

## LEH 1200, LEH 1500, LEH 1800

**Pressure range:** 33 to 1013 mbar  
**Suction volume flow:** 440 to 2050 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
- wide choice of material, therefore applicable nearly everywhere
- Internal service liquid return; adjustable from the outside
- protection against cavitation as standard
- incorporated dirt drain
- incorporated central drain
- no metallic contact of the rotating parts

The SIHI liquid ring vacuum pumps LEH 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 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 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 on the pump.

### GENERAL TECHNICAL DATA

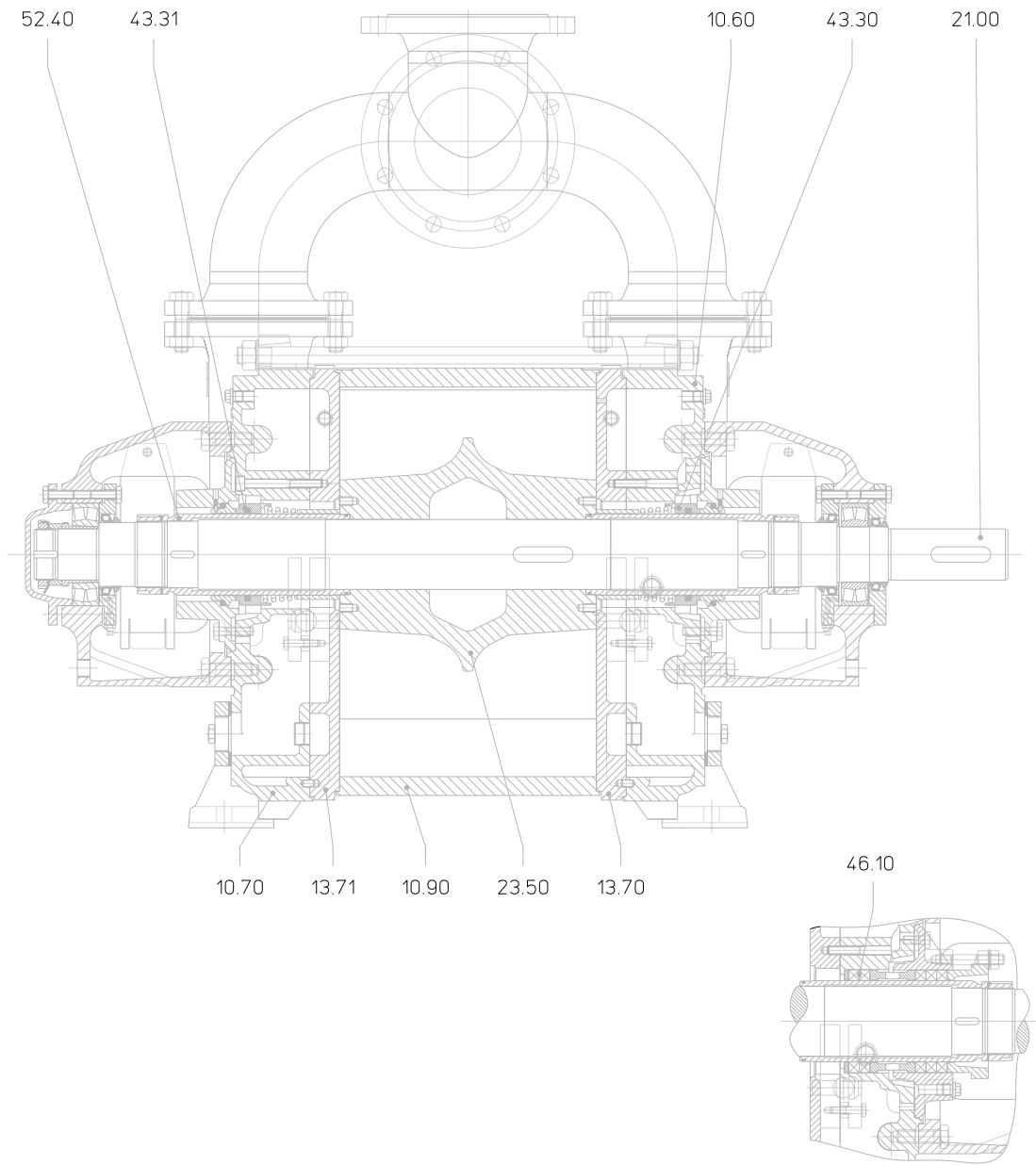
| Pump type                                                              | unit           | LEH 1200 | LEH 1500    | LEH 1800 |
|------------------------------------------------------------------------|----------------|----------|-------------|----------|
| Speed                                                                  | 50 Hz<br>60 Hz |          | 975<br>1175 |          |
| Max. compression over pressure                                         | bar            | 1,5      |             | 1,2      |
| Max. admissible pressure difference                                    | bar            | 1,5      |             | 1,2      |
| Hydraulic test (over pressure)                                         | bar            |          | 3           |          |
| Moment of inertial of the rotating pump parts and of the water filling | kg · m²        | 2,6      | 3,05        | 3,5      |
| Sound pressure level at a suction pressure of 80 mbar                  | dB (A)         |          | 79          |          |
| Min. pulley diameter permissible in case of V-belt drive               | mm             | 355      |             | 500      |
| Max. gas temperature                                                   | °C<br>°C       |          | 200<br>100  |          |
| Service liquid                                                         |                |          |             |          |
| max. admissible temperature                                            | °C             |          | 80          |          |
| max. viscosity                                                         | mm²/s          |          | 90          |          |
| max. density                                                           | kg/m³          |          | 1200        |          |
| volume up to shaft level                                               | liter          | 30       | 35          | 39,5     |
| Max. flow resistance of the heat exchanger                             | bar            |          | 0,2         |          |

The combination of several limiting values is not admissible.

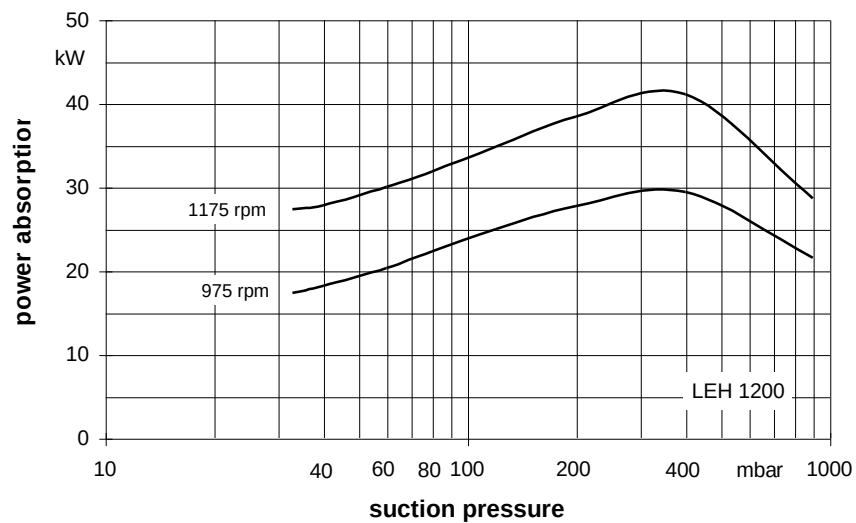
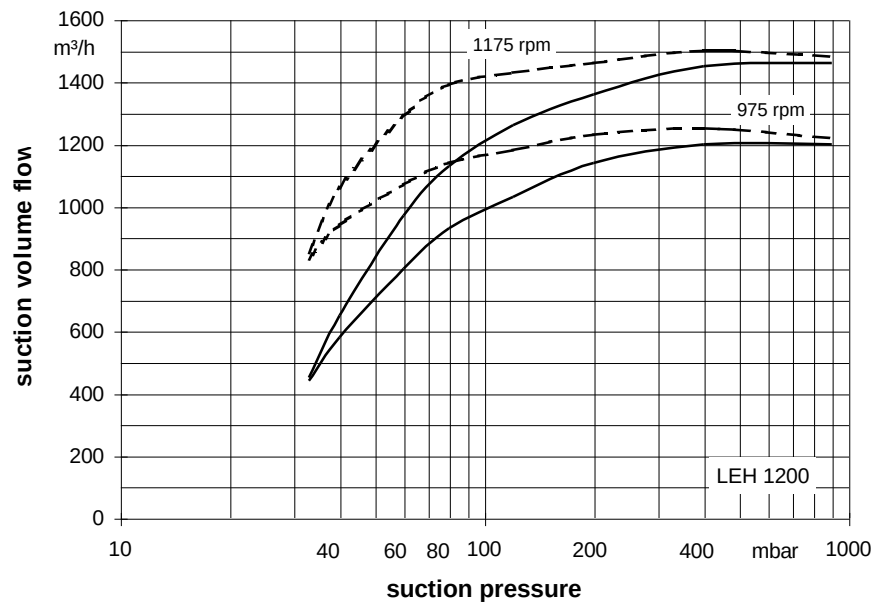
Material design

| Item.        | COMPONENTS               | MATERIAL DESIGN              |                                 |
|--------------|--------------------------|------------------------------|---------------------------------|
|              |                          | 0B                           | 4B                              |
| 10.60, 10.70 | Casing                   | 0.6025                       | 1.4408                          |
| 10.90        | Central body             | 1.0553                       | 1.4571                          |
| 13.70, 13.71 | Guide disk               | 0.6025                       | 1.4408                          |
| 21.00        | Shaft                    | 1.0503                       |                                 |
| 23.50        | Vane wheel impeller      | 0.7043                       | 1.4517                          |
| 43.30, 43.31 | Standard mechanical seal | Cr-steel / carbon / Perbunan | Cr Ni Mo-steel / carbon / Viton |
| 46.10        | Gland packing            | Soft packing                 |                                 |
| 52.40        | Shaft sleeve             | 1.4027.05                    | 1.4571                          |

Sectional drawing LEH 1200, LEH 1500, LEH 1800



## Suction volume flow and power absorption LEH 1200



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

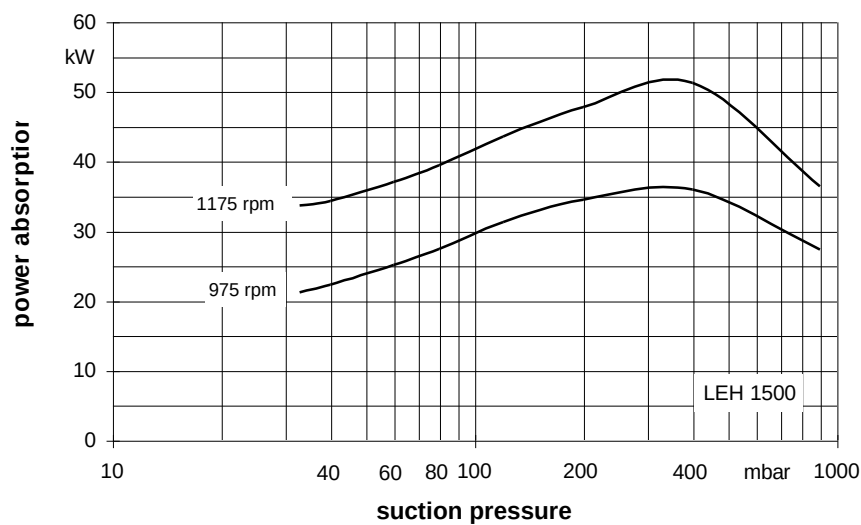
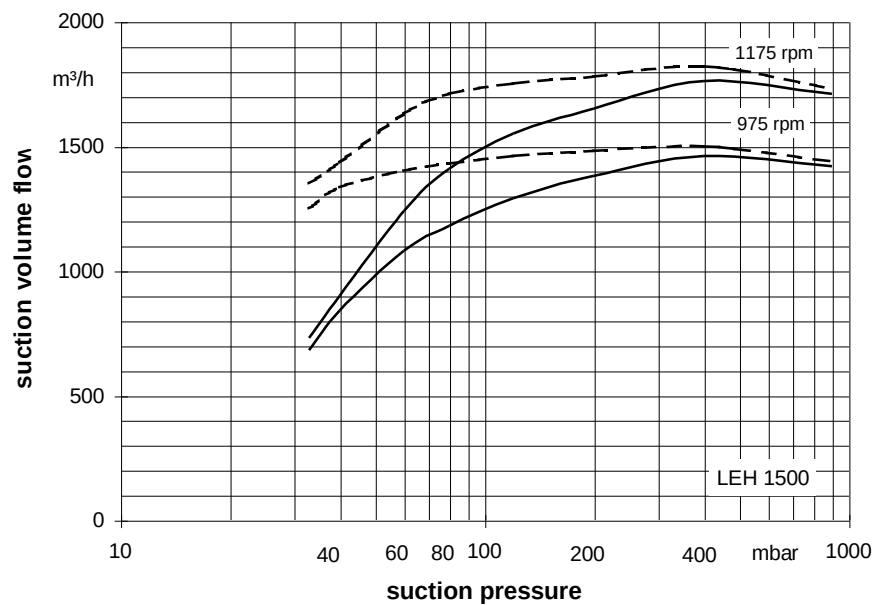
Compression pressure 1013 mbar (atmospheric pressure)

The suction volume flow is applied to the suction pressure

Tolerance of the operating data 10%

Max. fresh water need with lowest suction pressure

Suction volume flow and power absorption LEH 1500

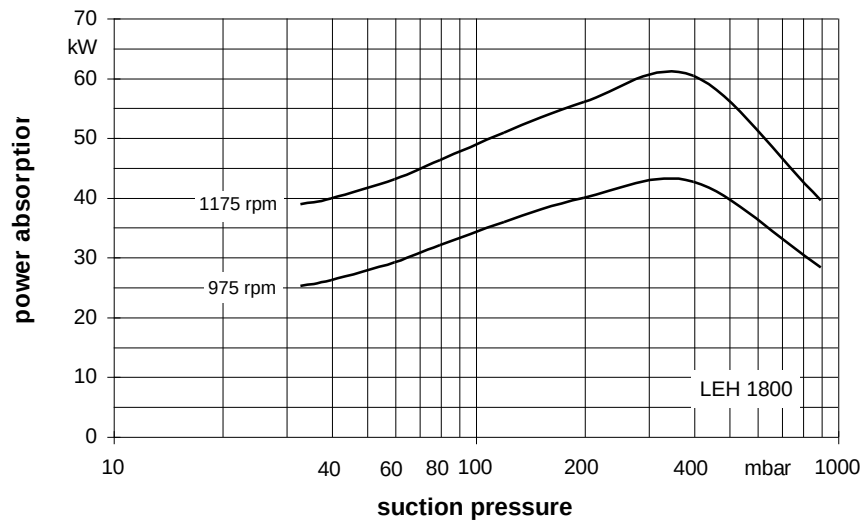
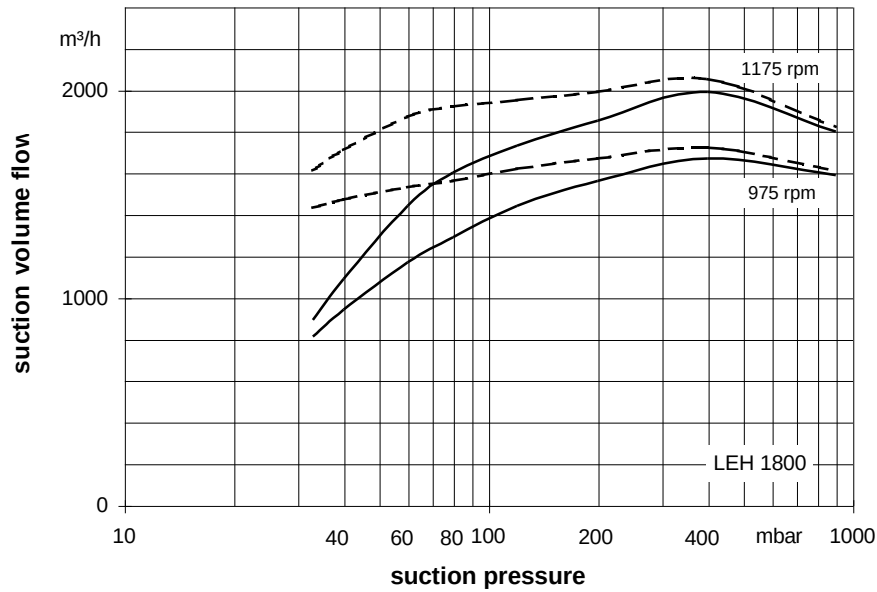


The operating data are applicable under the following conditions:

- 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%  
Max. fresh water need with lowest suction pressure

Suction volume and power absorption LEH 1800

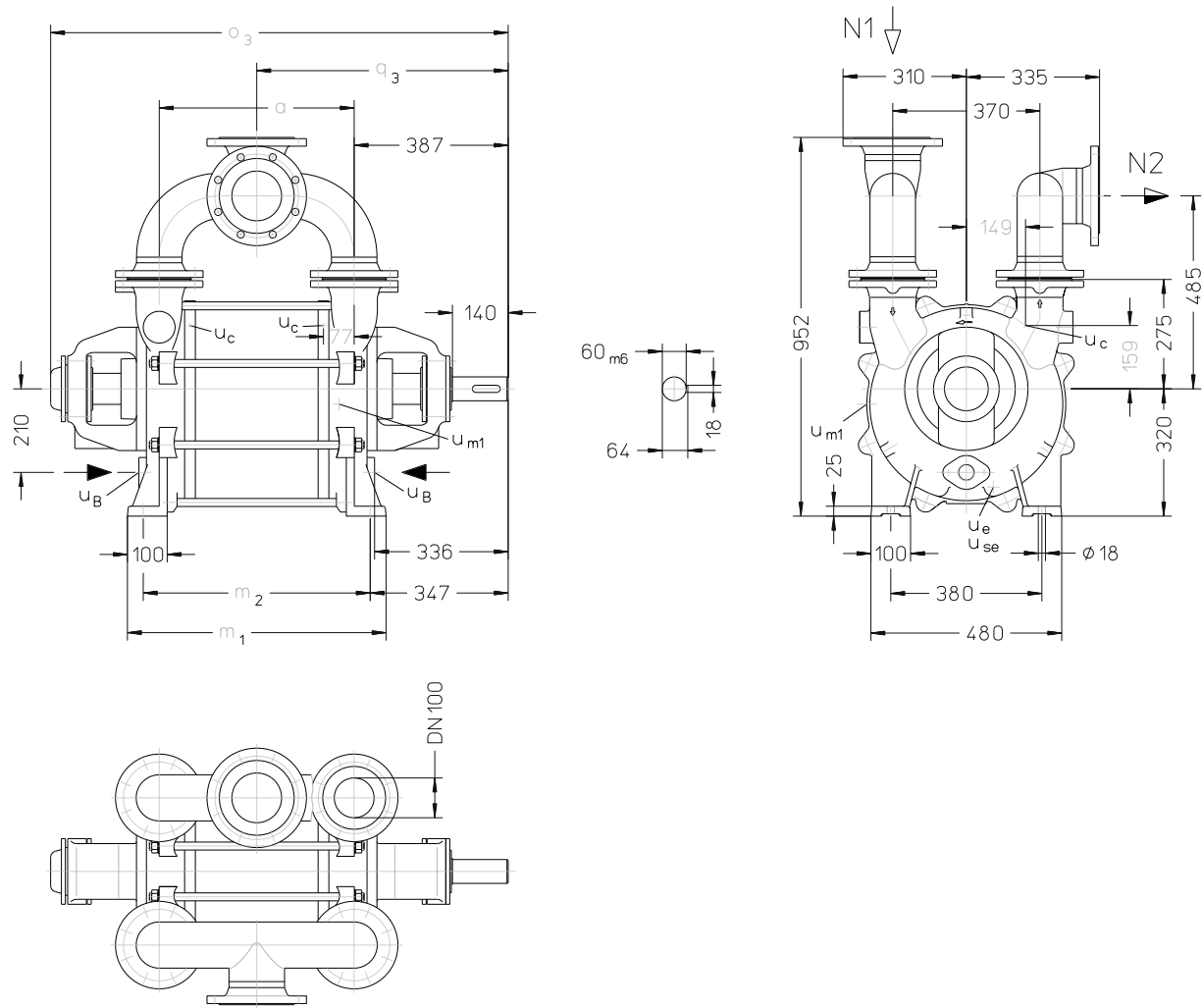


The operating data are applicable under the following conditions:

- 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%  
Max. fresh water need with lowest suction pressure

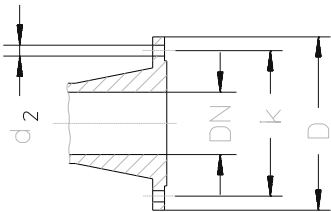
Dimension table LEH 1200, LEH 1500, LEH 1800



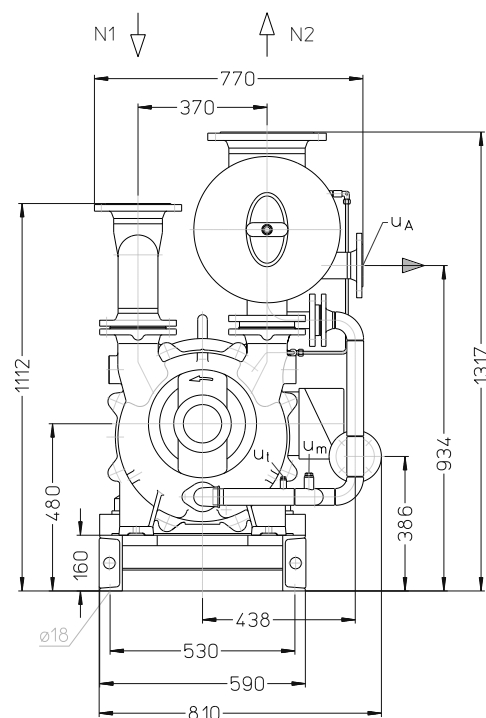
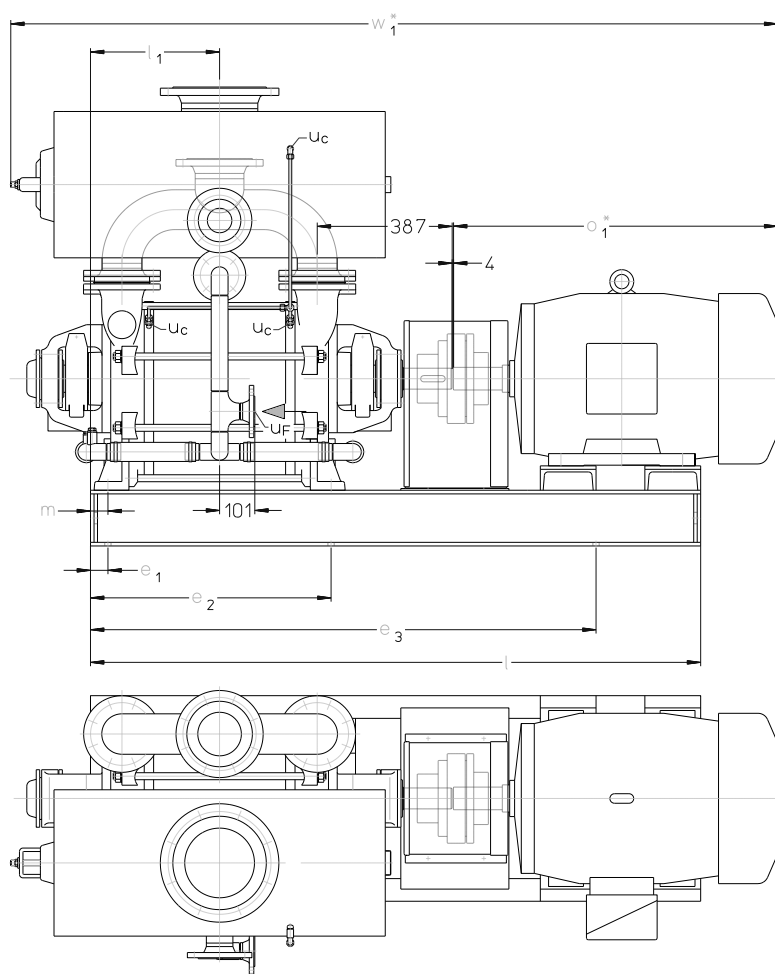
- N 1 = gas inlet DN 125  
N 2 = gas outlet DN 125  
u<sub>B</sub> = connection for service liquid G 1¼  
u<sub>c</sub> = connection for protection against cavitation G ¼  
u<sub>e</sub> = drain connection G ½  
u<sub>m1</sub> = connection for drain valve G ¾  
u<sub>se</sub> = connection for dirt drain G ½

|          | a   | m <sub>1</sub> | m <sub>2</sub> | o <sub>3</sub> | q <sub>3</sub> | weight<br>app. kg |
|----------|-----|----------------|----------------|----------------|----------------|-------------------|
| LEH 1200 | 490 | 651            | 571            | 1150           | 632            | 479               |
| LEH 1500 | 560 | 721            | 641            | 1220           | 667            | 519               |
| LEH 1800 | 615 | 776            | 696            | 1275           | 695            | 549               |

| flange connections to DIN 2501 PN 10 |        |        |
|--------------------------------------|--------|--------|
| DN                                   | 100    | 125    |
| k                                    | 180    | 210    |
| D                                    | 220    | 250    |
| number x d <sub>2</sub>              | 8 x 18 | 8 x 18 |



# Arrangement drawing LEH 1200, LEH 1500, LEH 1800 with overhead liquid separator



N 1 = gas inlet DN 125

N 2 = gas outlet DN 200

$U_A$  = connection for liquid drain DN 65

$U_F$  = connection for fresh liquid DN 40

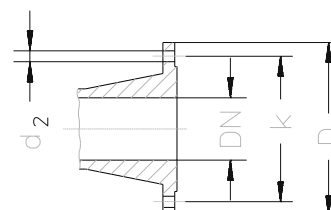
$U_c$  = connection for protection against cavitation G  $\frac{1}{4}$

$U_m$  = connection for pressure gauge G  $\frac{1}{2}$

$U_t$  = connection for thermometer G  $\frac{1}{4}$

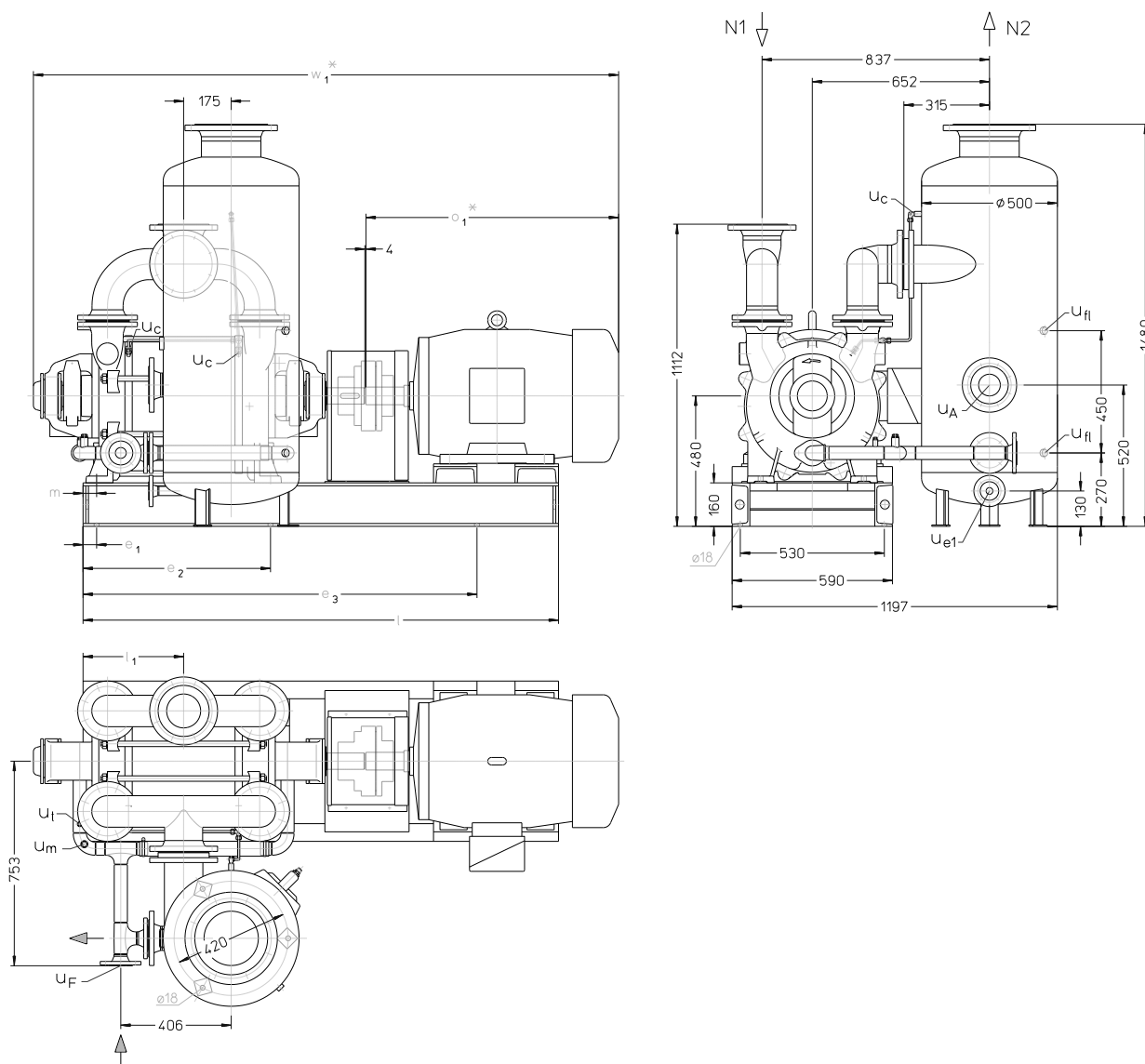
|          | electric motor 50 Hz |       |                   | e <sub>1</sub> | e <sub>2</sub> | e <sub>3</sub> | l    | l <sub>1</sub> | m  | o <sub>1</sub> * | w <sub>1</sub> * | weight<br>app. kg |
|----------|----------------------|-------|-------------------|----------------|----------------|----------------|------|----------------|----|------------------|------------------|-------------------|
|          | size                 | IP 55 | kW<br>EEx e II T3 |                |                |                |      |                |    |                  |                  |                   |
| LEH 1200 | 225 M                | 30    | -                 | 70             | 640            | 1370           | 1650 | 355            | 70 | 843              | 2043             | 1100              |
|          | 250 M                | -     | 33                | 50             | 690            | 1450           | 1750 |                |    | 930              | 2130             | 1225              |
| LEH 1500 | 250 M                | 37    | -                 |                | 735            | 1530           | 1900 | 370            | 50 | 2200             | 1260             |                   |
|          | 280 S                | -     | 40                |                |                |                |      |                |    | 1004             | 2274             | 1455              |
| LEH 1800 | 280 S                | 45    | -                 |                | 735            | 1530           | 1900 | 388            | 40 | 2329             | 1500             |                   |
|          | 280 M                | -     | 46                |                |                |                |      |                |    | 1055             | 2380             | 1570              |

| flange connections to DIN 2501 PN 10 |        |        |        |        |
|--------------------------------------|--------|--------|--------|--------|
| DN                                   | 40     | 65     | 125    | 200    |
| k                                    | 110    | 145    | 210    | 295    |
| D                                    | 150    | 185    | 250    | 340    |
| number x $d_2$                       | 4 x 18 | 4 x 18 | 8 x 18 | 8 x 22 |



\* dimensions dependent on the motor make

# Arrangement drawing LEH 1200, LEH 1500, LEH 1800 with upright liquid separator



N 1 = gas inlet DN 125

N 2 = gas outlet DN 200

UA = connection for liquid drain DN 80

UF = connection for fresh liquid DN 40

Uc = connection for protection against cavitation G 1/4

Ue1 = drain connection DN 25

Ufl = connection for liquid level indicator G 1/2

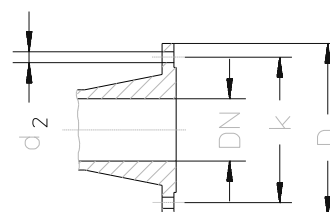
Um = connection for pressure gauge G 1/2

Ut = connection for thermometer G 1/4

|          | electric motor 50 Hz |       |                   | e <sub>1</sub> | e <sub>2</sub> | e <sub>3</sub> | l    | l <sub>1</sub> | m  | o <sub>1</sub> * | w <sub>1</sub> * | weight<br>app. kg |
|----------|----------------------|-------|-------------------|----------------|----------------|----------------|------|----------------|----|------------------|------------------|-------------------|
|          | size-                | IP 55 | kW<br>EEx e II T3 |                |                |                |      |                |    |                  |                  |                   |
| LEH 1200 | 225 M                | 30    | -                 | 50             | 640            | 1370           | 1650 | 355            | 70 | 843              | 1997             | 1100              |
|          | 250 M                | -     | 33                |                | 690            | 1450           | 1750 |                |    | 930              | 2084             | 1225              |
| LEH 1500 | 250 M                | 37    | -                 |                | 735            | 1530           | 1900 | 370            | 50 | 1004             | 2154             | 1260              |
|          | 280 S                | -     | 40                |                |                |                |      |                |    |                  | 2228             | 1455              |
| LEH 1800 | 280 S                | 45    | -                 |                |                |                |      | 388            | 40 | 1055             | 2283             | 1500              |
|          | 280 M                | -     | 46                |                |                |                |      |                |    |                  | 2334             | 1565              |

| flange connections to DIN 2501 PN 10 |        |        |        |        |        |
|--------------------------------------|--------|--------|--------|--------|--------|
| DN                                   | 25     | 40     | 80     | 125    | 200    |
| k                                    | 85     | 110    | 160    | 210    | 295    |
| D                                    | 115    | 150    | 200    | 250    | 340    |
| 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





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

| suction pressure in<br>[mbar] |                    | 33                                |     |     |    | 120                               |     |     |     | 200                               |     |     |     | 400                               |     |     |     |
|-------------------------------|--------------------|-----------------------------------|-----|-----|----|-----------------------------------|-----|-----|-----|-----------------------------------|-----|-----|-----|-----------------------------------|-----|-----|-----|
| pump                          | speed<br><br>[rpm] | KB                                |     |     | FB | KB                                |     |     | FB  | KB                                |     |     | FB  | KB                                |     |     | FB  |
|                               |                    | difference in<br>temperature [°C] |     |     |    | difference in<br>temperature [°C] |     |     |     | difference in<br>temperature [°C] |     |     |     | difference in<br>temperature [°C] |     |     |     |
|                               |                    | 10                                | 5   | 2   |    | 10                                | 5   | 2   |     | 10                                | 5   | 2   |     | 10                                | 5   | 2   |     |
| LEH 1200                      | 975                | 1,3                               | 2,3 | 4,3 | 10 | 1,7                               | 2,7 | 4,3 | 7,2 | 1,7                               | 2,7 | 4,2 | 6,4 | 1,7                               | 2,5 | 3,6 | 5,0 |
|                               | 1175               | 1,9                               | 3,2 | 5,4 |    | 2,1                               | 3,3 | 4,9 |     | 2,2                               | 3,2 | 4,6 |     | 2,1                               | 2,9 | 3,9 |     |
| LEH 1500                      | 975                | 1,5                               | 2,7 | 4,8 |    | 2,0                               | 3,1 | 4,7 |     | 2,0                               | 3,1 | 4,5 |     | 1,9                               | 2,8 | 3,8 |     |
|                               | 1175               | 2,2                               | 3,7 | 5,9 |    | 2,5                               | 3,7 | 5,2 |     | 2,5                               | 3,6 | 4,9 |     | 2,3                               | 3,2 | 4,1 |     |
| LEH 1800                      | 975                | 1,8                               | 3,0 | 5,2 |    | 2,2                               | 3,3 | 4,9 |     | 2,2                               | 3,3 | 4,7 |     | 2,1                               | 3,0 | 3,9 |     |
|                               | 1175               | 2,5                               | 4,0 | 6,3 |    | 2,7                               | 3,9 | 5,4 |     | 2,7                               | 3,8 | 5,1 |     | 2,5                               | 3,4 | 4,2 |     |

FB = fresh liquid service

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

### Data regarding the pump size - order notes

| series + size            | hydraulics + bearings                                                         | shaft sealing                                                                                     | material design                                                                       | casing seal   |
|--------------------------|-------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------|
|                          | <b>A</b> hydraulic A<br><b>•B</b> two grease lubricated antifriction bearings | 041 double gland packing<br>AAE mechanical seal O-rings Perbunan<br>AA1 as AAE, but O-rings Viton | 0B main parts of GG without non-ferrous metal<br>4B main parts of Cr Ni Mo-cast steel | 0 liquid seal |
| LEH 1200<br>1500<br>1800 | AB                                                                            | 041, AAE, AA1                                                                                     | 0B, 4B                                                                                | 0             |

### Design - Motor selection table

|                                               | designation | electric motor 50 Hz  |       |             |                             |       |             |
|-----------------------------------------------|-------------|-----------------------|-------|-------------|-----------------------------|-------|-------------|
| pump with free shaft end                      | 01          | motor enclosure IP 55 |       |             | motor enclosure EEx e II T3 |       |             |
| pump with coupling, pre-drilled at motor side | 04          | kW                    | size  | designation | kW                          | size  | designation |
| as above, but with motor, for example         | e.g. BC     | 30                    | 225 M | AC          | 33                          | 250 M | BL          |
| 37 kW three-phase motor                       |             | 37                    | 250 M | BC          | 40                          | 280 S | CL          |
| (50 Hz, 400 VΔ) at 975 rpm                    |             | 45                    | 280 S | CC          | 46                          | 280 M | DL          |

### Example for ordering:

The construction size LEH 1500 AB AAE 0B 0 with 37 kW three-phase ac motor (50 Hz, 400 VΔ) 975 rpm has the complete order number:

**BC**

**LEH• 1500 AB AAE 0B 0**

If 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 1200                      | LEH 1500                 | LEH 1800                 |
|-----------------------------------------|----------------------------------|---------------|-------------------------------|--------------------------|--------------------------|
| <b>Overhead liquid separator</b>        |                                  | type          |                               |                          |                          |
| material design                         | 130 / galvanized<br>172 / 1.4571 | weight        | XBa 11540<br>96 kg            | XBa 12540<br>100 kg      | XBa 13240<br>104 kg      |
| service liquid line                     |                                  | SIHI part No. | 35 008 563<br>35 008 564      | 35 009 504<br>35 009 506 | 35 009 509<br>35 009 510 |
| material design                         | 072 / St 37-0<br>172 / 1.4571    | SIHI part No. | 35 005 440<br>35 005 441      | 35 005 442<br>35 005 443 | 35 005 444<br>35 005 445 |
| cavitation protection line              |                                  |               |                               |                          |                          |
| material design                         | 072 / St 37-0<br>172 / 1.4571    | SIHI part No. | 20 027 920<br>20 037 289      | 20 027 921<br>20 037 290 | 20 027 922<br>20 037 291 |
| <b>Upright liquid separator</b>         |                                  | type          | XBp 2315                      |                          |                          |
| material design                         | 130 / galvanized<br>172 / 1.4571 | weight        | 98 kg                         |                          |                          |
| service liquid line                     |                                  | SIHI part No. | 35 005 449<br>35 005 447      |                          |                          |
| material design                         | 072 / St 37-0<br>172 / 1.4571    | SIHI part No. | 35 005 434<br>35 005 435      | 35 005 436<br>35 005 437 | 35 005 438<br>35 005 439 |
| cavitation protection line              |                                  |               |                               |                          |                          |
| material design                         | 072 / St 37-0<br>172 / 1.4571    | SIHI part No. | 20 043 410<br>20 043 411      | 20 043 412<br>20 043 413 | 20 043 414<br>20 043 415 |
| <b>SIHI-gas ejector</b>                 |                                  |               |                               |                          |                          |
| at service liquid temperature           | 15 °C                            |               | GEV 1200 A                    | GEV 1500 A               | GEV 1800 A               |
| at service liquid temperature           | 30 °C                            |               | GEV 1200 B                    | GEV 1500 B               | GEV 1800 B               |
| <b>SIHI-ball type non-return valve</b>  |                                  | type / weight | XCk 150 / 35,8 kg resp. 43 kg |                          |                          |
| material design                         | 767 / GG-25<br>784 / 1.4408      | SIHI part No. | 20 072 800<br>20 006 987      |                          |                          |
| <b>Reduction</b>                        |                                  | weight        | 16,5 kg                       |                          |                          |
| material design                         | 072 / St 37-0<br>172 / 1.4571    | SIHI part No. | 35 002 762<br>35 014 264      |                          |                          |
| <b>Motor</b> in case of standard design |                                  |               |                               |                          |                          |
| IP 55                                   |                                  | size          | 225 M                         | 250 M                    | 280 S                    |
|                                         |                                  | power         | 30 kW                         | 37 kW                    | 45 kW                    |
|                                         |                                  | weight        | 315 kg                        | 420 kg                   | 605 kg                   |
| EEx e II T3                             |                                  | size          | 250 M                         | 280 S                    | 280 M                    |
|                                         |                                  | power         | 33 kW                         | 40 kW                    | 46 kW                    |
|                                         |                                  | weight        | 420 kg                        | 605 kg                   | 670 kg                   |
| <b>Coupling</b>                         |                                  |               |                               |                          |                          |
| for motor IP 55                         |                                  | type / weight | A 180 / 14 kg                 | A 180 / 14 kg            | A 180 / 14 kg            |
| pump side                               |                                  | SIHI part No  | 43 035 527                    | 43 035 527               | 43 035 527               |
| motor side                              |                                  |               | 43 021 496                    | 43 034 392               | 43 021 495               |
| for motor EEx e II T3                   |                                  | type / weight | ADS 194 / 17,5 kg             | ADS 194 / 17,5 kg        | ADS 218 / 24 kg          |
| pump side                               |                                  | SIHI part No  | 43 040 600                    | 43 040 600               | 43 040 602               |
| motor side                              |                                  |               | 43 035 601                    | 43 038 678               | 43 038 708               |
| <b>contact safety device</b>            |                                  |               |                               |                          |                          |
| material design                         | 076 / steel<br>345 / 2.0321      | SIHI part No. | 35 004 798<br>35 004 803      |                          |                          |
| <b>base frame</b>                       |                                  |               |                               |                          |                          |
| for motor IP 55                         | 081 / USt 37-1                   | SIHI part No. | 35 005 431                    | 35 005 432               | 35 005 433               |
|                                         |                                  | weight        | 150 kg                        | 155 kg                   | 166 kg                   |
| for motor EEx e II T3                   | 081 / USt 37-1                   | SIHI part No. | 35 005 432                    | 35 005 433               |                          |
|                                         |                                  | weight        | 155 kg                        | 166 kg                   |                          |

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

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