

Liquid ring vacuum pumps

with magnetic coupling



LEH 1200, LEH 1500, LEH 1800

Pressure range: 33 to 1013 mbar
Suction volume flow : 400 to 1560 m³/h

CONSTRUCTION TYPE

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 seals.



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 a 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	LEH 1200	LEH 1500	LEH 1800
Nominal speed	rpm		975	
Power of the electric motor IP 55 ¹⁾ EEx e II T3 ¹⁾	kW	37	45	55
	kW	40	46	64
Max. compression over pressure	bar		0,6	
Max. admissible pressure difference	bar		1,2	
Hydraulic test (over pressure)	bar		3	
Moment of the inertial of the rotating pump parts and of the water filling (without outer magnet)	kg · m²	3,92	4,38	4,84
Sound pressure level at a suction pressure of 80 mbar	dB (A)		75	
Max. gas temperature	dry °C		100	
	saturated °C		50	
Service liquid				
max. admissible temperature	°C		50	
max. viscosity	mm²/s		90	
max. density	kg/m³		1200	
volume up to shaft level	liter	33	38	43
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.

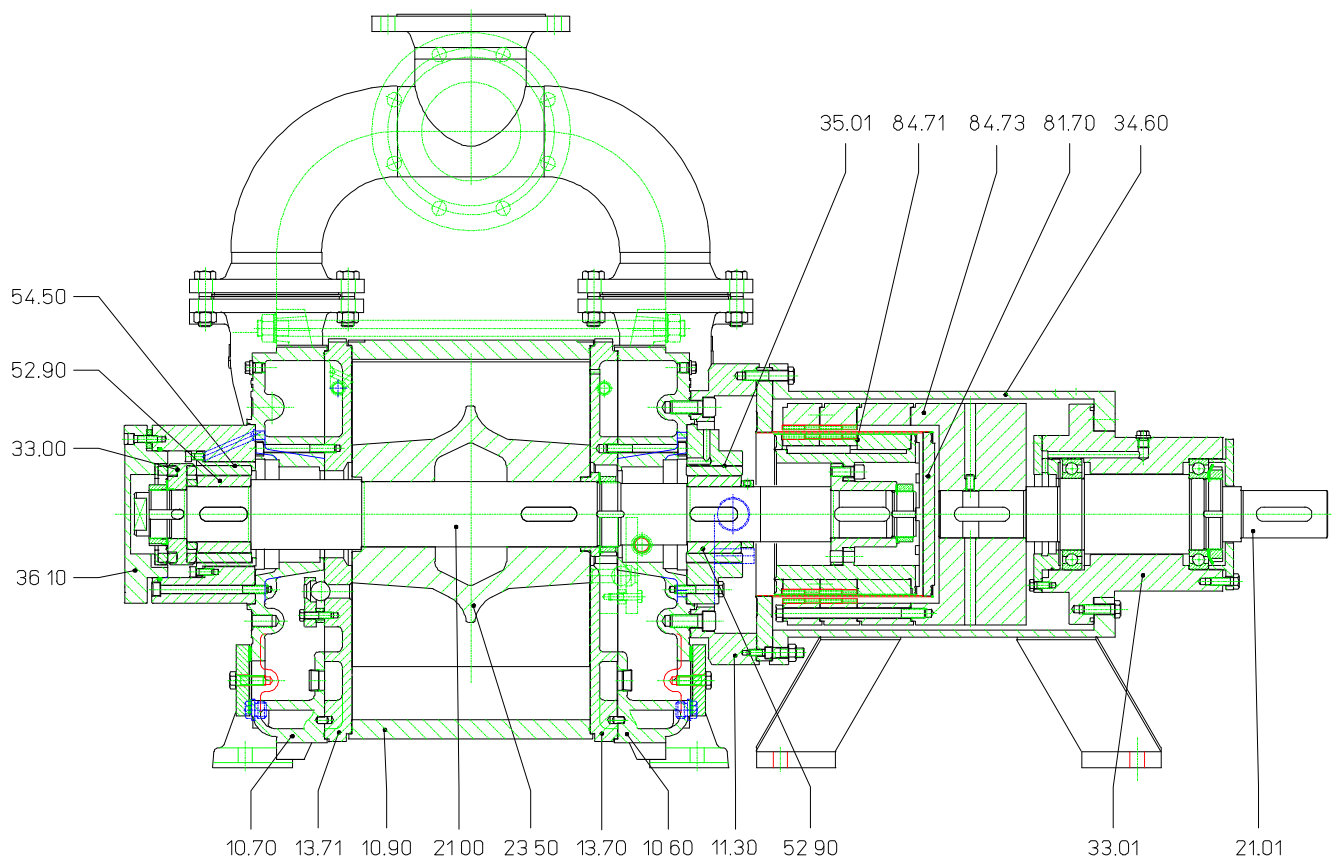
¹⁾ normally

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.

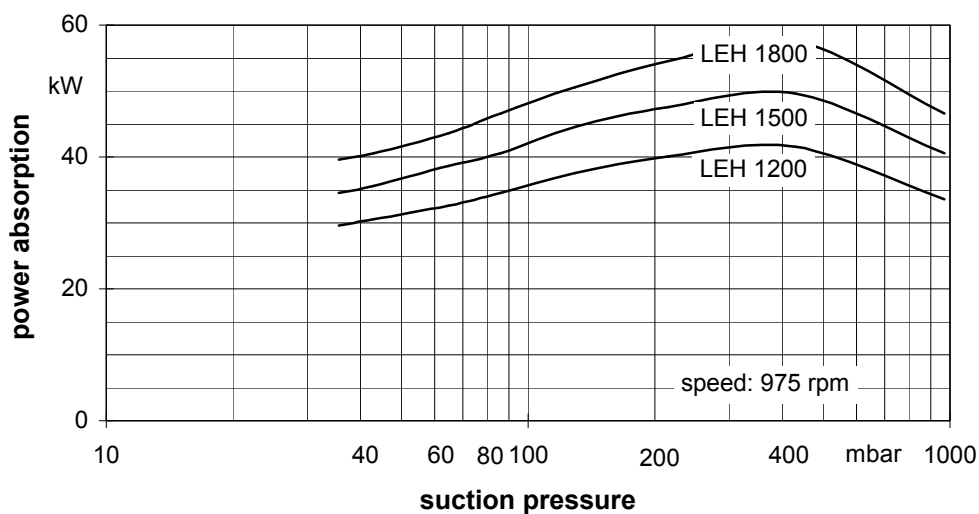
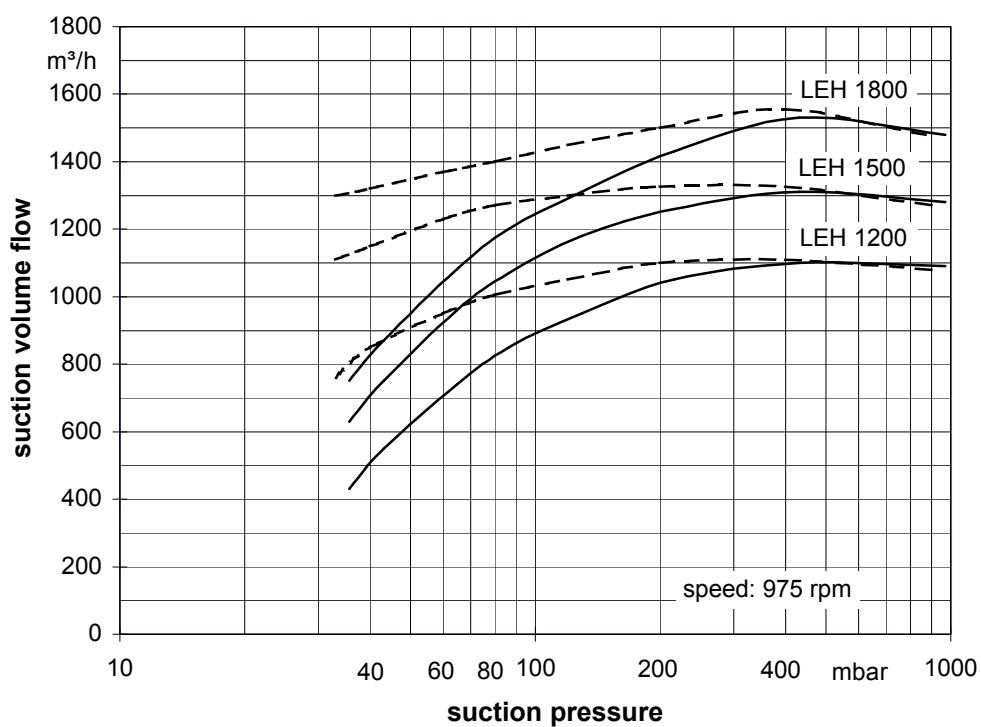
Material designs LEH 1200, LEH 1500, LEH 1800 with magnetic coupling

Item	COMPONENTS	MATERIAL DESIGN	
		0B	4B
10.60, 10.70	Casing	0 6025	1 4408
13.70, 13.71	Guide disk		
10.90	Central body	1.0038	1.4571
11.30	Intermediate casing	1.0553	1.4571
21.00, 21.01	Shaft	1.4021	1.4571 / 1.4021
23.50	Vane wheel impeller	0.7043	1.4517
34.60	Stool	1.0038	1.0553 stove enamelling
33.01	Bearing bracket	1.0553	
33.00	Thrust bearing	1.4462 / silicon carbide	
35.01, 54.50	Bush	1.0553 / 1.4571 / 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	
81.70	Isolation shroud	1.4571 / 2.4610	
84.71	Inner magnet	1.4571 / magnet	
84.73	Magnetic bell	1.0553	

Sectional drawing LEH 1200, LEH 1500, LEH 1800 with magnetic coupling



Suction volume flow and power absorption LEH 1200, LEH 1500, LEH 1800 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 _____

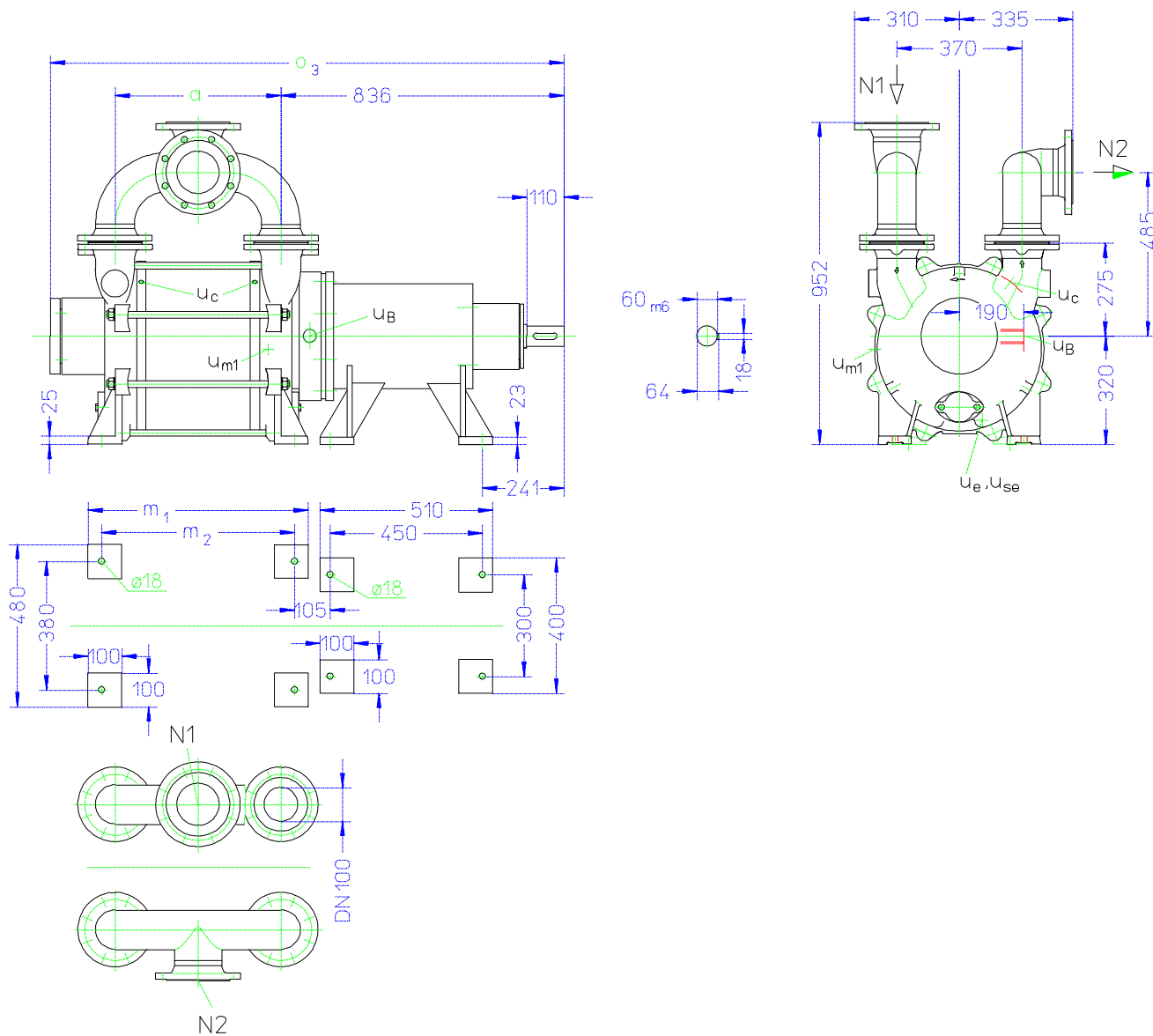
Compression pressure 1013 mbar (atmospheric pressure)

The suction volume flow is applied to the suction pressure

Tolerance of the operating data 10%

Max. fresh water need with lowest suction pressure

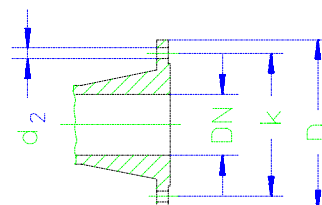
Dimension table LEH 1200, LEH 1500, LEH 1800 with magnetic coupling



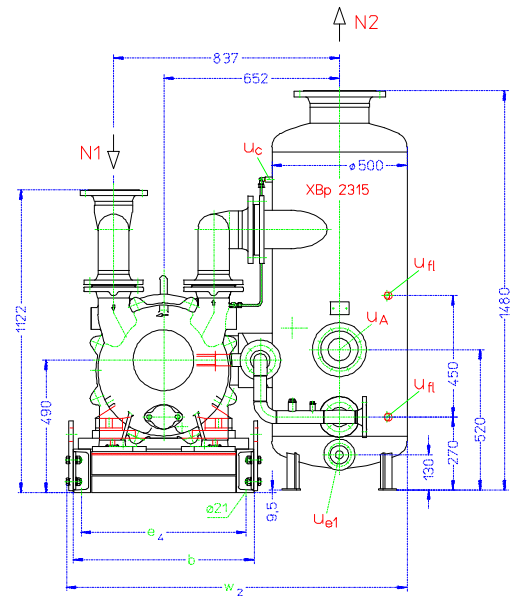
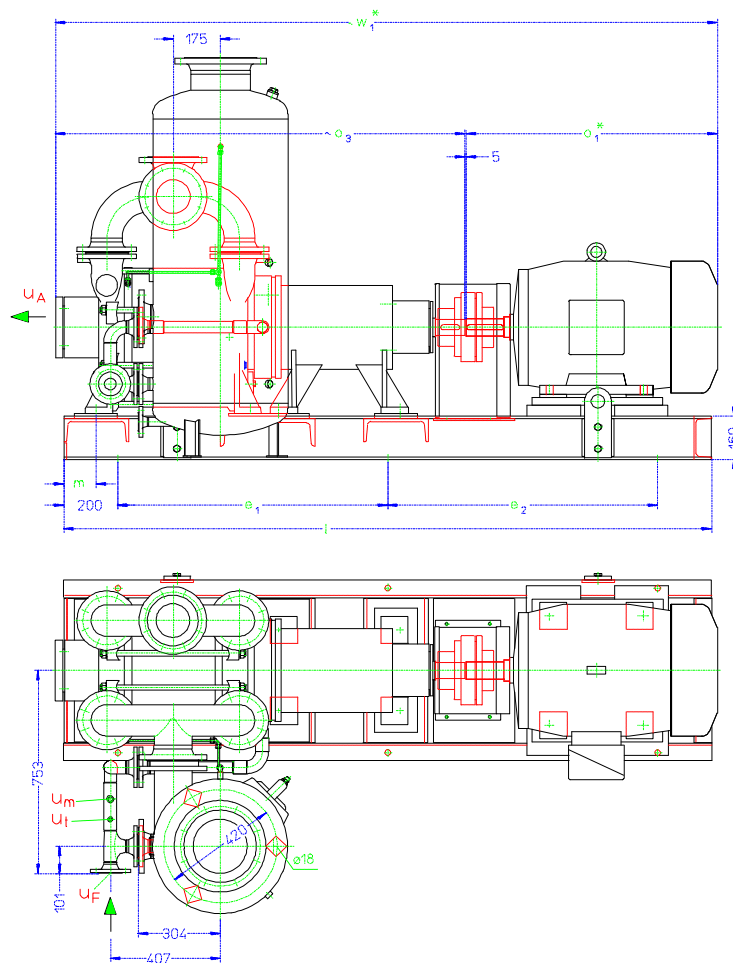
	a	m ₁	m ₂	o ₃	weight app. kg
LEH 1200	490	651	571	1518	780
LEH 1500	560	721	641	1588	820
LEH 1800	615	776	696	1643	850

- N 1 = gas inlet DN 125
N 2 = gas outlet DN 125
u_B = connection for service liquid G 1¼
u_C = connection for protection against cavitation G ¼
u_e = drain connection G ½
u_{m1} = connection for drain valve G ½
u_{se} = connection for dirt drain G ½

flange connections to DIN 2501 PN 10		
DN	100	125
k	180	210
D	220	250
number x d ₂	8 x 18	8 x 18



Arrangement drawing LEH 1200, LEH 1500, LEH 1800 with magnetic coupling



N 1 = gas inlet DN 125

N 2 = gas outlet DN 200

u_A = connection for liquid drain DN 80

$$u_F = \text{connection for fresh liquid DN 40}$$

u_c = connection for protection against cavitation G ¼

u_e = drain connection DN 25

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

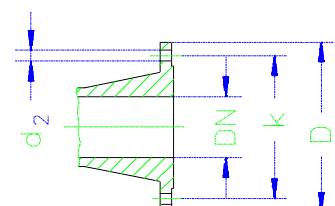
u_m = connection for pressure gauge G ½

u_t = connection for thermometer G ¼

	electric motor 50 Hz			b	e ₁	e ₂	e ₄	l	m	α ₁ *	α ₃	w ₁ *	w ₂	weight app. kg				
	size	IP 55	kW EEx e II T3															
LEH 1200	250 M	37	-	710	1000	1000	610	2400	120	930	1518	2453	1262	1720				
	280 S	-	40		1035			650	2435	155		1004		2527	1890			
LEH 1500	280 S	45	-							1050	1050	2500		85	1055	1588	2597	1860
	280 M	-	46		2648				1990									
LEH 1800	280 M	55	-		315 S				64						1200	1643	2703	1940
	315 S	-	64														2848	2120

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 ₂	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 [mbar]		33				120				200				400				
pump	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		
LEH	1200	975	1,65	2,83	4,97	10	1,94	3,06	4,67	7,2	1,99	3,03	4,43	6,4	1,88	2,73	3,75	5
	1500		1,94	3,25	5,46		2,25	3,42	5,00		2,27	3,35	4,69		2,12	2,98	3,93	
	1800		2,21	3,62	5,86		2,48	3,69	5,21		2,51	3,60	4,88		2,34	3,18	4,07	

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 + magnetic coupling		material design		casing seal	
	A •	hydraulic A	5 • •	36-pole magnet	0B	main parts of GG without non-ferrous metal	4	soft Teflon
	• F	two grease lubricated antifriction bearings	• A •	glandless with isolation shroud	4B	main parts of Cr Ni Mo cast steel		
			• • M	torque of the magnetic coupling *				
			• • N					
			• • P					
LEH	1200	AF	5AM		alternative 0B, 4B	4		
	1500		5AN					
	1800		5AP					

* The magnet size depends on the load range of the pump. In case of deviation from standard, please request further information and give details of your problems.

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		37	250 M	BC	40	280 S	CL
45 kW three-phase motor	e.g. CC	45	280 S	CC	46	280 M	DL
(50 Hz, 400 VΔ) at 975 rpm		55	280 M	DC	64	315 S	EL

Example for ordering:

The construction size LEH 1500 AF 5AN 4B 4 with 45 kW three-phase ac motor (50 Hz, 400 VΔ) 975 rpm has the complete order number:

LEH · 1500 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 LEH 1200, LEH 1500, LEH 1800 with magnetic coupling

Recommended accessories		LEH 1200	LEH 1500	LEH 1800
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	type / weight SIHI part No.	XBp 2315 / 98 kg 35 005 449 35 005 447		
	SIHI part No.	35 010 935 35 013 577	35 010 961 35 013 578	35 010 962 35 013 579
	SIHI part No.	20 043 410 20 043 411	20 043 412 20 043 413	20 043 414 20 043 415
SIHI-gas ejector at service liquid temperature at service liquid temperature		15 °C 30 °C	GEVA 1200 A GEVA 1200 B	GEVA 1500 A GEVA 1500 B GEVA 1800 A GEVA 1800 B
SIHI-ball type non-return valve material design 767 / GG-25 784 / 1.4408	type / weight SIHI part No.	XCk 150 / 35,8 resp. 43 kg 43 016 900 43 030 924		
Reduction material design 072 / St 37-0 172 / 1.4571	weight SIHI part No.	16,5 kg 35 002 762 35 014 264		
Motor IP 55 EEx e II T3	size power weight	250 M 37 kW 410 kg	280 S 45 kW 540 kg	280 M 55 kW 580 kg
	size power weight	280 S 40 kW 605 kg	280 M 46 kW 670 kg	315 S 64 kW 795 kg
Coupling for motor IP 55 pump side motor side for motor EEx e II T3 pump side motor side	type / weight SIHI part No.	A 180 / 14 kg 43 035 527 43 034 392	A 180 / 14 kg 43 035 527 43 021 495	
	type / weight SIHI part No.	ADS 194 / 17,5 kg 43 040 600 43 038 678	ADS 218 / 24 kg 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 for motor IP 55 081 / USt 37-1 for motor EEx e II T3 081 / USt 37-1	SIHI part No. weight SIHI part No. weight	35 010 946 354 kg 35 010 959 332 kg	35 010 959 332 kg	35 010 960 340 kg 35 014 356 300 kg
Smooth starter	type / weight	on request		

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

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