SINCE 1973

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SINCE 1973

Leak-Proof

Contributing to grow safe

AGITATOR SEALS

For Stainless Steel And Glass Lined Reactors

SINCE 1973

EFFECTIVELY PERFORMING IN THE INDUSTRIES OVER 4 DECADES

Leak-Proof has made significant contributions to the Indian Process industry.first in 1973 to manufacture mechanical seals.. first in 1983 to introduce flexible graphite, gaskets, packing and self sealing rings.. first to install facilities for manufacture of Silicon Carbide and High Alumina Ceramic seal faces, first to cartridgise heavy duty feed pump seals.. and so on.

The pioneering spirit pervades our business philosophy even today. We believe in quality and class in engineering excellence rather than volumes. This is reflected in our predominant position in the higher end seals market in India. And, in the remarkable successes of our innovative application engineered seals, even in the most severe duty conditions. Our seal series 800 HB2 in Boiler Feed Pumps; series 90B35 in turbulent slurry applications; series 900B in heavy duty pipe line pumping; series 88B2 the reverse balanced seal and 110U have made significant impact in the Indian industry and abroad in Argentina, Australia, Brazil, Canada, China, Colombia, Egypt, France, Germany, Indonesia, Iran, Jordan, Kenya, Kuwait, Malaysia, Nigeria, Norway, Oman, Philippines, Puertorico, Russia, Saudi Arabia, Spain, Tanzania, Taiwan, UAE, U.K., U.S.A., Vietnam, Venezuela etc.

We have a unique history. We have never considered competition seriously. We are always gone about confidently on our own, on the intrinsic strength of our engineering skills backed by state-of-art manufacturing, inspection and testing facilities, to make a name and earn a special position, in our field of endeavour.

Manufacturing unit with large expansion facilities at North Gujarat has greatly strengthened our capabilities to take on large requirements, at quick delivery schedules.

With our complete range of mechanical seals of all types and sizes and the ever reliable Grafoil range of gaskets & packings we have an enviable reputation for reliable industrial sealing products, in India and abroad.

SINCE 1973

GROUP OF COMPANIES

SINCE 1967

AN ISO 9001 : 2015 COMPANY

...together we achieve

EDR GROUP

AN ISO 9001 : 2015 COMPANY

***EDR Group** Established in the year 1967 was founded by Mr. E. D. Rajedia, Chairman of the Group. He initially stared with Transport Business. EDR Group with 5 companies under its fold, today, has its presence in diverse areas of engineering field.*

SINCE 1973

Leak-Proof Engineering (I) Pvt. Ltd.
Leak-Proof Cast (I) Pvt. Ltd.
Leak-Proof Enterprise (I) Pvt. Ltd.
Leak-Proof Steel Plant Project Pvt. Ltd.
Leak-Proof Auto parts Pvt Ltd.

*All the **EDR Group** companies are located in Gujarat state of India about 600 km north of Mumbai. We have group marketing network with 33 branch offices spread all over India serving major industrial hubs with head office located in Mumbai, commercial capital of India. Experienced sales and product support staff man branch officers.*

AGITATOR SEALS FOR REACTORS

Design Manual Second Edition

MATERIAL CODIFICATION SYSTEM

Material	Leak-Proof Code	DIN 24960 Code	Max. Temp. Limit °C
Carbon			
Carbon-R	P	B	+260
Carbon-M	J	A	+400
Plastic			
GFT	F	Y1	+175
CFT	T	Y2	+175
Metals			
Bronze	B	N	+175
Stellite	S	L	+175
Cast Iron	T	D	+150
Lecrolloy	M	S	+175
Hastelloy B	G	M1	+250
Hastelloy C	H	M	+250
SS 316 I	G		
Monel M	M4		
Metal Carbides			
TC (Co)-solid	K	U1	+400
TC (Co)-shrink fitted	K1	U11	+110
TC (Ni)-solid	Z	U2	+400
TC (Ni)-shrink fitted	Z1	U22	+110
SiC-solid	U	Q2	+425
SiC - shrink fitted	U1	Q22	+110
Metal Oxides			
Cerarmic	C	V	+95

Material	Leak-Proof Code	DIN 24960 Code	Temp. °C	Range	Comments
Nitrile (Buna-N)	O	P	–40	+120	
Neoprene	N	N	–20	+90	
Butyl	B	B	–55	+110	
Silicone	S	S	–50	+210	
Fluorosilicone	Q		–70	+205	With basic fuel and oils has good high & low temperature properties, particularly dry heat resistance.
EPR (EPDM)	E	E	–40	+150	Not resistant to mineral fats and oils.
Viton	V	V	–18	+200	With hot water to a maximum of 120°C only.
AFLAS	U		–40	+230	
PFE (CHEMRAZ)	P	K	–20	+240	
FFKM	K	K	–20	+270	
PTFE	L	T	–75	+230	
Glass Filed PTFE	F	Y1	–212	+250	
FEP	V1	M1	–40	+180	
Flexible Grafoil®	G	G	–270	+480	Very good resistance to high & low temperature

Notes
The temperature limits listed are for guidance only. The value may vary depending upon the nature of surrounding liquids

THE MATERIALS OF CONSTRUCTION

Ceramic: This is a super fine-grain High Alumina Ceramic Material (99.5% Al2 O3) that exhibits excellent low wear characteristics. It is the best seal face material for highly corrosive chemical services.

Metal impregnated Carbon: This is an antimony impregnated hard Carbon that is specially suited for extreme heavy duty application involving non-corrosive media. Boiler feed water and hydrocarbon service seals with this hard Carbon as a sealing face have a much longer service life. Hard Carbon exhibits better abrasive resistance and emergency dry running characteristics.

Resin impregnated Carbon: This is the normal rotary seal face material and grade of Carbon offered is obtained from the best internal sources. Recommended in most general purpose applications involving corrosive fluids, this Carbon exhibits good resistance to thermal shock and good dimensional stability over a wide temperature range. In addition, resin impregnated Carbon has low permeability and good thermal conductivity.

Tungsten Carbide: The universally accepted hard seal face that is available in two forms-nickel bonded and cobalt bonded. Solid seal rings of Tungsten Carbide are offered as a standard as against shrunk-fit faces with their inherent limitations.

Silicon Carbide: Technologically the best seal face material till date. It is highly resistant to thermal stress and corrosion in high temperature oxidising atmospheres has low wear properties and is an ideal seal face material for the petrochemical, fertilizer, chemical, refinery and off -shore duties. It is harder than Tungsten Carbide, Silicon Carbide also exhibits better dry run capabilities thus making it an ideal choice for an emergency dry running characteristics.

Lecrolloy: This is a specially developed high-chrome cast steel exhibiting excellent wear characteristics and is offered as a replacement to stellited faces. The major advantage of Lecrolloy faces lies in the fact that faces are solid single pieces and not deposits or coatings that are liable to peel off/chip off.

Glass Filled PTFE: Offered as a standard seal face material on outside mounted PTFE bellows type seals. Is recommended for extremely corrosive light duties only.

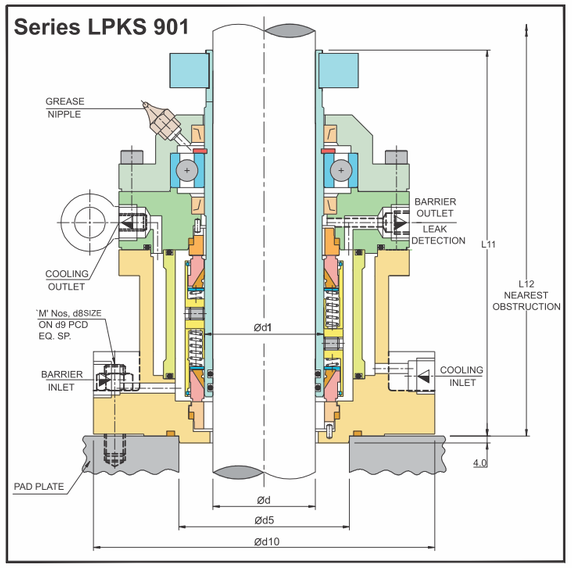
Other face Materials: Alternate face materials are available for custom seals and other special applications. Seal faces of stainless steel with stelliting and Ni-resist are available. Cast Iron faces are also available for certain noncritical duties. Seal faces with coating such as chrome oxide and TC coating can offered on request.

Material	Compressive Strength N/mm^2	Density g/cm^3	Modulus of elasticity kN/mm2	Coeff. of Thermal Expansion x $10^{-6}/^0C$	Thermal Conductivity W/m^0 C	Hardness
Carbon, resin impregnated	207-250	1.75-1.83	18.5-24	2.4-4.9	8-13	83-95*
Carbon, antimony impregnated	276-350	2.15-2.5	26-33	4-4.7	12.0	80.0*
Tungsten Carbide	3200-6200	14.3-14.9	550-620	4.6-7.0	80-115 1	230-1600**
Reaction bonded Silicon Carbide	2200	3.0	400	4.5	110	2400
Sintered Silicon Carbide	3900	3.15	410	4.3	130	2600
Ceramic	3000-3500	3.8-3.9	350-380	6.6-8.5	29-50	2000-2300**

* Scler. Hardness ** Vickers Hardness

Double Mechanical Seal — LPKS 901

FOR TOP / SIDE ENTRY AGITATORS, VESSELS AND MIXERS
DOUBLE ACTING, INDEPENDENT OF DIRECTION OF ROTATION



Applications :
- Petrochemicals and its vapours
- General Chemicals and its vapours
- Light Hydrocarbons and its vapours

Seal Characteristics :
- Double Acting Back to Back Seals
- Unbalanced
- Cartridge Unit
- Independent of Direction of Rotation
- Operated with Pressurised Barrier Fluid

Face Materials :
Carbon, Silicon Carbide

Metals Parts :
Contact Parts ** : SS 316, SS 304
Non Contact Parts : Carbon Steel
** NOTE : Higher Alloys on request

Secondary Seals :
PTFE, GFT

Operating Limits :
Shaft Diameter d : 45.....150mm*
Pressure p : Vacuum.....10 bar (max)
Temperature t : Amb.....200°C (max)
Shaft speed n : 600 rpm. (max)
Barrier fluid pressure : Vessel pressure + 1.5 Bar

SHAFT SIZE d g6 mm	SEAL SIZE d1 -0.002 inch	SEAL SIZE d1 -0.05 mm	d5 H12	M, d8	d9	d10	L11	L12
45.0	2.375	60.32	100.0	4, M10	155.0	180.0	205.0	260.0
50.0	2.375	60.32	100.0	4, M10	155.0	180.0	205.0	260.0
55.0	2.750	69.85	110.0	8, M12	180.0	200.0	215.0	270.0
60.0	2.750	69.85	110.0	8, M12	180.0	200.0	215.0	270.0
65.0	3.125	79.38	120.0	8, M12	190.0	215.0	225.0	280.0
70.0	3.125	79.38	120.0	8, M12	190.0	215.0	225.0	280.0
75.0	3.625	92.08	130.0	8, M12	200.0	230.0	235.0	290.0
80.0	3.625	92.08	130.0	8, M12	200.0	230.0	235.0	290.0
85.0	4.000	101.60	140.0	8, M16	225.0	255.0	235.0	290.0
90.0	4.000	101.60	140.0	8, M16	225.0	255.0	235.0	290.0
95.0	4.375	111.12	160.0	8, M16	250.0	300.0	240.0	290.0

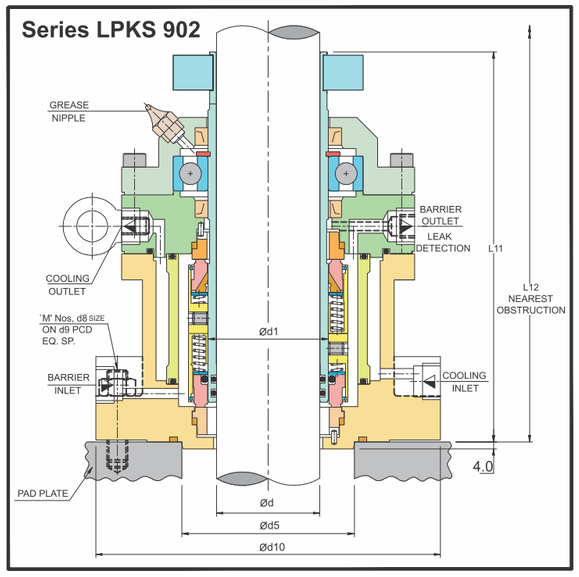
All dimensions are in mm unless otherwise specified

SHAFT SIZE d g6 mm	SEAL SIZE d1 -0.002 inch	SEAL SIZE d1 -0.05 mm	d5 H12	M,d8	d9	d10	L11	L12
100.0	4.375	111.12	160.0	8,M16	250.0	300.0	240.0	290.0
105.0	4.750	120.65	170.0	8,M16	260.0	330.0	260.0	310.0
110.0	4.750	120.65	170.0	8,M16	260.0	330.0	260.0	310.0
115.0	5.125	130.17	180.0	8,M16	270.0	330.0	270.0	320.0
120.0	5.125	130.17	180.0	8,M16	270.0	330.0	270.0	320.0
125.0	5.500	139.70	200.0	8,M16	280.0	330.0	275.0	325.0
130.0	5.500	139.70	200.0	8,M16	280.0	330.0	275.0	325.0
135.0	6.000	152.40	210.0	8,M16	295.0	385.0	280.0	330.0
140.0	6.000	152.40	210.0	8,M16	295.0	385.0	280.0	330.0
145.0	6.375	161.92	220.0	8,M16	300.0	395.0	290.0	340.0
150.0	6.375	161.92	220.0	8,M16	300.0	395.0	290.0	340.0

* Other sizes available on request

Double Mechanical Seal — LPKS 902

FOR TOP / SIDE ENTRY AGITATORS, VESSELS AND MIXERS
DOUBLE ACTING, INDEPENDENT OF DIRECTION OF ROTATION



Applications :
- Petrochemicals and its vapours
- General Chemicals and its vapours
- Light Hydrocarbons and its vapours

Seal Characteristics :
- Double Acting Back to Back Seals
- Unbalanced
- Cartridge Unit
- Independent of Direction of Rotation
- Operated with Pressurised Barrier Fluid

Face Materials :
Carbon, Silicon Carbide

Metals Parts :
Contact Parts ** : SS 316, SS 304
Non Contact Parts : Carbon Steel
** NOTE : Higher Alloys on request

Secondary Seals :
VITON, PTFE, GFT, KALREZ

Operating Limits :
Shaft Diameter d : 45.....150mm*
Pressure p : Vacuum.....10 bar (max)
Temperature t : Amb.....200°C (max)
Shaft speed n : 600 rpm. (max)
Barrier fluid pressure : Vessel pressure + 1.5 bar

SHAFT SIZE d g6 mm	SEAL\ SIZ d1 -0.002 inch	SEAL\ SIZ d1 -0.05 mm	d5 H12	M,d8	d9	d10	L11	L12
45.0	2.375	60.32	100.0	4,M10	155.0	180.0	205.0	260.0
50.0	2.375	60.32	100.0	4,M10	155.0	180.0	205.0	260.0
55.0	2.750	69.85	110.0	8,M12	180.0	200.0	215.0	270.0
60.0	2.750	69.85	110.0	8,M12	180.0	200.0	215.0	270.0
65.0	3.125	79.38	120.0	8,M12	190.0	215.0	225.0	280.0
70.0	3.125	79.38	120.0	8,M12	190.0	215.0	225.0	280.0
75.0	3.625	92.08	130.0	8,M12	200.0	230.0	235.0	290.0
80.0	3.625	92.08	130.0	8,M12	200.0	230.0	235.0	290.0
85.0	4.000	101.60	140.0	8,M16	225.0	255.0	235.0	290.0
90.0	4.000	101.60	140.0	8,M16	225.0	255.0	235.0	290.0
95.0	4.375	111.12	160.0	8,M16	250.0	300.0	240.0	290.0

All dimensions are in mm unless otherwise specified

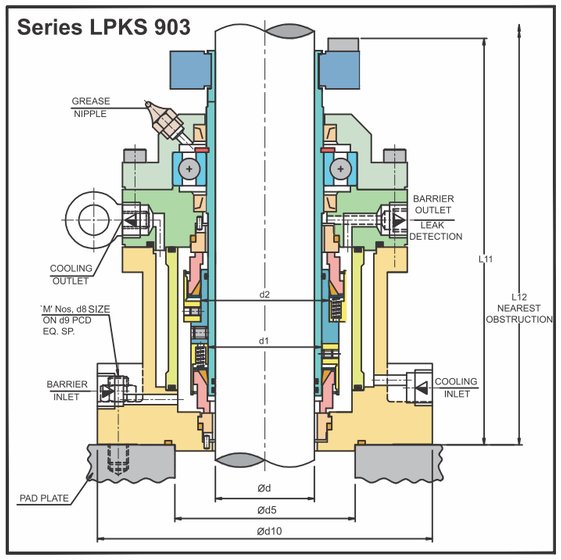
SHAFT SIZE d g6 mm	SEAL\ SIZ d1 -0.002 inch	SEAL\ SIZ d1 -0.05 mm	d5 H12	M, d8	d9	d10	L11	L12
100.0	4.375	111.12	160.0	8,M16	250.0	300.0	240.0	290.0
105.0	4.750	120.65	170.0	8,M16	260.0	330.0	260.0	310.0
110.0	4.750	120.65	170.0	8,M16	260.0	330.0	260.0	310.0
115.0	5.125	130.17	180.0	8,M16	270.0	330.0	270.0	320.0
120.0	5.125	130.17	180.0	8,M16	270.0	330.0	270.0	320.0
125.0	5.500	139.70	200.0	8,M16	280.0	330.0	275.0	325.0
130.0	5.500	139.70	200.0	8,M16	280.0	330.0	275.0	325.0
135.0	6.000	152.40	210.0	8,M16	295.0	385.0	280.0	330.0
140.0	6.000	152.40	210.0	8,M16	295.0	385.0	280.0	330.0
145.0	6.375	161.92	220.0	8,M16	300.0	395.0	290.0	340.0
150.0	6.375	161.92	220.0	8,M16	300.0	395.0	290.0	340.0

* Other sizes available on request

SERIES LPKS 901 & LPKS 902

Double Mechanical Seal — LPKS 903

FOR TOP / SIDE ENTRY AGITATORS, VESSELS AND MIXERS
DOUBLE ACTING, INDEPENDENT OF DIRECTION OF ROTATION



Applications :
- Petrochemicals and its vapours
- General Chemicals and its vapours
- Light Hydrocarbons and its vapours

Seal Characteristics :
- Double Acting Back to Back seals
- Balanced
- Cartridge Unit
- Independent of Direction of Rotation
- **Operated with Pressurised Barriers Fluid**

Face Materials :
Carbon, Silicon Carbide

Metals Parts :
Contact Parts ** : SS 316, SS 304
Non Contact Parts : Carbon Steel
** NOTE : Higher Alloys on request

Secondary Seals :
PTFE, GFT

Operating Limits :
Shaft Diameter d : 45.....150mm*
Pressure p : Vacuum.....35bar (max)
Temperature t : Amb.....200°C (max)
Shaft speed n : 600 rpm. (max)
Barrier fluid pressure : Vessel pressure + 1.5 bar

SHAFT SIZE d g6 mm	SEAL SIZE d1 $^{0}_{-0.002}$ inch	SEAL SIZE d1 $^{0}_{-0.05}$ mm	SEAL SIZE d2 $^{0}_{-0.002}$ inch	SEAL SIZE d2 $^{0}_{-0.05}$ mm	d5 H12	M, d8	d9	d10	L11	L12
45.0	2.250	57.15	2.625	66.68	100.0	4, M10	155.0	180.0	235.0	285.0
50.0	2.250	57.15	2.625	66.68	100.0	4, M10	155.0	180.0	235.0	285.0
55.0	2.750	69.85	3.125	79.38	110.0	8, M12	180.0	200.0	250.0	300.0
60.0	2.750	69.85	3.125	79.38	110.0	8, M12	180.0	200.0	250.0	300.0
65.0	3.250	82.55	3.500	88.90	120.0	8, M12	190.0	215.0	260.0	310.0
70.0	3.250	82.55	3.500	88.90	120.0	8, M12	190.0	215.0	260.0	310.0
75.0	3.500	88.90	3.875	98.42	130.0	8, M12	200.0	230.0	270.0	320.0
80.0	3.500	88.90	3.875	98.42	130.0	8, M12	200.0	230.0	270.0	320.0
85.0	4.000	101.60	4.375	111.12	140.0	8, M16	225.0	255.0	280.0	330.0
90.0	4.000	101.60	4.375	111.12	140.0	8, M16	225.0	255.0	280.0	330.0
95.0	4.375	111.12	4.750	120.65	160.0	8, M16	250.0	300.0	300.0	350.0

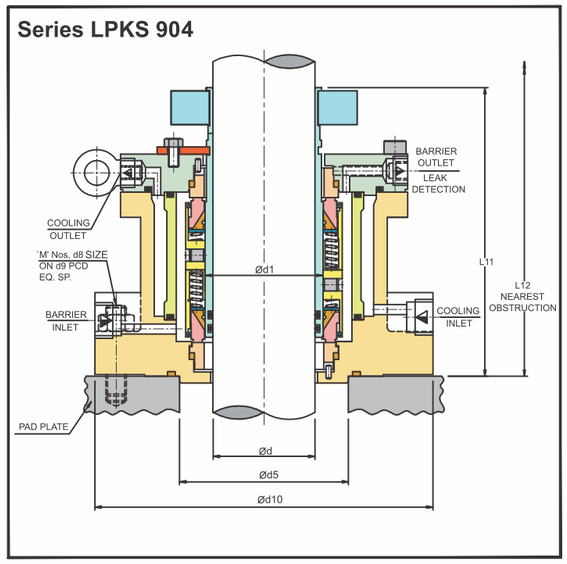
All dimensions are in mm unless otherwise spciefied

SHAFT SIZE d g6 mm	SEAL SIZE d1 $^{0}_{-0.002}$ inch	SEAL SIZE d1 $^{0}_{-0.05}$ mm	SEAL SIZE d2 $^{0}_{-0.002}$ inch	SEAL SIZE d2 $^{0}_{-0.05}$ mm	d5 H12	M, d8	d9	d10	L11	L12
100.0	4.375	111.12	4.750	120.65	160.0	8, M16	250.0	300.0	300.0	350.0
105.0	4.750	120.65	5.125	130.17	170.0	8, M16	260.0	330.0	305.0	355.0
110.0	4.750	120.65	5.125	130.17	170.0	8, M16	260.0	330.0	305.0	355.0
115.0	5.125	130.17	5.500	139.70	180.0	8, M16	270.0	330.0	310.0	360.0
120.0	5.125	130.17	5.500	139.70	180.0	8, M16	270.0	330.0	310.0	360.0
125.0	5.500	139.70	5.875	149.22	200.0	8, M16	280.0	330.0	320.0	370.0
130.0	5.500	139.70	5.875	149.22	200.0	8, M16	280.0	330.0	320.0	370.0
135.0	5.875	149.22	6.250	158.75	210.0	8, M16	295.0	385.0	330.0	380.0
140.0	5.875	149.22	6.250	158.75	210.0	8, M16	295.0	385.0	330.0	380.0
145.0	6.375	161.92	6.750	171.45	220.0	8, M16	300.0	395.0	340.0	390.0
150.0	6.375	161.92	6.750	171.45	220.0	8, M16	300.0	395.0	340.0	390.0

* Other sizes available on request

Double Mechanical Seal — LPKS 904

FOR TOP / SIDE ENTRY AGITATORS, VESSELS AND MIXERS
DOUBLE ACTING, INDEPENDENT OF DIRECTION OF ROTATION



Applications :
- Petrochemicals and its vapours
- General Chemicals and its vapours
- Light Hydrocarbons and its vapours

Seal Characteristics :
- Double Acting Back to Back seal
- Unbalanced
- Cartridge Unit
- Independent of Direction of Rotation
- Operated with Pressurised Barrier Fluid

Face Materials :
Carbon, Silicon Carbide

Metals Parts :
Contact Parts ** : SS 316, SS 304
Non Contact Parts : Carbon Steel
** NOTE : Higher Alloys on request

Secondary Seals:
PTFE, GFT

Operating Limits
Shaft Diameter d : 45.....150mm*
Pressure p : Vacuum.....10 bar (max)
Temperature t : Amb.....200°C (max)
Shaft speed n : 600 rpm. (max)
Barrier fluid pressure : Vessel pressure + 1.5 bar

SHAFT SIZE d g6 mm	SEAL SIZE d1 $^{0}_{-0.002}$ inch	SEAL SIZE d1 $^{0}_{-0.05}$ mm	d5 H12	M, d8	d9	d10	L11	L12
45.0	2.375	60.32	100.0	4, M10	155.0	180.0	170.0	220.0
50.0	2.375	60.32	100.0	4, M10	155.0	180.0	170.0	220.0
55.0	2.750	69.85	110.0	8, M12	180.0	200.0	180.0	230.0
60.0	2.750	69.85	110.0	8, M12	180.0	200.0	180.0	230.0
65.0	3.125	79.38	120.0	8, M12	190.0	215.0	190.0	240.0
70.0	3.125	79.38	120.0	8, M12	190.0	215.0	190.0	240.0
75.0	3.625	92.08	130.0	8, M12	200.0	230.0	200.0	250.0
80.0	3.625	92.08	130.0	8, M12	200.0	230.0	200.0	250.0
85.0	4.000	101.60	140.0	8, M16	225.0	255.0	200.0	250.0
90.0	4.000	101.60	140.0	8, M16	225.0	255.0	200.0	250.0
95.0	4.375	111.12	160.0	8, M16	250.0	300.0	200.0	250.0

All dimensions are in mm unless otherwise specified

SHAFT SIZE d g6 mm	SEAL SIZE d1 $^{0}_{-0.002}$ inch	SEAL SIZE d1 $^{0}_{-0.05}$ mm	d5 H12	M, d8	d9	d10	L11	L12
100.0	4.375	111.12	160.0	8, M16	250.0	300.0	200.0	250.0
105.0	4.750	120.65	170.0	8, M16	260.0	330.0	205.0	255.0
110.0	4.750	120.65	170.0	8, M16	260.0	330.0	205.0	255.0
115.0	5.125	130.17	180.0	8, M16	270.0	330.0	210.0	260.0
120.0	5.125	130.17	180.0	8, M16	270.0	330.0	210.0	260.0
125.0	5.500	139.70	200.0	8, M16	280.0	330.0	210.0	260.0
130.0	5.500	139.70	200.0	8, M16	280.0	330.0	210.0	260.0
135.0	6.000	152.40	210.0	8, M16	295.0	385.0	215.0	265.0
140.0	6.000	152.40	210.0	8, M16	295.0	385.0	215.0	265.0
145.0	6.375	161.92	220.0	8, M16	300.0	395.0	225.0	275.0
150.0	6.375	161.92	220.0	8, M16	300.0	395.0	225.0	275.0

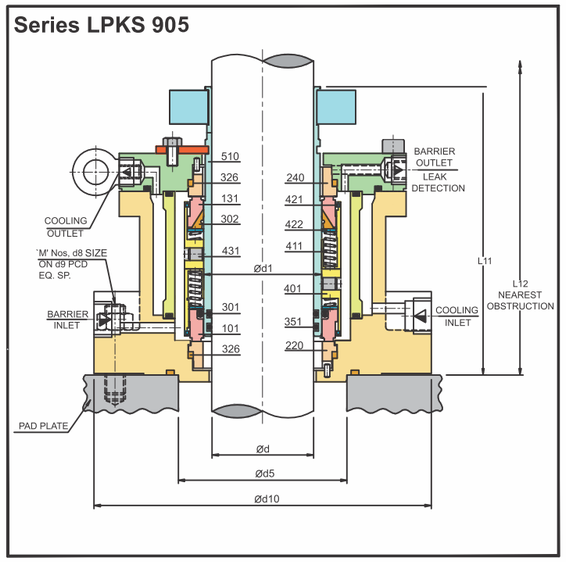
* Other sizes available on request

SERIES LPKS 903 & LPKS 904

Double Mechanical Seal

LPKS 905

FOR TOP / SIDE ENTRY AGITATORS, VESSELS AND MIXERS
DOUBLE ACTING, INDEPENDENT OF DIRECTION OF ROTATION



Applications :
- Petrochemicals and its vapours
- General Chemicals and its vapours
- Light Hydrocarbons and its vapours

Seal Characteristics :
- Double Acting Back to Back seals
- Unbalanced
- Cartridge Unit
- Independent of Direction of Rotation
- Operated with Pressurised Barrier Fluid

Face Materials :
Carbon, Silicon Carbide

Metals Parts :
Contact Parts ** : SS 316, SS 304
Non Contact Parts : Carbon Steel
** NOTE : Higher Alloys on request

Secondary Seals :
VITON, PTFE, GFT, FFKM

Operating Limits :
Shaft Diameter d : 45.....150mm*
Pressure p : Vacuum.....10 bar (max)
Temperature t : Amb.....200°C (max)
Shaft speed n : 600 rpm. (max)
Barrier fluid pressure : Vessel pressure + 1.5 bar

SHAFT SIZE d g6 mm	SEAL SIZE d1 0 -0.002 inch	SEAL SIZE d1 0 -0.05 mm	d5 H12	M, d8	d9	d10	L11	L12
45.0	2.375	60.32	100.0	4, M10	155.0	180.0	170.0	220.0
50.0	2.375	60.32	100.0	4, M10	155.0	180.0	170.0	220.0
55.0	2.750	69.85	110.0	8, M12	180.0	200.0	180.0	230.0
60.0	2.750	69.85	110.0	8, M12	180.0	200.0	180.0	230.0
65.0	3.125	79.38	120.0	8, M12	190.0	215.0	190.0	240.0
70.0	3.125	79.38	120.0	8, M12	190.0	215.0	190.0	240.0
75.0	3.625	92.08	130.0	8, M12	200.0	230.0	200.0	250.0
80.0	3.625	92.08	130.0	8, M12	200.0	230.0	200.0	250.0
85.0	4.000	101.60	140.0	8, M16	225.0	255.0	200.0	250.0
90.0	4.000	101.60	140.0	8, M16	225.0	255.0	200.0	250.0
95.0	4.375	111.12	160.0	8, M16	250.0	300.0	200.0	250.0

All dimensions are in mm unless otherwise specified

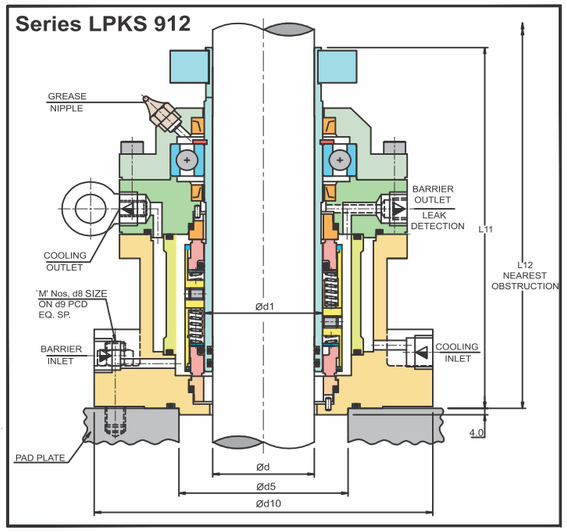
SHAFT SIZE d g6 mm	SEAL SIZE d1 0 -0.002 inch	SEAL SIZE d1 0 -0.05 mm	d5 H12	M, d8	d9	d10	L11	L12
100.0	4.375	111.12	160.0	8, M16	250.0	300.0	200.0	250.0
105.0	4.750	120.65	170.0	8, M16	260.0	330.0	205.0	255.0
110.0	4.750	120.65	170.0	8, M16	260.0	330.0	205.0	255.0
115.0	5.125	130.17	180.0	8, M16	270.0	330.0	210.0	260.0
120.0	5.125	130.17	180.0	8, M16	270.0	330.0	210.0	260.0
125.0	5.500	139.70	200.0	8, M16	280.0	330.0	210.0	260.0
130.0	5.500	139.70	200.0	8, M16	280.0	330.0	210.0	260.0
135.0	6.000	152.40	210.0	8, M16	295.0	385.0	215.0	265.0
140.0	6.000	152.40	210.0	8, M16	295.0	385.0	215.0	265.0
145.0	6.375	161.92	220.0	8, M16	300.0	395.0	225.0	275.0
150.0	6.375	161.92	220.0	8, M16	300.0	395.0	225.0	275.0

* Other sizes available on request

Double Mechanical Seal

LPKS 912

FOR TOP / SIDE ENTRY AGITATORS, VESSELS AND MIXERS
DOUBLE ACTING, INDEPENDENT OF DIRECTION OF ROTATION



Applications :
- Petrochemicals and its vapours
- General Chemicals and its vapours
- Light Hydrocarbons and its vapours

Seal Characteristics :
- Double Acting Back to Back seals
- Unbalanced
- Cartridge Unit
- Independent of Direction of Rotation
- Operated with Pressurised Barrier Fluid

Face Materials :
Carbon, Silicon Carbide

Metals Parts :
Contact Parts ** : SS 316, SS 304
Non Contact Parts : Carbon Steel
** NOTE : Higher Alloys on request

Secondary Seals :
VITON, FFKM

Operating Limits :
Shaft Diameter d : 45.....150mm*
Pressure p : Vacuum.....10 bar (max)
Temperature t : Amb.....200°C (max)
Shaft speed n : 600 rpm. (max)
Barrier fluid pressure : Vessel pressure + 1.5 bar

SHAFT SIZE d g6 mm	SEAL SIZE d1 0 -0.002 inch	SEAL SIZE d1 0 -0.05 mm	d5 H12	M, d8	d9	d10	L11	L12
45.0	2.375	60.32	100.0	4, M10	155.0	180.0	205.0	260.0
50.0	2.375	60.32	100.0	4, M10	155.0	180.0	205.0	260.0
55.0	2.750	69.85	110.0	8, M12	180.0	200.0	215.0	270.0
60.0	2.750	69.85	110.0	8, M12	180.0	200.0	215.0	270.0
65.0	3.125	79.38	120.0	8, M12	190.0	215.0	225.0	280.0
70.0	3.125	79.38	120.0	8, M12	190.0	215.0	225.0	280.0
75.0	3.625	92.08	130.0	8, M12	200.0	230.0	235.0	290.0
80.0	3.625	92.08	130.0	8, M12	200.0	230.0	235.0	290.0
85.0	4.000	101.60	140.0	8, M16	225.0	255.0	235.0	290.0
90.0	4.000	101.60	140.0	8, M16	225.0	255.0	235.0	290.0
95.0	4.375	111.12	160.0	8, M16	250.0	300.0	240.0	290.0

All dimensions are in mm unless otherwise specified

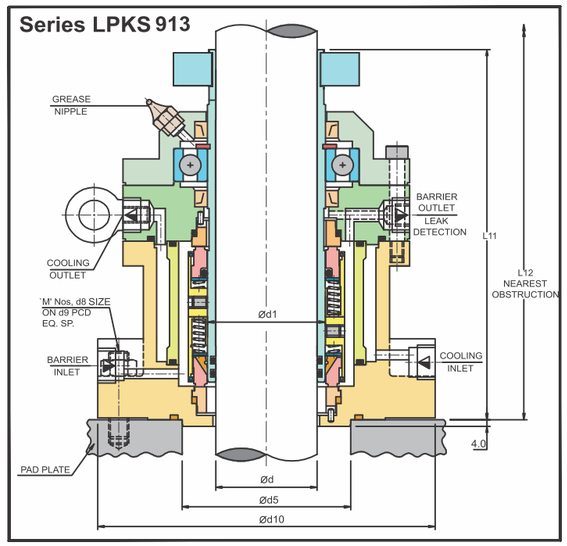
SHAFT SIZE d g6 mm	SEAL SIZE d1 0 -0.002 inch	SEAL SIZE d1 0 -0.05 mm	d5 H12	M, d8	d9	d10	L11	L12
100.0	4.375	111.12	160.0	8, M16	250.0	300.0	240.0	290.0
105.0	4.750	120.65	170.0	8, M16	260.0	330.0	260.0	310.0
110.0	4.750	120.65	170.0	8, M16	260.0	330.0	260.0	310.0
115.0	5.125	130.17	180.0	8, M16	270.0	330.0	270.0	320.0
120.0	5.125	130.17	180.0	8, M16	270.0	330.0	270.0	320.0
125.0	5.500	139.70	200.0	8, M16	280.0	330.0	275.0	325.0
130.0	5.500	139.70	200.0	8, M16	280.0	330.0	275.0	325.0
135.0	6.000	152.40	210.0	8, M16	295.0	385.0	280.0	330.0
140.0	6.000	152.40	210.0	8, M16	295.0	385.0	280.0	330.0
145.0	6.375	161.92	220.0	8, M16	300.0	395.0	290.0	340.0
150.0	6.375	161.92	220.0	8, M16	300.0	395.0	290.0	340.0

* Other sizes available on request

SERIES LPKS 905 & LPKS 912

Double Mechanical Seal — LPKS 913

FOR TOP / SIDE ENTRY AGITATORS, VESSELS AND MIXERS
DOUBLE ACTING, INDEPENDENT OF DIRECTION OF ROTATION



Applications :
- Petrochemicals and its vapours
- General Chemicals and its vapours
- Light Hydrocarbons and its vapours

Seal Characteristics :
- Double Acting Back to Back seal
- Unbalanced
- Cartridge Unit
- Independent of Direction of Rotation
- Operated with Pressurised Barrier Fluid

Face Materials :
Carbon, Silicon Carbide

Metals Parts :
Contact Parts ** : SS 316, SS 304
Non Contact Parts : Carbon Steel
** NOTE : Higher Alloys on request

Secondary Seals :
VITON, PTFE, GFT

Operating Limits :
Shaft Diameter d : 45.....150mm*
Pressure p : Vacuum.....10 bar (max)
Temperature t : Amb.....200°C (max)
Shaft speed n : 600 rpm. (max)
Barrier fluid pressure : Vessel pressure + 1.5 bar

SHAFT SIZE d g6 mm	SEAL SIZE d1 -0.002 inch	SEAL SIZE d1 -0.05 mm	d5 H12	M, d8	d9	d10	L11	L12
45.0	2.375	60.32	100.0	4, M10	155.0	180.0	205.0	260.0
50.0	2.375	60.32	100.0	4, M10	155.0	180.0	205.0	260.0
55.0	2.750	69.85	110.0	8, M12	180.0	200.0	215.0	270.0
60.0	2.750	69.85	110.0	8, M12	180.0	200.0	215.0	270.0
65.0	3.125	79.38	120.0	8, M12	190.0	215.0	225.0	280.0
70.0	3.125	79.38	120.0	8, M12	190.0	215.0	225.0	280.0
75.0	3.625	92.08	130.0	8, M12	200.0	230.0	235.0	290.0
80.0	3.625	92.08	130.0	8, M12	200.0	230.0	235.0	290.0
85.0	4.000	101.60	140.0	8, M16	225.0	255.0	235.0	290.0
90.0	4.000	101.60	140.0	8, M16	225.0	255.0	235.0	290.0
95.0	4.375	111.12	160.0	8, M16	250.0	300.0	240.0	290.0

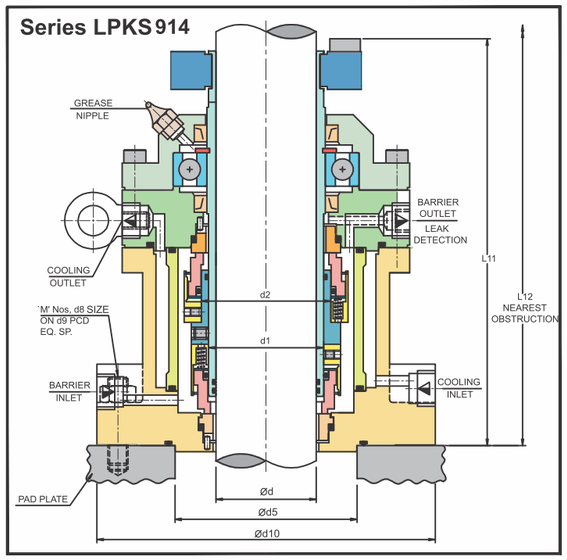
All dimensions are in mm unless otherwise specified

SHAFT SIZE d g6 mm	SEAL SIZE d1 -0.002 inch	SEAL SIZE d1 -0.05 mm	d5 H12	M, d8	d9	d10	L11	L12
100.0	4.375	111.12	160.0	8, M16	250.0	300.0	240.0	290.0
105.0	4.750	120.65	170.0	8, M16	260.0	330.0	260.0	310.0
110.0	4.750	120.65	170.0	8, M16	260.0	330.0	260.0	310.0
115.0	5.125	130.17	180.0	8, M16	270.0	330.0	270.0	320.0
120.0	5.125	130.17	180.0	8, M16	270.0	330.0	270.0	320.0
125.0	5.500	139.70	200.0	8, M16	280.0	330.0	275.0	325.0
130.0	5.500	139.70	200.0	8, M16	280.0	330.0	275.0	325.0
135.0	6.000	152.40	210.0	8, M16	295.0	385.0	280.0	330.0
140.0	6.000	152.40	210.0	8, M16	295.0	385.0	280.0	330.0
145.0	6.375	161.92	220.0	8, M16	300.0	395.0	290.0	340.0
150.0	6.375	161.92	220.0	8, M16	300.0	395.0	290.0	340.0

* Other sizes available on request

Double Mechanical Seal — LPKS 914

FOR TOP / SIDE ENTRY AGITATORS, VESSELS AND MIXERS
DOUBLE ACTING, INDEPENDENT OF DIRECTION OF ROTATION



Applications :
- Petrochemicals and its vapours
- General Chemicals and its vapours
- Light Hydrocarbons and its vapours

Seal Characteristics :
- Double Acting Back to Back
- Balanced
- Cartridge Unit
- Independent of Direction of Rotaton
- Operated with Pressurised Barrier Fluid

Face Materials :
Carbon, Silicon Carbide

Metals Parts :
Contact Parts ** : SS 316, SS 304
Non Contact Parts : Carbon Steel
** NOTE : Higher Alloys on request

Secondary Seals :
VITON, FFKM

Operating Limits :
Shaft Diameter d : 45.....150mm*
Pressure p : Vacuum.....35 bar (max)
Temperature t : Amb.....200°C (max)
Shaft speed n : 600 rpm. (max)
Barrier fluid pressure : Vessel pressure + 1.5 bar

SHAFT SIZE d g6 mm	SEAL SIZE d1 -0.002 inch	SEAL SIZE d1 -0.05 mm	SEAL SIZE d2 -0.002 inch	SEAL SIZE d2 -0.05 mm	d5 H12	M, d8	d9	d10	L11	L12
45.0	2.250	57.15	2.625	66.68	100.0	4, M10	155.0	180.0	235.0	285.0
50.0	2.250	57.15	2.625	66.68	100.0	4, M10	155.0	180.0	235.0	285.0
55.0	2.750	69.85	3.125	79.38	110.0	8, M12	180.0	200.0	250.0	300.0
60.0	2.750	69.85	3.125	79.38	110.0	8, M12	180.0	200.0	250.0	300.0
65.0	3.250	82.55	3.500	88.90	120.0	8, M12	190.0	215.0	260.0	310.0
70.0	3.250	82.55	3.500	88.90	120.0	8, M12	190.0	215.0	260.0	310.0
75.0	3.500	88.90	3.875	98.42	130.0	8, M12	200.0	230.0	270.0	320.0
80.0	3.500	88.90	3.875	98.42	130.0	8, M12	200.0	230.0	270.0	320.0
85.0	4.000	101.60	4.375	111.12	140.0	8, M16	225.0	255.0	280.0	330.0
90.0	4.000	101.60	4.375	111.12	140.0	8, M16	225.0	255.0	280.0	330.0
95.0	4.375	111.12	4.750	120.65	160.0	8, M16	250.0	300.0	300.0	350.0

All dimensions are in mm unless otherwise specified

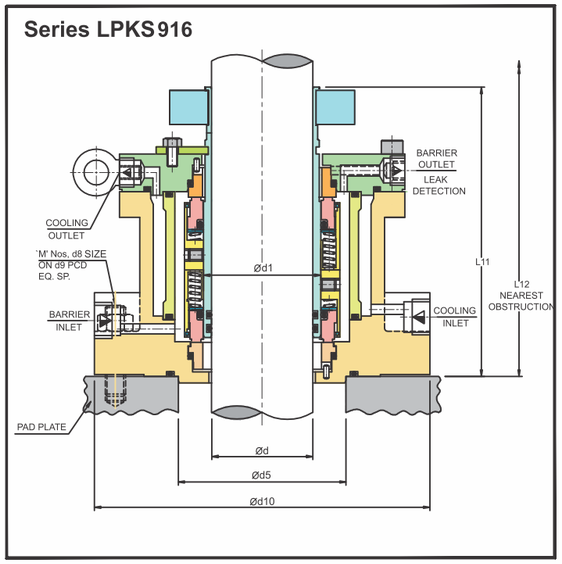
SHAFT SIZE d g6 mm	SEAL SIZE d1 -0.002 inch	SEAL SIZE d1 -0.05 mm	SEAL SIZE d2 -0.002 inch	SEAL SIZE d2 -0.05 mm	d5 H12	M, d8	d9	d10	L11	L12
100.0	4.375	111.12	4.750	120.65	160.0	8, M16	250.0	300.0	300.0	350.0
105.0	4.750	120.65	5.125	130.17	170.0	8, M16	260.0	330.0	305.0	355.0
110.0	4.750	120.65	5.125	130.17	170.0	8, M16	260.0	330.0	305.0	355.0
115.0	5.125	130.17	5.500	139.70	180.0	8, M16	270.0	330.0	310.0	360.0
120.0	5.125	130.17	5.500	139.70	180.0	8, M16	270.0	330.0	310.0	360.0
125.0	5.500	139.70	5.875	149.22	200.0	8, M16	280.0	330.0	320.0	370.0
130.0	5.500	139.70	5.875	149.22	200.0	8, M16	280.0	330.0	320.0	370.0
135.0	5.875	149.22	6.250	158.75	210.0	8, M16	295.0	385.0	330.0	380.0
140.0	5.875	149.22	6.250	158.75	210.0	8, M16	295.0	385.0	330.0	380.0
145.0	6.375	161.92	6.750	171.45	220.0	8, M16	300.0	395.0	340.0	390.0
150.0	6.375	161.92	6.750	171.45	220.0	8, M16	300.0	395.0	340.0	390.0

* Other sizes available on request

SERIES LPKS 913 & LPKS 914

Double Mechanical Seal — LPKS 916

FOR TOP / SIDE ENTRY AGITATORS, VESSELS AND MIXERS
DOUBLE ACTING, INDEPENDENT OF DIRECTION OF ROTATION



Applications :
- Petrochemicals and its vapours
- General Chemicals and its vapours
- Light Hydrocarbons and its vapours

Seal Characteristics :
- Double Acting Back to Back seals
- Unbalanced
- Cartridge Unit
- Independent of Direction of Rotation
- Operated with Pressurised Barrier Fluid

Face Materials :
Carbon, Silicon Carbide

Metals Parts :
Contact Parts ** : SS 316, SS 304
Non Contact Parts : Carbon Steel
** NOTE : Higher Alloys on request

Secondary Seals :
VITON, FFKM

Operating Limits :
Shaft Diameter d : 45.....150mm*
Pressure p : Vacuum.....10 bar (max)
Temperature t : Amb.....200°C (max)
Shaft speed n : 600 rpm. (max)
Barrier fluid pressure : Vessel pressure + 1.5 bar

SHAFT SIZE d g6 mm	SEAL SIZE d1 inch	SEAL SIZE d1 mm	d5 H12	M, d8	d9	d10	L11	L12
45.0	2.375	60.32	100.0	4, M10	155.0	180.0	170.0	220.0
50.0	2.375	60.32	100.0	4, M10	155.0	180.0	170.0	220.0
55.0	2.750	69.85	110.0	8, M12	180.0	200.0	180.0	230.0
60.0	2.750	69.85	110.0	8, M12	180.0	200.0	180.0	230.0
65.0	3.125	79.38	120.0	8, M12	190.0	215.0	190.0	240.0
70.0	3.125	79.38	120.0	8, M12	190.0	215.0	190.0	240.0
75.0	3.625	92.08	130.0	8, M12	200.0	230.0	200.0	250.0
80.0	3.625	92.08	130.0	8, M12	200.0	230.0	200.0	250.0
85.0	4.000	101.60	140.0	8, M16	225.0	255.0	200.0	250.0
90.0	4.000	101.60	140.0	8, M16	225.0	255.0	200.0	250.0
95.0	4.375	111.12	160.0	8, M16	250.0	300.0	200.0	250.0

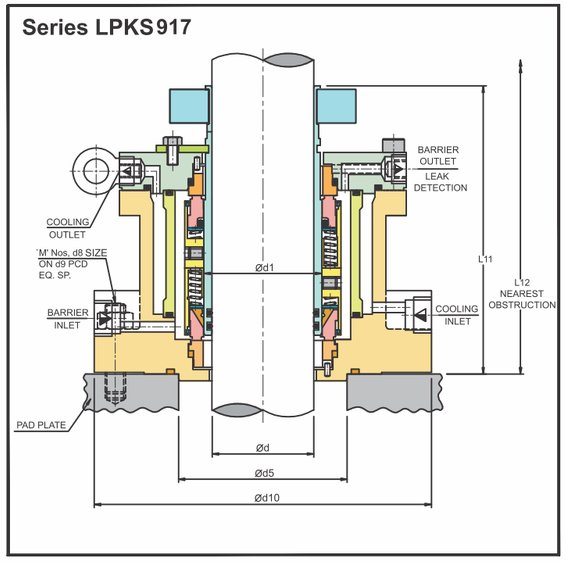
All dimensions are in mm unless otherwise specified

SHAFT SIZE d g6 mm	SEAL SIZE d1 inch	SEAL SIZE d1 mm	d5 H12	M, d8	d9	d10	L11	L12
100.0	4.375	111.12	160.0	8, M16	250.0	300.0	200.0	250.0
105.0	4.750	120.65	170.0	8, M16	260.0	330.0	205.0	255.0
110.0	4.750	120.65	170.0	8, M16	260.0	330.0	205.0	255.0
115.0	5.125	130.17	180.0	8, M16	270.0	330.0	210.0	260.0
120.0	5.125	130.17	180.0	8, M16	270.0	330.0	210.0	260.0
125.0	5.500	139.70	200.0	8, M16	280.0	330.0	210.0	260.0
130.0	5.500	139.70	200.0	8, M16	280.0	330.0	210.0	260.0
135.0	6.000	152.40	210.0	8, M16	295.0	385.0	215.0	265.0
140.0	6.000	152.40	210.0	8, M16	295.0	385.0	215.0	265.0
145.0	6.375	161.92	220.0	8, M16	300.0	395.0	225.0	275.0
150.0	6.375	161.92	220.0	8, M16	300.0	395.0	225.0	275.0

* Other sizes available on request

Double Mechanical Seal — LPKS 917

FOR TOP / SIDE ENTRY AGITATORS, VESSELS AND MIXERS
DOUBLE ACTING, INDEPENDENT OF DIRECTION OF ROTATION



Applications :
- Petrochemicals and its vapours
- General Chemicals and its vapours
- Light Hydrocarbons and its vapours

Seal Characteristics :
- Double Acting Back to Back seals
- Unbalanced
- Cartridge Unit
- Independent of Direction of Rotation
- Operated with Pressurised Barrier Fluid

Face Materials :
Carbon, Silicon Carbide

Metals Parts :
Contact Parts ** : SS 316, SS 304
Non Contact Parts : Carbon Steel
** NOTE : Higher Alloys on request

Secondary Seals :
VITON, PTFE, GFT

Operating Limits :
Shaft Diameter d : 45.....150mm*
Pressure p : Vacuum.....10 bar (max)
Temperature t : Amb.....200°C (max)
Shaft speed n : 600 rpm. (max)
Barrier fluid pressure : Vessel pressure + 1.5 bar

SHAFT SIZE d g6 mm	SEAL SIZE d1 inch	SEAL SIZE d1 mm	d5 H12	M, d8	d9	d10	L11	L12
45.0	2.375	60.32	100.0	4, M10	155.0	180.0	170.0	220.0
50.0	2.375	60.32	100.0	4, M10	155.0	180.0	170.0	220.0
55.0	2.750	69.85	110.0	8, M12	180.0	200.0	180.0	230.0
60.0	2.750	69.85	110.0	8, M12	180.0	200.0	180.0	230.0
65.0	3.125	79.38	120.0	8, M12	190.0	215.0	190.0	240.0
70.0	3.125	79.38	120.0	8, M12	190.0	215.0	190.0	240.0
75.0	3.625	92.08	130.0	8, M12	200.0	230.0	200.0	250.0
80.0	3.625	92.08	130.0	8, M12	200.0	230.0	200.0	250.0
85.0	4.000	101.60	140.0	8, M16	225.0	255.0	200.0	250.0
90.0	4.000	101.60	140.0	8, M16	225.0	255.0	200.0	250.0
95.0	4.375	111.12	160.0	8, M16	250.0	300.0	200.0	250.0

All dimensions are in mm unless otherwise specified

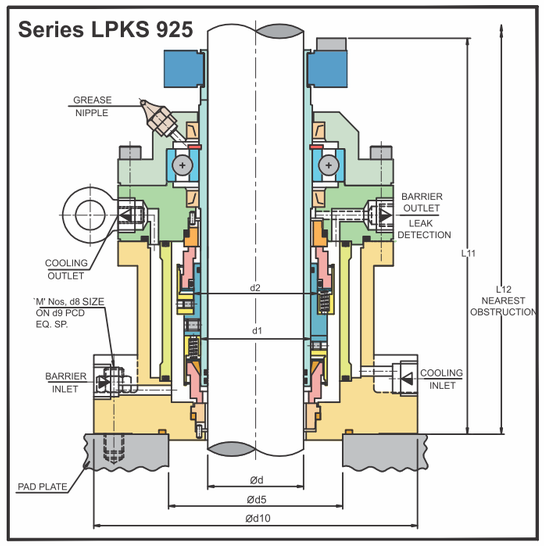
SHAFT SIZE d g6 mm	SEAL SIZE d1 inch	SEAL SIZE d1 mm	d5 H12	M, d8	d9	d10	L11	L12
100.0	4.375	111.12	160.0	8, M16	250.0	300.0	200.0	250.0
105.0	4.750	120.65	170.0	8, M16	260.0	330.0	205.0	255.0
110.0	4.750	120.65	170.0	8, M16	260.0	330.0	205.0	255.0
115.0	5.125	130.17	180.0	8, M16	270.0	330.0	210.0	260.0
120.0	5.125	130.17	180.0	8, M16	270.0	330.0	210.0	260.0
125.0	5.500	139.70	200.0	8, M16	280.0	330.0	210.0	260.0
130.0	5.500	139.70	200.0	8, M16	280.0	330.0	210.0	260.0
135.0	6.000	152.40	210.0	8, M16	295.0	385.0	215.0	265.0
140.0	6.000	152.40	210.0	8, M16	295.0	385.0	215.0	265.0
145.0	6.375	161.92	220.0	8, M16	300.0	395.0	225.0	275.0
150.0	6.375	161.92	220.0	8, M16	300.0	395.0	225.0	275.0

* Other sizes available on request

SERIES LPKS 916 & LPKS 917

Double Mechanical Seal — LPKS 925

FOR TOP / SIDE ENTRY AGITATORS, VESSELS AND MIXERS
DOUBLE ACTING, INDEPENDENT OF DIRECTION OF ROTATION



Applications :
- Petrochemicals and its vapours
- General Chemicals and its vapours
- Light Hydrocarbons and its vapours

Seal Characteristics :
- Double Acting Back to Back seals
- Balanced
- Cartridge Unit
- Independent of Direction of Rotation
- Operated with Pressurised Barrier Fluid

Face Materials :
Carbon, Silicon Carbide

Metals Parts :
Contact Parts ** : SS 316, SS 304
NonContact Parts : Carbon Steel
** NOTE : Higher Alloys on request

Secondary Seals :
VITON, PTFE, GPT

Operating Limits :
Shaft Diameter d : 45.....150mm*
Pressure p : Vacuum.....35 bar (max)
Temperature t : Amb.....200°C (max)
Shaft speed n : 600 rpm. (max)
Barrier fluid pressure : Vessel pressure + 1.5 bar

SHAFT SIZE d g6 mm	SEAL SIZE d1 +0 -0.002 inch	SEAL SIZE d1 +0 -0.05 mm	SEAL SIZE d2 +0 -0.002 inch	SEAL SIZE d2 +0 -0.05 mm	d5 H12	M, d8	d9	d10	L11	L12
45.0	2.250	57.15	2.625	66.68	100.0	4, M10	155.0	180.0	235.0	285.0
50.0	2.250	57.15	2.625	66.68	100.0	4, M10	155.0	180.0	235.0	285.0
55.0	2.750	69.85	3.125	79.38	110.0	8, M12	180.0	200.0	250.0	300.0
60.0	2.750	69.85	3.125	79.38	110.0	8, M12	180.0	200.0	250.0	300.0
65.0	3.250	82.55	3.500	88.90	120.0	8, M12	190.0	215.0	260.0	310.0
70.0	3.250	82.55	3.500	88.90	120.0	8, M12	190.0	215.0	260.0	310.0
75.0	3.500	88.90	3.875	98.42	130.0	8, M12	200.0	230.0	270.0	320.0
80.0	3.500	88.90	3.875	98.42	130.0	8, M12	200.0	230.0	270.0	320.0
85.0	4.000	101.60	4.375	111.12	140.0	8, M16	225.0	255.0	280.0	330.0
90.0	4.000	101.60	4.375	111.12	140.0	8, M16	225.0	255.0	280.0	330.0
95.0	4.375	111.12	4.750	120.65	160.0	8, M16	250.0	300.0	300.0	350.0

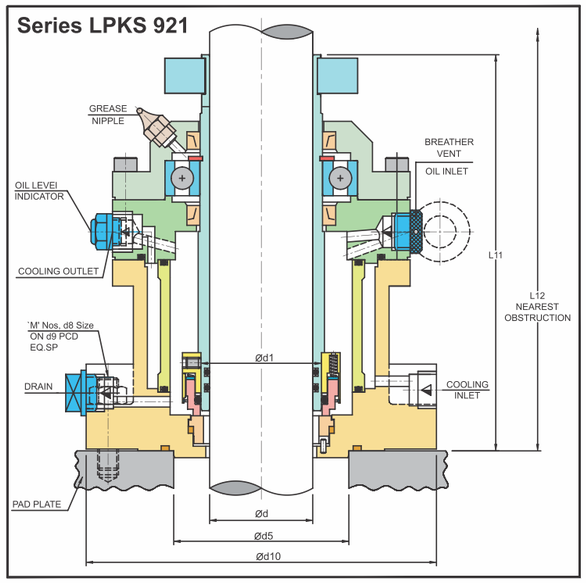
All dimensions are in mm unless otherwise specified

SHAFT SIZE d g6 mm	SEAL SIZE d1 +0 -0.002 inch	SEAL SIZE d1 +0 -0.05 mm	SEAL SIZE d2 +0 -0.002 inch	SEAL SIZE d2 +0 -0.05 mm	d5 H12	M, d8	d9	d10	L11	L12
100.0	4.375	111.12	4.750	120.65	160.0	8, M16	250.0	300.0	300.0	350.0
105.0	4.750	120.65	5.125	130.17	170.0	8, M16	260.0	330.0	305.0	355.0
110.0	4.750	120.65	5.125	130.17	170.0	8, M16	260.0	330.0	305.0	355.0
115.0	5.125	130.17	5.500	139.70	180.0	8, M16	270.0	330.0	310.0	360.0
120.0	5.125	130.17	5.500	139.70	180.0	8, M16	270.0	330.0	310.0	360.0
125.0	5.500	139.70	5.875	149.22	200.0	8, M16	280.0	330.0	320.0	370.0
130.0	5.500	139.70	5.875	149.22	200.0	8, M16	280.0	330.0	320.0	370.0
135.0	5.875	149.22	6.250	158.75	210.0	8, M16	295.0	385.0	330.0	380.0
140.0	5.875	149.22	6.250	158.75	210.0	8, M16	295.0	385.0	330.0	380.0
145.0	6.375	161.92	6.750	171.45	220.0	8, M16	300.0	395.0	340.0	390.0
150.0	6.375	161.92	6.750	171.45	220.0	8, M16	300.0	395.0	340.0	390.0

* Other sizes available on request

Wet Running Seal with Bearing — LPKS 921

FOR TOP / SIDE ENTRY AGITATORS, VESSELS AND MIXERS
SINGLE ACTING, INDEPENDENT OF DIRECTION OF ROTATION



Applications :
- Corrosive Chemicals
- General Light Chemicals
- Food Products
- Pharmaceutical Products

Seal Characteristics :
- Single Acting
- Reverse Balanced
- Outside Mounted
- Independent of Direction of Rotation
- With Bearing
- With Cooling Jacket

Face Materials :
Carbon, Silicon Carbide

Metals Parts :
Contact Parts ** : SS 316, SS 304
Non Contact Parts : Carbon Steel
** NOTE : Higher Alloys on request

Secondary Seals :
VITON, FEP, FFKM

Operating Limits
Shaft Diameter d : 45.....150mm*
Pressure p : Vacuum.....10 bar (max)
Temperature t : Amb.....180°C (max)
Shaft speed n : 320 rpm. (max)

SHAFT SIZE d g6 mm	SEAL SIZE d1 +0 -0.002 inch	SEAL SIZE d1 +0 -0.05 mm	d5 H12	M, d8	d9	d10	L11	L12
45.0	2.375	60.32	100.0	4, M10	155.0	180.0	205.0	260.0
50.0	2.375	60.32	100.0	4, M10	155.0	180.0	205.0	260.0
55.0	2.750	69.85	110.0	8, M12	180.0	200.0	215.0	270.0
60.0	2.750	69.85	110.0	8, M12	180.0	200.0	215.0	270.0
65.0	3.125	79.38	120.0	8, M12	190.0	215.0	200.0	270.0
70.0	3.125	79.38	120.0	8, M12	190.0	215.0	200.0	270.0
75.0	3.625	92.08	130.0	8, M12	200.0	230.0	230.0	280.0
80.0	3.625	92.08	130.0	8, M12	200.0	230.0	230.0	280.0
85.0	4.000	101.60	140.0	8, M16	225.0	255.0	200.0	280.0
90.0	4.000	101.60	140.0	8, M16	225.0	255.0	200.0	280.0
95.0	4.375	111.12	160.0	8, M16	250.0	300.0	220.0	280.0

All dimensions are in mm unless otherwise specified

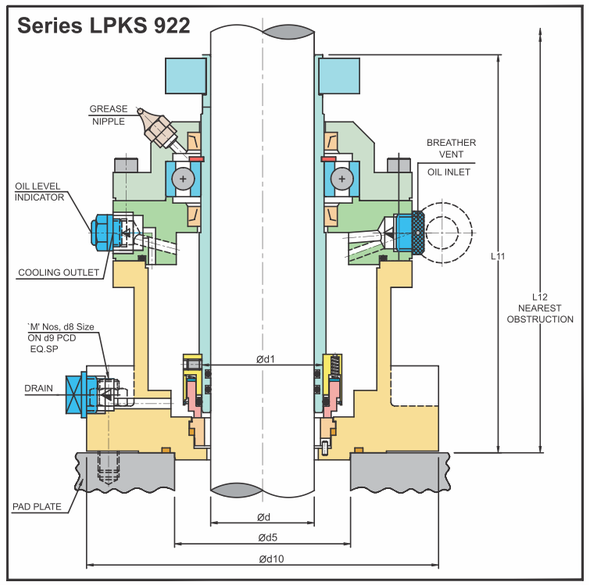
SHAFT SIZE d g6 mm	SEAL SIZE d1 +0 -0.002 inch	SEAL SIZE d1 +0 -0.05 mm	d5 H12	M, d8	d9	d10	L11	L12
100.0	4.375	111.12	160.0	8, M16	250.0	300.0	220.0	280.0
105.0	4.750	120.65	170.0	8, M16	260.0	330.0	220.0	280.0
110.0	4.750	120.65	170.0	8, M16	260.0	330.0	220.0	280.0
115.0	5.125	130.17	180.0	8, M16	270.0	330.0	230.0	280.0
120.0	5.125	130.17	180.0	8, M16	270.0	330.0	230.0	280.0
125.0	5.500	139.70	200.0	8, M16	280.0	330.0	230.0	280.0
130.0	5.500	139.70	200.0	8, M16	280.0	330.0	230.0	280.0
135.0	6.000	152.40	210.0	8, M16	295.0	385.0	230.0	280.0
140.0	6.000	152.40	210.0	8, M16	295.0	385.0	230.0	280.0
145.0	6.375	161.92	220.0	8, M16	300.0	395.0	240.0	300.0
150.0	6.375	161.92	220.0	8, M16	300.0	395.0	240.0	300.0

* Other sizes available on request

SERIES LPKS 925 & LPKS 921

Wet Running Seal with Bearing — LPKS 922

FOR TOP / SIDE ENTRY ABITATORS, VESSELS AND MIXERS
SINGLE ACTING, INDEPENDENT OF DIRECTION OF ROTATION



Applications :
- Corrosive Chemicals
- General Light Chemicals
- Food Products
- Pharmaceutical Products

Seal Characteristics :
- Single Acting
- Reverse Balanced
- Outside Mounted
- Independent of Direction of Rotation
- With Bearing

Face Materials :
Carbon, Silicon Carbide

Metals Parts :
Contact Parts ** : SS 316, SS 304
Non Contact Parts : Carbon Steel
** NOTE : Higher Alloys on request

Secondary Seals :
VITON, FEP, FFKM

Operating Limits :
Shaft Diameter d : 45.....150mm*
Pressure p : Vacuum.....10 bar (max)
Temperature t : Amb.....180°C (max)
Shaft speed n : 320 rpm. (max)

SHAFT SIZE d^{g6} mm	SEAL SIZE $d1^{0}_{-0.002}$ inch	SEAL SIZE $d1^{0}_{-0.05}$ mm	$d5^{H12}$	M, d8	d9	d10	L11	L12
45.0	2.375	60.32	100.0	4, M10	155.0	180.0	205.0	260.0
50.0	2.375	60.32	100.0	4, M10	155.0	180.0	205.0	260.0
55.0	2.750	69.85	110.0	8, M12	180.0	200.0	215.0	270.0
60.0	2.750	69.85	110.0	8, M12	180.0	200.0	215.0	270.0
65.0	3.125	79.38	120.0	8, M12	190.0	215.0	200.0	270.0
70.0	3.125	79.38	120.0	8, M12	190.0	215.0	200.0	270.0
75.0	3.625	92.08	130.0	8, M12	200.0	230.0	230.0	280.0
80.0	3.625	92.08	130.0	8, M12	200.0	230.0	230.0	280.0
85.0	4.000	101.60	140.0	8, M16	225.0	255.0	200.0	280.0
90.0	4.000	101.60	140.0	8, M16	225.0	255.0	200.0	280.0
95.0	4.375	111.12	160.0	8, M16	250.0	300.0	220.0	280.0

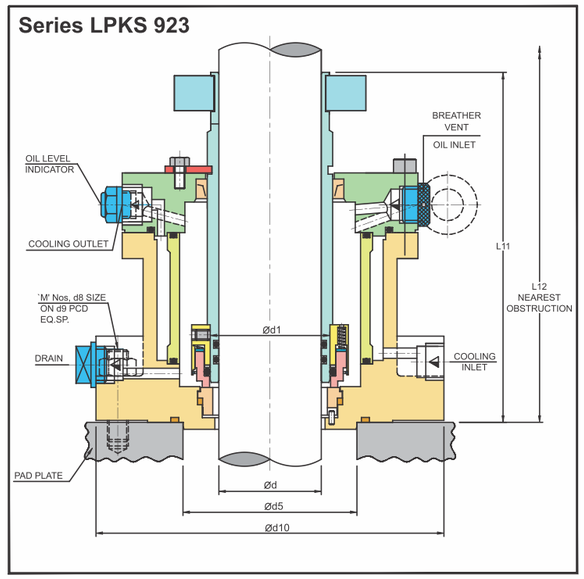
All dimensions are in mm unless otherwise specified

SHAFT SIZE d^{g6} mm	SEAL SIZE $d1^{0}_{-0.002}$ inch	SEAL SIZE $d1^{0}_{-0.05}$ mm	$d5^{H12}$	M, d8	d9	d10	L11	L12
100.0	4.375	111.12	160.0	8, M16	250.0	300.0	220.0	280.0
105.0	4.750	120.65	170.0	8, M16	260.0	330.0	220.0	280.0
110.0	4.750	120.65	170.0	8, M16	260.0	330.0	220.0	280.0
115.0	5.125	130.17	180.0	8, M16	270.0	330.0	230.0	280.0
120.0	5.125	130.17	180.0	8, M16	270.0	330.0	230.0	280.0
125.0	5.500	139.70	200.0	8, M16	280.0	330.0	230.0	280.0
130.0	5.500	139.70	200.0	8, M16	280.0	330.0	230.0	280.0
135.0	6.000	152.40	210.0	8, M16	295.0	385.0	230.0	280.0
140.0	6.000	152.40	210.0	8, M16	295.0	385.0	230.0	280.0
145.0	6.375	161.92	220.0	8, M16	300.0	395.0	240.0	300.0
150.0	6.375	161.92	220.0	8, M16	300.0	395.0	240.0	300.0

* Other sizes available on request

Wet Running Seal with Bearing — LPKS 923

FOR TOP / SIDE ENTRY ABITATORS, VESSELS AND MIXERS
SINGLE ACTING, INDEPENDENT OF DIRECTION OF ROTATION



Applications :
- Corrosive Chemicals
- General Light Chemicals
- Food Products
- Pharmaceutical Products

Seal Characteristics :
- Single Acting
- Reverse Balanced
- Outside Mounted
- Independent of Direction of Rotation
- Without Bearing
- With Cooling Jacket

Face Materials :
Carbon, Silicon Carbide

Metals Parts :
Contact Parts ** : SS 316, SS 304
Non Contact Parts : Carbon Steel
** NOTE : Higher Alloys on request

Secondary Seals
VITON, FEP, FFKM

Operating Limits :
Shaft Diameter d : 45.....150mm*
Pressure p : Vacuum.....10 bar (max)
Temperature t : Amb.....180°C (max)
Shaft speed n : 320 rpm. (max)

SHAFT SIZE d^{g6} mm	SEAL SIZE $d1^{0}_{-0.002}$ inch	SEAL SIZE $d1^{0}_{-0.05}$ mm	$d5^{H12}$	M, d8	d9	d10	L11	L12
45.0	2.375	60.32	100.0	4, M10	155.0	180.0	170.0	220.0
50.0	2.375	60.32	100.0	4, M10	155.0	180.0	170.0	220.0
55.0	2.750	69.85	110.0	8, M12	180.0	200.0	180.0	230.0
60.0	2.750	69.85	110.0	8, M12	180.0	200.0	180.0	230.0
65.0	3.125	79.38	120.0	8, M12	190.0	215.0	160.0	230.0
70.0	3.125	79.38	120.0	8, M12	190.0	215.0	160.0	230.0
75.0	3.625	92.08	130.0	8, M12	200.0	230.0	200.0	250.0
80.0	3.625	92.08	130.0	8, M12	200.0	230.0	200.0	250.0
85.0	4.000	101.60	140.0	8, M16	225.0	255.0	170.0	250.0
90.0	4.000	101.60	140.0	8, M16	225.0	255.0	170.0	250.0
95.0	4.375	111.12	160.0	8, M16	250.0	300.0	170.0	250.0

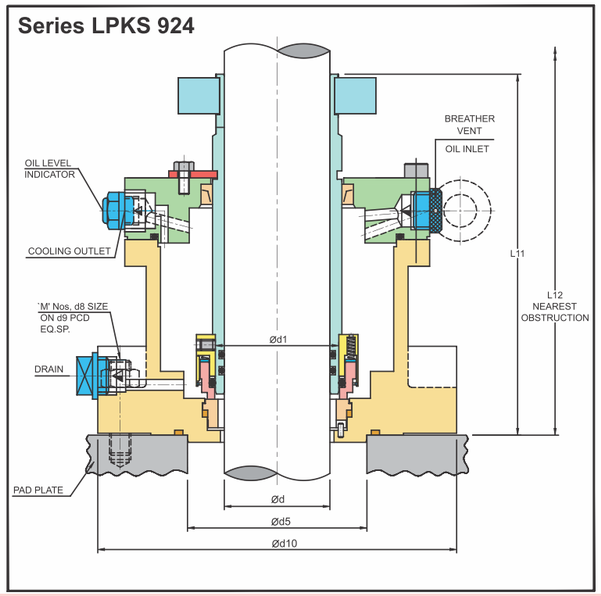
All dimensions are in mm unless otherwise specified

SHAFT SIZE d^{g6} mm	SEAL SIZE $d1^{0}_{-0.002}$ inch	SEAL SIZE $d1^{0}_{-0.05}$ mm	$d5^{H12}$	M, d8	d9	d10	L11	L12
100.0	4.375	111.12	160.0	8, M16	250.0	300.0	170.0	250.0
105.0	4.750	120.65	170.0	8, M16	260.0	330.0	170.0	250.0
110.0	4.750	120.65	170.0	8, M16	260.0	330.0	170.0	250.0
115.0	5.125	130.17	180.0	8, M16	270.0	330.0	175.0	250.0
120.0	5.125	130.17	180.0	8, M16	270.0	330.0	175.0	250.0
125.0	5.500	139.70	200.0	8, M16	280.0	330.0	175.0	250.0
130.0	5.500	139.70	200.0	8, M16	280.0	330.0	175.0	250.0
135.0	6.000	152.40	210.0	8, M16	295.0	385.0	180.0	250.0
140.0	6.000	152.40	210.0	8, M16	295.0	385.0	180.0	250.0
145.0	6.375	161.92	220.0	8, M16	300.0	395.0	180.0	250.0
150.0	6.375	161.92	220.0	8, M16	300.0	395.0	180.0	250.0

* Other sizes available on request

SERIES LPKS 922 & LPKS 923

FOR TOP / SIDE ENTRY AGITATORS, VESSELS AND MIXERS SINGLE ACTING, INDEPENDENT OF DIRECTION OF ROTATION



Applications :
- Corrosive Chemicals
- General Light Chemicals
- Food Products
- Pharmaceutical Products

Seal Characteristics :
- Single Acting
- Reverse Balanced
- Outside Mounted
- Independent of Direction of Rotation
- Without Bearing

Face Materials :
Carbon, Silicon Carbide

Metals Parts :
Contact Parts ** : SS 316, SS 304
Non Contact Parts : Carbon Steel
** NOTE : Higher Alloys on request

Secondary Seals :
VITON, FEP, FFKM

Operating Limits :
Shaft Diameter d : 45.....150mm*
Pressure p : Vacuum.....10 bar (max)
Temperature t : Amb.....180°C (max)
Shaft speed n : 320 rpm. (max)

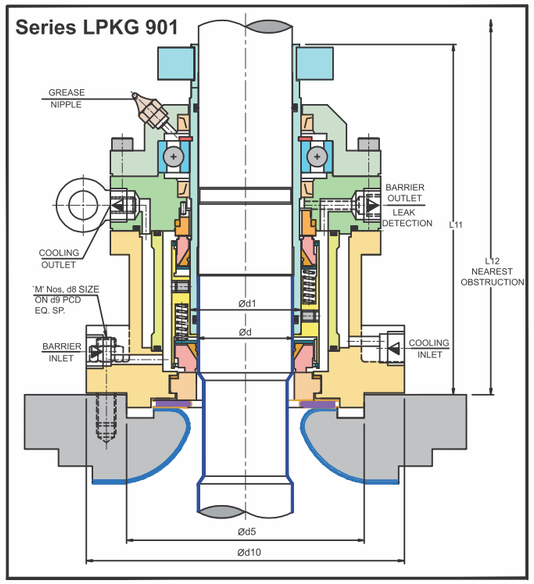
SHAFT SIZE d g6 mm	SEAL SIZE d1 -0.002 inch	SEAL SIZE d1 -0.05 mm	d5 H12	M, d8	d9	d10	L11	L12
45.0	2.375	60.32	100.0	4, M10	155.0	180.0	170.0	220.0
50.0	2.375	60.32	100.0	4, M10	155.0	180.0	170.0	220.0
55.0	2.750	69.85	110.0	8, M12	180.0	200.0	180.0	230.0
60.0	2.750	69.85	110.0	8, M12	180.0	200.0	180.0	230.0
65.0	3.125	79.38	120.0	8, M12	190.0	215.0	160.0	230.0
70.0	3.125	79.38	120.0	8, M12	190.0	215.0	160.0	230.0
75.0	3.625	92.08	130.0	8, M12	200.0	230.0	200.0	250.0
80.0	3.625	92.08	130.0	8, M12	200.0	230.0	200.0	250.0
85.0	4.000	101.60	140.0	8, M16	225.0	255.0	170.0	250.0
90.0	4.000	101.60	140.0	8, M16	225.0	255.0	170.0	250.0
95.0	4.375	111.12	160.0	8, M16	250.0	300.0	170.0	250.0

All dimensions are in mm unless otherwise specified

SHAFT SIZE d g6 mm	SEAL SIZE d1 -0.002 inch	SEAL SIZE d1 -0.05 mm	d5 H12	M, d8	d9	d10	L11	L12
100.0	4.375	111.12	160.0	8, M16	250.0	300.0	170.0	250.0
105.0	4.750	120.65	170.0	8, M16	260.0	330.0	170.0	250.0
110.0	4.750	120.65	170.0	8, M16	260.0	330.0	170.0	250.0
115.0	5.125	130.17	180.0	8, M16	270.0	330.0	175.0	250.0
120.0	5.125	130.17	180.0	8, M16	270.0	330.0	175.0	250.0
125.0	5.500	139.70	200.0	8, M16	280.0	330.0	175.0	250.0
130.0	5.500	139.70	200.0	8, M16	280.0	330.0	175.0	250.0
135.0	6.000	152.40	210.0	8, M16	295.0	385.0	180.0	250.0
140.0	6.000	152.40	210.0	8, M16	295.0	385.0	180.0	250.0
145.0	6.375	161.92	220.0	8, M16	300.0	395.0	180.0	250.0
150.0	6.375	161.92	220.0	8, M16	300.0	395.0	180.0	250.0

* Other sizes available on request

FOR TOP / SIDE ENTRY AGITATORS, VESSELS AND MIXERS DOUBLE ACTING, INDEPENDENT OF DIRECTION OF ROTATION



Applications :
- Pharmaceutical
- General Chemicals and its vapours

Seal Characteristics :
- Double Acting Back to Back seals
- Unbalanced
- Cartridge Unit
- Independent of Direction of Rotation
- Operated with Pressurised Barrier Fluids

Face Materials :
Carbon, Silicon Carbide

Metals Parts :
Contact Parts ** : SS 316, SS 304
Non Contact Parts : Carbon Steel
** NOTE : Higher Alloys on request

Secondary Seals :
PTFE, GFT

Operating Limits :
Shaft Diameter d : 50.....140mm*
Pressure p : Vacuum.....10 bar (max)
Temperature t : Amb.....200°C (max)
Shaft speed n : 600 rpm. (max)
Barrier fluid pressure : Vessel pressure + 1.5 bar

SHAFT SIZE d g6 mm	SEAL SIZE d1 -0.002 inch	SEAL SIZE d1 -0.05 mm	d5 H12	M, d8	d9	d10	L11	L12
40.0	2.000	50.80	114.0	4, M16	145.0	175.0	200.0	245.0
50.0	2.375	60.32	126.0	8, M16	155.0	180.0	200.0	245.0
60.0	2.750	69.85	137.0	8, M16	170.0	200.0	210.0	270.0
65.0	3.000	76.20	137.0	8, M16	170.0	200.0	210.0	270.0
80.0	3.625	92.08	167.0	8, M16	200.0	230.0	230.0	290.0
95.0	4.375	111.12	203.0	8, M16	270.0	300.0	240.0	290.0
100.0	4.375	111.12	203.0	8, M16	270.0	300.0	240.0	290.0

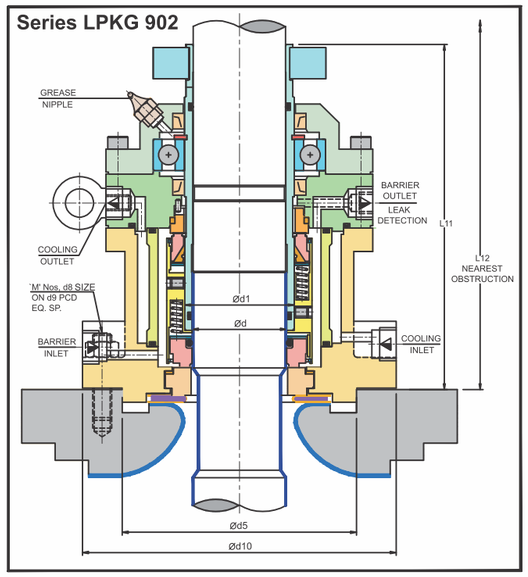
All dimensions are in mm unless otherwise specified

SHAFT SIZE d g6 mm	SEAL SIZE d1 -0.002 inch	SEAL SIZE d1 -0.05 mm	d5 H12	M, d8	d9	d10	L11	L12
110.0	4.750	120.65	220.0	8, M20	295.0	330.0	275.0	325.0
120.0	5.125	130.17	220.0	8, M20	295.0	330.0	275.0	325.0
125.0	5.000	139.70	220.0	8, M20	295.0	330.0	275.0	325.0
130.0	5.500	139.70	220.0	8, M20	295.0	330.0	275.0	325.0
140.0	6.000	152.40	313.0	12, M20	350.0	385.0	280.0	330.0
150.0	6.375	161.92	313.0	12, M20	350.0	385.0	280.0	330.0
160.0	6.750	171.45	313.0	12, M20	350.0	385.0	280.0	330.0

* Other sizes available on request

Double Mechanical Seal — LPKG 902

FOR TOP / SIDE ENTRY AGITATORS, VESSELS AND MIXERS DOUBLE ACTING, INDEPENDENT OF DIRECTION OF ROTATION



Applications :
- Pharmaceutical
- General Chemicals and its vapours

Seal Characteristics :
- Double Acting Back to Back seals
- Unbalanced
- Cartridge Unit
- Independent of Direction of Rotation
- Operated with Pressurised Barrier Fluids

Face Materials :
Carbon, Silicon Carbide

Metals Parts :
Contact Parts ** : SS 316, SS 304
Non Contact Parts : Carbon Steel
** NOTE : Higher Alloys on request

Secondary Seals
FFKM, PTFE, GFT

Operating Limits :
Shaft Diameter d : 50.....140mm *
Pressure p : Vacuum.....10 bar (max)
Temperature t : Amb.....200°C (max)
Shaft speed n : 600 rpm. (max)
Barrier fluid pressure : Vessel pressure + 1.5 bar

SHAFT SIZE d^{g6} mm	SEAL SIZE $d1^{0}_{-0.002}$ inch	SEAL SIZE $d1^{0}_{-0.05}$ mm	$d5^{H12}$	M, d8	d9	d10	L11	L12
40.0	2.000	50.80	114.0	4, M16	145.0	175.0	200.0	245.0
50.0	2.375	60.32	126.0	8, M16	155.0	180.0	200.0	245.0
60.0	2.750	69.85	137.0	8, M16	170.0	200.0	210.0	270.0
65.0	3.000	76.20	137.0	8, M16	170.0	200.0	210.0	270.0
80.0	3.625	92.08	167.0	8, M16	200.0	230.0	230.0	290.0
95.0	4.375	111.12	203.0	8, M16	270.0	300.0	240.0	290.0
100.0	4.375	111.12	203.0	8, M16	270.0	300.0	240.0	290.0

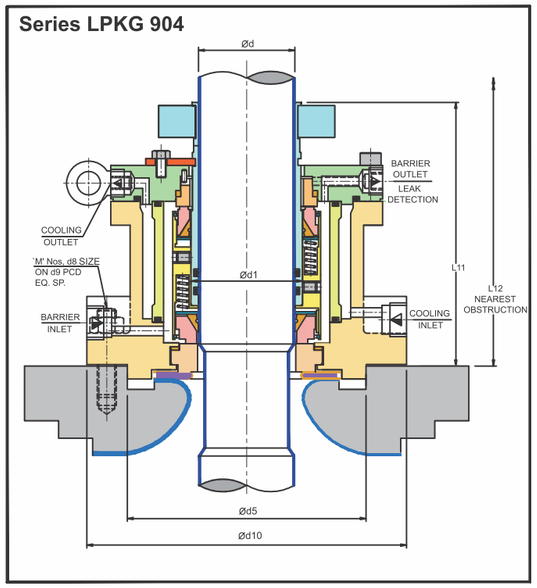
SHAFT SIZE d^{g6} mm	SEAL SIZE $d1^{0}_{-0.002}$ inch	SEAL SIZE $d1^{0}_{-0.05}$ mm	$d5^{H12}$	M, d8	d9	d10	L11	L12
110.0	4.750	120.65	220.0	8, M20	295.0	330.0	275.0	325.0
120.0	5.125	130.17	220.0	8, M20	295.0	330.0	275.0	325.0
125.0	5.000	139.70	220.0	8, M20	295.0	330.0	275.0	325.0
130.0	5.500	139.70	220.0	8, M20	295.0	330.0	275.0	325.0
140.0	6.000	152.40	313.0	12, M20	350.0	385.0	280.0	330.0
150.0	6.375	161.92	313.0	12, M20	350.0	385.0	280.0	330.0
160.0	6.750	171.45	313.0	12, M20	350.0	385.0	280.0	330.0

All dimensions are in mm unless otherwise specified

* Other sizes available on request

Double Mechanical Seal — LPKG 904

FOR TOP ENTRY GLASS LINED AGITATORS, VESSELS AND MIXERS DOUBLE ACTING, INDEPENDENT OF DIRECTION OF ROTATION



Applications :
- Pharmaceutical
- General Chemicals and its vapours

Seal Characteristics :
- Double Acting Back to Back seals
- Unbalanced
- Cartridge Unit
- Independent of Direction of Rotation
- Operated with Pressurised Barrier Fluids

Face Materials :
Carbon, Silicon Carbide

Metals Parts :
Contact Parts ** : SS 316, SS 304
Non Contact Parts : Carbon Steel
** NOTE : Higher Alloys on request

Secondary Seal :
PTFE, GFT

Operating Limits :
Shaft Diameter d : 50.....140mm*
Pressure p : Vacuum.....10 bar (max)
Temperature t : Amb.....200°C (max)
Shaft speed n : 600 rpm. (max)
Barrier fluid pressure : Vessel pressure + 1.5 bar

SHAFT SIZE d^{g6} mm	SEAL SIZE $d1^{0}_{-0.002}$ inch	SEAL SIZE $d1^{0}_{-0.05}$ mm	$d5^{H12}$	M, d8	d9	d10	L11	L12
40.0	2.000	50.80	114.0	4, M16	145.0	175.0	150.0	200.0
50.0	2.375	60.32	126.0	8, M16	155.0	180.0	150.0	200.0
60.0	2.750	69.85	137.0	8, M16	170.0	200.0	165.0	215.0
65.0	3.000	76.20	137.0	8, M16	170.0	200.0	165.0	215.0
80.0	3.625	92.08	167.0	8, M16	200.0	230.0	175.0	225.0
95.0	4.375	111.12	203.0	8, M16	270.0	300.0	185.0	235.0
100.0	4.375	111.12	203.0	8, M16	270.0	300.0	185.0	235.0

SHAFT SIZE d^{g6} mm	SEAL SIZE $d1^{0}_{-0.002}$ inch	SEAL SIZE $d1^{0}_{-0.05}$ mm	$d5^{H12}$	M, d8	d9	d10	L11	L12
110.0	4.750	120.65	220.0	8, M20	295.0	330.0	205.0	255.0
120.0	5.125	130.17	220.0	8, M20	295.0	330.0	205.0	255.0
125.0	5.500	139.70	220.0	8, M20	295.0	330.0	205.0	255.0
130.0	5.500	139.70	220.0	8, M20	295.0	330.0	205.0	255.0
140.0	6.000	152.40	313.0	12, M20	350.0	385.0	215.0	265.0
150.0	6.375	161.92	313.0	12, M20	350.0	385.0	215.0	265.0
160.0	6.750	171.45	313.0	12, M20	350.0	385.0	215.0	265.0

All dimensions are in mm unless otherwise specified

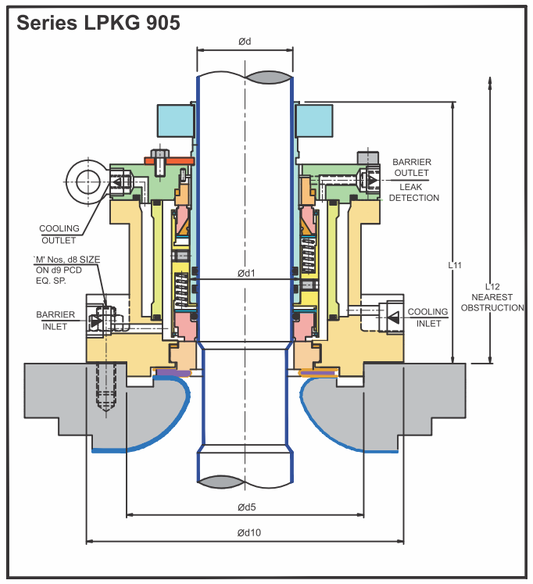
* Other sizes available on request

SERIES LPKG 902 & LPKG 904

Double Mechanical Seal

LPKG 905

FOR TOP / SIDE ENTRY ABITATORS, VESSELS AND MIXERS
DOUBLE ACTING, INDEPENDENT OF DIRECTION OF ROTATION



Applications :
- Pharmaceutical
- General Chemicals and its vapours

Seal Characteristics :
- Double Acting Back to Back seals
- Unbalanced
- Cartridge Unit
- Independent of Direction of Rotation
- Operated with Pressurised Barrier Fluids

Face Materials :
Carbon, Silicon Carbide

Metals Parts :
Contact Parts ** : SS 316, SS 304
Non Contact Parts : Carbon Steel
** NOTE : Higher Alloys on request

Secondary Seals :
FFKM, PTFE, GFT

Operating Limits :
Shaft Diameter d : 50.....140mm*
Pressure p : Vacuum.....10 bar (max)
Temperature t : Amb.....200°C (max)
Shaft speed n : 600 rpm. (max)
Barrier fluid pressure : Vessel pressure + 1.5 bar

SHAFT SIZE d g6 mm	SEAL SIZE d1 -0.002 inch	SEAL SIZE d1 -0.05 mm	d5 H12	M, d8	d9	d10	L11	L12
40.0	2.000	50.80	114.0	4, M16	145.0	175.0	150.0	200.0
50.0	2.375	60.32	126.0	8, M16	155.0	180.0	150.0	200.0
60.0	2.750	69.85	137.0	8, M16	170.0	200.0	165.0	215.0
65.0	3.000	76.20	137.0	8, M16	170.0	200.0	165.0	215.0
80.0	3.625	92.08	167.0	8, M16	200.0	230.0	175.0	225.0
95.0	4.375	111.12	203.0	8, M16	270.0	300.0	185.0	235.0
100.0	4.375	111.12	203.0	8, M16	270.0	300.0	185.0	235.0

All dimensions are in mm unless otherwise specified

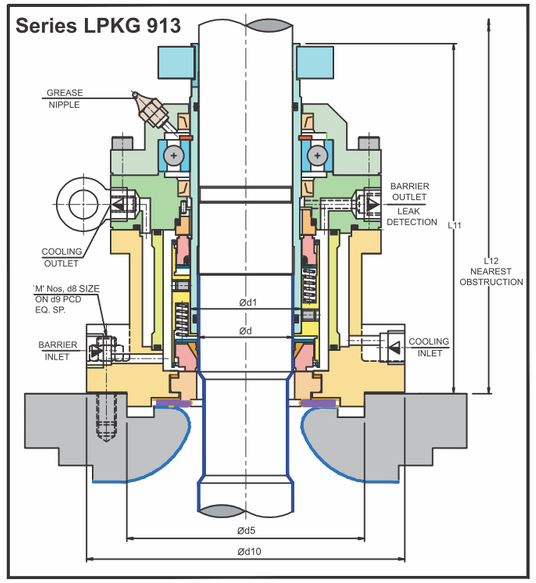
SHAFT SIZE d g6 mm	SEAL SIZE d1 -0.002 inch	SEAL SIZE d1 -0.05 mm	d5 H12	M, d8	d9	d10	L11	L12
110.0	4.750	120.65	220.0	8, M20	295.0	330.0	205.0	255.0
120.0	5.125	130.17	220.0	8, M20	295.0	330.0	205.0	255.0
125.0	5.500	139.70	220.0	8, M20	295.0	330.0	205.0	255.0
130.0	5.500	139.70	220.0	8, M20	295.0	330.0	205.0	255.0
140.0	6.000	152.40	313.0	12, M20	350.0	385.0	215.0	265.0
150.0	6.375	161.92	313.0	12, M20	350.0	385.0	215.0	265.0
160.0	6.750	171.45	313.0	12, M20	350.0	385.0	215.0	265.0

* Other sizes available on request

Double Mechanical Seal

LPKG 913

FOR TOP ENTRY AGITATORS, VESSELS AND MIXERS
DOUBLE ACTING, INDEPENDENT OF DIRECTION OF ROTATION



Applications :
- Pharmaceutical
- General Chemicals and its vapours

Seal Characteristics :
- Double Acting Back to Back seals
- Unbalanced
- Cartridge Unit
- Independent of Direction of Rotation
- Operated with Pressurised Barrier Fluids

Face Materials :
Carbon, Silicon Carbide

Metals Parts :
Contact Parts ** : SS 316, SS 304
Non Contact Parts : Carbon Steel
** NOTE : Higher Alloys on request

Secondary Seals :
PTFE, GFT

Operating Limits :
Shaft Diameter d : 50.....140mm*
Pressure p : Vacuum.....10 bar (max)
Temperature t : Amb.....200°C (max)
Shaft speed n : 600 rpm. (max)
Barrier fluid pressure : Vessel pressure + 1.5 bar

SHAFT SIZE d g6 mm	SEAL SIZE d1 -0.002 inch	SEAL SIZE d1 -0.05 mm	d5 H12	M, d8	d9	d10	L11	L12
40.0	2.000	50.80	114.0	4, M16	145.0	175.0	200.0	245.0
50.0	2.375	60.32	126.0	8, M16	155.0	180.0	200.0	245.0
60.0	2.750	69.85	137.0	8, M16	170.0	200.0	210.0	270.0
65.0	3.000	76.20	137.0	8, M16	170.0	200.0	210.0	270.0
80.0	3.625	92.08	167.0	8, M16	200.0	230.0	230.0	290.0
95.0	4.375	111.12	203.0	8, M16	270.0	300.0	240.0	290.0
100.0	4.375	111.12	203.0	8, M16	270.0	300.0	240.0	290.0

All dimensions are in mm unless otherwise specified

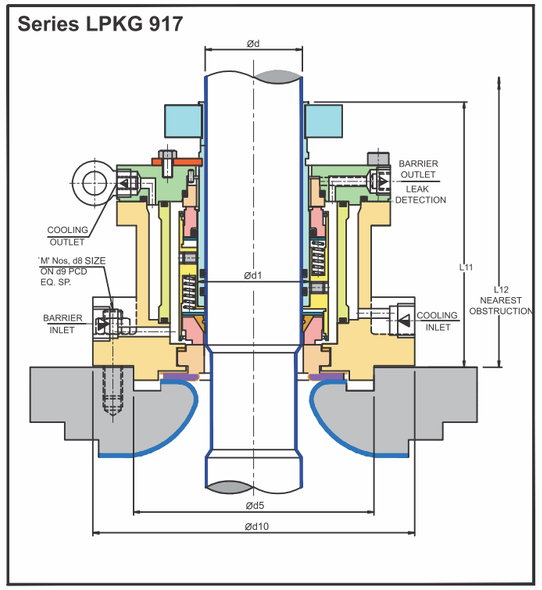
SHAFT SIZE d g6 mm	SEAL SIZE d1 -0.002 inch	SEAL SIZE d1 -0.05 mm	d5 H12	M, d8	d9	d10	L11	L12
110.0	4.750	120.65	220.0	8, M20	295.0	330.0	275.0	325.0
120.0	5.125	130.17	220.0	8, M20	295.0	330.0	275.0	325.0
125.0	5.000	139.70	220.0	8, M20	295.0	330.0	275.0	325.0
130.0	5.500	139.70	220.0	8, M20	295.0	330.0	275.0	325.0
140.0	6.000	152.40	313.0	12, M20	350.0	385.0	280.0	330.0
150.0	6.375	161.92	313.0	12, M20	350.0	385.0	280.0	330.0
160.0	6.750	171.45	313.0	12, M20	350.0	385.0	280.0	330.0

* Other sizes available on request

SERIES LPKG 905 & LPKG 913

Double Mechanical Seal — LPKG 917

FOR TOP ENTRY GLASS LINED AGITATORS, VESSELS AND MIXERS DOUBLE ACTING, INDEPENDENT OF DIRECTION OF ROTATION



Applications :
- Pharmaceutical
- General Chemicals and its vapours

Seal Characteristics
- Double Acting Back to Back seals
- Unbalanced
- Cartridge Unit
- Independent of Direction of Rotation
- Operated with Pressurised Barrier Fluids

Face Materials :
Carbon, Silicon Carbide

Metals Parts :
Contact Parts ** : SS 316, SS 304
Non Contact Parts : Carbon Steel
** NOTE : Higher Alloys on request

Operating Limits :
Shaft Diameter d : 50.....140mm*
Pressure p : Vacuum.....10 bar (max)
Temperature t : Amb.....200°C (max)
Shaft speed n : 600 rpm. (max)
Barrier fluid pressure : Vessel pressure + 1.5 bar

Secondary Seals :
PTFE, GFT

SHAFT SIZE d^{g6} mm	SEAL SIZE $d1^{0}_{-0.002}$ inch	SEAL SIZE $d1^{0}_{-0.05}$ mm	$d5^{H12}$	M, d8	d9	d10	L11	L12
40.0	2.000	50.80	114.0	4, M16	145.0	175.0	150.0	200.0
50.0	2.375	60.32	126.0	8, M16	155.0	180.0	150.0	200.0
60.0	2.750	69.85	137.0	8, M16	170.0	200.0	165.0	215.0
65.0	3.000	76.20	137.0	8, M16	170.0	200.0	165.0	215.0
80.0	3.625	92.08	167.0	8, M16	200.0	230.0	175.0	225.0
95.0	4.375	111.12	203.0	8, M16	270.0	300.0	185.0	235.0
100.0	4.375	111.12	203.0	8, M16	270.0	300.0	185.0	235.0

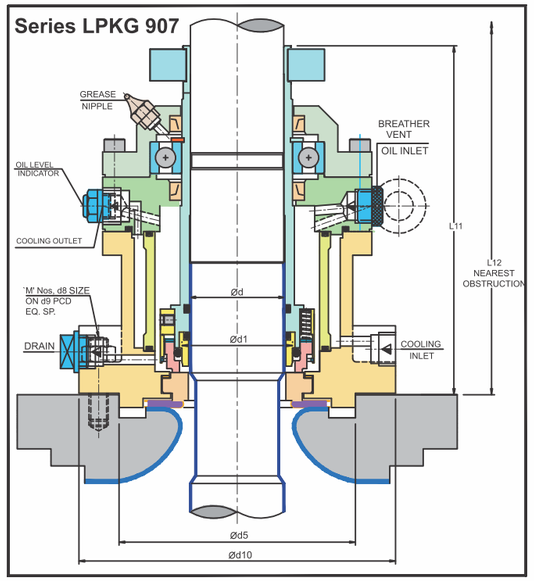
All dimensions are in mm unless otherwise specified

SHAFT SIZE d^{g6} mm	SEAL SIZE $d1^{0}_{-0.002}$ inch	SEAL SIZE $d1^{0}_{-0.05}$ mm	$d5^{H12}$	M, d8	d9	d10	L11	L12
110.0	4.750	120.65	220.0	8, M20	295.0	330.0	205.0	255.0
120.0	5.125	130.17	220.0	8, M20	295.0	330.0	205.0	255.0
125.0	5.500	139.70	220.0	8, M20	295.0	330.0	205.0	255.0
130.0	5.500	139.70	220.0	8, M20	295.0	330.0	205.0	255.0
140.0	6.000	152.40	313.0	12, M20	350.0	385.0	215.0	265.0
150.0	6.375	161.92	313.0	12, M20	350.0	385.0	215.0	265.0
160.0	6.750	171.45	313.0	12, M20	350.0	385.0	215.0	265.0

* Other sizes available on request

Wet Running Seal with Bearing — LPKG 907

FOR TOP ENTRY GLASS LINED AGITATORS, VESSELS AND MIXERS DOUBLE ACTING, INDEPENDENT OF DIRECTION OF ROATION



Applications :
- Pharmaceutical
- General Chemicals and its vapours

Seal Characteristics :
- Single Acting
- Reverse Balanced
- Outside Mounted
- Independent of Direction of Rotation
- With Bearing

Face Materials :
Carbon, Silicon Carbide

Metals Parts :
Contact Parts ** : SS 316, SS 304
Non Contact Parts : Carbon Steel
** NOTE : Higher Alloys on request

Operating Limits :
Shaft Diameter d : 50.....140mm*
Pressure p : Vacuum.....10 bar (max)
Temperature t : Amb.....180°C (max)
Shaft speed n : 320 rpm. (max)

Secondary Seals :
FEP, FFKM

SHAFT SIZE d^{g6} mm	SEAL SIZE $d1^{0}_{-0.002}$ inch	SEAL SIZE $d1^{0}_{-0.05}$ mm	$d5^{H12}$	M, d8	d9	d10	L11	L12
40.0	1.875	47.62	114.0	4, M16	145.0	175.0	200.0	245.0
50.0	2.250	57.15	126.0	8, M16	155.0	180.0	200.0	245.0
60.0	2.750	69.85	137.0	8, M16	170.0	200.0	210.0	270.0
65.0	2.875	73.02	137.0	8, M16	170.0	200.0	210.0	270.0
80.0	3.500	88.90	167.0	8, M16	200.0	230.0	230.0	290.0
95.0	4.375	111.12	203.0	8, M16	270.0	300.0	215.0	285.0
100.0	4.375	111.12	203.0	8, M16	270.0	300.0	215.0	285.0

All dimensions are in mm unless otherwise specified

SHAFT SIZE d^{g6} mm	SEAL SIZE $d1^{0}_{-0.002}$ inch	SEAL SIZE $d1^{0}_{-0.05}$ mm	$d5^{H12}$	M, d8	d9	d10	L11	L12
110.0	4.750	120.65	220.0	8, M20	295.0	330.0	230.0	290.0
120.0	5.125	130.17	220.0	8, M20	295.0	330.0	230.0	290.0
125.0	5.375	136.52	220.0	8, M20	295.0	330.0	230.0	290.0
130.0	5.500	139.70	220.0	8, M20	295.0	330.0	230.0	290.0
140.0	6.000	152.40	313.0	12, M20	350.0	385.0	235.0	290.0
150.0	6.375	161.92	313.0	12, M20	350.0	385.0	235.0	290.0
160.0	6.750	171.45	313.0	12, M20	350.0	385.0	235.0	290.0

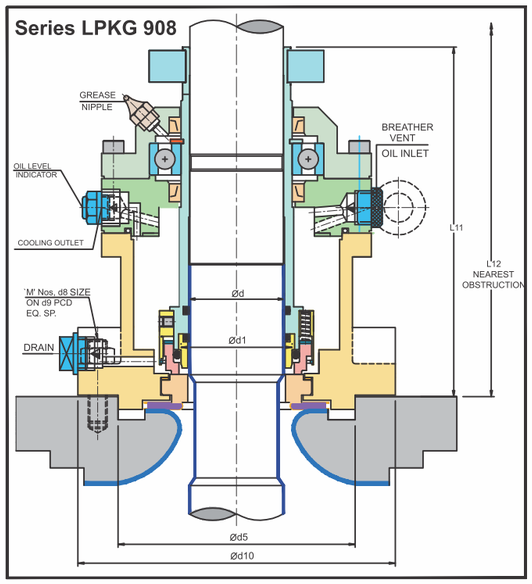
* Other sizes available on request

SERIES LPKG 917 & LPKG 907

Wet Running Seal with Bearing

LPKG 908

FOR TOP ENTRY GLASS LINED AGITATORS, VESSELS AND MIXERS SINGLE ACTING, INDEPENDENT OF DIRECTION OF ROTATION



Applications :

- Pharmaceutical
- General Chemicals and its vapours

Seal Characteristics :

- Single Acting
- Reverse Balanced
- Outside Mounted
- Independent of Direction of Rotation
- With Bearing

Face Materials :

Carbon, Silicon Carbide

Metals Parts :

Contact Parts ** : SS 316, SS 304
Non Contact Parts : Carbon Steel
** NOTE : Higher Alloys on request

Secondary Seals :

FEP, FFKM

Operating Limits :

Shaft Diameter d : 50.....140mm*
Pressure p : Vacuum.....10 bar (max)
Temperature t : Amb.....180°C (max)
Shaft speed n : 320 rpm. (max)

SHAFT SIZE d^{g6} mm	SEAL SIZE $d1^{0}_{-0.002}$ inch	SEAL SIZE $d1^{0}_{-0.05}$ mm	$d5^{H12}$	M, d8	d9	d10	L11	L12
40.0	1.875	47.62	114.0	4, M16	145.0	175.0	200.0	245.0
50.0	2.250	57.15	126.0	8, M16	155.0	180.0	200.0	245.0
60.0	2.750	69.85	137.0	8, M16	170.0	200.0	210.0	270.0
65.0	2.875	73.02	137.0	8, M16	170.0	200.0	210.0	270.0
80.0	3.500	88.90	167.0	8, M16	200.0	230.0	230.0	290.0
95.0	4.375	111.12	203.0	8, M16	270.0	300.0	215.0	285.0
100.0	4.375	111.12	203.0	8, M16	270.0	300.0	215.0	285.0

SHAFT SIZE d^{g6} mm	SEAL SIZE $d1^{0}_{-0.002}$ inch	SEAL SIZE $d1^{0}_{-0.05}$ mm	$d5^{H12}$	M, d8	d9	d10	L11	L12
110.0	4.750	120.65	220.0	8, M20	295.0	330.0	230.0	290.0
120.0	5.125	130.17	220.0	8, M20	295.0	330.0	230.0	290.0
125.0	5.375	136.52	220.0	8, M20	295.0	330.0	230.0	290.0
130.0	5.500	139.70	220.0	8, M20	295.0	330.0	230.0	290.0
140.0	6.000	152.40	313.0	12, M20	350.0	385.0	235.0	290.0
150.0	6.375	161.92	313.0	12, M20	350.0	385.0	235.0	290.0
160.0	6.750	171.45	313.0	12, M20	350.0	385.0	235.0	290.0

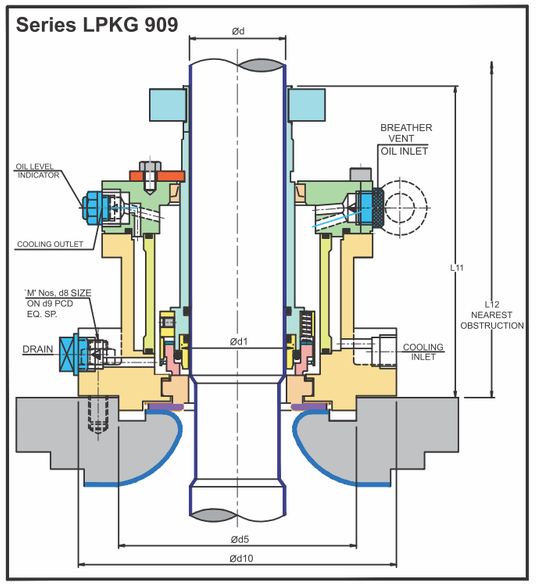
All dimensions are in mm unless otherwise specified

* Other sizes available on request

Wet Running Seal with Bearing

LPKG 909

FOR TOP ENTRY GLASS LINED AGITATORS, VESSELS AND MIXERS SINGLE ACTING, INDEPENDENT OF DIRECTION OF ROATION



Applications :

- Pharmaceutical
- General Chemicals and its vapours

Seal Characteristics :

- Single Acting
- Reverse Balanced
- Outside Mounted
- Independent of Direction of Rotation
- Without Bearing

Face Materials :

Carbon, Silicon Carbide

Metals Parts :

Contact Parts ** : SS 316, SS 304
Non Contact Parts : Carbon Steel
** NOTE : Higher Alloys on request

Secondary Seals :

FEP, FFKM

Operating Limits :

Shaft\ Diameter d : 50.....140mm*
Pressure p : Vacuum.....10 bar (max)
Temperature t : Amb.....180°C (max)
Shaft\ speed n : 320 rpm. (max)

SHAFT SIZE d^{g6} mm	SEAL SIZE $d1^{0}_{-0.002}$ inch	SEAL SIZE $d1^{0}_{-0.05}$ mm	$d5^{H12}$	M, d8	d9	d10	L11	L12
40.0	1.875	47.62	114.0	4, M16	145.0	175.0	150.0	200.0
50.0	2.250	57.15	126.0	8, M16	155.0	180.0	150.0	200.0
60.0	2.750	69.85	137.0	8, M16	170.0	200.0	165.0	215.0
65.0	2.875	73.02	137.0	8, M16	170.0	200.0	165.0	215.0
80.0	3.500	88.90	167.0	8, M16	200.0	230.0	175.0	215.0
95.0	4.375	111.12	203.0	8, M16	270.0	300.0	165.0	215.0
100.0	4.375	111.12	203.0	8, M16	270.0	300.0	165.0	215.0

SHAFT SIZE d^{g6} mm	SEAL SIZE $d1^{0}_{-0.002}$ inch	SEAL SIZE $d1^{0}_{-0.05}$ mm	$d5^{H12}$	M, d8	d9	d10	L11	L12
110.0	4.750	120.65	220.0	8, M20	295.0	330.0	170.0	220.0
120.0	5.125	130.17	220.0	8, M20	295.0	330.0	170.0	220.0
125.0	5.375	136.52	220.0	8, M20	295.0	330.0	170.0	220.0
130.0	5.500	139.70	220.0	8, M20	295.0	330.0	170.0	220.0
140.0	6.000	152.40	313.0	12, M20	350.0	385.0	180.0	230.0
150.0	6.375	161.92	313.0	12, M20	350.0	385.0	180.0	230.0
160.0	6.750	171.45	313.0	12, M20	350.0	385.0	180.0	230.0

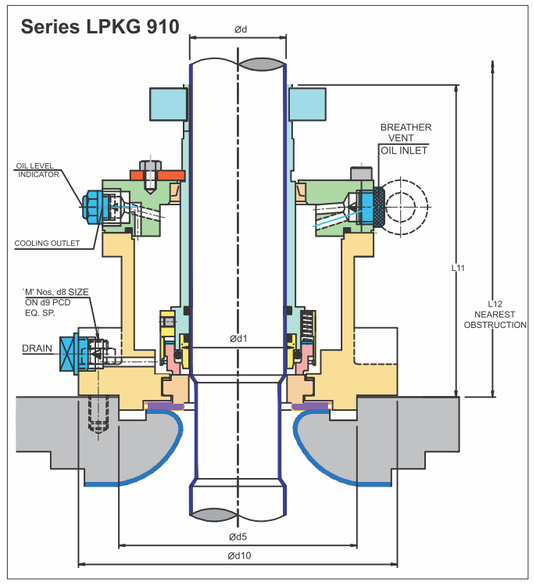
All dimensions are in mm unless otherwise specified

* Other sizes available on request

SERIES LPKG 908 & LPKG 909

Wet Running Seal with Bearing — LPKG 910

FOR TOP ENTRY GLASS LINED AGITATORS, VESSELS AND MIXERS SINGLE ACTING, INDEPENDENT OF DIRECTION OF ROTATION



Applications :
- Pharmaceutical
- General Chemicals and its vapours

Seal Characteristics :
- Single Acting
- Reverse Balanced
- Outside Mounted
- Independent of Direction of Rotation
- Without Bearing

Face Materials :
Carbon, Silicon Carbide

Metals Parts :
Contact Parts ** : SS 316, SS 304
Non Contact Parts : Carbon Steel
** NOTE : Higher Alloys on request

Secondary Seals :
FEP, FFKM

Operating Limits
Shaft Diameter d : 50.....140mm*
Pressure p : Vacuum.....10 bar (max)
Temperature t : Amb.....180°C (max)
Shaft speed n : 320 rpm. (max)

SHAFT SIZE d f6 mm	SEAL SIZE d1 -0.002 inch	SEAL SIZE d1 -0.05 mm	d5 H12	M, d8	d9	d10	L11	L12
40.0	1.875	47.62	114.0	4, M16	145.0	175.0	150.0	200.0
50.0	2.250	57.15	126.0	8, M16	155.0	180.0	150.0	200.0
60.0	2.750	69.85	137.0	8, M16	170.0	200.0	165.0	215.0
65.0	2.875	73.02	137.0	8, M16	170.0	200.0	165.0	215.0
80.0	3.500	88.90	167.0	8, M16	200.0	230.0	175.0	215.0
95.0	4.375	111.12	203.0	8, M16	270.0	300.0	165.0	215.0
100.0	4.375	111.12	203.0	8, M16	270.0	300.0	165.0	215.0

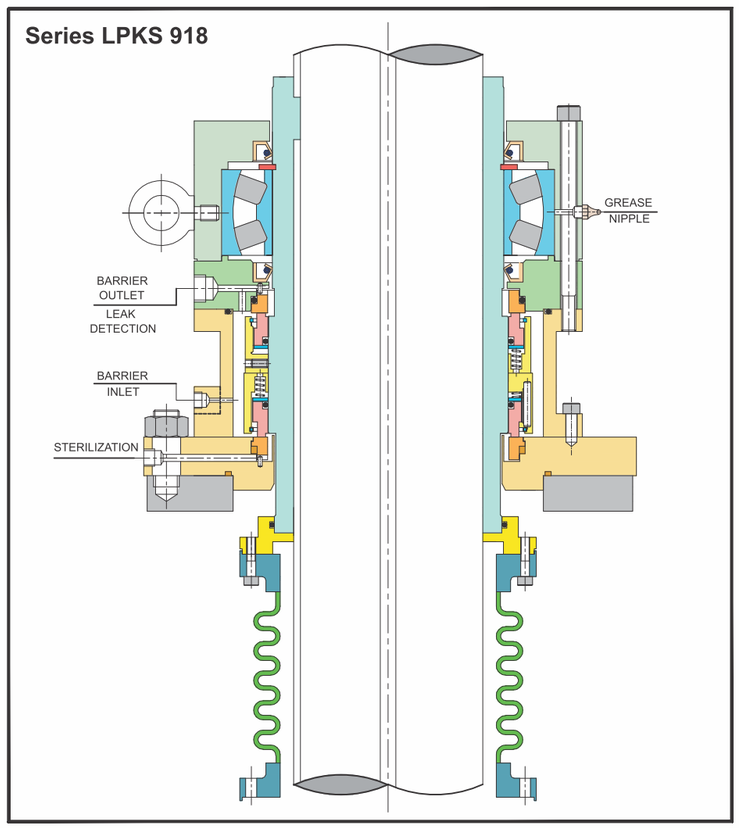
SHAFT SIZE d f6 mm	SEAL SIZE d1 -0.002 inch	SEAL SIZE d1 -0.05 mm	d5 H12	M, d8	d9	d10	L11	L12
110.0	4.750	120.65	220.0	8, M20	295.0	330.0	170.0	220.0
120.0	5.125	130.17	220.0	8, M20	295.0	330.0	170.0	220.0
125.0	5.375	136.52	220.0	8, M20	295.0	330.0	170.0	220.0
130.0	5.500	139.70	220.0	8, M20	295.0	330.0	170.0	220.0
140.0	6.000	152.40	313.0	12, M20	350.0	385.0	180.0	230.0
150.0	6.375	161.92	313.0	12, M20	350.0	385.0	180.0	230.0
160.0	6.750	171.45	313.0	12, M20	350.0	385.0	180.0	230.0

All dimensions are in mm unless otherwise specified

* Other sizes available on request

Double Mechanical Seal — LPKS 918

FOR TOP / SIDE ENTRY AGITATED NUTSCHE FILTERS (ANF) DOUBLE ACTING, INDEPENDENT OF DIRECTION OF ROTATION



SERIES LPKG 910 & LPKS 918

Applications :
- General Chemicals and its vapours
- Light Hydrocarbons and its vapours

Seal Characteristics :
- Double Acting Back to Back seals
- Cartridge Unit
- Independent of Direction of Rotation
- Operated with Pressurised Barrier Fluids

Face Materials :
Carbon, Silicon Carbide

Operating Limits :
Pressure p : Vacuum.....10 bar (max)
Temperature t : Amb.....200°C (max)
Shaft speed n : 600 rpm. (max)
Barrier fluid pressure : Vessel pressure + 1.5 bar

Metals Parts :
Contact Parts ** : SS 316, SS 304
Non Contact Parts : Carbon Steel
** NOTE : Higher Alloys on Request

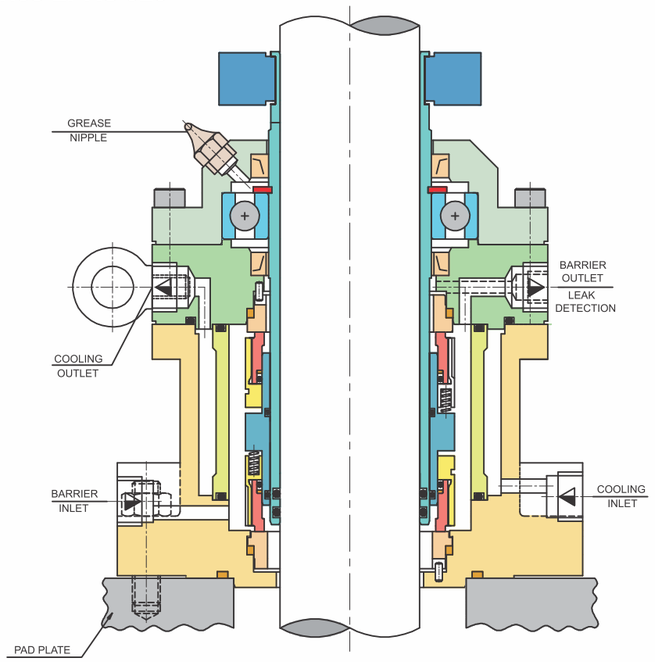
Secondary Seals :
VITON, FFKM, PTFE, GFT

Double Mechanical Seal

LPKS 920

FOR TOP /SIDE ENTRY AGITATORS AND MIXERS
DOUBLE ACTING, INDEPENDENT OF DIRECTION OF ROTATION

Series LPKS 920



Applications :
- Petrochemicals and its vapours
- General Chemicals and its vapours
- Light Hydrocarbons and its vapours

Face Materials :
Carbon, Silicon Carbide

Metals Parts :
Contact Parts ** : SS 316, SS 304
Non Contact Parts : Carbon Steel
** NOTE : Higher Alloys on request

Secondary Seals
VITON, FFKM

Seal Characteristics :
- Double Acting Back to Back seals
- Balanced
- Cartridge Unit
- Independent of Direction of Rotation
- **Operated with Pressurised Barrier Fluids**

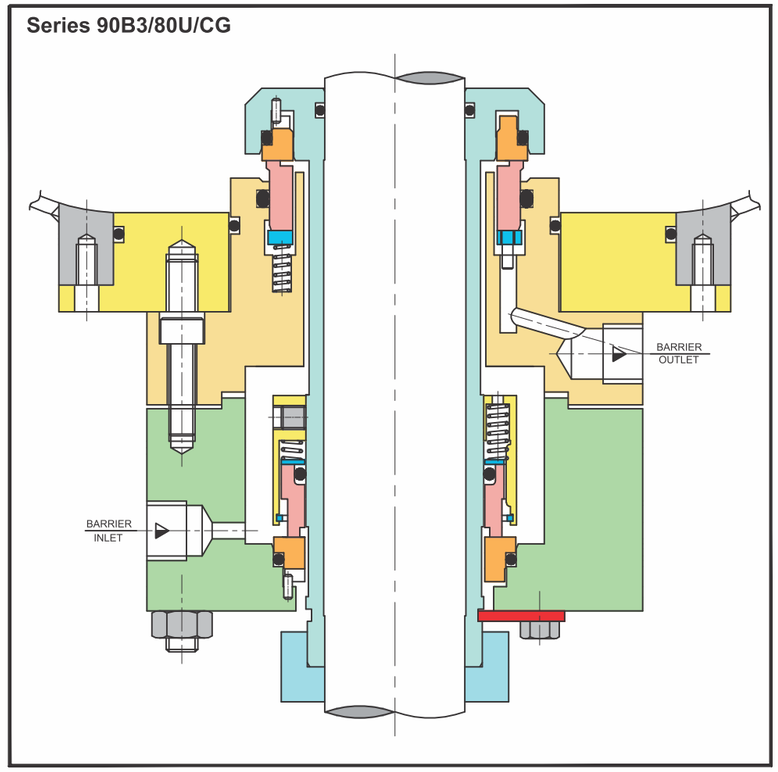
Operating Limits :
Pressure p : 30.....120 bar (max)
Temperature t : Amb.....200°C (max)
Shaft speed n : 600 rpm. (max)
Barrier fluid pressure : Vessel pressure + 1.5 bar

Double Mechanical Seal

90B3/80U/CG

FOR BOTTOM / SIDE ENTRY AGITATED VESSELS AND MIXERS
DOUBLE ACTING, INDEPENDENT OF DIRECTION OF ROTATION

Series 90B3/80U/CG



Applications :
- Flooded Reactors
- Lump Breakers & Choppers
- Horizontal Reactors & Mixers
- Grinding Mills
- Agitated Filter Dryers
- PC Autoclaves
- Sand Mill

Face Materials :
Carbon, Silicon Carbide, Tungsten Carbide, Ceramic

Metals Parts :
Contact Parts ** : SS 316, SS 304
Non Contact Parts : Carbon Steel
** NOTE : Higher Alloys on request

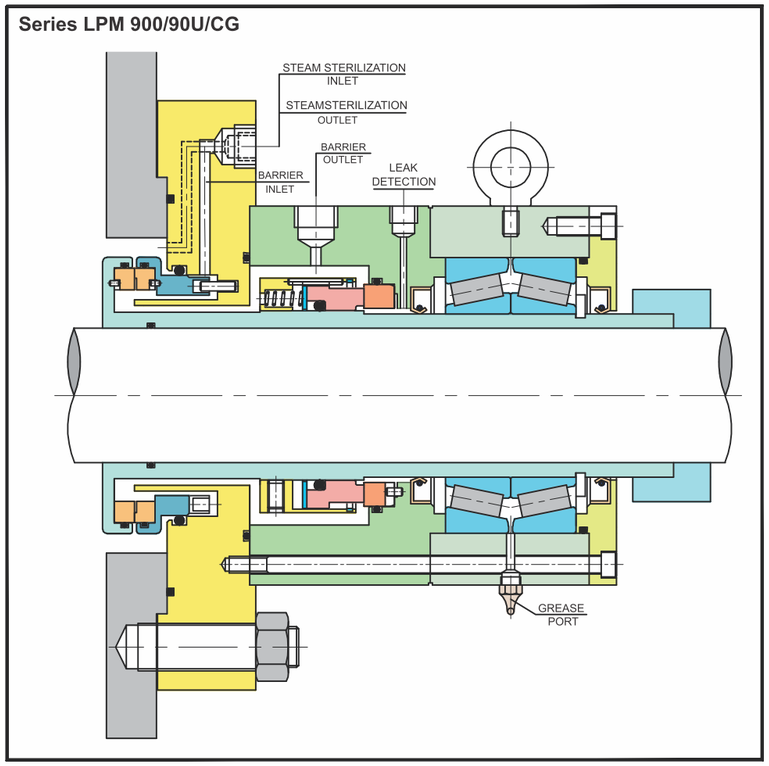
Secondary Seals :
VITON, ERP, FEP, PTFE, GFT, FFKM

Seal Characteristics :
- Double Acting Back to Back seals
- Cartridge Unit
- Independent of Direction of Rotation
- Operated with Pressurised Barrier Fluids

Operating Limits :
Pressure p : Vacuum.....10 bar (max)
Temperature t : Amb.....200°C (max)
Shaft speed n : 600 rpm. (max)
Barrier fluid pressure : Vessel pressure + 1.5 bar

FOR TOP /BOTTOM SIDE ENTRY AGITATORS AND MIXERS
DOUBLE ACTING, INDEPENDENT OF DIRECTION OF ROTATION

Series LPM 900/90U/CG



Applications :
- Flooded Reactors
- Lump Breakers & Choppers
- Horizontal Reactors & Mixers
- Grinding Mills
- Agitated Filter Dryers
- PC Autoclaves
- RVPD Reactors

Face Materials :
Carbon, Silicon Carbide

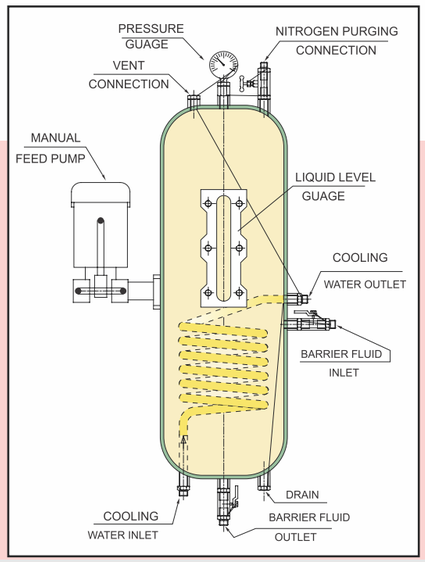
Metals Parts :
Contact Parts ** : SS 316, SS 304
Non Contact Parts : Carbon Steel
** NOTE : Higher Alloys on request

Secondary Seals :
VITON, FFKM

Seal Characteristics :
- Double Acting Back to Back seals
- Cartridge Unit
- Independent of Direction of Rotation
- Operated with Pressurised Barrier Fluids

Operating Limits :
Pressure p : Vacuum.....10 bar (max)
Temperature t : Amb.....200°C (max)
Shaft speed n : 600 rpm. (max)
Barrier fluid pressure : Vessel pressure + 1.5 bar

THERMOSYPHON VESSEL RCOMMENDED FOR API PLAN 52, 53A



Standard Style
Metal parts:
Thermosyphon shell :Carbon steel / SS 304 / SS 316
Cooling coil : SS 304 ISS 316
Empty weight : 1 0 kg (Approx)

Secondary Seal:
Elastomers

Operating Limits:

Capacity	: 7.0 ltrs
Design Pressure	: 35 bar
Hydraulic Test pressure	: 53 bar
Working temperature (max)	: 1500C
Heat Transfer area of cooling coil	: 0.2m2
Cooling water flow rate recommended	: 51trs/min

Connection specifications:

Cooling Water Inlet	318" NPT (F)
Cooling Water Outlet	3/8" NPT (F)
Barrier Fluid Inlet	318" NPT (F)
Barrier Fluid outlet	3/8" NPT (F)
Pressure Gauge Connection	318" NPT (F)
Filling Connection	3/8" NPT (F)
Nitrogen Purging Connection	318" NPT (F)
Feed Pump Connection	318" NPT (F)
Drain	3/8" NPT (F)

Accessories:

Pressure Gauge	: 0-40 bar
Level Gauge	: To indicate barrier fluid
Manual Feed Pump	: (optional)

Series LPTS07 is basically used as a storage & pressurising unit. This is used for double mechanical seals in back to back or tandem seal arrangement to provide necessary lubrication and cooling to the seal faces to achive recommended seal life. This is equipped with cooling coil inside the shell to bring down the temperature of barrier fluid coming from seal to Thermosyphon Vessel. Higher capacity upto 20 ltr. Can also be offered.

SERIES LPM 900/90U/CG & API PLAN 52, 53A

API PLAN 53B

A close loop Plan 53B (with Bladder Accumulator) allows stand- alone operation of a double liquid seal. It contains Air Fin Cooler, Pressure Transmitter, Pressure Gauge, Hand Pump, Valves, and Fittings etc.

Plan 53B System provides lubrication to seals, dissipate heat & maintain the required pressure gradient across the seal faces for back to back & tandem double seals.

A range of Standard designs with accumulator sizes from 20 to 50 LTRS & with various types of coolers can be offered.

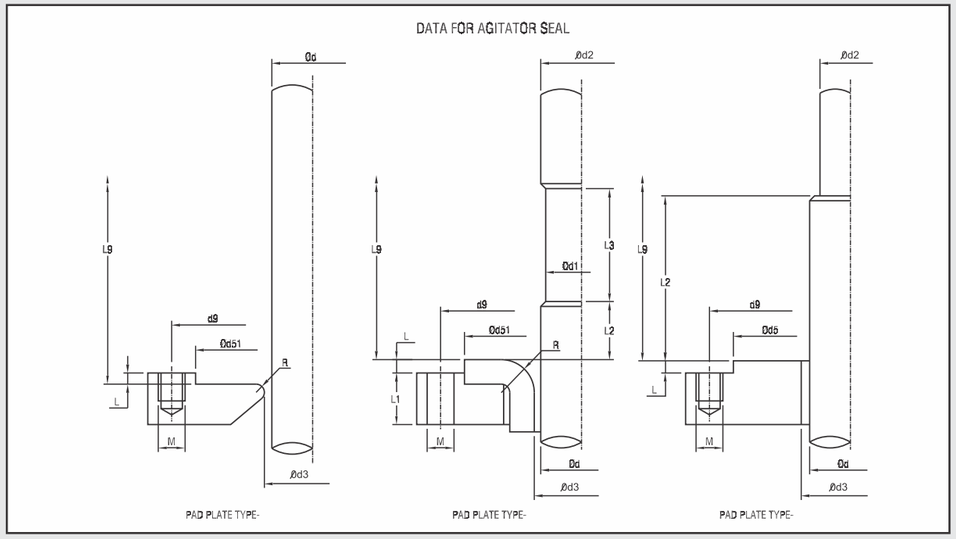
API PLAN 54 FORCED CIRCULATION SYSTEMS

Features

- Independent Pressurized fluid supply system.
- Compact and easy to operate.
- Automatic pressure hold.
- Available for various pressures & reservoir capacity i.e 40-120 Ltrs capacity & pressure 40 to 120 bar.

API PLAN 53B & API PLAN 54

AGITATOR INFORMATION DATA



d - Shaft OD.....
d1 - Shaft OD .....
d2 - Shaft OD .....
d3 - Pad plate ID .....
d5 - Spigot.....d51 .....
d9 - Bolt Circle.....
M - No. of Bolts ..... Size .....

L - Raised collar.....
L1 - Thickness .....
L2 - Shaft step from Pad .....
L3 - Distance between two steps .....
L9 - Nearest obstruction.....
R - Radius.....

Client .....

Address .....

Agitator Data
Make ..... Model .....
Item / Tag No. ..... Matl of Construction .....

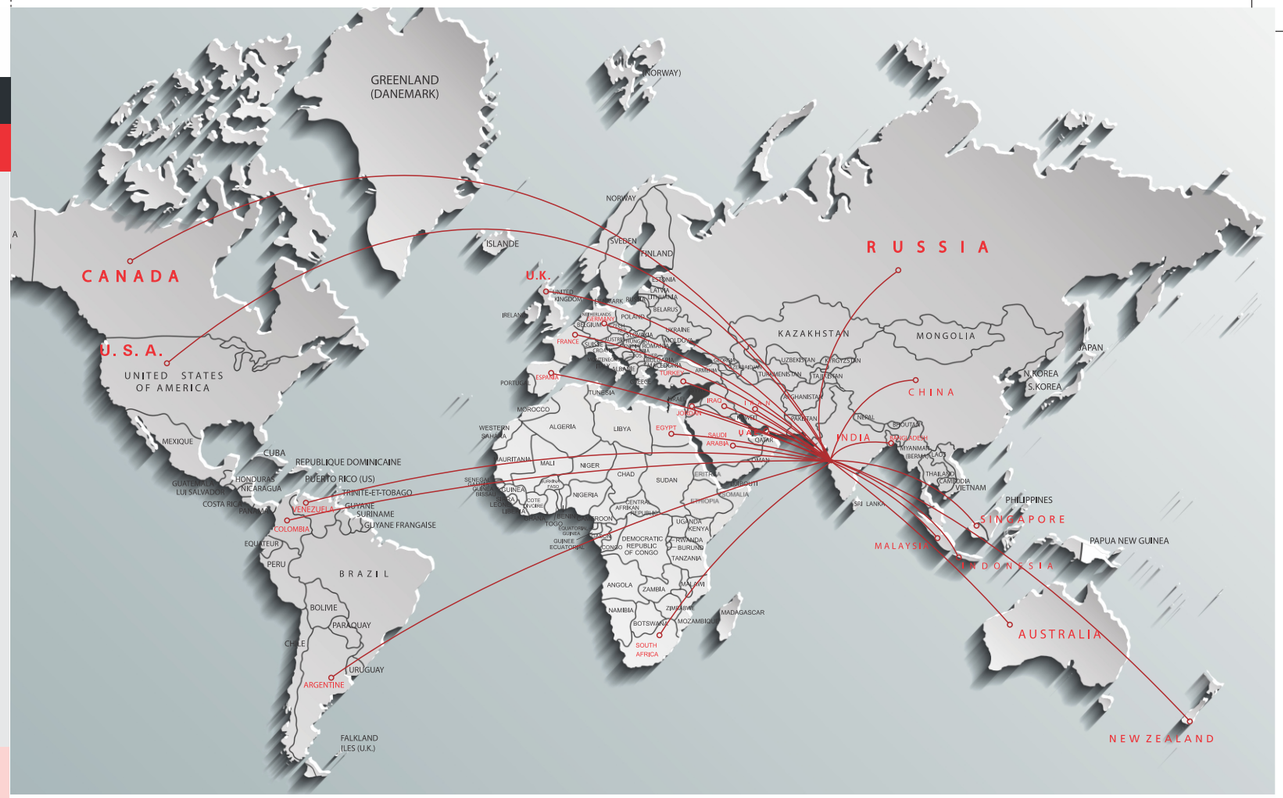
Existing seal arrangement (Gland Packing / Mechanical Seal).....
If mechanical seal, seal make & type
Existing mechanical seal working satisfactory Yes / No
If No, give details of seal failure in brief in remarks column.....

Operating Parameters
Vessel Pressure..... Speed .....
Direction of rotation from drive end ..... CW / CCW.....

Fluid Details
Fluid.....
Temperature..... Specific Gravity..... Viscosity .....
Boiling Point..... Freezing Point .....
Fluid Description ..... a. Clean..... b. Dirty..... c. Abrasive..... d. Slurry..... e. Toxic.....
Percentage of solids..... Grain size.....

API Plans
A) Recommended buffer/ barrier fluid..... Temperature .....
B) Recommended API Plan # Plan 52 (Non Pressurised Thermosyphon), # Plan 53 (Pressurised Thermosyphon), # Plan 54 (Barrier Fluid Circulation by external source)

Remarks .....
.....
.....



Exporting to the following countries :

U.S.A. ● CANADA ● COLOMBIA ● FRANCE ● GERMANY ● EGYPT ● U.A.E. ● SAUDI-ARABIA ● OMAN ● RUSSIA ● MALAYSIA ● AUSTRALIA ● IRAQ ● IRAN ● SINGAPORE
JORDAN ● INDONESIA ● VENEZUELA ● TURKEY ● NEW-ZEALAND ● SPAIN ● S. AFRICA ● ARGENTINA ● U.K. ● BANGLADESH

API 682 Testing Facility

Notes

SINCE 1973

Leak-Proof Engineering (I) Pvt. Ltd.

LEAK-PROOF, PRODUCTS AT A GLANCE

SINCE 1973