



**GHA SERIES  
 EXTREME DUTY ABRASIVE  
 G, J, N, R & S HYD SIZE  
 ROTARY GEAR PUMP**



The GHA series is designed for applications in the operating ranges noted below. These units are available with head and backhead jackets for temperature control, and packing or carbide mechanical seal options described on the following pages.

This abrasive handling, extreme duty series, provides superior wear resistance. The design also provides superior rotor shaft support and an integral, maintenance-free radial/thrust bearing for reduced deflection and wear. Reduced speeds enable service over extended periods. Information such as percentage, size and hardness of solids present in the liquid are useful to estimate pump life.

**FEATURES**

*HARDENED, WEAR RESISTANT GEARS,  
 HOUSING, HEAD, PIN, AND BUSHING  
 HARD FACE, WEAR RESISTANT  
 MECHANICAL SEAL  
 OVERSIZED TAPERED SEAL CAVITY  
 HEAVY DUTY NEEDLE ROLLER  
 BEARING  
 ROTOR END CLEARANCE EXTERNALLY  
 ADJUSTABLE  
 FLEXIBLE SEAL DESIGN ALLOWS FOR  
 A VARIETY OF INDUSTRY  
 STANDARD SEALS OR PACKING  
 BALL BEARING THRUST CONTROL*

**OPERATING RANGE**

CAPACITY (GPM) : (8 TO 325)  
 [LPM] : [25 TO 1020]  
 PRESSURE (PSI) : [0 TO 200]  
 [BAR] : [0 TO 14]  
 VISCOSITY (SSU) : (28 TO 250,000)  
 [cSt] : [1 TO 55,000]  
 TEMPERATURE (F) : (-60° TO 500°)  
 [C] : [-51° TO 260°]

**APPLICATIONS**

USE WITH ANY LIQUID  
 COMPATIBLE WITH  
 CAST IRON  
 ★ PAINTS  
 ★ INKS  
 ★ ADHESIVES  
 ★ WASTE LIQUIDS  
 ★ EMULSIONS  
 ★ FILTERING

EXTER- IOR	ROTOR & IDLER	HSG PORTS	IDLER BUSHING	BACKHD BEARING	IDLER PIN	SHAFT	SHAFT SEALING		ROTA- TION	INTERNAL RELIEF VALVE	
							MECHANICAL SEAL ●	PACKING ■		MATERIAL	SETTING
CAST IRON	HARD IRON	90° TAPPED/ FLNG'D	SILICON CARBIDE	① NEEDLE BEARING	TUNGSTEN CARBIDE	HARD. STEEL	SILICON CARB. SILICON CARB. VITON	ARAMID FIBER W/GRAPHITE	C.W.	DUCTILE IRON	75 PSI [5 BAR]

## Standard Models

**G H A 2 NK 3 - B**  
 | | | | | | | |  
 GEAR DUTY DESIGN PORT SIZE HYDRAULIC SEAL STYLE  
 SIZE SIZE

MODEL NUMBER	NOM. CAPACITY-SPEED		MAXIMUM				SHIPPING DATA		
	MAXIMUM		DIFFERENTIAL PRESSURE - PSI [BAR]			TEMP.	② Weight	Volume	
	GPM [LPM]	RPM 60 Hz [50 HZ]	BELOW 38 SSU [4 cSt]	38 TO 100 SSU [21 cSt]	100 TO 250,000 SSU [55,000 cSt]	°F [°C]			LBS [KG]
GHA 1-1/2 GC 3-B ● GHA 1-1/2 GC 4-B ■	8 [25]	870 [720]						57 [25,9]	2.9
GHA 1-1/2 GF 3-B ● GHA 1-1/2 GF 4-B ■	11 [36]							57 [25,9]	
GHA 1-1/2 GH 3-B ● GHA 1-1/2 GH 4-B ■	15 [49]							57 [25,9]	
GHA 1-1/2 GJ 3-B ● GHA 1-1/2 GJ 4-B ■	19 [60]							57 [25,9]	
GHA 2 JJ 3-B ● GHA 2 JJ 4-B ■	28 [88]		100 [7]	150 [10]	200 [14]	● 250 [119]		144 [65,5]	5.3
GHA 2 JL 3-B ● GHA 2 JL 4-B ■	38 [121]							144 [65,5]	
GHA 2 JP 3-B ● GHA 2 JP 4-B ■	54 [169]							144 [65,5]	
GHA 2 NK 3-B ● GHA 2 NK 4-B ■	60 [188]	580 [480]				■ 500 [260]		180 [81,6]	5.3
GHA 3 NK 3-B ● GHA 3 NK 4-B ■								180 [81,6]	
GHA 2 NM 3-B ● GHA 2 NM 4-B ■	80 [251]							180 [81,6]	
GHA 3 NM 3-B ● GHA 3 NM 4-B ■								180 [81,6]	
GHA 2 NP 3-B ● GHA 2 NP 4-B ■	99 [313]							180 [81,6]	
GHA 3 NP 3-B ● GHA 3 NP 4-B ■								180 [81,6]	10.7

STANDARD MODELS CONT.

① EXCEPT "S" SIZE AND 4-B MODELS (SILICON CARBIDE BUSHING).

② FOR 4-B UNIT WEIGHT, REFER TO GHS SECTION

● MECHANICAL SEAL  
■ PACKING

**THE GORMAN-RUPP COMPANY • MANSFIELD, OHIO**  
GORMAN-RUPP OF CANADA LIMITED • ST. THOMAS, ONTARIO, CANADA

# Standard Models Cont'd

MODEL NUMBER	NOM. CAPACITY-SPEED		MAXIMUM				SHIPPING DATA		
	MAXIMUM		DIFFERENTIAL PRESSURE - PSI [BAR]			TEMP.	Weight	Volume	
	GPM [LPM]	RPM 60 Hz [50 HZ]	BELOW 38 SSU [4 cSt]	38 TO 100 SSU [21 cSt]	100 TO 250,000 SSU [55,000 cSt]	°F [°C]	LBS [KG]	CU. FT.	
GHA 2 RM 3-B ● GHA 2 RM 4-B ■	85 [271]	350 [290]	100 [7]	150 [10]	200 [14]	● 250 [119] ■ 500 [260]	357 [162]	10.7	
GHA 2-1/2 RM 3-B ● GHA 2-1/2 RM 4-B ■							357 [162]		
GHA 3 RM 3-B ● GHA 3 RM 4-B ■							357 [162]		
GHA 3 RP 3-B ● GHA 3 RP 4-B ■							105 [339]		357 [162]
GHA 3 RR 3-B ● GHA 3 RR 4-B ■							125 [402]		357 [162]
GHA 3 RS 3-B ● GHA 3 RS 4-B ■							146 [465]		357 [162]
GHA 4 RS 3-B ● GHA 4 RS 4-B ■							146 [465]		357 [162]
GHA 3 SR 3-B ● GHA 3 SR 4-B ■	210 [660]	350 [290]	100 [7]	150 [10]	200 [14]	● 400 [204] ■ 500 [260]	530 [240]	17.3	
GHA 4 SR 3-B ● GHA 4 SR 4-B ■							530 [240]		
GHA 3 SU 3-B ● GHA 3 SU 4-B ■							325 [1020]		530 [240]
GHA 4 SU 3-B ● GHA 4 SU 4-B ■									530 [240]

PORTS ARE COMPATIBLE WITH 125# ANSI CAST IRON FLANGES. ALL OTHER PORTS ARE TAPPED NPT FOR ANSI PIPE.

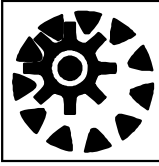
NOTE: PROPER PUMP APPLICATION REQUIRES CONSIDERATION OF ADDITIONAL FACTORS. PLEASE REVIEW APPLICATION GUIDE IN SECTION 500 OR CONSULT THE FACTORY.

# **GHA**

**FOR GHA DRIVE OPTIONS  
AND DIMENSIONS**

**SEE**

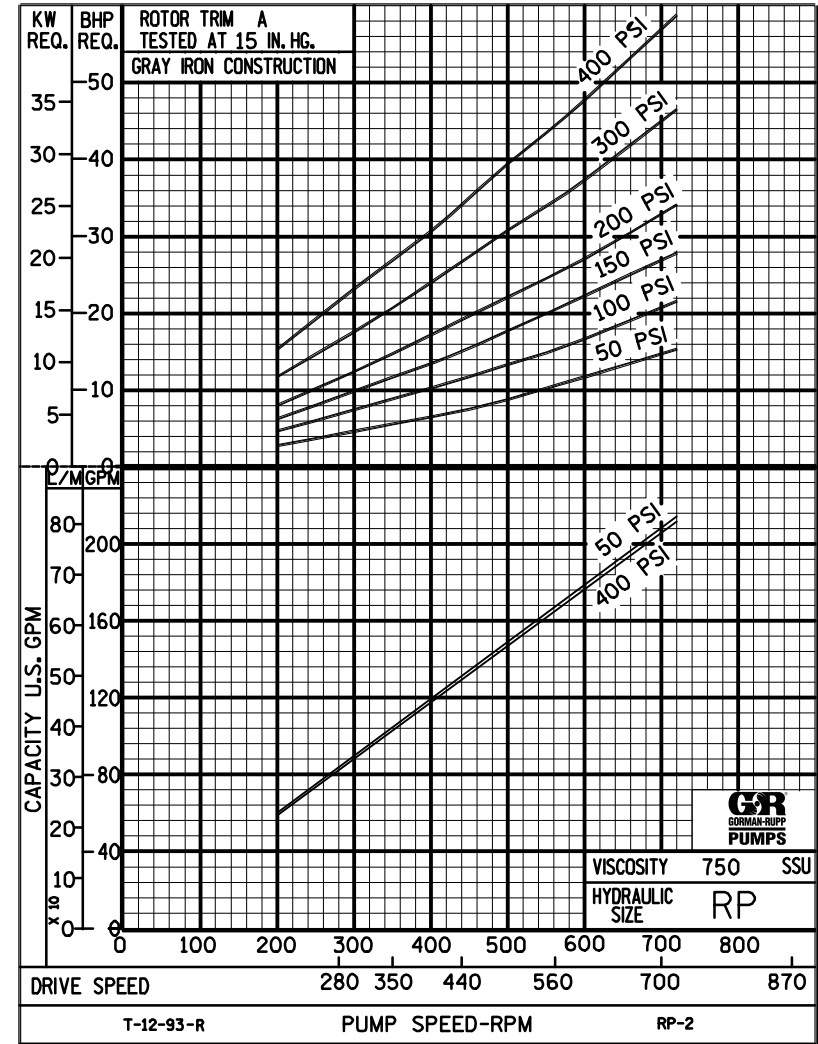
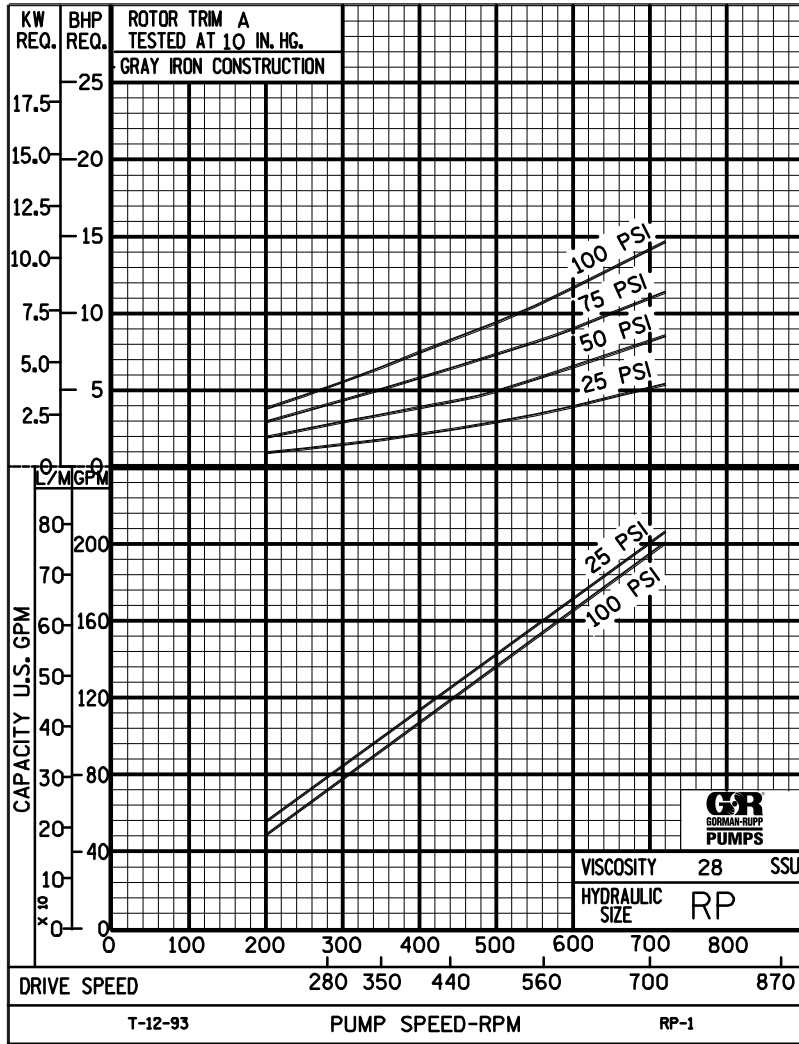
**SECTION 545**



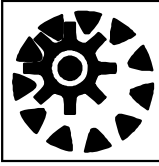
# PERFORMANCE CURVES

## SPEED VS. CAPACITY/HORSEPOWER

**RP** Hydraulic Size



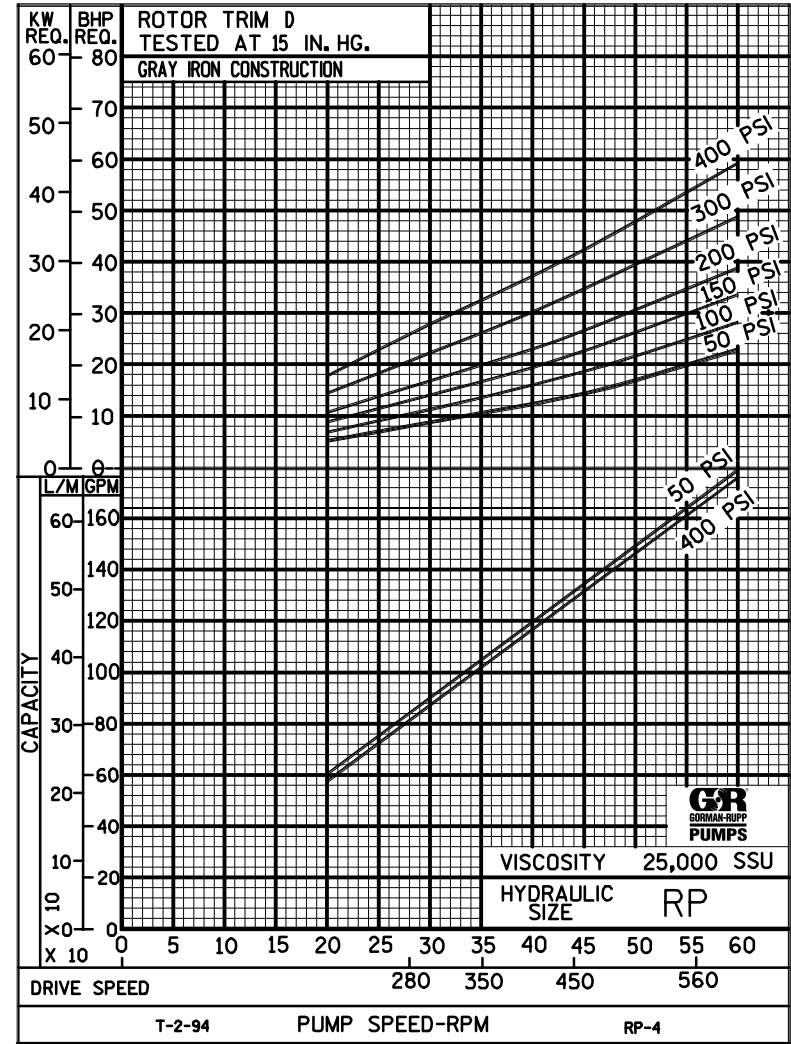
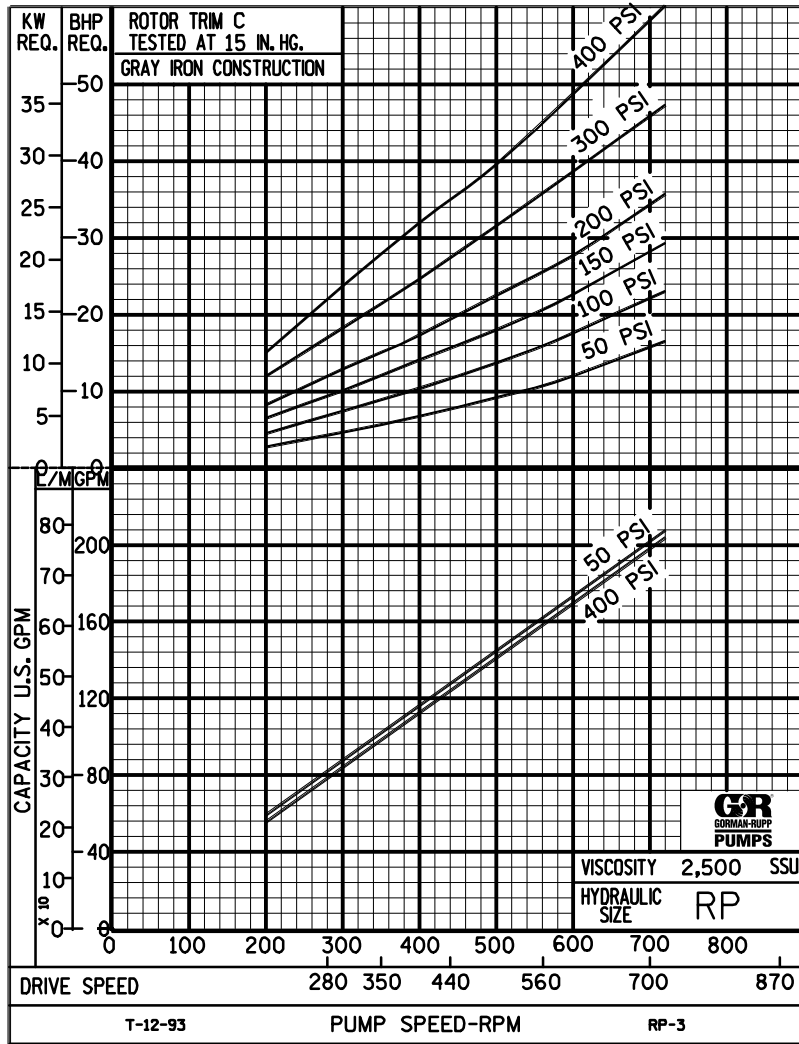
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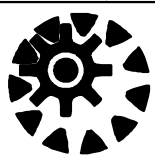
# PERFORMANCE CURVES

## SPEED VS. CAPACITY/HORSEPOWER

**RP** Hydraulic Size



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# RP

## PUMP HYDRAULIC SIZE CHART

SEC. 500

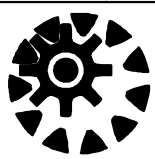
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215 GPM  
720 RPM

NOMINAL		ROTOR TRIM	VISCOSITY (SSU)	N.I.P.R. (PSIA)	FRICTION PIPE LOSS (PSI/FT) (Based on Sch 40 Steel Pipe)					FULL BYPASS RELIEF VALVE PRESSURE (PSI)					CAPACITY (GPM) / H.P. REQUIRED																															
CAP. GPM	SPEED RPM				PIPE DIAMETER					CRACKING PRESS. (PSI)					DIFFERENTIAL PRESSURE (PSI)																															
			2"	2 1/2"	3"	4"	6"	LOW PRES R/V		HI PRES R/V			HEAVY DUTY																																	
215	720	STD	28	4.0	.31	.13	.04	.01	-	62	87	123	185	206	204	202	200																													
			32		.33	.13	.04	.01	-							5.9	8.1	12	15																											
			38	4.0	.35	.14	.05	.01	-	64	90	126	187			208	206	204	202	196																										
			50		.38	.16	.05	.01	-							7.3	9.3	13	16	23																										
			70	4.0	.42	.18	.06	.02	-	69	95	130	192	251		210	208	208	206	202	198																									
			100		.46	.20	.07	.02	-							9.3	12	15	18	25	30																									
			150	4.0	.51	.22	.08	.02	-							212	212	210	210	208	204	202	200																							
			200		.55	.24	.08	.02	-	74	99	134	196	258		11	13	17	20	26	32	45	58																							
			300	4.0	.61	.27	.10	.03	-							214	212	212	212	210	208	206	206																							
			500		.72	.31	.11	.02	-	80	105	140	202	267		12	15	18	21	28	34	46	59																							
		750	4.0	.51	.25	.10	.04	.01							214	214	214	214	214	212	212	212																								
		1,000		.68	.33	.14	.05	.01	84	110	144	206	274		13	16	19	22	29	35	47	60																								
		2,000	4.3	1.35	.66	.28	.09	.02							208	208	208	206	206	206	206	204																								
		3,500		2.37	1.16	.49	.16	.03	92	118	151	213	287		15	17	20	24	30	36	48	61																								
		5,000	4.7	3.38	1.66	.70	.24	.05							208	208	208	208	206	206	206	204																								
		7,500		5.08	2.49	1.05	.35	.07	97	123	156	218	294		16	19	22	25	32	39	50	63																								
		10,000	5.2	6.77	3.32	1.39	.47	.09							210	208	208	208	208	208	206	206																								
		15,000		10.2	4.99	2.09	.71	.14	102	127	160	222	301		18	20	24	28	34	41	53	66																								
		20,000																																												
		25,000																																												
50,000																																														
75,000																																														
100,000																																														
150,000																																														
200,000																																														
250,000																																														

(NOTE) For speeds not shown on the pump hydraulic charts, consult factory.



# RP

## PUMP HYDRAULIC SIZE CHART

SEC. 500

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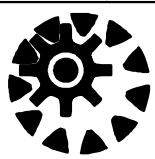
January 2010

**190 GPM  
640 RPM**

NOMINAL		ROTOR TRIM	VISCOSITY (SSU)	N.I.P.R. (PSIA)	FRICTION PIPE LOSS (PSI/FT) <small>(Based on Sch 40 Steel Pipe)</small>					FULL BYPASS RELIEF VALVE PRESSURE (PSI)					CAPACITY (GPM) / H.P. REQUIRED																
CAP. GPM	SPEED RPM				PIPE DIAMETER					CRACKING PRESS. (PSI)					DIFFERENTIAL PRESSURE (PSI)																
					2"	2 1/2"	3"	4"	6"	LOW PRES R/V		HI PRES R/V			MEDIUM DUTY AND HEAVY DUTY				HEAVY DUTY ONLY												
190	640	STD	28	3.2	.24	.10	.03	.01	-	60	85	122	180		184	181	179	177													
			32		.26	.10	.04	.01	-						4.9	7.3	10	13													
			38	3.2	.27	.11	.04	.01	-	63	88	124	183		185	182	180	179	174												
			50		.30	.13	.04	.01	-						6.2	8.9	12	15	19												
			70	3.2	.33	.14	.05	.01	-	67	92	128	187	248	187	185	183	178	176												
			100		.37	.16	.06	.02	-						7.9	10	13	16	21	28											
			150	3.2	.41	.17	.06	.02	-	71	97	132	191	253	189	187	186	185	183	181	179	176									
			200		.44	.19	.07	.02	-						8.9	12	15	18	22	29	39	50									
			300	3.2	.49	.21	.08	.02	-	77	102	136	196	260	190	189	188	188	187	185	184	183									
			500		.58	.25	.06	.02	-						10	13	16	19	24	30	40	50									
		750	3.2	.45	.22	.09	.03	.01	81	107	140	200	266	191	191	190	190	189	188	188	187										
		1,000		.60	.29	.12	.04	.01						11	13	16	19	24	30	41	51										
		2,000	3.5	1.19	.59	.25	.08	.02	88	114	146	207	276	186	185	185	184	183	183	182	180										
		3,500		2.09	1.03	.43	.15	.03						12	14	18	20	26	31	42	54										
		5,000	3.9	2.98	1.46	.61	.21	.04	93	119	150	211	281	187	186	185	185	184	184	184	181										
		7,500		4.47	2.20	.92	.31	.06						13	16	19	22	28	33	43	57										
		10,000	4.4	5.96	2.93	1.23	.41	.08	97	123	154	215	287	187	186	186	185	185	185	185	182										
		15,000		8.94	4.39	1.84	.62	.12						15	18	21	24	30	35	46	60										
		20,000	5.1	11.9	5.86	2.46	.83	.16	100	126	158	218	292	187	187	186	186	186	186	186	183										
		25,000		14.9	7.32	3.07	1.04	.20						17	20	23	27	32	37	48	63										
50,000																															
75,000																															
100,000																															
150,000																															
200,000																															
250,000																															

(NOTE) For speeds not shown on the pump hydraulic charts, consult factory.





# RP

## PUMP HYDRAULIC SIZE CHART

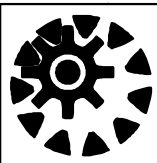
SEC. 500

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155 GPM  
520 RPM

NOMINAL		ROTOR TRIM	VISCOSITY (SSU)	N.I.P.R. (PSIA)	FRICTION PIPE LOSS (PSI/FT) <small>(Based on Sch 40 Steel Pipe)</small>					FULL BYPASS RELIEF VALVE PRESSURE (PSI)					CAPACITY (GPM) / H.P. REQUIRED																	
CAP. GPM	SPEED RPM				PIPE DIAMETER					CRACKING PRESS. (PSI)					DIFFERENTIAL PRESSURE (PSI)																	
					2"	2 1/2"	3"	4"	6"	LOW PRES R/V		HI PRES R/V			MEDIUM DUTY AND HEAVY DUTY				HEAVY DUTY ONLY													
155	520	STD	28	2.3	.16	.07	.02	.01	-	57	84	120	178		148	145	143	141														
			32		.17	.07	.02	.01	-						3.3	5.3	7.9	10														
			38	2.3	.19	.08	.03	.01	-	60	86	122	180		149	147	145	143	138													
			50		.20	.09	.03	.01	-						4.6	6.7	9.1	11	16													
			70	2.3	.23	.10	.03	.01	-	63	89	124	183	242	151	149	147	146	143	140												
			100		.25	.11	.04	.01	-						5.9	7.9	10	12	17	22												
			150	2.3	.28	.12	.04	.01	-	66	93	127	186	246	153	152	150	150	148	146	144	141										
			200		.31	.13	.05	.01	-						6.7	8.8	11	13	18	22	31	40										
			300	2.3	.35	.15	.05	.01	-	72	98	131	190	251	154	153	153	152	151	150	149	148										
			500		.41	.12	.05	.02	-						7.6	9.8	12	14	18	23	32	41										
		750	2.3	.36	.18	.07	.03	-	75	101	134	193	254	155	155	154	154	153	153	152	152											
		1,000		.48	.24	.10	.03	.01						7.8	10	12	14	19	23	33	41											
		2,000	2.9	.97	.47	.20	.07	.01	82	110	139	199	260	152	151	151	150	149	149	148	146											
		3,500		1.69	.83	.35	.12	.02						8.6	11	13	16	20	24	34	42											
		5,000	3.3	2.42	1.19	.50	.17	.03	86	112	142	202	264	153	152	152	151	151	150	149	148											
		7,500		3.63	1.78	.75	.25	.05						11	13	14	18	23	27	36	44											
		10,000	3.8	4.83	2.37	1.00	.34	.07	89	115	145	205	268	154	153	153	152	152	151	151	149											
		15,000		7.25	3.56	1.49	.50	.10						14	16	19	20	25	29	38	47											
		20,000	4.3	9.67	4.75	1.99	.67	.13	93	118	148	207	272	155	154	154	153	153	152	152	151											
		25,000		12.1	5.94	2.49	.84	.16						16	18	21	23	28	32	41	49											
50,000	6.1	24.2	11.9	4.98	1.68	.33	98	124	151	212	276	155	154	154	153	153	152	152	151													
75,000		36.3	17.8	7.47	2.52	.49						22	24	27	30	34	39	48	57													
100,000																																
150,000																																
200,000																																
250,000																																

(NOTE) For speeds not shown on the pump hydraulic charts, consult factory.



# RP

## PUMP HYDRAULIC SIZE CHART

SEC. 500

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**105 GPM  
350 RPM**

NOMINAL		ROTOR TRIM	VISCOSITY (SSU)	N.I.P.R. (PSIA)	FRICTION PIPE LOSS (PSI/FT) <small>(Based on Sch 40 Steel Pipe)</small>					FULL BYPASS RELIEF VALVE PRESSURE (PSI)					CAPACITY (GPM) / H.P. REQUIRED										
CAP. GPM	SPEED RPM				PIPE DIAMETER					CRACKING PRESS. (PSI)					DIFFERENTIAL PRESSURE (PSI)										
		2"	2 1/2"	3"	4"	6"	LOW PRES R/V		HI PRES R/V			MEDIUM DUTY AND HEAVY DUTY				HEAVY DUTY ONLY									
									50	75	100	150	200	25	50	75	100	150	200	300	400				
105	350	STD	28	1.5	.07	.03	.01	-	-	55	82	118	175		98	95	93	92							
			32	1.5	.08	.03	.01	-	-						1.5	4.1	4.9	6.9							
			38	1.5	.09	.04	.01	-	-	57	83	119	176		99	97	95	94	90						
			50	1.5	.10	.04	.01	-	-						2.2	4.3	5.9	7.4	11						
			70	1.5	.11	.05	.02	-	-	59	86	121	177	230	101	99	98	97	95	94					
			100	1.5	.13	.05	.02	.01	-						2.9	4.9	6.8	8.3	11	15					
			150	1.5	.14	.06	.02	.01	-	63	89	123	179	233	103	102	101	100	99	98	97	95			
			200	1.5	.15	.07	.02	-	-						3.5	5.3	7.2	8.8	12	15	20	27			
			300	1.5	.18	.05	.02	.01	-	67	93	125	181	235	104	103	103	102	102	100	100	100	99		
			500	1.5	.16	.08	.03	.01	-						3.8	5.6	7.4	8.9	12	15	21	27			
		750	1.6	.24	.12	.05	.02	-	70	95	127	183	237	105	105	104	104	103	102	102	101				
		1,000	1.6	.32	.16	.07	.02	-						3.9	5.7	7.5	9.1	12	15	21	28				
		2,000	2.0	.64	.32	.13	.04	.01	75	100	130	185	241	103	103	102	102	101	100	100	99	98			
		3,500	2.0	1.13	.55	.23	.08	.02						4.1	6.2	7.9	9.8	13	16	22	29				
		5,000	2.4	1.61	.79	.33	.11	.02	78	104	132	187	243	104	103	103	103	102	101	100	100				
		7,500	2.4	2.42	1.19	.50	.17	.03						5.2	7.9	8.9	11	14	17	24	30				
		10,000	2.8	3.22	1.58	.66	.22	.04	81	106	134	189	245	104	104	104	103	103	102	101	100				
		15,000	2.8	4.83	2.37	1.00	.34	.07						6.4	9.2	10	12	15	19	25	31				
		20,000	3.3	6.45	3.17	1.33	.45	.09	83	108	136	190	247	105	105	104	104	104	103	103	102				
		25,000	3.3	8.06	3.96	1.66	.56	.11						7.5	10	11	13	16	20	26	32				
50,000	5.0	16.1	7.92	3.32	1.12	.22	89	113	137	192	250	105	105	104	104	104	103	103	102						
75,000	5.0	24.2	11.9	4.98	1.68	.33						11	13	14	16	20	23	29	35						
100,000	6.9	32.2	15.8	6.64	2.24	.43	92	115	140	194	252	105	105	104	104	104	103	103	102						
150,000	6.9	48.4	23.8	9.96	3.36	.65						15	16	18	19	22	26	32	37						
200,000	8.7	64.5	31.7	13.3	4.48	.87	94	117	142	195	253	105	105	104	104	104	103	103	102						
250,000	8.7	80.6	39.6	16.6	5.60	1.09						19	21	22	24	24	28	34	40						

(NOTE) For speeds not shown on the pump hydraulic charts, consult factory.



# RP

SEC. 500

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**30 GPM**  
**100 RPM**

NOMINAL		VISCOSITY		N.I.P.R.	FRICTION PIPE LOSS (PSI/FT) <small>(Schedule 40 Steel Pipe)</small>					CAPACITY (GPM)				H.P. REQUIRED							
GPM	RPM	ROTOR TRIM	(SSU)	(PSIa)	PIPE DIAMETER					MEDIUM-DUTY & HEAVY-DUTY				HEAVY-DUTY ONLY							
					2½"	3"	4"	5"	6"	DIFFERENTIAL PRESSURE (PSI)				150	200	300	400				
						25	50	75	100	150	200	300	400								
30	100	STD																			
				"D"																	
			200,000	2.7	9.5	4	1.3	0.55	0.3	30	30	30	30	29	29	29	29				
			399,999		19	8	2.7	1.1	0.5	3.9	4.5	5.0	5.6	6.6	7.6	8.6	9.6				
			400,000	3						30	30	30	30	29	29	29	29				
			599,999		NR	12	4	1.6	0.8	4.2	4.8	5.3	5.9	6.8	7.8	8.8	9.8				
			600,000	3.7						30	30	30	30	29	29	29	29				
			799,999		NR	16	5.4	2.2	1	4.4	5.1	5.6	6.2	7.2	8.1	9.1	10				
			800,000	4						30	30	30	30	29	29	29	29				
			1M		NR	20	6.7	2.7	1.3	4.6	5.4	5.9	6.5	7.6	8.4	9.4	11				

(NOTE) For speeds not shown on the pump hydraulic charts, consult factory.