

# Liquid ring vacuum pumps

two stage



## LPH 75320, LPH 75330, LPH 75340

**Pressure range:** 33 to 1013 mbar  
**suction volume:** 500 to 1700 m<sup>3</sup>/h

### CONSTRUCTION

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

- handling of nearly all gasses and vapours
- non polluting due to a 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 vibration
- wide choice of material, therefore applicable nearly anywhere
- protection against cavitation as standard
- incorporated dirt drain
- no metallic contact of the rotating parts

The Sterling SIHI liquid ring vacuum pumps LPH 75320, LPH 75330 and LPH 75340 are two stage pumps.



### APPLICATIONS

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 33...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 the operation the pump must continuously be supplied with service liquid, normally water, in order to eliminate the heat resulting from the gas compression 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 with a device by which the contaminated service liquid can be drained during operation (dirt drain), if necessary.

The direction of the rotation is clockwise, when looking from the drive on the pump.

### GENERAL TECHNICAL DATA

Pump type	Unit	LPH 75320			LPH 75330			LPH 75340		
Speed	rpm	880	975 <sup>1)</sup>	1175	880	975 <sup>1)</sup>	1175	880	975 <sup>1)</sup>	1175
Maximum overpressure on compression	bar	1.5								
Permissible pressure difference between suction and discharge side	max.	1.8	1.8	1.8	1.8	1.7	1.6	1.7	1.6	1.5
	min.	1.4 <sup>2)</sup>			1.4 <sup>2)</sup>			1.4 <sup>2)</sup>		
Hydraulic test pressure (overpressure)	bar	3								
Moment of inertia of rotating parts of pump and water content	kg · m <sup>2</sup>	1.57			2.23			2.65		
Noise level at 80 mbar suction pressure	dB (A)	78	79	80	78	79	80	78	79	80
Minimum permissible pulley diameter for V belt drive	mm	315			355			355		
Maximum gas temperature	dry	200								
	saturated	100								
Service liquid:										
Maximum permissible temperature	°C	80								
Minimum permissible temperature	°C	10								
Maximum viscosity	mm <sup>2</sup> /s	90								
Maximum density	kg/m <sup>3</sup>	1200								
Liquid capacity up to middle of shaft	litre	36			47			54		
Maximum flow resistance of the heat exchanger	bar	0.2								

<sup>1)</sup> normal speed

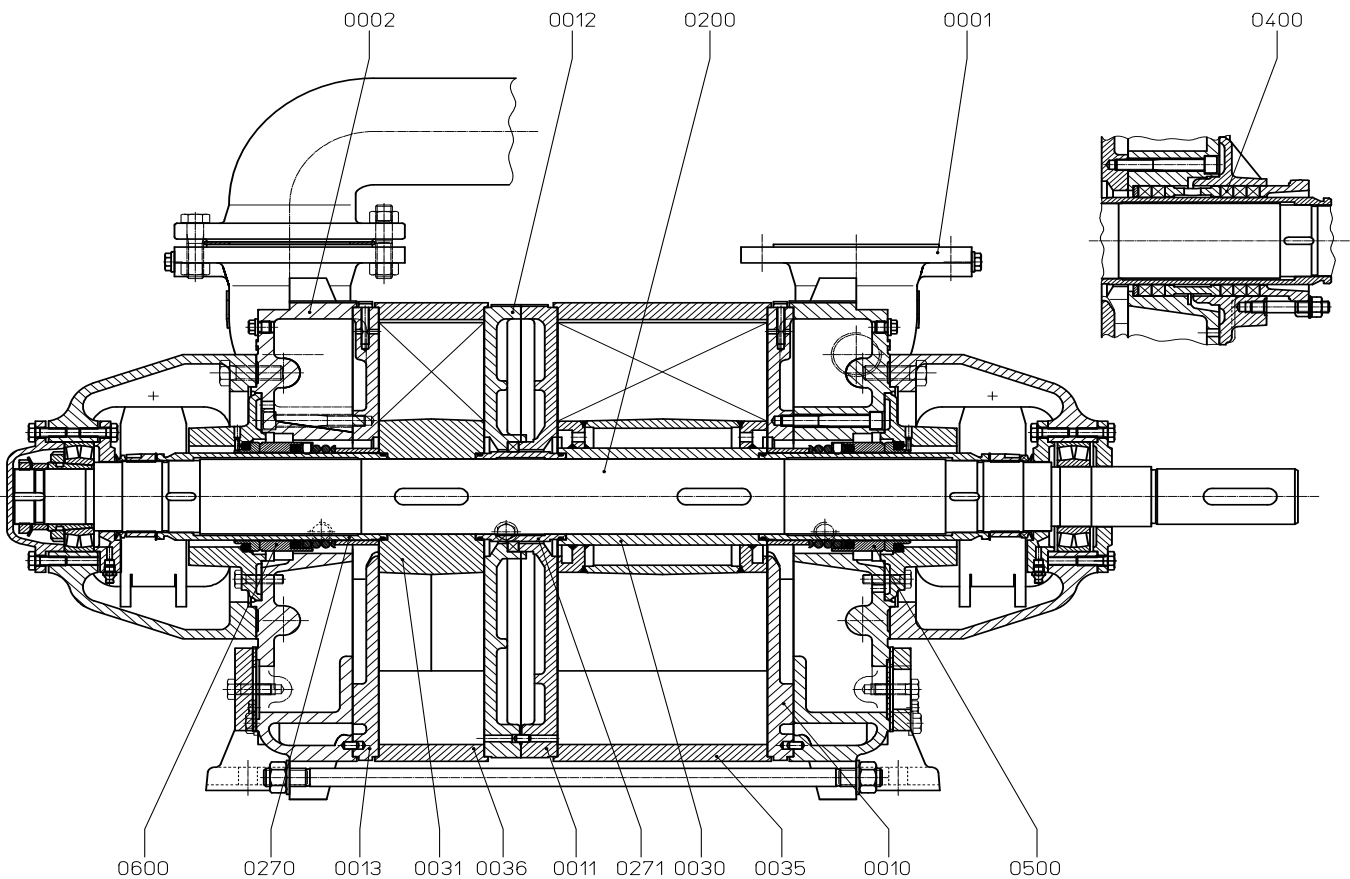
<sup>2)</sup> in case of belt drive

The combination of several limiting values is not admissible.

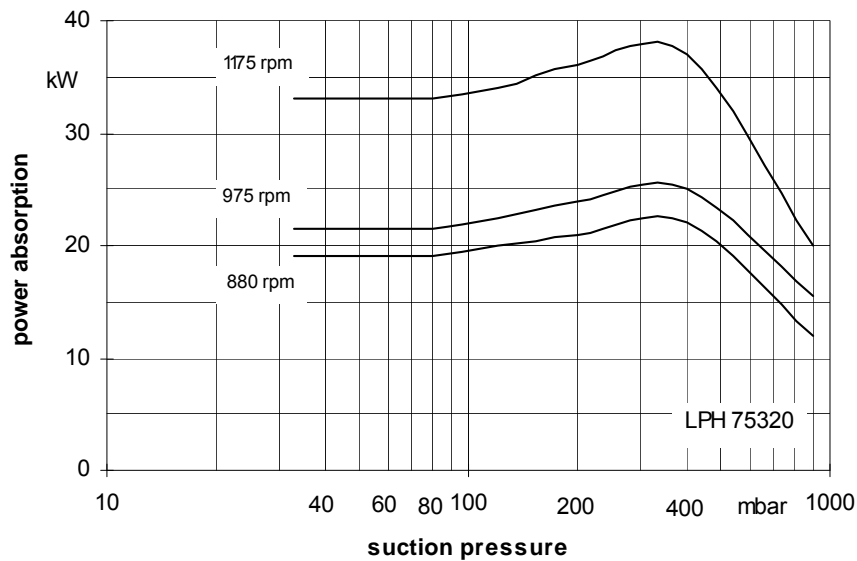
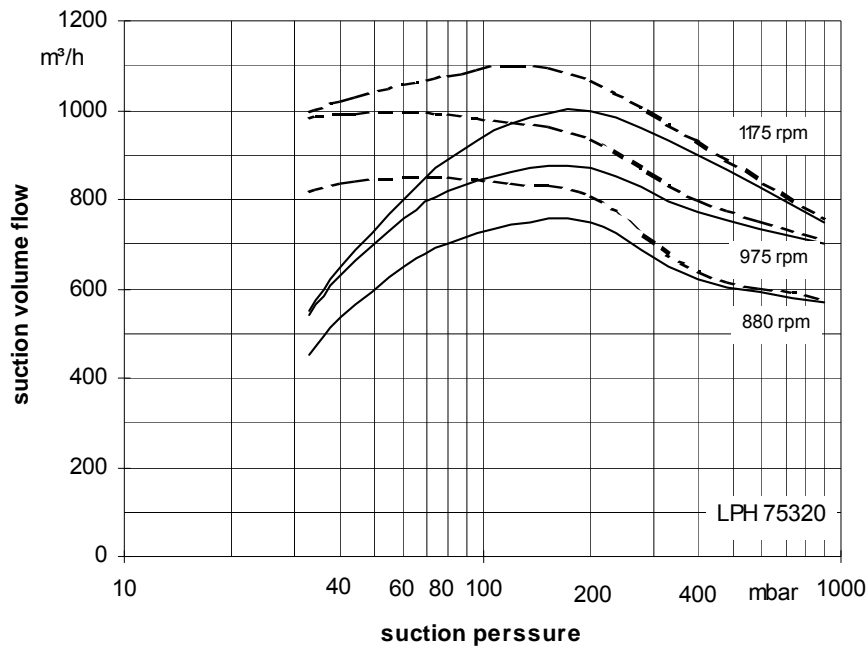
## Materials

Item	COMPONENT	MATERIALS	
		02	42
0001, 0002	Casing		
0010, 0011, 0012, 0013	Guide disc	0.6025	1.4408
0030, 0031	Vane wheel impeller	1.0619	
0035, 0036	Central body	1.0038 / 1.0553	1.4571
0200	Shaft	1.1191+N	
0270, 0271	Shaft protection sleeve	1.4021	1.4571
0400	Gland packing	GORE	-
0500, 0600	Mechanical seal	Cr-steel / carbon / Butadiene rubber	Cr Ni Mo-steel / carbon / Viton

## Cut-away diagram LPH 75320, LPH 75330, LPH 75340



# Performance Characteristics LPH 75320



The operating data is valid under the following conditions:

- Process media:
  - dry air: 20°C \_\_\_\_\_
  - steam saturated air: 20°C .....
- Service liquid:
  - water: 15°C

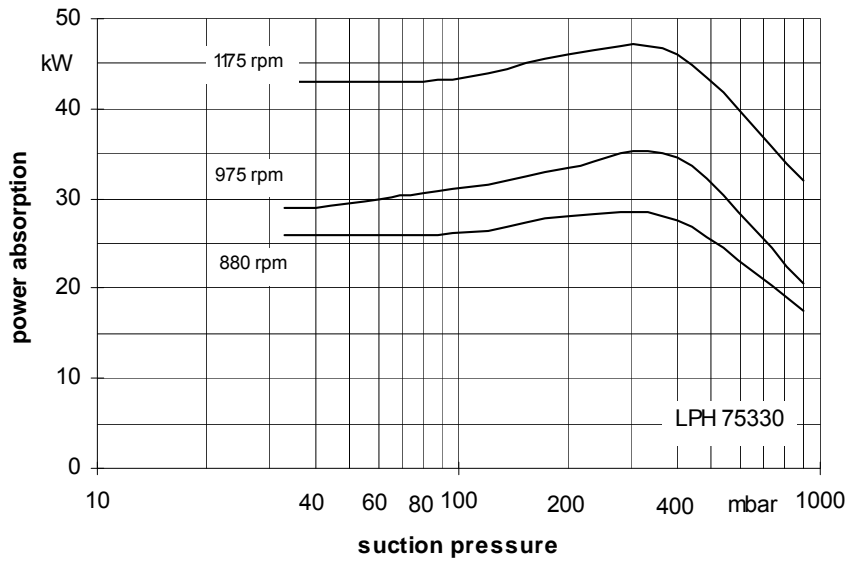
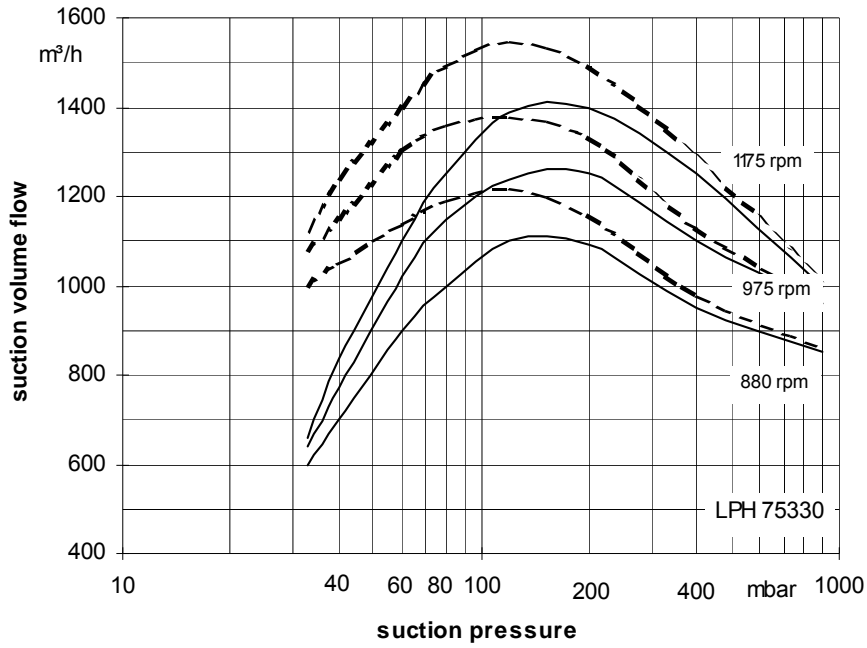
Pressure of gas to be evacuated: 1013 mbar (atmospheric pressure)

The suction volume is related to the suction pressure.

Tolerance on operating data is 10%.

The maximum consumption of make-up water occurs at the lowest suction pressure.

## Performance Characteristics LPH 75330



The operating data is valid under the following conditions:

- Process media:
  - dry air: 20°C \_\_\_\_\_
  - steam saturated air: 20°C - - - - -
- Service liquid:
  - water: 15°C \_\_\_\_\_

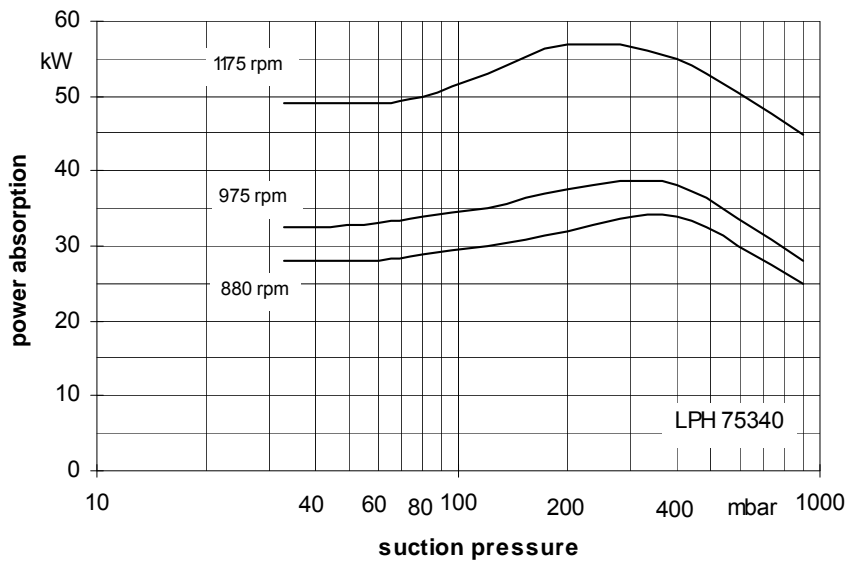
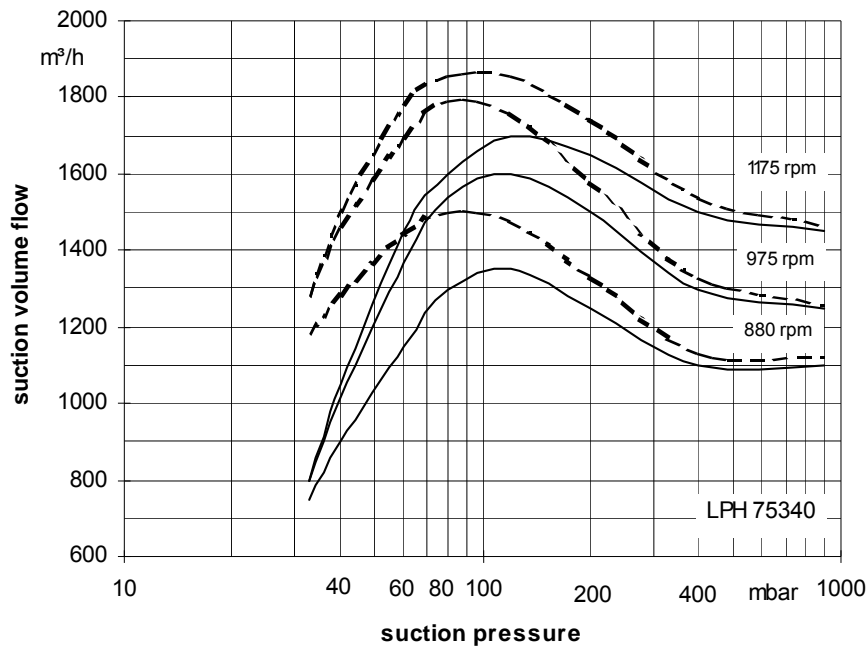
Pressure of gas to be evacuated: 1013 mbar (atmospheric pressure)

The suction volume is related to the suction pressure.

Tolerance on operating data is 10%.

The maximum consumption of make-up water occurs at the lowest suction pressure.

## Performance Characteristics LPH 75340



The operating data is valid under the following conditions:

- Process media:
  - dry air: 20°C \_\_\_\_\_
  - steam saturated air: 20°C .....
- Service liquid:
  - water: 15°C

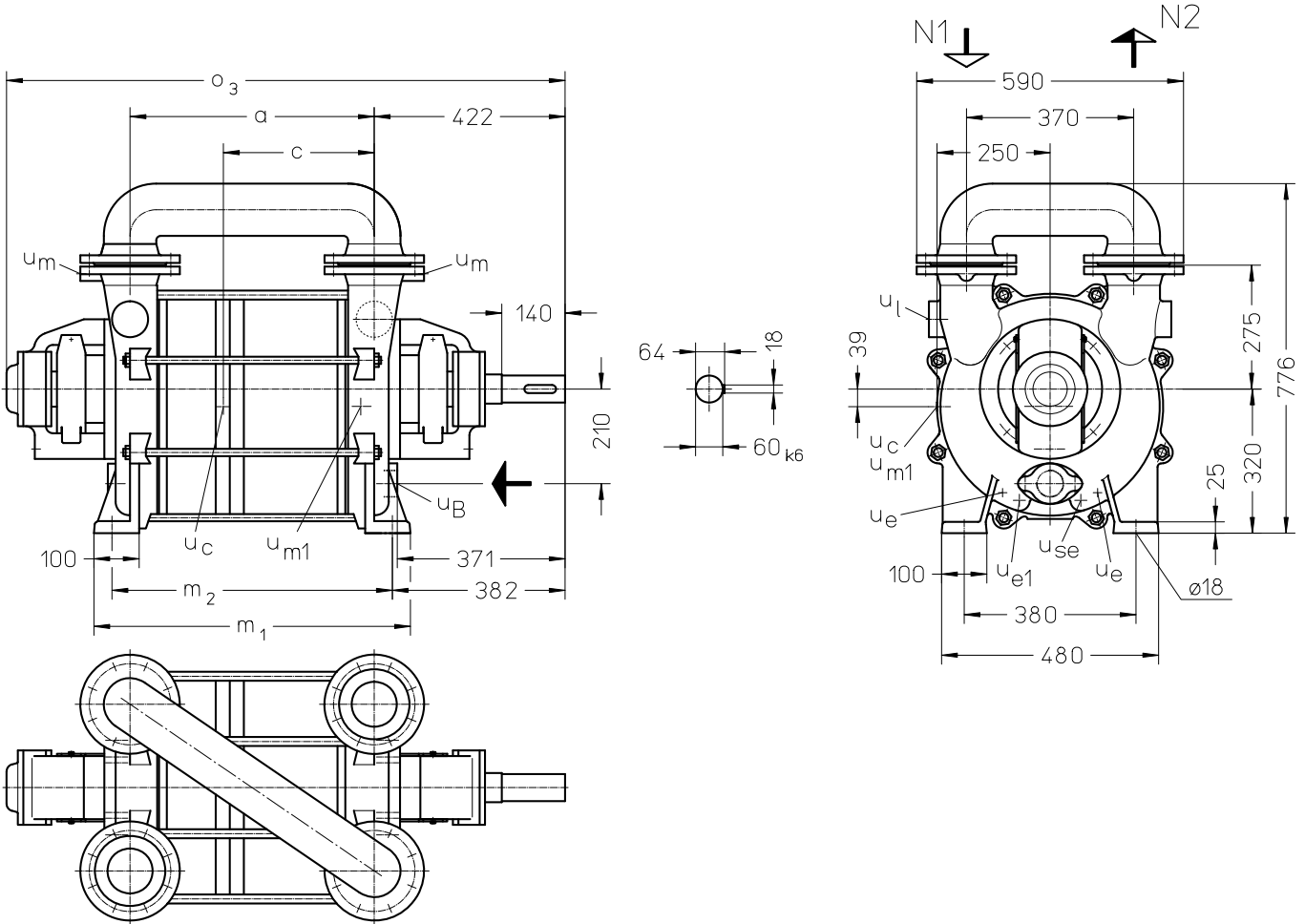
Pressure of gas to be evacuated: 1013 mbar (atmospheric pressure)

The suction volume is related to the suction pressure.

Tolerance on operating data is 10%.

The maximum consumption of make-up water occurs at the lowest suction pressure.

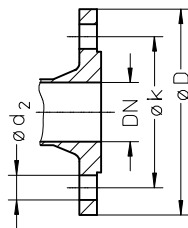
**Dimensions LPH 75320, LPH 75330, LPH 75340**



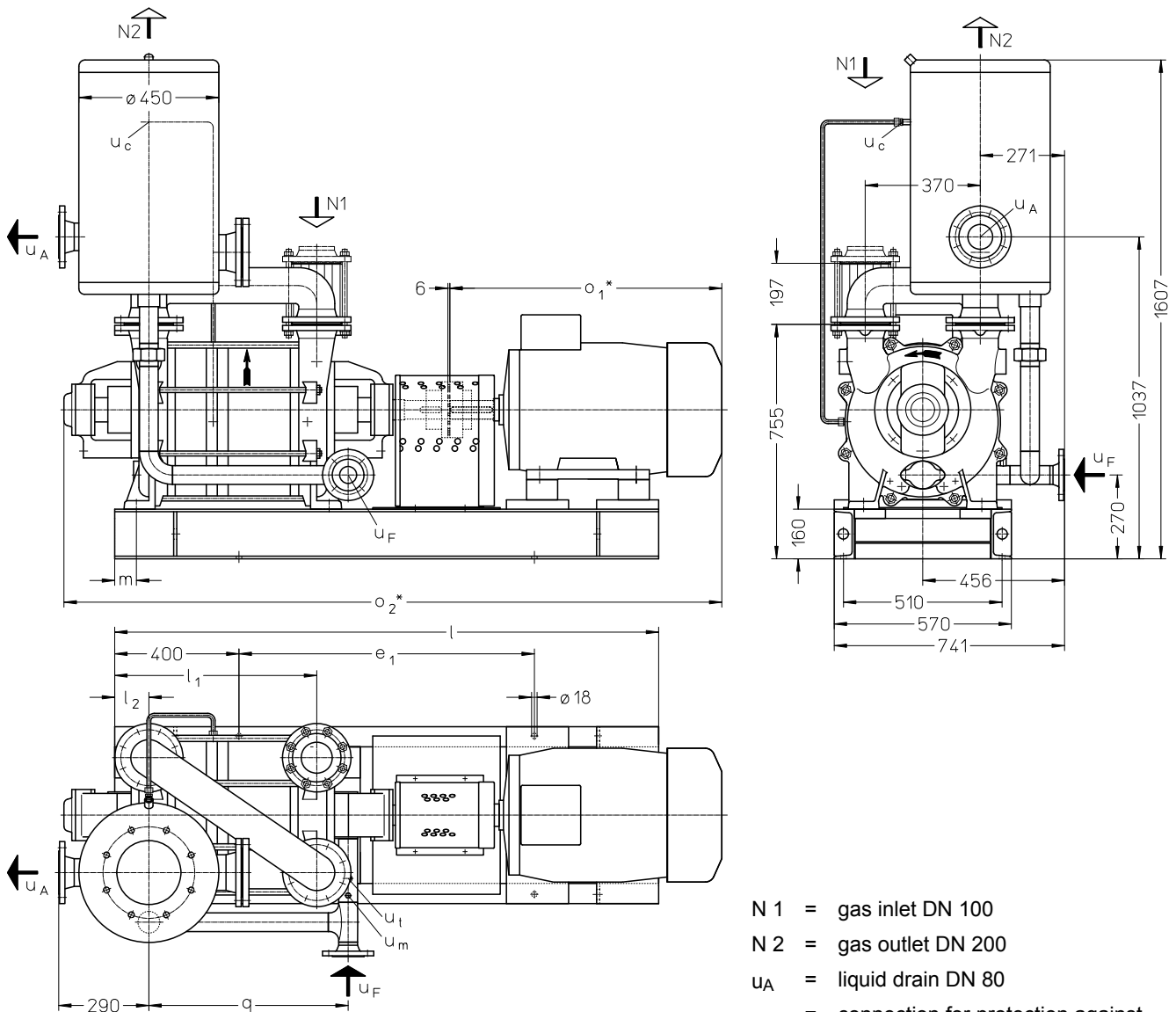
- N 1 = gas inlet DN 100
- N 2 = gas outlet DN 100
- u<sub>B</sub> = connection for service liquid G 2
- u<sub>c</sub> = connection for protection against cavitation G <sup>3</sup>/<sub>8</sub>
- u<sub>e</sub> = connection for drain G <sup>1</sup>/<sub>4</sub>
- u<sub>e1</sub> = connection for drain G <sup>1</sup>/<sub>2</sub>
- u<sub>l</sub> = connection for vent cock G 1 <sup>1</sup>/<sub>2</sub>
- u<sub>m</sub> = connection for pressure gauge G <sup>3</sup>/<sub>8</sub>
- u<sub>m1</sub> = connection for drain valve G <sup>1</sup>/<sub>2</sub>
- u<sub>se</sub> = connection for dirt drain G <sup>1</sup>/<sub>2</sub>

	a [mm]	c [mm]	m <sub>1</sub> [mm]	m <sub>2</sub> [mm]	o <sub>3</sub> [mm]	approx. weight for material design	
						02 [kg]	42 [kg]
LPH 75320	540	333	700	620	1235	450	485
LPH 75330	690	434	850	770	1385	570	620
LPH 75340	790	534	950	870	1485	640	690

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



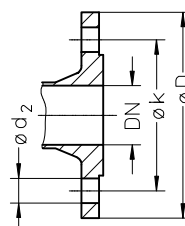
Arrangement drawing LPH 75320, LPH 75330, LPH 75340 with overhead liquid separator



- N 1 = gas inlet DN 100
- N 2 = gas outlet DN 200
- u<sub>A</sub> = liquid drain DN 80
- u<sub>C</sub> = connection for protection against cavitation G ¼
- u<sub>F</sub> = connection for make-up 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			e <sub>1</sub> [mm]	l [mm]	l <sub>1</sub> [mm]	l <sub>2</sub> [mm]	m [mm]	o <sub>1</sub> <sup>*</sup> [mm]	o <sub>2</sub> <sup>*</sup> [mm]	q [mm]	approx. weight [kg] at motor	
	size	IP 55	kW EEx e II T3									IP 55	Eex e II T3
LPH 75320	225 M	30	-	950	1750	650	110	70	807	2048	641	938	-
	225 M	-	27						875	2116		-	1060
LPH 75330	250 M	37	-	1300	2100	900	210	170	930	2321	791	1260	-
	280 S	-	40						1010	2401		-	1420
LPH 75340	280 S	45	-	1300	2100	900	110	70	960	2451	891	1460	-
	280 S	-	40						1010	2501		-	1490
	280 M	-	46									870	80

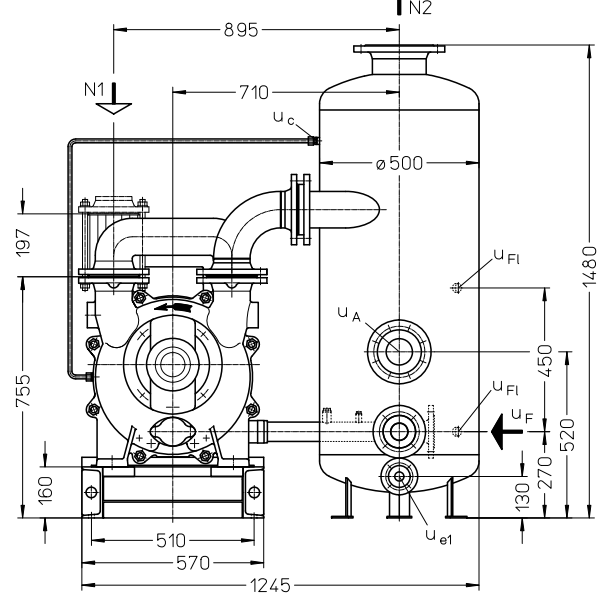
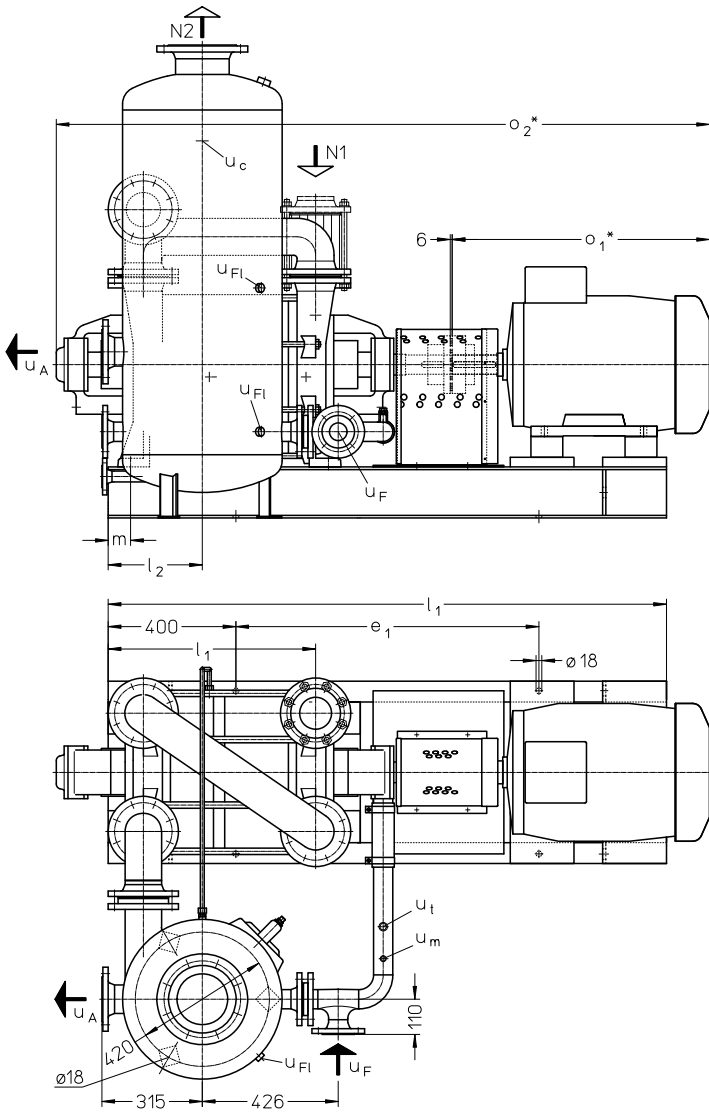
flange connections according to DIN 2501 PN 10 [mm]				
DN	50	80	100	200
k	125	160	180	295
D	165	200	220	340
number x d <sub>2</sub>	4 x 18	8 x 18	8 x 18	8 x 22



\* dimensions depend on the motor make

Arrangement drawing LPH 75320, LPH 75330, LPH 75340 with upright liquid

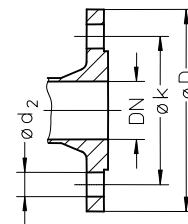
separator



- N 1 = gas inlet DN 100
- N 2 = gas outlet DN 150
- $u_A$  = liquid drain DN 80
- $u_c$  = connection for protection against cavitation G  $3/8$
- $u_{e1}$  = connection for drain DN 25
- $u_F$  = connection for make-up liquid DN 50
- $u_{FI}$  = connection for liquid level indicator G  $1/2$
- $u_m$  = connection for pressure gauge G  $1/4$
- $u_t$  = connection for thermometer G  $1/2$

	electric motor 50 Hz			$e_1$ [mm]	$l$ [mm]	$l_1$ [mm]	$l_2$ [mm]	$m$ [mm]	$o_1^*$ [mm]	$o_2^*$ [mm]	approx. weight [kg] at motor	
	size	IP 55	kW EEx e II T3								IP 55	EEx e II T3
LPH 75320	225 M	30	-	950	1750	650	295	70	807	2048	965	-
	225 M	-	27						875	2116	-	1090
LPH 75330	250 M	37	-	1300	2100	900	395	170	930	2321	1290	-
	280 S	-	40						1010	2401	-	1450
LPH 75340	280 S	45	-	1300	2100	900	295	70	960	2451	1490	-
	280 S	-	40						1010	2501	-	1520
	280 M	-	46								-	1575

flange connections according to DIN 2501 PN 10					
[mm]					
DN	25	50	80	100	150
k	85	125	160	180	240
D	115	165	200	220	285
Anzahl x $d_2$	4 x 14	4 x 18	8 x 18	8 x 18	8 x 22



\* dimensions depend on the motor make



**Make-up liquid consumption** in [m<sup>3</sup>/h] dependent upon suction pressure, speed, drive type and temperature difference

suction pressure in [mbar]		33				120				200				400							
pump type	speed [rpm]	KB				FB	KB				FB	KB				FB					
		temperature difference [°C]					temperature difference [°C]					temperature difference [°C]									
		20	10	5	2	20	10	5	2	20	10	5	2	20	10	5	2				
LPH 75320	880	0.7	1.3	2.2	3.8	7	0.8	1.3	2.2	3.5	6	0.8	1.3	2.1	3.2	5	0.7	1.2	1.7	2.3	3
	975	0.8	1.5	2.4	4.0		0.8	1.5	2.4	3.7		0.9	1.5	2.3	3.4		0.8	1.3	1.8	2.3	
	1175	1.2	2.0	3.1	4.7		1.2	2.0	3.0	4.3		1.2	1.9	2.8	3.8		1.0	1.5	2.0	2.5	
LPH 75330	880	1.0	1.7	2.7	4.3	7	1.0	1.7	2.6	3.9	6	1.0	1.6	2.5	3.5	5	0.8	1.3	1.8	2.4	3
	975	1.1	1.8	2.9	4.5		1.1	1.9	2.8	4.2		1.1	1.8	2.7	3.7		1.0	1.5	2.0	2.5	
	1175	1.5	2.4	3.6	5.1		1.4	2.3	3.3	4.6		1.4	2.2	3.1	4.0		1.2	1.7	2.2	2.6	
LPH 75340	880	1.0	1.8	2.9	4.4	7	1.1	1.8	2.8	4.1	6	1.1	1.8	2.6	3.7	5	1.0	1.5	2.0	2.5	3
	975	1.2	2.0	3.1	4.7		1.2	2.0	3.0	4.3		1.2	2.0	2.8	3.8		1.1	1.6	2.1	2.5	
	1175	1.6	2.6	3.8	5.3		1.7	2.6	3.6	4.7		1.6	2.5	3.3	4.2		1.3	1.8	2.3	2.7	

FB = total service liquid flow rate on once-through system

KB = flow of make-up water when combined with partial recirculation liquid at a temperature of 20°C, 10 °C, 5 °C, 2 °C warmer than make-up water

### Product code - order details

range + size	bearing + direction of rotation	shaft seal	materials	casing sealing
	<ul style="list-style-type: none"> <li>•B two grease lubricated antifriction bearing</li> <li>•N one shaft end clockwise</li> </ul>	041 double gland packing 135 mechanical seal with built-in flashing O-rings Perbunan AA1 mechanical seal with built-in flashing O-rings Viton	02 main parts out of cast iron, without non-ferrous metal 42 main parts out of stainless steel	0 liquid seal
LPH 75320 75330 75340	BN	041, 135, AA1	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 75330 BN 041 42 0 with 37.0 kW AC motor, 50 Hz, 400V □, IP55

## Accessories

Recommended accessory	material execution		LPH 75320	LPH 75330	LPH 75340
<b>Top mounted liquid separator</b>		type / weight	XBa 10040 / 70 kg		
Top mounted separator	1.4571	SIHI-part no.	43 132 196		
Service liquid pipework standard execution	steel, galvanised 1.4571	SIHI-part no.	35 003 195 35 003 196	35 003 197 35 003 198	35 003 199 35 003 200
Cavitation protection pipework	steel, galvanised 1.4571	SIHI-part no.	on request 20 087 829	on request 20 061 880	
Blank flange DN 100	1.0038 1.4571	SIHI-part no.	43 002 146 43 002 148		
<b>Side mounted liquid separator</b>		type / weight	XBp 2311 / 96 kg		
Side mounted separator	1.4571	SIHI-part No.	43 143 081		
Service liquid pipework standard execution	steel, galvanised 1.4571	SIHI-part no.	35 003 180 35 003 181	35 003 182 20 027 246	35 003 183 35 003 184
Cavitation protection pipework	steel, galvanised 1.4571	SIHI-part no.	20 081 960 20 074 206	on request 20 054 451	
Pressure pipework (bend)	1.0254 1.4571	SIHI-Part No.	35 003 231 35 003 232		
<b>SIHI – non return ball valve</b>					
Intermediate flange execution XCk 100	0.6025 + Butadiene rubber 0.6025 + Teflon 1.4408 + Teflon	SIHI-part no. weight	20 072 798 / 16 kg 20 072 797 / 16 kg 20 006 983 / 17.5 kg		
<b>Motor</b> Standard execution IP 55		size power weight	225 M 30 kW 225 kg	250 M 37 kW 410 kg	280 S 45 kW 540 kg
Coupling for motor IP 55		type / weight	A 180 / 14 kg		
pump side		SIHI-part no.	43 035 527		
motor side			43 021 496	43 034 392	43 021 495
Coupling guard	steel	SIHI-part no.	43 042 330		43 042 359
<b>Motor</b> in EEx e II T3 execution		size power weight	225 M 27 kW 350 kg	280 S 40 kW 570 kg	280 M 46 kW 625 kg
Coupling for motor EEx e II T3		type / weight	ADS 194 / 17.5 kg		ADS 218 / 24 kg
pump side		SIHI-part no.	43 040 600		43 111 088
motor side			43 028 518	43 111 101	43 038 708
Coupling guard	brass	SIHI-part no.	43 042 331		43 042 360
<b>Base frame</b>	steel	SIHI-part no. weight	43 124 771 142 kg	43 060 846 160 kg	

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

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