

# Rotaflex® Long-Stroke Pumping Unit

Delivers high-performance rod lift in deep, high-volume, and problematic wells

## Applications

- High-volume and high-load wells
- Deviated and horizontal wells prone to sucker-rod and tubing failure
- Heavy oil or high gas-to-liquid (GLR) wells
- Alternative to electric submersible pump (ESP) systems

## Features and Benefits

- The Rotaflex pumping unit enables the transition to reciprocating rod-lift earlier in the production life cycle
- Unit arrives at the wellsite 90% preassembled for quick setup
- Optimized gear reducer combined with an efficient unit geometry requires less torque and reduces power usage by 15 to 40%
- Speed sentry monitors and records all pumping events and serves as an intelligent link to connected optimization systems
- Platform and rear-access doors above the gear reducer provide access away from the load belt for efficient maintenance
- Platform kick plates and grate prevent dropped objects and slips
- Ladder system enables easy access to critical components
- Large maintenance doors eliminate confined space issues and enable simplified maintenance; large front platform enables easy access to load counterweights
- Integrated hydraulic rollback system moves the unit at least 12 ft (3.6 m) away from the wellhead for easy access to the well
- Monitoring system analyzes unit vibration, belt tracking, rod load, and rod position with parameter-based alarm and shut-down capabilities

## Pumping Unit Description

The Weatherford Rotaflex long-stroke pumping unit delivers a long stroke up to 366 in. (9.3 m) for efficient pumping in deep, high-volume, and problematic wells.

The long, slow pump stroke allows more time for fluids to enter the pump intake, which increases pump fillage and lifting efficiency. The long stroke, efficient counterbalance system, and unique unit geometry also increase system efficiency and energy savings. By reducing cycles and reversals by 40 to 60%, the unit lessens rod-on-tubing wear, minimizes downhole failures, and substantially lengthens sucker-rod and downhole-pump life.

Paired with the optional WellPilot® controller, the Rotaflex unit optimizes each and every stroke for more efficient lifting than a beam-unit, rod-lift system.



Compared to standard pumping units, the Weatherford Rotaflex long-stroke pumping unit improves productivity with a longer stroke, more complete barrel fillage, and less wear on surface and downhole equipment.



# Rotaflex® Long-Stroke Pumping Unit

## Standard Features

All Rotaflex pumping units include the following as standard equipment:

- Speed sentry to safely monitor for overspeed, load violations, and more
- System-performance sensors, including upper- and lower-proximity switches, vibration sensor, belt-alignment sensors, hydraulic-brake-pressure sensors, oil-level sensors, and a 50K load cell
- Complete wiring and quick connectors link the unit, junction box, and speed sentry to enable a plug-and-play pumping unit
- Integrated hydraulic rollback system enables easy access to the wellhead
- Hydraulic braking system
- Rod-rotator trip device
- Wire-mesh safety fence
- Front wind-shear panels
- Unit guard
- Belt-guide wheels

## Optional Equipment

All Rotaflex pumping units can be optionally equipped with the following:

- WellPilot® variable-speed drive (VSD) controls speed throughout the stroke cycle to optimize downhole plunger travel and increases production rates by 20%
- Units available that meet Class 1, Division 2 Canada Standards Association (CSA) requirement

## Complementary Equipment

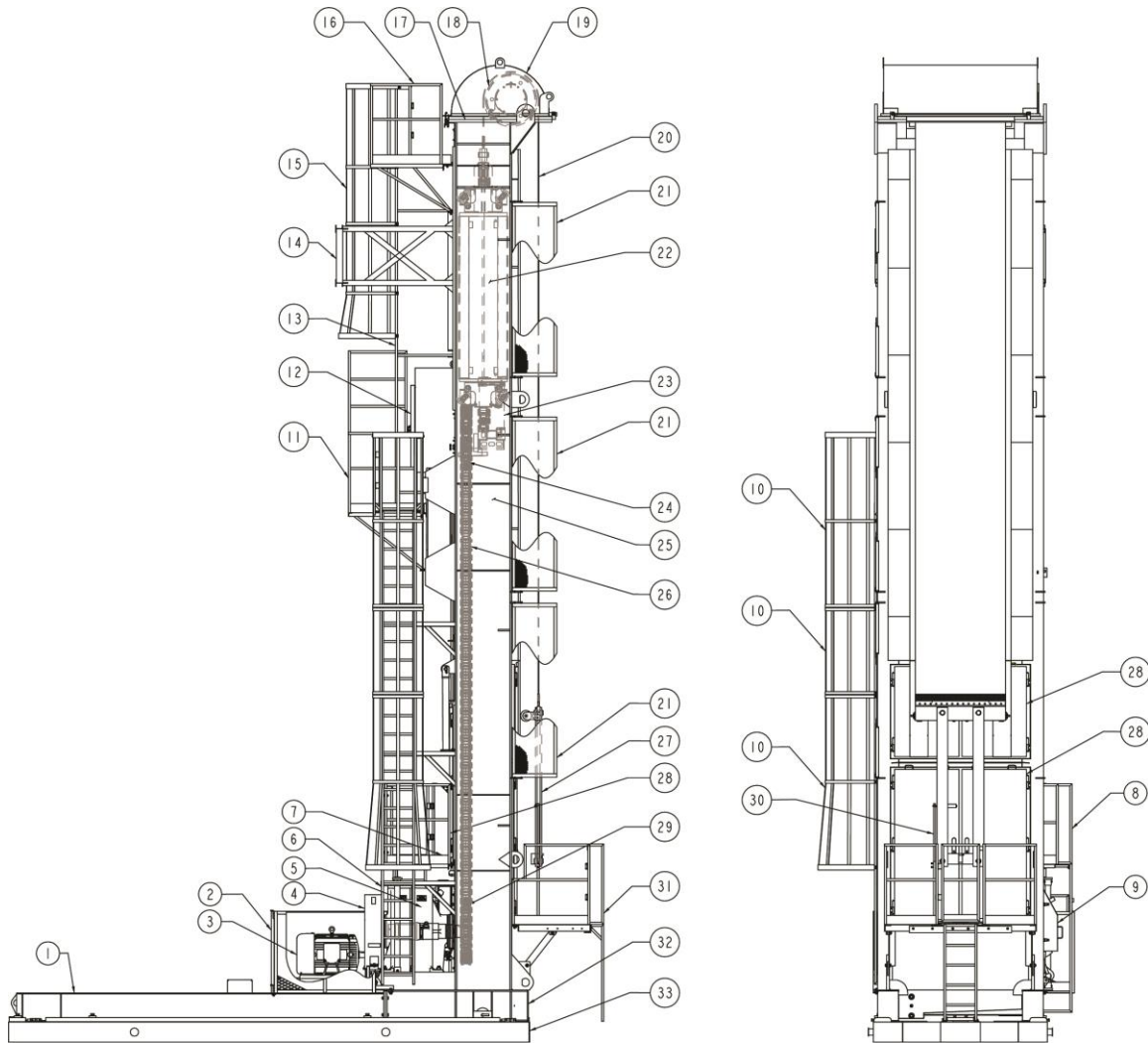
All Rotaflex pumping units are compatible with the following Weatherford technologies:

- Premium sucker rods deliver maximized run life
- COROD® and semielliptical COROD continuous rods reduce rod-string weight and enable deeper lifting
- Sand-tolerant pump increases run life in solids-bearing wells
- ForeSite® production-optimization platform maximizes performance well-by-well and throughout a producing asset



# Rotaflex® Long-Stroke Pumping Unit

## Parts Identification

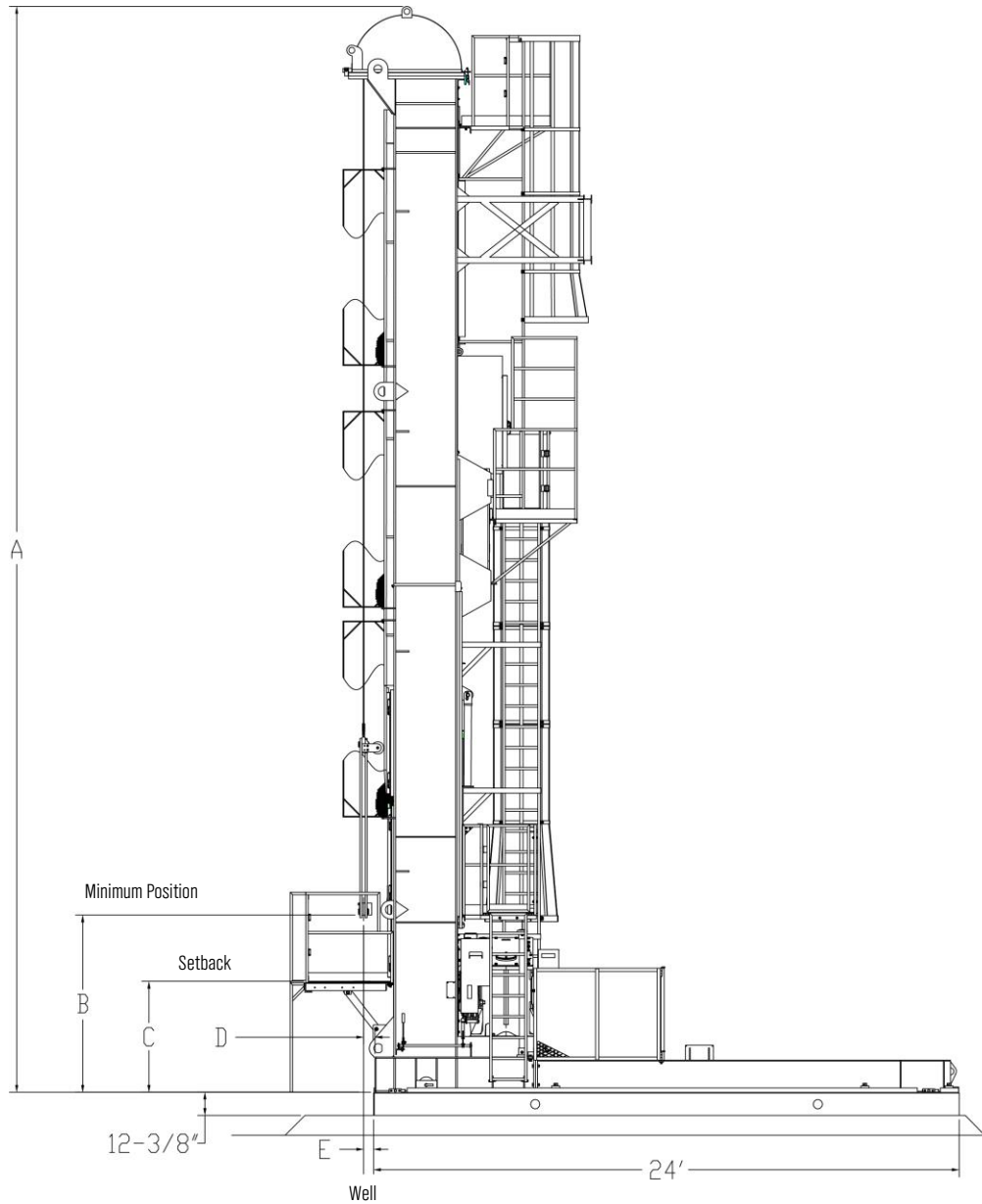


1	Skid	12	Top sprocket enclosure	23	Carriage frame/traversing mechanism
2	Wire-mesh safety fence	13	Top ladder	24	Idler sproket
3	Prime mover	14	Crown shipping strut	25	Tower
4	V-belt/belt guard	15	Top ladder cage	26	Chain
5	Reducer	16	Top platform	27	Hanger bar
6	Bottom ladder	17	Crown	28	Counterweight doors
7	Rear-access platform	18	Top drum	29	Drive sproket
8	Ladder to rear-access platform	19	Hood	30	Rod rotator
9	Brake/brake guard	20	Load belt	31	Front platform
10	Bottom ladder cage	21	Wind guards	32	Tower base
11	Mid-tower platform	22	Counterweight box	33	Concrete base



# Rotaflex® Long-Stroke Pumping Unit

## Dimensional Data



Model	A	B	C	D	E
700	434.97 in. (11.05 m)	80 in. (2.03 m)	48 in. (1.22 m)	6.5 in. (.17 m)	5.75 in. (.15 m)
950	484.64 in. (12.31 m)	73.27 in. (1.86 m)	49.88 in. (1.27 m)	5.38 in. (.14 m)	4.63 in. (.12 m)
1100	533.03 in. (13.54 m)	86.94 in. (2.21 m)	54.4 in. (1.38 m)	5.38 in. (.14 m)	4.63 in. (.12 m)
1150	593.03 in. (15.06 m)	86.96 in. (2.21 m)	54.4 in. (1.38 m)	5.38 in. (.14 m)	4.63 in. (.12 m)
1155	593.03 in. (15.06 m)	85.37 in. (2.17 m)	54.4 in. (1.38 m)	5.38 in. (.14 m)	4.63 in. (.12 m)



# Rotaflex® Long-Stroke Pumping Unit

## General Specifications

Size	700	950	1100	1150	1155
Reducer rating	228,000 in-lb (25,761 N-m)	350,000 in-lb (39,545 N-m)	350,000 in-lb (39,545 N-m)	350,000 in-lb (39,545 N-m)	500,000 in-lb (56,492 N-m)
Stroke length	236 in. (5.994 m)	288 in. (7.315 m)	306 in. (7.772 m)	366 in. (9.296 m)	366 in. (9.296 m)
Max polished-rod load	26,500 lb (12,020 kg)	36,000 lb (16,329 kg)	50,000 lb (22,680 kg)	50,000 lb (22,680 kg)	50,000 lb (22,680 kg)
Sprocket diameter	27.327 in. (694 mm)	33.547 in. (852 mm)	33.547 in. (852 mm)	33.547 in. (852 mm)	36.720 in. (933 mm)
Max SPM <sup>A</sup>	5	4.5	4.3	3.64	3.75
Racetrack average SPM	6	5.6	5.4	4.6	4.7
Peak straight-way SPM	6.9	6.24	5.96	5.05	5.2
Maximum ramp acceleration	80 in./sec <sup>2</sup> (2.03 m/sec <sup>2</sup> )	80 in./sec <sup>2</sup> (2.03 m/sec <sup>2</sup> )	80 in./sec <sup>2</sup> (2.03 m/sec <sup>2</sup> )	80 in./sec <sup>2</sup> (2.03 m/sec <sup>2</sup> )	80 in./sec <sup>2</sup> (2.03 m/sec <sup>2</sup> )
Minimum SPM <sup>B</sup>	No minimum for short-term operation				
Minimum counterweight	6,450 lb (2,926 kg)	8,730 lb (3,960 kg)	9,700 lb (4,400 kg)	9,700 lb (4,400 kg)	9,800 lb (4,445 kg)
Additional counterweight	14,880 lb (6,749 kg)	18,800 lb (8,528 kg)	29,600 lb (13,426 kg)	29,600 lb (13,426 kg)	29,600 lb (13,426 kg)
Total counterweight	21,330 lb (9,675 kg)	27,530 lb (12,487 kg)	39,300 lb (17,826 kg)	39,300 lb (17,826 kg)	39,400 lb (17,872 kg)
Load-belt width	39.37 in. (1,000 mm)	42 in. (1,067 mm)	50 in. (1,270 mm)	50 in. (1,270 mm)	50 in. (1,270 mm)
Load-belt length	27.03 ft (8.24 m)	31.5 ft (9.6 m)	33.83 ft (10.3 m)	38.83 ft (11.83 m)	38.83 ft (11.83 m)
Installed dimensions <sup>C</sup>	18.1 × 11.5 × 36.4 ft (5.5 × 3.5 × 11.1 m)	27.3 × 11.9 × 40.4 ft (8.3 × 3.6 × 12.3 m)	27.3 × 11.9 × 44.3 ft (8.3 × 3.6 × 13.5 m)	27.3 × 11.9 × 49.3 ft (8.3 × 3.6 × 15 m)	27.3 × 11.9 × 49.3 ft (8.3 × 3.6 × 15 m)
Shipping dimensions	36.4 × 8.2 × 9.7 ft (11.1 × 2.5 × 2.95 m)	40.5 × 8.7 × 10.2 ft (12.3 × 2.6 × 3.1 m)	44.5 × 8.7 × 10.2 ft (13.6 × 2.6 × 3.1 m)	49.5 × 8.7 × 10.2 ft (15.1 × 2.6 × 3.1 m)	49.5 × 8.7 × 10.2 ft (15.1 × 2.6 × 3.1 m)
Shipping weight	35,800 lb (16,230 kg)	56,100 lb (25,447 kg)	60,900 lb (27,624 kg)	63,500 lb (28,803 kg)	64,500 lb (29,257 kg)
Concrete base weight	22,250 lb (10,190 kg)	29,000 lb (13,154 kg)			
Concrete base dimensions	21 x 7.4 x 1 ft (6.4 x 2.3 x .3 m)	24 x 8.5 x 1 ft (7.3 x 2.6 x .3 m)			
Working temperature <sup>D</sup>	-4 to 122°F (-20 to 50°C)				
Automatic braking system	Standard				
Speed sentry	Standard				
Sensors	Standard				
Hydraulic rollback system	Standard				

<sup>A</sup> This is the maximum SPM when operating at a constant speed. A variable speed drive (VSD) must be used to operate the unit in racetrack mode.

<sup>B</sup> At SPMs less than .8 SPM, the oiling system in the Rotaflex pumping unit may not adequately lubricate the chain. When a VSD is used, less than .5 SPM is not recommended.

<sup>C</sup> These dimensions exclude the front platform, motor guard, and any other attachments added in the field. The length is measured at the base.

<sup>D</sup> This is the standard unit rating. The Rotaflex pumping unit operates under these ambient temperatures if the correct fluids have been added to the appropriate components.



# Rotaflex® Long-Stroke Pumping Unit

## Maximum Production by Depth\*

Depth	Rotaflex 700 without Drive					Rotaflex 700 with Drive				
	Pump Size	SPM	Reducer	Structural	Production at 100%	Pump Size	SPM	Reducer	Structural	Production at 100%
2,000 ft (609 m)	4.75	5	66%	96%	2,945 B/D (466.488 m <sup>3</sup> /d)	4.75	6	68%	97%	3,585 B/D (567.864 m <sup>3</sup> /d)
3,000 ft (914 m)	3.75	5	65%	95%	1,779 B/D (281.7936 m <sup>3</sup> /d)	3.75	6	62%	95%	2,155 B/D (341.352 m <sup>3</sup> /d)
4,000 ft (1,219 m)	3.25	5	66%	99%	1,300 B/D (205.92 m <sup>3</sup> /d)	3.25	6	62%	99%	1,585 B/D (251.064 m <sup>3</sup> /d)
5,000 ft (1,524 m)	2.75	5	59%	100%	898 B/D (142.2432 m <sup>3</sup> /d)	2.75	6	56%	98%	1,100 B/D (174.24 m <sup>3</sup> /d)
6,000 ft (1,828 m)	2.25	5	52%	97%	623 B/D (98.6832 m <sup>3</sup> /d)	2.25	6	57%	100%	700 B/D (121.968 m <sup>3</sup> /d)
7,000 ft (2,133 m)	2	5	49%	100%	433 B/D (68.5872 m <sup>3</sup> /d)	2	6	55%	100%	597 B/D (94.5648 m <sup>3</sup> /d)
8,000 ft (2,438 m)	1.5	5	49%	100%	380 B/D (60.192 m <sup>3</sup> /d)	1.5	6	50%	100%	440 B/D (69.696 m <sup>3</sup> /d)
9,000 ft (2,743 m)	1.25	5	42%	100%	278 B/D (44.0352 m <sup>3</sup> /d)	1.25	6	45%	100%	357 B/D (56.5488 m <sup>3</sup> /d)
10,000 ft (3,048 m)	1.06	5	35%	100%	202 B/D (31.9968 m <sup>3</sup> /d)	1.06	6	43%	100%	254 B/D (40.2336 m <sup>3</sup> /d)
11,000 ft (3,352 m)	1.06	5	34%	100%	150 B/D (23.76 m <sup>3</sup> /d)	1.06	6	43%	98%	186 B/D (29.4624 m <sup>3</sup> /d)

\* Table indicates theoretical (not actual) results.



# Rotaflex® Long-Stroke Pumping Unit

## Maximum Production by Depth\* (continued)

Depth	Rotaflex 950 without Drive					Rotaflex 950 with Drive				
	Pump Size	SPM	Reducer	Structural	Production at 100%	Pump Size	SPM	Reducer	Structural	Production at 100%
2,000 ft (609 m)	5.75	4.5	94%	99.9%	4,757 B/D (756.24 m <sup>3</sup> /d)	5.75	5.5	93.8%	99.1%	5,910 B/D (936.24 m <sup>3</sup> /d)
3,000 ft (914 m)	4.75	4.5	90%	99.9%	3,082 B/D (489.84 m <sup>3</sup> /d)	4.75	5.48	92.9%	99.4%	3,759 B/D (595.44 m <sup>3</sup> /d)
4,000 ft (1,219 m)	3.75	4.49	77.4%	100%	1,966 B/D (312.48 m <sup>3</sup> /d)	3.75	5.49	87%	99.9%	2,404 B/D (380.88 m <sup>3</sup> /d)
5,000 ft (1,524 m)	3.25	4.49	76.1%	100%	1,430 B/D (227.28 m <sup>3</sup> /d)	3.25	5.5	80.8%	99.7%	1,766 B/D (279.84 m <sup>3</sup> /d)
6,000 ft (1,828 m)	2.75	4.48	73.1%	100%	1,040 B/D (165.12 m <sup>3</sup> /d)	2.75	5.5	76.6%	99.8%	1,296 B/D (205.2 m <sup>3</sup> /d)
7,000 ft (2,133 m)	2.5	4.49	65.4%	99.5%	830 B/D (131.76 m <sup>3</sup> /d)	2.25	5.5	64.2%	98%	903 B/D (143.04 m <sup>3</sup> /d)
8,000 ft (2,438 m)	2.25	4.4	61.2%	100%	650 B/D (103.2 m <sup>3</sup> /d)	2	5.5	58.2%	99.9%	704 B/D (111.84 m <sup>3</sup> /d)
9,000 ft (2,743 m)	1.75	4.5	50.9%	100%	443 B/D (70.32 m <sup>3</sup> /d)	1.75	5.5	53.7%	99.9%	557 B/D (88.32 m <sup>3</sup> /d)
10,000 ft (3,048 m)	1.5	4.5	46.6%	100%	329 B/D (52.08 m <sup>3</sup> /d)	1.5	5.5	57.9%	99.8%	424 B/D (67.2 m <sup>3</sup> /d)
11,000 ft (3,352 m)	1.25	4.5	44.2%	99.7%	240 B/D (37.92 m <sup>3</sup> /d)	1.25	5.5	61.2%	100%	301 B/D (47.76 m <sup>3</sup> /d)
12,000 ft (3,657 m)	1.25	4.5	39.6%	91.3%	226 B/D (35.76 m <sup>3</sup> /d)	1.25	5.5	49.6%	91%	290 B/D (45.84 m <sup>3</sup> /d)

\* Table indicates theoretical (not actual) results.



# Rotaflex® Long-Stroke Pumping Unit

## Maximum Production by Depth\* (continued)

Depth	Rotaflex 1100 without Drive					Rotaflex 1100 with Drive				
	Pump Size	SPM	Reducer	Structural	Production at 100%	Pump Size	SPM	Reducer	Structural	Production at 100%
2,000 ft (609 m)	5.75	4.3	99.5%	85.8%	4,963 B/D (788.88 m <sup>3</sup> /d)	5.75	5.5	93.8%	99.1%	6,132 B/D (971.28 m <sup>3</sup> /d)
3,000 ft (914 m)	4.75	4.3	99.5%	90%	3,319 B/D (527.52 m <sup>3</sup> /d)	4.75	5.48	92.9%	99.4%	4,100 B/D (649.44 m <sup>3</sup> /d)
4,000 ft (1,219 m)	4.25	4.3	99.2%	99.2%	2,549 B/D (405.12 m <sup>3</sup> /d)	3.75	5.49	87%	99.9%	3,203 B/D (507.36 m <sup>3</sup> /d)
5,000 ft (1,524 m)	3.75	4.3	94.5%	99.2%	1,934 B/D (307.44 m <sup>3</sup> /d)	3.25	5.5	80.8%	99.7%	2,449 B/D (387.84 m <sup>3</sup> /d)
6,000 ft (1,828 m)	3.25	4.3	91.5%	99.1%	1,464 B/D (232.56 m <sup>3</sup> /d)	2.75	5.5	76.6%	99.8%	1,867 B/D (295.68 m <sup>3</sup> /d)
7,000 ft (2,133 m)	2.75	4.3	85.5%	99.9%	1,072 B/D (170.4 m <sup>3</sup> /d)	2.25	5.5	64.2%	98%	1,391 B/D (220.32 m <sup>3</sup> /d)
8,000 ft (2,438 m)	2.5	4.3	85.5%	99.9%	893 B/D (141.84 m <sup>3</sup> /d)	2.00	5.5	58.2%	99.9%	1,121 B/D (177.6 m <sup>3</sup> /d)
9,000 ft (2,743 m)	2.25	4.3	80.6%	99.8%	697 B/D (110.64 m <sup>3</sup> /d)	1.75	5.5	53.7%	99.9%	926 B/D (146.64 m <sup>3</sup> /d)
10,000 ft (3,048 m)	2	4.3	69%	99.9%	567 B/D (90 m <sup>3</sup> /d)	1.50	5.5	57.9%	99.8%	758 B/D (120 m <sup>3</sup> /d)
11,000 ft (3,352 m)	1.75	4.3	61.3%	96%	445 B/D (70.56 m <sup>3</sup> /d)	1.25	5.5	61.2%	100%	588 B/D (93.12 m <sup>3</sup> /d)
12,000 ft (3,657 m)	1.5	4.29	59.2%	99.9%	342 B/D (54.24 m <sup>3</sup> /d)	1.25	5.5	49.6%	91%	492 B/D (78 m <sup>3</sup> /d)

\* Table indicates theoretical (not actual) results.





# Rotaflex® Long-Stroke Pumping Unit

## Maximum Production by Depth\* (continued)

Depth	Rotaflex 1150 without Drive					Rotaflex 1150 with Drive				
	Pump Size	SPM	Reducer	Structural	Production at 100%	Pump Size	SPM	Reducer	Structural	Production at 100%
2,000 ft (609 m)	5.75	3.63	99.9%	88.9%	5,033 B/D (800.16 m <sup>3</sup> /d)	5.75	4.96	99.1%	85.9%	6,955 B/D (1,101.6 m <sup>3</sup> /d)
3,000 ft (914 m)	4.75	3.63	99.7%	90.2%	3,393 B/D (539.28 m <sup>3</sup> /d)	4.75	4.96	99.7%	82.9%	4,627 B/D (732.96 m <sup>3</sup> /d)
4,000 ft (1,219 m)	4.25	3.63	97.9%	99%	2,643 B/D (429.12 m <sup>3</sup> /d)	4.25	4.96	98.1%	88.4%	3,561 B/D (564 m <sup>3</sup> /d)
5,000 ft (1,524 m)	3.75	3.63	98.5%	99.8%	2,034 B/D (323.28 m <sup>3</sup> /d)	3.75	4.57	99.5%	95.4%	2,552 B/D (404.16 m <sup>3</sup> /d)
6,000 ft (1,828 m)	3.25	3.63	91.7%	99.6%	1,521 B/D (241.68 m <sup>3</sup> /d)	3.25	4.97	96.7%	99.9%	2,126 B/D (336.72 m <sup>3</sup> /d)
7,000 ft (2,133 m)	2.75	3.62	86.8%	100%	1,112 B/D (176.64 m <sup>3</sup> /d)	2.75	4.97	92.8%	100%	1,559 B/D (246.96 m <sup>3</sup> /d)
8,000 ft (2,438 m)	2.5	3.64	82.9%	99.1%	895 B/D (142.08 m <sup>3</sup> /d)	2.5	4.98	82.7%	99.8%	1,287 B/D (203.76 m <sup>3</sup> /d)
9,000 ft (2,743 m)	2.25	3.63	79.3%	99.4%	729 B/D (115.68 m <sup>3</sup> /d)	2.25	5	77.4%	97.8%	1,032 B/D (163.44 m <sup>3</sup> /d)
10,000 ft (3,048 m)	2.25	3.63	75.4%	99.8%	695 B/D (110.4 m <sup>3</sup> /d)	2	4.98	78.7%	99.9%	828 B/D (131.04 m <sup>3</sup> /d)
11,000 ft (3,352 m)	2	3.62	71.3%	100%	562 B/D (89.28 m <sup>3</sup> /d)	1.75	4.99	80.9%	99.7%	667 B/D (105.6 m <sup>3</sup> /d)
12,000 ft (3,657 m)	1.75	3.64	63.8%	99.4%	433 B/D (68.64 m <sup>3</sup> /d)	1.75	4.99	74.1%	99.5%	631 B/D (99.84 m <sup>3</sup> /d)

\* Table indicates theoretical (not actual) results.



# Rotaflex® Long-Stroke Pumping Unit

## Maximum Production by Depth\* (continued)

Depth	Rotaflex 1155 without Drive					Rotaflex 1155 with Drive				
	Pump Size	SPM	Reducer	Structural	Production at 100%	Pump Size	SPM	Reducer	Structural	Production at 100%
2,000 ft (609 m)	5.75	3.74	80.1%	96.9%	5,256 B/D (68.64 m <sup>3</sup> /d)	5.75	4.83	81.1%	98.4%	6,911 B/D (1,094.64 m <sup>3</sup> /d)
3,000 ft (914 m)	5.25	3.73	82.5%	85.9%	4,090 B/D (650.16 m <sup>3</sup> /d)	5.25	4.83	80.6%	97.4%	5,480 B/D (868.08 m <sup>3</sup> /d)
4,000 ft (1,219 m)	4.5	3.74	74%	95.5%	2,977 B/D (473.28 m <sup>3</sup> /d)	4.50	4.84	81.3%	96.7%	3,895 B/D (617.04 m <sup>3</sup> /d)
5,000 ft (1,524 m)	4	3.75	75.3%	99.1%	2,321 B/D (368.88 m <sup>3</sup> /d)	3.75	4.81	74.1%	96.6%	2,726 B/D (431.76 m <sup>3</sup> /d)
6,000 ft (1,828 m)	3.5	3.74	66.9%	98.9%	1,737 B/D (276 m <sup>3</sup> /d)	3.25	4.82	70.6%	99.8%	2,065 B/D (327.12 m <sup>3</sup> /d)
7,000 ft (2,133 m)	3	3.74	64.6%	99%	1,299 B/D (206.4 m <sup>3</sup> /d)	2.75	4.83	63.1%	99.7%	1,530 B/D (242.4 m <sup>3</sup> /d)
8,000 ft (2,438 m)	2.75	3.74	59.6%	99.8%	1,061 B/D (138.72 m <sup>3</sup> /d)	2.50	4.83	58.1%	98.8%	1,252 B/D (206.88 m <sup>3</sup> /d)
9,000 ft (2,743 m)	2.5	3.74	59.2%	100%	874 B/D (115.68 m <sup>3</sup> /d)	2.25	4.83	55.9%	99.5%	995 B/D (157.68 m <sup>3</sup> /d)
10,000 ft (3,048 m)	2.25	3.74	53.2%	99.9%	727 B/D (115.44 m <sup>3</sup> /d)	2.00	4.83	53%	99.6%	804 B/D (127.44 m <sup>3</sup> /d)
11,000 ft (3,352 m)	2	3.75	50.4%	99.3%	586 B/D (94.56 m <sup>3</sup> /d)	1.75	4.75	48.7%	99.7%	630 B/D (99.84 m <sup>3</sup> /d)
12,000 ft (3,657 m)	1.75	3.74	44.9%	99.6%	452 B/D (71.76 m <sup>3</sup> /d)	1.75	4.85	49.8%	99.8%	614 B/D (97.2 m <sup>3</sup> /d)

\* Table indicates theoretical (not actual) results.

