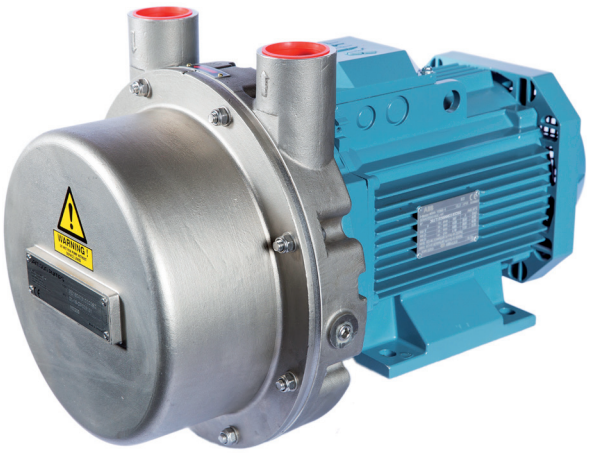
INSTRUCTION MANUAL FOR SAMSON LIQUID RING PUMPS, TYPES: **ME65, ME160**



DOC9002D

SAMSON PUMPS

CONTENTS

1 INTRODUCTION

1.1 Declaration of conformity

SAMSON PUMPS

Declaration of Conformity

Annex IIA

Samson Pumps A / S
Petersmindevej 21
DK-8800 Viborg

Hereby declares that the following products:

Liquid ring pump
ME65, ME160

Conforms to the directive:

Machinery Directive 2006/42/EC
Low Voltage Directive 2014/35/EU

I hereby declare, that the liquid ring pumps are in conformity with the following harmonized standards:

DS/EN ISO 12100:2011	Safety of machinery - General principles for design - Risk assessment and risk reduction
DS/EN 1012-2 + A1:2009	Compressors and Pumps - Safety requirements - Part 2: Vacuum pumps

The standards above only apply to the extent that it is relevant for the purpose of the pump.
The product must not be used before the complete system, which it must be incorporated in, has been conformity assessed and found to comply with all relevant health and safety requirements of 2006/42/EC and other relevant directives. The product must be included in the overall risk assessment.

Viborg, 09.03.2017

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DOC4017A

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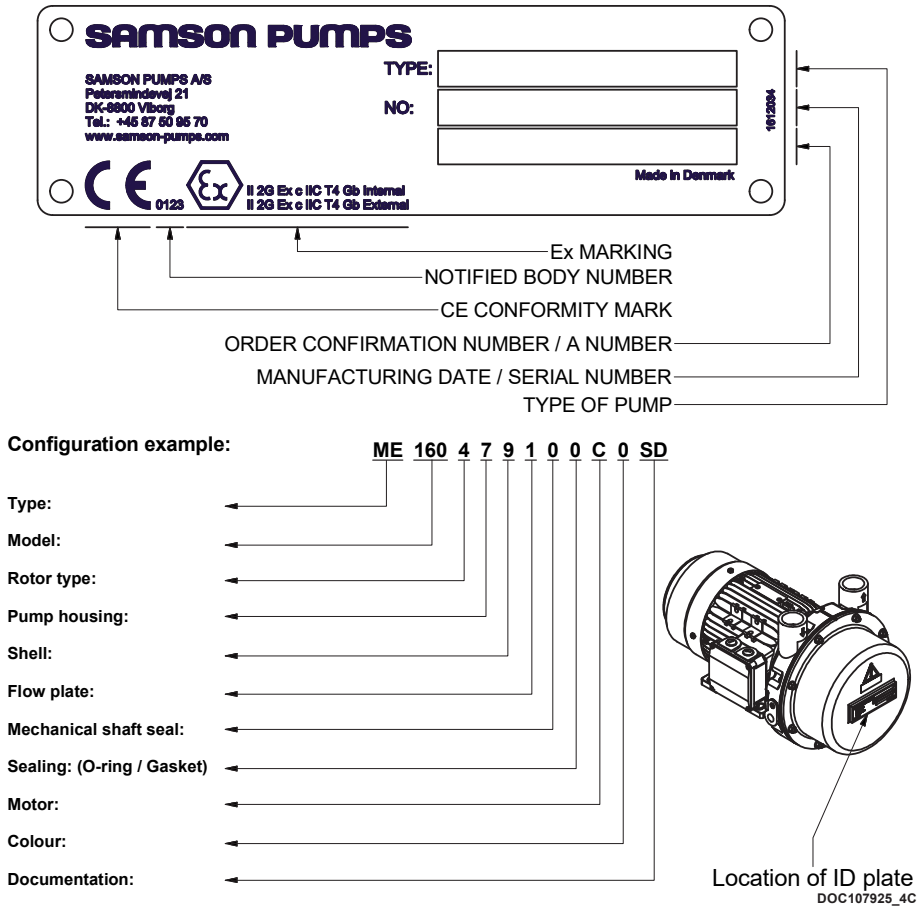
1.2 Explanation of warning symbols

Important technical and safety instructions is showed by symbols. If instructions not performed correctly, may lead to personnel injury or incorrect function of the pump.

To be used with all safety instructions that must be followed. A failure to follow the instructions may result in injury and/or incorrect machine operation.

1.3 Marking and identification

The pump is equipped with an identification plate that is shown below.



1.4 Field of application

Inlet of foreign objects can damage the pump.

The pump is designed exclusively to pump gases, including atmospheric air.

WARNING!
Do not operate the pump so that cavitation can occur! For further information see instruction manual for the Samson Pumps vacuum limiter.

It must be ensured that the inlet gas cannot react with the service liquid and create aggressive bonds that break down the pump's components.

For other operating data, see specifications.

- The pump may only be used with media that are not aggressive to the pump's materials. See section 2.8 for components and appertaining materials.

1.5 Disposal

Samson’s liquid ring pump is manufactured so that most of the device can be reused/recycled.

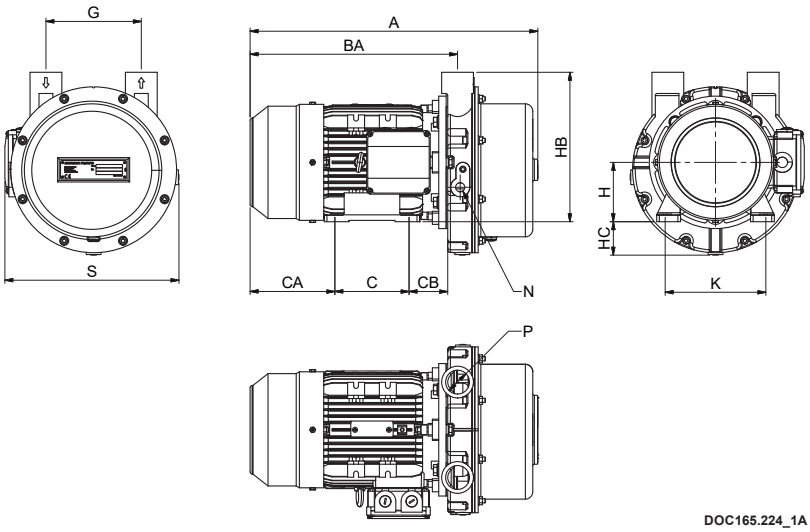
Samson Pumps thus offer users of the company’s pumps the option of returning used pumps to be restored or scrapped.

For those who do not wish to take up the factory on this offer, the pump must be taken apart and sorted into its separate components. See section 2.8 for the material of which the pump is made.

These components must be disposed of in accordance with national regulations.

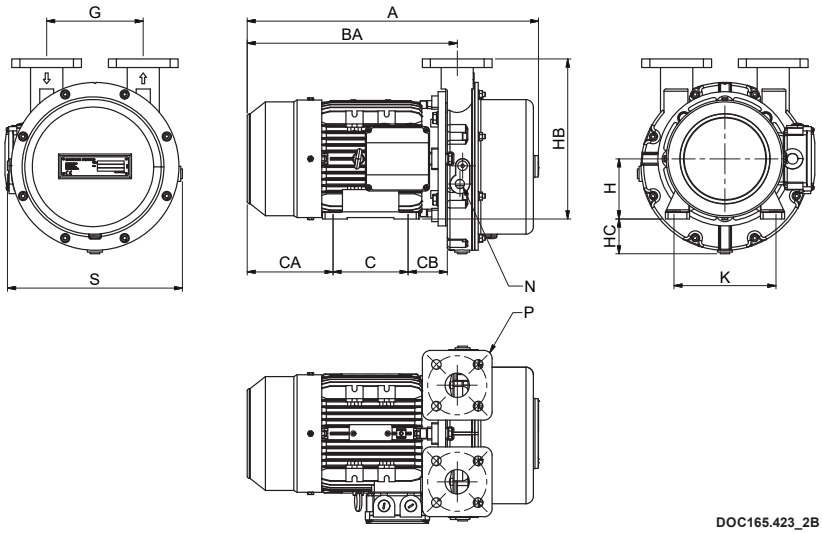
2 TECHNICAL DATA

2.1 Dimensions - Stainless steel pump housing



Dimensions [mm]														
Pump type	A	BA	C	CA	CB	G	H	HB	HC	K	N	P	S	Weight [kg]
ME65	472	368	140	143	66	180	100	270	77	160	½" BSP	1 ½" BSP	326	59
ME160	543	391	140	160	73	180	112	282	65	190	½" BSP	1 ½" BSP	326	71

2.2 Dimensions - Cast iron pump housing



Dimensions [mm]														
Pump type	A	BA	C	CA	CB	G	H	HB	HC	K	N	P	S	Weight [kg]
ME65	472	368	140	143	66	180	100	286	77	160	½" BSP	DN40	325	62
ME160	543	392	140	160	73	180	112	300	65	190	½" BSP	DN40	331	74

2.3 Specifications

A failure to meet these specifications may result in damage to the pump!

Description	Minimum	Maximum
Ambient temperature, operation	-20°C	55°C
Ambient temperature, storage	-20°C	55°C
Humidity	-	80%
Intake temperature, suction side	-	80°C
Intake temperature, service liquid	-	50°C
Service liquid pipe connection, dimension	1/2”	-
Service liquid pipe connection, length	-	6 m
Noise level	-	70 dB
Revolutions	1420 rpm	1700 rpm
Pressure	33 mbara	1013 mbara
Service liquid flow	3 litres/minute, self-regulating*	-

* -It is recommended to install service liquid system that is self-regulating to ensure the pump is supplied with as much water as needed.

2.4 Power consumption and output

ME65

	Pressure	[mbara]	33	100	200	300	400	500	600	700	800
1420 [rpm]	Flow	[m³/h]	7	46	57	60	63	64	65	64	63
	Consumption	[kW]	1.9	2.1	2.2	2.3	2.3	2.3	2.2	2.1	1.9
1700 [rpm]	Flow	[m³/h]	22	61	72	76	78	80	80	79	79
	Consumption	[kW]	2.7	2.8	2.9	3	3	3	2.9	2.8	2.6

ME160

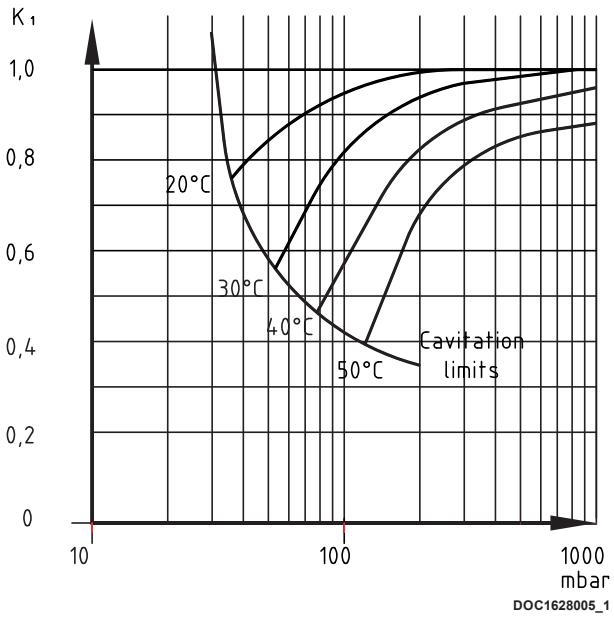
1420 [rpm]	Flow	[m³/h]	60	145	150	151	153	153	153	153	152
	Consumption	[kW]	3.7	3.8	3.9	4	4	4	3.9	3.8	3.6
1700 [rpm]	Flow	[m³/h]	79	159	165	167	168	169	170	170	168
	Consumption	[kW]	5.2	5.4	5.5	5.5	5.6	5.5	5.5	5.4	5.2

The data is based on the following parameters:
- Air temperature 20°C
- Service liquid temperature 15°C
- Test performed with dry air and 1,013 mbar absolute.
- Tolerance ±10%

2.5 Correction factor

When the temperature of the service liquid exceeds 15°C, the pump's capacity will be affected with respect to the specified values.

To determine the output at a higher temperature, the correction factor can be used.



Capacity at service liquid temperature higher than 15°C :

$Q_{t>15} = Q_{15} \times K_1$

2.6 Operating the pump

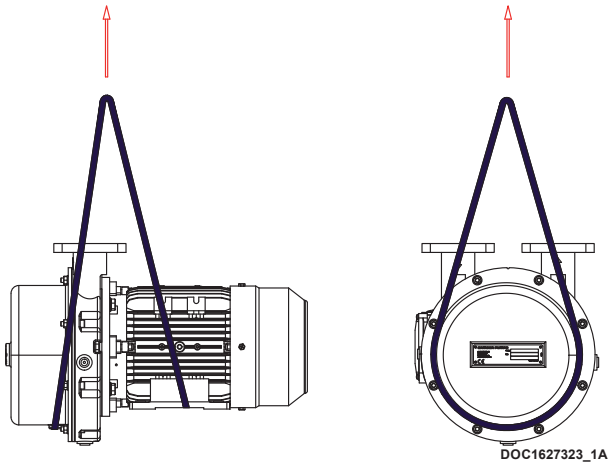
The pump may not be used if it is damaged or the identification plate is missing!

The pump must be transported in such way that is not exposed to vibrations and impacts that can overload the bearings.

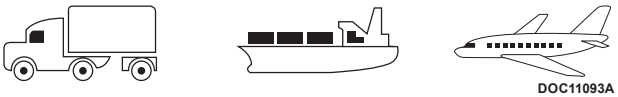
The pump must be inspected for damages upon delivery. If the pump is damaged, it may not be used and the damage must be reported to the dealer.

Ensure that the pump's identification plate is intact and that the marking of the pump corresponds to its use.

The pump may only be handled using approved lifting eyes, in accordance with nationally applicable regulations and only in a vertical motion.



The pump can be transported in the following ways:



2.7 Pump storage

A failure to comply with the requirements for storing the pump may result in internal damage to the device.

If the temperature is below freezing point of the service liquid it may damage the pump. Under these conditions the pump must be drained completely.

All plugs and protective covers must be fitted during storage.

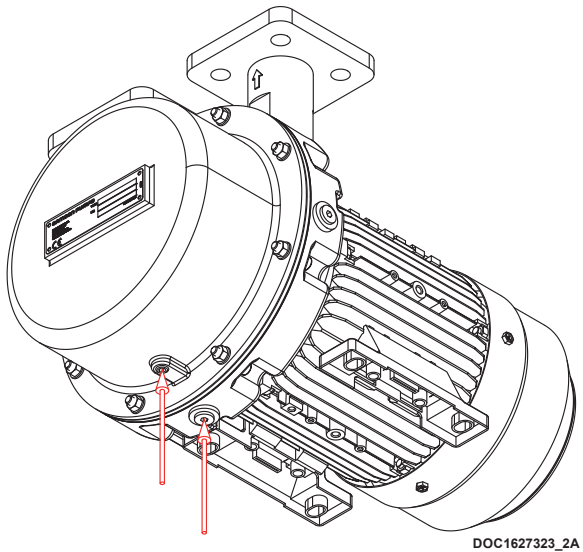
The pump's service liquid is drained on delivery, and the pump can be immediately stored in accordance with the technical specifications.

After operation, the pump can be stored for 30 days without further action.

If the pump remains out of operation for a longer period of time after use, its service liquid must be drained, and the liquid supply to the pump must be shut off.

When emptying the pump, it is important that all compartments inside the pump are emptied.

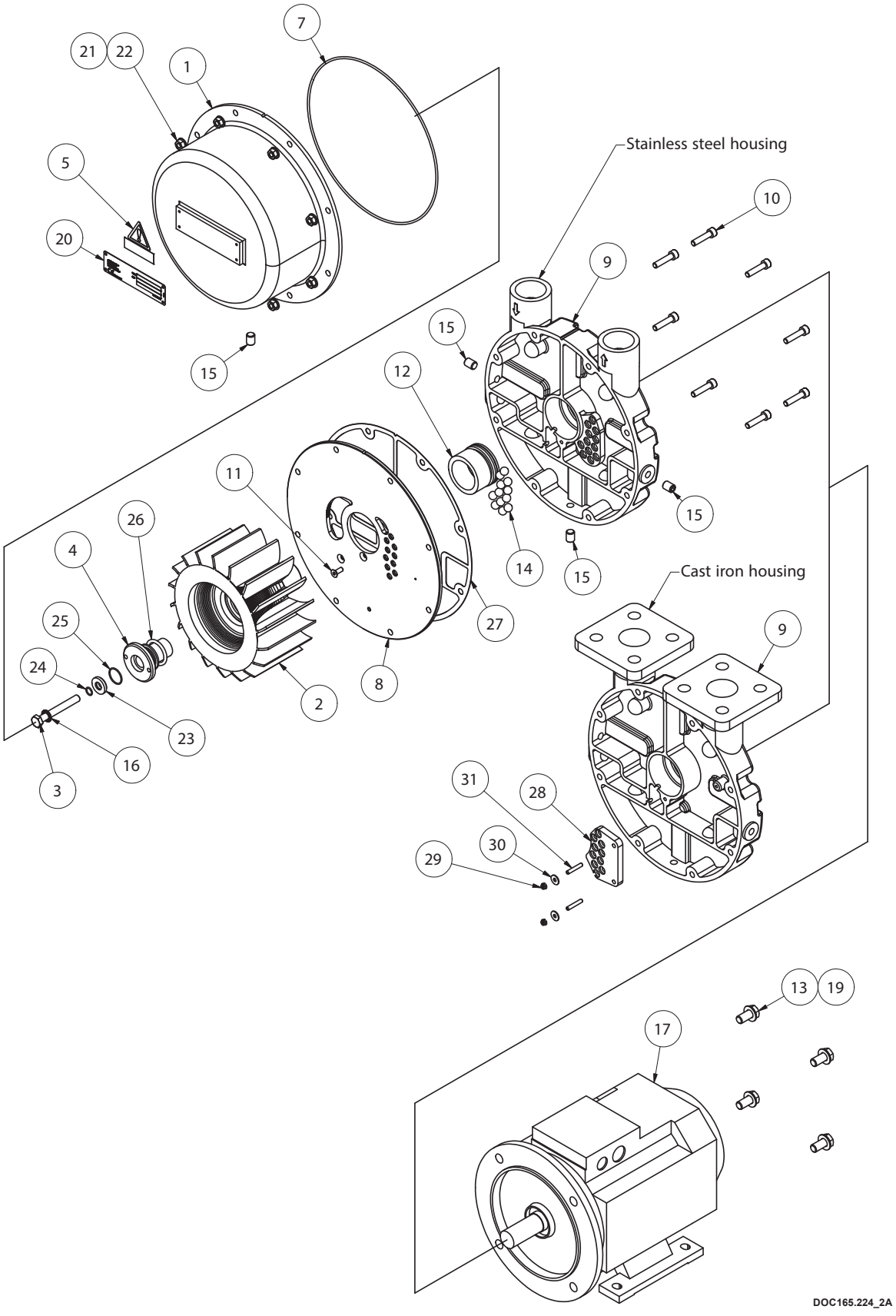
The pump can be fitted with valves in the draining connections. See below.



2.8 Materials

Term	Pos.	Material	Description
Pump cover	1	Stainless steel	W.Nr.1.4408
Rotor	2	Stainless steel	W.Nr.1.4404
Bolt	3	Stainless steel	A4
Adjusting disc	4	Steel	W.Nr.1.4436 / 1.4401
Sticker, Warning	5	Foil	Fascal 400
O-ring*	7	NBR / EPDM / Viton	-
Flow plate	8	Stainless steel	W.Nr.1.4401
Pump housing	9	Cast iron	EN-GJL-250; EN1561
		Stainless steel	W.Nr.1.4401
Bolt	10	Stainless steel	A4
Screw	11	Stainless steel	A4
Mechanical shaft seal	12	NBR / AISI / Carbon	-
Bolt	13	Stainless steel	A4
Valve balls	14	Polypropylene	PPH100NA-20M Anti-static
Plug ¼"*	15	Steel	1.067; DIN 906
		Stainless steel	A4
Washer	16	Stainless steel	A4
Motor	17	Aluminium	-
O-ring*	18	NBR / EPDM / Viton	-
Washer	19	Stainless steel	A4
Identification plate	20	Stainless steel	AISI 316
Washer	21	Stainless steel	A4
Nut	22	Stainless steel	A4
Reduction ring	23	Stainless steel	EN 1.4401
O-ring*	24	NBR / EPDM / Viton	-
O-ring*	25	NBR / EPDM / Viton	-
O-ring*	26	NBR / EPDM / Viton	-
Gasket	27	Teflon	Top-Chem2003
Ball guide	28	Polyethylene	PEHD 1000
Nut	29	Stainless steel	A4
Washer	30	Stainless steel	A4
Screw	31	Stainless steel	A4

* -See section 1.3 for configuration of pump.


7
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Stainless steel housing
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Cast iron housing
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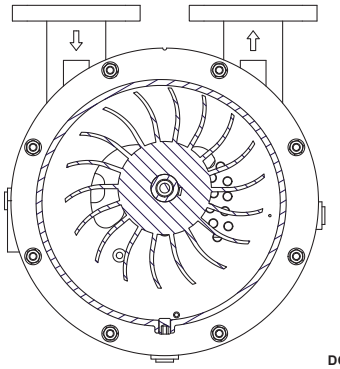
3 DESIGN OF THE SYSTEMS

3.1 The pump's function

As the name suggests, the pump works with a liquid ring. There is no mechanical contact between the moving parts, and the liquid works like small pistons that, in principle, function as a traditional piston pump.



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When the pump is started, the liquid ring will rotate at the same speed as the rotor. The rotor is positioned slightly higher than the centre point and divides the liquid ring up into cells. If one were to see the cell in the top position, it would be completely filled with liquid.

As the cell rotates, an air space is created against the hub of the rotor. The liquid moves like a piston away from the hub of the rotor and thereby creates a suction effect. As the cell reaches the bottom, the movement changes direction and causes the service liquid to be pushed in towards the hub of the rotor. The air is thus pushed out of the cell, which becomes completely filled with liquid and ready for a new suction cycle. In order to separate the suction and pressure sides of the pump, the ends of the shell are fitted with a flow plate and pump housing. Some pump types have connections at both ends, while others – known as monoblock pumps – only have a connection on one end of the liquid ring.

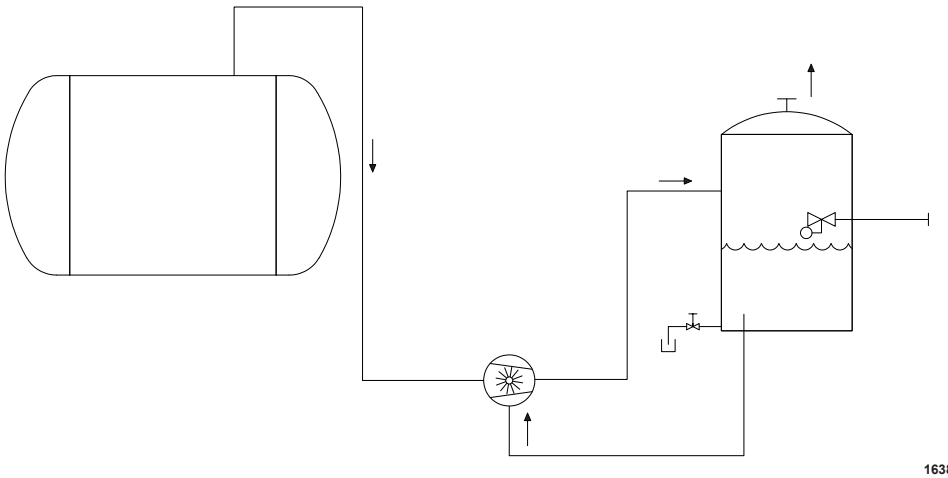
A certain volume of the service liquid and gas will flow out of the pump. The pump must therefore be constantly supplied with new service liquid.

In addition to replacing any lost liquid, the new liquid supply will cool the compressor gas in the pump and lubricate the mechanical shaft seals.

The composition and correct addition of service liquid are essential to the functioning of the pump.

3.2 System layout example

The liquid ring pump can be integrated in a system which is shown on illustration below.The example illustrates the pump installed with a liquid separator, air cooler and product tank.



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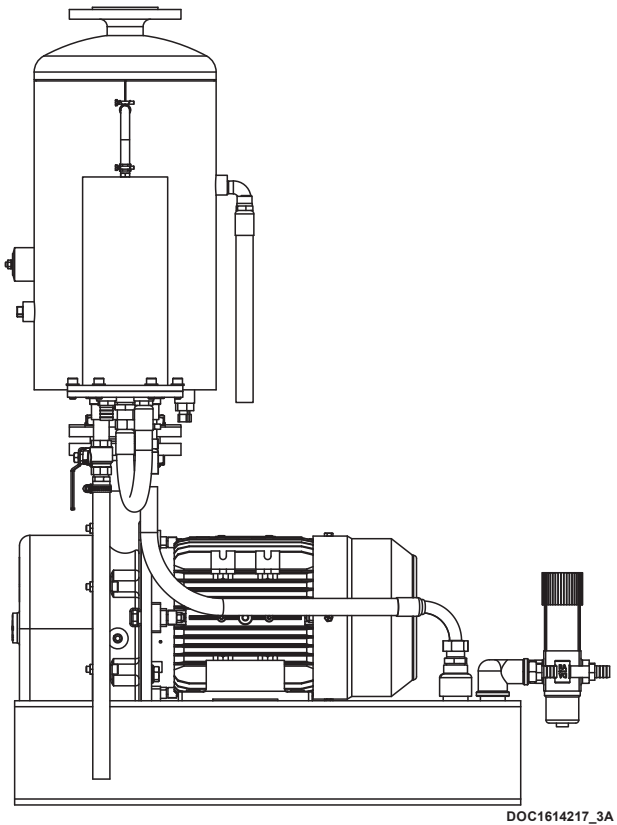
3.3 Liquid separator

Liquid separator is mounted in such way that the minimum level of service liquid is 0,5 m above the pump´s shaft.



To prevent calcium deposits, use a liquid separator or take necessary measures to prevent calcium in the service liquid.

The liquid separator is located in immediate proximity to the pump, so that the length of the outlet pipe from the pump is minimised.

Due to potential pressure loss, the length may not exceed 6 metres. The level of liquid in the liquid separator is recommended to be kept at 1-1.5 metres above the pump's shaft. This ensures the correct influx pressure and the correct flow of service liquid.

The liquid supply between the liquid separator and pump must be implemented with a permanent pipe connection with a dimension and length specified in specitications .

It may be advantageous to fit the liquid separator with a float valve which automatically supplies liquid and maintains a constant level.

The liquid separator can be fitted with a drain valve the lowest place in the tank. The valve can be operated when the separator needs to be drained to remove contaminants.

3.4 Cooling system

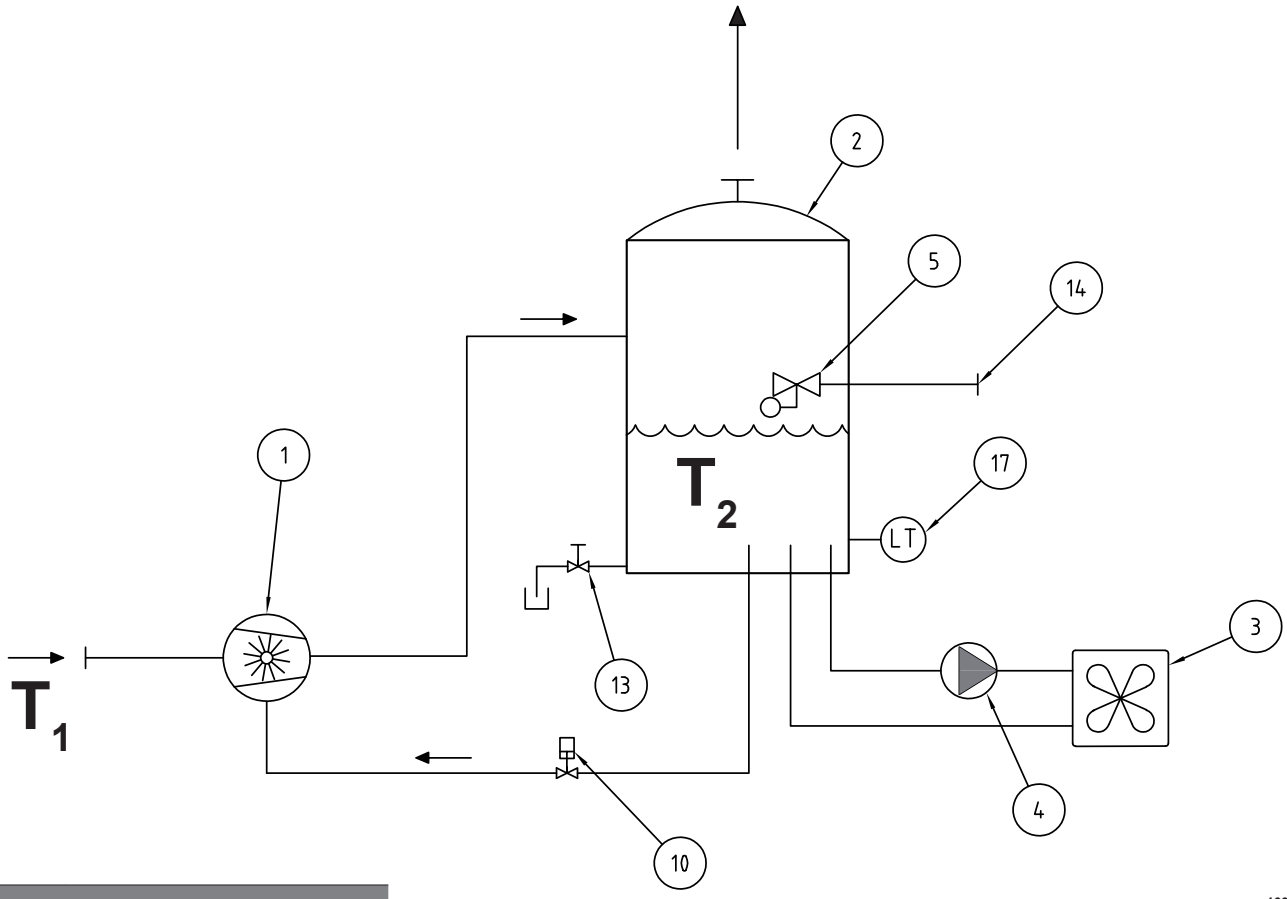
The compression in the pump generates heat, which will cause the temperature of the service liquid to rise. This means that it will often be necessary to cool the liquid. This can be done using an air cooler, heat exchanger or by using a temperature control valve, that will open and fill cold water into the liquid separator.

For short-term operation with intermittent breaks, natural cooling may be sufficient.

Depending on the temperature, the suctioned gas may be sufficient for cooling purposes, though it may also lead to an increased need for cooling.

The necessary cooling requirement can be found on page 17 for ME65 and on page 18 for ME160.

Delta T (▲t) is the temperature difference between the suctioned gas (T_1) and the maximum acceptable service liquid temperature (T_2). See below.



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Pos.	Description
1	Vacuum pump
2	Liquid separator
3	Cooler
4	Circulation pump
5	Float valve
10	Stop valve
13	Drain valve
14	Service liquid connection
17	Level transmitter

***Example 1**: The intake temperature is 5°C, and the desired maximum service liquid temperature is 45°C.*

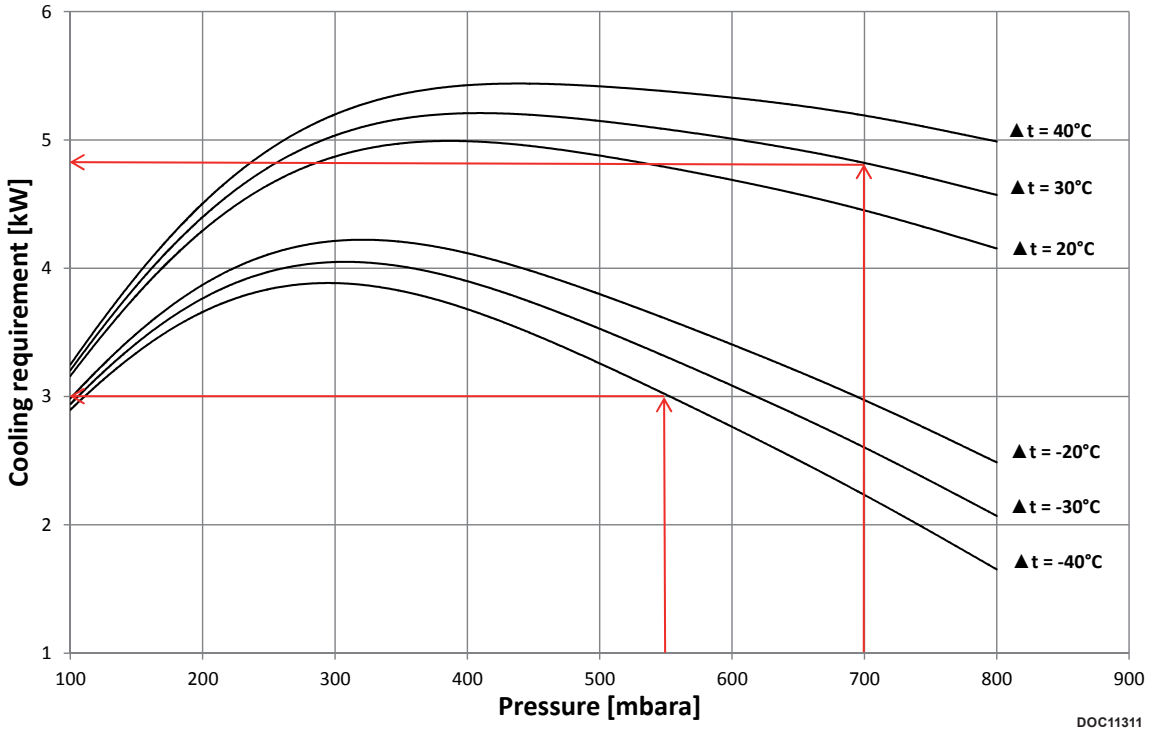
▲t = 5-45 = - 40°C.

The cooling requirement at a pressure of 550 mbara will be 3 kW. See below.

***Example 2**: The intake temperature is 60°C, and the desired maximum service liquid temperature is 30°C.*

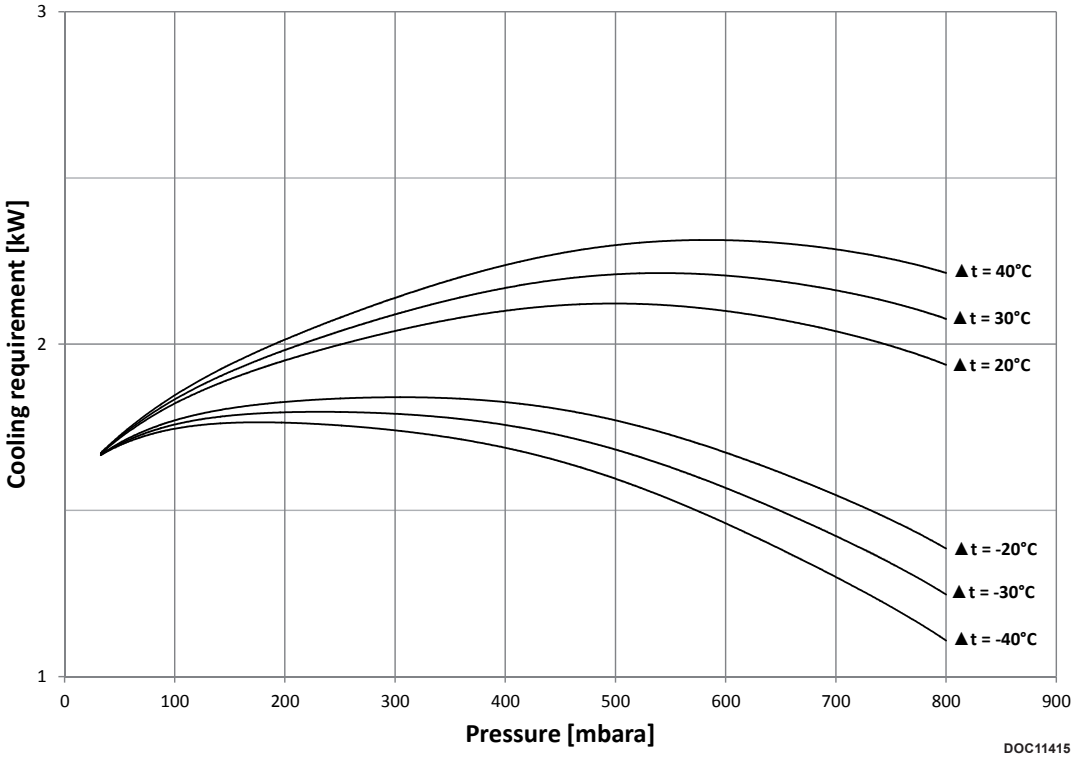
▲t = 60-30 = 30°C.

The cooling requirement at a pressure of 700 mbara will be 4.8 kW. See below.

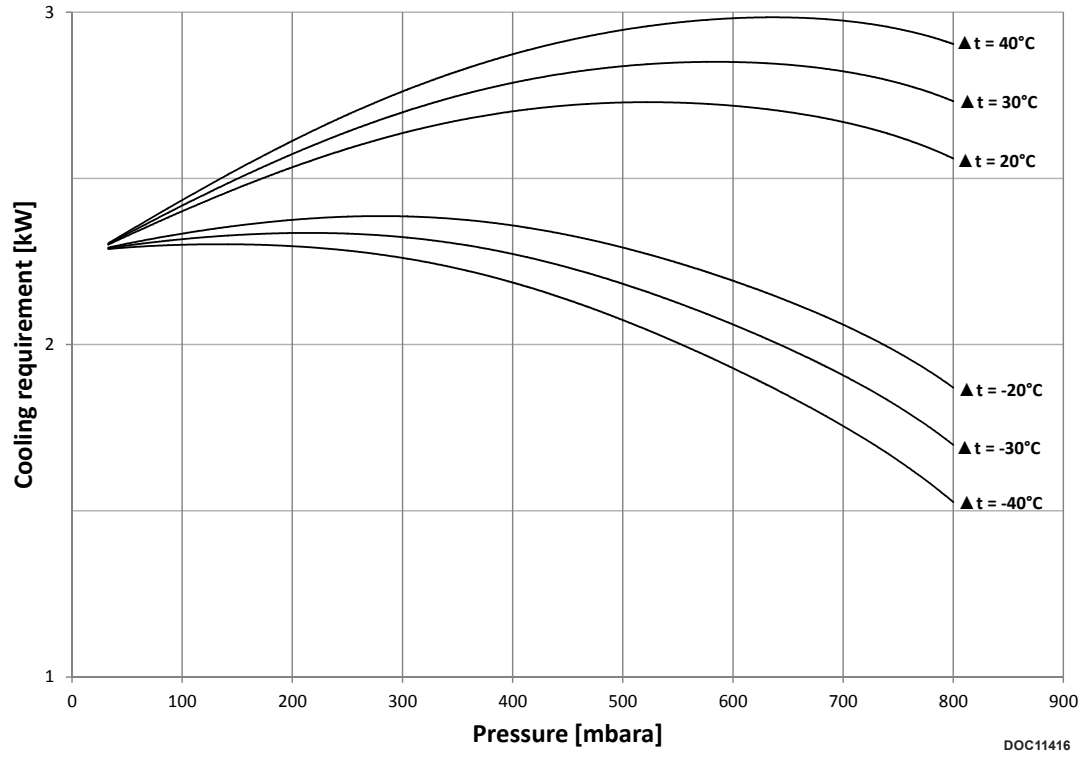


3.4.1 ME65 - Vacuum

ME65 - 1420 rpm - Vacuum

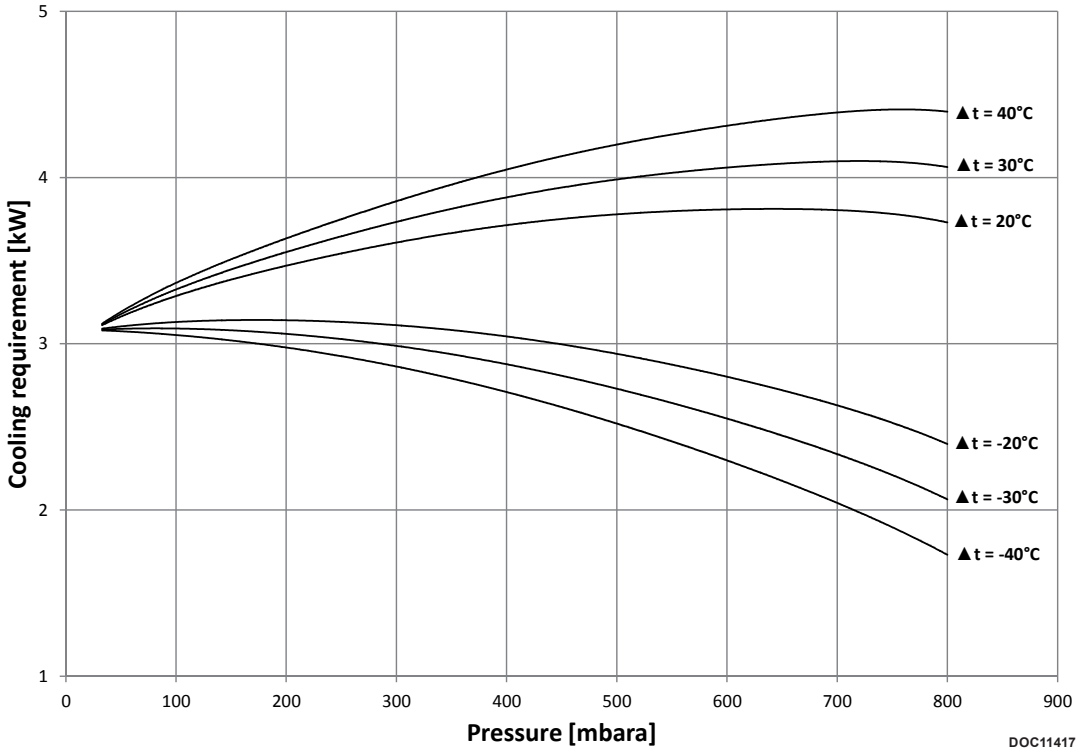


ME65 - 1700 rpm - Vacuum

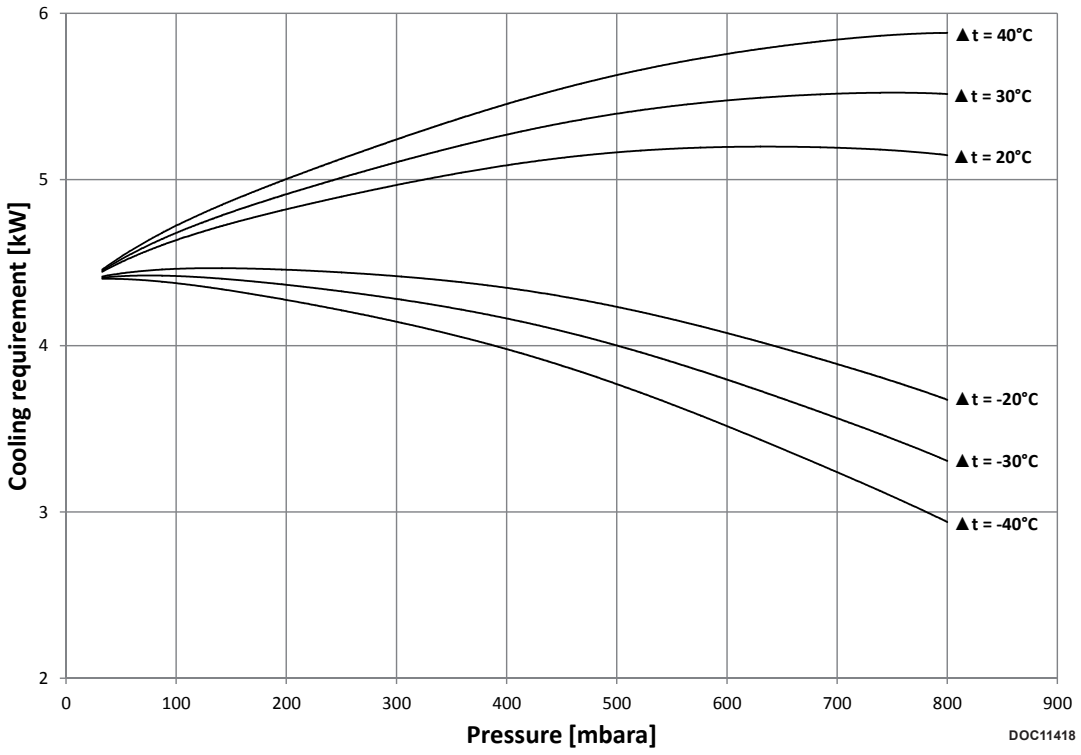


3.4.2 ME160 - Vacuum

ME160 - 1420 rpm - Vacuum



ME160 - 1700 rpm - Vacuum



3.5 Pipe system

The pipes that are connected to the pump's suction and outlet sides must be at least the same dimension as the pump. The length of the pipe system affects the pump's capacity and should be calculated to account for pressure drop in longer pipe installations.

Depending on the operating pressure, longer pipe lengths may affect the pump's output. For pipe lengths greater than 10 metres, a pressure drop calculation should be made, and the pipe dimensions should be increased so that the pressure loss is held to an acceptable level.

The pipe system should be mounted so that the horizontal pipes have a min. of 1% decline back towards the liquid separator.

Table below can be used for reference values.

Connection	Length < 10 metres	Length 10-50 metres	Length 50-100 metres
Suction side	Min. DN 40	Min. DN 50	Min. DN 65
Outlet side	Min. DN 40	Min. DN 50	Min. DN 65

The outlet from the liquid separator should be led outside of the building, because the outlet air is warm and humid.

With respect to the exhaust, measures must be put in place to account for damp air that may form ice in cold surroundings.

3.6 Service liquid requirements

Only water-based liquid may be used as service liquid.
For operating conditions where there is a risk of ice formation in the service liquid system, a suitable anti-freeze must be used.

4 INSTALLATION AND START-UP

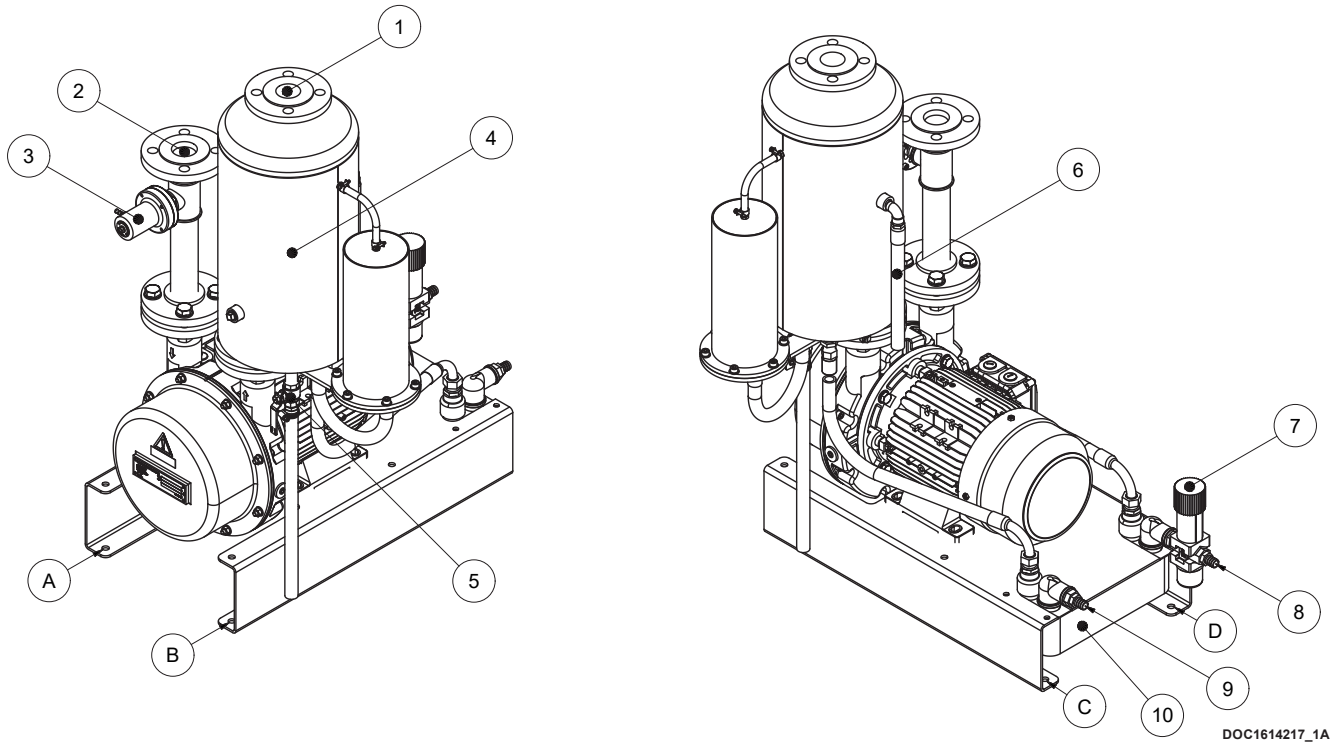
4.1 Securing the pump

If the tolerance for securing the pump is not observed, there is a risk of damage.

The pump must be installed on a stable foundation, which must be level and stable, so that the pump is not twisted or exposed to profile distortion.

The pump must be anchored with M12 foundation bolts on all four holes (A-D), which must be tightened to 60 Nm.

The illustration below shows a complete unit that can be supplied from Samson Pumps.
For further information visit www.samson-pumps.com



Pos.	Description	Pos.	Description
1	Outlet	6	Overflow liquid separator
2	Inlet	7	Thermostatic valve (AVTA)
3	Vacuum limiter	8	Inlet - cooling water
4	Liquid separator	9	Outlet - cooling water
5	Drain valve liquid separator	10	Plate heat exchanger

4.2 Connections to the pump

- Check for foreign objects in the pump and physical damage on pump.
- Gaskets to be handeled with highest degree of caution.
- Gasket and sealing surfaces must be cleaned before assembly.

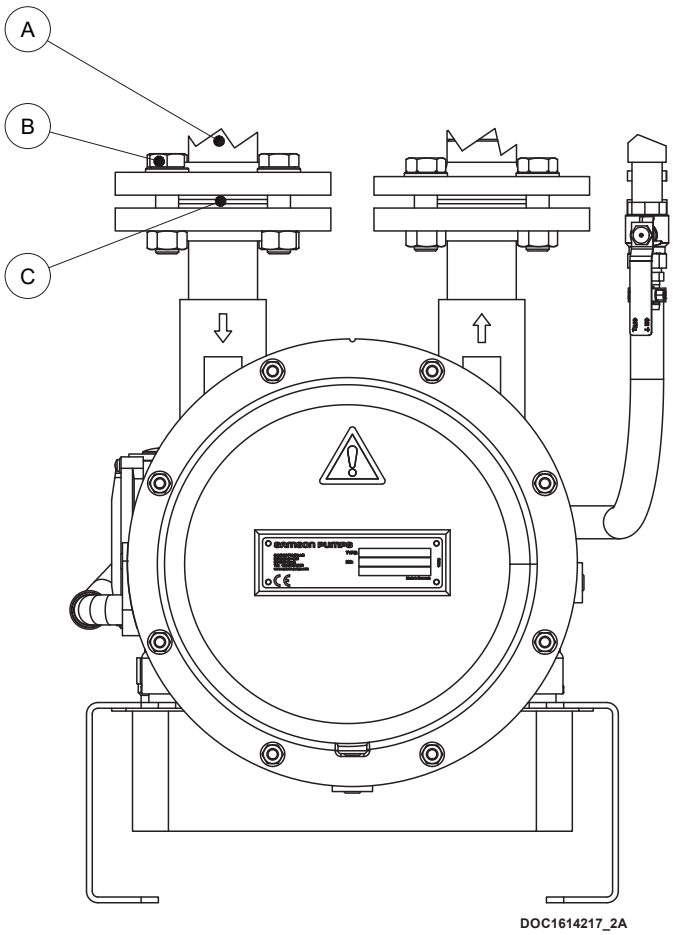
Immediate before connecting the pipes, remove protective covers. Connection of the pump's suction and pressure pipe connections must be made with a gasket in between. (C)

The M12 bolts must be tightened to 60 Nm. (B)

In order to prevent tensions in the pump, the pipe connections (A) must be tensionless while tightening the bolts.

Suction- and pressure branches are supposed to be vertical with a limit of ± 5°.

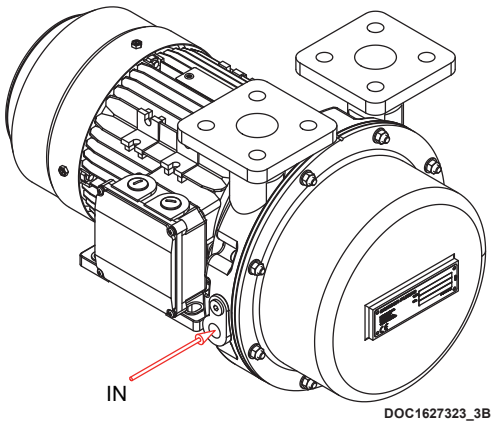
The connections to the pump's suction- and pressure branches should be kept as short as possible. The pipe diameters should be the same size as those on the pump. However, where longer connections are unavoidable, larger diameter pipe-work should be employed. Please contact Samson Pumps.



4.3 Connecting the service liquid

The service liquid connection must be established as showed below, to ensure optimal working conditions for the pump, and so that the mechanical shaft seal is lubricated by the service liquid.

It is recommended to mount a valve on the connection, which can open and close the service liquid supply independently of the pump.



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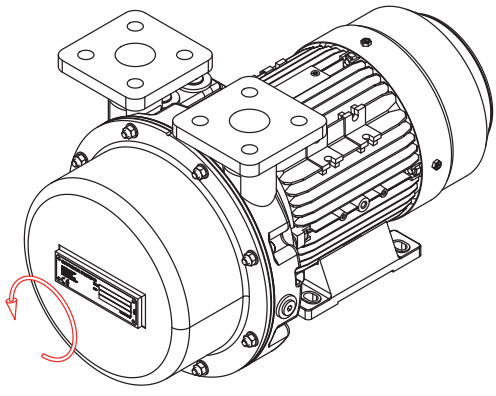
4.4 Prior to start-up

- Do not start the pump without service liquid, as this will damage the mechanical shaft seals.
- Do not start the pump if it is completely filled with service liquid.
- Stop the pump immediately if the rotational direction does not correspond to the directional arrow.
- A failure to follow the above guidelines may result in damage to the pump.

4.5 Direction of rotation

Check the direction of rotation by briefly starting the pump.

The direction of rotation of the rotor must correspond to the direction arrow!



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5 RECOMMENDED SERVICE, MAINTENANCE AND INSPECTION INTERVALS

A failure to observe the inspection intervals described in table below may result in damage to the pump.

Section	Operation	Interval
5.1	Drain liquid separator to remove contaminants	Weekly or as needed
5.2	Inspection and cleaning (if necessary) of service liquid's supply pipe	Monthly

5.1 Draining the liquid separator

While the pump is stopped, the liquid separator must be drained to remove contaminants.

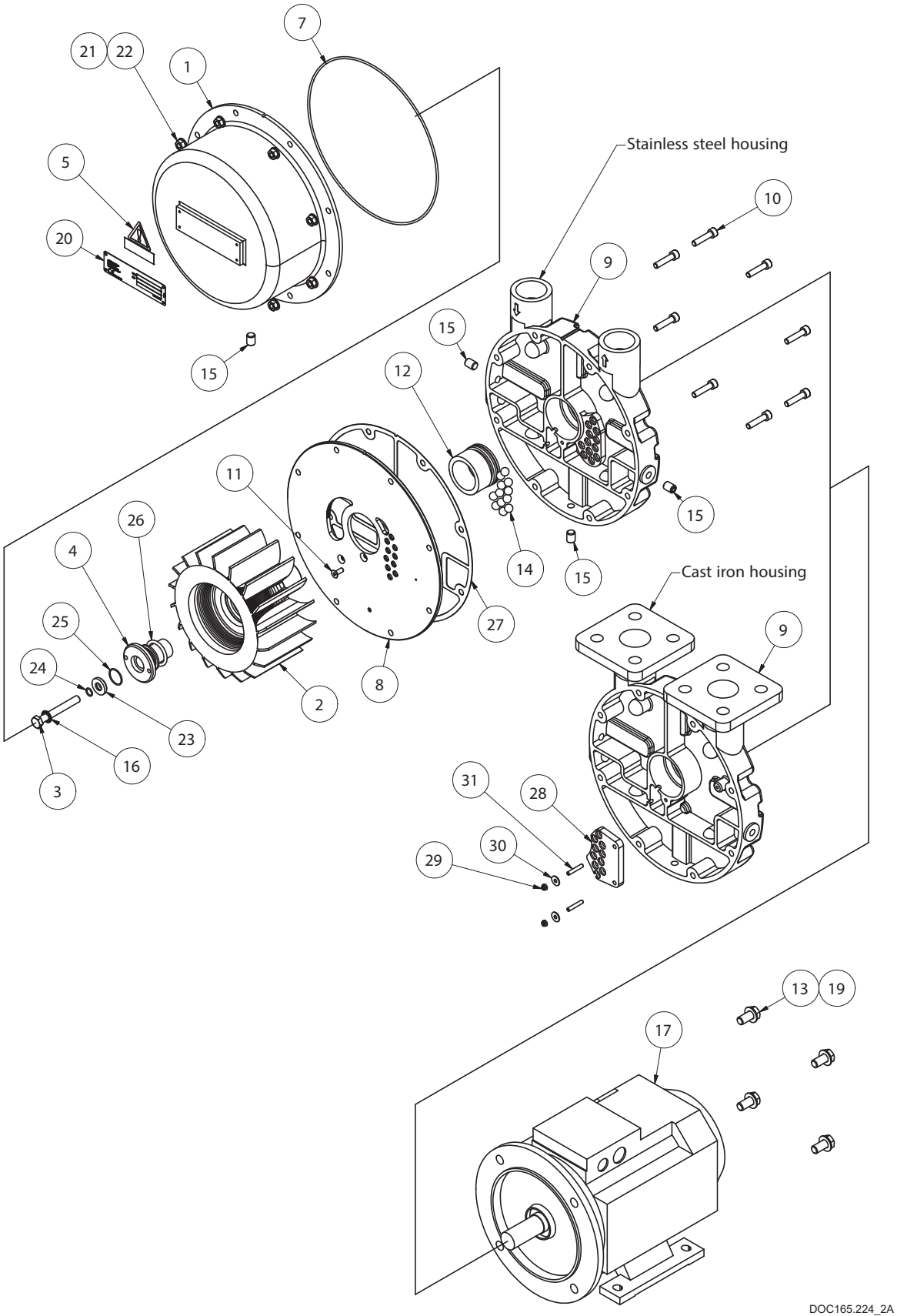
5.2 Inspection and cleaning of service liquid's supply pipe

The pipe connection between the liquid separator and pump must be inspected at least once a month, and any contaminants must be removed.

6 TROUBLESHOOTING

Problem	Cause	Effect	Corrective measure
The pump is unable to create a vacuum	• The pump is not receiving enough service liquid • The temperature of the service liquid is too high	• Reduced output • The pump can become damaged during cavitation	• Check the liquid supply • Stop the pump and wait until the temperature has dropped to a sufficient level, or lower the temperature of the service liquid inlet.
Power consumption too high during operation	• The pump is receiving too much service liquid	• The pump can become worn	• Check the liquid supply
The start-up power is too high	• Too much service liquid in the pump prior to start-up	• Noise at start-up and possible overload of the power supply	• Check the stop valves in the liquid supply for leakage
Noise during operation	• Cavitation	• Severe damage to the pump and potential risk of breakdown	• Increase the suction pressure or lower the temperature of the service liquid
Leakage from the bearing housing's drain holes	• Damaged shaft seal	• Bearings may become damaged • Potential risk of explosive gas leak	• Stop the pump and contact the manufacturer

7 SPARE PARTS



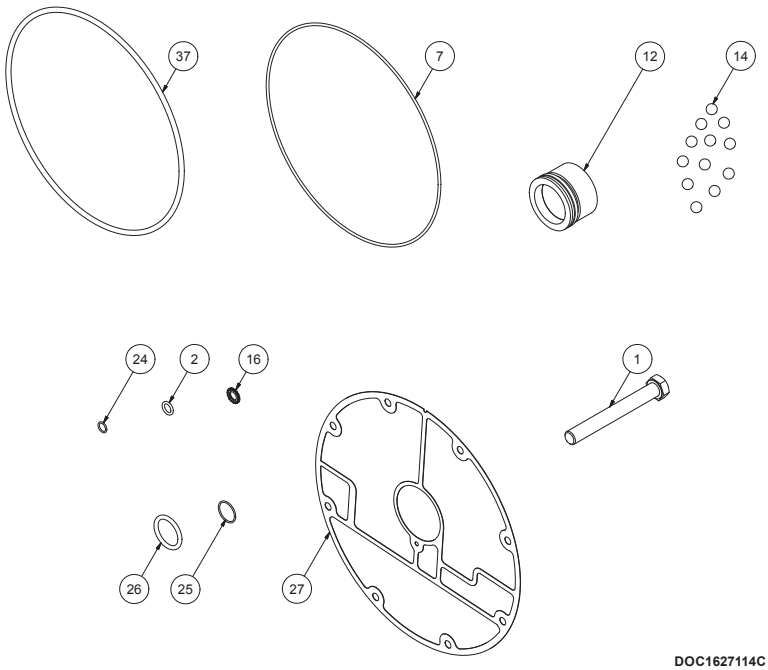
7.1 Spare parts list

Pos.	Description	Qty	Material	SS cover	Cast iron housing	SS housing
1	Pump cover	1	AISI 316L	•	•	•
2	Rotor	1	EN 1.4404	•	•	•
3	Bolt	1	A4	•	•	•
4	Adjusting disc (Model A)	1	EN 1.4436	•	•	•
	Adjusting disc (Model B+C)		EN 1.4436	•	•	•
5	Sticker, Warning	1	Fascal 400	•	•	•
7	O-ring Ø259.3x5.7	1	NBR Shore 70	-	•	•
	O-ring Ø260x3		NBR Shore 70	•	•	•
	O-ring Ø260x3		EPDM Shore 70	•	•	•
	O-ring Ø260x3		VITON Shore 70	•	•	•
8	Flow plate	1	EN1.4401	•	•	•
9	Pump housing	1	EN-GJL-250; EN 1561	•	•	-
	Pump housing		EN1.4401	•	-	•
10	Allen screw M8x30	8	A4	•	•	•
	Allen screw M8x35		A4	•	•	•
11	Allen screw M6x16	1	A4	•	•	•
12	Mechanical shaft seal Ø45	1	AISI 316	•	•	•
	Mechanical shaft seal Ø45		Stainless steel / Teflon	•	•	•
13	Bolt M12x25	4	A4	•	•	•
14	Valve ball Ø12	12	PEHD 1000 White, Anti static	•	•	•
15	Plug 1/4” tapered Original Allen	4	A4	•	•	•
	Plug 1/4” tapered Original Allen		Steel	•	•	•
16	Lock washer	1	A4	•	•	•
17	Motor	1	Aluminium	•	•	•
19	M12 Washer	4	A4	•	•	•

	Description	Qty	Material	SS cover	Cast iron housing	SS housing
20	Name plate, CE	1	AISI 316	•	•	•
21	M8 Washer	8	A4	•	-	•
22	M8 Lock nut	8	A4	•	-	•
23	Reduction ring (Model C)	1	EN 1.4401	•	•	•
	O-ring Ø10x1.5 (Model C)		NBR Shore 70	•	•	•
24	O-ring Ø10x1.5 (Model C)	1	EPDM Shore 70	•	•	•
	O-ring Ø10x1.5 (Model C)		VITON Shore 70	•	•	•
	O-ring Ø23x1.5 (Model C)		NBR Shore 70	•	•	•
25	O-ring Ø23x1.5 (Model C)	1	EPDM Shore 70	•	•	•
	O-ring Ø23x1.5 (Model C)		VITON Shore 70	•	•	•
	O-ring Ø32x4.5		NBR Shore 70	•	•	•
26	O-ring Ø32x4.5	1	EPDM Shore 70	•	•	•
	O-ring Ø32x4.5		VITON Shore 70	•	•	•
27	Gasket for pump housing, Teflon	1	Teflon, PTFE	•	•	•
28	Ball guide	1	PEHD 1000	•	•	-
29	M5 Lock nut DIN 985	2	A4	•	•	-
30	M5 washer A4	2	A4	•	•	-
31	M5x30 DIN 916 A4	2	A4	•	•	-

7.2 Gasket set - overview

P/N: 1606033 - NBR version
P/N: 1606047 - EPDM version
P/N: 1606049 - EPDM/PTFE version



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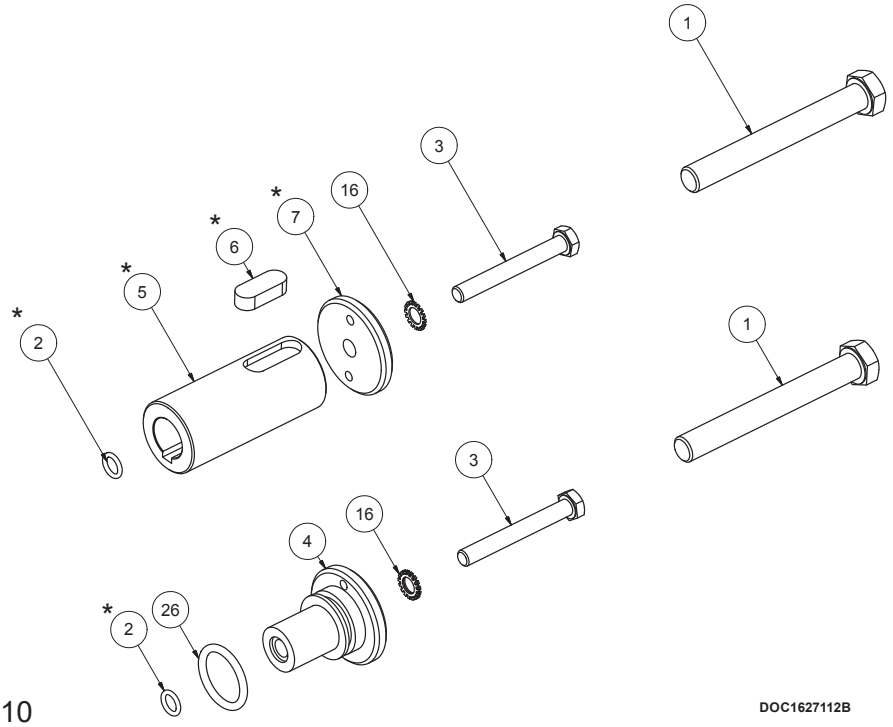
Pos.	Description	Qty	Material
1	Puller, M16x130 bolt (Model C - service tool)	1	Steel FZB 8.8
2	O-ring Ø10.78x2.62 (Model A+B)	1	NBR Shore 70
	O-ring Ø10.78x2.62 (Model A+B)		EPDM Shore 70
	O-ring Ø10.78x2.62 (Model A+B)		VITON Shore 70
7	O-ring Ø260x3	1	NBR Shore 70
	O-ring Ø260x3		EPDM Shore 70
	O-ring Ø260x3		VITON Shore 70
12	Mechanical shaft seal Ø45	1	AISI 316
	Mechanical shaft seal Ø45		Stainless steel / Teflon
14	Valve ball Ø12	12	PEHD 1000 White, Anti static
16	Lock washer	1	A4
24	O-ring Ø10x1.5 (Model C)	1	NBR Shore 70
	O-ring Ø10x1.5 (Model C)		EPDM Shore 70
	O-ring Ø10x1.5 (Model C)		VITON Shore 70
25	O-ring Ø23x1.5 (Model C)	1	NBR Shore 70
	O-ring Ø23x1.5 (Model C)		EPDM Shore 70
	O-ring Ø23x1.5 (Model C)		VITON Shore 70
26	O-ring Ø32x4.5	1	NBR Shore 70
	O-ring Ø32x4.5		EPDM Shore 70
	O-ring Ø32x4.5		VITON Shore 70
27	Gasket for pump housing, Teflon	1	Teflon, PTFE
37**	O-ring Ø259.3x5.7	1	NBR Shore 70

** - Out of production. Contact Samson Pumps to check the stock left*
*** - Only for use with composite cover*

7.3 Previous models of spare part kit for rotor replacement

Model A
Applied before Dec. 2005

Model B
Applied from Jan. 2006 to Nov. 2010



NOTE: For identification of manufacturing year, see page 6.

Pos.	Description	Qty	Material
1	Puller, M16x130 bolt (Model C - service tool)	1	Steel FZB 8.8
2	O-ring Ø10.78x2.62 (Model A+B) O-ring Ø10.78x2.62 (Model A+B) O-ring Ø10.78x2.62 (Model A+B)	1	NBR Shore 70 EPDM Shore 70 VITON Shore 70
3	Bolt M10	1	A4
4	Adjusting disc (Model A) Adjusting disc (Model B+C)	1	EN 1.4436 EN 1.4436
5	Extention bush (Model A)	1	AISI 303
6	Parallel key 14x9x40	1	AISI 316
7	Adjusting disc (Model A)	1	EN 1.4436
16	Lock washer	1	A4
26	O-ring Ø32x4.5 O-ring Ø32x4.5 O-ring Ø32x4.5	1	NBR Shore 70 EPDM Shore 70 VITON Shore 70

* - Out of production.Contact Samson Pumps for a solution.

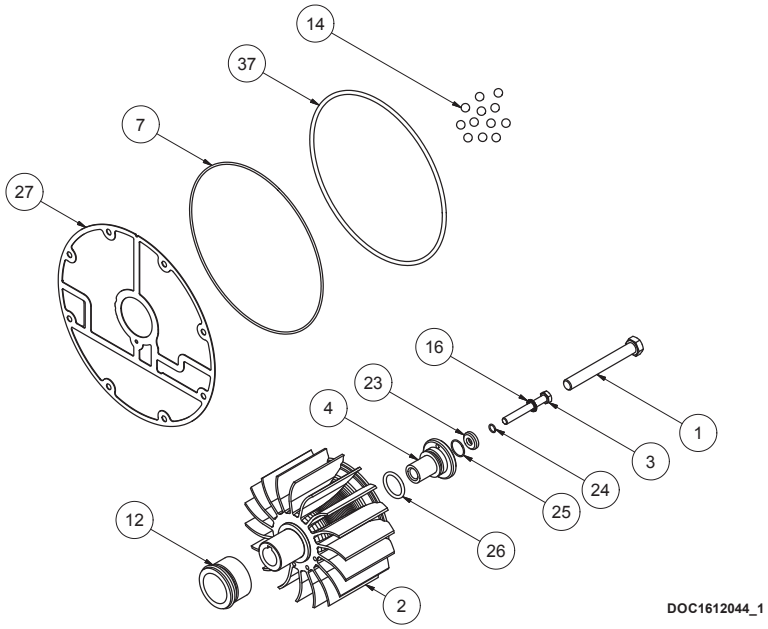
7.4 Current model of spare part kit for rotor replacement

Spare part kit for installation of a new rotor on a pump of previous modification

Model C

This spare kit is needed for installation of a new rotor on the pumps produced before Nov. 2010

P/N: 1612044 - NBR version
P/N: 1612045 - EPDM version
P/N: 1612046 - EPDM/PTFE version



Pos.	Description	Qty	Material
1	Puller, M16x130 bolt (service tool)	1	Steel FZB 8.8
2	Rotor	1	EN 1.4404
3	Bolt M10	1	A4
4	Adjusting disc	1	EN 1.4436
7	O-ring Ø260x3 O-ring Ø260x3 O-ring Ø260x3	1	NBR Shore 70 EPDM Shore 70 VITON Shore 70
12	Mechanical shaft seal Ø45 Mechanical shaft seal Ø45	1	AISI 316 Stainless steel / Teflon
14	Valve ball Ø12	12	PEHD 1000 White, Anti static
16	Lock washer	1	A4
23	Reduction ring	1	EN 1.4401
24	O-ring Ø10x1.5 O-ring Ø10x1.5 O-ring Ø10x1.5	1	NBR Shore 70 EPDM Shore 70 VITON Shore 70
25	O-ring Ø23x1.5 O-ring Ø23x1.5 O-ring Ø23x1.5	1	NBR Shore 70 EPDM Shore 70 VITON Shore 70
26	O-ring Ø32x4.5 O-ring Ø32x4.5 O-ring Ø32x4.5	1	NBR Shore 70 EPDM Shore 70 VITON Shore 70
27	Gasket for pump housing, Teflon	1	Teflon, PTFE
37*	O-ring Ø259.3x5.7	1	NBR Shore 70

** - Only for use with composite cover*

Notes:

SAMSON PUMPS

Samson Pumps is the only company in the world to specialise exclusively in liquid ring vacuum pumps. Samson pumps are made in Denmark and used around the globe. We offer worldwide delivery, and we export to more than 80 countries around the world.

For over 40 years, our name has been synonymous with the strongest pumps for vacuum trucks and tankers. We constantly adapt our products to meet the changing needs of our customers. Today, it is not enough to simply produce a pump. Products must be refined so the customer can concentrate on what they do best. We therefore offer a wide range of standardised components that allow our customers to build vacuum systems without the need for specialist in-house expertise.

Strength and durability are our hallmarks! We have often heard from customers that our pumps are working in many years, and in most cases without the need for maintenance or repair. This emboldens us to say that we have the strongest program of pumps on the market.

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