

**Directions for use of the
Samson liquid ring pumps
ME65 - ME160**



ME65 - ME160

- Before installing the pump, please read carefully the installation and operation manual.
- Installation of the pump and any ancillary equipment. should be carried out in accordance with the prevailing health and safety legislation.
- When building and operating the plant. Please follow the national legal safety regulations, instructions and specifications applying to the machine and plant type in question.
- The liquid ring pump is designed to operate in normal atmosphere as well as most gases.
- Before starting the pump it must be filled with liquid. It should not be run dry.



SAMSON PUMPS

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Spare parts overview

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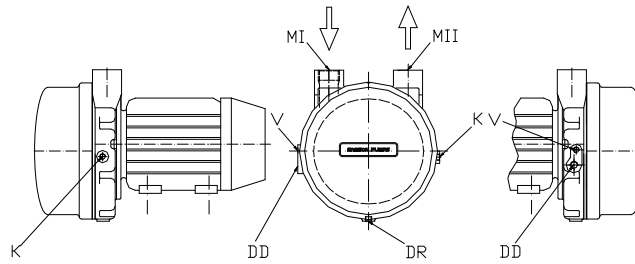
Storage, transportation and handling

Storage conditions of pump

Suction and pressure branch as well as the operation liquid supply are all closed when the pump is delivered. This is done to prevent extraneous matters from getting into the pump.

The protective plugs are not to be removed unless new pipes are joined.

The Samson liquid ring pump is shipped off without sealing liquid.

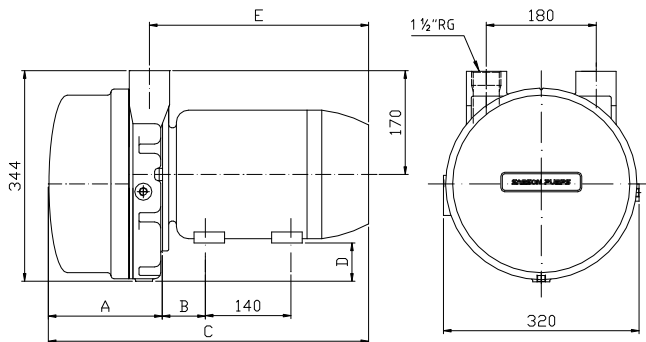


When emptying the pump make sure that all chambers in the pump are drained.

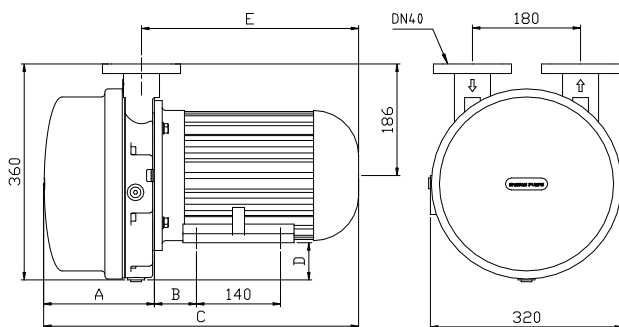
If the pump is stopped for a longer period the operation liquid needs to be drained off the pump and instead be filled with antifreeze. The antifreeze is to prevent the pump from corrosion and the impeller from seizing.

If the pump is to be drained completely the operation liquid supply (DD) and the protective plugs (DR) need to be removed.

Dimensions

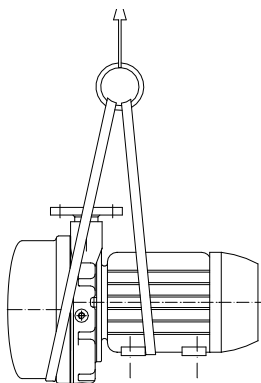


Without flanges	ME65	ME160
A (mm)	139	187
B (mm)	63	70
C (mm)	459	524
D (mm)	75	63
E (mm)	341	358



With flanges	ME65	ME160
A (mm)	139	185
B (mm)	63	70
C (mm)	464	525
D (mm)	75	63
E (mm)	347	358

Lift point



Technical data:

Characteristics	ME65	ME160
Suction capacity at 100 mbar abs: 1500 rpm – 50 HZ [m ³ /h]	30	90
Suction capacity at 500 mbar abs: 1500 rpm – 50 HZ [m ³ /h]	75	155
Vacuum / maximum decompression [mbar abs]	28	28
Energy consumption at 500 mbar vacuum and: 1500 rpm [kw]	2,1	3,8
Consumption of operation liquid at recirkulation. The consumption is depending on operating conditions [l/h]	600	1200
Consumption of operation liquid at normal operation, with recirculation [l/h]	0,3	0,5
Operation liquid temperature at above-mentioned output [C°]	15	15
Noise level at 1475 min ⁻¹ /33 mbar [dBA]	76	76
Weight [kg]	60	70
Casing Stainless steel WST	1.4401	1.4401
Guide disc	1.4401	1.4401
Cover Cast plastic	SGS	SGS
Impeller		
Bronze (red bronze)	Rg. 5444	Rg. 5444
Stainless steel	1.4404	1.4404
Valve balls	PTFE	PTFE
Shaft seal, mechanical carbon slide ring sealing	+	+

Installation of the pump

Siting the liquid ring pump

The liquid ring pump should be installed on a suitably rigid base and fixed in the four legs of the electric motor.

Mounting conditions

Suction- and pressure branches are supposed to be vertical with a limit of $\pm 5^\circ$. The indicator on the motor shows the rotation direction of the pump. This can also be determined by the impeller impellers moving downwards on a level with the supply (DD) of sealing water.

The connections to the pump's suction- and pressure branches as well as the operation liquid supply should be kept as short as possible. The pipe work 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 consult Samson.

If the pressure pipe that conducts both water and air (between the pump and the liquid separator) is situated in vertical position, it should not be more than 1,5 meters above the pump.

Connection/Installation of power supply

When the pump is filled with water, make sure to check up on the rotation direction by starting up the pump for a shorter period. At the same time, make sure that the voltage is correct.

Environmental operating matters

The pump is capable of operating in wet and dry environments. If dust is present then a suitable inlet filter should be installed.

Changing and removing the operation liquid

The operation liquid might, during operation, have been supplied with hazardous materials together with the sucked in air so when changing or removing it, make sure to take precautionary measures into consideration.

Information concerning the pump

Mode of operation/working principles

The Samson liquid ring pump operates as cellular wheel pump. The axle and the impeller are the only movable parts on the pump. They are not in contact with any of the stationary parts of the pump. The shaft seal is of the slide ring type.

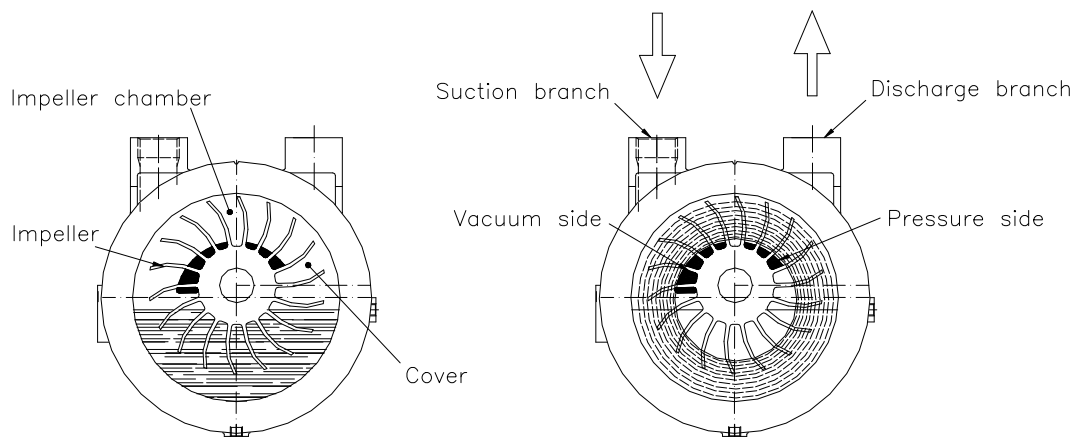
When the pump is turned on the operation liquid is thrown towards the impeller chamber, when this happens the operation liquid will automatically form in the shape of a ring and hereby follow the circulation of the impeller. When the rotation takes place a cushion of air will appear between the liquid ring and the impeller hub.

The impeller is situated eccentrically above the center of the pump, thus the cushion of air will only appear under- and next to the hub. Above the hub the operation liquid makes very close contact to the hub. (This of course requires a very precise level of liquid.)

The cushion of air will be divided by the impeller blades and thereby form into several small cushions of air. During this rotation the cushions of air will continuously be forced into different volume concentrations. Every single cushion of air will appear immediately after the blades of the impeller have passed the top point of the rotation and thereby be increased with every half rotation the impeller achieves. This causes a vacuum which results in air entering the impeller chamber from the suction branch.

The suction air is compressed when the impeller reaches yet another half round. Hereby a positive pressure arises and the air will be forced out through the impeller chamber to the discharge branch.

The purpose of the cover is to shut off the impeller chamber and lead the air in and out. The cover is provided with two air passages, one for suction of air and one for blow out steam.



When the pump is operating it must be supplied with operation liquid, which usually is water, in order to prevent an overload of heat which might arise with the rotation of the liquid ring and the air compression. While this takes place the amount of liquid which is present in the shape of drops due to evaporative loss.

Field of application/Operation range

The Samson liquid ring pump is able to handle gasses which do not react with H₂O or other operating liquids.

When operating with water at a temperature of 15°C and a pressure which consists of 1013 mbar on the pressure side it should theoretically be possible to achieve a suction pressure of at least 35 mbar.

The efficiency of the pump decreases if the temperature of the operation liquid rises, therefore a low working temperature is recommended.

If the temperature of the water is at 40°C the efficiency will decrease by 10%, at 50°C approximately 25%.

The absolute permissible temperature for suction air/gas is at 100°C and 80°C for the operation liquid.

Cavitation

Cavitation is a condition where the pressure in the system has fallen to under the steam pressure for the individual operation liquid. By this the liquid boils and steam bubbles arise in the operation liquid. A crackling sound is heard and the suction capacity is at the current temperature of the intake air and of the operation liquid exceeded. Continuous operation in this condition will cause great mechanical damage.

Noise level

The level of sound pressure at a distance of one meter from the pump and 1,6 m above ground level is set to 2006/42/EC.

The level of sound pressure is specified as a L_{eq}-value (meaning the average level of sound pressure on a working day of 8 hours - for further information look through the technical data.)

Operating the pump

Limitation in field of application

The liquid ring pump is exclusively constructed for operating in conditions of atmospheric air and most gases. The pump should not be used for suction of large amounts of liquid together with the air.

Starting the pump

When starting the pump make sure that liquid is supplied. It is important that the shaft seals do not operate in dry conditions.

When starting the pump the level of operation liquid is not supposed to exceed the operation liquid supply opening (DD).

This could be controlled with an installation of a tap which is fitted to the connection pipe.

If the pump is overfilled with operation liquid the surplus amount of liquid should be drained before starting the pump. This should be done in order to prevent overload of the impeller and the electric motor.

If the operation liquid does not meet the level that is required for operating it cannot make any pressure/vacuum as the liquid ring cannot be made. This also means that the pump itself cannot suck in operation liquid and therefore it needs to be compulsory filled.

Make sure that the rotation direction is correct.

When starting the pump pressure- and suction branches should not be blocked.

Adjustments

In order to have the pump operate at its maximum it is important that the operation liquid supply consists of a proper dimension.

Different installations require different adjustments. They are all interdependent of the pumps mounting and the way the operation liquid supply is adjusted. (For further information look up the chapter concerning "Examples of installation").

Stopping the pump

Before stopping the pump it should be brought into neutral position. Then the power for the electric motor can be shut off. If using a manual closing valve with the operation liquid supply it should also be shut off just before stopping the pump.

Maintaining the pump

Blocking/deposition of the pump's channels might occur as a result of lime or other materials in the operation liquid. The pump stands deliming with a normal deliming agent if the only the instruction for the product concerned is followed.

The pump should be washed down with water until the outlet of the pump is totally clean. The pipe from the operation liquid, the plugs and other accessories may be reinstalled so that the pump once again can be supplied with operation liquid to its required level.

Lubrication of the pump

The electric motor is equipped with lifetime lubricated bearings and therefore it needs no lubrication.

The shaft seals of the pump are constantly being lubricated by the operation liquid therefore they need no further maintenance. If operating without operation liquid the shaft seals will be damaged.

Operations of maintenance

The user is responsible for controlling:

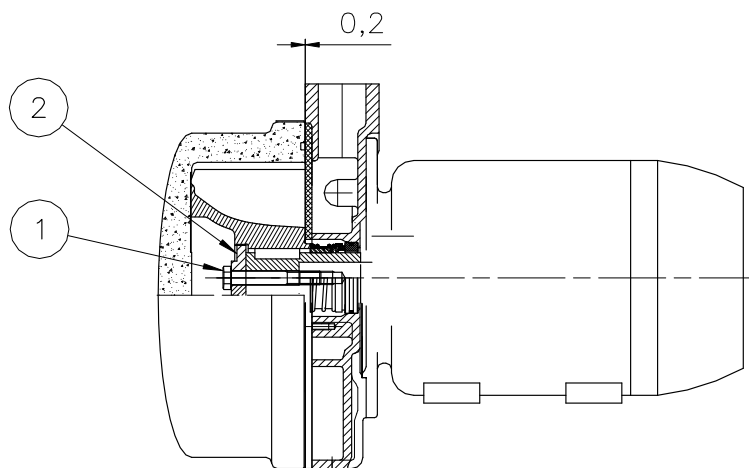
- that the pump has the correct level of liquid in the casing
- that the suction piping is correct
- that the supply of operation liquid can take place unimpeded
- that all bolts are secure.

Repairing the pump

If the pump needs to be repaired it should be done by a person that is highly qualified in such operations.

Adjustment of the impeller

The distance between the impeller and the flowplate is to be max. 0,2 mm. The distance is adjusted by loosening the screw (pos 1) and the distance can now be adjusted on the washer (pos. 2) When the required distance is obtained, the distance is locked by tightening the screw (pos 1).



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Warning!!

Incorrect changing of seals and bearings can result in severe damage to the pump.

Dismounting and removing the pump

The Samson liquid ring pump is produced so that the main part of the pump is recyclable. Therefore Samson offers the consumer the option of being able to return those pumps which are worn out and the pumps can either be renovated or scrapped.

For those who do not wish to make use of this offer the pump should be dismantled as follows:

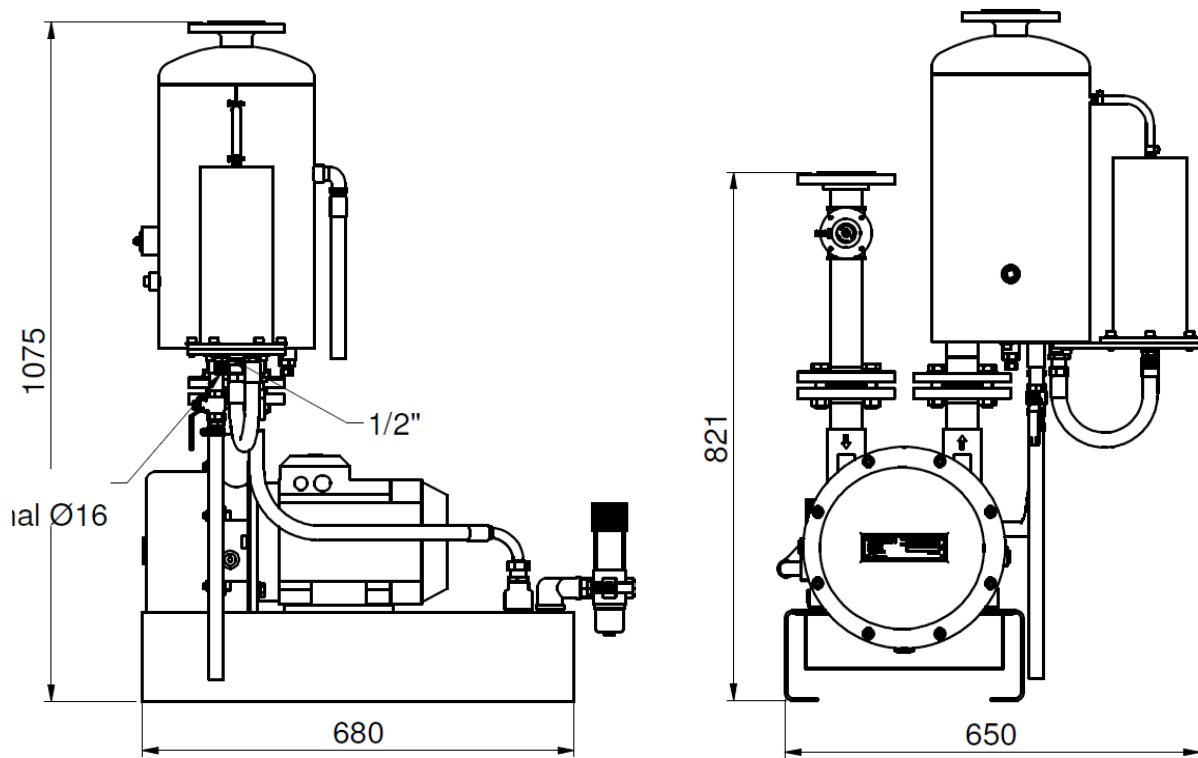
- Operation liquid
- Packings
- Seals
- Sealing rings
- Impeller casing of Polyurethane

The disposal of these should meet the national regulations.

Remaining parts which consist of metal can be remelted.

Example of installation

With separator on the pressure pipe:



DOC1614217


CE- marking



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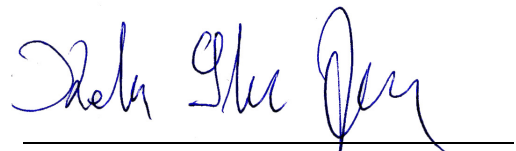
**SAMSON PUMPS A/S declares at its own risk that the products
Samson liquid ring pumps ME65 and ME160**

SAMSON SAMSON PUMPS A/S Petersmindevej 21 DK-8800 Viborg Tel.: +45 87 50 96 70 Fax.: +45 87 50 95 71 www.samson-pumps.com	TYPE:	ME65xxxxxxxxxxx
	NO:	
 2006/42/EC		Made in Denmark

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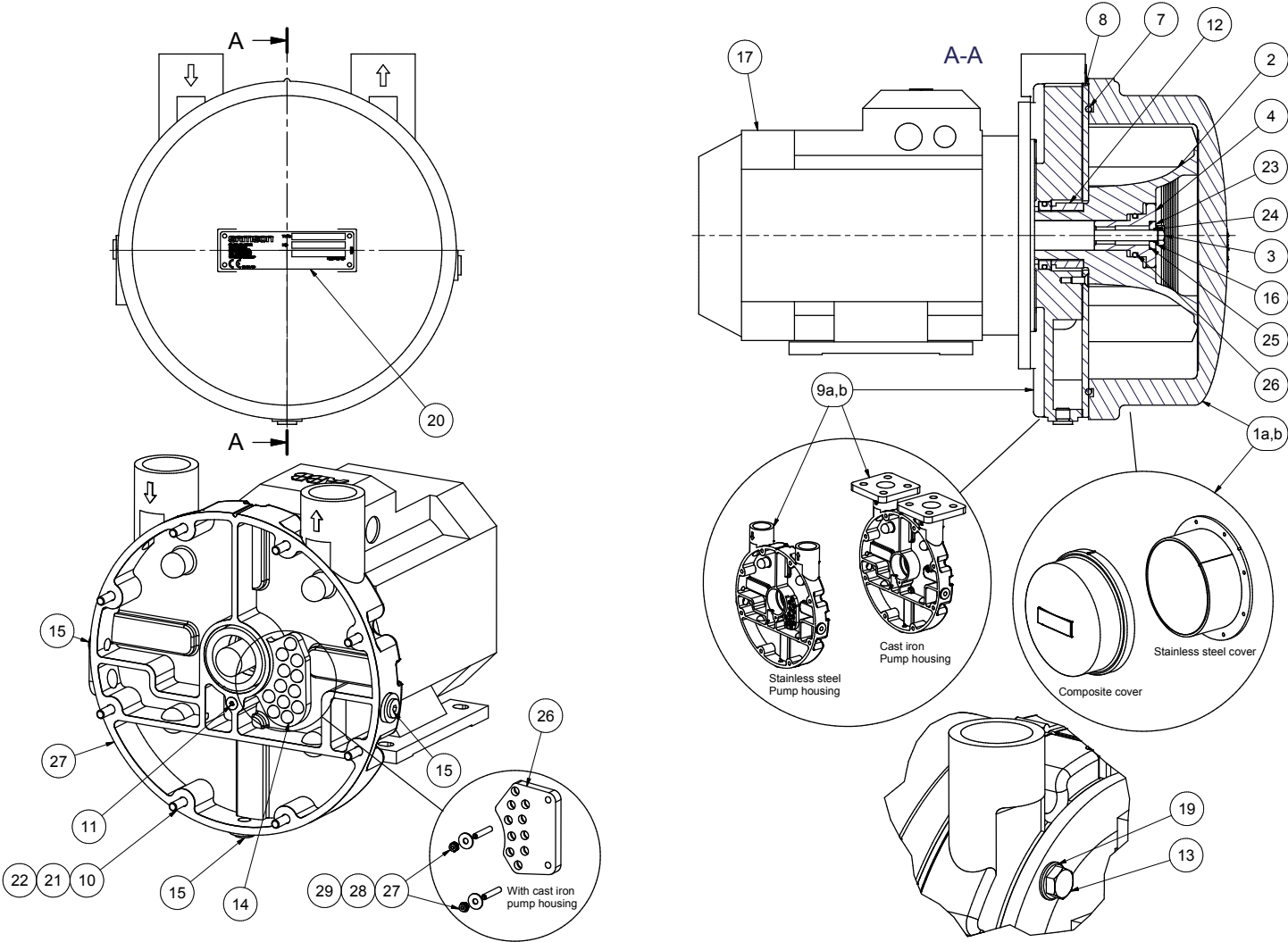
has been produced in agreement with the relevant basic safety and health requirements of the Directive 2006/42/EC

8800 Viborg, Denmark Jan. 2014



Kelvin S. Jensen
R & D Manager

SPARE PARTS OVERVIEW



Doc.no. 1627115

ME65 - SPARE PART LIST

Pos	Qty	Part name	Material	Composite cover	Stainless steel cover	Cast iron housing	Stainless steel housing
1a	1	Pump cover	Composite, SGS	•	-	•	•
1b		Pump cover	AISI 316L	-	•	•	•
2	1	Rotor	EN 1.4404	•	•	•	•
3	1	Bolt M10x65	A4	•	•	•	•
4a **	1	Adjusting disc (Model A) See page 7	EN 1.4436	•	•	•	•
4b		Adjusting disc (Model B+C) See page 7	EN 1.4436	•	•	•	•
5 **	1	Extention bush (Model A) See page 7	AISI 303	•	•	•	•
6 **	1	Parallel key 14x9x35	AISI 316	•	•	•	•
7a	1	O-ring Ø259.3x5.7	NBR Shore 70	•	-	•	•
7b		O-ring Ø260x3	NBR Shore 70	-	•	•	•
7c		O-ring Ø260x3	EPDM Shore 70	-	•	•	•
7d		O-ring Ø260x3	VITON Shore 70	-	•	•	•
8	1	Flow plate	EN1.4401	•	•	•	•
9a	1	Pump housing	EN-GJL-250; EN 1561	•	•	•	-
9b		Pump housing	EN1.4401	•	•	-	•
10a	8	Allen screw M8x30	A4	•	•	•	•
10b		Allen screw M8x35	A4	-	•	•	•
11	1	Allen screw M6x16	A4	•	•	•	•
12	1	Mechanical shaft seal Ø45 Mechanical shaft seal Ø45	AISI 316 Stainless steel / Teflon	•	•	•	•
13	4	Bolt M12x25	A4	•	•	•	•
14a	10	Valve ball Ø12	Polypropylehne, Green	•	•	•	•
14b		Valve ball Ø12 ATEX approved	PEHD 1000 Black, Anti static	-	•	-	•
15a	3	1/4" End plug	Steel	•	•	•	-
15b		1/4" End plug	A4	•	•	-	•
16	1	Lock washer	A4	•	•	•	•
17 *	1	ABB motor 3.0kW	Aluminium	•	•	•	•
18a **	1	O-ring Ø10.78x2.62 (Model A+B) Page 7	NBR Shore 70	•	•	•	•
18b **		O-ring Ø10.78x2.62 (Model A+B) Page 7	EPDM Shore 70	•	•	•	•
18c **		O-ring Ø10.78x2.62 (Model A+B) Page 7	VITON Shore 70	•	•	•	•
19	4	M12 Washer	A4	•	•	•	•
20	1	Name plate, CE	AISI 316	•	•	•	•
21	8	M8 Washer	A4	-	•	-	•
22	8	M8 Lock nut	A4	-	•	-	•
23	1	Reduction ring (Model C) See page 7	EN 1.4401	•	•	•	•
24a	1	O-ring Ø10x1.5 (Model C) See page 7	NBR Shore 70	•	•	•	•
24b		O-ring Ø10x1.5 (Model C) See page 7	EPDM Shore 70	•	•	•	•
24c		O-ring Ø10x1.5 (Model C) See page 7	VITON Shore 70	•	•	•	•
25a	1	O-ring Ø23x1.5 (Model C) See page 7	NBR Shore 70	•	•	•	•
25b		O-ring Ø23x1.5 (Model C) See page 7	EPDM Shore 70	•	•	•	•
25c		O-ring Ø23x1.5 (Model C) See page 7	VITON Shore 70	•	•	•	•
26a	1	O-ring Ø32x4.5	NBR Shore 70	•	•	•	•
26b		O-ring Ø32x4.5	EPDM Shore 70	•	•	•	•
26c		O-ring Ø32x4.5	VITON Shore 70	•	•	•	•
27	1	Gasket for pump housing, Teflon	Teflon, PTFE	•	•	•	•
28	1	Ball guide	PEHD 1000	•	•	•	-
29	2	M5 Lock nut DIN 985	A4	•	•	•	-
30	2	M5 washer A4	A4	•	•	•	-
31	2	M5x30 DIN 916 A4	A4	•	•	•	-

* Contact Samson Pumps for motor specifications and part number

** Out of production. Contact Samson Pumps to check the stock left

Used in pumps with:

ME160 - SPARE PART LIST

Pos	Qty	Part name	Material	Composite cover	Stainless steel cover	Cast iron housing	Stainless steel housing
1a	1	Pump cover	Composite, SGS	•	-	•	•
1b		Pump cover	AISI 316L	-	•	•	•
2	1	Rotor	EN 1.4404	•	•	•	•
3	1	Bolt M10x80	A4	•	•	•	•
4a *	1	<i>Adjusting disc (Model A) See page 7</i>	<i>EN 1.4436</i>	•	•	•	•
4b		<i>Adjusting disc (Model B+C) See page 7</i>	<i>EN 1.4436</i>	•	•	•	•
5 **	1	<i>Extention bush (Model A) See page 7</i>	<i>AISI 303</i>	•	•	•	•
6 **	1	<i>Parallel key 14x9x40</i>	<i>AISI 316</i>	•	•	•	•
7a	1	O-ring Ø259.3x5.7	NBR Shore 70	•	-	•	•
7b		O-ring Ø260x3	NBR Shore 70	-	•	•	•
7c		O-ring Ø260x3	EPDM Shore 70	-	•	•	•
7d		O-ring Ø260x3	VITON Shore 70	-	•	•	•
8	1	Flow plate	EN1.4401	•	•	•	•
9a	1	Pump housing	EN-GJL-250; EN 1561	•	•	•	-
9b		Pump housing	EN1.4401	•	•	-	•
10a	8	Allen screw M8x30	A4	•	•	•	•
10b		Allen screw M8x35	A4	-	•	•	•
11	1	Allen screw M6x16	A4	•	•	•	•
12	1	Mechanical shaft seal HN45	AISI 304	•	•	•	•
13	4	Bolt M12x25	A4	•	•	•	•
14a	10	Valve ball Ø12	Polypropylehne, Green	•	•	•	•
14b		Valve ball Ø12 ATEX approved	PEHD 1000 Black, Anti static	-	•	-	•
15a	3	1/4" End plug	Steel	•	•	•	-
15b		1/4" End plug	A4	•	•	-	•
16	1	Lock washer	A4	•	•	•	•
17 *	1	ABB motor 5.5kW	Aluminium	•	•	•	•
18a **	1	<i>O-ring Ø10.78x2.62 (Model A+B) Page 7</i>	<i>NBR Shore 70</i>	•	•	•	•
18b **		<i>O-ring Ø10.78x2.62 (Model A+B) Page 7</i>	<i>EPDM Shore 70</i>	•	•	•	•
18c **		<i>O-ring Ø10.78x2.62 (Model A+B) Page 7</i>	<i>VITON Shore 70</i>	•	•	•	•
19	4	M12 Washer	A4	•	•	•	•
20	1	Name plate, CE	AISI 316	•	•	•	•
21	8	M8 Washer	A4	-	•	-	•
22	8	M8 Lock nut	A4	-	•	-	•
23	1	Reduction ring (Model C)	EN 1.4401	•	•	•	•
24a	1	<i>O-ring Ø10x1.5 (Model C) See page 7</i>	<i>NBR Shore 70</i>	•	•	•	•
24b		<i>O-ring Ø10x1.5 (Model C) See page 7</i>	<i>EPDM Shore 70</i>	•	•	•	•
24c		<i>O-ring Ø10x1.5 (Model C) See page 7</i>	<i>VITON Shore 70</i>	•	•	•	•
25a	1	<i>O-ring Ø23x1.5 (Model C) See page 7</i>	<i>NBR Shore 70</i>	•	•	•	•
25b		<i>O-ring Ø23x1.5 (Model C) See page 7</i>	<i>EPDM Shore 70</i>	•	•	•	•
25c		<i>O-ring Ø23x1.5 (Model C) See page 7</i>	<i>VITON Shore 70</i>	•	•	•	•
26a	1	O-ring Ø32x4.5	NBR Shore 70	•	•	•	•
26b		O-ring Ø32x4.5	EPDM Shore 70	•	•	•	•
26c		O-ring Ø32x4.5	VITON Shore 70	•	•	•	•
27	1	Gasket for pump housing, Teflon	Teflon, PTFE	•	•	•	•
28	1	Ball guide	PEHD 1000	•	•	•	-
29	2	M5 Lock nut DIN 985	A4	•	•	•	-
30	2	M5 washer A4	A4	•	•	•	-
31	2	M5x30 DIN 916 A4	A4	•	•	•	-
32	1	Puller, M16x130 bolt (Model C - service tool) See page 7	Steel FZB 8.8				

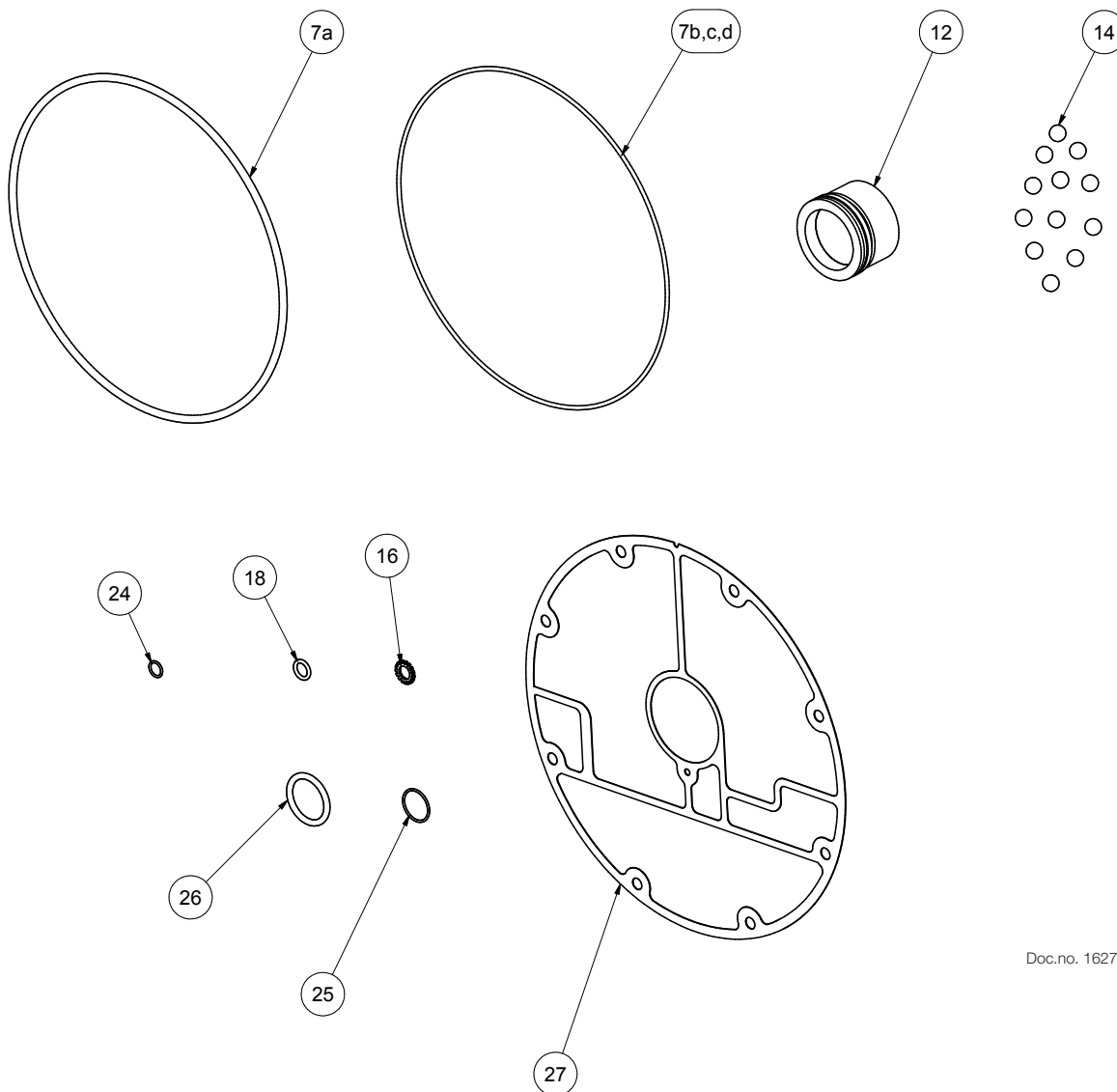
* Contact Samson Pumps for motor specifications and part number

** Out of production. Contact Samson Pumps to check the stock left

SET OF SEALS overview:

P/N: 1606032 - NBR ATEX version
 P/N: 1606046 - EPDM ATEX version
 P/N: 1606048 - EPDM/PTFE ATEX version

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



Doc.no. 1627114

Type key number:

Type of mechanical shaft seal:

- 0 - NBR
- 1 - EPDM
- 2 - PTFE

Material for Gasket:

- 0 - NBR
- 1 - EPDM

Type of Documentation:

- SD - Standard
- X1 - ATEX Zone I
- X2 - ATEX Zone II

SAMSON

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CE 2006/42/EC

TYPE:

NO:

106912
Made in Denmark

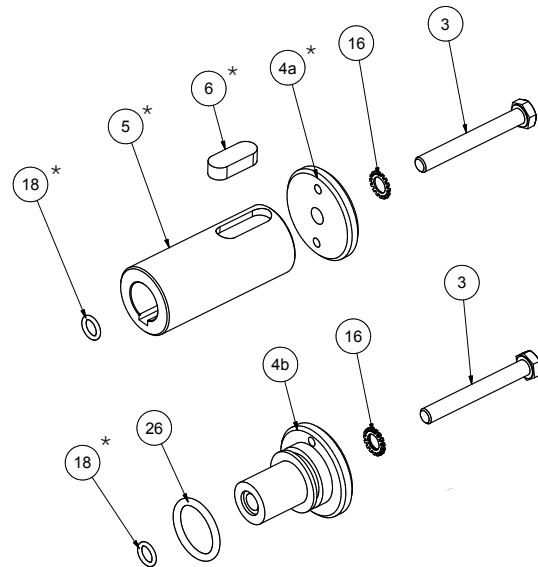
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PREVIOUS MODELS OF SPARE PART KIT:

**Spare part kits for rotor replacement
APPLIED BEFORE DEC.2005**

Model A
Applied before Dec. 2005

Model B
Applied from Jan. 2006 to Nov. 2010

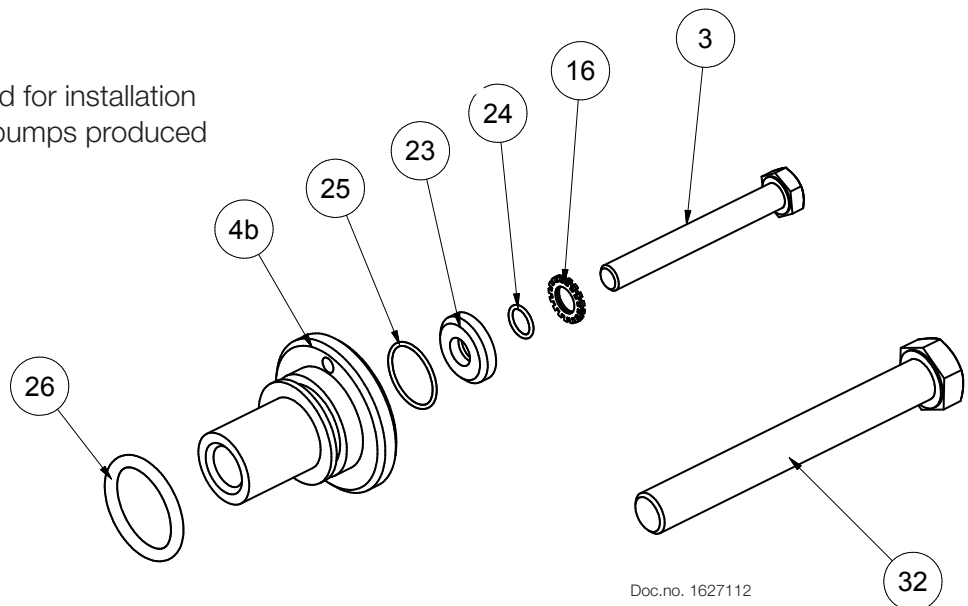


* Out of production. Contact Samson Pumps to check the stock left.

CURRENT MODEL OF SPARE PART KIT:

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



Doc.no. 1627112

Type key number:

<p>SAMSON PUMPS A/S Petersmindevej 21 DK-8800 Viborg Tel.: +45 87 50 96 70 Fax.: +45 87 50 95 71 www.samson-pumps.com</p> 2006/42/EC	TYPE: ME160xxxxx10xxSD	106912
	NO: 01-11-OPxxxxxx	
	<div style="border: 1px solid black; width: 100px; height: 20px; margin: 5px;"></div> <p style="text-align: right; font-size: small;">Made in Denmark</p>	

Year of manufacturing
Month of manufacturing

Doc.no. 106912_2