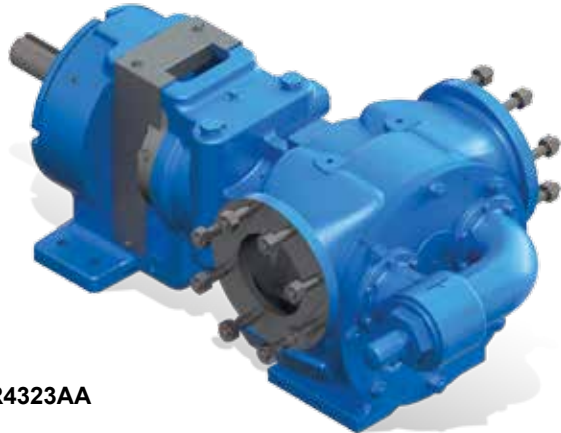


VIKING UNIVERSAL 682 PUMPS

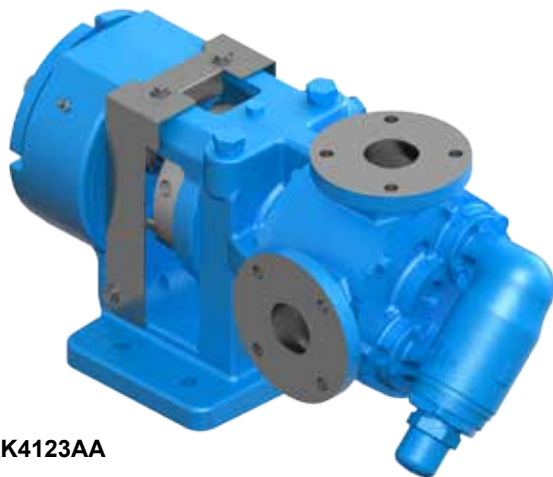
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SERIES 4223AA & 4323AA (Steel Externals)

Heavy-Duty, Foot-Mounted Internal Gear Pumps With API 682 Seals



R4323AA



KK4123AA

Operating Range:

Steel Externals Series 4223AA & 4323AA		
Nominal Flow	(GPM)	15 - 1600
	(M ³ /hr.)	3.4 - 364
Pressure Range	(PSI)	To 200 PSI
	(Bar)	To 14 Bar
Temp. Range	(°F)	-20°F to +400°F
	(°C)	-29°C to +205°C
Viscosity Range	(SSU)	28 SSU to 35,000 SSU
	(cSt)	0.1 cSt to 7,700 cSt

Note: Lower temperatures available with special materials.
Higher pressures available with factory approval.
Higher viscosities (to 2,000,000 SSU / 440,000 cSt) available with cartridge lip seals that fit API 682 dimensions, but are not API 682 compliant.

Nominal Flow Rates:

Pump Size	Steel Externals Series	
	GPM	M ³ /hr
H	15	3.4
HL	30	6.8
K	75	17
KK	100	23
LQ	135	31
LL	140	32
LS	200	45
Q	300	68
QS	500	113
N	600	136
R	1100	250
RS	1600	364

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VIKING UNIVERSAL 682 PUMPS

SERIES 4223AA & 4323AA (Steel Externals)

Series Description

The Universal 682 Series with API 682 seals is a complete series of pumps that offers the flexibility and adaptability of the Universal Seal series, and combines it with a bracket that accepts API 682-compliant cartridge seals.

For those seeking compliance with API Standard 676 for Positive Displacement pumps, Viking offers three options:

1. Universal Seal Series pumps with steel externals (Series 4123A, 4223A & 4323A, found in catalog Section 630) comply with most key requirements of API 676, but take exceptions to a number of specifications, including that they offer cartridge seals, but not API 682 cartridge seals.
2. Universal 682 Seal Series (4223AA & 4323AA, found in this catalog Section 632) offers all of the features, benefits and options of the Universal Seal Series pumps with steel externals, but features a larger bracket that enables use of API-682-compliant cartridge seals. This is the most versatile model available with the widest choice of options, yet offers the ability to use most brands and styles of API 682 seals and API seal plans.
3. The Universal XPD 676 Series (4223AX, 4323AX, found in catalog Section 633), is designed to be in full compliance with the API 676 standard, including API 682-compliant seals. These are Viking's most robust pumps, period. But full compliance actually limits the options available, so consider the AA models if the pump must be significantly customized to the application.

Key Features & Benefits

- Jacketed bracket with API 682 seal chamber standard
- Dual tapered roller-type thrust bearings with 25,000 hour L-10 life standard
- All Universal Seal Displacements (H, HL, K, KK, LQ, LL, LS, Q, QS, N, R & RS)
- All Universal Seal head options (Plain Head or With Relief Valve). Note: Standard is less valve. Integral relief valve not allowed by API 676 unless specified by user.
- All Universal Seal flange options (Class 150 or 300 Flat Face or Raised Face)
- All Universal Seal porting options (90° or opposite porting, rotatable to any position)
- All Universal Seal jacketing options (jacketed casing, jacketed head, jacketed relief valve)
- All Universal Seal material options (standard steel, low temperature steel, NACE-compliant steel), various bushing and gasketing or O-ring options
- Reversible direction of flow for line stripping
- Drain Port Option (NPT or welded flange adapter)

A full list of deviations from the API 676 specification is found in TR-701.



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

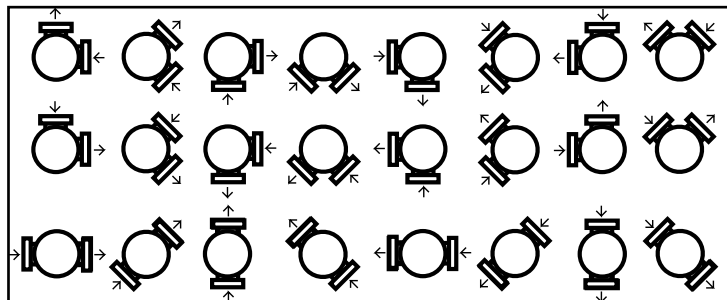
Revolvable Pump Casings Standard on H through Q Sizes

Universal 682 Seal Pumps are equipped with pump casings that can be positioned to meet common piping configurations. H through Q sizes have standard 90° ports which can be turned to any of eight positions, except where limited by the flange size. Direction of flow is reversible so any given port can be used as suction or discharge. Typical port configurations are shown below. See Optional Casings tables for available port options.

90° port options

Opposite port options

(Not available in all sizes)

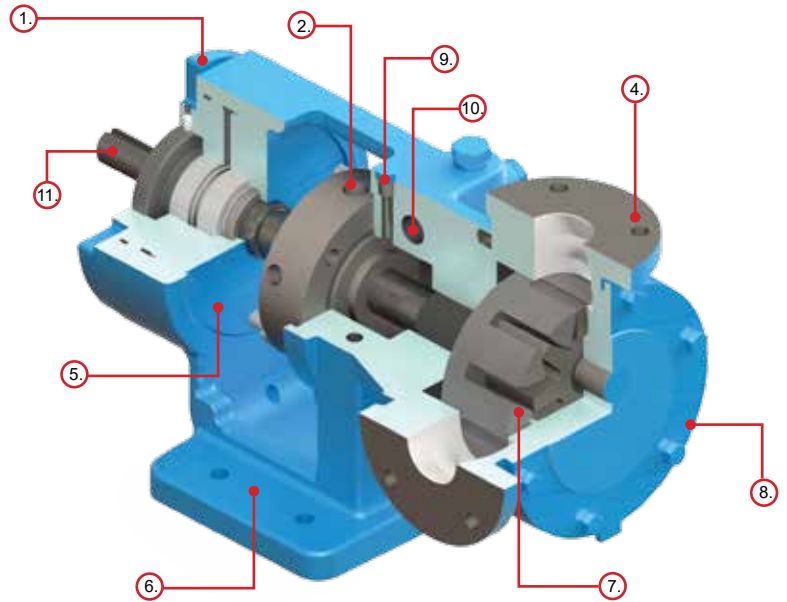


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Pump Construction and Features

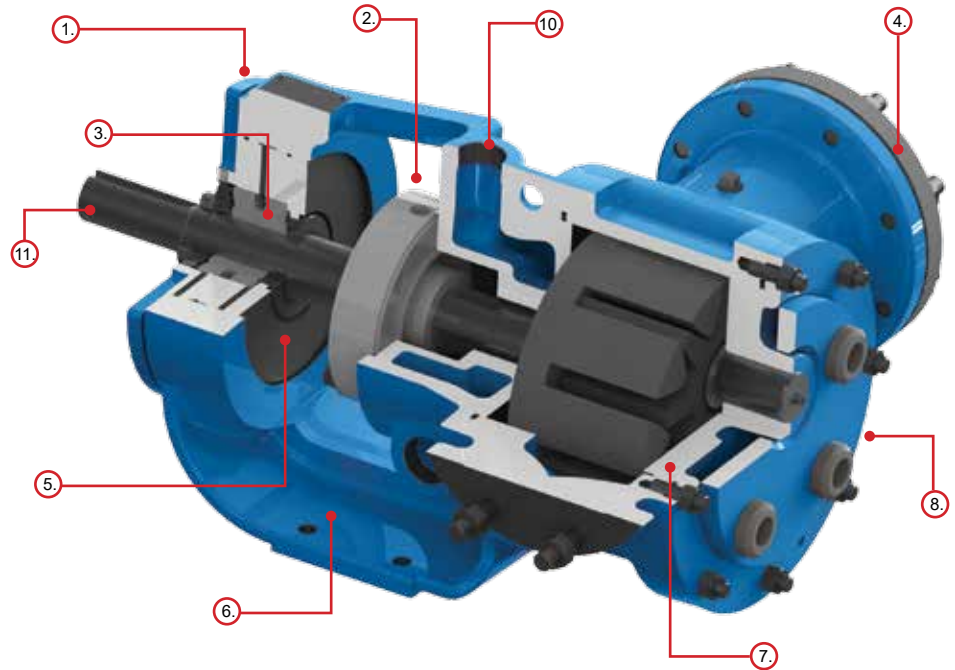
- 1. Large diameter threaded bearing housing allows easy removal of cartridge seals.
- 2. Seal chamber accepts most brands of cartridge seals conforming to API 682, Plan 13 standard, other seal plans available.
- 3. Tapered roller thrust bearings provide minimum 25,000 hour L-10 life at maximum flow, pressure and viscosity.
- 4. Multiple port sizes, types, and ratings are available including threaded, raised and flat face flanged (Class 150 & Class 300).

KK4223AA



- 5. Bearing housing protected by lip seals standard, with labyrinth seal option
- 6. One-piece cast bracket provides rigid foundation to maximize seal and bearing life.
- 7. Rotor end clearance can be adjusted to compensate for wear or for higher temperatures or viscosities by rotating the threaded bearing housing (1).
- 8. Plain head standard. Optional Head Jacket (shown).
- 9. Seal chamber venting port for start-up and draining pump prior to maintenance.
- 10. Jacketed bracket enables heating or cooling. Option casing and head jacketing.
- 11. Rectangular keyways transmit more torque.

QS4223AA

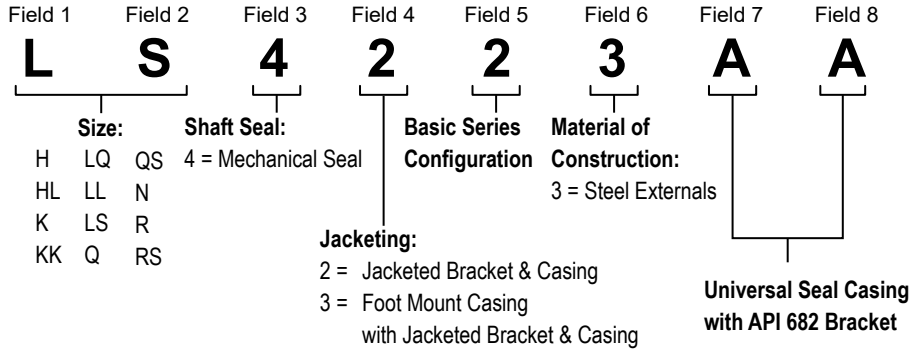


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VIKING UNIVERSAL 682 PUMPS

SERIES 4223AA & 4323AA (Steel Externals)

Model Number Key

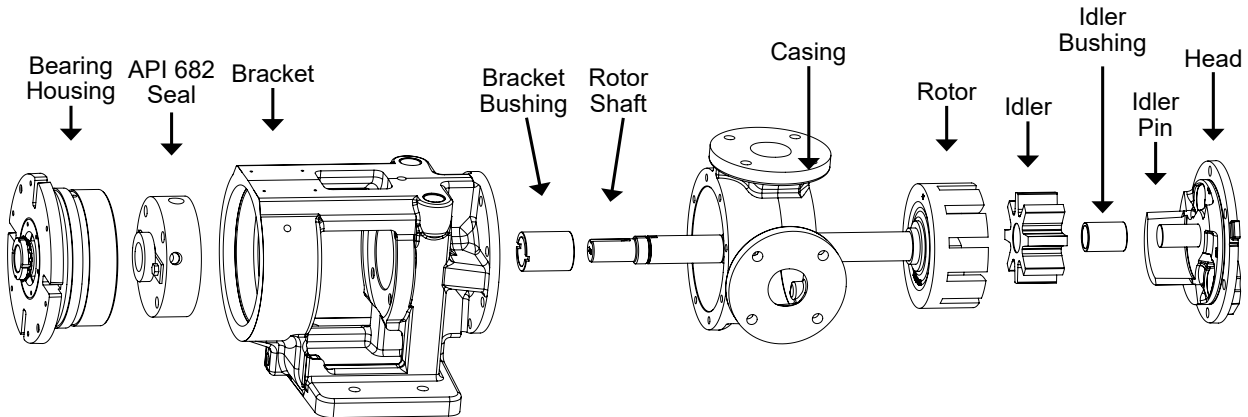


Materials of Construction

Component	Steel Externals Jacketed Series 223AA, 4223AA	
Casing	Steel ASTM A216, Grade WCB	
Head	Steel ASTM A216, Grade WCB	
Optional Head Jacket Plate	Steel ASTM A216, Grade WCB	
Bracket	⑤ Steel ASTM A216, Grade WCB	
Idler	② ③ Cast Iron ASTM A48 Class 35B	
Rotor	Standard	① Cast Iron ASTM A48, Class 35B
	Steel Fitted	④ Steel ASTM A148, Grade 80-40
Rotor Shaft	⑤ Steel ASTM A108, Grade 1045	
Idler Pin	Hardened Steel ASTM A108, Grade 1045	
Idler Bushing	Carbon Graphite	
Bracket Bushing	Carbon Graphite	
Mechanical Seal	SS gland, Carbon / SiC / Viton®	

- ① KK, LS, QS, N and RS sizes have ductile iron rotor, ASTM A536 Grade 60-40-18.
- ② Steel fitted Q and QS sizes have steel idler.
- ③ H and HL sizes have powdered metal idler, MPIF Std 35 FC-0208-50.
- ④ Material specification for HL steel rotor is AISI 8620, LS steel rotor is ASTM A148 80-50.
- ⑤ Traceability standard.

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VIKING UNIVERSAL 682 PUMPS

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SERIES 4223AA & 4323AA (Steel Externals)

Specifications

U.S. Units:

Model Number	⑤ Standard Port Size	Nominal Pump Rating (100 SSU and below)		Max. Hydrostatic Pressure	① Max. Discharge Pressure for 100 SSU Liquid at rated speed	② Max. Recommended Temp. for Standard Pump (°F)	Steel Fitted Recommended Above	Approx. Shipping Weight with Valve
	Inches	GPM	RPM	PSIG	PSIG	④ Mech Seal	SSU	Pounds
H4223AA	③ 1 ½	15	1750	400	200	350	25,000	170
HL4223AA	③ 1 ½	30	1750	400	200	350	7,500	170
K4223AA	③ 2	80	780	400	200	350	25,000	215
KK4223AA	③ 2	100	780	400	200	350	75,000	215
LQ4223AA	③ 2 ½	135	640	400	200	350	25,000	345
LL4223AA	③ 3	140	520	400	200	350	2,500	350
LS4223AA	③ 3	200	640	400	200	350	75,000	360
Q4223AA	③ 4	300	520	400	200	350	7,500	640
QS4223AA	③ 6	500	520	400	200	350	75,000	700
N4323AA	③ 6	600	350	400	200	225	75,000	1015
R4323AA	③ 8	1100	280	400	200	225	25,000	2050
RS4323AA	③ 10	1600	280	400	125	225	75,000	2450

NOTE: H-N size pumps are standard with a jacketed bracket and plain head. R size pumps are standard with a jacketed bracket and jacketed head. RS size pumps are standard with a jacketed bracket, jacketed casing and jacketed head.

- ① For maximum recommended discharge pressures at different viscosities, see performance curves, which can be electronically generated with the Viking Pump Selector Program, located on www.vikingpump.com. If suction pressure exceeds 50 PSIG, consult factory. Higher pressures possible with factory approval based on application details.
- ② Higher temperatures can be handled with special construction and/or extra clearances, consult factory.
- ③ Ports are suitable for Class 150 ANSI steel or stainless steel companion flanges or flanged fittings.
- ④ Temperature based on Viton® seal as standard. Lower temperature limits may be required when using other seal elastomers
- ⑤ See page 632.11 for other port size options.

Metric Units:

Model Number	⑤ ⑥ Standard Port Size	Nominal Pump Rating (22 cSt and below)		Max. Hydrostatic Pressure	① Max Discharge Pressure for 22 cSt Liquid at rated speed	② Max Recommended Temp. for Standard Pump (°C)	Steel Fitted Const. Recommended Above	Approx. Shipping Weight with Valve
	Inches	M³/hr	RPM	BAR	BAR	④ Mech Seal	cSt	KG
H4223AA	③ 1 ½	3.4	1450	28	14	180	5,500	77
HL4223AA	③ 1 ½	6.8	1450	28	14	180	1,650	77
K4223AA	③ 2	18	780	28	14	180	5,500	98
KK4223AA	③ 2	23	780	28	14	180	16,500	98
LQ4223AA	③ 2 ½	31	640	28	14	180	5,500	156
LL4223AA	③ 3	32	520	28	14	180	550	159
LS4223AA	③ 3	45	640	28	14	180	16,500	163
Q4223AA	③ 4	68	520	28	14	180	1,650	290
QS4223AA	③ 6	114	520	28	14	180	16,500	318
N4323AA	③ 6	136	350	28	14	107	16,500	460
R4323AA	③ 8	250	280	28	14	107	5,500	930
RS4323AA	③ 10	364	280	28	9	107	16,500	1111

NOTE: H-N size pumps are standard with a jacketed bracket and plain head. R size pumps are standard with a jacketed bracket and jacketed head. RS size pumps are standard with a jacketed bracket, jacketed casing and jacketed head.

- ① For maximum recommended discharge pressures at different viscosities, see performance curves, which can be electronically generated with the Viking Pump Selector Program, located on www.vikingpump.com. If suction pressure exceeds 50 PSIG, consult factory. Higher pressures possible with factory approval based on application details.
- ② Higher temperatures can be handled with special construction and/or extra clearances. Consult factory.
- ③ Ports are suitable for Class 150 ANSI steel or stainless steel companion flanges or flanged fittings.
- ④ Temperature based on Viton® seal as standard. Lower temperature limits may be required when using other seal elastomers.
- ⑤ See page 632.7 for other port size options.
- ⑥ Port sizes are inch standard, not metric design or size.

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VIKING UNIVERSAL 682 PUMPS

SERIES 4223AA & 4323AA (Steel Externals)

Optional Casings for Different Port Configurations

Model Number	Standard Ports †	Non-Jacketed Casing Options						Jacketed Casing Options	
H4123AA	1.5"①	1.5"②®	2"①®	2"②®				2"②®	
HL4123AA	1.5"①	1.5"②®	2"①®	2"②®				2"②®	
K4123AA	2"①	2"②®	2.5"①®	2.5"②®	3"①®	3"②®	4"①®	4"②®	3"①®; 4"①®; 3"②®; 3"②®
KK4123AA	2"①	2"②®	2.5"①®	2.5"②®	3"①®	3"②®	4"①®	4"②®	3"①®; 4"①®; 3"②®; 3"②®
LQ4123AA	2.5"①	2.5"②®	3"②®	4"①®	4"②®	6"①®			3"①®; 3"②®; 4"②®
LL4123AA	3"①	3"②®	4"①®	4"②®					
LS4123AA	3"①	3"②®	4"①®	4"②®					4"①®; 6"①®; 4"②®
Q4123AA	4"①	4"②®	5"①®	5"②®	6"①®*	6"②®*	6"①®	6"②®	4"①®; 4"②®
QS4123AA	6"①◎	6"①®	6"②◎						6"①®; 6"②◎
N4323AA	6"①◎								6"①®; 8"②◎
R4323AA	8"①◎								8"①◎
RS4323AA	10"①◎								

† Standard port configuration is 90° which may be rotated (H-Q) or opposite (QS-RS) with right hand inlet viewed from the shaft end. 90° ports may be rotated.

① Port(s) suitable for Class 150 ANSI steel or stainless steel companion flanges or flanged fittings.

② Port(s) suitable for Class 300 ANSI steel or stainless steel companion flanges or flanged fittings.

® 90° port arranged for Right Hand inlet (viewed from shaft end)

ℳ 90° port arranged for Left Hand inlet (viewed from shaft end)

Ⓝ Non-Rotatable Ports at 90 degree angle, contact factory for available orientation (right hand or left hand)

◎ Opposite Ports

* Core smaller than port size

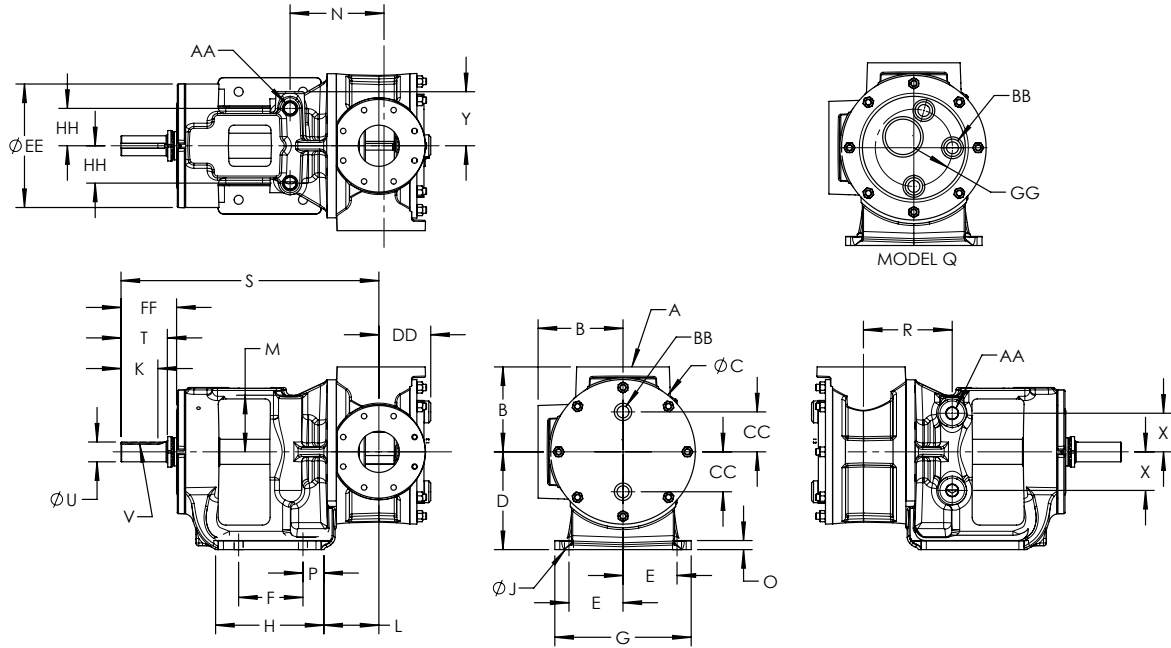
Contact factory for flange details (e.g. Flat face or raised face flanges)

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SERIES 4223AA & 4323AA (Steel Externals)

Dimensions - H through Q Sizes – All Materials of Construction



Model Number	A (in)		B	C	D	E	F	G	H	J	K	L	M	N	O
H4223AA HL4223AA	① 1.5	in	4.00	4.75	6.00	4.25	5.00	11.00	8.63	0.47	0.99	3.83	3.83	5.95	0.94
		mm	101.6	120.7	152.4	108.0	127.0	279.4	219.2	11.9	25.1	97.3	97.3	151.1	23.9
K4223AA KK4223AA	① 2	in	5.25	8.00	6.50	4.38	3.50	11.00	7.74	0.53	1.42	3.00	4.00	6.02	0.94
		mm	133.4	203.2	165.1	111.3	88.9	279.4	196.6	13.5	36.1	76.2	101.6	152.9	23.9
LQ4223AA	① 2.5	in	7.19	10.25	7.00	5.00	5.00	12.50	8.39	0.53	1.42	3.38	4.34	7.01	0.81
		mm	182.6	260.4	177.8	127.0	127.0	317.5	213.1	13.5	36.1	85.9	110.2	178.1	20.6
LL4223AA	① 3	in	7.19	10.25	7.00	5.00	5.00	12.50	8.39	0.53	1.42	3.38	4.34	7.01	0.81
		mm	182.6	260.4	177.8	127.0	127.0	317.5	213.1	13.5	36.1	85.9	110.2	178.1	20.6
LS4223AA	① 3	in	7.19	10.25	7.00	5.00	5.00	12.50	8.39	0.53	1.42	4.55	4.34	8.18	0.81
		mm	182.6	260.4	177.8	127.0	127.0	317.5	213.1	13.5	36.1	115.6	110.2	207.8	20.6
Q4223AA	① 4	in	8.25	14.00	9.50	5.25	6.25	13.25	10.52	0.69	3.58	5.35	5.50	8.63	1.08
		mm	209.6	355.6	241.3	133.4	158.8	336.6	267.2	17.5	90.9	135.9	139.7	219.2	27.4

Model Number		P	R	S	T	U	V	X	Y	② AA	③ BB	CC	DD	EE	FF	GG	HH
H4223AA HL4223AA	in	1.61	5.95	16.91	1.59	0.75	.19 x .09	2.38	3.63	3/4"	1/2"	0.94	2.41	8.38	2.30		2.38
	mm	40.9	151.1	429.5	40.4	19.1		60.5	92.2			23.9	61.2	212.9	58.4		60.5
K4223AA KK4223AA	in	2.00	6.02	18.58	2.29	1.125	.25 x .12	2.63	3.62	3/4"	1-1/4"	1.75	3.25	8.43	2.92		2.41
	mm	50.8	152.9	471.9	58.2	28.6		66.8	91.9			44.5	82.6	214.1	74.2		61.2
LQ4223AA	in	1.38	7.01	22.98	2.25	1.12	.25 x .12	3.00	4.25	1"	1"	3.00	3.81	8.43	2.93		2.75
	mm	35.1	178.1	583.7	57.2	28.4		76.2	108.0			76.2	96.8	214.1	74.4		69.9
LL4223AA	in	1.38	7.01	22.98	2.25	1.12	.25 x .12	3.00	4.25	1"	1"	3.00	4.31	8.43	2.93		2.75
	mm	35.1	178.1	583.7	57.2	28.4		76.2	108.0			76.2	109.5	214.1	74.4		69.9
LS4223AA	in	1.38	8.18	24.15	3.55	1.44	.38 x .19	3.00	4.25	1"	1"	3.00	4.5	8.43	4.03		2.75
	mm	35.1	207.8	613.4	90.2	36.6		76.2	108.0			76.2	114.3	214.1	102.4		69.9
Q4223AA	in.	2.03	8.63	25.06	4.50	1.94	.50 x .25	3.75	5.25	1"	1-1/4"		4.57	12.09	5.35	3.75	3.63
	mm	51.6	219.2	636.5	114.3	49.3		95.3	133.4				116.1	307.1	135.9	95.3	92.2

① Ports are suitable for Class 150 ANSI steel or stainless steel companion flanges or flanged fittings.

② Ports for steam or hot oil jacketing are inch standard NPT threads. Metric (mm) equivalents are for information only, and do not indicate a metric thread size.

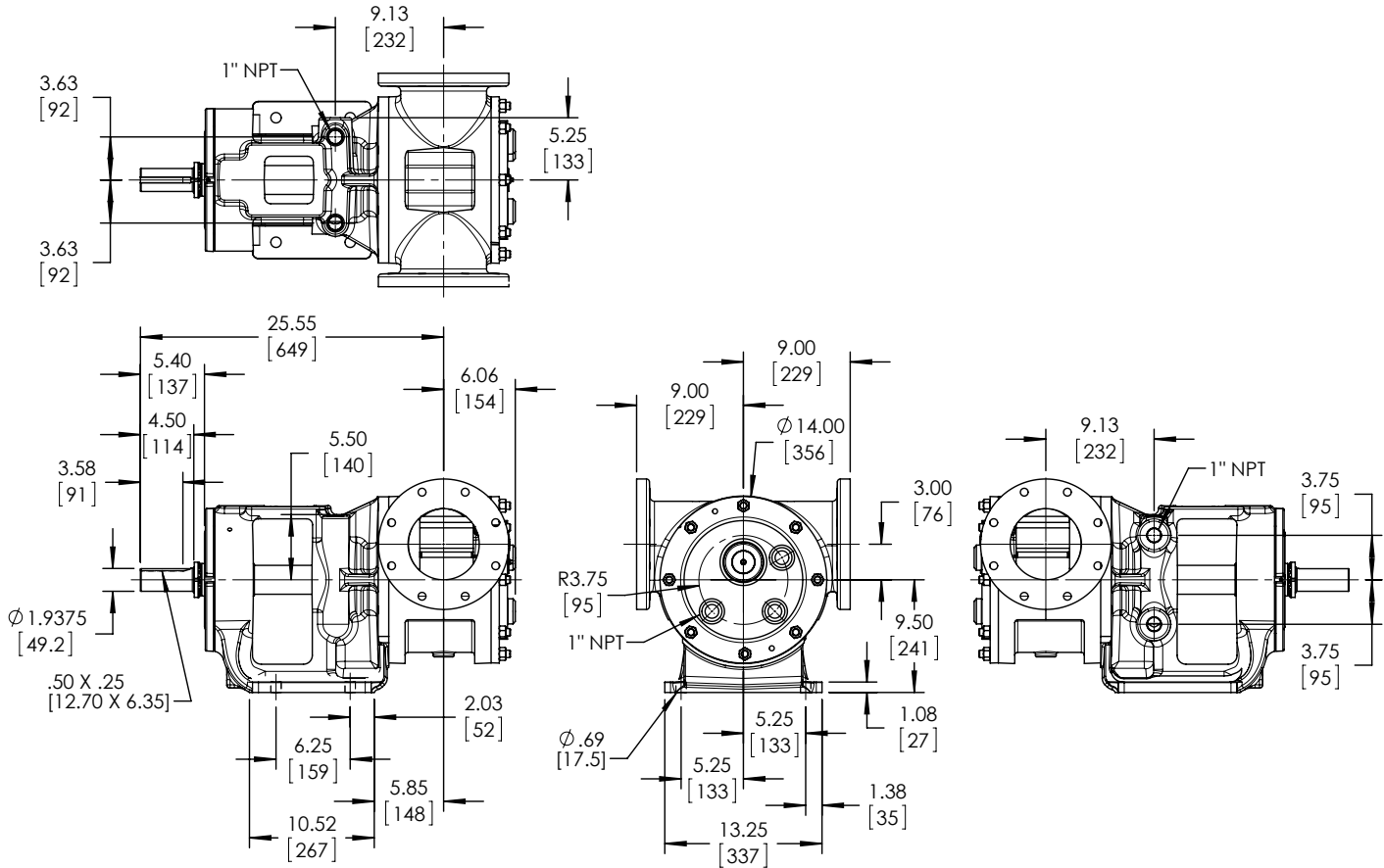
③ "BB" Dimension for Q223A and Q227A is 1"(25.4 mm).

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VIKING UNIVERSAL 682 PUMPS

SERIES 4223AA & 4323AA (Steel Externals)

Dimensions - QS Size – All Materials of Construction



Model Number	BB*	DD	GG
Mechanical Seal			
QS4223AA	1 (25.4)	6.06 (152.93)	3.75 (95.25)

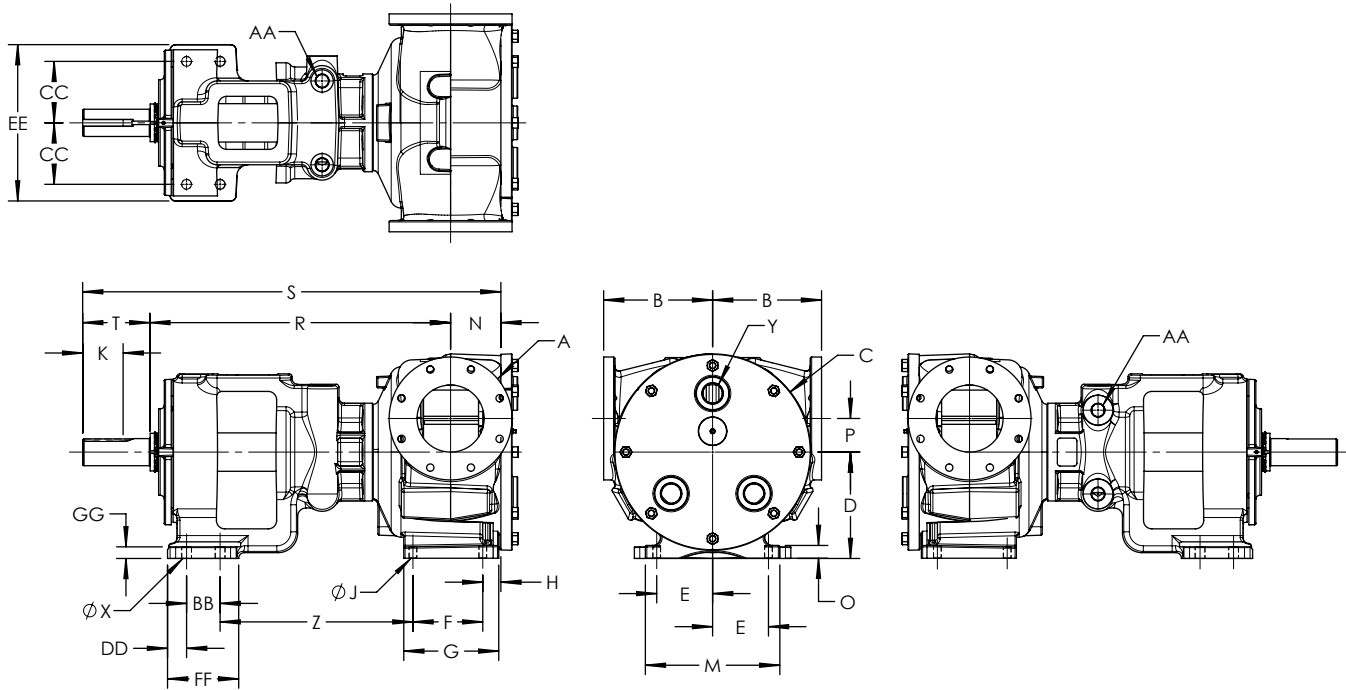
* Ports for steam or hot oil jacketing are inch standard NPT threads. Metric (mm) equivalents are for information only, and do not indicate a metric thread size.

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SERIES 4223AA & 4323AA (Steel Externals)

Dimensions - N, R & RS, Sizes – All Materials of Construction



Model Number	A (in)		B	C	D	E	F	G	H	J	K	M	N	O	P	R	S	T	U	V	X	Y	Z
N4324AA N4323AA N4327AA	① 6	in	9.75	17.25	9.50	5.00	6.25	8.69	1.62	0.69	4.50	12.00	4.50	1.00	3.00	26.00	36.50	6.00	2.44	.62 x .31	0.69	N/A	18.94
		mm	247.7	438.1	241.3	127.0	158.7	220.7	41.1	17.5	114.3	304.8	114.3	25.4	76.2	660.4	927.1	152.4	62.0	15.74 x 7.87	17.5	N/A	481.0
R4324AA R4323AA R4327AA	① 8	in	14.25	24.50	13.25	6.75	7.00	10.56	2.31	0.78	6.00	16.00	5.62	1.00	4.50	28.75	41.00	6.62	3.44	.88 x .44	0.69	1.25	19.25
		mm	361.9	622.3	336.5	171.4	177.8	268.2	58.7	19.8	152.4	406.4	142.7	25.4	114.3	730.2	1041	168.1	87.4	22.35 x 11.18	17.5	31.7	488.9
RS4324AA RS4323AA RS4327AA	① 10	in	14.25	24.5	13.25	6.75	7.00	13.12	4.81	0.88	6.00	16.46	8.12	1.30	4.50	28.55	43.49	6.62	3.44	.88 x .44	0.88	1.25	19.25
		mm	361.9	622.30	336.5	171.4	177.8	333.24	122.17	22.35	152.4	418.08	206.24	33.02	114.3	725.17	1104.64	168.1	87.4	22.35 x 11.18	22.35	31.7	488.9

Model Number		AA	BB	CC	DD	EE	FF	GG
N4324AA N4323AA N4327AA	in	1	3.00	5.50	1.46	14.00	6.37	1.19
	mm	---	76.2	139.7	37.1	355.6	161.8	30.2
R4324AA R4323AA R4327AA	in	1.5	3.25	7.75	2.01	19.00	7.17	1.20
	mm	---	82.6	196.9	51.1	482.6	182.1	30.5
RS4324AA RS4323AA RS4327AA	in	1.5	3.25	7.75	2.01	19.00	7.17	1.20
	mm	---	82.6	196.9	51.1	482.6	182.1	30.5

① Ports are suitable for use with Class 150 ANSI steel or stainless steel companion flanges or flanged fittings.

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VIKING UNIVERSAL 682 PUMPS

SERIES 4223AA & 4323AA (Steel Externals)

Performance Curve Notes

Printed performance curves are not available.

Performance curves can be electronically generated with the Viking Pump Selector Program. This program can be located on www.vikingpump.com for the general public.

For authorized distributors, this program can be found listed under the “Products” tab at www.idexconnect.com. Security passwords are required to access IDEXconnect.

INLET CONDITIONS: The performance curves show “Based on 10 (or 15) In.-Hg.,” which is the standard test condition. This is not the maximum vacuum capability of the pump.

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.

FOR VISCOSITIES GREATER THAN 750 SSU (NPSH_R data not available): The performance curves are based on 10 or 15 In.-Hg. While vacuums up to 20 In.-Hg. will not generally result in any loss of capacity, it is recommended that the suction line size and possibly the pump port size

be increased to hold the expected vacuum to 15 In.-Hg. or less. Vacuum above 20 In.-Hg. should be avoided. Refer to General Catalog, Engineering Section 510 for information on determining line size.

THIN LIQUIDS: pump capacity when handling 28 SSU liquids (solvents, etc.) is shown on the 38 SSU performance curve as a broken line. Pressure shown on broken line is maximum recommended for 28 SSU liquid. Horsepower for 28 SSU is same as 38 SSU at any given pressure. Carbon graphite bushings must be used handling 28 SSU liquids.

MECHANICAL EFFICIENCY: The Mechanical Efficiency (expressed in percent) can be calculated using the following formula:

$$\text{Mechanical Efficiency} = \frac{(\text{Differential Pressure, PSI}) (\text{Capacity, GPM}) (100)}{(\text{Horsepower, BHP}) (1715)}$$

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

Steel Externals Series 4223A and 4323A

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 ^①	9.5	13.5
K, KK	-	1.7	1.8	1.9	2.1	2.3	2.8	3.3	4.4 ^①	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 ^①	7.3	10.8	-	-	-	-	-
LL	1.6	1.8	2.0	2.2	2.5	3.0	3.8	5.0 ^①	7.3	-	-	-	-	-	-
LS	1.6	1.8	2.0	2.2	2.5	3.0	3.8	5.0	7.3 ^①	10.8	-	-	-	-	-
Q, QS	1.9	2.1	2.3	2.7	3.3	4.2	6.1 ^①	8.4	12.7	-	-	-	-	-	-
N ^②	2.1	2.3	3.5	4.5	6.3	9.5	15.0	-	-	-	-	-	-	-	-
R ^②	2.7	3.2	4.2	5.8	8.2	11.9	-	-	-	-	-	-	-	-	-

① Maximum Speed for Stainless Steel Models

② Ductile Iron not available in N and R sizes

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SERIES 4223AA & 4323AA (Steel Externals)

Performance Curve Notes Cont'd

METRIC CONVERSION: The following table has been compiled for conversion to metric values.

VACUUM		PRESSURE			CAPACITY		
In.-Hg (inches of mercury)	KPa* (Kilopascals)	PSI (lb./in ²)	kPa* (Kilopascals)	BAR	GPM (US gal/minute)	LPM (Liter/Minute)	M ³ /hr
1	3.4	1	6.9	0.07	1	3.8	0.23
5	17	25	172	1.7	0.26	1	0.06
10	34	50	345	3.4	4.4	16.7	1
15	51	100	690	6.9			
20	68	150	1034	10.3			
25	85	200	1379	13.8			
		250	1724	17.2			

* 100 kPa = 1 bar