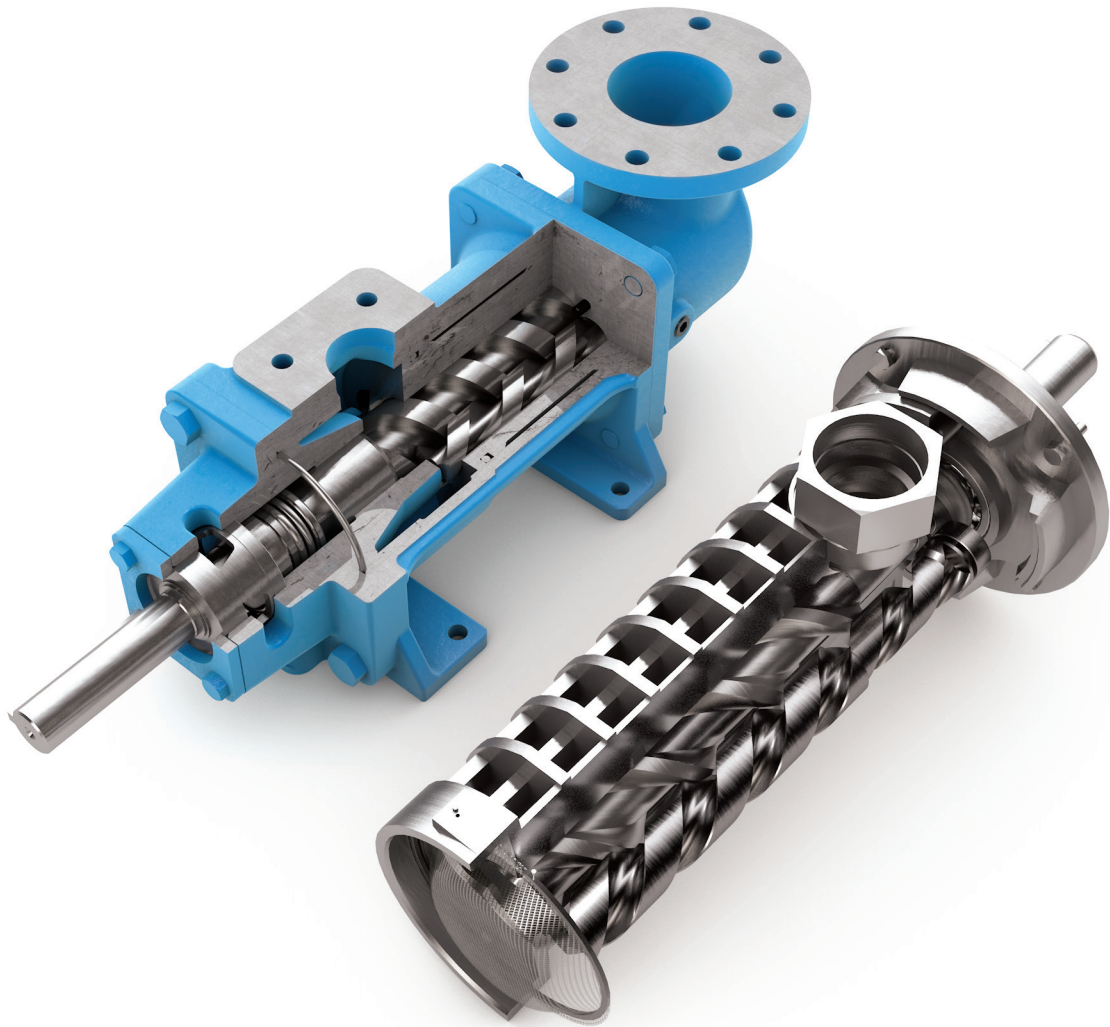




HYDRAULIC ELEVATOR PUMP

DATA BOOK



IT'S TIME TO GIVE YOUR RELIABILITY A LIFT.

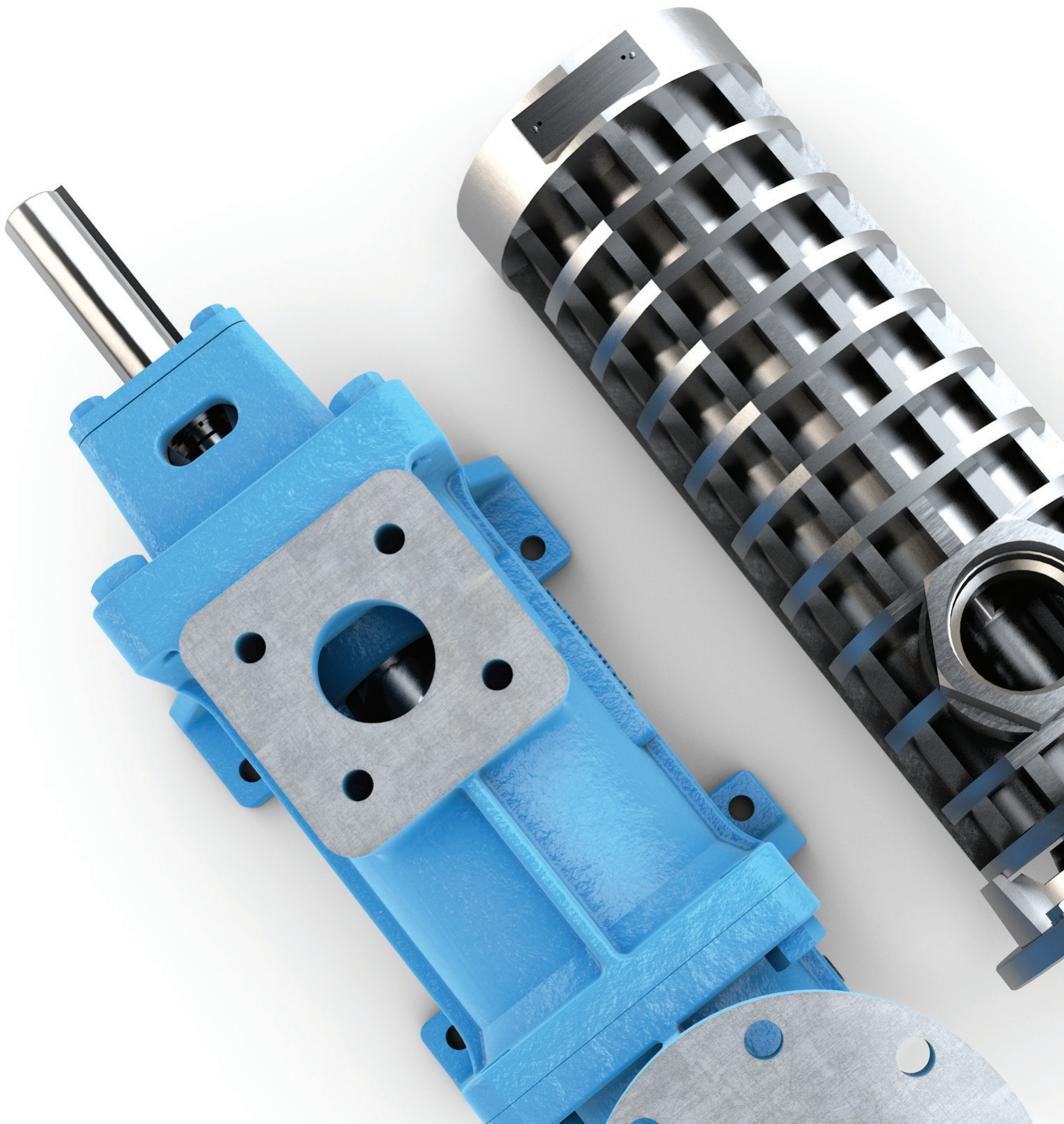
As the most dependable pumps on the market, our IMO® 3D and 4PIC pump series deliver an overall cost of ownership that's significantly lower than competitors' pumps. It's a difference that gives your customers peace of mind and you an important selling point.

BUILT ON AN UNMATCHED REPUTATION

If you're replacing a pump after decades of service, chances are, that old pump you're replacing is an IMO®. And there's a reason for that. Our pumps are built to last and have exceeded expectations for over a half-century. And while technology may have changed over the years, our commitment to quality hasn't.

WHY PUMPS MADE IN THE USA WILL PAY OFF EVEN BEFORE THEY'RE INSTALLED.

Being manufactured in Columbia, Kentucky and Monroe, North Carolina doesn't just mean our pumps offer the benefits of top quality American construction, it also means we can have them to you in a fraction of the time.

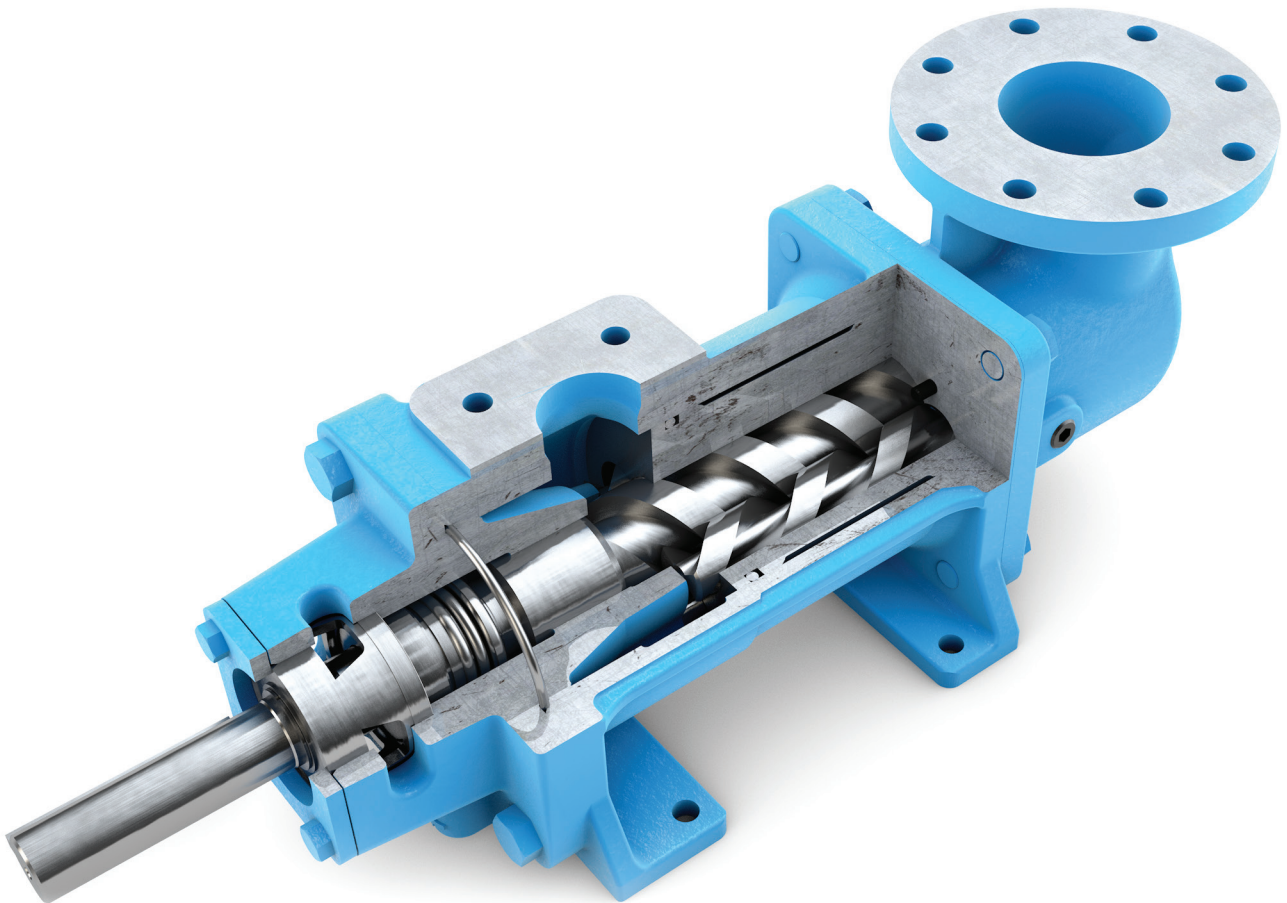


PROVEN PUMPS. ENGINEERED TO LAST.

The 3D Pump Series is designed to stand up to demanding conditions and deliver decades of flawless performance.

FEATURES INCLUDE:

- › Internal hydraulic balance.
- › A single grease packed and sealed ball bearing eliminates the concern for bearing failure due to contamination in the pumped liquid.
- › One single spring friction drive mechanical seal.



PROVEN PUMPS. ENGINEERED TO LAST.

The 4PIC Pump Series features a single-piece case/housing in aluminum material. And like the 3D Series, its sturdy construction is engineered to deliver uncompromising reliability year after year.

FEATURES INCLUDE:

- › No gasket or O-ring joints.
- › Full internal hydraulic balance.
- › Single ball bearing that carries no axial load.
- › High efficiency hanging idler configuration.
- › No thrust components in pump suction area.



THE RIGHT SOLUTION. THE RIGHT FIT.

You'll find an IMO® 4PIC pump for every elevator application.

A BETTER PUMP. A BETTER SOLUTION. A BETTER OPTION.

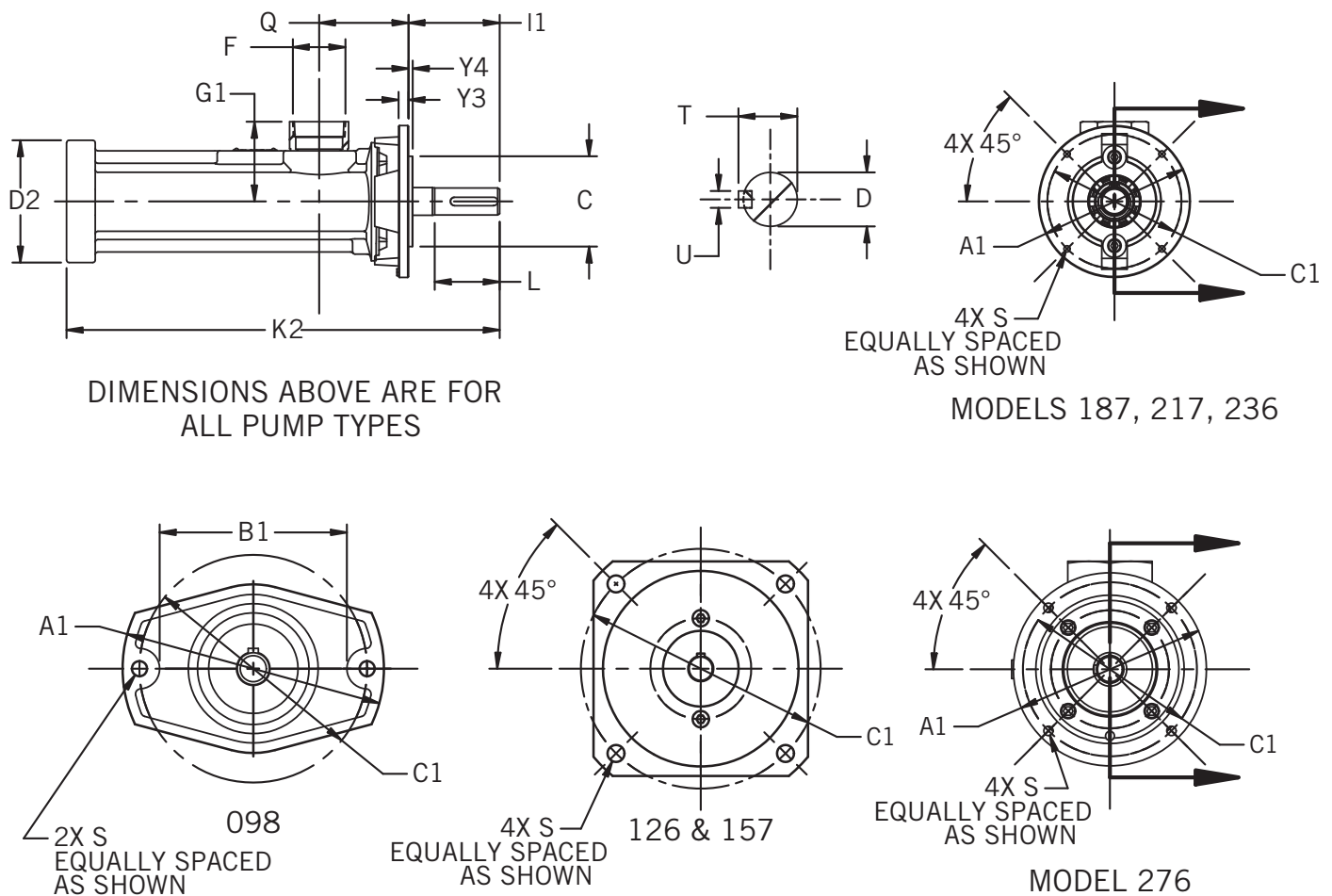
There may be slightly lower priced pumps out there, but none come with the dependability, efficiency and expertise that will deliver easier installation and years of flawless performance like the IMO® 3D Series and 4PIC Series from CIRCOR.

WONDERING WHICH PUMP FITS YOUR NEEDS?

Use the charts on the following pages to find the right pump based on specs, performance, car speed, applications and more.

SUBMERSIBLE PUMP DIMENSIONAL INFORMATION

Pump reference dimensions found on page 7.



SUBMERSIBLE PUMP DIMENSIONAL INFORMATION

Pump reference outline drawings found on page 6.

SUBMERSIBLE PUMP DIMENSIONS (INCHES)

Model	Pump				Shaft				Discharge	
	D ₂	I ₁	K ₂	Q	D	L	T	U	F	G ₁
098	3.15	2.28	11.14	2.28	<u>.7472</u> .7480	1.38	0.85	<u>.2362</u> .2350	3/4" NPT	2.54
126	4.45	2.28	12.40	2.64	<u>.7472</u> .7480	1.38	0.85	<u>.2362</u> .2350	1" NPT	2.95
157	4.45	2.28	13.90	2.83	<u>.7472</u> .7480	1.38	0.85	<u>.2362</u> .2350	1 1/2" NPT	3.03
187	5.59	4.25	18.46	3.98	<u>1.2598</u> 1.2589	3.15	1.38	<u>.3937</u> .3923	2" NPT	3.94
217	6.30	4.25	20.24	4.17	<u>1.2598</u> 1.2589	3.15	1.38	<u>.3937</u> .3923	2" NPT	3.74
236	6.30	4.25	21.46	4.17	<u>1.2598</u> 1.2589	3.15	1.38	<u>.3937</u> .3923	2" NPT	3.94
276	7.48	4.02	27.13	5.75	<u>1.2598</u> 1.2589	2.56	1.38	<u>.3937</u> .3923	3" NPT	4.84
276*	7.75	4.21	26.73	5.55	<u>1.2598</u> 1.2589	2.56	1.38	<u>.3937</u> .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
098	<u>6.1018</u> 6.1002	4.33	-	5.31	0.35	0.16	0.39	-	11	13
126	<u>6.1018</u> 6.1002	4.33	4.33	5.31	0.35	0.55	0.39	0.08	17	20
157	<u>6.1018</u> 6.1002	4.33	4.33	5.31	0.35	0.55	0.39	0.08	23	26
187	7.09	<u>4.3744</u> 4.3736	-	6.26	0.31	-	0.47	0.20	38	42
217	7.09	<u>4.3744</u> 4.3737	-	6.26	0.31	-	0.47	0.20	51	55
236	7.09	<u>4.3744</u> 4.3738	-	6.26	0.31	-	0.47	0.20	59	63
276	11.50	<u>8.6614</u> 8.6603	-	10.24	0.69	-	0.71	0.20	90	110
276*	9.02	<u>4.3745</u> 4.3736	-	8.12	0.44	-	0.59	0.20	90	110

*C4PICX-276 Pump Dimensions

SUBMERSIBLE PUMP PERFORMANCE DATA

TYPICAL PERFORMANCE AT VARIOUS PRESSURES FOR SUBMERSIBLE ELEVATOR PUMPS

@3400 RPM, 150 SSU

Pump Model	Pump Number		Differential Pressure (psi)									
			200	300	400	500	600	700	800	900	1000	
B4PIC-098P	3402/001	GPM	8.6	8.4	8.2	8.1	7.9	7.8	7.7	7.6	7.5	
		BHP	1.7	2.3	2.8	3.4	3.9	4.5	5.0	5.6	6.1	
B4PIC-098C	3402/002	GPM	11.4	11.1	10.9	10.7	10.5	10.4	10.2	10.1	10.0	
		BHP	2.1	2.8	3.5	4.3	5.0	5.7	6.5	7.2	7.9	
B4PIC-098BG	3402/003	GPM	12.5	12.3	12.2	12.1	12.0	11.8	11.7	11.6	11.5	
		BHP	5.4	5.8	6.2	6.8	7.1	7.5	7.9	8.3	8.7	
B4PIC-098BJ	3402/004	GPM	16.0	15.7	15.4	15.2	15.0	14.8	14.6	14.4	14.2	
		BHP	2.6	3.6	4.7	5.7	6.7	7.7	8.7	9.8	10.8	
B4PIC-126L	3412/004	GPM	18.5	18.0	17.5	17.0	16.7	16.3	16.0	15.7	15.4	
		BHP	3.6	4.9	6.1	7.3	8.6	9.8	11.0	12.2	13.5	
B4PIC-126AC	3412/005	GPM	25.0	24.0	23.0	23.0	22.0	22.0	21.0	21.0	21.0	
		BHP	4.4	6.1	7.7	9.3	10.9	12.6	14.2	15.8	17.4	
B4PIC-157S	3422/009	GPM	33.0	32.0	31.0	31.0	31.0	30.0	30.0	29.0	29.0	
		BHP	5.8	7.9	9.9	12.0	14.0	16.2	18.3	20.3	22.4	
B4PIC-157E	3422/010	GPM	39.0	39.0	38.0	37.0	37.0	36.0	36.0	35.0	35.0	
		BHP	6.7	9.2	11.7	14.3	16.8	19.3	21.9	24.4	26.9	
B4PIC-157C	3422/011	GPM	47.0	46.0	45.0	45.0	44.0	43.0	43.0	43.0	42.0	
		BHP	7.6	10.5	13.5	16.4	19.4	22.4	25.3	28.3	31.3	
A4PIC-187AJ	3432/082	GPM	52.2	51.0	50.0	49.1	48.2	47.5	46.8	46.1	45.5	
		BHP	9.2	12.5	15.9	19.3	22.6	26.0	29.4	32.7	36.1	
A4PIC-187Y	3432/078	GPM	56.8	55.6	54.5	53.6	52.8	52.0	51.3	50.7	50.0	
		BHP	9.7	13.4	17.0	20.6	24.3	27.9	31.5	35.1	38.8	
A4PIC-187P	3432/079	GPM	62.2	60.8	59.5	58.5	57.5	56.6	55.7	55.0	54.2	
		BHP	10.5	14.5	18.5	22.5	26.5	30.5	34.5	38.5	42.5	
A4PIC-187M	3432/080	GPM	67.9	66.3	64.9	63.7	62.6	61.6	60.7	59.8	58.9	
		BHP	11.2	15.6	20.0	24.4	28.8	33.1	37.5	41.9	46.3	
A4PIC-187	3432/081	GPM	78.6	77.0	75.6	74.4	73.3	72.3	71.4	70.8	69.7	
		BHP	12.5	17.5	22.5	27.5	32.5	37.5	42.5	47.5	52.5	
B4PIC-217Y	3442/262	GPM	88.5	86.7	85.1	83.8	82.5	81.4	80.4	79.4	78.4	
		BHP	15.1	20.7	26.4	32.0	37.7	43.3	48.9	54.6	60.2	
B4PIC-217P	3442/263	GPM	98.5	69.7	95.1	93.8	92.5	91.4	90.4	89.4	88.4	
		BHP	16.3	22.5	28.7	34.9	41.2	47.4	53.6	59.8	66.0	
B4PIC-217M	3442/264	GPM	106.9	104.7	102.9	101.3	99.8	98.5	97.2	96.0	94.9	
		BHP	17.4	24.2	31.0	37.8	44.6	51.5	58.3	65.1	71.9	
B4PIC-217	3442/265	GPM	123.9	121.8	120.0	118.4	117.0	115.7	114.5	113.4	112.3	
		BHP	19.4	27.2	34.9	42.7	50.5	58.3	66.0	73.8	81.6	
B4PIC-236G	3452/269	GPM	144.5	142.0	139.9	138.0	136.4	134.8	133.4	132.0	130.7	
		BHP	23.1	32.2	41.3	50.4	59.5	68.6	77.6	86.7	95.8	

Flow and power is typical at 3400 RPM,150 SSU and intended for reference only.

For actual performance, refer to the CIRCOR Selection program.

TYPICAL PERFORMANCE AT VARIOUS PRESSURES FOR SUBMERSIBLE ELEVATOR PUMPS

@3400 RPM, 150 SSU (continued)

Pump Model	Pump Number		Differential Pressure (psi)								
			200	300	400	500	600	700	800	900	1000
B4PIC-236	3452/270	GPM	162.8	160.5	158.5	156.8	155.3	153.8	152.5	151.3	150.1
		BHP	25.2	35.3	45.3	55.4	65.5	75.6	85.7	95.8	105.9
B4PIC-236AS	3452/271	GPM	189.6	186.5	183.9	181.6	179.6	177.7	175.9	174.3	172.7
		BHP	28.7	40.6	52.4	64.3	76.1	88.0	99.8	111.7	123.6
C4PIC-276P	3462/015	GPM	204.9	201.5	198.7	196.2	194.0	191.9	190.0	188.2	186.5
		BHP	33.6	46.4	59.2	72.0	84.8	97.7	110.5	123.3	136.1
C4PICX-276P	3462/018	GPM	204.9	201.5	198.7	196.2	194.0	191.9	190.0	188.2	186.5
		BHP	33.6	46.4	59.2	72.0	84.8	97.7	110.5	123.3	136.1
C4PIC-276G	3462/017	GPM	230.1	226.2	223.0	220.1	217.5	215.1	212.9	210.8	208.8
		BHP	36.8	51.2	65.6	80.0	94.4	108.9	123.3	137.7	152.1
C4PICX-276G	3462/019	GPM	230.1	226.2	223.0	220.1	217.5	215.1	212.9	210.8	208.8
		BHP	36.8	51.2	65.6	80.0	94.4	108.9	123.3	137.7	152.1
C4PIC-276	3462/016	GPM	258.3	254.7	251.6	248.8	246.4	244.1	242.0	240.0	238.1
		BHP	40.0	56.0	72.0	88.0	104.1	120.1	136.1	152.1	168.2
C4PICX-276	3462/020	GPM	258.3	254.7	251.6	248.8	246.4	244.1	242.0	240.0	238.1
		BHP	40.0	56.0	72.0	88.0	104.1	120.1	136.1	152.1	168.2

Flow and power is typical at 3400 RPM, 150 SSU and intended for reference only.
For actual performance, refer to the CIRCOR Selection program.

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 pages 6 and 7 in this publication
Filtration _____ Inlet Strainers are supplied

SUBMERSIBLE PUMPS

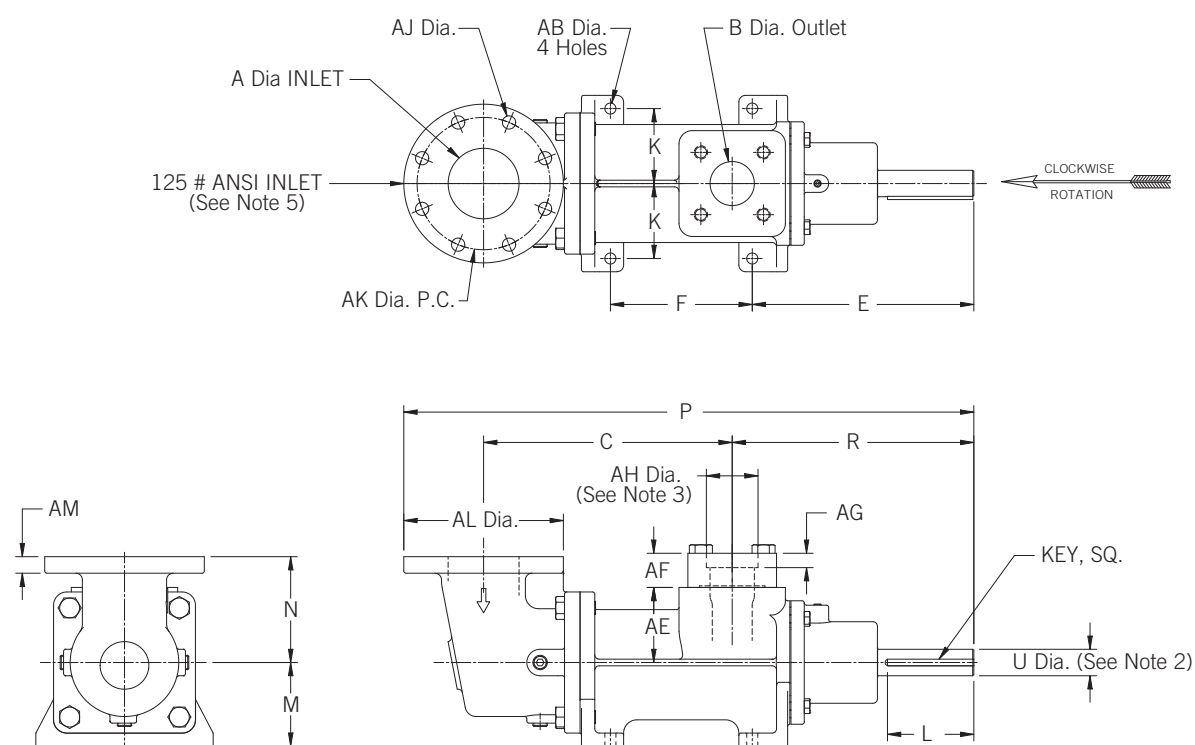
CHARTS FOR DETERMINING CAR SPEED BASED ON PUMP MODEL (FT/MIN)

Operating Conditions: 3400 RPM, 350 PSI, 150 SSU

Pump Model	Plunger Diameter																
	GPM	2.75	3	3.5	4	4.5	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10
B4PIC-098P	8.3	27	23	17	13	10	8	7	6	5	4	4	3	3	3	2	2
A4PIC-098C	11	36	30	22	17	13	11	9	7	6	6	5	4	4	3	3	3
B4PIC-098BG	13.2	43	36	26	20	16	13	11	9	8	7	6	5	4	4	4	3
B4PIC-098BJ	15.6	51	42	31	24	19	15	13	11	9	8	7	6	5	5	4	4
B4PIC-126L	17.7	57	48	35	27	21	17	14	12	10	9	8	7	6	5	5	4
B4PIC-126AC	24	78	65	48	37	29	24	19	16	14	12	10	9	8	7	7	6
B4PIC-157S	32	104	87	64	49	39	31	26	22	19	16	14	12	11	10	9	8
B4PIC-157E	38	123	103	76	58	46	37	31	26	22	19	17	15	13	11	10	9
B4PIC-157C	46	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	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
B4PIC-217Y	85.9	279	234	151	132	104	84	70	59	50	43	37	33	29	26	23	21
B4PIC-217P	95.9	311	261	192	147	116	94	78	65	56	48	42	37	33	29	26	23
B4PIC-217M	103.8	336	283	208	159	126	102	84	71	60	52	45	40	35	31	28	25
B4PIC-217	120.8	392	329	242	185	146	118	98	82	70	60	53	46	41	37	33	30
B4PIC-236G	140.9	457	384	282	216	171	138	114	96	82	70	61	54	48	43	38	35
B4PIC-236	159.5	517	434	319	244	193	156	129	109	93	80	69	61	54	48	43	39
B4PIC-236AS	185.2	600	504	371	284	224	182	150	126	107	93	81	71	63	56	50	45
C4PIC-276P*	200.1	645	546	401	307	242	196	162	136	116	100	87	77	68	61	54	49
C4PIC-276G*	224.5	729	612	393	344	272	220	182	153	130	112	98	86	76	68	61	55
C4PIC-276*	253.1	821	690	507	388	307	248	205	172	147	127	110	97	86	77	69	62

*Includes 4PICX pumps

DRY MOUNTED PUMP DIMENSIONS, ROTOR SIZES 187-350



Pump Model	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	KEY SQ
3D-187	2.5	1.5	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	0.25
3D-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	0.375
3D-250	4	2.5	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	0.375
3D-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	0.5
3D-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	0.5
3D-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	0.5

Pump Model	U	V	X	AB	AC	AD	AE	AF	AG	AH	AJ	AK	AL	AM	AN
3D-187	1.125	7.50	8.31	0.63	2.50	1.88	3.63	-	-	-	-	-	-	-	2.38
3D-218	1.5	9.00	10.38	0.63	3.00	2.25	4.13	1.46	0.72	2.41	4 x.75	6.00	7.50	0.75	2.25
3D-250	1.5	10.00	11.94	0.63	3.13	2.38	4.26	1.96	0.81	2.91	8 x.75	7.50	9.00	0.94	2.38
3D-275	1.875	11.00	13.69	0.63	3.25	2.38	5.01	2.22	0.94	3.54	8 x.75	7.50	9.00	1.13	3.25
3D-312	2	12.00	15.38	0.63	3.38	2.63	5.25	2.22	0.94	3.54	8 x.75	7.50	9.00	0.94	3.31
3D-350	2	13.00	17.31	0.63	3.38	2.63	6.26	2.72	1.13	4.55	8 x .875	8.50	10.00	0.94	3.44

NOTES: 1. Cast iron cased pumps. 2. "U" dimensions are subject to standard NEMA tolerances. 3. Dimension "AH" is weld socket (weld by customer). Removable socket weld flange must be ordered with pump. 4. Top inlet position is standard. 5. LL™-187 has 2 ½ inch NPT inlet and 1 ½ inch NPT outlet, NOT shown as above. 6. All table values are approximate. No tolerances are implied.

DRY MOUNTED PUMP PERFORMANCE DATA

PUMP MODEL: 3D-187

Speed (rpm)		Differential Pressure (psi)			
		200	300	400	500
1500	GPM	29.8	28	26.4	25
	BHP	4.8	7	9.2	11.4
1650	GPM	33.7	31.8	30.2	28.8
	BHP	5.3	7.7	10.1	12.6
1800	GPM	37.5	35.6	34	32.6
	BHP	5.8	8.4	11.1	13.8
1950	GPM	41.3	39.4	37.8	36.5
	BHP	6.3	9.2	12.1	15
2100	GPM	45.1	43.2	41.7	40.2
	BHP	6.8	9.9	13.1	16.2
2250	GPM	48.9	47.1	45.5	44.1
	BHP	7.3	10.7	14	17.4
2400	GPM	52.7	50.9	49.3	47.9
	BHP	7.9	11.4	15	18.6
2550	GPM	56.6	54.7	53.1	51.7
	BHP	8.4	12.2	16	19.8
2700	GPM	60.4	58.5	56.9	55.5
	BHP	9	13	17	21
2850	GPM	64.2	62.3	60.7	59.4
	BHP	9.5	13.8	18	22.2
3000	GPM	68	66.1	64.6	63.2
	BHP	10.1	14.5	19	23.4
3150	GPM	71.8	70	68.4	67
	BHP	10.6	15.3	20	24.7
3300	GPM	75.6	73.8	72.2	70.8
	BHP	11.2	16.1	21	25.9
3450	GPM	79.5	77.6	76	74.6
	BHP	11.8	16.9	22	27.2
3600	GPM	83.3	81.4	79.8	78.4
	BHP	12.4	17.7	23.1	28.4
3750	GPM	87.1	85.2	83.6	82.3
	BHP	13	18.5	24.1	29.7
3900	GPM	90.9	89	87.5	86.1
	BHP	13.5	19.3	25.1	30.1
4050	GPM	94.7	92.9	91.3	89.9
	BHP	14.1	20.2	26.2	32.2
4200	GPM	98.5	96.7	95.1	93.7
	BHP	14.7	21	27.2	33.5
4375	GPM	103	101.1	99.5	98.2
	BHP	15.5	22	28.4	35

For performance at lower or higher speeds than referenced above, contact CIRCOR. Flow and power is typical at 150 SSU fluid viscosity and intended for reference only. For actual performance, refer to the CIRCOR Selection program.

DRY MOUNTED PUMP PERFORMANCE DATA

PUMP MODEL: 3D-218

Speed (rpm)		Differential Pressure (psi)			
		200	300	400	500
1500	GPM	49.3	46.7	44.6	42.7
	BHP	7.6	11.1	14.6	18.2
1650	GPM	55.3	52.8	50.6	48.8
	BHP	8.4	12.2	16.1	20
1800	GPM	61.4	58.9	56.7	54.8
	BHP	9.2	13.4	17.7	21.9
1950	GPM	67.5	64.9	62.8	60.9
	BHP	10	14.6	19.2	23.8
2100	GPM	73.5	71	68.8	66.9
	BHP	10.8	15.8	20.7	25.7
2250	GPM	79.6	77	74.9	73
	BHP	11.7	17	22.3	27.6
2400	GPM	85.6	83.1	80.9	79.1
	BHP	12.5	18.2	23.8	29.5
2550	GPM	91.7	89.2	87	85.1
	BHP	13.4	19.4	25.4	31.4
2700	GPM	97.8	95.2	93.1	91.2
	BHP	14.2	20.6	27	33.3
2850	GPM	103.8	101.3	99.1	97.2
	BHP	15.1	21.8	28.6	35.3
3000	GPM	109.9	107.3	105.2	103.3
	BHP	16	23.1	30.2	37.2
3150	GPM	115.9	113.4	111.3	109.4
	BHP	16.9	24.3	31.8	39.2
3300	GPM	122	119.5	117.3	115.4
	BHP	17.8	25.6	33.4	41.1
3450	GPM	128.1	125.5	123.4	121.5
	BHP	18.7	26.9	35	43.1
3600	GPM	134.1	131.6	129.4	127.5
	BHP	19.6	28.1	36.6	45.1
3750	GPM	140.2	137.6	135.5	133.6
	BHP	20.6	29.4	38.3	47.1
3900	GPM	146.2	143.7	141.6	139.7
	BHP	21.5	30.7	39.9	49.1
4000	GPM	150.3	147.7	145.6	143.7
	BHP	22.1	31.6	41	50.4

For performance at lower or higher speeds than referenced above, contact CIRCOR. Flow and power is typical at 150 SSU fluid viscosity and intended for reference only. For actual performance, refer to the CIRCOR Selection program.

DRY MOUNTED PUMP PERFORMANCE DATA

PUMP MODEL: 3D-250

Speed (rpm)		Differential Pressure (psi)			
		200	300	400	500
1500	GPM	76.7	73.6	71	68.7
	BHP	11.3	16.5	21.8	27.1
1650	GPM	85.7	82.6	80	77.7
	BHP	12.5	18.3	24.1	29.9
1800	GPM	94.8	91.7	89.1	86.8
	BHP	14.7	20	26.4	32.7
1950	GPM	103.8	100.7	98.1	95.8
	BHP	14.9	21.8	28.6	35.5
2100	GPM	112.9	109.8	107.2	104.9
	BHP	16.2	23.6	30.9	38.3
2250	GPM	121.9	118.8	116.2	113.9
	BHP	17.4	25.3	33.2	41.2
2400	GPM	131	127.9	125.3	123
	BHP	18.7	27.1	35.6	44
2550	GPM	140	136.9	134.3	132
	BHP	20	29	37.9	46.9
2700	GPM	149.1	146	143.4	141.1
	BHP	21.3	30.8	40.3	49.8
2850	GPM	158.1	155	152.4	150.1
	BHP	22.6	32.6	42.7	52.7
3000	GPM	167.2	164.1	161.5	159.2
	BHP	23.9	34.4	45	55.6
3150	GPM	176.2	173.1	170.5	168.2
	BHP	25.2	36.3	47.4	58.5
3300	GPM	185.3	182.2	179.5	177.2
	BHP	26.6	38.2	49.8	61.4
3450	GPM	194.3	191.2	188.6	186.3
	BHP	27.9	40.1	52.2	64.4
3600	GPM	203.3	200.2	197.6	195.3
	BHP	29.3	42	54.6	67.3

For performance at lower or higher speeds than referenced above, contact CIRCOR. Flow and power is typical at 150 SSU fluid viscosity and intended for reference only. For actual performance, refer to the CIRCOR Selection program.

DRY MOUNTED PUMP PERFORMANCE DATA

PUMP MODEL: 3D-275

Speed (rpm)		Differential Pressure (psi)				
		200	300	400	500	600
1500	GPM	105	101.5	98.6	96	93.7
	BHP	15	22	29	36.1	43.1
1650	GPM	117	113.5	110.6	108	105.7
	BHP	16.6	24.3	32.1	39.8	47.5
1800	GPM	129.1	125.6	122.7	120.1	117.8
	BHP	18.2	26.6	35.1	43.5	51.9
1950	GPM	141.1	137.6	134.7	132.1	129.8
	BHP	19.8	29	38.1	47.2	56.4
2100	GPM	153.1	149.7	146.7	144.2	141.8
	BHP	21.5	31.3	41.2	51	60.8
2250	GPM	165.2	161.7	158.8	156.2	153.9
	BHP	23.2	33.7	44.3	54.8	65.3
2400	GPM	177.2	173.8	170.8	168.3	165.9
	BHP	24.9	36.1	47.3	58.6	69.8
2550	GPM	189.3	185.8	182.9	180.3	178
	BHP	26.6	38.5	50.5	62.4	74.3
2700	GPM	201.3	197.8	194.9	192.3	190
	BHP	28.3	40.9	53.6	66.2	78.9
2850	GPM	213.3	209.9	207	204.4	202
	BHP	30	43.4	56.7	70.1	83.4
3000	GPM	225.4	221.9	221.9	70.1	214.1
	BHP	31.8	45.6	59.9	73.9	88

For performance at lower or higher speeds than referenced above, contact CIRCOR. Flow and power is typical at 150 SSU fluid viscosity and intended for reference only. For actual performance, refer to the CIRCOR Selection program.

DRY MOUNTED PUMP PERFORMANCE DATA

PUMP MODEL: 3D-312

Speed (rpm)		Differential Pressure (psi)				
		200	300	400	500	600
1500	GPM	156.8	152.3	148.5	145.2	142.2
	BHP	22.0	32.3	42.6	52.9	63.2
1650	GPM	174.4	170.0	166.2	162.8	159.8
	BHP	24.4	35.7	47.0	58.4	69.7
1800	GPM	192.1	187.6	183.6	180.5	177.5
	BHP	26.7	39.1	51.5	63.8	76.2
1950	GPM	209.8	205.3	201.5	198.2	195.2
	BHP	29.1	42.5	55.9	69.3	82.7
2100	GPM	227.4	223.0	219.2	215.9	212.8
	BHP	31.6	46.0	60.4	74.8	89.3
2250	GPM	245.1	240.6	236.9	233.5	230.5
	BHP	34.0	49.5	64.9	80.4	95.9
2400	GPM	262.8	258.3	254.5	251.2	248.2
	BHP	36.5	53.0	69.5	86.0	102.5
2550	GPM	280.4	276.0	272.2	268.9	265.9
	BHP	39.0	56.5	74.0	91.6	109.1
2700	GPM	298.1	293.6	289.9	286.5	283.5
	BHP	41.5	60.1	78.6	97.2	115.7

For performance at lower or higher speeds than referenced above, contact CIRCOR. Flow and power is typical at 150 SSU fluid viscosity and intended for reference only. For actual performance, refer to the CIRCOR Selection program.

DRY MOUNTED PUMP PERFORMANCE DATA

PUMP MODEL: 3D-350

Speed (rpm)		Differential Pressure (psi)				
		200	300	400	500	600
1500	GPM	225.2	220.1	215.7	211.9	208.4
	BHP	30.9	45.4	59.9	74.4	88.8
1650	GPM	250.1	244.9	240.5	236.7	233.2
	BHP	34.2	50.1	66.1	82.0	97.9
1800	GPM	274.9	269.7	265.4	261.5	258.0
	BHP	37.5	54.9	72.3	89.7	107.1
1950	GPM	299.7	294.5	290.2	286.3	282.9
	BHP	40.9	59.7	78.6	97.4	116.2
2100	GPM	324.5	319.4	315.0	311.2	307.7
	BHP	44.3	64.6	84.9	105.2	125.4
2250	GPM	349.4	344.2	339.8	336.0	332.5
	BHP	47.8	69.5	91.2	112.9	134.7
2400	GPM	374.2	369.0	364.7	360.8	357.3
	BHP	51.2	74.4	97.6	120.8	143.9
2500	GPM	390.7	385.6	381.2	377.4	373.9
	BHP	53.6	77.7	101.9	126.0	150.1

For performance at lower or higher speeds than referenced above, contact CIRCOR. Flow and power is typical at 150 SSU fluid viscosity and intended for reference only. For actual performance, refer to the CIRCOR Selection program.

DRY MOUNTED PUMP PERFORMANCE DATA

SPECIFICATIONS AND FEATURES:

Rotor Case/Housing	Iron
Power Rotor	Ground Alloy Steel
Idler rotors	Ground Pearlitic Iron
Operating Pressure	To 600 psig – Belt Drive (see performance charts)
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	Single spring, elastomeric bellows with mechanical seal
Bearing	Cartridge-type, permanently grease-packed, single row radial deep groove ball bearing
O-Rings	Buna N
Filtration	60–100 mesh suction strainer recommended

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

CHARTS FOR DETERMINING SHAFT SPEED (RPM) FROM FLOW RATE

Flow Rate (GPM) @ 100 SSU and 200 PSI

Pump Model	15	20	25	30	35	40	50	75	100	125
3D-187	-	-	-	1580	1776	1973	2366	3348	-	-
3D-218	-	-	-	-	-	-	1581	2200	2818	3437
3D-250	-	-	-	-	-	-	-	1523	1938	2352
3D-275	-	-	-	-	-	-	-	-	-	1793
3D-312	-	-	-	-	-	-	-	-	-	-
3D-350	-	-	-	-	-	-	-	-	-	-

Pump Model	150	175	200	225	250	275	300	325	350	375
3D-187	-	-	-	-	-	-	-	-	-	-
3D-218	-	-	-	-	-	-	-	-	-	-
3D-250	2767	3181	-	-	-	-	-	-	-	-
3D-275	2104	2415	2727	-	-	-	-	-	-	-
3D-312	-	1700	1914	2127	2340	2553	-	-	-	-
3D-350	-	-	-	1530	1681	1832	1983	2134	2285	2436

For performance at lower or higher speeds than referenced above, contact CIRCOR. Flow and power is typical at 150 SSU fluid viscosity and intended for reference only. For actual performance, refer to the CIRCOR Selection program.

DRY MOUNTED PUMP PERFORMANCE DATA

CHARTS FOR DETERMINING FLOW RATE (GPM) FROM CAR SPEED (FT/MIN)

Car Speed	Plunger Diameter																Car Speed
	2.75	3	3.5	4	4.5	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	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.

DRY MOUNT OR SUBMERSIBLE ELEVATOR PERFORMANCE

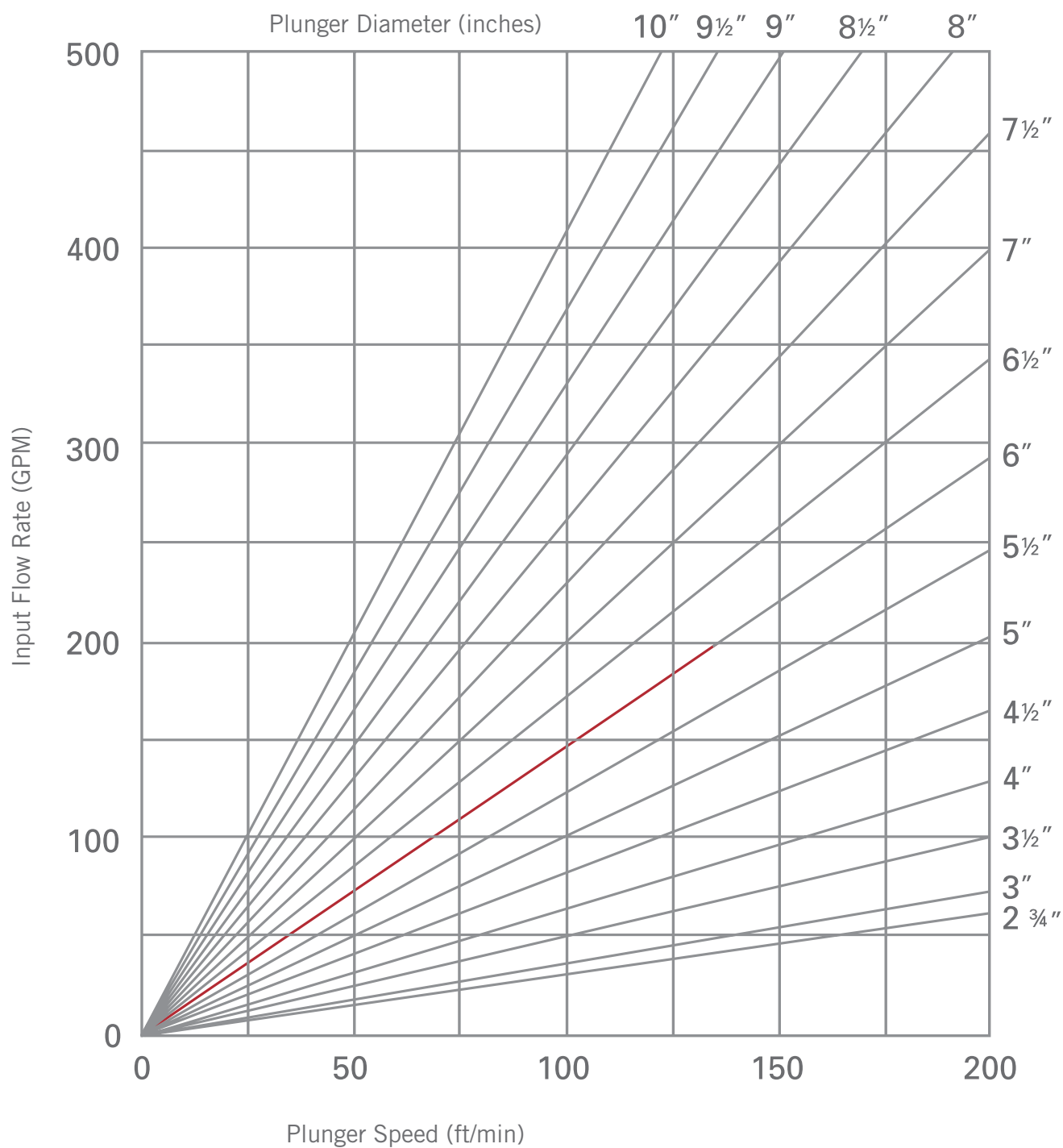
CHARTS FOR DETERMINING PSI FROM GROSS LOADS

Net Load	Plunger Diameter (inches)															
	2.75	3	3.5	4	4.5	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	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	-	-	-	706	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
Add per 100 lbs	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.

DRY MOUNT OR SUBMERSIBLE ELEVATOR PERFORMANCE

EFFECT OF FLOW RATE ON PLUNGER SPEED



DRY MOUNT AND/OR SUBMERSIBLE PUMPS

INSTALLATION GUIDELINES

To assume trouble free operations, please follow these guidelines:

MOUNTING – DRY

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 – DRY

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 – DRY OR SUBMERSIBLE

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 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 – DRY OR SUBMERSIBLE

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 – DRY OR SUBMERSIBLE

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

For dry mount pumps, remove seal vent plug, fill seal chamber with pumped fluid and replace seal vent plug.

SERVICE HINTS

IF OPERATION OF THE PUMP IS NOISY, CHECK THE FOLLOWING POINTS:

- › Air entrained in oil, or leaks in suction line.
- › Vortexing or low oil level in reservoir.
- › Restrictions in suction line or clogged strainer.
- › Incorrect alignment of pump and motor.
- › Excessive belt tension or slip.
- › Motor, pump, bracket or other component loose.
- › Unmatched belt set, or unbalanced sheave.
- › Pump suction capability exceeded – oil too cold or pump speed excessive.
- › Worn pump.
- › Damaged or unbalanced motor.

IF THERE IS NO OIL FLOW OR PRESSURE IS TOO LOW, CHECK THE FOLLOWING POINTS:

- › Restricted pump suction.
- › Control valve damaged or malfunctioning.
- › Excessively cold and viscous oil.
- › Low oil in reservoir.
- › Incorrect motor rotation.
- › Belts slipping.
- › Worn or damaged pump.



CIRCOR is a market-leading, global provider of integrated flow control solutions, specializing in the manufacture of highly engineered valves, instrumentation, pumps, pipeline products and services, and associated products, for critical and severe service applications in the oil and gas, power generation, industrial, process, maritime, aerospace, and defense industries.

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Asia | Europe | Middle East | North America | South America

CIRCOR
1710 Airport Rd
Monroe, NC 28110
USA

Allweiler GmbH
Allweiler Straße 1
78315 Radolfzell
Germany
+49 (0)7732 86-0



circorpt.com/elevators

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