SAMSON LIQUID RING VACUUM PUMPS

DELTA UNITS

INSTRUCTION MANUAL FOR SAMSON DELTA UNITS, TYPES:

DELTA 5, -10, -20, -30, -40, -50, -60, -70, -90, -100

DOC3713B

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 products:

Delta 5, -10, -20, -30, -40, -50, -60, -70, -90, -100

Conforms to directive:

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

I hereby declare, that the products 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 products.
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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1.2 Explanation of warning symbols

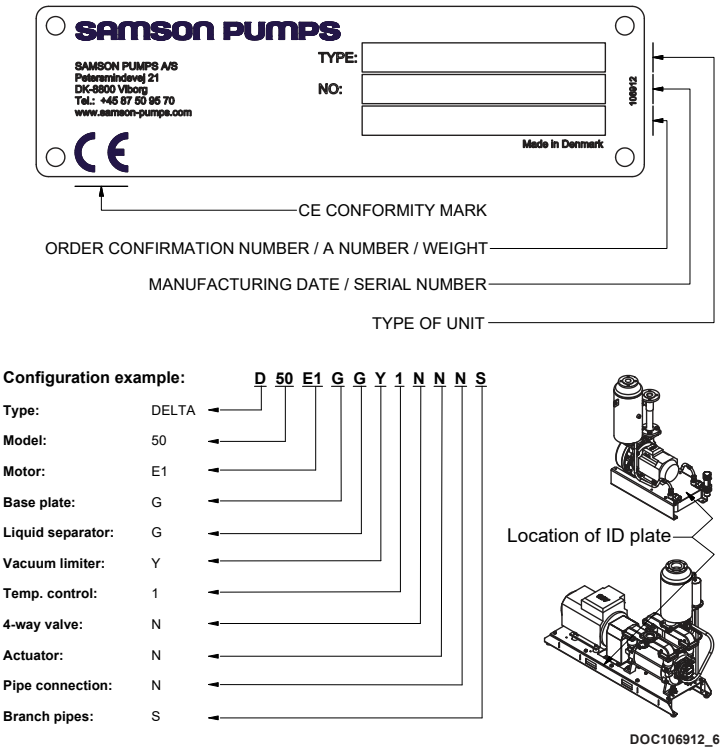
Important technical and safety instructions is showed by symbols. If instructions are not performed correctly, it may lead to personnel injury or incorrect function of the Delta unit.

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.

This symbol refers to hazardous situations involving electricity. A failure to observe the safety warnings may result in injury or death. The work may only be carried out by trained professionals who are familiar with the equipment.

1.3 Marking and identification

The unit is equipped with an identification plate that is shown below. It contains important information, which can be useful in case of troubleshooting, service, weight etc.



1.4 Purpose of use

DELTA series are built with direct transmission.

The basic module consists of pump, electric motor and transmission ready for operation.

Additionally, the unit can be configured with the following additional modules:

- Liquid separator (See liquid separator manual)
- Cooling module based on partial recirculation of service liquid (See liquid separator manual)
- Cooling module based on a heat exchanger (See liquid separator manual)
- Cooling unit with air cooler (See liquid separator manual)
- 4-way valve for vacuum- and pressure operation (See 4-way valve manual)

For further information regarding the additional modules, please study our website www.samson-pumps.com, or contact our sales department.

2 TECHNICAL DATA

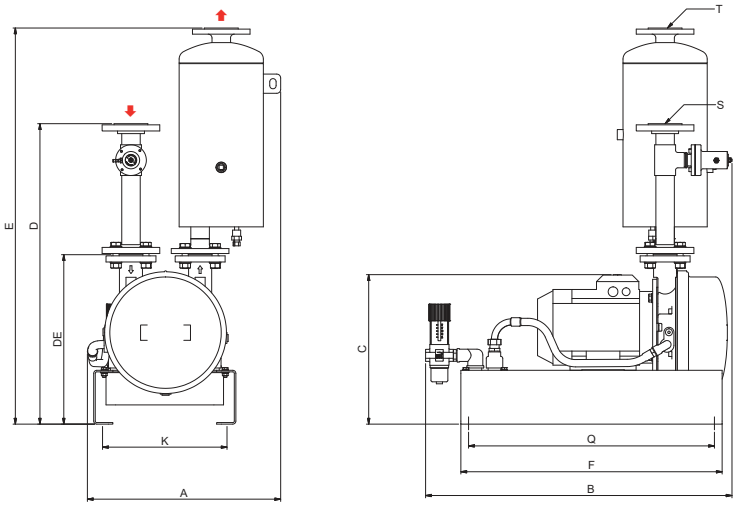
2.1 Available models

DELTA unit models	Applicable with pump types	Weight based on motor [kW]:
DELTA 5	ME65 or ME160	4
DELTA 10	KE180 or KE200	5,5
DELTA 20	KE225 or KE300	7,5
DELTA 30	KL350 or KL400	11
DELTA 40	KL430 or KL500	15
DELTA 50	KS500 or KS510	18
DELTA 60	KS625 or KS725	22
DELTA 70	KS910 or KS1025	30
DELTA 90	KM2200	75
DELTA 100	KM2700	75

2.2 Dimensions [mm]

DELTA unit series	A	B	C	D	DE	E	F	K	Q	S Suction	T Discharge	Weight [kg]
DELTA 5	505	860	390	785	440	995	680	310	640	DN40	DN40	150
DELTA 10	440	1600	540	475	-	1150	1285	370	1225	DN40	DN50	250
DELTA 20	440	1641	492	488	-	1150	1405	370	1345	DN40	DN50	270
DELTA 30	440	1722	558	523	-	1185	1405	370	1345	DN50	DN50	370
DELTA 40	440	1631	573	523	-	1220	1465	370	1405	DN50	DN50	400
DELTA 50	860	1665	642	750	-	1435	1665	480	1605	DN100	DN100	600
DELTA 60	860	1730	596	750	-	1435	1730	480	1670	DN100	DN100	640
DELTA 70	1015	1870	730	750	-	1855	1870	480	1810	DN100	DN100	790
DELTA 90	990	3100	995	766	-	1920	3000	920	2900	DN125	DN150	1590
DELTA 100	990	3240	985	766	-	1920	3000	920	2900	DN125	DN150	1660

DELTA 5



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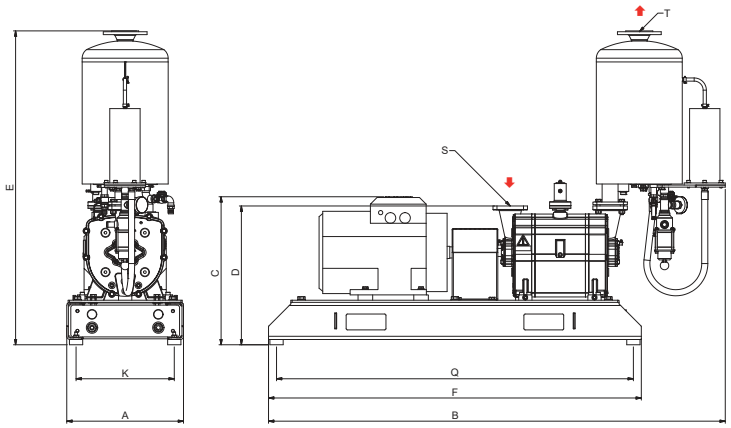
DELTA 10-40



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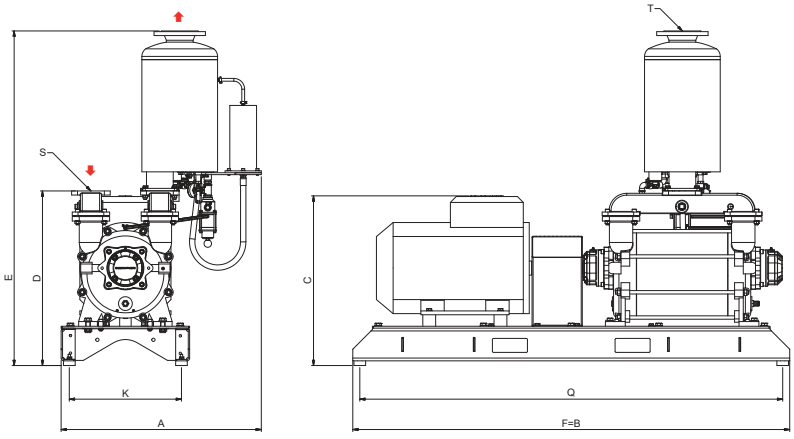
DELTA 50-70



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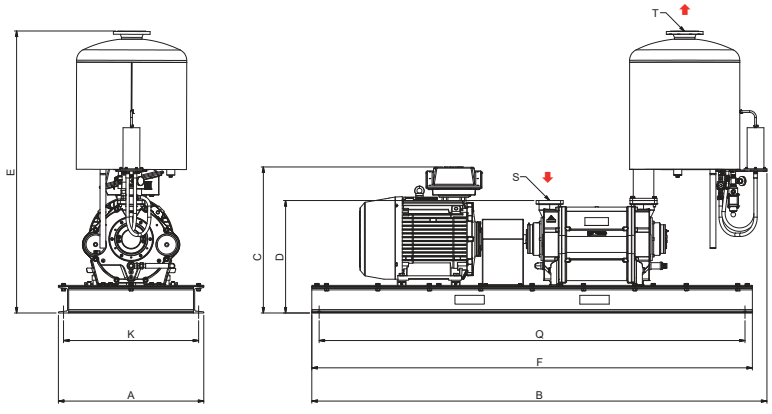
DELTA 90-100



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2.3 Storage conditions

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 or filled with anti freeze liquid.

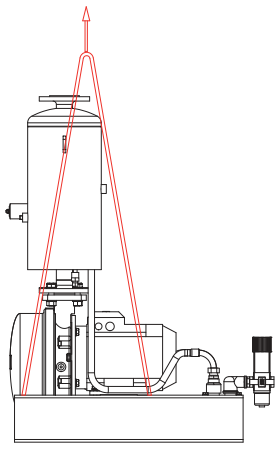
At storage for more than 30 days, see manual for:
- Electrical motor
- Liquid ring pump
- Liquid separator
- 4-way valve

2.4 Handling and transport

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

By fork-lift truck handling the unit can be transported in the original container or onto an approved EUR pallet.
Handling with crane must only be made by hooking the unit's lifting eye loops.
The weight of the respective DELTA unit can be found on the nameplate. See Chapter 1.3

DELTA 5



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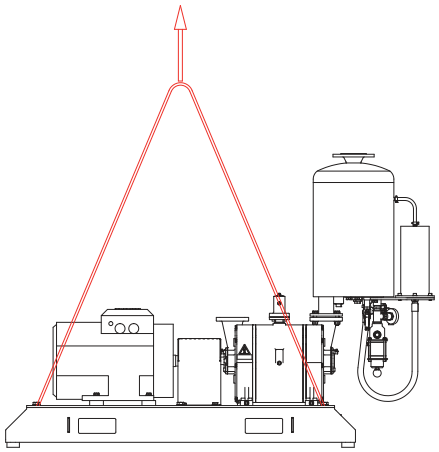
DELTA 10-100



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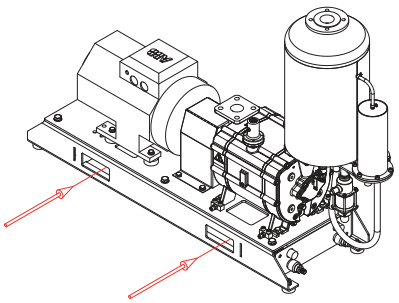
DELTA 10-100



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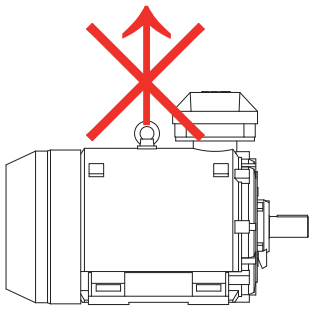
The loop eye of the electrical motor may not be used for gripping by lifting the entire unit.



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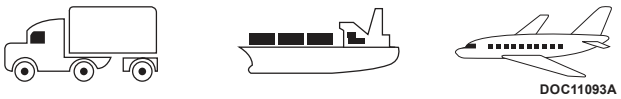
The unit can be transported in the following ways:



2.5 Removal and disposal

The most parts of the Samson DELTA units can be recycled.

Samson Pumps therefore offers the user of Samson DELTA units opportunity to return worn units for renovation or scrapping. For those who do not wish to make use of the offer of the factory, the DELTA units after separation have to be separated into components.

Worn DELTA units can be separated into following components:

- Service liquid
- Gaskets
- Hoses
- Plastic Parts

These parts are to be disposed according to national rules.

The residue consisting of metal components can be sent for re-melting.

3 INSTALLATION AND START-UP

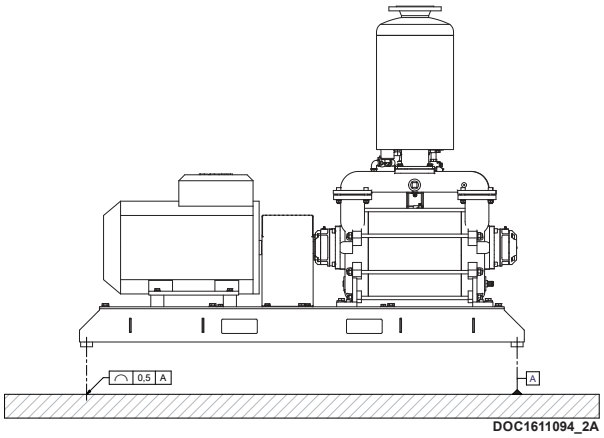
3.1 Installation requirements

3.1.1 Anchoring

The unit must be mounted onto a stable foundation, which has to be right and torsion stable, so that the unit is not exposed to torsion.

The unit must be anchored with foundation bolts in all four holes or be placed directly on foundation without bolts.

Vibration dampers must be mounted between unit and foundation.



3.1.2 Electrical installation

- Make sure power supply is disconnected before installing cables on motor!
- Electrical connections are made only by authorized personnel!

Reference is made to the manual of the actual electrical motor.

3.1.3 Service liquid supply

For units without liquid separator - see actual liquid ring pump manual.
For units with liquid separator mounted - see liquid separator manual.

3.2 Prior to start-up

- Do not start the unit without service liquid, as this will damage the mechanical shaft seals.
- Do not start the unit if it is completely filled with service liquid.
- Do not start the unit before the grease cartridges have been activated as, this can damage the pump.
- Stop the unit 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 unit.

3.2.1 Activating the grease cartridges

Turn the knob on both grease cartridges clockwise to position 12.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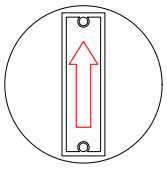
3.2.2 Direction of rotation

Check the direction of rotation by briefly starting the pump. The direction of rotation of the rotor must correspond to the direction arrow!

If the direction of rotation is incorrect - the cause is an improper electrical connection. Please call authorized personnel for corrective action.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3.2.3 Vacuum limiter

If the unit is equipped with a vacuum limiter, make sure it is adjusted in accordance with the vacuum limiter manual.


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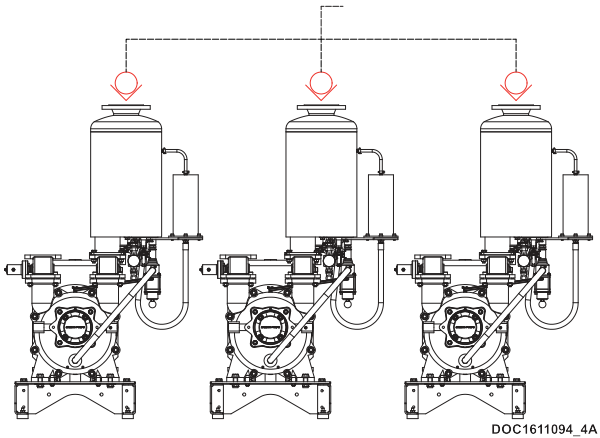
3.2.4 Serial connection

If the unit is included in an installation with multiple units in serial connection or connected to a vacuum tank.

It is important that the outlet side of the unit is equipped with a Non-Return Valve.

Without the Non-Return Valve, the other units might draw intake of false air through the actual unit when this is not in operation.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3.3 Start-Up

Start the unit. Perform a visual inspection of unit for leakages, noise and vibrations.

If any of those symptons are present, STOP the unit immediately! Start troubleshooting.

4 SERVICE, MAINTENANCE AND INSPECTION INTERVALS

4.1 Maintenance

Do not perform any maintenance work on unit, while in use!

4.1.1 Lubrication of pump bearings

- Check the automatic lubrication cartridges every 3 months.
- If level of grease reaches zero, the cartridge must be replaced.
- When replaced, turn activator on position 12.
- Detailed instructions about pump, see manual for the actual liquid ring pump.

4.1.2 Lubrication of motor bearings

- See manual for the actual motor.

4.1.3 4-way valve (if equipped)

- Each grease nipple must be greased every 3 months, with 6-8 g of LGWA2 grease.
- DELTA unit out of use for 30 days or more, must be greased before start.
- Detailed instructions about 4-way valve, see 4-way valve manual.

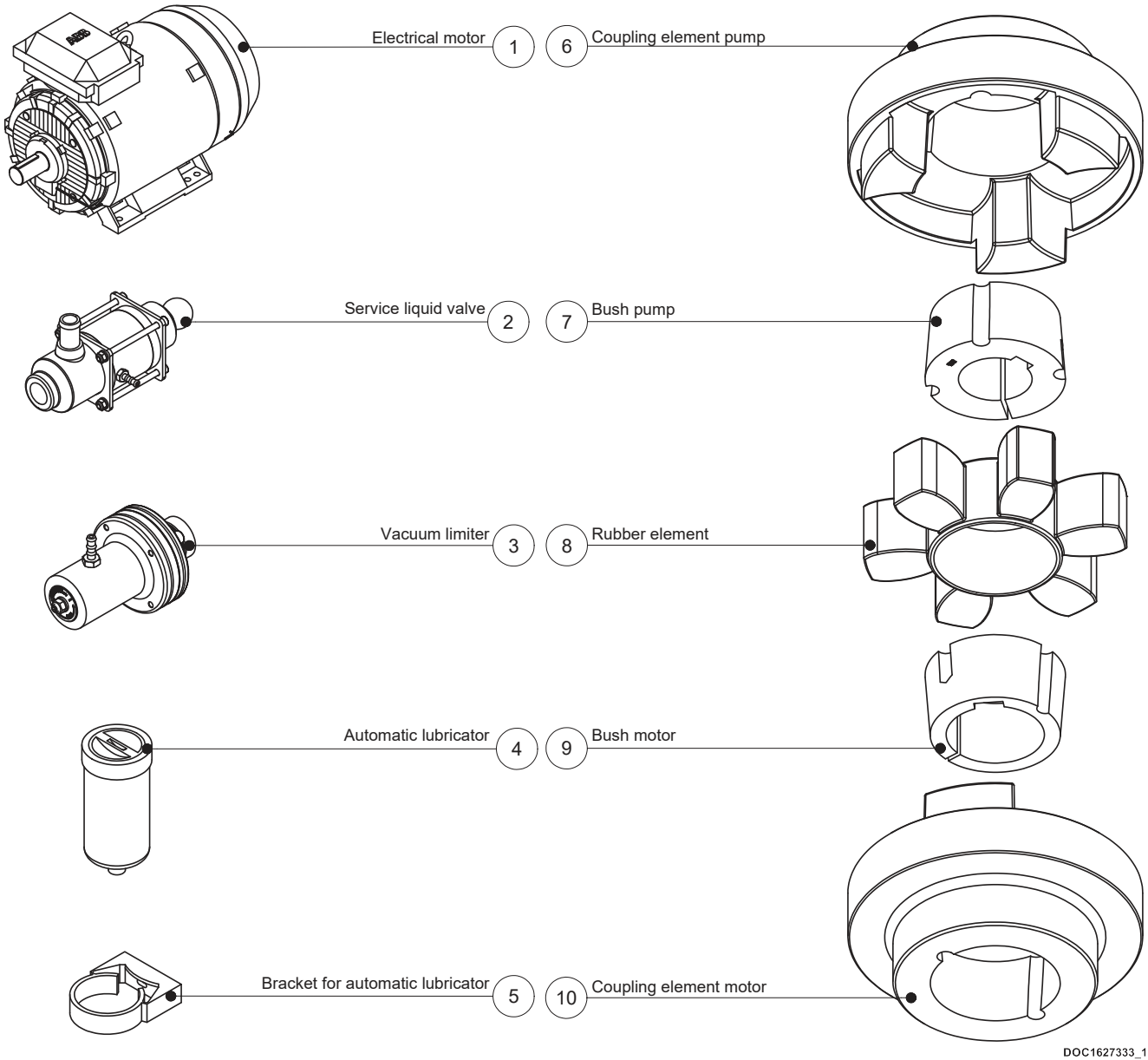
4.1.4 Liquid separator (if equipped)

- It is recommended that liquid separator is emptied daily by manually opening the drain valve.
- DELTA unit out of use for 30 days or more, it is recommended to close the external water supply and to empty the liquid separator.
- Detailed instructions about liquid separator, see liquid separator manual.

5 SPARE PARTS

5.1 How to order

When ordering spare parts, please indicate the desired position, as well as the type and number, which are indicated on the nameplate of the unit. See below.



Notes:

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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