

Bennett Sample Pumps

Submersible Piston Pump

U.S. Patent No. 4295801

Canadian Patent nos. 1166075 & 1187331

- Portable and dedicated units
- Pumping lifts-0 to 1000 feet
- Infinitely variable flow rates
- 1.4 inch & 1.8 inch diameter pumps
- Stainless Steel Construction
- Compressed air or bottled gas operated
- Reels, tube bundles & well casing caps for complete portable & dedicated systems

Bennett Sample Pumps, Inc.

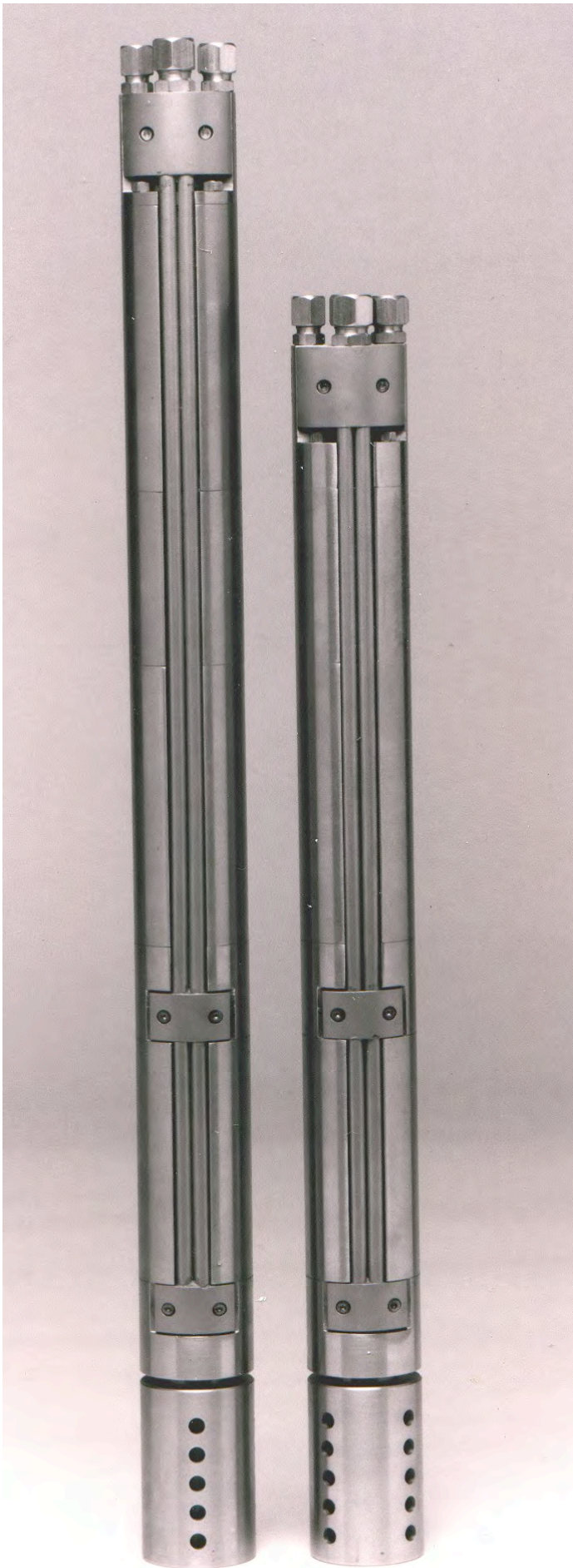
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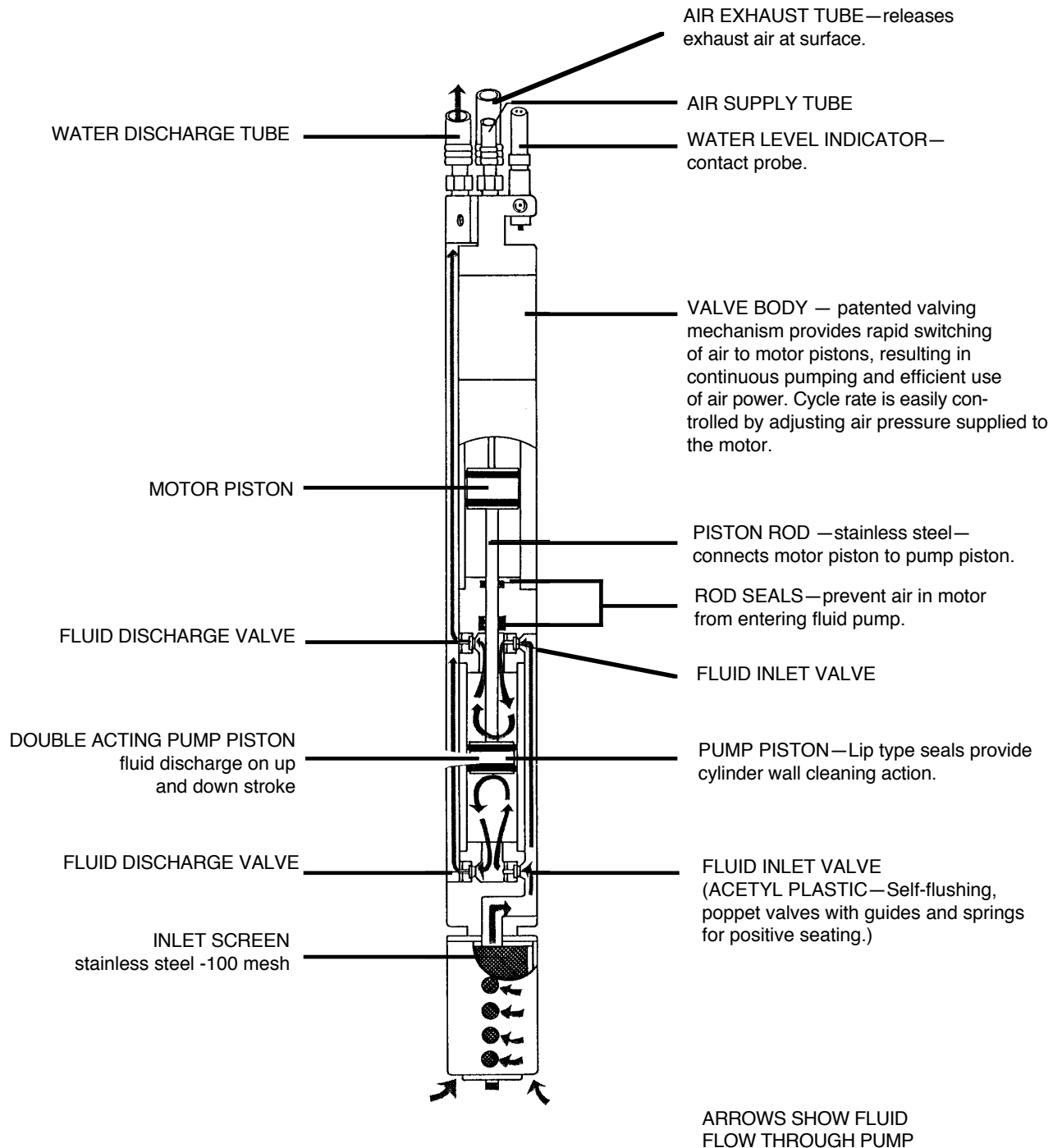
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Bennett Sample Pumps have automatic reciprocating piston motors, operated by compressed air, that generate power for operating a double acting, piston fluid pump. Models for lifts up to 500 feet have one motor piston; Models for lifts up to 1000 feet have two motor pistons, providing increased power for operating the pump. All models have a differential ratio between the motor pistons and the pump to accomplish lifts using low pressure air from small compressors.

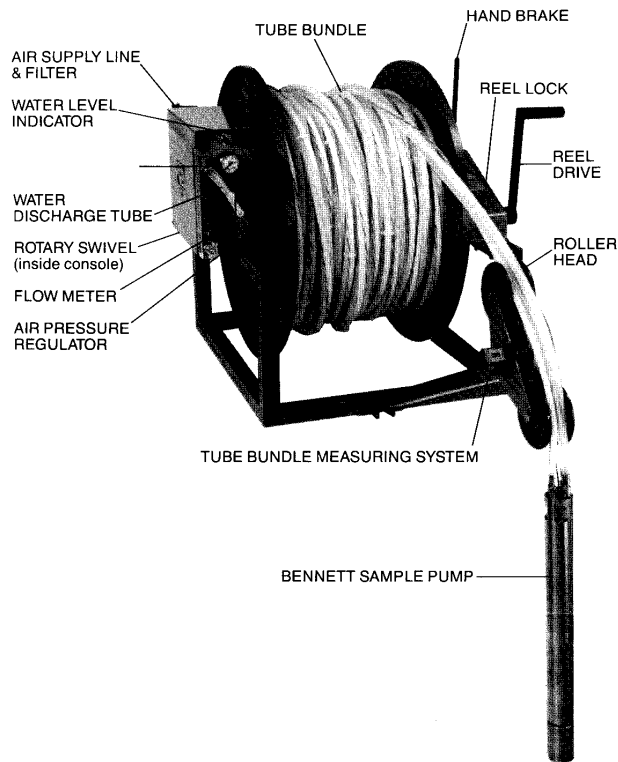


Bennett Pumps may be operated in any position from horizontal to vertical. These pumps will operate submerged to great depths or above water with a drop tube attached to the fluid inlet.

Bennett Sample Pumps may be used as portable units, capable of sampling multiple boreholes, or used in dedicated well systems. They are constructed to permit easy dis-assembly in the field for cleaning and replacement of pump seals and valves, using ordinary tools. Repair kits containing all parts for re-conditioning the pump are available. Pump body, piston and piston rod are made of stainless steel.

Bennett Sample Pump Units

A pump unit for applications where portability is required. Each unit consists of a Bennett Pump, a tube bundle (choice of length and materials) and a tube bundle reel. The reel is equipped with all controls for operating the pump. The portable units are completely assembled, tested and shipped ready for use.



Tube Bundle—Construction—stainless steel cable core, polypropylene air supply and air exhaust tubes, choice of materials for water discharge tube, electric cord for water level indicator, nylon wire ties to hold bundle together (PVC tape wrap optional).

Water Level Indicator System—A sonar alarm sounds when probe installed in pump head touches water. System powered by a 6 volt battery inside console.

Rotary Swivel—Installed on reel axle, eliminates disconnecting lines when setting pump.

Flow Meter—Monitors pump discharge rate .2 to 2.0 gpm.

Air Pressure Regulator & Gage—Adjustable for controlling pump discharge.

Hand Brake—Controls lowering speed into borehole.

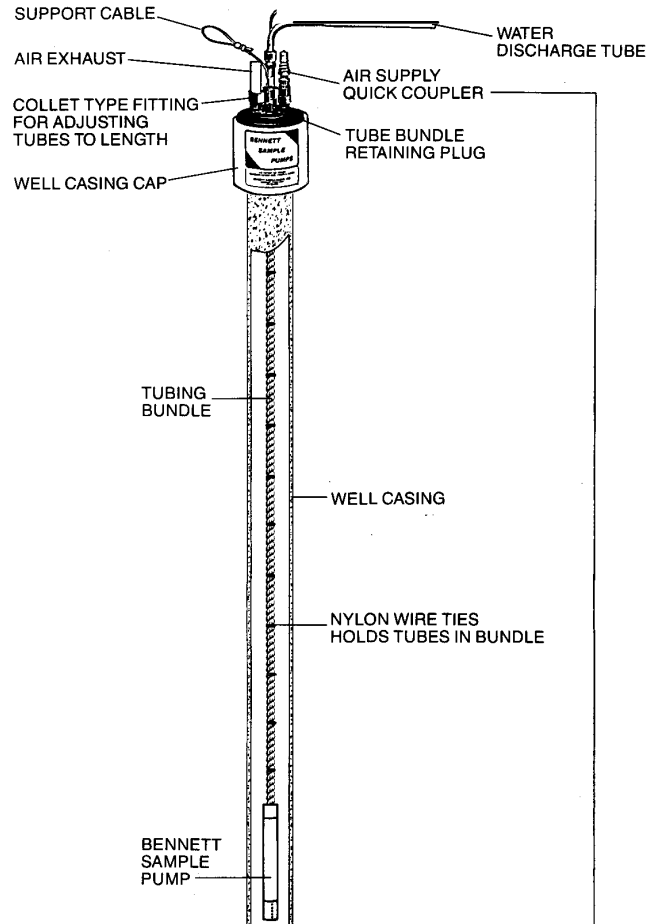
Reel Drive—Sprocket and chain drive with reduction ratio for hand crank operation. Power drive system available for larger reels.

Reel Lock—Holds pump in fixed position in borehole.

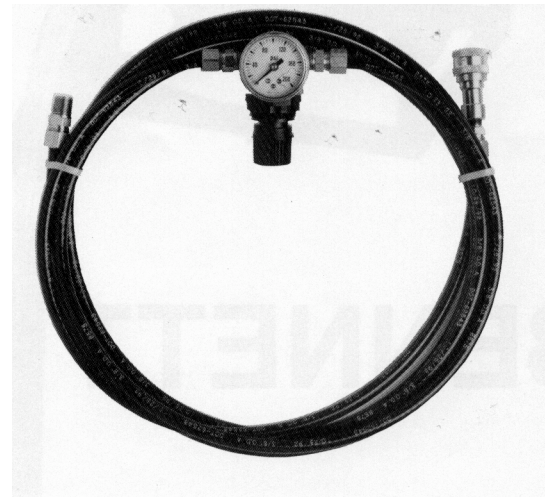
Roller Head—Guides tube bundle into borehole.

Tube Bundle Measuring System—A mechanical counter attached to the measuring wheel reads in feet & tenths.

A dedicated well system consists of a Bennett Sample Pump, a tube bundle (made to required length), a well casing cap and tube bundle retaining plug. Tube bundles are shipped on wooden spools with all fittings installed for easy installation.



HAND HELD AIR PRESSURE REGULATOR WITH HOSE AND QUIDK COUPLER



Bennett Sample Pumps

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MODELS 180 & 1800 (for 2" and larger wells)

SPECIFICATIONS

PUMP MODEL NO.	DIAMETER	LENGTH	WEIGHT	MOTOR CYLINDERS	PISTON STROKE	PISTON CYCLES PER MINUTE
180	1.8"	19.625"	10.5 lbs.	1	3"	Variable from 0 to 90 CPM maximum
1800	1.8"	23.625"	13 lbs.	2	3"	

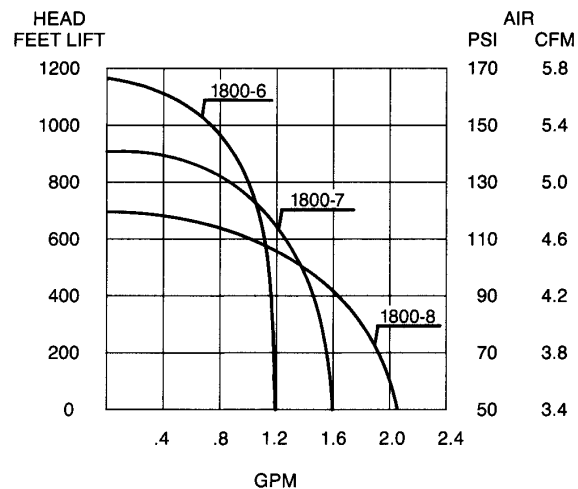
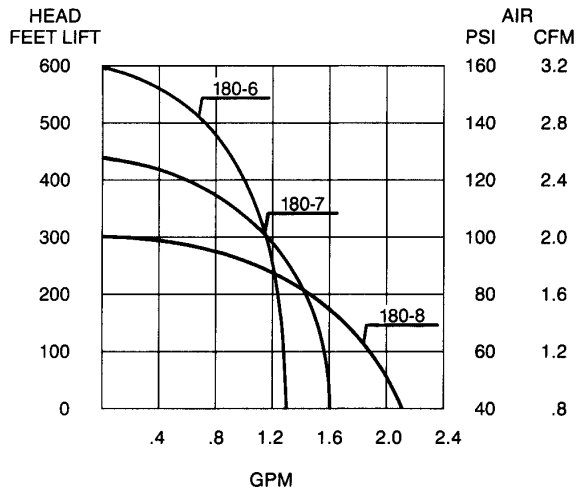
Materials of Construction: 303 and 304 Stainless Steel

Model 180 and 1800 pumps are equipped with a 1" diameter pump piston for maximum flow rates at low pumping lifts. Intermediate lifts require a 7/8" diameter pump piston that reduces the flow rate. High lift applications require a 3/4" diameter pump piston with further reductions in pump flow rate.

PUMP PERFORMANCE CURVES COMPRESSED AIR REQUIREMENTS

MODEL 180-6—3/4" Pump Piston
MODEL 180-7—7/8" Pump Piston
MODEL 180-8—1.0" Pump Piston

MODEL 1800-6—3/4" Pump Piston
MODEL 1800-7—7/8" Pump Piston
MODEL 1800-8—1.0" Pump Piston



The performance curves show maximum flow rates at given lifts. Lower flow rates are obtained, at any lift, by reducing the air pressure to the pump motor.

Bennett Sample Pumps

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MODELS 140 & 1400 (for 1.5" and larger wells)

SPECIFICATIONS

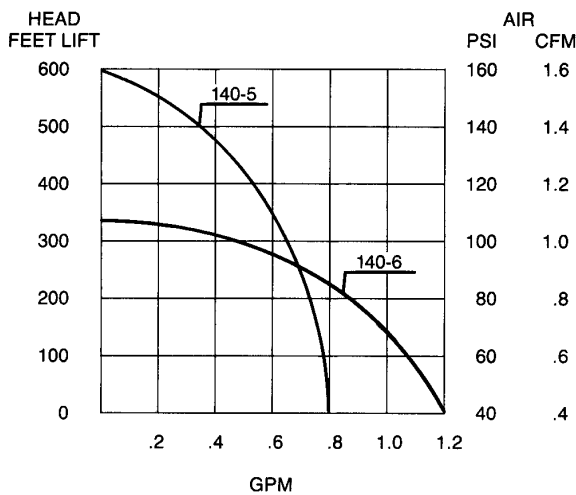
PUMP MODEL NO.	DIAMETER	LENGTH	WEIGHT	MOTOR CYLINDERS	PISTON STROKE	PISTON CYCLES PER MINUTE
140	1.4"	16"	5 lbs.	1	2.5"	Variable from 0 to 110 CPM maximum
1400	1.4"	19.25"	6 lbs.	2	2.5"	

Materials of Construction: 303 and 304 Stainless Steel

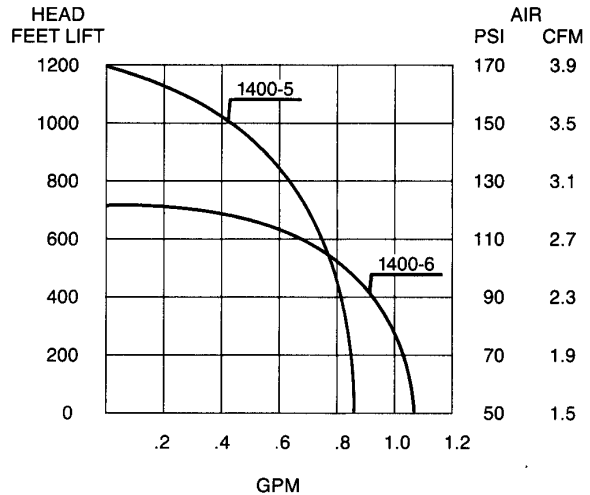
The Model 140 and 1400 pumps are equipped with a 3/4" diameter pump piston to produce higher flow rates at low pumping lifts. The pumps are equipped with a 5/8" diameter pump piston to produce higher discharge pressures required for higher lift pumping, with a reduction in flow rate.

PUMP PERFORMANCE CURVES COMPRESSED AIR REQUIREMENTS

MODEL 140-5—5/8" Pump Piston
MODEL 140-6—3/4" Pump Piston



MODEL 1400-5—5/8" Pump Piston
MODEL 1400-6—3/4" Pump Piston



The performance curves show maximum flow rates at given lifts. Lower flow rates are obtained, at any lift, by reducing the air pressure to the pump motor.

BENNETT TUBING BUNDLE

For use with BENNETT SAMPLE PUMPS as reel operated units and as dedicated systems

TUBE BUNDLE CONSTRUCTION

Core	3/32" Stainless Steel Cable
*Air Supply Tube	Polypropylene—FDA Approved
*Air Exhaust Tube	Polypropylene—FDA Approved
Water Discharge Tube	Choice of Polypropylene, Teflon, Nylon
**Electric Cord	18-2 with Polyethylene Jacket
Tube Bundle Binding	Nylon Wire Ties
Optional Binding	PVC Tape Wrap

*Tube Bundles with all Tubes of Teflon, Nylon and other materials are available on request.

**No Electric Cord in Dedicated Tube Bundles.

Tube Bundles are available in three basic sizes as shown below:

	SIZE #1	SIZE #2	SIZE#3
Air Supply Tube	3/8" od x 1/4" id	1/2" od x 3/8" id	1/2" od x 3/8" id
Air Exhaust Tube	1/2" od x 3/8" id	5/8" od x 1/2" id	5/8" od x 1/2" id
Water Discharge Tube	1/2" od x 3/8" id	5/8" od x 1/2" id	9/16" od x 3/8" id

Size #1 Tube Bundle is recommended for lower flow rates and shorter tube bundle lengths. Size #2 is recommended for higher flow rates and longer tube bundle length. Size #3 Tube Bundle is recommended for lower flow rates where high lift and high pumping pressure is required.

TUBE BUNDLES FOR PORTABLE UNITS

PART NO.	RECOMMENDED PUMP MODELS	PUMPING LIFTS	CONSTRUCTION MATERIALS
RPT1	180,140,1400	500 feet	Air Supply Line-Polypropylene Air Exhaust Line-Polypropylene Water Discharge Tube-FEP TEFLON
RPT2	1800	500 feet	Air Supply Line-Polypropylene Air Exhaust Line-Polypropylene Water Discharge Tube—FEP TEFLON
RP1	180,140,1400	500 feet	Air Supply Line-Polypropylene Air Exhaust Line-Polypropylene Water Discharge Line-Polypropylene
RP2	1800	600 feet	Air Supply Line-Polypropylene Air Exhaust Line-Polypropylene Water Discharge Line-Polypropylene
*RP3	1400,1800	600 to 1,000 feet	Air Supply Line-Polypropylene Air Exhaust Line-Polypropylene Water Discharge Line-Polypropylene

*Tape Wrap is standard on RP3 Tube Bundles and is optional on others.

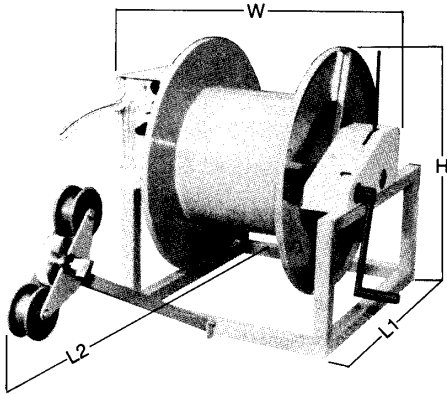
TUBE BUNDLES FOR DEDICATED SYSTEMS

DPT1	180,140,1400	500 feet	Air Supply Line-Polypropylene Air Exhaust Line-Polypropylene Water Discharge Tube-FEP TEFLON
DPT2	1800	500 feet	Air Supply Line-Polypropylene Air Exhaust Line-Polypropylene Water Discharge Tube-FEP TEFLON
DP1	180,140,1400	500 feet	Air Supply Line-Polypropylene Air Exhaust Line-Polypropylene Water Discharge Line-Polypropylene
DP2	1800	600 feet	Air Supply Line-Polypropylene Air Exhaust Line-Polypropylene Water Discharge Line-Polypropylene
DP3	1400,1800	600 to 1,000 feet	Air Supply Line-Polypropylene Air Exhaust Line-Polypropylene Water Discharge Line-Polypropylene

The Well Casing Caps slip over the outside of the casing and have a tube bundle retaining plug that suspends the tube bundle and pump in the well. The retaining plugs have collet type fittings that permit adjusting tubes to desired length. A stainless steel discharge elbow is supplied with each dedicated well system.

BENNETT TUBING BUNDLE REELS FOR PORTABLE OPERATION OF BENNETT SAMPLE PUMPS

CLASS 1 REEL

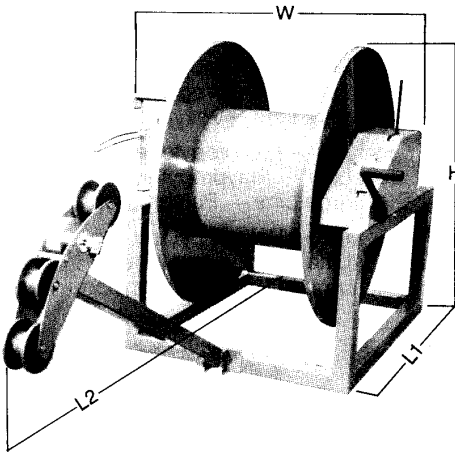


Reels are constructed of 1 1/2" square tubing for the frame and have a 16" reel drum diameter. This reel is recommended for use with the Series 1 Tube Bundle which is about 1 inch in diameter.

SPECIFICATIONS

Model	Cap. 1" Tubing Bundle	Drive System	L1-L2	W	H	WEIGHT
R1-15	150 ft.	Manual	26"-52"	23"	26"	80 lbs
R1-30	300 ft.	Manual	28"-56"	27"	28"	90 lbs
R1-40	400 ft.	Manual	30"-60"	29"	30"	105 lbs

CLASS 2 REEL



Reels are constructed of 2" square tubing for the frame and have a 18" reel drum diameter. This reel is recommended for use with the Series 2 Tube Bundle which is about 1 1/8 inches in diameter.

SPECIFICATIONS

Model	Cap. 1 1/8" Tubing	Drive System	L1-L2	W	H	Weight
R2PD-45	450 ft.	Elec. 1/2 hp. 120 V. AC	38"-75"	36"	38"	260 lbs.
R2PD-60	600 ft.	Elec. 1/2 hp. 120 V. AC	38"-75"	40"	38"	270 lbs.
R2PD-80	800 ft.	Elec. 3/4 hp. 120 V. AC	42"-83"	38"	42"	290 lbs.
R2PD-100	1000 ft.	Elec. 3/4 hp. 120 V. AC	42"-83"	42"	42"	300 lbs.

STANDARD EQUIPMENT

Manual Drive Reels have a sprocket and chain drive system with a hand brake and lock system.

Electric Power Drive models have a sprocket and chain drive system coupled to a right angle speed reducer with an electric brake placed between the speed reducer and the electric drive motor.

All reels have a fold-up guide roller head with measuring wheel and counter; rotary swivel on the axle for air and water transfer, with electrical slip rings for operating the water level indicator; instrument console contains the water level indicator, alarm and switch, pump flow meter and air pressure regulator for operating the pump.

The reels are constructed of carbon steel materials and are painted with an industrial lacquer paint.