

# Liquid ring vacuum pumps

## single-stage

## LPH 70123, LPH 70530, LPH 70540

**Pressure range:** 120 to 1013 mbar  
**Suction volume flow:** 500 to 1900 m<sup>3</sup>/h

### CONSTRUCTION TYPE

Sterling SIHI liquid ring vacuum pumps are displacement pumps of uncomplicated and robust construction with the following particular features:

- handling of nearly all gases and vapours
- non-polluting due to nearly isothermal compression
- oil-free, as no lubrication in the working chamber
- small quantities of entrained liquid can be handled
- easy maintenance and reliable operation
- low noise and nearly free from vibrations
- wide choice of material, therefore applicable nearly everywhere
- incorporated dirt drain
- incorporated central drain
- no metallic contact of the rotating parts

The Sterling SIHI liquid ring vacuum pumps LPH 70123, LPH 70530 and LPH 70540 are single-stage ones. They can be applied without modification as compressors up to a compression pressure of 1,5 bar ( see catalogue part K).

### APPLICATION

Handling and exhausting of dry and humid gases, entrained liquid can be handled during normal duty. The pumps are applied in all fields where a pressure of 120...900 mbar must be created by robust vacuum pumps.

Fields of application are for example

- chemistry and pharmacy for distilling and degassing
- electric industry for impregnation and drying
- plastics industry for degassing etc.



### NOTE

During operation the pump must continuously be supplied with service liquid, normally water, in order to eliminate the heat resulting from the gas compressor and to replenish the liquid ring, because part of the liquid is leaving the pump together with the gas. This liquid can be separated from the gas in a liquid separator (see catalogue part accessories).

It is possible to reuse the service liquid. The pumps are equipped with a device by which the contaminated service liquid can continuously be drained during operation (dirt drain), if necessary. The direction of rotation is clockwise, when looking from the drive on the pump.

### GENERAL TECHNICAL DATA

Pump type	unit	LPH 70123	LPH 70530	LPH 70540
Speed	rpm	880 975 <sup>1)</sup> 1175	880 975 <sup>1)</sup> 1175	880 975 <sup>1)</sup> 1175
Max. compression over pressure	bar		1,5	
Max. admissible pressure difference	bar	1,8 1,8 1,4 <sup>2)</sup> 1,8	1,8 1,7 1,4 <sup>2)</sup> 1,6	1,7 1,6 1,4 <sup>2)</sup> 1,5
Hydraulic test (over pressure)	bar		3	
Moment of inertial of the rotating pump parts and the water filling	kg · m <sup>2</sup>	1,36	1,76	2,26
Sound pressure level at a suction pressure of 200 mbar	dB (A)	76 77 78	78 79 80	78 79 80
Min. pulley diameter admissible in case of V-belt drive	mm	315 315 355	355	400
Max. gas temperature	°C		200	
	dry			
	saturated		100	
Service liquid				
max. admissible temperature	°C		100	
max. viscosity	mm <sup>2</sup> /s		90	
max. density	kg/m <sup>3</sup>		1200	
volume up to shaft level	liter	32	35	38
Max. flow resistance of the heat exchanger	bar		0,2	

The combination of several limiting values is not admissible.

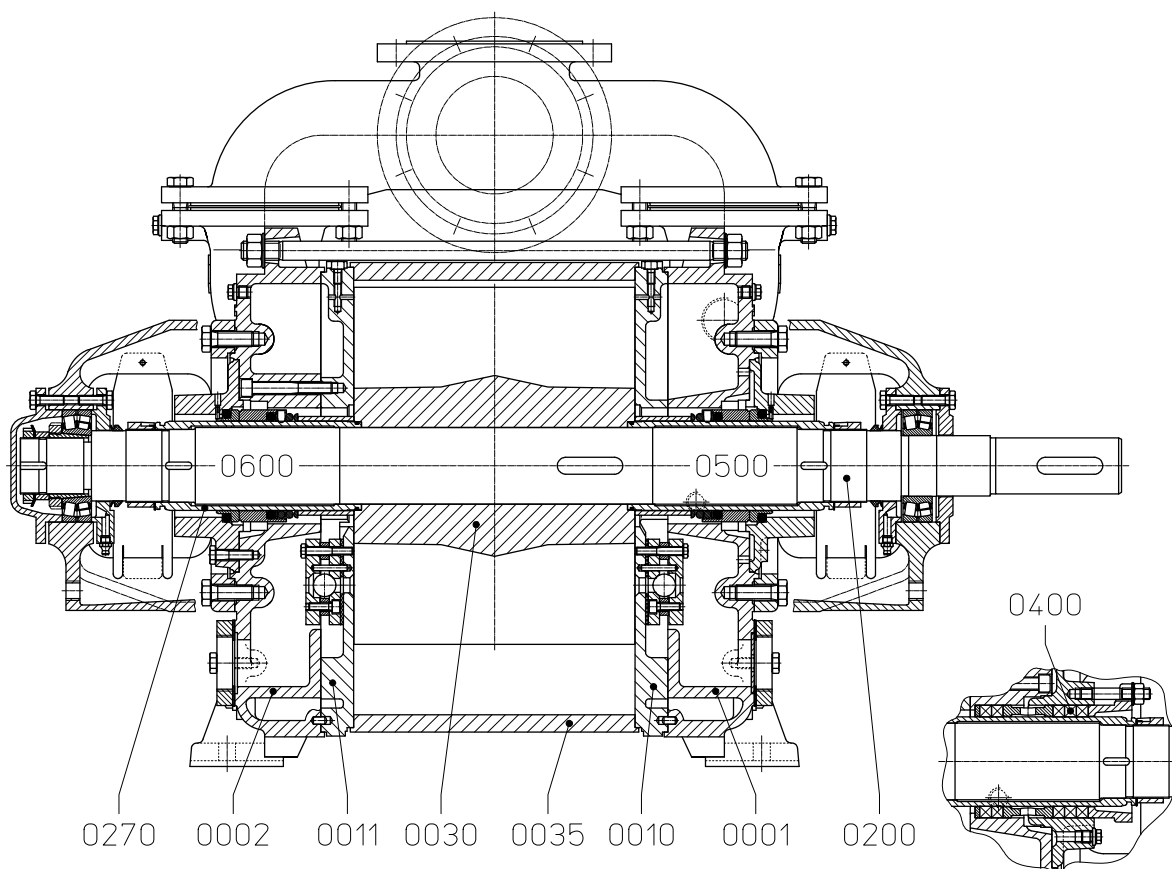
<sup>1)</sup> normal speed

<sup>2)</sup> with V-belt drive

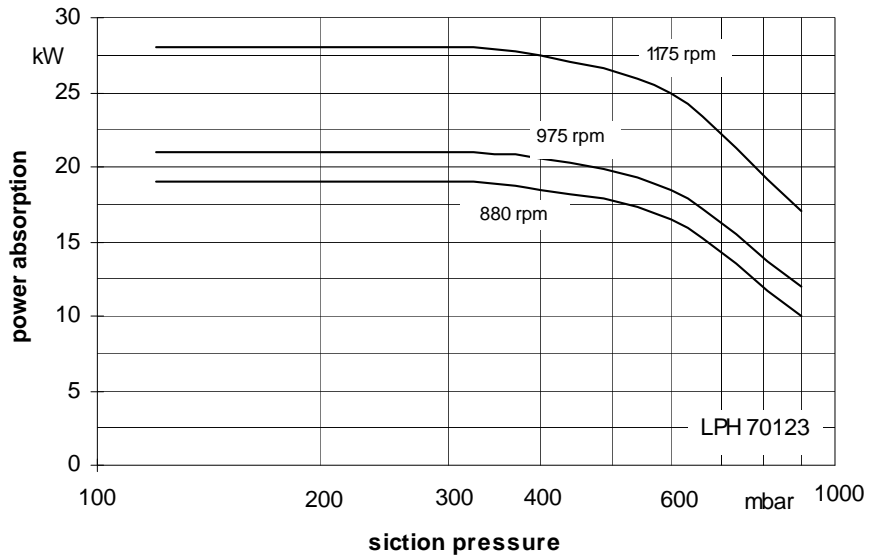
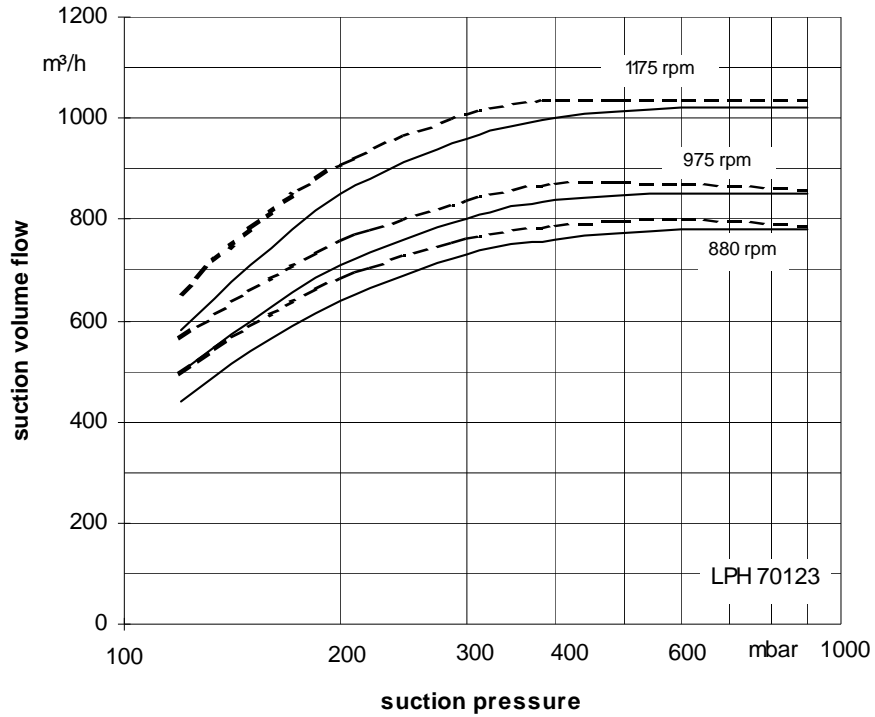
## Material design

Item.	COMPONENTS	MATERIAL DESIGN	
		02	42
0001, 0002	Casing	0.6025	1.4408
0010, 0011	Guide disk	0.6025	1.4408
0030	Vane wheel impeller	1.0570	1.4517
0035	Central body	1.0038	1.4571
0200	Shaft	1.0503	
0270	Shaft sleeve	1.4027.05	1.4571
0400	Gland packing	GORE	-
0500, 0600	Mechanical seal	Cr-steel / carbon / Perbunan	Cr Ni Mo-steel / carbon / Viton

## Sectional drawing LPH 70123, LPH 70530, LPH 70540



**Suction volume flow and power absorption LPH 70123**

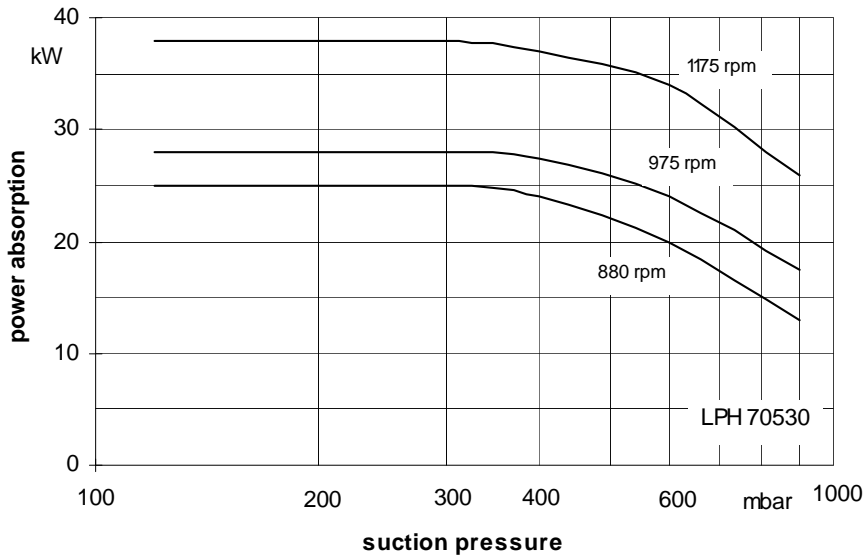
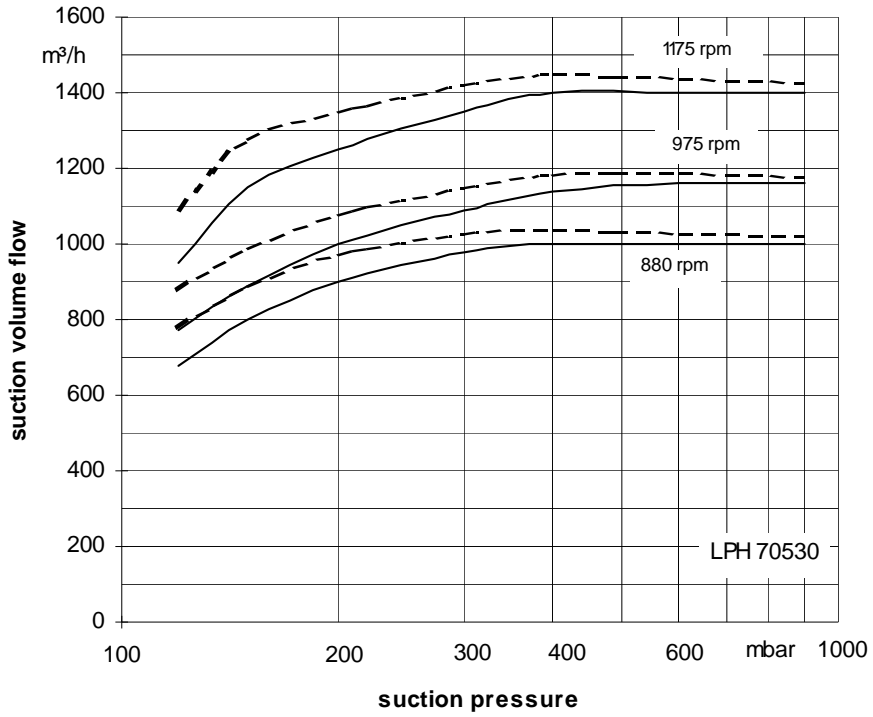


The operating data are applicable under the following conditions:

- pumping medium:
  - dry air: 20°C \_\_\_\_\_
  - water vapour saturated air: 20°C - - - - -
- service liquid:
  - water: 15°C \_\_\_\_\_

Compression pressure 1013 mbar (atmospheric pressure)  
 The suction volume flow is applied to the suction pressure  
 Tolerance of the operating data 10% and of the power absorption 5%  
 Max. fresh water need with the lowest suction pressure.

# Suction volume flow and power absorption LPH 70530

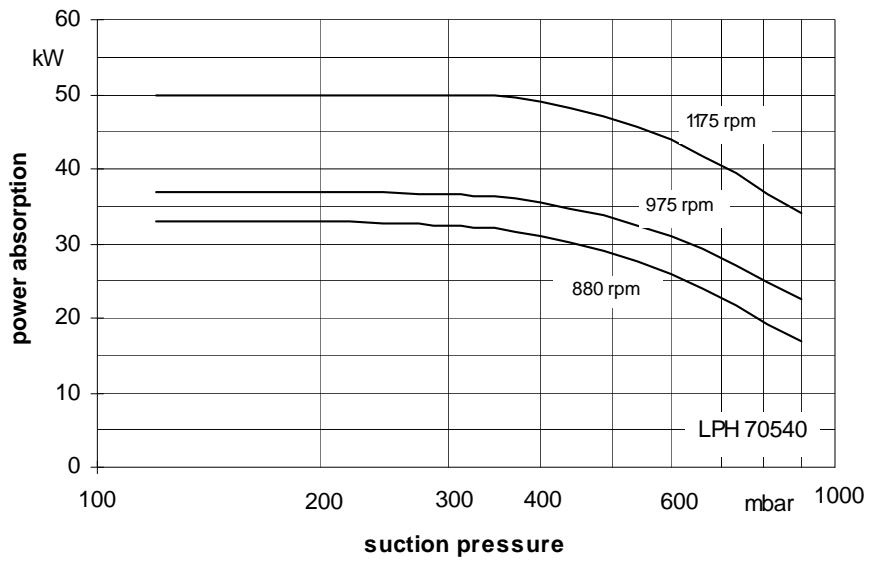
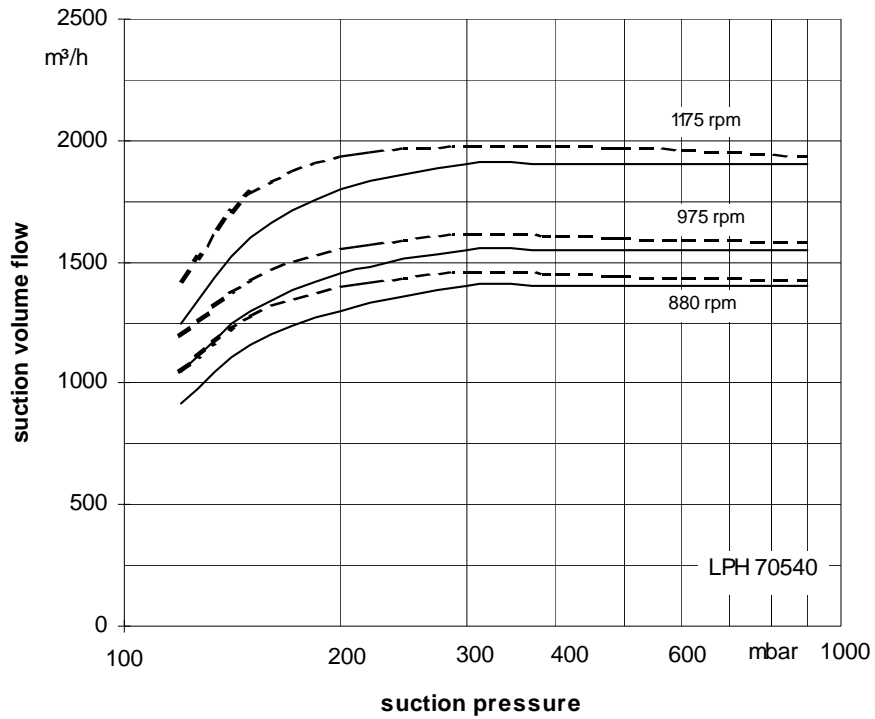


The operating data are applicable under the following conditions:

- pumping medium:
  - dry air: 20°C \_\_\_\_\_
  - water vapour saturated air: 20°C - - - - -
- service liquid:
  - water: 15°C \_\_\_\_\_

Compression pressure 1013 mbar (atmospheric pressure)  
 The suction volume flow is applied to the suction pressure  
 Tolerance of the operating data 10% and of the power absorption 5%  
 Max. fresh water need with the lowest suction pressure.

## Suction volume flow and power absorption LPH 70540



The operating data are applicable under the following conditions:

- pumping medium:
  - dry air: 20°C \_\_\_\_\_
  - water vapour saturated air: 20°C - - - - -
- service liquid:
  - water: 15°C \_\_\_\_\_

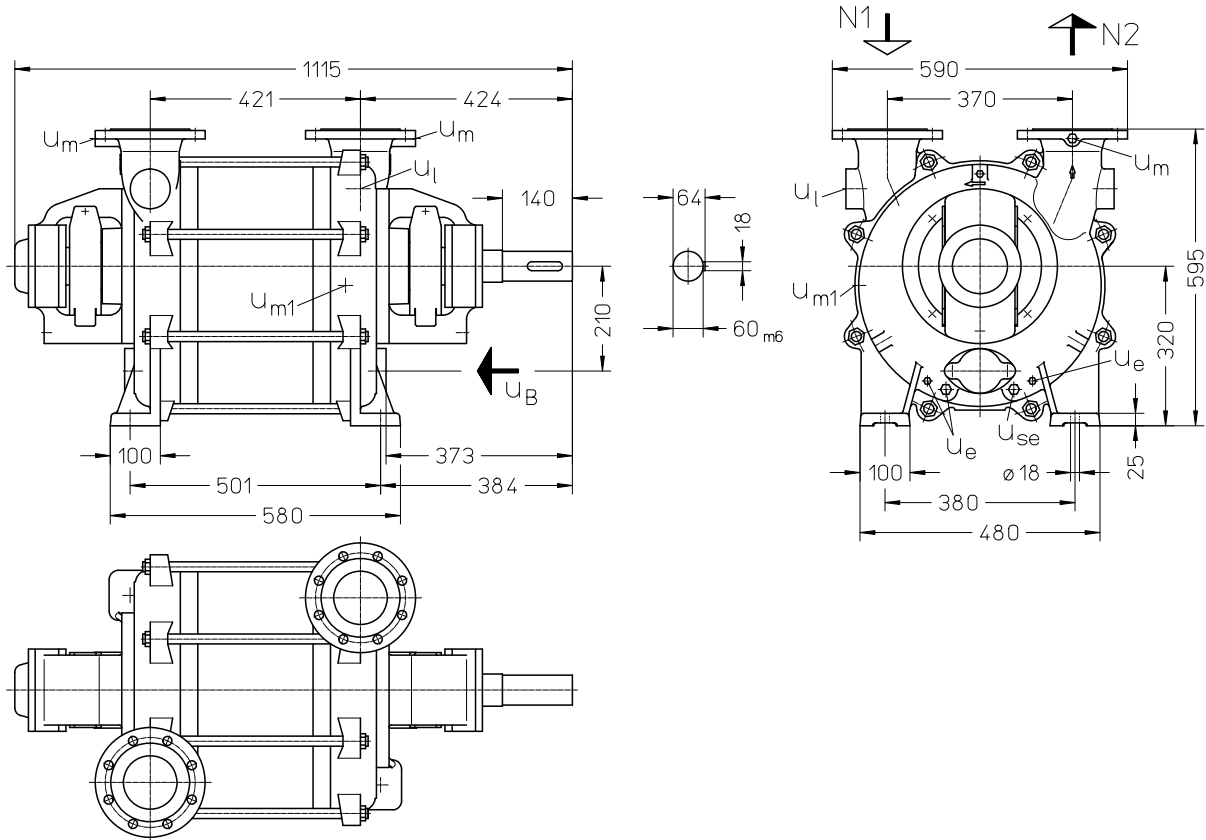
Compression pressure 1013 mbar (atmospheric pressure)

The suction volume flow is applied to the suction pressure

Tolerance of the operating data 10% and of the power absorption 5%

Max. fresh water need with the lowest suction pressure.

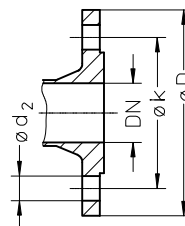
## Dimension table LPH 70123



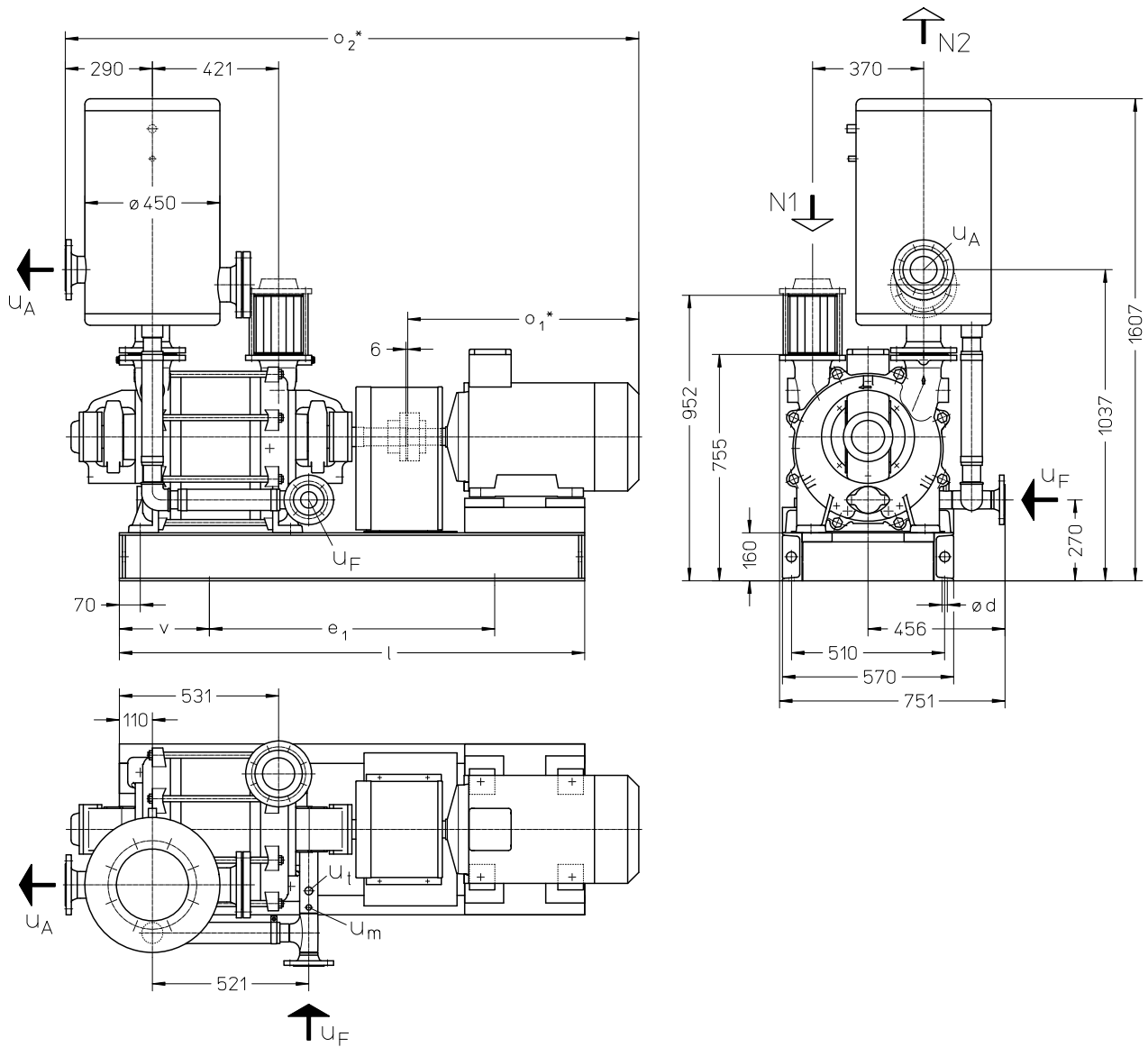
**weight: abt. 370 kg**

- N 1 = gas inlet DN 100
- N 2 = gas outlet DN 100
- U<sub>B</sub> = connection for service liquid G 2
- U<sub>e</sub> = drainage (screwed plug) G ¼
- U<sub>l</sub> = connection for vent cock G 1 ½
- U<sub>m</sub> = connection for pressure gauge G ¾
- U<sub>m1</sub> = connection for drain valve G ½
- U<sub>se</sub> = connection for dirt drain G ½

flange connections to DIN 2501 PN 10 [mm]	
DN	100
k	180
D	220
number x d <sub>2</sub>	8 x 18



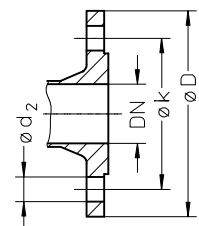
# Arrangement drawings LPH 70123 with overhead liquid separator



- N 1 = gas inlet DN 100
- N 2 = gas outlet DN 200
- U<sub>A</sub> = connection for liquid drain DN 80
- U<sub>F</sub> = connection for fresh liquid DN 50
- U<sub>m</sub> = connection for pressure gauge G ¼
- U<sub>t</sub> = connection for thermometer G ½

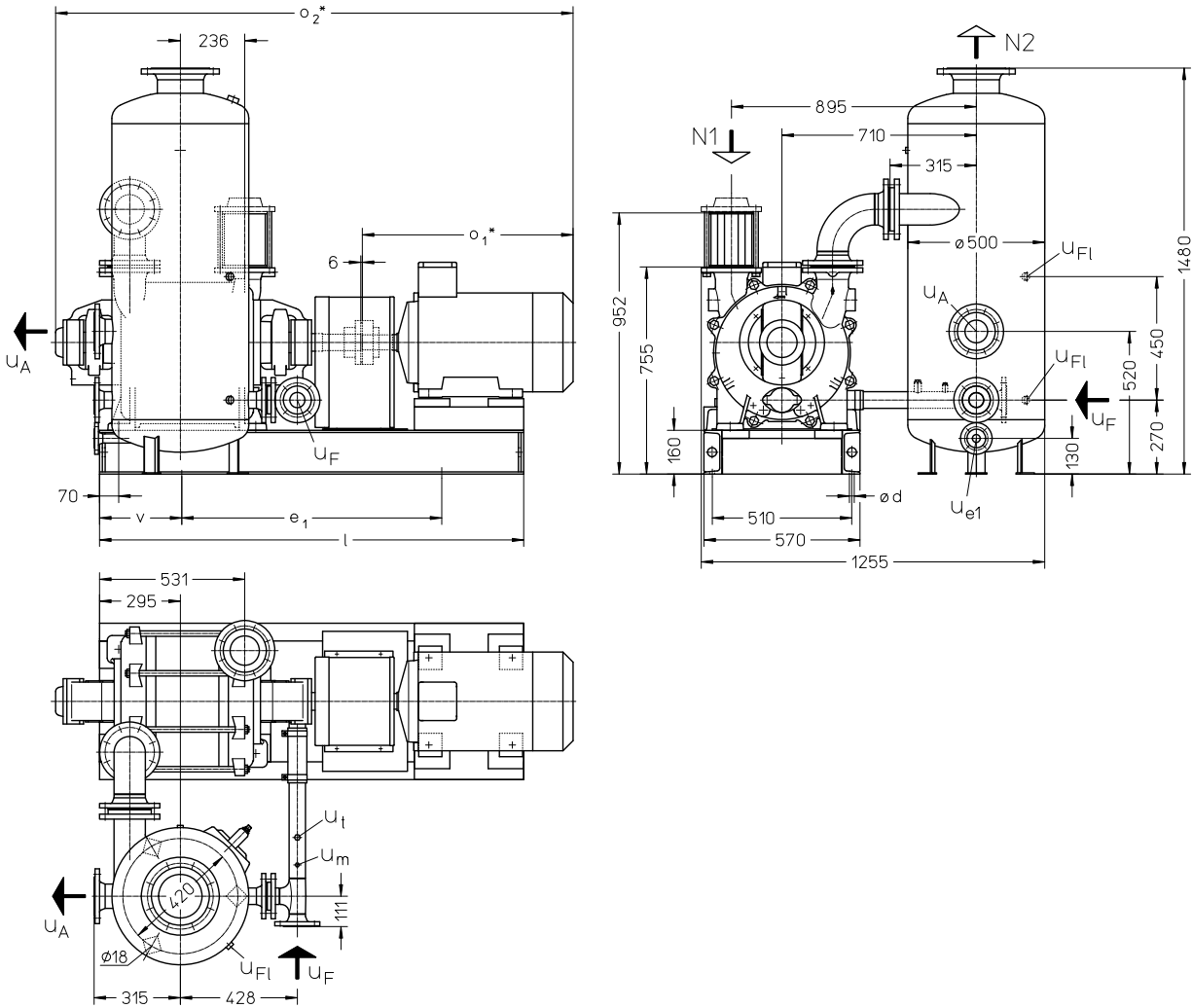
	electric motor 50 Hz			d [mm]	e <sub>1</sub> [mm]	l [mm]	o <sub>1</sub> * [mm]	o <sub>2</sub> * [mm]	v [mm]	approx. weight [kg]
	size	kW								
LPH 70123	200 L	22	-	18	950	1550	770	1910	300	820
	225 M	-	27	15	1000	1700	875	2015	350	1000

flange connections to DIN 2501 PN 10 [mm]				
DN	50	80	100	200
k	125	160	180	295
D	165	200	220	340
number x d <sub>2</sub>	4 x 18	8 x 18	8 x 18	8 x 22



\* dimensions dependent on the motor make

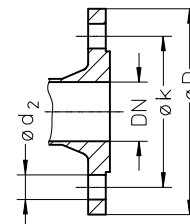
Arrangement drawing LPH 70123 with upright liquid separator



- N 1 = gas inlet DN 100
- N 2 = gas outlet DN 150
- UA = connection for liquid drain DN 80
- Ue1 = drain connection DN 25
- UF = connection for fresh liquid DN 50
- UF1 = connection for liquid level indicator G ½
- Um = connection for pressure gauge G ¼
- Ut = connection for thermometer G ½

	electric motor 50 Hz			d [mm]	e <sub>1</sub> [mm]	l [mm]	o <sub>1</sub> * [mm]	o <sub>2</sub> * [mm]	v [mm]	approx. weight [kg]
	size	IP 55	kW EEx e II T3							
LPH 70123	200 L	22	-	18	950	1550	770	1891	300	850
	225 M	-	27	15	1000	1700	875	1996	350	1030

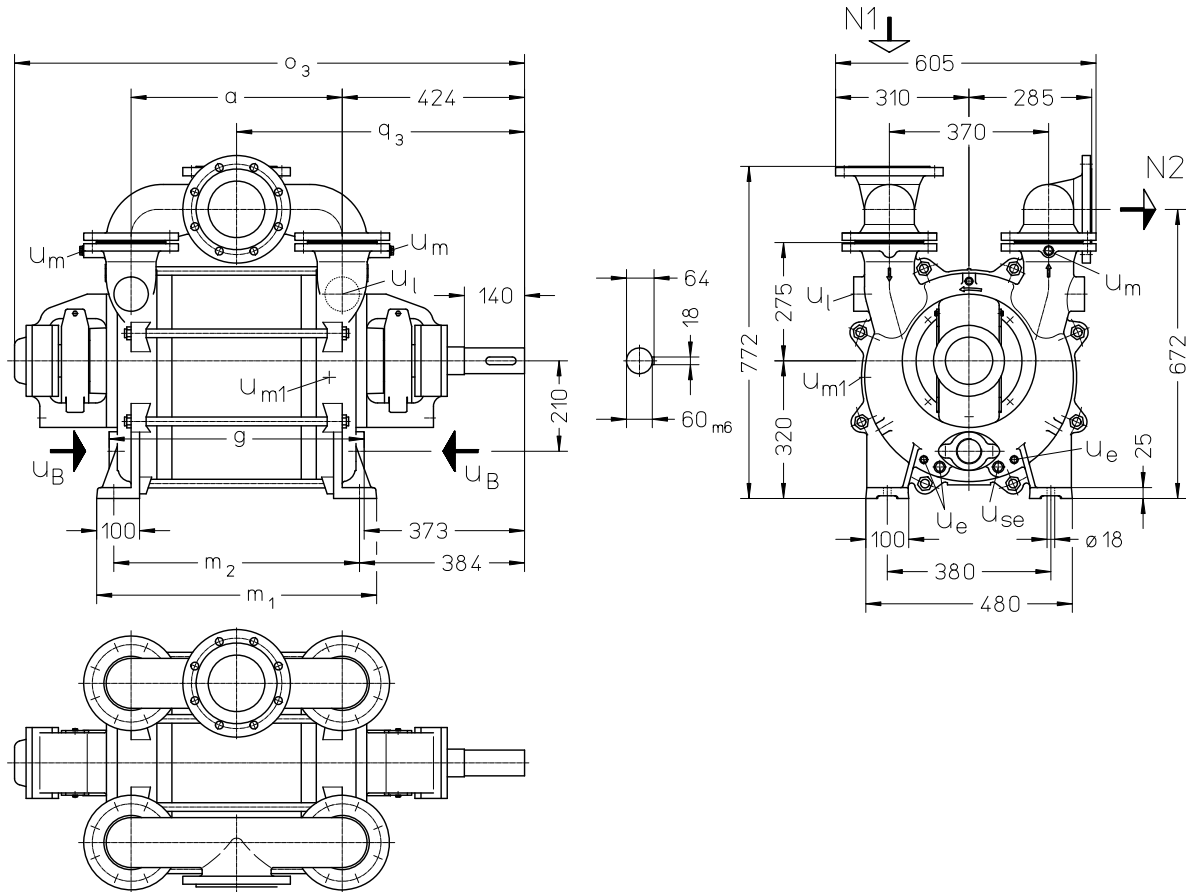
flange connections to DIN 2501 PN 10 [mm]					
DN	25	50	80	100	150
k	85	125	160	180	240
D	115	165	200	220	285
number x d <sub>2</sub>	4 x 14	4 x 18	8 x 18	8 x 18	8 x 22



\* dimensions dependent on the motor make



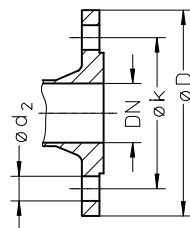
**Dimension table LPH 70530, LPH 70540**



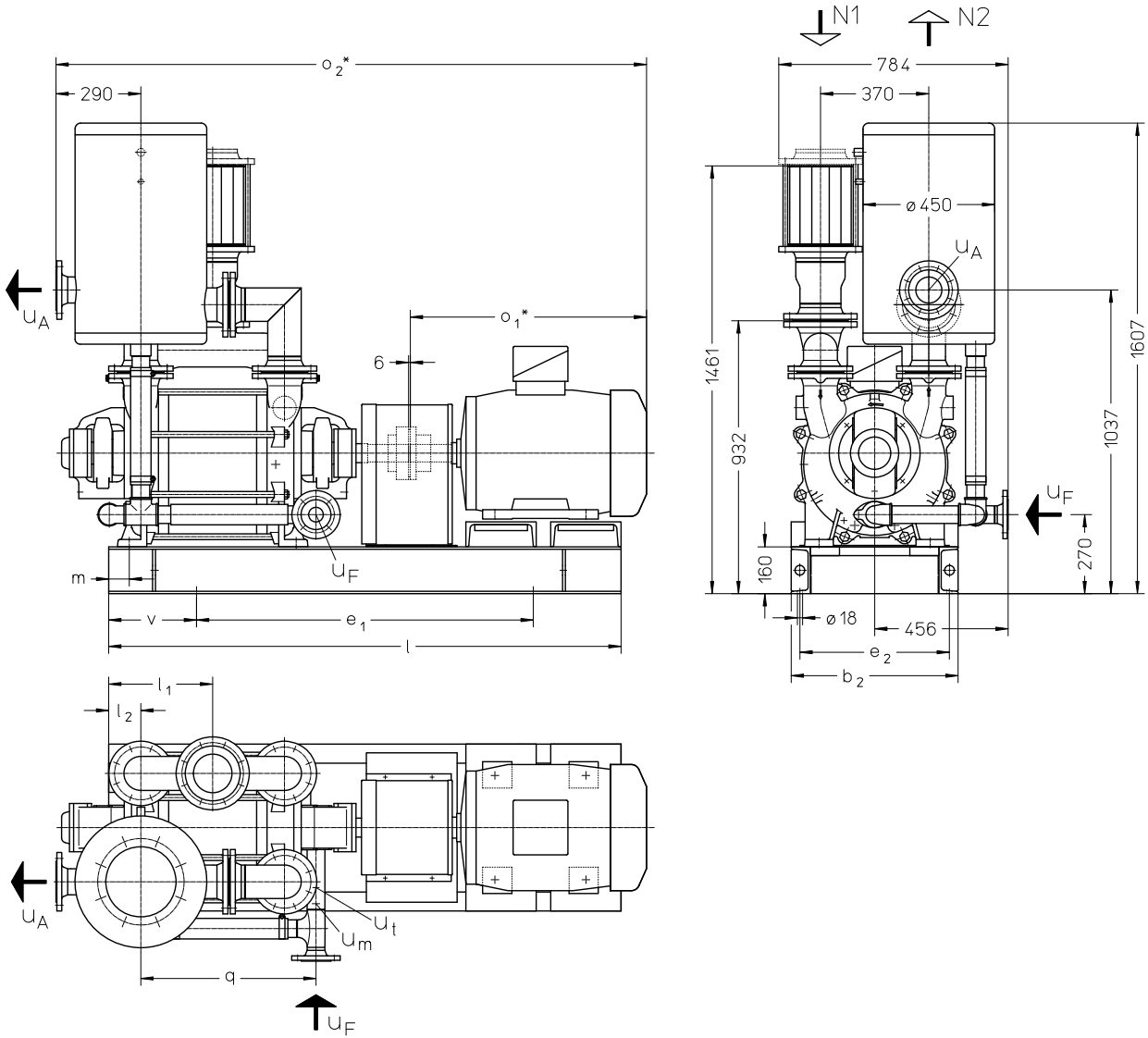
- N 1 = gas inlet DN 125
- N 2 = gas outlet DN 125
- u<sub>B</sub> = connection for service liquid G 2
- u<sub>e</sub> = drainage (screwed plug) G ¼
- u<sub>l</sub> = connection for vent cock G 1½
- u<sub>m</sub> = connection for pressure gauge G ¾
- u<sub>m1</sub> = connection for drain valve G ½
- u<sub>se</sub> = connection for dirt drain G ½

	a [mm]	g [mm]	m <sub>1</sub> [mm]	m <sub>2</sub> [mm]	o <sub>3</sub> [mm]	q <sub>3</sub> [mm]	approx. weight [kg]
LPH 70530	491	593	650	571	1185	669	490
LPH 70540	591	693	750	671	1285	719	540

flange connections to DIN 2501 PN 10 [mm]	
DN	125
k	210
D	250
number x d <sub>2</sub>	8 x 18



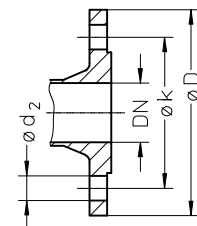
Arrangement drawing LPH 70530, LPH 70540 with overhead liquid separator



- N 1 = gas inlet DN 150
- N 2 = gas outlet DN 200
- UA = connection for liquid drain DN 80
- UF = connection for fresh liquid DN 50
- Um = connection for pressure gauge G ¼
- Ut = connection for thermometer G ½

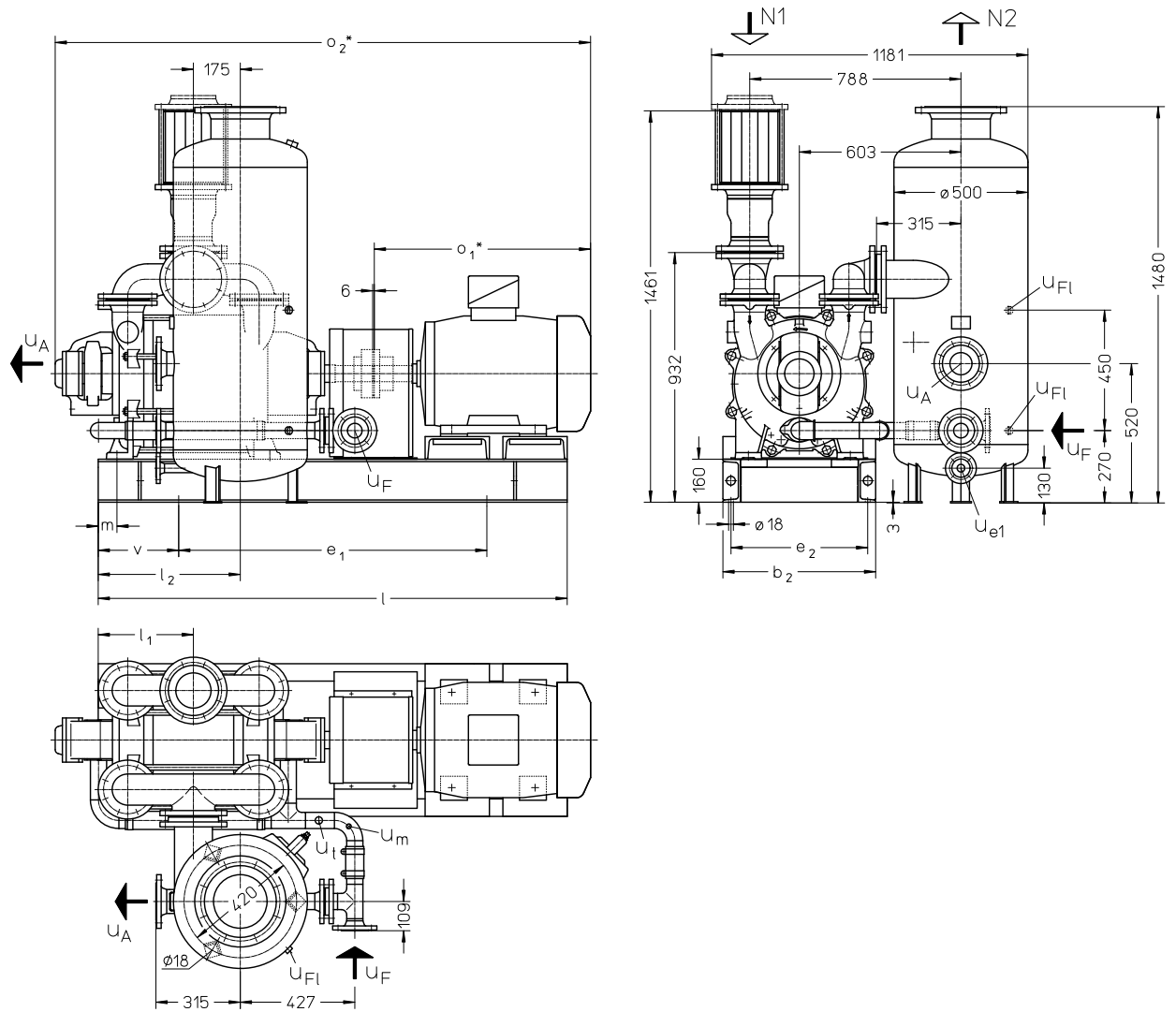
	electric motor 50 Hz			b <sub>2</sub> [mm]	e <sub>1</sub> [mm]	e <sub>2</sub> [mm]	l [mm]	l <sub>1</sub> [mm]	l <sub>2</sub> [mm]	m [mm]	o <sub>1</sub> * [mm]	o <sub>2</sub> * [mm]	q [mm]	v [mm]	approx. weight [kg]
	size	kW													
LPH 70530	225 M	30	-	570	1050	510	1750	355	110	70	807	2017	598	350	1000
	250 M	-	33		1140		1940	445	200	160	935	2145			1220
LPH 70540	280 S	45	-	590	1100	530	1900	375	80	40	960	2270	698	400	1370
	280 S	-	40								1010	2320			1420
	280 M	-	46	570	1140	510	1940	395	100	60	1470				

flange connections to DIN 2501 PN 10 [mm]				
DN	50	80	150	200
k	125	160	240	295
D	165	200	285	340
number x d <sub>2</sub>	4 x 18	8 x 18	8 x 22	8 x 22



\* dimensions dependent on the motor make

### Arrangement drawing LPH 70530, LPH 70540 with upright liquid separator



N 1 = gas inlet DN 150

N 2 = gas outlet DN 200

u<sub>A</sub> = connection for liquid drain DN 80

u<sub>e1</sub> = drain connection DN 25

u<sub>F</sub> = connection for fresh liquid DN 50

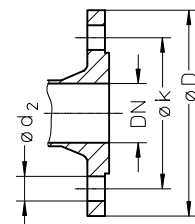
u<sub>F1</sub> = connection for liquid level indicator G ½

u<sub>m</sub> = connection for pressure gauge G ¼

u<sub>t</sub> = connection for thermometer G ½

	electric motor 50 Hz			b <sub>2</sub> [mm]	e <sub>1</sub> [mm]	e <sub>2</sub> [mm]	l [mm]	l <sub>1</sub> [mm]	l <sub>2</sub> [mm]	m [mm]	o <sub>1</sub> * [mm]	o <sub>2</sub> * [mm]	v [mm]	approx. weight [kg]
	size	IP 55	kW											
LPH 70530	225 M	30	-	570	1050	510	1750	355	530	70	807	1998	350	1030
	250 M	-	33		1140		1940	445	620	160	935	2126		
LPH 70540	280 S	45	-	590	1100	530	1900	375	550	40	960	2251	400	1400
	280 S	-	40								1010	2301		1450
	280 M	-	46	570	1140	510	1940	395	570	60	1500			

flange connections to DIN 2501 PN 10 [mm]					
DN	25	50	80	150	200
k	85	125	160	240	295
D	115	165	200	285	340
number x d <sub>2</sub>	4 x 14	4 x 18	8 x 18	8 x 22	8 x 22



\* dimensions dependent on the motor make

**Fresh water requirement** in [m<sup>3</sup>/h] dependent on suction pressure, speed, mode of operation and difference in temperature

suction pressure in [mbar]		120				400				600				900							
pump	speed [rpm]	KB				FB	KB				FB	KB				FB					
		difference in temperature [°C]					difference in temperature [°C]					difference in temperature [°C]									
		20	10	5	2		20	10	5	2		20	10	5	2		20	10	5	2	
LPH 70123	880	0,7	1,15	1,8	2,7	4	0,65	1,05	1,55	2,2	3	0,5	0,85	1,15	1,55	2	0,25	0,35	0,44	0,53	0,6
	975	0,75	1,25	1,9	2,75		0,70	1,1	1,6	2,25		0,55	0,9	1,25	1,6		0,3	0,4	0,46	0,54	
	1175	0,9	1,5	2,2	3,0		0,85	1,3	1,85	2,4		0,7	1,05	1,33	1,7		0,35	0,45	0,5	0,55	
LPH 70530	880	0,9	1,6	2,6	4,05	6,5	0,85	1,45	2,2	3,3	4,8	0,7	1,15	1,7	2,4	3,3	0,35	0,55	0,7	0,85	1
	975	1,0	1,75	2,75	4,2		0,95	1,6	2,4	3,4		0,8	1,25	1,85	2,5		0,45	0,6	0,75	0,88	
	1175	1,3	2,15	3,25	4,65		1,2	1,9	2,75	3,7		1,0	1,55	2,1	2,7		0,55	0,7	0,8	0,92	
LPH 70540	880	1,2	2,0	3,15	4,7	7	1,05	1,75	2,6	3,65	5	0,85	1,35	1,95	2,65	3,5	0,4	0,6	0,75	0,88	1
	975	1,3	2,2	3,35	4,85		1,15	1,9	2,75	3,75		0,95	1,5	2,1	2,75		0,5	0,65	0,8	0,91	
	1175	1,65	2,65	3,85	5,3		1,5	2,3	3,15	4,05		1,25	1,8	2,4	2,95		0,6	0,75	0,85	0,94	

FB = fresh liquid service

KB = combined liquid service with service water 20 °C, 10 °C, 5 °C, 2 °C warmer than the fresh water.

**Data regarding the pump size - order notes**

series + size	hydraulik +bearings	shaft sealing	material design	casing seal
	B• 2 antifriction bearings •N 1 shaft end, clockwise	041 double gland packing 135 mechanical seal, SIHI-FN	02 main parts of iron cast without non-ferrous metal 42 main parts of Cr Ni Mo-cast steel	0 liquid seal
LPH 70123 70530 70540	BN	041, 135	02, 42	0

**Motor Selection**

For our products we offer a lot of different motor types.

To identify the right motor please specify frequency, voltage and protection class.

**Example of an Order:**

LPHA 70123 BN 135 02 0 with 30.0 kW AC motor, 50 Hz, 400V Δ, IP55

## Accessories

Recommended accessories			LPH 70123	LPH 70530	LPH 70540	
<b>Overhead liquid separator</b>				XBa 10040 70 kg		
material design	Steel, galvanised 1.4571	type weight SIHI part No..		35 000 443 35 000 444		
service liquid line						
material design	1.0254 1.4571	SIHI part No.	35 003 201 35 003 202	35 003 192 35 005 866	35 003 193 35 003 194	
suction line						
material design	1.0254 1.4571	SIHI part No.	-	35 003 233 35 015 999	35 003 234 35 007 180	
blank flange DN 100						
material design	1.0038 1.4571	SIHI part No.	43 002 146 43 002 148	-	-	
<b>Upright liquid separator</b>				XBp 2312 98 kg		
material design	Steel, galvanised 1.4571	type weight SIHI part No.	XBp 2311 96 kg 35 000 568 35 000 569	35 000 571 35 000 572		
service liquid line						
material design	1.0254 1.4571	SIHI part No.	35 003 173 35 003 174	35 003 176 35 003 177	35 003 178 35 003 179	
suction line						
material design	1.0254 1.4571	SIHI part No.	35 003 231 35 003 232	-	-	
<b>Non-return valve</b>				XCk 150 / 36 kg resp. 43 kg		
material design	0.6025 + Butadiene rubber 1.4408 + Teflon	type / weight SIHI part No.	XCk 100 / 16 kg resp. 17,5 kg 20 072 798 20 006 983	20 072 800 20 006 987		
reduction						
material design	1.0038 1.4571	SIHI part No.	-	35 002 762 35 014 264		
<b>Motor</b> in case of standard design						
IP 55		size power weight	200 L 22 kW 190 kg	225 M 30 kW 225 kg	280 S 45 kW 540 kg	
EEx e II T3		size power weight	225 M 27 kW 350 kg	250 M 33 kW 450 kg	280 S 40 kW 580 kg	280 M 46 kW 635 kg
<b>Coupling</b> for motor IP 55						
pump side		type weight SIHI part No.	A 180 14 kg 43 035 527	A 180 14 kg 43 035 527	A 200 20 kg 43 000 275	
motor side			43 041 669	43 021 496	43 021 500	
for motor EEx e II T3						
pump side		type weight SIHI part No.	ADS 194 17 kg 43 040 600	ADS 194 17 kg 43 040 600	ADS 194 17 kg 43040600	ADS 218 24 kg 43040602
motor side			43 028 518	43 035 601	43038678	43038708
<b>Contact safety device</b>						
material design	Steel Brass	SIHI part No.		43 042 359 43 042 360		
<b>Base frame</b>						
for motor IP 55	Steel	SIHI part No. weight	35 010 956 131 kg	43 059 298 137 kg	35 012 202 151 kg	
for motor EEx e II T3	Steel	SIHI part No. weight	35 028 562 151 kg	35 019 567 133 kg	35012202 151 kg	35019567 193 kg

Any changes in the interest of the technical development are reserved.

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