

VIKING BEHIND THE ROTOR SEAL INTERNAL GEAR PUMPS

SERIES 4124B & 4224B (Cast Iron)

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Series Description

The "B Series" heavy duty internal gear pumps include both 4124B (non-jacketed) and 4224B (jacketed) models with Behind-The-Rotor (BTR) dynamic shaft seals. By locating the mechanical seal immediately behind the rotor, this offers several advantages over traditional heavy-duty internal gear pumps with stuffing box seals:

- The grease-lubricated bracket bushing has no contact with the pumped liquid, ensuring longest possible life. The pump is re-greasable, with a lip seal at the stuffing box to retain grease and a relief fitting to prevent over-greasing.
- The grease-filled bracket helps to prevent air and moisture from reaching the seal faces, which can reduce crystallization of some air or water-reactive liquids.
- All pumped liquid is contained in the casing area, which enables superior flushing to clean the casing.
- The optional abrasive liquid mechanical seal enables viscosities to 250,000 SSU (55,000 cSt), providing an alternative to packed gland pumps or to pumps with cartridge seals to handle higher viscosities.
- Hard material options (tungsten carbide idler pin and idler bushing, abrasive liquid seal with flush line) enable the same abrasion-resistant design found in the 4624B abrasive liquid pumps, but with jacketed bracket and head.

Operating Range:

Nominal Flow		GPM	8 to 500
		m ³ /h	1.8 to 114
Pressure Range		PSI	200
		Bar	14
Temp. Range		°F	-60 to 650
		°C	-51 to 343
Viscosity Range	Standard Seal	SSU	15,000
		cSt	3,300
	Abrasive Liquid Seal	SSU	250,000
		cSt	55,000

Nominal Flow Rates:

Pump Size	GPM	m ³ /h
G	8	1.8
H	15	3.4
HL	30	6.8
AK	67	15
K	75	17
KK	100	23
L/LQ	135	31
LL	140	32
LS	200	45
Q	300	68
QS	500	114



K4124B



Q4224B

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Major Design Features:

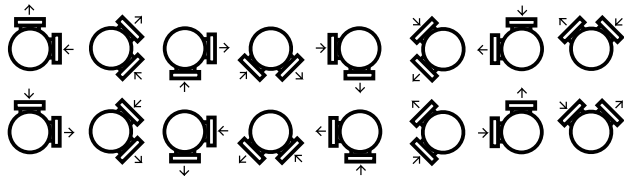
- Positive Displacement Internal Gear pumping principle handles a broad range of viscosities with constant flow rate.
- Footed cast iron bracket provides rigid mounting to help maintain alignment, which extends seal and bearing life.
- Axial rotor thrust is controlled by double row ball or tapered roller bearings mounted in the rotatable bearing housing, which enables fast, easy end clearance adjustment.
- Can use direct drive, gear reducer or gearmotor drive, or belt-drive.
- Pressure relief valve standard on non-jacketed (4124B) pumps, optional on jacketed (4224B) models.
- Jacketed models (4224B) enable heating to liquify ambient temperature solids prior to startup using steam or other heat transfer fluid, with jacketed bracket and head.

Revolvable Pump Casings Standard

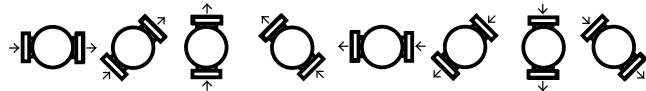
All "B Series" pumps are equipped with casings that can be turned to eight positions (except the LQ, LL & LS sizes, which cannot have any port in the 6 o'clock position). Direction of flow is reversible, so any port may be either suction or discharge. The relief valve must "point" towards the suction port in all cases. G through Q sizes have 90° ports standard, QS size has 180° (opposite) ports standard.

Possible port configurations are illustrated at right.

90° port options:



Opposite port options:



Materials of Construction

Component	Standard Material	
Casing	Cast Iron, ASTM A48, Class 35B	
Head	Cast Iron, ASTM A48, Class 35B	
Bracket	Cast Iron, ASTM A48, Class 35B	
Idler	Standard	Steel Fitted
	① Cast Iron, ASTM A48, Class 35B	② Cast Iron, ASTM A48, Class 35B
Rotor	Standard	Steel Fitted
	③ Cast Iron, ASTM A48, Class 35B	Steel, ASTM A216, Grade WCB
Rotor Shaft	Steel, ASTM A108, Grade 1045	
Idler Pin	Hardened Steel, ASTM A108, Grade 1045	
Idler Bushing	Carbon Graphite	
Bracket Bushing (no product contact)	Bronze, ASTM B584 (B505), Alloy C93700	
Pressure Relief Valve	Cast Iron, ASTM A48, Class 35B	
Standard Mechanical Seal	Carbon vs. Silicon Carbide Faces, Viton® Elastomers	
Optional Abrasive Liquid Seal	Silicon Carbide vs. Silicon Carbide Faces, Viton® Elastomers	

① G, H and HL sizes have a powdered metal idler: Powdered Metal MPIF 35, FC-0208-50 (G), Powdered Metal MPIF 35, FC-0208-45 (H, HL)

② Q and QS sizes have a steel idler when pump is steel fitted.

③ AK, KK, LS and QS sizes have ductile iron rotor.

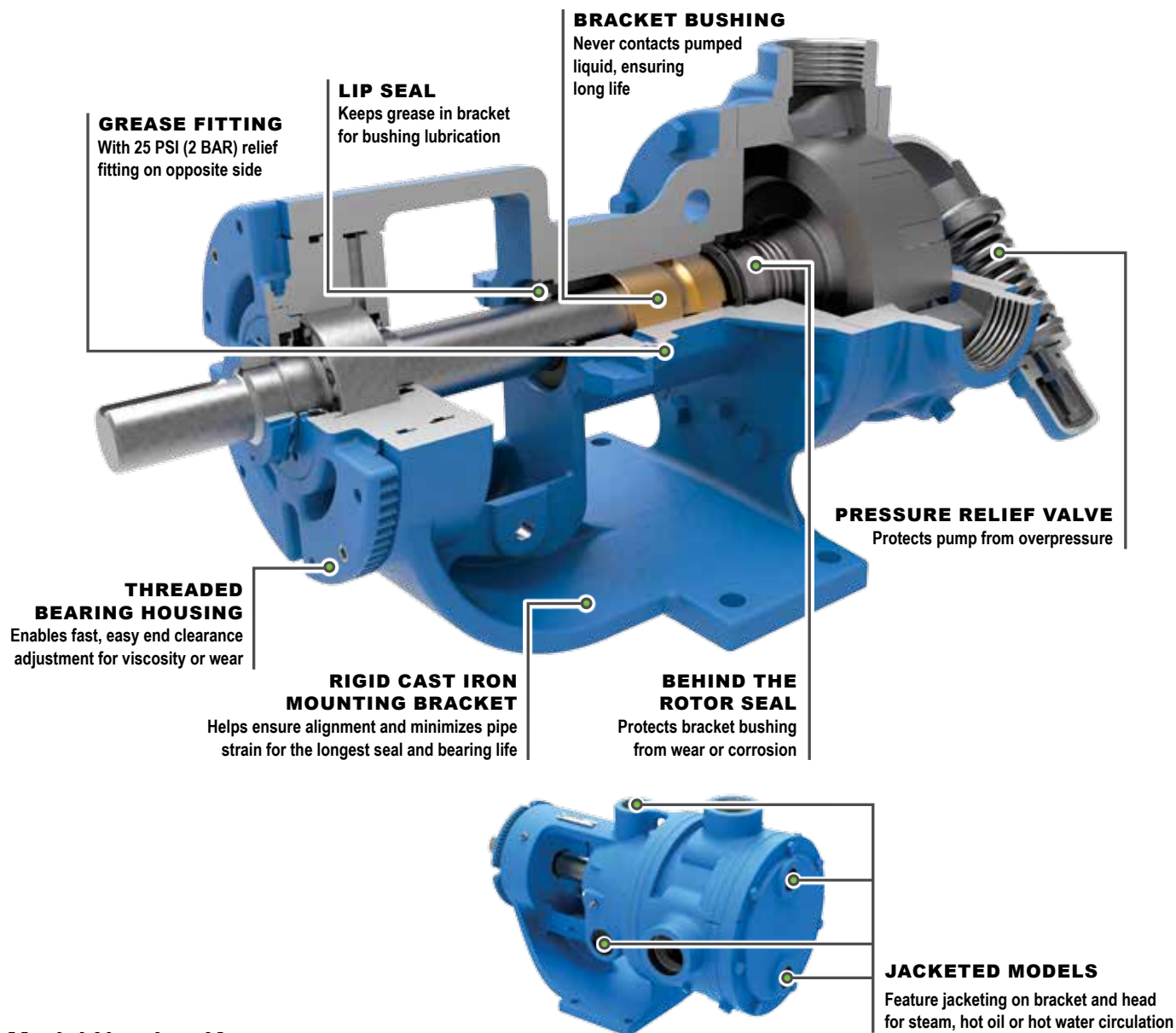
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SERIES 4124B & 4224B (Cast Iron)

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Features and Benefits:



Model Number Key:

KK

Size:
G L
H LQ
HL LL
AK LS
K Q
KK QS

4

Seal:
4 = Mechanical Seal

1

Jacketing:
1 = No Jacketing
2 = Jacketed

2

Basic Series Configuration

4

Material of Construction:
4 = Cast Iron

B

Seal Location:
B = Behind the Rotor

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VIKING BEHIND THE ROTOR SEAL INTERNAL GEAR PUMPS

SERIES 4124B & 4224B (Cast Iron)

Specifications (U.S. Units)

Model Number		Port Size	① Port Type	Nominal Pump Rating (100 SSU & below)		Maximum Hydrostatic Pressure	② Maximum Discharge Pressure for 100 SSU liquid at rated speed	③ Maximum Recommended Temperature for Standard Pump	Steel Fitted Recommended Above	Approximate Shipping Weight, 4124B w/valve	Approximate Shipping Weight, 4224B
				GPM	RPM		PSIG	PSIG			
Standard	Jacketed	Inches									
G4124B	N/A	1	NPT	8	1750	400	200	350	7,500	22	N/A
H4124B	H4224B	1-1/2	NPT	15	1750	400	200	350	25,000	38	42
HL4124B	HL4224B	1-1/2	NPT	30	1750	400	200	350	7,500	40	45
AK4124B	N/A	2	NPT	67	1450	400	200	350	25,000	78	N/A
K4124B	K4224B	2	NPT	75	780	400	200	350	25,000	105	120
KK4124B	KK4224B	2	NPT	100	780	400	200	350	75,000	110	125
L4124B	L4224B	2	NPT	135	640	400	200	350	25,000	155	175
LQ4124B	LQ4224B	2-1/2	Flange	135	640	400	200	350	25,000	175	190
LL4124B	LL4224B	3	Flange	140	520	400	200	350	2,500	185	200
LS4124B	LS4224B	3	Flange	200	640	400	200	350	75,000	190	210
Q4124B	Q4224B	4	Flange	300	520	400	200	350	7,500	440	480
QS4124B	QS4224B	6	Flange	500	520	400	200	350	75,000	540	580

Specifications (Metric Units)

Model Number		Port Size	① Port Type	Nominal Pump Rating (100 SSU & below)		Maximum Hydrostatic Pressure	② Maximum Discharge Pressure for 100 SSU liquid at rated speed	③ Maximum Recommended Temperature for Standard Pump	Steel Fitted Recommended Above	Approximate Shipping Weight, 4124B w/valve	Approximate Shipping Weight, 4224B
				m³/h	RPM		PSIG	PSIG			
Standard	Jacketed	Inches									
G4124B	N/A	1	NPT	1.8	1750	28	14	177	1,650	10	N/A
H4124B	H4224B	1-1/2	NPT	3.4	1750	28	14	177	5,500	17	19
HL4124B	HL4224B	1-1/2	NPT	7	1750	28	14	177	1,650	18	20
AK4124B	N/A	2	NPT	15	1450	28	14	177	5,500	35	N/A
K4124B	K4224B	2	NPT	18	780	28	14	177	5,500	48	54
KK4124B	KK4224B	2	NPT	23	780	28	14	177	16,500	50	57
L4124B	L4224B	2	NPT	31	640	28	14	177	5,500	70	79
LQ4124B	LQ4224B	2-1/2	Flange	31	640	28	14	177	5,500	80	86
LL4124B	LL4224B	3	Flange	32	520	28	14	177	550	84	91
LS4124B	LS4224B	3	Flange	45	640	28	14	177	16,500	86	95
Q4124B	Q4224B	4	Flange	68	520	28	14	177	1,650	200	218
QS4124B	QS4224B	6	Flange	114	520	28	14	177	16,500	245	265

① Flange ports are suitable for use with Class 125 ANSI cast iron companion flanges or flanged fittings. G through Q ports are at 90°, QS ports are at 180° (opposite).

② For maximum recommended discharge pressures at different viscosities, see performance curves, which can be 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.

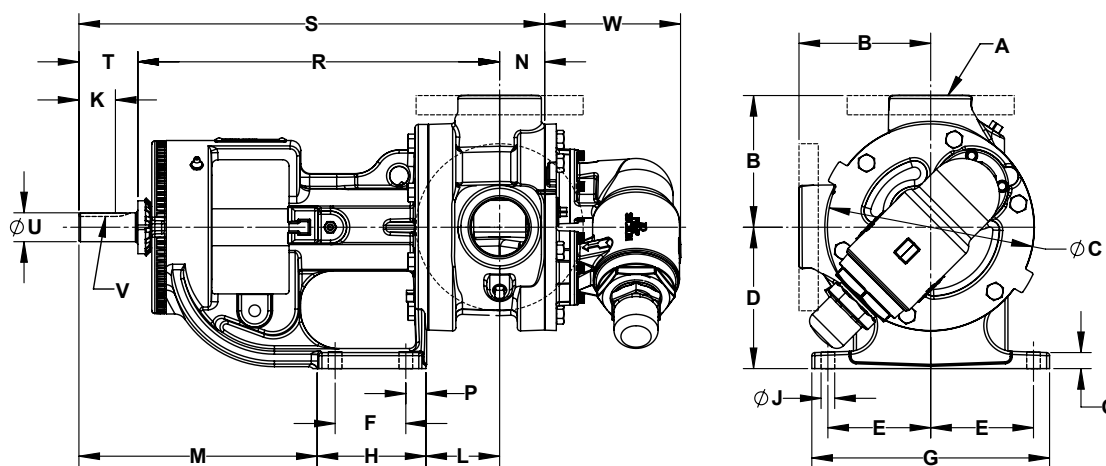
③ Extra clearances are required above 225°F / 107°C, based on standard Viton seal. Higher temperatures can be handled with special construction. Consult factory.

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Dimensions G through Q 4124B (Non-Jacketed)



U.S. Units (Dimensions in inches)

Model Number	A (in)	B	C	D	E	F	G	H	J	K	L	M	N	O	P	R	S	T	U	V	W
G4124B	① 1	2.50	3.66	2.75	1.62	1.31	4.00	2.38	0.34	0.57	1.21	4.87	1.09	0.31	0.63	7.34	9.55	1.12	0.50	.12 x .06	2.71
H4124B HL4124B	① 1.5	3.00	4.75	3.50	2.75	2.25	6.75	3.50	0.47	0.99	3.38	5.19	1.19	0.56	0.62	10.44	13.25	1.62	0.75	.19 x .09	2.85
AK4124B	① 2	4.50	6.62	5.25	2.88	2.00	6.75	4.13	0.41	1.67	2.72	8.84	2.00	0.44	1.11	13.19	17.69	2.50	1.00	.25 x .12	4.77
K4124B KK4124B	① 2	5.12	8.00	5.50	4.00	2.75	9.25	4.00	0.53	1.42	3.00	9.38	1.75	0.62	0.62	14.12	18.12	2.25	1.12	.25 x .12	5.25
L4124B	① 2	6.50	10.25	7.00	4.38	4.00	10.00	5.38	0.53	1.42	3.38	9.12	1.75	0.62	0.62	15.62	19.62	2.25	1.12	0.38 x 0.19	5.43
LQ4124B	② 2.5	7.19	10.25	7.00	4.38	4.00	10.00	5.38	0.53	1.42	3.38	9.12	1.75	0.62	0.62	15.62	19.62	2.25	1.12	0.38 x 0.19	5.43
LL4124B	② 3	7.19	10.25	7.00	4.38	4.00	10.00	5.38	0.53	1.42	3.38	9.12	2.25	0.62	0.62	15.62	20.12	2.25	1.12	0.38 x 0.19	5.43
LS4124B	② 3	7.19	10.25	7.00	4.38	4.00	10.00	5.38	0.53	2.55	4.59	9.12	2.44	0.62	0.79	15.75	21.69	3.5	1.44	.38 x .19	5.26
Q4124B	② 4	8.25	14.00	8.75	4.12	4.00	10.00	6.00	0.69	3.58	6.53	10.94	3	0.80	1.11	19.25	26.75	4.5	1.94	.50 x .25	8.29

Metric Units (Dimensions in millimeters, except "A" dimension in inches - no metric equivalent)

Model Number	A (in)	B	C	D	E	F	G	H	J	K	L	M	N	O	P	R	S	T	U	V	W
G4124B	① 1	63.5	93.0	69.9	41.1	33.3	101.6	60.5	8.8	14.5	30.7	123.7	27.7	7.9	16.0	186.4	242.6	28.4	12.7	3.05 x 1.52	68.8
H4124B HL4124B	① 1.5	76.2	120.6	88.9	69.8	57.1	171.4	88.9	11.9	25.1	85.8	131.8	30.2	14.2	15.7	265.2	336.5	41.1	19	4.83 x 2.29	72.4
AK4124B	① 2	114.3	168.1	133.4	73.2	50.8	171.5	104.9	10.4	42.4	69.1	224.5	50.8	11.2	28.2	335.0	449.3	63.5	25.4	6.35 x 3.05	121.2
K4124B KK4124B	① 2	130	203.2	139.7	101.6	69.8	234.9	101.6	13.5	36.1	76.2	238.3	44.4	15.7	15.7	358.6	460.2	57.1	28.4	6.35 x 3.05	133.3
L4124B	① 2	165.1	260.3	177.8	111.3	101.6	254	136.7	13.5	36.1	85.9	231.6	44.4	15.7	15.7	396.7	498.3	59.7	36.6	9.65 x 4.83	137.9
LQ4124B	② 2.5	182.6	260.3	177.8	111.3	101.6	254	136.7	13.5	36.1	85.9	231.6	44.4	15.7	15.7	396.7	498.3	59.7	36.6	9.65 x 4.83	137.9
LL4124B	② 3	182.6	260.3	177.8	111.3	101.6	254	136.7	13.5	36.1	85.9	231.6	57.1	15.7	15.7	396.7	511	59.7	36.6	9.65 x 4.83	137.9
LS4124B	② 3	182.6	260.3	177.8	111.3	101.6	254	136.7	13.5	64.8	116.6	231.6	62	15.7	20.1	400	550.9	88.9	36.6	9.65 x 4.83	133.6
Q4124B	② 4	209.5	355.6	222.2	104.6	101.6	254	152.4	17.5	90.9	165.9	277.9	76.2	20.3	28.2	488.9	679.4	114.3	49.3	12.70 x 6.35	210.6

① Ports are tapped for standard (NPT) pipe.

② Ports are suitable for use with Class 125 ANSI cast iron companion flanges or flanged fittings.

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

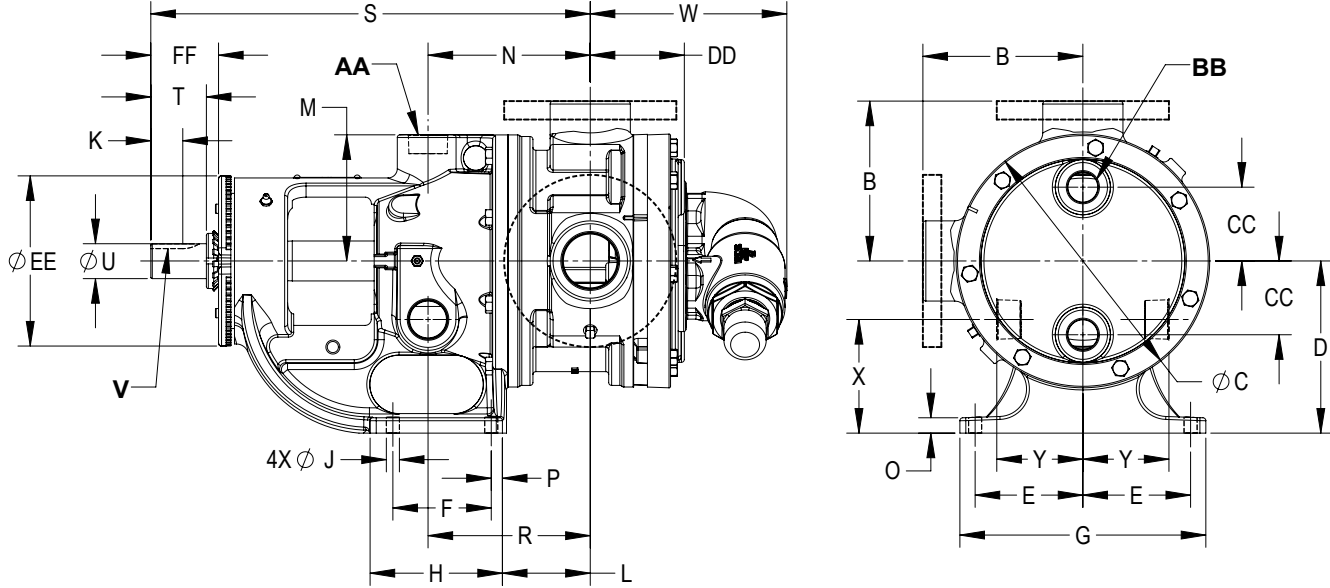
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VIKING BEHIND THE ROTOR SEAL INTERNAL GEAR PUMPS

SERIES 4124B & 4224B (Cast Iron)

Dimensions H through Q 4224B (Jacketed) - U.S. Units

Dimensions in inches



Model Number	A (in)	B	C	D	E	F	G	H	J	K	L	M	N	O
H4224B HL4224B	① 1.5	3	4.75	3.5	2.75	2.25	6.75	3.5	0.47	0.99	3.38	2.38	4	0.56
K4224B KK4224B	① 2	5.12	8	5.5	4	2.75	9.25	4	0.53	1.42	3	4	5.75	0.62
L4224B	① 2	6.5	10.25	7	4.38	4	10	5.38	0.53	1.42	3.38	5.12	6.56	0.62
LQ4224B	② 2.5	7.19	10.25	7	4.38	4	10	5.38	0.53	1.42	3.38	5.12	6.56	0.62
LL4224B	② 3	7.19	10.25	7	4.38	4	10	5.38	0.53	1.42	3.38	5.12	6.56	0.62
LS4224B	② 3	7.19	10.25	7	4.38	4	10	5.38	0.53	2.55	4.59	5.12	7.4	0.62
Q4224B	② 4	8.25	14	8.75	4.12	4	10	6	0.69	3.58	6.62	7	7.62	0.75

Model Number	P	R	S	T	U	V	W	X	Y	AA	BB	CC	DD	EE	FF
H4224B HL4224B	0.62	4	12.06	1.62	0.75	.19 x .09	4.04	1.8	1.83	0.75	0.5	0.94	2.41	5.75	2.3
K4224B KK4224B	0.62	5.75	16.38	2.25	1.12	.25 x .12	7	3.38	2.75	1.25	1.25	1.75	3.25	6.75	2.92
L4224B	0.62	6.56	17.88	2.35	1.44	0.38 x 0.19	7.18	4.62	3.25	1.25	1	3	3.81	6.75	2.93
LQ4224B	0.62	6.56	17.88	2.35	1.44	0.38 x 0.19	7.18	4.62	3.25	1.25	1	3	3.81	6.75	2.93
LL4224B	0.62	6.56	17.88	2.35	1.44	0.38 x 0.19	7.18	4.62	3.25	1.25	1	3	4.31	6.75	2.93
LS4224B	0.79	7	19.25	3.5	1.44	.38 x .19	7.72	4.4	3.3	1.25	1	3	4.5	7	4.03
Q4224B	1.3	6.62	23.75	4.5	1.94	.50 x .25	11.25	5.5	4.5	1.5	1.25	---	4.57	8.38	5.35

① Ports are tapped for standard (NPT) pipe.

② Ports are suitable for use with Class 125 ANSI cast iron companion flanges or flanged fittings.

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

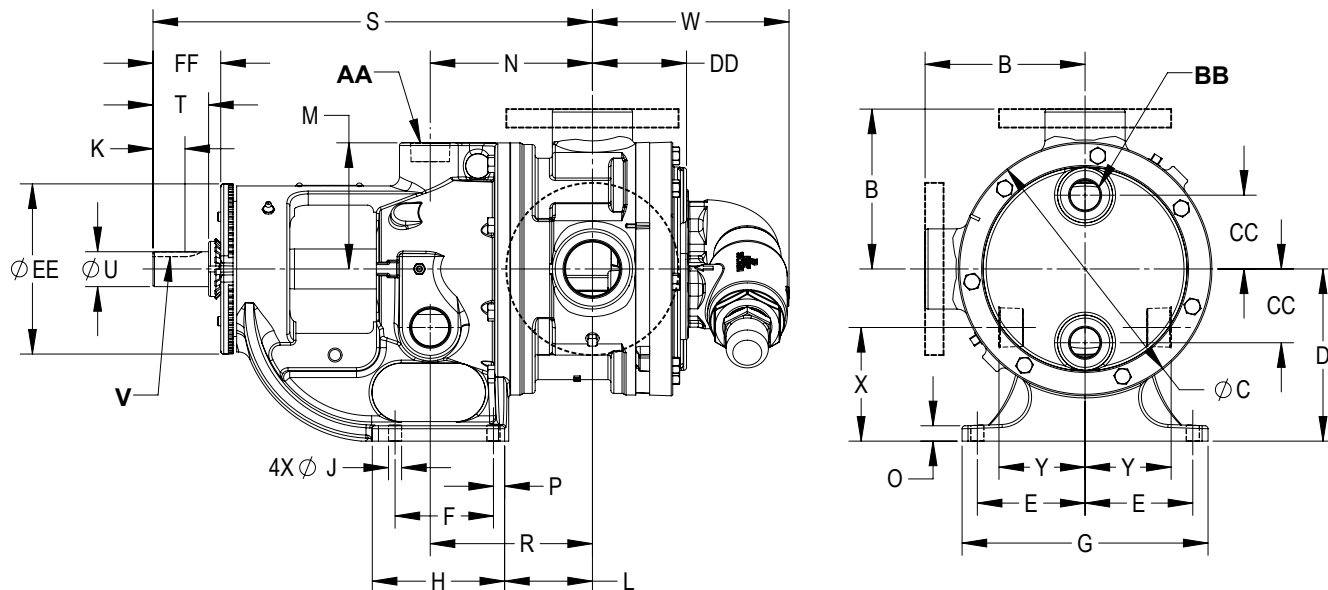
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Dimensions H through Q 4224B (Jacketed) - Metric Units

Dimensions in millimeters (except "A" dimension in inches - no metric equivalent)



Model Number	A (in)	B	C	D	E	F	G	H	J	K	L	M	N	O
H4224B HL4224B	① 1.5	76.2	120.6	88.9	69.8	57.1	171.4	88.9	11.9	25.1	85.8	60.5	101.6	14.2
K4224B KK4224B	① 2	130	203.2	139.7	101.6	69.8	234.9	101.6	13.5	36.1	76.2	101.6	146	15.7
L4224B	① 2	165.1	260.3	177.8	111.3	101.6	254	136.7	13.5	36.1	85.9	130	166.6	15.7
LQ4224B	② 2.5	182.6	260.3	177.8	111.3	101.6	254	136.7	13.5	36.1	85.9	130	166.6	15.7
LL4224B	② 3	182.6	260.3	177.8	111.3	101.6	254	136.7	13.5	36.1	85.9	130	166.6	15.7
LS4224B	② 3	182.6	260.3	177.8	111.3	101.6	254	136.7	13.5	64.8	116.6	130	188	15.7
Q4224B	② 4	209.5	355.6	222.2	104.6	101.6	254	152.4	17.5	90.9	168.1	177.8	193.5	19

Model Number	P	R	S	T	U	V	W	X	Y	AA	BB	CC	DD	EE	FF
H4224B HL4224B	15.7	101.6	306.3	41.1	19	4.83 x 2.29	102.6	45.7	46.5	19	12.7	23.9	61.2	146	58.4
K4224B KK4224B	15.7	146	416	57.1	28.4	6.35 x 3.05	177.8	85.9	69.8	31.7	31.7	44.4	82.5	171.4	74.2
L4224B	15.7	166.6	454.2	59.7	36.6	9.65 x 4.83	182.4	117.3	82.5	31.7	25.4	76.2	96.8	171.4	74.4
LQ4224B	15.7	166.6	454.2	59.7	36.6	9.65 x 4.83	182.4	117.3	82.5	31.7	25.4	76.2	96.8	171.4	74.4
LL4224B	15.7	166.6	454.2	59.7	36.6	9.65 x 4.83	182.4	117.3	82.5	31.7	25.4	76.2	109.5	171.4	74.4
LS4224B	20.1	177.8	488.9	88.9	36.58	9.65 x .83	196.1	111.8	83.8	31.7	25.4	76.2	114.3	177.8	102.4
Q4224B	33	168.1	603.2	114.3	49.3	12.70 x .35	285.7	139.7	114.3	38.1	31.7	---	116.1	212.8	135.9

① Ports are tapped for standard (NPT) pipe.

② Ports are suitable for use with Class 125 ANSI cast iron companion flanges or flanged fittings.

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

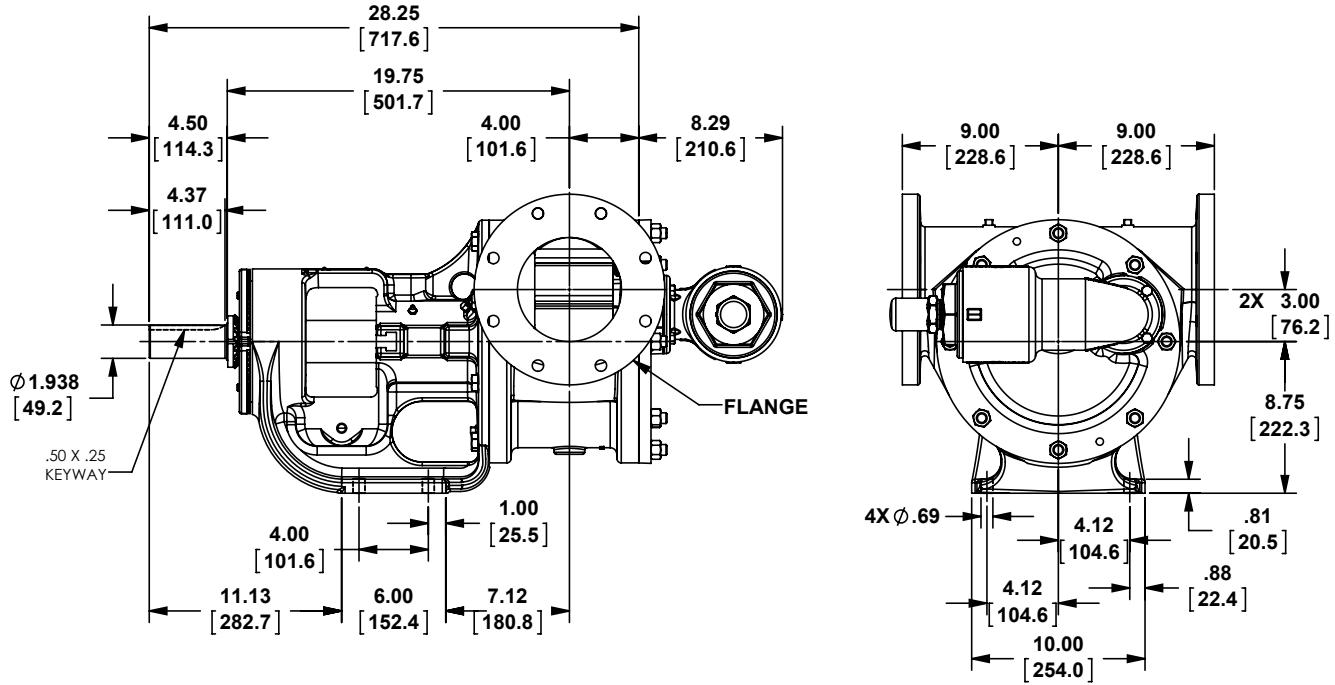
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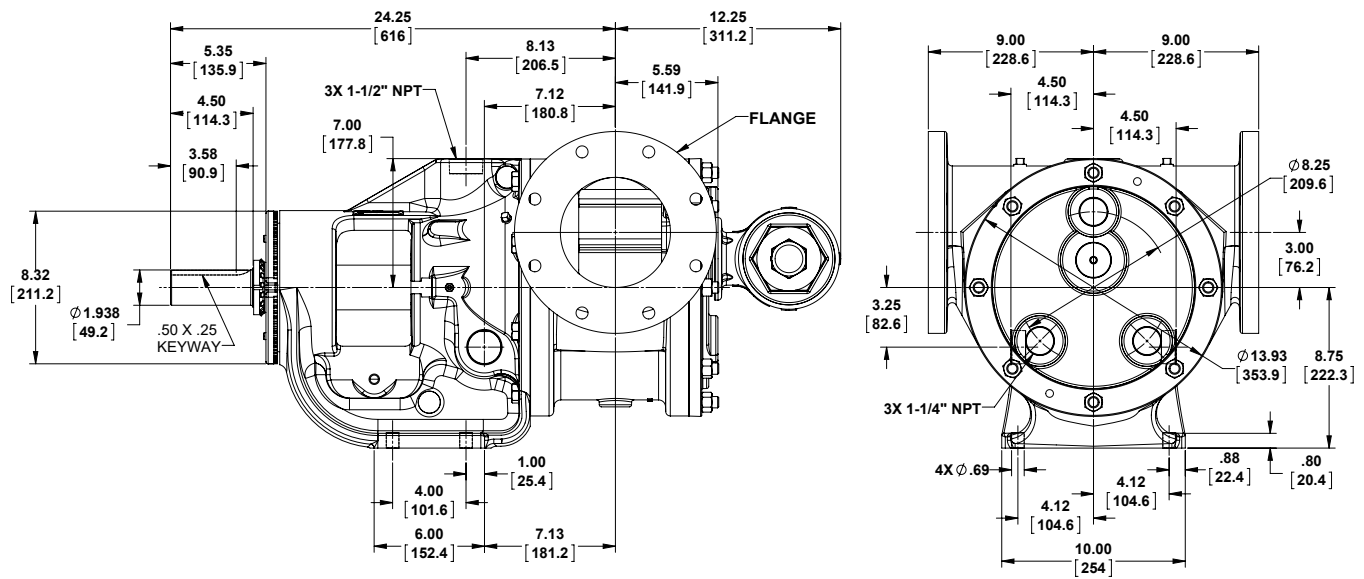
Dimensions QS 4124B (Non-Jacketed)

Dimensions shown in inches with millimeter equivalent shown in parentheses



Dimensions QS 4224B (Jacketed)

Dimensions shown in inches with millimeter equivalent shown in parentheses



NOTE: QS4124B / 4224B flanges are 6", suitable for use with Class 125 ANSI cast iron companion flanges or flanged fittings. They are studded, not through-bolt.

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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.

NPSH_R data is not available on the pump selector.

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 idler 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

Cast Iron Series 4124B and 4224B

PUMP SIZE	PUMPS SPEED, RPM														
	100	125	155	190	230	280	350	420	520	640	780	950	1150	1450	1750
G	-	-	-	-	-	-	-	1.8	2.0	2.2	2.6	3.1	3.9	5.6	7.6
H, HL	-	-	-	-	1.7	1.8	1.9	2.1	2.4	2.8	3.4	4.5	6.2	9.5	13.5
AK	-	-	1.6	1.7	1.8	2.0	2.3	2.7	3.2	3.9	5.5	7.7	11.2	17	-
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	-	-	-	-	-	-

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)	GPM (US gal/minute)	LPM (Liter/Minute)
1	3.4	1	6.9	1	3.8
5	17	25	172	0.26	1
10	34	50	345		
15	51	100	690		
20	68	150	1034		
25	85	200	1379		
		250	1724		

* 100 kPa = 1 bar