



DISTRIBUTED BY

HARCO
ENTERPRISES LTD.

1-800-361-5361

Alfa Laval SX

Rotary lobe pumps

Introduction

The Alfa Laval SX Rotary Lobe Pump is designed with optimized pump head geometry and multi-lobe rotors to ensure low-shear operation with minimum pulsation. This makes the SX the best choice for maintaining the integrity of delicate products.

The pump is designed according to the most stringent hygienic design standards and with verified, effective Cleaning-in-Place (CIP) and Sterilization-in-Place (SIP).

Applications

The SX Rotary Lobe pump is designed for gentle transportation of process fluids in hygienic and ultra-clean applications in the biotechnology and pharmaceutical industries, in the home and personal care sector, and for demanding food applications.

The SX Rotary Lobe Pump is available with 14 different pump head displacements based on seven different gearbox modules to handle flow rates up to 115 m³/h and differential pressures up to 15 bar.

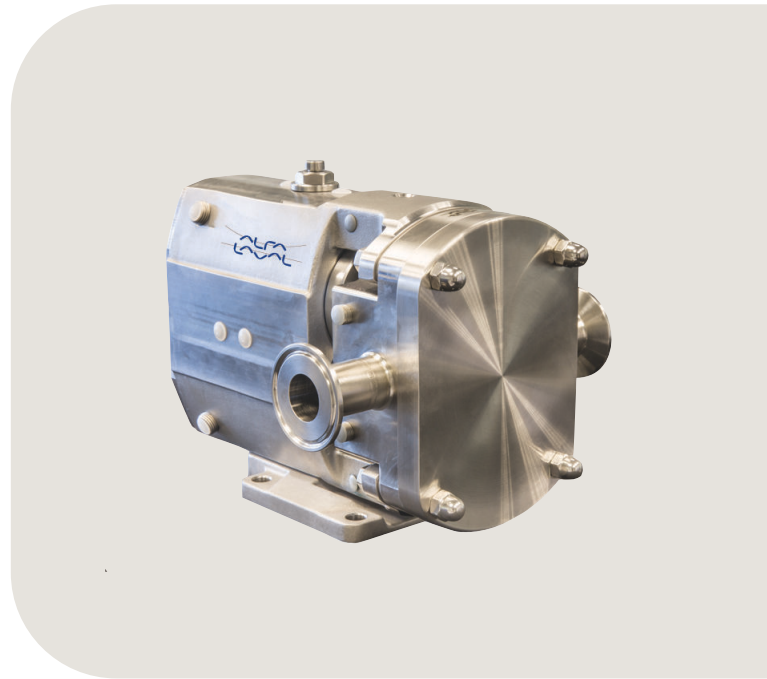
Benefits

- Low pulsation and very gentle pumping, making the pump ideal for sensitive products.
- Minimized shearing for protecting end-product quality.
- Low maintenance, increased process uptime.
- Maximized performance and minimized risk of contamination.

Standard design

All media contacting steel components, like the rotor case, front cover, rotors and rotor nuts, are in W. 1.4404 (AISI 316L). The robust cast iron gearbox provides maximum shaft rigidity and easy oil seal replacement. The gearbox design is universal which enables the flexibility of mounting pumps with the inlet and outlet ports in either a vertical or horizontal plane by changing the foot and its position.

The standard Alfa Laval SX has four-lobe rotors rated to 302°F, facilitating use with CIP and SIP processes.



Fully front-loading and fully interchangeable single, single flushed, and double mechanical shaft seals are available. All media contacting elastomers are controlled compression joints, the latest technology where static and dynamic elastomer seals are used to prevent leakage of pumped media to the atmosphere.

The Alfa Laval SX can be supplied either as a bare shaft pump or mounted on a base plate complete with coupling, guard, gear motor and shroud for easy, plug-and-play installation.

Working principle

A gear train in the pump gearbox drives the rotors and provides accurate synchronization of the multi-lobe rotors. The movement of the counter-rotating rotors creates a partial vacuum that allows atmospheric pressure or other external pressures to force fluid into the pump chamber. As the rotors revolve, an expanding cavity forms, filling with fluid. As the blades disengage, each dwell forms a cavity. As the rotor

blades engage, the cavity diminishes, and fluid is displaced into the outlet port.

TECHNICAL DATA

| Standard specification | |
|-----------------------------|-------------------------|
| Product wetted steel parts: | W. 1.4404 (316L) |
| Inside surface finish: | Mech Ra ≤ 32 |
| Gearbox: | Cast iron |
| Base plate: | Stainless steel |
| Coupling guard: | Stainless steel |
| Rotor: | Four-lobe |
| Product wetted elastomers: | EPDM |
| Other elastomers: | FPM |
| Shaft seal: | Single mechanical (R00) |
| Rotary seal face: | Carbon |
| Stationary seal face: | Stainless steel |

| Shaft seals | |
|--|-----------------------------|
| Single, single flush and double mechanical available. All options are fully front loading and interchangeable. | |
| Max flush pressure, single flush: | 7.25 psi |
| Max flush pressure, double mechanical: | 1 bar over product pressure |
| Water consumption, flushed or double mechanical: | 0.13 gallon/min |
| Flush connections: | BSPT or NPT |

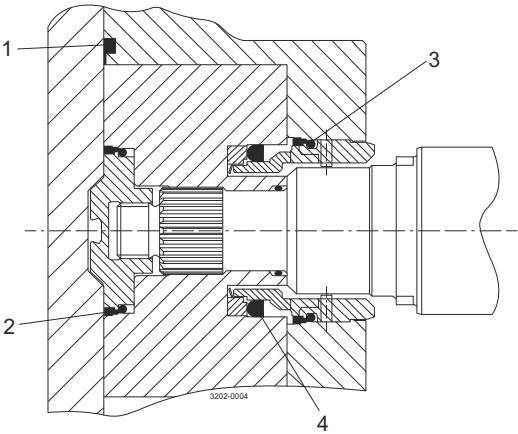
| Temperature | |
|---------------------------------|-------|
| Max process and CIP temperature | 302°F |

| Motor | |
|---|--|
| Gear motor, 4 poles, to IEC metric standard, 50/60 Hz, suitable for frequency conversion, IP55, insulation class F. | |

| Warranty | |
|--|--|
| Extended 3-years warranty on SX pumps. The warranty covers all non wear parts on the condition that genuine Alfa Laval Spare Parts are used. | |

Media contacting elastomers

All media contacting elastomers are controlled compression joints, the latest technology where static and dynamic elastomer seals are used to prevent pumped media leaking to atmosphere.



- 1. Front cover compression joint
- 2. Spline sealing cup seal
- 3. Cup seal
- 4. Squad ring

Flows/Pressures/Connections

| SX Series | SX Model | Displacement | | | Inlet and Outlet Connection Size | | Differential Pressure (see note 1) | | Maximum Speed |
|-----------|----------|--------------|------------------|-----------------|----------------------------------|-----|------------------------------------|-----|---------------|
| | | Litre/rev | Imp gall/100 rev | US gall/100 rev | mm | in | bar | psi | rev/min |
| 1 | SX1NLD | 0.05 | 1.11 | 1.32 | 25 | 1 | 12 | 175 | 1200 |
| | SX1WLD | 0.07 | 1.54 | 1.85 | 40 | 1.5 | 7 | 100 | 1200 |
| 2 | SX2NLD | 0.128 | 2.82 | 3.38 | 40 | 1.5 | 15 | 215 | 1000 |
| | SX2WLD | 0.181 | 3.98 | 4.78 | 50 | 2 | 7 | 100 | 1000 |
| 3 | SX3NLD | 0.266 | 5.85 | 7.03 | 50 | 2 | 15 | 215 | 1000 |
| | SX3WLD | 0.35 | 7.70 | 9.25 | 65 | 2.5 | 7 | 100 | 1000 |
| 4 | SX4NLD | 0.46 | 10.12 | 12.15 | 50 | 2 | 15 | 215 | 1000 |
| | SX4WLD | 0.63 | 13.86 | 16.65 | 65 | 2.5 | 10 | 145 | 1000 |
| 5 | SX5NLD | 0.82 | 18.04 | 21.67 | 65 | 2.5 | 15 | 215 | 600 |
| | SX5WLD | 1.15 | 25.30 | 30.38 | 80 | 3 | 10 | 145 | 600 |
| 6 | SX6NLD | 1.40 | 30.80 | 36.99 | 80 | 3 | 15 | 215 | 500 |
| | SX6WLD | 1.90 | 41.80 | 50.20 | 100 | 4 | 10 | 145 | 500 |
| 7 | SX7NLD | 2.50 | 55.00 | 66.05 | 100 | 4 | 15 | 215 | 500 |
| | SX7WLD | 3.80 | 83.60 | 100.40 | 150 | 6 | 10 | 145 | 500 |

Note 1. These pressure ratings may vary for pumps with certain threaded connections.

Maximum Solid Size Capability

| Pump sizes | Max. size of spherical solids (in) |
|------------|------------------------------------|
| SX1 | 0.28 |
| SX2 | 0.39 |
| SX3 | 0.51 |
| SX4 | 0.63 |
| SX5 | 0.75 |
| SX6 | 0.98 |
| SX7 | 1.10 |

Weight

| Model | Bare Shaft Pump (lbs.) | |
|--------|------------------------|------------------|
| | Horizontal porting | Vertical porting |
| SX1NLD | 37 | 39 |
| SX1WLD | 39 | 41 |
| SX2NLD | 75 | 77 |
| SX2WLD | 77 | 79 |
| SX3NLD | 130 | 134 |
| SX3WLD | 134 | 138 |
| SX4NLD | 247 | 254 |
| SX4WLD | 260 | 267 |
| SX5NLD | 342 | 342 |
| SX5WLD | 364 | 364 |
| SX6NLD | 613 | 613 |
| SX6WLD | 639 | 639 |
| SX7NLD | 741 | 758 |
| SX7WLD | 789 | 807 |

Shaft Seal Options

- Single or single flush/quench (steam barrier for aseptic application) R00 type mechanical seals.
- Double R00 type mechanical seal for flush.

All sealing options are fully front loading and fully interchangeable without the need for additional housings or pump component changes. Specialised seal setting of the mechanical seal is not required as the seal is dimensionally set on assembly. This feature further enhances fast and efficient on-site seal interchangeability.

Materials for Mechanical Seals

Carbon/Stainless Steel, Silicon Carbide/Silicon Carbide or variations of these materials to suit fluid being pumped and/or application requirements. The seal seat and face material combinations are all EHEDG compliant.

Standard Specification Options

- Tri-clamp inlet and outlet ports standard.
- Screwed male inlet and outlet ports to DIN11851, DIN11864, SMS, ISS/IDF, RJT or Tri-clamp.
- Heating/Cooling Jacket for Rotorcase Cover.
- ATEX compliance.
- Complete pump unit comprising: Pump + Baseplate (mild or stainless steel) + coupling with guard + Geared electric motor suitable for (or supplied with) frequency speed control or manual variable speed drive (advise motor enclosure and electrical supply).

Pump Sizing

In order to correctly size a rotary lobe pump some essential information is required. Provision of this information listed below enables our Technical Support personnel to obtain the optimum pump selection.

Product/Fluid Data

- Fluid to be pumped
- Viscosity
- SG/Density
- Pumping temperature, minimum, normal and maximum
- Cleaning in Place temperature(s), minimum, normal and maximum

Performance Data

- Flow rate, minimum, normal and maximum
- Discharge head/pressure (closest to pump outlet)
- Suction condition

Bareshaft Pump Dimensions

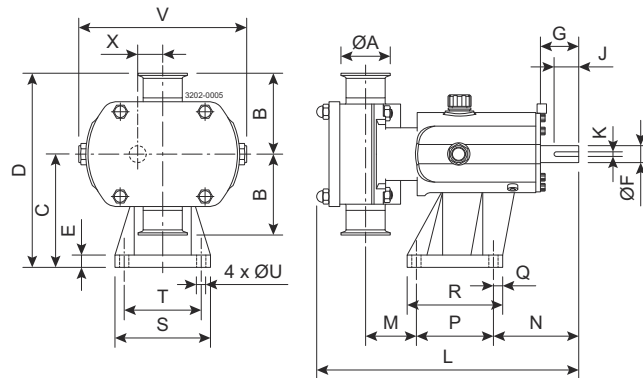


Figure 1. Vertically ported

All dimensions in inches, except where noted

| PUMP | A | B | C | D | E | F | G | J | K | L | M | N | P | Q | R | S | T | U | V | X |
|--------|------|------|-------|-------|------|------|------|------|------|-------|------|-------|-------|------|-------|-------|------|------|-------|------|
| SX1NLD | 1.00 | 3.74 | 4.45 | 8.19 | 0.63 | 0.63 | 1.57 | 1.18 | 0.20 | 11.14 | 2.11 | 3.94 | 3.15 | 0.87 | 4.49 | 4.09 | 3.15 | 0.39 | 7.05 | 0.93 |
| SX1WLD | 1.50 | 3.74 | 4.45 | 8.19 | 0.63 | 0.63 | 1.57 | 1.18 | 0.20 | 11.65 | 2.36 | 3.94 | 3.15 | 0.87 | 4.49 | 4.09 | 3.15 | 0.39 | 7.05 | 0.93 |
| SX2NLD | 1.50 | 4.13 | 5.79 | 9.92 | 0.63 | 0.87 | 1.97 | 1.26 | 0.24 | 12.87 | 2.30 | 4.37 | 3.94 | 0.47 | 4.88 | 4.88 | 3.94 | 0.47 | 8.62 | 1.28 |
| SX2WLD | 2.00 | 4.13 | 5.79 | 9.92 | 0.63 | 0.87 | 1.97 | 1.26 | 0.24 | 13.50 | 2.58 | 4.37 | 3.94 | 0.47 | 4.88 | 4.88 | 3.94 | 0.47 | 8.62 | 1.28 |
| SX3NLD | 2.00 | 4.92 | 6.89 | 11.81 | 0.87 | 1.10 | 2.36 | 1.57 | 0.31 | 17.09 | 2.85 | 5.59 | 6.10 | 0.59 | 7.28 | 6.10 | 4.92 | 0.55 | 9.96 | 1.48 |
| SX3WLD | 2.50 | 4.92 | 6.89 | 11.81 | 0.87 | 1.10 | 2.36 | 1.57 | 0.31 | 17.72 | 3.07 | 5.59 | 6.10 | 0.59 | 7.28 | 6.10 | 4.92 | 0.55 | 9.96 | 1.48 |
| SX4NLD | 2.00 | 5.91 | 8.39 | 14.29 | 0.98 | 1.50 | 3.15 | 2.48 | 0.39 | 20.35 | 2.95 | 6.85 | 7.87 | 0.67 | 9.21 | 7.24 | 5.91 | 0.55 | 12.09 | 1.95 |
| SX4WLD | 2.50 | 5.91 | 8.39 | 14.29 | 0.98 | 1.50 | 3.15 | 2.48 | 0.39 | 21.10 | 3.20 | 6.85 | 7.87 | 0.67 | 9.21 | 7.24 | 5.91 | 0.55 | 12.09 | 1.95 |
| SX5NLD | 2.50 | 6.89 | 10.12 | 17.01 | 1.06 | 1.77 | 4.33 | 2.76 | 0.55 | 23.70 | 2.40 | 10.39 | 7.87 | 0.79 | 9.45 | 8.66 | 7.09 | 0.55 | 13.81 | 2.36 |
| SX5WLD | 3.00 | 6.86 | 10.12 | 17.01 | 1.06 | 1.77 | 4.33 | 2.76 | 0.55 | 24.80 | 3.17 | 10.39 | 7.87 | 0.79 | 9.45 | 8.66 | 7.09 | 0.55 | 13.81 | 2.36 |
| SX6NLD | 3.00 | 7.48 | 11.61 | 19.09 | 1.06 | 1.89 | 4.33 | 2.76 | 0.55 | 27.20 | 3.07 | 10.51 | 10.24 | 0.79 | 11.81 | 9.84 | 8.27 | 0.55 | 15.75 | 2.76 |
| SX6WLD | 4.00 | 7.48 | 11.61 | 19.09 | 1.06 | 1.89 | 4.33 | 2.76 | 0.55 | 28.31 | 3.54 | 10.51 | 10.24 | 0.79 | 11.81 | 9.84 | 8.27 | 0.55 | 15.75 | 2.76 |
| SX7NLD | 4.00 | 8.07 | 14.37 | 22.44 | 1.02 | 2.36 | 4.33 | 3.54 | 0.71 | 30.20 | 3.70 | 11.34 | 11.02 | 0.98 | 12.99 | 11.42 | 9.45 | 0.71 | 18.70 | 3.21 |
| SX7WLD | 6.00 | 8.07 | 14.37 | 22.44 | 1.02 | 2.36 | 4.33 | 3.54 | 0.71 | 32.32 | 4.76 | 11.34 | 11.02 | 0.98 | 12.99 | 11.42 | 9.45 | 0.71 | 18.70 | 3.21 |

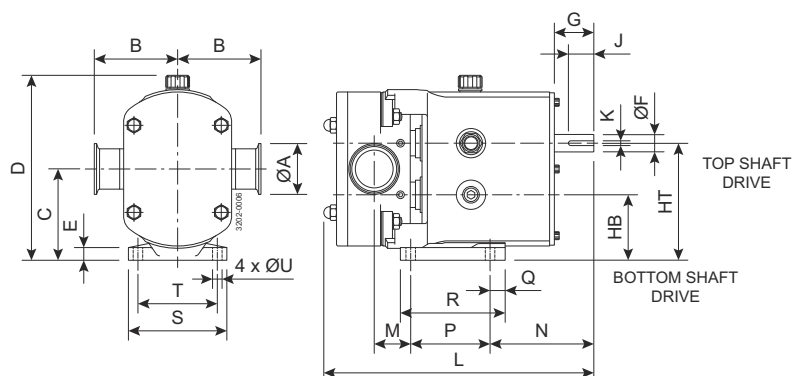


Figure 2. Horizontally ported

All dimensions in inches, except where noted

| PUMP | A | B | C | D | E | F | G | HB | HT | J | K | L | M | N | P | Q | R | S | T | U |
|---------|------|------|-------|-------|------|------|------|------|-------|------|------|-------|------|-------|-------|------|-------|-------|------|------|
| SX1NLD | 1.00 | 3.74 | 3.54 | 7.40 | 0.39 | 0.63 | 1.57 | 2.62 | 4.47 | 1.18 | 0.20 | 11.14 | 1.16 | 4.61 | 3.15 | 0.98 | 4.53 | 3.94 | 3.15 | 0.39 |
| SX1WLD | 1.50 | 3.74 | 3.54 | 7.40 | 0.39 | 0.63 | 1.57 | 2.62 | 4.47 | 1.18 | 0.20 | 11.65 | 1.69 | 4.61 | 3.15 | 0.98 | 4.53 | 3.94 | 3.15 | 0.39 |
| SX2NLD | 1.50 | 4.13 | 4.53 | 9.17 | 0.63 | 0.87 | 1.97 | 3.25 | 5.81 | 1.26 | 0.24 | 12.87 | 1.52 | 5.16 | 3.94 | 0.75 | 5.20 | 4.88 | 3.94 | 0.47 |
| SX2WLD | 2.00 | 4.13 | 4.53 | 9.17 | 0.63 | 0.87 | 1.97 | 3.25 | 5.81 | 1.26 | 0.24 | 13.50 | 1.79 | 5.16 | 3.94 | 0.75 | 5.20 | 4.88 | 3.94 | 0.47 |
| SX3NLD | 2.00 | 4.92 | 5.43 | 10.75 | 0.71 | 1.1 | 2.36 | 3.96 | 6.91 | 1.57 | 0.31 | 17.09 | 2.74 | 6.89 | 4.92 | 1.18 | 7.13 | 6.06 | 4.92 | 0.55 |
| SX3WLD | 2.50 | 4.92 | 5.43 | 10.75 | 0.71 | 1.1 | 2.36 | 3.96 | 6.91 | 1.57 | 0.31 | 17.72 | 2.95 | 6.89 | 4.92 | 1.18 | 7.13 | 6.06 | 4.92 | 0.55 |
| SX4NLD | 2.00 | 5.91 | 6.42 | 12.80 | 0.79 | 1.5 | 3.15 | 4.47 | 8.37 | 2.48 | 0.39 | 20.35 | 2.95 | 8.81 | 5.91 | 1.38 | 7.95 | 7.24 | 5.91 | 0.55 |
| SX4WLD | 2.50 | 5.91 | 6.42 | 12.80 | 0.79 | 1.5 | 3.15 | 4.47 | 8.37 | 2.48 | 0.39 | 21.10 | 3.21 | 8.81 | 5.91 | 1.38 | 7.95 | 7.24 | 5.91 | 0.55 |
| SX5NLD | 2.50 | 6.89 | 7.68 | 15.04 | 0.87 | 1.77 | 4.33 | 5.31 | 10.04 | 2.76 | 0.55 | 23.70 | 2.60 | 10.98 | 7.09 | 1.38 | 9.45 | 8.27 | 7.09 | 0.55 |
| SX5WLD | 3.00 | 6.89 | 7.68 | 15.04 | 0.87 | 1.77 | 4.33 | 5.31 | 10.04 | 2.76 | 0.55 | 24.80 | 3.37 | 10.98 | 7.09 | 1.38 | 9.45 | 8.27 | 7.09 | 0.55 |
| SX6NLD | 3.00 | 7.48 | 8.86 | 17.17 | 0.87 | 1.89 | 4.33 | 6.10 | 11.61 | 2.76 | 0.55 | 28.20 | 3.07 | 10.51 | 10.2 | 0.79 | 11.81 | 8.66 | 7.48 | 0.55 |
| SX6WLD | 4.00 | 7.48 | 8.86 | 17.17 | 0.87 | 1.89 | 4.33 | 6.10 | 11.61 | 2.76 | 0.55 | 28.31 | 3.54 | 10.51 | 10.2 | 0.79 | 11.81 | 8.66 | 7.48 | 0.55 |
| SX7/NLD | 3.94 | 8.07 | 10.89 | 20.63 | 1.06 | 2.36 | 4.33 | 7.68 | 14.09 | 3.54 | 0.71 | 30.20 | 3.90 | 10.75 | 11.42 | 0.98 | 13.39 | 11.42 | 9.45 | 0.71 |
| SX7/WLD | 5.91 | 8.07 | 10.89 | 20.63 | 1.06 | 2.36 | 4.33 | 7.68 | 14.09 | 3.54 | 0.71 | 32.32 | 4.96 | 10.75 | 11.42 | 0.98 | 13.39 | 11.42 | 9.45 | 0.71 |

This document and its contents are subject to copyrights and other intellectual property rights owned by Alfa Laval Corporate AB. No part of this document may be copied, re-produced or transmitted in any form or by any means, or for any purpose, without Alfa Laval Corporate AB's prior express written permission. Information and services provided in this document are made as a benefit and service to the user, and no representations or warranties are made about the accuracy or suitability of this information and these services for any purpose. All rights are reserved.

200006104-1-EN-US

© Alfa Laval Corporate AB

How to contact Alfa Laval

Up-to-date Alfa Laval contact details for all countries are always available on our website at www.alfalaval.com

DISTRIBUTED BY
HARCO
ENTERPRISES LTD.
1-800-361-5361

