

Liquid ring vacuum pumps

in compact design



LEM 250 LEL 250

Pressure range: 33 to 1013 mbar
Suction volume flow: 100 to 280 m³/h

CONSTRUCTION TYPE

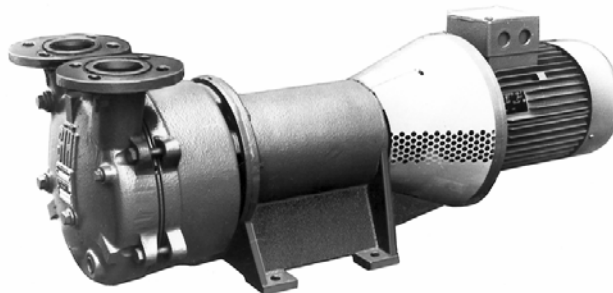
SIHI liquid ring vacuum pumps are displacement pumps of uncomplicated and robust construction with the following particular features:

- 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
- shaft not contact with the medium
- protection against cavitation as standard
- incorporated dirt drain
- incorporated central drain
- no metallic contact of the rotating parts

The SIHI liquid ring vacuum pumps LEM/LEL 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.



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	LEM 250 LEL 250
Speed	50 Hz 60 Hz	rpm 1450 1750
Max. compression over pressure	bar	LEM 0,3 / LEL 0,5
Max. admissible pressure difference	bar	LEM 1,1 / LEL 1,5
Hydraulic test (over pressure)	bar	3
Moment of inertial of the rotating pump parts and of the water filling	kg · m ²	0,097
Sound pressure level at a suction pressure of 80 mbar	dB (A)	65
Max. gas temperature	dry saturated	°C 200 °C 100
Service liquid		
max. admissible temperature	°C	80
max. viscosity	mm ² /s	4
max. density	kg/m ³	1200
volume up to shaft level	liter	4
Max. flow resistance of the heat exchanger	bar	0,2

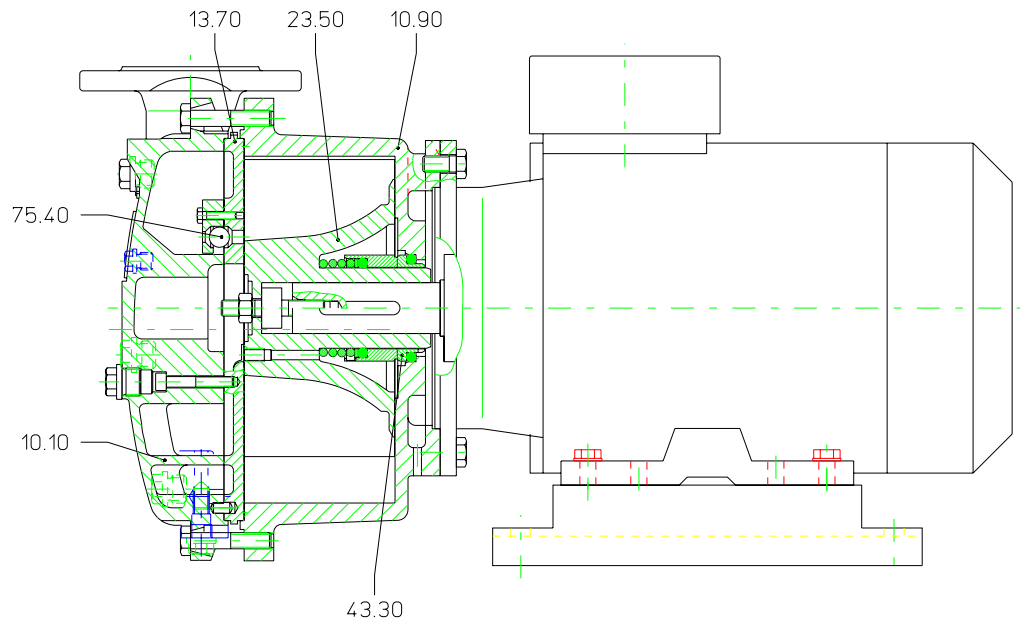
The combination of several limiting values is not admissible.

Material design

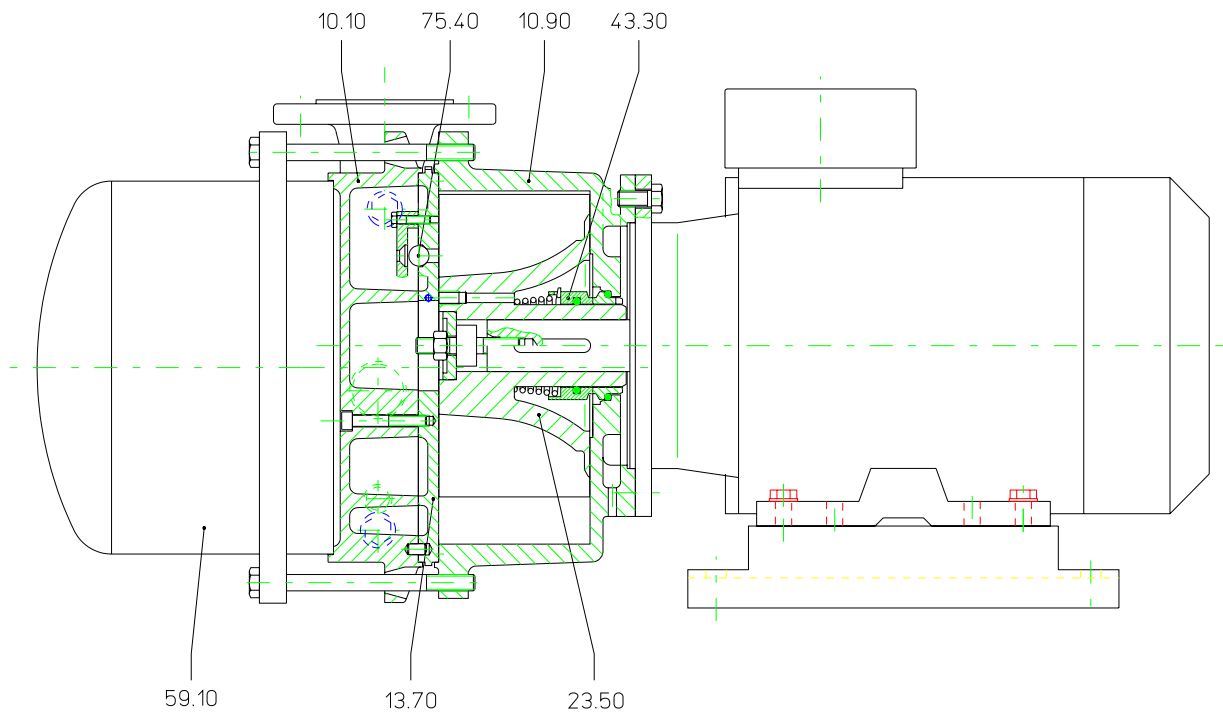
Item	COMPONENTS	MATERIAL DESIGN	
		0A	4B
10.10	Casing	0.6025	1.4408
10.90	Central body		
13.70	Guide disk		
21.00*	Shaft	1.0503	
23.50	Vane wheel impeller	2.1096.01	1.4517
34.01*	Motor carrier	0.6025	0.6025 (with annealing lacquer)
43.30	Standard mechanical seal	Cr-steel / carbon / Perbunan	Cr Ni Mo-steel / carbon / Viton
59.10	Integrated pre-arranged separator	1.0038	1.4571
75.40	Valve balls	polyamide A	PTFE

* only for LEL 250

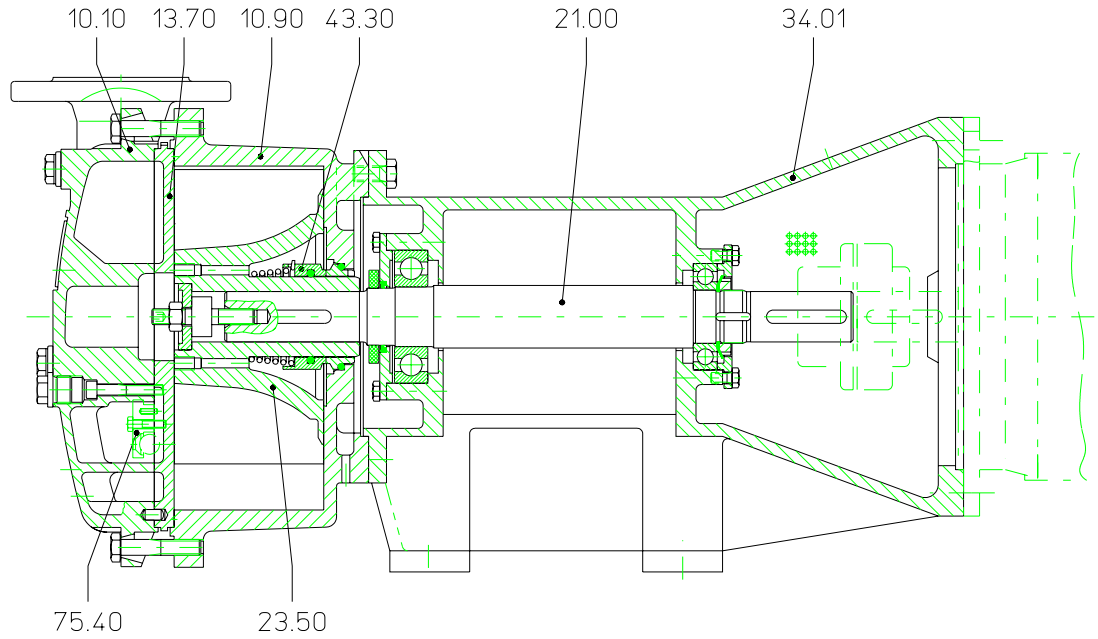
Sectional drawing LEM 250



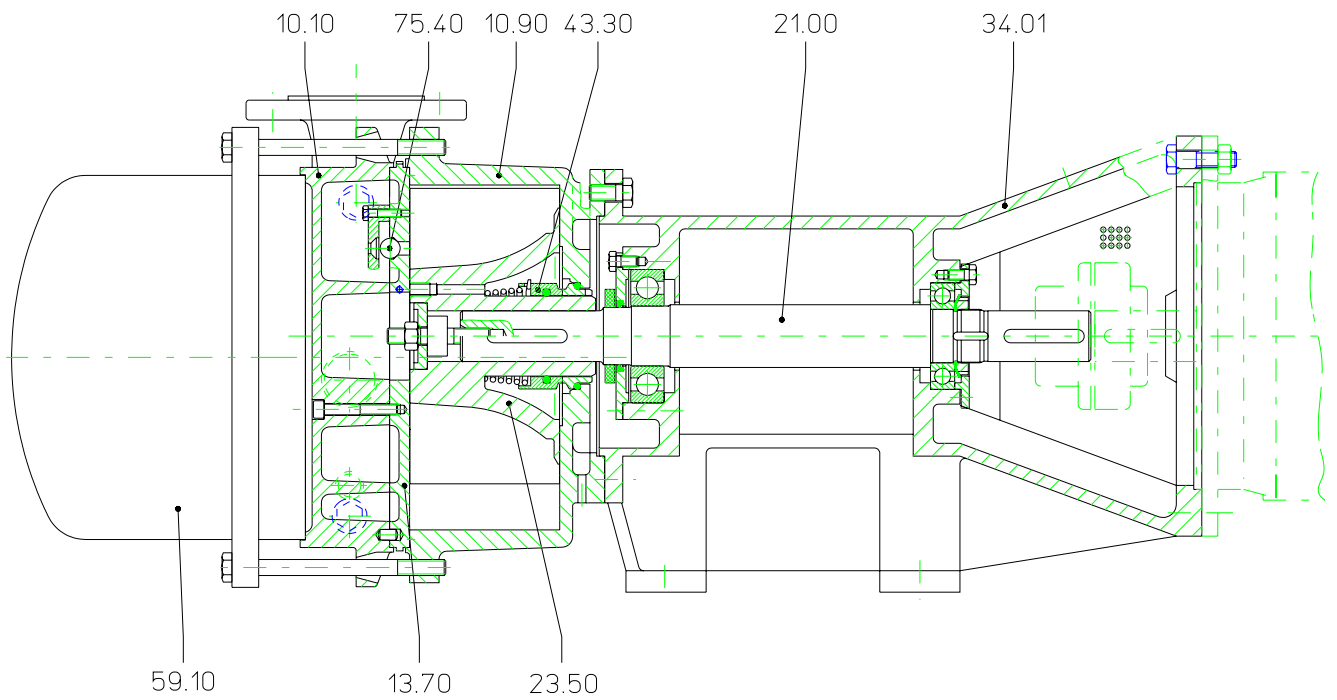
Sectional drawing LEM 250 with integrated pre-arranged separator



Sectional drawing LEL 250



Sectional drawing LEL 250 with integrated pre-arranged separator



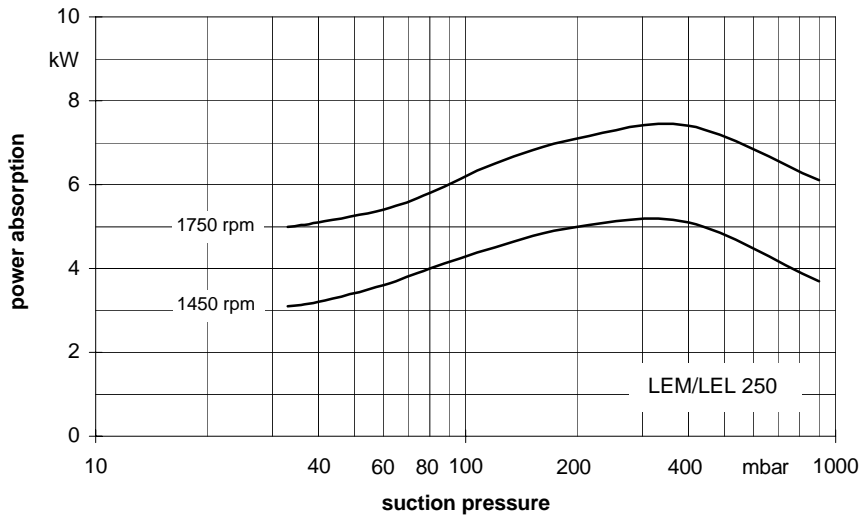
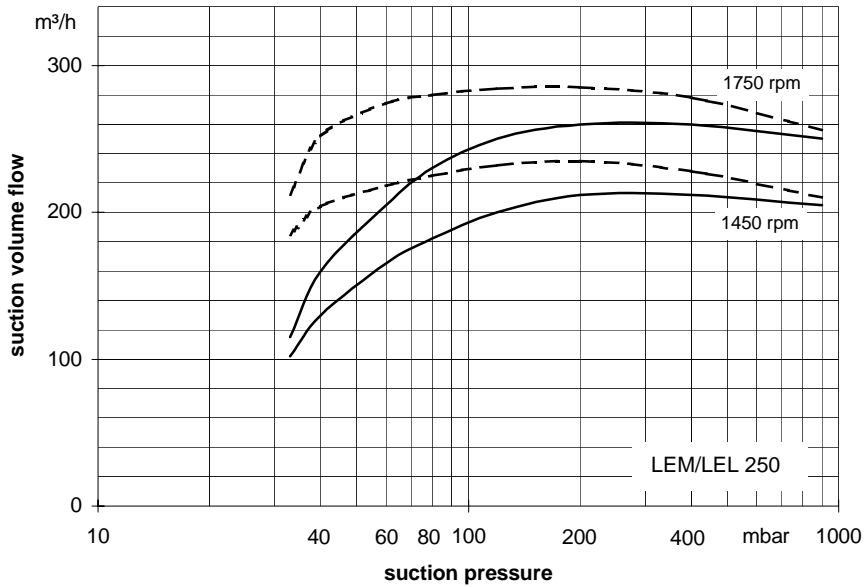
Fresh water requirements in [m³/h] dependent on suction pressure, speed, mode of operation and difference in temperature

suction pressure [mbar]		33			120			200			400						
pump	speed [rpm]	KB			FB	KB			FB	KB			FB				
		difference in temperature [°C]				difference in temperature [°C]				difference in temperature [°C]							
		10	5	2		10	5	2		10	5	2					
LEM/LEL 250	1450	0,22	0,37	0,63	1.2	0,29	0,45	0,70	1.1	0,30	0,46	0,68	1.0	0,28	0,42	0,59	0.8
	1750	0,32	0,50	0,77		0,37	0,55	0,79		0,38	0,55	0,75		0,35	0,49	0,64	

FB = fresh liquid service

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

Suction volume flow and power absorption LEM 250 / LEL 250

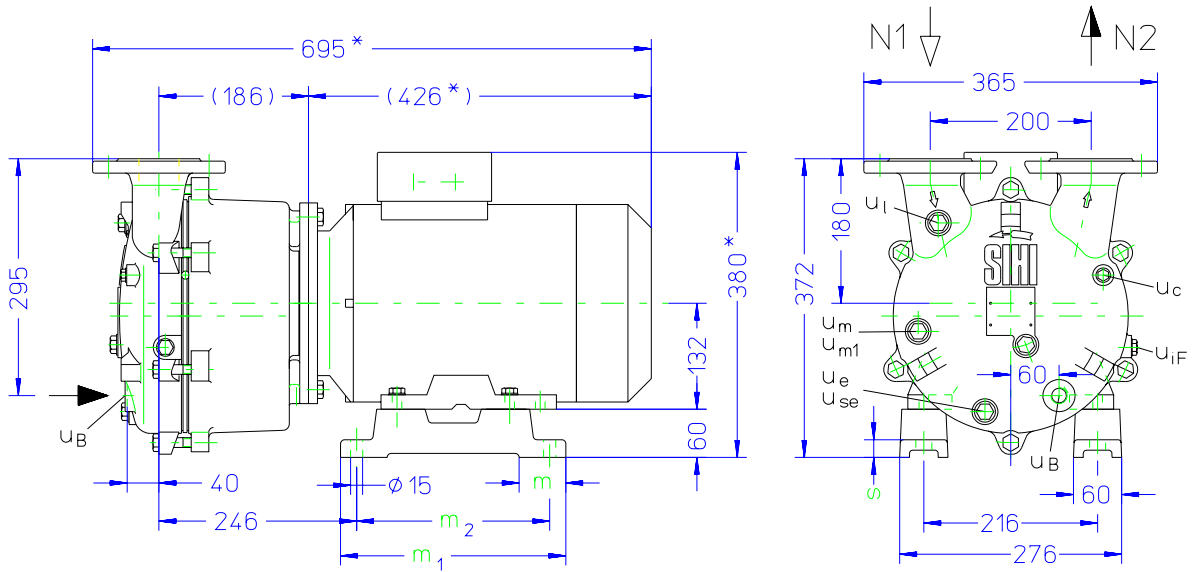


The operating data are applicable under the following conditions:

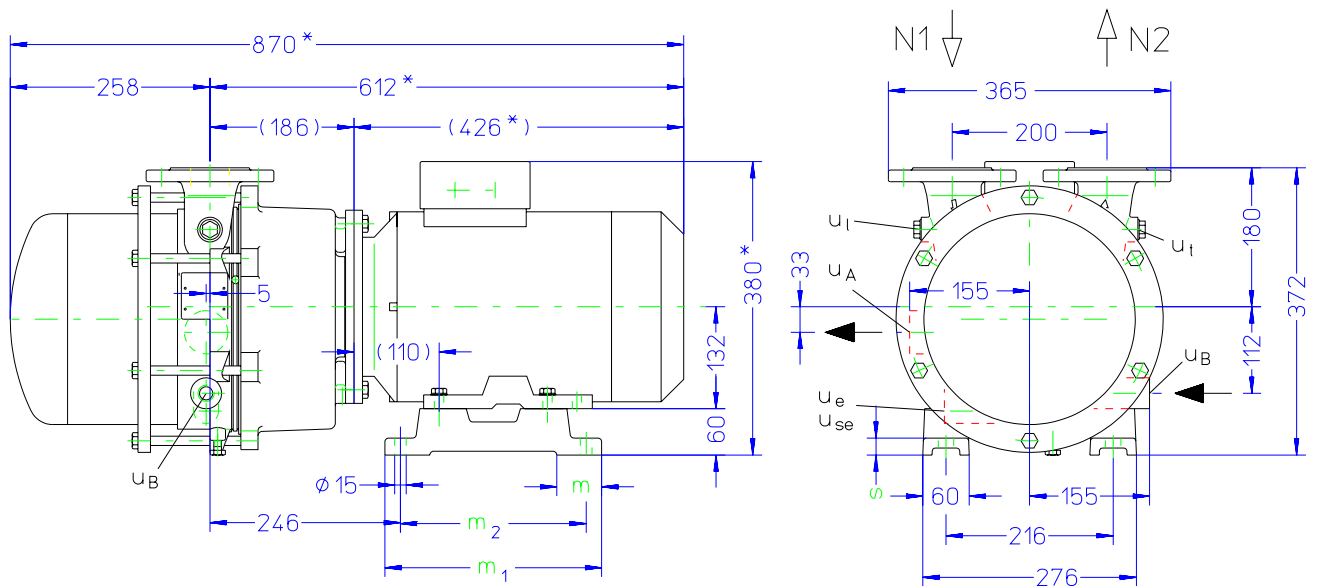
- pumping medium:
 - dry air: 20°C _____
 - water vapour saturated air: 20°C
- service liquid:
 - water: 15°C

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 LEM 250



Dimension table LEM 250 with integrated pre-arranged separator



N 1 = gas inlet DN 50

N 2 = gas outlet DN 50

u_A = connection for liquid drain G 1¼

u_B = connection for service liquid G ½

u_c = connection for protection against cavitation G ¼

u_e = drain connection G ½

u_{se} = connection for dirt drain G ½

u_i = connection for vent cock G ½

u_m = connection for pressure gauge G ½

u_{m1} = connection for drain valve G ½

u_t = connection for thermometer G ½

u_{iF} = adjusting screw for internal liquid return

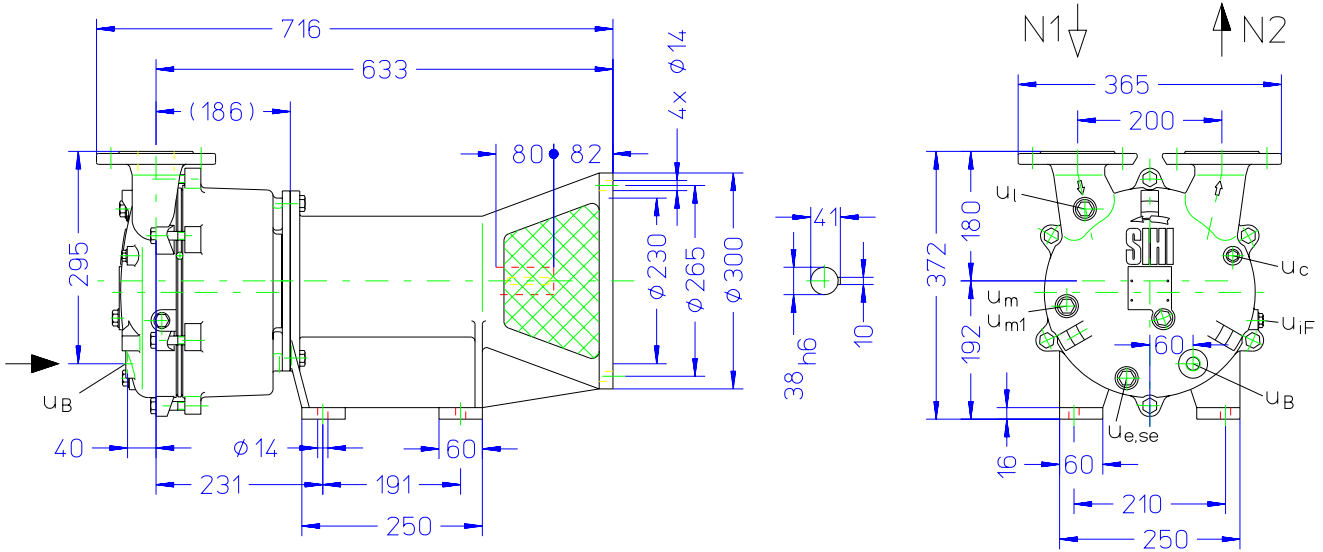
	electric motor IP 55			m	m ₁	m ₂	s	weight abt. kg	
	size	50 Hz	60 Hz					LEM	+ integr. pre-arranged separator
LEM 250	132 S	5,5	-	58	280	240	22	108	117
	132 M	-	8,0	-	320	278	28	114	123

other motors on request

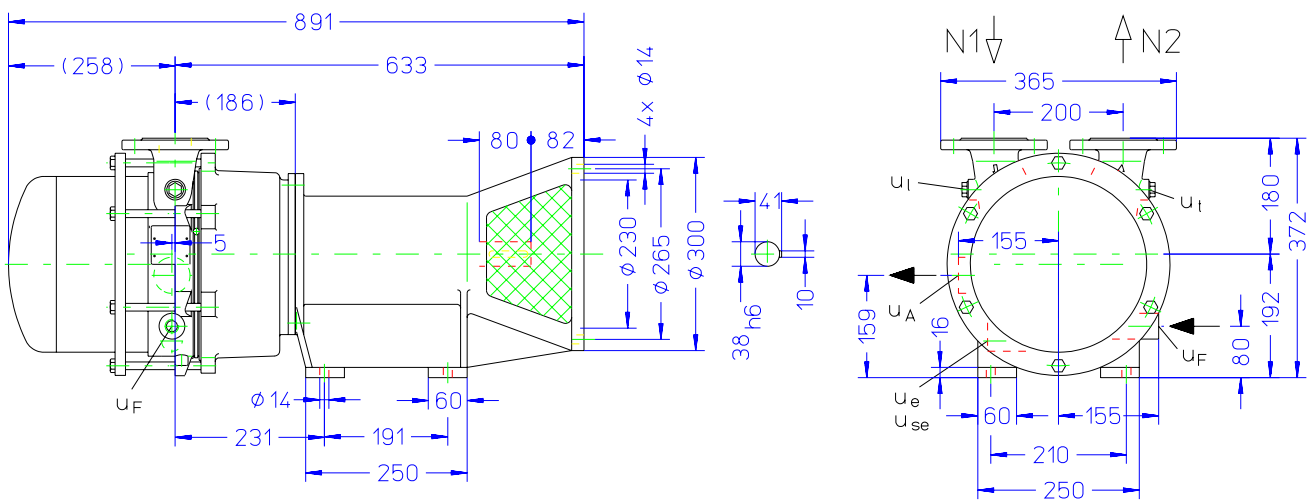
* dimensions dependent on the motor make

flange connections see page 8

Dimension table LEL 250



Dimension table LEL 250 with integrated pre-arranged separator

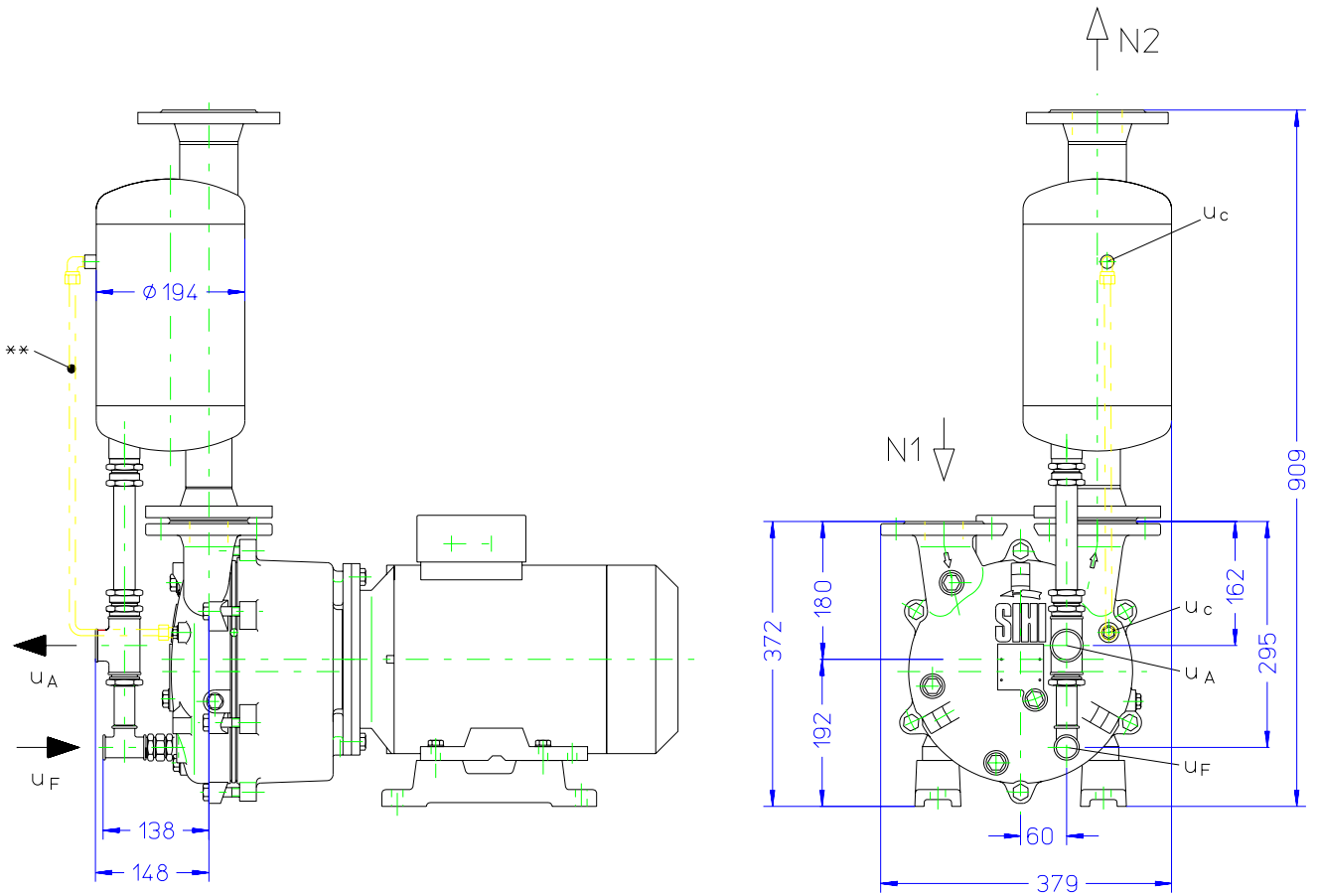


- N 1 = gas inlet DN 50
- N 2 = gas outlet DN 50
- u_A = connection for liquid drain G 1 1/4
- u_B = connection for service liquid G 1/2
- u_c = connection for protection against cavitation G 1/4
- u_e = drain connection G 1/2
- u_{se} = connection for dirt drain G 1/2
- u_l = connection for vent cock G 1/2
- u_m = connection for pressure gauge G 1/2
- u_{m1} = connection for drain valve G 1/2
- u_t = connection for thermometer G 1/2
- u_{iF} = adjusting screw for internal liquid return

	weight abt. kg	
	LEL	+ integr. pre-arranged separator
LEL 250	91	100

flange connections see page 8

Arrangement drawing LEM 250



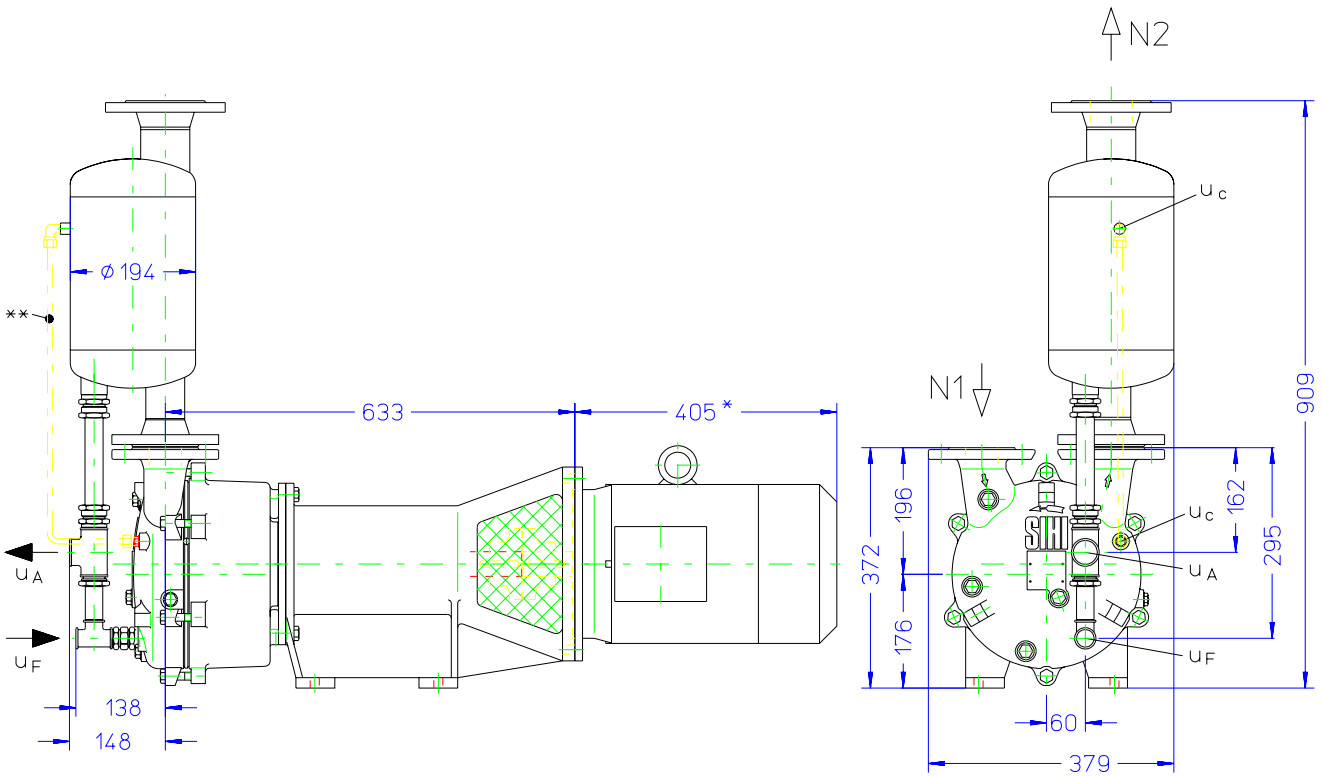
	electric motor IP 55			weight abt. kg
	size	kW		
		50 Hz	60 Hz	
LEM 250	132 S	5,5	-	122
	132 M	-	8,0	128

other motors on request
 ** see list of accessories

flange connections see page 8

- N 1 = gas inlet DN 50
- N 2 = gas outlet DN 65
- u_A = connection for liquid drain G 1
- u_F = connection for fresh liquid G ½
- u_c = connection for protection against cavitation G ¼

Arrangement drawing LEL 250



	electric motor 50 Hz			weight abt. kg
	size	kW		
		IP 55	EEx e II T3	
LEL 250	132 S	5,5	-	150
	132 M	-	6,8	185

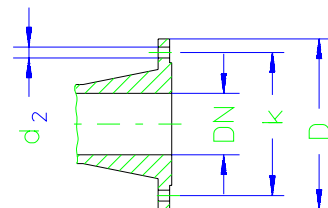
- N 1 = gas inlet DN 50
- N 2 = gas outlet DN 65
- u_A = connection for liquid drain G 1
- u_F = connection for fresh liquid G ½
- u_c = connection for protection against cavitation G ¼

flange connections to DIN 2501 PN 10		
DN	50	65
k	125	145
D	165	185
number x d ₂	4 x 18	4 x 18

other motors on request

* dimension dependent on the motor make

** see list of accessories



Data regarding the pump size - order notes

series + size	hydraulics + bearings	shaft sealing	material design	casing seal
	<ul style="list-style-type: none"> A• hydraulic A R• with integrated pre-arranged separator •Z two grease lubricated antifriction bearings arranged in the motor •B as •Z but arranged in the motor carrier 	<ul style="list-style-type: none"> AAE standard mechanical seal O-rings Perbunan AA1 as AAE, but O-rings Viton 	<ul style="list-style-type: none"> 0A main parts of GG 4B main parts of Cr Ni Mo-cast steel 	0 liquid seal
LEM 250	AZ, RZ	AAE, AA1	0A, 4B	0
LEL 250	AB, RB			

Motor selection table LEM

	motor enclosure IP 55 50 Hz					motor enclosure IP 55 60 Hz				
	Y-voltage V +/- 5%	Δ-voltage V +/- 5%	power kW	size	motor- design.	Y-voltage V +/- 5%	Δ-voltage V +/- 5%	power kW	size	motor- design.
LEM 250	660-725	380-420	5,5	132 S	AW	---	380-480	8,0	132 M	DX

Example for ordering:

The construction size LEM 250 AZ AAE 0A 0 with 5,5 kW three-phase ac motor (50 Hz, 400 VΔ) 1450 rpm has the complete order number:

LEM• 250 AZ AAE 0A 0 AW

Design for LEL

	designation	electric motor 50 Hz					
		motor enclosure IP 55			motor enclosure EEx e II T3		
pump with free shaft end	01	kW	size	motor design.	kW	size	motor design.
pump with coupling, pre-drilled at motor side	04						
as above, but with motor, for example 5,5 kW three phase motor (50 Hz, 400 VΔ) at 1450 rpm	e.g. NB	5,0	132 S	NB	6,8	132 M	PK

Example for ordering:

The construction size LEL 250 AB AAE 0A 0 with 5,5 kW three-phase ac motor (50 Hz, 400 VΔ) 1450 rpm has the complete order number:

LEL• 250 AB AAE 0A 0

NB

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 cope is replaced by a letter in the factory.

Accessories LEM 250, LEL 250

Recommended accessories		LEM 250 LEL 250
Overhead liquid separator	type	XBa 940
material design 130 / galvanized 172 / 1.4571	weight SIHI part No.	10,5 kg 35 000 385 35 000 386
material design 072 / St 37-0 172 / 1.4571	SIHI part No.	35 010 860 35 012 649
cavitation protection line		
material design 072 / St 37-0 172 / 1.4571	SIHI part No.	35 003 345 35 003 346
Upright liquid separator	type	XBp 414
material design 130 / galvanized 172 / 1.4571	weight SIHI part No.	31 kg 35 000 504 35 000 505
service liquid line		
material design 072 / St 37-0 172 / 1.4571	SIHI part No.	35 003 242 35 003 243
discharge line (bend)		
material design 072 / St 37-0 172 / 1.4571	SIHI part No.	35 003 214 35 003 215
cavitation protection line		
material design 072 / St 37-0 172 / 1.4571	SIHI part No.	20 041 563 20 041 564
SIHI-gas ejector		
at service liquid temperature	15 °C	GEV 250 A
at service liquid temperature	30 °C	GEV 250 B
SIHI-ball type non-return valve	type / weight	XCk 50 / 3,6 resp. 10,8 kg
material design 767 / GG-25 784 / 1.4408	SIHI part No.	43 016 892 20 029 498
Standard motor only for LEL		
IP 55	size power weight	132 S 5,5 kW 45 kg
EEx e II T3	size power weight	132 M 6,8 kW 80 kg
Coupling only for LEL		
for motor IP 55	type / weight	B 95 / 2,6 kg
pump side	SIHI part No.	43 021 429
motor side		43 021 433
for motor EEx e II T3	type / weight	BDS 103 / 3,1 kg
pump side	SIHI part No.	43 028 126
motor side		43 025 941

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

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