

Johnson Pump (UK)

rotary lobe pumps



**VEDDER** 

Solutions in Pumping Technology

# Johnson Pump (UK) rotary lobe pumps



Rotary lobe pumps are used in a variety of industries including pulp and paper, chemical, food, beverage, pharmaceutical, and biotechnology. They are popular in these diverse industries because they offer superb hygienic qualities, high efficiency, reliability, corrosion resistance and good clean-in-place and sterilize-in-place (CIP/SIP) characteristics.

Rotary lobe pumps can handle solids (e.g., fruit pieces and meat cubes), slurries, pastes, and a variety of liquids. If wetted, they offer self-priming performance. A gentle pumping action minimizes product degradation. They also offer continuous and intermittent reversible flows and can operate dry for brief periods of time. Flow is relatively independent of changes in process pressure, too, so output is constant and continuous

## Working principle



The pumping action of the rotary lobe pump principle is generated by the contra rotation of two pumping elements (rotors) within a chamber (rotorcase). The rotors are located on shafts, which in turn are mounted within an external gearbox and supported by the bearings; the timing gears are also located on the shafts. The timing gears transfer the energy from the drive shaft to the driven shaft, synchronising the rotors such that they rotate without contact with each other. As the rotors pass the suction port, see Fig 5a, the cavity generated increases creating a pressure decrease, which induces the pumped medium to flow into the rotorcase.



The pumped medium is carried around the rotorcase by the rotors to the discharge side of the pump. Here the cavity decreases and the pumped medium is discharged from the rotorcase.



# Rotary lobe pumps, model Classic+



The NEW Classic+ combines a proven design with innovative features to produce a lobe pump ideally suited for today's demanding applications requiring a traditional lobe pump.

With 316L Stainless Steel product-wetted parts, hygienic design, and low-shear flow, the Classic+ meets the demand for high product quality, reliability, and service. Being of a design proven over many years, the Classic+ offers superior reliability in a wide range of applications.

Designed and manufactured using the latest computer aided design, manufacture, test, and inspection techniques, several innovative Johnson features have been incorporated within the product. These result in the Classic+ range being ideally suited to both continuous and intermittent transfer or process applications, offering a wide range of displacements. Every Classic+ model offers smooth flow, positive self priming pumping action, dry running, and reverse flow ability with low agitation or shear.

Classic+ has the benefit of being universal mounting.



## Advantages

- ATEX compliant
- Tri-lobe or multi-lobe rotor forms
- Flush rotor retention
- Hygienic flush front cover design
- Universal mounting with bolt on feet
- Easy to change shaft and port orientation
- Self draining when ports vertical
- Low shear
- Externally mounted shaft seals
- Operates in either direction
- Protected front oil seals, prevents ingress of water from pressure washers
- Simple to maintain

## Technical details

Flow range	: 205 m <sup>3</sup> /h
Differential pressure	: up to 15 bar +
Viscosity	: up to 250.000 cP
Temperature	: up to 150 °C

## Characteristics

- Classic rotary lobe pump design
- Mechanical seals or simple 'O' ring seal
- Standard 0.8µm Ra machine finish
- Enhanced surface finishes available
- Scratch resistant powder coated finish on CP10 - CP30
- Two pack epoxy finish on CP40 & CP50
- FDA 3-A approval

## Material selection

Standard materials wetted parts	SS 316L
Standard housing materials	SS 316L

## Optional

- Wetted parts in Hastelloy C22 and other materials
- Seals with Perfluorolastomer elastomers
- ATEX compliant pumps
- Special drive sets for stringent and hazardous applications



## Key features of the Classic+ Series

### ■ Versatility and safety

For maximum flexibility, the feet of the pump may be removed and re-set to change the drive and port orientation to operate with the ports in a horizontal or a vertical position or to accommodate a top or bottom shaft drive. For heat sensitive applications, jackets may be fitted to the rotorcase and/or front cover to either heat or cool the pump head. To protect the pump, a spring or air loaded relief valve may be fitted to the front cover. This can be set on site to protect the pump from over pressurisation and is available with air operation for automated CIP processes.

### ■ Stays cleaner

Hygienically designed, it produces a gentle pumping action for delicate liquids with soft solids as found in the food industry. The robust, stainless steel construction is suited to the aggressive slurries and pastes of the chemical industry. For hygiene and corrosion resistance all product-wetted parts are manufactured from AISI 316L (DIN1.4404) stainless steel.

### ■ Easier maintenance

The mechanical seals are of cartridge design with the rotary seat retention isolated from the pumped medium giving improved operation and easier assembly, setting and maintenance. Available in single, flushed or double seal configurations, all seal combinations use the same component wearing parts.

### ■ Flow ranges

Model	Litres /rev.	Pressure Bar	Port Ø mm	Max Speed rpm
CP10/0005/12	0.046	12	25	1400
CP10/0008/08	0.083	8	40	1400
CP10/0011/05	0.111	5	40	1400
CP20/0020/12	0.202	12	40	1000
CP20/0031/07	0.313	7	50	1000
CP30/0069/12	0.694	12	50	750
CP30/0113/07	1.125	7	80	750
CP40/0180/12	1.800	12	80	700
CP40/0250/07	2.500	7	100	700
CP50/0351/12	3.514	12	100	650
CP50/0525/08	5.250	8	150	650

## Application areas

### ■ Fresh Organic Soups

For the smooth handling of florets of cauliflower and broccoli, whole beans and pulses, tomatoes and tofu to make the finest fresh soups.

### ■ Personal Care Products

Many personal care products are very sensitive, some, like toothpastes are abrasive, others, like mascara are very, very thick and sticky.

### ■ Chocolate

Handled badly, the texture and taste of chocolate can easily change; chocolate needs low shear and a constant temperature. This requires a certain 'know-how'. A Johnson Pump offers both.

### ■ Dairy Cream

Hygiene is one of the most important factors in the dairy industry, so is the knowledge of product handling. Dairy creams require different handling solutions according to the fat content and pumping temperature.

### ■ Pet Foods

We can offer pumps with special hardened internals to handle everything from the raw ingredients such as chicken viscera and fats, to the finished gravies and sauces.

### ■ Culinary Sauces

Almost all culinary sauces such as finished cook-in sauces, condiment sauces such as mustard, horseradish and mint, through to apple and cranberry sauces. Shear sensitive pumping is an absolute requirement for the products.

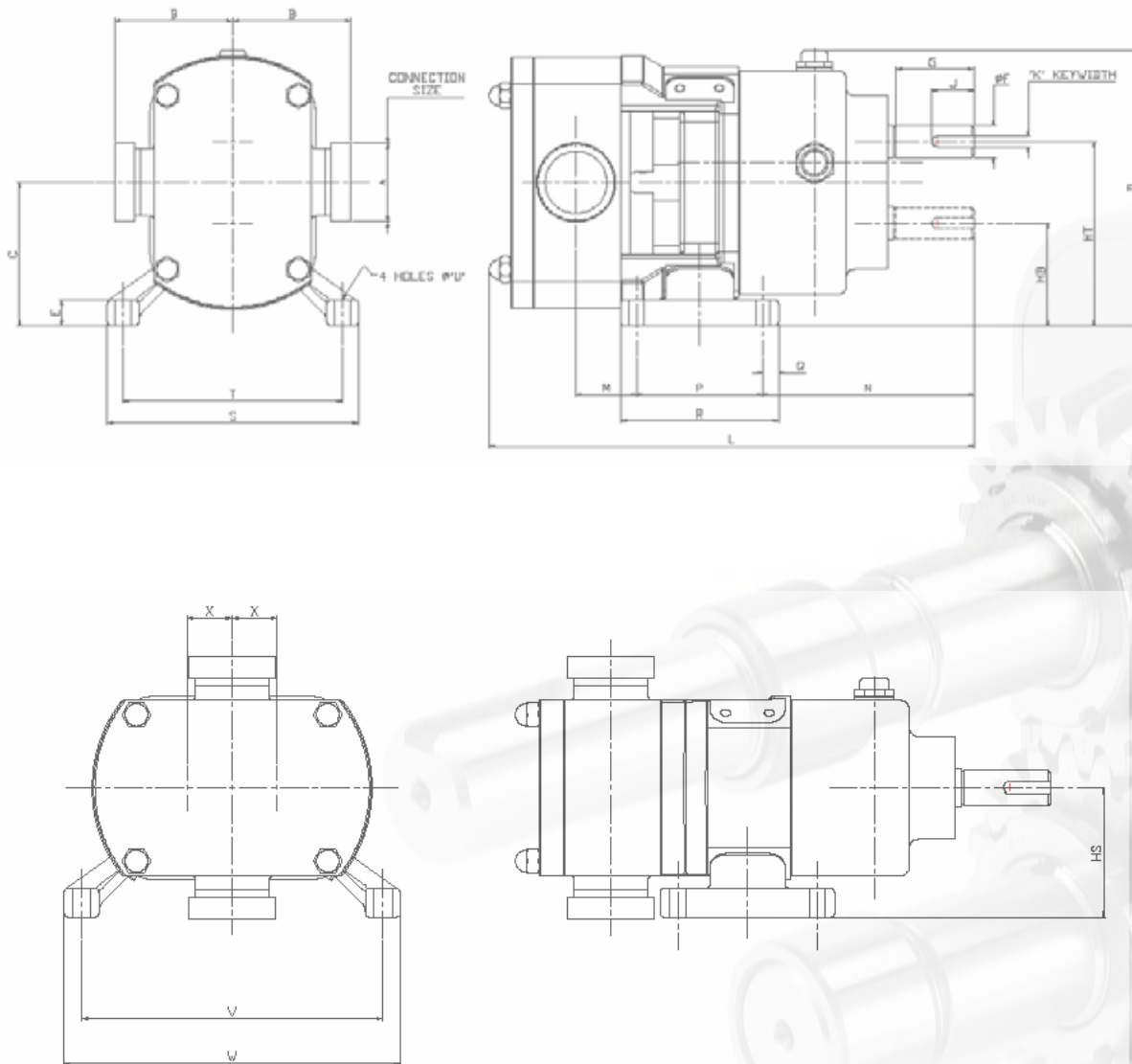
### ■ Pharmacy

For pumping inhalants to cough syrups, injectables to creams

### ■ Chemical industry

Almost all chemicals can be pumped without problems

## Dimensions



Millimetres MODEL	A	B1	B2	B3	B4	B5	C	D	E	F (mm)	G	HB	HS	HT	J	K (mm)	L	M	N	P	Q	R	S	T	U	V	W	X	Weight (Kg)
CP10/0005	25	89	89	103	103	103	74	157	10	18 j6	28	48	63	100	25	6	249	47.5	116.4	45	10	65	146	126	8.5	162.5	183	26	13
CP10/0008	40	89	111	103	103	103	74	157	10	18 j6	28	48	63	100	25	6	264	54.5	116.4	45	10	65	146	126	8.5	162.5	183	26	14
CP10/0011	40	89	111	103	103	103	74	157	10	18 j6	28	48	63	100	25	6	276	65.5	116.4	45	10	65	146	126	8.5	162.5	183	26	15
CP20/0020	40	98	120	112	112	112	109	219	20	24 j6	59	78	88.75	140	32	8	349	35	160.5	96	12	120	195	167	11	207.5	235.5	31	28
CP20/0031	50	98	120	112	112	120	109	219	20	24 j6	59	78	88.75	140	32	8	369	46	160.5	96	12	120	195	167	11	207.5	235.5	31	31
CP30/0069	50	124	146	138	138	146	133.5	272	25	38 k6	69.5	87	111.3	180	40	10	443	60.6	196.5	115	15	145	258	228	13	272.3	302.3	46.5	71
CP30/0113	80	124	156	138	146	151	133.5	272	25	38 k6	69.5	87	111.3	180	40	10	478	80.6	196.5	115	15	145	258	228	13	272.3	302.3	46.5	77
CP40/0180 Horizontal	80	159	191	173	181	186	177	343	23	48 k6	110	114	175	240	90	14	647	163	262.8	120	22.5	165	220	184	18	-	-	63	150
CP40/0180 Vertical	80	159	191	173	181	186	177	343	23	48 k6	110	114	175	240	90	14	647	131	230.75	184	18	220	-	-	18	228	273	63	150
CP40/0250 Horizontal	100	163	206	173	181	186	177	343	23	48 k6	110	114	175	240	90	14	679	181.3	262.8	120	22.5	165	220	184	18	-	-	63	150
CP40/0250 Vertical	100	163	206	173	181	186	177	343	23	48 k6	110	114	175	240	90	14	679	149.5	230.75	184	18	220	-	-	18	228	273	63	162
CP50/0351 Horizontal	100	188	235	210	210	215	215	422	30	60 m6	104	135	205	295	59	18	755	212	285	150	25	200	260	220	20	-	-	80	252
CP50/0351 Vertical	100	188	235	210	210	215	215	422	30	60 m6	104	135	205	295	59	18	755	168	241	238	20	278	-	-	20	250	300	80	252
CP50/0525 Horizontal	150	N/A	N/A	182	182	N/A	215	422	30	60 m6	104	135	205	295	59	18	815	240	285	150	25	200	260	220	20	-	-	80	274
CP50/0525 Vertical	150	n/A	N/A	182	182	N/A	215	422	30	60 m6	104	135	205	295	59	18	815	196	241	238	20	278	-	-	20	250	300	80	274

# Rotary lobe pumps, model Sterilobe

## Special feature:

The Sterilobe Pump is especially suitable for pharmaceutical applications such as in high abrasive powder/paste masses. A worn seal can be exchanged from the front of the pump body without having to dismantle the whole pump housing.



## Advantages

- Enhanced cleaning and CIP capabilities (easy access to seal area)
- Generous seal access facilitates simple front loading and removal of seal, even for flushed and double options without stripping the pump.
- Cover joint profile improves hygienic characteristics and self-draining capabilities.
- Rugged gearbox construction enables the carrying of radial loads.
- Stainless gear cover and electro-less nickel plated bearing housing provide clean and corrosion resistant external finish.

## Material selection

Standard materials wetted parts	SS 316L
Standard housing materials	SS 316L

## Technical details

Flow range	: 230 m <sup>3</sup> /h
Differential pressure	: up to 15 bar +
Viscosity	: up to 250.000 cP
Temperature	: up to 150 °C

## Characteristics

- Mechanical seals or simple 'O' ring seal
- Standard 0.6 µRa machine finish
- Enhanced surface finishes available
- Scratch resistant powder coated finish on CP10 - CP30
- Two pack epoxy finish on CP40 & CP50
- FDA 3-A approval
- EHEDG certified
- ATEX compliant pumps

## Optional

- Special drive sets for stringent and hazardous applications

## Flow ranges

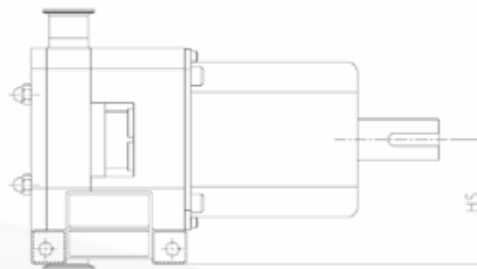
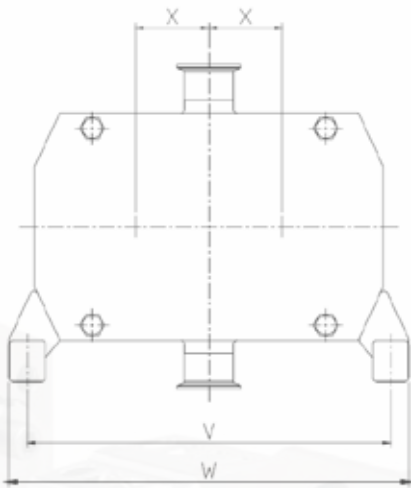
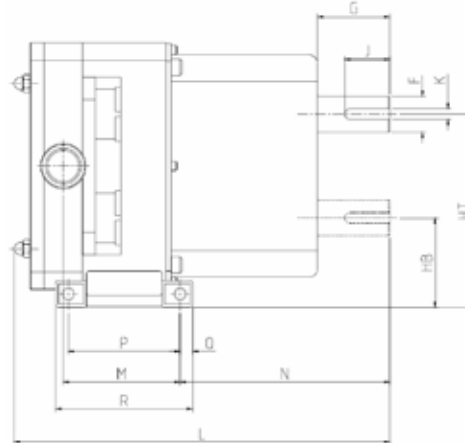
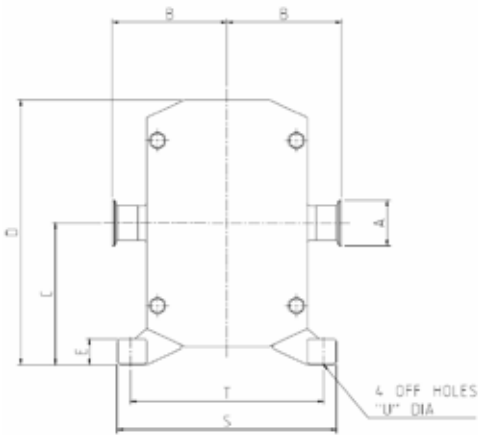
Model Sterilobe	Litres /rev.	Pressure Bar	Port Ø mm	Max Speed rpm
SLAS	0.039	15	19	1400
SLAL	0.059	10	25	1400
SLBS	0.081	15	25	1200
SLBL	0.122	10	38	1200
SLCS	0.169	15	38	1200
SLCL	0.254	10	50	1200
SLDS	0.352	15	38	1000
SLDL	0.528	10	50	1000
SLES	0.732	15	50	800
SLEL	1.099	10	76	800
SLFS	1.524	15	76	600
SLFL	2.286	100	101	600
SLGS	2.170	15	101	600
SLGL	4.754	10	152	600
SLHS	6.400	15	152	600

# Dimensions



## Applications

- Acids
- Alcohol
- Beans
- Blood
- Butter
- Chemicals
- Chocolate
- Dressings
- Emulsions
- Explosives
- Flavourings
- Glucose
- Glues
- Margarine
- Marmalade
- Penicillin
- Resins
- Solvents
- Sulphate soap
- Syrup
- Tall oil
- Toffee
- Tomato paste
- Whey
- Yeast
- Yoghurt



Sterilobe Model

	A	B1	B2	B3	B4	B5	C	D	E	F	G	HB	HS	HT	J	K	L	M	N	P	Q	R	S	T	U	V	W	X
SLAS	19	69	83	N/A	97	97	87.5	158	22	14	25.5	60.5	74.5	115.5	20	5	235	84	118.5	62	11	84	149	128	9	156	176	27.5
SLAL	25	83	83	N/A	97	97	87.5	158	22	14	25.5	60.5	74.5	115.5	20	5	244	86	118.5	62	11	84	149	128	9	156	176	27.5
SLBS	25	101	101	115	115	115	101	185	22	20	35.5	67.5	85	135.5	35	6	300	85	174	62	11	84	170	149	9	182	202	34
SLBL	40	101	123	115	115	115	101	185	22	20	35.5	67.5	85	135.5	35	6	311	90	174	62	11	84	170	149	9	182	202	34
SLCS	40	107	129	121	121	121	129	233	30	24	46	86.5	101.5	171.5	30	8	332	123	162.5	124	14	152	203	173	13	228	257	42.5
SLCL	50	107	129	121	121	129	129	233	30	24	46	86.5	101.5	171.5	30	8	346	131	162.5	124	14	152	203	173	13	228	257	42.5
SLDS	40	127	139	131	131	131	156.5	294	29	40	80	99	121.5	214	50	12	417	129.5	232.5	124	14	152	243	214	13	284.5	313.5	57.5
SLDL	50	127	139	131	131	139	156.5	294	29	40	80	99	121.5	214	50	12	436	139.5	232.5	124	14	152	243	214	13	284.5	313.5	57.5
SLES	50	158	167	159	159	167	192.3	60	43	48	80	122	180	262	60	14	494	155	275.5	170	16	202	360	320	18	354	384	70
SLEL	80	158	167	159	167	172	192	360	43	48	80	122	180	262	60	14	518	167	275.5	170	16	202	360	320	18	354	384	70
SLFS	80	173	205	187	195	200	216	409	43	50	80	136	191	296	65	16	572	176.5	305	170	16	202	382	342	18	402	432	80
SLFL	100	177	220	187	195	200	216	409	43	50	80	136	191	296	65	16	606	191.5	305	170	16	202	382	342	18	402	432	80
SLGS	100	194	237	204	212	217	251	480	43	60	108	156	202	346	90	18	742	211	419	170	16	202	405	365	18	472	502	95
SLGL	150	194	237	204	212	217	251	480	43	60	108	156	202	346	90	18	795	237	419	170	16	202	405	365	18	472	502	95

## Key features of the Sterilobe Series

### ■ Rotors

Both Bi-wing and Multi-Lobe rotors are available with clearances to 150°C making them suitable for all CIP and SIP conditions.



*Biwing rotors deliver a higher flow, therefore very much suitable for higher viscosities.*



*Multi lobe rotors give less pulse and are therefore ideal pumps for shear sensitive media.*

### ■ Relief valves

All pumps except the SLHS pump may be fitted with front cover relief valves to protect the pump and seals from over-pressure situations. The spring operated piston type valve is supplied with a security bonnet to prevent operator interference.

Valves may also be specified with a handwheel for manual CIP opening or pneumatic operation for automatic CIP systems.

### ■ EHEDG and Hygienic Applications

The pump conforms to all the relevant EHEDG cleanliness requirements and in the critical area of the mechanical seal, exceeds the design criteria to make the Steri-Lobe one of the cleanest standard construction pumps available.

The standard internal surface finish is 0.6 µRa, 25% better than most other manufacturers which can be further improved by electro-polishing and passivating for those applications where enhanced surface finish is required. The gear case is also stainless steel 1, improving cleanliness and corrosion resistance while adding to the aesthetic qualities of the pump. These can be polished to a mirror finish if required.

### ■ Pump heating and cooling

All pumps may be fitted with front cover and rotor case jackets when required. Jackets are designed to maintain the liquid at pumping temperature

### ■ Sealing options

The pumps are designed with DIN 24960 L1K seal envelopes allowing proprietary seals to be fitted, particularly useful in applications where a site standard seal supplier is specified. As standard the Steri-Lobe is fitted with a class 1 hygienic mechanical seal 1. The following constructions are available:

- Single Mechanical (Standard)
- Single Mechanical with low pressure flush
- Double Mechanical seal

### ■ Seal Faces and elastomers:

- Silicon Carbide / Carbon (Standard)
- Silicon Carbide / Silicon Carbide
- FDA EPDM
- FDA Viton®
- Perfluoroelastomer

Alternatively, there is a simple single 'O' ring seal available 1. This low cost option is available in FDA EPDM or Viton and is suitable for lubricating liquids. This option is especially suited to strip clean operations.

