

# Alfa Laval DuraCirc

## Circumferential Piston Pump

### Introduction

The Alfa Laval DuraCirc delivers the perfect balance of durability, reliability, high efficiency and superior hygienic performance. Combined with design features enabling simple service, the DuraCirc keeps process running. In addition to a class leading range of flow and pressure capabilities, DuraCirc comes with globally recognized hygienic certification. The innovative design also includes features that make cleaning and maintenance faster, easier and more dependable.

### Applications

Designed for Cleaning-in-Place (CIP), the Alfa Laval DuraCirc is ideal for hygienic applications within the dairy, food, beverage, home and personal care industries. The highly efficient design is particularly suited to applications that are low in viscosity with medium to high discharge pressures and require equipment that can be cleaned in place.

The DuraCirc Circumferential Piston Pump is available with 13 different pump head displacements to handle flow rates up to 656 US gpm and differential pressures up to 40 bar.

### Benefits

- DuraCirc Hi-Life rotors provides high efficiency while eliminating contact to casing thus increasing pump life.
- Certified to both EHEDG and 3A, reducing both process cross contamination risk and CIP cycle time, maintaining process yield as well as cutting cleaning costs.
- Truly front-loading single seal, full component interchangeability without complicated maintenance procedures, long life bearing operation and one single long-life lubricant making service faster and easier, increasing process uptime.
- Robust, durable design via strong gearcase incorporating increased diameter shafts and optimally positioned heavy-duty bearings, minimizes risk of pump head contact, reducing service requirement, maintaining process continuity.
- DuraCirc Uni-Fit port option allows easy direct replacement of other major brands into existing process systems, without changing pipework.



### Standard design

Twin-wing Hi-Life piston rotors made of special non-galling alloy are standard. All other media contacting steel components, like the rotor case, front cover and rotor nuts are in W. 1.4404 (AISI 316L). With stainless steel gear case and feet, the DuraCirc pump has an all stainless steel exterior, making it exceptional corrosion resistant.

The gearbox is as standard designed with duplex shafts and a strong, long life bearing arrangement. This provides for a very robust and rigid shaft assembly design – a prerequisite for the very high volumetric efficiency achieved.

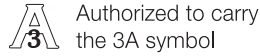
With profiled defined compression elastomers and an optimised shaft seal location, the DuraCirc is designed according to the most stringent hygienic design standards and with verified and effective CIP cleanability.

The pump features a front-loading single mechanical seal, which allows quick and easy inspection or replacement

without the need to disassemble pipework. Single flushed and double mechanical shaft seals as well as O-ring seals are available as options.

The Alfa Laval DuraCirc 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.

partial vacuum at the suction port as the rotors unmesh, causing fluid to enter the pump. The fluid is transported around the channel by the rotor pistons, and is displaced as the rotor pistons re-mesh, generating pressure at the discharge port. The direction of flow is reversible.



### Working principle

The rotor pistons rotate around the circumference of the channel in the pump casing. This continuously generates a

### Technical data

#### Standard specification

|                                   |                                     |
|-----------------------------------|-------------------------------------|
| Piston rotors:                    | DuraCirc Hi-Life, Non-Galling Alloy |
| Other product wetted steel parts: | W. 1.4404 (316L)                    |
| Inside surface finish:            | Mech Ra ≤ 0.8                       |
| Shafts:                           | Duplex 1.4460 (329)                 |
| Gear box:                         | Stainless steel                     |
| Base plate:                       | Stainless steel                     |
| Coupling guard:                   | Stainless steel                     |
| Product wetted elastomers:        | EPDM                                |
| Other elastomers:                 | FPM                                 |
| Shaft seal:                       | Single mechanical                   |
| Rotary seal face:                 | Silicon Carbide                     |
| Stationary seal face:             | Carbon                              |

#### Shaft seals

Single mechanical, single mechanical with flush, double mechanical and single and flushed O-ring seal available.

|  |                      |
|--|----------------------|
| Max process pressure, mechanical seal, SiC/Car:      | 217 PSI              |
| Max process pressure, mechanical seal, SiC/SiC:      | Max pressure of pump |
| Max flush pressure, single flush:                    | 7.25 PSI             |
| Max flush pressure, double mechanical seal, SiC/Car: | 232 PSI              |
| Max flush pressure, double mechanical seal, SiC/SiC: | 290 PSI              |
| Max process pressure, O-ring seal:                   | 102 PSI              |
| Max flush pressure, O-ring seal:                     | 7.25 PSI             |
| Flush water consumption:                             | 7 gallon/hour        |
| Flush connections, DuraCirc 32-43:                   | NPT 1/8"             |
| Flush connections, DuraCirc 52-74:                   | NPT 1/4"             |

#### Temperature

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

#### Motors

Gear motor, 4 poles, to Nema standard, premium efficiency, suitable for frequency conversion.

#### Warranty

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

### Process data

| Pump Model | Displacement |                  |                 | Inlet/Outlet |      | Diff. Pressure |     | Max speed |
|------------|--------------|------------------|-----------------|--------------|------|----------------|-----|-----------|
|            | Litres/rev   | Imp gall/100 rev | US gall/100 rev | mm           | inch | Bar            | PSI | rpm       |
| 32         | 0,03         | 0.66             | 0.79            | 25           | 1    | 25             | 362 | 1000      |
| 33         | 0,06         | 1.32             | 1.58            | 40           | 1½   | 25             | 362 | 1000      |
| 34         | 0,12         | 2.64             | 3.17            | 50           | 2    | 16             | 232 | 1000      |
| 42         | 0,23         | 5.06             | 6.07            | 50           | 2    | 20             | 290 | 750       |
| 43         | 0,29         | 6.38             | 7.66            | 50           | 2    | 13             | 188 | 750       |
| 52         | 0,38         | 8.36             | 10.03           | 50           | 2    | 37             | 536 | 750       |



| Pump Model | Displacement |                  |                 | Inlet/Outlet |      | Diff. Pressure |     | Max speed |
|------------|--------------|------------------|-----------------|--------------|------|----------------|-----|-----------|
|            | Litres/rev   | Imp gall/100 rev | US gall/100 rev | mm           | inch | Bar            | PSI | rpm       |
| 53         | 0,59         | 12.97            | 15.57           | 65           | 2½   | 25             | 362 | 750       |
| 54         | 0,96         | 21.12            | 25.3            | 80           | 3    | 16             | 232 | 750       |
| 62         | 1,44         | 31.67            | 38.04           | 80           | 3    | 37             | 536 | 600       |
| 63         | 1,97         | 43.33            | 52.03           | 100          | 4    | 25             | 362 | 600       |
| 72         | 1,92         | 42.23            | 50.7            | 100          | 4    | 40             | 580 | 600       |
| 73         | 2,86         | 62.91            | 75.55           | 150          | 6    | 25             | 362 | 600       |
| 74         | 4,14         | 91.1             | 109.4           | 150          | 6    | 16             | 232 | 600       |

### Dimensions

(inch)

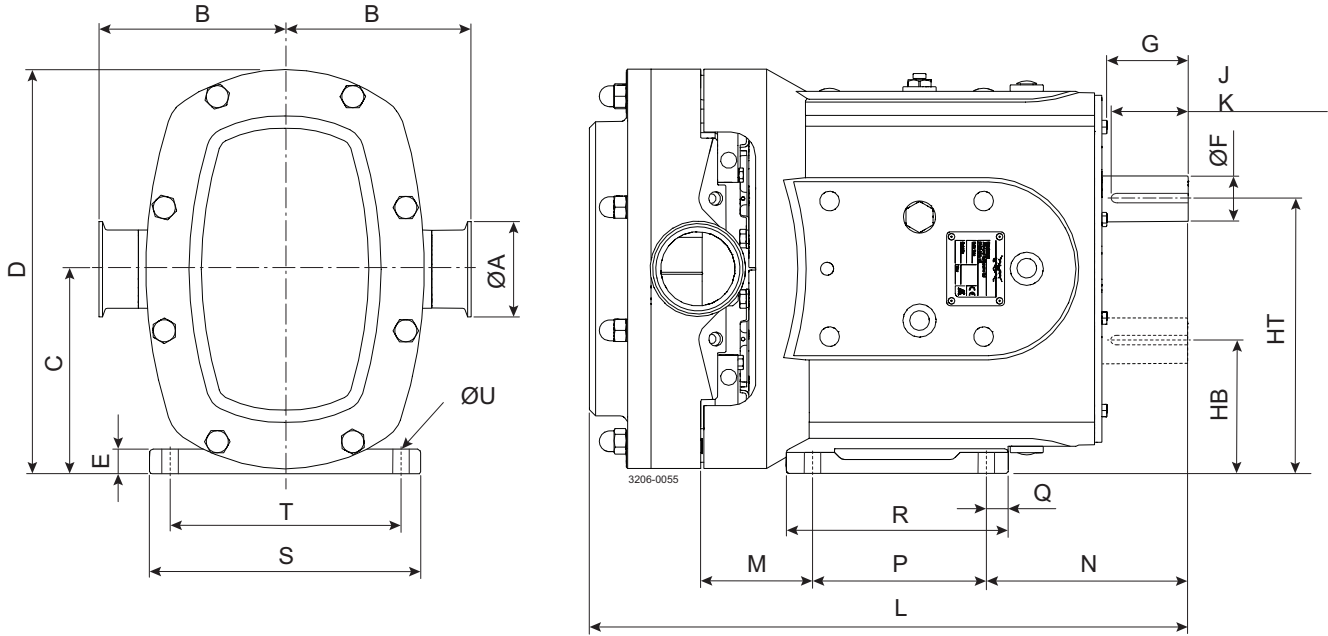


Figure1. Horizontally ported

ØU = 4 Holes

J = Key Length

K = Key Width

### DuraCirc Uni-Fit dimensions

| Pump Model | A   | B   | C    | D    | E   | F   | G   | HB  | HT   | J   | K   | L    | M   | N   | P   | Q   | R    | S    | T   | U   |
|------------|-----|-----|------|------|-----|-----|-----|-----|------|-----|-----|------|-----|-----|-----|-----|------|------|-----|-----|
| 32         | 1.0 | 3.5 | 4.2  | 8.3  | 0.5 | 0.9 | 1.7 | 3.2 | 5.9  | 1.3 | 0.2 | 13.0 | 2.0 | 4.9 | 3.9 | 1.0 | 5.5  | 5.9  | 4.9 | 0.5 |
| 33         | 1.5 | 3.5 | 4.2  | 8.3  | 0.5 | 0.9 | 1.7 | 3.2 | 5.9  | 1.3 | 0.2 | 13.2 | 2.0 | 4.9 | 3.9 | 1.0 | 5.5  | 5.9  | 4.9 | 0.5 |
| 34         | 1.5 | 3.5 | 4.2  | 8.3  | 0.5 | 0.9 | 1.7 | 3.2 | 5.9  | 1.3 | 0.2 | 14.0 | 2.4 | 4.9 | 3.9 | 1.0 | 5.5  | 5.9  | 4.9 | 0.5 |
| 42         | 1.5 | 4.3 | 5.2  | 10.3 | 0.4 | 1.1 | 2.2 | 3.5 | 6.9  | 1.6 | 0.3 | 16.3 | 2.8 | 5.5 | 4.9 | 0.6 | 6.2  | 7.3  | 6.0 | 0.6 |
| 43         | 2.0 | 4.3 | 5.2  | 10.3 | 0.4 | 1.1 | 2.2 | 3.5 | 6.9  | 1.6 | 0.3 | 16.6 | 3.2 | 5.5 | 4.9 | 0.6 | 6.2  | 7.3  | 6.0 | 0.6 |
| 52         | 2.0 | 5.4 | 7.3  | 13.7 | 1.6 | 1.5 | 2.6 | 4.2 | 8.7  | 2.5 | 0.4 | 18.6 | 3.3 | 6.6 | 5.5 | 0.9 | 7.1  | 8.7  | 7.5 | 0.6 |
| 53         | 2.5 | 5.4 | 7.3  | 13.7 | 1.6 | 1.5 | 2.6 | 4.2 | 8.7  | 2.5 | 0.4 | 19.1 | 3.5 | 6.6 | 5.5 | 0.9 | 7.1  | 8.7  | 7.5 | 0.6 |
| 54         | 3.0 | 5.4 | 7.3  | 13.7 | 1.6 | 1.5 | 2.6 | 4.2 | 8.7  | 2.5 | 0.4 | 20.2 | 4.4 | 6.6 | 5.5 | 0.9 | 7.1  | 8.7  | 7.5 | 0.6 |
| 62         | 3.0 | 6.3 | 9.4  | 17.2 | 2.3 | 1.8 | 3.3 | 4.9 | 10.8 | 2.8 | 0.6 | 23.1 | 4.6 | 7.8 | 6.3 | 1.0 | 8.8  | 9.8  | 8.5 | 0.6 |
| 63         | 4.0 | 6.3 | 9.4  | 17.2 | 2.3 | 1.8 | 3.3 | 4.9 | 10.8 | 2.8 | 0.6 | 23.9 | 4.9 | 7.8 | 6.3 | 1.0 | 8.8  | 9.8  | 8.5 | 0.6 |
| 72         | 4.0 | 7.4 | 10.4 | 19.8 | 1.7 | 2.4 | 4.1 | 6.0 | 9.1  | 3.5 | 0.7 | 27.6 | 4.3 | 9.7 | 8.5 | 0.8 | 10.9 | 11.0 | 9.7 | 0.6 |
| 73         | 6.0 | 8.0 | 10.4 | 19.8 | 1.7 | 2.4 | 4.1 | 6.0 | 9.1  | 3.5 | 0.7 | 28.5 | 4.8 | 9.7 | 8.5 | 0.8 | 10.9 | 11.0 | 9.7 | 0.6 |
| 74         | 6.0 | 8.5 | 10.4 | 19.8 | 1.7 | 2.4 | 4.1 | 6.0 | 9.1  | 3.5 | 0.7 | 29.9 | 5.7 | 9.7 | 8.5 | 0.8 | 10.9 | 11.0 | 9.7 | 0.6 |



**Note!** DuraCirc Uni-Fit is an option to meet port to port and port height dimensions of other major brands.



**CSI**

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### DuraCirc standard dimensions

| Pump Model | A   | B   | C   | D    | E   | F   | G   | HB  | HT   | J   | K   | L    | M   | N   | P   | Q   | R    | S    | T   | U   |
|------------|-----|-----|-----|------|-----|-----|-----|-----|------|-----|-----|------|-----|-----|-----|-----|------|------|-----|-----|
| 32         | 1.0 | 4.1 | 4.5 | 8.7  | 0.5 | 0.9 | 1.7 | 3.2 | 5.9  | 1.3 | 0.2 | 13.0 | 2.0 | 4.9 | 3.9 | 1.0 | 5.5  | 5.9  | 4.9 | 0.5 |
| 33         | 1.5 | 4.1 | 4.5 | 8.7  | 0.5 | 0.9 | 1.7 | 3.2 | 5.9  | 1.3 | 0.2 | 13.2 | 2.0 | 4.9 | 3.9 | 1.0 | 5.5  | 5.9  | 4.9 | 0.5 |
| 34         | 2.0 | 4.1 | 4.5 | 8.7  | 0.5 | 0.9 | 1.7 | 3.2 | 5.9  | 1.3 | 0.2 | 13.9 | 2.4 | 4.9 | 3.9 | 1.0 | 5.5  | 5.9  | 4.9 | 0.5 |
| 42         | 2.0 | 4.9 | 5.2 | 10.3 | 0.4 | 1.1 | 2.2 | 3.5 | 6.9  | 1.6 | 0.3 | 16.3 | 2.8 | 5.5 | 4.9 | 0.6 | 6.2  | 7.3  | 6.1 | 0.6 |
| 43         | 2.0 | 4.9 | 5.2 | 10.3 | 0.4 | 1.1 | 2.2 | 3.5 | 6.9  | 1.6 | 0.3 | 16.6 | 3.2 | 5.5 | 4.9 | 0.6 | 6.2  | 7.3  | 6.1 | 0.6 |
| 52         | 2.0 | 5.9 | 6.4 | 12.8 | 0.7 | 1.5 | 2.6 | 4.2 | 8.7  | 2.5 | 0.4 | 18.6 | 3.3 | 6.6 | 5.5 | 0.9 | 7.1  | 8.7  | 7.5 | 0.6 |
| 53         | 2.5 | 5.9 | 6.4 | 12.8 | 0.7 | 1.5 | 2.6 | 4.2 | 8.7  | 2.5 | 0.4 | 19.1 | 3.5 | 6.6 | 5.5 | 0.9 | 7.1  | 8.7  | 7.5 | 0.6 |
| 54         | 3.0 | 6.3 | 6.4 | 12.8 | 0.7 | 1.5 | 2.6 | 4.2 | 8.7  | 2.5 | 0.4 | 20.2 | 4.4 | 6.6 | 5.5 | 0.9 | 7.1  | 8.7  | 7.5 | 0.6 |
| 62         | 3.0 | 7.3 | 7.9 | 15.7 | 0.8 | 1.8 | 3.3 | 4.9 | 10.8 | 2.8 | 0.6 | 23.1 | 4.6 | 7.8 | 6.3 | 1.0 | 8.8  | 9.8  | 8.5 | 0.6 |
| 63         | 4.0 | 7.3 | 7.9 | 15.7 | 0.8 | 1.8 | 3.3 | 4.9 | 10.8 | 2.8 | 0.6 | 23.9 | 4.9 | 7.8 | 6.3 | 1.0 | 8.8  | 9.8  | 8.5 | 0.6 |
| 72         | 4.0 | 8.0 | 9.5 | 18.9 | 0.9 | 2.4 | 4.1 | 6.0 | 13.0 | 3.5 | 0.7 | 27.6 | 4.3 | 9.7 | 8.5 | 0.8 | 10.9 | 11.0 | 9.7 | 0.6 |
| 73         | 6.0 | 8.0 | 9.5 | 18.9 | 0.9 | 2.4 | 4.1 | 6.0 | 13.0 | 3.5 | 0.7 | 28.5 | 4.8 | 9.7 | 8.5 | 0.8 | 10.9 | 11.0 | 9.7 | 0.6 |
| 74         | 6.0 | 8.0 | 9.5 | 18.9 | 0.9 | 2.4 | 4.1 | 6.0 | 13.0 | 3.5 | 0.7 | 29.9 | 5.7 | 9.7 | 8.5 | 0.8 | 10.9 | 11.0 | 9.7 | 0.6 |

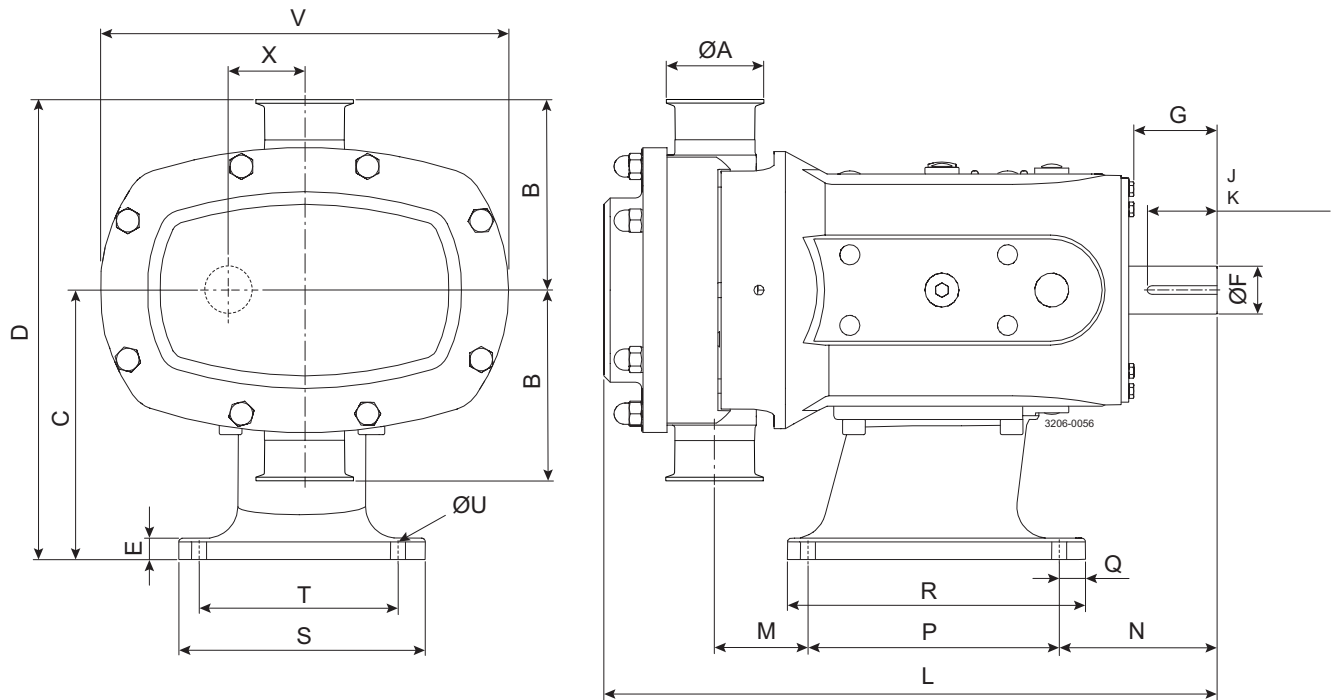


Figure2. Vertically ported

ØU = 4 Holes  
 J = Key Length  
 K = Key Width

### DuraCirc standard dimensions

| Pump Model | A   | B   | C    | D    | E   | F   | G   | J   | K   | L    | M   | N    | P   | Q   | R    | S   | T   | U   | V    | X   |
|------------|-----|-----|------|------|-----|-----|-----|-----|-----|------|-----|------|-----|-----|------|-----|-----|-----|------|-----|
| 32         | 1.0 | 4.1 | 5.8  | 9.9  | 0.5 | 0.9 | 1.7 | 1.3 | 0.2 | 13.0 | 2.0 | 4.9  | 4.0 | 1.6 | 6.3  | 5.1 | 4.0 | 0.5 | 8.0  | 1.3 |
| 33         | 1.5 | 4.1 | 5.8  | 9.9  | 0.5 | 0.9 | 1.7 | 1.3 | 0.2 | 13.2 | 2.0 | 4.9  | 4.0 | 1.6 | 6.3  | 5.1 | 4.0 | 0.5 | 8.0  | 1.3 |
| 34         | 2.0 | 4.1 | 5.8  | 9.9  | 0.5 | 0.9 | 1.7 | 1.3 | 0.2 | 13.9 | 2.4 | 4.9  | 4.0 | 1.6 | 6.3  | 5.1 | 4.0 | 0.5 | 8.0  | 1.3 |
| 42         | 2.0 | 4.9 | 6.9  | 11.8 | 0.6 | 1.1 | 2.2 | 1.6 | 0.3 | 16.3 | 2.0 | 5.1  | 6.1 | 1.9 | 8.7  | 6.3 | 4.9 | 0.6 | 10.0 | 1.7 |
| 43         | 2.0 | 4.9 | 6.9  | 11.8 | 0.6 | 1.1 | 2.2 | 1.6 | 0.3 | 16.6 | 2.4 | 5.1  | 6.1 | 1.9 | 8.7  | 6.3 | 4.9 | 0.6 | 10.0 | 1.7 |
| 52         | 2.0 | 5.9 | 8.4  | 14.3 | 0.7 | 1.5 | 2.6 | 2.5 | 0.4 | 18.6 | 2.4 | 5.2  | 7.9 | 0.7 | 9.1  | 7.5 | 5.9 | 0.6 | 12.8 | 2.2 |
| 53         | 2.5 | 5.9 | 8.4  | 14.3 | 0.7 | 1.5 | 2.6 | 2.5 | 0.4 | 19.1 | 2.6 | 5.2  | 7.9 | 0.7 | 9.1  | 7.5 | 5.9 | 0.6 | 12.8 | 2.2 |
| 54         | 3.0 | 6.3 | 8.4  | 14.6 | 0.7 | 1.5 | 2.6 | 2.5 | 0.4 | 20.2 | 3.5 | 5.2  | 7.9 | 0.7 | 9.1  | 7.5 | 5.9 | 0.6 | 12.8 | 2.2 |
| 62         | 3.0 | 7.3 | 10.1 | 17.4 | 0.7 | 1.8 | 3.3 | 2.8 | 0.6 | 23.1 | 3.3 | 19.2 | 7.9 | 1.7 | 10.2 | 8.7 | 7.1 | 0.6 | 15.6 | 3.0 |
| 63         | 4.0 | 7.3 | 10.1 | 17.4 | 0.7 | 1.8 | 3.3 | 2.8 | 0.6 | 23.9 | 3.6 | 19.2 | 7.9 | 1.7 | 10.2 | 8.7 | 7.1 | 0.6 | 15.6 | 3.0 |



| Pump Model | A   | B   | C    | D    | E   | F   | G   | J   | K   | L    | M   | N   | P    | Q   | R    | S   | T   | U   | V    | X   |
|------------|-----|-----|------|------|-----|-----|-----|-----|-----|------|-----|-----|------|-----|------|-----|-----|-----|------|-----|
| 72         | 4.0 | 8.0 | 11.6 | 19.6 | 0.8 | 2.4 | 4.1 | 3.5 | 0.7 | 27.6 | 3.8 | 8.4 | 10.2 | 1.2 | 12.2 | 9.8 | 8.3 | 0.6 | 18.7 | 3.5 |
| 73         | 6.0 | 8.0 | 11.6 | 19.6 | 0.8 | 2.4 | 4.1 | 3.5 | 0.7 | 28.5 | 4.3 | 8.4 | 10.2 | 1.2 | 12.2 | 9.8 | 8.3 | 0.6 | 18.7 | 3.5 |
| 74         | 6.0 | 8.0 | 11.6 | 19.6 | 0.8 | 2.4 | 4.1 | 3.5 | 0.7 | 29.9 | 5.2 | 8.4 | 10.2 | 1.2 | 12.2 | 9.8 | 8.3 | 0.6 | 18.7 | 3.5 |

## Options

- Silicon Carbide/Silicon Carbide mechanical seal faces.
- Single mechanical shaft seal with flush.
- Double mechanical shaft seal.
- EDPM or FPM O-ring seal, single and flushed.
- Product wetted elastomers in FPM or FFPM.
- High efficiency Hi-Flow rotor.
- Horizontal or vertical porting.
- Heating and cooling jacket.
- Rectangular inlet.
- Aseptic option (see separate data sheet)
- Stainless steel shroud covering coupling and motor.
- Baseplate fitted with adjustable stainless steel ball feet.

## Pump sizing

In order to correctly size a circumferential piston 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
- 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

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CSI

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