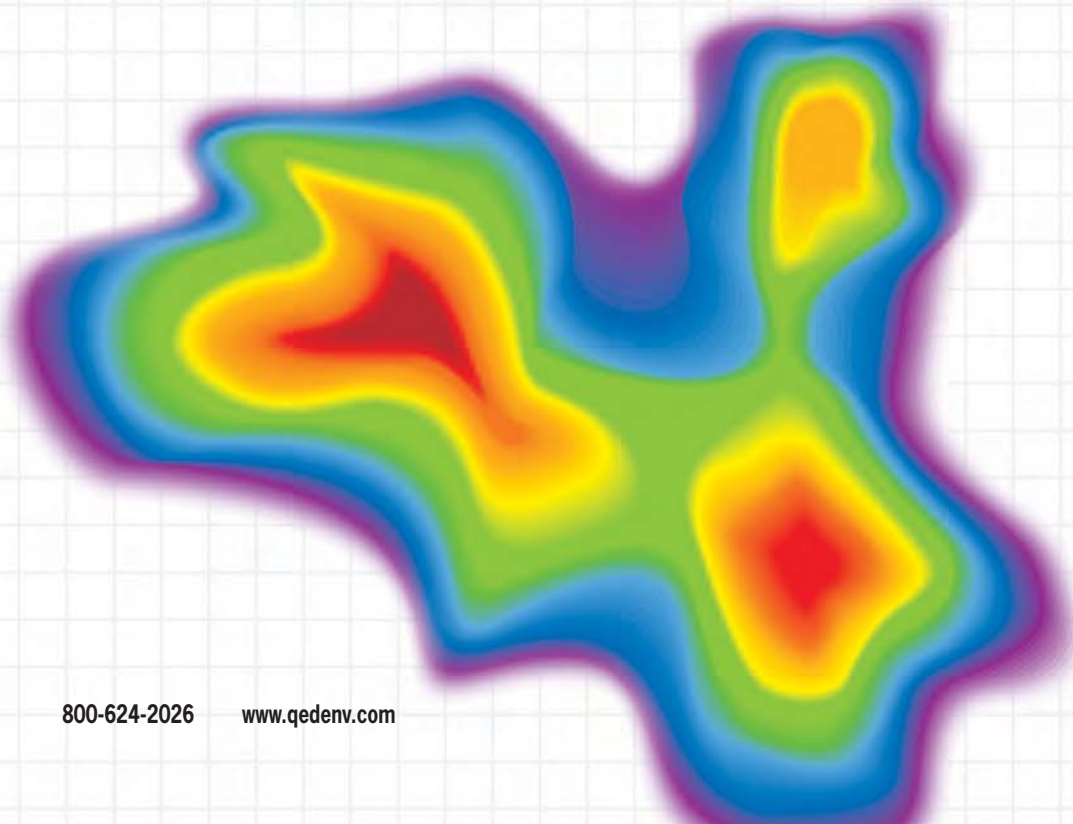




Free Product Recovery Equipment Catalog

*The Broadest Range of Equipment for Effective
Removal of Floating Hydrocarbons and DNAPL*



The QED Advantage



QED has been supplying the widest variety of equipment for free product and DNAPL recovery for over 25 years, using its site experience to develop and adapt high-performance products that are reliable and durable. Rather than just offering a single product technology, QED provides a range of solutions to let you match the needs of the site, ranging from active skimmers to in-well separators and passive skimmers, and from total fluids pumps to floating inlets for vacuum extraction systems. All of this equipment is backed by QED's experienced application specialists in the field and at the factory, and supported by an extremely responsive customer service team that is recognized as the industry leader. Proven equipment, expert help with its selection and installation, and support you can count on when you need it – *that's the QED advantage!*

Selecting Equipment for Contaminant Source Removal

LNAPL and DNAPL cleanup projects aren't all the same, so equipment to remove the contaminant source should be chosen to match project goals and site conditions. For example, fresh gasoline spills are far different than sites contaminated with weathered diesel fuel, and sites with several feet of floating hydrocarbons have different project goals than those with just a thin sheen. That's why QED offers the widest choice in source removal pumping technologies, rather than just a single equipment type.

Put Our Experience to Work for You – Now!

Need experienced guidance selecting the right equipment for your application?

Authorised distributor

In Australia:

For customer service, call 1300-735-292
To email an order, ordersau@thermofisher.com
To order online: thermofisher.com

In New Zealand:

For customer service, call 0800-933-966
To email an order, ordersnz@thermofisher.com
To order online: thermofisher.com

ThermoFisher
SCIENTIFIC

Equipment Selection Guidelines

Selecting the best equipment for LNAPL and DNAPL source reduction depends on matching it to the site conditions and project goals. The major factors to consider are:

What are the project goals and constraints? The starting point for equipment selection is the consideration of factors such as: the importance of pumping LNAPL or DNAPL only, and not water; the expected duration of the project and total volume of LNAPL or DNAPL to be removed; the availability of site labor for service; and the overall budget.

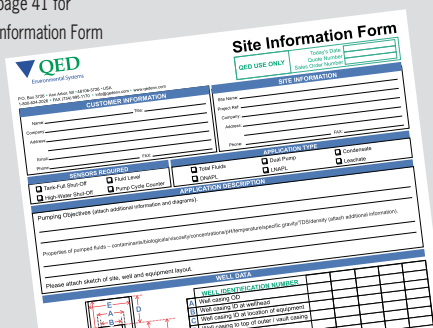
Does everything fit into the well? Equipment selection depends on well diameter, well depth, depth to water and its fluctuation, and LNAPL or DNAPL layer thickness.

What's being removed? The type of fuel or solvent, its viscosity, density, temperature, age of spill, and the presence of biological growth or debris affect equipment performance.

What LNAPL or DNAPL removal rate is needed? The hydraulic conductivity of the formation, the LNAPL or DNAPL recovery rate in the wells, and the pumping strategy determine the maximum LNAPL or DNAPL flow rate that will be required.

You can get prompt, expert assistance on equipment selection by calling QED to speak to an experienced applications specialist at **800-624-2026**.

See page 41 for Site Information Form

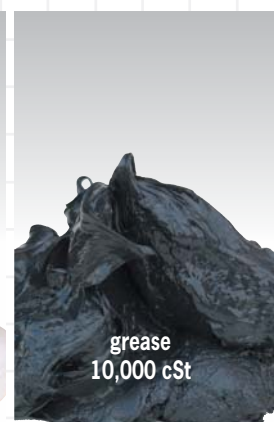
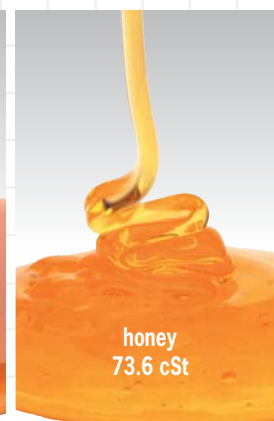
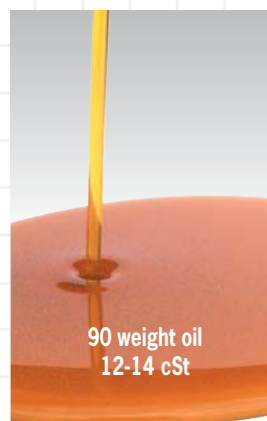
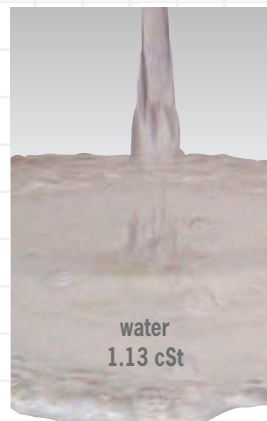


Free Product Recovery Equipment Application Overview

	SOS® AutoGenie™	SPG AutoGenie™	SOS® Programmable Genie®	SPG Programmable Genie®
Fresh gasoline	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Weathered diesel or fouled fuel conditions		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
LNAPL target layer thickness <2 in.	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
LNAPL target layer thickness >2 in.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Water table fluctuation <12 in.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Water table fluctuation >12 in.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Below-grade vault well termination needed	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Water exclusion extremely important				
System off-time control important			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Water column below floating layer <18 in.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
No contact of drive air with pumped liquid	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Representative Properties of Selected Fluids

Liquid	Specific Gravity	Viscosity
SAE 30W oil	.88-.94 g/cm ³ 60°F (15.6°C)	9.6-12.9 cSt 210°F (98.9°C)
SAE 85W oil	.88-.94 g/cm ³ 60°F (15.6°C)	11.0 cSt min 210 (98.9°C)
SAE 90W oil	.88-.94 g/cm ³ 60°F (15.6°C)	14.0-25 cSt min 210 (98.9°C)
Benzene	.899 g/cm ³ 32°F (0°C)	1.0 cSt 32°F (0°C)
	.885 g/cm ³ 60°F (15.6°C)	.744 cSt 68°F (20°C)
Corn Oil	.924 g/cm ³ 60°F (15.6°C)	28.7 cSt 130°F (54.4°C)
		8.6 cSt 212°F (100°C)
Creosote	1.04-1.10 g/cm ³ 60°F (15.6°C)	60°F (15.6°C)
		130°F (54.4°C)
Crude Oil 40	.825 g/cm ³ 60°F (15.6°C)	9.7 cSt 60°F (15.6°C)
Diesel fuel 2D	.82-.95 g/cm ³ 60°F (15.6°C)	2.0-6.0 cSt 100°F (37.8°C)
		1.0-3.97 cSt 130°F (54.4°C)
Diesel fuel 5D	.82-.95 g/cm ³ 60°F (15.6°C)	86.6 cSt max 122°F (50°C)
		35.2 cSt max 160°F (71.1°C)
Fuel Oil #2	.82-.95 g/cm ³ 60°F (15.6°C)	3.0-7.4 cSt 70°F (21.1°C)
		2.11-4.28 cSt 100°F (37.8°C)
Fuel Oil #3	.82-.95 g/cm ³ 60°F (15.6°C)	2.69-5.84 cSt 70°F (21.1°C)
		2.06-3.97 cSt 100°F (37.8°C)
Fuel Oil #6	.82-.95 g/cm ³ 60°F (15.6°C)	97.4-660 cSt 122°F (50°C)
		37.5-172 cSt 160°F (71.1°C)
Gasoline	.72 g/cm ³ 60°F (15.6°C)	.64 cSt 60°F (15.6°C)
Honey		73.6 cSt 100°F (37.8°C)
Cutting Oil		40.0-46 cSt 100°F (37.8°C)
		23.0-26 cSt 130°F (54.4°C)
Kerosene	.78-.82 g/cm ³ 60°F (15.6°C)	2.71 cSt 68°F (20°C)
Jet Fuel	.82 g/cm ³ 60°F (15.6°C)	7.9 cSt -30°F (-34.4°C)
Molasses	1.40-1.46 g/cm ³ 60°F (15.6°C)	281-5070 cSt 100°F (37.8°C)
Naphthalene	1.145 g/cm ³ 68°F (20°C)	.9 cSt 176°F (80°C)
Olive Oil	.91-.92 g/cm ³ 60°F (15.6°C)	43.2 cSt 100°F (37.8°C)
		24.1 cSt 130°F (54.4°C)
Pine Tar	1.06 g/cm ³ 60°F (15.6°C)	559 cSt 100°F (37.8°C)
Turpentine	.86-.87 g/cm ³ 60°F (15.6°C)	86.6-95.2 cSt 100°F (37.8°C)
Fresh Water	1.0 g/cm ³ 60°F (15.6°C)	1.13 cSt 60°F (15.6°C)
		.55 cSt 130°F (54.4°C)
Whale Oil	.925 g/cm ³ 60°F (15.6°C)	35.0-39.6 cSt 100°F (37.8°C)
		19.9-23.4 cSt 130°F (54.4°C)



Based on material from the Hydraulic Institute with additions by Ingersoll-Rand cSt = Centistokes



Characterize Your Specific Site

The QED Test Kit enables you to measure the density and viscosity of your actual floating hydrocarbon layer. This FREE, do-it-yourself kit comes complete with simple, illustrated instructions. Once you have recorded the results of your hydrocarbon test, QED application specialists will be able to provide expert technical assistance in system design and specification.

Free Product Recovery (LNAPL)

AutoGenie™ and Programmable Genie®

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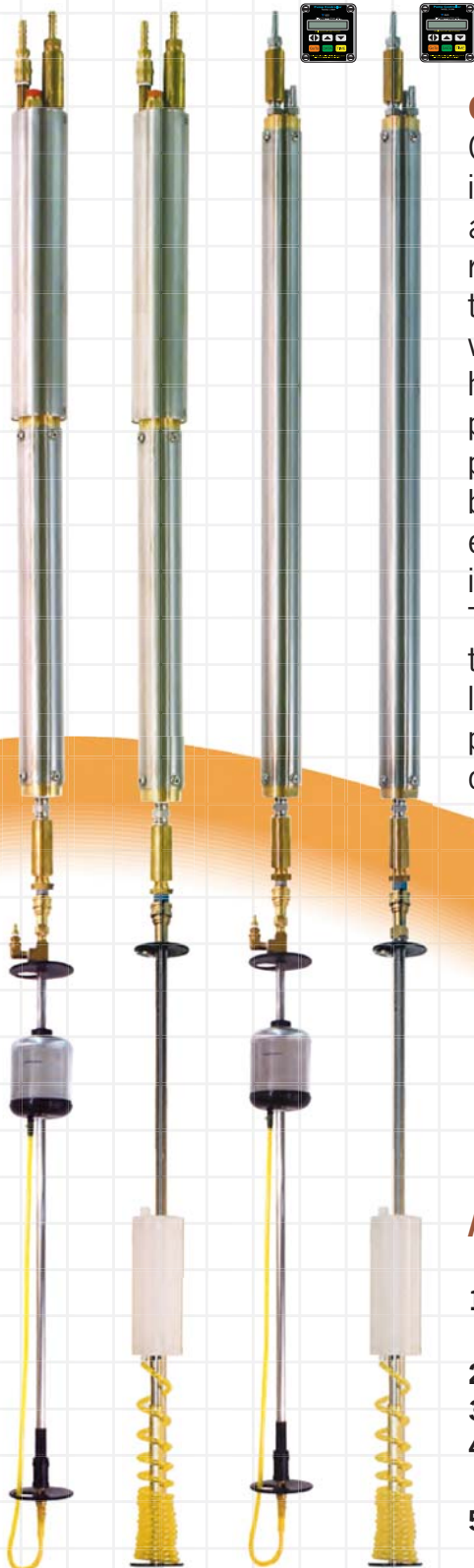
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Genie® Skimmers



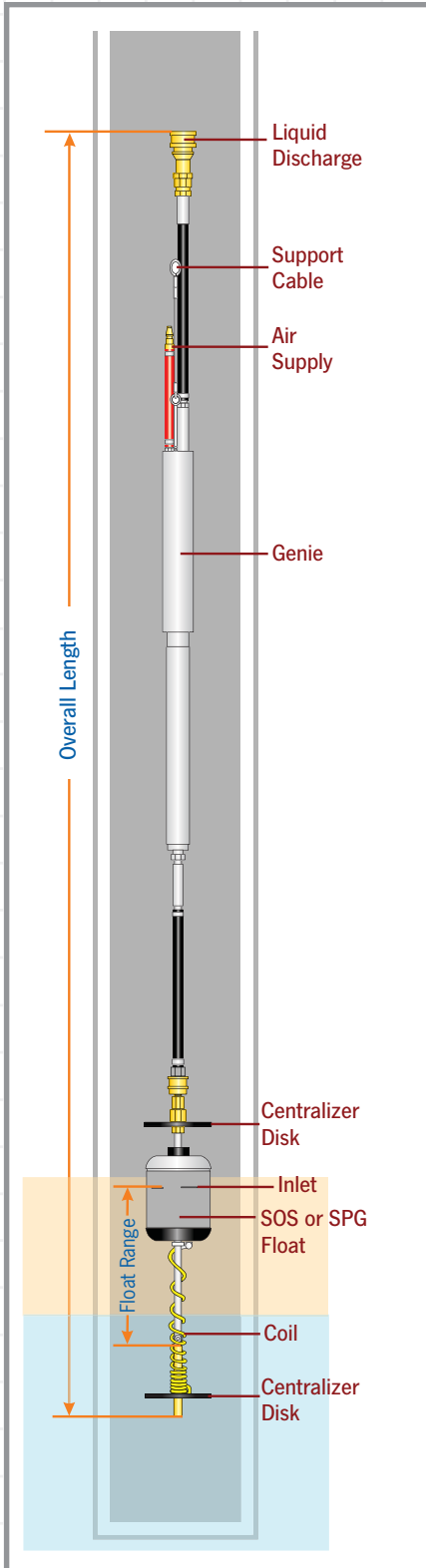
Overview

Genie® skimmers are safe, reliable and complete systems for removing floating LNAPL layers from wells. The SPG and SOS® AutoGenie™ and Programmable Genie® skimmers are air-operated selective LNAPL removal systems with a high suction pump and a floating inlet designed to follow the LNAPL layer as the ground water level fluctuates. The SPG version uses a specific gravity float and the SOS version uses a hydrophobic screen to avoid taking in water. All Genie skimmer systems pump the LNAPL using a special bladder pump with high suction capability, positioned above the floating inlet section of the system. The use of a bladder pump eliminates air contact with the LNAPL fluids, minimizing emulsification and eliminating VOC emissions. The AutoGenie uses an integral pneumatic timer to control the pump fill and discharge times. The Programmable Genie uses an electronic controller mounted outside the well to allow adjustment of pump cycles and off times. A complete line of matched accessories is available to help with installation and performance, including in-well tubing and hose, well caps, LNAPL collection tank full shutoffs and other items.

Advantages

- 1 Specialized bladder pump is extremely durable, provides high suction to maintain flow and eliminates contact of drive air with pumped fluid.
2. Choice of two types of selective floating inlets.
3. Choice of Continuous Automatic or Programmable cycling.
4. Available in several different lengths and diameters to accommodate specific well conditions.
5. Low air consumption.

SOS Inlet SPG Inlet SOS Inlet SPG Inlet
└── AutoGenies ──┬── Programmable Genies ──┘



Model Overview Chart

Maximum LNAPL Recovery Rate*	Float Travel Ranges	Overall Lengths	Maximum LNAPL Viscosity	Surface Control Required
AutoGenie SPG2 - 2 in. wells				
160 gpd (605 Lpd)	15 in., 24 in., 45 in., (38 cm, 61 cm, 114 cm)	95 in. to 130 in. (241 cm to 330 cm)	1000 centistokes	No
320 gpd (1,211 Lpd)	15 in., 24 in., 45 in., (38 cm, 61 cm, 114 cm)	118 in. to 153 in. (300 cm to 389 cm)	1000 centistokes	No
AutoGenie SPG4 - 4 in. wells				
160 gpd (605 Lpd)	24 in., 45 in., 60 in., (61 cm, 114 cm, 152 cm)	109 in. to 145 in. (277 cm to 368 cm)	1000 centistokes	No
320 gpd (1,211 Lpd)	24 in., 45 in., 60 in., (61 cm, 114 cm, 152 cm)	133 in. to 169 in. (338 cm to 429 cm)	1000 centistokes	No
AutoGenie SOS4 - 4 in. wells				
160 gpd (605 Lpd)	12 in., 24 in., 48 in., (30 cm, 61 cm, 122 cm)	90 in. to 129 in. (229 cm to 328 cm)	200 centistokes	No
320 gpd (1,211 Lpd)	12 in., 24 in., 48 in., (30 cm, 61 cm, 122 cm)	115 in. to 153 in. (292 cm to 389 cm)	200 centistokes	No
Programmable Genie SPG2 - 2 in. wells				
160 gpd (605 Lpd)	15 in., 24 in., 45 in., (38 cm, 61 cm, 114 cm)	84 in. to 119 in. (213 cm to 302 cm)	1000 centistokes	Yes
320 gpd (1,211 Lpd)	15 in., 24 in., 45 in., (38 cm, 61 cm, 114 cm)	108 in. to 144 in. (274 cm to 366 cm)	1000 centistokes	Yes
Programmable Genie SPG4 - 4 in. wells				
160 gpd (605 Lpd)	24 in., 45 in., 60 in., (61 cm, 114 cm, 152 cm)	99 in. to 136 in. (251 cm to 345 cm)	1000 centistokes	Yes
320 gpd (1,211 Lpd)	24 in., 45 in., 60 in., (61 cm, 114 cm, 152 cm)	123 in. to 160 in. (312 cm to 406 cm)	1000 centistokes	Yes
Programmable Genie SOS4 - 4 in. wells				
160 gpd (605 Lpd)	12 in., 24 in., 48 in., (30 cm, 61 cm, 122 cm)	80 in. to 119 in. (203 cm to 302 cm)	200 centistokes	Yes
320 gpd (1,211 Lpd)	12 in., 24 in., 48 in., (30 cm, 61 cm, 122 cm)	105 in. to 143 in. (267 cm to 363 cm)	200 centistokes	Yes

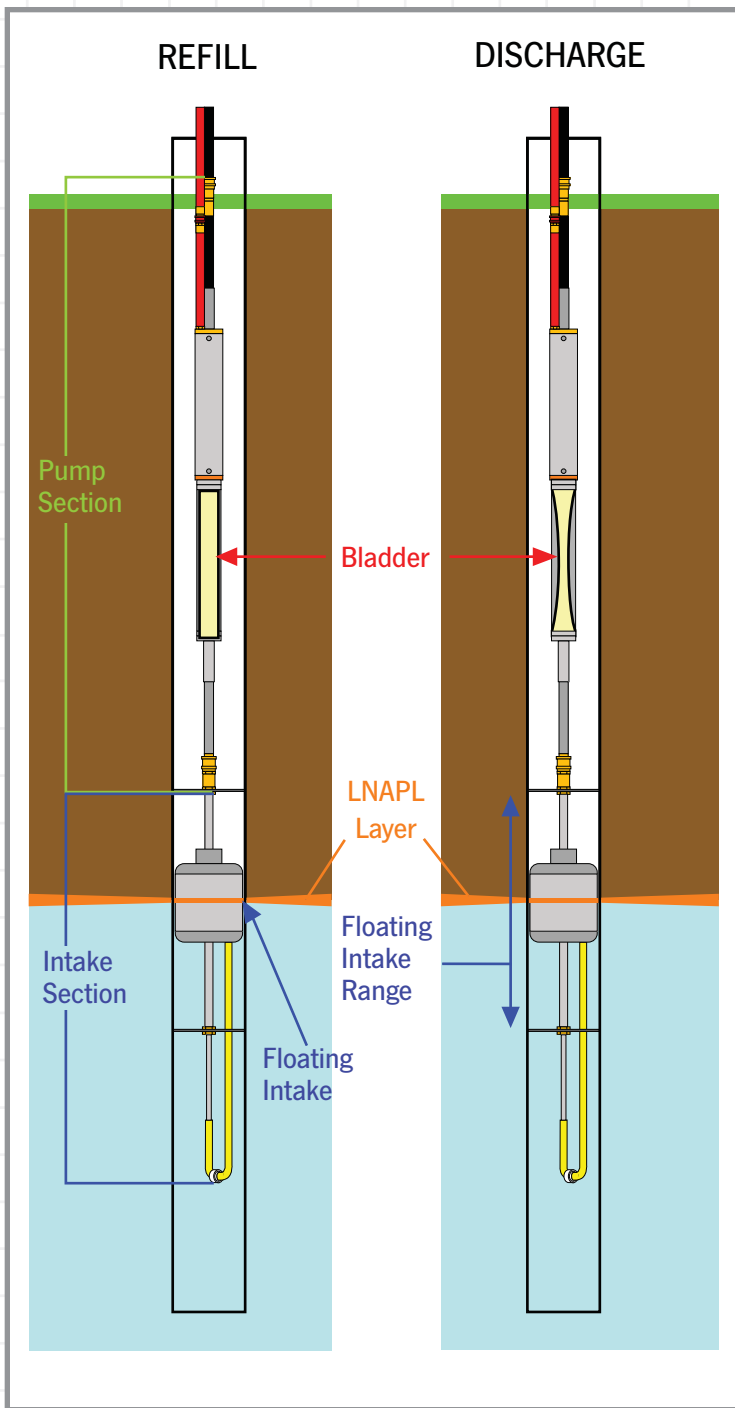
* gpd = gallons per day, Lpd = liters per day



Characterize Your Specific Site

The QED Test Kit enables you to measure the density and viscosity of your actual floating hydrocarbon layer. This FREE, do-it-yourself kit comes complete with simple, illustrated instructions. Once you have recorded the results of your hydrocarbon test, QED application specialists will be able to provide expert technical assistance in system design and specification.

AutoGenie™ and Programmable Genie®



How It Works

All Genie® Systems

The free product enters the skimmer system through the floating inlet, flows down through a flexible tube, then is pulled upward by the pump's suction action during the fill cycle.

During the discharge cycle, the bladder is squeezed by the compressed air and the LNAPL is pumped to the collection system at the ground surface. Then, during the fill cycle the compressed air around the bladder is exhausted again and the specialized, high-rebound bladder expands, resuming its original shape. This pulls fluid into the bladder through the check valve at the bottom of the pump.

C100M Pump Controller

The C100M Digital Controller offers easy and flexible control of skimmer system operation in a compact, solar and AC-powered unit. Touch-pad control and digital display simplify its programming. Programmable Genies® utilize the C100M Controller which allows the user to not only control the pump fill/discharge cycles, but also to set OFF periods to match the LNAPL pumping rates to the recovery rates of the well. The C100M includes an AC power supply for locations where solar power is either not available or insufficient to support high rate pump operation. In solar-powered mode, the C100M is rated intrinsically safe. See page 40 or consult the factory for more detailed information on the C100M.

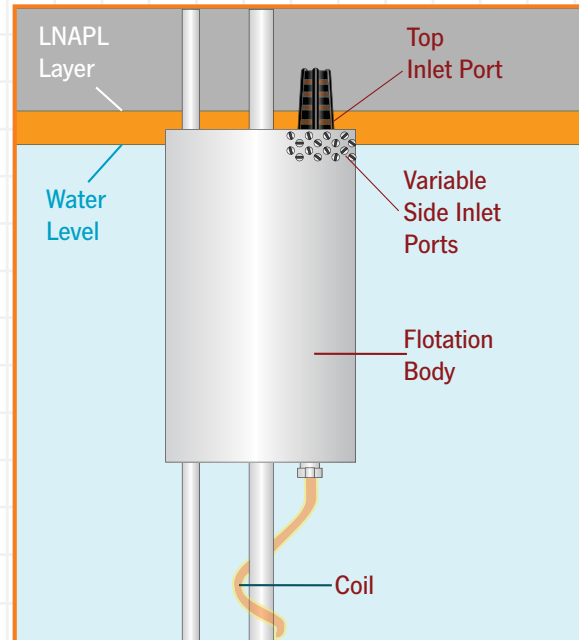


SPG Inlet

The SPG (specific gravity) inlet uses a float with a controlled specific gravity that causes it to float on water but not in the free product. The SPG float has its fluid top inlet port positioned near the top so that it is always above water. If the LNAPL layer gets too thin, the SPG inlet will also be above the LNAPL layer and cease recovery of hydrocarbons until more enters the well. To accommodate a range of final LNAPL layer thickness, the SPG float has multiple, variable inlet ports that can be opened or plugged in the field to adjust the effective level of the inlet port.

Note: The SPG inlet is designed to recover thin, as well as thicker, more viscous hydrocarbons.

SPG Float

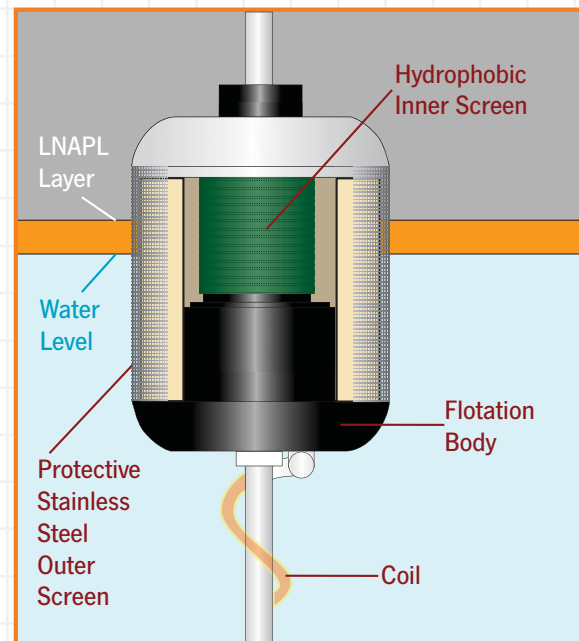


SOS® Inlet

The SOS (selective oil skimmer) inlet uses a float with an inlet port inside a hydrophobic screen. The hydrophobic screen avoids taking in water, even if the float occasionally sticks or drags as the liquid level fluctuates. While this is a distinct advantage of the SOS inlet over the SPG type, the SOS inlet screen is more subject to plugging due to potential debris or “biogrowth” present in the well. The SOS inlet is best used for less viscous hydrocarbons, as shown in the specification charts.

Note: The SOS inlet is designed to recover thin, less viscous hydrocarbons.

SOS Float



2" SPG2 AutoGenie™



2" SPG2 AutoGenie™ Skimmer

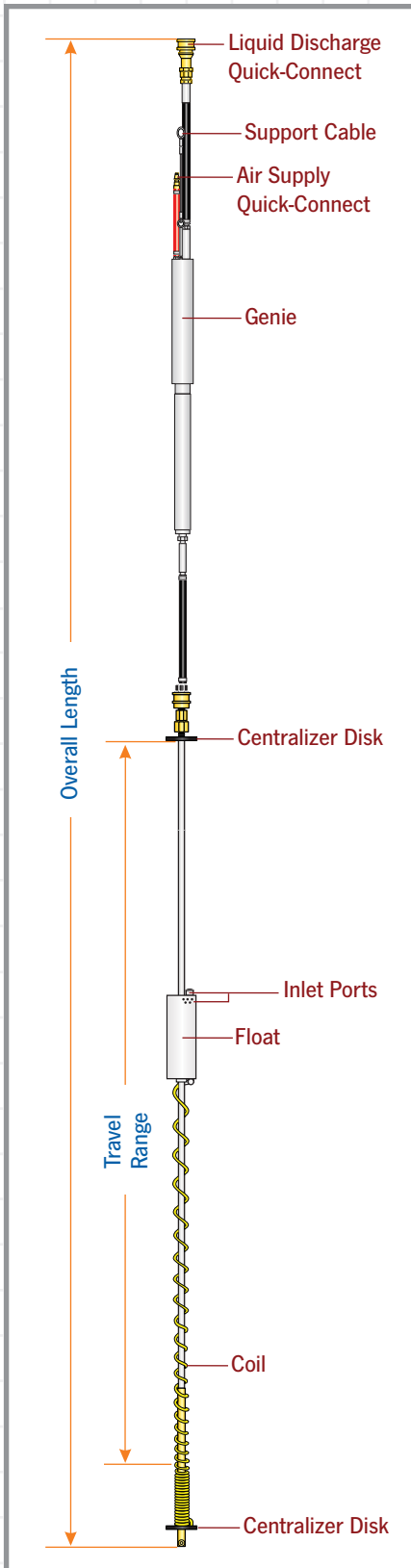
The 2" SPG2 AutoGenie™ is a safe, reliable and complete system designed to remove free product from 2" or larger wells. The 2" SPG2 AutoGenie system consists of an air-powered pumping unit with a floating inlet that tracks changes in the water level. The SPG float uses specific gravity to avoid water intake, and includes multiple inlet hole positions to allow fine-tuning of the inlet level as the floating layer thickness is reduced. The special Genie bladder pump with high suction capacity delivers proven reliability and durability. The AutoGenie uses an integral pneumatic timer to control the bladder pump fill and discharge times. A complete line of accessories is available, including in-well tubing, well caps, LNAPL collection tank full shutoffs, and other items.

Warranty

SPG2 AutoGenies are warranted for one (1) year.

Advantages

1. Specialized bladder pump is extremely durable, provides high suction to maintain flow, and eliminates contact of drive air with pumped fluid.
2. Continuous, automatic operation that is 100% air powered.
3. Available in a range of flow rates and float travel ranges to best fit site needs.
4. Low air consumption.



The 2" SPG2 AutoGenie™ is available in 6 different models with varying inlet float travel ranges and pumping rates. Why so many options? QED has found that each free product site and well can have its own challenges in terms of well depth, liquid column depth, water level fluctuation and desired LNAPL pumping rate. For example, the model with the longest pump and float travel range may be too long for some wells. Check the dimensions and flow rates below, or just call QED's application specialists to help select the best match for your project.

Specifications

AutoGenie Model	Maximum LNAPL Recovery Rate*	Float Travel Range	Overall Length	Minimum Liquid Column
AG2415 SPG2	160 gpd (605 Lpd)	15 in. (38 cm)	95 in. (241 cm)	6 in. (15 cm)
AG2424 SPG2	160 gpd (605 Lpd)	24 in. (61 cm)	105 in. (267 cm)	12 in. (30 cm)
AG2445 SPG2	160 gpd (605 Lpd)	45 in. (114 cm)	130 in. (330 cm)	15 in. (38 cm)
AG4815 SPG2	320 gpd (1,211 Lpd)	15 in. (38 cm)	118 in. (300 cm)	6 in. (15 cm)
AG4824 SPG2	320 gpd (1,211 Lpd)	24 in. (61 cm)	129 in. (328 cm)	12 in. (30 cm)
AG4845 SPG2	320 gpd (1,211 Lpd)	45 in. (114 cm)	153 in. (389 cm)	15 in. (38 cm)

Minimum Well ID	2 in. (5 cm)
Maximum OD	1.92 in. (4.88 cm)
Maximum Depth	150 ft. (45.7 m)
Air Supply Pressure (min/max)	40/100 psi (2.7/6.9 bar)
LNAPL Fluid Density	< .85 SG
Kinematic Viscosity	1-1000 centistokes
Recommended Initial LNAPL Layer	> 3 in. (> 7.6 cm)
Residual LNAPL Layer	≥ 0.25 in. (.64 cm)
Suitable Types of LNAPL	Gasoline, diesel, jet fuels, kerosene, #2 - #5 fuel oils, light weight motor oil and hydraulic fluid
Materials	Brass, Tygon®, stainless steel, Viton®, Teflon®
Fitting Type	Quick-connect
Hose or Tubing	Both are available

Tygon is a registered trademark of Saint Gobain - Norton. Viton is registered trademark of DuPont Dow Elastomers.

Teflon is a registered trademark of Dupont.

* gpd = gallons per day, Lpd = liters per day

4" SPG4 AutoGenie™

4" SPG4 AutoGenie™ Skimmers

The 4" SPG4 AutoGenie™ is a safe, reliable and complete system for removing free product layers from wells. The 4" SPG4 AutoGenie system consists of an air-powered pumping unit with a floating inlet that tracks changes in the water level. The SPG float uses specific gravity to avoid water intake and includes multiple inlet hole positions to allow fine-tuning of the inlet level as the floating layer thickness is reduced. The special Genie bladder pump with high suction capacity delivers proven reliability and durability. The AutoGenie uses an integral pneumatic timer to control the bladder pump fill and discharge times. A complete line of matched accessories is available to help installation and performance, including in-well tubing, well caps, LNAPL collection tank full shutoffs and other items.

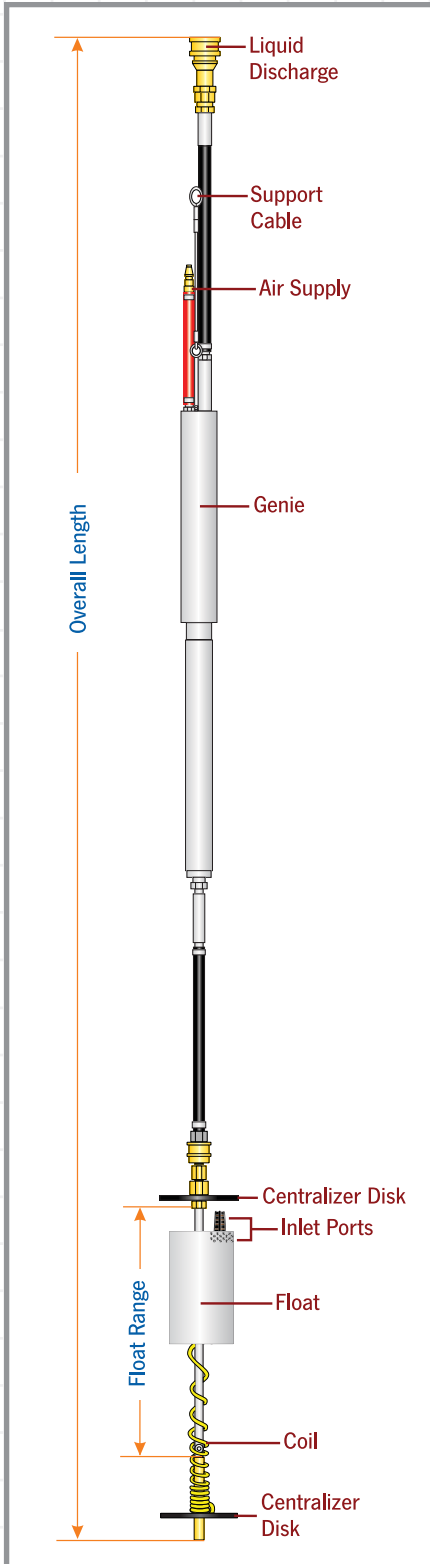
Warranty

SPG4 AutoGenies are warranted for one (1) year.

Advantages

1. Specialized bladder pump is extremely durable, provides high suction to maintain flow, and eliminate contact of drive air with pumped fluid.
2. Continuous, automatic operation that is 100% air powered.
3. Available in a range of flow rates and float travel ranges.
4. Low air consumption.





The 4" SPG4 AutoGenie™ is available in 8 different models with varying inlet float travel ranges and pumping rates. Why so many options? QED has found that each free product site and well can have its own challenges in terms of well depth, liquid column depth, water level fluctuation and desired LNAPL pumping rate. For example, the model with the longest pump and float travel range may be too long for some wells. Check the dimensions and flow rates below, or just call QED to help select the best match for your project.

Specifications

AutoGenie Model	Maximum LNAPL Recovery Rate*	Float Travel Range	Overall Length	Minimum Liquid Column
AG2424L SPG4	160 gpd (605 Lpd)	24 in. (61 cm)	124 in. (315 cm)	31 in. (79 cm)
AG2424C SPG4	160 gpd (605 Lpd)	24 in. (61 cm)	109 in. (277 cm)	15 in. (38 cm)
AG2445 SPG4	160 gpd (605 Lpd)	45 in. (114 cm)	129 in. (329 cm)	15 in. (38 cm)
AG2460 SPG4	160 gpd (605 Lpd)	60 in. (152 cm)	145 in. (368 cm)	16 in. (41 cm)
AG4824L SPG4	320 gpd (1,211 Lpd)	24 in. (61 cm)	148 in. (376 cm)	31 in. (79 cm)
AG4824C SPG4	320 gpd (1,211 Lpd)	24 in. (61 cm)	133 in. (338 cm)	15 in. (38 cm)
AG4845 SPG4	320 gpd (1,211 Lpd)	45 in. (114 cm)	153 in. (389 cm)	15 in. (38 cm)
AG4860 SPG4	320 gpd (1,211 Lpd)	60 in. (152 cm)	169 in. (429 cm)	16 in. (41 cm)

Minimum Well ID	4 in. (10 cm)
Maximum OD	3.79 in. (9.63 cm)
Maximum Depth	150 ft. (45.7 m)
Air Supply Pressure (min/max)	40/100 psi (2.7/6.9 bar)
LNAPL Fluid Density	< .85 SG
Kinematic Viscosity	1-1000 centistokes
Recommended Initial LNAPL Layer	> 3 in. (> 7.6 cm)
Residual LNAPL Layer	≥ 0.25 in. (.64 cm)
Suitable Types of LNAPL	Gasoline, diesel, jet fuels, kerosene, #2 - #5 fuel oils, light weight motor oil and hydraulic fluid
Materials	Brass, Tygon®, stainless steel, Viton®, Teflon®
Fitting Type	Quick-connect
Hose or Tubing	Both are available

Tygon is a registered trademark of Saint Gobain - Norton. Viton is registered trademark of DuPont Dow Elastomers.

Teflon is a registered trademark of Dupont.

* gpd = gallons per day, Lpd = liters per day

4" SOS[®]4 AutoGenie[™]

4" SOS[®]4 AutoGenie[™] Skimmers

The 4" SOS[®]4 AutoGenie[™] is a safe, reliable and complete system for removing free product layers from wells. The 4" SOS4 AutoGenie system consists of an air-powered pumping unit with a floating inlet that tracks changes in the water level. The SOS inlet uses a hydrophobic screen to avoid taking in water. The special Genie bladder pump with high suction capacity delivers proven reliability and durability. The AutoGenie uses an integral pneumatic timer to control the bladder pump fill and discharge times. A complete line of matched accessories is available to help installation and performance, including in-well tubing, well caps, LNAPL collection tank full shutoffs and other items.

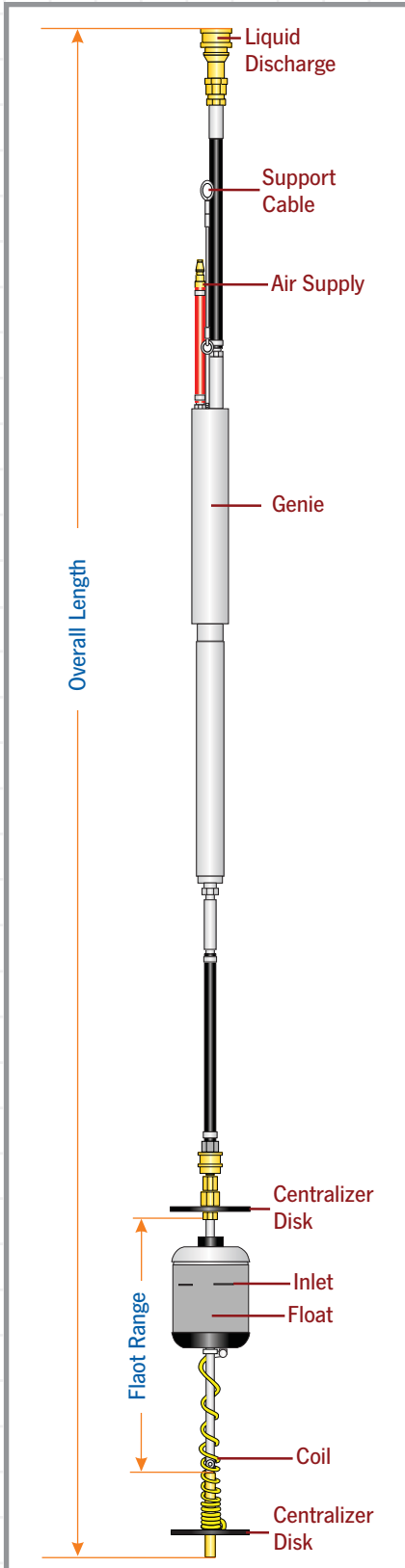
Warranty

SOS4 AutoGenies are warranted for one (1) year.

Advantages

1. Specialized bladder pump is extremely durable, provides high suction to maintain flow, and eliminates contact of drive air with pumped fluid.
2. Continuous, automatic operation that is 100% air powered.
3. Available in a range of flow rates and float travel ranges.
4. Low air consumption.





The 4" SOS[®]4 AutoGenie™ is available in 8 different models with varying inlet float travel ranges and pumping rates. Why so many options? QED has found that each free product recovery site and well can have its own challenges in terms of well depth, liquid column depth, water level fluctuation and desired LNAPL pumping rate. For example, the model with the longest pump and float travel range may be too long for some wells. Check the dimensions and flow rates below, or just call QED to help select the best match for your project.

Specifications

AutoGenie Model	Maximum LNAPL Recovery Rate*	Float Travel Range	Overall Length	Minimum Liquid Column
AG2412 SOS4	160 gpd (605 Lpd)	12 in. (30 cm)	90 in. (229 cm)	5 in. (13 cm)
AG2424L SOS4	160 gpd (605 Lpd)	24 in. (61 cm)	125 in. (318 cm)	29 in. (74 cm)
AG2424C SOS4	160 gpd (605 Lpd)	24 in. (61 cm)	108 in. (274 cm)	11 in. (28 cm)
AG2448 SOS4	160 gpd (605 Lpd)	48 in. (122 cm)	129 in. (328 cm)	11 in. (28 cm)
AG4812 SOS4	320 gpd (1,211 Lpd)	12 in. (30 cm)	115 in. (292 cm)	5 in. (13 cm)
AG4824L SOS4	320 gpd (1,211 Lpd)	24 in. (61 cm)	149 in. (378 cm)	29 in. (74 cm)
AG4824C SOS4	320 gpd (1,211 Lpd)	24 in. (61 cm)	132 in. (335 cm)	11 in. (28 cm)
AG4848 SOS4	320 gpd (1,211 Lpd)	48 in. (122 cm)	153 in. (389 cm)	11 in. (28 cm)

Minimum Well ID	4 in. (10 cm)
Maximum OD	3.79 in. (9.63 cm)
Maximum Depth	150 ft. (45.7 m)
Air Supply Pressure (min/max)	40/100 psi (2.7/6.9 bar)
LNAPL Fluid Density	< 1.0 SG
Kinematic Viscosity	1-200 centistokes
Recommended Initial LNAPL Layer	> 3 in. (> 7.6 cm)
Residual LNAPL Layer	Sheen
Suitable Types of LNAPL	Gasoline, fresh diesel fuel, jet fuels, kerosene, light fuel oils
Materials	Brass, Tygon [®] , stainless steel, Viton [®] , Teflon [®]
Fitting Type	Quick-connect
Hose or Tubing	Both are available

Tygon is a registered trademark of Saint Gobain - Norton. Viton is registered trademark of DuPont Dow Elastomers.

Teflon is a registered trademark of Dupont.

* gpd = gallons per day, Lpd = liters per day

2" SPG2 Programmable Genie®

C100M
Controller



2" SPG Programmable Genie® Skimmer

The 2" SPG2 Programmable Genie® is a safe, reliable and complete system for removing free product from wells. The 2" SPG2 Programmable Genie system consists of an air-powered pumping unit with a floating inlet that tracks the changes in the water level. The SPG float uses specific gravity to avoid water intake and includes multiple inlet hole positions to allow fine-tuning of the inlet level as the floating layer thickness is reduced. The special Genie bladder pump with high suction capacity delivers proven reliability and durability. The 2" SPG2 Programmable Genie utilizes the C100M Controller which allows the user to not only control the pump fill/discharge cycles, but also to set OFF periods to match the LNAPL pumping rate to the LNAPL recovery rate of the well. A complete line of matched accessories is available to help installation and performance, including in-well tubing, well caps, on/off timers, LNAPL collection tank-full shutoffs and other items. The 2" SPG2 Programmable Genie is available in 6 different models with varying inlet float travel ranges and pumping rates. Why so many options? QED has found that each LNAPL site well can have its own challenges in terms of well depth, water level fluctuation and desired LNAPL pumping rate. For example, the model with the longest pump and float travel range may be too long for some wells. Check the dimensions and flow rates below, or just call QED to help select the best match for your project.

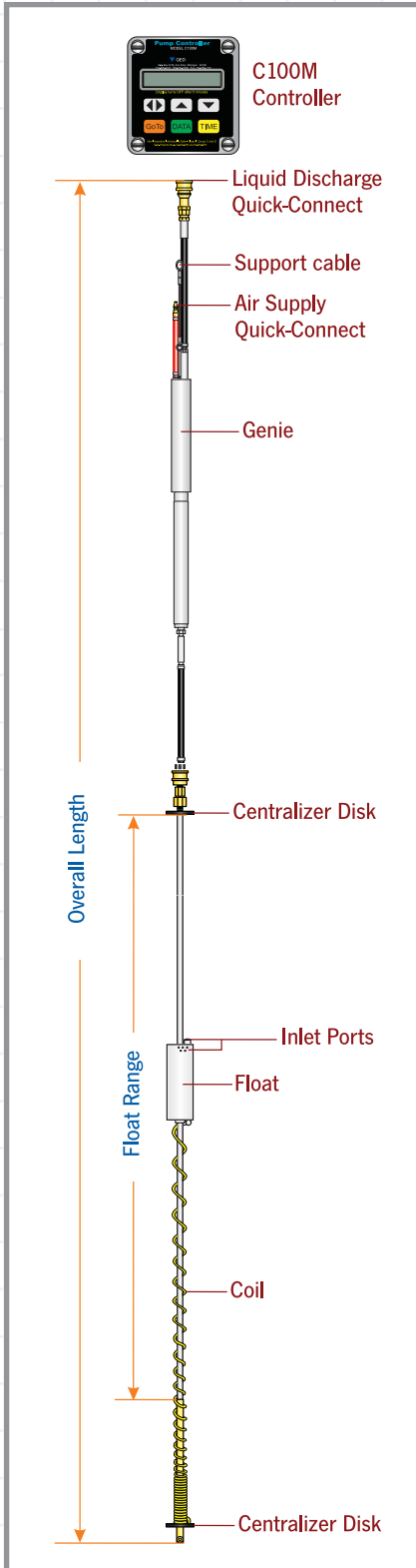
Warranty

SPG2 Programmable Genies are warranted for one (1) year.

Advantages

1. Specialized bladder pump is extremely durable, provides high suction to maintain flow, and eliminates contact of drive air with pumped fluid.
2. Easy-to-use digital control of pump discharge and refill cycles.
3. Available in a range of flow rates and float travel ranges.
4. Low air consumption.

2" SPG2 Programmable Genie®



Specifications

Programmable Genie Model	Maximum LNAPL Recovery Rate*	Float Travel Range	Overall Length	Minimum Liquid Column
PG2415 SPG2	160 gpd (605 Lpd)	15 in. (38 cm)	84 in. (213 cm)	6 in. (15 cm)
PG2424 SPG2	160 gpd (605 Lpd)	24 in. (61 cm)	95 in. (241 cm)	12 in. (30 cm)
AG2445 SPG2	160 gpd (605 Lpd)	45 in. (114 cm)	119 in. (302 cm)	15 in. (38 cm)
AG4815 SPG2	320 gpd (1,211 Lpd)	15 in. (38 cm)	108 in. (274 cm)	6 in. (15 cm)
AG4824 SPG2	320 gpd (1,211 Lpd)	24 in. (61 cm)	120 in. (305 cm)	12 in. (30 cm)
AG4845 SPG2	320 gpd (1,211 Lpd)	45 in. (114 cm)	144 in. (366 cm)	15 in. (38 cm)

Minimum Well ID	2 in. (5 cm)
Maximum OD	1.92 in. (4.88 cm)
Maximum Depth	150 ft. (45.7 m)
Air Supply Pressure (min/max)	40/100 psi (2.7/6.9 bar)
LNAPL Fluid Density	< .85 SG
Kinematic Viscosity	1-1000 centistokes
Recommended Initial LNAPL Layer	> 3 in. (> 7.6 cm)
Residual LNAPL Layer	≥ 0.25 in. (.64 cm)
Suitable Types of LNAPL	Gasoline, diesel, jet fuels, kerosene, #2 - #5 fuel oils, light weight motor oil and hydraulic fluid
Materials	Brass, Tygon®, stainless steel, Viton®, Teflon®
Fitting Type	Quick-connect
Hose or Tubing	Both are available

Tygon is a registered trademark of Saint Gobain - Norton. Viton is registered trademark of DuPont Dow Elastomers.

Teflon is a registered trademark of Dupont.

* gpd = gallons per day, Lpd = liters per day

C100M Pump Controller

The C100M Digital Controller is solar-powered and provides advanced operational capabilities at an economical price. Easy-to-use digital control of pump discharge and refill cycles and programmed OFF times make it convenient to optimize LNAPL recovery to match site conditions.



Tank full shutoff for the collection tank is a safe, simple and inexpensive add-on to the C100M, as an optional level control function. The C100M includes both a highly effective solar power system and a conventional AC power supply. Under solar-powered operation, the C100M is CSA rated as intrinsically safe.

4" SPG4 Programmable Genie®

C100M
Controller



4" SPG Programmable Genie® Skimmer

The 4" SPG4 Programmable Genie® is a safe, reliable and complete system for removing free product from wells. The 4" SPG4 Programmable Genie system consists of an air-powered pumping unit with a floating inlet that tracks changes in the water level. The SPG float uses specific gravity to avoid water intake, and includes multiple inlet hole positions to allow fine-tuning of the inlet level as the floating layer thickness is reduced. The special Genie bladder pump with high suction capacity delivers proven reliability and durability. The 4" SPG4 utilizes the C100M Controller which allows the user to not only control the pump fill/discharge cycles but also to set OFF periods to match the LNAPL pumping rate to the LNAPL recovery rate of the well. A complete line of matched accessories is available to help installation and performance, including in-well tubing, well caps, LNAPL collection tank full shutoffs and other items.

Warranty

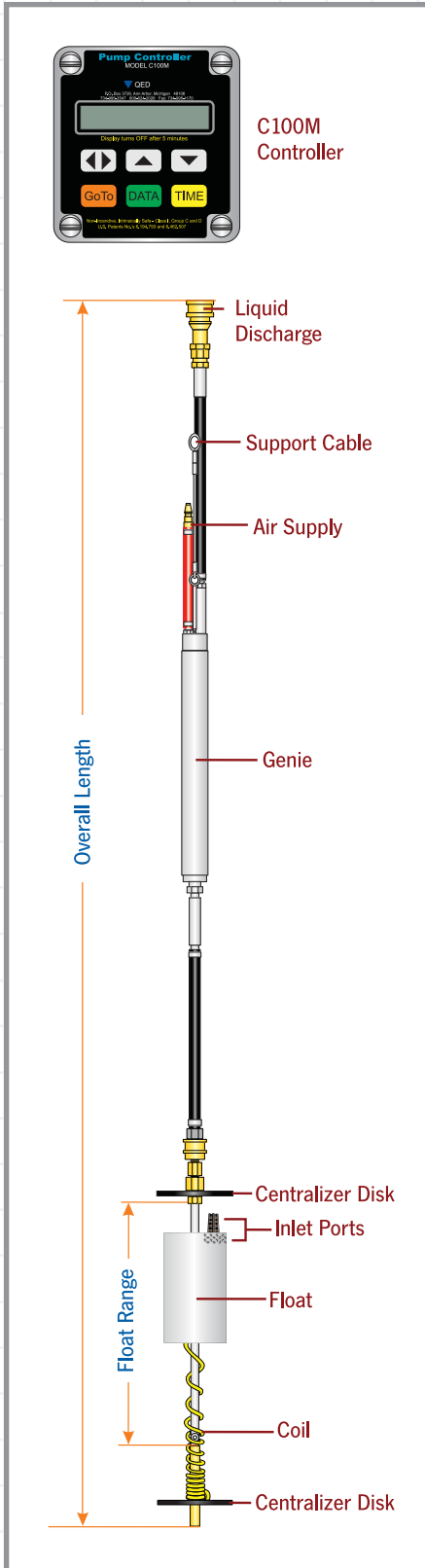
SPG4 Programmable Genies are warranted for one (1) year.

Advantages

1. Specialized bladder pump is extremely durable, provides high suction to maintain flow, and eliminates contact of drive air with pumped fluid.
2. Easy-to-use digital control of pump discharge and refill cycles.
3. Available in a range of flow rates and float travel ranges.
4. Low air consumption.



4" SPG4 Programmable Genie®



Specifications

Programmable Genie Model	Maximum LNAPL Recovery Rate*	Float Travel Range	Overall Length	Minimum Liquid Column
PG2424L SPG4	160 gpd (605 Lpd)	24 in. (61 cm)	114 in. (290 cm)	31 in. (79 cm)
PG2424C SPG4	160 gpd (605 Lpd)	24 in. (61 cm)	99 in. (251 cm)	15 in. (38 cm)
PG2445 SPG4	160 gpd (605 Lpd)	45 in. (114 cm)	119 in. (302 cm)	15 in. (38 cm)
PG2460 SPG4	160 gpd (605 Lpd)	60 in. (152 cm)	136 in. (345 cm)	16 in. (41 cm)
PG4824L SPG4	320 gpd (1,211 Lpd)	24 in. (61 cm)	139 in. (353 cm)	31 in. (79 cm)
PG4824C SPG4	320 gpd (1,211 Lpd)	24 in. (61 cm)	123 in. (312 cm)	15 in. (38 cm)
PG4845 SPG4	320 gpd (1,211 Lpd)	45 in. (114 cm)	143 in. (363 cm)	15 in. (38 cm)
PG4860 SPG4	320 gpd (1,211 Lpd)	60 in. (152 cm)	160 in. (406 cm)	16 in. (41 cm)

Minimum Well ID	4 in. (10 cm)
Maximum OD	3.79 in. (9.63 cm)
Maximum Depth	150 ft. (45.7 m)
Air Supply Pressure (min/max)	40/100 psi (2.7/6.9 bar)
LNAPL Fluid Density	< .85 SG
Kinematic Viscosity	1-1000 centistokes
Recommended Initial LNAPL Layer	> 3 in. (> 7.6 cm)
Residual LNAPL Layer	≥ 0.25 in. (.64 cm)
Suitable Types of LNAPL	Gasoline, diesel, jet fuels, kerosene, #2 - #5 fuel oils, light weight motor oil and hydraulic fluid
Materials	Brass, Tygon®, stainless steel, Viton®, Teflon®
Fitting Type	Quick-connect
Hose or Tubing	Both are available

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Teflon is a registered trademark of Dupont.

* gpd = gallons per day, Lpd = liters per day

C100M Pump Controller

The C100M Digital Controller is solar-powered and provides advanced operational capabilities at an economical price. Easy-to-use digital control of pump discharge and refill cycles and programmed OFF times make it convenient to optimize LNAPL recovery to match site conditions.



Tank full shutoff for the collection tank is a safe, simple and inexpensive add-on to the C100M, as an optional level control function. The C100M includes both a highly effective solar power system and a conventional AC power supply. Under solar-powered operation, the C100M is CSA rated as intrinsically safe.

4" SOS®4 Programmable Genie®

**C100M
Controller**



4" SOS® Programmable Genie® Skimmer

The 4" SOS®4 Programmable Genie® is a safe, reliable and complete system for removing free product from wells. The 4" SOS4 Programmable Genie system consists of an air-operated pumping unit with a floating inlet that tracks the changes in the water level. The SOS inlet uses a hydrophobic screen to avoid taking in water. The special Genie bladder pump with high suction capacity delivers proven reliability and durability. The 4" SOS4 Programmable Genie utilizes the C100M Controller which allows the user to not only control the pump fill/discharge cycles, but also to set OFF periods to match the LNAPL pumping rate to the LNAPL recovery rate of the well. A complete line of matched accessories is available to help installation and performance, including in-well tubing, well caps, LNAPL collection tank full shutoffs and other items.

Warranty

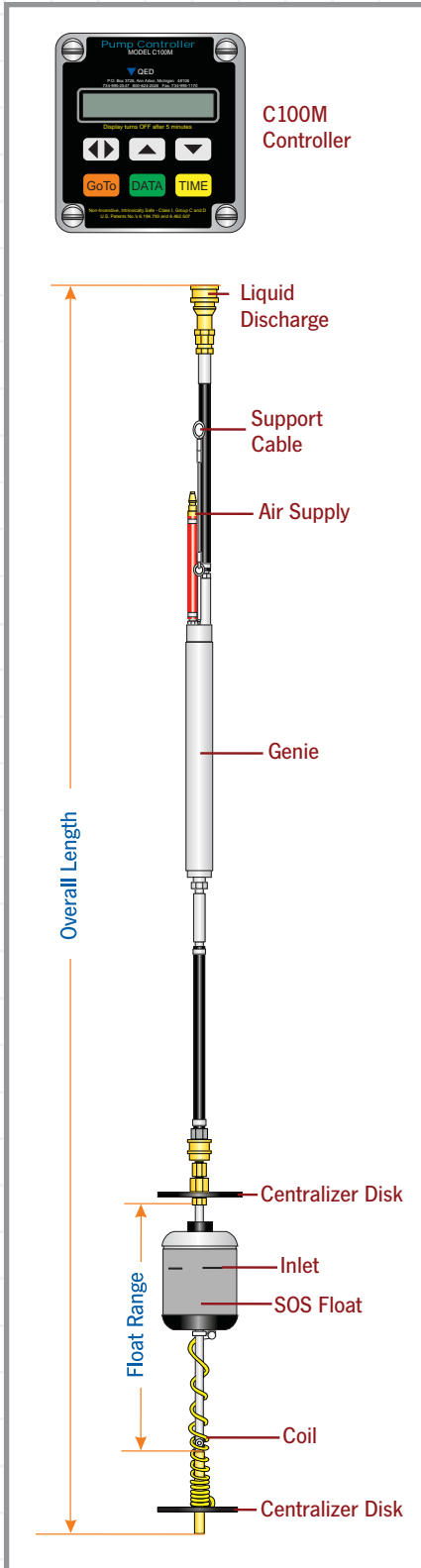
SOS4 Programmable Genies are warranted for one (1) year.

Advantages

1. Specialized bladder pump is extremely durable, provides high suction to maintain flow, and eliminate contact of drive air with pumped fluid.
2. Easy-to-use digital control of pump discharge and refill cycles.
3. Available in a range of flow rates and float travel ranges.
4. Low air consumption.



4" SOS[®]4 Programmable Genie[®]



Specifications

Programmable Genie Model	Maximum LNAPL Recovery Rate*	Float Travel Range	Overall Length	Minimum Liquid Column
PG2412 SOS4	160 gpd (605 Lpd)	12 in. (30 cm)	80 in. (203 cm)	5 in. (13 cm)
PG2424L SOS4	160 gpd (605 Lpd)	24 in. (61 cm)	115 in. (292 cm)	29 in. (74 cm)
PG2424C SOS4	160 gpd (605 Lpd)	24 in. (61 cm)	98 in. (249 cm)	11 in. (28 cm)
PG2448 SOS4	160 gpd (605 Lpd)	48 in. (122 cm)	119 in. (302 cm)	11 in. (28 cm)
PG4812 SOS4	320 gpd (1,211 Lpd)	12 in. (30 cm)	105 in. (267 cm)	5 in. (13 cm)
PG4824L SOS4	320 gpd (1,211 Lpd)	24 in. (61 cm)	139 in. (353 cm)	29 in. (74 cm)
PG4824C SOS4	320 gpd (1,211 Lpd)	24 in. (61 cm)	122 in. (310 cm)	11 in. (28 cm)
PG4848 SOS4	320 gpd (1,211 Lpd)	48 in. (122 cm)	143 in. (363 cm)	11 in. (28 cm)

Minimum Well ID	4 in. (10 cm)
Maximum OD	3.79 in. (9.63 cm)
Maximum Depth	150 ft. (45.7 m)
Air Supply Pressure (min/max)	40/100 psi (2.7/6.9 bar)
LNAPL Fluid Density	< 1.0 SG
Kinematic Viscosity	1-200 centistokes
Recommended Initial LNAPL Layer	> 3 in. (> 7.6 cm)
Residual LNAPL Layer	Sheen
Suitable Types of LNAPL	Gasoline, fresh diesel fuel, jet fuels, kerosene, light fuel oils
Materials	Brass, Tygon [®] , stainless steel, Viton [®] , Teflon [®]
Fitting Type	Quick-connect
Hose or Tubing	Both are available

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Teflon is a registered trademark of Dupont.

* gpd = gallons per day, Lpd = liters per day

C100M Pump Controller

The C100M Digital Controller is solar-powered and provides advanced operational capabilities at an economical price. Easy-to-use digital control of pump discharge and refill cycles and programmed OFF times make it convenient to optimize LNAPL recovery to match site conditions.



Tank full shutoff for the collection tank is a safe, simple and inexpensive add-on to the C100M, as an optional level control function. The C100M includes both a highly effective solar power system and a conventional AC power supply. Under solar-powered operation, the C100M is CSA rated as intrinsically safe.

SOS® Passive Skimmers

For Low Recovery Wells

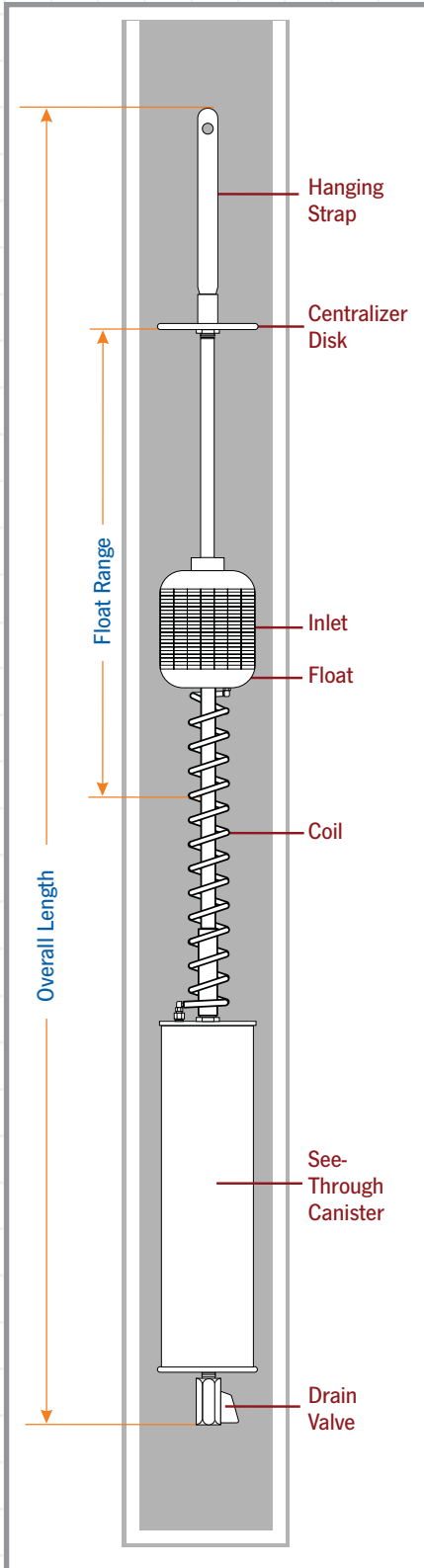
The QED family of Passive Skimmers has been designed for free product recovery applications in sites where active pumping systems are not applicable due to existing conditions or extreme low permeability formations. The floating intake head follows the groundwater fluctuations in the recovery well, allowing only the free-floating phase (LNAPL) to be captured, without taking water, and stored in the built-in reservoir for further manual transfer to a tank.

Passive Skimmers are available for 2" (50 mm) and 4" (100 mm) extraction wells, with different reservoir capacities.

Advantages

1. Simple systems for extreme low recovery applications.
2. Inexpensive option if active system is not practical.





Specifications

Model No.	2 in. SOS 301079	2 in. SOS 301080	4 in. SOS 301032	4 in. SOS 301033
Canister Volume	20 oz. (600 cc)	30 oz. (900 cc)	101 oz. (3,000 cc)	203 oz. (6,000 cc)
Well Diameter	2 in. (5 cm)	2 in. (5 cm)	4 in. (10 cm)	4 in. (10 cm)
Float Travel Range	12 in. (30 cm)	12 in. (30 cm)	18 in. (46 cm)	18 in. (46 cm)
Overall Length	65 in. (165 cm)	76.5 in. (194 cm)	69.5 in. (177 cm)	85.5 in. (217 cm)
Maximum Fluid Depth Required	38.5 in. (98 cm)	50.5 in. (128 cm)	37 in. (95 cm)	59 in. (137 cm)
LNAPL Fluid Density	< 1.0 SG			
Kinematic Viscosity @ 50 °F (10 °C)	200 centistokes			
Recommended Initial LNAPL Layer	> .25 in. (> .64 cm)			
Residual LNAPL Layer	0.25 in. (.64 cm)			
Suitable Types of LNAPL	Gasoline, jet fuel			
Materials	Stainless steel, Viton®, PVC, brass, closed cell foam.			

Viton is registered trademark of DuPont Dow Elastomers.



Characterize Your Specific Site

The QED Test Kit enables you to measure the density and viscosity of your actual floating hydrocarbon layer. This FREE, do-it-yourself kit comes complete with simple, illustrated instructions. Once you have recorded the results of your hydrocarbon test, QED application specialists will be able to provide expert technical assistance in system design and specification.

AutoSkimmer™ Pump System



For High Recovery Wells.

The AutoSkimmer™ Pump System automatically recovers free product and pumps on demand when the pump is filled, combining the industry-leading AutoPump® with the rugged SPG floating inlet. The system can then be switched to higher flow, total fluids pumping by removing the floating inlet. When site conditions call for this approach, nothing beats the AutoPump/SPG inlet combination; both of these technologies have been proven in the field for many years around the world. The AutoPump mechanism means that the pump cycles only when it is filled with LNAPL, reducing air consumption without adding any additional controls or sensors. The SPG inlet includes selectable side inlet ports for versatility in fine-tuning LNAPL intake when the floating layer is reduced in thickness.

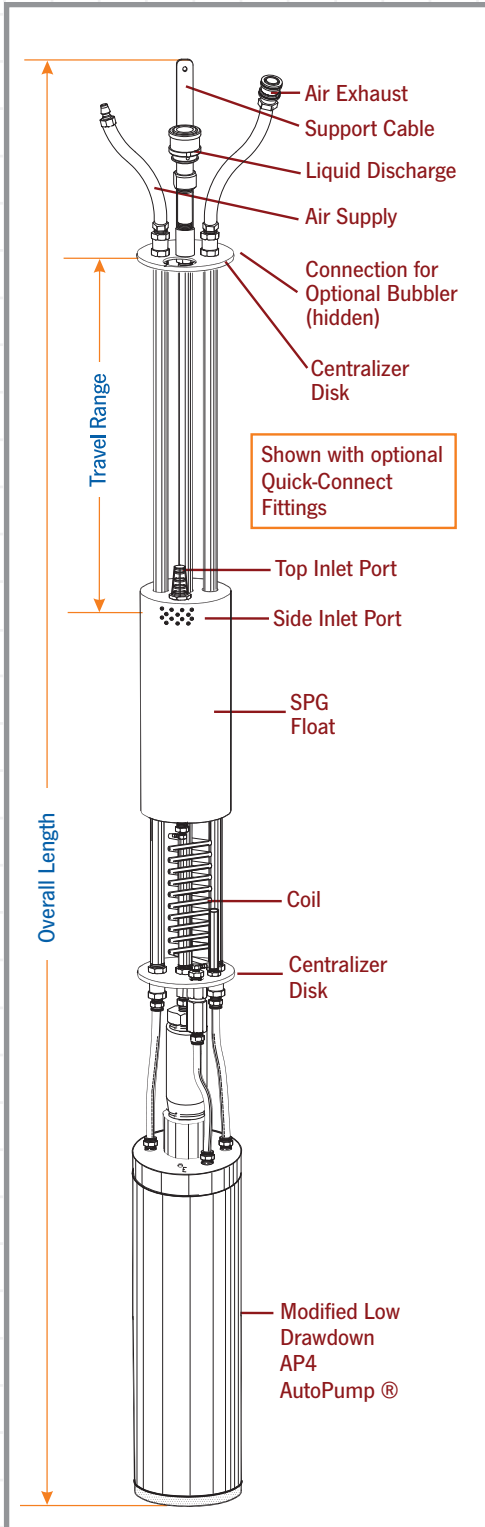
Warranty

AutoSkimmers are warranted for one (1) year.

Advantages

1. Unique design allows pump to cycle only when it is completely full of fluid.
2. Versatile design allows floating inlet removal for conversion to total fluids pumping after the LNAPL is largely eliminated.
3. Air-powered, intrinsically safe.
4. Built-in ON/OFF control with internal float.
5. Proven reliability and durability.

AutoSkimmer™ Pump System



Specifications

AutoSkimmer Model	Short AP4-SPG4 (301243)
*Maximum LNAPL Recovery Rate	320 gpd (1,211 Lpd)
Float Travel Range	16 in. (41 cm)
Overall Length	78 in. (198 cm)
Minimum Liquid Column	52 in. (132 cm)
Pressure Range	5-120 psi (0.4-8.5 kg/cm ²)
High Pressure Option	5-120 psi (0.4-8.5 kg/cm ²)
Minimum Well ID	4 in. (10 cm)
Maximum OD	3.5 in. (8.9 cm)
Maximum Depth	200 ft. (60.9 m)
LNAPL Fluid Density	< .85 SG
Kinematic Viscosity	1-1000 centistokes
Recommended Initial LNAPL Layer	> 3 in. (> 7.6 cm)
Residual LNAPL Layer	> .25 in. (.64 cm)
Suitable Types of LNAPL	Gasoline, diesel, jet fuels, kerosene, #2 - #5 fuel oils, light weight motor oil and hydraulic fluid
Materials	Brass, Tygon®, stainless steel, Viton®, Teflon®
Fitting Type	Quick-connect or barbs
Hose or Tubing	Both are available

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Teflon is a registered trademark of DuPont

* gpd = gallons per day, Lpd = liters per day



Characterize Your Specific Site

The QED Test Kit enables you to measure the density and viscosity of your actual floating hydrocarbon layer. This FREE, do-it-yourself kit comes complete with simple, illustrated instructions. Once you have recorded the results of your hydrocarbon test, QED application specialists will be able to provide expert technical assistance in system design and specification.

Pulse Pump® System



2" Pulse Pump

Cleanup well conditions can be downright hostile: powerful solvents, strong acids, caustic bases, corrosive chlorides. That's why QED makes the Pulse Pump® series (our basic gas displacement pumps) in a variety of proven materials that won't just survive, but will deliver years of trouble-free performance.

Every Pulse Pump model has only two moving parts downwell: high-clearance, self-cleaning ball check valves. This simplicity keeps them working when high solids, viscosity, or chemical attack cause other pumps to clog or break down. An external controller is required to control the alternating pressurization and venting cycles for the pump.

The Pulse Pump design is especially suited for sinking hydrocarbons (DNAPL) recovery, which is often complicated by high viscosity and/or extremely aggressive solvents. Intrinsically safe Pulse Pump systems are fast and easy to install, with no electrical connections at the wellhead.

Flow optimization is simple too; rugged, dependable pumps and controllers (the solar/AC powered C100M and the all-pneumatic L360) deliver reliable operation without needing frequent attention or repair.

Even in the harshest environments, they just keep working – in the most demanding ground water cleanup, leachate collection, and sinking layer recovery applications.

Warranty

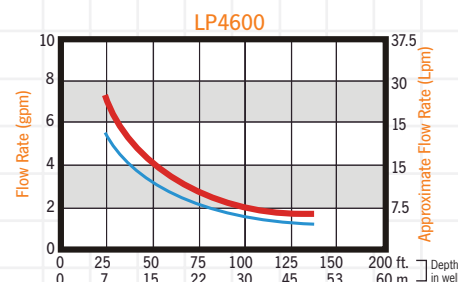
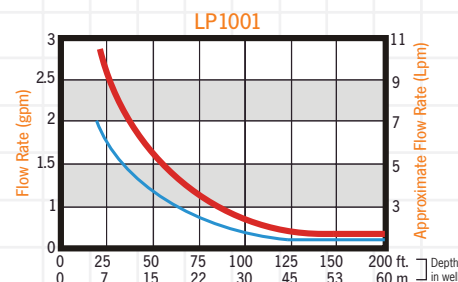
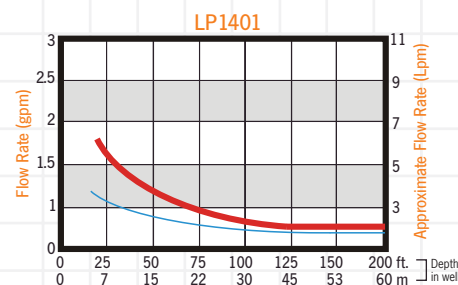
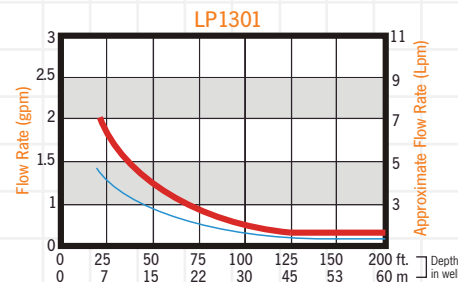
Pulse Pumps are warranted for one (1) year.

Advantages

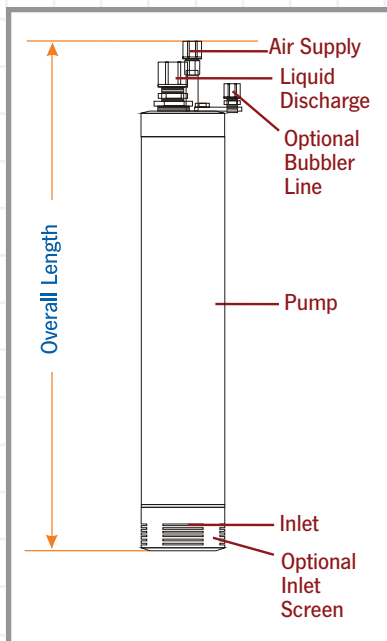
1. Only 2 moving parts downwell for reliable operation even in high solids and the thickest liquids.
2. Ultimate resistance to chemical attack. Durable materials and simple, rugged construction.
3. Economical, low-maintenance performance in sinking layer recovery and other tough applications.
4. Easy-to-use digital control of pump discharge and refill cycles.

Pulse Pump Flow Rates

Note on flow curves: 100 psi (700 kPa) drive air supplied for all pumps.



2' Submergence 10' Submergence



Specifications

	Pulse Pump 2 in.		Pulse Pump 4 in.	
Model No.	LP1301	LP 1401	LP1001	LP 4600
Pump Type	Pneumatic Displacement	Pneumatic Displacement	Pneumatic Displacement	Pneumatic Displacement
Inlet	Bottom*	Bottom*	Bottom*	Bottom*
OD	1.66 in. (42 mm)	1.25 in. (32 mm)	2.88 in. (73 mm)	2.88 in. (73 mm)
Length	20 in. (51 cm)	20 in. (51 cm)	15.5 in. (39.4 cm)	49.5 in. (126 cm)
Weight	2 lbs. (.9 kg)	1.5 lbs. (.7 kg)	3 lbs. (1.4 kg)	8 lbs. (3.6 kg)
Materials	Stainless steel, PTFE	Brass	PVC	PVC
Fittings: Type / Materials	Compression / SS	Barb / Brass	Compression / Nylon	Barb / Nylon
Sizes: Liquid Discharge	1/2 in. (13 mm)	1/2 in. (13 mm)	3/4 in. (19 mm)	3/4 in. (19 mm)
Air Supply	3/8 in. (9 mm)	3/8 in. (9 mm)	1/2 in. (13 mm)	1/2 in. (13 mm)
Pump Stroke	.09 gal. (350 mL)	.08 gal. (300 mL)	.17 gal. (650 mL)	.53 gal. (2,000 mL)
Operating Pressure Range	40-100 psi (275-700 kPa)	40-100 psi (275-700 kPa)	40-100 psi (275-700 kPa)	40-100 psi (275-700 kPa)
Maximum Depth	230 ft. (70 m)	230 ft. (70 m)	230 ft. (70 m)	230 ft. (70 m)
***Maximum Flow Rate	2 gpm (7.5 Lpm) 2,880 gpd (10,900 Lpd)	1.8 gpm (6.8 Lpm) 2,592 gpd (9,810 Lpd)	3 gpm (11.4 Lpm) 4,320 gpd (16,350 Lpd)	7.5 gpm (28 Lpm) 10,800 gpd (40,880 Lpd)
Minimum Submergence	< 1 ft. (< 30 cm)	< 1 ft. (< 30 cm)	< 1 ft. (< 30 cm)	< 1 ft. (< 30 cm)
Density of Pumped Liquid	Any	Any	Any	Any
Cap Sizes	2, 4, 5, 6, and 8 in.** (50, 100, 125, 150 and 200 mm)	2, 4, 5, 6, and 8 in.** (50, 100, 125, 150 and 200 mm)	4, 5, 6, and 8 in.** (100, 125, 150 and 200 mm)	2, 4, 5, 6, and 8 in.** (100, 125, 150 and 200 mm)

* Top Inlet Can also available.

** Other sizes available by special order.

*** gpm = gallons per minute, gpd = gallons per day, Lpm = liters per minute, Lpd = liters per day

C100M Pump Controller

The C100M Digital Controller is solar-powered and provides advanced operational capabilities at an economical price. Easy-to-use digital control of pump discharge and refill cycles and programmed OFF times make it convenient to optimize LNAPL recovery to match site conditions.



L360 Controller

The L360 Cycle Controller provides rugged, all-pneumatic control of pump cycle times for the Programmable Genie and Pulse Pump. The L360 is especially suited to sites where no electronics are allowed, or where pump cycle rates exceed the limits of the C100M in solar mode. The L370 LevelMate can be used with the L360 to shut off the system when the well level drops below the set point.



Iron Horse™ Pump System



Iron Horse™ Extended-Duty Piston Pumps are built for durability based on QED's 20 years of engineering experience in landfill pumping. Iron Horse pumps are designed to provide dependable pumping in applications that benefit from the special capabilities of piston pumps, such as slant wells, sites requiring no air contact with the pumped fluids, and drawdown to extremely low levels.

Iron Horse pumps are air-powered and use a reciprocating air cylinder at the wellhead to drive a piston down in the well, connected by a flexible fiberglass rod. Each piston stroke lifts a known amount of liquid and provides positive suction at the inlet. Piston pumps can be installed in wells and risers at any angle, including horizontal.

Unlike older piston pump designs used in landfills and remediation sites, Iron Horse pumps are designed from the start for durability and serviceability to greatly reduce maintenance frequency and costs. In comparative testing, Iron Horse has demonstrated critical component life many times that of older piston pump designs. Iron Horse's pump simplicity and strength advantages are visible even from first appearances. QED's extensive engineering experience and resources have delivered the first piston pump good enough to carry our name.

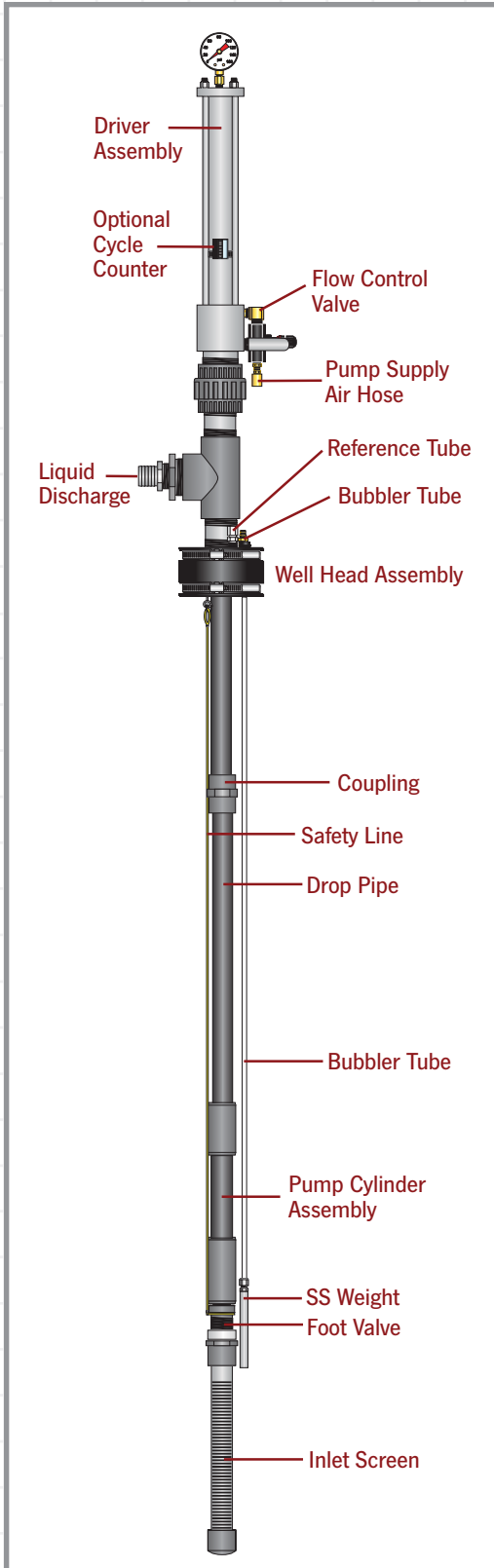
Warranty

Iron Horse pumps are warranted for one (1) year.

Advantages

1. No contact between drive air and contaminated fluids.
2. Extreme low draw-down capability.
3. Seal-less stainless steel piston eliminates costly seal maintenance.
4. Simple driver with reliable, built-in reciprocation mechanism.
5. Heavy-duty, stainless steel construction used for key components subject to wear.

Iron Horse™ Pump System



Specifications

IH 200 System (2 in. Drop Pipe)	
* Maximum Flow Rate	5 gpm (18.9 Lpm)
Approximate Pump Volume/Cycle	0.120 gal. (.454 L)
Maximum Cycle Rate	40 cpm
** Maximum Depth	180 ft. (54.8 m)
Minimum Liquid Pumping Level Above Bottom	Standard screen: 18 in. (45.7 cm) Short screen: 6 in. (15.2 cm)
Maximum Air Pressure	120 psi (8.4 kg/cm ²)
Minimum Well Casing Inside Diameter	2 in. (5 cm)
*** Temperature Range	Downhole: Max 180 °F (82.2 °C) Surface: Min -20 °F (-28.8 °C)
IH 125 System (1-1/4 in. Drop Pipe)	
* Maximum Flow Rate	2 gpm (7.5 Lpm)
Approximate Pump Volume/Cycle	0.045 gal. (.170 L)
Maximum Cycle Rate	40 cpm
** Maximum Depth	400 ft. (121.9 m)
Minimum Liquid Pumping Level Above Bottom	Standard screen: 12 in. (30.5 cm) Short screen: 6 in. (15.2 cm)
Maximum Air Pressure	120 psi (8.4 kg/cm ²)
Minimum Well Casing Inside Diameter	4 in. (10 cm)
*** Temperature Range	Downhole: Max 180 °F (82.2 °C) Surface: Min -20 °F (-28.8 °C)
Model IHD-Driver Assembly	
Weight	22 lbs. (9.97 kg)
Length	50 in. (1.27 m) without gage
Maximum Diameter	4 in. (10 cm)
Drive Piston Diameter	2 in. (5 cm)

* gpm = gallons per minute, Lpm = liters per minute

** Consult factory for depths greater than 400 ft.

*** Assumes dry air supply — a properly sized desiccant air dryer is recommended for winter use in cold climates.

Eliminator™ Pump System



The Eliminator™ is a high capacity bladder pump designed for DNAPL removal in 2" (50 mm) and 4" (100 mm) wells. The Eliminator is also used to handle viscous contaminants, such as crude oil.

The Eliminator uses a bladder of PTFE or elastomer to isolate the pump air supply from the pumped liquid. As a result, there is no contact between the drive air and the contaminated fluids inside the bladder and, therefore, no emissions of potentially contaminated air.

Eliminator pumps provide reliable bottom-inlet pumping. A wide range of accessories are available, including "roving" well caps to allow accurate pump inlet positioning, and bladder replacement kits for easy field maintenance.

The Eliminator is powered by compressed air and requires an external timer-based controller to control the air cycling ON and OFF to the bladder pump. Controller options include the solar/AC powered C100M and the all-pneumatic L360.

When the bladder is squeezed from the outside by the compressed air, fluid within the bladder is forced out through a check valve at the top of the pump. Then, when the air pressure around the bladder is exhausted, the bladder expands resuming its original shape. This pulls fluid into the bladder through the bottom inlet.

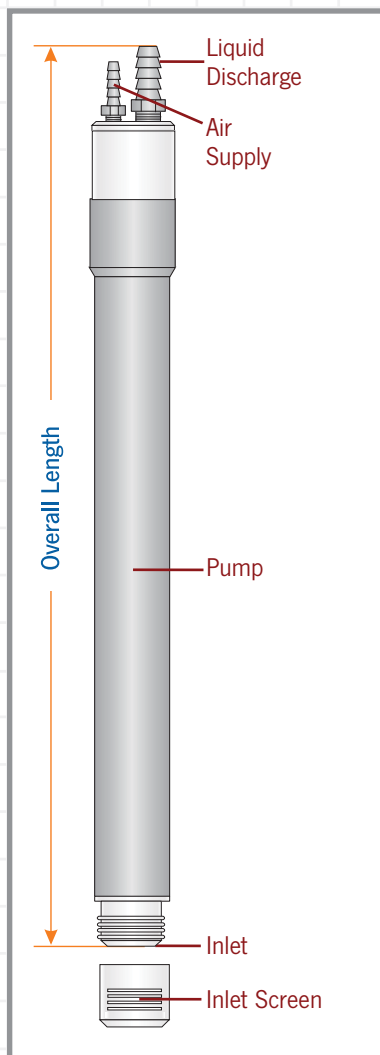
Warranty

Eliminator pumps are warranted for one (1) year.

Advantages

1. 100% air-powered operation.
2. No contact between drive air and contaminated fluids.
3. Available for 2" (50 mm) and 4" (100 mm) wells or larger.

Eliminator™ Pump System



Specifications

Model No.	2 in. 301301	2 in. 301311	4 in. LP1702
Pump Type	Pneumatic bladder	Pneumatic bladder	Pneumatic bladder
Inlet	Top or Bottom	Top or Bottom	Top or Bottom
OD	1.7 in. (4.3 cm)	1.7 in. (4.3 cm)	3 in. (7.5 cm)
Length	57 in. (145 cm)	82 in. (208 cm)	40 in. (102 cm)
Weight	6 lbs. (2.7 kg)	7 lbs. (3.2 kg)	11.5 lbs. (5.2 kg)
Materials	Stainless steel, brass Viton®, Teflon®, Urethane bladder	Stainless steel, brass Viton®, Teflon®, Urethane bladder	Stainless steel, Q-Tal, PTFE bladder, Viton® o-rings
Fittings	Brass quick-connects	Brass quick-connects	Brass barbs
Fitting Sizes	Liquid Discharge: 1/4 in. (.64 cm) Air Supply: 1/4 in. (.64 cm)	Liquid Discharge: 1/4 in. (.64 cm) Air Supply: 1/4 in. (.64 cm)	Liquid Discharge: 3/4 in. (19 mm) Air Supply: 1/2 in. (13 mm)
Volume per Cycle	.03 gal. (125 mL)	.06 gal. (245 mL)	0.53 gal. (2,000 mL)
Operating Pressure Range	40-100 psi (2.8-6.9 bar)	40-100 psi (2.8-6.9 bar)	40-100 psi (2.8-6.9 bar)
Maximum Depth	150 ft. (46 m)	150 ft. (46 m)	230 ft. (70 m)
*Maximum Flow Rate	.135 gpm (.51 Lpm)	.260 gpm (.983 Lpm)	6 gpm (23 Lpm)
Minimum Submergence	3 in. (7.6 cm)	3 in. (7.6 cm)	18 in. (45.6 cm)
Density of Pumped Liquid	Any	Any	Any
Cap Sizes	2, 3, 4, 5, 6, and 8 in. (50, 75, 100, 125, 150 and 200 mm)	2, 4, 5, 6, and 8 in. (50, 75, 100, 125, 150 and 200 mm)	2, 4, 5, 6, and 8 in. (50, 75, 100, 125, 150 and 200 mm)

Note: Custom bladder pumps are available, consult factory at 800-624-2026.

Note: The volume per cycle and maximum flow rate shown are estimates; the liquid submergence and air pressure supplies can affect these estimates. Viton is registered trademark of DuPont Dow Elastomers. Teflon is a registered trademark of Dupont.

* gpm = gallons per minute, Lpm = liters per minute

C100M Pump Controller

The C100M Digital Controller is solar-powered and provides advanced operational capabilities at an economical price. Easy-to-use digital control of pump discharge and refill cycles and programmed OFF times make it convenient to optimize LNAPL recovery to match site conditions.



L360 Controller

The L360 Cycle Controller provides rugged, all-pneumatic control of pump cycle times for the Programmable Genie and Pulse Pump. The L360 is especially suited to sites where no electronics are allowed, or where pump cycle rates exceed the limits of the C100M in solar mode. The L370 LevelMate can be used with the L360 to shut off the system when the well level drops below the set point.



AutoPump® System



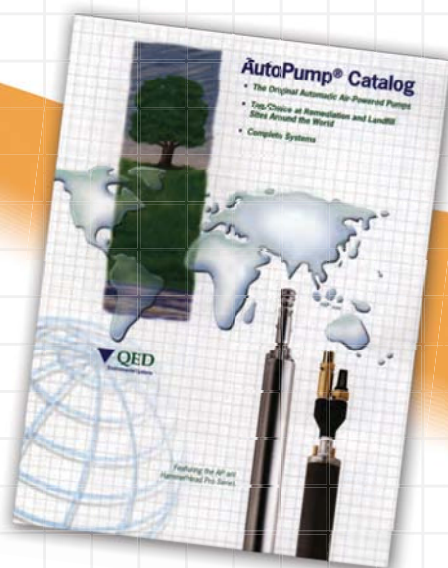
Some remediation sites with very thick free product layers or other special conditions may be best served with a higher flow, non-selective top inlet pump. The top inlet AutoPump® is a simple, safe and reliable pump for achieving flow rates as high as 7 gpm with just 6" of fluid over the pump inlet. Its air-powered operation is safe and dependable under conditions that challenge other types of pumps. Because it is automatic with low level shutoff built in, no separate level control sensors or controls are needed – just connect the AutoPump to a compressed air source. The AutoPump was the first air-powered automatic pump, introduced over 25 years ago and improved through experience. Call QED for more information on which AutoPump model is best suited for your application.

Warranty

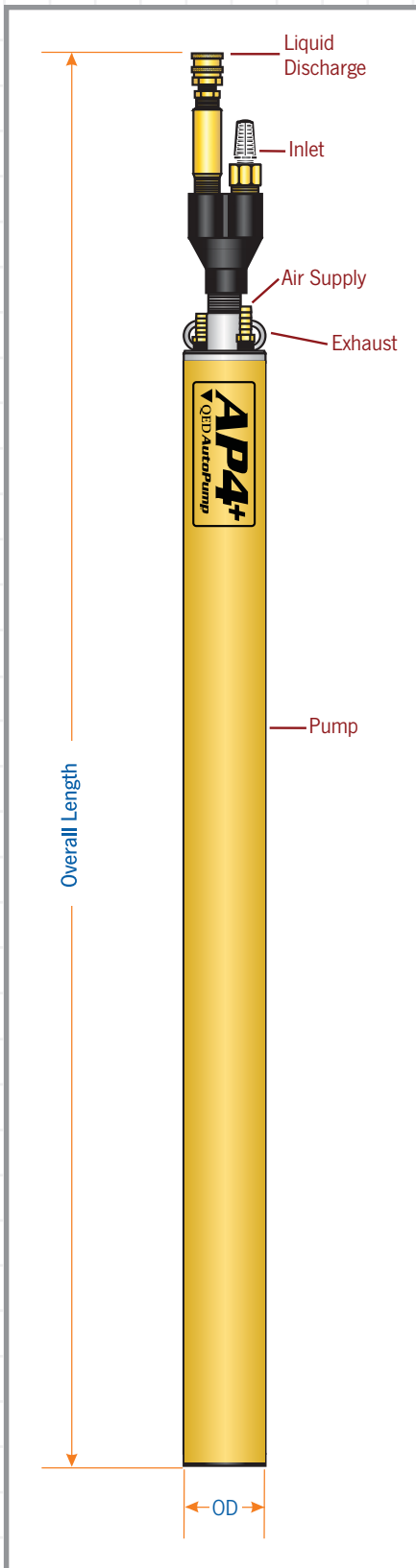
AP4+ AutoPumps are warranted for five (5) years:
100% materials and workmanship.
AP2 AutoPumps are warranted for one (1) year.

Advantages

1. Air-powered pump operation for safety and durability.
2. Top or bottom inlet position.
3. Materials of construction matched to site conditions.
4. High clearance fluid pathways.
5. A simple yet rugged operating mechanism.
6. Pump length to match water column and meet drawdown requirements.



4" AutoPump
with top inlet



Specifications

Model No.	4 in. Top Inlet AutoPumps			2 in. Top Inlet AutoPumps	
	Long AP4+T	Short AP4+T	Low Drawdown AP4+T	Long AP2T	Short AP2T
Overall Length	57 in. (145 cm)	42 in. (107 cm)	29 in. (74 cm)	57 in. (145 cm)	35 in. (107 cm)
OD	3.5 in. (8.9 cm)	3.5 in. (8.9 cm)	3.5 in. (8.9 cm)	1.75 in. (4.45 cm)	1.75 in. (4.45 cm)
Actuation Level	52 in. (132 cm)	37 in. (94 cm)	24 in. (62 cm)	52 in. (132 cm)	31 in. (79 cm)
*Maximum Flow Rate	10 gpm (38 Lpm)	9 gpm (34 Lpm)	6.4 gpm (24 Lpm)	1.9 gpm (7.2 Lpm)	1.6 gpm (6 Lpm)
Maximum Depth	425 ft. (130 m)**	425 ft. (130 m)**	250 ft. (76 m)	300 ft. (91.4 m)	300 ft. (91.4 m)

* gpm = gallons per minute, Lpm = liters per minute

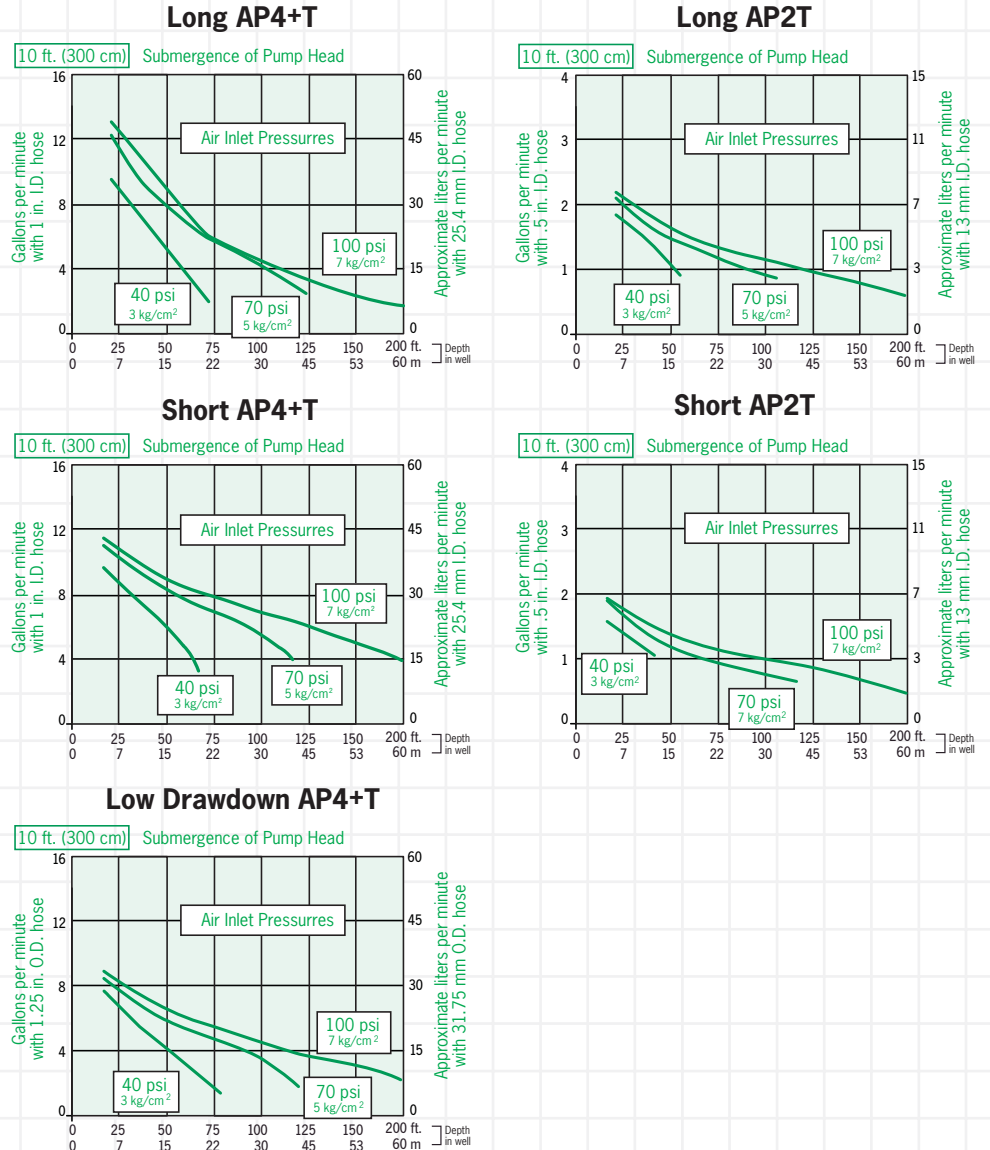
• Consult QED for higher flow requirements.

• Optional 2.63 in. (6.68 cm) OD available.

** High pressure option for 4 in. AP Pumps

• Optional radial inlet model provides 11.5 in. (29 cm) actuation level.

AutoPump Flow Charts



AutoTracker® Vacuum Extraction Inlet



The AutoTracker® Floating Extraction Inlet (U.S. Patent No. 6,520,259) optimizes dual-phase extraction and bio-slurping system performance by assuring proper air-to-water ratios even as water levels change.

Groundwater fluctuations can cause severe disruptions for dual-phase extraction systems using a fixed entrainment drop pipe, or “stinger tube”.

When the water table falls below the elevation of a fixed extraction inlet, groundwater recovery ceases and treatment efficiency decreases. When the water level rises above the end of a fixed inlet, vapor recovery becomes impossible. AutoTracker Floating Extraction Inlets eliminate these common causes of system shutdowns and missed recovery goals. Startup and restarts are also easier with the AutoTracker.

Warranty

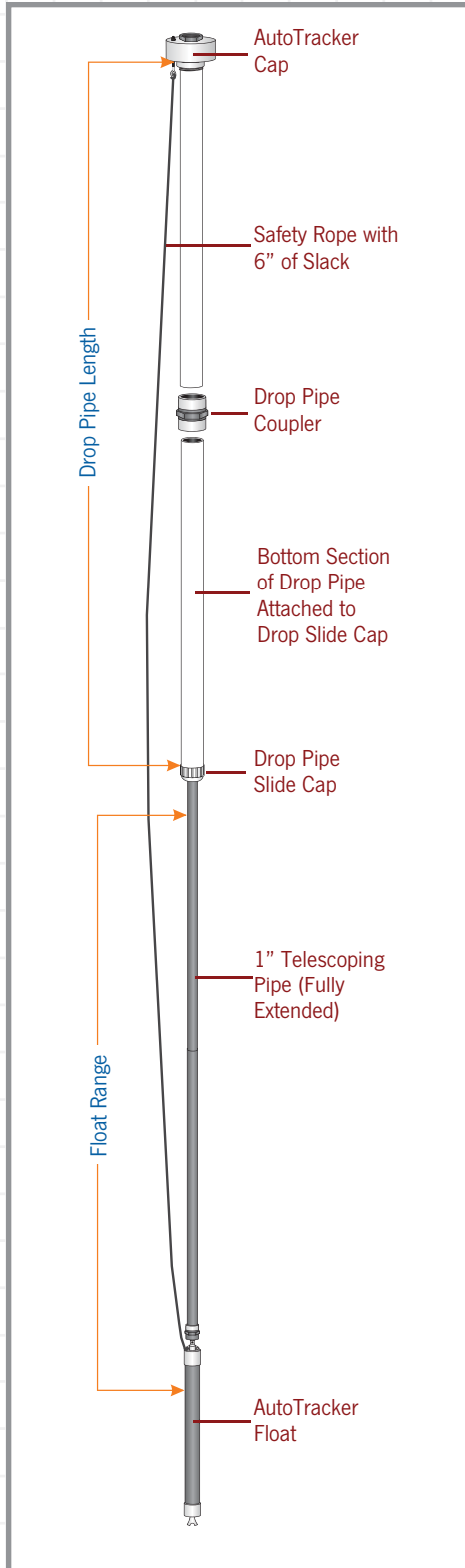
AutoTracker is warranted for one (1) year.

Advantages

1. Maintains air and liquid flow balance to reduce O&M costs and clean up sites faster.
2. Easier system startup and restart.
3. No need for precise inlet positioning.



AutoTracker® Vacuum Extraction Inlet



Specifications

Model No.	AT5	AT10
Float Range	5 ft. (1.5 m)	10 ft. (3 m)
Minimum Well Depth Below Top of Casing Needed to Achieve Full Travel Range	13.75 ft. (4.19 m)	23.75 ft. (7.24 m)
Elevation Range of Floating Inlet Travel w/Minimum Well Depth	8.75-13.75 ft. (2.67-4.19 m)	13.75-23.75 ft. (4.19-7.24 m)
Float Length	33.5 in. (85.09 cm)	33.5 in. (85.09 cm)
Floating Section OD	2.8 in. max (7.11 cm max)	2.8 in. max (7.11 cm max)
Weight	5.8 lbs. (2.63 kg)	5.8 lbs. (2.63 kg)

Model Selection Chart

Model No.	AT5	AT10
Desired Midpoint of Float Range	8.5 ft. (2.5 m)	16 ft. (6.4 m)
	13.5 ft. (4.1 m)	21 ft. (4.8 m)
	18.5 ft. (5.6 m)	26 ft. (7.9 m)
	23.5 ft. (7.1 m)	31 ft. (9.4 m)
	28.5 ft. (7.1 m)	36 ft. (10.9 m)
	33.5 ft. (10.2 m)	Other
	Other	Other
	Other	Other
Float Travel Range	6-11 ft. (1.8-3.3 m)	11-21 ft. (3.3-4.8 m)
	11-16 ft. (3.3-4.8 m)	16-26 ft. (6.4-7.9 m)
	16-21 ft. (4.8-6.4 m)	21-31 ft. (4.8-9.4 m)
	21-26 ft. (6.4-7.9 m)	26-36 ft. (7.9-10.9 m)
	26-31 ft. (7.9-9.4 m)	31-41 ft. (9.4-12.5 m)
	31-36 ft. (9.4-10.9 m)	± 5 ft. (1.5 m) from midpoint
	± 2.5 ft. (.76 m) from midpoint	
	Other	
Drop Pipe Length Required	5 ft. (1.5 m) Minimum	10 ft. (3 m) Minimum
	10 ft. (3 m)	15 ft. (4.5 m)
	15 ft. (4.5 m)	20 ft. (6 m)
	20 ft. (6 m)	25 ft. (7.6 m)
	25 ft. (7.6 m)	30 ft. (9.1 m) Maximum
	30 ft. (9.1 m) Maximum	= midpoint -6 ft. (1.8 m)
	= midpoint -3.5 ft. (1 m)	
	Other	

Digital Controller



C100M Digital Controller

QED offers pneumatic and electronic control options to match project needs for pacing the pumping rate of free product or DNAPL and shutting down the pump when the collection tank is full. All QED controls and equipment are performance tested before shipping – your assurance of trouble-free operation.

C100M Pump Controller

The C100M Digital Controller can be used to set pump refill and discharge cycle times and variable “off” times for the Programmable Genie®, Pulse Pump® and Eliminator™. The C100M is solar-powered, with unique power-saving circuit design and a 10-day battery backup to allow operation even in northern region winter conditions. It is rated as intrinsically safe in solar mode. An AC power adapter is also included for site conditions which prevent solar charging. The C100M provides easy-to-use digital control of pump discharge and refill cycles. Its programmable OFF time settings make it convenient to adjust daily pumping rates so that maximum LNAPL flow through the soil can be maintained, to enhance long-term recovery rates. Optional level switches for the C100M provide an economical means for system shutdown when the collection tank is full and/or the well level drops too low.

Specifications

Control Type	Solar/Electrical/Pneumatic
Dimensions	W - 3.5 in. (8.9 cm) H - 3.65 in. (9.3 cm) D - 3.5 in. (8.9 cm)
Weight	3 lbs. (1.4 kg)
Enclosure Type	Fiber reinforced thermoplastic NEMA 4X and UL 508
Power	SOLAR: Shatterproof solar panel on enclosure top with backup battery pack with 10-day reserve capacity. CSA* compliance, intrinsically safe, class 1, division 1, group C & D 110 VAC**. Power converter plugs into standard 110 VAC outlet and supplies 3 VDC (300 milliamp) to connector plug in enclosure bottom.
Operating Temperature	-20 °F to 150 °F (-28.9 °C to 65.6 °C)
Display	TYPE: LCD display with 16 character alphanumeric, temperature compensated contrast, and power OFF control. WINDOW: Non-glare, double hardened optical acrylic.
Pneumatic Control	TYPE: Latching solenoid with dual port manifold. FITTING: Female 1/4-18 in. NPT brass with nickel plating. PRESSURE: 125 psi (8.625 bar) maximum.
Flow Capacity	Sufficient for single Genie. Contact QED for other requirements

* C100M is rated CSA intrinsically safe when used in solar mode only.

** C100M is NOT rated CSA intrinsically safe when used with 110 VAC power converter.



L360 Pulse Sender Pneumatic Controller



L370 LevelMate

Pneumatic Pump Controls

The L360 Pulse Sender cycle controller provides rugged, all-pneumatic control of pump cycle times for the Programmable Genie®, Pulse Pump® and Eliminator™. The L360 is especially suited to sites where no electronics are allowed, or where pump cycle rates exceed the limits of the C100M in solar mode. The L370 LevelMate provides on/off level control and can be used with the L360 to shut off the system when the well level drops below the set point.

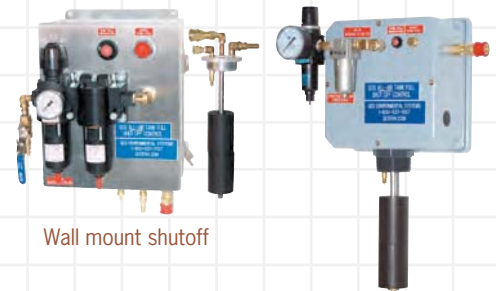
Pump Controller Specifications

Model No.	L360 Pulse Sender	L370 Level Mate
Dimensions	W - 6.06 in. (15.4 cm) H - 4.2 in. (10.7 cm) D - 7 in. (17.8 cm)	W - 6.06 in. (15.4 cm) H - 4.2 in. (10.7 cm) D - 5.25 in. (13.3 cm)
Weight	6 lbs. (2.7 kg)	4 lbs. (1.8 kg)
Operating Pressure	40-100 psi (275-700 kPa)	40-100 psi (275-700 kPa)
Maximum Free Air Flow	7 scfm (12 m ³ /h)	N/A
Features	Provides alternating, timed pressure and exhaust cycles. Reliable "poppet" timers and air power valving. High-accuracy, low-drift, 360° pneumatic timers. Locking regulator ring, cycle counter tap for easy counter installation, and high flow air valve.	Multi-well level control, corrosion resistant level sensor valve. Efficient external orifice/filter module. 3-6 in. (7.5-15 cm) ON/OFF range.

AIR REQUIREMENTS: For best results with all controllers, 2-3 scfm (3.4-5.1 m³/h) per Pulse Pump and 1-2 scfm (1.7-3.4 m³/h) per Eliminator at 100 psi (700 kPa) of clean, dry air supply is required. 10 micron filtration, <10 ppm oil, dew point 20 °F (11 °C) below minimum operating temperature. Maximum total system discharge head is 230 ft. (70 m) of water.

Tank Full Shutoffs

For the ultimate in safety and reliability, QED offers premium, all-pneumatic tank full shutoff controls in wall-mount (301425) and tank-mount (301426) versions. Both of these field-proven controls use fail-safe and redundant mechanisms to ensure that the pumping system is reliably switched off when the LNAPL or DNAPL collection tank is full.



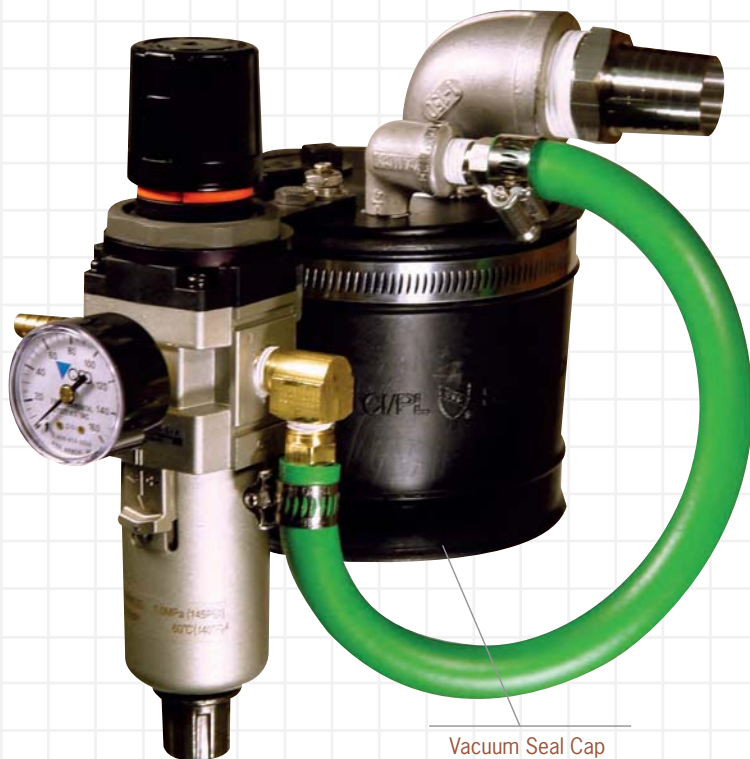
Wall mount shutoff

Tank mount shutoff

Tank Full Shutoff Specifications

Model No.	Wall-Mount 301425	Tank-Mount 301426
Control Type	Pneumatic	Pneumatic
Dimensions	W - 15 in. (38.1 cm) H - 16 in. (40.6 cm) D - 11 in. (27.9 cm)	W - 5 in. (12.7 cm) H - 13 in. (33 cm) D - 5 in. (12.7 cm)
Shipping Weight	40 lbs. (18.1 kg)	18 lbs. (8.2 kg)

Well Caps



Hundreds of wellhead cap and flange combinations are available from QED on a standard and custom basis to fit site needs and ease installation and service. Common features include quick-connect fittings, sealing versions for use with vacuum extraction, well access ports for level or other uses, and means for adjusting the pump level. Our cap assemblies are based on our 20 years of experience and thousands of installations; call QED for more detailed information and guidance on the best cap choice for your project.

Advantages

1. Easy assembly with leak-tight connections.
2. Unmatched range of connector fittings to make installation and maintenance easier and more efficient.

Specifications

Wellhead Assembly	Description	Fitting Types (hoses and tubing)	Fitting Materials	Well Diameter
Open-Hole Cap	Non-sealing cap with open pass-through holes allows easy pump height adjustment with support rope/cable.	No fittings	N/A	2, 4, 6, in. custom (50, 100, 150 mm)
Slip	Non-sealing cap with fitting for connection to air supply and liquid discharge lines.	Barbs, quick-connects, compression fittings	Brass, stainless steel, poly	2, 4, 6, in. custom (50, 100, 150 mm)
Vacuum Seal	Sealing cap with fittings for connection to air supply and liquid discharge lines	Barbs, quick-connects, compression fittings	Brass, stainless steel, poly	2, 4, 6, in. custom (50, 100, 150 mm)
Flange	Sealing flange with fittings for connection to air supply and liquid discharge lines	Barbs, quick-connects, compression fittings	Brass, stainless steel, poly	Custom



QED offers both nylon tubing and nitrile hose depending on site conditions and user preference. We also can supply a variety of other materials of construction for tubing and hose to match extreme fluid chemistry or temperatures that may be encountered at challenging sites.

The UV-protected nylon tubing QED supplies is Grade 12 and offers superior chemical resistance to most compounds, as well as being resistant to cracking and swelling when exposed to direct sunlight. The light-weight nylon tubing fits the variety of QED connections at the wellhead, surface and down well. The standard sizes available are 1/4" OD, 3/8" OD, 1/2" OD, 5/8" OD, 3/4" OD, 1" OD and 1-1/4" OD.

QED's nitrile hose is very user friendly. The color-coded hose is easy to handle, bend and coil, and fits all QED connections at the wellhead, surface and down well. The standard sizes available are 1/4" ID, 3/8" ID, 1/2" ID, 5/8" ID, 3/4" ID and 1" ID.

Advantages

- 1. All dimensions of tubes, hoses and fittings are carefully designed and controlled to ensure high flow capacity, easy assembly, high pullout strength and leak-tight connections.**
- 2. Unmatched range of connector fitting options to make installation and maintenance easier and more efficient.**
- 3. QED offers a variety of materials of construction for both tubing and hose to meet the extremes of fluid chemistry and temperature.**

Yellow Jacket Interface Meter



IS100 YellowJacket Interface Meter

The Yellow Jacket Oil/Water Interface Meter is loaded with features to make it easier to use and more productive under real field conditions. Certified Intrinsically safe, the Yellow Jacket is used to measure the thickness of floating or sinking hydrocarbons in groundwater accurately, safely, and reliably. The easy-to-read heavy duty Kynar jacketed tape is accurate to 1/100 of a foot with printing beneath the jacketing to eliminate the possibility of the graduations wearing off. The Yellow Jacket has modular electronics and an easy-to-replace probe. The unit is powered by a single 9-volt battery and comes standard with a carrying case and cleaning kit.

Warranty

Yellow Jacket interface meters have a limited 10-year warranty.

Advantages

1. Certified intrinsically safe to CSA and ANSI/UL standards.
2. Environmentally protected encapsulated circuit for durability on an easily removable modular electronic panel.
3. Easy field changeable probe.
4. Slim stainless steel probe with a non-removable .75" probe protector.
5. Probe holder, tape guide, cleaning kit, and carrying case included.
6. Heavy duty tape with a breaking load of over 300 pounds.

Specifications

Model No.	IS100	IS100M
Dimensions	W - 13.5 in. (34 cm) H - 10 in. (25 cm) D - 8 in. (20 cm)	W - 13.5 in. (34 cm) H - 10 in. (25 cm) D - 8 in. (20 cm)
Overall Weight	8 lbs. (3.3 kg) less case	8 lbs. (3.3 kg) less case
Power Supply	9-volt rectangular battery	9-volt rectangular battery
Probe Dimesions	.75" (19 mm) diameter	.75" (19 mm) diameter
Sensor Type	Optical and electrical conductance	Optical and electrical conductance
Accuracy	1/100 ft. (3 mm), repeatable	1 millimeter, repeatable
Tape Length	100 ft. (30.5 m)	30 m (97.8 ft.)
Tape Calibration	1/100 ft. (3 mm) increments	1 millimeter increments
Wetted Materials	Stainless steel, Kynar®, Viton®, and engineered plastics	Stainless steel, Kynar®, Viton®, and engineered plastics
Tape Breaking Load	300 lbs. (136 kg)	300 lbs. (136 kg)
Accessories Included	Probe holder, tape guide, cleaning kit, and carrying case	Probe holder, tape guide, cleaning kit, and carrying case

Kynar is a registered trademark of Arkema Inc. Viton is a registered trademark of DuPont Dow Elastomers.

Compressed Air Supply

All of the pumping systems in this catalog require a compressed air supply to operate. The air usage requirements for each system are described in the respective specification sections. Also, air dryers may be needed to prevent air line freeze-up during cold weather operation, and these require additional air flow. Once the site total maximum air demand is determined, reserve capacity needs to be added so that the compressor doesn't run too much, a key factor in promoting long service life. The application specialists at QED are ready to assist you in selecting an air supply system for your project, including providing quotes for complete compressor systems with dryers, in addition to the TH3 Compressor described below.



TH3 compressor

TH3 Compressor

This compact AC-powered compressor can be the perfect fit for small LNAPL recovery systems. The TH3 features a very durable, oil-less piston design for long life and eliminates the need to maintain oil levels. It should not to be confused with low-end, consumer grade compressors. Optional features include an automated tank drain for releasing accumulated moisture, and a refrigerated dryer to avoid air supply line freeze-up in cold weather operation.

Specifications

Dimensions	L - 19 in. (48.26 cm) W - 15.6 in. (39.62 cm) H - 16.5 in. (41.91 cm)
Shipping Weight	54 lbs. (24.49 kg)
Amps	11.4
Voltage	115
Motor Size	1.25 HP
Compressor Type	Oilless single piston
Air Delivery	2.1 scfm @ 100 psi
Receiver Tank	4.5 gal.

Options

Automatic tank drain
Refrigerated air dryer
Water trap

Notes



Site Information Form

P.O. Box 3726 • Ann Arbor, MI • 48106-3726 • USA
 1-800-624-2026 • FAX (734) 995-1170 • info@qedenv.com • www.qedenv.com

QED USE ONLY

Today's Date _____
 Quote Number _____
 Sales Order Number _____

CUSTOMER INFORMATION	SITE INFORMATION
Name: _____ Title: _____	Site Name: _____
Company: _____	Project Ref: _____
Address: _____	Company: _____
_____	Address: _____
Email: _____	_____
Phone: _____ FAX: _____	Phone: _____ FAX: _____

SENSORS REQUIRED	APPLICATION TYPE
<input type="checkbox"/> Tank-Full Shut-Off <input type="checkbox"/> Fluid Level <input type="checkbox"/> High-Water Shut-Off <input type="checkbox"/> Pump Cycle Counter	<input type="checkbox"/> Total Fluids <input type="checkbox"/> Dual Pump <input type="checkbox"/> Condensate <input type="checkbox"/> DNAPL <input type="checkbox"/> LNAPL <input type="checkbox"/> Leachate

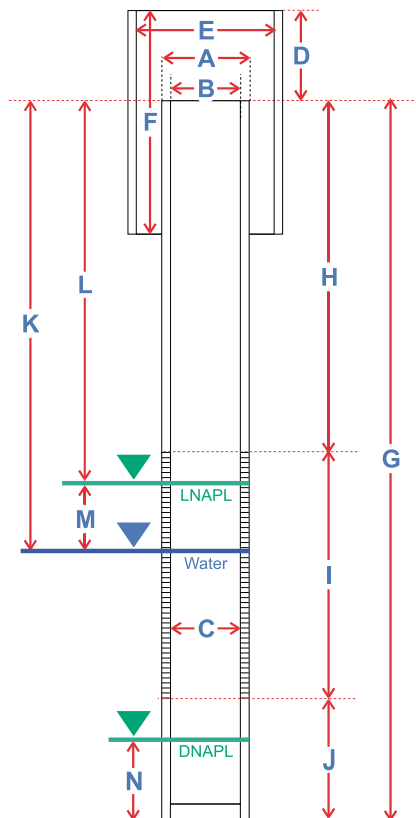
APPLICATION DESCRIPTION

Pumping Objectives (attach additional information and diagrams).

Properties of pumped fluids – contaminants/biologicals/viscosity/concentrations/pH/temperature/specific gravity/TDS/density (attach additional information).

Please attach sketch of site, well and equipment layout.

WELL DATA



Note: Please note any special characteristic on illustration above

WELL IDENTIFICATION NUMBER					
A	Well casing OD				
B	Well casing ID at wellhead				
C	Well casing ID at location of equipment				
D	Well casing to top of outer / vault casing				
E	Vault Dimensions				
F	Vault Depth				
G	Depth to bottom of the well				
H	Depth to top of screen				
I	Screen length				
J	Sump depth				
K	Depth to static water level				
L	Depth to top of LNAPL layer (if present)				
M	LNAPL thickness (if present)				
N	DNAPL thickness (if present)				
	Desired fluid pumping rate				
	Final drawdown level				
	LNAPL removal rate (if present)				
	Water / Leachate removal rate				
	DNAPL removal rate (if present)				
	Maximum daily water table fluctuation				
	Casing Materials				
	Well angle off vertical (% or degrees)				
	Exhausting inside or outside the well				
	Well under vacuum (Hg or H2O)				
	Any known material degradation (yes/no)				

The information provided on this form will be kept confidential by QED.

QED Pumping Technologies

Free Product Recovery Systems

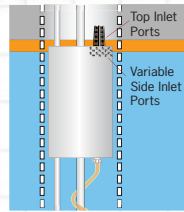
Genie® Systems

The Genie systems use a high-suction pump to draw in free product through a floating inlet that tracks changes in liquid level in the well.

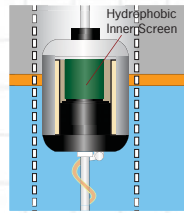
Pump – The air-powered Genie pump's special, high-rebound bladder creates high suction to more reliably draw in fluids, even when debris or high viscosities are present. The pump discharges fluid when the bladder is pressurized, and draws in fluid when the pump enters the vent cycle and the special bladder rebounds. The bladder prevents the drive air from contacting the pumped fluid.

Floating inlet types – The SPG inlet float is buoyant in water and sinks in hydrocarbon to keep its inlet ports above water. Multiple, selectable inlet ports allow fine-tuning of the floating layer thickness that can be achieved. The SOS inlet uses a hydrophobic screen to avoid taking in water.

Control options – The basic controls alternate pressurizing and venting of the Genie pump bladder automatically, while programmable controls allow setting system "OFF" periods to match the recovery rate of hydrocarbons into the well.



SPG Float



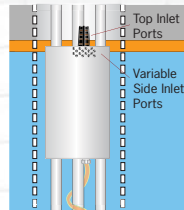
SOS Float

Passive Skimmers

Passive skimmers use floating inlets coupled to a simple downwell collection chamber. The passive skimmer is raised to the surface to be emptied, then lowered back into the well for another fill cycle.

AutoSkimmer®

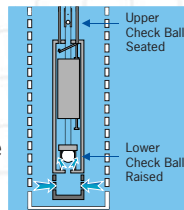
The AutoSkimmer combines a floating inlet with the air-powered automatic AutoPump®, which cycles only when the pump fills with liquid. No external controller is needed. When the floating layer has been substantially removed from the well, the AutoSkimmer can then be converted to a top fill, total fluids pump for extraction of contaminated water.



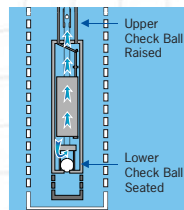
Total Fluids/Vapor Extraction

AutoPump®

The AutoPump is an air-powered, automatic pump for total fluids. An internal float operates an air control valve inside the pump, applying compressed drive air to the pump chamber when it fills and raises the float, and venting the pump chamber when it is emptied and the float falls. This automatic cycling applies compressed air efficiently, only when needed, and the pump shuts itself off if the liquid level falls in the well.



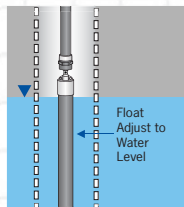
Refill Cycle



Discharge Cycle

AutoTracker®

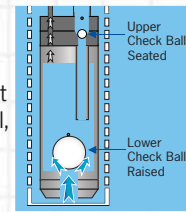
The AutoTracker is a floating, high performance inlet that replaces traditional "stinger" tubes or pipes in vacuum extraction systems. The floating action allows the extraction system to operate more consistently and efficiently when liquid levels change in the well.



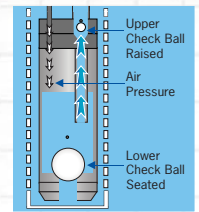
DNAPL Removal Systems

Pulse Pump®

The Pulse Pump is a simple, gas displacement pump with just two moving parts in the fluid – the inlet and outlet check balls. An external, surface-mounted controller alternately pressurizes the pump chamber to discharge the contents to the surface, then vents the pump body to allow it to refill again by hydrostatic pressure.



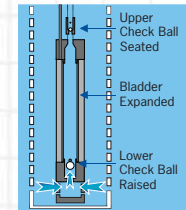
Refill Cycle



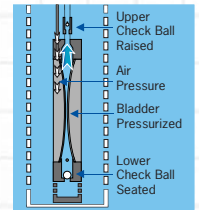
Discharge Cycle

Eliminator®

The Eliminator is a heavy-duty bladder pump with just three moving parts – the bladder and the inlet and outlet check balls. An external, surface-mounted controller alternately pressurizes the pump chamber to discharge the contents to the surface, then vents the pump body to allow it to refill again by hydrostatic pressure. The bladder prevents any contact of the drive air with the pumped fluid.



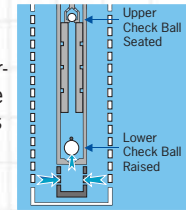
Refill Cycle



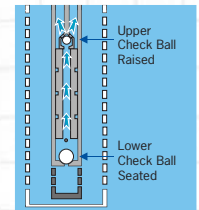
Discharge Cycle

Iron Horse®

The Iron Horse is a downwell piston pump driven by a wellhead air-powered driver. Piston pumps are capable of handling viscous fluids and have no contact between the drive air and the pumped fluid.



Refill Cycle



Discharge Cycle

The World Leader in Air-powered Pumps

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QED leads the industry in producing more accurate, cost-effective ways to collect groundwater samples.

- Genuine Micro-Purge® Low-Flow Sampling Pumps and Controls
- Dedicated Sampling Pumps
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Well Wizard®



Sample Pro®



Quick Filter®

Remediation and Landfill Pumping

QED pumps and systems for landfill leachate and condensate and groundwater remediation have been recognized worldwide for their superior quality and reliability for over two decades.

From small municipal facilities to large industrial and military sites, QED can supply the equipment and expertise.

- Air-powered Automatic Pumps
- Piston Pumps



AutoPump®



Iron Horse™

Air Strippers/VOC Removal

Unique air stripper designs for removing volatile compounds (VOC) from groundwater and industrial process streams.

- Sliding Tray SS Air Strippers
- Stacking Poly Air Strippers



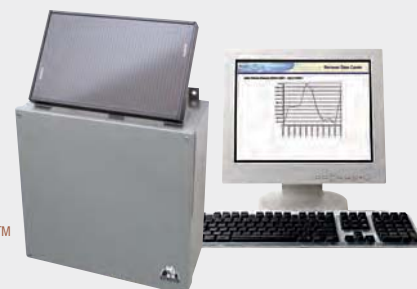
EZ-Tray®



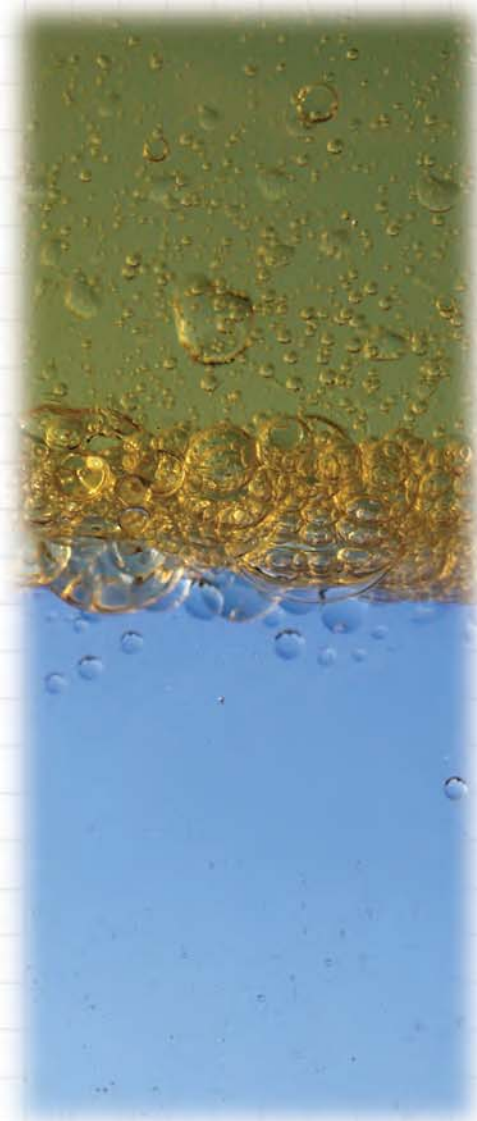
EZ-Stacker®

Wireless Data Systems

Complete data delivery and reporting system that delivers dependable reporting of well level and pump flow data, clearly charted and displayed, and securely archived.



Retriever™



Beyond the Basics...

Success with a free product recovery system involves more than just the basic hardware. QED's 20 years of specialized air-powered pumping experience on thousands of sites with a broad range of applications has built a strong base of expertise and problem solving capabilities. QED technical experts will work with you on identifying the relevant site information important to meeting your project objectives for free product or DNAPL recovery. The equipment will be selected to meet your site-specific application.

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- Mix of wellhead assemblies to meet specific site needs
- Fluid discharge and air supply components
- Tank full shut-off and other control and safety items
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