

# SIHI<sup>LPH-X</sup> - Liquid Ring Vacuum Pump

Two Stage



SIHI® Pumps

## LPH 65320, LPH 65327

**Pressure Range:** 33 to 1013 mbar  
**Suction Volume:** 300 to 700 m<sup>3</sup>/h

### CONSTRUCTION

Sterling SIHI liquid ring vacuum pumps have a simple but robust construction with the following features and benefits:

- Near isothermal compression
- Oil free, with no internal lubrication
- Capable of handling almost all gases and vapours
- Able to handle quantities of liquid "carry over"
- Low maintenance and safe operation
- Low noise and almost vibration free
- Available in a wide range of materials
- Broad range of applications
- O-ring sealing as standard
- Cavitation protection as standard
- Drain hole as standard
- Built-in solids drain
- Rotating metallic parts are non contacting to minimise wear
- ATEX compliance

Sterling SIHI liquid ring vacuum pumps of the range LPH 65320 and LPH 65327 are two stage pumps.

### APPLICATIONS

Evacuation and pumping of dry gases and saturated vapours. The pumps can also handle liquids. These units offer pressures in the range of 33...900 mbar(a) to atmospheric. Much lower pressures are available by using ancillaries such as ejectors and lobular boosting pumps. Typical application areas include:

- Chemical and pharmaceutical industry for distillation, drying and degassing
- Food and beverage industry for low temperature cooking, and bottle filling
- Electronic industry for impregnation and drying
- Plastics & Rubber industry for degassing
- Healthcare for sterilisers and general vacuum



### Note

By continuously feeding the pump with a small amount of service liquid (usually water), the heat due to gas/vapour compression is conducted away. This also replenishes the liquid ring and ensures that it does not become saturated with process media. Recharging the pump with service liquid at ambient temperature enables the unit to condense evacuated gases / vapours. It can therefore be used for solvent recovery. The condensed gas and liquid can be separated in a liquid separator. More information is provided in the accessory catalogues.

The integrated solids drain permits the removal of any entrained solids whilst the pump is operating. The service liquid can therefore, simply be re-circulated.

The rotation of the pump is clockwise when viewed from the drive end.

### GENERAL TECHNICAL DATA

| Pump Type  | Units               | LPH 65320 | LPH 65327    |
|--|---------------------|-----------|--------------|
| Speed  | 50 Hz<br>60 Hz      | rpm       | 1450<br>1740 |
| Maximum overpressure on compression                                | bar                 | 1.0       | 0.8          |
| Permissible pressure difference between suction and discharge side | max.<br>min.        | bar       | 1.5<br>0.2   |
| Hydraulic test pressure (overpressure)                             | bar                 | 3.0       |              |
| Moment of inertia of rotating parts of pump and water content      | kg · m <sup>2</sup> | 0.32      | 0.38         |
| Noise level at 80 mbar suction pressure                            | dB (A)              | 76        |              |
| Minimum permissible pulley diameter for V belt drive               | mm                  | 160       |              |
| Maximum gas temperature:   | dry<br>saturated    | °C<br>°C  | 200<br>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               | 16.0      | 19.0         |
| Maximum flow resistance of the heat exchanger                      | bar                 | 0.2       |              |

In selecting a pump, avoid choosing one which is likely to be operating at a combination of its maximum permissible limits e.g. maximum

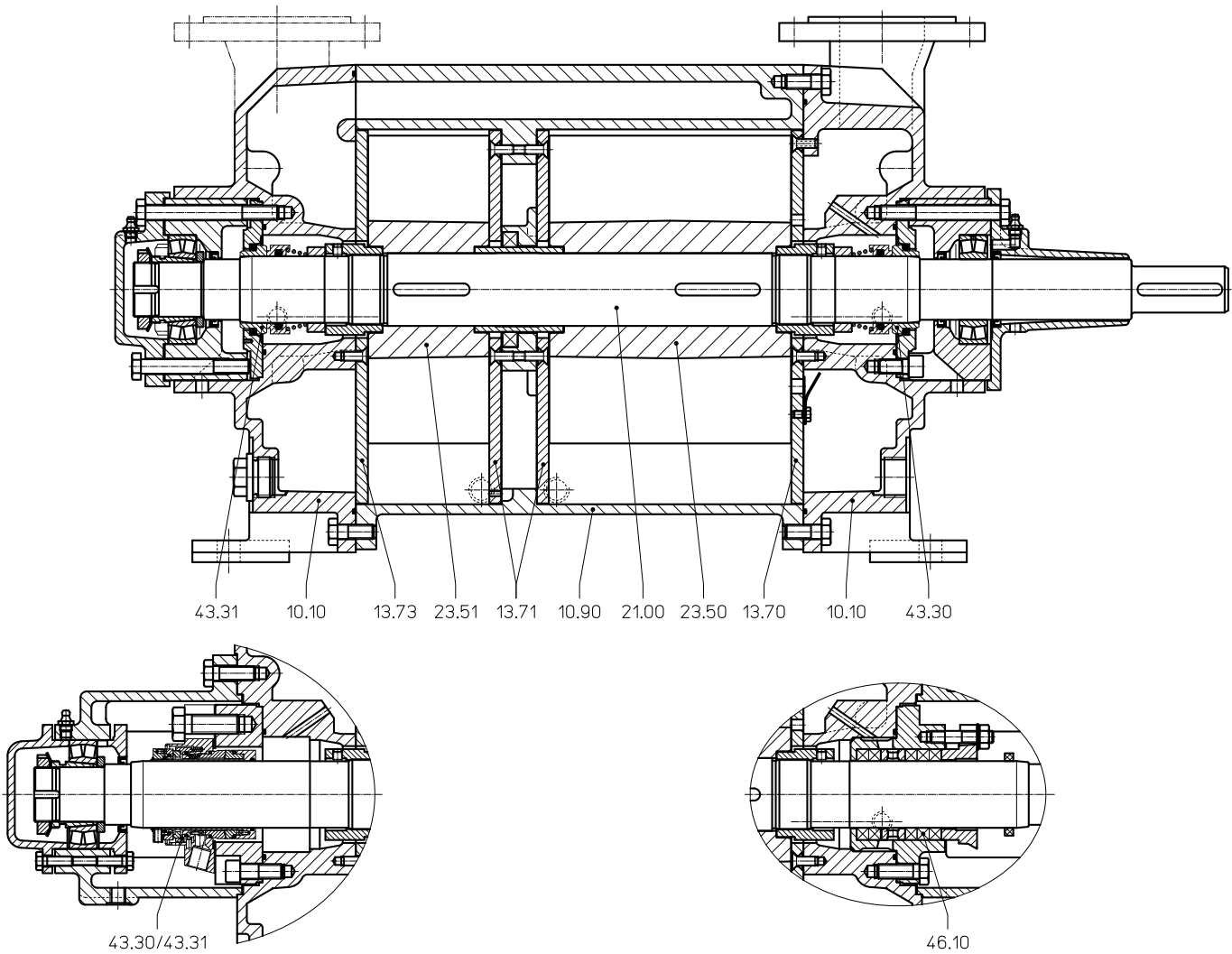
# SIHI<sup>LPH-X</sup>

viscosity and maximum permissible pressure difference.

## Materials

| Position Number     | Component                              | MATERIALS                            |                                 |
|---------------------|--|--------------------------------------|---------------------------------|
|                     |  | 0B                                   | 4B                              |
| 10.10               | Vacuum casing                          | 0.6025                               | 1.4408                          |
| 10.90               | Central body                           |                                      |                                 |
| 13.70, 13.71, 13.73 | Guide disc                             |                                      | 1.4404                          |
| 21.00               | Shaft                                  | 1.4021                               | 1.4517 / 1.4408                 |
| 23.50, 23.51        | Impeller                               | 1.0553 / 1.0619                      | 1.4517 / 1.4408                 |
| 43.30, 43.31        | Mechanical seal,<br>Type SIHI FK (AG•) | Cr-Steel / Carbon / Butadiene rubber | Cr Ni Mo-Steel / Carbon / Viton |
| 43.30, 43.31        | Double mechanical seal                 | on request                           |                                 |
| 46.10               | Gland packing                          | GORE                                 | -                               |

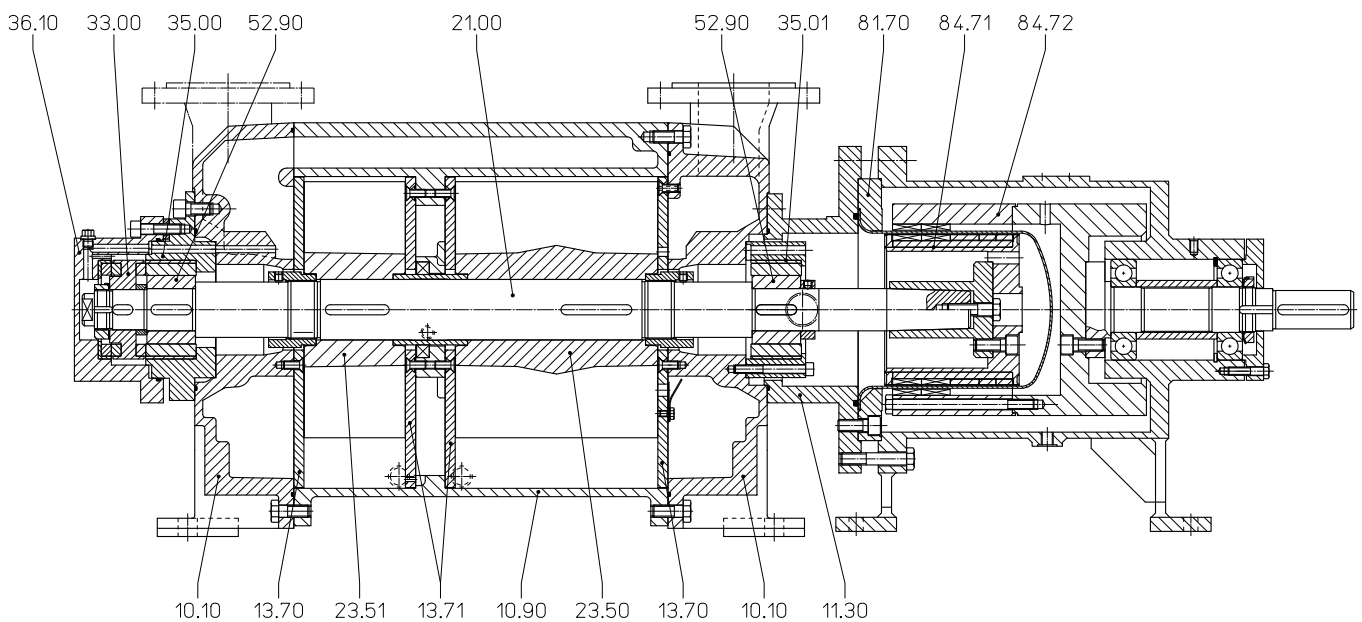
Cut-away diagram LPH 65320, LPH 65327 with single, double mechanical seal and gland packing



**Materials LPH 65320, LPH 65327 with magnetic coupling**

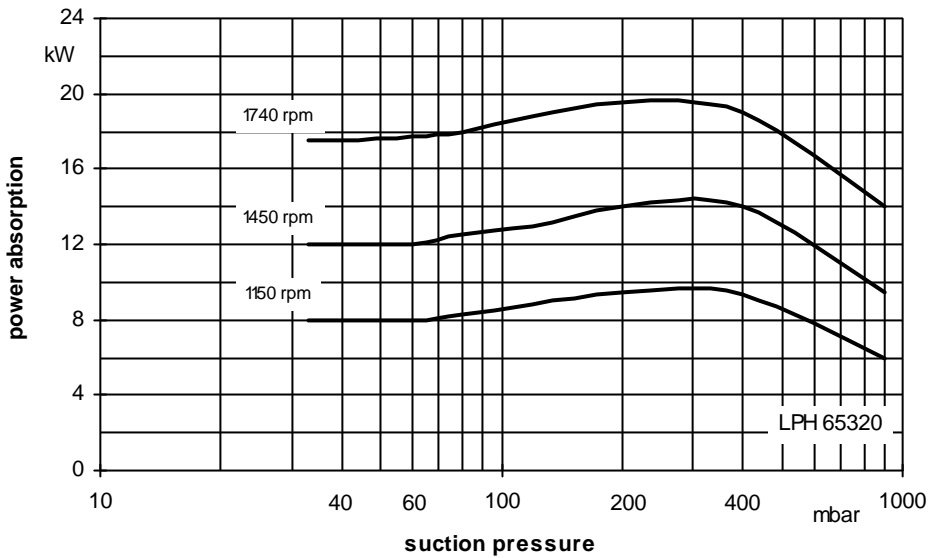
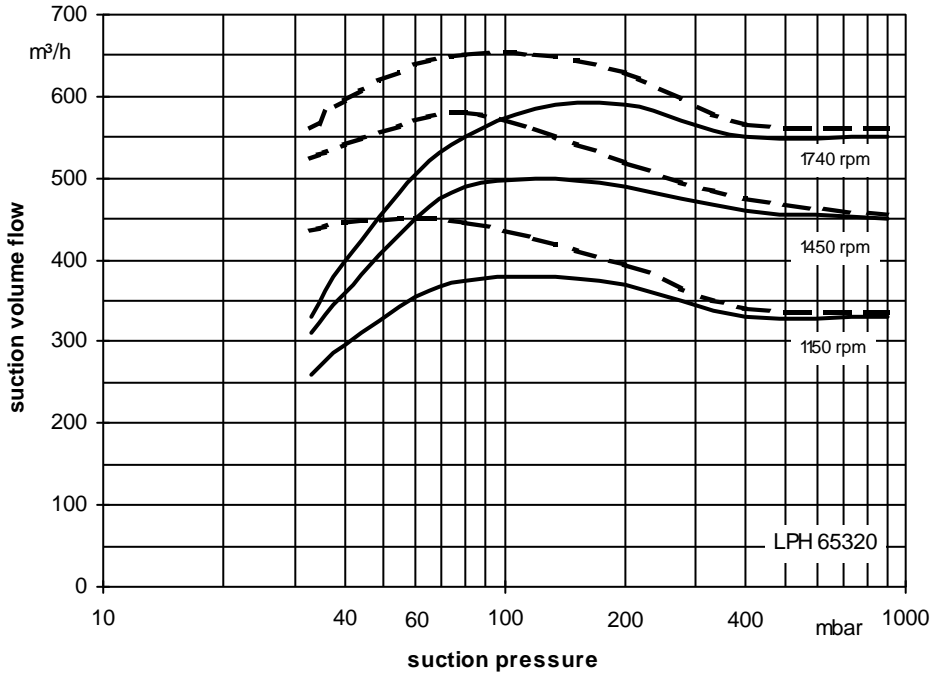
| Position Number | COMPONENT           | MATERIALS                |                          |
|-----------------|---------------------|--------------------------|--------------------------|
|                 |                     | 0B                       | 4B                       |
| 10.60           | Casing              | 0.6025                   | 1.4408                   |
| 10.90           | Central body        |                          |                          |
| 13.70, 13.71    | Guide disc          |                          |                          |
| 11.30           | Intermediate casing | 1.0553                   | 1.4571                   |
| 21.00           | Shaft               | 1.4021                   |                          |
| 23.50, 23.51    | Vane wheel impeller | 1.0553                   | 1.4517                   |
| 33.00           | Thrust bearing      | 1.4462 / silicon carbide |                          |
| 35.00, 35.01    | Bearing housing     | 1.0553 / silicon carbide | 1.4571 / silicon carbide |
| 36.10           | Bearing cover       |                          |                          |
| 52.90, 52.91    | Bushing             | tungsten carbide         |                          |
| 81.70           | Isolation shroud    | 1.4571 / 2.4610          |                          |
| 84.71           | Inner magnet        | 1.4571 / 2.4610 / magnet |                          |
| 84.72           | Outer magnet        | 1.0553 / magnet          |                          |

**Cut-away diagram LPH 65320, LPH 65327 with magnetic coupling**



All information in this catalogue, like general technical data, performance data, dimensions, arrangement drawings, accessories, etc. don't refer to the magnetic coupling execution. Please contact the manufacturer about more information.

## Performance Characteristics LPH 65320



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

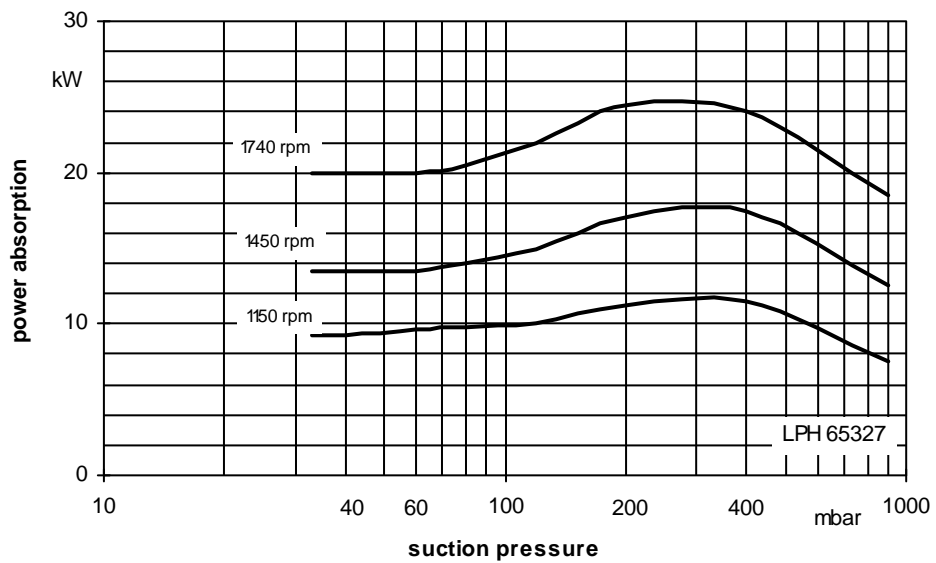
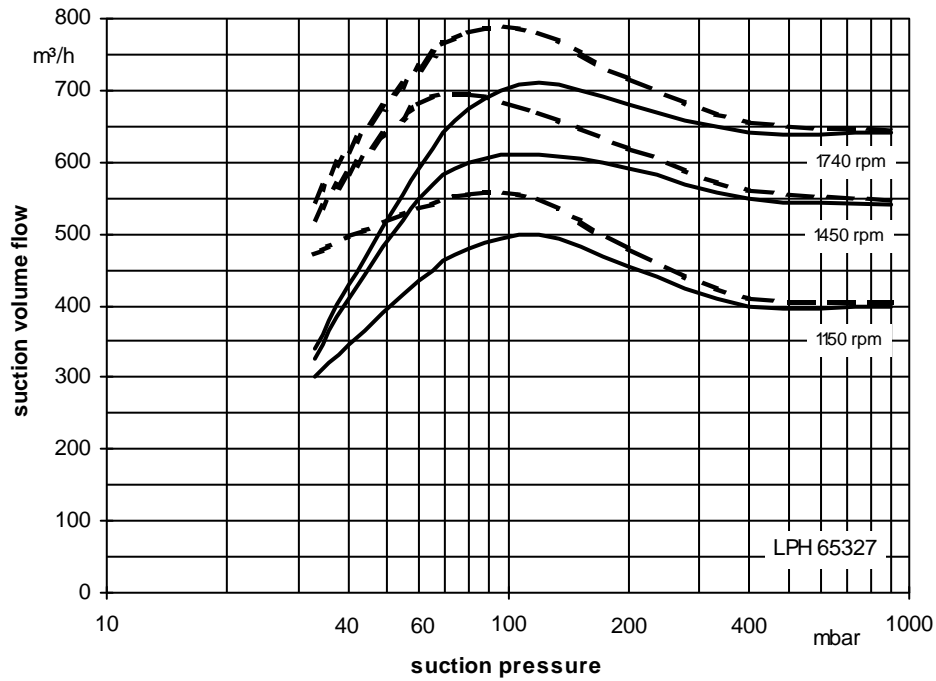
Pressure of gas to be evacuated: 1013 mbar (Atmospheric pressure)

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 65327



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

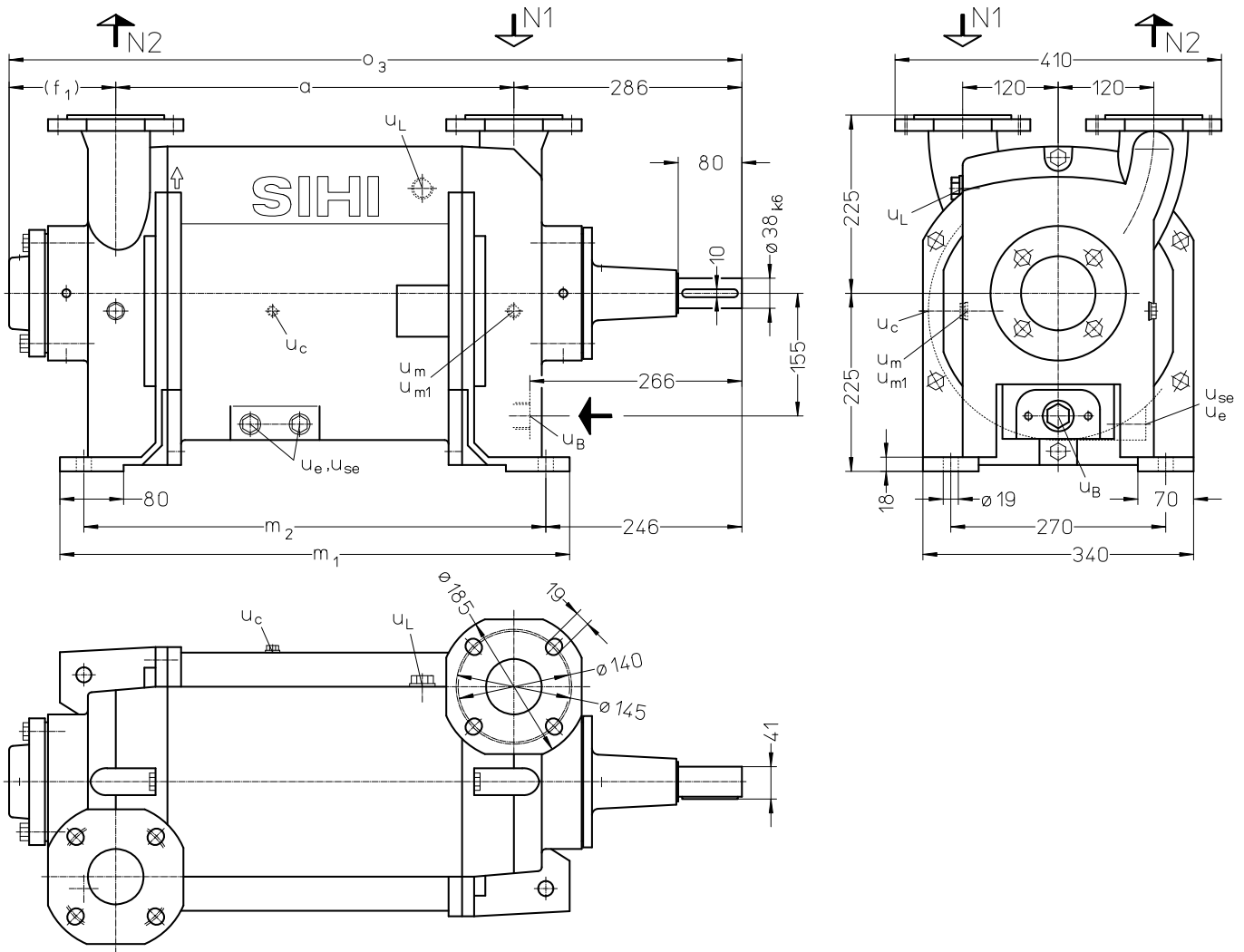
Pressure of gas to be evacuated: 1013 mbar (Atmospheric pressure)

The suction volume is related to the suction pressure.

Tolerance on operating data is 10%.

Maximum consumption of make up water occurs at the lowest suction pressure.

## Dimensions LPH 65320, LPH 65327 with single mechanical seal and gland packing



N 1 = Gas-inlet DN 65 (according to DIN 2501 PN 10)  
 Gas-inlet 2 1/2" (according to ANSI 150 lbs)

N 2 = Gas-outlet DN 65 (according to DIN 2501 PN 10)  
 Gas-outlet 2 1/2" (according to ANSI 150 lbs)

$u_B$  = Connection for service liquid G 1

$u_c$  = Connection for cavitation protection G 1/4

$u_e$  = Connection for drain G 1/2

$u_{se}$  = Connection for dirt drain G 1/2

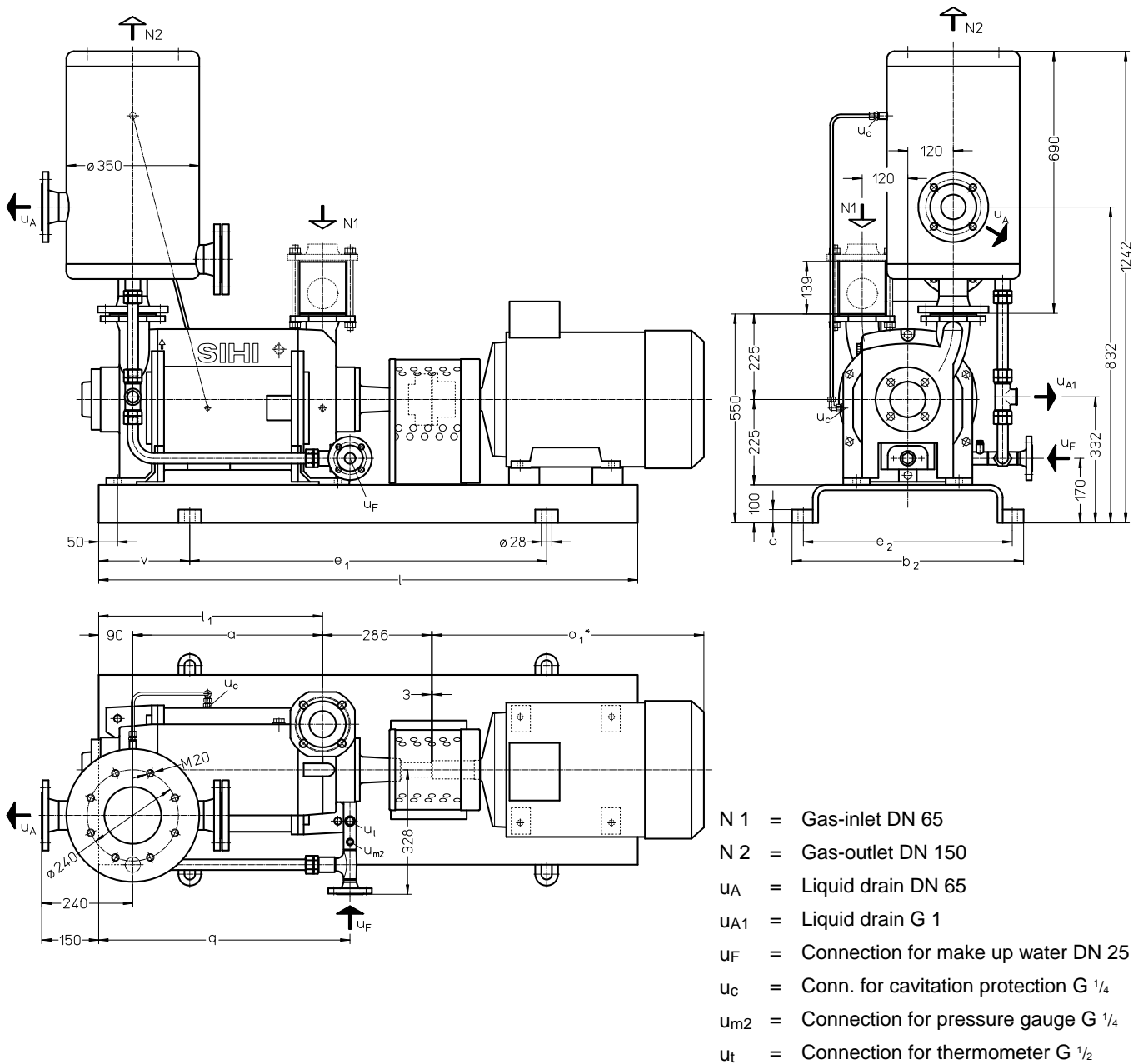
$u_L$  = Connection for air cock G 3/4

$u_m$  = Connection for pressure gauge G 3/8 (Grey cast iron)  
 Connection for pressure gauge G 3/4 (Stainless steel)

$u_{m1}$  = Connection for drainage valve or liquid level sensor G 3/8 (grey cast iron)  
 Connection for drainage valve or liquid level sensor G 3/4 (stainless steel)

|           | execution       | a<br>[mm] | f <sub>1</sub><br>[mm] | m <sub>1</sub><br>[mm] | m <sub>2</sub><br>[mm] | o <sub>3</sub><br>[mm] | approx. weight<br>[kg] |
|-----------|-----------------|-----------|------------------------|------------------------|------------------------|------------------------|------------------------|
| LPH 65320 | mechanical seal | 500       | 134                    | 640                    | 580                    | 920                    | 200                    |
|           | gland packing   |           | 223                    |                        |                        | 1009                   |                        |
| LPH 65327 | mechanical seal | 566       | 134                    | 706                    | 646                    | 986                    | 215                    |
|           | gland packing   |           | 223                    |                        |                        | 1075                   |                        |

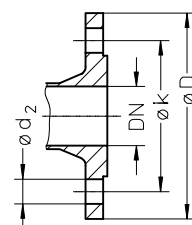
## LPH 65320, LPH 65327 with single mechanical seal, gland packing and with top-mounted liquid separator



|           | E-Motor 50 Hz |       |                | base-plate | a [mm] | b <sub>2</sub> [mm] | c [mm] | e <sub>1</sub> [mm] | e <sub>2</sub> [mm] | l [mm] | l <sub>1</sub> [mm] | o <sub>1</sub> * [mm] | q [mm] | v [mm] | approx. weight [kg] |
|-----------|---------------|-------|----------------|------------|--------|---------------------|--------|---------------------|---------------------|--------|---------------------|-----------------------|--------|--------|---------------------|
|           | size          | IP 55 | kW EEx e II T3 |            |        |                     |        |                     |                     |        |                     |                       |        |        |                     |
| LPH 65320 | 160 L         | 15.0  | -              | S487       | 500    | 610                 | 35     | 940                 | 550                 | 1420   | 590                 | 588                   | 662    | 240    | 455                 |
|           | 180 M         | -     | 15.0           |            |        |                     |        |                     |                     |        |                     | 715                   |        |        | 535                 |
| LPH 65327 | 180 M         | 18.5  | -              | S388       | 566    | 540                 | 40     | 1060                | 490                 | 1600   | 656                 | 712                   | 728    | 270    | 491                 |
|           | 180 L         | -     | 17.5           |            |        |                     |        |                     |                     |        |                     | 715                   |        |        | 555                 |

\* Dimensions dependent upon motor supplier

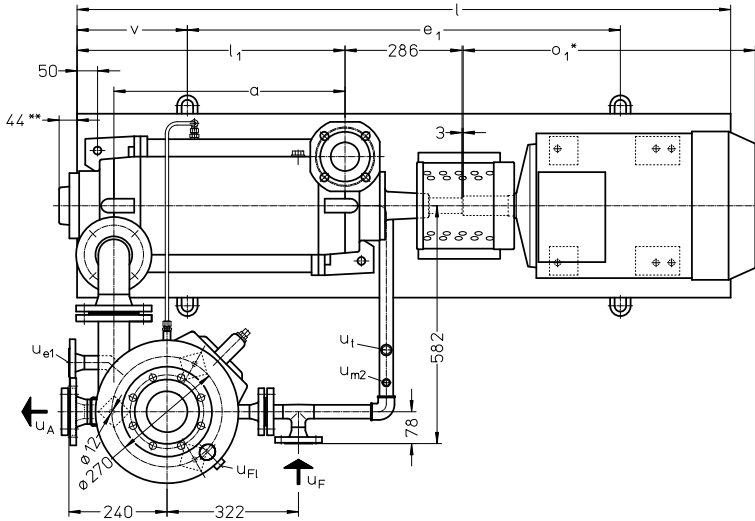
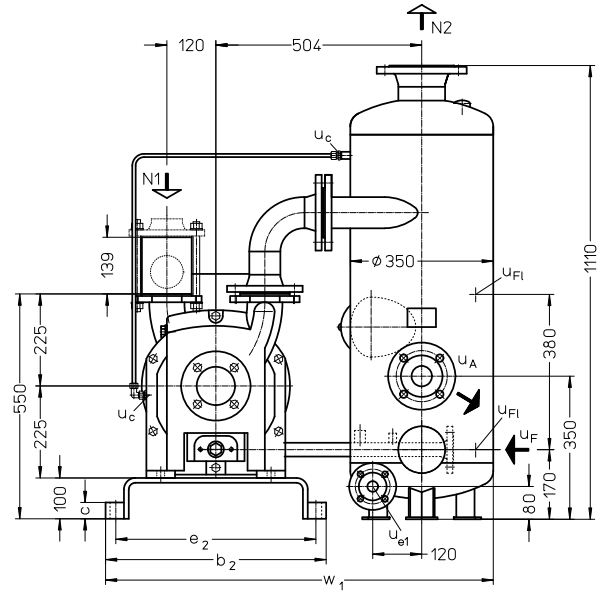
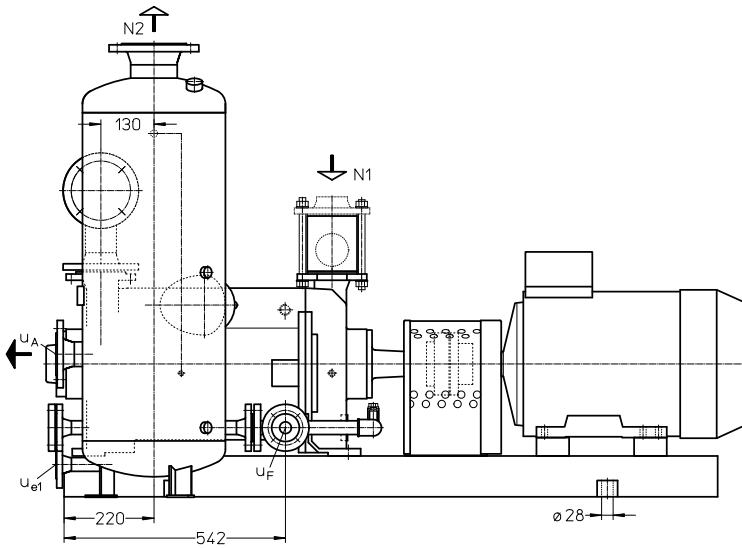
| Flange dimensions according to DIN 2501 PN 10 [mm] |        |        |
|--|--------|--------|
| DN   | 25     | 65     |
| k  | 85     | 145    |
| D  | 115    | 185    |
| Number x d <sub>2</sub>                            | 4 x 14 | 4 x 18 |



# SIHI LPH-X

LPH 65320, LPH 65327

with single mechanical seal, gland packing and with side-mounted liquid separator



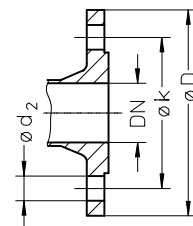
- N 1 = Gas-inlet DN 65
- N 2 = Gas-outlet DN 100
- U<sub>A</sub> = Liquid drain DN 50
- U<sub>c</sub> = Connection for cavitation protection G 1/4
- U<sub>e1</sub> = Connection for drain DN 25
- U<sub>F</sub> = Connection for make up water DN 25
- U<sub>Fl</sub> = Connection for liquid level indicator G 1/2
- U<sub>m2</sub> = Connection for pressure gauge G 1/4
- U<sub>t</sub> = Connection for thermometer G 1/2

|           | E-Motor 50 Hz |      |              | base-plate | a [mm] | b <sub>2</sub> [mm] | c [mm] | e <sub>1</sub> [mm] | e <sub>2</sub> [mm] | l [mm] | l <sub>1</sub> [mm] | o <sub>1</sub> * [mm] | v [mm] | w <sub>1</sub> [mm] | approx. weight [kg] |
|-----------|---------------|------|--------------|------------|--------|---------------------|--------|---------------------|---------------------|--------|---------------------|-----------------------|--------|---------------------|---------------------|
|           | size          | kW   | EEEx e II T3 |            |        |                     |        |                     |                     |        |                     |                       |        |                     |                     |
| LPH 65320 | 160 L         | 15.0 | -            | S487       | 500    | 610                 | 35     | 940                 | 550                 | 1420   | 590                 | 588                   | 240    | 984                 | 473                 |
|           | 180 M         | -    | 15.0         |            |        |                     |        |                     |                     |        |                     | 715                   |        |                     | 553                 |
| LPH 65327 | 180 M         | 18.5 | -            | S388       | 566    | 540                 | 40     | 1060                | 490                 | 1600   | 656                 | 712                   | 270    | 949                 | 512                 |
|           | 180 L         | -    | 17.5         |            |        |                     |        |                     |                     |        |                     | 715                   |        |                     | 576                 |

\* Dimensions dependent upon motor supplier

\*\* Dimension +89mm at execution with gland packing

| Flange dimensions according to DIN 2501 PN 10 [mm] |        |        |        |        |
|--|--------|--------|--------|--------|
| DN   | 25     | 50     | 65     | 100    |
| k  | 85     | 125    | 145    | 180    |
| D  | 115    | 165    | 185    | 220    |
| Number x d <sub>2</sub>                            | 4 x 14 | 4 x 18 | 4 x 18 | 8 x 18 |





**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 [1/min] | 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 65320                  | 1150          | 0.30                        | 0.55 | 0.91 | 1.51 | 2.7 | 0.33                        | 0.58 | 0.94 | 1.50 | 2.5 | 0.34                        | 0.59 | 0.93 | 1.42 | 2.2 | 0.32 | 0.52 | 0.77 | 1.09 | 1.5 |
|                            | 1450          | 0.43                        | 0.75 | 1.17 | 1.77 |     | 0.46                        | 0.77 | 1.18 | 1.73 |     | 0.47                        | 0.78 | 1.15 | 1.61 |     | 0.43 | 0.67 | 0.92 | 1.20 |     |
|                            | 1750          | 0.59                        | 0.97 | 1.42 | 2.00 |     | 0.61                        | 0.98 | 1.41 | 1.91 |     | 0.61                        | 0.95 | 1.33 | 1.74 |     | 0.53 | 0.78 | 1.03 | 1.27 |     |
| LPH 65327                  | 1150          | 0.34                        | 0.61 | 1.00 | 1.60 | 2.7 | 0.37                        | 0.64 | 1.02 | 1.58 | 2.5 | 0.39                        | 0.67 | 1.03 | 1.51 | 2.2 | 0.37 | 0.60 | 0.85 | 1.15 | 1.5 |
|                            | 1450          | 0.48                        | 0.81 | 1.25 | 1.84 |     | 0.51                        | 0.85 | 1.27 | 1.80 |     | 0.55                        | 0.88 | 1.25 | 1.69 |     | 0.50 | 0.75 | 1.00 | 1.25 |     |
|                            | 1750          | 0.65                        | 1.05 | 1.51 | 2.05 |     | 0.69                        | 1.08 | 1.50 | 2.00 |     | 0.71                        | 1.08 | 1.44 | 1.82 |     | 0.61 | 0.87 | 1.10 | 1.31 |     |

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       | Hydraulic + Bearings  | Shaft Seal   | Materials  | Casing Sealing   |
|--------------------|---|--|--|------------------|
|                    | <ul style="list-style-type: none"> <li>A• 1. Hydraulic</li> <li>•B two greased roller bearings</li> </ul> | 041 Gland Packing<br>AGE Mechanical Seal type SIHI FK, O-Rings Butadiene rubber<br>AG1 Mechanical Seal type SIHI FK, O-Rings Viton | 0B Main parts from cast iron (GG) and impellers in steel<br>4B Main parts out of stainless steel | 1 O-Ring Sealing |
| LPH 65320<br>65327 | AB  | 041, AGE<br>AG1  | 0B<br>4B   | 1                |

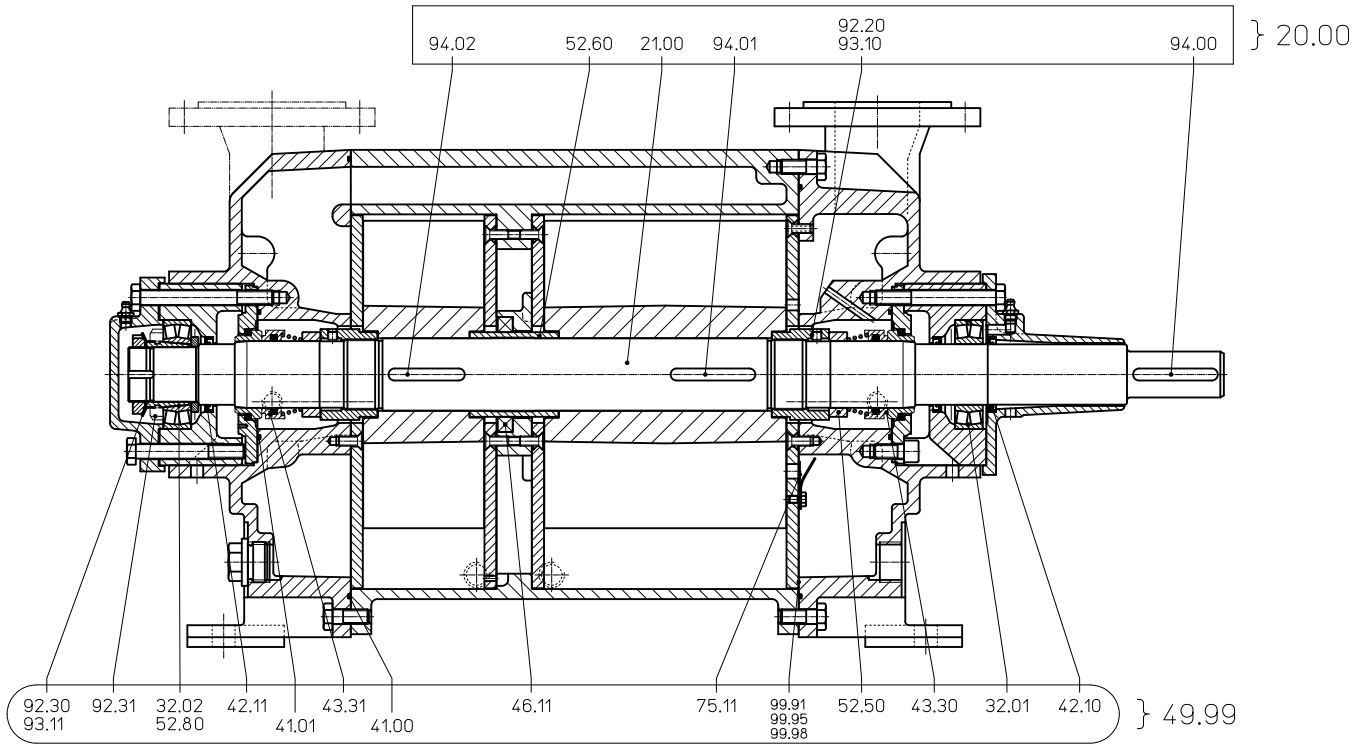
## Motor Selection

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:

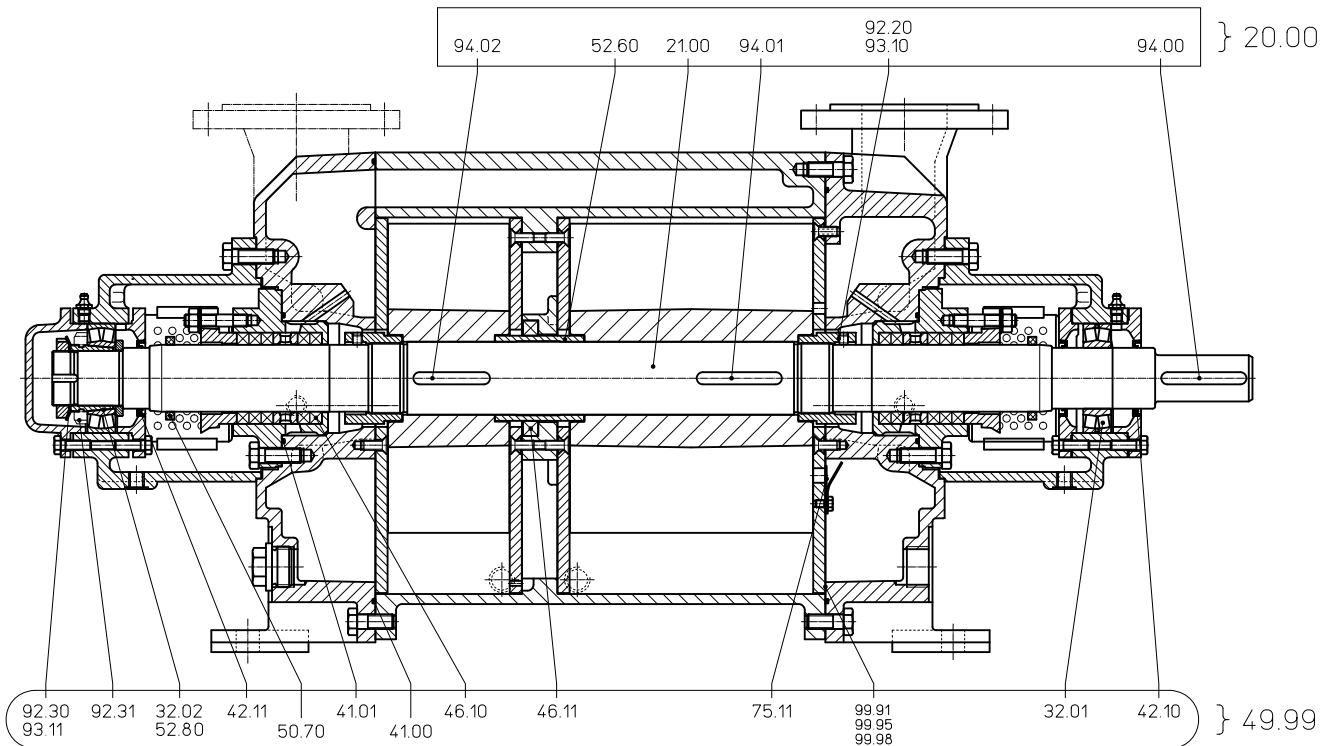
LPHX 65327 AB AGE 0B 1 with 18.5 kW AC motor, 50 Hz, 400V Δ, IP55

## Spare Parts Order Number



| Material Design 0B |                  |            |            |
|--------------------|------------------|------------|------------|
| Group              | Spare parts kit  | LPH 65320  | LPH 65327  |
| 20.00              | Shaft            | 65 007 930 | 65 007 771 |
| 49.99              | Basic repair AGE | 65 007 772 |            |

| Material Design 4B |                  |            |            |
|--------------------|------------------|------------|------------|
| Group              | Spare parts kit  | LPH 65320  | LPH 65327  |
| 20.00              | Shaft            | 65 007 931 | 65 007 540 |
| 49.99              | Basic repair AG1 | 65 007 886 |            |



| Material Design 0B |                  |            |            |
|--------------------|------------------|------------|------------|
| Group              | Spare parts kit  | LPH 65320  | LPH 65327  |
| 20.00              | Shaft            | 65 007 896 | 65 007 932 |
| 49.99              | Basic repair 041 | 65 007 897 |            |

**Accessories**

| Recommended Accessory                                     | Material Execution  |                                | LPH 65320  | LPH 65327                                  |
|---|---|--------------------------------|--|--|
| <b>Top Mounted Liquid Separator</b>                       |   | Type / Weight                  | XBa 5540 / 35 kg   |  |
| Top mounted separator                                     | Steel, galvanised<br>1.4571                                     | SIHI-Part No.                  | 43 134 149<br>43 132 195   |  |
| Service liquid pipework,<br>standard execution            | Steel<br>1.4571   | SIHI-Part No.                  | 35 003 119<br>35 003 120   | 35 003 121<br>35 003 122                   |
| Service liquid pipework,<br>thermostatic control 24V      | Steel + Brass<br>1.4571 + Brass                                 | SIHI-Part No.                  | 20 073 220<br>20 073 221   |  |
| Cavitation protection<br>pipework                         | Steel, galvanised<br>1.4571                                     | SIHI-Part No.                  | 20 039 166<br>20 039 167   |  |
| <b>Side Mounted Liquid Separator</b>                      |   | Type / Weight                  | XBp 0912 / 51 kg   |  |
| Side mounted separator                                    | Steel, galvanised<br>1.4571                                     | SIHI-Part No.                  | 43 132 197<br>43 132 198   |  |
| Service liquid pipework,<br>standard execution            | Steel<br>1.4571   | SIHI-Part No.                  | 35 003 112<br>35 003 113   | 35 003 115<br>35 003 117                   |
| Service liquid pipework,<br>thermostatic control 24V      | Steel + Brass<br>1.4571 + Brass                                 | SIHI-Part No.                  | 20 073 312<br>20 073 313   |  |
| Cavitation protection<br>pipework                         | Steel, galvanised<br>1.4571                                     | SIHI-Part No.                  | 20 054 090<br>20 036 462   |  |
| Pressure pipework (bend)                                  | 1.0254<br>1.4571  | SIHI-Part No.                  | 35 003 224<br>35 003 226   |  |
| Liquid level indicator                                    | Brass + Plexiglas<br>1.4571 + Plexiglas                         | SIHI-Part No.                  | 43 014 912<br>43 040 384   |  |
| <b>Sterling SIHI - Gas Ejector</b>                        |   | Type / Weight                  | GPV 6011 / 47 kg   | GPV 6012 / 47 kg                           |
| at service liquid temperature 15 °C                       |   | Type / Weight                  | GPV 6311 / 48 kg   | GPV 6312 / 48 kg                           |
| <b>Sterling SIHI - Non Return Ball Valve</b>              |   |                                |  |  |
| Intermediate flange<br>execution XCk 65                   | 0.6025 + Butadiene rubber<br>0.6025 + Teflon<br>1.4408 + Teflon | SIHI-Part No.<br>Weight        | 20 072 794 / 5.6 kg<br>20 072 793 / 5.6 kg<br>20 029 500 / 15.8 kg   |  |
| Flange execution with<br>glass cylinder XCk 656           | 0.6025 + Butadiene rubber<br>0.6025 + Teflon<br>1.4408 + Teflon | SIHI-Part No.<br>Weight        | 20 072 851 / 10.0 kg<br>20 072 852 / 10.0 kg<br>20 072 850 / 10.0 kg |  |
| <b>Drain Valve + Double nipple</b>                        |   |                                |  |  |
| XCg 015   | Steel   | SIHI-Part No.                  | 43 014 545 + 43 013 086  |  |
| XCg 015   | 1.4571  |                                | 43 014 547 + 43 013 097  |  |
| <b>Air Inlet Valve +<br/>Double nipple</b>                |   |                                |  |  |
|   | Brass<br>1.4408   | SIHI-Part No.                  | 43 045 945 + 43 013 090<br>43 053 736 + 43 013 091                   |  |
| <b>Motor</b><br>standard execution IP 55                  |   | Size<br>Power<br>Weight        | 160 L<br>15.0 kW<br>85 kg  | 180 M<br>18.5 kW<br>113 kg                 |
| Coupling for motor IP 55<br>Pump side<br>Motor side       |   | Type / Weight<br>SIHI-Part No. | B 125 / 6.2 kg<br>43 021 460<br>43 021 464                           | B 125 / 6.2 kg<br>43 021 460<br>43 021 462 |
| Coupling guard <sup>1)</sup>                              | Steel   | SIHI-Part No.                  | 43 042 306   |  |
| Coupling guard <sup>2)</sup>                              | Steel   | SIHI-Part No.                  | 43 042 304   |  |
| <b>Motor</b><br>in EEx e II T3 execution                  |   | Size<br>Power<br>Weight        | 180 M<br>15.0 kW<br>165 kg   | 180 L<br>17.5 kW<br>177 kg                 |
| Coupling for motor EEx e II T3<br>Pump side<br>Motor side |   | Type / Weight<br>SIHI-Part No. | BDS 135 / 6.6 kg<br>43 111 062<br>43 090 912                         |  |
| Coupling guard <sup>1)</sup>                              | Brass   | SIHI-Part No.                  | 43 042 307   |  |
| Coupling guard <sup>2)</sup>                              | Brass   | SIHI-Part No.                  | 43 042 305   |  |
| <b>Baseplate</b>  |   | Type / Weight<br>SIHI-Part No. | S 487 / 105 kg<br>43 040 642   | S 388 / 95 kg<br>43 040 969                |

<sup>1)</sup> execution with mechanical seal

<sup>2)</sup> execution with gland packing

Designs subject to change without prior notice.

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