

Elevator Pump Data Book

Imo[®]
Pump

A Colfax Business Unit

3 Screw Pumps

Technical and General Information

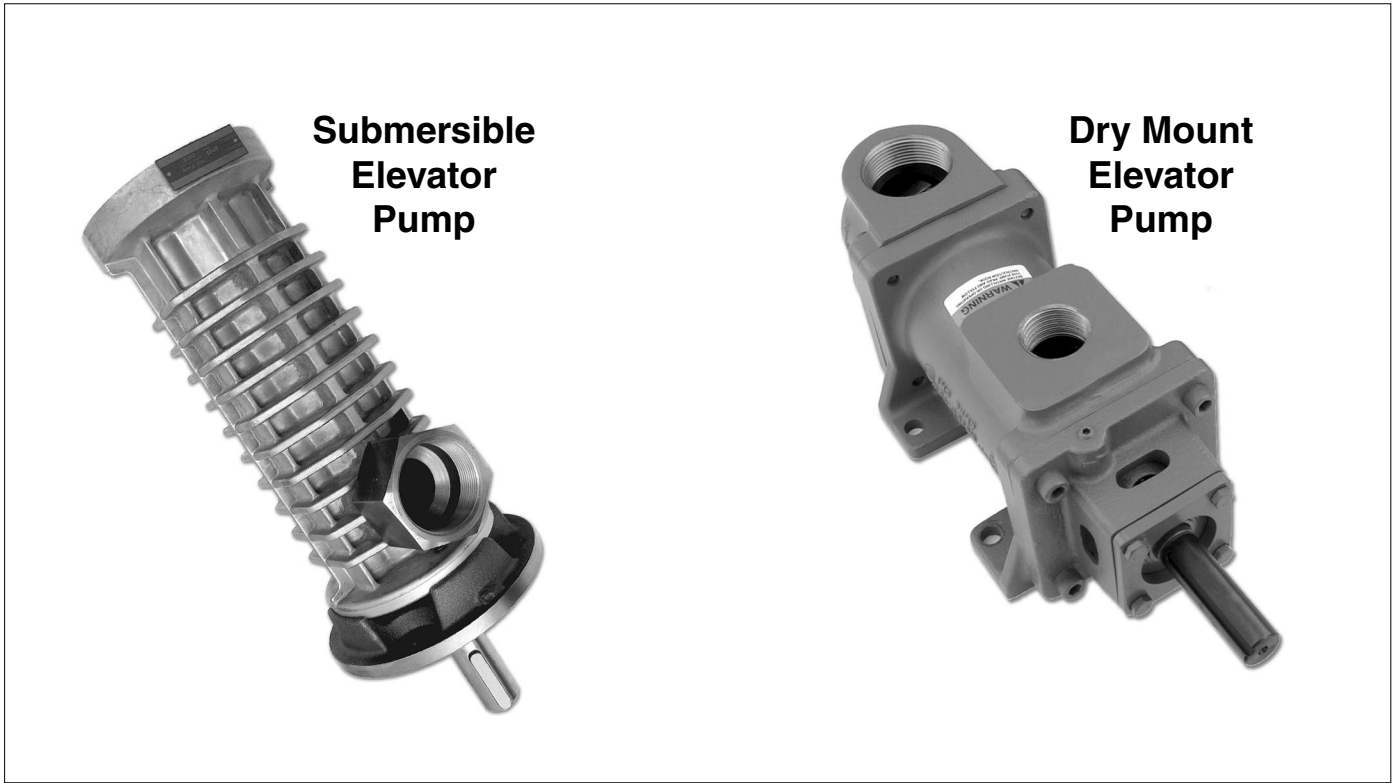


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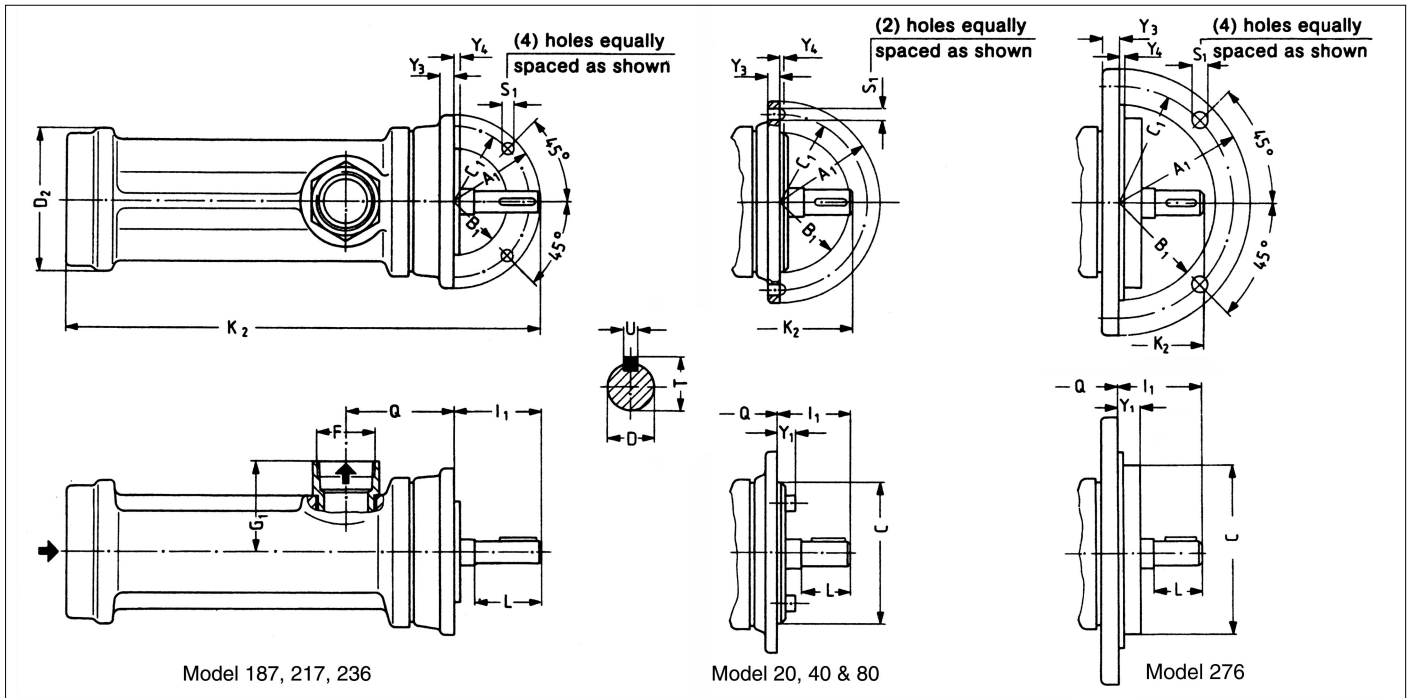
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Submersible Pump Dimensions (inches)



Model	Pump				Shaft				Discharge	
	D ₂	I ₁	K ₂	Q	D	L	T	U	F	G ₁
20	3.15	2.28	11.14	2.28	$\frac{.74785}{.74702}$	1.38	.85	$\frac{.2362}{.2350}$	3/4" NPT	2.54
40	4.45	2.28	12.40	2.64	$\frac{.74785}{.74702}$	1.38	.85	$\frac{.2362}{.2350}$	1" NPT	2.95
80	4.45	2.28	13.90	2.83	$\frac{.74785}{.74702}$	1.38	.85	$\frac{.2362}{.2350}$	1 1/2" NPT	3.03
187	5.59	4.25	18.46	3.98	$\frac{1.25955}{1.25856}$	3.15	1.38	$\frac{.3937}{.3923}$	2" NPT	3.94
217	6.30	4.25	20.24	4.17	$\frac{1.25955}{1.25856}$	3.15	1.38	$\frac{.3937}{.3923}$	2" NPT	3.74
236	6.30	4.25	21.46	4.17	$\frac{1.25955}{1.25856}$	3.15	1.38	$\frac{.3937}{.3923}$	2" NPT	3.94
276	7.48	4.02	27.13	5.75	$\frac{1.25955}{1.25856}$	2.56	1.38	$\frac{.3937}{.3923}$	3" NPT	4.84
276*	7.75	4.21	26.73	5.55	$\frac{1.2598}{1.2589}$	2.56	1.38	$\frac{.3937}{.3923}$	2 1/2" NPT	4.84

Model	Flange								Weight (lbs.)	
	A ₁	B ₁	C	C ₁	S ₁	Y ₁	Y ₃	Y ₄	Net	Ship
20	$\frac{6.1018}{6.1002}$	4.33	-	5.31	.35	.16	.39	-	11	13
40	$\frac{6.1018}{6.1002}$	4.33	4.33	5.31	.35	.55	.39	.08	17	20
80	$\frac{6.1018}{6.1002}$	4.33	4.33	5.31	.35	.55	.39	.08	23	26
187	7.09	$\frac{4.3744}{4.3736}$	-	6.26	.31	-	.47	.20	38	42
217	7.09	$\frac{4.3744}{4.3736}$	-	6.26	.31	-	.47	.20	51	55
236	7.09	$\frac{4.3744}{4.3736}$	-	6.26	.31	-	.47	.20	59	63
276	11.50	$\frac{8.6614}{8.6603}$	-	10.24	.69	-	.71	.20	90	110
276*	9.02	$\frac{4.3745}{4.3736}$	-	8.12	.44	-	.59	.20	90	110

* A4PICX-276 Pump Dimensions

Submersible Pump Performance Data

Minimum Flow Rates at Various Pressures for Submersible Elevator Pumps @ 3400 Rpm, 150 SSU

Part Number	Pump Model	Pressure (PSIG)								
			200	250	300	350	400	450	500	550
GS672523	20USNP38	GPM	8.6	8.5	8.4	8.3	8.2	8.2	8.1	8.0
		HP	1.7	2.0	2.3	2.5	2.8	3.1	3.4	3.6
GS672522	20USNP46	GPM	11.4	11.3	11.1	11.0	10.9	10.8	10.7	10.6
		HP	2.1	2.4	2.8	3.2	3.5	3.9	4.3	4.6
GS672525	20USNP50	GPM	13.6	13.4	13.3	13.2	13.0	12.9	12.7	12.6
		HP	2.1	2.5	2.9	3.3	3.7	4.1	4.6	5.0
GS672524	20USNP56	GPM	16.0	15.8	15.7	15.6	15.4	15.3	15.2	15.1
		HP	2.6	3.1	3.6	4.2	4.7	5.2	5.7	6.2
GS535494	40USNP41	GPM	18.5	18.2	18.0	17.7	17.5	17.3	17.0	16.8
		HP	3.6	4.3	4.9	5.5	6.1	6.7	7.3	7.9
GS535495	40USNP49	GPM	25.0	24.0	24.0	24.0	23.0	23.0	23.0	23.0
		HP	4.4	5.3	6.1	6.9	7.7	8.5	9.3	10.1
GS535497	80USNP36	GPM	33.0	32.0	32.0	32.0	31.0	31.0	31.0	31.0
		HP	5.8	6.8	7.9	8.9	9.9	11.0	12.0	13.0
GS535498	80USNP42	GPM	39.0	39.0	39.0	38.0	38.0	38.0	37.0	37.0
		HP	6.7	8.0	9.2	10.5	11.7	13.0	14.3	15.5
GS535496	80USNP46	GPM	47.0	46.0	46.0	46.0	45.0	45.0	45.0	44.0
		HP	7.6	9.0	10.5	12.0	13.5	15.0	16.4	17.9
3432/082	A4PIC-187AJ	GPM	52.2	51.6	51.0	50.5	50.0	49.5	49.1	48.6
		HP	9.2	10.9	12.5	14.2	15.9	17.6	19.3	21.0
3432/078	A4PIC-187Y	GPM	56.8	56.1	55.6	55.0	54.5	54.1	53.6	53.2
		HP	9.7	11.5	13.4	15.2	17.0	18.8	20.6	22.4
3432/079	A4PIC-187P	GPM	62.2	61.4	60.8	60.1	59.5	59.0	58.5	58.0
		HP	10.5	12.5	14.5	16.5	18.5	20.5	22.5	24.5
3432/080	A4PIC-187M	GPM	67.9	67.0	66.3	65.5	64.9	64.3	63.7	63.1
		HP	11.2	13.4	15.6	17.8	20.0	22.2	24.4	26.6
3432/081	A4PIC-187	GPM	78.6	77.8	77.0	76.3	75.6	75.0	74.4	73.9
		HP	12.5	15.0	17.5	20.0	22.5	25.0	27.5	30.0
3442/260	A4PIC-217Y	GPM	88.5	87.5	86.7	85.9	85.1	84.4	83.8	83.1
		HP	15.1	17.9	20.7	23.6	26.4	29.2	32	34.8
3442/259	A4PIC-217P	GPM	98.5	97.5	96.7	95.9	95.1	94.4	93.8	93.1
		HP	16.3	19.4	22.5	25.6	28.7	31.8	34.9	38.0
3442/257	A4PIC-217M	GPM	106.9	105.8	104.7	103.8	102.9	102.1	101.3	100.5
		HP	17.4	20.8	24.2	27.6	31.0	34.4	37.8	41.2
3442/258	A4PIC-217	GPM	123.9	122.8	121.8	120.8	120.0	119.2	118.4	117.7
		HP	19.4	23.3	27.2	31.0	34.9	38.8	42.7	46.6
3452/266	A4PIC-236G	GPM	144.5	143.2	142.0	140.9	139.9	138.9	138.0	137.2
		HP	23.1	27.7	32.2	36.8	41.3	45.9	50.4	54.9
3452/267	A4PIC-236	GPM	162.8	161.6	160.5	159.5	158.5	157.6	156.8	156.0
		HP	25.2	30.2	35.3	40.3	45.3	50.4	55.4	60.5
3452/268	A4PIC-236AS	GPM	189.6	188.0	186.5	185.2	183.9	182.8	181.6	180.6
		HP	28.7	34.6	40.6	46.5	52.4	58.3	64.3	70.2
3462/009	A4PIC-276P	GPM	204.9	203.1	201.5	200.1	198.7	197.4	196.2	195.1
3462/012	A4PICX-276P	HP	33.6	40.0	46.4	52.8	59.2	65.6	72.0	78.4
3462/011	A4PIC-276G	GPM	230.1	228	226.2	224.5	223	221.5	220.1	218.8
3462/013	A4PICX-276G	HP	36.8	44	51.2	58.4	65.6	72.8	80	87.2
*3462/010	A4PIC-276	GPM	258.3	256.4	254.7	253.1	251.6	250.2	248.8	247.6
*3462/014	A4PICX-276	HP	40.0	48.0	56.0	64.0	72.0	80.0	88.0	96.0

* Elevated inlet pressure may be required to prevent cavitation – contact Factory.

Submersible Pump Performance Data

Minimum Flow Rates at Various Pressures for Submersible Elevator Pumps @ 3400 Rpm, 150 SSU

Part Number	Pump Model	Pressure (PSIG)									
			600	650	700	750	800	850	900	950	1000
GS672523	20USNP38	GPM	7.9	7.8	7.8	7.7	7.7	7.6	7.6	7.5	7.5
		HP	3.9	4.2	4.5	4.8	5.0	5.3	5.6	5.9	6.1
GS672522	20USNP46	GPM	10.5	10.5	10.4	10.3	10.2	10.2	10.1	10.0	10.0
		HP	5.0	5.4	5.7	6.1	6.5	6.8	7.2	7.6	7.9
GS672525	20USNP50	GPM	12.5	12.3	12.2	12.1	12.0	11.8	11.7	11.6	11.5
		HP	5.4	5.8	6.2	6.8	7.1	7.5	7.9	8.3	8.7
GS672524	20USNP56	GPM	15.0	14.9	14.8	14.7	14.6	14.5	14.4	14.3	14.2
		HP	6.7	7.2	7.7	8.2	8.7	9.3	9.8	10.3	10.8
GS535494	40USNP41	GPM	16.7	16.5	16.3	16.1	16.0	15.8	15.7	15.5	15.4
		HP	8.6	9.2	9.8	10.4	11.0	11.6	12.2	12.9	13.5
GS535495	40USNP49	GPM	22.0	22.0	22.0	21.0	21.0	21.0	21.0	21.0	21.0
		HP	10.9	11.8	12.6	13.4	14.2	15.0	15.8	16.6	17.4
GS535497	80USNP36	GPM	31.0	30.0	30.0	30.0	30.0	29.0	29.0	29.0	29.0
		HP	14.0	15.1	16.2	17.3	18.3	19.3	20.3	21.4	22.4
GS535498	80USNP42	GPM	37.0	36.0	36.0	36.0	36.0	35.0	35.0	35.0	35.0
		HP	16.8	18.1	19.3	20.6	21.9	23.2	24.4	25.7	26.9
GS535496	80USNP46	GPM	44.0	44.0	43.0	43.0	43.0	43.0	43.0	42.0	42.0
		HP	19.4	20.9	22.4	23.8	25.3	26.8	28.3	29.8	31.3
3432/082	A4PIC-187AJ	GPM	48.2	47.9	47.5	47.1	46.8	46.4	46.1	45.8	45.5
		HP	22.6	24.3	26.0	27.7	29.4	31.0	32.7	34.4	36.1
3432/078	A4PIC-187Y	GPM	52.8	52.4	52.0	51.7	51.3	51.0	50.7	50.3	50.0
		HP	24.3	26.1	27.9	29.7	31.5	33.3	35.1	37.0	38.8
3432/079	A4PIC-187P	GPM	57.5	57.0	56.6	56.2	55.7	55.3	55.0	54.6	54.2
		HP	26.5	28.5	30.5	32.5	34.5	36.5	38.5	40.5	42.5
3432/080	A4PIC-187M	GPM	62.6	62.1	61.6	61.1	60.7	60.2	59.8	59.4	58.9
		HP	28.8	31.0	33.1	35.3	37.5	39.7	41.9	44.1	46.3
3432/081	A4PIC-187	GPM	73.3	72.8	72.3	71.8	71.4	70.9	70.5	70.1	69.7
		HP	32.5	35.0	37.5	40.0	42.5	45.0	47.5	50.0	52.5
3442/260	A4PIC-217Y	GPM	82.5	82	81.4	80.9	80.4	79.9	79.4	78.9	78.4
		HP	37.7	40.5	43.3	46.1	48.9	51.7	54.6	57.4	60.2
3442/259	A4PIC-217P	GPM	92.5	92.0	91.4	90.9	90.4	89.9	89.4	88.9	88.4
		HP	41.2	44.3	47.4	50.5	53.6	56.7	59.8	62.9	66.0
3442/257	A4PIC-217M	GPM	99.8	99.1	98.5	97.8	97.2	96.6	96.0	95.5	94.9
		HP	44.6	48.1	51.5	54.9	58.3	61.7	65.1	68.5	71.9
3442/258	A4PIC-217	GPM	117.0	116.3	115.7	115.1	114.5	113.9	113.4	112.8	112.3
		HP	50.5	54.4	58.3	62.1	66.0	69.9	73.8	77.7	81.6
3452/266	A4PIC-236G	GPM	136.4	135.6	134.8	134.1	133.4	132.7	132.0	131.4	130.7
		HP	59.5	64.0	68.6	73.1	77.6	82.2	86.7	91.3	95.8
3452/267	A4PIC-236	GPM	155.3	154.5	153.8	153.2	152.5	151.9	151.3	150.7	150.1
		HP	65.5	70.6	75.6	80.7	85.7	90.8	95.8	100.9	105.9
3452/268	A4PIC-236AS	GPM	179.6	178.6	177.7	176.8	175.9	175.1	174.3	173.5	172.7
		HP	76.1	82.1	88.0	93.9	99.8	105.8	111.7	117.6	123.6
3462/009	A4PIC-276P	GPM	194.0	192.9	191.9	190.9	190.0	189.1	188.2	187.3	186.5
3462/012	A4PICX-276P	HP	84.8	91.2	97.7	104.1	110.5	116.9	123.3	129.7	136.1
3462/011	A4PIC-276G	GPM	217.5	216.3	215.1	214	212.9	211.8	210.8	209.8	208.8
3462/013	A4PICX-276G	HP	94.4	101.7	108.9	116.1	123.3	130.5	137.7	144.9	152.1
*3462/010	A4PIC-276	GPM	246.4	245.2	244.1	243.0	242.0	241.0	240.0	239.1	238.1
*3462/014	A4PICX-276	HP	104.1	112.1	120.1	128.1	136.1	144.1	152.1	160.2	168.2

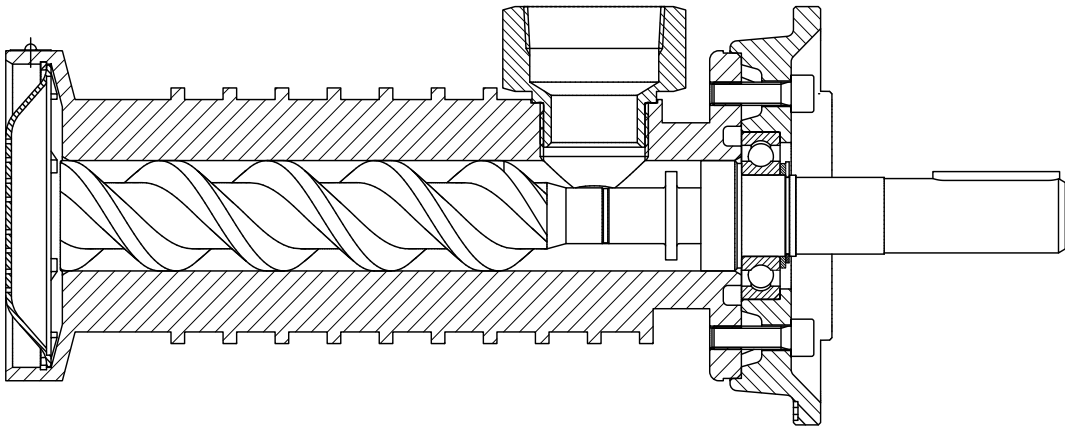
* Elevated inlet pressure may be required to prevent cavitation – contact Factory.

Submersible Pumps

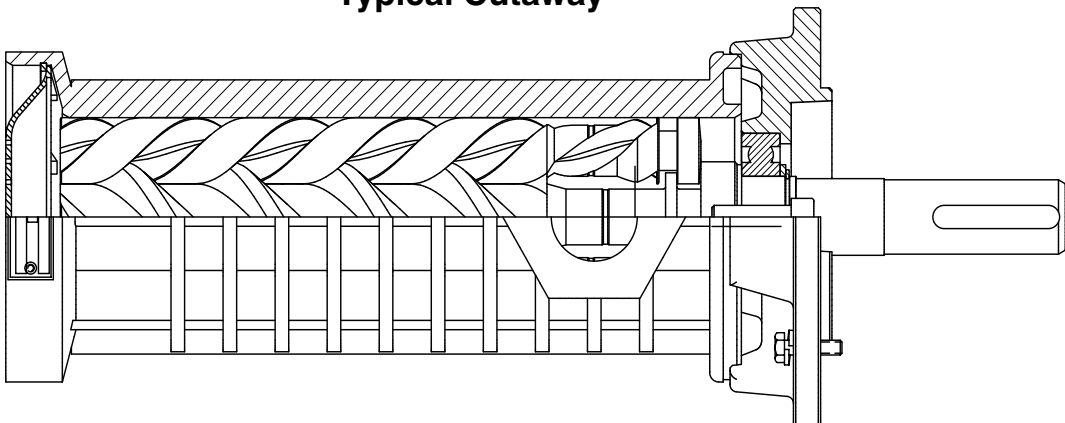
4PIC Specifications and Features

Rotor Housing	Aluminum
Power Rotor	Steel
Idler Rotors	Pearlitic Iron
Operating Pressure	1000 psi maximum
Inlet Pressure	Submersed in tank
Viscosity	Minimum 60 SSU
Temperature	0°F – 180°F
Drive	Direct Drive Only with submersible motor
Rotation	Clockwise, as viewed facing pump shaft
Mounting	Flange mounted directly to submersible motor
Discharge Connections	Refer to page 3 in this publication
Filtration	Inlet Strainers are supplied

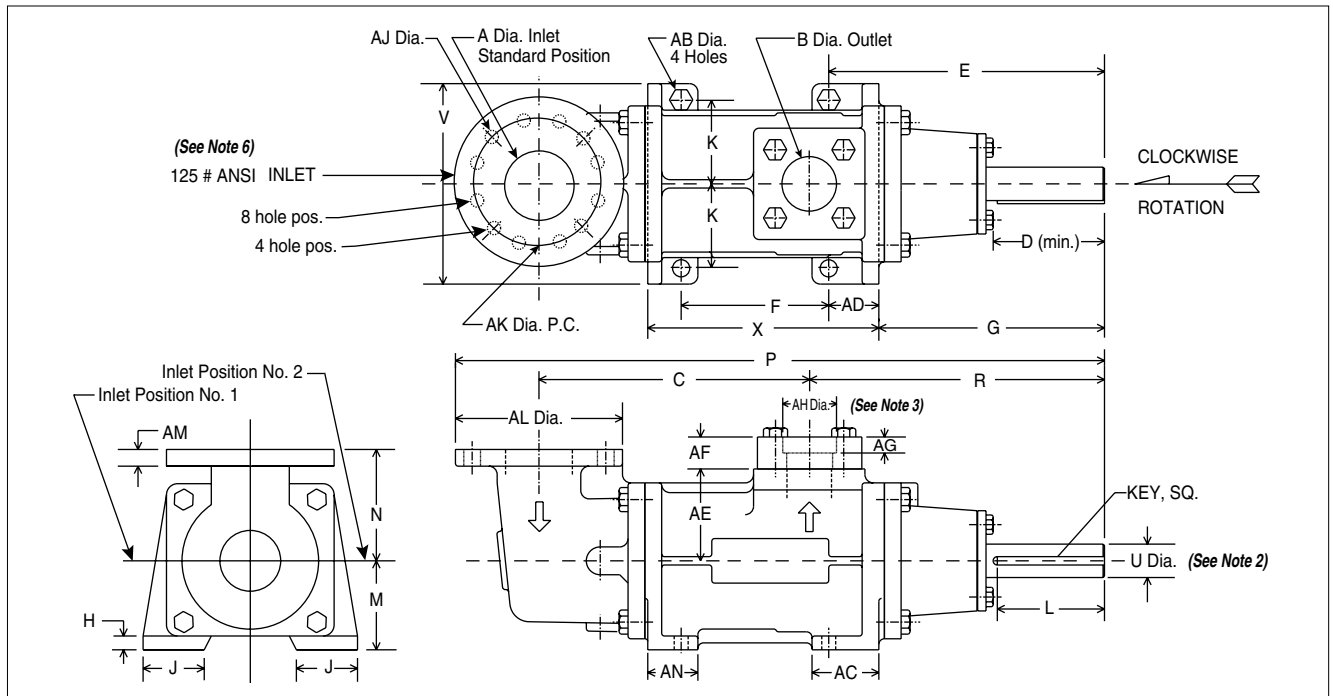
Typical Section



Typical Cutaway



Dry Mounted Pump Dimensions, Rotor Sizes 137 - 350

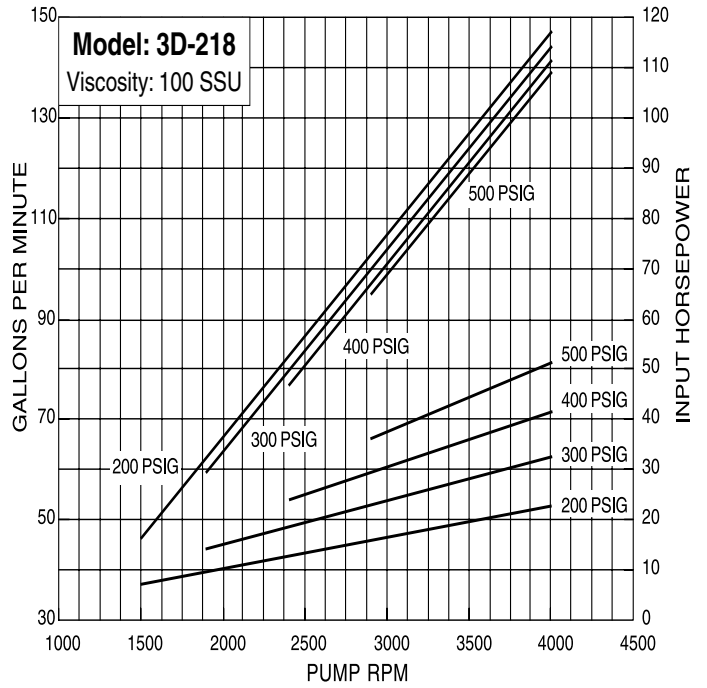
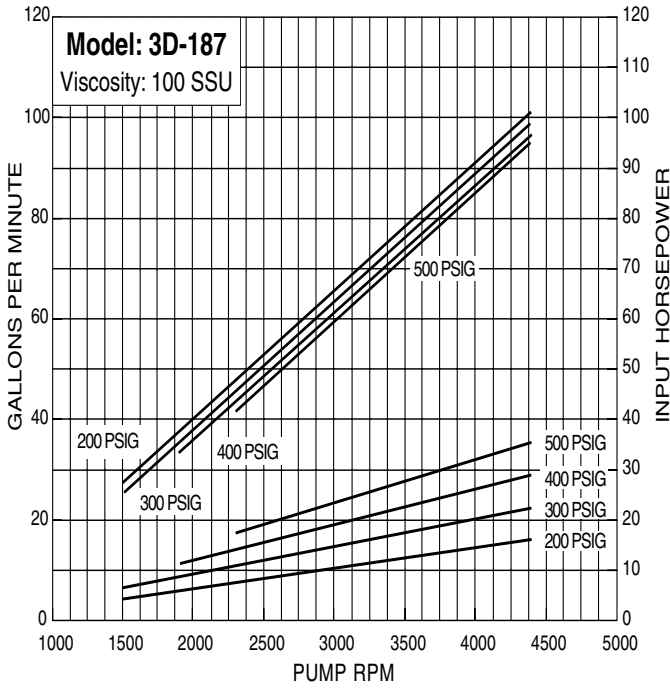
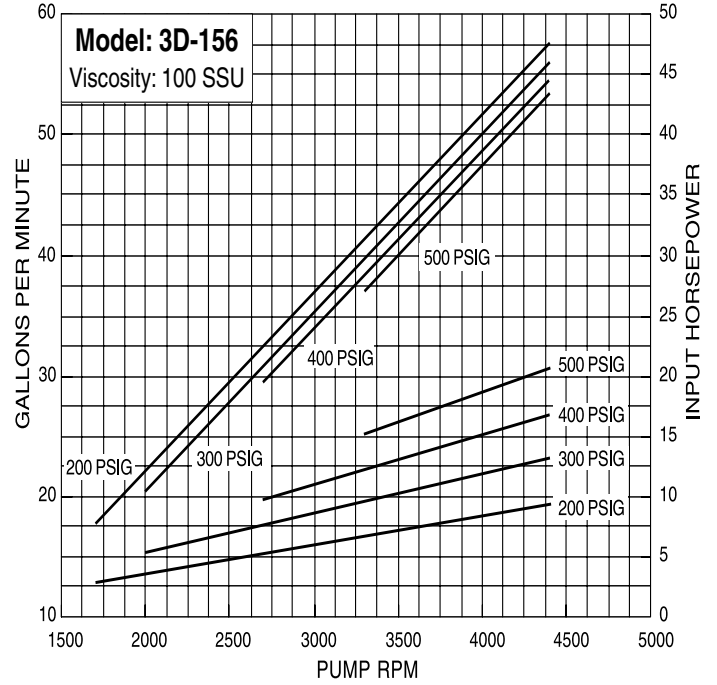
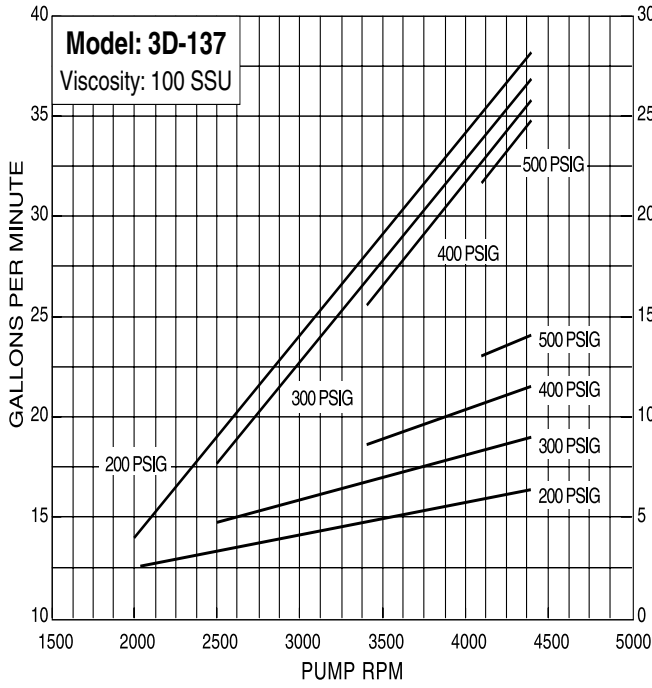


Pump Model	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	Key SQ
A3D-137	1 1/2	1	7.07	2.24	7.33	3.50	5.53	.50	-	2.63	1.88	-	3.13	16.65	7.71	1/4
A3D-156	2	1 1/2	7.87	2.85	8.13	4.13	6.25	0.50	-	2.88	2.88	-	3.25	18.44	8.44	1/4
G3D-187	2 1/2	1 1/2	8.95	3.31	8.81	4.88	6.93	0.50	3.75	3.13	3.31	3.49	3.25	20.26	9.06	1/4
G3D-218	3	2	12.14	5.00	12.38	6.63	10.13	0.63	4.50	3.75	4.81	4.00	5.00	29.14	13.26	3/8
G3D-250	4	2-1/2	14.02	4.96	12.50	8.00	10.12	0.75	5.00	4.25	4.81	4.74	6.00	32.15	13.63	3/8
G3D-275	4	3	15.40	4.54	12.09	8.94	9.71	0.75	2.63	4.50	4.25	5.12	6.69	33.48	13.59	1/2
AG3D-312	4	3	17.53	4.25	11.99	10.19	9.36	0.75	2.63	5.25	4.25	5.50	6.25	35.26	13.24	1/2
AG3D-350	5	4	19.79	4.22	12.03	12.00	9.40	0.75	2.88	5.75	4.25	6.25	7.00	38.44	13.66	1/2

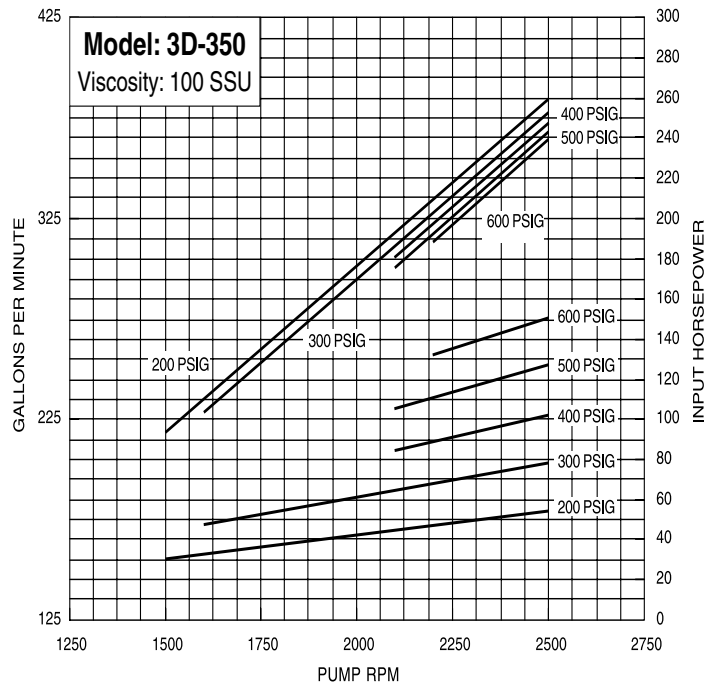
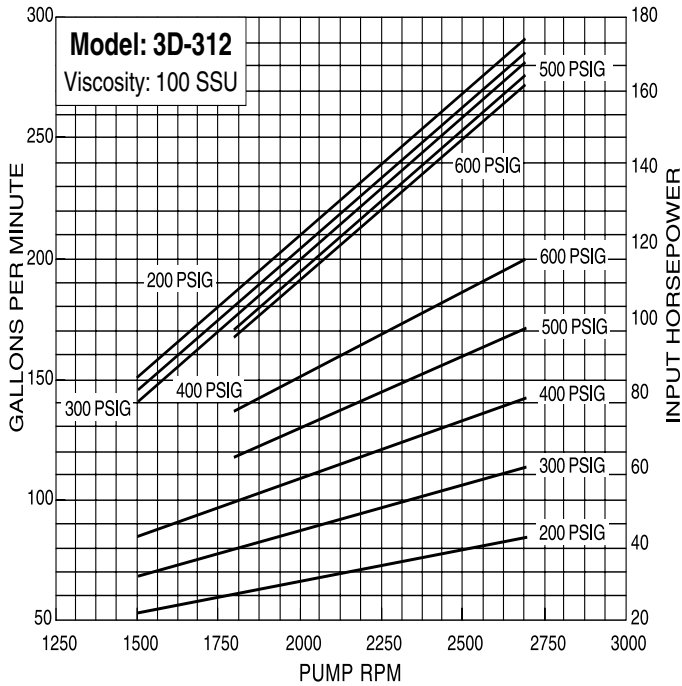
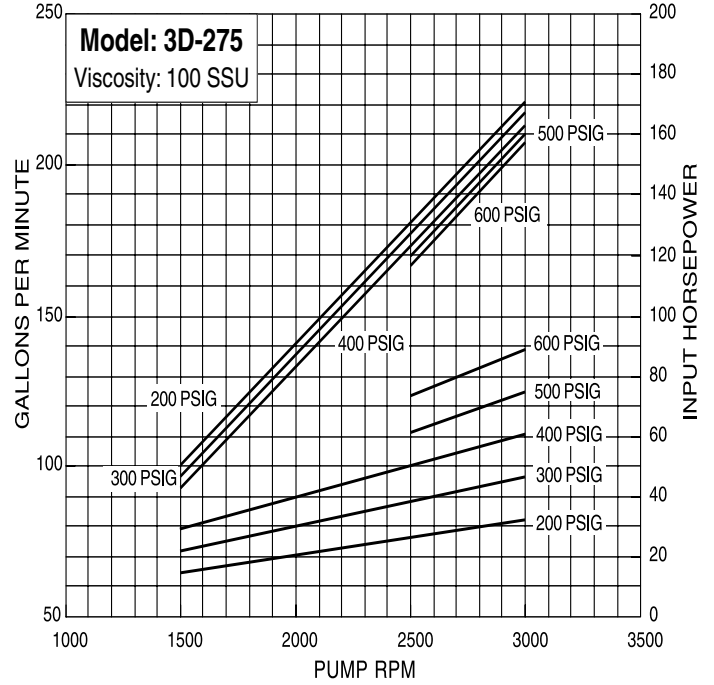
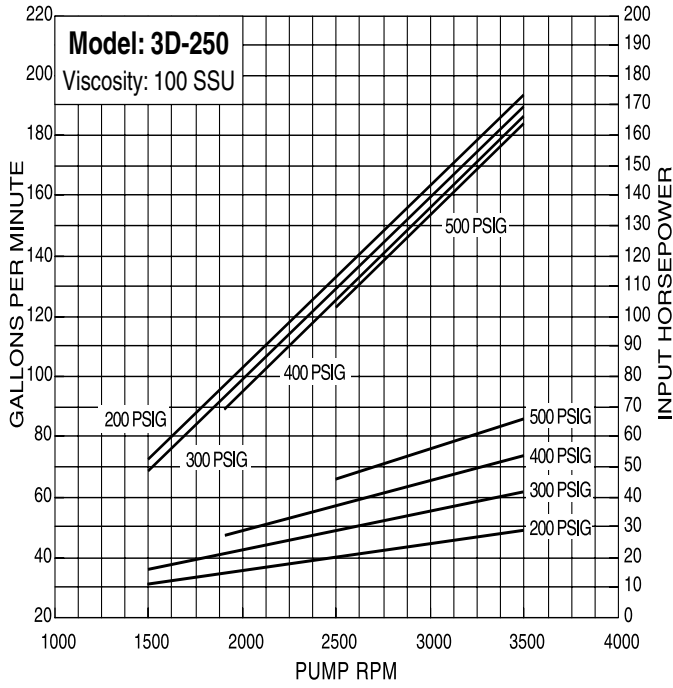
Pump Model	U	V	X	AB	AC	AD	AE	AF	AG	AH	AJ	AK	AL	AM	AN	WT (lbs.)
A3D-137	1	6.50	7.25	0.44	2.50	1.88	2.88	-	-	-	-	-	-	-	2.50	50
A3D-156	1	7.00	7.88	0.63	2.50	1.88	3.38	-	-	-	-	-	-	-	2.50	66
G3D-187	1 1/8	7.50	8.31	0.63	2.50	1.88	3.63	-	-	-	-	-	-	-	2.38	82
G3D-218	1 1/2	9.00	10.38	0.63	3.00	2.25	4.13	1.46	0.72	2.41	4 x 3/4	6.00	7.50	0.75	2.25	154
G3D-250	1 1/2	10.00	11.94	0.63	3.13	2.38	4.26	1.96	0.81	2.91	8 x 3/4	7.50	9.00	0.94	2.38	202
G3D-275	1 7/8	11.00	13.69	0.63	3.25	2.38	5.01	2.22	0.94	3.54	8 x 3/4	7.50	9.00	1.13	3.25	246
AG3D-312	2	12.00	15.38	0.63	3.38	2.63	5.25	2.22	0.94	3.54	8 x 3/4	7.50	9.00	0.94	3.31	281
AG3D-350	2	13.00	17.31	0.63	3.38	2.63	6.26	2.72	1.13	4.55	8 x 7/8	8.50	10.00	0.94	3.44	410

- NOTES:**
- Dimensions are for cast iron cased pumps.
 - "U" dimensions are subject to standard NEMA tolerances.
 - Dimension "AH" is weld socket (weld by customer). Removable socket weld flange is included with pump.
 - Top inlet position is standard.
 - A3DB-137 has 1 1/2 inch NPT inlet and 1 inch NPT outlet, **NOT** as shown above.
 - A3DB-156 has 2 inch NPT inlet and 1 inch NPT outlet, **NOT** as shown above.
 - G3DB-187 has 2 1/2 inch NPT inlet and 1 1/2 inch NPT outlet, **NOT** as shown above.
 - All table values are approximate. No tolerances are implied.

Dry Mounted Hydraulic Elevator Performance Curves



Dry Mounted Hydraulic Elevator Performance Curves



Dry Mounted Elevator Pumps

Specifications and Features

Rotor Housing	Iron
Power Rotor	Ground Alloy Steel
Idler Rotors	Ground Pearlitic Iron
Operating Pressure	To 500 psig – Belt Drive (see Performance Charts*) To 600 psig – (contact Factory for details)
Viscosity	100 SSU minimum at maximum temperature**
Temperature	0°F – 160°F
Drive	Direct or Belt
Rotation	Clockwise, facing pump shaft
Mounting	Any attitude
Shaft Seal	Mechanical seal with Buna N bellows, carbon rotating face and iron stationary seat
Bearing	Cartridge-type, permanently grease-packed, single row radial deep groove ball bearing
O-Rings	Buna N
Gaskets	Cellulose fiber
Filtration	60 – 100 mesh suction strainer recommended

* Sizes 275-350 suitable for 600 psi belt drive. Consult Imo for details.

** Lower viscosities may be permissible with review and approval by Imo Pump.

Chart for Determining Shaft Speed (RPM) from Flow Rate

Pump Model	Flow Rate (GPM) @ 100 SSU and 200 PSI										Pump Model
	15	20	25	30	35	40	50	75	100	125	
3D-137	2083	2581	3079	3578	4076	–	–	–	–	–	3D-137
3D-156	–	1839	2179	2518	2858	3197	3876	–	–	–	2D-156
3D-187	–	–	–	1580	1776	1973	2366	3348	–	–	3D-187
3D-218	–	–	–	–	–	–	1581	2200	2818	3437	3D-218
3D-250	–	–	–	–	–	–	–	1523	1938	2352	3D-250
3D-275	–	–	–	–	–	–	–	–	–	1793	3D-275
3D-312	–	–	–	–	–	–	–	–	–	–	3D-312
3D-350	–	–	–	–	–	–	–	–	–	–	3D-350

Pump Model	Flow Rate (GPM) @ 100 SSU and 200 PSI										Pump Model
	150	175	200	225	250	275	300	325	350	375	
3D-137	–	–	–	–	–	–	–	–	–	–	3D-137
3D-156	–	–	–	–	–	–	–	–	–	–	2D-156
3D-187	–	–	–	–	–	–	–	–	–	–	3D-187
3D-218	–	–	–	–	–	–	–	–	–	–	3D-218
3D-250	2767	3181	–	–	–	–	–	–	–	–	3D-250
3D-275	2104	2415	2727	–	–	–	–	–	–	–	3D-275
3D-312	–	1700	1914	2127	2340	2553	–	–	–	–	3D-312
3D-350	–	–	–	1530	1681	1832	1983	2134	2285	2436	3D-350

Dry Mounted Elevator Pumps

Installation Guidelines

To assure trouble free operations, please follow these guidelines:

Mounting

Mount pump and motor as integral units on common, rigid baseplate to avoid shifting and misalignment. Isolation pads (bracket to frame) will help reduce vibration. Check motor/pump rotation to avoid pump damage.

Belt Drive

Sheaves must be balanced and shaft bores must be concentric with belt grooves. Place sheave close to bearing retainer. Avoid sheave misalignment by using straight-edge to ensure alignment.

Adjust belt tension to manufacturer's recommendations.

Suction Conditions

Size piping adequately and avoid multiple fittings. Install 60-100 mesh strainer on suction line to protect pump. Assure adequate surface area to avoid excessive pressure drop when dirty.

Do not exceed pump suction capability to

avoid cavitation which causes noise, vibration and pump damage.

Lowest oil level of reservoir must cover inlet-line to prevent vortexing. Place return lines below lowest oil level. Keep reservoir and piping clean at all times. Clean system before each start-up. Vent reservoir through filter/breather to exclude dirt.

Temperature

Avoid exceeding oil temperature specifications. (Normal oil temperature range is 60°F to 135°F for most installations). Install tank heaters as required. Run bypass lines from hydraulic block or valve to reservoir, not to pump suction.

Start-Up

Fill pump with oil before start-up. Open suction and discharge valves, bleed system air and start pump under low pressure. Check system for air leaks, especially suction piping. Set pressure valve at lowest pressure consistent with satisfactory elevator operation.

Service Hints

If operation of the pump is noisy, check the following points:

1. Air entrained in oil, or leaks in suction line.
2. Vortexing or low oil level in reservoir.
3. Restrictions in suction line or clogged strainer.
4. Incorrect alignment of pump and motor.
5. Excessive belt tension or slip.
6. Motor, pump, bracket or other component loose.
7. Unmatched belt set, or unbalanced sheave.
8. Pump suction capability exceeded – oil too cold or pump speed excessive.
9. Worn pump.
10. Damaged or unbalanced motor.

If there is no oil flow or pressure is too low, check the following points:

1. Restricted pump suction.
2. Control valve damaged or malfunctioning.
3. Excessively cold and viscous oil.
4. Low oil in reservoir.
5. Incorrect motor rotation.
6. Belts slipping.
7. Worn or damaged pump.

Submersible Pumps

Chart for Determining Car Speed Based on Pump Model (ft/min)

Operating Conditions: 3400 RPM, 350 PSI, 150 SSU

Pump Model	Plunger Diameter																
	GPM	2¾	3	3½	4	4½	5	5½	6	6½	7	7½	8	8½	9	9½	10
20USNP38	8.3	27	23	17	13	10	8	7	6	5	4	4	3	3	3	2	2
20USNP46	11	36	30	22	17	13	11	9	7	6	6	5	4	4	3	3	3
20USNP50	13.2	43	36	26	20	16	13	11	9	8	7	6	5	4	4	4	3
20USNP56	15.6	51	42	31	24	19	15	13	11	9	8	7	6	5	5	4	4
40USNP41	17.7	57	48	35	27	21	17	14	12	10	9	8	7	6	5	5	4
40USNP49	24.0	78	65	48	37	29	24	19	16	14	12	10	9	8	7	7	6
80USNP36	32.0	104	87	64	49	39	31	26	22	19	16	14	12	11	10	9	8
80USNP42	38.0	123	103	76	58	46	37	31	26	22	19	17	15	13	11	10	9
80USNP46	46.0	149	125	92	70	56	45	37	31	27	23	20	18	16	14	12	11
A4PIC--187AJ	50.5	164	138	101	77	61	50	41	34	29	25	22	19	17	15	14	12
A4PIC-187Y	55.0	178	150	110	84	67	54	45	37	32	28	24	21	19	17	15	13
A4PIC-187P	60.1	195	164	120	92	73	59	49	41	35	30	26	23	20	18	16	15
A4PIC-187M	65.5	212	178	131	100	79	64	53	45	38	33	29	25	22	20	18	16
A4PIC-187	76.3	247	208	153	117	92	75	62	52	44	38	33	29	26	23	21	19
A4PIC-217Y	85.9	279	234	151	132	104	84	70	59	50	43	37	33	29	26	23	21
A4PIC-217P	95.9	311	261	192	147	116	94	78	65	56	48	42	37	33	29	26	23
A4PIC-217M	103.8	336	283	208	159	126	102	84	71	60	52	45	40	35	31	28	25
A4PIC-217	120.8	392	329	242	185	146	118	98	82	70	60	53	46	41	37	33	30
A4PIC-236G	140.9	457	384	282	216	171	138	114	96	82	70	61	54	48	43	38	35
A4PIC-236	159.5	517	434	319	244	193	156	129	109	93	80	69	61	54	48	43	39
A4PIC-236AS	185.2	600	504	371	284	224	182	150	126	107	93	81	71	63	56	50	45
A4PIC-276P*	200.1	645	546	401	307	242	196	162	136	116	100	87	77	68	61	54	49
A4PIC-276G*	224.5	729	612	393	344	272	220	182	153	130	112	98	86	76	68	61	55
A4PIC-276*	253.1	821	690	507	388	307	248	205	172	147	127	110	97	86	77	69	62

*Includes A4PICX design.

Elevator Performance

Chart for Determining Flow Rate (GPM) from Car Speed (ft/min)

Car Speed	Plunger Diameter															Car Speed	
	2¾	3	3½	4	4½	5	5½	6	6½	7	7½	8	8½	9	9½		10
1	0.3	0.4	0.5	0.7	0.8	1.0	1.2	1.5	1.7	2.0	2	3	3	3	4	4	1
10	3	4	5	7	8	10	12	15	17	20	23	26	29	33	37	41	10
20	6	7	10	13	17	20	25	29	34	40	46	52	59	66	74	82	20
30	9	11	15	20	25	31	37	44	52	60	69	78	88	99	110	122	30
40	12	15	20	26	33	41	49	59	69	80	92	104	118	132	147	163	40
50	15	18	25	33	41	51	62	73	86	100	115	130	147	165	184	204	50
60	18	22	30	39	50	61	74	88	103	120	138	157	177	198	221	245	60
70	22	26	35	46	58	71	86	103	121	140	161	183	206	231	258	285	70
80	25	29	40	52	66	82	99	117	138	160	183	209	236	264	294	326	80
90	28	33	45	59	74	92	111	132	155	180	206	235	265	297	331	367	90
100	31	37	50	65	83	102	123	147	172	200	229	261	295	330	368	408	100
110	34	40	55	72	91	112	136	161	189	220	252	287	324	363	405	448	110
120	37	44	60	78	99	122	148	176	207	240	275	313	353	396	441	489	120
130	40	48	65	85	107	132	160	191	224	260	298	339	383	429	478	530	130
140	43	51	70	91	116	143	173	205	241	280	321	365	412	462	515	571	140
150	46	55	75	98	124	153	185	220	258	300	344	391	442	495	552	611	150
160	49	59	80	104	132	163	197	235	276	320	367	417	471	528	589	652	160
170	52	62	85	111	140	173	210	249	293	340	390	443	501	561	625	693	170
180	55	66	90	117	149	183	222	264	310	360	413	470	530	594	662	734	180
190	59	70	95	124	157	194	234	279	327	379	436	496	560	627	699	774	190
200	62	73	100	130	165	204	247	293	344	399	459	522	589	660	736	815	200
210	65	77	105	137	173	214	259	308	362	419	482	548	618	693	773	856	210
220	68	81	110	143	182	224	271	323	379	439	504	574	648	726	809	897	220
230	71	84	115	150	190	234	284	338	396	459	527	600	677	759	846	938	230
240	74	88	120	157	198	245	296	352	413	479	550	626	707	792	883	978	240
250	77	92	125	163	206	255	308	367	431	499	573	652	736	825	920	1019	250

Req. GPM = Total Area x .0519 x Car Speed Req.

Car Speed = (GPM/ Total Area) x 19.27

Note: Check with cylinder manufacturer for actual cylinder size/displacement.

Elevator Performance

Chart for Determining PSI from Gross Loads**

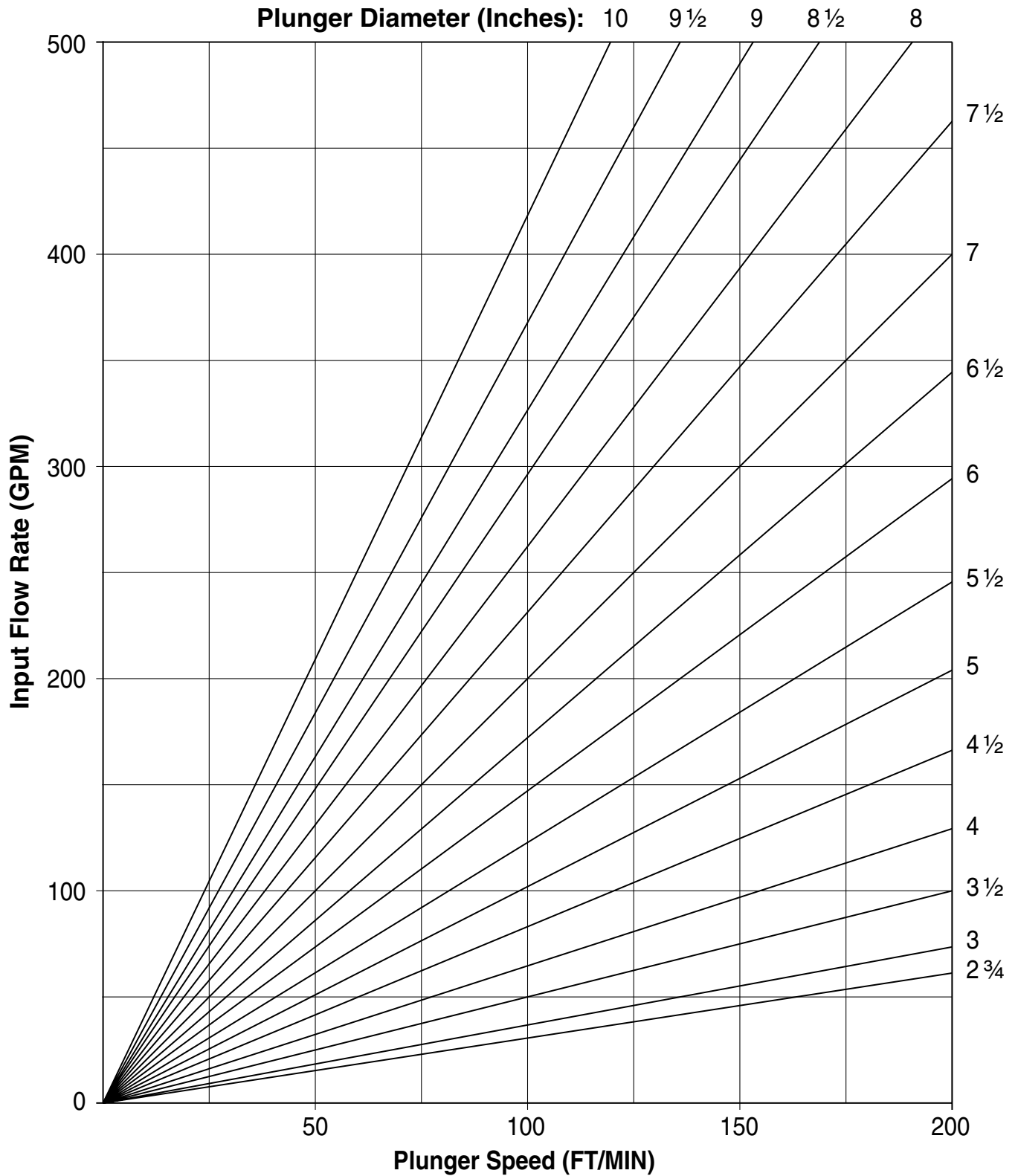
Net Load*	Plunger Diameter (inches)															
	2¾	3	3½	4	4½	5	5½	6	6½	7	7½	8	8½	9	9½	10
1000	168	141	104	80	63	51	42	35	30	26	23	20	18	16	14	13
1500	253	212	156	119	94	76	63	53	45	39	34	30	26	24	21	19
2000	337	283	208	159	126	102	84	71	60	52	45	40	35	31	28	25
2500	421	354	260	199	157	127	105	88	75	65	57	50	44	39	35	32
3000	505	424	312	239	189	153	126	106	90	78	68	60	53	47	42	38
3500	589	495	364	279	220	178	147	124	105	91	79	70	62	55	49	45
4000	673	566	416	318	252	204	168	141	121	104	91	80	70	63	56	51
4500	758	637	468	358	283	229	189	159	136	117	102	90	79	71	63	57
5000	842	707	520	398	314	255	210	177	151	130	113	99	88	79	71	64
5500	926	778	572	438	346	280	231	195	166	143	124	109	97	86	78	70
6000	1010	849	624	477	377	306	253	212	181	156	136	119	106	94	85	76
6500	–	920	676	517	409	331	274	230	196	169	147	129	115	102	92	83
7000	–	–	728	557	440	357	295	248	211	182	158	139	123	110	99	89
7500	–	–	780	597	472	382	316	265	226	195	170	149	132	118	106	95
8000	–	–	–	637	503	407	337	283	241	208	181	159	141	126	113	102
8500	–	–	–	676	534	433	358	301	256	221	192	169	150	134	120	108
9000	–	–	–	716	566	458	379	318	271	234	204	179	159	141	127	115
9500	–	–	–	756	597	484	400	336	286	247	215	189	167	149	134	121
10000	–	–	–	796	629	509	421	354	301	260	226	199	176	157	141	127
12000	–	–	–	–	755	611	505	424	362	312	272	239	211	189	169	153
14000	–	–	–	–	–	713	589	495	422	364	317	279	247	220	198	178
16000	–	–	–	–	–	815	673	566	482	416	362	318	282	252	226	204
18000	–	–	–	–	–	–	758	637	542	468	407	358	317	283	254	229
20000	–	–	–	–	–	–	–	707	603	520	453	398	352	314	282	255
25000	–	–	–	–	–	–	–	884	753	650	566	497	441	393	353	318
30000	–	–	–	–	–	–	–	1061	904	780	679	597	529	472	423	382
35000	–	–	–	–	–	–	–	–	1055	909	792	696	617	550	494	446
40000	–	–	–	–	–	–	–	–	–	1039	905	796	705	629	564	509
50000	–	–	–	–	–	–	–	–	–	–	–	995	881	786	705	637
<i>Add per 100 lbs.</i>	17	14	10	8	6	5	4	4	3	3	2	2	2	2	1	1

Net Load includes: Platform, Sling, Enclosure, Plunger Weight, and Cargo Friction Loss.

For maximum PSI, add CAPACITY to above figures.

Elevator Reference Information

Effect of Flow Rate on Plunger Speed





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