

UNIVERSAL PRODUCT LINE: STEEL EXTERNALS — JACKETED PUMPS

SERIES 4223AA, 4323AA (API 682 Seal)

Section	1304
Page	1304.1
Issue	D

TABLE OF CONTENTS

Features & Benefits	2
Revolvable Pump Casings.....	2
Materials of Construction	2
Cutaway View & Pump Features	3
Model Number Key	4
Specifications	4
Optional Casings – H through RS Sizes.....	5
Dimensions – H through Q Sizes	6
Dimensions – QS Size	7
Dimensions – N, R, RS Sizes – Jacketed Bracket.....	8
NPSH Required	9

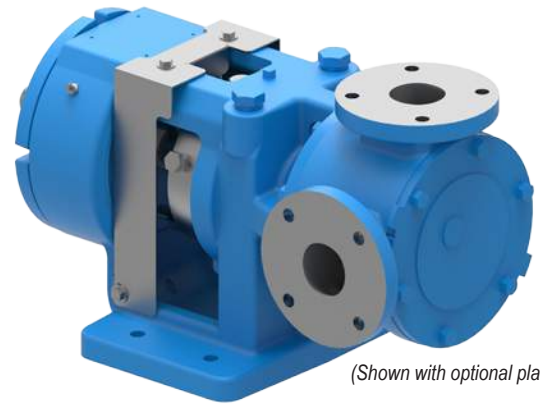
RELATED PRODUCTS

Steel Externals, Jacketed Pumps (API 676 Compliant):
Catalog Section 1305

Stainless Steel, Jacketed Pumps (API 676 Compliant):
Catalog Section 1705

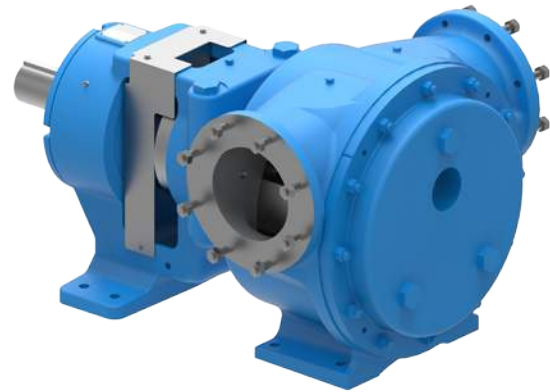
SERIES DESCRIPTION

4223AA & 4323AA Series pumps offer all of the features, benefits and options of the Universal Product Line pumps with steel externals construction, but feature 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.



(Shown with optional plain head)

KK4223AA



R4323AA

OPERATING RANGE

SERIES	NOMINAL FLOW		MAXIMUM PRESSURE		TEMPERATURE RANGE		VISCOSITY RANGE	
	GPM	m ³ h	PSI	Bar	°F	°C	SSU	cSt
4223AA	15 - 1,600	3.4 - 364	200	14	-20 to +550	-30 to +290	28 to 35,000	1 to 7,500
4323AA	15 - 1,600	3.4 - 364	200	14	-20 to +550	-30 to +290	28 to 35,000	1 to 7,500

Section	1304
Page	1304.2
Issue	D

UNIVERSAL PRODUCT LINE: STEEL EXTERNALS — JACKETED PUMPS

SERIES 4223AA, 4323AA (API 682 Seal)

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 Product Line Displacements (H, HL, K, KK, LQ, LL, LS, Q, QS, N, R & RS)
- All Universal Product Line 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 Product Line flange options (Class 150 or 300 Flat Face or Raised Face)
- All Universal Product Line porting options (90° or opposite porting, rotatable to any position)
- All Universal Product Line jacketing options (jacketed casing, jacketed head, jacketed relief valve)
- All Universal Product Line 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
- Standard with jacketed bracket.

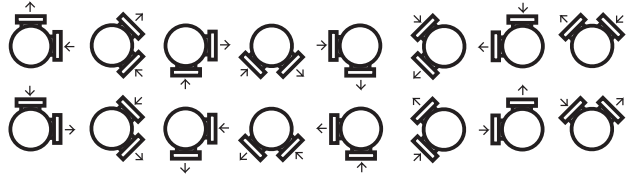
A full list of deviations from the API 676 specification is found in TR-701.



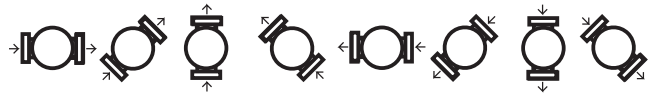
Viking Universal Product Line pumps carry a three year limited warranty. See catalog section 000 for details.

REVOLVABLE PUMP CASINGS

90° port options:



Opposite port options:



NOTE: See page 1304.5 for a complete list of casing options by size.

MATERIALS OF CONSTRUCTION

Component	Standard Material	
Casing	⑤ Steel, ASTM A216, Class WCB	
Head	⑤ Steel, ASTM A216, Class WCB	
Optional Head Jacket Plate	Steel, ASTM A216, Class WCB	
Bracket	⑤ Steel, ASTM A216, Class WCC	
Idler	②③ 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	
Relief Valve	Steel, ASTM A216, Class WCB	
Standard Mechanical Seal	SS Gland, Carbon / Silicon Carbide / FKM Elastomers	

- 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. **Note:** head-mounted relief valve or cover plate traceability is optional, not standard.

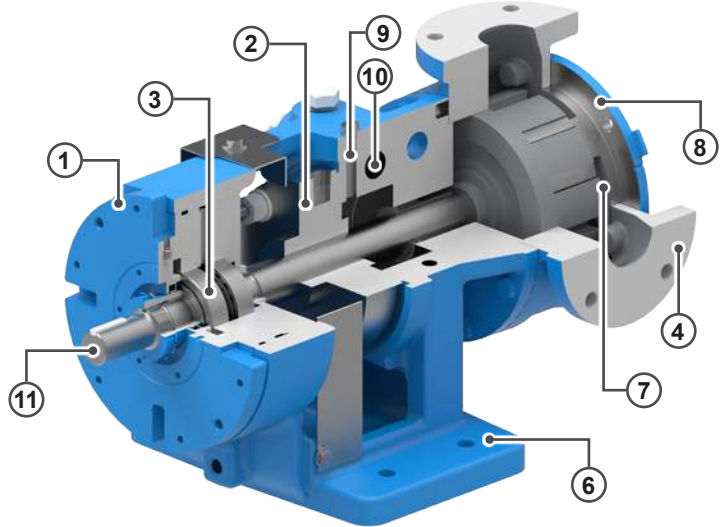
**UNIVERSAL PRODUCT LINE:
STEEL EXTERNALS — JACKETED PUMPS**
SERIES 4223AA, 4323AA (API 682 Seal)

Section	1304
Page	1304.3
Issue	D

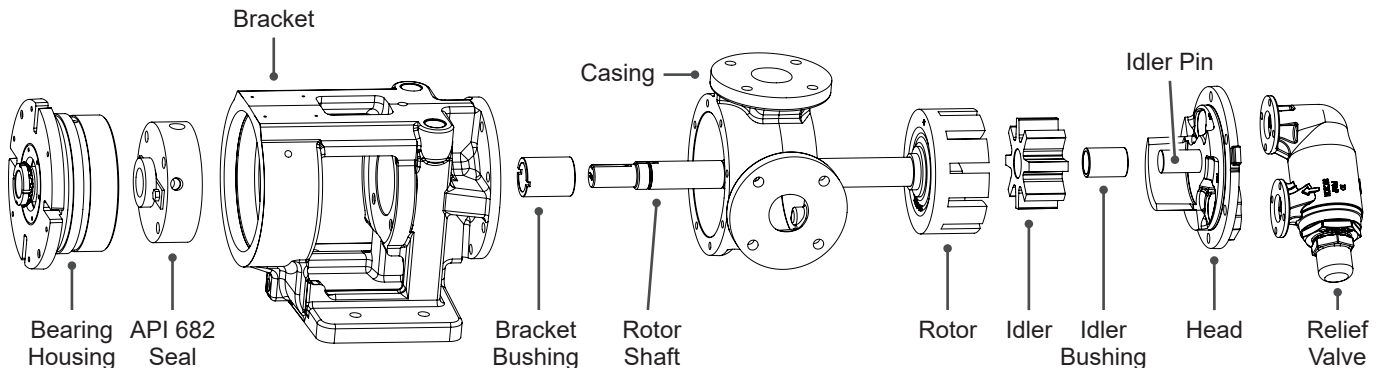
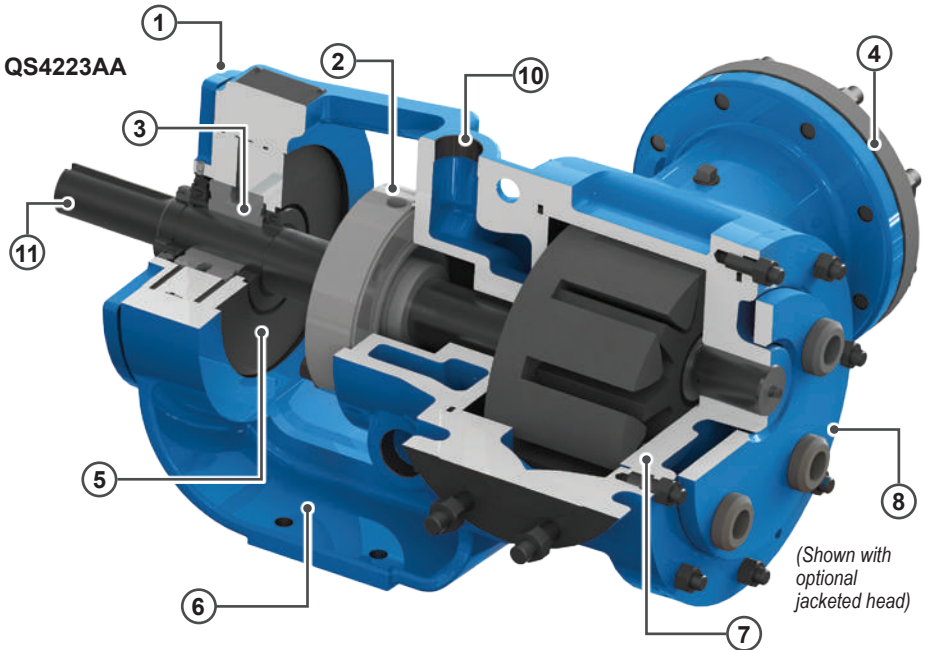
CUTAWAY VIEW & PUMP FEATURES

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).
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. Head Jacket Optional (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 jacking.
11. Rectangular keyways transmit more torque.

KK4223AA



QS4223AA

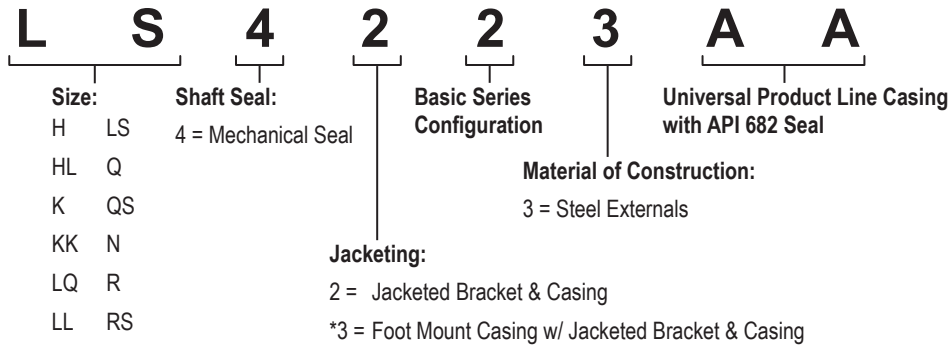


Section	1304
Page	1304.4
Issue	D

UNIVERSAL PRODUCT LINE: STEEL EXTERNALS — JACKETED PUMPS

SERIES 4223AA, 4323AA (API 682 Seal)

MODEL NUMBER KEY



* Only the N through RS sizes are foot mount with jacketed bracket.

SPECIFICATIONS

Model Number	③ Standard Port Size	Nominal Pump Rating (100 SSU & below)			④ Maximum Hydrostatic Pressure		① Maximum Discharge Pressure		② Maximum Recommended Temperature for Standard Pump		Approximate Shipping Weight with Valve	
	Inches	GPM	m ³ /h	RPM	PSIG	BAR	PSIG	BAR	°F	°C	Lbs.	Kg.
H4223AA	1 ½	15	3.4	1750	400	28	200	14	350	180	170	77
HL4223AA	1 ½	30	6.8	1750	400	28	200	14	350	180	170	77
K4223AA	2	80	18	780	400	28	200	14	350	180	215	98
KK4223AA	2	100	23	780	400	28	200	14	350	180	215	98
LQ4223AA	2 ½	135	31	640	400	28	200	14	350	180	345	156
LL4223AA	3	140	32	520	400	28	200	14	350	180	350	159
LS4223AA	3	200	45	640	400	28	200	14	350	180	360	163
Q4223AA	4	300	68	520	400	28	200	14	350	180	640	290
QS4223AA	6	500	114	520	400	28	200	14	350	180	700	318
N4223AA	6	600	136	350	400	28	200	14	350	180	1,015	460
R4323AA	8	1,100	250	280	400	28	200	14	350	180	2,050	930
RS4323AA	10	1,600	364	280	400	28	125	9	350	180	2,450	1,111

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 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 Higher temperatures can be handled with special construction and/or extra clearances, consult factory. Temperature based on Fluoroelastomer (FKM) seal as standard. Lower temperature limits may be required when using other seal elastomers
- ③ Ports are suitable for Class 150 steel or stainless steel companion flanges or flanged fittings.
- ④ Maximum hydrostatic pressure for standard pump construction. Rating is dependent on seal, gaskets and ports.

**UNIVERSAL PRODUCT LINE:
STEEL EXTERNALS — JACKETED PUMPS**
SERIES 4223AA, 4323AA (API 682 Seal)

Section	1304
Page	1304.5
Issue	D

OPTIONAL CASINGS – H THROUGH RS SIZES

Size	Standard Casings		Non-Jacketed Casing Options							Fully-Jacketed Casing Options
	Ports (Inches)	Rotatable Data								
H	1.5"①®	Fully Rotatable	1.5"②®	2"①®	2"②®					2"②®
HL	1.5"①®	Fully Rotatable	1.5"②®	2"①®	2"②®					2"②®
K	2"①®	Fully Rotatable	2"②®	2.5"①®	2.5"②®	3"①®	3"②®	4"①®	4"②®	3"①®, 4"①®, 3"②®, 3"②◎
KK	2"①®	Fully Rotatable	2"②®	2.5"①®	2.5"②®	3"①®	3"②®	4"①®	4"②®	3"①®, 4"①®, 3"②®, 3"②◎
LQ	2.5"①®	Ports cannot face down	2.5"②®	3"②®	4"①®	4"②®	6"①®			3"①®, 3"②®, 4"②®
LL	3"①®	Ports cannot face down	3"②®	4"①®	4"②®					
LS	3"①®	Fully Rotatable	3"②®	4"①®	4"②®					4"①®, 6"①®, 4"②®
Q	4"①®	Fully Rotatable	4"②®	5"①®	5"②®	6"①®*	6"②®*	6"①◎	6"②◎	4"①®, 4"②®
QS	6"①◎	Rotatable with special casing	6"①®	6"②◎						6"①®, 6"②◎
N	6"①◎	Not Rotatable								6"①®, 8"②◎
R	8"①◎	Not Rotatable								8"①◎
RS	10"①◎	Not Rotatable								

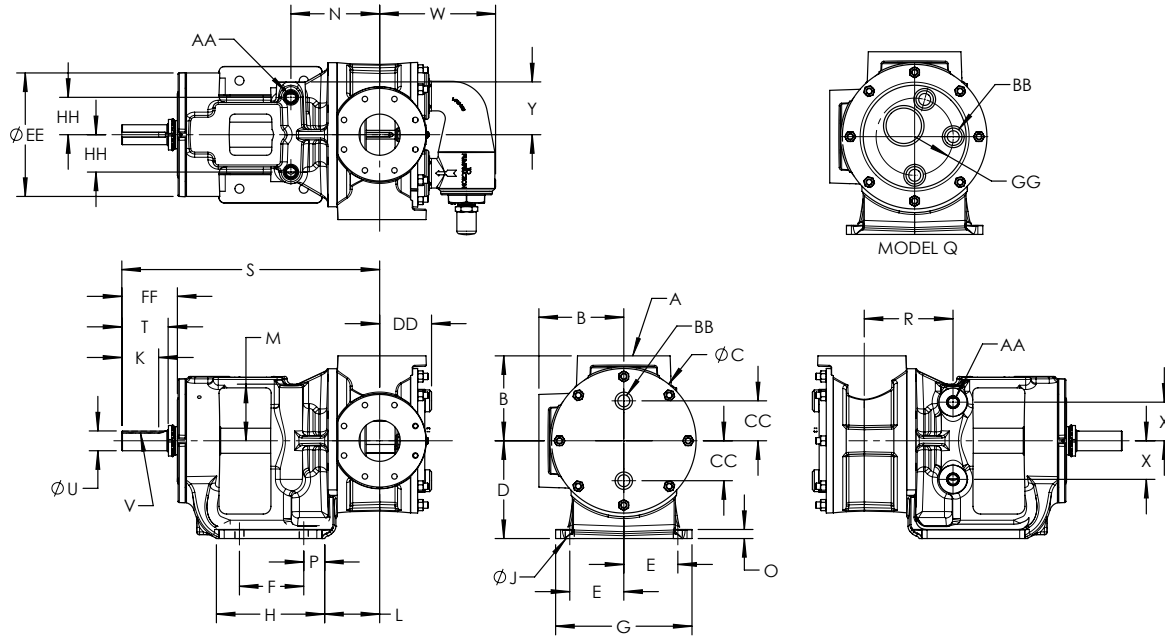
- ① Ports suitable for Class 150 ANSI steel or stainless steel companion flanges or flanged fittings.
- ② Ports suitable for Class 300 ANSI steel or stainless steel companion flanges or flanged fittings.

- Ⓝ Non-Rotatable Ports at 90 degree angle, contact factory for available orientation (right hand or left hand)
- ◎ Opposite Ports
- ® 90° port arranged for Right Hand inlet (viewed from shaft end)

Section	1304
Page	1304.6
Issue	D

**UNIVERSAL PRODUCT LINE:
STEEL EXTERNALS — JACKETED PUMPS**
SERIES 4223AA, 4323AA (API 682 Seal)

DIMENSIONS – H THROUGH Q SIZES



Model Number	A (in)		B	C	D	E	F	G	H	J	K	L	M	N	O	P
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	1.61
		mm	102	121	152	108	127	279	219	12	25	97	97	151	24	41
K4223AA KK4223AA	① 2	in	5.25	8.00	6.50	4.38	3.50	11.00	7.74	0.53	1.42	4.62	4.00	6.02	0.94	2.00
		mm	133	203	165	111	89	279	197	13	36	117	102	153	24	51
LQ4223AA	① 2.5	in	7.19	10.25	7.00	5.00	5.00	12.50	8.39	0.53	2.55	3.38	4.34	7.01	0.81	1.38
		mm	183	260	178	127	127	318	213	13	65	86	110	178	21	35
LL4223AA	① 3	in	7.19	10.25	7.00	5.00	5.00	12.50	8.39	0.53	2.55	3.38	4.34	7.01	0.81	1.38
		mm	183	260	178	127	127	318	213	13	65	86	110	178	21	35
LS4223AA	① 3	in	7.19	10.25	7.00	5.00	5.00	12.50	8.39	0.53	2.55	4.55	4.34	8.18	0.81	1.38
		mm	183	260	178	127	127	318	213	13	65	116	110	208	21	35
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	2.03
		mm	210	356	241	133	159	337	267	18	91	136	140	219	27	52

Model Number		R	S	T	U (in)	V (in)	W	X	Y	AA (in)	BB (in)	CC	DD	EE	FF	GG	HH
H4223AA HL4223AA	in	5.95	16.91	1.59	0.75	.19 x .07	4.04	2.38	3.63	3/4"	1/2"	0.94	2.41	8.38	2.30	—	2.38
	mm	151	430	40			103	60	92			24	61	213	58	—	60
K4223AA KK4223AA	in	6.02	18.58	2.29	1.12	.25 x .10	7.00	2.63	3.62	3/4"	1/4"	1.75	3.25	8.43	2.92	—	2.41
	mm	153	472	58			178	67	92			44	83	214	74	—	61
LQ4223AA	in	7.01	23.01	3.50	1.12	.38 x .14	7.18	3.00	4.25	1"	1"	3.00	3.81	8.43	4.33	—	2.75
	mm	178	584	89			182	76	108			76	97	214	110	—	70
LL4223AA	in	7.01	23.01	3.50	1.12	.38 x .14	7.18	3.00	4.25	1"	1"	3.00	4.31	8.43	4.33	—	2.75
	mm	178	584	89			182	76	108			76	109	214	110	—	70
LS4223AA	in	8.18	24.15	3.50	1.44	.38 x .14	7.18	3.00	4.25	1"	1"	3.00	4.50	8.43	4.33	—	2.75
	mm	208	613	89			182	76	108			76	114	214	110	—	70
Q4223AA	in	8.63	25.06	4.50	1.94	.50 x .20	11.25	3.75	5.13	1"	1"	—	4.57	12.09	5.40	3.75	3.63
	mm	219	637	114			286	95	130			—	116	307	137	95	92

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

② Ports are suitable for use with Class 125 ANSI cast iron.

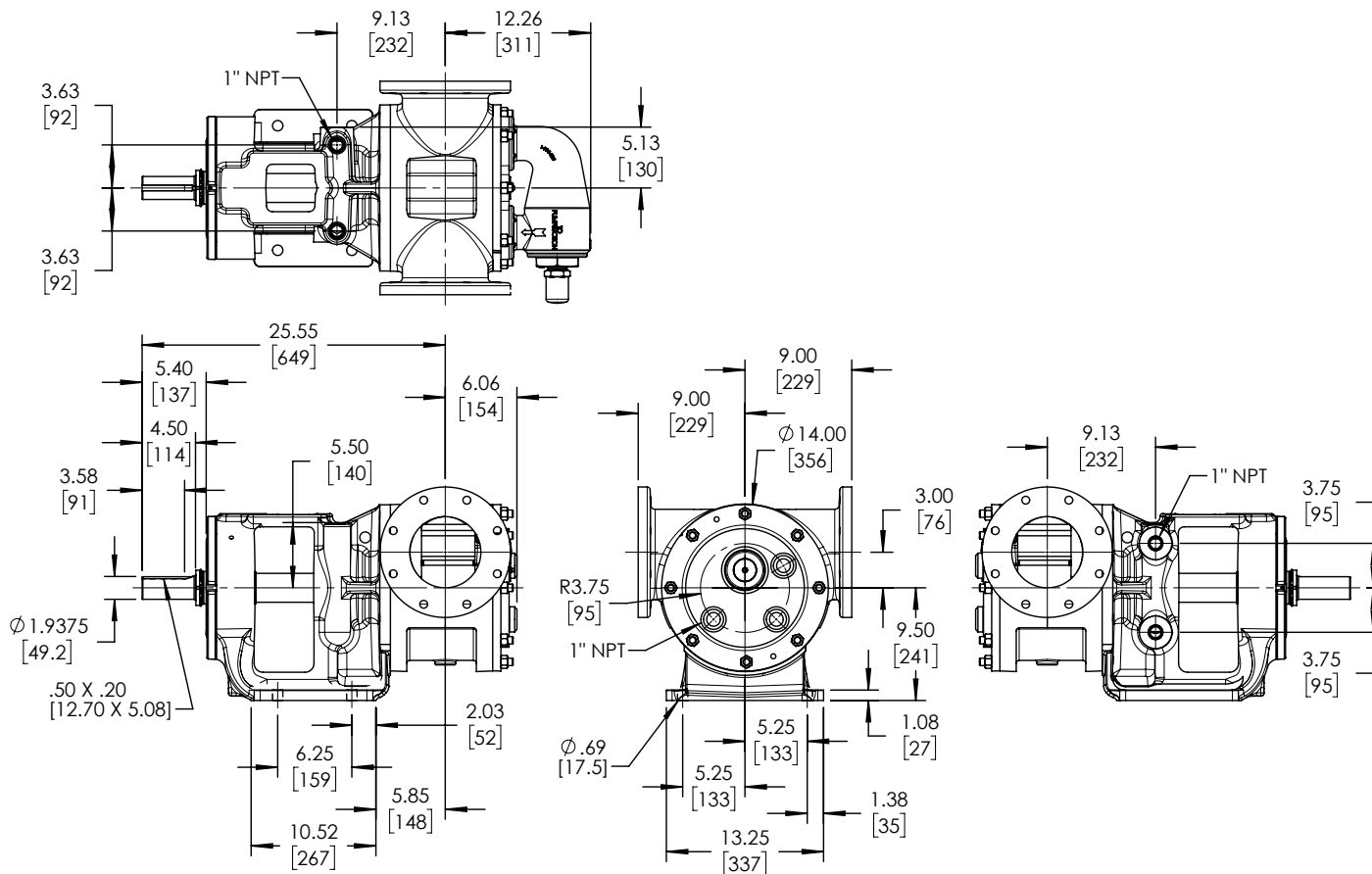
③ BB dimension for Q4223A is 1".

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

**UNIVERSAL PRODUCT LINE:
STEEL EXTERNALS — JACKETED PUMPS**
SERIES 4223AA, 4323AA (API 682 Seal)

Section	1304
Page	1304.7
Issue	D

DIMENSIONS — QS SIZE



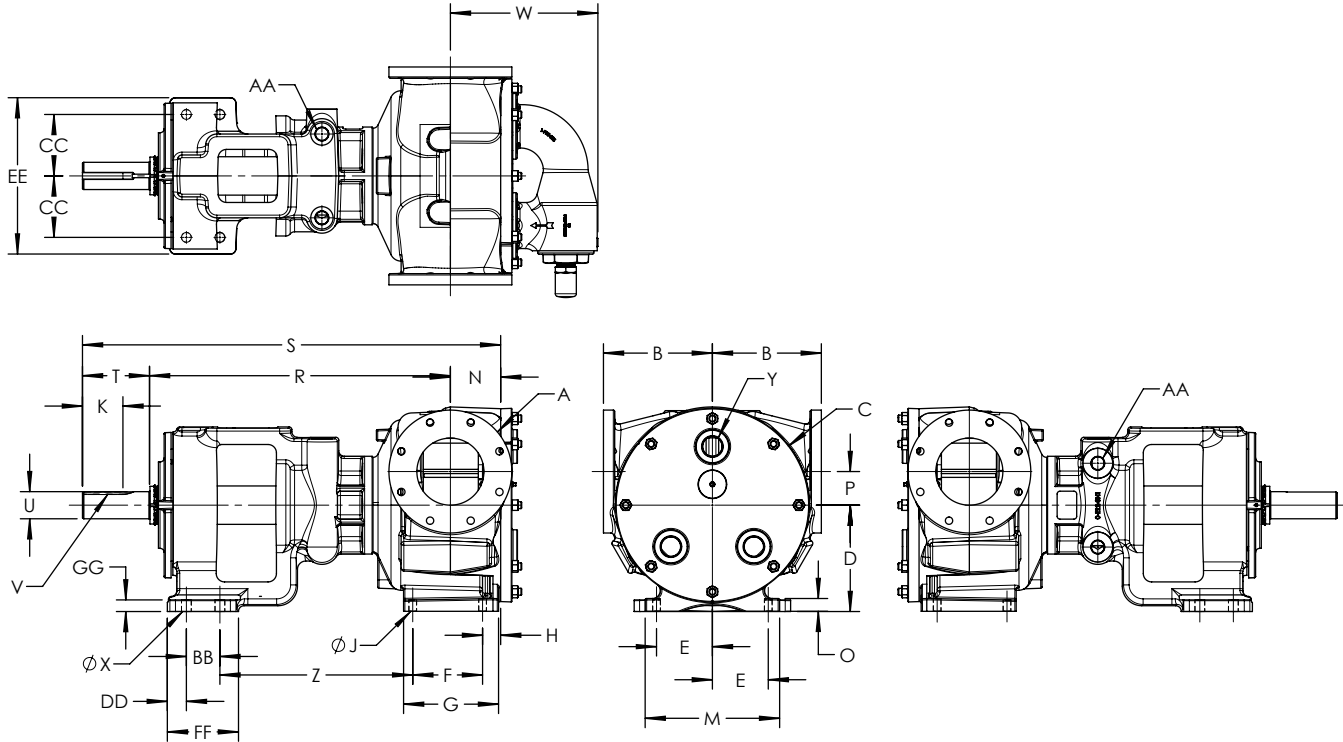
Model Number	BB*	DD	GG
QS4223AA	1.00	6.06 (153)	3.75 (95)

* 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.

Section	1304
Page	1304.8
Issue	D

**UNIVERSAL PRODUCT LINE:
STEEL EXTERNALS — JACKETED PUMPS**
SERIES 4223AA, 4323AA (API 682 Seal)

DIMENSIONS – N, R, RS SIZES – JACKETED BRACKET



Model Number	A (in)		B	C	D	E	F	G	H	J	K	M	N	O	P	R	S
N4323AA	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	37.43
		mm	248	438	241	127	159	221	41	18	114	305	114	25	76	660	951
R4323AA	① 8	in	14.25	24.50	13.25	6.75	7.00	10.56	2.31	0.88	6.00	16.00	5.62	1.00	4.50	28.75	41.25
		mm	362	622	337	171	178	268	59	22	152	406	143	25	114	730	1048
RS4323AA	① 10	in	14.25	24.50	13.25	6.75	7.00	13.12	4.81	0.88	6.00	16.46	8.12	1.30	4.50	28.55	43.29
		mm	362	622	337	171	178	333	122	22	152	418	206	33	114	725	1100

Model Number		T	U (in)	V (in)	W	X	Y	Z	AA (in)	BB	CC	DD	EE	FF	GG
N4323AA	in	6.00	2.44	.62 X .23	8.63	0.69	1"	17.28	1.00	3.00	5.50	1.70	14.00	6.37	1.19
	mm	152			219	18		439		76	140	43	356	162	30
R4323AA	in	6.62	3.44	.88 X .32	12.00	0.88	1-1/4"	16.08	1.50	3.25	7.75	2.01	19.00	7.17	1.20
	mm	168			305	22		408		83	197	51	483	182	31
RS4323AA	in	6.62	3.44	.88 X .32	—	0.88	1-1/2"	16.08	1.50	3.25	7.75	2.01	19.00	7.17	1.20
	mm	168			—	22		408		83	197	51	483	182	31

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

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

**UNIVERSAL PRODUCT LINE:
STEEL EXTERNALS — JACKETED PUMPS**
SERIES 4223AA, 4323AA (API 682 Seal)

Section	1304
Page	1304.9
Issue	D

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 curve generator.

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	—	—	—	—
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	—	—	—	—	—	—
N	2.1	2.3	3.5	4.5	6.3	9.5	15.0	—	—	—	—	—	—	—	—
R	6.1	7.1	8.3	10.1	12.1	15.2	—	—	—	—	—	—	—	—	—
RS	7.0	8.5	10.4	13.1	17.2	22.4	—	—	—	—	—	—	—	—	—