Liquid ring vacuum pumps

LEH 3600, LEH 4400

Pressure range: **33 to 1013 mbar**
Suction volume flow: **1100 to 5150 m³/h**

CONSTRUCTION TYPE

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

- non-polluting due to nearly isothermal compression
- oil-free, as no lubrication in the working chamber
- handling of nearly all gases and vapours
- small quantities of entrained liquid can be handled
- easy maintenance and reliable operation
- low noise and nearly free from vibration
- protection against cavitation as standard
- incorporated dirt drain
- no metallic contact of the rotating parts

The SIHI liquid ring vacuum pumps are single-stage ones.

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 33 to 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 impregnating 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 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 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 end on the pump.

GENERAL TECHNICAL DATA

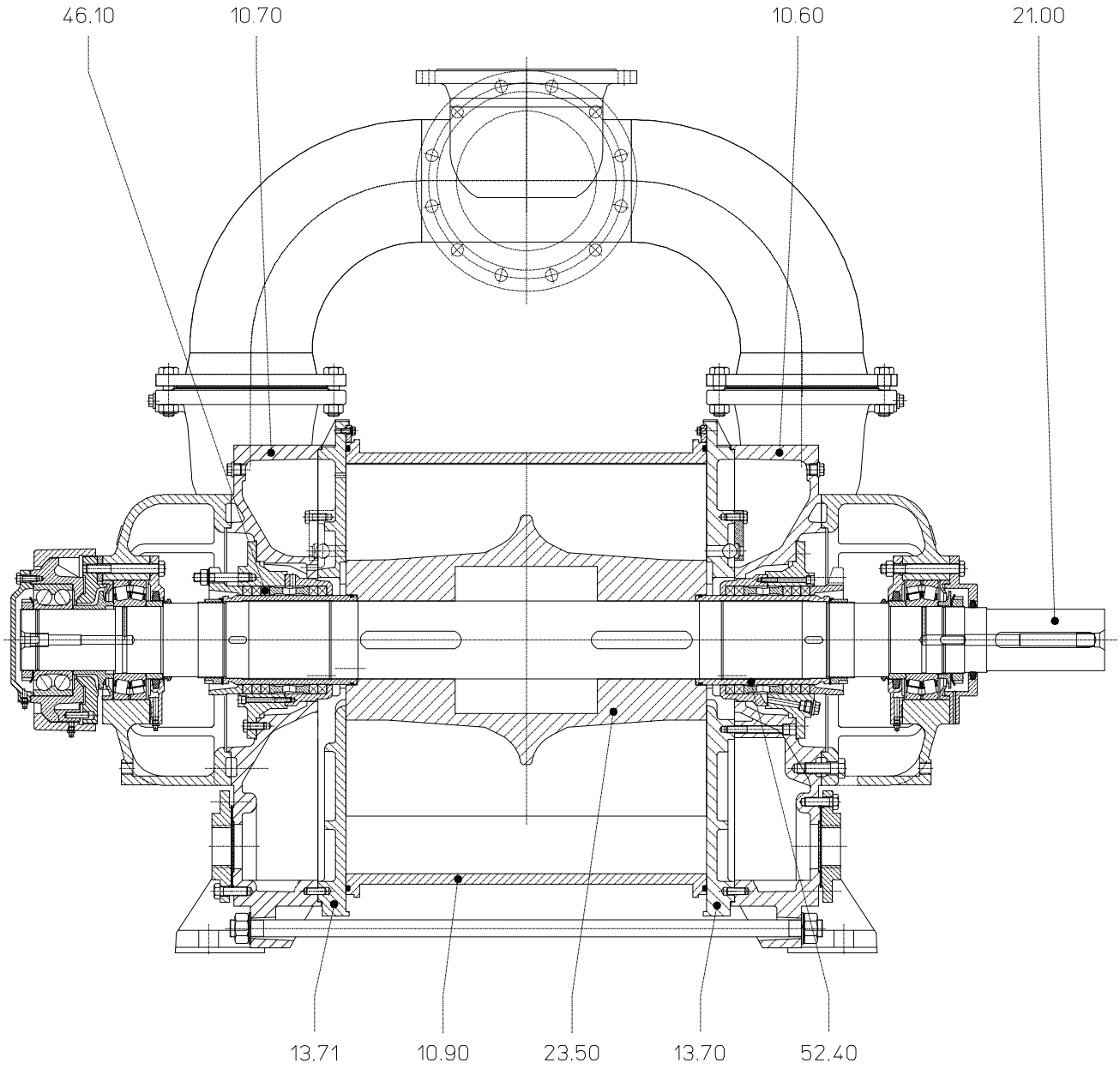
Pump type		unit	LEH 3600	LEH 4400
Speed	50 Hz 60 Hz	rpm	585 700	
Max. compression over pressure		bar	1,5	
Max. admissible pressure difference		bar	1,5	
Hydraulic test (over pressure)		bar	3	
Moment of inertial of the rotating pump parts and of the water filling		kg · m²	26,6	32,4
Sound pressure level at a suction pressure of 80 mbar		dB (A)	84	
Min. pulley diameter permissible in case of V-belt drive		mm	710	800
Max. gas temperature	dry saturated	°C °C	160 80	
Service liquid				
max. admissible temperature		°C	60	
max. viscosity		mm²/s	90	
max. density		kg/m³	1200	
volume up to shaft level		liter	165	193
Max. flow resistance of the heat exchanger		bar	0,2	

The combination of several limiting values is not admissible.

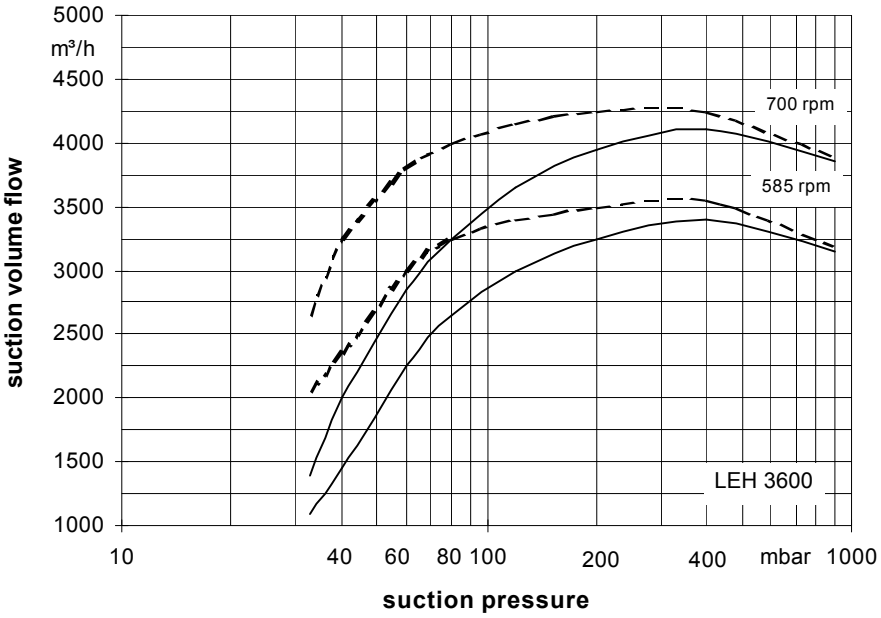
Material design

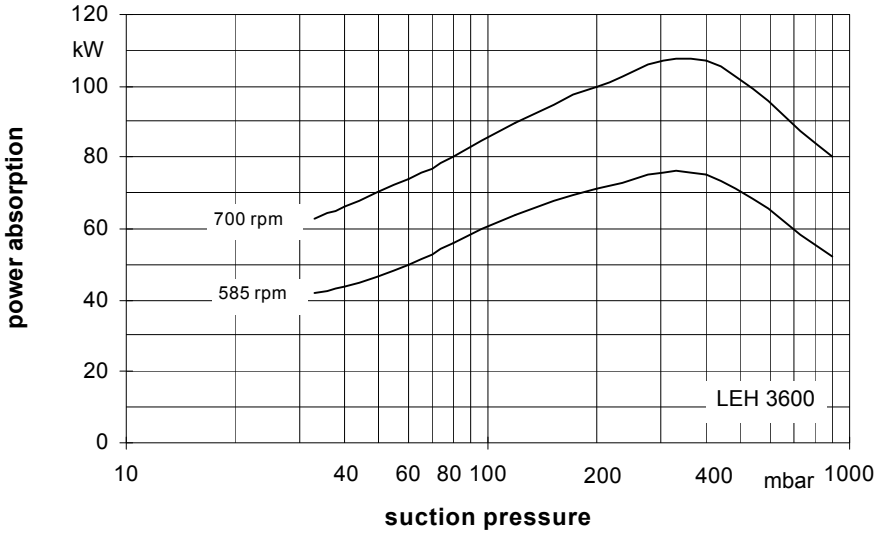
Item	COMPONENTS	MATERIAL DESIGN 0B
10.60, 10.70	Casing	0.6025
10.90	Central body	1.0038
13.70, 13.71	Guide disk	0.6025
21.00	Shaft	1.0503
23.50	Vane wheel impeller	1.0553
46.10	Gland packing	Soft packing
52.40	Shaft sleeve	1.4027.05

Sectional drawing LEH 3600, LEH 4400



Suction volume flow and power absorption LEH 3600



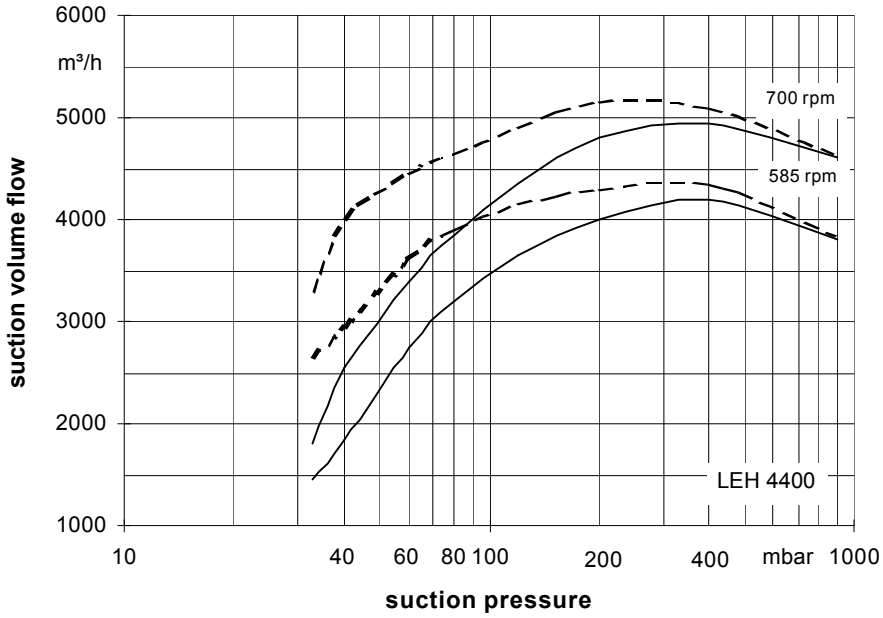


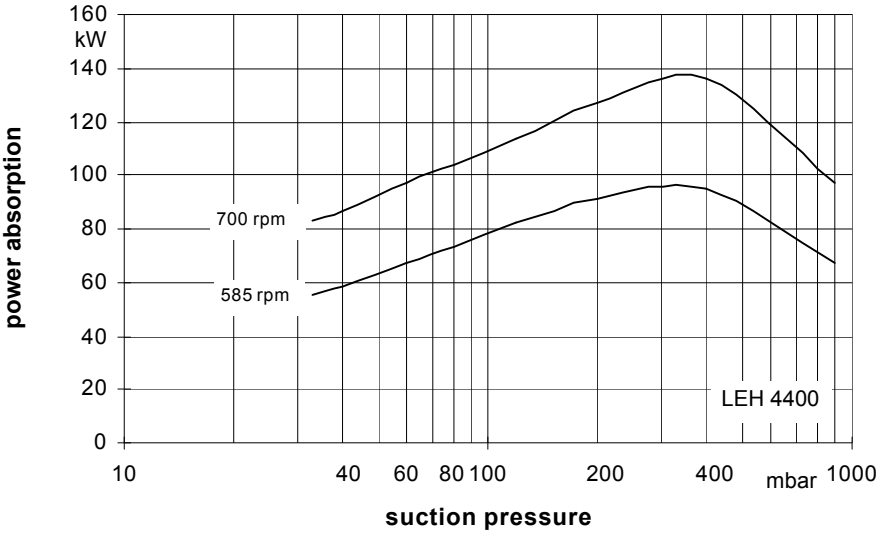
The operating data are valid under the following conditions:

- 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 power absorption 5%
Max. fresh water need with the lowest suction pressure

Suction volume flow and power absorption LEH 4400





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

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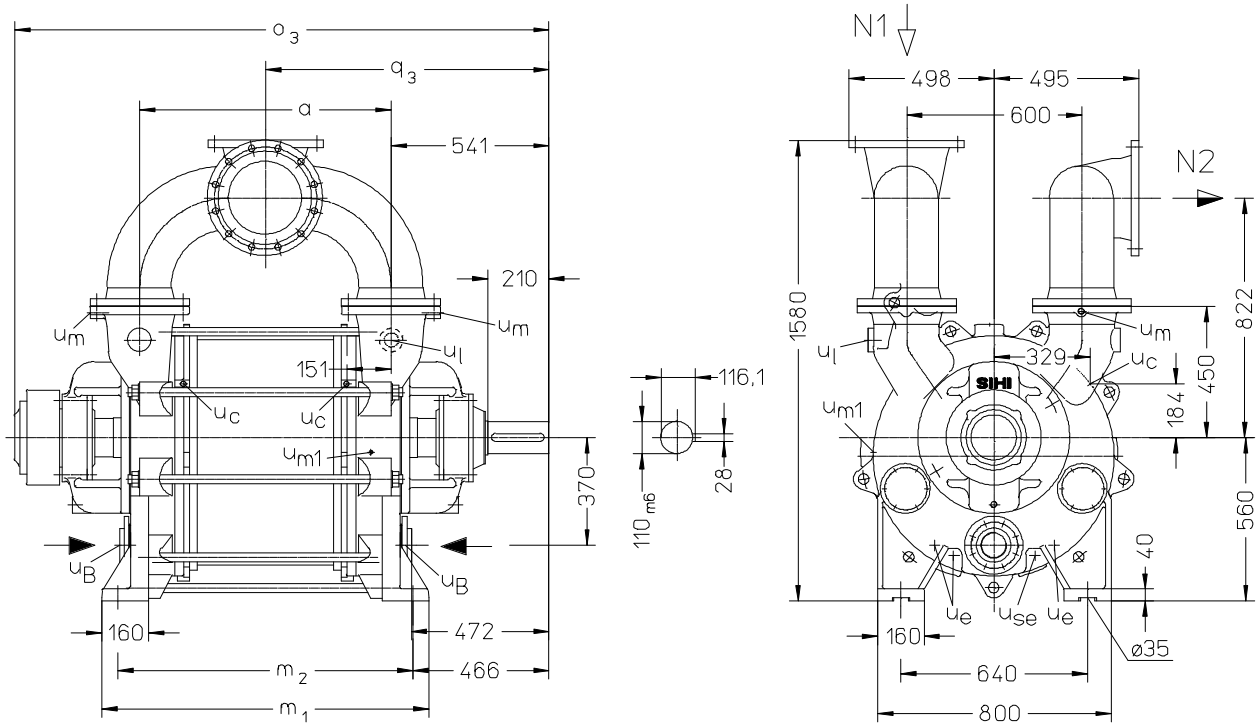
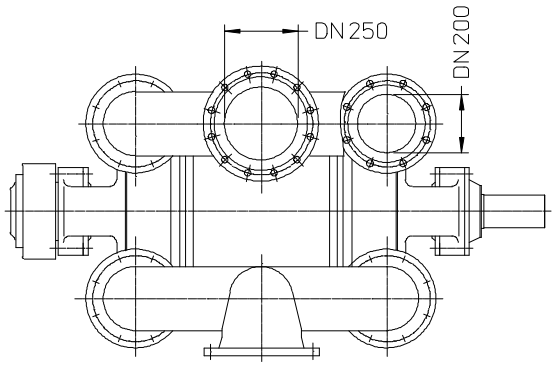
Tolerance of the operating data 10% and power absorption 5%
Max. fresh water need with the lowest suction pressure

Dimension table LEH 3600, LEH 4400





N 1 = gas inlet DN 250

N 2 = gas outlet DN 250

u_B = connection for service liquid G 3

u_c = connection for protection against cavitation G ½

u_e = drain connection G ¾

u_l = connection for vacuum breaker cock G 1½

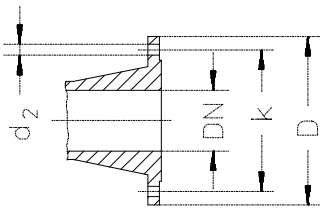
u_m = connection for pressure gauge G ½

u_{m1} = connection for drain valve G ¾

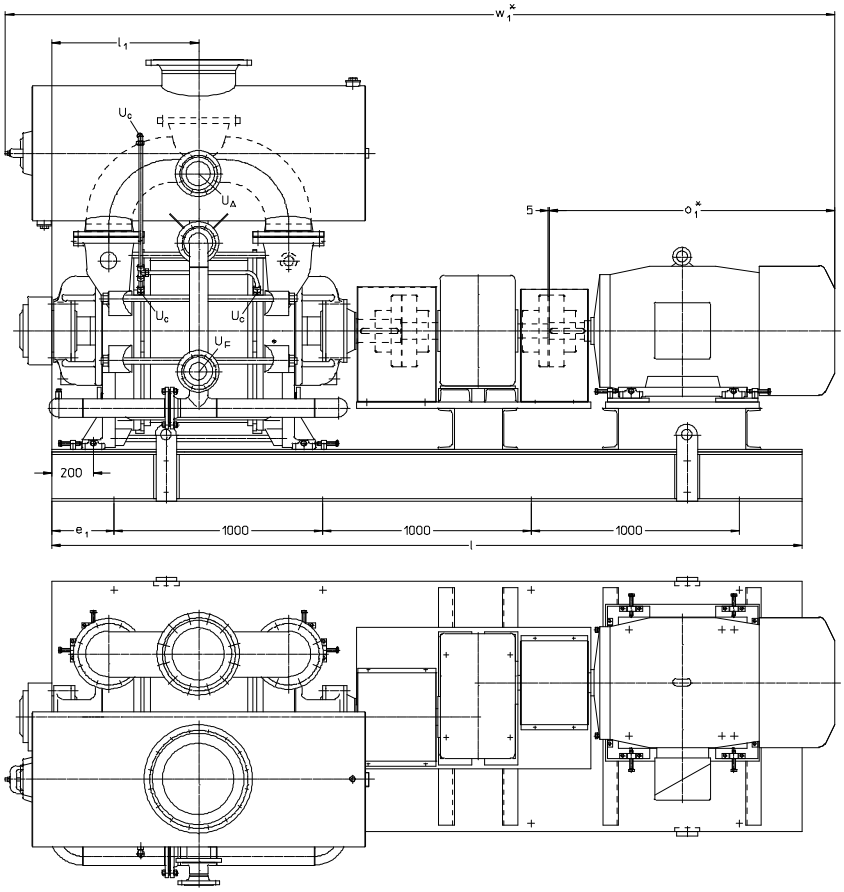
u_{se} = connection for dirt drain G ¾

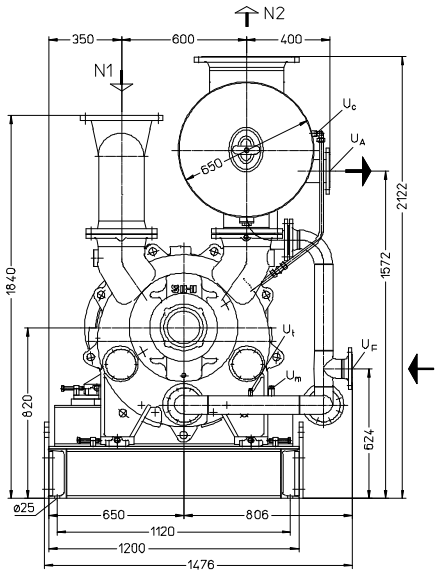
	a	m_1	m_2	o_3	q_3	weight app.. kg
LEH 3600	861	1121	1011	1830	971	1950
LEH 4400	986	1246	1136	1955	1033	2050

flange connections to DIN 2501 PN 10		
DN	200	250
k	295	350
D	340	395
number x d_2	8 x 23	12 x 22



Arrangement drawing LEH 3600, LEH 4400 with overhead liquid separator

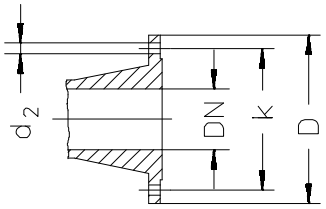




N 1 = gas inlet DN 250
N 2 = gas outlet DN 350
u_A = connection for liquid drain DN 100
u_c = connection for protection against cavitation G ½
u_F = connection for fresh liquid DN 80
u_m = connection for pressure gauge G ½
u_t = connection for thermometer G ¼

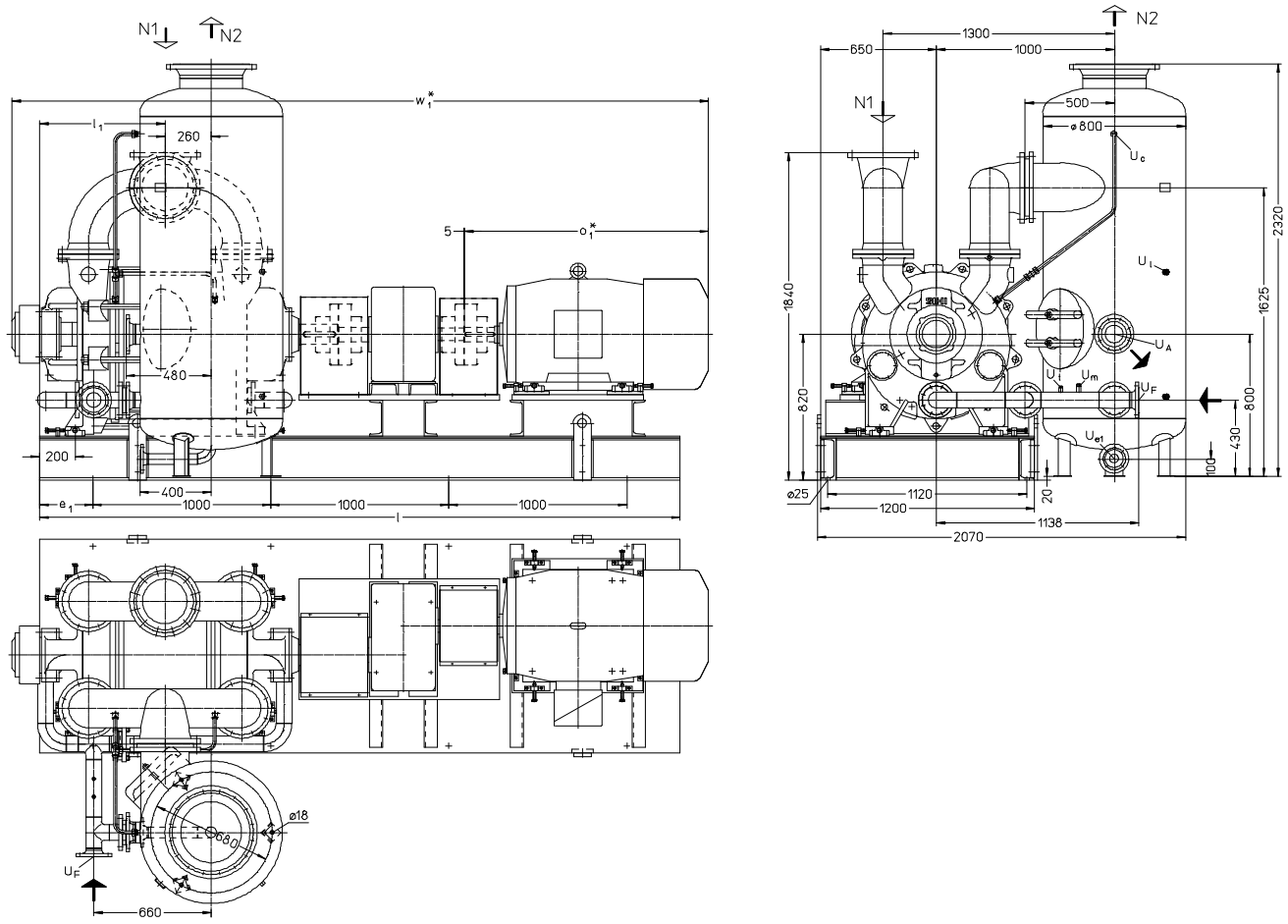
	electric motor 50 Hz		e_1	l	l_1	o_1 *	w_1 *	weight
	size	kW IP 55						app. kg
LEH 3600	315 L	90	300	3600	705	1371	3980	4980
LEH 4400	355 M	110	375	3750	768	1440	4174	5600

flange connections to DIN 2501 PN 10				
DN	80	100	250	350
k	160	180	350	460
D	200	220	395	505
number x d_2	8 x 18	8 x 18	12 x 22	16 x 22



* dimensions dependent to the motor make

Arrangement drawing LEH 3600, LEH 4400 with upright liquid separator



N 1 = gas inlet DN 250

N 2 = gas outlet DN 350

u_A = connection for liquid drain DN 100

u_c = connection for protection against cavitation G ½

u_{e1} = drain connection DN 50

u_F = connection for fresh liquid DN 80

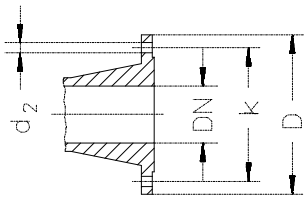
u_{fl} = connection for liquid level indicator G ½

u_m = connection for pressure gauge G ½

u_t = connection for thermometer G ¼

	electric motor 50 Hz		e_1	l	l_1	o_1 *	w_1 *	weight
	size	kW IP 55						app. kg
LEH 3600	315 L	90	300	3600	705	1371	3912	4990
LEH 4400	355 M	110	375	3750	768	1440	4106	5600

flange connections to DIN 2501 PN 10					
DN	50	80	100	250	350
k	125	160	180	350	460
D	165	200	220	395	505
number x d_2	4 x 18	8 x 18	8 x 18	12 x 22	16 x 22



* dimensions dependent on the motor make

Fresh water requirements in [m³/h] dependent on suction pressure, speed, mode of operation and difference in temperature

Suction pressure in [mbar]		33				120				200				400			
pump	speed	KB difference in temperature [°C]			FB	KB difference in temperature [°C]			FB	KB difference in temperature [°C]			FB	KB difference in temperature [°C]			FB
	[rpm]	10	5	2		10	5	2		10	5	2		10	5	2	
LEH 3600	585	3,0	5,2	9,3	19,0	4,0	6,2	9,3	14,0	4,0	6,1	8,6	12,0	3,8	5,5	7,3	9,5
	700	4,2	6,9	11,2		5,0	7,4	10,3		5,0	7,1	9,4		4,7	6,3	7,9	
LEH 4400	585	3,9	6,5	11,1	21,0	4,7	7,2	10,3	14,5	4,8	6,9	9,5	12,5	4,4	6,0	7,7	9,5
	700	5,3	8,5	13,2		5,9	8,3	11,2		5,8	8,0	10,2		5,2	6,8	8,2	

FB = fresh liquid service

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

Data regarding the pump size - order notes

series + size	hydraulics + bearings	shaft sealing	material design	casting seal
	A• hydraulic A •B two lubricated antifriction bearings	041 double gland packing	0B main parts of GG without non-ferrous metal	0 liquid seal
LEH 3600	AB	041	0B	0
4400				

Design - Motor selection table

	designation	electric motor 50 Hz		
pump with free shaft end	01	motor enclosure IP 55		
pump with coupling, pre-drilled at motor side	04	kW	size	designation
as above, but with motor, for example 110 kW three-phase motor	e.g. HD	90 110	315 L 355 M	GD HD
(50 Hz, 400 VΔ) at 585 rpm				

Example for ordering:

The construction size LEH 4400 AB 041 0B 0 with 110 kW three-phase motor (50 Hz, 400 VΔ) 585 rpm has the complete order number: **LEH· 4400 AB 041 0B 0 HD**

For motors with other voltage or frequency are required a special information should be given.

On delivery the point (•) in the fourth place of the type code is replaced by a letter in the factory.

Accessories

Recommended accessories			LEH 3600	LEH 4400
Overhead liquid separator		type	XBa 50040	XBa 50041
		weight	262 kg	275 kg
material design	130 / galvanized	SIHI part No.	35 009 537	35 009 983
	172 / 1.4571		35 009 539	35 009 984
service liquid line				
material design	072 / St 37-0	SIHI part No.	35 009 921	35 009 923
	172 / 1.4571		35 009 922	35 009 924
cavitation protection line				
material design	072 / St 37-0	SIHI part No.	35 009 925	35 009 980
	172 / 1.4571		35 009 970	35 009 981
Upright liquid separator		type	XBp 10013	
		weight	273 kg	
material design	130 / galvanized	SIHI part No.	35 010 145	
	172 / 1.4571		35 010 146	
service liquid line				
material design	072 / St 37-0	SIHI part No.	35 009 680	35 009 623
	172 / 1.4571		35 009 681	35 006 149
cavitation protection line				
material design	072 / St 37-0	SIHI part No.	35 010 210	35 010 212
	172 / 1.4571		35 010 211	35 010 213
SIHI-gas ejector			on request	
Non-return valve			on request	
Motor in case of standard design				
IP 55		size	315 L	355 M
		power	90 kW	110 kW
		weight	1105 kg	1570 kg
Coupling				
pump side		type	ADS 340	
gearing side				
Contact safety device			on request	
Gearing		type	PIV-PB16 (i=2,8)	
Coupling				
gearing side		type	ADS 340	
pump side				
Contact safety device			on request	
Base frame				
for motor IP 55	081 / RSt 37-2	SIHI part No.	35 014 856	35 014 889
		weight	1260 kg	1300 kg

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

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