



Total Solution Of Hygienic Materials



HYGIENIC FLUID EQUIPMENT PROFESSIONAL MANUFACTURERS

As a professional sanitary stainless steel pipe and fittings factory, we do molding design and manufacture, heat treatment, casting, forging, electrolytic polishing, drilling, milling machine, CNC machining, cleaning, welding, assembling, packing, we offer a wide range of choices.

King Lai's research and development team is constantly searching to improve our craftsmanship. With regular machinery-acquiring plans, King Lai has effectively lowered production cost and helped customers earn the greatest profit margin and market share in their regions.



CUSTOMER SUCCESS IS OUR SUCCESS



Kunshan Kinglai Hygienic Materials Co., Ltd. (KL) founded in 2000, and gone public on 6th September 2011. KL expertise in hygienic materials research and manufacture, including vacuum vessel, pump, valve, flange, pressure vessel, tubing and fittings, etc. 68 series product covers 100,000 types comply with UHP & UHV. KL sanitary division serves customers in various industries, from daily articles of dairy, food, and beverage, to laboratory studies of chemical, pharmaceutical, and bio-tech. KL products are manufactured to meet different regional standards and custom-built products are available upon request. "CUSTOMER SUCCESS IS OUR SUCCESS" is the service tenet that we adhere to all the time.

KL is a professional hygienic material manufacturer with high-tech in several fields, like new material, precision machining, surface treatment, clean room, ultra vacuum etc. KL is one of the few manufacturers which carry a complete technical system, and also is a leading company worldwide.

KL had been certified by ASME BPE in 2013 for both tubing and fitting (*manufacturer), which is the NO.1 in Asia. Also, KL product comply with 3A, DIN, ISO, EHEDG etc.

We feature quick delivery, best quality, competitive pricing and excellent service for KL product.



THERE IS NO END OF STARTING

KingLai group for many years to fully meet customer demand as own duty, set a good brand image. Excellent management team and a good space to grow up and become a world-class high clean application materials suppliers, in the global food industry, pharmaceutical, biochemical, pharmaceutical industry and electronic clean areas have stable high-end customers, become the new the sustained and rapid growth of the company.

2014 EHEDG Certified

2013 ASME BPE Certified

Certified tubing and fitting manufacturer by ASME BPE Org.

2012/2013 KingLai Group

Joint Venture with abc on pressure vessel

Investment on ITO equipment production

2011 Listed Stock (SZSE: 300260)

Certified by GB, ASME(pressure vessel)

Certified by 3A(diaphragm valve, Filter, Changeover valve, tube)

Expansion the 3rd phase(Hefeng factory)

2009 Polaris Factory

3A Certified

ISO9001-2008, PED Certified,

2008 Certified of pressure piping

Certified by ISO, BSI

2007 Established Polaris Stainless Steel Technology Co., Ltd.

2006Expansion the 3rd phase(KingLai factory)

Certified by 3A(C pumps, Ball valve, Check valve)

2004 Certified by ISO 9001-2000

2000 Built the domestic factory (KingLai factory)

1991 Founded in Taiwan



APPLICATION FIELDS

As high clean applied materials has the global scope began to widespread popularization application, Our product is safe and efficient transmission fluid, control fluid steering, in food, beverage, dairy, and other industrial production in the in a wide range of applications. Fluid handling equipment such as pumps, valves, heat exchangers, storage equipment and pipeline fittings and installation materials, etc. in the company can meet customer multiple design as well as to the health of the strict requirements.

BIO-PHARM EQUIPMENTS

PHARMACEUTICAL,
CHEMICAL,
PERSONAL CARE
LIFE SCIENCE



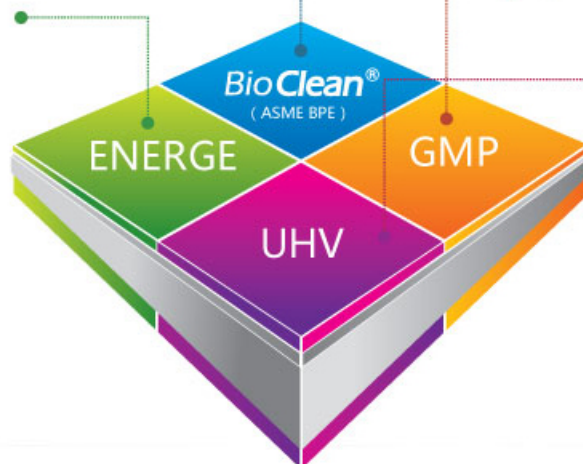
FOODS & BEVERAGE SAFETY PRODUCTION

DRINKS, DAIRY, BREW, WINES,



ENERGY SAVING & ENVIRONMENTS

SOLAR CELL, LED

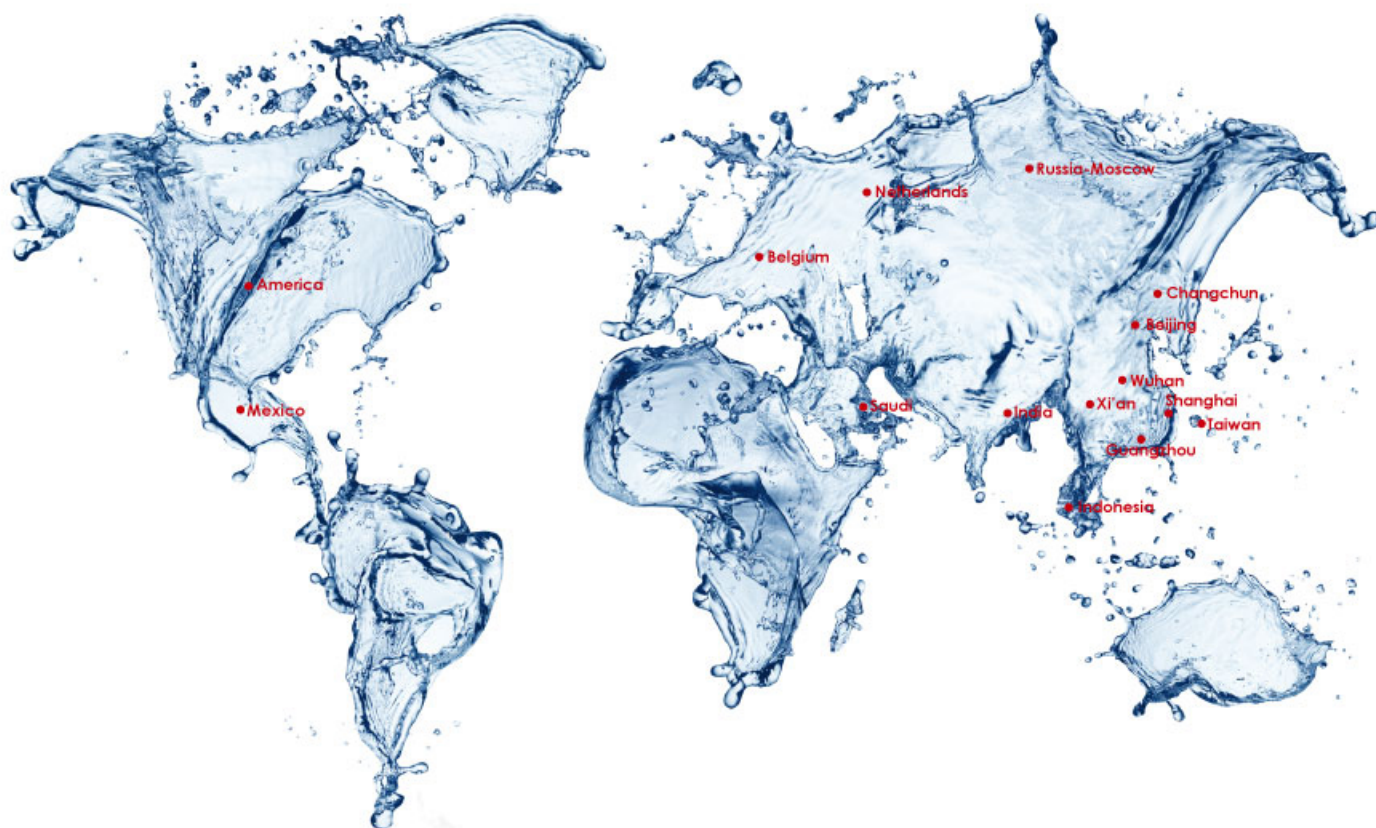


ELECTRONIC & SEMICON

SEMICONDUCTION
OPTICAL COATING,
ITO, UHP DELIVERY



MARKET & WORLDWIDE TRADE NETWORK



With our success and wide acceptance by our OEM/ODM customers worldwide, we further expand our services to domestic customers in China and Taiwan.

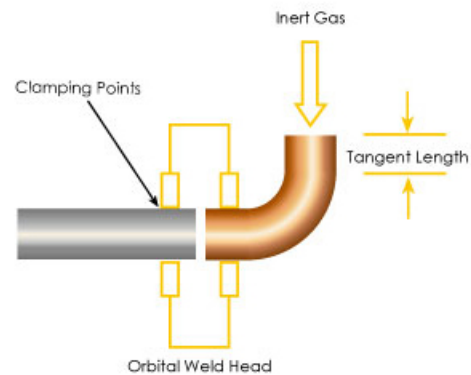
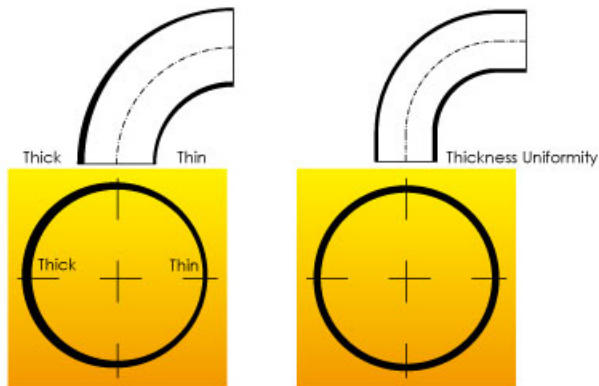
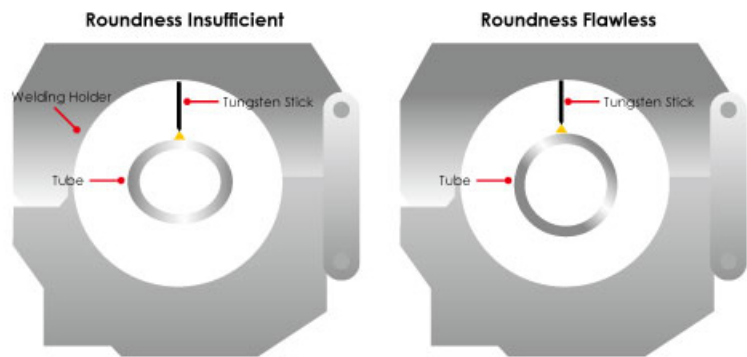
King Lai is constantly improving and upgrading to meet all technological requirements. King Lai's ISO 9001 certification and 3A certification are the results of our dedication to customer service and product quality. With this in mind, we are proud to say "customer success is our success". King Lai supplies to America, Europe, and other major industrial countries worldwide. As a mature manufacturer, we persist in research and development as well as quality management in lowering production cost while generating the highest efficiency. We feature quick delivery, best quality, competitive pricing and excellent service for fitting.

AUTOMATIC WELDING

KL raw material applies to ASTM 304 and 316L with good corrosion resistance and good performance in welding. KL is now using automatic welding, like Orbital welding, TIG welding, MIG welding, to replace hand welding, which can improve working environment & efficiency, meanwhile low down labor cost.

KL tubing automatic welding procedure

1. Long tangent, easy for fixture
2. Fitting roundness, ASME BPE 2012 DT-3-1
3. Fitting wall thickness, ASME BPE 2012 DT-3-1



TIG & Orbital

1. Pulse heating is good for heat sensitive material welding, because high temperature lasts very short period of time and iron condensation is fast.
2. It's good for thin coil welding, because only small heat input and little space been affected.
3. It's good for welding by one side in shape by both sides, because size of heat input and welding pool can be controlled.
4. High frequency arc shock to refine grain, eliminate porosity, improve joint performance.
5. It's suitable for high-speed welding, and can obtain better work efficiency.

Weakness of hand welding

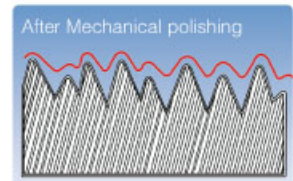
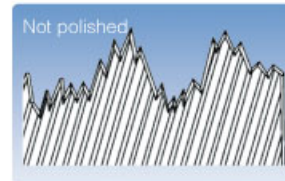
1. Crack
2. Non-fusion
3. Lack of penetration
4. Bubble
5. Undercut
6. Crater
7. Slag inclusion
8. Burn through
9. Overlap
10. Forming uneven
11. Weld repair

POLISHING PROCESS

KL hygienic tubing using 2B cold rolling coil, special welding procedure guarantee full penetration, and good welding performance complies with sanitary requirements for tubing.

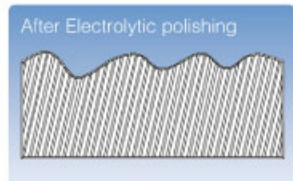
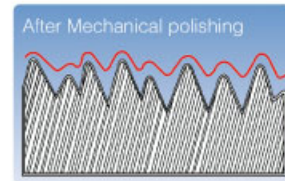
Mechanically Polished (MP)

Metal polishing wheel remove metallic contamination, make surface smooth as satin.



Electro-polished EP

Electro polish process removes spine and sunken, forming a protection layer to increase corrosion resistance. KL process MP before EP, which can guarantee a smooth surface and zero dead room.



Bright Annealing-BA

Tubing temperature need to be cool down below 100°F with hydrogen protection, after reaching 1050°F. It removes inner stress, and on the other hand, generates a passivation layer to increase the corrosion resistance.

Asid Cleaning & Passivated-AP

Pickle or passivation process can remove contaminations on surface, and generates a protection layer to increase corrosion resistance.

KL MP & EP process can guarantee surface roughness requirement of ASME BPE (0.8-0.375), and 0.12 is doable upon request.



Buffing polishing (BP)

It is commonly used to improve the surface brightness of decorative stainless steel industry, despite the Ra value may be better, but many corner crack was observed under the electron microscope, the surface with many impurities and abrasive particles.

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KDV-KingLai Diaphragm Valves

Applied Field

- Foods & Beverage
- Life Science
- Bio-Pharmaceutical
- Chemical
- Semi-conduction
- UHP
- Any WFI (Water For Injection) media



3ACertified



Features

- All air-tight shut down function design
- Apply to high flow rate, high corrosion, and high viscosity liquid
- SIP & CIP is available
- Easy maintenance
- Diaphragm seal comply with USP CLASS VI & FDA
- Unique design on structure guarantees longer service life



Diaphragm Design

The diaphragms are available for EPDM and TFM, The 2-piece design allows the two elastomer to work independently of each other, thereby reducing the tension caused by different thermic properties.

Each application has different working conditions and therefore different on the diaphragms, in order to select the most suitable diaphragm for application, the following factors should be considered: working pressure, Application temperatures, Process fluids (product, cleaning liquid, sterilisation, passivation, ect), EPDM is suitable for most application and for high temperature, a typical feature of this valve is its suitability for mechanical polluted media.

Standard	EPDM	EPDM+TFM	EPDM+PTFE	Silicone
DN15	⊗	⊗	⊗	
DN20	⊗	⊗		
DN25	⊗	⊗		
DN40	⊗	⊗		
DN50	⊗	⊗		
DN65				⊗
DN80				⊗

Documentation

- FDA- Declaration of conformity to FDA (CFR 21: 177.2600 or 177.1550)
- USP- Certificate of conformity to USP Class V



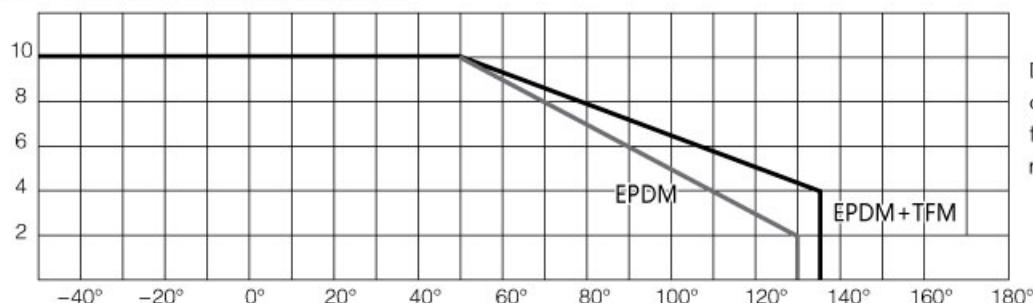
FDA



USP

Temperature & Lifetime

Pressure – Temperature recommendations:



Diaphragm life can be doubled when consecutive working temperature reduce 10°

Valve Body Design

Z Series 2-way valves

KDV-M with manually operated

KDV-P with pneumatically operated

KDV-U with manually operated

T Series T-valves(Zero Dead Design)

KDV-TC with manually operated(cast body)

KDV-TF with manually operated(forged block body)

KDV-TU with manually operated(BPE point of use valve)

M Series

KDMP Multi-port valves

KGMP Tandem valves



Valve types	Cast	Forged	Block
2 way valves	☐	☐	
T valves	☐	☐	☐
Tandem valves	☐	☐	☐
Multi-port valves			☐

Types	Cast	Forged and Block
Material	316L, EN 1.4409 CF3M	316L, EN 1.4404 10213-4
Delta ferrite	≤20%	≤3%
Sulphur content	0.017%	0.017%

Documentation

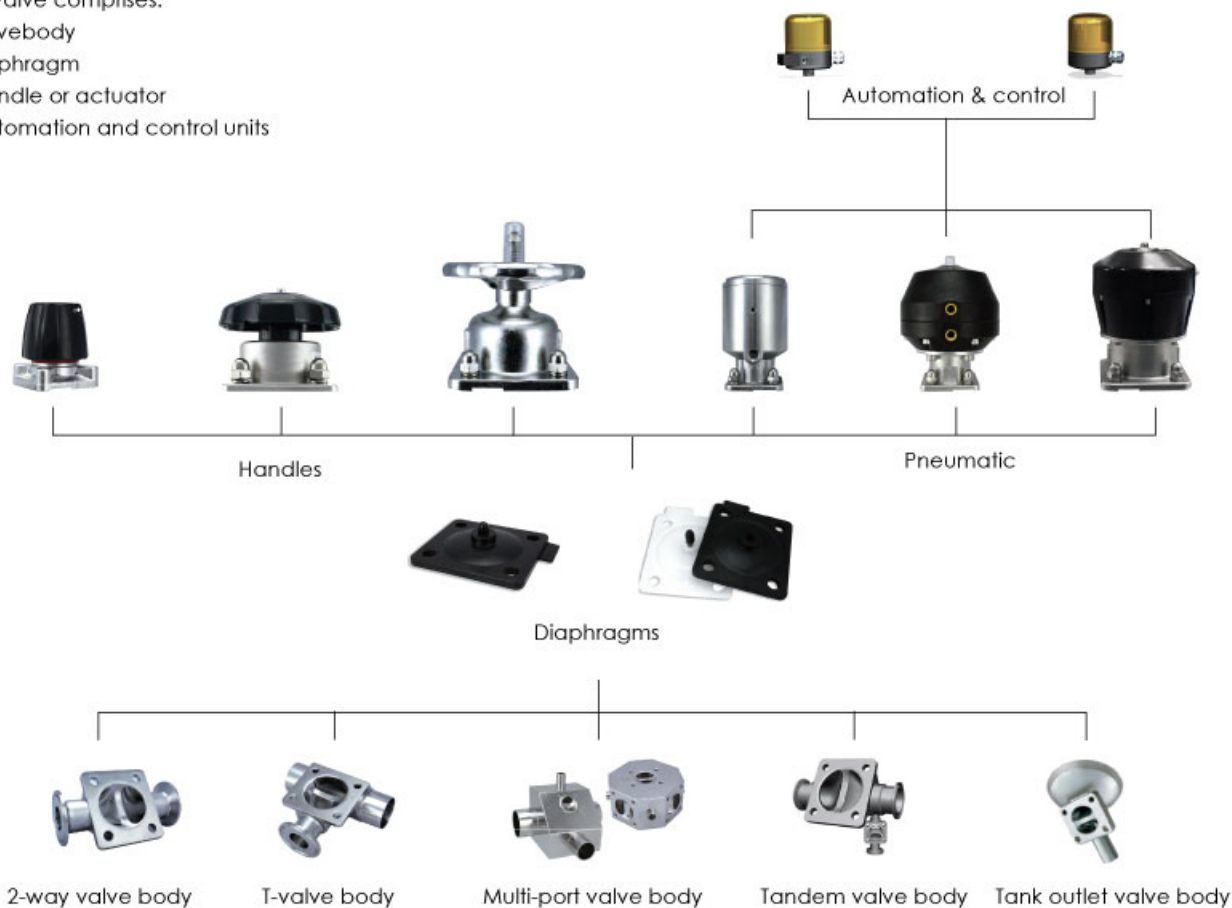
- 3.1/ MTR traceability certificate corresponding to EN 10204

Modular design

With its modular design, almost all configurations are feasible.

The valve comprises:

- Valvebody
- Diaphragm
- Handle or actuator
- Automation and control units



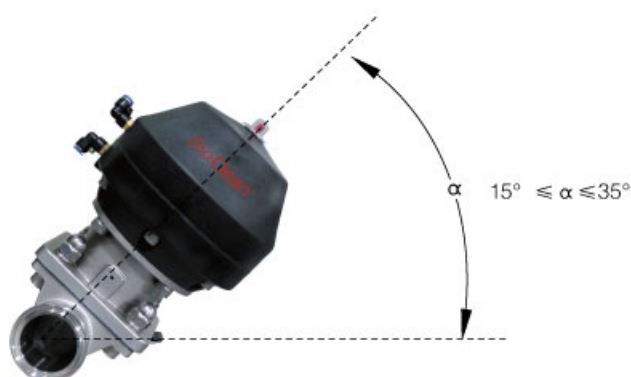
Handle and actuator options:

The diaphragm valves can be operated by a handle or a pneumatic actuator. Alfa Laval offers 4 different types of manual handles and 3 different types of pneumatic actuators.

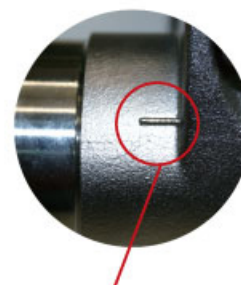
The handles and actuators are available in different materials: Stainless Steel (SS), PC, PP, Aluminium Alloy.

SIZE	PP		PC		SS		Aluminium Alloy	
	Handles	Actuators	Handles	Actuators	Handles	Actuators	Handles	Actuators
DN15			⊗			⊗		
DN20			⊗			⊗		
DN25		⊗	⊗					
DN40		⊗	⊗					
DN50		⊗	⊗					
DN65					⊗			⊗
DN80					⊗			⊗

Installation for self-draining operation



$\alpha = 15^\circ$ up to 35° (Marking must face upwards, 12 o'clock position). Drain marks permanently marked on both sides of the valve body show the correct mounting position to optimise drain ability.



Marking for self-drain angle.

Selection Table

Connection Standard	DIN	D	Connection Type	weld-weld	1
	ISO	I		clamp-clamp	2
	3A	A		weld-clamp	3
	BPE	B			
Connection Size	DN15	15	Body Material	316L	6L
	DN20	20		304L	4L
	DN25	25	Sealing Material	EPDM	E
	DN40	40		EPDM+TFM	ET
	DN50	50		EPDM+PTFE	EF
	DN65	65		Silicone	Si
	DN80	80	Polish Way	Mechanical Polish	MP
Actuator Type	Manual	M		Electronic Polish	EP
	Normally Open	NO	Feedback Type(only for pneumatic)		
	Normally Closed	NC	Magnetic Valve	Have	1
	Air/Air	AA		None	0
Body Configuration	2-way valve	Z	Sensor	None	N
	U Type	U		Single Indicator	SI
	T-valve	T		Double Indicator	DI
	Tandem valve	G	Sensor Type	Sensor Indicator	I
	Multi-port valve	M		Mechanical Type	M

Remark: 1, Request about GMP & DMP valve, Please contact with Kinglai; 2, if the valve with feedback device used in dangerous area, please inform the anti-explosion level of electronic components;

Option samples:

	I	20	M	Z	1	6L	ET	EP	1	SI	I
Connection Standard	—	—	—	—	—	—	—	—	—	—	—
Connection Size	—	—	—	—	—	—	—	—	—	—	—
Actuator Type	—	—	—	—	—	—	—	—	—	—	—
Body Configuration	—	—	—	—	—	—	—	—	—	—	—
Connection Type	—	—	—	—	—	—	—	—	—	—	—
Body Material	—	—	—	—	—	—	—	—	—	—	—
Sealing Material	—	—	—	—	—	—	—	—	—	—	—
Polishing Type	—	—	—	—	—	—	—	—	—	—	—
Feedback Way	—	—	—	—	—	—	—	—	—	—	—

Remark: 3A, 0.75" weld, electronic manual two diaphragm valve, 316L, EPDM+TFM diaphragm, with magnetic valve and single sensor.

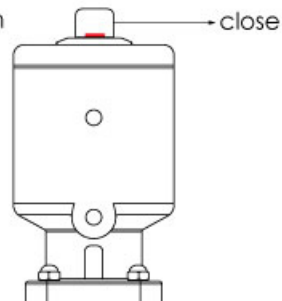
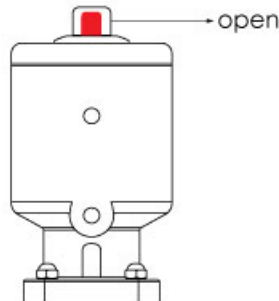
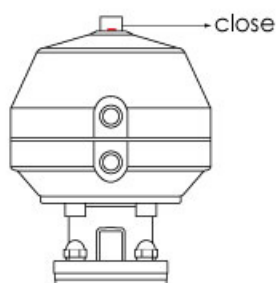
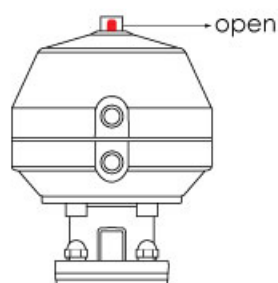
Z KDV-P with pneumatically operated BioClean Diaphragm Valves series

Working Pressure	0-10 bar
Working Temp.	-40~140°C
Actuator	pneumatically operated
Seal Material	EPDM, EPDM + TFM
Body Design	2-way
Body Material	316L (EN1.4409 CF3M Cast / EN1.4404 Forge)
Port Size	0.5"~ 0.75" (Stainless Steel bonnet) 1.0"~ 2.0" (PP bonnet) 2.5"~ 3.0" (Aluminium Alloy bonnet)
Connection	KDV-P160/P120: weld-weld KDV-P260/P220: weld-clamp KDV-P360/P320: clamp-clamp
Surface Finish	outside surface sanding , Internally $Ra \leq 0.5\mu m$ (SF1) , $Ra \leq 0.375\mu m$ (SF4)
Connection Standard	DIN、ISO、ASME BPE、3A



ACTUATOR (pneumatic)

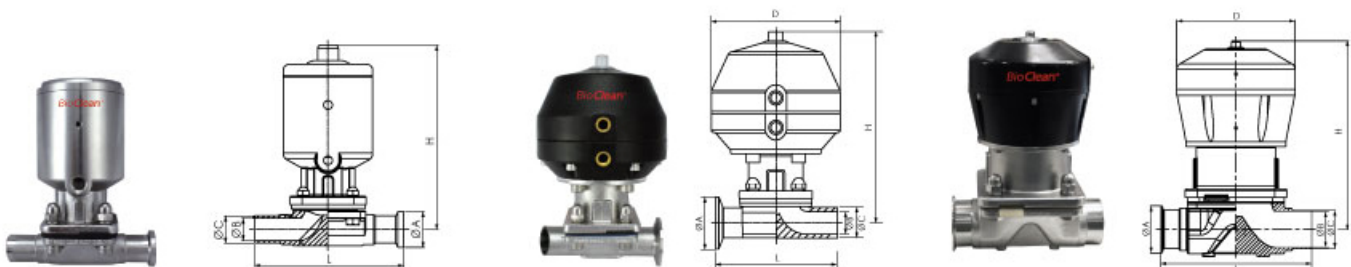
Size	0.5"~ 0.75"、1.0"~ 2.0"、2.5"~ 3.0"
Material	Aluminium Alloy bonnet, SS bonnet, PP bonnet, 304 Rock, 304 valve stem,
Signal feedback	Can be installed sensors, electromagnetic valve intelligent controller
Indicator	On/off status





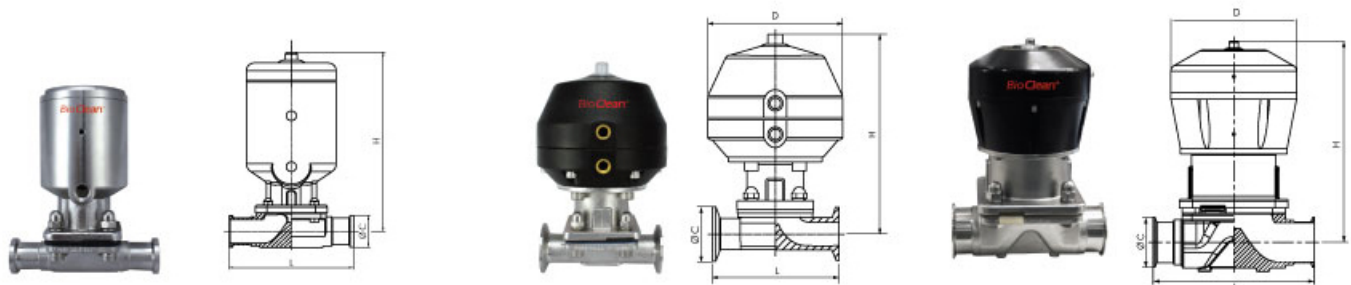
KDV-P160/P120

No.	Size	B	C	D	H	L
1543120-000050	0.5"	9.4	12.7	/	101	61.0
1543120-000075	0.75"	15.8	19.1	/	128	97.6
1543160-000100	1.0"	22.1	25.4	128	189.7	120
1543160-000150	1.5"	34.8	38.1	164	254.5	159
1543160-000200	2.0"	47.5	50.8	164	273.5	190
1543160-000250	2.5"	60.2	63.5	193	311.6	250
1543160-000300	3.0"	72.9	76.2	193	311.6	250



KDV-P260/P220

No.	Size	A	B	C	D	H	L
1543220-000050	0.5"	25.0	9.4	12.7	\	101	62.0
1543220-000075	0.75"	25.0	15.8	19.1	\	128	99.6
1543260-000100	1.0"	50.4	22.1	25.4	128	189.7	120
1543260-000150	1.5"	50.4	34.8	38.1	164	254.5	159
1543260-000200	2.0"	63.9	47.5	50.8	164	273.5	190
1543260-000250	2.5"	91.0	60.2	63.5	193	311.6	250
1543260-000300	3.0"	106.0	72.9	76.2	193	311.6	250



KDV-P360/P320

No.	Size	A	D	H	L
1543320-000050	0.5"	25.0	\	101	63.0
1543320-000075	0.75"	25.0	\	128	101.6
1543360-000100	1.0"	50.4	128	189.7	120
1543360-000150	1.5"	50.4	164	254.5	159
1543360-000200	2.0"	63.9	164	273.5	190
1543360-000250	2.5"	91.0	193	311.6	250
1543360-000300	3.0"	106.0	193	311.6	250

Z KDV-P with manually operated BioClean Diaphragm Valves series

Working Pressure	0-10 bar
Working Temp.	-40~140°C
Actuator	Manually operated
Seal Material	Silicone / EPDM, EPDM + TFM
Body Design	2-way
Body Material	316L (EN1.4409 CF3M Cast)
Port Size	0.5"~ 0.75", 1.0"~ 2.0", 2.5"~ 3.0"
Connection	KDV-M100/M121: weld-weld KDV-M200/M221: weld-clamp KDV-M300/M321: clamp-clamp
Surface Finish	Outside Surface sanding , Internally $Ra \leq 0.5\mu m$ (SF1) , $Ra \leq 0.375\mu m$ (SF4)
Connection Standard	DIN, ISO, ASME BPE, 3A

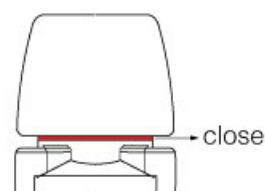
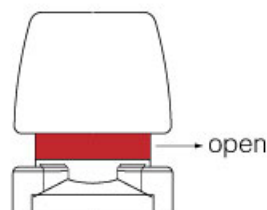
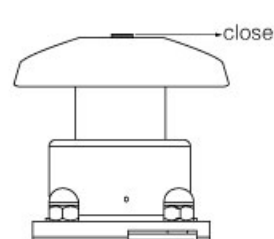
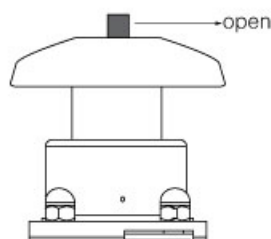
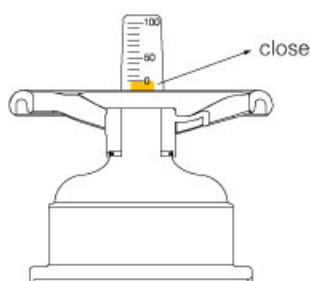
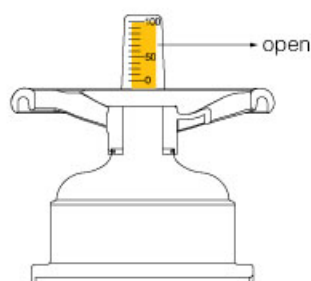


KDV(SS Bonnet)

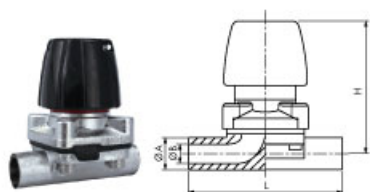
Size	2.5"~3.0"
Material	SS bonnet , 304 Rock, 304 valve stem
Indicator	On/off status

KDV(PC Bonnet)

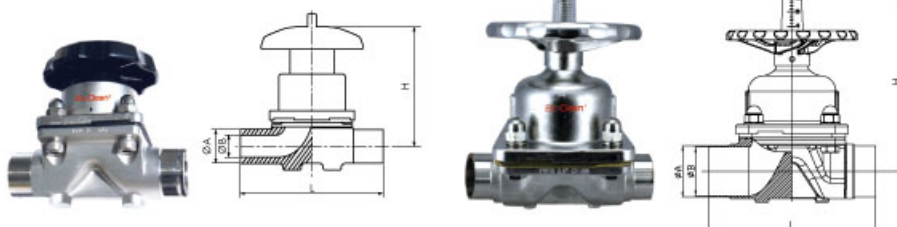
Size	0.5"~2.0"
Material	PC bonnet , 304 Rock, 304 valve stem
Indicator	On/off status



KDV-M121



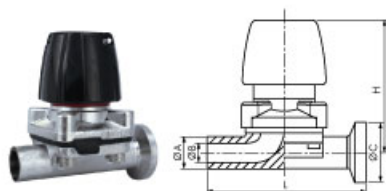
KDV-M100



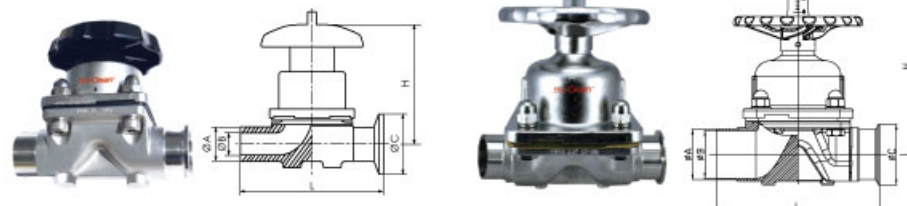
KDV-M100/M121

No.	Size	A	B	H	L
1543121-000050	0.5"	12.7	9.4	58	61.0
1543100-000075	0.75"	19.1	15.8	85	113.0
1543100-000100	1.0"	25.4	22.1	106	120.0
1543100-000150	1.5"	38.1	34.8	124	159.0
1543100-000200	2.0"	50.8	47.5	134	190.0
1543100-000250	2.5"	63.5	60.2	264	250
1543100-000300	3.0"	76.2	72.9	269	250

KDV-M221



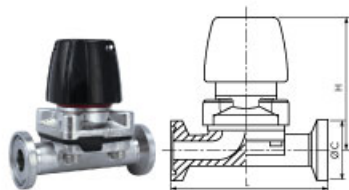
KDV-M200



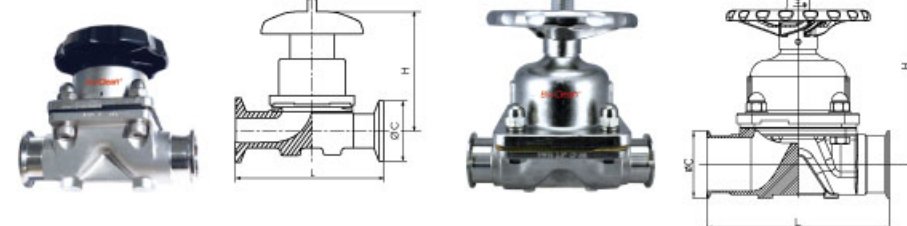
KDV-M200/M221

No.	Size	A	B	C	H	L
1543221-000050	0.5"	12.7	9.4	25.0	58	62.0
1543200-000075	0.75"	19.1	15.8	25.4	85	115.0
1543200-000100	1.0"	25.4	22.1	50.4	106	120.0
1543200-000150	1.5"	38.1	34.8	50.4	124	159.0
1543200-000200	2.0"	50.8	47.5	63.9	134	190.0
1543200-000250	2.5"	63.5	60.2	77.5	264	250
1543200-000300	3.0"	76.2	72.9	90.9	269	250

KDV-M321



KDV-M300



KDV-M300/M221

No.	Size	C	H	L
1543321-000050	0.5"	25.0	58	62.0
1543300-000075	0.75"	25.4	85	115.0
1543300-000100	1.0"	50.4	106	120.0
1543300-000150	1.5"	50.4	124	159.0
1543300-000200	2.0"	63.9	134	190.0
1543300-000250	2.5"	77.5	264	250
1543300-000300	3.0"	90.9	269	250

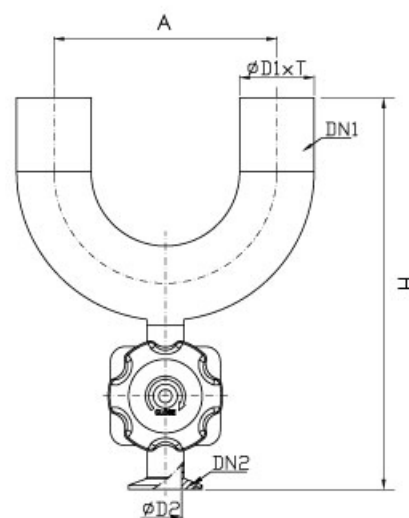
Z KDV-MU with manually operated BioClean Diaphragm Valves series

Working Pressure	0~10 bar
Working Temp.	-40~140°C
Actuator	Manually operated
Seal Material	EPDM, EPDM + TFM
Body Design	U type welding
Body Material	316L (EN1.4409 CF3M Cast)
Port Size	Inlet (DN1) 1.0"~3.0", Outlet (DN2) 0.5"~2.0"
Connection	2 way weld(U tee)
SurfaceFinish	Outside Surface sanding , Internally Ra≤0.5µm (SF1) , Ra≤0.375µm (SF4)
Connection Standard	DIN, ISO, ASME BPE, 3A



KDV-MU400

No.	DN1×DN2	A	H	D1	D2	T
1543400-075050	0.75"×0.5"	114.3	86.2	19.1	9.4	1.65
1543400-075075	0.75"×0.75"	114.3	86.2	19.1	19.1	1.65
1543400-100050	1.0"×0.5"	114.3	171.7	25.4	9.4	1.65
1543400-100075	1.0"×0.75"	114.3	191.0	25.4	15.8	1.65
1543400-100100	1.0"×1.0"	114.3	199.0	25.4	22.1	1.65
1543400-150050	1.5"×0.5"	152.4	189.1	38.1	9.4	1.65
1543400-150075	1.5"×0.75"	152.4	217.9	38.1	15.8	1.65
1543400-150100	1.5"×1.0"	152.4	245.5	38.1	22.1	1.65
1543400-150150	1.5"×1.5"	152.4	295.0	38.1	34.8	1.65
1543400-200050	2.0"×0.5"	152.4	208.9	50.8	9.4	1.65
1543400-200075	2.0"×0.75"	152.4	186.9	50.8	15.8	1.65
1543400-200100	2.0"×1.0"	152.4	264.9	50.8	22.1	1.65
1543400-200150	2.0"×1.5"	152.4	314.0	50.8	34.8	1.65
1543400-200200	2.0"×2.0"	152.4	338.0	50.8	47.5	1.65
1543400-250050	2.5"×0.5"	190.5	244.0	63.5	9.4	1.65
1543400-250075	2.5"×0.75"	190.5	263.6	63.5	15.8	1.65
1543400-250100	2.5"×1.0"	190.5	301.0	63.5	22.1	1.65
1543400-250150	2.5"×1.5"	190.5	340.0	63.5	34.8	1.65
1543400-250200	2.5"×2.0"	190.5	361.0	63.5	47.5	1.65
1543400-300050	3.0"×0.5"	228.6	270.0	76.2	9.4	1.65
1543400-300075	3.0"×0.75"	228.6	307.0	76.2	15.8	1.65
1543400-300100	3.0"×1.0"	228.6	326.0	76.2	22.1	1.65
1543400-300150	3.0"×1.5"	228.6	365.0	76.2	34.8	1.65
1543400-300200	3.0"×2.0"	228.6	386.0	76.2	47.5	1.65



DN1	DN2				
	0.5"	0.75"	1.0"	1.5"	2.0"
1.0"	⊗	⊗	⊗		
1.5"	⊗	⊗	⊗	⊗	
2.0"	⊗	⊗	⊗	⊗	⊗
2.5"	⊗	⊗	⊗	⊗	⊗
3.0"	⊗	⊗	⊗	⊗	⊗

T KDV-T T valve with manually operated BioClean Diaphragm Valves series

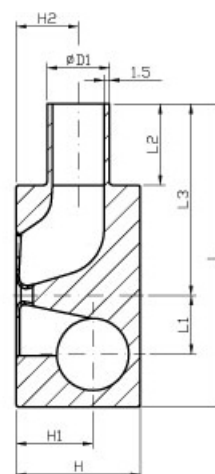
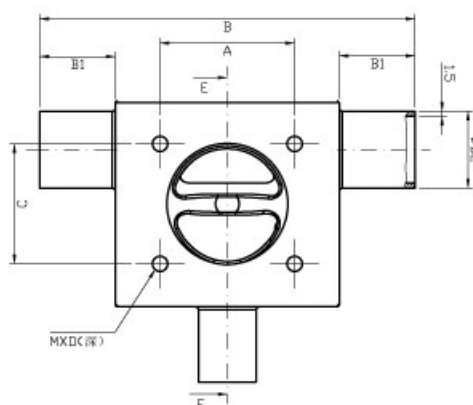
Working Pressure	0-10 bar
Working Temp.	-40~140°C
Actuator	manually operated
Seal Material	EPDM, EPDM+TFM
Body Design	Block, Five axis machining, Zero dead design
Body Material	316L (Block, EN1.4409)
Port Size	Inlet (DN1) 1.0"~2.0", Outlet (DN2) 0.5"~1.5"
Connection	Tee Weld
Surface Finish	Outside Surface sanding , Internally Ra≤0.5μm (SF1) , Ra≤0.375μm (SF4)
Connection Standard	ISO, DIN, ASME BPE, 3A



Feature

Compact structure, Sufficient drain, No dead Area, forging body, compact structure of intergranular, quick Sterilization and sufficient, advanced device incorporated machining, safety and workable installation, design of main tube bigger than the branch tube guarantee the main tube traffic, suitable for taking in, draining, taking point in pure water system.

DN1	DN2			
	0.5"	0.75"	1.0"	1.5"
1.0"	⊗	⊗	⊗	
1.5"	⊗	⊗	⊗	⊗
2.0"	⊗	⊗	⊗	⊗



KDV-T5

No.	D1	D2	A	B	B1	C	D	H	H1	H2	L	L1	L2	L3	M
1543612-10005002	12.7	25.4	22.0	82.0	25.0	22.0	6.0	35.0	20.0	8.5	66.0	15.3	20.0	36.0	M4
1543612-10007502	19.1	25.4	44.5	114.5	25.0	39.7	10.0	38.0	23.5	19.0	93.0	17.9	25.0	55.0	M6
1543612-10010002	25.4	25.4	54.0	124.0	25.0	46.0	10.0	38.0	23.5	19.0	93.0	17.9	25.0	59.0	M8
1543612-15007502	19.1	38.1	39.7	100.0	25.0	44.5	8.0	48.0	27.7	12.5	97.0	23.5	25.0	53.0	M6
1543612-15010002	25.4	38.1	54.0	124.0	25.0	46.0	10.0	51.0	29.9	19.0	105.0	25.0	25.0	59.0	M8
1543612-20010002	25.4	50.8	54.0	134.0	30.0	46.0	10.0	64.0	36.2	19.0	118.0	32.0	25.0	59.0	M8
1543612-20015002	38.1	50.8	70.0	162.0	30.0	65.0	10.0	66.0	39.1	26.0	133.0	34.1	25.0	71.0	M10

T KDV-T T valve with manually operated BioClean Diaphragm Valves series

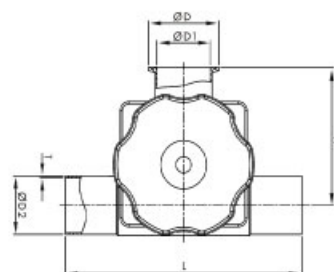
Working Pressure	0-10 bar
Working Temp.	-40~140°C
Actuator	Manually operated
Seal Material	EPDM, EPDM + TFM, Silicone
Body Design	Zero dead design
Body Material	316L (EN1.4409 CF3M)
Port Size	Inlet (DN1) 1.0"~2.5", Outlet (DN2) 0.5"~2.0"
Connection	KDV-T600: weld-weld, KDV-T900: clamp-clamp
Surface Finish	Outside Surface sanding, Internally Ra≤0.5μm (SF1), Ra≤0.375μm (SF4)
Connection Standard	DIN, ISO, ASME BPE, 3A

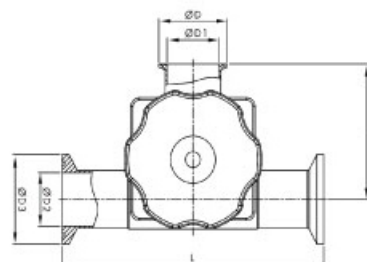


DN1	DN2				
	0.5"	0.75"	1.0"	1.5"	2.0"
1.0"	⊗	⊗	⊗		
1.5"	⊗	⊗	⊗	⊗	
2.0"	⊗	⊗	⊗	⊗	⊗
2.5"	⊗	⊗	⊗	⊗	⊗

KDV-T600

No.	SIZE	D	D1	D2	H	L	T
1543600-050050	0.5"×0.5"	25.0	9.4	12.7	44.5	72	1.65
1543600-075075	0.75"×0.75"	25.0	15.8	19.1	61.4	101	1.65
1543600-100050	1.0"×0.5"	25.0	9.4	25.4	51.3	82	1.65
1543600-100075	1.0"×0.75"	25.0	15.8	25.4	65.0	101	1.65
1543600-100100	1.0"×1.0"	50.4	22.1	25.4	76.9	125	1.65
1543600-150050	1.5"×0.5"	25.0	9.4	38.1	59.5	82	1.65
1543600-150075	1.5"×0.75"	25.0	15.8	38.1	72.0	101	1.65
1543600-150100	1.5"×1.0"	50.4	22.1	38.1	84.0	124	1.65
1543600-150150	1.5"×1.5"	50.4	34.8	38.1	98.1	150	1.65
1543600-200050	2.0"×0.5"	25.0	9.4	50.8	66.6	92	1.65
1543600-200075	2.0"×0.75"	25.0	15.8	50.8	79.1	111	1.65
1543600-200100	2.0"×1.0"	50.4	22.1	50.8	92.0	134	1.65
1543600-200150	2.0"×1.5"	50.4	34.8	50.8	105.1	160	1.65
1543600-200200	2.0"×2.0"	64.0	47.5	50.8	120.3	176	1.65
1543600-250050	2.5"×0.5"	25.0	9.4	63.5	73.6	92	1.65
1543600-250075	2.5"×0.75"	25.0	15.8	63.5	86.1	111	1.65
1543600-250100	2.5"×1.0"	50.4	22.1	63.5	98.1	135	1.65
1543600-250150	2.5"×1.5"	50.4	34.8	63.5	112.2	160	1.65

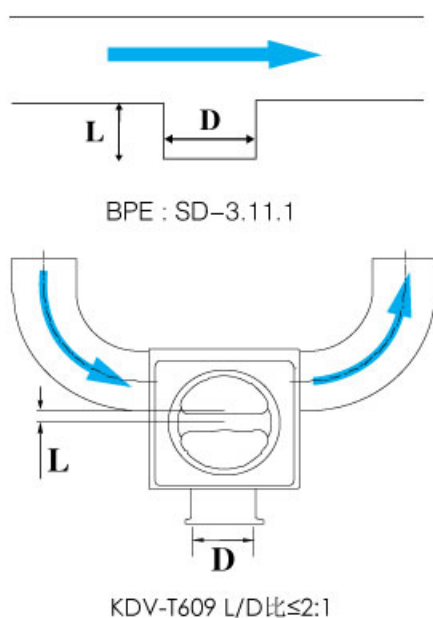



KDV-T900

No.	SIZE	D	D1	D2	D3	H	L
1543900-050050	0.5"×0.5"	25.0	9.4	9.4	25.0	44.5	97.4
1543900-075075	0.75"×0.75"	25.0	15.8	15.8	25.0	61.4	126.4
1543900-100050	1.0"×0.5"	25.0	9.4	22.1	50.4	51.3	107.4
1543900-100075	1.0"×0.75"	25.0	15.8	22.1	50.4	65.0	126.4
1543900-100100	1.0"×1.0"	50.4	22.1	22.1	50.4	76.9	150.4
1543900-150050	1.5"×0.5"	25.0	9.4	34.8	50.4	59.5	107.4
1543900-150075	1.5"×0.75"	25.0	15.8	34.8	50.4	72.0	126.4
1543900-150100	1.5"×1.0"	50.4	22.1	34.8	50.4	84.0	149.4
1543900-150150	1.5"×1.5"	50.4	34.8	34.8	50.4	98.1	175.4
1543900-200050	2.0"×0.5"	25.0	9.4	47.5	63.9	66.6	117.4
1543900-200075	2.0"×0.75"	25.0	15.8	47.5	63.9	79.1	136.4
1543900-200100	2.0"×1.0"	50.4	22.1	47.5	63.9	92.0	159.4
1543900-200150	2.0"×1.5"	50.4	34.8	47.5	63.9	105.1	185.4
1543900-200200	2.0"×2.0"	64.0	47.5	47.5	63.9	120.3	201.4
1543900-250050	2.5"×0.5"	25.0	9.4	60.2	77.5	73.6	117.4
1543900-250075	2.5"×0.75"	25.0	15.8	60.2	77.5	86.1	136.4
1543900-250100	2.5"×1.0"	50.4	22.1	60.2	77.5	98.1	160.4
1543900-250150	2.5"×1.5"	50.4	34.8	60.2	77.5	112.2	185.4

T KDV-TU T valve with manually operated BioClean Diaphragm Valves series

Working Pressure	0~10 bar
Working Temp.	-40~140°C
Actuator	Manually operated
Seal Material	EPDM, EPDM + TFM
Body Design	Zero dead design
Body Material	316L (EN1.4409 CF3M)
Port Size	Inlet (DN1) 1.0"~2.5", Outlet (DN2) 0.5"~2.0"
Connection	KDV-TU6: weld-weld
SurfaceFinish	Outside Surface sanding , Internally Ra≤0.5μm (SF1) , Ra≤0.375μm (SF4)
Connection Standard	DIN, ISO, ASME BPE, 3A

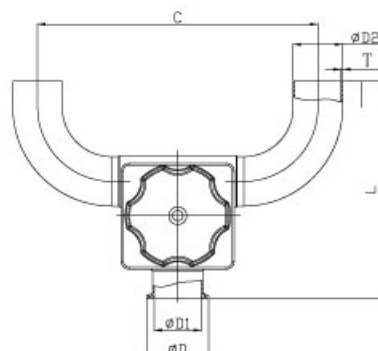


Size		DN2				
		0.5"	0.75"	1.0"	1.5"	2.0"
DN1	0.5"	⊙				
	0.75"		⊙			
	1.0"	⊙	⊙	⊙		
	1.5"	⊙	⊙	⊙	⊙	
	2.0"	⊙	⊙	⊙	⊙	⊙
	2.5"	⊙	⊙	⊙	⊙	

We reduced welding joints to enhance MOC cleanliness to reduce liquid to be held up between valve cofferdam and diaphragm, and minimize the length of tunnel. Based on ASME BPE SD-3.11.1 aseptic design requirements, L/D≤2:1, to minimize the risk of bacteria traps, our design can avoid the liquid to be held up in outlet for safety assurance while looping.

Feature

In the cycle system of producing pure water and water for injection, the U type diaphragm valve is one point of sensitive area, because it ensure the purity of cycle system, avoid germ pollution, it should be highest level of safety and purity.



KDV-TU6

No.	SIZE	D	D1	D2	T	C	L
1543609-050050	0.5"×0.5"	25.0	9.4	12.7	1.65	109.2	120.7
1543609-075075	0.75"×0.75"	25.0	15.8	19.1	1.65	128.2	137.6
1543609-100050	1.0"×0.5"	25.0	9.4	25.4	1.65	128.2	127.5
1543609-100075	1.0"×0.75"	25.0	15.8	25.4	1.65	147.2	141.2
1543609-100100	1.0"×1.0"	50.4	22.1	25.4	1.65	171.2	153.1
1543609-150050	1.5"×0.5"	25.0	9.4	38.1	1.65	166.4	154.8
1543609-150075	1.5"×0.75"	25.0	15.8	38.1	1.65	185.4	167.3
1543609-150100	1.5"×1.0"	50.4	22.1	38.1	1.65	208.4	179.3
1543609-150150	1.5"×1.5"	50.4	34.8	38.1	1.65	234.4	193.4
1543609-200050	2.0"×0.5"	25.0	9.4	50.8	1.65	204.4	187.2
1543609-200075	2.0"×0.75"	25.0	15.8	50.8	1.65	223.4	199.8
1543609-200100	2.0"×1.0"	50.4	22.1	50.8	1.65	246.4	211.7
1543609-200150	2.0"×1.5"	50.4	34.8	50.8	1.65	272.4	225.8
1543609-200200	2.0"×2.0"	64.0	47.5	50.8	1.65	288.4	241.0
1543609-250050	2.5"×0.5"	25.0	9.4	63.5	1.65	242.6	213.3
1543609-250075	2.5"×0.75"	25.0	15.8	63.5	1.65	261.6	225.8
1543609-250100	2.5"×1.0"	50.4	22.1	63.5	1.65	285.6	237.8
1543609-250150	2.5"×1.5"	50.4	34.8	63.5	1.65	310.6	251.9

M KDMP-multi-port valve BioClean Diaphragm Valves series

Working Pressure	0-10 bar
Working Temp.	-40~150°C
Actuator	manually / pneumatically operated
Seal Material	Reference to our diaphragm options
Body Design	OEM / ODM
Body Material	316L Ultrapure raw materica (Block, EN1.4409 CF3M)
SurfaceFinish	External $Ra \leq 0.5\mu m$ (SF1) , Internal $Ra \leq 0.375\mu m$ (SF4)
Connection	ISO, DIN, ASME BPE, 3A
Feature	Multi-port valve can save time and room of installation, save cost.

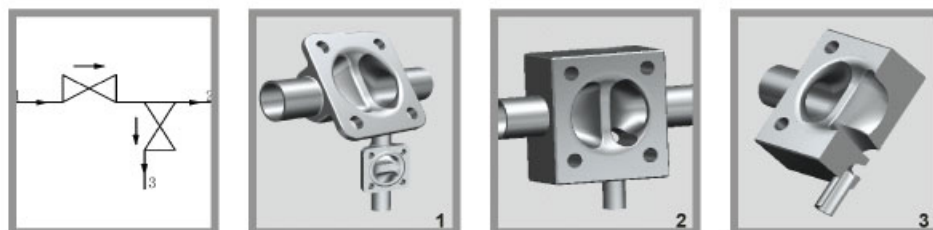


The evolution process

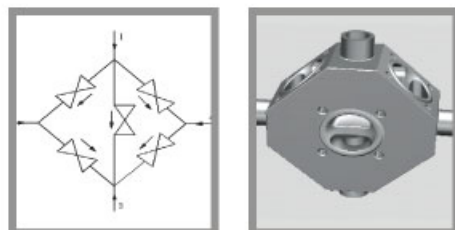
T valve with aseptic outlet



GMP tandem valve



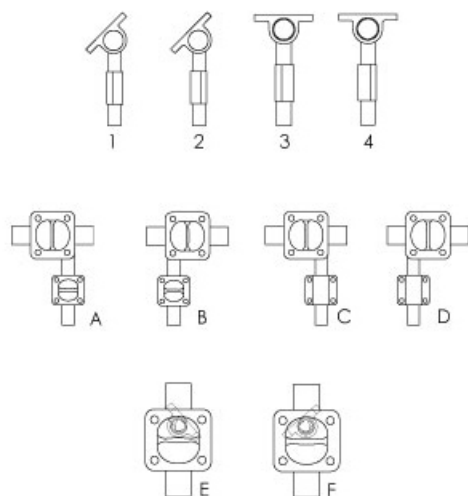
Chromatography valve





KGMP-tandem valve
BioClean Diaphragm Valves
series

The tandem valves are available in a wide variety of angles and positions. Tandem valves are available as machined from block or from forged material (shown in picture).



Vertical installation with left side banch

	HVL-01		HVL-02		HVL-03		HVL-04
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Vertical installation with right side banch

	HVR-01		HVR-02		HVR-03		HVR-04
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Vertical installation with left/right side banch

	HVR-05		HVR-06		HVR-07		HVR-08
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Horizontal installation with left side banch

	HHL-01		HHL-02		HHR-01		HHR-02
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Horizontal installation with upper banch

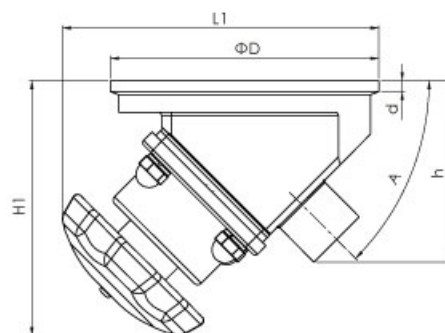
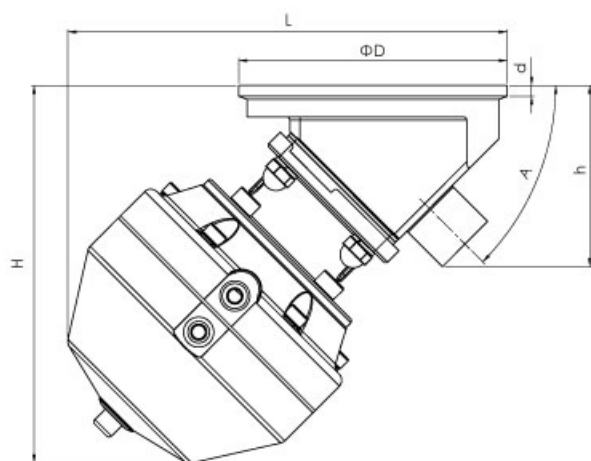
	VHU-01		VHU-02		VHD-01		VHD-02
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KTBV Tank Bottom Valve

Tank Bottom Valve is applied in pharmaceutical, food and beverage industrial, normally install at the bottom of tank, sampling and draining function, can composite SIP/CIP: KL Tank bottom valve is develop from diaphragm valve, avoid dead area.



Working Pressure	0-10 bar
Working Temp.	-40~140°C
Actuator	Manually operated, Pneumatically operated
Seal Material	EPDM+PTFE
Body Design	Zero dead design
Body Material	316L/1.4435 (EN1.4409 CF3M)
SurfaceFinish	Outside Surface sanding , Internally Ra≤0.5μm (SF1) , Ra≤0.375μm (SF4)
Connection Standard	ISO/SMS , 3A
Connection	weld-weld, clamp-clamp



KBTV

Size	A	D	H	H1	L	L1	h	d
1.0"	45°	119	175.1	122.9	206.6	154.1	82.9	6
1.5"	45°	160	225.1	151.6	262	207	108	6.5
2.0"	45°	180	234.3	167	274	274	120.7	6.5
3.0"	45°	250	344.7	270	402.4	326.1	173.5	8.5

KSV Sampling Valve

The Unique sampling valve is specially designed for the food and pharmaceutical and biotechnological industries. The valve is equipped with a double seat which make it possible to sterilize the entire seat between sampling, thereby elimination the risk of cross contamination.

KSV sampling valve body can design based on the assembling surface, can be welding as exist on tank, fitting, connector. Exist branch can be different from the connection type, now matter it is soft tube, clamp connection, thread:

KSV sampling valve: rotate the handle, material is POM which can ensure the strength and will not too in high working temperature



Products

KSV-G6 sampling valve / KSV-S6 CIP sampling valve

Low Viscosity: 0-200cp, particles diameter<2mm.

Application: brew, dairy, pharmaceutical, and industrial.

Suitable For : water, milk, brewery, cosmetically, oil, pharmaceutical.

KSV-S9 CIP Sampling Valve

Low Viscosity: 0-200cp, particles diameter<2mm,

Application: brew, dairy, pharmaceutical, and biotechnology

Suitable For: milk, brewery, cosmetically, toothpaste

Sterilize

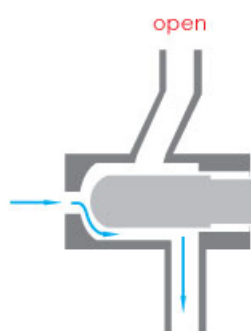
- 1, turn off the valve,
- 2, dry steam,
- 3, pressure 2bar,
- 4, temperature 121°C for one minutes



Sampling

turning on valve, retracts the valve stem and membrane seal and enables the product to flow freely through the open valve.

By utilizing the standard components and sampling, ensure the smooth work in condition(2 bar, 121°C)



Welding

- 1, the thickness of tank is less 4mm, welding inside
- 2, more than 4mm thickness of tank, welding uniform inside and outside:
- 3, welding on the fitting,
- 4, argon gas welding,
- 5, polish inside welding line, in case of the gasket material.

Maintains

100 time sampling, replace the sealing component, based on working temperature and experience to replace, sealing plug should reply per 6 months;
Installation the new sealing component, turn off the valve, position actually, insert the stick. When installation, do not hurt the sealing material avoiding the pollution.

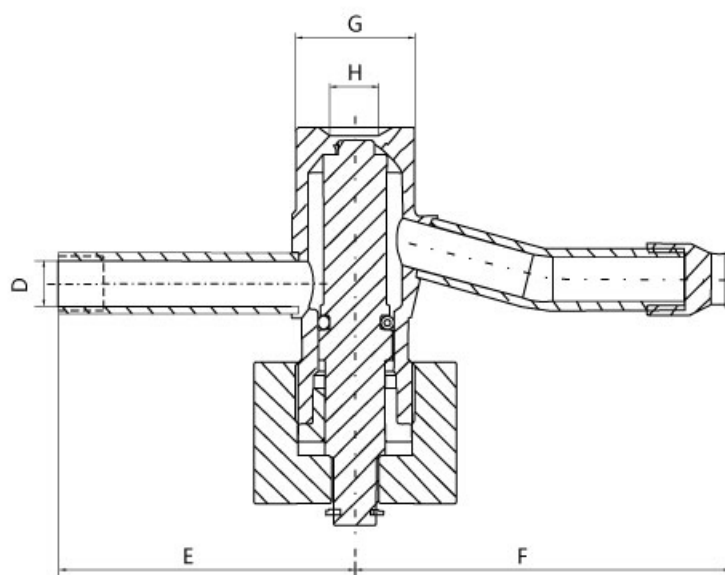
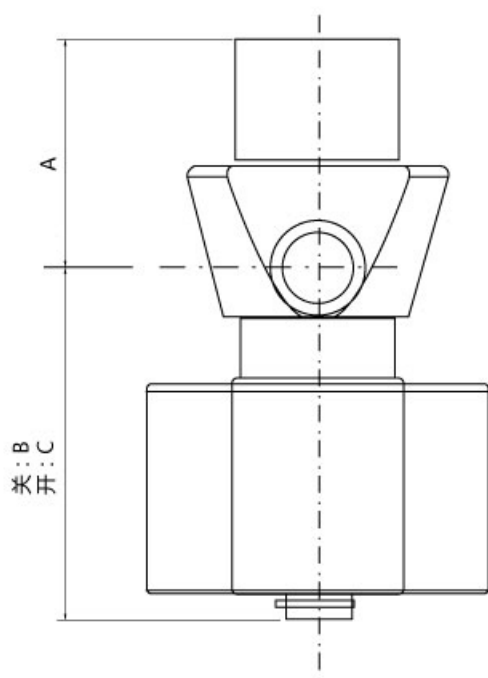
KSV-G6/S6/S9 Sampling valve KL BioClean Sampling valves

Product wetted steel parts	316L
Other steel parts	304
Seal materials	PTFE/EPDM
Valve heads	POM
Surface Finish	Internally $Ra \leq 0.5\mu m$ (SF1), Externally $Ra \leq 0.8\mu m$
Max. pressure	0.6Mpa
Min. pressure	0.04Mpa
Temperature range	-20°C~120°C
Sterilization temperature	$\leq 121^\circ C$ (Max20min)
Connection	weld-weld, clamp-clamp



Size

No.	A	B	C	D	E	F	G	H	行程
KSB-G6	24.5	49.5	51.9	6	49.5	/	19	6	4
KSB-S6	34.5	47	50.4	6	51	62.7	19	6	3.4
KSB-S9	32	49.5	55	9	62	78.5	25	9	5.5



KBV Hygienic Ball Valve

KBV is a Hygienic ball valve. The full bore design with zero flow restriction, is the best choice for viscous or particulate liquids.

Applicable to the food, beverage, pharmaceutical and chemical industry.

A 90° rotation of the valve stem is transferred to the ball and thereby opening or closing the valve. A special selected PTFE material grade secures long lifetime of the product wetted seals. KBV is operated by a pneumatic actuator or manually operated by means of a handle with lockable positions. The valve is assembled with screws for easy inspection and maintenance.

The actuator is made in three standard versions, normally closed (NC), normally open (NO) and air/air activated (A/A).



Seal Material-encapsulated & standard

Feature	Teflon
Temperature Range	-40~232°C
Acid Resistance	Excellent
Alkali Resistance	Excellent
Gasoline Resistance	Excellent
Diesel oil resistance	Excellent
Abrasion resistance	Excellent
Compression Set	Excellent

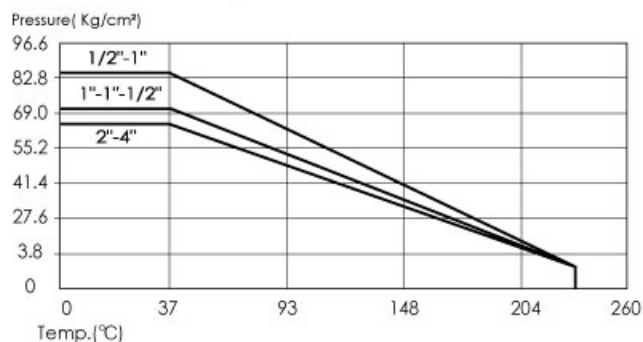
Min. Torque Ranges

Size	Torque (Kgf.m)
15.0	0.9
20.0	1.1
25.0	1.4
38.0	2.7
51.0	3.1
63.5	5.0
76.1	7.3
101.6	10.7

Air Consumption Ranges

Size	Air Pressure (Kg/cm ²)	In 5.5Kg/cm ² , Air Consumption	
		double-acting	single-action
15.0	4-6	3.4	3.4
20.0	4-6	6.9	3.4
25.0	4-6	6.9	3.4
38.0	4-6	6.9	6.9
51.0	4-6	15.1	6.9
63.5	4-6	24.8	15.1
76.1	4-6	24.8	24.8
101.6	4-6	41.4	24.8

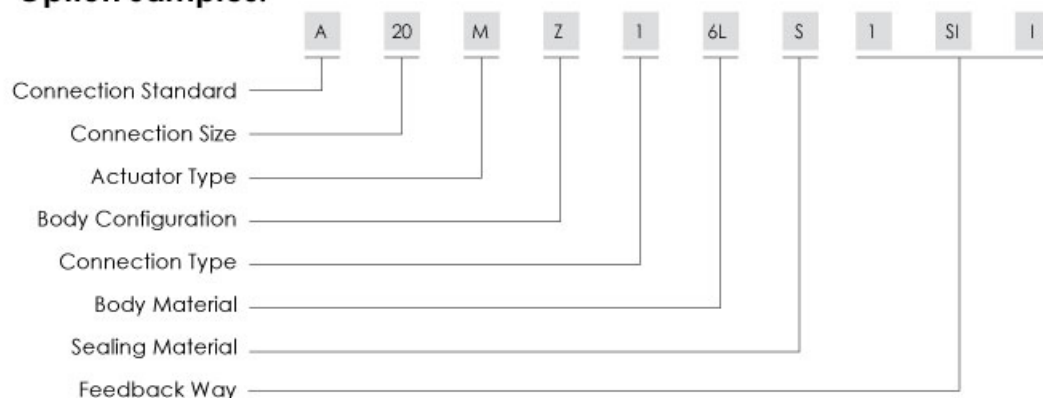
Pressure and Temperature



Selection table

Connection Standard	DIN	D	Connection Type	welding ends	1
	ISO	I		clamp/clamp	2
	3A	A		welding/clamp	3
	BPE	B			
Connection Size	0.5"	15	Body Material	316L	6L
	0.75"	20		304L	4L
	1.0"	25	Sealing Material	Standard	S
	1.5"	40		Encapsulated	E
	2.0"	50	Feedback Type(only for pneumatic)		
	2.5"	65	Magnetic Valve	Have	1
	3.0"	80		None	0
	4.0"	100	Sensor	None	N
Actuator Type	Manual	M		Single Indicator	SI
	Normally Open	NO		Double Indicator	DI
	Normally Closed	NC	Sensor Type	Sensor Indicator	I
	Air/Air	AA		Mechanical Type	M
Body Configuration	2-way valve	Z			
	Tee Type	T			

Option samples:



Remark: 3A, 0.75" weld, electronic manual two way ball valve, 316L, Standard Sealing Material, with magnetic valve and single sensor.

Remark: 1, Request about GMP & DMP valve, Please contact with Kinglai; 2, if the valve with feedback device used in dangerous area, please inform the anti-explosion lever of electronic components;

KBV-P with pneumatically operated
KingLai Hygienic Ball Valves

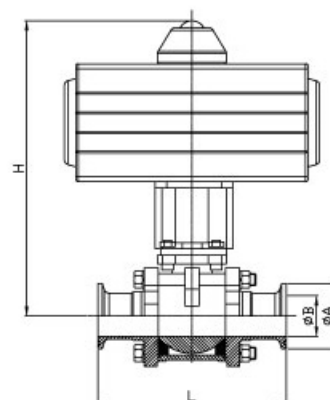
Working Pressure	0-10 bar
Working Temp.	-40~140°C (Standard) , -40~120°C (Encapsulated)
Actuator	pneumatically operated: Normally Open (NO) , Normally Closed (NC) , Air/Air (A/A)
Seal Material	PTFE
Body Design	2-way
Body Material	316L (EN1.4409 CF3M)
Port Size	0.5"~ 4.0"
Connection	Welding ends, Clamp/Clamp
Surface Finish	outside surface sanding , Internally Ra≤0.8μm
Connection Standard	DIN, ISO, ASME BPE, 3A



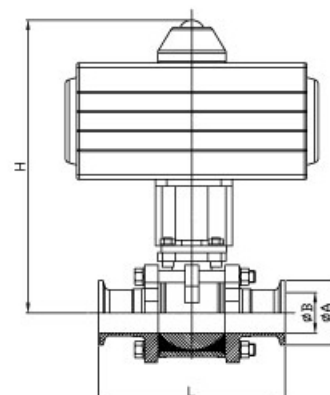
Remark: In order to protect valve please make sure axial move 30~40mm which depends on specification when welding two flange.

KBV-PC-S: Clamp/Clamp, Standard

No.	SIZE	A	B	L	H
1507401-000050	1/2"	25.0	9.4	88.6	165
1507401-000075	3/4"	25.0	15.8	102.7	165
1507401-000100	1.0"	50.4	22.1	114.3	170
1507401-000150	1.5"	50.4	34.8	139.7	200
1507401-000200	2.0"	63.9	47.5	158.8	220
1507401-000250	2.5"	77.5	60.3	198.2	250
1507401-000300	3.0"	91.0	72.9	227.5	275
1507401-000400	4.0"	119.0	97.6	242.0	315

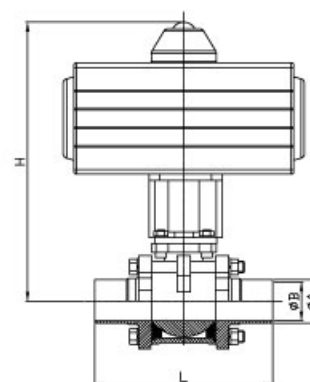

KBV-PC-E: Clamp/Clamp, Encapsulated

No.	SIZE	A	B	L	H
1507402-000050	1/2"	25.0	9.4	88.6	165
1507402-000075	3/4"	25.0	15.8	102.7	165
1207402-000100	1.0"	50.4	22.1	114.3	170
1207402-000150	1.5"	50.4	34.8	139.7	200
1207402-000200	2.0"	63.9	47.5	158.8	220
1507402-000250	2.5"	77.5	60.3	198.2	250
1507402-000300	3.0"	91.0	72.9	227.5	275
1507402-000400	4.0"	119.0	97.6	242.0	315

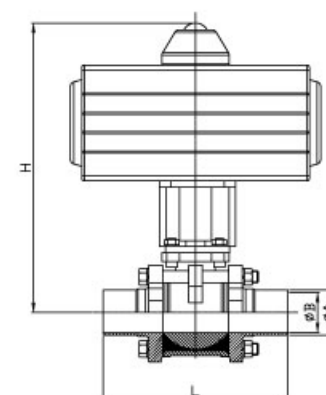



KBV-PW-S: Welding ends, Standard

No.	SIZE	A	B	L	H
1507301-000050	1/2"	12.7	9.4	88.6	165
1507301-000075	3/4"	19.1	15.8	102.7	165
1507301-000100	1.0"	25.4	22.1	115.2	170
1507301-000150	1.5"	38.1	34.8	139.9	200
1507301-000200	2.0"	50.8	47.5	158.1	220
1507301-000250	2.5"	63.5	60.3	198.2	250
1507301-000300	3.0"	76.1	72.9	227.5	275
1507301-000400	4.0"	101.6	97.6	242.0	315


KBV-PW-E: Welding ends, Encapsulated, (A/A)

No.	SIZE	A	B	L	H
1507300-000050	1/2"	12.7	9.4	88.6	165
1507300-000075	3/4"	19.1	15.8	102.7	165
1507300-000100	1.0"	25.0	22.1	115.2	170
1507300-000150	1.5"	38.0	34.8	139.9	200
1507300-000200	2.0"	51.0	47.5	158.1	220
1507300-000250	2.5"	63.5	60.3	198.2	250
1507300-000300	3.0"	76.1	72.9	227.5	275
1507300-000400	4.0"	101.6	97.6	242.0	315



KBV-M with manually operated
 KingLai Hygienic Ball Valves

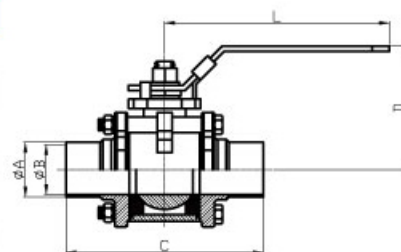
Working Pressure	0~8bar
Working Temp.	-20~80℃
Actuator	manually operated
Seal Material	PTFE
Body Design	2-WAY VALVE
Body Material	316L(EN1.4409CF3M)
Port Size	0.5"~4.0"
Connection	Welding ends, Clamp/Clamp
Surface Finish	outside surface sanding, Internal Ra≤0.8um
Connection Standard	DIN, ISO, 3A, ASME BPE



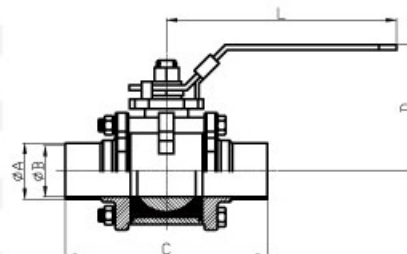
Remark: In order to protect valve please make sure axial move 30~40mm which depends on specification when welding two flange.

KBV-MW-S: Welding ends, Standard

No.	SIZE	A	B	C	D	L
1507001-000050	1/2"	12.7	9.4	88.6	52.1	100
1507001-000075	3/4"	19.1	15.8	102.7	57.9	132
1507001-000100	1.0"	25.4	22.1	114.3	62.0	132
1507001-000150	1.5"	38.1	34.8	139.7	98.0	175
1507001-000200	2.0"	50.8	47.5	158.8	103.9	175
1507001-000250	2.5"	63.5	60.3	198.2	141.0	260
1507001-000300	3.0"	76.1	72.9	227.5	154.9	260
1507001-000400	4.0"	101.6	97.6	242.0	175.0	260


KBV-MW-E: Welding ends, Encapsulated

No.	SIZE	A	B	C	D	L
1507000-000050	1/2"	12.7	9.4	88.6	52.1	100
1507000-000075	3/4"	19.1	15.8	102.7	57.9	132
1507000-000100	1.0"	25.4	22.1	114.3	62.0	132
1507000-000150	1.5"	38.1	34.8	139.7	98.0	175
1507000-000200	2.0"	50.8	47.5	158.8	103.9	175
1507000-000250	2.5"	63.5	60.3	198.2	141.0	260
1507000-000300	3.0"	76.1	72.9	227.5	154.9	260
1507000-000400	4.0"	101.6	97.6	242.0	175.0	260

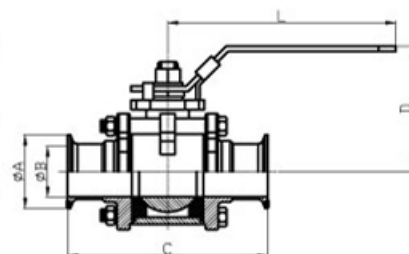




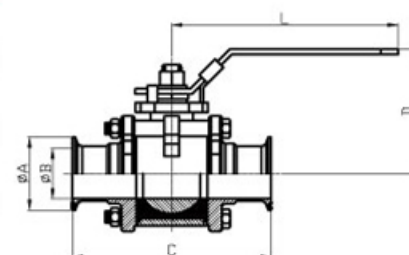
2
2.1

KBV-MC-S: Clamp Joint, Standard

No.	SIZE	A	B	C	D	L
1507101-000050	1/2"	25.0	9.4	88.6	52.1	100
1507101-000075	3/4"	25.0	15.8	102.7	57.9	132
1507101-000100	1.0"	50.4	22.1	115.2	62.0	132
1507101-000150	1.5"	50.4	34.8	139.9	98.0	175
1507101-000200	2.0"	63.9	48.6	158.1	103.9	175
1507101-000250	2.5"	77.5	60.3	198.2	141.0	260
1507101-000300	3.0"	91.0	72.9	227.5	154.9	260
1507101-000400	4.0"	119.0	97.6	242.0	175.0	260


KBV-MC-E: Clamp Joint, Encapsulated

No.	SIZE	A	B	C	D	L
1507100-000050	1/2"	25.0	9.4	88.6	52.1	100
1507100-000075	3/4"	25.0	15.8	102.7	57.9	132
1507100-000100	1.0"	50.4	22.1	115.2	62.0	132
1507100-000150	1.5"	50.4	34.8	139.9	98.0	175
1507100-000200	2.0"	63.9	48.6	158.1	103.9	175
1507100-000250	2.5"	77.5	60.3	198.2	141.0	260
1507100-000300	3.0"	91.0	72.9	227.5	154.9	260
1507100-000400	4.0"	119.0	97.6	242.0	175.0	260



KingLai High platform ball valve

The full bore design with zero flow restriction, is the best choice for viscous or particulate liquids. There is no need of supporter and connection shaft which can save installing time and cost. AMST 316L stainless steel for body material and PTFE material for seals which can meet USP6 and FDA. Applicable to the food, beverage, pharmaceutical and chemical industry.

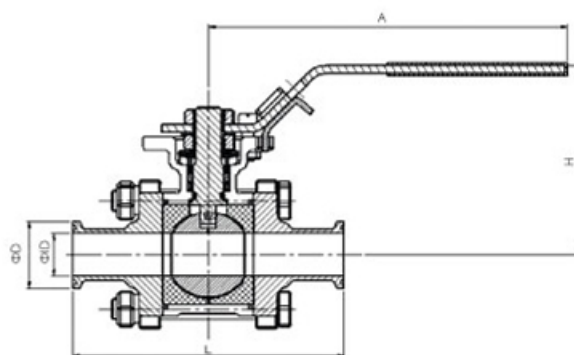
Working principle

A 90° rotation of the valve stem is transferred to the ball and thereby opening or closing the valve. It is closed when clockwise 90° and open when anti clockwise. The door opened once the yellow on the handle of manually ball valve (or groove of valve top) / pneumatic valve paralleled to the path of valve, and closed when perpendicular.



Technical Data

Size	0.5"~4"
Temperature range	-10°C~+140°C (EPDM)
Pressure	-8bar
Product wetted steel parts	316L
Other steel parts	304
Seal Material	PTFE
External surface finish	Electrical polish
Internal surface finish	Ra≤0.8um
Connect	3A
Clamp	SMS 3008
Weld	ISO2037
Ball Valve type	3 pieces



Size	L	A	H
0.5"	88.6	132.5	67.8
0.75"	102.7	132.5	70.5
1.0"	115.2	132.5	79.9
1.5"	139.9	219	100.5
2.0"	158.1	219	104.0
2.5"	198.0	322.7	144.3
3.0"	227.5	322.7	154.2
4.0"	241.0	322.7	178.3

KBFV Hygienic Butterfly Valve

KBFV is a Hygienic pneumatically or manually operated butterfly valve for use in stainless steel pipe systems. Due to their large opening areas, the valves offer low flow resistance and provide gentle treatment of low and medium viscosity product. The valve is the main solution of modern processing technology.

The actuator is made in three standard versions, normally closed (NC), normally open (NO) and air/air activated (A/A).

A 90° rotation of the valve stem is transferred to the stainless steel disc and thereby opening or closing the valve. When the valve disc contacts the seal ring, the torque will be increased.



EHEDG has authorised the use of the EHEDG Certification logo for KingLai equipment complying with the EHEDG hygienic design criteria. The Certification includes cleanability testing of equipment according to the methodology described in EHEDG guidelines.

Products

KBFV-M/P with pneumatic and manual

KBFV-MM handle micro adjustment

BFV-MF/PF flange type connection

Feature

- Fire Protecting, long lifetime, No-maintenance
- Special sealing design, No liquid residue, EHEDG certified
- Finish open and close within 1s under 80psi air pressure
- Over 100,000 times safety testing
- Circulation time of actuator can be adjusted by air valve freely.
- Can be set feedback sign per your request

Seal Ring

Feature	EPDM	Viton	Silicone
Temperature Range	-48~135℃	-29~204℃	-62~232℃
Acid Resistance	Good-Excellent	Good	Good
Alkali Resistance	Good-Excellent	Poor-Good	Poor-Fair
Gasoline Resistance	Poor-Fair	Good-Excellent	Good
Diesel Resistance	Good	Good-Excellent	Good
Abrasion Resistance	Good-Excellent	Good	Good-Excellent
Compression Set	Fair	Good-Excellent	Good-Excellent

* Good-Excellent>Good>Poor-Good>Fair>Poor-Fair

Pressure ranges (kg/cm²)

Size	In 20 °C
1.0	9.6
1.5	9.6
2.0	9.6
2.5	7.5
3.0	7.5
4.0	5.8

Torque ranges

Size	Torque (Kgf.m)
1.0	0.5
1.5	0.7
2.0	1.1
2.5	2.2
3.0	2.6
4.0	3.9

Air consumption ranges (kg/cm²)

Size	Air Pressure	In 6.2kg/cm ² , air consumption
1.0	0.5	1.3
1.5	0.7	1.3
2.0	1.1	1.3
2.5	2.2	1.3
3.0	2.6	1.3
4.0	3.9	2.7



Selection table

Connection Standard	DIN	D
	ISO	I
	3A	A
	BPE	B

Connection Size	1.0"	25
	1.5"	40
	2.0"	50
	2.5"	65
	3.0"	80
	4.0"	100

Actuator Type	Lockable Multiposition Handle	L
	Multipositioning handle	M
	Regulating handle	R
	Normally Open	NO
	Normally Closed	NC
	Air/Air	AA

Body Material	316L	6L
	304L	4L

Connection Type	Welding ends	1
	clamp/clamp	2
	Welding/clamp	3
	Two male parts	4
	Male part/Welding ends	5
	Male part/clamp	6

Sealing Material	EPDM	E
	Viton	V
	Silicone	S

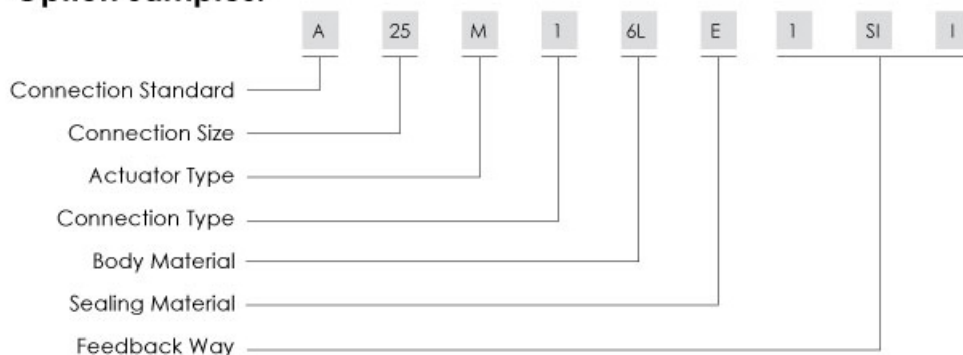
Feedback Type(only for pneumatic)		
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Magnetic Valve	Have	1
	None	0

Sensor	None	N
	Single Indicator	SI
	Double Indicator	DI

Sensor Type	Sensor Indicator	I
	Mechanical Type	M

Option samples:



Remark: 3A, 1.0" weld, Multipositioning handle butterfly valve, 316L, EPDM Sealing Material, with magnetic valve and single sensor.

Remark: 1, Request about GMP & DMP valve, Please contact with Kinglai; 2, if the valve with feedback device used in dangerous area, please inform the anti-explosion lever of electronic components;

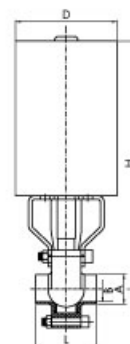
KBFV-P with pneumatically operated KingLai Hygienic Butterfly Valves

Working Pressure	0-10 bar
Working Temp.	-40~140°C (Standard) , -40~120°C (Encapsulated)
Actuator	pneumatically operated: Normally Open (NO) , Normally Closed (NC) , Air/Air (A/A)
Seal Material	EPDM / Silicon / Viton
Body Material	316L (EN1.4409 CF3M)
Port Size	1.0"~ 4.0"
Connection	welding ends, clamp/clamp, two male parts
Surface Finish	External surface finish Ra≤1.6μm, Internal surface finish Ra≤0.8μm
Connection Standard	DIN, ISO, ASME BPE, 3A



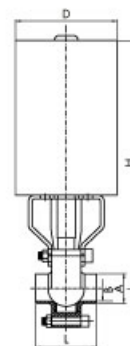
KBFV-PW: Welding ends, NC

No.	SIZE	A	B	D	H	L
1501300-000100	1.0"	25.4	22.1	83.5	210	50
1501300-000150	1.5"	38.1	34.8	83.5	215	50
1501300-000200	2.0"	50.8	47.5	83.5	222	50
1501300-000250	2.5"	63.5	60.2	83.5	230	50
1501300-000300	3.0"	76.1	72.8	83.5	235	50
1501300-000400	4.0"	101.6	97.4	101.6	273	50



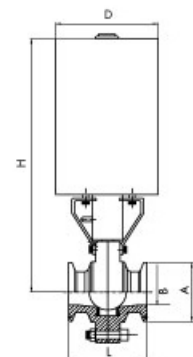
KBFV-PW: Welding ends, A/A

No.	SIZE	A	B	D	H	L
1501301-000100	1.0"	25.4	22.1	83.5	210	50
1501301-000150	1.5"	38.1	34.8	83.5	215	50
1501301-000200	2.0"	50.8	47.5	83.5	222	50
1501301-000250	2.5"	63.5	60.2	83.5	230	50
1501301-000300	3.0"	76.1	72.8	83.5	235	50
1501301-000400	4.0"	101.6	97.4	101.6	273	50

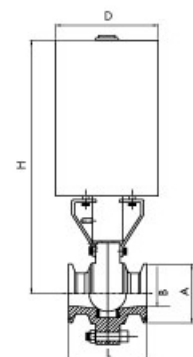


**KBFV-PC: Clamp/Clamp, NC**

No.	SIZE	A	B	D	H	L
1501400-000100	1.0"	50.4	22.1	83.5	210	75.4
1501400-000150	1.5"	50.4	34.8	83.5	215	75.4
1501400-000200	2.0"	63.9	47.5	83.5	222	75.4
1501400-000250	2.5"	77.5	60.2	83.5	230	75.4
1501400-000300	3.0"	91.0	72.8	83.5	235	75.4
1501400-000400	4.0"	119.0	97.4	101.6	273	91.6

**KBFV-PC: Clamp/Clamp, A/A**

No.	SIZE	A	B	D	H	L
1501401-000100	1.0"	50.4	22.1	83.5	210	75.4
1501401-000150	1.5"	50.4	34.8	83.5	215	75.4
1501401-000200	2.0"	63.9	47.5	83.5	222	75.4
1501401-000250	2.5"	77.5	60.2	83.5	230	75.4
1501401-000300	3.0"	91.0	72.8	83.5	235	75.4
1501401-000400	4.0"	119.0	97.4	101.6	273	91.6



KBFBV-M with manually operated KingLai Hygienic Butterfly Valves

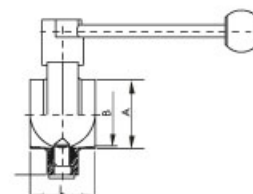
Working Pressure	0-10 bar
Working Temp.	-40~150°C
Actuator	manually operated
Seal Material	EPDM / Silicon / Viton
Body Material	304, 316L (EN1.4409 CF3M)
Port Size	1.0"~ 4.0"
Connection	welding ends, clamp/clamp, two male parts
Surface Finish	External surface finish Ra≤1.6μm, Internal surface finish Ra≤0.8μm
Connection Standard	DIN, ISO, ASME BPE, 3A



2
2.2

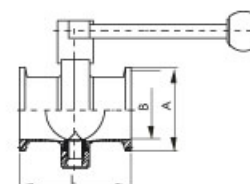
KBFBV-MM: Multipositioning handle, Welding ends

No.	SIZE	A	B	L
1501001-000100	1.0"	25.4	22.1	50
1501001-000150	1.5"	38.1	34.8	50
1501001-000200	2.0"	50.8	47.5	50
1501001-000250	2.5"	63.5	60.2	50
1501001-000300	3.0"	76.1	72.8	50
1501001-000400	4.0"	101.6	97.4	60



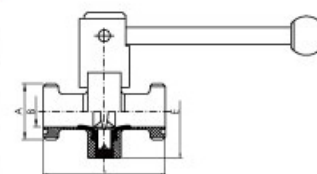
KBFBV-MM: Multipositioning handle, Clamp/Clamp

No.	SIZE	A	B	L
1501101-000100	1.0"	50.4	22.1	75.4
1501101-000150	1.5"	50.4	34.8	75.4
1501101-000200	2.0"	63.9	47.5	75.4
1501101-000250	2.5"	77.5	60.2	75.4
1501101-000300	3.0"	91.0	72.8	75.4
1501101-000400	4.0"	119.0	97.4	91.6



**KBFV-MM: Multipositioning handle, Two male parts**

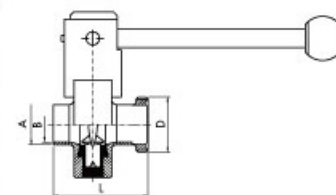
No.	SIZE	A/RD	B	L
1501201-000100	1.0"	40×1/6	22.1	80
1501201-000150	1.5"	60×1/6	34.8	80
1501201-000200	2.0"	70×1/6	47.5	80
1501201-000250	2.5"	85×1/6	60.2	88
1501201-000300	3.0"	98×1/6	72.8	100
1501201-000400	4.0"	125×1/6	97.4	100



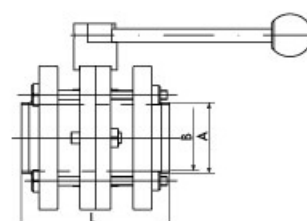
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**KBFV-MM: Multipositioning handle, Male part / Welding ends**

No.	SIZE	A	B	D	L
1501502-000100	1.0"	25.4	22.1	RD40×1/6	65.0
1501502-000150	1.5"	38.1	34.8	RD60×1/6	65.0
1501502-000200	2.0"	50.8	47.5	RD70×1/6	65.0
1501502-000250	2.5"	63.5	60.2	RD85×1/6	65.0
1501502-000300	3.0"	76.2	72.9	RD98×1/6	75.0
1501502-000400	4.0"	101.6	97.4	RD125×1/6	75.0

**KBFV-MM: Multipositioning handle, Welding ends**

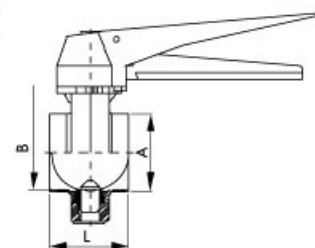
No.	SIZE	A	B	L
1501011-000100	1.0"	50.4	22.1	99
1501011-000150	1.5"	50.4	34.8	99
1501011-000200	2.0"	63.9	47.5	104
1501011-000250	2.5"	77.5	60.2	106
1501011-000300	3.0"	91.0	72.8	110
1501011-000101	4.0"	119.0	97.4	128





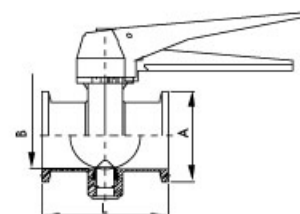
KBFV-ML: Lockable Multiposition Handle, Welding ends

No.	SIZE	A	B	L
1501000-000100	1.0"	25.4	22.1	50
1501000-000150	1.5"	38.1	34.8	50
1501000-000200	2.0"	50.8	47.5	50
1501000-000250	2.5"	63.5	60.2	50
1501000-000300	3.0"	76.2	72.9	50
1501000-000400	4.0"	101.6	97.4	60



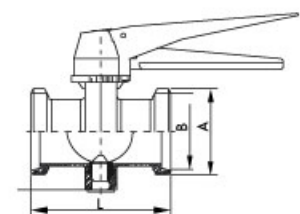
KBFV-ML: Lockable Multiposition Handle, Clamp/Clamp

No.	SIZE	A	B	L
1501100-000100	1.0"	50.4	22.1	75.4
1501100-000150	1.5"	50.4	34.8	75.4
1501100-000200	2.0"	63.9	47.5	75.4
1501100-000250	2.5"	77.5	60.2	75.4
1501100-000300	3.0"	91.0	72.8	75.4
1501100-000400	4.0"	119.0	97.4	91.6



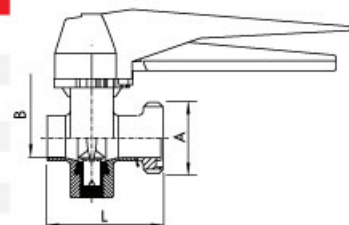
KBFV-ML: Lockable Multiposition Handle, Two male parts

No.	SIZE	A/RD	B	L
1501200-000100	1.0"	40×1/6	22.1	80
1501200-000150	1.5"	60×1/6	34.8	80
1501200-000200	2.0"	70×1/6	47.5	80
1501200-000250	2.5"	85×1/6	60.2	80
1501200-000300	3.0"	98×1/6	72.8	100
1501200-000400	4.0"	125×1/6	97.4	100

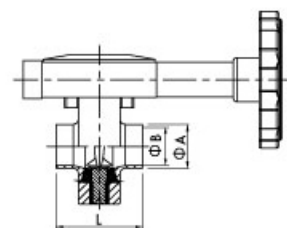


**KBFV-ML: Lockable Multiposition Handle, Male part / Welding ends**

No.	SIZE	A/RD	B	L
1501501-000100	1.0"	40×1/6	22.1	65
1501501-000150	1.5"	60×1/6	34.8	65
1501501-000200	2.0"	70×1/6	47.5	65
1501501-000250	2.5"	85×1/6	60.2	65
1501501-000300	3.0"	98×1/6	72.8	75
1501501-000400	4.0"	125×1/6	97.4	75

**KBFV-MR: Regulating handle, Welding ends**

No.	SIZE	A	B	L
1501055-000100	1.0"	25.4	22.1	50
1501055-000150	1.5"	38.1	34.8	50
1501055-000200	2.0"	50.8	47.5	50
1501055-000250	2.5"	63.5	60.2	50
1501055-000300	3.0"	76.2	72.8	50
1501055-000400	4.0"	101.6	97.4	50



KPV Hygienic Piston Valve

KPV is an extremely reliable and hygienic design for stopping or diverting flow in single or multi-directional systems.

KPV is a pneumatic seat valve in a hygienic and modular design for a wide field of duties, e.g. as a shut-off valve with two (2) or three (3) ports or as a change-over valve with three (3) to five (5) ports. The valve is remote-controlled by means of compressed air. It has few and simple moveable parts which results in a very reliable valve and low maintenance cost.

To ensure a high degree of flexibility the valve seat between the two bodies in the Change-over version is loose. The valve features an optimized life span of the seals through a defined compression design. The actuator is connected to the valve body using a yoke and all components are assembled with clamp ring.



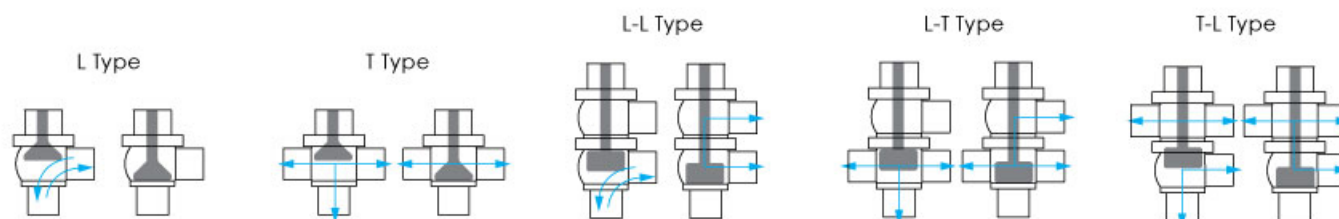
Feature(Pneumatically operated)

- SS316L applied to valve body, high thickness for controlling ball design guarantee the satiability.
- Tri-clamp joint makes multiple assemblies possible, simple design and easy to operate.
- Certified by 3A
- All parts contact with product can be cleaned separately.
- Signal feedback device is available upon request.
- Valve body can turn around 180degree, NO/NC is available.

Feature(Manually operated)

It's been used widely in controlling pressure and flow rate, and different assembly is available upon request, like 2-3 for Shut-off valve, or 3-5 for changeover valve.

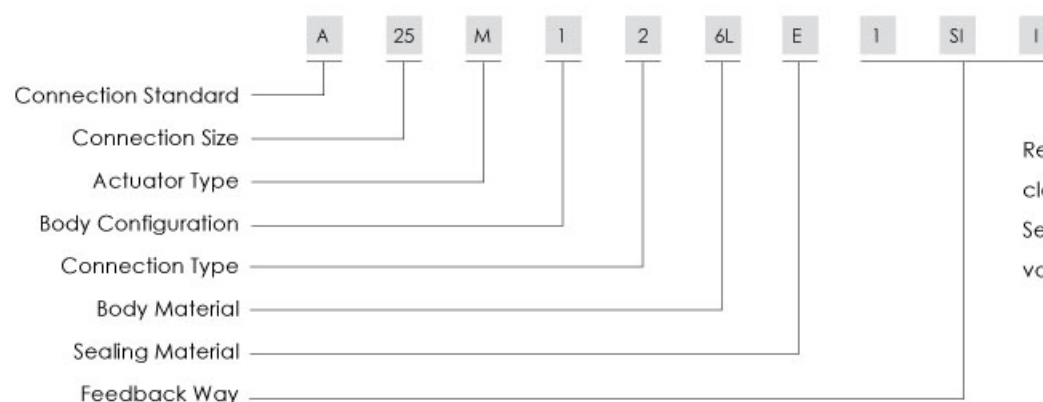
Flow Direction



Selection table

Connection Standard	DIN	D	Connection Type	welding ends	1
	ISO	I		clamp/clamp	2
	3A	A			
Connection Size	1.0"	25	Body Material	316L	6L
	1.5"	40		304L	4L
	2.0"	50	Sealing Material	EPTM+PTFE	EP
	2.5"	65		Silicone+PTFE	SP
	3.0"	80		Viton+PTFE	VP
Actuator Type	Manual	M	Feedback Type(only for pneumatic)		
	Normally Open	NO	Magnetic Valve	Have	1
	Normally Closed	NC		None	0
	Air/Air	AA	Sensor	None	N
Body Configuration	L-L Type	1		Single Indicator	SI
	T-L Type	2		Double Indicator	DI
	T-T Type	3	Sensor Type	Sensor Indicator	I
	L Type	4		Mechanical Type	M
	T Type	5			
	L-T Type	6			

Option samples:



Remark: 3A, 1.0" piston valve, clamp/clamp, 316L, EPTM+PTFE Sealing Material, with magnetic valve and single sensor.

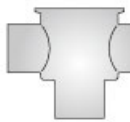
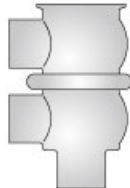
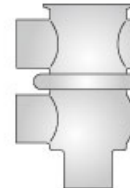
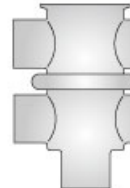
Remark: 1, Request about GMP & DMP valve, Please contact with Kinglai; 2, if the valve with feedback device used in dangerous area, please inform the anti-explosion lever of electronic components;

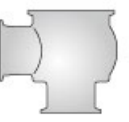
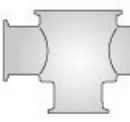
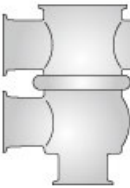
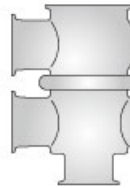
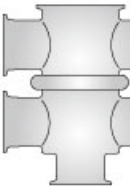
KPV-P with pneumatically operated KingLai Hygienic Piston Valves

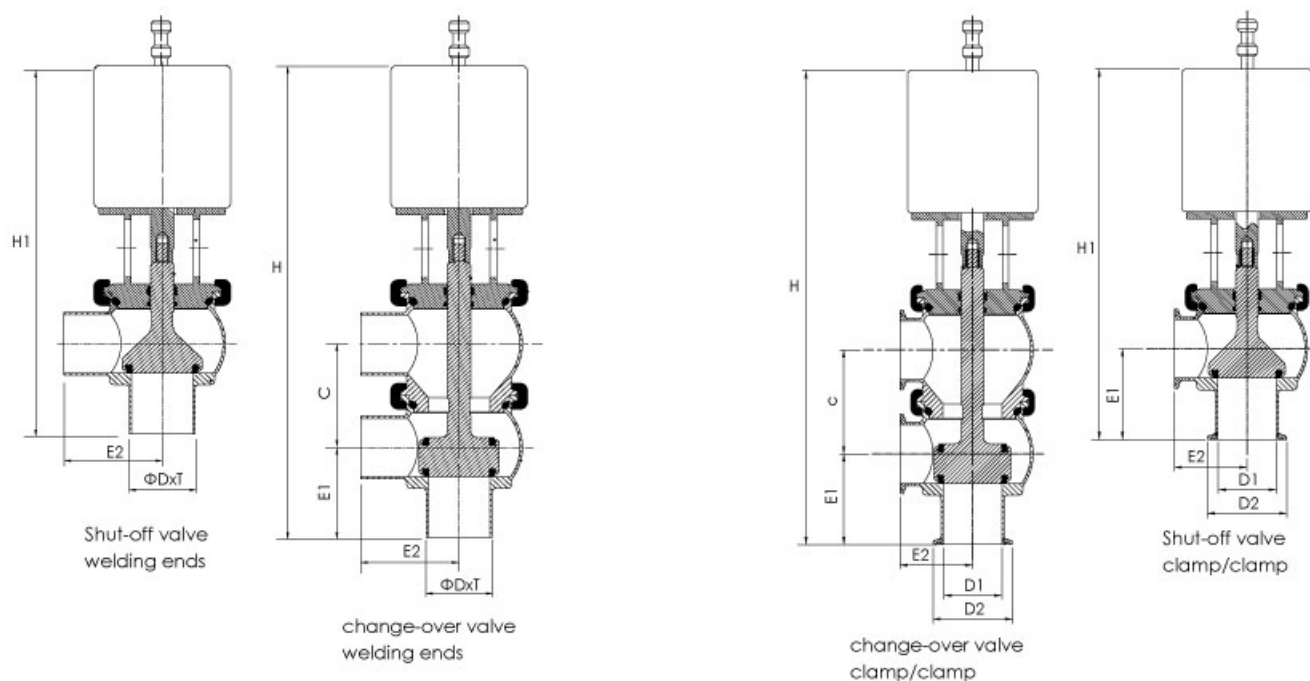
Working Pressure	0-10 bar
Working Temp.	-40~140°C (Standard) , -40~120°C (Encapsulated)
Actuator	pneumatically operated: Normally Open (NO) , Normally Closed (NC) , Air/Air (A/A)
Seal Material	EPDM / Viton / Silicone
Body Design	L-L Type, T-L Type, T-T Type, L Type, T Type, L-T Type
Body Material	316L (EN1.4409 CF3M) , 304 (EN1.4308)
Port Size	1.0"~ 3.0"
Connection	Welding ends, Clamp/Clamp
Surface Finish	outside surface sanding , Internally Ra≤0.8μm
Connection Standard	DIN, ISO, 3A, JIS



Valve Body compositions

					
L 200	T 300	L-L 210	T-L 220	L-T 310	T-T 320
DIN:1526411	DIN:1526511	DIN:1526111	DIN:1526611	DIN:1526311	DIN:1526211

					
L 2001	T 3002	L-L 2102	T-L 2203	L-T 3103	T-T 3204
DIN:1526414	DIN:1526514	DIN:1526114	DIN:1526614	DIN:1526314	DIN:1526214


KPV-PW: Welding ends (change-over valve/Shut-off valve)

No.	Size	OD×T	E1	E2	C	H	H1
XXXXXXX-000100	1.0"	25.4×1.65	50.0	50.0	68.0	324.5	256.5
XXXXXXX-000150	1.5"	38.1×1.65	49.5	49.5	68.0	324.5	256.5
XXXXXXX-000200	2.0"	50.8×1.65	61.0	61.0	84.0	354	270.5
XXXXXXX-000250	2.5"	63.5×1.65	81.0	81.0	107.0	476	369.0
XXXXXXX-000300	3.0"	76.2×1.65	86.0	86.0	121.0	487	366.0

KPV-PC: Clamp/Clamp (change-over valve/Shut-off valve)

No.	Size	E1	E2	D1	D2	C	H	H1
XXXXXXX-000100	1.0"	62.7	62.7	22.1	50.4	68	337.2	269.2
XXXXXXX-000150	1.5"	62.7	62.7	34.8	50.4	68	337.2	269.2
XXXXXXX-000200	2.0"	73.7	73.7	47.5	63.9	84	366.7	283.2
XXXXXXX-000250	2.5"	93.7	93.7	60.2	77.5	107	488.7	381.7
XXXXXXX-000300	3.0"	98.7	98.7	72.9	90.9	121	499.7	378.7

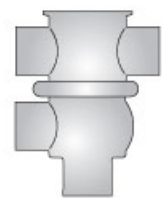
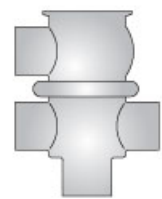
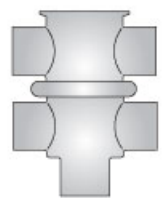
Note: xxxxxx coding need to be fixed, so that the finished part code will be locked.

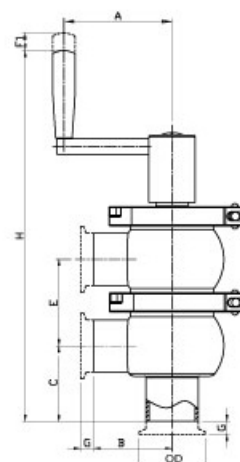
KPV-M with manually operated KingLai Hygienic Piston Valves

Working Pressure	0-10 bar
Working Temp.	-40~140°C
Actuator	manually operated
Seal Material	EPDM / Viton / Silicone
Body Design	L-L Type, T-L Type, T-T Type, L Type, T Type, L-T Type
Body Material	316L (EN1.4409 CF3M) , 304 (EN1.4308)
Port Size	1.0"~ 3.0"
Connection	Welding ends, Clamp/Clamp
SurfaceFinish	outside surface sanding , Internally Ra≤0.8μm
Connection Standard	DIN, ISO, 3A, JIS



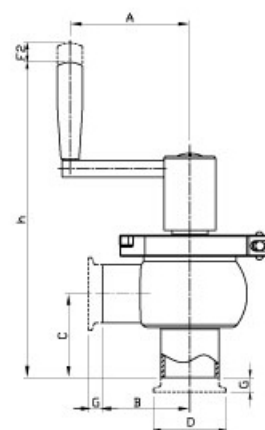
Valve Body compositions

					
L 200	T 300	L-L 210	T-L 220	L-T 310	T-T 320
DIN:1526413	DIN:1526513	DIN:1526113	DIN:1526613	DIN:1526213	DIN:1526313

**KPV-M: Welding ends (change-over valve)**

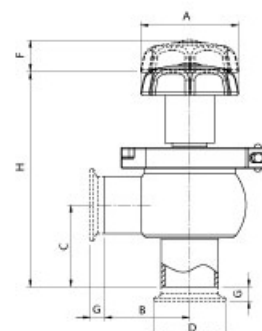
No.	SIZE	A	B	C	OD	E	F1	G	H
XXXXXXXX-000150	1.5"	105	49.5	49.5	50.4	66	17	12.7	222
XXXXXXXX-000200	2.0"	105	61.0	61.0	63.9	84	24	12.7	252
XXXXXXXX-000250	2.5"	105	81.0	81.0	77.5	106.5	24	12.7	328
XXXXXXXX-000300	3.0"	105	86.0	86.0	90.9	120	27	12.7	337

Note: xxxxxx coding need to be fixed, so that the finished part code will be locked.

**KPV-M: Welding ends (Shut-off valve)**

No.	SIZE	A	B	C	OD	F2	G	H
XXXXXXXX-000150	1.5"	105	49.5	49.5	50.4	22	12.7	153
XXXXXXXX-000200	2.0"	105	61.0	61.0	63.9	30	12.7	166
XXXXXXXX-000250	2.5"	105	81.0	81.0	77.5	30	12.7	218
XXXXXXXX-000300	3.0"	105	86.0	86.0	90.9	30	12.7	214

Note: xxxxxx coding need to be fixed, so that the finished part code will be locked.

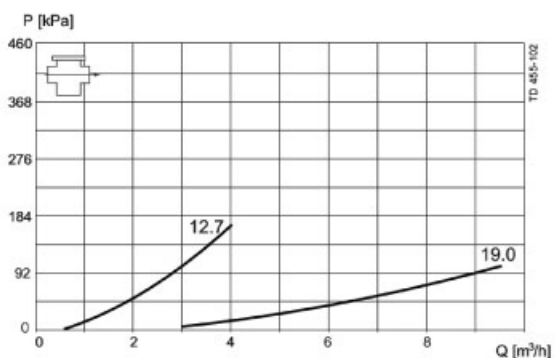
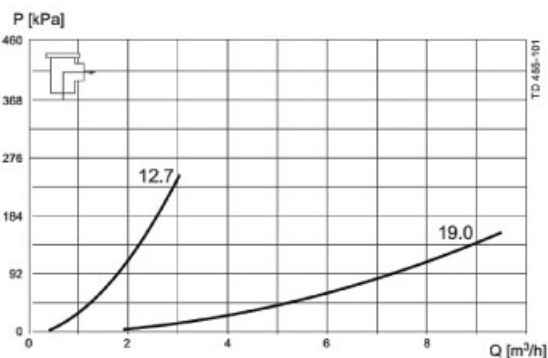
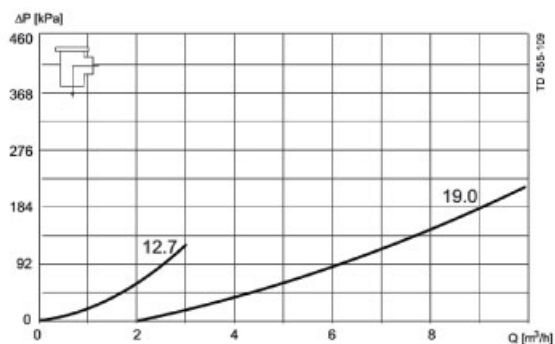
**KPV-M: Welding ends (Regulating valve)**

No.	SIZE	A	B	C	OD	F	G	H
XXXXXXXX-000150	1.5"	45	57.8	43.5	50.4	22	12.7	153
XXXXXXXX-000200	2.0"	45	66	43.2	63.9	30	12.7	166
XXXXXXXX-000250	2.5"	45	85	83.7	77.5	30	12.7	218
XXXXXXXX-000300	3.0"	45	90	74.3	90.9	30	12.7	214

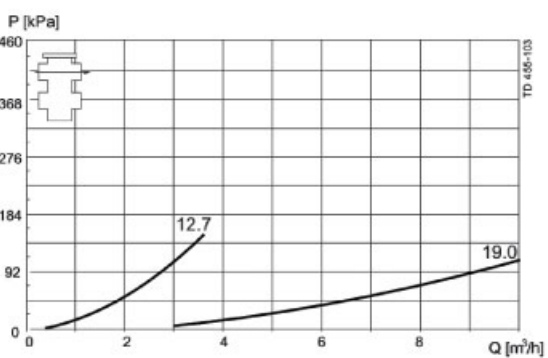
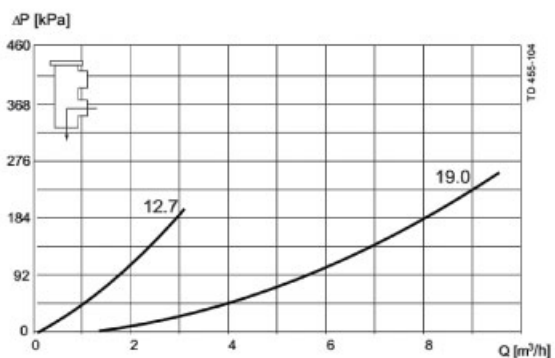
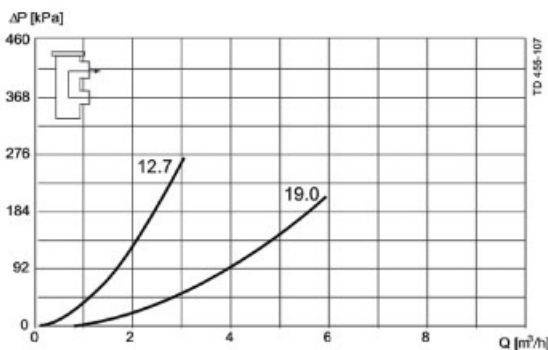
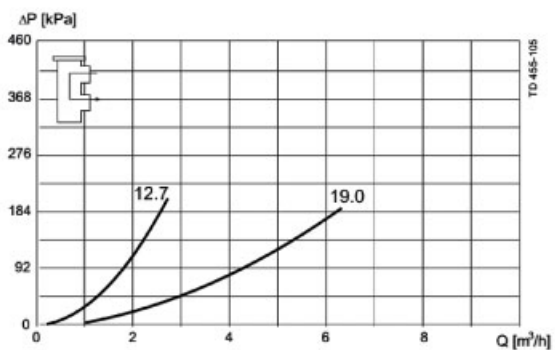
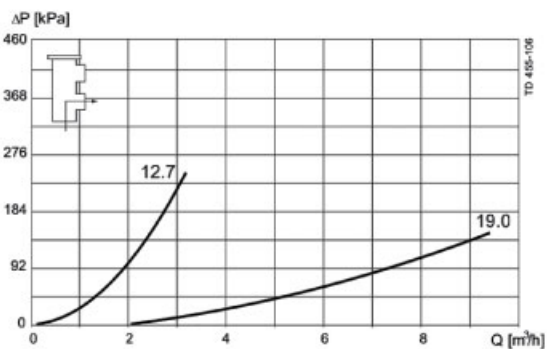
Note: xxxxxx coding need to be fixed, so that the finished part code will be locked.

Pressure/Flow

shut-off valve



change-over valve



KCV Hygienic Check Valves

KCV is designed to guarantee flow not go back in piping system. Self-active check valve MUST be installed in vertical direction, only allows flow down to upper side. There is no spring involved; it relies on gravity to seal the valve. The valve body is forged, it's hygienic and easy to clean, no dead area. Tri-clamp assembly, easy to be installed and inspection.

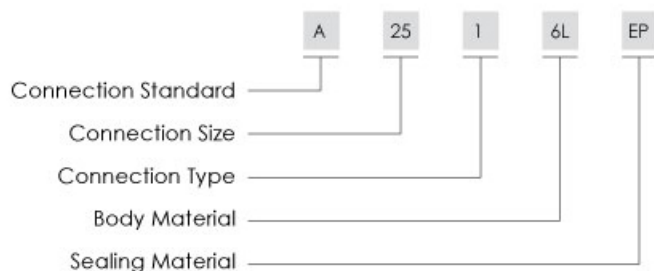


2
2.4

Selection table

Connection Standard	DIN	D
	ISO	I
	3A	A
Connection Size	1.0"	25
	1.5"	40
	2.0"	50
	2.5"	65
	3.0"	80
Connection Type	welding ends	1
	clamp/clamp	2
Body Material	316L	6L
	304L	4L
Sealing Material	EPDM	E
	Silicone	S
	Viton	V

Option samples:



Remark: 3A, 1.0", welding ends,
check valve with manually operated,
316L, EPDM Sealing Material.

Remark: 1, Request about GMP & DMP valve, Please contact with Kinglai; 2, if the valve with feedback device used in dangerous area, please inform the anti-explosion lever of electronic components;

KCK no-return valve

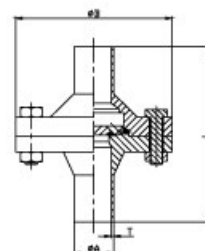
KingLai Hygienic Check Valves

Working Pressure	4.5 bar
Working Temp.	150°C
Seal Material	EPDM, Viton, Silicone
Body Material	316L
Port Size	0.5"~ 2.0", 1.0"~ 6.0"
Connection	Welding ends, Clamp/Clamp
Surface Finish	External surface finish $Ra \leq 3.2\mu m$, Internal surface finish $Ra \leq 0.8\mu m$
Connection Standard	DIN, ISO, 3A, BS



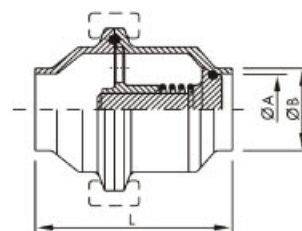
KCK-A: Wending ends

No.	SIZE	A	B	L ± 0.5	T
1502008-000050	1/2"	12.7	100.0	100.0	1.65
1502008-000075	3/4"	19.1	100.0	100.0	1.65
1502008-000100	1.0"	25.4	100.0	112.0	1.65
1502008-000150	1.5"	38.1	110.0	115.0	1.65
1502008-000200	2.0"	50.8	110.0	115.0	1.65



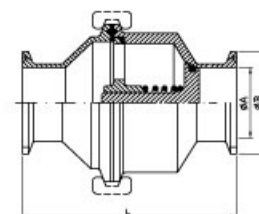
KCK-W: Wending ends

No.	SIZE	A	B	L
1502001-000100	1.0"	22.1	25.4	60
1502001-000150	1.5"	34.8	38.1	75
1502001-000200	2.0"	47.5	50.8	75
1502001-000250	2.5"	60.2	63.5	75
1502001-000300	3.0"	72.9	76.2	75
1502001-000400	4.0"	97.4	101.6	119
1502001-000600	6.0"	146.8	166.9	177.5



KCK-C: Clamp/Clamp

No.	SIZE	A	B	L
1502110-000100	1.0"	22.1	50.4	85.4
1502110-000150	1.5"	34.8	50.4	100.4
1502110-000200	2.0"	47.5	63.9	100.4
1502110-000250	2.5"	60.2	77.5	100.4
1502110-000300	3.0"	72.9	90.9	100.4
1502110-000400	4.0"	97.4	118.9	150.6
1502110-000600	6.0"	146.8	166.9	215.6



Four-Way Valves/ Air Pressure Valve

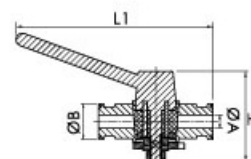
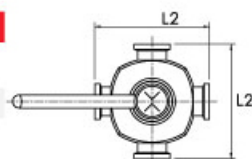
KingLai Hygienic Valves

Working Pressure	0-10 bar
Working Temp.	-10°C~150°C
Seal Material	PTFE
Body Material	316L
Connection	Welding ends, Clamp/Clamp
Surface Finish	External surface finish $Ra \leq 1.6\mu m$, Internal surface finish $Ra \leq 0.8\mu m$
Application	User friendly for chromatographic system, CIP/SIP



Four-Way Valves

No.	A	B	H	L1	L2
1507199-000050	9.4	25	63	137.4	80
1507199-000775	7.75	25	63	137.4	80
1507199-000100	22.1	50.4	107	224.0	150
OEM/ODM	25	63	137.4	80	



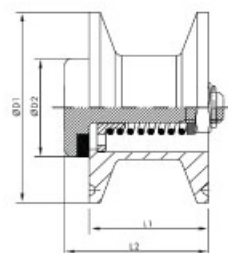
Air Pressure Valve

- Applied to product contact with air
- Spring holding to seal
- Good seal performance, guarantee long service lifetime (EPDM)
- Spine and nut holding position of spring, guarantee seal work properly
- Easy installation and inspection
- Design can be applied to CIP system
- Widely used in tank, piping system cleaning or drain out



Air Pressure Valve

SIZE	L1	L2	D1	D2
0.5"	30.0	36.2	50.4	26.0



BioClean® Pumps

Kinglai's centrifugal pumps meet the various needs of the market. Our centrifugal pumps have advanced hygienic design and gentle product handling for the greatest efficiency, they provide a long and trouble-free service life that ensures low cost of ownership. The product has low noise levels and lowest NPSH requirement. This reduces energy cost, lowers the risk of cavitation and provides a safe working environment. Our centrifugal pump series can be divided into three categories, KL-C, KL-S and KL-LR.

KL-C meets the requirements of sanitary processes for gentle product treatment. The series of products is certificated with 3A standard, and adapted to the food, beverage, dairy and brew industries.

KL-S series high efficiency centrifugal pumps meet the needs of highly purified and certificated with WFI standard and other strict requirements of standards. The product is certificated 3A standard as well. The series products can be cleaned and sterilized both during production line and manually. Product contact surface Ra≤0.5 μm.

KL-LR series are Liquid Ring Pumps, which means they can be used to pump products containing air or gas. This makes them ideal as return pumps in CIP/SIP systems, as well as for emptying tanks.



Hygienic Centrifugal Pumps - C series



Hygienic High-Efficiency Centrifugal Pump - S series



Liquid Ring Pumps - LR series

Products

KL-C series

KL-C100 inlet 1.5"/ outlet 1.0" with 3.68" impeller
 KL-C114 inlet 1.5"/ outlet 1.5" with 4" impeller
 KL-C216 inlet 2.0"/ outlet 1.5" with 6" impeller
 KL-C218 inlet 2.0"/ outlet 1.5" with 8" impeller
 KL-C328 inlet 3.0"/ outlet 2.0" with 8" impeller
 KL-C4410 inlet 4.0"/ outlet 4.0" with 10" impeller

KL-S series

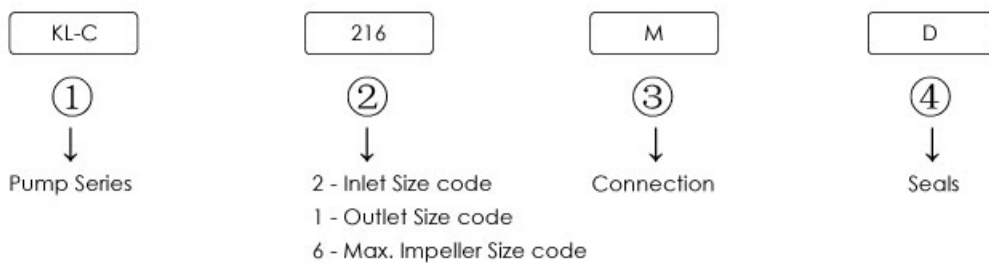
KL-S2016 inlet 2.0"/ outlet 1.5" with 6.0" impeller
 KL-S2017 inlet 2.0"/ outlet 1.5" with 7.0" impeller
 KL-S2528 inlet 2.5"/ outlet 2.0" with 8.5" impeller

KL-LR series

KL-LR117 inlet 1.5"/ outlet 1.5" with 7.0" impeller
 KL-LR228 inlet 2.0"/ outlet 2.0" with 8.0" impeller
 KL-LR229 inlet 2.5"/ outlet 2.5" with 9.0" impeller

Selection table

Determining model number of your pump is easy as ①-②-③-④



Motor kw

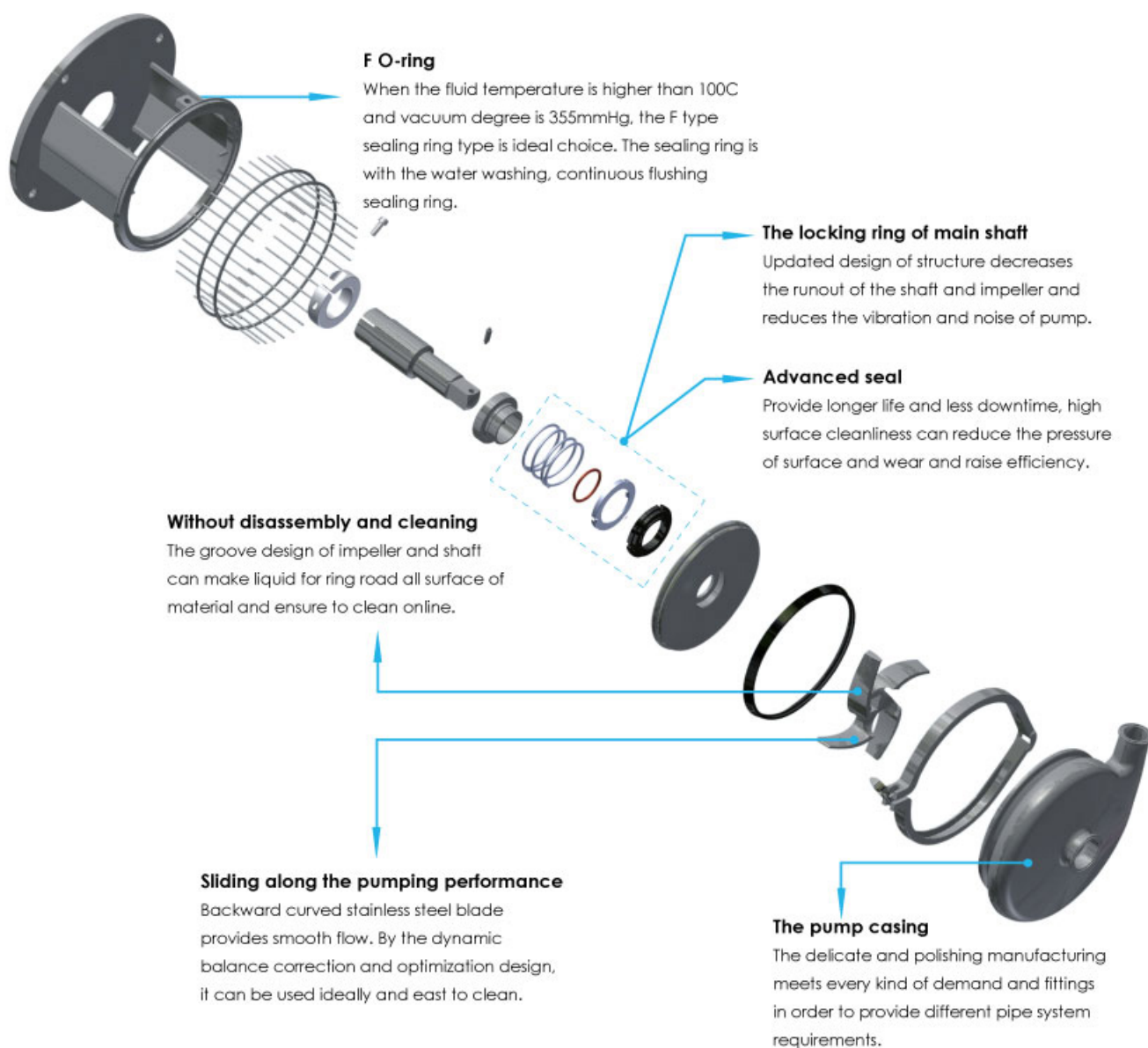
	M2BA	80		90		100	112	132		160		180		200		225	250
	Power	0.75kW	1.1kW	1.5kW	2.2kW	3kW	4kW	5.5kW	7.5kW	11kW	15kW	18.5kW	22kW	30kW	37kW	45kW	55kW
C	C100	◆															
	C114	◆	◆	◆	◆												
	C216			◆	◆	◆	◆	◆									
	C218						◆	◆	◆	◆							
	C328							◆	◆	◆	◆						
	C4410									◆	◆	◆	◆	◆	◆	◆	◆
S	S2016	◆	◆	◆	◆	◆	◆										
	S2017		◆	◆	◆	◆	◆	◆									
	S2528					◆	◆	◆	◆	◆	◆	◆	◆				
LR	LR117			◆	◆												
	LR228					◆	◆	◆									
	LR229								◆	◆							

KL-C Centrifugal Pumps

1. The pump shell uses high-purity stainless steel plate by extrusion molding body after cold welding, so strength and toughness of pump are very good, and the surface treatment is delicate polishing.
2. The gap between impeller and the pump shell in the appropriate minimum cavitation and noise level at the same time as far as possible in the fluid viscosity is larger, provide safe and quiet working environment.
3. Design of the sealing front mounted design and optimization of simple mechanical, ensure the high efficiency, time and trouble free operation can centrifugal pump, reduces the cost of maintenance and operation.
4. High quality mechanical seal (single / double sealing) meets the FDA certification and 3A specifications.
5. Casting open impeller, the CNC five axis machining, not only guarantee the impeller strength and high precision and is suitable for cleaning, CIP function.
6. A rolling groove design, can effectively avoid the backwater, with self-cleaning function.

Working principle

1. Impeller installed in the pump shell and the pump shaft, together with the rotation, impeller blade to kinetic energy and pressure energy forms convey energy to the fluid
2. When the pump works cannot reverse rotation, facing the pump head to see past counterclockwise rotation is correct.

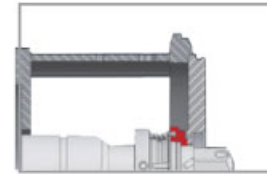


The Spec of O-ring

All sanitary O-rings meet 3A certification.

D Type External Balanced O-ring(Hygiene)

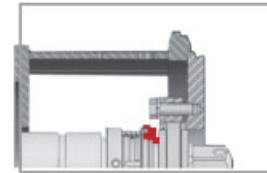
There are various applications of multifunctional sealing electric and they are very durable. We can use it on dairy products, vegetables, drink and acidic cleaner detergent.



D type

DG Type External balance with static ring O-ring (Single seal)

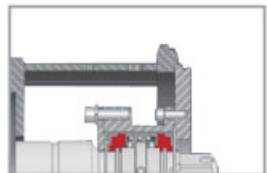
DG is used by the D standard type which is rotary seal parts and reversible silicon carbide, tungsten carbide or ceramic base. Typical applications include of syrup, fruit juice, drinks, chocolate and abrasive product.



DG type

E Type Rinse with water Dual Mechanical O-ring (Hygiene)

Designed for heavy industry vacuum application of liquid viscous products, mud pump temperature may exceed 100 degrees Celsius, under pressure is allowed to use in the cooling and / or seal agent sealing body, discharge tube sealing when using the body surface or vacuum sealing in the cooling seal cooling and / or seal agent in low pressure can be sealed in circulation



E type

F Type Rinse with water and External balanced O-ring (Hygiene)

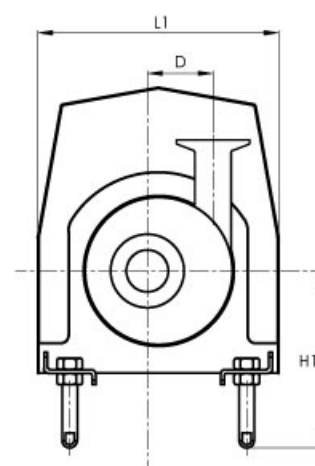
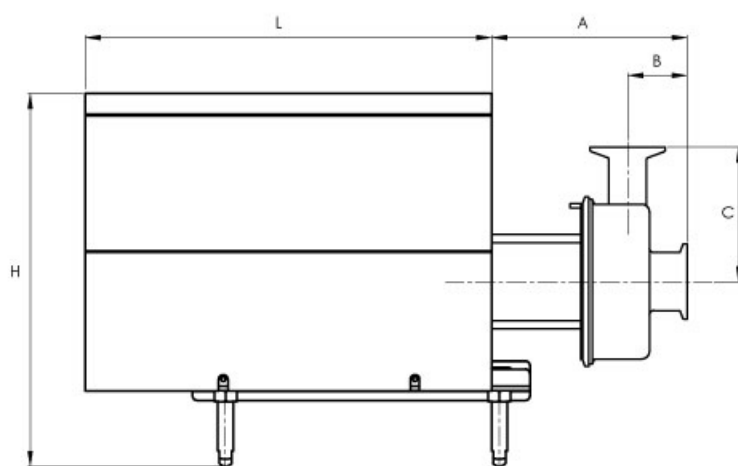
This is the same as D type beside of adding rinse with water.

Dual mechanical seal using environment

1. High viscosity will cause floating, so single seal is easy to leakage. And high viscosity fluid flow back slowly in machine sealing, cooling fluid on the machine seal variation, double mechanical seal for circulating cooling water.
2. High temperature sealing wear fast, decrease strength of materials and sealing ring is easy to aging. Dual mechanical seal provide to cooling circulating water.
3. Solid particles will also affect the dynamic float, wear seal fast, and backflow slowly of fluid containing solid particles in the machine seal at the cooling effect of the mechanical seal, fluid variation, double mechanical seal for circulating cooling water.
4. If system pressure is high, sealing type machine is easy to leak. Dual mechanical seal can increase the tolerance of pressure.
5. Cavitation in serious condition cause the movement distance of impeller shaft is enlarged, seal wear faster, with double mechanical seal, external supply of cooling water.

C KL-C Centrifugal Pumps KingLai BioClean Pumps series

Materials	316L
Other Materials	304
SurfaceFinish	MP, EP
Materials of Seal	Viton, Teflon
Type of Seal	D, DG, E, F type
Connection	Clamp, Weld, Flange, Male part
Motor Size	M2BA80, M2BA90, M2BA100, M2BA112, M2BA132, M2BA160
Power	0.75kw~55kw
Max. inlet pressure	1000kpa
Temperature range	-10℃~140℃
Float	0~180T/H
Head	0~70M
3A certification	3A-02-11/NO.1413



Pump Dimension (mm)

Size	C100	C114	C216	C218	C328
A	100	224	225	231	246
B	40	40	49	55	55
C	88.9	92	114	140	140
D	35	67	94	120	120

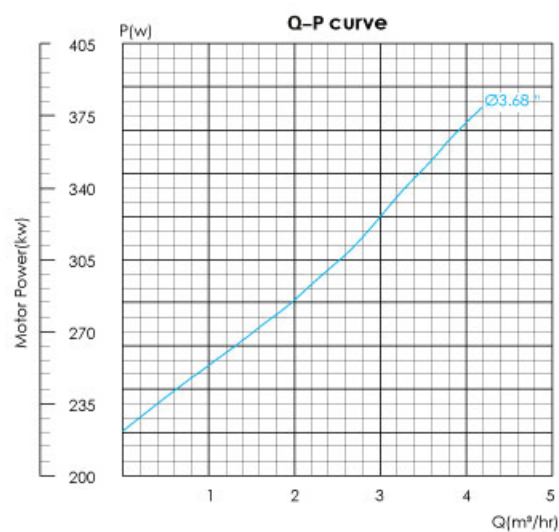
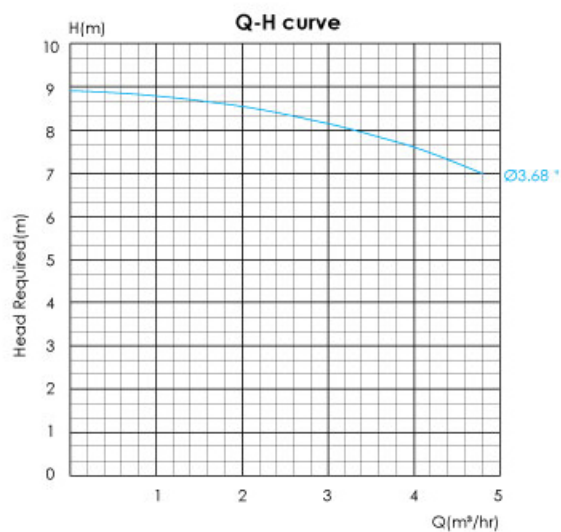
Motor Dimension (mm)

Size	M2BA 80	M2BA 90	M2BA 100	M2BA 112	M2BA 132	M2BA 160
L	350	350	390	390	530	550
L1	223	223	273	273	323	373
H	32	322	398	398	485	563
H1	162	172	183	194	242	270
Power	0.75/1.1kw	1.5/2.2kw	3kw	4kw	5.5/7.5kw	11/5kw

Flow chart

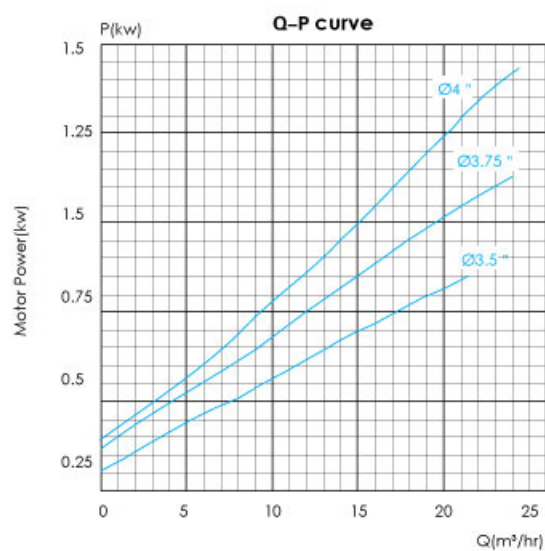
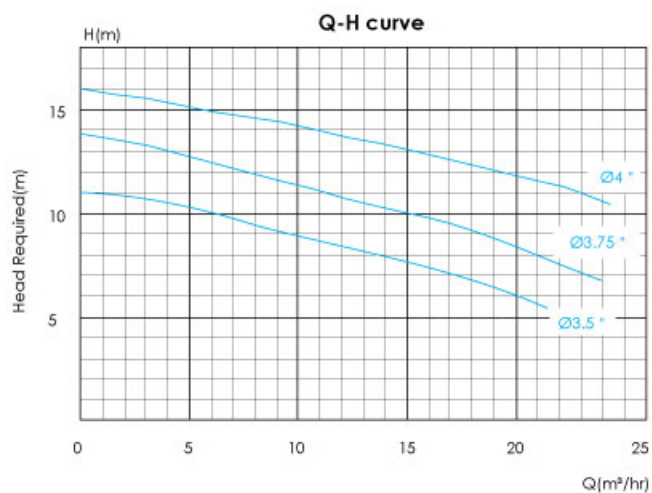
KL-C100 Centrifugal Pumps

Media	Speed	Frequency	Impeller diameter		Inlet	Outlet	Material
			Max.	Min.			
20±5°C water	2950RPM	50HZ	Ø3.68 "	Ø1.5 "	Ø1.5 "	Ø1.0 "	316L/304



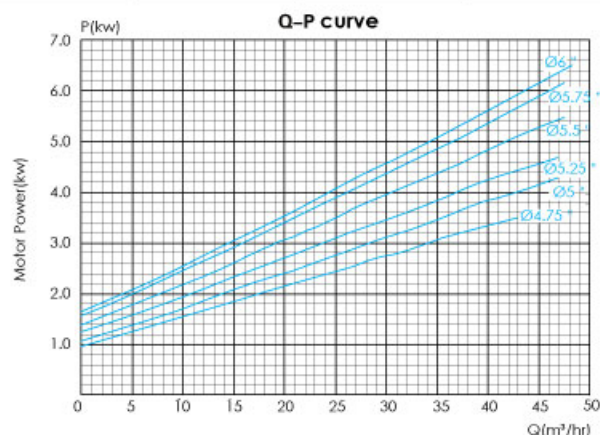
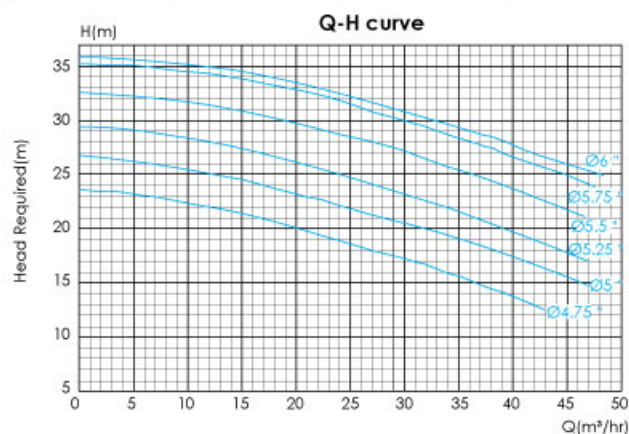
KL-C114 Centrifugal Pumps

Media	Speed	Frequency	Impeller diameter		Inlet	Outlet	Material
			Max.	Min.			
20±5°C water	2950RPM	50HZ	Ø4 "	Ø3.5 "	Ø1.5 "	Ø1.5 "	316L/304



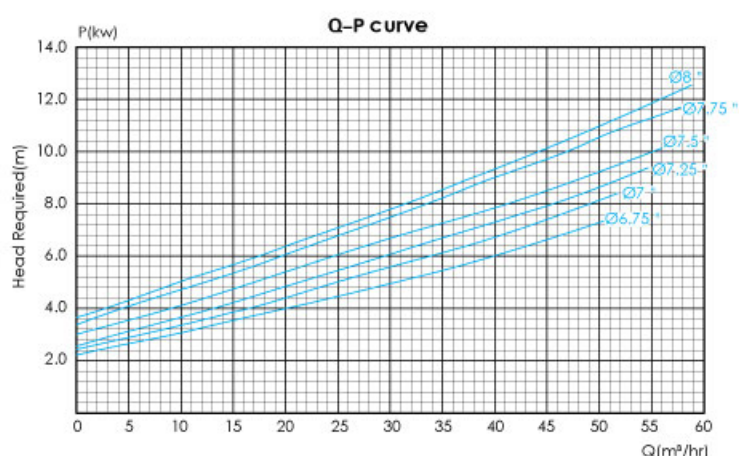
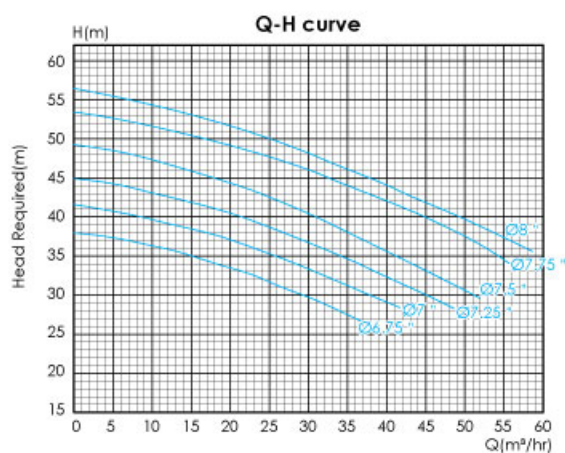
KL-C216 Centrifugal Pumps

Media	Speed	Frequency	Impeller diameter		Inlet	Outlet	Material
			Max.	Min.			
20±5°C water	2950RPM	50HZ	Ø6 "	Ø4.75 "	Ø2.0 "	Ø1.5 "	316L/304



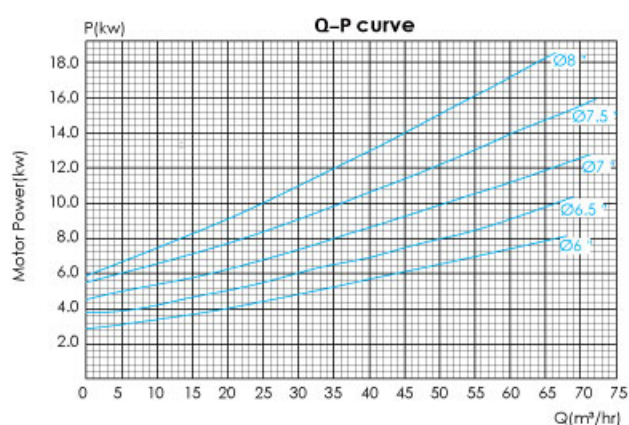
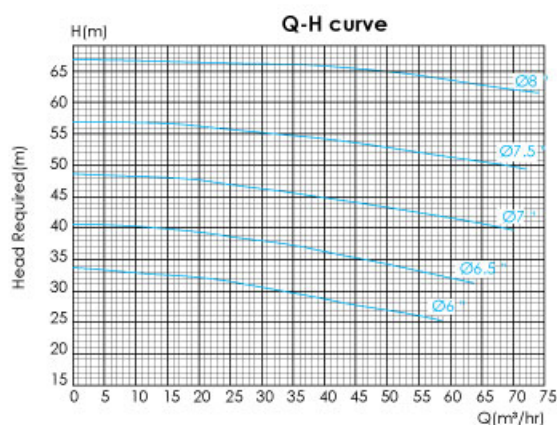
KL-C218 Centrifugal Pumps

Media	Speed	Frequency	Impeller diameter		Inlet	Outlet	Material
			Max.	Min.			
20±5°C water	2950RPM	50HZ	Ø8 "	Ø6.75 "	Ø2.0 "	Ø1.5 "	316L/304



KL-C328 Centrifugal Pumps

Media	Speed	Frequency	Impeller diameter		Inlet	Outlet	Material
			Max.	Min.			
20±5°C water	2950RPM	50HZ	Ø8 "	Ø6 "	Ø3.0 "	Ø2.0 "	316L/304



KL-S Hygienic High-Efficiency Centrifugal Pump

High-efficiency/ Low maintenance cost/ Gentle treatment/ Complete CIP ability/ Low cavitation request/ Long period sealing/ Reliability and durability

Operating principle:

- 1, Impeller is installed in the pump housing, which rotates together with the axle, impeller blades convey energy to the fluid through the pressure form and kinetic energy form.
- 2, The pump impeller can't reverse rotation at work, it's the right direction in counterclockwise when you are facing the pump.

Heavy type

With a minimum wall thickness of 6mm modular solid pieces for pump, provide the best protection in anti-pressure, anti-seismic, impact resistance, low noise for trouble-free operation. It can be sustained more pressure shocks and cavitation.

Front rotating seal ring loaded design

KL-S series, which reduce maintain time and effort, single mechanical seal will be removed pump cover, impeller, it's easy to install and unload without removing the pump case. Unique internal seal, cooling and lubrication, it can extend the working life, bear the more pressure at 0.8Mpa.

Compact internal construction

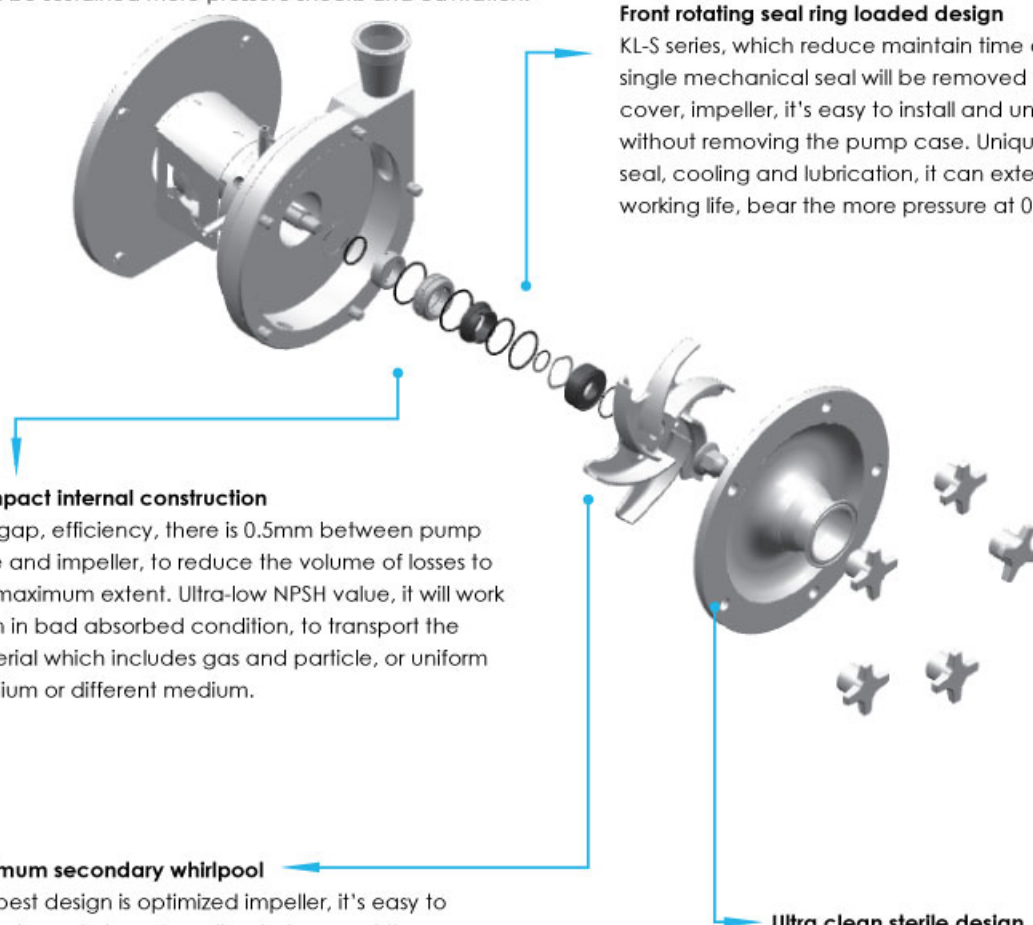
Tiny gap, efficiency, there is 0.5mm between pump case and impeller, to reduce the volume of losses to the maximum extent. Ultra-low NPSH value, it will work even in bad absorbed condition, to transport the material which includes gas and particle, or uniform medium or different medium.

Minimum secondary whirlpool

The best design is optimized impeller, it's easy to operate and clean. Impeller design meet the maximum efficiency and allow low cavitation requirements. Make the product more smooth and quiet operation. According to fluid mechanics principle of optimization design of pump pressure channels to ensure the smooth delivery for the material, soft, smooth, maximum limit the material in the pump head of the secondary vortex fell to the lowest, maximum reduce the temperature of material, thermal effect problem, thus ensure the pump work efficient.

Ultra clean sterile design

Contact surface which pump chamber, the impeller, gland are with the liquid will polish to below Ra0.5 micron, concave corner will not be designed in the channel theoretically, if inevitable, concave corner radius are above 1.6 mm, in order to make sure the media or cleaning fluid flow through without residual, causing bacteria breeding and cross contamination of the product.



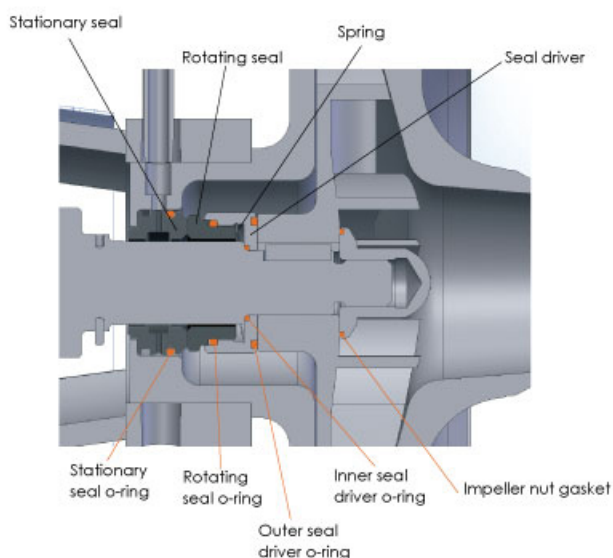
S series seal component

A single sealing components, double seal mechanical seal of the S series centrifugal pump with high quality material through FDA and 3A certification, strict test carried out in accordance with the most severe working conditions and standards applicable to the liquid viscosity to 1200CPS products, such as spring water and injection water, fruit juice, a little heavy liquid like flesh and syrup.

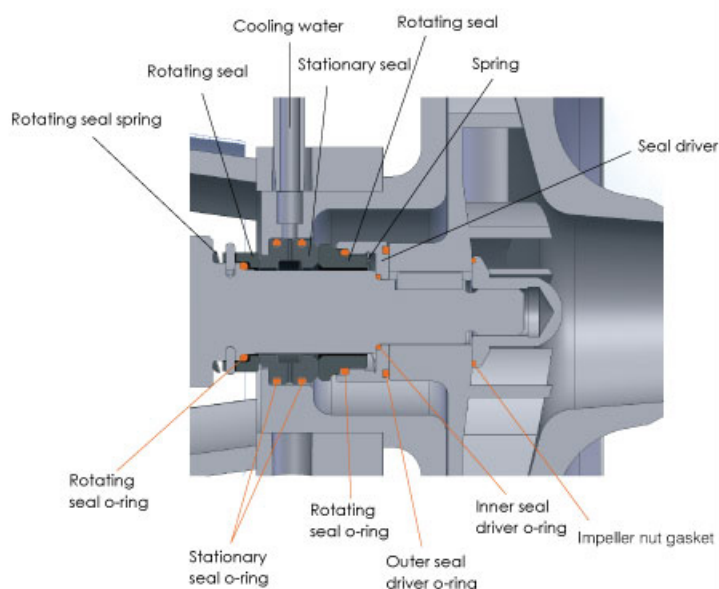
According to the material, temperature and different working conditions, there are a variety of seal materials available, fully applicable to the CIP and SIP system.



Single Sealing Components



Double Seal Mechanical Seal



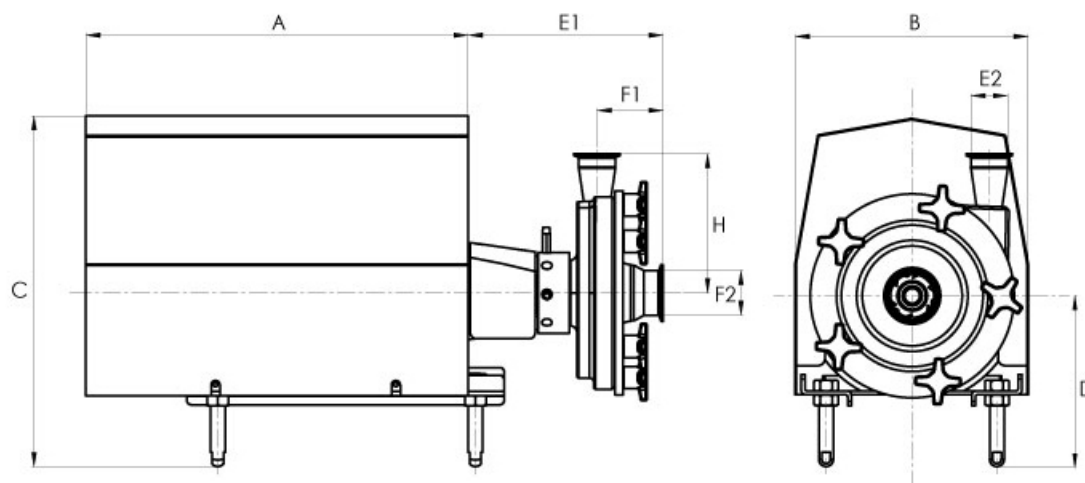
Double mechanical seal using environment

1. Medium high viscosity will impact on floating ring, single seal leakage easily. And the backflow slow high viscosity fluid in the machine seal at the cooling effect of the mechanical seal, fluid variation, double mechanical seal for circulating cooling water
2. High temperature seal wear more quickly, the decrease of tensile strength, sealing ring is easy to aging, double mechanical seal for circulating cooling water
3. Containing solid particles, will also affect the east ring floating, seal wear faster, slower and backflow of fluid containing solid particles in the machine seal at the cooling effect of the mechanical seal, fluid variation, use of mechanical seal for circulating cooling water
4. High pressure (higher than 0.8Mpa) easy to leak sealing external machine, double mechanical seal to increase pressure
5. Serious cavitation, the impeller axial movement distance becomes larger, seal wear faster, with double mechanical seal, external supply of cooling water.

S KL-S High-Efficiency Centrifugal Pump

KingLai BioClean Pumps series

Materials	316L
Other Materials	304
SurfaceFinish	Ra≤0.5μm
Materials of Seal	BUNA-N, Viton, Teflon
Type of Seal	Single seal, Double seal
Connection	Clamp, Weld, Flange, Male part
Motor Size	M2BA80, M2BA90, M2BA100, M2BA112, M2BA132, M2BA160, M2BA180
Power	0.75kw~22kw
Max. inlet pressure	1000kpa
Temperature range	-20℃~180℃
Float	0~60T/H
Head	0~75M



Motor Dimension (mm)

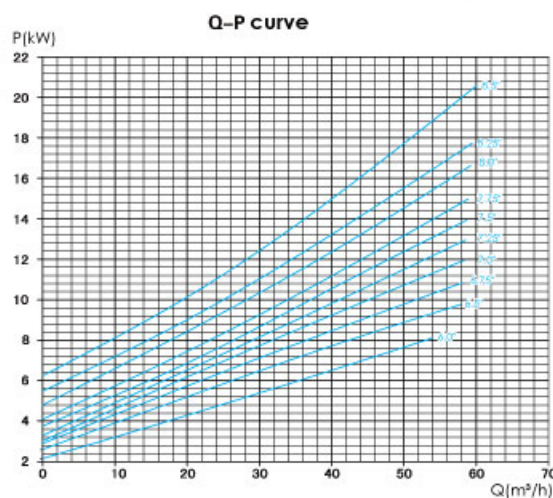
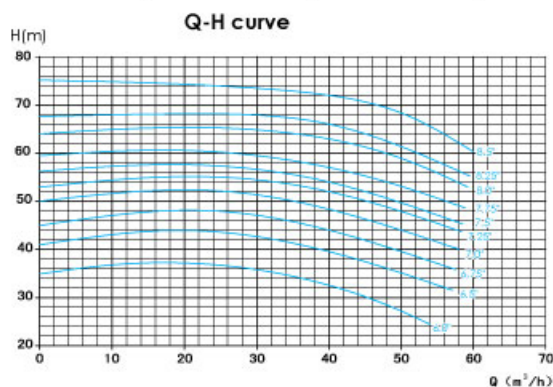
Size	M2BA 80	M2BA 90	M2BA 100	M2BA 112	M2BA 132	M2BA 160
A	350.0	350.0	390.0	390.0	530.0	550.0
B	223.0	223.0	273.0	273.0	323.0	373.0
C	322.0	322.0	398.0	398.0	485.0	563.0
D	162.0	172.0	183.0	194.0	242.0	270.0
Power	0.75kw/1.1kw	1.5kw/2.2kw	3kw	4kw	5.5kw/7.5kw	11kw/15kw

Pump Dimension (mm)

Size	S2016	S2017		S2828		
	M2BA 80/90	M2BA 80/90	M2BA 100	M2BA 100/112	M2BA 132	M2BA 160
E1	233.0	233.0	253.0	252.0	270.0	300.0
F1	91.0	91.0	91.0	91.6	91.6	91.6
H	169.0	169.0	169.0	192.8	192.8	192.8
E2	38.1	38.1	38.1	50.8	50.8	50.8
F2	50.8	50.8	50.8	63.5	63.5	63.5

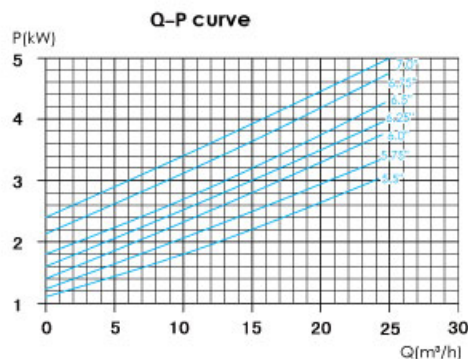
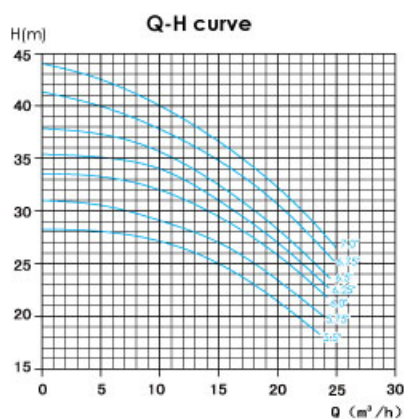
KL-S2528 Centrifugal Pumps

Media	Speed	Frequency	Impeller diameter		Inlet	Outlet	Material
			Max.	Min.			
20±5°C water	2950RPM	50HZ	Ø8.5 "	Ø6.5 "	Ø2.5 "	Ø2.0 "	316L/304



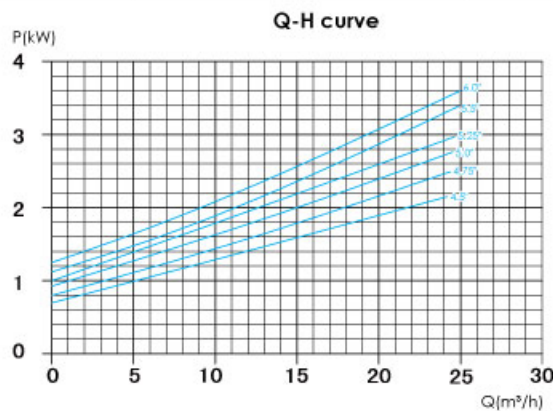
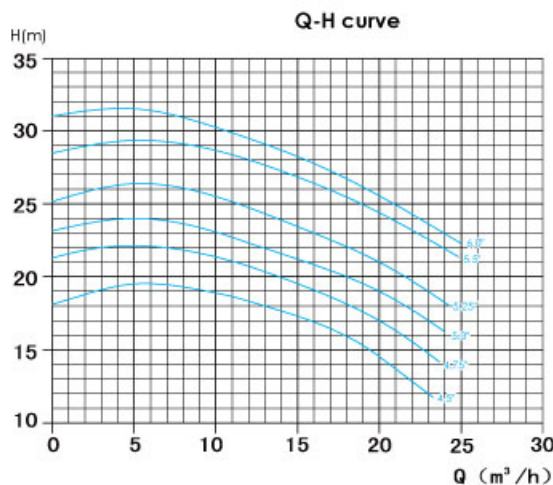
KL-S2017 Centrifugal Pumps

Media	Speed	Frequency	Impeller diameter		Inlet	Outlet	Material
			Max.	Min.			
20±5°C water	2950RPM	50HZ	Ø7.5 "	Ø5.5 "	Ø2.0 "	Ø1.5 "	316L/304



KL-S2016 Centrifugal Pumps

Media	Speed	Frequency	Impeller diameter		Inlet	Outlet	Material
			Max.	Min.			
20±5°C water	2900RPM	50HZ	Ø6.0 "	Ø4.5 "	Ø2.0 "	Ø1.5 "	316L/304

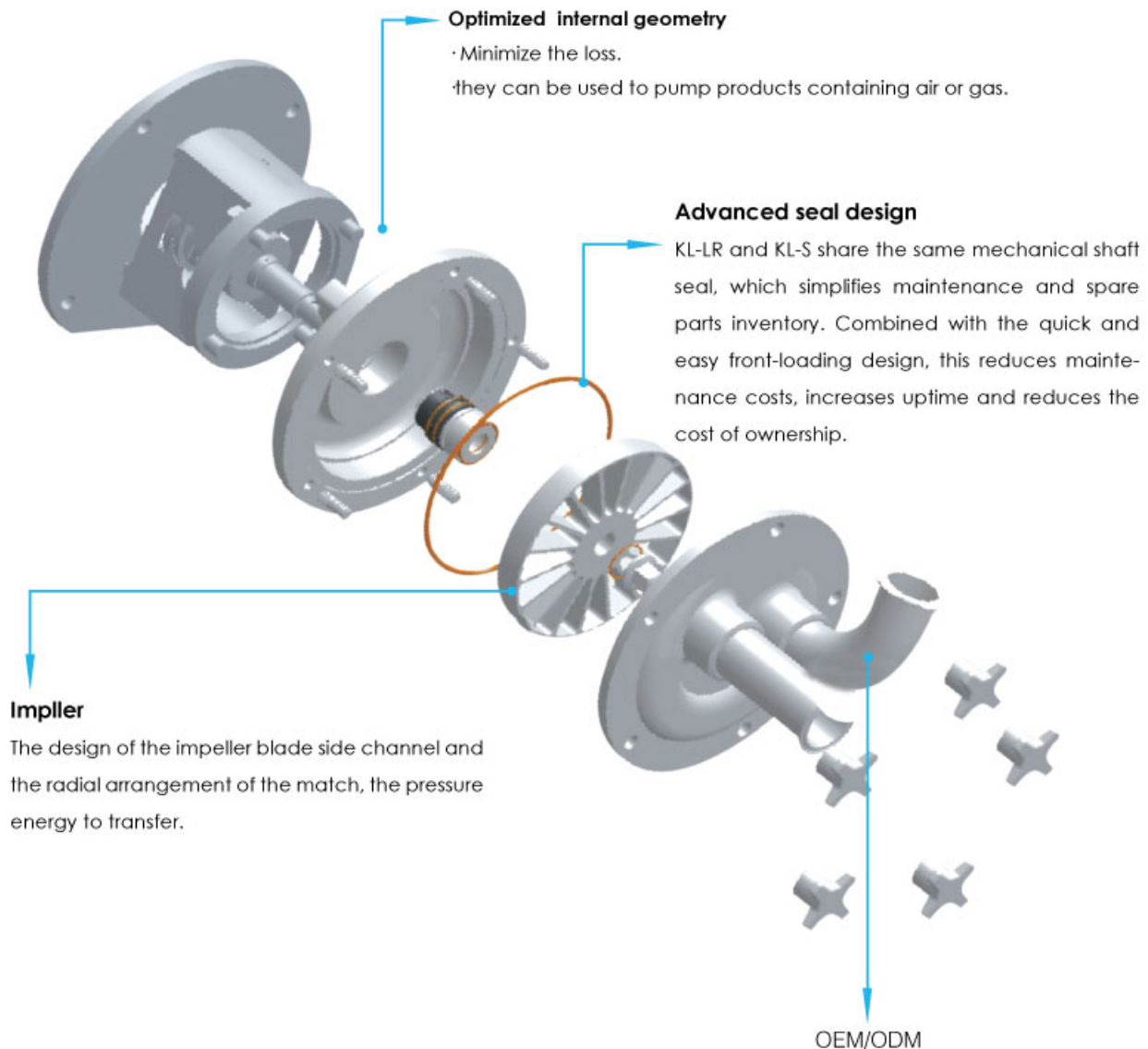


KL-LR Liquid Ring Pumps

1. Series-LR use a design pattern that the Impeller blades arranged radioactivity is compatible with Side pressure channel to Transfer pressure energy.
2. Minimum clearance between the pump casing and impeller ensures an excellent self-priming ability.
3. Use the same Single or double mechanical seals with the KL series centrifugal pumps, reducing maintenance costs. Before sealing ring load, longer life, greater pressure up 0.8Mpa.
4. use a Sanitary design pattern that there is not any blind angle.

Operating Principle

1. Impeller disposed between the casings inlet of the pump body, It is fitted on the shaft and rotate together.
2. rotation of the impeller and arrangement of the lateral, create a negative pressure of imports in the pump, resulting in a suction pump.
3. Meanwhile, the liquid accept the energy in the form of kinetic energy and pressure energy, To push it through the impeller cover.



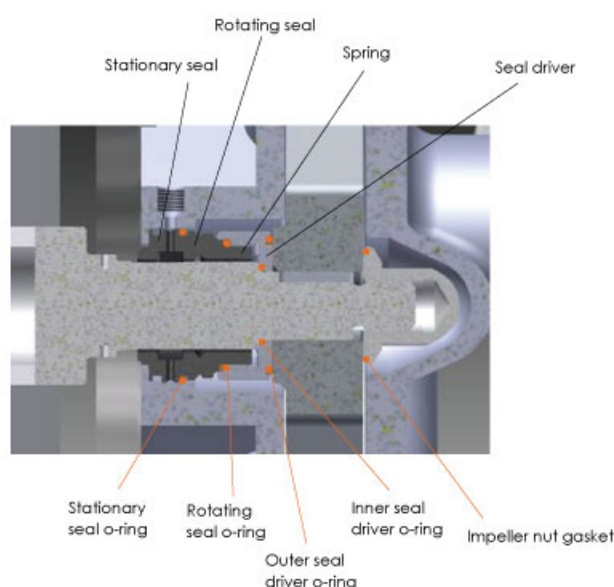
LR-Series seal assembly

Single Seal assembly and Double Seal assembly are available with FDA & 3A certification, and are tested under harsh working conditions. They are ideal for viscosity around 1200cps, such as pure water, WFI, fruit juice, syrup etc.

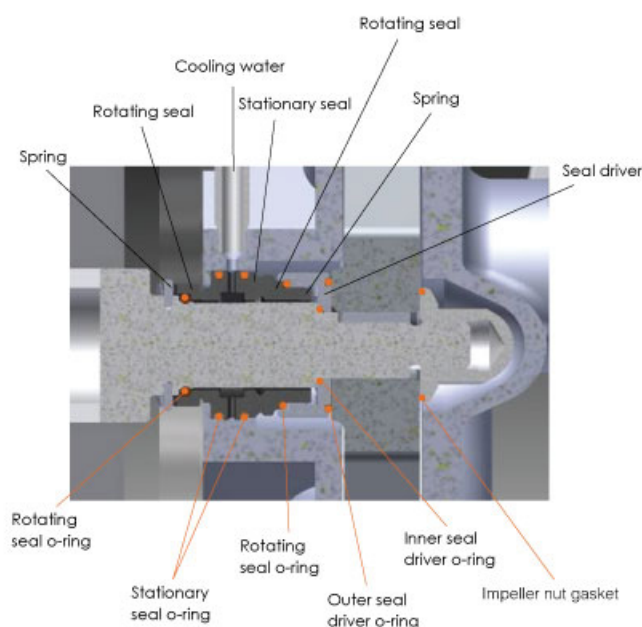
Many materials are optional, ideal for CIP & SIP system.



Single Sealing Components



Double Seal Mechanical Seal



Double mechanical seal using environment

1. Medium high viscosity will impact on floating ring, single seal leakage easily. And the backflow slow high viscosity fluid in the machine seal at the cooling effect of the mechanical seal, fluid variation, double mechanical seal for circulating cooling water
2. High temperature seal wear more quickly, the decrease of tensile strength, sealing ring is easy to aging, double mechanical seal for circulating cooling water
3. Containing solid particles, will also affect the east ring floating, seal wear faster, slower and backflow of fluid containing solid particles in the machine seal at the cooling effect of the mechanical seal, fluid variation, use of mechanical seal for circulating cooling water
4. High pressure (higher than 0.8Mpa) easy to leak sealing external machine, double mechanical seal to increase pressure
5. Serious cavitation, the impeller axial movement distance becomes larger, seal wear faster, with double mechanical seal, external supply of cooling water.

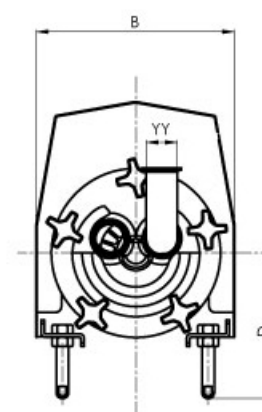
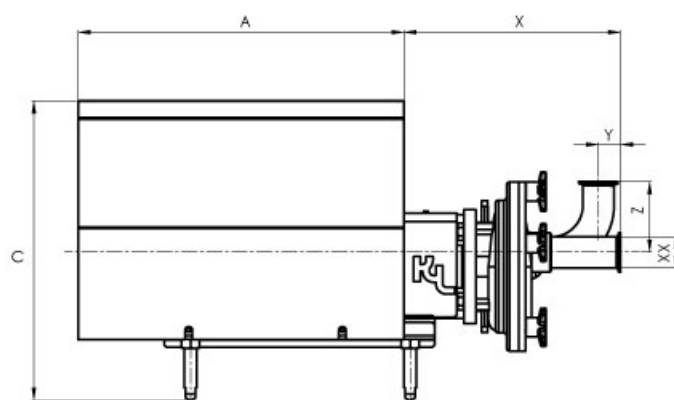
LR

KL-LR Liquid Ring Pumps

KingLai BioClean Pumps

series

Materials	316L
Other Materials	304
SurfaceFinish	External Sanding, Internal Ra≤0.8μm
O-Ring	VITON
Seal Materials	C/Silicon
Type of Seal	Single seal, Double seal
Connection	Clamp, Weld, Flange, Male part
Power	1.5kw~11kw(M2BA90~M2BA160)
Max. inlet pressure	0.5MPa(Max)
Temperature range	-20℃~180℃
Noise Range	≤85dB(One meter away)
Motor	ABB, 3P, 50Hz, 380V, IP55, 1450RMP

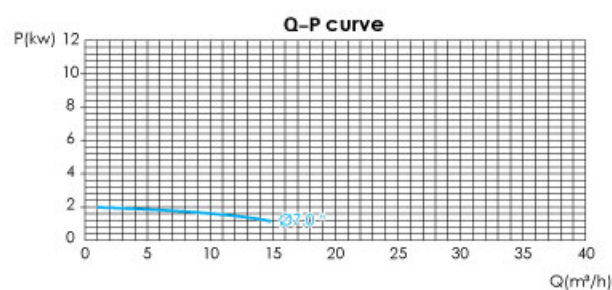
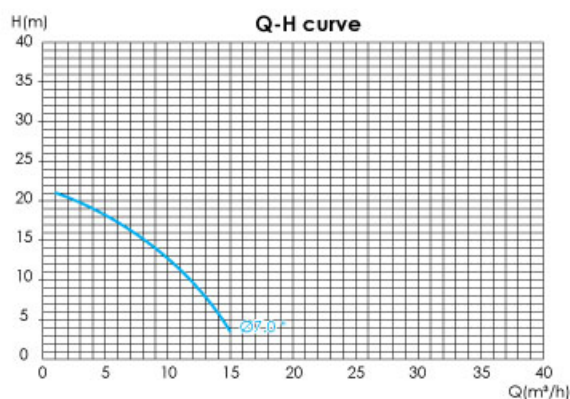


Pump Dimension (mm)

Size	A	B	C	D	X	Y	Z	XX	YY	功率
LR117	350	223	322	172	313	35.5	87	38.1	38.1	1.5KW
	350	223	322	172	323	35.5	87	38.1	38.1	2.2KW
LR228	390	273	398	183	324	36	114	50.8	50.8	3KW
	390	273	398	194	324	36	114	50.8	50.8	4KW
	530	323	485	242	344	36	114	50.8	50.8	5.5KW
LR229	530	323	485	242	351	37	127	63.5	63.5	7.5KW
	550	373	563	270	371	37	127	63.5	63.5	11KW

KL-LR117 Liquid Ring Pump

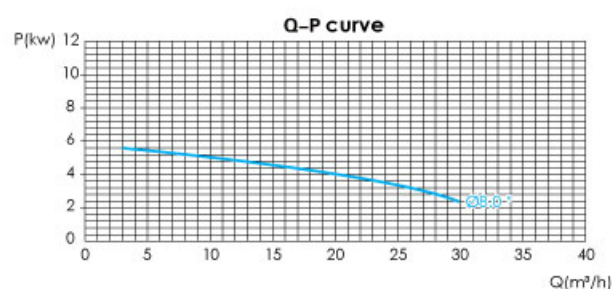
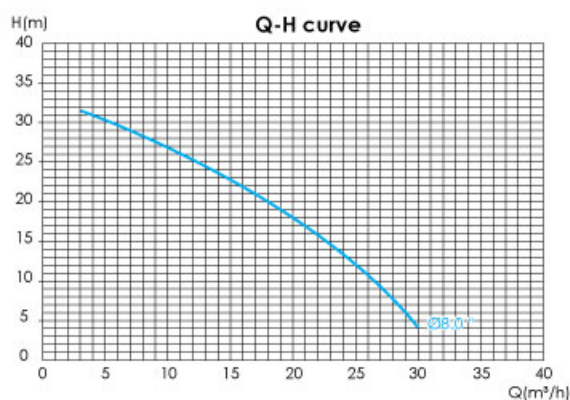
Medium	Speed	Frequency	Impeller diameter	Inlet	Outlet	Suction	Material
20±5°C water	1450RPM	50HZ	Ø7.0 "	Ø1.5 "	Ø1.5 "	8M	316L/304



3
3.3

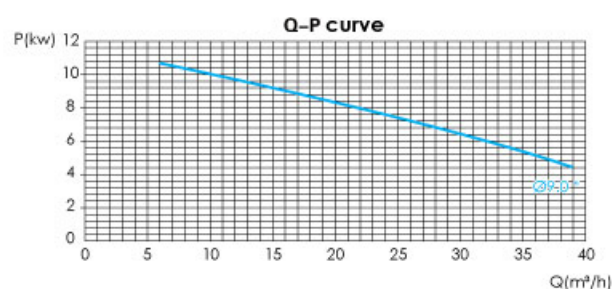
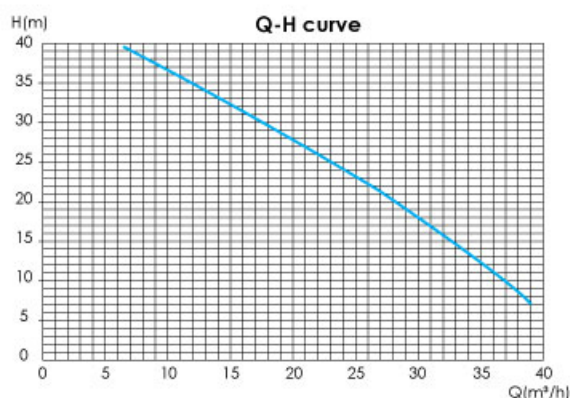
KL-LR228 Liquid Ring Pump

Medium	Speed	Frequency	Impeller diameter	Inlet	Outlet	Suction	Material
20±5°C water	1450RPM	50HZ	Ø8.0 "	Ø2.0 "	Ø2.0 "	8M	316L/304



KL-LR229 Liquid Ring Pump

Medium	Speed	Frequency	Impeller diameter	Inlet	Outlet	Suction	Material
20±5°C water	1450RPM	50HZ	Ø9.0 "	Ø2.5 "	Ø2.0 "	8M	316L/304



Viscosity and specific gravity table all kinds of different products

Variety		Specific Gravity	Viscosity
Acetic Acid	5%	1.01	
	10%	1.01	31.7 SSU@15°C
	50%	1.06	33 SSU@15°C
	80%	1.08	35 SSU@15°C
Animal Fat		0.9	130 SSU@46°C
			50 SSU@93°C
Barbecue Sauce		1.05	11,555 SSU@4~24°C
Beer		1.02	32 SSU@20°C
Blood-Animal		.93-.98	15,000 SSU@13°C
Butter		.93-.98	15,000 SSU@13°C
			440 SSU@32°C
			220 SSU@46°C
Coconut Oil		0.92	125 SSU@41°C
Corn Oil		0.92	135 SSU@54°C
			54 SSU@100°C
			150 SSU@21°C
Corn Starch Solutions	22Baume	1.18	130 SSU@38°C
	24Baume	1.2	600 SSU@21°C
			440 SSU@38°C
	25Baume	1.21	1400 SSU@21°C
			800 SSU@38°C
	Cottage Cheese	1.02	4300 SSU
Dressing			
Cream(Sweet)		1	73 SSU
		.99	140 SSU
		.99	215 SSU
Egg Yolk		1.12	21,500 SSU@1.7°C
Gelatin		1.01	1,380-2,580 SSU@71°C
Glucose		1.35-1.44	35M-100M SSU@38°C
			4M-11M SSU@65.5°C
Honey		1.3	1250 1425 SSU@38°C
Ice Cream		1.15	1050 SSU@ °C
Lard		0.96	287 SSU@38°C
Linseed Oil		.92-.94	143 SSU@38°C
			93 SSU@54.5°C
Malt Syrup		1.41	85,400 SSU@25°C
Maple Syrup		1.37	2,000 SSU@ °C
Margarine		0.93	13,900 SSU@29°C
		1.02-1.05	31.5 SSU@20°C
Molasses	A.First	1.4-1.46	1300-23,500 SSU@38°C
	B.Second	1.43-1.48	700-8160 SSU@54°C
			6535-61,180 SSU@38°C
	C.Blackstrap	1.46-1.49	3058-61,180 SSU@54°C
			12,190-255M SSU@38°C
Mustard		1	17,000 SSU@29.4°C
Olive Oil		.91-.92	200 SSU@38°C
Peanut Butter		1.2	77,400 SSU@43~60°C
Sesame Sees Oil		0.92	184 SSU@38°C
			100 SSU@54°C
Soy Bean Oil		0.91	500 SSU@7°C
Tomato Paste		1.14	60M-80M SSU
			21M SSU@approx.
Water		1	31 SSU@20°C

Friction Loss Table

The following table was developed to indicate loss of head due to friction-in meter loss per fitting or in meter loss per meter of tubing - through stainless steel tubes and sanitary fittings.

Friction Loss in Sanitary OD Tubes and Fittings

Capacity in m³/hr.	Tube Size																	
	1" ID=0.870"			1-1/2" ID=1.370"			2" ID=1.870"			2-1/2" ID=2.370"			3" ID=2.870"			4" ID=3.834"		
	Tube	Elbow	Tee	Tube	Elbow	Tee	Tube	Elbow	Tee	Tube	Elbow	Tee	Tube	Elbow	Tee	Tube	Elbow	Tee
0.5	0.01	0.003	0.030															
1.0	0.025	0.006	0.061															
1.1	0.035	0.008	0.076															
2.3	0.12	0.018	0.021	0.02	0.003	0.045	0.005	0.005	0.030									
3.4	0.25	0.030	0.242	0.04	0.006	0.076	0.013	0.006	0.045									
4.5	0.43	0.067	0.455	0.06	0.009	0.091	0.02	0.008	0.061	0.005	0.006	0.030	0.003	0.006	0.018			
5.7	0.66	0.021	0.697	0.08	0.012	0.121	0.025	0.009	0.076	0.006	0.009	0.045	0.004	0.009	0.024			
6.8	0.93	0.212	1.000	0.105	0.018	0.167	0.035	0.015	0.091	0.008	0.015	0.061	0.005	0.012	0.030			
8.0	1.22	0.379	1.576	0.135	0.027	0.242	0.04	0.018	0.121	0.011	0.018	0.076	0.006	0.015	0.039			
9.1				0.17	0.033	0.303	0.05	0.024	0.152	0.015	0.021	0.091	0.007	0.018	0.045			
10.2				0.21	0.048	0.394	0.063	0.030	0.182	0.02	0.027	0.106	0.008	0.020	0.055			
11.4				0.25	0.061	0.485	0.073	0.036	0.212	0.022	0.030	0.121	0.01	0.021	0.061			
13.6				0.34	0.106	0.667	0.1	0.055	0.273	0.03	0.036	0.136	0.015	0.024	0.076			
18.2				0.57	0.230	1.121	0.16	0.091	0.455	0.05	0.045	0.167	0.02	0.030	0.121			
22.7				0.85	0.409	1.758	0.23	0.133	0.697	0.075	0.055	0.182	0.03	0.033	0.152	0.008	0.012	0.030
27.3				1.18	0.621	2.758	0.32	0.194	1.000	0.105	0.064	0.303	0.04	0.039	0.182	0.01	0.015	0.045
31.8							0.42	0.258	1.364	0.14	0.070	0.379	0.05	0.048	0.242	0.013	0.018	0.061
36.4							0.54	0.342	1.758	0.17	0.085	0.485	0.07	0.061	0.333	0.015	0.021	0.076
40.9							0.67	0.439	2.242	0.205	0.094	0.606	0.08	0.064	0.394	0.02	0.024	0.091
45.5							0.81	0.552	2.727	0.245	0.106	0.758	0.1	0.079	0.485	0.025	0.027	0.121

Friction Loss in Sanitary OD Tubes and Fittings

Capacity In m³/hr.	Tube Size														
	1" ID=0.870"			1-1/2" ID=1.370"			2" ID=1.870"			2-1/2" ID=2.370"			3" ID=2.870"		
	Tube	Elbow	Tee	Tube	Elbow	Tee	Tube	Elbow	Tee	Tube	Elbow	Tee	Tube	Elbow	Tee
50.0							0.95	0.673	3.333	0.29	0.124	0.909	0.12	0.091	0.576
54.5							1.10	0.797	4.091	0.34	0.145	1.121	0.14	0.100	0.667
59.1										0.39	0.161	1.364	0.165	0.118	0.758
63.6										0.45	0.185	1.606	0.19	0.127	0.848
68.2										0.515	0.212	1.879	0.22	0.152	0.939
79.5										0.68	0.318	2.576	0.28	0.203	1.242
90.9										0.86	0.470	3.333	0.36	0.267	1.576
102.3										1.05	0.682	4.091	0.44	0.333	2.000
113.6													0.54	0.424	2.424
125.0													0.64	0.515	2.879
136.4													0.75	0.621	3.091
147.7													0.87	0.730	3.939
159.1													1.0	0.848	4.545
170.5														0.26	0.130
181.8														0.3	0.152
193.2														0.33	0.170
204.5														0.37	0.188
215.9														0.41	0.212
227.3														0.45	0.242
250.0														0.53	0.321

Superior Tanks for Ultra-Pure Applications



KL Sterile storage tank design is in line with food and medical industry the most strict hygiene requirements, and fully compatible with in situ cleaning (CIP) process, the storage tank with hemispherical upper parts and hemispherical or conical bottom, and after a careful design and testing, can be in 4 bar of the maximum pressure and absolute vacuum conditions to complete the task. This means that even under the condition of hard work, they can work safely. KL Sterile storage tank has a variety of different diameter and height to choose from, so that adapted to the available space, and can be customized to meet the special needs of customers. KL Sterile storage tank is equipped with different mixing equipment, very suitable for special food and beverage applications. And the level of design to choose from, it is very suitable for products containing particles, such as the production of prepared foods. All surfaces in contact with the product through the mirror polishing, and outside surface with wool surface finish.

Custom Vessels

ABC-KL will manufacture customized vessels for your food, beverage, pharmaceutical, chemical and electronics applications under the following considerations:

Vessel Volume: Maximum 90,000 liters with a diameter of 14 feet

Pressure Rating: Design and built to ASME code and stamped

Corrosion Resistance: Material of construction is stainless steel and other nickel based alloys

Quality: Highest quality vessels available in the market today

Technology And Testing Ensure Performance

Beginning with the inspection of raw materials and throughout the manufacturing process, rigorous testing and documentation procedures assure compliance with the most stringent industry standards. Prior to shipment, your tanks undergo documented tests that may include dye penetrant examination, radiographic examination, pressure testing, profilometer readings of surface finish, saline & ferrite testing and fiber optic borescopic examination of contact surfaces.

The Custom Advantage

Because we know that every application is unique, we design each tank individually, so you never have to adapt your processing operations to our products. With customized designs from ABC-KL, you determine the precise specifications to meet your requirements, including:

- Capacity and pressure rating
- Mechanical and electropolished surface finish to less than 10 micro-inches Ra
- Stationary or portable design
- Cone, sloped or dished bottoms
- Fixed or removable tops
- Port types, sizes and locations
- Dimple, conventional and half pipe heating and cooling jackets
- Chloride-free insulation with stainless steel sheathing
- Accessories such as lights, sightglasses, handholes, sensors, load cells, sampling valves & spargers, Ingold fittings for instrumentation and top and bottom mount mixers

All ABC-KL custom tanks offer:

- Materials including stainless steel and other nickel based alloys
- ASME Code Stamping with National Board Registration
- CE/PED Certification
- G/B150, TSGR0004-2009
- JB/T4730-2005 NB/T47015-2011
- Certified profilometer readings on mechanical and electropolished surface finish
- Borescopic inspection



4
4.1



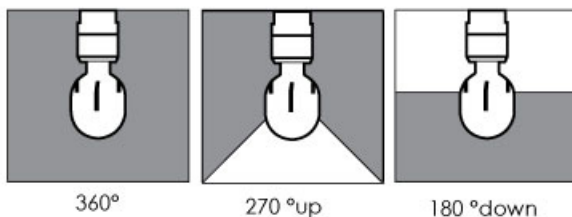
KRSH Rotary Spray Head

KRSH is a rotary spray head that uses cleaning media to provide coverage and impact. The device represents an effective alternative to traditional static spray balls because it uses low volumes of cleaning fluid at low pressure. The double ball bearing in the RSH's rotating head makes the device suitable for all industrial cleaning applications, including tanks, reactors, vessels and other containers ranging from 0.05 m³ to 50 m³, depending on dimensions and cleaning task. The flow of the cleaning media causes the head of the KRSH to rotate, and the fan-shaped jets lay out a swirling pattern throughout the tank or reactor. This generates the impact needed for the efficient removal of residual product; the cascading flow covers all internal surfaces of the vessel.



4
4.2

Spray Pattern



Technical Expertise

Raw material

AISI 316L (UNS S31603)

Min. tank opening

RSH-25 25mm diameter(DN25)

RSH-45 45mm diameter(DN45)

RSH-65 65mm diameter(DN65)

Max. working temp.

95°C (Max. ambient temp. 140°C)

Impact cleaning radius

RSH25 max. r=0.6M

RSH45 max. r=1.4M

RSH65 max. r=2M

Working pressure

1-3 bar (Recommended pressure: 2bar)

Spray pattern

360/270 up/180 down

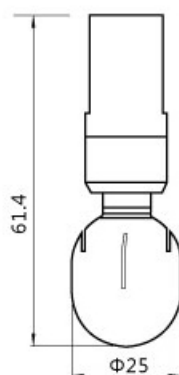
Connection

Thread, Weld-on, Clip-on

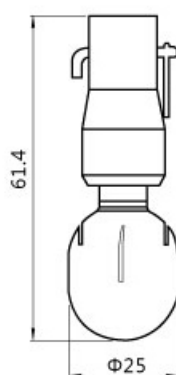
KRSH Rotary Spray Head-Φ25

Tank Cleaning Equipment

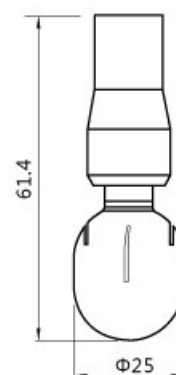
Lubricant	Self-lubricating with the cleaning fluid
Material	AISI 316L (UNSS31603)
Min.tankopening	25mm diameter(DN25)
Working pressure	1~3bar
Recommended pressure	2bar
Working temp.	95℃
Ambient temp.	140℃
Wetting radius	2.5m
Cleaning radius	Max. 0.6m
Connections	Thread: 3/8"Rp(BSP) Clip-on: 3/4"(BPE/3A) Weld-on: 3/4"(BPE/3A)
Standard Surface Finish	Ra0.8μm Internal, Ra0.8μm External
Improved Surface Finish	Ra0.8μm Internal, Ra0.8μm External+Mirror polish



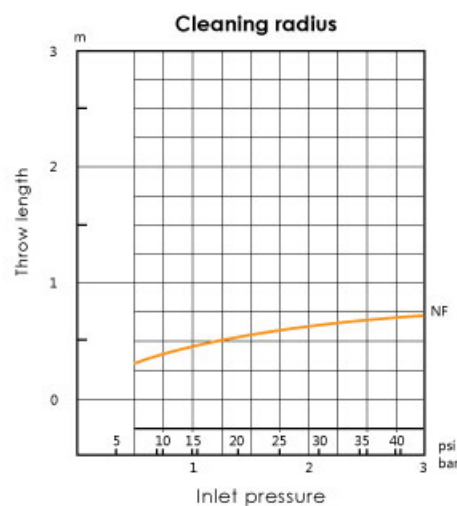
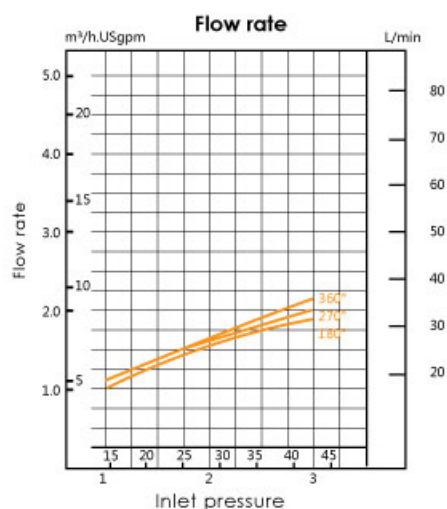
Thread



Clip-on



Weld-on



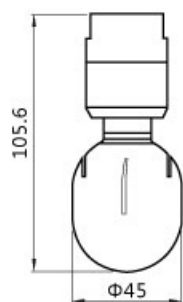
KRSH Rotary Spray Head-Φ45

Tank Cleaning Equipment

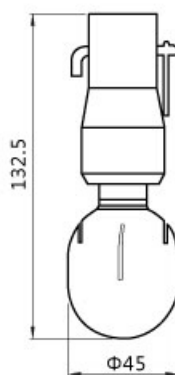
Lubricant	Self-lubricating with the cleaning fluid
Material	AISI 316L (UNSS31603)
Port Size	Min. Φ45mm
Working pressure	1~3bar
Recommended pressure	2bar
Working temp.	95°C
Ambient temp.	140°C
Wetting radius	3m
Cleaning radius	Max. 1.4m
Connections	Thread: 3/4"Rp(BSP) Clip-on: 1.0"(BPE/ISO) Weld-on: 1.0"
Standard Surface Finish	Ra0.8μm Internal, Ra0.8μm External
Improved Surface Finish	Ra0.8μm Internal, Ra0.8μm External+Mirror polish



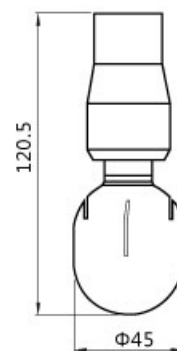
4
4.2



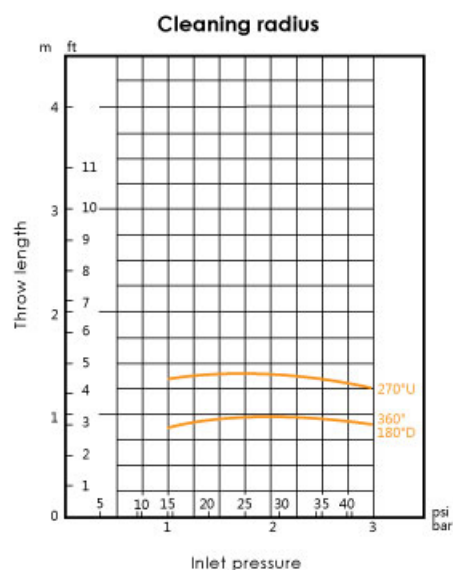
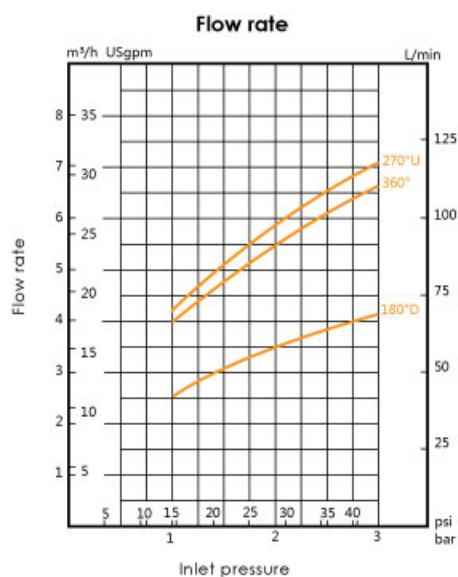
Thread



Clip-on

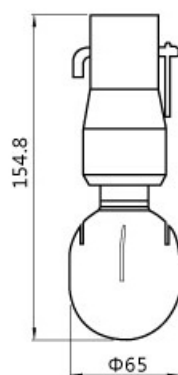


Weld-on

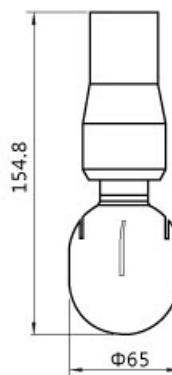


KRSH Rotary Spray Head-Φ65 Tank Cleaning Equipment

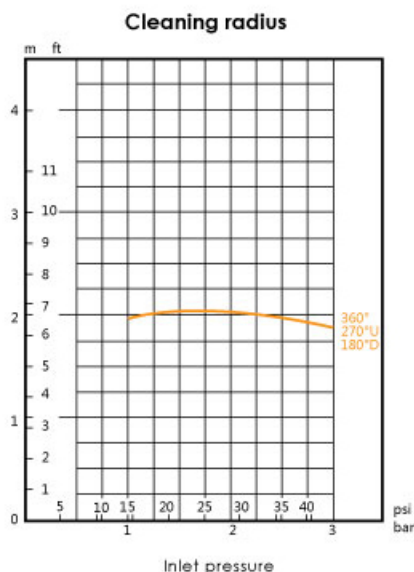
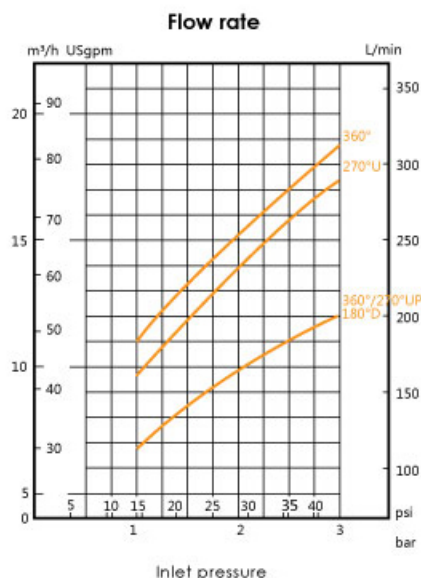
Lubricant	Self-lubricating with the cleaning fluid
Material	AISI 316L (UNSS31603)
Port Size	Min.Φ25mm
Working pressure	1~3bar
Recommended pressure	2bar
Working temp.	95℃
Ambient temp.	140℃
Wetting radius	3m
Cleaning radius	Max. 2m
Connections	Clip-on: 1.5"/2.0"(BPE/ISO) Weld-on: 1.5"/2.0"(BPE/ISO)
Standard Surface Finish	Ra0.8μm Internal, Ra0.8μm External
Improved Surface Finish	Ra0.8μm Internal, Ra0.8μm External+Mirror polish



Clip-on



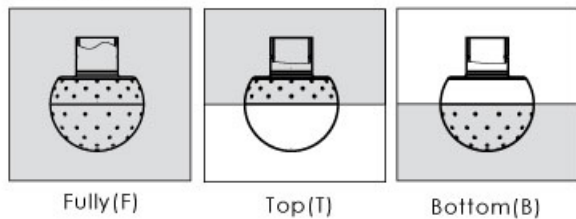
Weld-on



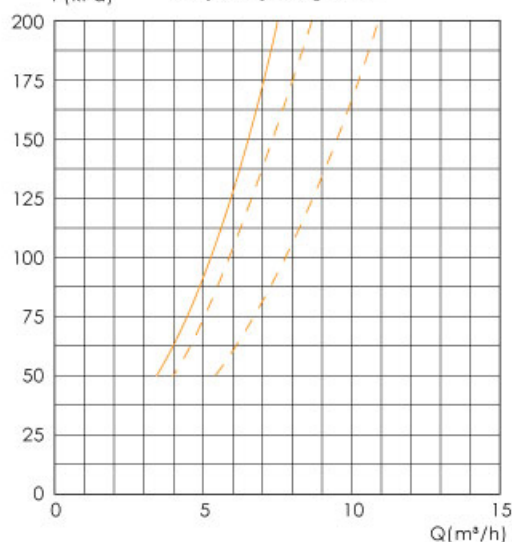
KSB Spray Ball Tank Cleaning Equipment

KSB is a fixed spray ball used for cleaning storage tanks.
Fixed spray balls are used for less demanding cleaning duties.
Can be customized to meet customers' specific needs.

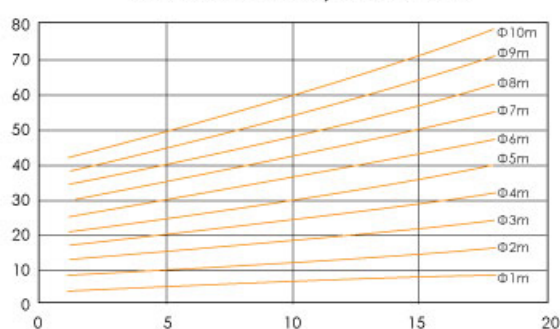
Spray Pattern



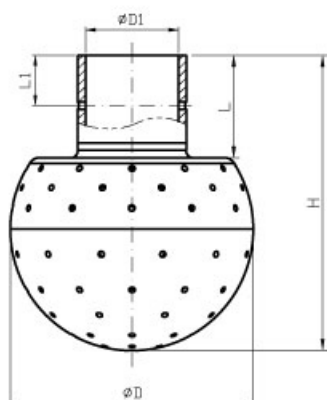
P(kPa) Capacity diagrams



Flow Rate Demand/Vertical Tank



360° Fully

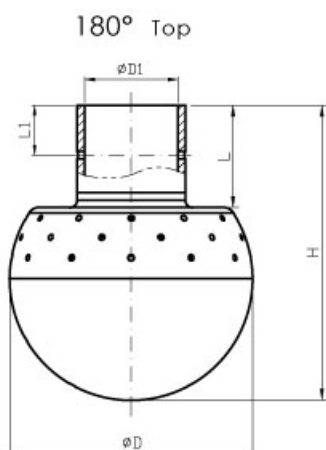


360° (Fully)

SIZE	D	D1	H	L	L1	Q(m³/h) 1bar	Q(m³/h) 2.5bar	Flow Diameter (Φm)
DN25	28.2	65	52.6	21.0	9.0	11.0	17.3	2.0-3.0
DN25-1	29.2	65	52.6	21.0	9.0	11.0	17.3	2.0-3.0
DN32	34.2	65	79.0	27.4	13.4	16.5	19.5	2.5-3.5
DN32-1	35.2	65	79.0	27.4	13.4	16.5	19.5	2.5-3.5
DN40	40.2	65	79.0	27.4	13.4	11.8	19.2	2.5-3.5
DN40-1	41.2	65	79.0	27.4	13.4	11.8	19.2	2.5-3.5
DN50	52.2	91	114.0	38.5	38.5	28.6	41.7	4.0-5.0
DN50	53.2	91	114.0	38.5	38.5	28.6	41.7	4.0-5.0

SIZE	D	D1	H	L	L1	Q(m³/h) 1bar	Q(m³/h) 2.5bar	Flow Diameter (Φm)
ISO19	19.3	40	52.6	21.0	9.0	4.2		1.0-1.5
ISO25	25.3	65	79.0	27.4	13.4	11.0	17.3	2.5-3.0
ISO38	38.3	65	79.0	27.4	13.4	11.8	19.2	2.5-3.5
ISO51	51.3	91	114.0	38.5	17.25	28.6	41.7	4.0-5.0

SIZE	D	D1	H	L	L1	Q(m³/h) 1bar	Q(m³/h) 2.5bar	Flow Diameter (Φm)
3/4"	19.3	40	52.6	21.0	9.0	4.2		1.0-1.5
1.0"	25.3	65	79.0	27.4	13.4	11.0	17.3	2.5-3.0
1.5"	38.3	65	79.0	27.4	13.4	11.8	19.2	2.5-3.5
2.0"	51.3	91	114.0	38.5	17.25	28.6	41.7	4.0-5.0

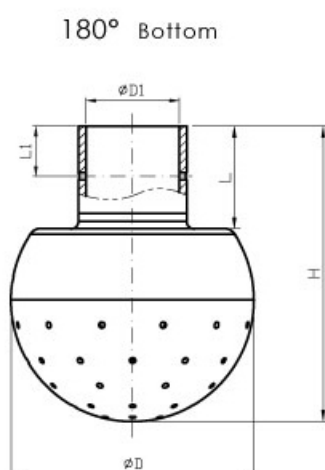


180° (Top)

SIZE	D	D1	H	L	L1	Q(m³/h) 1bar	Q(m³/h) 2.5bar	Flow Diameter (Φm)
DN25	28.2	65	52.6	21.0	9.0	8.7	12.8	2.5-3.0
DN25-1	29.2	65	52.6	21.0	9.0	8.7	12.8	2.5-3.0
DN32	34.2	65	79.0	27.4	13.4	9.8	15.6	2.5-3.5
DN32-1	35.2	65	79.0	27.4	13.4	9.8	15.6	2.5-3.5
DN40	40.2	65	79.0	27.4	13.4	9.6	14.8	2.5-3.5
DN40-1	41.2	65	79.0	27.4	13.4	9.6	14.8	2.5-3.5
DN50	52.2	91	114.0	38.5	38.5	19.5	30.6	4.0-5.0
DN50-1	53.2	91	114.0	38.5	38.5	19.5	30.6	4.0-5.0

SIZE	D	D1	H	L	L1	Q(m³/h) 1bar	Q(m³/h) 2.5bar	Flow Diameter (Φm)
ISO19	19.3	40	52.6	21.0	9.0	2.1		1.0-1.5
ISO25	25.3	65	79.0	27.4	13.4	8.7	12.8	2.5-3.0
ISO38	38.3	65	79.0	27.4	13.4	9.6	14.8	2.5-3.5
ISO51	51.3	91	114.0	38.5	17.25	19.5	30.6	4.0-5.0

SIZE	D	D1	H	L	L1	Q(m³/h) 1bar	Q(m³/h) 2.5bar	Flow Diameter (Φm)
3/4"	19.3	40	52.6	21.0	9.0	2.1		1.0-1.5
1.0"	25.3	65	79.0	27.4	13.4	8.7	12.8	2.5-3.0
1.5"	38.3	65	79.0	27.4	13.4	9.6	14.8	2.5-3.5
2.0"	51.3	91	114.0	38.5	17.25	19.5	30.6	4.0-5.0



180° (Bottom)

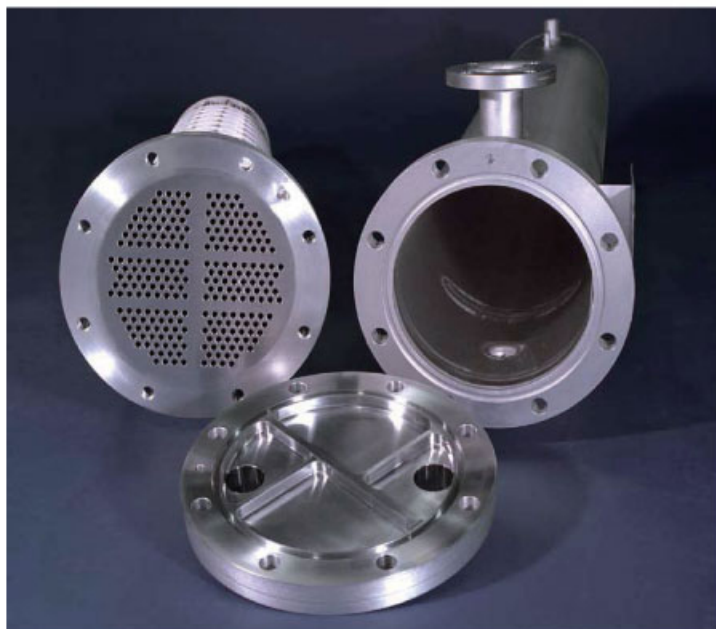
SIZE	D	D1	H	L	L1	Q(m³/h) 1bar	Q(m³/h) 2.5bar	Flow Diameter (Φm)
DN25	28.2	65	52.6	21.0	9.0	7.0	10.9	2.0-3.0
DN25-1	29.2	65	52.6	21.0	9.0	7.0	10.9	2.0-3.0
DN32	34.2	65	79.0	27.4	13.4	7.8	12.5	2.5-3.5
DN32-1	35.2	65	79.0	27.4	13.4	7.8	12.5	2.5-3.5
DN40	40.2	65	79.0	27.4	13.4	10.9	16.6	2.5-3.5
DN40-1	41.2	65	79.0	27.4	13.4	10.9	16.6	2.5-3.5
DN50	52.2	91	114.0	38.5	38.5	17.0	28.0	4.0-4.5
DN50-1	53.2	91	114.0	38.5	38.5	17.0	28.0	4.0-4.5

SIZE	D	D1	H	L	L1	Q(m³/h) 1bar	Q(m³/h) 2.5bar	Flow Diameter (Φm)
ISO19	19.3	40	52.6	21.0	9.0	2.5		1.0-1.5
ISO25	25.3	65	79.0	27.4	13.4	7.0	10.9	2.0-3.0
ISO38	38.3	65	79.0	27.4	13.4	10.9	16.6	2.5-3.5
ISO51	51.3	91	114.0	38.5	17.25	17.0	28.0	4.0-5.0

SIZE	D	D1	H	L	L1	Q(m³/h) 1bar	Q(m³/h) 2.5bar	Flow Diameter (Φm)
3/4"	19.3	40	52.6	21.0	9.0	2.5		1.0-1.5
1.0"	25.3	65	79.0	27.4	13.4	7.0	10.9	2.0-3.0
1.5"	38.3	65	79.0	27.4	13.4	10.9	16.6	2.5-3.5
2.0"	51.3	91	114.0	38.5	17.25	17.0	28.6	4.0-5.0

Allegheny Bradford Corporation

When it comes to heat exchangers, ABC sets the industry standard. Quality is the cornerstone of our heat exchangers from start to finish. Our engineering specialists work closely with you to custom design the most efficient, cost effective heat exchanger for your thermal transfer requirements. From the documentation of raw materials in compliance with BPE codes, to the precision CNC machining of tubesheets and bonnets, to final finishing, testing and documentation, Allegheny Bradford Heat Exchangers are manufactured to deliver superior performance and trouble-free operation, even in the most demanding ultra-pure processing environments. Allegheny Bradford Corporation custom designs every heat exchanger specifically to meet your exact application requirements. Specially designed computer software combines fluid dynamics, thermophysical properties, thermodynamics and actual empirical data to ensure your shell and tube heat exchanger design is perfect for your application.



Our each HXR consists of the following making characteristics:

- Custom designed, state-of-the-art hydraulic tube expansion – eliminates spiral stress and work hardening and minimizes damage to the tube finish
- Custom designed, state-of-the-art orbital tube welders for tube-to-tubesheet seal welds
- Proprietary tube-bending apparatus for U-tube designs ensures product contact surface finish adherence in the U-bend area
- All heat exchangers with surface finishes of 0.6µm to 0.3µm include electronics-grade seamless tubing
- Sanitary welded tubing is available for surface finishes of greater than 0.75µm
- 100% BPE compliant
- Stringent QA/QC procedures
- The excellent document control department make all certification documents, More than 50 years, All HXRs 100% through the FDA certification



Technical specifications

Our state-of-the-art fabrication technology uses high-pressure hydraulic expansion to seal the tube-to-tube sheet joints. This reduces the risk of roller expansion damage, as well as work-hardening effects and excessive thinning of the tubing. In addition, our proprietary integrated double tube design virtually eliminates the possibility of cross contamination. The result is consistent performance, reduced maintenance and extended equipment life. Before the shipment, each HXR should be take the rigorous testing and detection of program files, including below:

- Hydrostatic pressure testing
- Dye penetration examination
- Radiography
- Profilometer readings of surface finish to ensure surface finishes to less than 25 microinches Ra.
- Computer-verified performance
- The light and endoscopic examination

Code & Standards

- TEMA
- ASME BPE 2005
- ASME UM, U, NBR & R
- Canadian Registration (CRN)
- CE/PED
- TUV
- Singapore Ministry of Manpower (MOM)



Hygienic Tubes And Fittings

Kinglai is your complete source for specialized fittings and tubing required in food, dairy, beverage, personal care, biotechnology and pharmaceutical process applications. Smooth, crevice-free interiors and secure, self-aligning joints are characteristic for Kinglai Fittings. Each offers superior corrosion-resistance and unmatched service life. Kinglai fittings are designed and manufactured to ensure dimensional accuracy and structural integrity, making them easy to install. Tubing is manufactured to Kinglai's stringent specifications, making it a perfect match for the weld fittings. Choose from a wide range of tube sizes, surface finishes and connect options.

The Sanitary product range offers a wide range of tubes and fittings with an internal surface finish from $Ra < 0,375\mu m$ to $Ra < 1,6\mu m$. The Sanitary range has tubes and fittings according to DIN, ISO, BS and ASME dimension standards.



Size range of finished sanitary tubes

ISO			3A			DIN(DIN11850) SERIES2			DIN(DIN11850) SERIES1			DIN			ASME BPE			BS			GB		
NOM. SIZE	OD	T	NOM. SIZE	OD	T	NOM. SIZE	OD	T	NOM. SIZE	OD	T	NOM. SIZE	OD	T	NOM. SIZE	OD	T	NOM. SIZE	OD	T	NOM. SIZE	OD	T
						DN10	13	1.5	DN10	12	1.0	DN10	12	1.5	1/4"	6.35	0.89						
						DN15	19	1.5	DN15	18	1.0	DN15	18	1.5	3/8"	9.53	0.89						
			1/2"	12.7	1.65	DN20	23	1.5	DN20	22	1.0	DN20	22	1.5	1/2"	12.7	1.65	1/2"	12.7	1.6	1/2"	12.7	1.5
			3/4"	19.1	1.65	DN25	29	1.5	DN25	28	1.0	DN25	28	1.5	3/4"	19.1	1.65	3/4"	19.1	1.6	3/4"	19.1	1.5
25	25.0	1.2	1.0"	25.4	1.65	DN32	35	1.5	DN32	34	1.0	DN32	34	1.5	1.0"	25.4	1.65	1.0"	25.4	1.6	1.0"	25.4	1.5
32	31.8	1.2																1.25"	31.8	1.6	1.25"	31.8	1.5
38	38.0	1.2	1.5"	38.1	1.65										1.5"	38.1	1.65	1.5"	38.1	1.6	1.5"	38.1	1.5
						DN40	41	1.5	DN40	40	1.0	DN40	40	1.5									
51	51.0	1.2	2.0"	50.8	1.65	DN50	53	1.5	DN50	52	1.0	DN50	52	1.5	2.0"	50.8	1.65	2.0"	50.8	1.6	2.0"	50.8	1.5
63	63.5	1.6	2.5"	63.5	1.65										2.5"	63.5	1.65	2.5"	63.5	1.6	2.5"	63.5	1.5
						DN65	70	2													2.5"	63.5	2
76	76.1	1.6	3.0"	76.2	1.65										3.0"	76.2	1.65	3.0"	76.2	1.6	3.0"	76.2	1.5
						DN80	85	2													3.0"	76.2	2
																					3.5"	88.9	2
101	101.6	2	4.0"	101.6	2.11	DN100	104	2							4.0"	101.6	2.11	4.0"	101.6	2	4.0"	101.6	2
104	104.0	2				DN125	129	2													4.5"	114.3	2
129	129.0	2	6.0"	152.4	2.77	DN150	154	2							6.0"	152.4	2.77	6.0"	154	2			
204	204.0	2	8.0"	203.2	2.77	DN200	204	2										8.0"	204	2			
																		10.0"	254	2			

Hygienic Clamp: Rated Internal Working Pressure

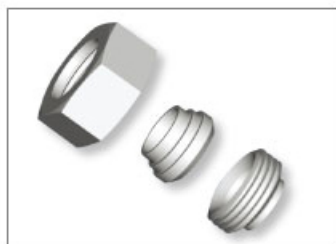
Nom.Size	@70°F/21°C		@250°F/121°C		@70°F/21°C		@250°F/121°C		@70°F/21°C		@250°F/121°C	
	PSI	bar	PSI	bar	PSI	bar	PSI	bar	PSI	bar	PSI	bar
1/2" & 3/4"	1500	103	1200	83					1500	103	1200	83
1.0" & 1 1/2"	500	34	250	17	600	41	300	21	1500	103	1200	83
2.0"	450	31	250	17	550	38	275	19	1000	69	800	55
2 1/2"	400	28	200	14	450	31	225	16	1000	69	800	55
3.0"	350	24	150	10	350	24	160	11	1000	69	800	55
4.0"	200	14	125	9	250	17	150	10	1000	69	800	55
5.0"	175	12	100	7								
6.0"	150	10	75	5								
8.0"	100	7	50	3								
10.0"	40	3	30	2								

Hygienic Union



DIN1212002

RJT1412001



3A



ISO



IDF

Material features of union ring seals

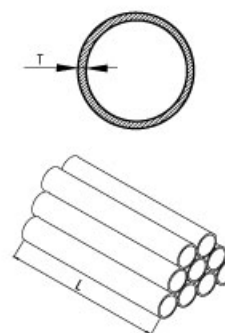
FEATURE	EPDM	NBR	Viton	Silicone	TEFLON
Temperature Range	-48~135°C -55~275°F	-40~120°C -40~248°F	-29~204°C -20~400°F	-62~232°C -80~450°F	-40~232°C -40~450°F
Acid Resistance	Good-Excellent	Good	Good	Good	Good-Excellent
Alkali Resistance	Good-Excellent	Good	Poor-Good	Poor-Fair	Good-Excellent
Gasoline Resistance	Poor-Fair	Good-Excellent	Good-Excellent	Good	Good-Excellent
Diesel Resistance	Good	Good	Good-Excellent	Good	Good-Excellent
Abrasion Resistance	Good-Excellent	Good	Good	Good-Excellent	Good-Excellent
Compression Set	Fair	Good	Good-Excellent	Good-Excellent	Fair

※ Good-Excellent > Good > Poor-Good > Fair > Poor-Fair

Hygienic Tubes

No.	Nominal Size	L	T
A158000**000025	25.0	6100.0	1.65
A158000**000038	38.0	6100.0	1.65
A158000**000051	51.0	6100.0	1.65
A158000**000063	63.5	6100.0	1.65
A158000**000076	76.1	6100.0	1.65
A158000**000101	101.6	6100.0	2
A158000**000104	104.0	6100.0	2

**Polishing grade



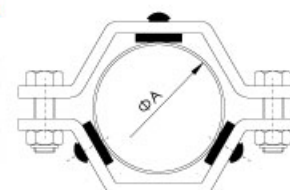
Seal Ring

No.	Nom. Size	E	F	L
1515001-000100	1.0"	22.4	50.5	5.5
1515001-000150	1.5"	35.0	50.5	5.5
1515001-000200	2.0"	47.8	64.0	5.5
1515001-000250	2.5"	60.5	77.5	5.5
1515001-000300	3.0"	73.1	91.0	5.5
1515001-000400	4.0"	97.8	119.0	5.5
1515001-000600	6.0"	147.2	166.9	5.5
1515001-000800	8.0"	198.0	217.7	5.5



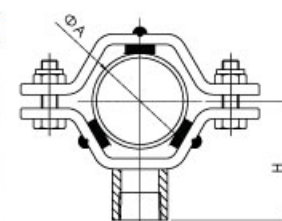
Tube holder, 2 Piece saddle HEX - No Attachment

No.	Nom. Size	A
1524001-000100	1.0"	25.4
1524001-000150	1.5"	38.1
1524001-000200	2.0"	50.8
1524001-000250	2.5"	63.5
1524001-000300	3.0"	76.2
1524001-000400	4.0"	101.6
1524001-000600	6.0"	152.4



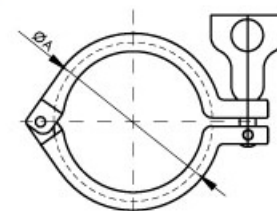
Tube holder, 2 Piece saddle HEX With Welding Attachment

No.	Nom. Size	A	H
1524204-000100	1.0"	25.4	47.6
1524204-000150	1.5"	38.1	50.8
1524204-000200	2.0"	50.8	52.4
1524204-000250	2.5"	63.5	69.8
1524204-000300	3.0"	76.2	70.6
1524204-000400	4.0"	101.6	81.0

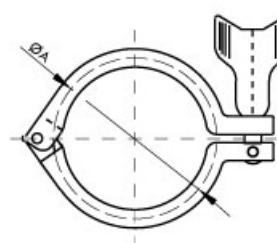


13MHH Clamp

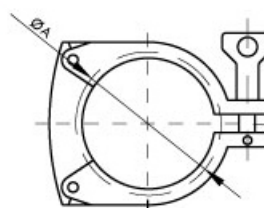
No.	Nom.Size	A
1513016-000025	1/2"	28.6
1513016-000025	3/4"	28.6
1513016-000051	1.0"	53.9
1513016-000051	1.5"	53.9
1513016-000064	2.0"	67.4
1513016-000078	2.5"	80.9
1513016-000091	3.0"	94.4
1513016-000119	4.0"	122.4
1513016-000167	6.0"	170.4
1513016-000218	8.0"	221.2
1513016-000268	10.0"	272.0

**13MHH Clamp**

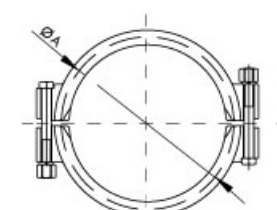
No.	Nom.Size	A
1513001-000025	1/2"	28.6
1513001-000025	3/4"	28.6
1513001-000051	1.0"	53.9
1513001-000051	1.5"	53.9
1513001-000064	2.0"	67.4
1513001-000078	2.5"	80.9
1513001-000091	3.0"	94.4
1513001-000119	4.0"	122.4
1513001-000167	6.0"	170.4
1513001-000218	8.0"	221.2
1513001-000268	10.0"	272.0

**13MHH3 Clamp**

No.	Nom.Size	A
1513003-000051	1.0"	53.9
1513003-000051	1.5"	53.9
1513003-000064	2.0"	67.4
1513003-000078	2.5"	80.9
1513003-000091	3.0"	94.4
1513003-000119	4.0"	122.4

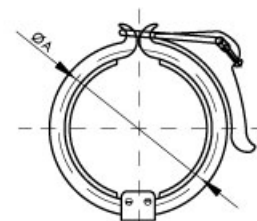
**13MHP Clamp**

No.	Nom.Size	A
1513002-000025	1/2"	28.6
1513002-000025	3/4"	28.6
1513002-000051	1.0"	52.0
1513002-000051	1.5"	52.0
1513002-000064	2.0"	65.5
1513002-000078	2.5"	79.0
1513002-000091	3.0"	92.5
1513002-000119	4.0"	120.0
1513002-000167	6.0"	170.4



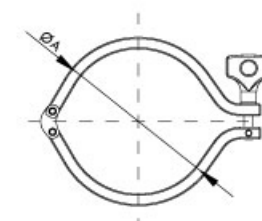
13MHL Clamp

No.	Nom.Size	A
1513004-000051	1.0"	53.9
1513004-000051	1.5"	53.9
1513004-000064	2.0"	67.4
1513004-000078	2.5"	80.9
1513004-000091	3.0"	94.4
1513004-000119	4.0"	122.4



TC Clamp

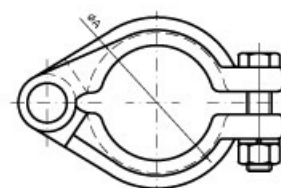
No.	Nom.Size	A
1513017-000051	1.0"	53.4
1513017-000051	1.5"	53.4
1513017-000064	2.0"	66.0
1513017-000078	2.5"	81.3
1513017-000091	3.0"	94.0
1513017-000119	4.0"	122.0
1513017-000167	6.0"	171.2
1513017-000218	8.0"	222.0
1513017-000268	10.0"	274.0



5
5.2

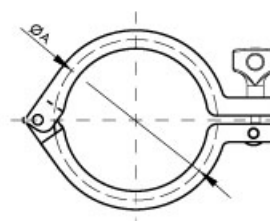
TC Clamp

No.	Nom.Size	A
1513021-000051	1.5"	55.0
1513021-000064	2.0"	72.0
1513021-000078	2.5"	89.0
1513021-000091	3.0"	103.2
1513021-000119	4.0"	128.0



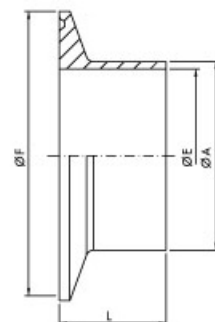
TC Clamp

No.	Nom.Size	A
1513022-000100	1.0"	56.0
1513022-000150	1.5"	56.0
1513022-000200	2.0"	72.3
1513022-000250	2.5"	89.5
1513022-000300	3.0"	103.6
1513022-000400	4.0"	129.0

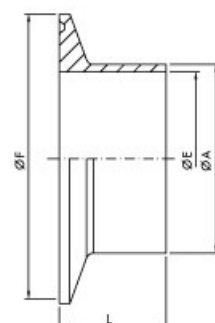


14 WMP Clamp Ferrule

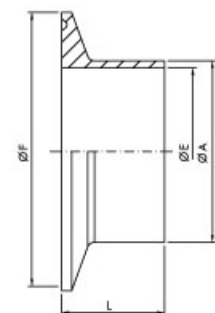
No.	Nom.Size	A	E	F	L
1514001-000050	1/2"	12.7	9.40	25.0	12.7
1514001-000075	3/4"	19.1	15.75	25.0	12.7
1514001-000100	1.0"	25.4	22.10	50.4	12.7
1514001-000150	1.5"	38.1	34.80	50.4	12.7
1514001-000200	2.0"	50.8	47.50	63.9	12.7
1514001-000250	2.5"	63.5	60.20	77.5	12.7
1514001-000300	3.0"	76.2	72.90	90.9	12.7
1514001-000400	4.0"	101.6	97.40	118.9	15.8
1514001-000600	6.0"	152.4	146.80	166.9	19.1
1514001-000800	8.0"	203.2	197.60	217.7	22.2
1514001-001000	10.0"	254.0	247.20	268.5	22.2
1514001-001200	12.0"	304.8	298.0	319.3	25.4

**14 WMP Clamp Ferrule**

No.	Nom.Size	A	E	F	L
1514003-000050	1/2"	12.7	9.4	25.0	28.6
1514003-000075	3/4"	19.1	15.8	25.0	28.6
1514003-000100	1.0"	25.4	22.1	50.4	28.6
1514003-000150	1.5"	38.1	34.8	50.4	28.6
1514003-000200	2.0"	50.8	47.5	63.9	28.6
1514003-000250	2.5"	63.5	60.2	77.5	28.6
1514003-000300	3.0"	76.2	72.9	90.9	28.6
1514003-000400	4.0"	101.6	97.4	118.9	28.6
1514003-000600	6.0"	152.4	146.8	166.9	38.1
1514003-000800	8.0"	203.2	197.6	217.7	38.1
1514003-001000	10.0"	254.0	247.2	268.5	38.1
1514003-001200	12.0"	304.8	298.0	319.3	38.1

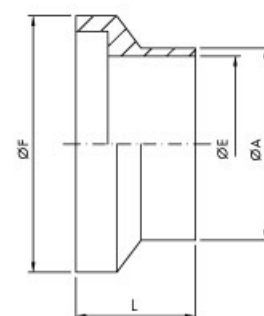
**14 AMP-AWF Clamp Ferrule**

No.	Nom.Size	A	E	F	L
1514004-000050	1/2"	12.7	9.4	25.0	44.5
1514004-000075	3/4"	19.1	15.8	25.0	44.5
1514004-000100	1.0"	25.4	22.1	50.4	44.5
1514004-000150	1.5"	38.1	34.8	50.4	44.5
1514004-000200	2.0"	50.8	47.5	63.9	57.2
1514004-000250	2.5"	63.5	60.2	77.5	57.2
1514004-000300	3.0"	76.2	72.9	90.9	57.2
1514004-000400	4.0"	101.6	97.4	118.9	57.2
1514004-000600	6.0"	152.4	146.9	166.9	76.2



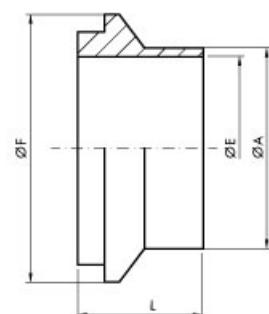
14 WMP Clamp Ferrule

No.	Nom.Size	A	E	F	L
1514008-000100	1.0"	25.7	22.1	50.7	20.0
1514008-000150	1.5"	38.4	34.8	50.7	23.9
1514008-000200	2.0"	51.1	47.5	67.1	26.3
1514008-000250	2.5"	63.8	60.2	84.1	29.5
1514008-000300	3.0"	76.5	72.9	98.4	31.1
1514008-000400	4.0"	101.9	97.4	123.8	34.2
1514008-000600	6.0"	152.7	146.9	190.4	28.7
1514008-000800	8.0"	203.5	197.7	241.2	28.7



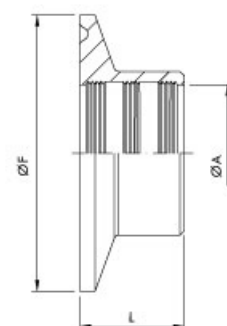
14 AMP Clamp Ferrule

No.	Nom.Size	A	E	F	L
1514007-000100	1.0"	25.7	22.1	50.7	20.0
1514007-000150	1.5"	38.4	34.8	50.7	23.9
1514007-000200	2.0"	51.1	47.5	67.1	26.3
1514007-000250	2.5"	63.8	60.2	84.1	29.5
1514007-000300	3.0"	76.5	72.9	98.4	31.1
1514007-000400	4.0"	101.9	97.4	123.8	34.2
1514007-000600	6.0"	152.7	146.9	190.4	28.7
1514007-000800	8.0"	203.5	197.7	241.2	28.7



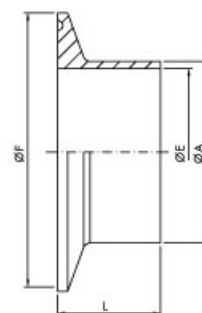
14 RMP Clamp Ferrule

No.	Nom.Size	A	F	L
1514009-000100	1.0"	50.4	25.5	19.1
1514009-000150	1.5"	50.4	38.2	28.6
1514009-000200	2.0"	63.9	50.9	33.4
1514009-000250	2.5"	77.5	63.6	34.9
1514009-000300	3.0"	90.9	76.3	36.5
1514009-000400	4.0"	118.9	101.7	38.1

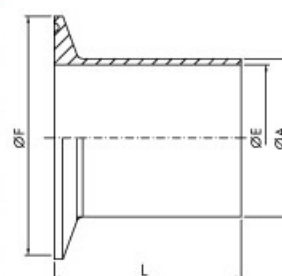


14 MPW Clamp Ferrule

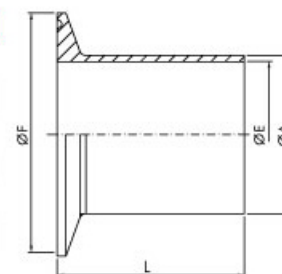
No.	Nom.Size	A	E	F	L
1514025-000100	1.0"	25.4	22.1	50.4	41.3
1514025-000150	1.5"	38.1	34.8	50.4	41.3
1514025-000200	2.0"	50.8	47.85	63.9	44.5
1514025-000250	2.5"	63.5	60.2	77.5	44.5
1514025-000300	3.0"	76.2	72.9	90.9	46.0
1514025-000400	4.0"	101.6	97.4	118.9	54.0

**14 WLMF Clamp Ferrule**

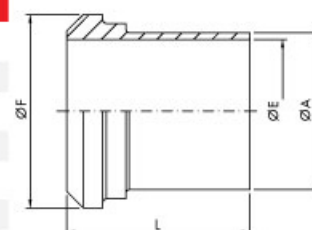
No.	Nom.Size	A	E	F	L
1514013-000050	1/2"	25.0	12.7	9.4	76.2
1514013-000075	3/4"	25.0	19.1	15.8	76.2
1514013-000100	1.0"	50.4	25.4	22.1	76.2
1514013-000150	1.5"	50.4	38.1	34.8	76.2
1514013-000200	2.0"	63.9	50.8	47.5	76.2
1514013-000250	2.5"	77.5	63.5	60.2	76.2
1514013-000300	3.0"	90.9	76.2	72.9	101.6
1514013-000400	4.0"	118.9	101.6	97.4	101.6
1514013-000600	5.0"	166.9	152.4	146.8	152.4
1514013-000800	8.0"	217.7	203.2	197.6	152.4

**TS/14AHT Clamp Ferrule**

No.	Nom.Size	A	E	F	L
1514035-000100	1.0"	25.4	22.1	50.4	114.3
1514035-000150	1.5"	38.1	34.9	50.4	114.3
1514035-000200	2.0"	50.8	47.5	63.9	114.3
1514035-000250	2.5"	63.5	60.2	77.5	114.3
1514035-000300	3.0"	76.2	72.9	90.9	114.3
1514035-000400	4.0"	101.6	97.4	118.9	117.4

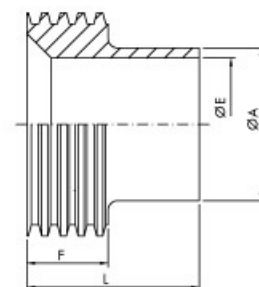
**14A Clamp Ferrule**

No.	Nom.Size	A	E	F	L
1514020-000100	1.0"	22.1	25.4	33.4	34.9
1514020-000150	1.5"	34.8	38.1	46.9	38.1
1514020-000200	2.0"	47.5	50.8	60.5	38.1
1514020-000250	2.5"	60.2	63.5	74.0	44.5
1514020-000300	3.0"	72.9	76.2	87.5	44.5
1514020-000400	4.0"	97.4	101.6	114.5	44.5



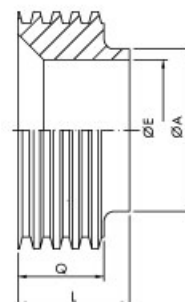
15A Male Part, Long

No.	Nom.Size	A	E	F	L
1514042-000100	1.0"	25.4	22.1	14.3	34.9
1514042-000150	1.5"	38.1	34.8	14.3	38.1
1514042-000200	2.0"	50.8	47.5	15.1	38.1
1514042-000250	2.5"	63.5	60.2	18.3	44.5
1514042-000300	3.0"	76.2	72.9	19.1	44.5
1514042-000400	4.0"	101.6	97.4	22.2	44.5



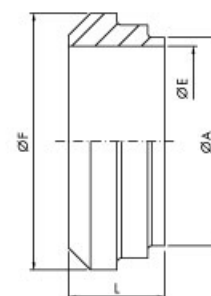
15 TR Male Part

No.	Nom.Size	A	E	F	L
1514010-000100	1.0"	25.4	22.1	17.5	13.5
1514010-000150	1.5"	38.1	34.8	17.5	13.5
1514010-000200	2.0"	50.8	47.5	18.3	14.3
1514010-000250	2.5"	63.5	60.2	21.4	17.5
1514010-000300	3.0"	76.2	72.9	23.8	18.3
1514010-000400	4.0"	101.6	97.4	31.0	21.4



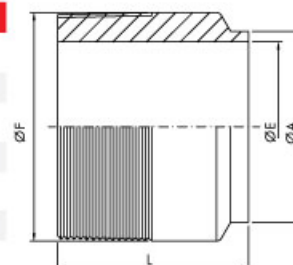
14 PR Liner

No.	Nom.Size	A	E	F	L
1514011-000100	1.0"	25.4	22.1	33.4	17.5
1514011-000150	1.5"	38.1	34.8	46.9	17.5
1514011-000200	2.0"	50.8	47.5	60.5	18.3
1514011-000250	2.5"	63.5	60.2	74.0	21.4
1514011-000300	3.0"	76.2	72.9	87.5	23.8
1514011-000400	4.0"	101.6	97.4	114.5	31.0



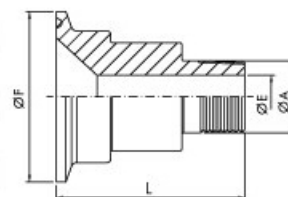
Male Part

No.	Nom.Size	A	E	F	L
1514049-000100	1.0"	25.4	22.1	1.0"-11.5NPT	44.5
1514049-000150	1.5"	38.1	34.8	1.5"-11.5NPT	44.5
1514049-000200	2.0"	50.8	47.5	2.0"-11.5NPT	46.0
1514049-000250	2.5"	63.5	60.2	2.5"-8NPT	58.7
1514049-000300	3.0"	76.2	72.9	3.0"-8NPT	63.5
1514049-000400	4.0"	101.6	97.4	4.0"-8NPT	65.1
1514049-000600	6.0"	152.4	146.9	6.0"-8NPT	76.2

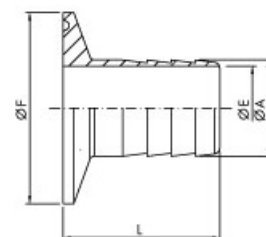


21MPOUTSET Liner

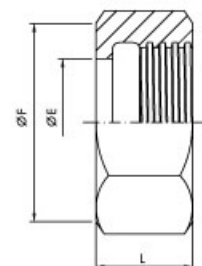
No.	Nom.Size	A	F	L
1514063-100050	1.0"x1/2"	1/2"-14NPT	50.4	55.6
1514063-100075	1.0"x3/4"	3/4"-14NPT	50.4	55.6
1514063-100100	1.0"x1.0"	1.0"-11.5NPT	50.4	57.2
1514063-100150	1.0"x1.5"	1.5"-11.5NPT	50.4	62.0
1514063-150050	1.5"x1/2"	1/2"-14NPT	50.4	55.6
1514063-150075	1.5"x3/4"	3/4"-14NPT	50.4	55.6
1514063-150100	1.5"x1.0"	1.0"-11.5NPT	50.4	58.7
1514063-150125	1.5"x1.25"	1.25"-11.5NPT	50.4	62.0
1514063-150150	1.5"x1.5"	1.5"-11.5NPT	50.4	62.0
1514063-150200	1.5"x2.0"	2.0"-11.5NPT	50.4	66.8
1514063-200050	2.0"x1/2"	1/2"-14NPT	63.9	63.9
1514063-200100	2.0"x1.0"	1.0"-11.5NPT	63.9	60.3
1514063-200125	2.0"x1.25"	1.25"-11.5NPT	63.9	62.7
1514063-200150	2.0"x1.5"	1.5"-11.5NPT	63.9	62.7
1514063-200200	2.0"x2.0"	2.0"-11.5NPT	63.9	67.6
1514063-250150	2.5"x1.5"	1.5"-11.5NPT	77.5	70.6
1514063-250200	2.5"x2.0"	2.0"-11.5NPT	77.5	70.6
1514063-250250	2.5"x2.5"	2.5"-8NPT	77.5	83.3
1514063-300300	3.0"x3.0"	3.0"-8NPT	90.9	88.9
1514063-400400	4.0"x4.0"	4.0"-8NPT	118.9	96.8

**14 MPHR Liner**

No.	Nom.Size	A	E	F	L
1514044-000100	1.0"	25.4	20.6	50.4	42.9
1514044-000150	1.5"	38.1	33.3	50.4	42.9
1514044-000200	2.0"	50.8	46.0	63.9	58.7
1514044-000250	2.5"	63.5	58.7	77.5	59.5
1514044-000300	3.0"	76.2	72.0	90.9	78.6
1514044-000400	4.0"	101.6	97.4	118.9	86.5

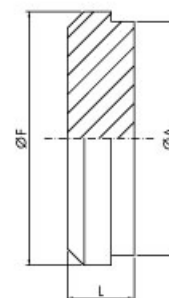
**13H Nut**

No.	Nom.Size	E	F	L
1508001-000100	1.0"	30.3	46.0	23.0
1508001-000150	1.5"	43.4	61.1	24.6
1508001-000200	2.0"	56.5	76.2	27.0
1508001-000250	2.5"	69.6	91.3	30.2
1508001-000300	3.0"	82.7	106.5	32.5
1508001-000400	4.0"	108.9	137.7	38.1

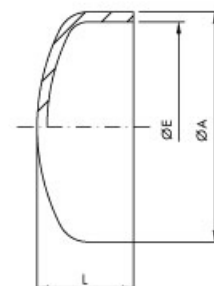


16A Blank

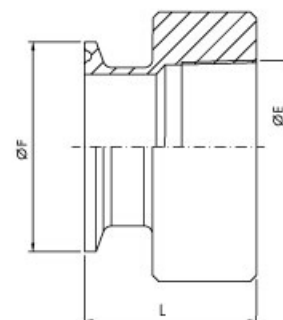
No.	Nom.Size	A	F	L
1516003-000100	1.0"	33.4	29.5	12.0
1516003-000150	1.5"	46.9	42.6	14.4
1516003-000200	2.0"	60.5	55.7	15.9
1516003-000250	2.5"	74.0	68.8	16.7
1516003-000300	3.0"	87.5	81.9	18.3
1516003-000400	4.0"	114.5	108.1	20.6


16W Blank End Caps

No.	Nom.Size	A	F	L
1516004-000050	1/2"	12.7	9.4	6.4
1516004-000075	3/4"	19.1	15.8	7.9
1516004-000100	1.0"	25.4	22.1	19.1
1516004-000150	1.5"	38.1	34.8	14.3
1516004-000200	2.0"	50.8	47.5	19.1
1516004-000250	2.5"	63.5	60.2	25.4
1516004-000300	3.0"	76.2	72.9	31.8
1516004-000400	4.0"	101.6	97.4	38.1
1516004-000600	6.0"	152.4	146.8	57.2

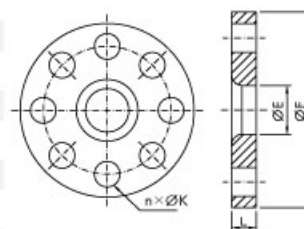

22MP Blank End Caps

No.	Nom.Size	E	F	L
1514062-100075	1"x3/4"	3/4"-14NPT	50.4	41.3
1514062-100150	1"x1.5"	1.5"-11.5NPT	50.4	57.2
1514062-150050	1.5"x1/2"	1/2"-14NPT	50.4	41.3
1514062-150125	1.5"x1.25"	1.25"-11.5NPT	50.4	57.2
1514062-150200	1.5"x2.0"	2.0"-11.5NPT	50.4	57.2
1514062-200150	2.0"x1.5"	1.5"-11.5NPT	63.9	42.9
1514062-200200	2.0"x2.0"	2.0"-11.5NPT	63.9	59.7
1514062-200250	2.0"x2.5"	2.5"-8NPT	63.9	60.3
1514062-250150	2.5"x1.5"	1.5"-11.5NPT	77.5	42.2
1514062-250200	2.5"x2.0"	2.0"-11.5NPT	77.5	43.6
1514062-250250	2.5"x2.5"	2.5"-8NPT	77.5	53.3
1514062-300300	3.0"x3.0"	3.0"-8NPT	90.9	55.9
1514062-400400	4.0"x4.0"	4.0"-8NPT	118.9	66.7

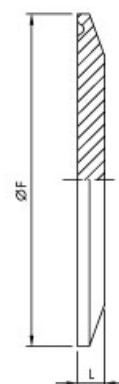


38SL BACK-UP FLANGE

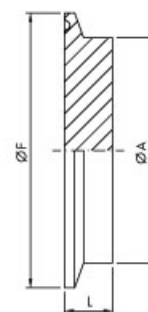
No.	Nom.Size	E	F	L	nxK
1514043-000050	1/2"	14.3	88.9	9.5	4x15.9
1514043-000075	3/4"	20.7	98.4	9.5	4x15.9
1514043-000100	1.0"	27.0	108.0	9.5	4x15.9
1514043-000150	1.5"	39.7	127.0	9.5	4x15.9
1514043-000200	2.0"	52.4	152.4	11.1	4x19.1
1514043-000250	2.5"	65.1	177.8	11.1	4x19.1
1514043-000300	3.0"	77.8	190.5	12.7	4x19.1
1514043-000400	4.0"	103.2	228.6	12.7	8x19.1
1514043-000600	6.0"	154.0	279.4	14.3	8x22.2

**16 AMP Blank**

No.	Nom.Size	F	L
1516001-000050	1/2"	25.0	4.8
1516001-000075	3/4"	25.0	4.8
1516001-000100	1.0"	50.4	6.4
1516001-000150	1.5"	50.4	6.4
1516001-000200	2.0"	63.9	6.4
1516001-000250	2.5"	77.5	6.4
1516001-000300	3.0"	90.9	6.4
1516001-000400	4.0"	118.9	8.0
1516001-000600	6.0"	166.9	11.1
1516001-000800	8.0"	217.7	11.1
1516001-001000	10.0"	268.5	11.1
1516001-001200	12.0"	319.3	12.7

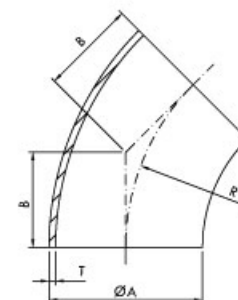
**23 BMP Blank**

No.	Nom.Size	A	F	L
1516002-000050	1/2"	19.1	25.4	13.5
1516002-000075	3/4"	19.1	25.4	13.5
1516002-000100	1.0"	38.1	50.4	13.5
1516002-000150	1.5"	38.1	50.4	13.5
1516002-000200	2.0"	50.8	63.9	13.5
1516002-000250	2.5"	63.5	77.5	13.5
1516002-000300	3.0"	76.2	90.9	13.5
1516002-000400	4.0"	101.6	118.9	16.7



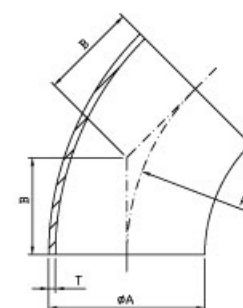
Automatic Tube Weld: 45° Elbow

No.	Nom.Size	AxT	B	R
1506001-000050	1/2"	12.7x1.65	8.0	19.1
1506001-000075	3/4"	19.1x1.65	11.9	28.6
1506001-000100	1.0"	25.4x1.65	15.8	38.1
1506001-000150	1.5"	38.1x1.65	23.7	57.2
1506001-000200	2.0"	50.8x1.65	31.6	76.2
1506001-000250	2.5"	63.5x1.65	39.7	95.3
1506001-000300	3.0"	76.2x1.65	47.4	114.3
1506001-000400	4.0"	101.6x2.11	63.1	152.4
1506001-000600	6.0"	152.4x2.77	94.7	228.6



Automatic Tube Weld: 45° Elbow

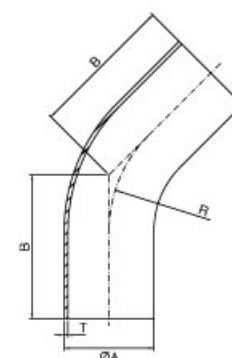
No.	Nom.Size	AxT	B	R
1506101-000050	1/2"	12.7x1.65	8.0	19.1
1506101-000075	3/4"	19.1x1.65	11.9	28.6
1506101-000100	1.0"	25.4x1.65	15.8	38.1
1506101-000150	1.5"	38.1x1.65	23.7	57.2
1506101-000200	2.0"	50.8x1.65	31.6	76.2
1506101-000250	2.5"	63.5x1.65	39.7	95.3
1506101-000300	3.0"	76.2x1.65	47.4	114.3
1506101-000400	4.0"	101.6x2.11	63.1	152.4
1506101-000600	6.0"	152.4x2.77	94.7	228.6



5
5.3

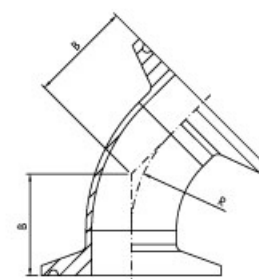
Automatic Tube Weld: 45° Elbow, Long

No.	Nom.Size	AxT	B	R
1506103-000050	1/2"	12.7x1.65	57.2	28.6
1506103-000075	3/4"	19.1x1.65	57.2	28.6
1506103-000100	1.0"	25.4x1.65	57.2	38.1
1506103-000150	1.5"	38.1x1.65	63.5	57.2
1506103-000200	2.0"	50.8x1.65	76.2	76.2
1506103-000250	2.5"	63.5x1.65	85.7	95.3
1506103-000300	3.0"	76.2x1.65	92.1	114.3
1506103-000400	4.0"	101.6x2.11	114.3	152.4
1506103-000600	6.0"	152.4x2.77	158.8	228.3



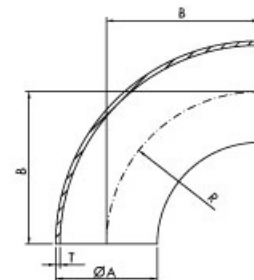
Clamp Joint: 45° Elbow

No.	Nom.Size	AxT	B	R
1506201-000050	1/2"	12.7x1.65	25.4	28.6
1506201-000075	3/4"	19.1x1.65	25.4	28.6
1506201-000100	1.0"	25.4x1.65	28.6	38.1
1506201-000150	1.5"	38.1x1.65	36.5	57.2
1506201-000200	2.0"	50.8x1.65	44.5	76.2
1506201-000250	2.5"	63.5x1.65	52.4	95.3
1506201-000300	3.0"	76.2x1.65	60.3	114.3
1506201-000400	4.0"	101.6x2.11	79.4	152.4
1506201-000600	6.0"	152.4x2.77	132.8	228.6



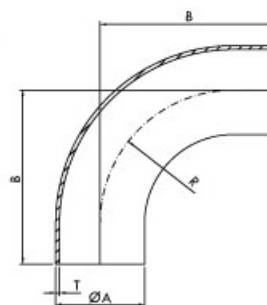
Automatic Tube Weld: 90° Elbow

No.	Nom.Size	AxT	B	R
1506000-000050	1/2"	12.7x1.65	19.1	19.1
1506000-000075	3/4"	19.1x1.65	28.6	28.6
1506000-000100	1.0"	25.4x1.65	38.1	38.1
1506000-000150	1.5"	38.1x1.65	57.2	57.2
1506000-000200	2.0"	50.8x1.65	76.2	76.2
1506000-000250	2.5"	63.5x1.65	95.3	95.3
1506000-000300	3.0"	76.2x1.65	114.3	114.3
1506000-000400	4.0"	101.6x2.11	152.4	152.4
1506000-000600	6.0"	152.4x2.77	228.6	228.6



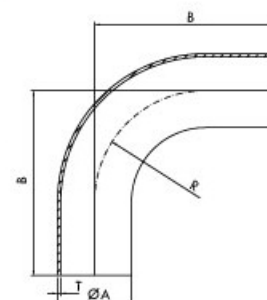
Automatic Tube Weld: 90° Elbow

No.	Nom.Size	AxT	B	R
1506100-000100	1.0"	25.4x1.65	52.4	38.1
1506100-000150	1.5"	38.1x1.65	74.6	57.2
1506100-000200	2.0"	50.8x1.65	103.2	76.2
1506100-000250	2.5"	63.5x1.65	131.8	95.3
1506100-000300	3.0"	76.2x1.65	160.3	114.3
1506100-000400	4.0"	101.6x2.11	211.1	152.4



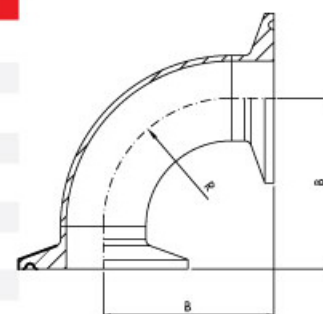
Automatic Tube Weld: 90° Elbow, Long

No.	Nom.Size	AxT	B	R
1506102-000038	3/8"	9.53x0.89	66.7	28.6
1506102-000050	1/2"	12.7x1.65	76.2	28.6
1506102-000075	3/4"	19.1x1.65	76.2	28.6
1506102-000100	1.0"	25.4x1.65	76.2	38.1
1506102-000150	1.5"	38.1x1.65	95.3	57.2
1506102-000200	2.0"	50.8x1.65	120.7	76.2
1506102-000250	2.5"	63.5x1.65	139.7	95.3
1506102-000300	3.0"	76.2x1.65	158.8	114.3
1506102-000400	4.0"	101.6x2.11	203.2	152.4
1506102-000600	6.0"	152.4x2.77	292.1	228.6



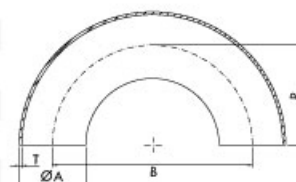
Clamp Joint: 90° Elbow

No.	Nom.Size	AxT	B	R
1506200-000050	1/2"	12.7x1.65	41.3	28.6
1506200-000075	3/4"	19.1x1.65	41.3	28.6
1506200-000100	1.0"	25.4x1.65	50.8	38.1
1506200-000150	1.5"	38.1x1.65	69.9	57.2
1506200-000200	2.0"	50.8x1.65	88.9	76.2
1506200-000250	2.5"	63.5x1.65	108.0	95.3
1506200-000300	3.0"	76.2x1.65	127.0	114.3
1506200-000400	4.0"	101.6x2.11	168.3	152.4
1506200-000600	6.0"	152.4x2.77	247.7	228.6



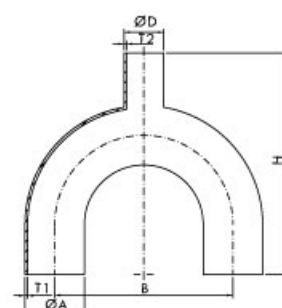
Automatic Tube Weld: 180° Elbow

No.	Nom.Size	AxT	B	R
1506002-000050	1/2"	12.7x1.65	38.2	19.1
1506002-000075	3/4"	19.1x1.65	57.2	28.6
1506002-000100	1.0"	25.4x1.65	76.2	38.1
1506002-000150	1.5"	38.1x1.65	114.3	57.2
1506002-000200	2.0"	50.8x1.65	152.4	76.2
1506002-000250	2.5"	63.5x1.65	190.5	95.3
1506002-000300	3.0"	76.2x1.65	228.6	114.3
1506002-000400	4.0"	101.6x2.11	304.8	152.4



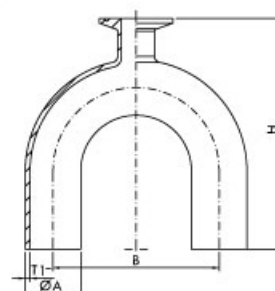
Automatic Tube Weld: Short Outlet, 180° Reducing Tee

No.	Nom.Size	AxT1	DxT2	B	H
1506109-100050	1.0"x1/2"	25.4x1.65	12.7x1.65	114.3	108.5
1506109-100075	1.0"x3/4"	25.4x1.65	19.1x1.65	114.3	108.5
1506109-000100	1.0"x1.0"	25.4x1.65	25.4x1.65	114.3	108.5
1506109-150050	1.5"x1/2"	38.1x1.65	12.7x1.65	152.4	173.7
1506109-150075	1.5"x3/4"	38.1x1.65	19.1x1.65	152.4	173.7
1506109-150100	1.5"x1.0"	38.1x1.65	25.4x1.65	152.4	174.1
1506109-000150	1.5"x1.5"	38.1x1.65	38.1x1.65	152.4	174.1
1506109-200050	2.0"x1/2"	50.8x1.65	12.7x1.65	152.4	206.2
1506109-200075	2.0"x3/4"	50.8x1.65	19.1x1.65	152.4	206.2
1506109-200100	2.0"x1.0"	50.8x1.65	25.4x1.65	152.4	206.2
1506109-200150	2.0"x1.5"	50.8x1.65	38.1x1.65	152.4	206.5
1506109-000200	2.0"x2.0"	50.8x1.65	50.8x1.65	152.4	206.5
1506109-250075	2.5"x3/4"	63.5x1.65	19.1x1.65	190.5	232.2
1506109-250100	2.5"x1.0"	63.5x1.65	25.4x1.65	190.5	232.2
1506109-250150	2.5"x1.5"	63.5x1.65	38.1x1.65	190.5	232.2
1506109-250200	2.5"x2.0"	63.5x1.65	50.8x1.65	190.5	232.2
1506109-000250	2.5"x2.5"	63.5x1.65	63.5x1.65	190.5	232.2
1506109-300050	3.0"x1/2"	76.2x1.65	12.7x1.65	228.6	255.5
1506109-300075	3.0"x3/4"	76.2x1.65	19.1x1.65	228.6	255.5
1506109-300100	3.0"x1.0"	76.2x1.65	25.4x1.65	228.6	257.4
1506109-300150	3.0"x1.5"	76.2x1.65	38.1x1.65	228.6	257.4
1506109-300200	3.0"x2.0"	76.2x1.65	50.8x1.65	228.6	257.4
1506109-300250	3.0"x2.5"	76.2x1.65	63.5x1.65	228.6	257.4
1506109-000300	3.0"x3.0"	76.2x1.65	76.2x1.65	228.6	257.4
1506109-400050	4.0"x1/2"	101.6x2.11	12.7x1.65	304.8	331.7
1506109-400075	4.0"x3/4"	101.6x2.11	19.1x1.65	304.8	331.7
1506109-400100	4.0"x1.0"	101.6x2.11	25.4x1.65	304.8	333.6
1506109-400150	4.0"x1.5"	101.6x2.11	38.1x1.65	304.8	333.6
1506109-400200	4.0"x2.0"	101.6x2.11	50.8x1.65	304.8	333.6
1506109-400250	4.0"x2.5"	101.6x2.11	63.5x1.65	304.8	333.6
1506109-400300	4.0"x3.0"	101.6x2.11	76.2x1.65	304.8	333.6
1506109-000400	4.0"x4.0"	101.6x2.11	101.6x2.11	304.8	333.6

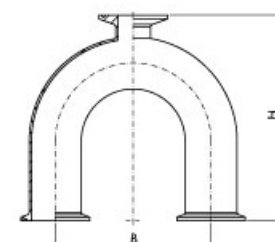


Automatic Tube Weld: Short outlet Clamp Joint, 180° Reducing Tee

No.	Nom.Size	AxT1	B	H
1506309-000075	3/4"x3/4"	19.1x1.65	114.3	98.9
1506309-100050	1.0"x1/2"	25.4x1.65	114.3	102.1
1506309-100075	1.0"x3/4"	25.4x1.65	114.3	102.1
1506309-000100	1.0"x1.0"	25.4x1.65	114.3	102.1
1506309-150050	1.5"x1/2"	38.1x1.65	152.4	148.3
1506309-150075	1.5"x3/4"	38.1x1.65	152.4	148.3
1506309-150100	1.5"x1.0"	38.1x1.65	152.4	148.5
1506309-000150	1.5"x1.5"	38.1x1.65	152.4	148.5
1506309-200050	2.0"x1/2"	50.8x1.65	152.4	168.1
1506309-200075	2.0"x3/4"	50.8x1.65	152.4	168.1
1506309-200100	2.0"x1.0"	50.8x1.65	152.4	168.1
1506309-200150	2.0"x1.5"	50.8x1.65	152.4	168.4
1506309-000200	2.0"x2.0"	50.8x1.65	152.4	168.4
1506309-250075	2.5"x3/4"	63.5x1.65	190.5	194.0
1506309-250100	2.5"x1.0"	63.5x1.65	190.5	194.0
1506309-250150	2.5"x1.5"	63.5x1.65	190.5	194.0
1506309-250200	2.5"x2.0"	76.2x1.65	228.6	219.3
1506309-000250	2.5"x2.5"	63.5x1.65	190.5	194.0
1506309-300250	2.5"x2.5"	76.2x1.65	190.5	194.0

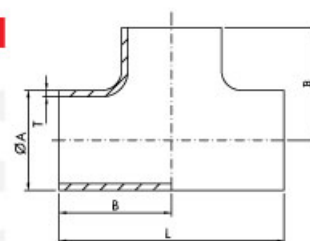
**Clamp Joint: Short Outlet, 180° Reducing Tee**

No.	Nom.Size	B	H
1506209-100050	1.0"x1/2"	114.3	114.8
1506209-100075	1.0"x3/4"	114.3	114.8
1506209-000100	1.0"x1.0"	114.3	114.8
1506209-150050	1.5"x1/2"	114.3	161.0
1506209-150075	1.5"x3/4"	114.3	161.0
1506209-150100	1.5"x1.0"	114.3	161.4
1506209-000150	1.5"x1.5"	114.3	161.4
1506209-200050	2.0"x1/2"	152.4	180.8
1506209-200075	2.0"x3/4"	152.4	180.8
1506209-200100	2.0"x1.0"	152.4	180.8
1506209-200150	2.0"x1.5"	152.4	181.1
1506209-000200	2.0"x2.0"	152.4	181.1
1506209-250050	2.5"x1/2"	190.5	206.7
1506209-250075	2.5"x3/4"	190.5	206.7
1506209-250100	2.5"x1.0"	190.5	206.7
1506209-250150	2.5"x1.5"	190.5	206.7
1506209-250200	2.5"x2.0"	190.5	206.7
1506209-000250	2.5"x2.5"	190.5	206.7



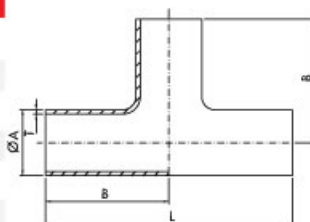
Automatic Tube Weld: Straight Tee

No.	Nom.Size	AxT	B	R
1503100-000075	3/4"	19.1x1.65	25.4	50.8
1503100-000100	1.0"	25.4x1.65	28.6	57.2
1503100-000150	1.5"	38.1x1.65	42.1	84.1
1503100-000200	2.0"	50.8x1.65	52.4	104.7
1503100-000250	2.5"	63.5x1.65	59.6	119.1
1503100-000300	3.0"	76.2x1.65	65.9	131.8
1503100-000400	4.0"	101.6x2.11	87.35	174.7



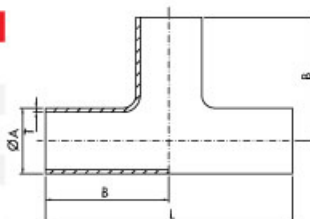
Automatic Tube Weld: Straight Tee

No.	Nom.Size	AxT	B	R
1503101-000050	1/2"	12.7x1.65	19.1	38.1
1503101-000075	3/4"	19.1x1.65	47.6	95.2
1503101-000100	1.0"	25.4x1.65	47.6	95.2
1503101-000150	1.5"	38.1x1.65	57.2	114.4
1503101-000200	2.0"	50.8x1.65	76.2	152.4
1503101-000250	2.5"	63.5x1.65	76.2	152.4
1503101-000300	3.0"	76.2x1.65	82.6	165.2
1503101-000400	4.0"	101.6x2.11	98.4	196.8
1503101-000600	6.0"	152.4x2.11	127.0	254.0



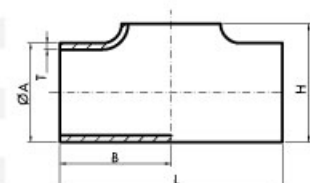
Automatic Tube Weld: Straight Tee

No.	Nom.Size	AxT	B	R
1503102-000025	1/4"	6.35x0.89	44.5	89.0
1503102-000035	3/8"	9.53x0.89	44.5	89.0
1503102-000050	1/2"	12.7x1.65	47.6	95.2
1503102-000075	3/4"	19.1x1.65	50.8	101.6
1503102-000100	1.0"	25.4x1.65	54.0	108.0
1503102-000150	1.5"	38.1x1.65	60.3	120.6
1503102-000200	2.0"	50.8x1.65	73.0	146.0
1503102-000250	2.5"	63.5x1.65	79.4	158.8
1503102-000300	3.0"	76.2x1.65	85.7	171.4
1503102-000400	4.0"	101.6x2.11	104.8	209.6
1503102-000600	6.0"	152.4x2.77	142.9	285.8



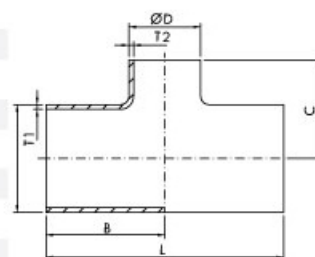
Automatic Tube Weld: Short Outlet Tee

No.	Nom.Size	AxT	B	H	R
1503000-000075	3/4"	19.1x1.65	25.4	19.8	50.8
1503000-000100	1.0"	25.4x1.65	28.6	27.0	57.2
1503000-000150	1.5"	38.1x1.65	42.1	40.5	84.1
1503000-000200	2.0"	50.8x1.65	52.4	54.0	104.7
1503000-000250	2.5"	63.5x1.65	59.6	67.0	119.1
1503000-000300	3.0"	76.2x1.65	65.9	79.5	131.8
1503000-000400	4.0"	101.6x2.11	87.4	105.5	174.7

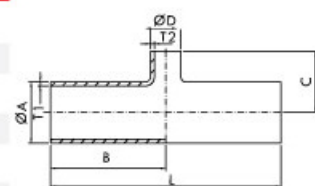


Automatic Tube Weld: Short Outlet, Reducing Tee

No.	Nom.Size	AxT1	DxT2	B	C	L
1503100-100050	1.0"x1/2"	25.4x1.65	12.7x1.65	28.6	29.2	57.2
1503100-100075	1.0"x3/4"	25.4x1.65	19.1x1.65	28.6	29.2	57.2
1503100-150050	1.5"x1/2"	38.1x1.65	12.7x1.65	42.1	36.6	84.1
1503100-150075	1.5"x3/4"	38.1x1.65	19.1x1.65	42.1	36.6	84.1
1503100-150100	1.5"x1.0"	38.1x1.65	25.4x1.65	42.1	34.9	84.1
1503100-200075	2.0"x3/4"	50.8x1.65	19.1x1.65	52.4	44.1	104.8
1503100-200100	2.0"x1.0"	50.8x1.65	25.4x1.65	52.4	41.3	104.8
1503100-200150	2.0"x1.5"	50.8x1.65	38.1x1.65	52.4	48.4	104.8
1503100-250100	2.0"x1.0"	63.5x1.65	25.4x1.65	59.6	47.6	119.1
1503100-250150	2.5"x1.5"	63.5x1.65	38.1x1.65	59.6	54.8	119.1
1503100-250200	2.5"x2.0"	63.5x1.65	50.8x1.65	59.6	58.7	119.1
1503100-300025	3.0"x1/4"	76.2x1.65	63.5x0.89	65.9	61.1	131.8
1503100-300050	3.0"x1/2"	76.2x1.65	25.4x1.65	65.9	61.1	131.8
1503100-300075	3.0"x3/4"	76.2x1.65	38.1x1.65	65.9	61.1	131.8
1503100-300100	3.0"x1.0"	76.2x1.65	50.8x1.65	65.9	61.1	131.8
1503100-300150	3.0"x1.5"	76.2x1.65	63.5x1.65	65.9	61.1	131.8
1503100-300200	3.0"x2.0"	76.2x1.65	12.7x1.65	65.9	65.1	131.8
1503100-300250	3.0"x2.5"	76.2x1.65	19.1x1.65	87.3	65.9	131.8
1503100-400100	4.0"x1.0"	101.6x2.11	25.4x1.65	87.3	66.8	174.6
1503100-400150	4.0"x1.5"	101.6x2.11	38.1x1.65	87.3	73.8	174.6
1503100-400200	4.0"x2.0"	101.6x2.11	50.8x1.65	87.3	77.8	174.6
1503100-400250	4.0"x2.5"	101.6x2.11	63.5x1.65	87.3	78.6	174.6
1503100-400300	4.0"x3.0"	101.6x2.11	76.2x1.65	87.3	76.6	174.6

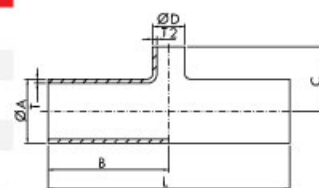
**Automatic Tube Weld: Short Outlet, Reducing Tee**

No.	Nom.Size	AxT1	DxT2	B	C	L
1503101-100050	1.0"x1/2"	25.4x1.65	12.7x1.65	47.8	25.4	95.5
1503101-100075	1.0"x3/4"	25.4x1.65	19.1x1.65	47.8	28.5	95.5
1503101-150050	1.5"x1/2"	38.1x1.65	12.7x1.65	57.2	31.8	114.3
1503101-150075	1.5"x3/4"	38.1x1.65	19.1x1.65	57.2	35.1	114.3
1503101-150100	1.5"x1.0"	38.1x1.65	25.4x1.65	57.2	54.1	114.3
1503101-200050	2.0"x1/2"	50.8x1.65	12.7x1.65	76.2	38.1	152.4
1503101-200075	2.0"x3/4"	50.8x1.65	19.1x1.65	76.2	41.4	152.4
1503101-200100	2.0"x1.0"	50.8x1.65	25.4x1.65	76.2	60.3	152.4
1503101-200150	2.0"x1.5"	50.8x1.65	38.1x1.65	76.2	63.5	152.4
1503101-250150	2.5"x1.5"	63.5x1.65	38.1x1.65	76.2	69.9	152.4
1503101-250200	2.5"x2.0"	63.5x1.65	50.8x1.65	76.2	82.6	152.4
1503101-300150	3.0"x1.5"	76.2x1.65	38.1x1.65	82.6	76.2	165.5
1503101-300200	3.0"x2.0"	76.2x1.65	50.8x1.65	82.6	88.9	165.1
1503101-300250	3.0"x2.5"	76.2x1.65	63.5x1.65	82.6	82.6	165.1
1503101-400150	4.0"x1.5"	101.6x2.11	38.1x1.65	98.6	88.9	197.1
1503101-400200	4.0"x2.0"	101.6x2.11	50.8x1.65	98.6	101.6	197.1
1503101-400250	4.0"x2.5"	101.6x2.11	63.5x1.65	98.6	95.3	197.1
1503101-400300	4.0"x3.0"	101.6x2.11	76.2x1.65	98.6	95.3	197.1
1503101-600150	6.0"x1.5"	152.4x2.11	38.1x1.65	127.0	114.3	254.0
1503101-600200	6.0"x2.0"	152.4x2.11	50.8x1.65	127.0	127.0	254.0
1503101-600250	6.0"x2.5"	152.4x2.11	63.5x1.65	127.0	120.7	254.0
1503101-600300	6.0"x3.0"	152.4x2.11	76.2x1.65	127.0	120.7	254.0
1503101-600400	6.0"x4.0"	152.4x2.11	101.6x2.11	127.0	123.7	254.0



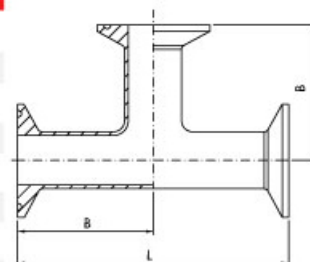
Automatic Tube Weld: Short Outlet, Reducing Tee

No.	Nom.Size	AxT1	DxT2	B	C	L
1503102-050038	1/2"x 3/8"	12.7x1.65	9.53x0.89	47.6	47.6	95.2
1503102-075025	3/4"x1/4"	19.1x1.65	6.35x0.89	50.8	50.8	101.6
1503102-075038	3/4"x3/8"	19.1x1.65	9.53x0.89	50.8	50.8	101.6
1503102-075050	3/4"x1/2"	19.1x1.65	12.7x1.65	50.8	50.8	101.6
1503102-100025	1.0"x1/4"	25.4x1.65	6.35x0.89	54.0	54.0	108.0
1503102-100038	1.0"x3/8"	25.4x1.65	9.53x0.89	54.0	54.0	108.0
1503102-100038	1.0"x1/2"	25.4x1.65	12.7x1.65	54.0	54.0	108.0
1503102-100075	1.0"x3/4"	25.4x1.65	19.1x1.65	54.0	54.0	108.0
1503102-150025	1.5"x1/4"	38.1x1.65	6.35x0.89	60.3	60.3	120.6
1503102-150050	1.5"x1/2"	38.1x1.65	12.7x1.65	60.3	60.3	120.6
1503102-150038	1.5"x3/8"	38.1x1.65	9.53x0.98	60.3	60.3	120.6
1503102-150075	1.5"x3/4"	38.1x1.65	19.1x1.65	60.3	60.3	120.6
1503102-150100	1.5"x1.0"	38.1x1.65	25.4x1.65	60.3	60.3	120.6
1503102-200025	2.0"x1/4"	50.8x1.65	6.35x0.89	73.0	66.7	146.0
1503102-200038	2.0"x3/8"	50.8x1.65	9.53x0.89	73.0	66.7	146.0
1503102-200050	2.0"x1/2"	50.8x1.65	12.7x1.65	73.0	66.7	146.0
1503102-200075	2.0"x3/4"	50.8x1.65	19.1x1.65	73.0	66.7	146.0
1503102-200100	2.0"x1.0"	50.8x1.65	25.4x1.65	73.0	66.7	146.0
1503102-200150	2.0"x1.5"	50.8x1.65	38.1x1.65	73.0	66.7	146.0
1503102-250038	2.5"x3/8"	63.5x1.65	9.53x0.89	79.4	73.0	158.8
1503102-250050	2.5"x1/2"	63.5x1.65	12.7x1.65	79.4	73.0	158.8
1503102-250075	2.5"x3/4"	63.5x1.65	19.1x1.65	79.4	73.0	158.8
1503102-250100	2.5"x1.0"	63.5x1.65	25.4x1.65	79.4	73.0	158.8
1503102-250150	2.5"x1.5"	63.5x1.65	38.1x1.65	79.4	73.0	158.8
1503102-250200	2.5"x2.0"	63.5x1.65	50.8x1.65	79.4	73.0	158.8
1503102-300500	3.0"x1/2"	76.2x1.65	12.7x1.65	85.7	79.4	171.4
1503102-300075	3.0"x3/4"	76.2x1.65	19.1x1.65	85.7	79.4	171.4
1503102-300100	3.0"x1.0"	76.2x1.65	25.4x1.65	85.7	79.4	171.4
1503102-300150	3.0"x1.5"	76.2x1.65	38.1x1.65	85.7	79.4	171.4
1503102-300200	3.0"x2.0"	76.2x1.65	50.8x1.65	85.7	79.4	171.4
1503102-300250	3.0"x2.5"	76.2x1.65	63.5x1.65	85.7	79.4	171.4
1503102-400050	4.0"x1/2"	101.6x2.11	12.7x1.65	104.8	92.1	209.6
1503102-400075	4.0"x3/4"	101.6x2.11	19.1x1.65	104.8	92.1	209.6
1503102-400100	4.0"x1.0"	101.6x2.11	25.4x1.65	104.8	92.1	209.6
1503102-400150	4.0"x1.5"	101.6x2.11	38.1x1.65	104.8	92.1	209.6
1503102-400200	4.0"x2.0"	101.6x2.11	50.8x1.65	104.8	98.4	209.6
1503102-400250	4.0"x2.5"	101.6x2.11	63.5x1.65	104.8	98.4	209.6
1503102-400300	4.0"x3.0"	101.6x2.11	76.2x1.65	104.8	98.4	209.6
1503102-600075	6.0"x3/4"	152.4x2.77	19.1x1.65	142.9	123.8	285.8
1503102-600100	6.0"x1.0"	152.4x2.77	25.4x1.65	142.9	123.8	285.8
1503102-600150	6.0"x1.5"	152.4x2.77	38.1x1.65	142.9	123.8	285.8
1503102-600200	6.0"x2.0"	152.4x2.77	50.8x1.65	142.9	123.8	285.8
1503102-600250	6.0"x2.5"	152.4x2.77	63.5x1.65	142.9	123.8	285.8
1503102-600300	6.0"x3.0"	152.4x2.77	76.2x1.65	142.9	123.8	285.8
1503102-600400	6.0"x4.0"	152.4x2.77	101.6x2.11	142.9	130.2	285.8

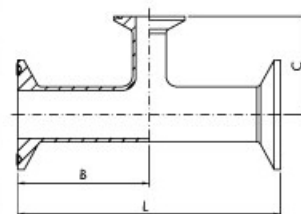


Clamp Joint: Straight Tee

No.	Nom.Size	B	L
1503301-00050	1/2"	31.6	63.2
1503301-00075	3/4"	60.3	120.7
1503301-00100	1.0"	60.3	120.7
1503301-00150	1.5"	69.9	139.7
1503301-00200	2.0"	88.9	177.8
1503301-00250	2.5"	88.9	177.8
1503301-00300	3.0"	95.3	190.5
1503301-00400	4.0"	114.3	228.6

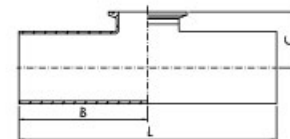
**Clamp Joint: Reducing Tee**

No.	Nom.Size	B	C	L
1503309-150100	1.5"x1.0"	54.75	46.0	109.5
1503309-200100	2.0"x1.0"	65.10	54.0	130.2
1503309-200150	2.0"x1.5"	65.10	61.0	130.2
1503309-250150	2.5"x1.5"	72.25	71.4	144.5
1503309-250200	2.5"x2.0"	72.25	71.4	144.5
1503309-300100	3.0"x1.0"	78.60	77.8	157.2
1503309-300150	3.0"x1.5"	78.60	77.8	157.2
1503309-300200	3.0"x2.0"	78.60	77.8	157.2
1503309-300250	3.0"x2.5"	78.60	78.6	157.2
1503309-400050	4.0"x1/2"	103.20	123.8	206.4
1503309-400075	4.0"x3/4"	103.20	123.8	206.4
1503309-400100	4.0"x1.0"	103.20	123.8	206.4
1503309-400150	4.0"x1.5"	103.20	123.8	206.4
1503309-400200	4.0"x2.0"	103.20	123.8	206.4
1503309-400250	4.0"x2.5"	103.20	123.8	206.4
1503309-400300	4.0"x3.0"	103.20	123.8	206.4



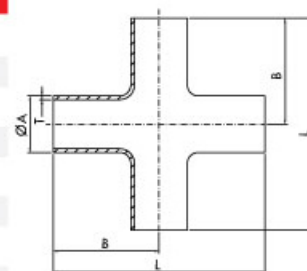
Automatic Tube Weld: Short Outlet Clamp Joint, Reducing Tee

No.	Nom.Size	B	C	L
1503201-075050	3/4"x1/2"	50.8	25.4	101.6
1503201-100050	1.0"x1/2"	54.0	28.6	108.0
1503201-100075	1.0"x3/4"	54.0	28.6	108.0
1503201-150050	1.5"x1/2"	60.3	34.9	120.7
1503201-150075	1.5"x3/4"	60.3	34.9	120.7
1503201-150100	1.5"x1.0"	60.3	34.9	120.7
1503201-200050	2.0"x1/2"	70.3	41.3	146.1
1503201-200075	2.0"x3/4"	70.3	41.3	146.1
1503201-200100	2.0"x1.0"	70.3	41.3	146.1
1503201-200150	2.0"x1.5"	70.3	41.3	146.1
1503201-02550	2.5"x1/2"	79.4	47.6	158.8
1503201-250075	2.5"x3/4"	79.4	47.6	158.8
1503201-250100	2.5"x1.0"	79.4	47.6	158.8
1503201-250150	2.5"x1.5"	79.4	47.6	158.8
1503201-250200	2.5"x2.0"	79.4	47.6	158.8
1503201-300050	3.0"x1/2"	85.7	54.0	171.5
1503201-300075	3.0"x3/4"	85.7	54.0	171.5
1503201-300100	3.0"x1.0"	85.7	54.0	171.5
1503201-300150	3.0"x1.5"	85.7	54.0	171.5
1503201-300200	3.0"x2.0"	85.7	54.0	171.5
1503201-300250	3.0"x1/4"	85.7	54.0	171.5
1503201-400050	4.0"x1/2"	104.8	66.7	209.6
1503201-400075	4.0"x3/4"	104.8	66.7	209.6
1503201-400100	4.0"x1.0"	104.8	66.7	209.6
1503201-400150	4.0"x1.5"	104.8	66.7	209.6
1503201-400200	4.0"x2.0"	104.8	66.7	209.6
1503201-400250	4.0"x2.5"	104.8	66.7	209.6
1503201-400300	4.0"x3.0"	104.8	66.7	209.6
1503201-600500	6.0"x1/2"	142.9	92.1	285.8
1503201-600100	6.0"x1.0"	142.9	92.1	285.8
1503201-600150	6.0"x1.5"	142.9	92.1	285.8
1503201-600300	6.0"x3.0"	142.9	92.1	285.8
1503201-600400	6.0"x4.0"	142.9	95.3	285.8

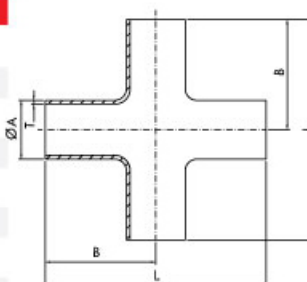


Automatic Tube Weld: Straight Cross

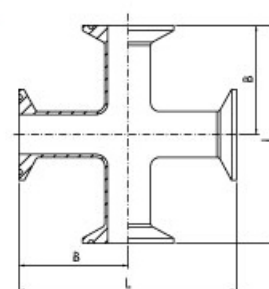
No.	Nom.Size	AxT1	B	L
1504101-000050	1/2"	12.7x1.65	19.1	38.1
1504101-000075	3/4"	19.1x1.65	47.6	95.2
1504101-000100	1.0"	25.4x1.65	47.6	95.2
1504101-000150	1.5"	38.1x1.65	57.2	114.4
1504101-000200	2.0"	50.8x1.65	76.2	152.4
1504101-000250	2.5"	63.5x1.65	76.2	152.4
1504101-000300	3.0"	76.2x1.65	82.6	165.2
1504101-000400	4.0"	101.6x2.11	98.4	196.8
1504101-000600	6.0"	152.4x2.77	127.0	254.0

**Automatic Tube Weld: Straight Cross**

No.	Nom.Size	AxT1	B	L
1504102-000050	1/2"	12.7x1.65	47.6	95.2
1504102-000075	3/4"	19.1x1.65	50.8	101.6
1504102-000100	1.0"	25.4x1.65	54.0	108.0
1504102-000150	1.5"	38.1x1.65	60.3	120.6
1504102-000200	2.0"	50.8x1.65	76.0	146.0
1504102-000250	2.5"	63.5x1.65	79.4	158.8
1504102-000300	3.0"	76.2x1.65	85.7	171.4
1504102-000400	4.0"	101.6x2.11	104.8	209.6

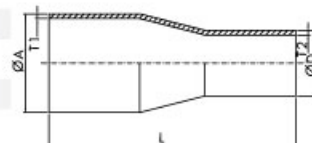
**Clamp Joint: Straight Cross**

No.	Nom.Size	B	L
1504301-000050	1/2"	31.6	63.5
1504301-000075	3/4"	60.3	120.6
1504301-000100	1.0"	60.3	120.6
1504301-000150	1.5"	69.9	139.8
1504301-000200	2.0"	88.9	177.8
1504301-000250	2.5"	88.9	177.8
1504301-000300	3.0"	95.3	190.6
1504301-000400	4.0"	114.2	228.4



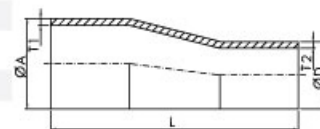
Automatic Tube Weld: Concentric Reducer

No.	Nom.Size	AxT1	DxT2	L
1505004-050025	1/2"x1/4"	12.7x1.65	6.35x0.89	101.6
1505004-050038	1/2"x3/8"	12.7x1.65	9.53x0.89	101.6
1505004-075038	3/4"x3/8"	19.1x1.65	9.53x0.89	101.6
1505004-075050	3/4"x1/2"	19.1x1.65	12.7x1.65	101.6
1505004-100038	1.0"x3/8"	25.4x1.65	9.53x0.89	114.3
1505004-100050	1.0"x1/2"	25.4x1.65	12.7x1.65	114.3
1505004-100075	1.0"x3/4"	25.4x1.65	19.1x1.65	101.6
1505004-150038	1.5"x3/8"	38.1x1.65	9.53x0.89	152.4
1505004-150050	1.5"x1/2"	38.1x1.65	12.7x1.65	139.7
1505004-150075	1.5"x3/4"	38.1x1.65	19.1x1.65	127.0
1505004-150100	1.5"x1.0"	38.1x1.65	25.4x1.65	127.0
1505004-200050	2.0"x1/2"	50.8x1.65	12.7x1.65	196.9
1505004-200075	2.0"x3/4"	50.8x1.65	19.1x1.65	184.2
1505004-200100	2.0"x1.0"	50.8x1.65	25.4x1.65	184.2
1505004-200150	2.0"x1.5"	50.8x1.65	38.1x1.65	133.4
1505004-250050	2.5"x1/2"	63.5x1.65	12.7x1.65	247.7
1505004-250075	2.5"x3/4"	63.5x1.65	19.1x1.65	235.0
1505004-250025	2.5"x1.0"	63.5x1.65	25.4x1.65	235.0
1505004-250150	2.5"x1.5"	63.5x1.65	38.1x1.65	184.2
1505004-250200	2.5"x2.0"	63.5x1.65	50.8x1.65	139.7
1505004-300500	3.0"x1/2"	76.2x1.65	12.7x1.65	298.5
1505004-300075	3.0"x3/4"	76.2x1.65	19.1x1.65	285.8
1505004-300100	3.0"x1.0"	76.2x1.65	25.4x1.65	285.8
1505004-300150	3.0"x1.5"	76.2x1.65	38.1x1.65	235.0
1505004-300200	3.0"x2.0"	76.2x1.65	50.8x1.65	190.5
1505004-300250	3.0"x2.5"	76.2x1.65	63.2x1.65	139.7
1505004-400050	4.0"x1/2"	101.6x2.11	12.7x1.65	406.4
1505004-400075	4.0"x3/4"	101.6x2.11	19.1x1.65	393.7
1505004-400100	4.0"x1.0"	101.6x2.11	25.4x1.65	393.7
1505004-400150	4.0"x1.5"	101.6x2.11	38.1x1.65	342.9
1505004-400200	4.0"x2.0"	101.6x2.11	50.8x1.65	298.5
1505004-400250	4.0"x2.5"	101.6x2.11	63.5x1.65	247.7
1505004-400300	4.0"x3.0"	101.6x2.11	76.2x1.65	196.9
1505004-600300	6.0"x3.0"	152.4x2.77	76.2x1.65	254.0
1505004-600400	6.0"x4.0"	152.4x2.77	101.6x2.77	254.0



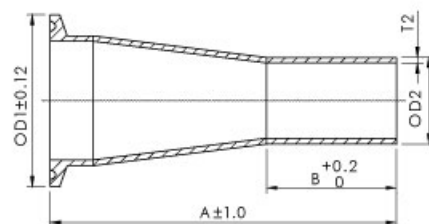
Automatic Tube Weld: Eccentric Reducer

No.	Nom.Size	AxT1	DxT2	L
1505104-050038	1/2"x3/8"	12.7x1.65	9.53x0.89	101.6
1505104-075050	3/4"x1/2"	19.1x1.65	12.7x1.65	101.6
1505104-100050	1.0"x1/2"	25.4x1.65	12.7x1.65	114.3
1505104-150038	1.0"x3/8"	25.4x1.65	9.53x0.89	114.3
1505104-100075	1.0"x3/4"	25.4x1.65	19.1x1.65	101.6
1505104-150050	1.5"x1/2"	38.1x1.65	12.7x1.65	139.7
1505104-150075	1.5"x3/4"	38.1x1.65	19.1x1.65	127.0
1505104-150100	1.5"x1.0"	38.1x1.65	25.4x1.65	127.0
1505104-200050	2.0"x1/2"	50.8x1.65	12.7x1.65	196.9
1505104-200075	2.0"x3/4"	50.8x1.65	19.1x1.65	184.2
1505104-200100	2.0"x1.0"	50.8x1.65	25.4x1.65	184.2
1505104-200150	2.0"x1.5"	50.8x1.65	38.1x1.65	133.4
1505104-250050	2.5"x1/2"	63.5x1.65	12.7x1.65	247.7
1505104-250075	2.5"x3/4"	63.5x1.65	19.1x1.65	235.0
1505104-250100	2.5"x1.0"	63.5x1.65	25.4x1.65	235.0
1505104-250150	2.5"x1.5"	63.5x1.65	38.1x1.65	184.2
1505104-250200	2.5"x2.0"	63.5x1.65	50.8x1.65	139.7
1505104-300050	3.0"x1/2"	76.2x1.65	12.7x1.65	298.5
1505104-300075	3.0"x3/4"	76.2x1.65	19.1x1.65	285.8
1505104-300100	3.0"x1.0"	76.2x1.65	25.4x1.65	285.8
1505104-300150	3.0"x1.5"	76.2x1.65	38.1x1.65	235.0
1505104-300200	3.0"x2.0"	76.2x1.65	50.8x1.65	190.5
1505104-300250	3.0"x2.5"	76.2x1.65	63.5x1.65	139.7
1505104-400050	3.0"x1/2"	101.6x2.11	12.7x1.65	406.4
1505104-400075	3.0"x3/4"	101.6x2.11	19.1x1.65	393.7
1505104-400100	4.0"x1.0"	101.6x2.11	25.4x1.65	393.7
1505104-400150	4.0"x1.5"	101.6x2.11	38.1x1.65	342.9
1505104-400200	4.0"x2.0"	101.6x2.11	50.8x1.65	298.5
1505104-400250	4.0"x2.5"	101.6x2.11	63.5x1.65	247.7
1505104-400300	4.0"x3.0"	101.6x2.11	76.2x1.65	196.9
1505104-600300	6.0"x3.0"	152.4x2.77	76.2x1.65	247.7
1505104-600400	6.0"x4.0"	152.4x2.77	101.6x2.77	254.0



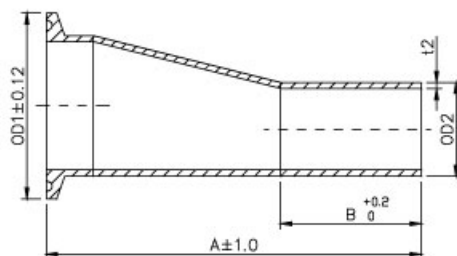
Clamp Joint: Tube Weld Concentric Reducer

No.	Size	OD1	OD2	T2	A	B
1505201-075050	3/4"x1/2"	25.4	12.7	1.65	76.2	38.1
1505201-100050	1.0"x1/2"	50.4	12.7	1.65	88.9	38.1
1505201-100075	1.0"x3/4"	50.4	19.05	1.65	76.2	38.1
1505201-150050	1.5"x1/2"	50.4	12.7	1.65	114.3	38.1
1505201-150075	1.5"x3/4"	50.4	19.05	1.65	101.6	38.1
1505201-150100	1.5"x1.0"	50.4	25.4	1.65	101.6	38.1
1505201-200050	2.0"x1/2"	63.9	12.7	1.65	165.1	38.1
1505201-200075	2.0"x3/4"	63.9	19.05	1.65	152.4	38.1
1505201-200100	2.0"x1.0"	63.9	25.4	1.65	152.4	38.1
1505201-200150	2.0"x1.5"	63.9	38.1	1.65	101.6	38.1
1505201-250100	2.5"x1.0"	77.5	25.4	1.65	203.2	38.1
1505201-250150	2.5"x1.5"	77.5	38.1	1.65	152.4	38.1
1505201-250200	2.5"x2.0"	77.5	50.8	1.65	108.0	44.5
1505201-300100	3.0"x1.0"	90.9	25.4	1.65	254.0	38.1
1505201-300150	3.0"x1.5"	90.9	38.1	1.65	203.2	38.1
1505201-300200	3.0"x2.0"	90.9	50.8	1.65	158.8	44.5
1505201-300250	3.0"x2.5"	90.9	63.5	1.65	108.0	44.5
1505201-400100	4.0"x1.0"	118.9	25.4	1.65	358.8	38.2
1505201-400150	4.0"x1.5"	118.9	38.1	1.65	308.0	38.2
1505201-400200	4.0"x2.0"	118.9	50.8	1.65	263.5	44.5
1505201-400250	4.0"x2.5"	118.9	63.5	1.65	212.7	44.5


5
5.5

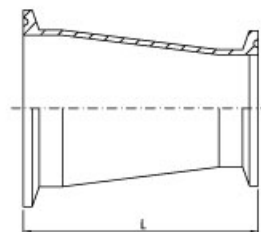
Clamp Joint: Tube Weld Eccentric Reducer

No.	Size	OD1	OD2	T2	A	B
1505301-075050	3/4"x1/2"	25.4	12.7	1.65	76.2	38.1
1505301-100050	1.0"x1/2"	50.4	12.7	1.65	88.9	38.1
1505301-100075	1.0"x3/4"	50.4	19.05	1.65	76.2	38.1
1505301-150050	1.5"x1/2"	50.4	12.7	1.65	114.6	38.1
1505301-150075	1.5"x3/4"	50.4	19.05	1.65	101.6	38.1
1505301-150100	1.5"x1.0"	50.4	25.4	1.65	101.6	38.1
1505301-200050	2.0"x1/2"	63.9	12.07	1.65	165.1	38.1
1505301-200075	2.0"x3/4"	63.9	19.05	1.65	152.4	38.1
1505301-200100	2.0"x1.0"	63.9	25.4	1.65	152.4	38.1
1505301-200150	2.0"x1.5"	63.9	38.1	1.65	101.6	38.1
1505301-250075	2.5"x3/4"	77.5	19.05	1.65	203.2	38.1
1505301-250100	2.5"x1.0"	77.5	25.4	1.65	203.2	38.1
1505301-250150	2.5"x1.5"	77.5	38.1	1.65	152.4	38.1
1505301-250200	2.5"x2.0"	77.5	50.8	1.65	108.0	44.5
1505301-300100	3.0"x1.0"	90.9	25.4	1.65	254.0	38.1
1505301-300150	3.0"x1.5"	90.9	38.1	1.65	203.2	38.1
1505301-300200	3.0"x2.0"	90.9	50.8	1.65	158.8	44.5
1505301-300250	3.0"x2.5"	90.9	63.5	1.65	108.0	44.5
1505301-400100	4.0"x1.0"	118.9	25.4	1.65	358.8	38.2
1505301-400150	4.0"x1.5"	118.9	38.1	1.65	308.0	38.2
1505301-400200	4.0"x2.0"	118.9	50.8	1.65	263.5	44.5
1505301-400250	4.0"x2.5"	118.9	63.5	1.65	212.7	44.5
1505301-400350	4.0"x3.5"	118.9	76.2	1.65	161.9	44.5
1505301-600400	6.0"x4.0"	166.9	101.6	2.11	228.6	69.85

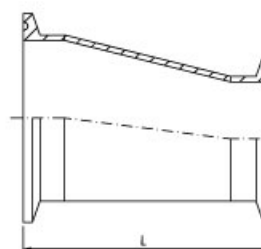


Clamp Joint: Concentric Reducer

No.	Nom.Size	L
1505200-075050	3/4"x1/2"	50.8
1505200-100050	1.0"x1/2"	63.5
1505200-100075	1.0"x3/4"	50.8
1505200-150050	1.5"x1/2"	88.9
1505200-150075	1.5"x3/4"	76.2
1505200-150100	1.5"x1.0"	76.2
1505200-200050	2.0"x1/2"	139.7
1505200-200075	2.0"x3/4"	127.0
1505200-200100	2.0"x1.0"	127.0
1505200-200150	2.0"x1.5"	76.2
1505200-250050	2.5"x1/2"	190.5
1505200-250075	2.5"x3/4"	177.8
1505200-250100	2.5"x1.0"	177.8
1505200-250150	2.5"x1.5"	127.0
1505200-250200	2.5"x2.0"	76.2
1505200-300075	3.0"x3/4"	228.6
1505200-300150	3.0"x1.5"	117.8
1505200-300200	3.0"x2.0"	127.0
1505200-300250	3.0"x2.5"	76.2
1505200-400100	4.0"x1.0"	333.4
1505200-400150	4.0"x1.5"	282.6
1505200-400200	4.0"x2.0"	231.8
1505200-400250	4.0"x2.5"	181.0
1505200-400300	4.0"x3.0"	130.2
1505200-600400	6.0"x4.0"	193.7

**Clamp Joint: Eccentric Reducer**

No.	Nom.Size	L
1505300-075050	3/4"x1/2"	50.8
1505300-100050	1.0"x1/2"	63.5
1505300-100075	1.0"x3/4"	50.8
1505300-150050	1.5"x1/2"	88.9
1505300-150075	1.5"x3/4"	76.2
1505300-150100	1.5"x1.0"	76.2
1505300-200050	2.0"x1/2"	139.7
1505300-200075	2.0"x3/4"	127.0
1505300-200100	2.0"x1.0"	127.0
1505300-200150	2.0"x1.5"	76.2
1505300-250050	2.5"x1/2"	190.5
1505300-250075	2.5"x3/4"	177.8
1505300-250100	2.5"x1.0"	177.8
1505300-250150	2.5"x1.5"	127.0
1505300-250200	2.5"x2.0"	76.2
1505300-300075	3.0"x3/4"	228.6
1505300-300150	3.0"x1.5"	117.8
1505300-300200	3.0"x2.0"	127.0
1505300-300250	3.0"x2.5"	76.2
1505300-400100	4.0"x1.0"	333.4
1505300-400150	4.0"x1.5"	282.6
1505300-400200	4.0"x2.0"	231.8
1505300-400250	4.0"x2.5"	181.0
1505300-400300	4.0"x3.0"	130.2
1505300-600400	6.0"x4.0"	193.7





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