

Liquid ring vacuum pumps

for waste disposal vehicles



SL 2100, SL 2700, SL 3100

Pressure range: 150 mbar to 1,5 bar (overpressure)

Suction volume flow: 1010 to 3080 m³/h

CONSTRUCTION TYPE

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

- handling of all gases and vapours
- robust operating behaviour
- insensitive to entrained liquids
- low noise level, nearly free from vibration
- direct drive or belt drive
- very little wear because of regular dirt drain (out of the pump) and application of steel as construction material
- symmetrical design therefore optionally clockwise or anticlockwise operation by easy shifting of the shaft
- no lubricant in the working chamber
- compact design, small size



SL 2100

- wide effective speed range from 800 to 1600 rpm
- weight-saving construction
- leakproof shaft seal, optionally: Special seal with radial shaft seal ring and gland packing ring or mechanical seal with bellows.

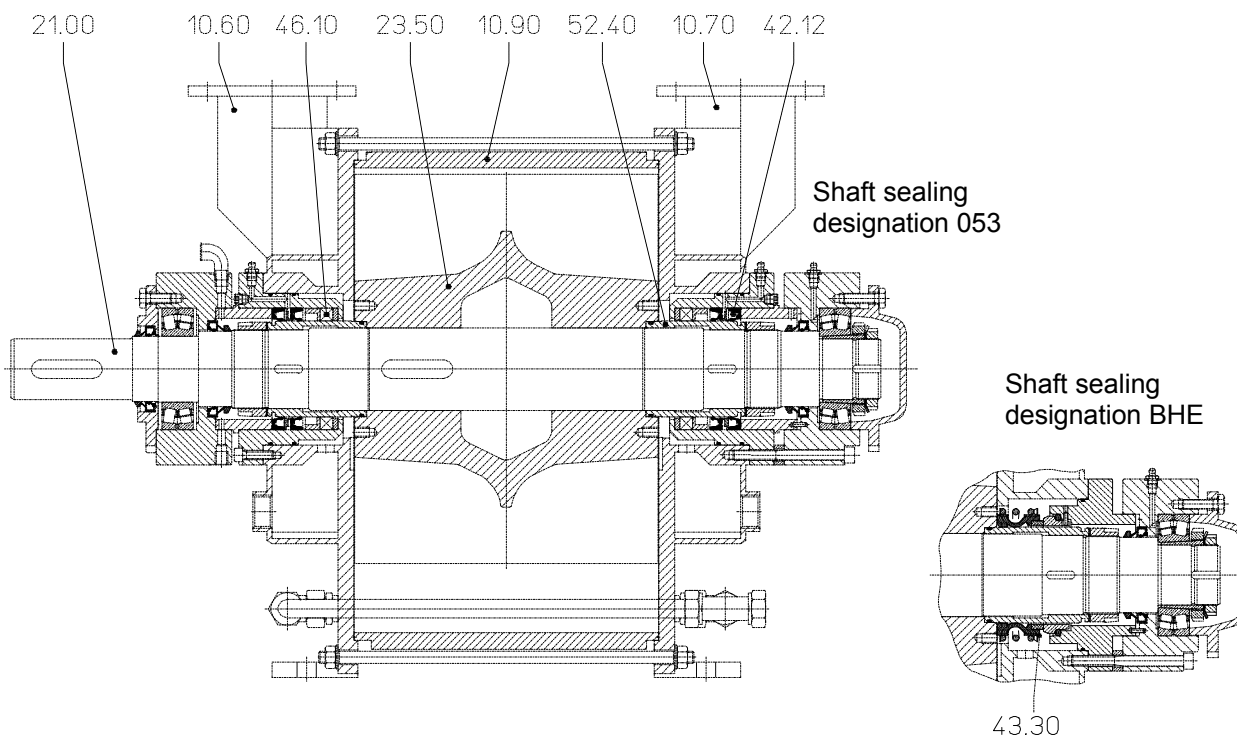
GENERAL TECHNICAL DATA

Pump type	unit	SL 2100	SL 2700	SL 3100
Suction volume flow (at 400 mbar, 1600 rpm and with water vapour saturated air)	m ³ /h	2190	2700	3080
Speed	min / max rpm		800 / 1600	
Power absorption (at 400 mbar and 1600 rpm)	kW	68	84	94
Power absorption (at 0,5 bar (overpressure) and 1600 rpm)	kW	76	87	103
Moment of inertial of the rotating pump parts and of the water filling (without coupling or pulley)	kg · m ²	2,6	3,05	3,5
Sound pressure level (distance 7 m, 200 mbar / 0,5 bar (overpressure))	dB (A)	65 / 67	66 / 68	67 / 69
Max. gas temperature	dry °C saturated °C		160 80	
Service liquid temperature	min / max °C		10 / 60	
Liquid volume of the pump (up to shaft mid)	liter	25	30	34
Min. suction pressure at vacuum operation	mbar		150	
Min. admissible pulley of diameter in vacuum operation	mm	236		300
Max. compression pressure in compressor operation	bar (overpressure)		1,5	
Min. admissible pulley of diameter in compressor operation	0,5 bar 1,0 bar 1,5 bar mm	236 236 300	236 300 350	300 300 400

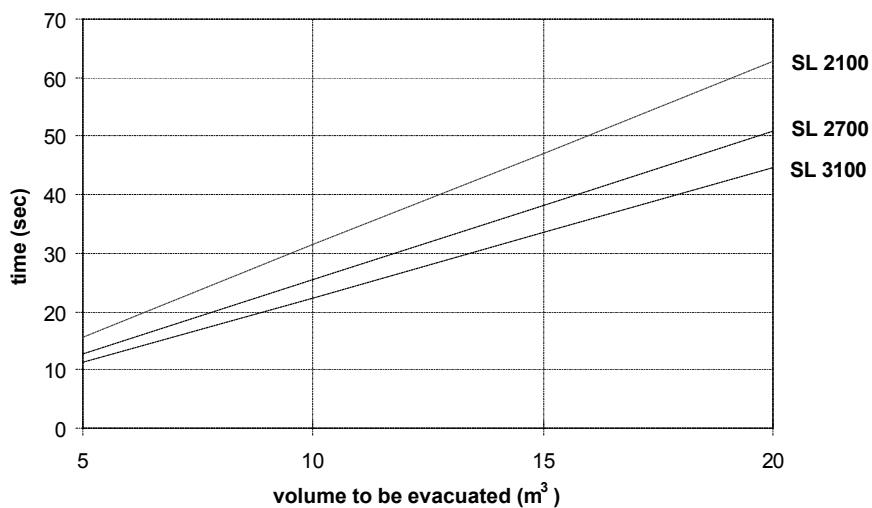
Material design

Item	COMPONENTS	Construction type special sealing SL 053 0B.0	Construction type mechanical seal SL BHE 0B.0
10.60, 10.70	Casing	1.0038	
10.90	Central body		
23.50	Vane wheel impeller	0.7043	
21.00	Shaft	1.0060	
52.40	Shaft sleeve	1.4021 (with protective coat against wear)	
46.10, 42.12, 43.30	Shaft sealing	GORE / Viton-RWDR	Cr cast / Carbon / Viton

Sectional drawing SL 2100, SL 2700, SL 3100



Evacuation times (from atmosphere to 150 mbar)



Note:
These evacuation times are standard values. The real duration depends on the tightness of the entire system.

Suction volume flow and power absorption SL 2100, SL 2700, SL 3100

The tables show the operating data of the liquid ring vacuum pump under catalogue conditions (pumping gas: water vapour saturated air at 20 °C, service liquid water at 20 °C)

SL 2100		power absorption in kW					
speed rpm	suction volume flow m³/h	vacuum operation (p ₂ = 1013 mbar)			compressor operation (p ₁ = 0 bar)		
		200 mbar kW	400 mbar kW	600 mbar kW	0,5 bar kW	1,0 bar kW	1,5 bar kW
1600	2190	72	68	64	76	93	110
1400	1930	55	52	48	58	72	
1200	1660	41	38	35	44	58	
1000	1370	30	28	25	32	44	
800	1010	23	20	18	24		

SL 2700		power absorption in kW					
speed rpm	suction volume flow m³/h	vacuum operation (p ₂ = 1013 mbar)			compressor operation (p ₁ = 0 bar)		
		200 mbar kW	400 mbar kW	600 mbar kW	0,5 bar kW	1,0 bar kW	1,5 bar kW
1600	2700	86	84	83	87	110	136
1400	2400	66	63	62	70	85	
1200	2080	49	47	43	53	66	
1000	1720	36	33	31	38	50	
800	1350	26	24	21	27	35	

SL 3100		power absorption in kW					
speed rpm	suction volume flow m³/h	vacuum operation (p ₂ = 1013 mbar)			compressor operation (p ₁ = 0 bar)		
		200 mbar kW	400 mbar kW	600 mbar kW	0,5 bar kW	1,0 bar kW	1,5 bar kW
1600	3080	95	94	93	103	122	145
1400	2700	72	71	70	79	96	
1200	2320	54	51	49	60	74	
1000	1910	39	36	35	43	56	
800	1360	28	26	24	30	39	

Service liquid flow

During operation the pump must continuously be supplied with water out of the separator, 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.
Generally the cooling of the service liquid is made by means of a

separate air/water cooler with circulating pump that are switched on simultaneously with the auxiliary drive.

A level switch in the separator releases an alarm, if the service liquid level falls below the minimum (about 1/5 of the separator volume), then the circulating pump is switched on.

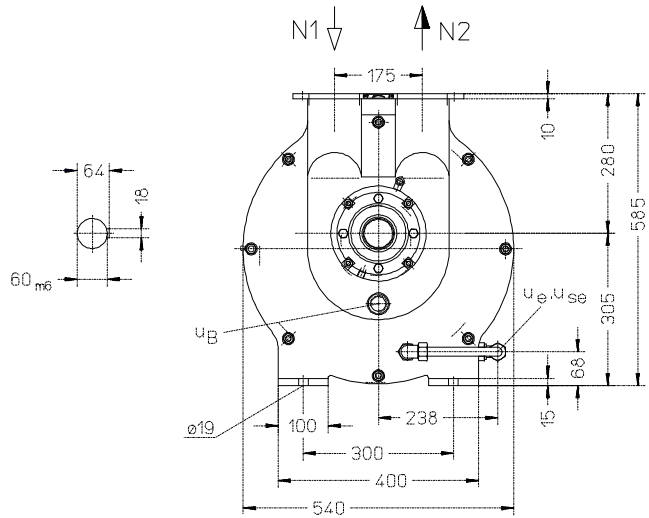
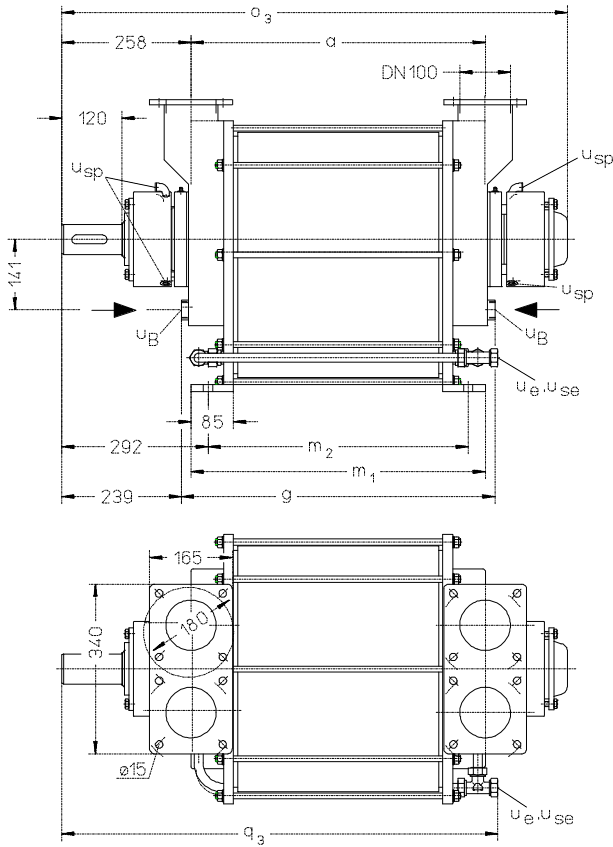
pump	speed rpm	Service liquid flow m³/h					
		vacuum operation (p ₂ = 1013 mbar)			compressor operation (p ₁ = 0 bar)		
		200 mbar	400 mbar	600 mbar	0,5 bar	1,0 bar	1,5 bar
SL 2100							
SL 2700	800 ... 1600	4,1	3,4	2,7	2,9	4,6	6,0
SL 3100							

Service liquid flow dependent on the suction/compression pressure.

The indicated values refer to standard applications where the service liquid is supplied under compression pressure p₂ (atmospheric pressure in case of vacuum operation).

In case of circulating liquid operation when using a liquid pump the values must not be lower than the indicated values.

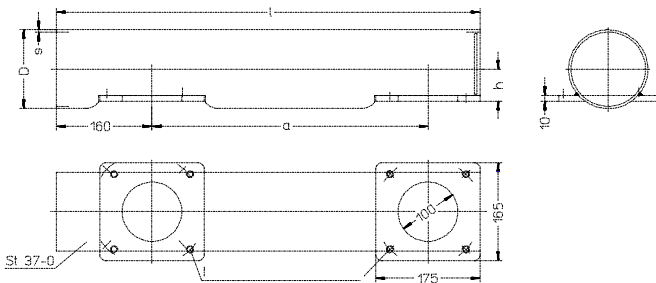
Dimension table SL 2100, SL 2700, SL 3100



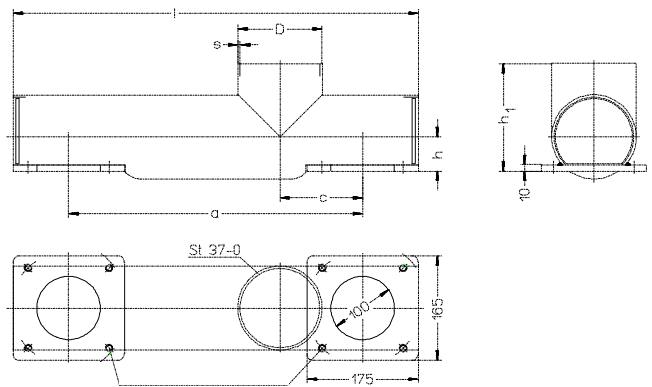
	a	g	m ₁	m ₂	o ₃	q ₃	weight app. kg
SL 2100	463	501	463	395	884	745	295
SL 2700	533	571	533	465	954	815	317
SL 3100	588	626	588	520	1009	870	345

- N1 = gas inlet DN 100
- N2 = gas outlet DN 100
- U_B = connection for service liquid G 1
- U_e = U_{se} = drain connection / connection for dirt drain 18 x 1 (Ermeto)
- U_{sp} = connection for flushing liquid G ¼

Y-pipes (as accessories)



M12 bored during assembly



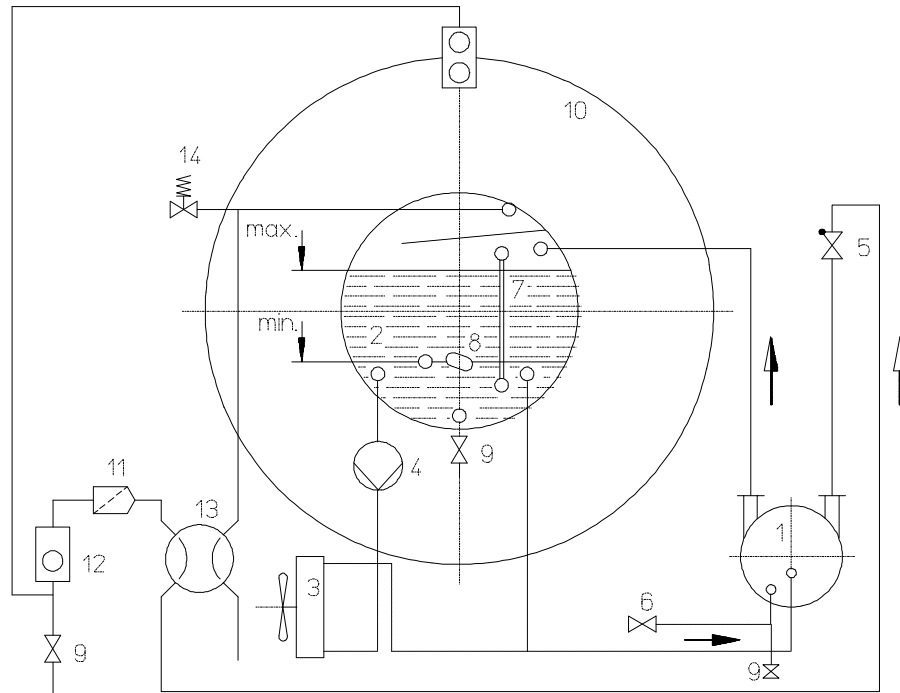
M12 bored during assembly

	D	a	h	l	s	weight app. kg
SL 2100	133	463	54	710	4	12
SL 2700		533		780		13
SL 3100	159	588	72	835	4,5	18

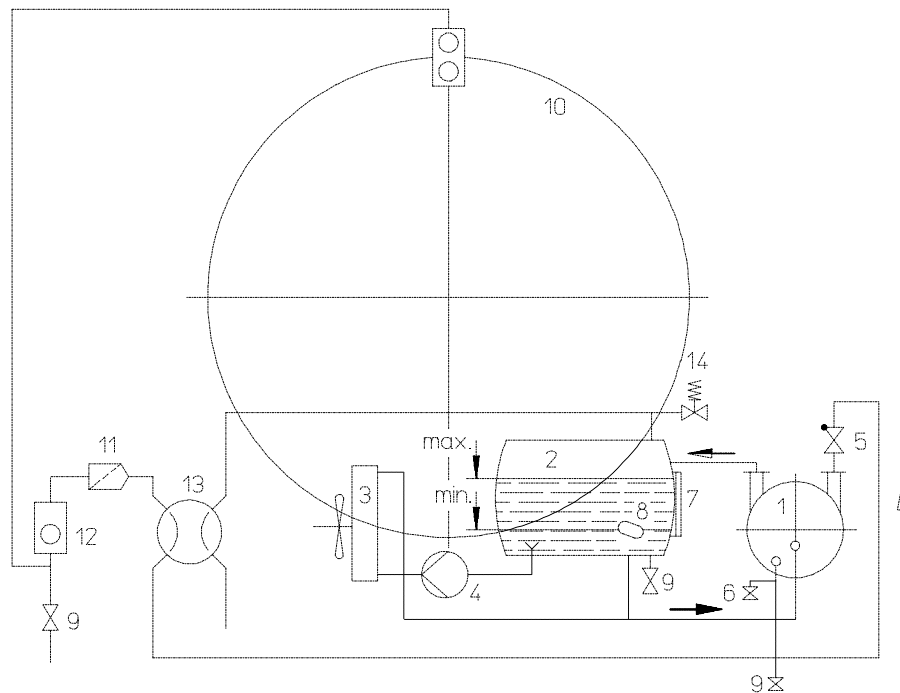
	D	a	c	h	h ₁	l	s	weight app. kg
SL 2100	133	463	130	54	170	638	4	13
SL 2700		533	150			708		14
SL 3100	159	588	180	72	195	763	4,5	20

(Including each 8 studs M12 x 25, 8 hexagonal nuts M12 and 2 flat gaskets DN 100)

Circuit diagram - waste disposal vehicle with fixed suction tank



Circuit diagram - waste disposal vehicle with tiltable suction tank



- | | |
|------------------------------|--|
| 1 liquid ring vacuum pump | 9 drain |
| 2 separator | 10 suction tank |
| 3 water/air cooler | 11 stainer |
| 4 circulating pump | 12 prevention against liquid inflow into the suction line (with floating ball) |
| 5 non-return valve | 13 4-way cock |
| 6 dirt drain | 14 safety valve |
| 7 liquid level | 15 vacuum limiting valve |
| 8 low level switch for water | |

Data regarding the pump size - order notes

series + size	bearings + direction of rotation	shaft sealing	material design	casing seal
	<ul style="list-style-type: none"> B• two antifriction bearings •O anticlockwise pump •N clockwise pump 	053 special sealing BHE mechanical seal	02 main parts of steel and ductile iron	0 liquid seal
2100 SL 2700 3100	BO, BN	053, BHE	02	0

Example for ordering:

The construction size SL 2700 with anticlockwise rotating and special sealing has the complete order number:

SL 2700 BO 053 02 0

Accessories

Recommended accessories				SL 2100	SL 2700	SL 3100
Y-pipe (incl. seals and screws) St 37-0	horizontal	pipe connection		20 044 481	20 044 482	20 044 483
	vertical	pipe connection		20 045 275	20 045 276	20 045 277
Non-return valve	Ms/PPO/EPDM	DN 100	3,2 kg	43 014 583		
	GG/PA/VA	DN 125	5,6 kg	43 024 907	43 024 907	
	GG/PA/VA	DN 150	8,4 kg			43 032 590
Vacuum-limiting valve		G 1¼	2,6 kg	43 030 841		
		G 1½	3,0 kg		43 029 810	
	Cr-steel/EPDM	G 2	3,8 kg			43 026 652
Air/water cooler 1 bar						(on request)
Air/water cooler 6 bar						(on request)
Ex-proof motor and fan wheel						(on request)
Thermal-lag switch	(putting in the circuit of cooler and circulating pump)				(on request)	
Circulating pump						(on request)
Safety valve	GG/SS	DN 40	16 kg	43 036 361		
	GG/SS	DN 50	22 kg	43 036 362	43 036 362	
	GG/SS	DN 65	32 kg		43 036 363	43 036 363
Liquid separator			450 litres			
	St grounded		450 litres	(on request)		
			550 litres			
Three- and four-way valves with safety hand lever				3-way valve	4-way valve	3-way valve
	GG / bronze	DN 125		43036346	43036350	43036346
		DN 150				43036350
Maintenance accessories	grease gun				43 038 935	
	grease cartridge		400 g		43 038 936	
	filter bag		(for hanging up into a water bucket)		43 025 692	
	300 / 290 mm					
	packing worm				43 034 004	
sealing compound		310 ml		43 016 381		

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

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