-			1660														
SKC.8.07 SKD.8.06	110	113	172	277	EZ3	160M4	11.0	60.57.02.1	68.40.08.1	430	150	1491	160	160	200	257	105	600	653	703	1580	360	890	176	200	400	376
				297		160L4	15.0					1535														
		116	175	340	EZ7	180M4	18.5		68.40.19.1			1589														
				350		180L4	22.0					1589														
				440		200L4	30.0		-			1709														
SKC.8.08 SKD.8.07	117	120	179	284	EZ3	160M4	11.0	60.57.02.1	68.40.08.1	430	150	1540	160	160	200	257	105	649	702	752	1580	360	890	176	200	400	376
				304		160L4	15.0					1584														
		123	182	347	EZ7	180M4	18.5		68.40.19.1			1638														
				357		180L4	22.0					1638														
				447		200L4	30.0		-			1758														
SKD.8.08	124	127	186	291	EZ3	160M4	11.0	60.57.02.1	68.40.08.1	430	150	1589	160	160	200	257	105	698	751	801	1580	360	890	176	200	400	376
				311		160L4	15.0					1633														
		130	189	354	EZ7	180M4	18.5		68.40.19.1			1682														
				364		180L4	22.0					1682														
				454		200L4	30.0		-			1807														

The pump symbol structure

The pump symbol consists of the following elements.

S	K	C		6		0	8		5		1	1	6	0		5
a	a	a		b		c	c		d		e_1	e_2	e_3	e_4		h

where: a a a - classification group SK and product type
C - for work with inflow
D - for work with deep suction

b - pump size (2-8)

c c - pump type dimension (01-08), number of stages of the pump

d - Material selection

$e_1 e_2 e_3 e_4$ - pump design

h - delivery completeness,

Pump marking for liquid propane-butane gas (LPG)

Pumps for LPG gas are made only from materials „5" or „6" and only as the design type „1160" for SKC and „1161" for SKD. It is necessary to add „LPG" at the end of the marking.

Example of the marking:

SKC.4.08.5.1160.5.LPG

SKD.4.08.5.1161.5.LPG

Delivery completeness

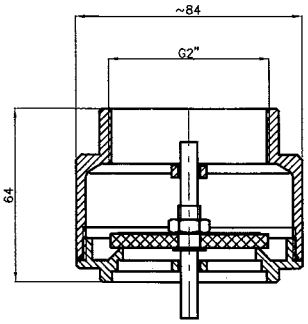
1 - The pump with free shaft end
2 - The pump with coupling
3 - The pump with coupling, foundation bolts, and coupling guard on the foundation plate
4 - Completeness 3 + motor

Additional equipment for SKD - LPG pumps

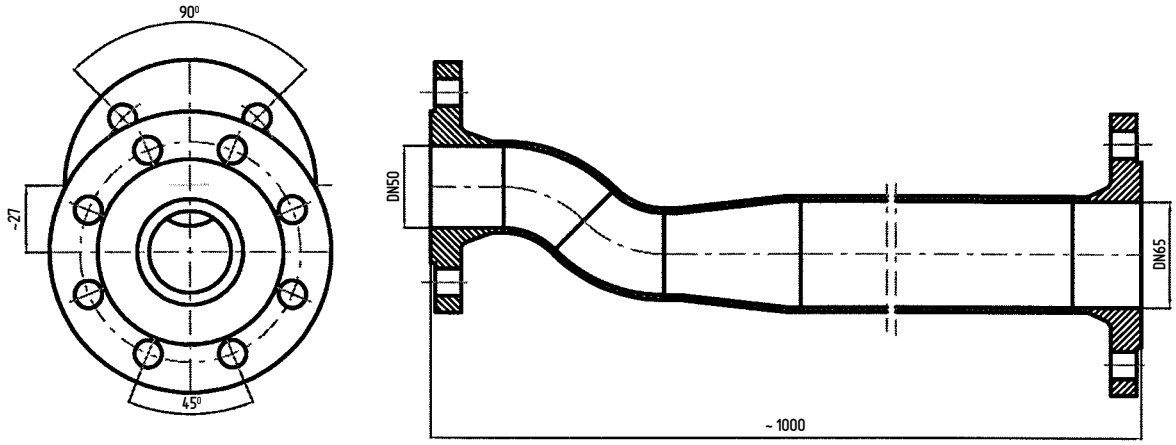
On customer request, the SKD - LPG pump can be additionally equipped with the following items manufactured by **Hydro-Vacuum S.A.**:

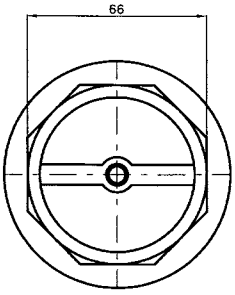
- separator
- diffuser
- flow normalizing section
- ZZG check valve

The diffuser and the flow normalizing section are offered made of unalloyed steel or of austenitic steel for as low working temperatures as -20oC or -40oC, including pumps made of unalloyed steel under the supervision of the Office of Technical Inspection.

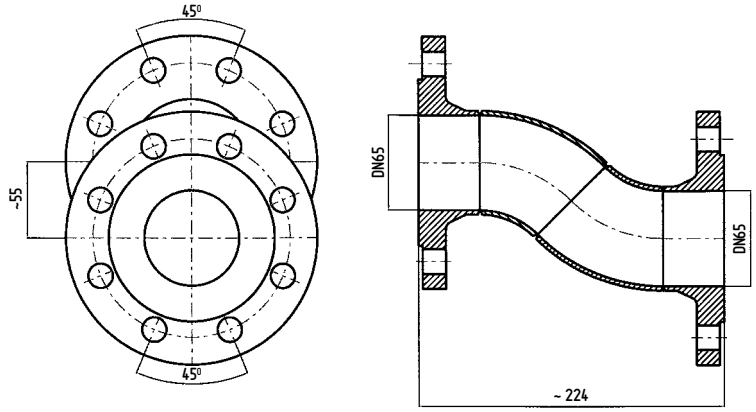


Flow normalizing section SKD.3; 4



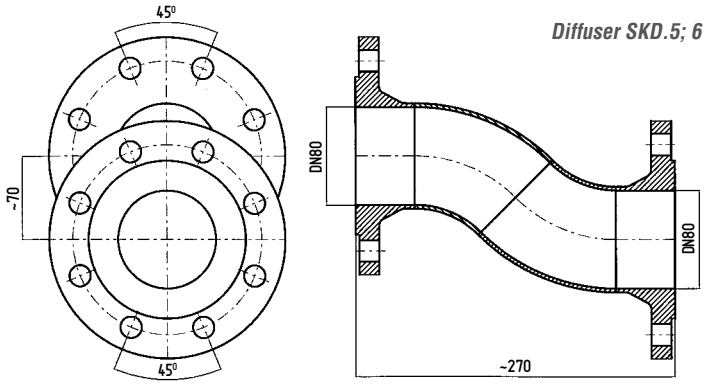


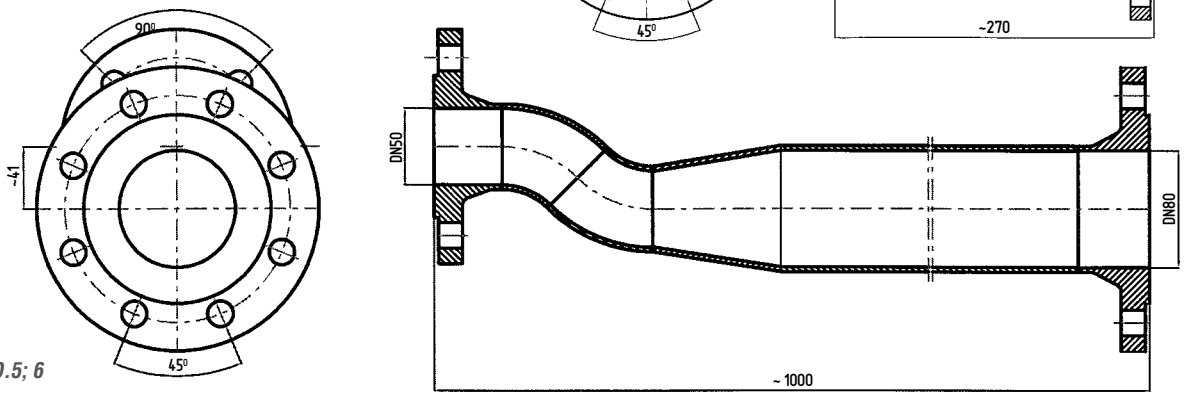
Check valve



Diffuser SKD.3; 4

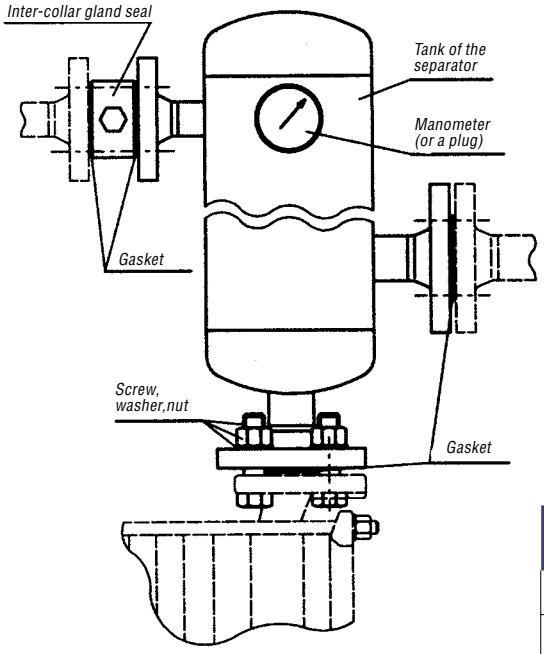
Diffuser SKD.5; 6





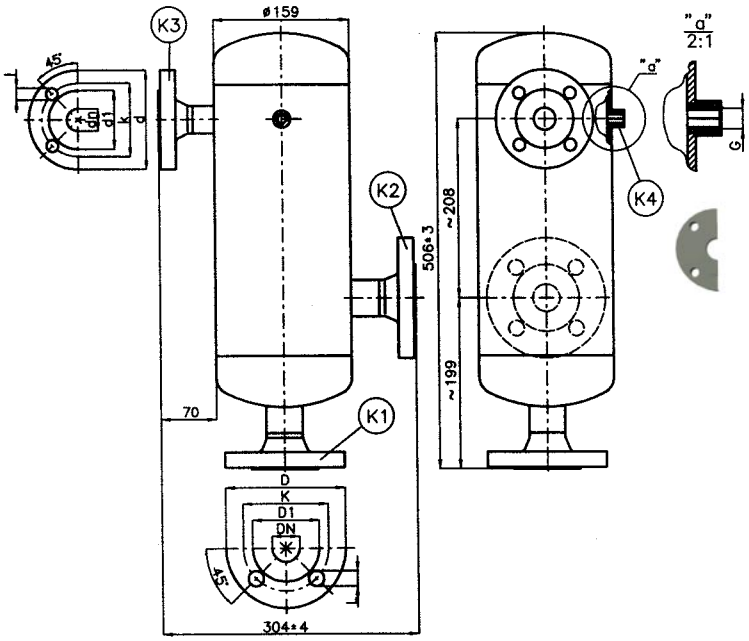
Flow normalizing section SKD.5; 6

Separator assembly scheme
(elements included in the set)



Separator's type (mark on the name plate)	Design variant	Supply completeness	Minimal working temperature	Type of the pump
ZBS.4/1	3250	1 (with a manometer) 3 (with a cork)	- 20 °C	SKD.3/4
ZBS.4/3	4260	2 (with a manometer) 4 (with a cork)	- 40 °C	
ZBS.4/2	3270	1 (with a manometer) 3 (with a cork)	- 20 °C	SKD.5/6
ZBS.4/4	4280	2 (with a manometer) 4 (with a cork)	- 40 °C	

Dimensions of the separator

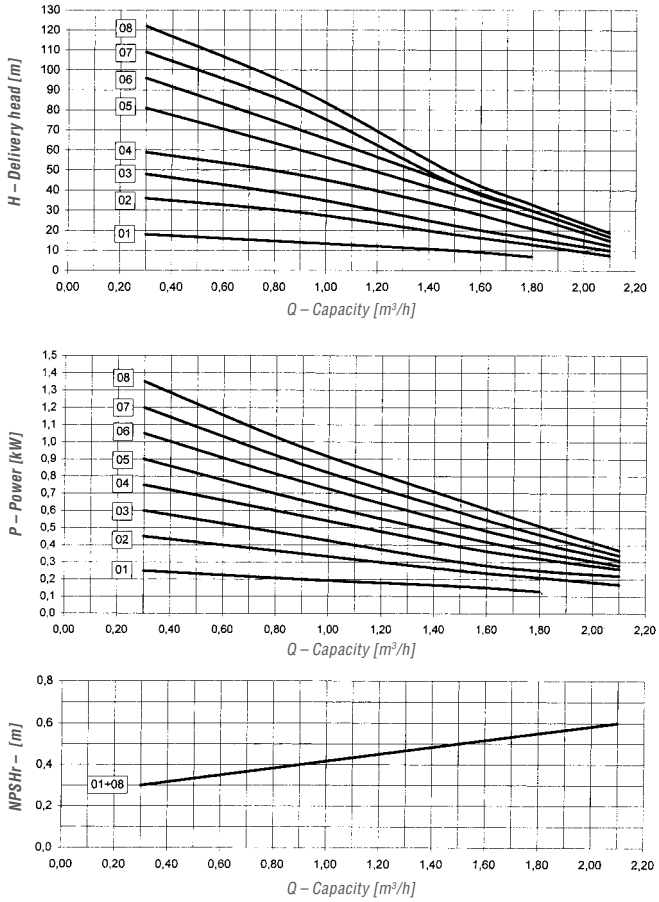


Type of connectors	
K1	Inlet from the pump
K2	Outlet of the liquid phase (to the distributor)
K3	Outlet of the gas phase (to the tank)
K4	Connector pipe of a manometer

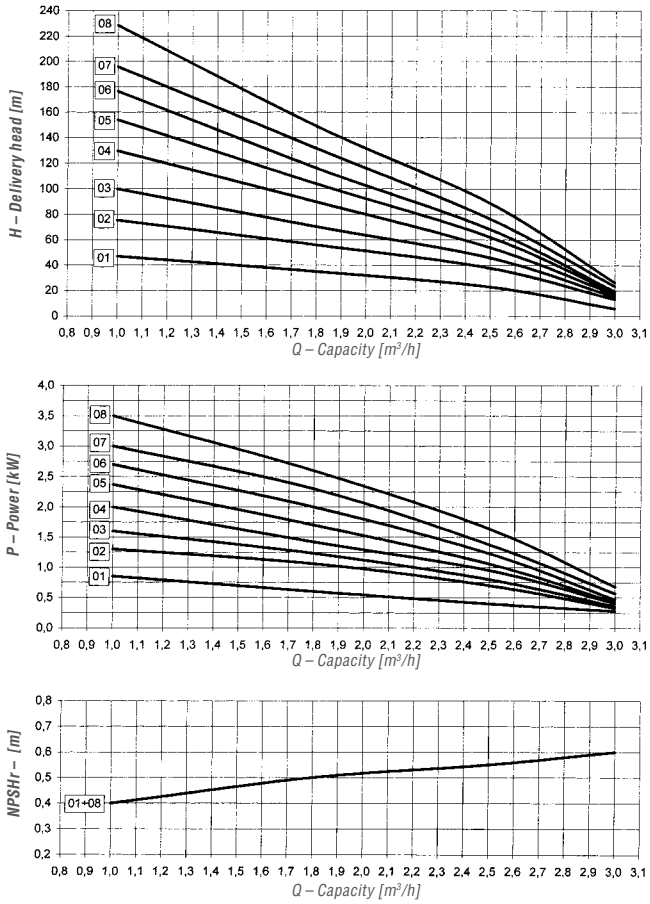
Design variant	DN	D1	K	D	L	dn	d1	k	d	l	G
3250	32	76	100	140	18	25	65	85	115	14	G 1/4"
4260											G 1/2"
3270	40	84	110	150	18						G 1/4"
4280											G 1/2"

** - Collar sizes acc. to the norm PN-ISO 7005-1*
*** - assembly lengths of the gland seal is 40 mm*

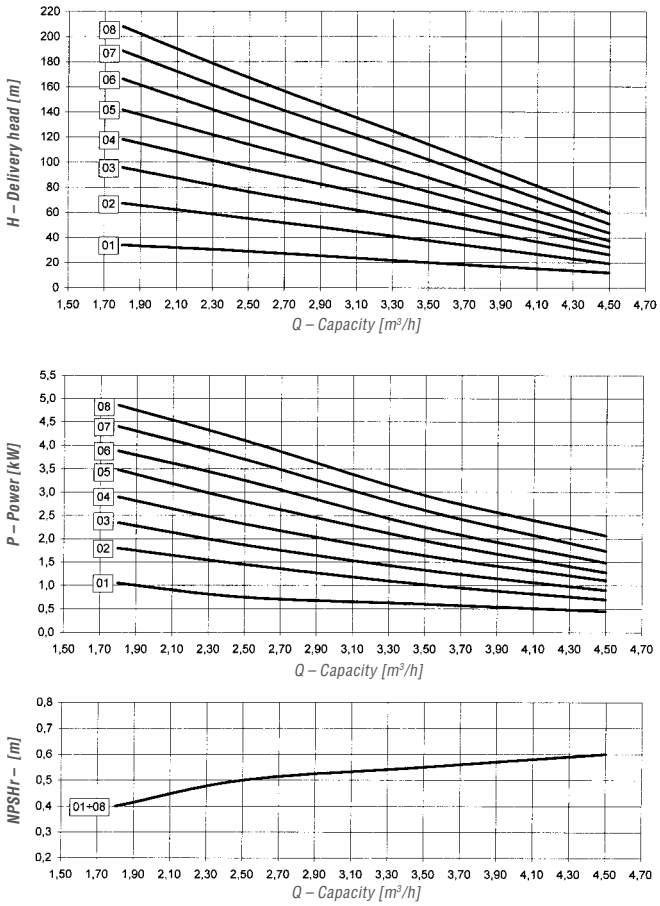
The characteristics of the SKC.2 and SKD.2 pump 50 Hz



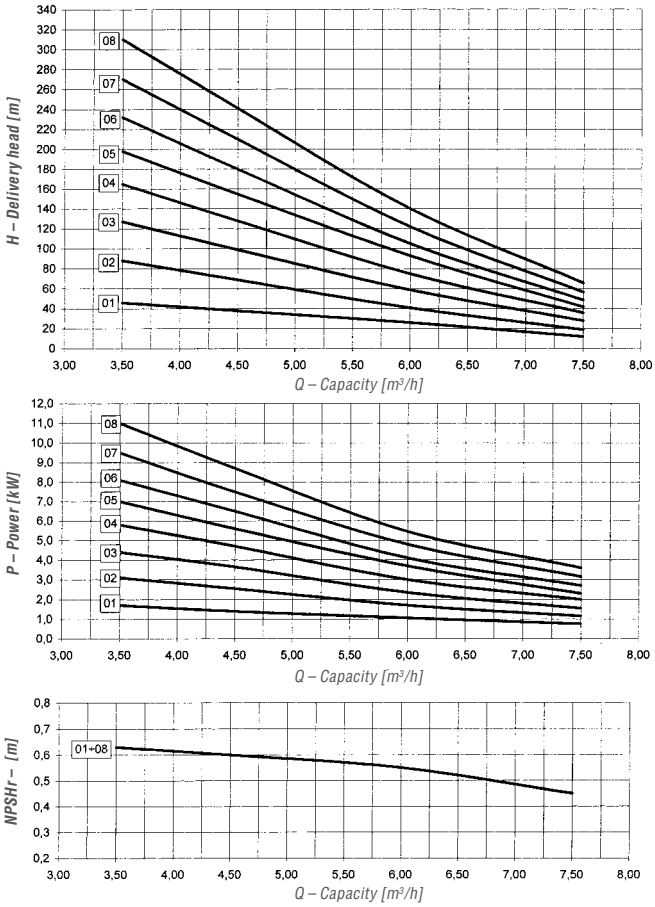
The characteristics of the SKC.3 and SKD.3 pump 50 Hz



The characteristics of the SKC.4 and SKD.4 pump 50 Hz



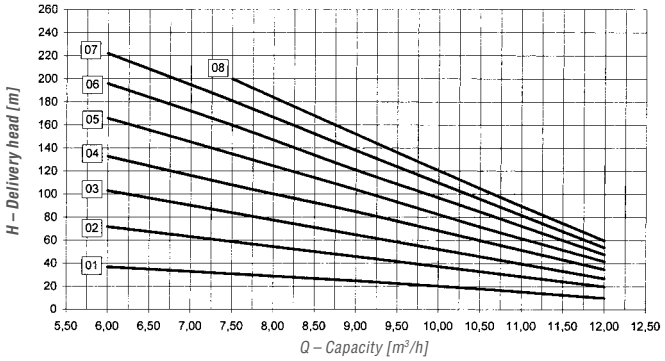
The characteristics of the SKC.5 and SKD.5 pump 50 Hz

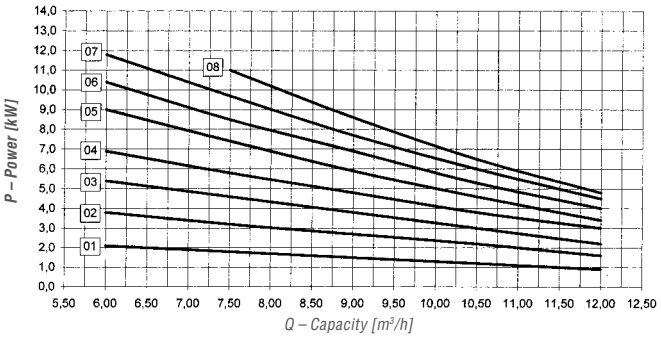


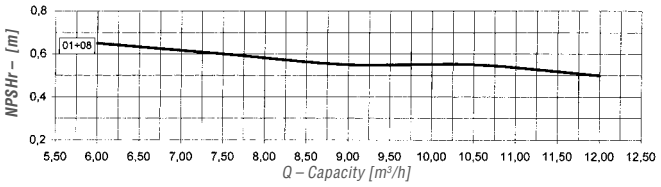
Description of the characteristic quantities of SKC/SKD.2 ÷ SKC/SKD.8 pumps:

H[m] - *H delivery head* ***Q[m³/h]*** - *Q Capacity* ***NPSH[m]*** - *net positive suction head* ***P[kW]*** - *Power of one stage*

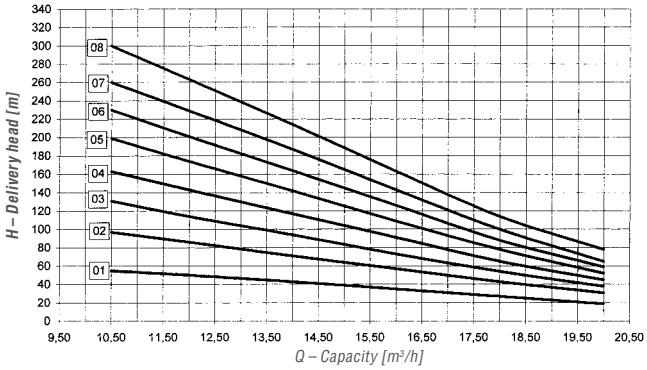
The characteristics of the SKC.6 and SKD.6 pump 50 Hz

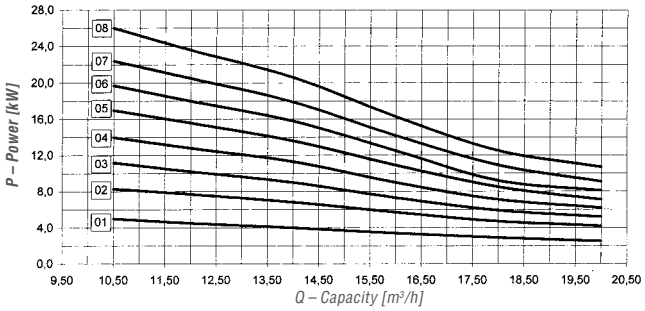


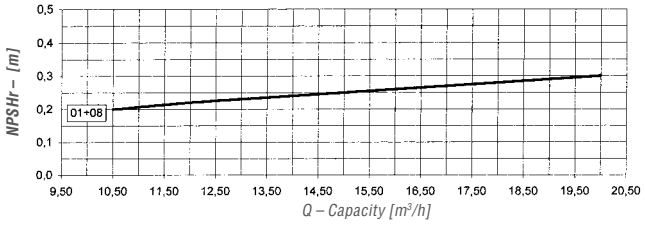




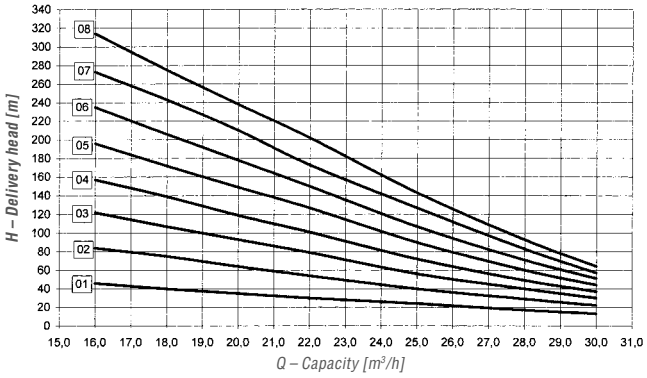
The characteristics of the SKC.7 and SKD.7 pump 50 Hz

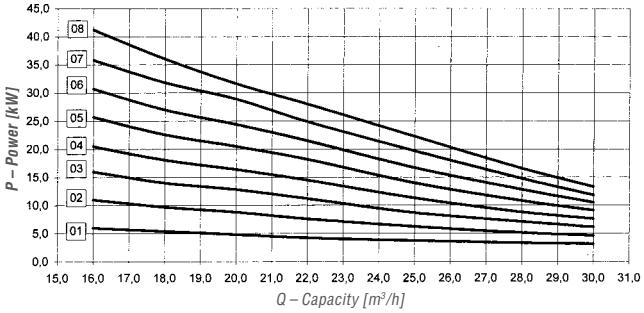


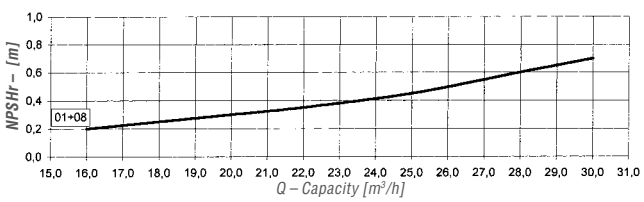




The characteristics of the SKC.8 and SKD.8 pump 50 Hz







Technical requirements

During assembly of the installation, special attention should be paid to meeting the following technical requirements:

- when assembling the pump which is going to cooperate with an underground tank, it is necessary to minimize the resistance of flow in the suction pipeline. Hence the pump should be mounted as close as possible to the vertical section of the pipe coming out of the underground tank (max. 2m far from the suction flange of the pump). The minimum diameter of the suction pipe should be 2 inches. The underground tank should be equipped with ZZG check valve which was functionally tested and is characterised by minimum flow resistance.
- one should try to maximally limit the flow resistance in the suction pipe
- flow cross-section should not be changed just before the pump, by assembly of elbows, filters, valves or reducers
- it is absolutely necessary to apply a gas flow normalizing section before the intake to the SKC pump (Lmin=20d)

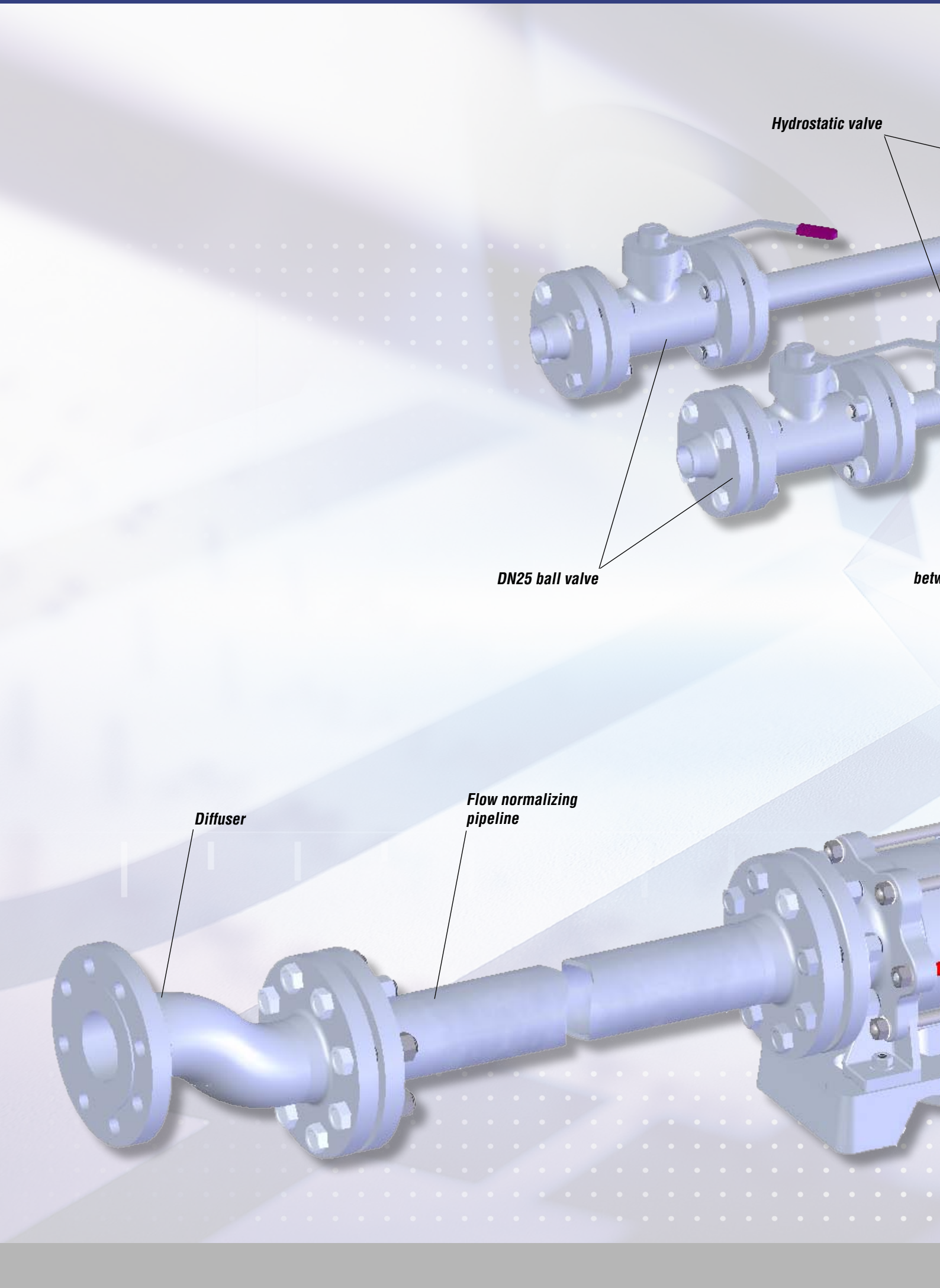
During the switch-off of the pump, the ball valve on the pressure side of the pump must be opened in half. In case of complete opening of that valve, there is a danger of gas evaporation (the pump would operate beyond the catalogue range). The ball valve in the pressure equallizing pipe and the ball valve at the suction side must be entirely opened during the pump start-up, one must be absolutely sure that the pump is filled with liquid gas.

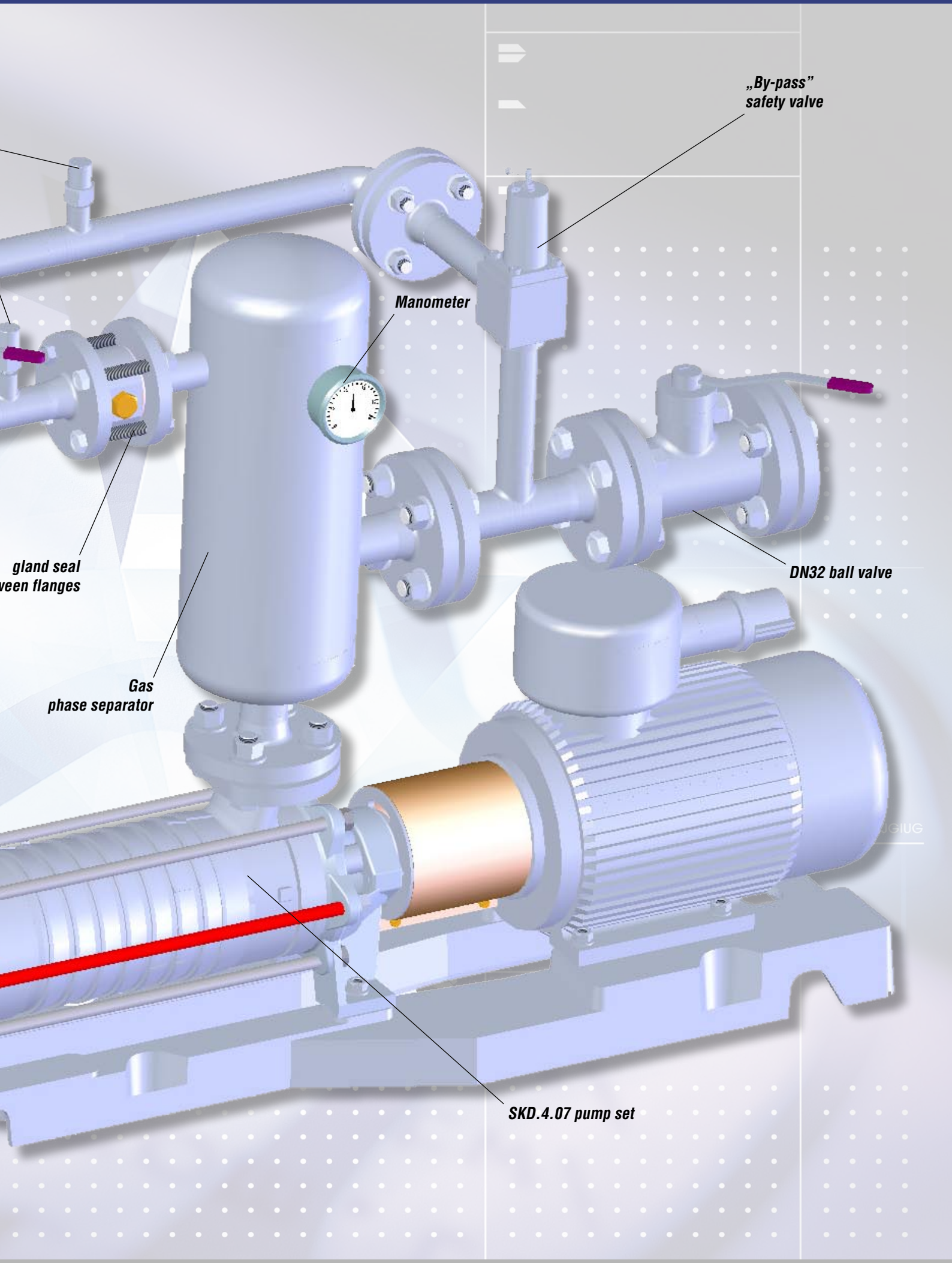
To be sure that the pump is filled with the gas, it is recommended to install a flow meter or a flow indicator, below the ball valve in the pressure pipe.

- the suction pipe should be as short as possible; the entire pumping system should be protected against external heat impact.
- the gas flow speed in the suction pipe cannot exceed 1m/s
- for contaminated liquids, the pipeline should be equipped with the filter
- the free section of the filter must be at least three times as big as the nominal diameter of the intake pipe of the pump
- the filter should be cleaned periodically
- minimal diameter of the suction pipe must be at least of the same length as pump connectors (dr ≥ds) along the whole length of the pipeline (from the tank outlet to the pump connector).
- gas flow direction is marked on the pump with arrows
- installation of the pipe must be performed in such a way that there is no stress at the connections to the pump (it is recommended to use compensators)
- before connecting to the pump, the pipe installation should be carefully cleaned of welding chips, rasping, stain and other foreign bodies
- if the pipe is installed in the area of explosion hazard, one has to apply devices required by the binding safety regulations.
- motor rotation direction must be consistent with the pump rotation direction (marked on the suction housing)

Local regulations concerning electrical devices should be observed.

- motor rotation direction is couterclockwise , looking at the pump from the motor direction
- it is necessary to check the position of the coupling after putting the pump on the foundation and connecting it to the installation.


Hydrostatic valve
DN25 ball valve
betw
Diffuser
Flow normalizing
pipeline


„By-pass”
safety valve
Manometer
gland seal
veen flanges
DN32 ball valve
Gas
phase separator
SKD.4.07 pump set

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- *designed, manufactured and sold millions of pumps*

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