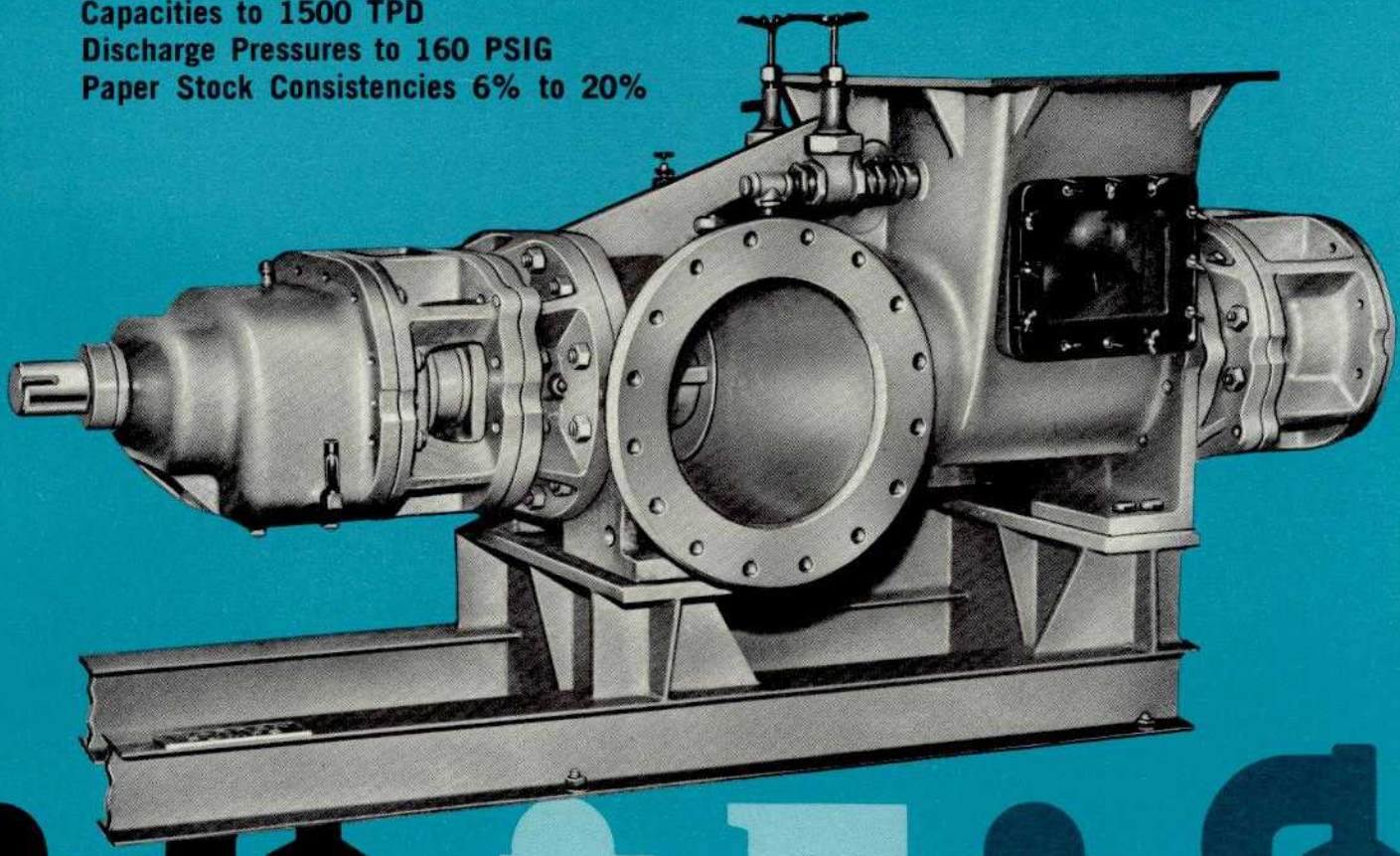
WARREN

High Density Stock Pumps

Capacities to 1500 TPD
Discharge Pressures to 160 PSIG
Paper Stock Consistencies 6% to 20%



High Density Stock Pumps

Unique Design Features

- SMOOTH PULSELESS FLOW with no vibration.
- Continuous sustained operating pressures in excess of 100 psig and higher with no drop in tonnage.
- Low horsepower requirements.
- Compact dimensions. Minimum number of components required to make up complete installed unit.
- No auxiliary feeders required.
- Simplified maintenance.
- Pump and/or driver can be mounted in any desired position to suit installation requirements.
- Complete, positive air removal.

Description and Application

Warren High Density Stock Pumps are extremely rugged and reliable. They are designed for developing high pressure **with little or no vibration.** Conservative design in critical areas assures reliable operation over extended periods of time in this severe application . . . the pumping of high consistency stocks.

Warren High Density Stock Pumps handle all kinds of pulps . . . such as: Kraft, Sulphate, NSSC, Sawdust, Groundwood, Waste Paper, Broke, Disc-wood, and Refined Shieves. They are used in the following types of applications and many others: Brown Stock to Storage; Bleach Plant (all stages); Refiner Feed.

Design and Construction

CASING: The casing (body, front and rear brackets) is available in cast iron or stainless steel. The front and rear heads are always cast iron. All metal thicknesses are adequate for maximum stress conditions plus 3/8" corrosion allowance. Body walls are hard surfaced to prevent wear caused by the erosive action of the stock and to prevent galling characteristic of austenitic stainless steels. The body has two large clean out holes, one of which has a transparent cover so operating people can observe pump performance.

ROTATING ELEMENT: This is a screw-type pump using two pumping screws and two auxiliary suction feeders mounted on the same shafts as the screws. A discharge feeder is used on one shaft to permit uniform, steady discharge of stock. Shaft sleeves protect shafts from packing wear. Hydraulic loads are in the axial direction thus reducing packing maintenance. The materials of construction for the rotating element are the same as those for the casing except that in cast iron pumps the shafts are an SAE 4140 steel.

TIMING GEARS: The two timing gears are precision-cut, full herringbone gears. They are timed at the factory to maintain proper clearance between pumping screws. The timing gears are an SAE 8620 steel, carburized, hardened and lapped.

BEARINGS: The four radial bearings are heavy duty, roller type, sized to handle the maximum loads ever to be encountered. Lubrication is obtained from the splashing caused by the timing gears. A large oil reservoir, filled with a good grade of EP lubricant lubricates both the gears and bearings. The thrust bearings are steep angle tapered roller type. They are a double roller design capable to carrying both the axial thrust loads and the radial loads. To prevent excessive preloading of the thrust bearing, the separable cones are positioned with a factory manufactured spacer. Both thrust bearings are oil lubricated from an oil reservoir in the rear head.

SEALS: All oil reservoirs are protected by lip type oil seals which in turn are protected by special labyrinth type bronze deflectors. With proper maintenance, stock or water cannot enter the oil reservoirs.

STUFFING BOXES: The stuffing boxes are extra deep and are equipped with Teflon lantern rings. One ring of packing is between the bottom of the stuffing box and the lantern ring. Special porting permits water or other liquids to be introduced into the lantern ring to keep stock out of the packing area. Each stuffing box has a replaceable throat bushing. Glands are split for easy removal and better access to the packing. Only two (2) stuffing boxes are under discharge pressure.

POSITIVE AIR BLEED: Patented air bleed device removes air from stock before it enters discharge area. It is used to eliminate pulsations on refiner feed and long line transfer applications.

This pump is protected by the following patents:

U. S. 3,057,655	Canada 651,029
U. S. 2,994,562	U. S. 3,198,582
U. S. 3,198,132	(other patents pending)

High Density Stock Pumps

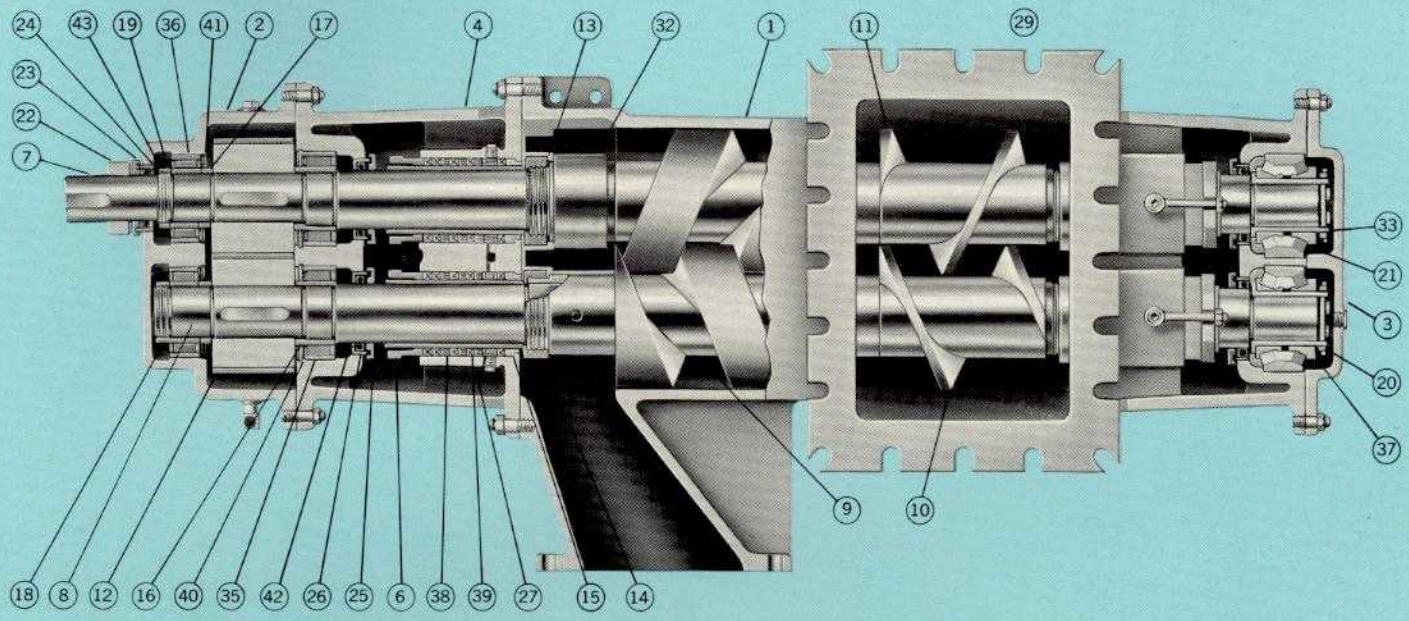
Design Data

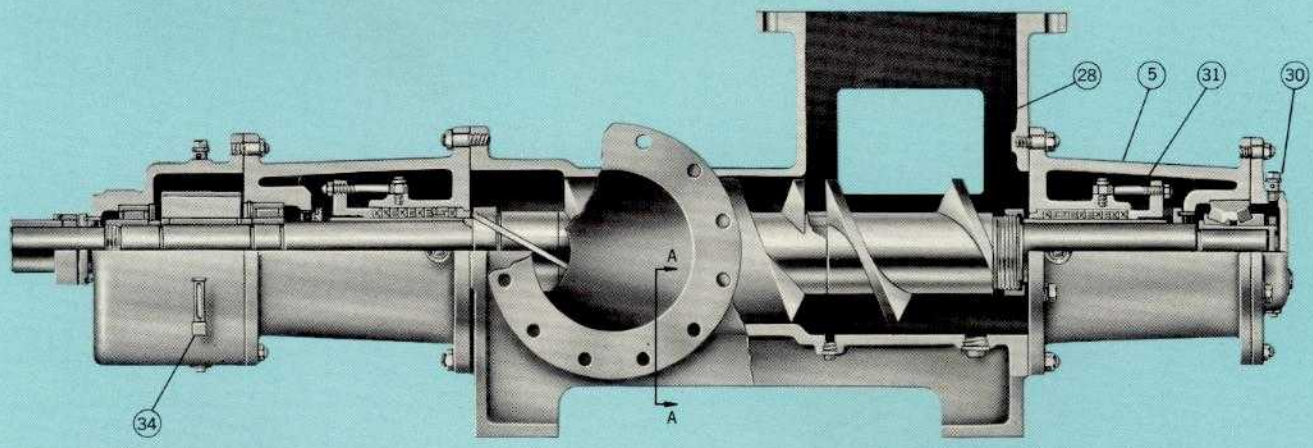
PUMP SIZE		#6	#8	#11	#125	#160
Shaft Dia. at Cplg.		1.8750/1.8745	2.0000/1.9995	3.5000/3.4995	4.0000/3.9995	4.5000/4.4995
Sleeve Dia. at Stuff. Box		2.630/2.620	3.255/3.245	5.000/4.995	5.880/5.870	6.630/6.620
Inboard Radial Brg.		Hyatt A-5211-TS	Hyatt A-5213-TS	Hyatt A-5220-TS	Hyatt A-5224-TS	Hyatt A-5226-TS
Outboard Radial Brg.		Hyatt A-5210-TS	Hyatt A-5212-TS	Hyatt A-5219-TS	Hyatt A-5222-TS	Hyatt A-5224-TS
Thrust Bearing		Timken 023Z0070	Timken 023Z0077	Timken 023Z0071	Timken 023Z0080	Timken 023Z0084
Bearing Span		39⅛	51⅛	72¼	76½	100⅝
Packing	No. Rings Stuff. Box	5	6	8	7	7
	Size	⅜ SQ.	½ SQ.	⅝ SQ.	⅝ SQ.	¾ SQ.
	Type	John Crane Style C-59	John Crane Style C-59	John Crane Style C-59	John Crane Style C-59	John Crane Style C-59
Max. Dia. Sphere Size		1¼	1¾	2½	2⅝	3¾

Parts List

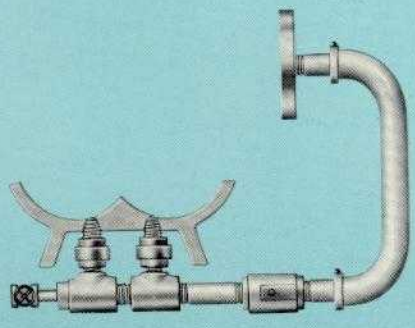
PART NO.	PART	PART NO.	PART	PART NO.	PART
1.	Body	16.	Timing Gear Spacer	31.	Gland Swing Bolt
2.	Front Head	17.	Gear & Bearing Spacer	32.	Discharge Feeder
3.	Rear Head	18.	Locknut, L. H.	33.	Bearing Adjusting Sleeve
4.	Front Bearing Bracket	19.	Locknut, R. H.	34.	Sight Glass
5.	Rear Bearing Bracket	20.	Locknut	35.	Roller Bearing
6.	Split Gland	21.	Lockwasher	36.	Roller Bearing
7.	Long Shaft	22.	Coupling End Shaft Sleeve	37.	Thrust Bearing Assembly
8.	Short Shaft	23.	Labyrinth Ring	38.	Packing Ring
9.	Screws (2 per set)	24.	Bushing	39.	Packing Ring
10.	Suction Feeder, R. H.	25.	Labyrinth Ring	40.	Snap Ring
11.	Suction Feeder, L. H.	26.	Bushing	41.	Snap Ring
12.	Timing Gear	27.	Lantern Ring	42.	Oil Seal
13.	Shaft Sleeve, R. H.	28.	Hand Hole Cover- Plexiglass	43.	Oil Seal
14.	Shaft Sleeve, L. H.	29.	Hand Hole Cover		Air Bleed Assembly (Patented)
15.	Stuffing Box Bushing	30.	Vent & Fill Plug		

Typical Sectional Views





View A-A Air Bleed (Patented)



High Density Stock Pumps

DISCHARGE PRESSURE PSIG		CAPACITY IN TONS PER										
		25	50	75	100	125	150	200	250	300	350	400
20	SIZE	No. 6	No. 6	No. 6	No. 6	No. 6	No. 6	No. 8	No. 8	No. 8	No. 11	No. 11
	RPM	190	340	490	640	790	940	520	640	760	365	415
	BHP	4	7	9	12	15	17	18	22	25	26	29
40	SIZE	No. 6	No. 6	No. 6	No. 6	No. 6	No. 6	No. 8	No. 8	No. 8	No. 11	No. 11
	RPM	230	380	530	680	830	980	560	680	800	390	440
	BHP	5	8	12	15	18	21	24	30	35	37	41
60	SIZE	No. 6	No. 6	No. 6	No. 6	No. 6	No. 6	No. 8	No. 8	No. 11	No. 11	No. 11
	RPM	270	420	570	720	870	1020	600	720	360	410	460
	BHP	8	11	15	19	23	26	32	38	42	48	54
80	SIZE	No. 6	No. 6	No. 6	No. 6	No. 6	No. 6	No. 8	No. 8	No. 11	No. 11	No. 11
	RPM	310	460	610	760	910	1060	640	760	385	435	485
	BHP	10	16	18	22	27	31	40	48	54	61	68
100	SIZE	No. 6	No. 6	No. 6	No. 6	No. 6	No. 6	No. 8	No. 8	No. 11	No. 11	No. 11
	RPM	355	505	655	805	955	1100	680	800	405	455	505
	BHP	12	17	22	27	32	37	49	58	67	74	83
120	SIZE	No. 6*	No. 6*	No. 6*	No. 6*	No. 11*	No. 11*	No. 11*	No. 11*	No. 11*	No. 11*	No. 11*
	RPM	410	635	860	1085	285	320	395	465	5.40	615	685
	BHP	13	19	26	32	40	45	56	66	76	86	96
140	SIZE	No. 6*	No. 6*	No. 6*	No. 11*	No. 11*	No. 11*	No. 11*	No. 11*	No. 11*	No. 11*	No. 11*
	RPM	440	665	890	265	300	335	410	485	555	630	705
	BHP	14	22	29	42	48	53	64	76	87	98	110
160	SIZE	No. 6*	No. 6*	No. 6*	No. 11*	No. 11*	No. 11*	No. 11*	No. 11*	No. 11*	No. 11*	No. 11*
	RPM	475	700	925	280	315	355	425	500	575	645	720
	BHP	17	25	33	49	55	61	74	86	99	112	124

*Consult Warren

Pump Selection Table

How to use Selection Table

BHP shown is for 10% AD consistency
To correct for other consistencies above 10% use these formulas:

#6 High Density Pump
New BHP = BHP (from table) + $\frac{RPM}{910}$ (New Consistency − 10%)

#8 High Density Pump
New BHP = BHP (from table) + $\frac{RPM}{625}$ (New Consistency − 10%)

#11 High Density Pump
New BHP = BHP (from table) + $\frac{RPM}{307}$ (New Consistency − 10%)

#125 High Density Pump
New BHP = BHP (from table) + $\frac{RPM}{205}$ (New Consistency − 10%)

#160 High Density Pump
New BHP = BHP (from table) + $\frac{RPM}{190}$ (New Consistency − 10%)

Example: Required to pump 500 TPD of 15% AD stock at 100 psig discharge pressure.
Solution: From table this would be a #11 High Density Pump operating at 605 RPM and requiring 99 BHP at 10% consistency. At 15% Consistency BHP = $99 + \frac{605}{307}(15-10) = 109$ BHP

Suggest a 1.25 factor on BHP for motor sizing. This table is for approximate pump and driver selection only. For capacities and discharge pressures not shown, please consult Warren.

Materials Application Guide

This table is intended to be a general guide only to material selection.)

CAST IRON	Raw and washed kraft (sulphate) Non-corrosive stock above 7 pH
CAST IRON, NI-RESIST FITTED	Mild corrosive, near neutral pH (usually above 5) i.e., washed, bleached or NSSC, groundwood. Also, mild corrosive screened stock or rejects, broke.
STAINLESS STEEL	Bleaching, some sulphate, low pH broke, some NSSC and groundwood.

DAY (A.D.) AT 10%/15%													
	450	500	550	600	700	800	900	1000	1100	1200	1300	1400	1500
	No. 11 465 33	No. 11 515 36	No. 11 565 39	No. 125 410 44	No. 125 475 51	No. 125 540 58	No. 125 605 65	No. 160 295 45	No. 160 323 50	No. 160 352 56	No. 160 381 61	No. 160 410 67	No. 160 438 73
	No. 11 490 46	No. 11 535 50	No. 11 585 54	No. 125 425 61	No. 125 490 71	No. 125 555 79	No. 125 621 90	No. 160 304 71	No. 160 333 79	No. 160 361 87	No. 160 390 95	No. 160 419 103	No. 160 447 111
	No. 11 510 60	No. 11 560 65	No. 11 610 71	No. 125 440 79	No. 125 510 91	No. 125 570 102	No. 125 638 115	No. 160 313 99	No. 160 342 110	No. 160 371 120	No. 160 400 130	No. 160 428 141	No. 160 456 151
	No. 11 530 74	No. 11 580 82	No. 11 630 88	No. 125 460 99	No. 125 525 112	No. 125 590 127	No. 125 655 142	No. 160 332 129	No. 160 351 142	No. 160 380 154	No. 160 409 167	No. 160 437 180	No. 160 466 193
	No. 11 555 91	No. 11 605 99	No. 11 650 107	No. 125 475 119	No. 125 540 134	No. 125 605 152	No. 125 671 170	No. 160 322 160	No. 160 361 175	No. 160 389 190	No. 160 418 205	No. 160 447 220	No. 160 475 236
	No. 11* 760 107	No. 125* 565 121											
	No. 125* 530 125	No. 125* 576 137					CONSULT WARREN						
	No. 125* 540 142	No. 125* 590 155											

Materials of Construction

PART	CAST IRON			CAST IRON, NI-RESIST FITTED			STAINLESS STEEL		
	Material	Warren Spec	Equivalent ASTM	Material	Warren Spec	Equivalent ASTM	Material	Warren Spec	Equivalent ASTM
Body	Cast Iron	A010G	A48 Cl. 35	Cast Iron	A010G	A48 Cl. 35	Stainless Steel	B407G	A296 Gr. CF-8M
Screws	Cast Iron	A010U	A48 Cl. 35	Ni-resist	A621U	A436 Type 2	Stainless Steel	B407U	A296 Gr. CF-8M
Feeders	Cast Iron	A010A	A48 Cl. 35	Cast Iron	A010A	A48 Cl. 35	Stainless Steel	B407A	A296 Gr. CF-8M
Shafts	Steel	F084A	A434 Gr. 4140	Steel	F084A	A434 Gr. 4140	Stainless★ Steel	G232A	A276 Type 316
Shaft Sleeves	Abrasion-Resistant Alloy Iron	A060A	–	Abrasion-Resistant Alloy Iron	A060A	–	Stainless Steel	B407A	A296 Gr. CF-8M
Brackets/Stuff. Box Housing	Cast Iron	A010A	A48 Cl. 35	Cast Iron	A010A	A48 Cl. 35	Stainless Steel	B407A	A296 Gr. CF-8M
Glands	Bronze	C060A	B62	Bronze	C060A	B62	Stainless Steel	B407A	A296 Gr. CF-8M
Timing Gears	Hardened Steel	F120D	A322 Gr. 8620	Hardened Steel	F120D	A322 Gr. 8620	Hardened Steel	F120D	A322 Gr. 8620

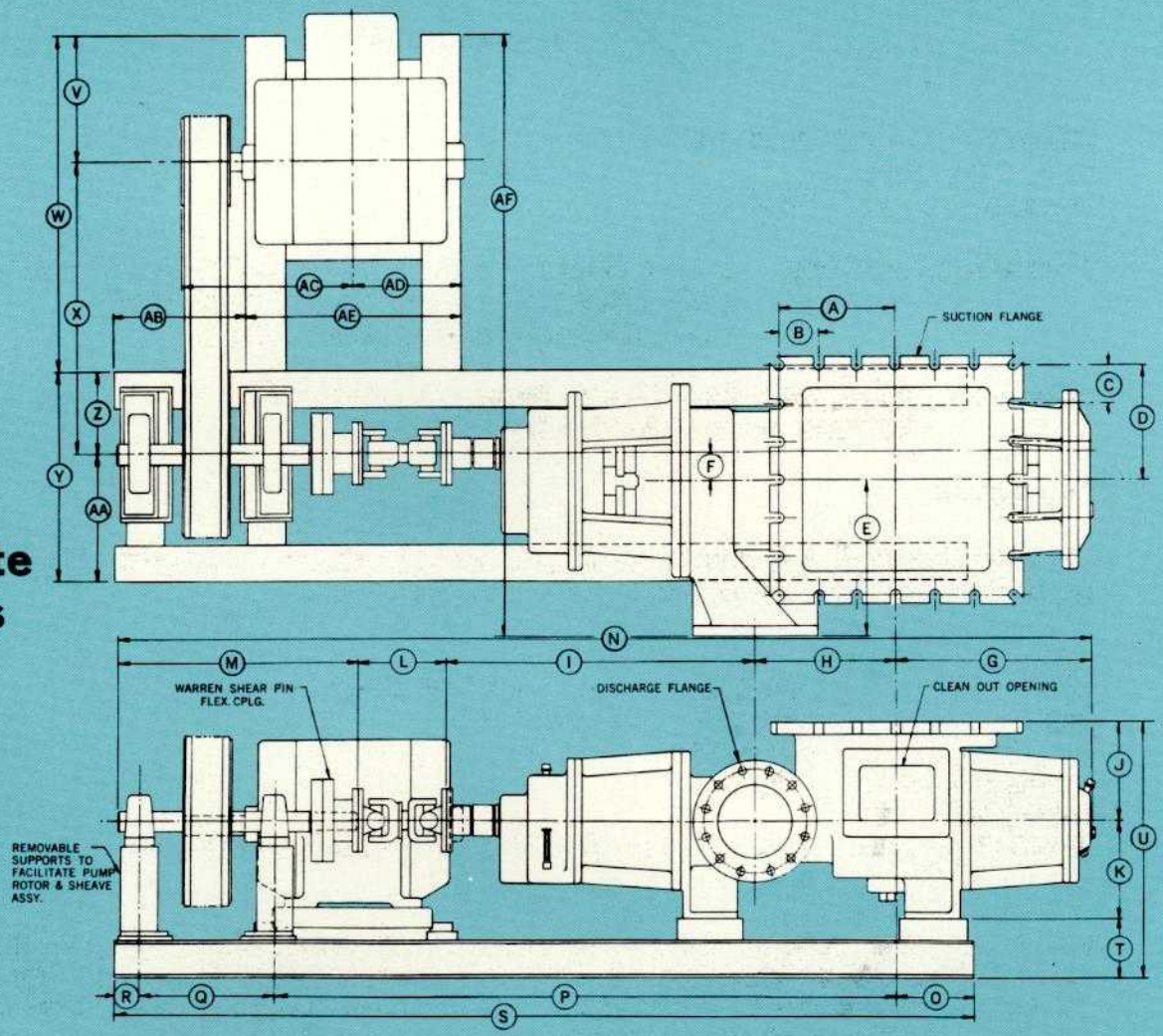
Note: All wearing surfaces (body bores and screws) have hard overlays for abrasion resistance. Baseplates are fabricated steel.

★Alloy Steel Clad with 316SS No. 11, 125 & 160 sizes).

Warren Pumps, Inc.

WARREN, MASSACHUSETTS
PEACE DALE, RHODE ISLAND

Approximate Dimensions



PUMP SIZE	DISCH. FLGE.				SUCTION FLANGE							E	F	G	H	I	J	K	L
	SIZE & RATING	O.D.	No. & SIZE HOLES	B.C.	OUTSIDE DIM.	INSIDE DIM.	No. SLOTTED HOLES	A	B	C	D								
#6	6-150#	11	(8)⅞	9½	22½ SQ.	17 SQ.	(24)¾	10⅝	3⅞	3⅞	10⅝	13¾	2¼	16⅞	11⅜	30⅞	10½	10	9⅞
#8	8-150#	13½	(8)⅞	11¾	27 SQ.	20 SQ.	(24)1"	12½	4⅜	4⅜	12½	17	3	21⅛	15⅛	33¼	10¾	12	9½
#11	12-150#	19	(12)1	17	23½ x 31½	16 x 24	(20)1⅛	10⅝	5⅝	4⅞	14⅝	23½	4¼	28⅝	22¼	44 27/32	18	14	13 29/32
#125	16-150#	23½	(16)1⅛	21¼	24 x 38	16 x 30	(22)1⅛	10½	5¼	5	17½	24 13/16	4 13/16	30¼	31½	44⅞	20	12½	18 3/16
#160	20-150#	27½	(20)1¼	25	32 x 44	24 x 36	(24)1⅛	14⅜	5¾	5⅞	20 9/16	28	6	59½	46	49	24	16	23

PUMP SIZE	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF
#6	23	7'-8"	9	59 9/16"	14 1/16	7	7'-5⅝"	6	26½	19	41¾	29½	18	6¾	11¼	13¾	19¾	13 5/16	30	64½
#8	28 1/16	8'-11"	7¾	66⅜"	17 13/16	4¼	8'-0 3/16"	6 3/16	28 15/16	19⅛	45⅝	35	23	8½	14½	16⅜	22½	13⅜	26¾	74⅛
#11	36 1/16	12'-1⅝"	10¼	7'-6½"	24 13/16	3½	10'-9 9/16"	9¾	41¾	21⅜	60⅝	50	29	10¼	18¾	20 7/16	29⅝	17 13/16	35⅝	98⅝
#125	40¼	12'-3⅛"	9⅝	8'-8¾"	26 11/16	5½	12'-2½"	14½	47	20⅝	57 15/16	48	31	10 11/16	20 5/16	26¾	29 5/16	16¾	33½	98¼
#160	40 3/16	16'-7⅞"	13⅝	10'-9 9/16"	25 11/16	5½	14'-6"	17	57	20 5/16	106 5/16	99	38	13	25	25⅝	33	21	42	153 5/16

All dimensions in inches

Dimensions not to be used for construction purposes

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