

**UNIVERSAL PRODUCT LINE:
DUCTILE IRON — JACKETED PUMPS**
SERIES 226A, 4226A

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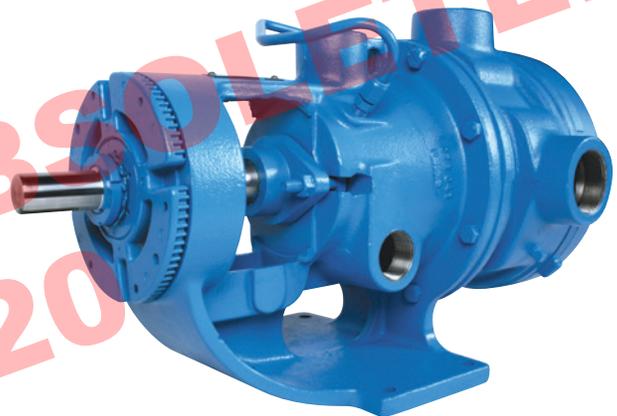
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SERIES DESCRIPTION

Pumps are designed for a broad range of applications, from thin to thick, requiring continuous duty at pressures up to 200 PSI (14 Bar). Even higher pressures are possible with high fluid viscosities at reduced operating speeds (consult factory). They are also capable of operating under suction lift conditions and operate equally well in either direction.

The Universal Product Line has the broadest range of sealing options of all pumps built by Viking. The stuffing box on all sizes accepts packing, numerous component single mechanical seals, or a wide variety of cartridge seals.

The Universal Product Line is Viking Pump’s most versatile line of internal gear pumps due to the availability of many design and material options.



KK4226A

RELATED PRODUCTS

Ductile Iron, Non-Jacketed Pumps: Catalog Section 1601
 Cast Iron, Jacketed Pumps: Catalog Section 1402

OPERATING RANGE

SERIES	NOMINAL FLOW		MAXIMUM PRESSURE		TEMPERATURE RANGE		VISCOSITY RANGE	
	GPM	m ³ h	PSI	Bar	°F	°C	SSU	cSt
226A	15 - 500	3 - 114	200	14	-60 to +650	-50 to +345	28 to 2,000,000	0.1 to 440,000
4226A	15 - 500	3 - 114	200	14	-60 to +650	-50 to +345	28 to 2,000,000	0.1 to 440,000

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FEATURES & BENEFITS

- Positive Displacement Internal Gear pumping principle handles a broad range of viscosities with constant flow rate
- Axial rotor thrust is controlled by double row ball bearing or tapered roller bearings; bushings provided a secondary point of radial shaft support
- Rotatable bearing housing provides easy rotor end clearance adjustment to compensate for viscosity or wear
- Numerous material options are available for bushings, idler pins, shafts, rotors, idlers and elastomers
- Gear and pump geometry has been optimized based on more than 100 years of experience
- Footed ductile iron bracket provides rigid mounting to help maintain alignment, which extends seal and bearing life
- Can use direct drive, gear reducer or gearmotor drive, or belt-drive
- Series designed with an enlarged bearing housing. Used in conjunction with a spacer coupling permits easy cartridge seal installation and removal in place without removing the head and rotor/shaft.
- Seal options include packing, single component seals, cartridge lip seals and cartridge single and double mechanical seals. Various seal flush plans are available.



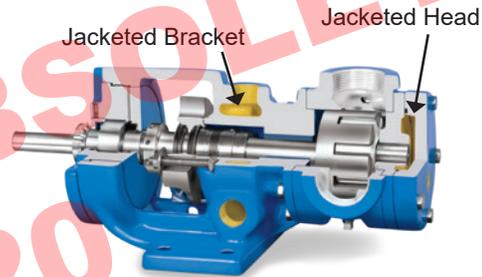
Viking Universal Product Line pumps carry a three year limited warranty. See catalog section 000 for details.

JACKETING

Jacketed pumps provide a cavity, or jacket, on the external wall of the pump through which steam or heat transfer liquid can be passed to control the temperature of the fluid in the pump. The heat transfer medium flows in a closed loop back to the boiler or heater. Applications include “melting” ambient temperature solids like asphalt which solidify in the pump when it cools, and maintaining precise temperature control in processes like manufacturing polymers and epoxy resins.

Standard-Jacketed Pumps

226A & 4226A Series are standard-Jacketed pumps, featuring jacketing on the head and bracket only. They are typically used for melting ambient temperature solids.



Standard-Jacketed Pump Cutaway – HL4226A

PORTING & SEALING

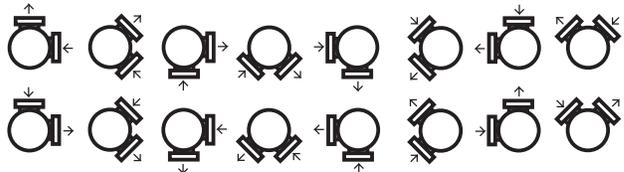
A variety of opposite and 90° port configurations are available, including top suction with bottom or side discharge designs typically mounted at the bottom of a tank or reactor.

Jacketed port options for steam or heat transfer liquid are threaded.

The seal chamber design accepts packing, component seals or cartridge seals. Seal plans, including API plan 53 and 54, are available.

REVOLVABLE PUMP CASINGS

90° port options:



Opposite port options:



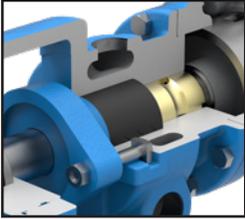
NOTE: See page 1401.9 for a complete list of casing options by size.

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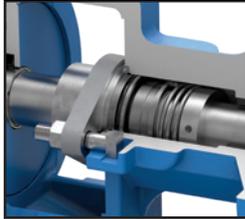
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CUTAWAY VIEW & PUMP FEATURES

Packing



Component Seal



Cartridge Seal

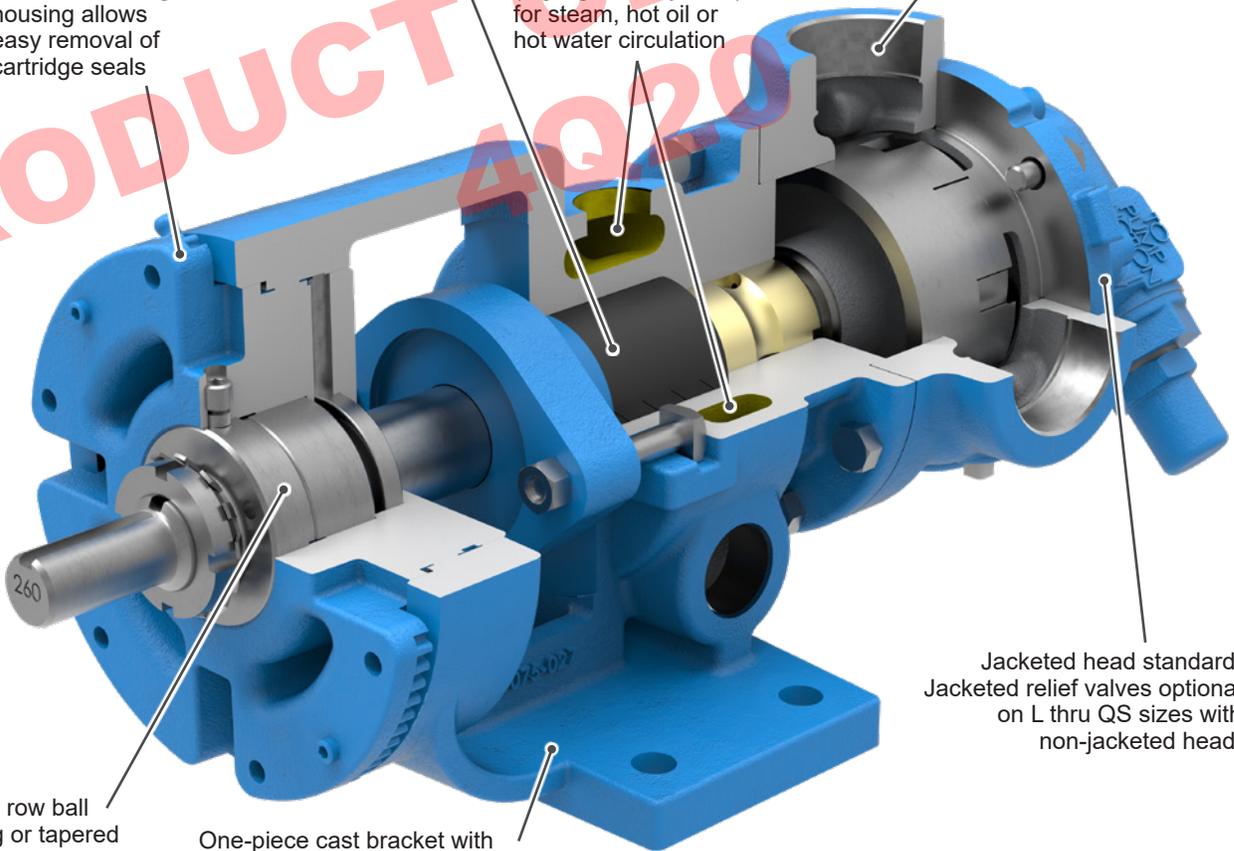


Seal chamber accepts packing and a variety of component and cartridge style mechanical and lip seals, in both single and double mechanical seal configurations

Large diameter threaded bearing housing allows easy removal of cartridge seals

Jacketing (highlighted in yellow) for steam, hot oil or hot water circulation

Multiple port sizes, types, and ratings are available including threaded and flanged (Class 150, Class 300)



Double row ball bearing or tapered roller bearings for axial thrust control

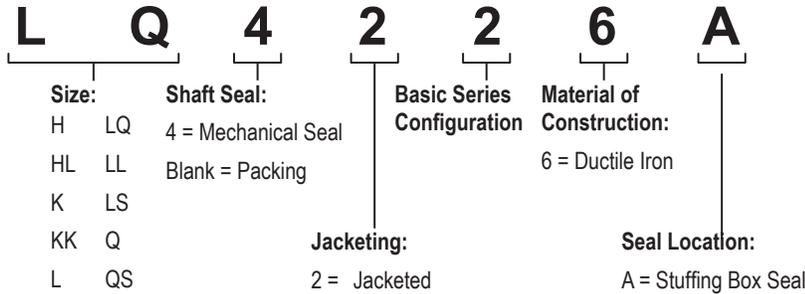
One-piece cast bracket with seal between bearings provides rigid foundation to maximize seal and bearing life

Jacketed head standard. Jacketed relief valves optional on L thru QS sizes with non-jacketed head.

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MODEL NUMBER KEY



STANDARD MATERIALS OF CONSTRUCTION

Component	Standard Material	
Casing	Ductile Iron, ASTM A536 Grade 60-40-18	
Head	Ductile Iron, ASTM A536 Grade 60-40-18	
Head Plate	Steel, ASTM A216, Grade WCB	
Bracket	Ductile Iron, ASTM A536 Grade 60-40-18	
Idler	① ② Cast Iron, ASTM A48, Class 35B	
Rotor	Standard	③ Cast Iron, ASTM A48, Class 35B
	Steel Fitted	④ Steel, ASTM A148, Grade 80-40
Shaft	⑤ Steel, ASTM A108, Grade 1045	
Idler Pin	Hardened Steel, ASTM A108, Grade 1045	
Idler Bushing	(4126A)	Carbon Graphite
	(126A)	Bronze, ASTM B584 (B505), Alloy C93700
Bracket Bushing	(4126A)	Carbon Graphite
	(126A)	Bronze, ASTM B584 (B505), Alloy C93700
Pressure Relief Valve	⑥ Ductile Iron, ASTM A536 Grade 60-40-18	
Standard Packing (126A)	Braided PTFE	
Standard Mechanical Seal (4126A)	Carbon vs. Silicon Carbide Faces, PTFE Elastomers	

- ① H and HL sizes have a powdered metal idler: Powdered Metal MPIF 35, FC-0208-50
- ② Q and QS sizes have a hardened steel idler when pump is steel fitted: ASTM A148 Grade 80-40.
- ③ KK, LS and QS sizes have ductile iron rotor: ASTM A536 Grade 60-40-18.
- ④ Material specification for HL size steel rotor is AISI 8620, LS size steel rotor is ASTM A148 80-50.
- ⑤ K, KK, L, LQ, LL and LS sizes are high strength steel ASTM A434 Type 4140 Grade BC or equivalent.
- ⑥ H and HL size relief valves are steel.

SPECIAL MATERIALS & OPTIONS SELECTION GUIDELINES

For High Viscosities - Above 2,500 SSU (550 cSt)

- Steel fitted construction recommended above the following viscosities, according to pump size:

Viscosity	Pump Size									
	H	HL	K	KK	L	LQ	LL	LS	Q	QS
SSU	25,000	7,500	25,000	75,000	25,000	25,000	2,500	75,000	7,500	75,000
cSt	5,500	1,700	5,500	17,000	5,500	5,500	550	17,000	1,700	17,000

- Extra clearances, depending on viscosity. Contact factory for clearance specifications.
- Special Sealing:
FKM Type 1 component seals good up to 15,000 SSU (3,300 cSt).
Standard PTFE Type 9 seals good up to 25,000 SSU (5,500 cSt).
Packed gland good up to 2,000,000 SSU (440,000 cSt).
Cartridge triple lip seals available to 2,000,000 SSU (440,000 cSt).
- Larger ports may be required depending on suction conditions.
- Pump should be operated at slower than normal speeds, which may require a larger pump.
- For viscosities over 250,000 SSU (55,000 cSt), contact factory for additional pump construction and operation recommendations.

For low viscosities or non-lubricating liquids – Below 100 SSU (20 cSt)

- Carbon graphite bushings.
- Pump should be operated at slower than normal speeds, which may require a larger pump.

For high temperatures – Above 225° F (107°C)

- High temperature elastomers – Buna up to 225°F (105°C); FKM up to 350°F (175°C); PTFE up to 450°F (230°C); FFKM up to 550°F (290°C); Grafoil up to 700°F. (370°C). High temp packing in excess of 500°F (260°C).
- High temperature bushings recommended depending on temperature, size and specific material. See ESB-3 for recommendations.
- Additional operating clearances may be required depending on temperature, size and specific material. See ES-2 for recommendations.
- For temperatures above 450°F (230°C), special materials and sealing requirements may be needed. Contact factory for recommendations.
- Pump should be operated at slower than normal speeds, which may require a larger pump.

For abrasive or dirty liquids

- If possible, filter or strain out the abrasives present.
- Wear resistant bushings - hardened cast iron, tungsten carbide or Colmonoy coated.
- Abrasive-resistant idler pin - tungsten carbide or Colmonoy plus TC filler coated pins.
- Hardened or hard-coated shafting.
- Abrasive-resistant seals.
- For high concentrations of abrasives or particle sizes greater than 250 microns (0.010 in), contact factory for recommendations.
- Pump should be operated at slower than normal speeds, which may require a larger pump.
- Consult factory for specific recommendations.

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SPECIFICATIONS

Model Number	③ Standard Port Size	Nominal Pump Rating (100 SSU & below)			Max. Hydrostatic Pressure		① Maximum Discharge Pressure		Max. Recommended Temperature for Standard Pump		Approx. Shipping Weight with Valve	
	Inches	GPM	m ³ /h	RPM	PSIG	BAR	PSIG	BAR	°F	°C	Lbs.	Kg.
H226A	1 ½	15	3.5	1750	400	28	200	14	450	230	38	17
H4226A	1 ½	15	3.5	1750	400	28	200	14	450	230	38	17
HL226A	1 ½	30	7	1750	400	28	200	14	450	230	40	18
HL4226A	1 ½	30	7	1750	400	28	200	14	450	230	40	18
K226A	2	80	18	780	400	28	200	14	450	230	105	48
K4226A	2	80	18	780	400	28	200	14	450	230	105	48
KK226A	2	100	23	780	400	28	200	14	450	230	110	50
KK4226A	2	100	23	780	400	28	200	14	450	230	110	50
L226A	2	135	31	640	400	28	200	14	450	230	155	70
L4226A	2	135	31	640	400	28	200	14	450	230	155	70
LQ226A	2 ½	135	31	640	400	28	200	14	450	230	175	80
LQ4226A	2 ½	135	31	640	400	28	200	14	450	230	175	80
LL226A	3	140	32	520	400	28	200	14	450	230	185	84
LL4226A	3	140	32	520	400	28	200	14	450	230	185	84
LS226A	3	200	45	640	400	28	200	14	450	230	190	86
LS4226A	3	200	45	640	400	28	200	14	450	230	190	86
Q226A	4	300	68	520	250	17	200	14	450	230	440	200
Q4226A	4	300	68	520	250	17	200	14	450	230	440	200
QS226A	6	500	114	520	250	17	200	14	450	230	540	245
QS4226A	6	500	114	520	250	17	200	14	450	230	540	245

① For maximum recommended discharge pressures at different viscosities, see performance curves, which can be electronically generated with the Viking Pump Curve Generator, located on www.vikingpump.com. If suction pressure exceeds 50 PSIG, consult factory. Higher pressures possible with factory approval based on application details.

② Extra clearances are required above 450°F / 220°C. Higher temperatures can be handled with special construction, consult factory.

③ Ports are tapped for standard (NPT) pipe on sizes H through L. Other thread standards available. Sizes LQ through QS have flange ports suitable for use with Class 150 ANSI steel or stainless steel companion flanges or flanged fittings. H through Q ports are at 90° QS ports are at 180° (opposite)

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OPTIONAL CASINGS

Size	Standard Casings		Optional Casings		
	Ports (Inches)	Rotatable Data			
H	1½" ①Ⓜ	Fully Rotatable	1½" ③Ⓜ	2" ③Ⓜ	
HL	1½" ①Ⓜ	Fully Rotatable	1½" ③Ⓜ	2" ③Ⓜ	
K	2" ①Ⓜ	Fully Rotatable	2" ③Ⓜ	3" ③Ⓜ	4" ③Ⓜ
KK	2" ①Ⓜ	Fully Rotatable	2" ③Ⓜ	3" ③Ⓜ	4" ③Ⓜ
L	2" ①Ⓜ	Fully Rotatable			
LQ	2½" ②Ⓜ	Ports cannot face down	3" ③Ⓜ	4" ③Ⓜ	
LL	3" ②Ⓜ	Fully Rotatable			
LS	3" ②Ⓜ	Fully Rotatable			
Q	4" ②Ⓜ	Fully Rotatable			
QS	6" ②Ⓜ	Rotatable with special casing			

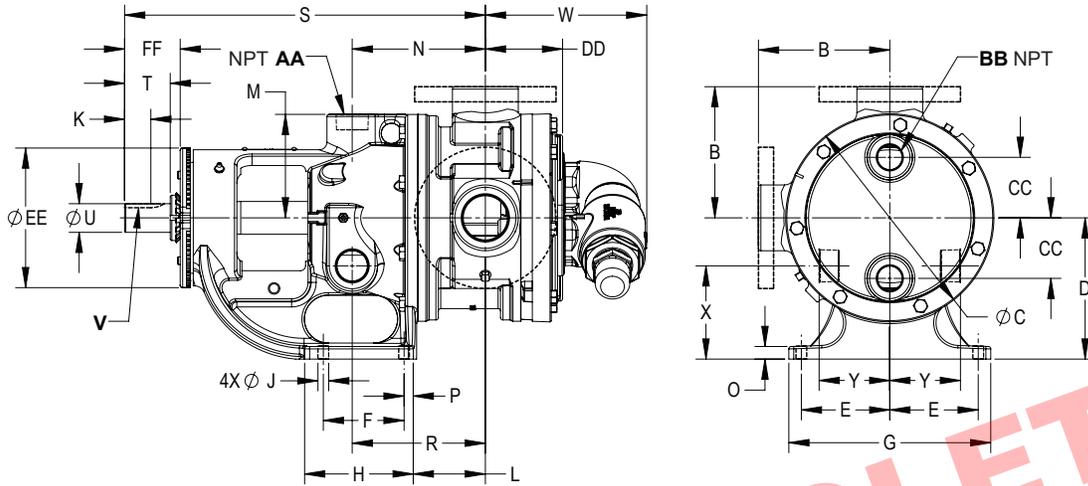
- ① Port(s) tapped for standard (NPT) pipe.
- ② Port(s) suitable for use with Class 150 ANSI steel or stainless steel companion flanges or flanged fittings.
- ③ Port(s) suitable for use with Class 300 ANSI steel or stainless steel companion flanges or flanged fittings.
- Ⓜ Opposite Ports
- Ⓜ 90° port arranged for Right Hand inlet (viewed from shaft end)

PRODUCT OBSOLETE
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**UNIVERSAL PRODUCT LINE:
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DIMENSIONS – H THROUGH Q SIZES



Model Number		A (in)	B	C	D	E	F	G	H	J	K	L	M	N	O	
Packed	Mechanical Seal															
H226A	H4226A	① 1½	in	3.00	4.75	3.50	2.75	2.25	6.75	3.50	0.47	0.99	3.38	2.38	4.00	0.56
HL226A	HL4226A		mm	76	121	89	70	57	171	89	12	25	86	61	102	14
K226A	K4226A	① 2	in	5.12	8.00	5.50	4.00	2.75	9.25	4.00	0.53	1.42	3.00	4.00	5.75	0.62
KK226A	KK4226A		mm	130	203	140	102	70	235	102	14	36	76	102	146	16
L226A	L4226A	① 2	in	6.50	10.25	7.00	4.38	4.00	10.00	5.38	0.53	1.42	3.38	5.12	6.56	0.62
LQ226A	LQ4226A		mm	165	260	178	111	102	254	137	14	36.1	86	130	167	16
LL226A	LL4226A	② 2½	in	7.19	10.25	7.00	4.38	4.00	10.00	5.38	0.53	1.42	3.38	5.12	6.56	0.62
LL226A	LL4226A		mm	183	260	178	111	102	254	137	14	36.1	86	130	167	16
LS226A	LS4226A	② 3	in	7.19	10.25	7.00	4.38	4.00	10.00	5.38	0.53	1.42	3.38	5.12	6.56	0.62
LS226A	LS4226A		mm	183	260	178	111	102	254	137	14	36.1	86	130	167	16
Q226A	Q4226A	② 4	in	8.25	14.00	8.75	4.12	4.00	10.00	6.00	0.69	3.58	6.62	7.00	7.62	0.75
Q226A	Q4226A		mm	210	356	222	105	102	254	152	18	91	168	178	194	19

Model Number		P	R	S	T	U (in)	V (in)	W*	X	Y	AA (in)	BB (in)	CC	DD	EE	FF	
Packed	Mechanical Seal																
H226A	H4226A	in	0.62	4.00	12.06	1.62	0.75	.19 X .09	4.04	1.80	1.83	0.75	0.50	0.94	2.41	5.75	2.30
HL226A	HL4226A	mm	16	102	306	41			103	46	47			24	61	146	58
K226A	K4226A	in	0.62	5.75	16.38	2.25	1.12	.25 X .12	7.00	3.38	2.75	1.25	1.25	1.75	3.25	6.75	2.92
KK226A	KK4226A	mm	16	146	416	57			178	86	70			44	83	171	74
L226A	L4226A	in	0.62	6.56	17.88	2.25	1.12	.25 X .12	7.18	4.62	3.25	1.25	1.00	3.00	3.81	6.75	2.93
LQ226A	LQ4226A	mm	16	167	454	57			182	117	83			76	97	171	74
LL226A	LL4226A	in	0.62	6.56	17.88	2.25	1.12	.25 X .12	7.18	4.62	3.25	1.25	1.00	3.00	3.81	6.75	2.93
LL226A	LL4226A	mm	16	167	454	57			182	117	83			76	110	171	74
LS226A	LS4226A	in	0.62	7.00	19.25	3.50	1.44	.38 X .19	7.72	4.40	3.30	1.25	1.00	3.00	4.50	7.00	4.03
LS226A	LS4226A	mm	16	178	489	89			196	112	84			76	114	178	102
Q226A	Q4226A	in	1.00	6.62	23.75	4.50	1.94	.50 X .25	11.25	5.50	4.50	1.50	1.25	---	4.57	8.38	5.35
Q226A	Q4226A	mm	25	168	603	114			286	140	114			---	116	213	136

① Ports are tapped for standard (NPT) pipe. Other thread standards available.

② Ports are suitable for use with Class 150 ANSI cast iron.

* Non-jacketed valve only.

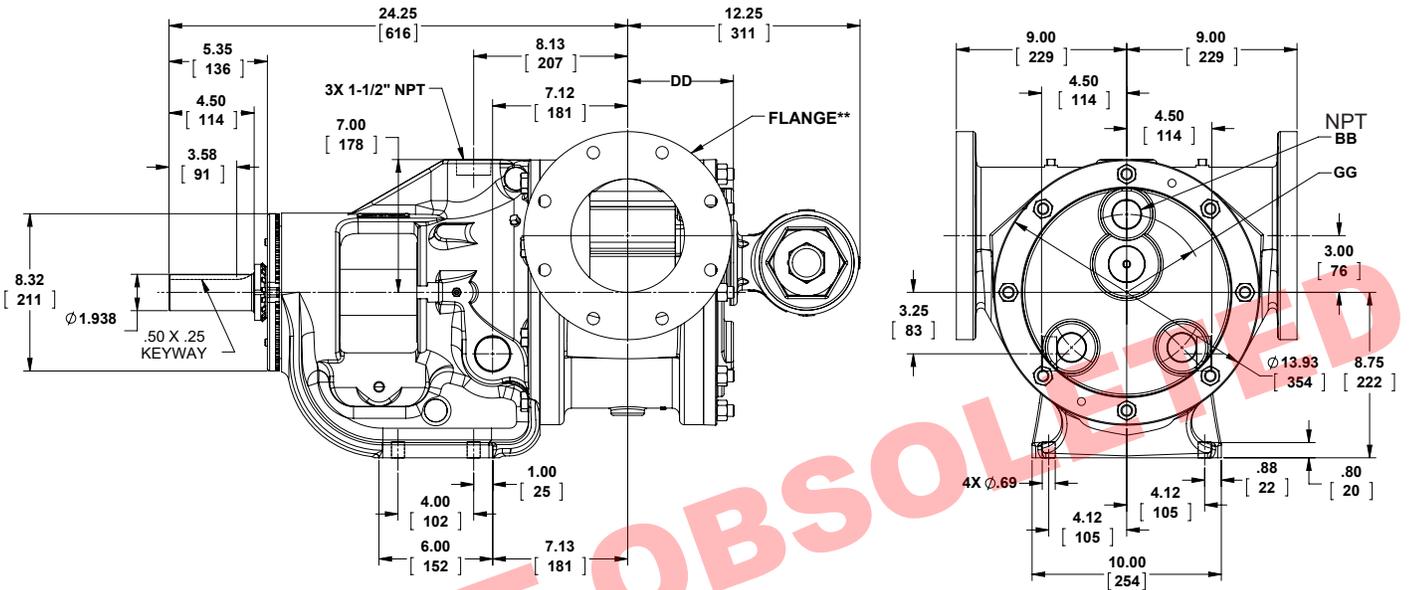
These dimensions are average and not for construction purposes. Certified prints on request.

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DIMENSIONS — QS SIZE

Dimensions shown in inches with millimeter equivalent shown in parentheses



Model Number		BB*	DD	GG
Packed	Mechanical Seal			
QS226A	QS4226A	1.25	5.57 (141)	4.12 (105)

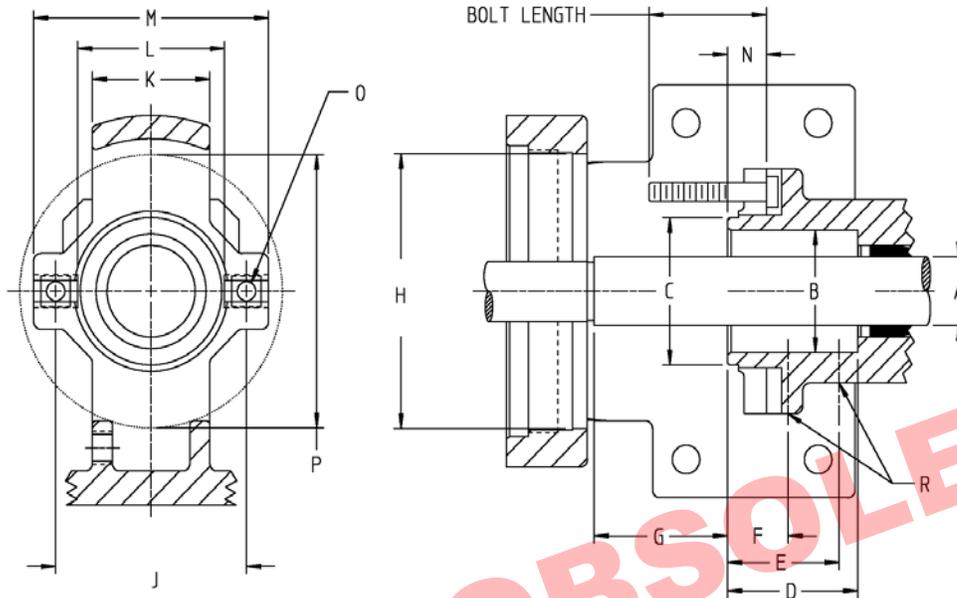
* Ports for steam or hot oil jacketing are inch standard NPT threads.

** **NOTE:** Flanges are 6", suitable for use with Class 150 ANSI steel or stainless steel companion flanges or flanged fittings. They are studded, not through-bolt.

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DIMENSIONS – STUFFING BOX SEAL CHAMBER



Pump Size		A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	R
H & HL	In	1.12	2.00	2.41	2.22	1.90	1.03	2.27	4.50	3.00 to 3.50	2.00	2.50	4.00	0.66	5/16	4.47	1/8
	mm	51	61	56	48	26	58	114	76 to 89	51	64	102	17	114		3	
K & KK	In	1.44	①2.31	3.00	3.13	2.25	1.25	3.00	5.25	3.50 to 4.50	2.50	3.00	5.00	0.38	7/16	5.25	1/4
	mm	58.7	76	80	57	32	76	133	89 to 114	64	76	127	10	133		6	
L, LQ, & LL	In	1.44	①2.31	3.00	3.13	2.25	1.25	4.00	5.25	3.50 to 4.50	2.50	3.00	5.00	0.44	7/16	5.25	1/4
	mm	58.7	76	80	57	32	102	133	89 to 114	64	76	127	11	133		6	
LS	In	1.62	2.38	2.80	2.70	2.25	1.16	3.52	5.25	3.25 to 4.50	3.00	2.80	5.00	0.46	7/16	5.25	1/4
	mm	60	71	69	57	30	89	133	83 to 114	76	71	127	12	133		6	
Q & QS	In	2.44	3.42	4.50	4.00	2.50	1.53	4.10	6.75	5.50 to 6.25	3.20	4.50	7.20	0.56	5/8	6.75	1/4
	mm	87	114	102	64	39	104	171	140 to 159	81	114	183	14	171		6	

① Bracket is counter bored to a diameter of 2.687 inches (68 mm), 0.12 inches (3 mm) deep from stuffing box face.

② Studs are used in place of cap screws.

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NPSH REQUIRED

Printed performance curves are not available.

Performance curves can be electronically generated with the Viking Pump Curve Generator on vikingpump.com.

NPSHR data is not available on the pump selector.

NPSH (Net Positive Suction Head): The $NPSH_R$ (Net Positive Suction Head Required by the pump) is given in the table below and applies for viscosities through 750 SSU. $NPSH_A$ (Net Positive Suction Head – Available in the system) must be greater than the $NPSH_R$. For a complete explanation of NPSH, see Application Data Sheet AD-19.

FOR VISCOSITIES UP TO 750 SSU – See $NPSH_R$ table below.

$NPSH_R$ for high viscosities can be estimated using the following method:

1. Calculate line loss for a 1 foot long pipe of a diameter matching the pump inlet port size. Use your flow rate and max viscosity.
2. Convert this value into Feet of Liquid (S.G. 1.0)
3. Add this value to the $NPSH_R$ value in the chart below.

$NPSH_R$ – FEET OF LIQUID (Specific Gravity 1.0), Viscosities up to 750 SSU

PUMP SIZE	PUMPS SPEED, RPM														
	100	125	155	190	230	280	350	420	520	640	780	950	1150	1450	1750
H, HL	—	—	—	—	1.7	1.8	1.9	2.1	2.4	2.8	3.4	4.5	6.2	9.5	13.5
K, KK	—	1.7	1.8	1.9	2.1	2.3	2.8	3.3	4.4	6.3	9.1	—	—	—	—
L	1.6	1.8	2.0	2.2	2.5	3.0	3.8	5.0	7.3	10.8	—	—	—	—	—
LQ	1.6	1.8	2.0	2.2	2.5	3.0	3.8	5.0	7.3	10.8	—	—	—	—	—
LL	1.6	1.8	2.0	2.2	2.5	3.0	3.8	5.0	7.3	—	—	—	—	—	—
LS	1.6	1.8	2.0	2.2	2.5	3.0	3.8	5.0	7.3	10.8	—	—	—	—	—
Q, QS	1.9	2.1	2.3	2.7	3.3	4.2	6.1	8.4	12.7	—	—	—	—	—	—