

Liquid ring vacuum pumps with magnetic coupling



LEH 600, LEH 800, LEH 900

Pressure range: 33 to 1013 mbar
Suction volume flow: 195 to 765 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 600	LEH 800	LEH 900
Nominal speed	rpm		1450	
Power of the electric motor	IP 55 ¹⁾	18,5	30	30
	EEx e II T3 ¹⁾	24	24	30
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	0,66	0,73	0,81
Sound pressure level at a suction pressure of 80 mbar	dB (A)	74	75	76
Max. gas temperature	dry		100	
	saturated		50	
Service liquid	max. admissible temperature		50	
	max. viscosity		90	
	max. density		1200	
	volume up to shaft level	liter	14	15
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.

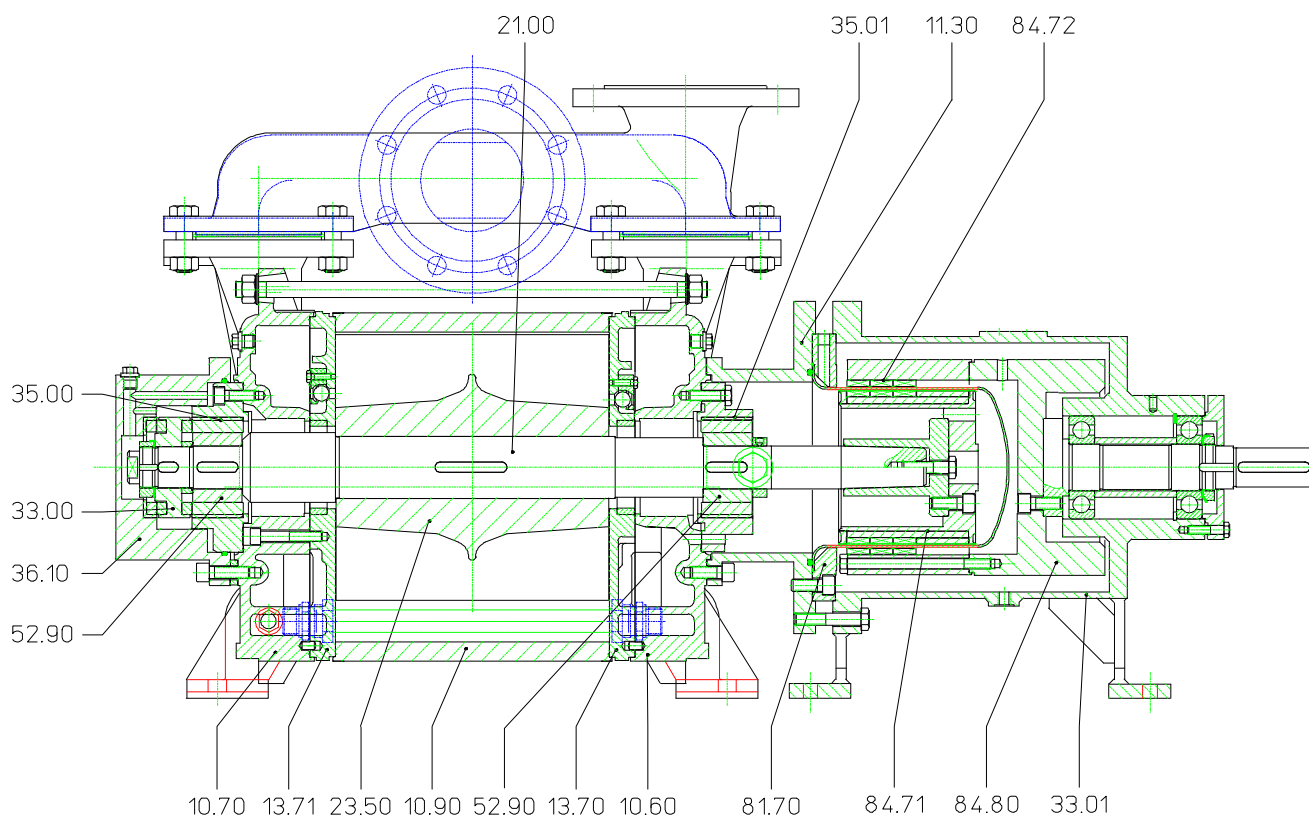
¹⁾ normally

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.

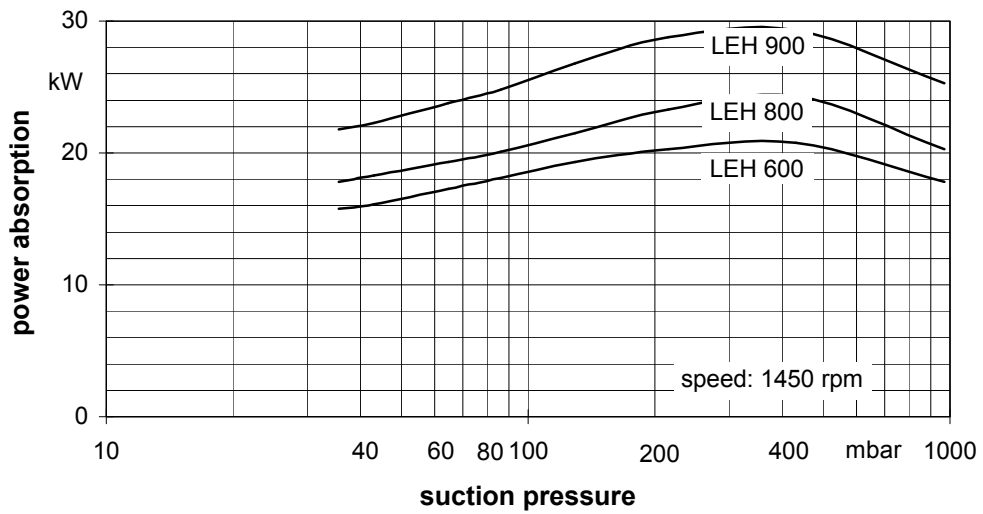
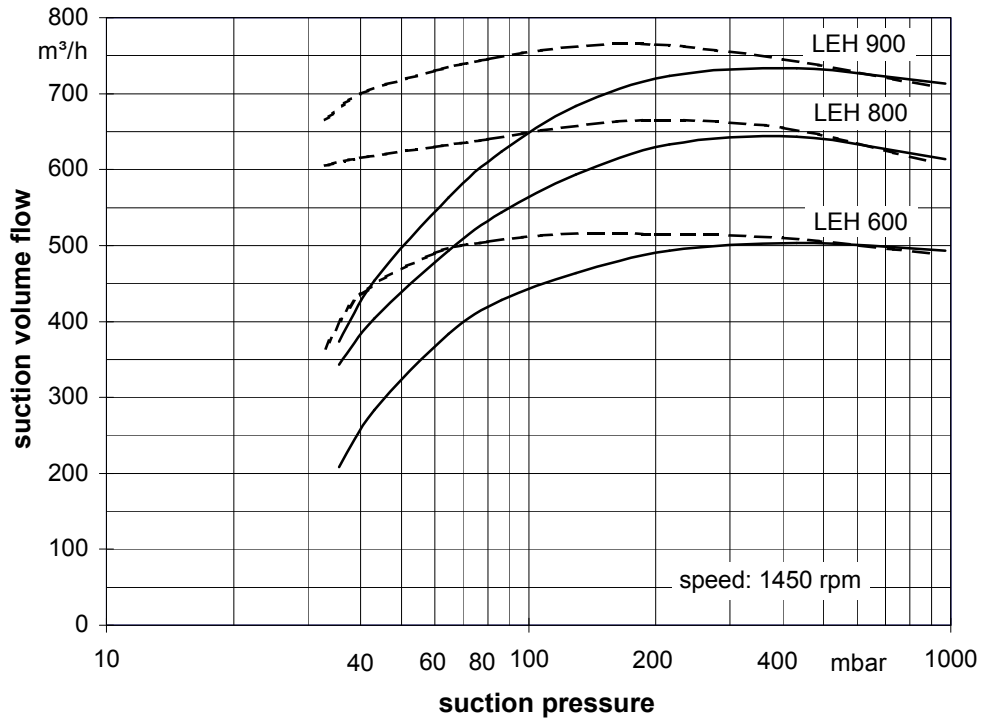
Material designs LEH 600, LEH 800, LEH 900 with magnetic coupling

Item	COMPONENTS	MATERIAL DESIGN	
		0B	4B
10.60, 10.70	Casing	0.6025	1.4408
13.70, 13.71	Guide disk		1.4581
10.90	Central body		
11.30	Intermediate casing	1.0553	1.4571
21.00	Shaft	1.4021	
23.50	Vane wheel impeller	0.7043	1.4517
33.01	Bearing bracket	1.0553	1.0553 stove enamelling
33.00	Thrust bearing	1.4462 / silicon carbide	
35.00, 35.01	Bearing housing	1.0553 / 1.4571 / silicon carbide	1.4571 / silicon carbide
36.10	Bearing cover (group)	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	
84.72	Outer magnet	1.0553 / magnet	
84.80	Inertia body	1.0553	

Sectional drawing LEH 600, LEH 800, LEH 900 with magnetic coupling



Suction volume flow and power absorption LEH 600, LEH 800, LEH 900 with magnetic coupling

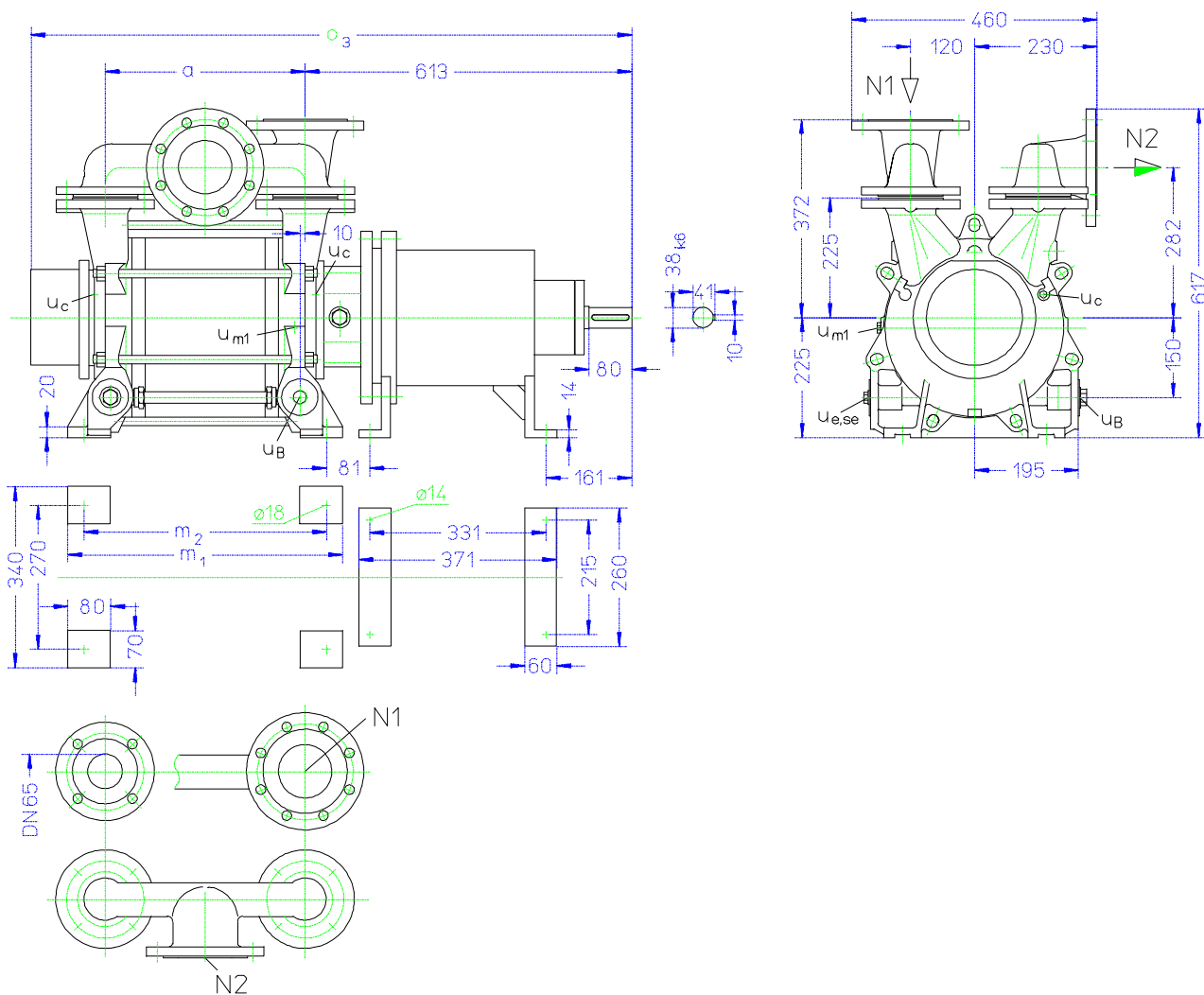


The operating data are applicable under the following conditions:

- 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

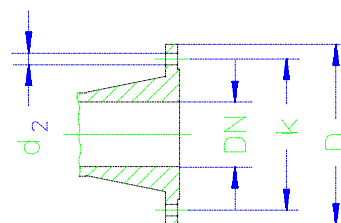
Dimension table LEH 600, LEH 800, LEH 900 with magnetic coupling



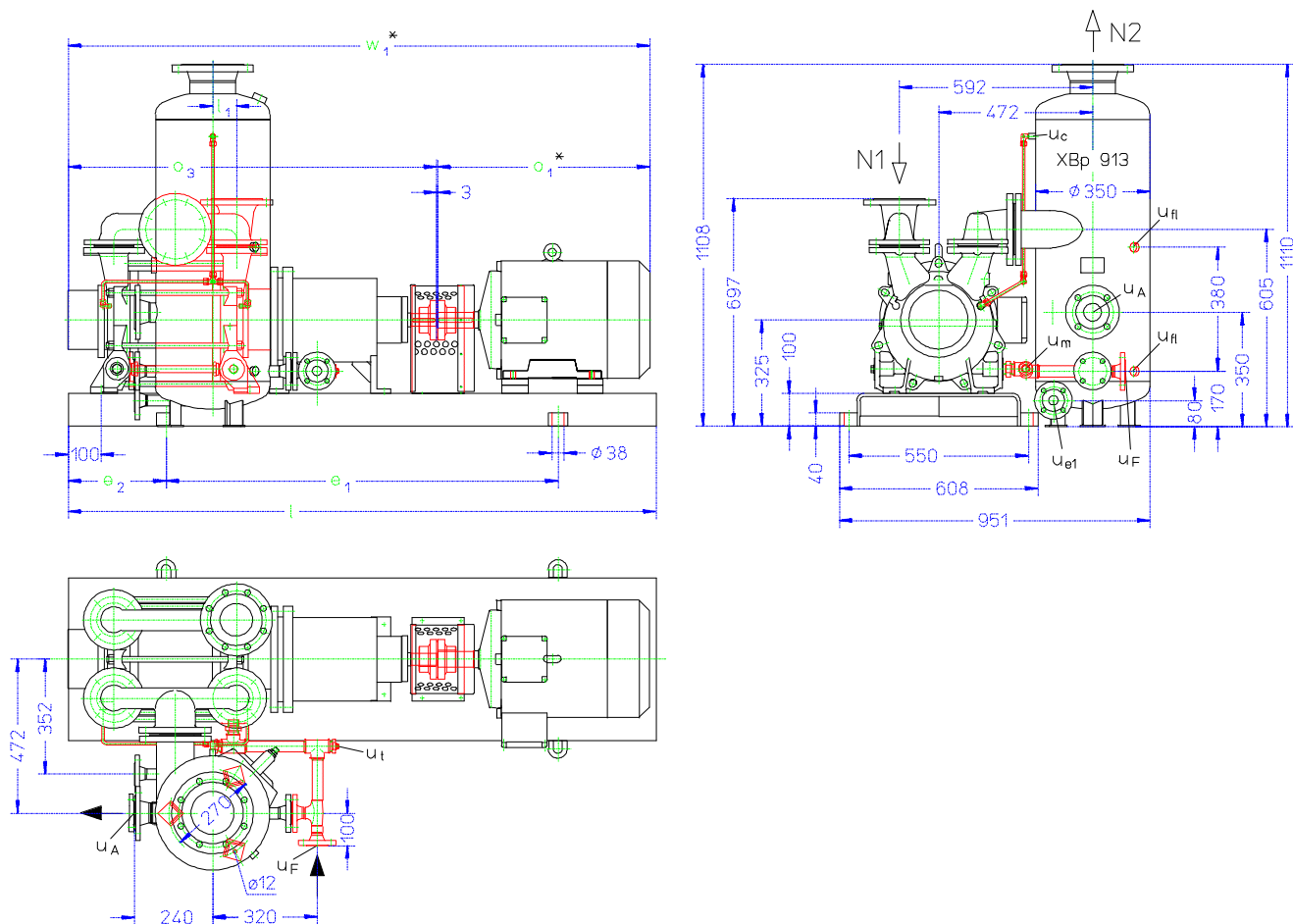
- N 1 = gas inlet DN 100
- N 2 = gas outlet DN 100
- U_B = connection for service liquid G 1
- U_c = connection for protection against cavitation G ¼
- U_e = drain connection G ½
- U_{m1} = connection for drain valve G ¾
- U_{se} = connection for dirt drain G ½

	a	m ₁	m ₂	o ₃	weight app. kg
LEH 600	375	515	455	1128	365
LEH 800	416	556	496	1169	375
LEH 900					385

flange connections to DIN 2501 PN 10		
DN	65	100
k	145	180
D	185	220
number x d ₂	4 x 18	8 x 18



Arrangement drawing LEH 600, LEH 800, LEH 900 with magnetic coupling

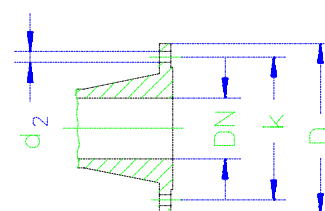


- N 1 = gas inlet DN 100
- N 2 = gas outlet DN 125
- UA = connection for liquid drain DN 50
- UF = connection for fresh liquid DN 25
- Uc = connection for protection against cavitation G ¼

- ue1 = drain connection DN 25
- ufi = connection for liquid level indicator G ½
- um = connection for pressure gauge G ½
- ut = connection for thermometer G ¼

	electric motor 50 Hz			e1	e2	l	l1	o1 *	o3	w1 *	weight app. kg
	size	IP 55	kW EEx e II T3								
LEH 600	180 M	18,5	-	1200	300	1800	73	650	1128	1781	690
	200 L	-	24								1869
LEH 800	200 L	30	-	1340	330	2000	93	738	1169	1910	795
	200 L	-	24								835
LEH 900	200 L	30	-	1340	330	2000	93	738	1169	1910	810
	225 S	-	30								1990

flange connections to DIN 2501 PN 10				
DN	25	50	100	125
k	85	125	180	210
D	115	165	220	250
number x d2	4 x 14	4 x 18	8 x 18	8 x 18



* 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	600	0,80	1,27	1,97	3,1	0,93	1,40	2,01	2,85	0,94	1,38	1,92	2,6	0,84	1,16	1,52	1,9
	800	0,93	1,47	2,28	3,6	1,06	1,59	2,30	3,25	1,09	1,60	2,22	3,0	0,99	1,37	1,77	2,2
	900	1,16	1,83	2,79	4,3	1,34	2,01	2,86	4,0	1,38	2,01	2,77	3,7	1,24	1,72	2,24	2,8

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
	<ul style="list-style-type: none"> A • hydraulic A • F two grease lubricated antifriction bearings 	<ul style="list-style-type: none"> 4 • • 26-pole magnet • A • glandless with isolation shroud • • F torque of the magnetic coupling * • • H 	<ul style="list-style-type: none"> 0B main parts of GG without non-ferrous metal 4B main parts of Cr Ni Mo cast steel 	4 soft Teflon
LEH 600 800 900	AF	4AF 4AH 4AH	alternative 0B, 4B	4

* 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					
		motor enclosure IP 55			motor enclosure EEx e II T3		
pump with free shaft end	01	kW	size	designation	kW	size	designation
pump with coupling, pre-drilled at motor side	04						
as above, but with motor, for example		18,5	180 M	VB	24	200 L	XK
30 kW three-phase motor	e.g. XB	30,0	200 L	XB	30	225 S	ZK
(50 Hz, 400 VΔ) at 1450 rpm							

Example for ordering:

The construction size LEH 800 AF 4AH 4B 4 with 30 kW three-phase ac motor (50 Hz, 400 VΔ) 1450 rpm has the complete order number:

LEH 800 AF 4AH 4B 4 XB

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 600, LEH 800, LEH 900 with magnetic coupling

Recommended accessories		LEH 600	LEH 800	LEH 900
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		XBp 913 / 53 kg	
	SIHI part No.		35 000 537 35 000 538	
	SIHI part No.	35 003 148 35 003 149	35 003 150 35 003 151	
	SIHI part No.	20 043 839 20 043 840	20 043 841 20 043 842	
SIHI-gas ejector at service liquid temperature at service liquid temperature	15 °C	GEVA 600 A	GEVA 800 A	GEVA 900 A
	30 °C	GEVA 600 B	GEVA 800 B	GEVA 900 B
SIHI-ball type non-return valve material design 767 / GG-25 784 / 1.4408	type / weight	XCk 100 / 16 resp. 17,5 kg		
	SIHI part No.	43 016 898 43 029 322		
Motor IP 55 EEx e II T3	size	180 M	200 L	
	power	18,5 kW	30 kW	
	weight	154 kg	215 kg	
	size		200 L	225 S
	power		24 kW	30 kW
	weight		254 kg	305 kg
Coupling for motor IP 55 pump side motor side for motor EEx e II T3 pump side motor side	type / weight	B 125 / 6 kg	B 140 / 7 kg	
	SIHI part No.	43 021 460 43 021 462	43 021 474 43 021 477	
	type / weight	BDS 135 / 6,5 kg	BDS 152 / 8,5 kg	BDS 152 / 8,5 kg
	SIHI part No.	43 028 122 43 028 118	43 025 967 43 030 019	43 025 967 43 000 741
Contact safety device material design 076 / steel 345 / 2.0321	SIHI part No.	35 004 647 35 004 650		
base plate for motor IP 55 and EEx e II T3 material design 081 / RSt 37-2	type / weight	S 489 / 104 kg	S 490 / 136 kg	
	SIHI part No.	35 000 022	35 000 023	
Smooth starter	type / weight	on request		

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

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