

Liquid ring vacuum pumps with magnetic coupling



LPH 75320, LPH 75330, LPH 75340

Pressure range: 33 to 1013 mbar
Suction volume flow: 485 to 1615 m³/h

CONSTRUCTION TYPE

Sterling SIHI liquid ring vacuum pumps with magnetic coupling are displacement pumps of simple and robust design meeting high demands on tightness. Two liquid surrounded sleeve bearings of tungsten and silicon carbide bear the shaft axially and radial. The application of high-grade magnetic materials with high density of energy guarantees the transmission of the nominal torque and safety during the start-up phase and in case of overload.

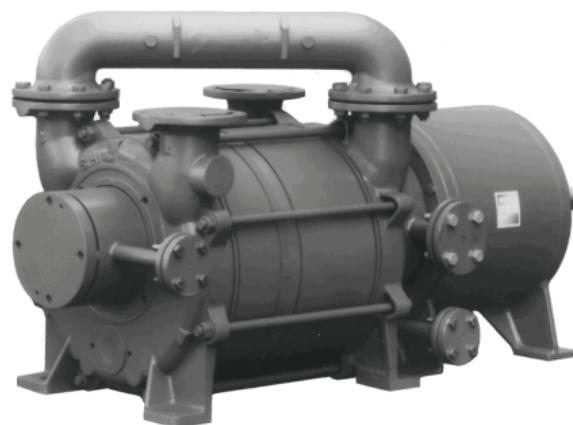
The modular magnetic system makes possible the optimal adaptation to different operating conditions. The main components of the pumps mostly are equal to those of the standard pumps, the connecting dimensions are identical.

The material design can be adapted to the operating conditions.

APPLICATION

The vacuum pumps with magnetic coupling are suitable for handling and exhausting of nearly all dry and humid gases.

They are applied wherever extremely high demands on tightness exist which cannot be met by pumps with shaft seal.



NOTE

The main fields of application are in the chemical and pharmaceutical industry where polluting, unhealthy or dangerous media are to be handled. Many different process vapours can be exhausted and the generated condensate possibly can be used as service liquid for the pump.

For that purpose the service liquid, separated from the gas in all liquid separator, is run in a circuit. For the cooling of the system a heat exchanger is arranged in the circulating liquid line.

GENERAL TECHNICAL DATA

| Pump type | unit | LPH 75320 | LPH 75330 | LPH 75340 |
|---|---|-----------|------------------------|-----------|
| Normal speed | 50 Hz | | 975 | |
| Power of the electric motor ¹ | IP 55 | 37 | 45 | 55 |
| | EEx e II T3 | 40 | 46 | 64 |
| Max. compression over pressure | bar | | 0,6 | |
| Max. admissible pressure difference | bar | | 1,5 | |
| Hydraulic test (over pressure) | bar | | 3 | |
| Moment of the inertial of the rotating pump parts and of the water filling (without outer magnet) | kg · m ² | 2,89 | 3,56 | 3,99 |
| Sound pressure level at a suction of 80 mbar | dB (A) | | 79 | |
| Max. gas temperature | dry | | 100 | |
| | saturated | | 50 | |
| Service liquid | | | | |
| max. admissible temperature | °C | | 50 | |
| max. viscosity | mm ² /s | | 90 | |
| max. density | kg/m ³ | | 1200 | |
| volume up to shaft | liter | 39 | 50 | 57 |
| Max. flow resistance of the heat exchanger | bar | | 0,2 | |
| Leakage | $\frac{\text{mbar} \cdot \text{l}}{\text{s}}$ | | < 1 · 10 ⁻³ | |

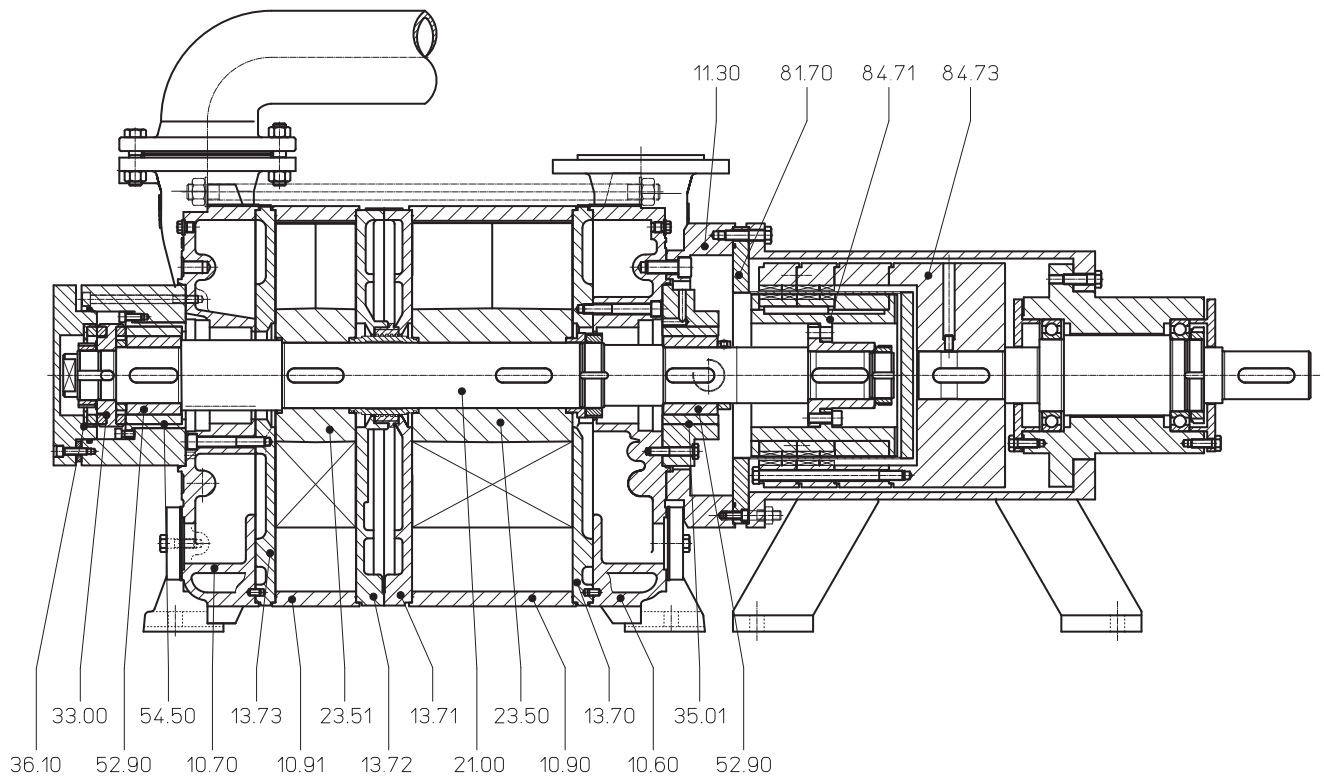
The combination of several limiting values is not admissible.

1) The dimensioning of the magnetic coupling and of the electric motor depends on the physical data of the service liquid and of the suction and discharge pressure of the pump.

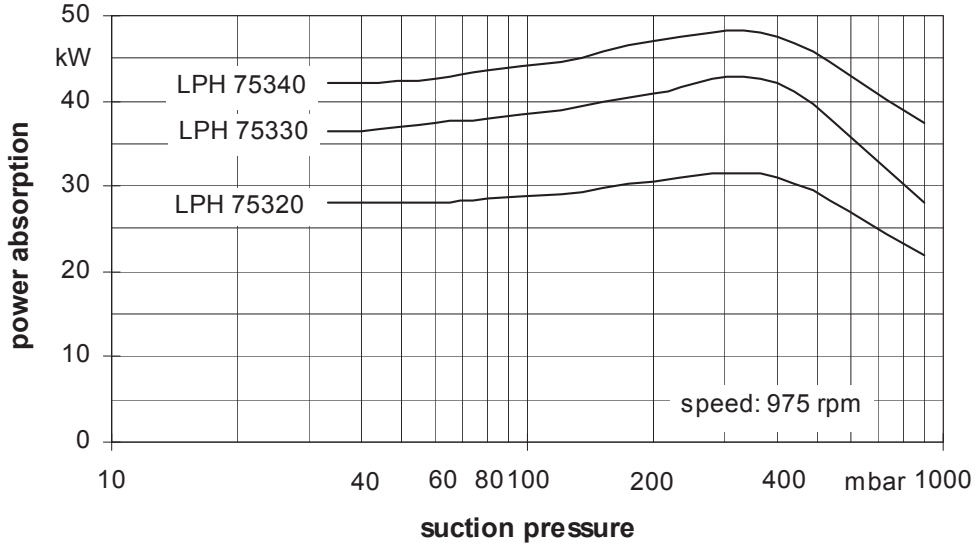
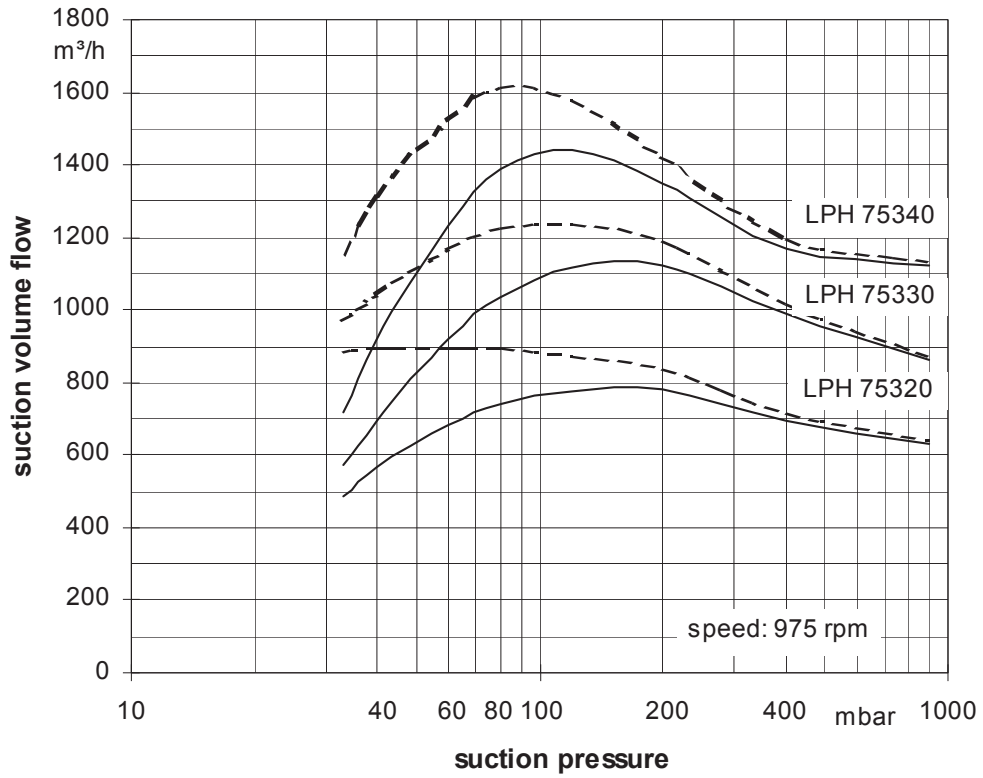
Material design LPH 75320, LPH 75330, LPH 75340 with magnetic coupling

| Item | COMPONENTS | MATERIAL DESIGN | |
|-------------------------------|--------------------------------|-----------------------------------|-----------------------------------|
| | | 0B | 4B |
| 10.60, 10.70 | Casing | 0.6025 | 1.4408 |
| 10.90, 10.91 | Central body | 1.0038 | 1.4581 |
| 13.70, 13.71, 13.72, 13.73 | Guide disk, intermediate piece | 0.6025 | 1.4408 |
| 11.30 | Intermediate casing | 1.0553 | 1.4571 |
| 21.00 | Shaft | 1.4021 | |
| 23.50, 23.51 | Vane wheel impeller | 1.0553 | |
| 33.00 | Thrust bearing | 1.4462 / silicon carbide | |
| 35.01 | Bush | 1.0553 / silicon carbide | 1.4571/ silicon carbide |
| 36.10 | Bearing cover | 1.0553 / 1.4462 / silicon carbide | 1.4571 / 1.4462 / silicon carbide |
| 52.90 | Bushing | tungsten carbide | |
| 54.50 | Bush | 1.4571 / silicon carbide | |
| 81.70 | Isolation shroud | 1.4571 / 2.4610 | |
| 84.71 | Inner magnet | 1.4571 / Magnet | |
| 84.73 | Magnetic bell | 1.0553 / Magnet | |

Sectional drawing LPH 75320, LPH 75330, LPH 75340 with magnetic coupling



Suction volume flow and power absorption LPH 75320, LPH 75330, LPH 75340 with magnetic coupling



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

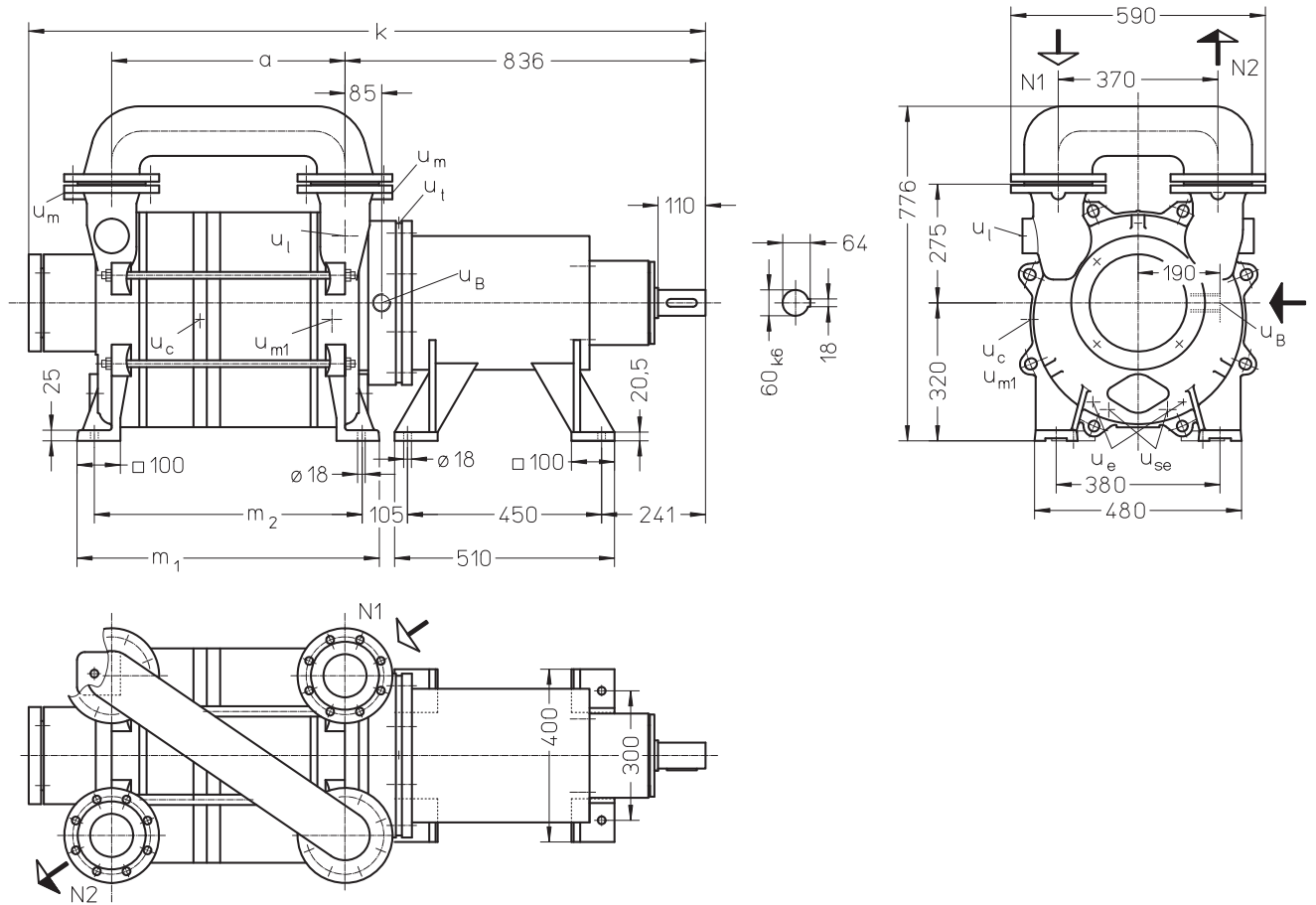
Compression pressure 1013 mbar (atmospheric pressure)

The suction volume flow is applied to the suction pressure

Tolerance of the operating data 10%

Max. fresh water need with lowest suction pressure

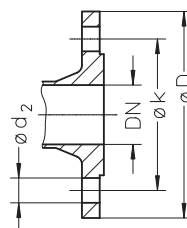
Dimension table LPH 75320, LPH 75330, LPH 75340 with magnetic coupling



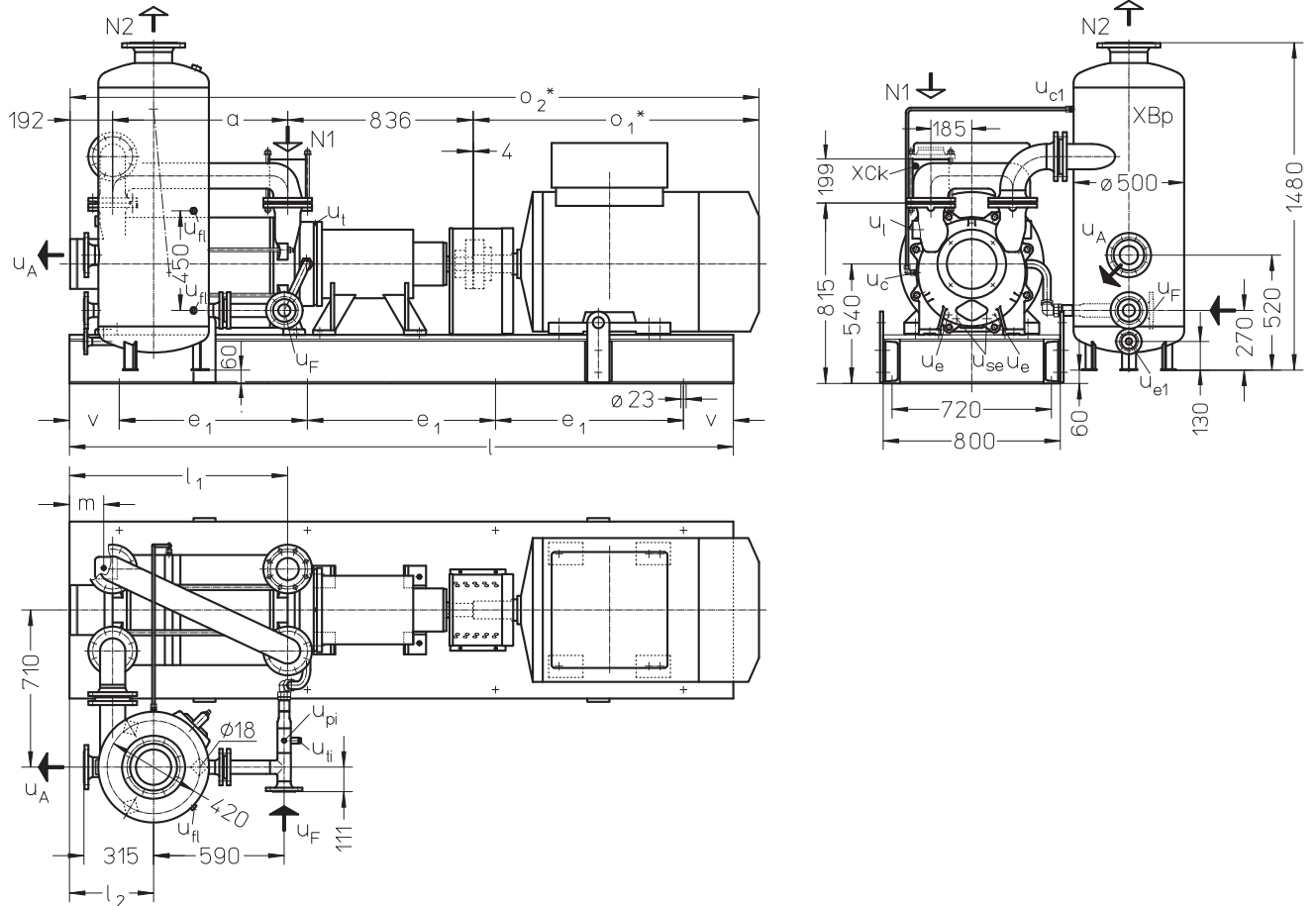
- N 1 = gas-inlet DN 100
- N 2 = gas-outlet DN 100
- u_B = connection for service liquid G 1¼
- u_c = connection for protection against cavitation G ¾
- u_e = drain connection G ¼
- u_l = connection for vent cock G 1½
- u_m = connection for pressure gauge G ¾
- u_{m1} = connection for drain valve G ½
- u_{se} = connection for dirt drain G ½
- u_t = connection for temperature monitoring M12x1

| | a | m ₁ | m ₂ | o ₃ | weight abt. kg |
|-----------|-----|----------------|----------------|----------------|-------------------|
| LPH 75320 | 541 | 701 | 621 | 1570 | 780 |
| LPH 75330 | 691 | 851 | 771 | 1720 | 870 |
| LPH 75340 | 791 | 951 | 871 | 1820 | 930 |

| flange connections to DIN 2501 PN 10 | |
|--------------------------------------|--------|
| DN | 100 |
| k | 180 |
| D | 220 |
| number x d ₂ | 8 x 18 |



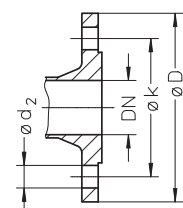
Arrangement drawing LPH 75320, LPH 75330, LPH 75340 with magnetic coupling



- N 1 = gas-inlet DN 100
- N 2 = gas-outlet DN 150
- u A = connection for liquid drain DN 80
- u c = connection for protection against cavitation G 3/8
- u c1 = connection for protection against cavitation G 3/8
- u e1 = drain connection DN 25
- u F = connection for fresh liquid DN 50
- u fl = connection for liquid level indicator G 1/2
- u pi = connection for pressure gauge G 1/4
- u t = connection for temperature monitoring M12x1
- u ti = connection for thermometer G 1/2

| | electric motor 50 Hz | | | a | e ₁ | l | l ₁ | l ₂ | m | v | o ₁ * | o ₂ * | weight | |
|--------------|----------------------|-------|--------------|-----|----------------|------|----------------|----------------|-----|-----|------------------|------------------|--------|--|
| | size | IP 55 | EEEx e II T3 | | | | | | | | | | kW | pump + motor + coupling + base frame abt. kg |
| LPH 75320 | 250 M | 37 | - | 541 | 750 | 2800 | 886 | 530 | 305 | 275 | 930 | 2503 | 1790 | 1930 |
| | 280 S | - | 40 | | | | | | | | 1044 | 2617 | 1950 | 2090 |
| LPH 75330 | 280 S | 45 | - | 691 | 850 | 3000 | 986 | 380 | 155 | 225 | 1005 | 2728 | 1990 | 2130 |
| | 280 M | - | 46 | | | | | | | | 1095 | 2818 | 2075 | 2215 |
| LPH 75340 | 280 M | 55 | - | 791 | 850 | 3000 | 986 | 380 | 155 | 225 | 1005 | 2828 | 2090 | 2230 |
| | 315 S | - | 64 | | | | | | | | 1220 | 3043 | 2420 | 2560 |

| flange connection to DIN 2501 PN 10 | | | | | |
|-------------------------------------|--------|--------|--------|--------|--------|
| DN | 25 | 50 | 80 | 100 | 150 |
| k | 85 | 125 | 160 | 180 | 240 |
| D | 115 | 165 | 200 | 220 | 285 |
| number x d ₂ | 4 x 14 | 4 x 18 | 8 x 18 | 8 x 18 | 8 x 22 |



* Dimensions and position of the connection box dependent on motor make

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

| suction pressure[mbar] | | 33 | | | | | 120 | | | | | 200 | | | | | 400 | | | | |
|------------------------|----------------|--------------------------------|------|------|----|--------------------------------|------|------|----|--------------------------------|------|------|----|--------------------------------|------|------|-----|--|--|--|--|
| pump type | speed [rpm] | KB | | | FB | KB | | | FB | KB | | | FB | KB | | | FB | | | | |
| | | difference in temperature [°C] | | | | difference in temperature [°C] | | | | difference in temperature [°C] | | | | difference in temperature [°C] | | | | | | | |
| | | 10 | 5 | 2 | | 10 | 5 | 2 | | 10 | 5 | 2 | | 10 | 5 | 2 | | | | | |
| LPH | 75320 | 1,90 | 3,15 | 5,15 | 9 | 1,90 | 3,05 | 4,85 | 8 | 1,90 | 3,00 | 4,55 | 7 | 1,60 | 2,30 | 3,10 | 4 | | | | |
| | 75330 | 2,35 | 3,70 | 5,70 | | 2,35 | 3,65 | 5,40 | | 2,35 | 3,50 | 5,00 | | 1,90 | 2,55 | 3,25 | | | | | |
| | 75340 | 2,60 | 4,00 | 6,00 | | 2,60 | 3,90 | 5,65 | | 2,55 | 3,75 | 5,20 | | 2,00 | 2,70 | 3,35 | | | | | |

FB = fresh liquid requirements

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

Data regarding the pump size - order hints

| series + size | hydraulics + bearings | shaft sealing + magnetic coupling | material design | casing seal |
|--------------------------------|--|--|---|---------------|
| LPH 75320 75330 75340 | A • hydraulic A • F two grease lubricated antifriction bearings | 5 • • 36-pole magnet • A • glandless with isolation shroud • • M torque of the magnetic coupling ¹⁾ • • N • • P | 0B main parts GG without non-ferrous metal 4B main parts Cr Ni Mo-cast steel | 4 soft Teflon |
| | AF | 5AM 5AN 5AP | alternative 0B, 4B | 4 |

1) The dimensioning of the magnetic coupling and of the electric motor depends on the physical data of the service liquid and of the suction and discharge pressure of the pump.
In case of deviation from standard, please request further information and give details of your problem.

Motor selection table delivery with motor

| | IMB3; 50 Hz; 400 VΔ ; 975 rpm | | | | | |
|-----------|-------------------------------|-------|-------------|------------------------------|-------|-------------|
| | motor protection IP 55 | | | motor protection EEx e II T3 | | |
| | power | size | designation | power | size | designation |
| LPH 75320 | 37 kW | 250 M | BC | 40 kW | 280 S | CL |
| LPH 75330 | 45 kW | 280 S | CC | 46 kW | 280 M | DL |
| LPH 75340 | 55 kW | 280 M | DC | 64 kW | 315 S | EL |

Example for ordering:

The construction size LPH 75330 AF 5AN 4B 4 with 45 kW three-phase motor (IMB3; 50 Hz; 400 VΔ) 975 rpm has the complete order number

LPH• 75330 AF 5AN 4B 4 CC

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 LPH 75320, LPH 75330, LPH 75340 with magnetic coupling

| recommended accessories | | | LPH 75320 | LPH 75330 | LPH 75340 |
|--|----------------------------------|--------------------------|---|--------------------------|-----------|
| Upright liquid separator material design 130 / galvanized 172 / 1.4571 service liquid line material design 072 / St 37-0 172 / 1.4571 cavitation protection line material design 072 / St 37-0 172 / 1.4571 discharge line (bend) material design 072 / St 37-0 172 / 1.4571 | type / weight | | XBp 2311 / 96 kg | | |
| | SIHI part No. | | 35 000 568 35 000 569 | | |
| | SIHI part No. | | on request on request | | |
| | SIHI part No. | | on request on request | | |
| | SIHI part No. | | 35 003 231 35 003 232 | | |
| Sterling SIHI ball type non-return valve material design 767 / 0.6025+NBR 784 / 1.4408+PTFE | type SIHI part No. /weight | | XCk 100 43 016 898 / 16,0 kg 43 029 322 / 17,5 kg | | |
| Motor IP 55 EEx e II T3 | size | 250 M | 280 S | 280 M | |
| | power | 37 kW | 45 kW | 55 kW | |
| | weight | 410 kg | 540 kg | 580 kg | |
| | size | 280 S | 280 M | 315 S | |
| | power | 40 kW | 46 kW | 64 kW | |
| | weight | 570 kg | 625 kg | 910 kg | |
| Coupling for motor IP 55 pump side motor side for motor EEx e II T3 pump side motor side | type / weight | A 180 / 14 kg | A 180 / 14 kg | | |
| | SIHI part No. | 43 035 527 43 034 392 | 43 035 527 43 021 495 | | |
| | type / weight | ADS 194 / 17,5 kg | ADS 218 / 24 kg | | |
| | SIHI part No. | 43 040 600 43 038 678 | 43 040 602 43 040 603 | | |
| Contact safety device material design 076 / steel 345 / 2.0321 | SIHI part No. | | 35 004 816 35 004 817 | 35 004 800 35 004 801 | |
| Base frame material design 081 / 1.0254 | weight, abt. SIHI part No. | | 500 kg on request | 550 kg on request | |
| Base support for motor size 250 003 / 0.6025 for motor size 280 003 / 0.6025 for motor size 315 081 / steel | SIHI part No. | 8x 43 041 080 / 8x2,3 kg | 8x 43 041 077 / 8x1,3 kg 4x 49 064 175 / 4x 0,6 kg | | |
| Resistance thermometer lengthening piece M12x1-G ½ material design 172 / 1.4571 | type SIHI part No. | | PT 100-EEx i 43 039 552 | | |
| | SIHI part No. | | 20 000 532 | | |
| Smooth starter | type / weight | | on request | | |

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

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