



Franklin Electric
ENERGY SYSTEMS

INTELLIGENT SUBMERSIBLE TURBINE PUMPS

FE PETRO® introduced the first variable speed submersible pump for the petroleum industry in 1995. Since that time, high volume marketers around the world have realized the benefits of filling cars faster during peak business periods that only variable speed submersibles can deliver. Station size and volumes have continued to grow. To meet the needs of these high volume retailers, FE PETRO® offers the intelligent submersible turbine pump, the industry's highest performing 4" diameter submersible pump.

HIGHLIGHTS

Constant Flow

Depending on peak business requirements, marketers now have a choice of either 2 hp or 4 hp variable speed models. 2 hp provides constant 10 gpm (38 lpm) for up to eight fueling positions operating simultaneously, 4 hp for up to 12 positions.

VFGC/EcoVFC™ Design Highlights

The VFGC and EcoVFC™ feature a dual seven segment display to show diagnostic faults. A serial interface is standard to connect to INCON System Sentinel™ software for remote reporting of pump alarms and sharing other pump/ATG intelligence. The VFGC and EcoVFC™ detect and display these system conditions:

- Dry tank (initiates an immediate pump shut-down)
- Continuous pump run
- Low incoming voltage
- Pump motor failure
- Short circuit detection
- Controller faults
- Open circuit detection

For reduced installation cost, a shielded power cable is not required. Pump protection extends pump life and extended run fault alerts a condition that may render line leak detection ineffective. Remote reporting of pump alarms and sharing of IST® and ATG intelligence further reduce station operating costs.



Pump Motor

- 2 hp or 4 hp, variable speed, two-stage centrifugal type pump motor with integral, automatic, thermal overload protection.
- Max. flow: 2 hp = 416 lpm (110 gpm), 4 hp = 530 lpm (140 gpm).
- Max. pressure: selectable operating pressure on VFGC or EcoVFC™ between 1.65 bar and 2.9 bar deadhead.
- Available with MAGSHELL®, which results in 45% increased flow area around motor.

Liquid Compatibility

- Max. liquid viscosity: 70 SSU at 60° F (15° C).
- IST® models imply alcohol-gasoline compatibility for fuel mixtures containing diesel fuel with up to 20% biodiesel, 100% biodiesel, up to 85% ethanol with gasoline, and 20% MTBE, 20% ETBE or 17% TAME with gasoline.
- IST® models can also be used for fuel mixtures containing up to 5% biodiesel with diesel fuels, fuel oils, kerosene, Avgas, and jet fuels in a non-gelled pourable state.
- All wetted elastomers are made of a high grade, fluorocarbon compound.

SPECIFICATIONS

Power Requirements	IST® models can only be powered by a VFGC or the EcoVFC™ controllers.
Single phase incoming power supply	2 hp models can operate with single phase incoming power supply to the VFGC
Three-phase incoming power supply	2 hp and 4 hp models operate with three-phase incoming power supply to the EcoVFC™
Other incoming power supply	Incoming power supply to the VFGC can be 200-250 VAC, 50 Hz and 360-440 VAC, 50 Hz for the EcoVFC™.
	VFGC outputs a three-phase, variable frequency signal, valid for FE PETRO® variable speed pumps only.
	2 hp max. motor draw: 9 Amps
	4 hp max. motor draw: 15 Amps
	VFGC or EcoVFC™ max. line draw: 20 Amps.

ORDER INFORMATION

Intelligent STP Model Designation System

A typical turbine model designation has up to five components to define the pump being supplied as follows:

IST® XXXXX Y - A - B

IST® = Basic model designation

Note: All IST® models include the options of alcohol-gasoline compatibility, variable speed and variable length as part of the base model.

XXXXX = Factory installed options

IST® model designations may include one or more of the following characters in alphabetical order:

- F = Floating suction adapter (1½" NPT female adapter)
- K = Intake filter screen (IFS, factory installed to PMA)
- M = MagShell® (flow enhancing, expanded PMA shell)
- R* = Model R check valve (1.65 bar relief/1.52 bar reset for PLLD)

Y = Pump motor horsepower rating**

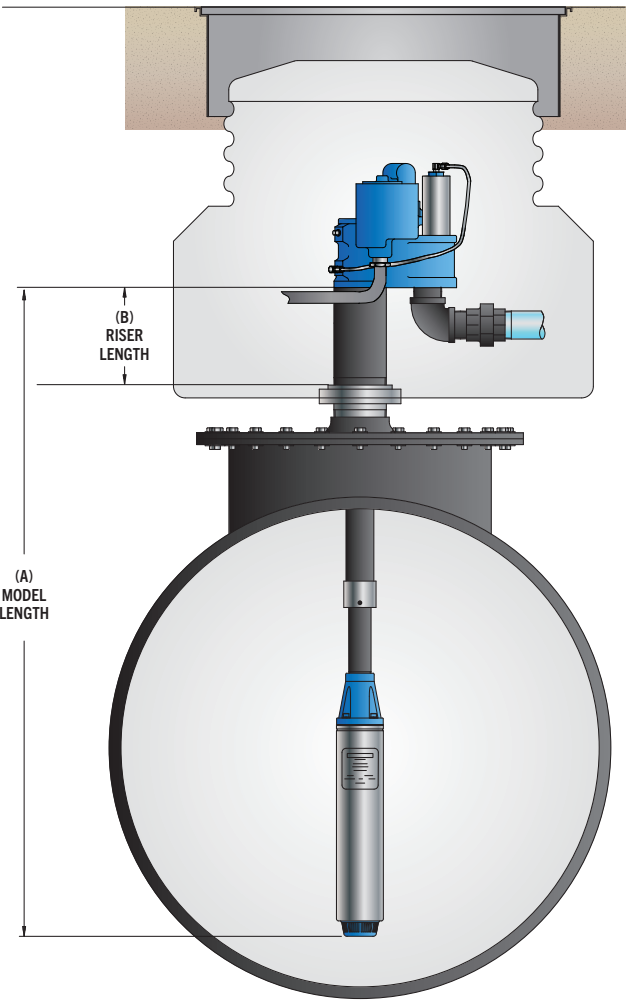
VS4 = 4 hp variable speed

A = Model length (see table)

- VL1 = STP variable length range #1
- VL2 = STP variable length range #2
- VL3 = STP variable length range #3

B = Riser pipe length (diagram above)

Riser pipe length is expressed as two numeric characters that indicate the total length of the riser in inches. Riser pipes are available from 178 mm to 1524 mm in 25.4 mm increments (additional charge for risers 787 mm or longer).



Part	Model Length* Range	Model Length Range Number
2 Hp	1486 mm—2228 mm	VL1
	2274 mm—3835 mm	VL2
	3087 mm—5429 mm	VL3
4 Hp	1613 mm—2355 mm	VL1
	2401 mm—3962 mm	VL2
	3214 mm—5556 mm	VL3

*If not otherwise specified, all models are supplied with standard model check valve (2.76 bar relief/2.41 bar reset for MLD, TS-LS300, and TS-LS500).

**If not otherwise specified, 2 Hp variable speed pump motor horsepower rating is implied for IST® models.

VARIABLE SPEED SUBMERSIBLE TURBINE PUMPS

Maximize profits, minimise expenses. Introduced in 1995, FE PETRO® brand variable speed submersible turbine pumps (STPs) were the first of their kind for the petroleum industry. With faster fill times during peak hours and power savings during non-peak hours, FE PETRO® brand variable speed STPs allow you to maximize profits while minimising operating expenses. Check out these benefits only FE PETRO® brand variable speed STPs, the industry's highest performing 4" diameter STPs, can provide.



HIGHLIGHTS

- Faster, more consistent flow rates than fixed speed systems for higher throughput at virtually the same total cost of ownership.
- Ramping up and down of pressure makes nozzles easier to squeeze and helps reduce overall system wear.
- Energy savings during non-peak business hours and increased flow during peak hours.
- Potential for reduced energy costs without sacrificing a faster customer fuelling experience and without a transducer or special wiring.
- Energy savings during non-peak business hours and increased flow during peak hours.
- Potential for reduced energy costs without sacrificing a faster customer fuelling experience and without a transducer or special wiring.
- A variable speed STP will ramp up and down to provide only the pressure needed to meet demand and significantly minimise the effects of hydraulic hammer.
- Control is determined through the PMA power consumption, eliminating the need for a transducer or special wiring.
- Setup selections include 2 Hp or 4 Hp, MLD or PLLD, gas or diesel, and Primary-Secondary, alternating circuit manifolded pump control options.

Liquid Compatibility

- Max. liquid viscosity: 70 SSU at 60° F (15° C).
- STP variable speed models are listed for fuel mixtures containing up to 10% ethanol, and 20% MTBE, 20% ETBE or 17% TAME with gasoline.
- IST® variable speed models are listed for fuel mixtures containing diesel fuel with up to 20% biodiesel, 100% biodiesel, up to 85% ethanol with gasoline, and 20% MTBE, 20% ETBE or 17% TAME with gasoline.
- All variable speed (non-AG) models can also be used for fuel mixtures containing up to 5% biodiesel with diesel fuels, fuel oils, kerosene, Avgas and jet fuels in a non-gelled pourable state.
- All wetted elastomers are made of a high grade, fluorocarbon compound.

Pump Motor

- 2 Hp or 4 Hp, variable speed, two-stage centrifugal type pump motor with integral, automatic, thermal overload protection.
- Max. pressure: selectable operating pressure on VFGC or EcoVFC™ between 1.65 bar and 2.9 bar deadhead.
- Available with MAGSHELL® which results in 45% increased flow area around motor.

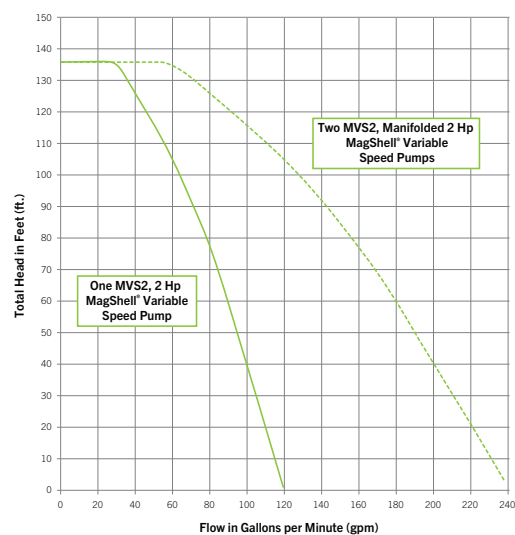
Power Requirements

- Variable speed pumps can only be controlled by a VFGC or EcoVFC™ variable frequency controller:
- VS2 models can operate with single-phase incoming power supply to the VFGC.
- VS2 and VS4 models can operate with three-phase incoming power supply to the EcoVFC™.
- Incoming power supply is 200-250 VAC, 50 Hz for the VFGC and 360-440 VAC, 50 Hz for the EcoVFC™.
- VFGC and EcoVFC™ output a three-phase, variable frequency signal, valid for FE PETRO® variable speed pumps only.
- VS2 max. motor draw: 9 Amps.
- VS4 max. motor draw: 15 Amps.
- VFGC or EcoVFC™ max. line draw: 20 Amps.

SPECIFICATIONS

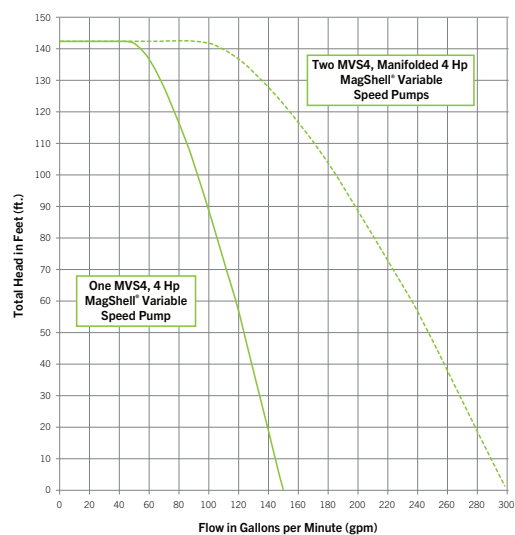
Variable Speed Models	In variable length only
Check Valve	70 mm diameter fluorocarbon and steel backing washer
Pressure Relief Valve	Available in four pressure relief settings, integral to check valve. Standard model relieves at 2.76 bar and resets above 2.41 bar.
Syphon	Venturi-type syphon supplies with every submersible. Syphon check valve and secondary syphon sold separately.
Air Eliminator	Every submersible includes a tank return path with one-way check valve to provide active air elimination
Electrical Disconnect	Electrical yoke for positive contractor disconnect

2 Hp Variable Speed Pump Performance Chart



Performance based on pumping gasoline (0.72 specific gravity). Pressure is taken at the manifold discharge outlet. ISTM and STPMVS2 turbines can only be powered by a Guardian Series™ VFC with single or three phase incoming power.

4 Hp Variable Speed Pump Performance Chart



Performance based on pumping gasoline (0.72 specific gravity). Pressure is taken at the manifold discharge outlet. ISTMVS4 and STPMVS4 turbines can only be powered by a Guardian Series™ VFC with three phase incoming power.

ORDER INFORMATION

Ordering Guide

A typical turbine model designation has up to five components to define the pump being supplied as follows:

STP XXXXX Y - A - B

XXX = Basic model designation

- STP = These standard variable speed and variable length models are capable of up to 10% ethanol with gasoline.
- IST** = These variable speed and variable length models include alcohol-gasoline compatibility (up to 85% ethanol, up to 20% biodiesel, or 100% biodiesel).

YYYYY = Factory installed options

- Model designations may include one or more of the following characters in alphabetical order:
- F = Floating suction adapter (1½" NPT female adapter)
- K = Intake filter screen (IFS, factory installed to PMA)
- M = MagShell® (flow enhancing, expanded PMA shell)
- R* = Model R check valve (1.65 bar relief/1.52 bar reset for PLLD)

Z = Pump motor horsepower rating

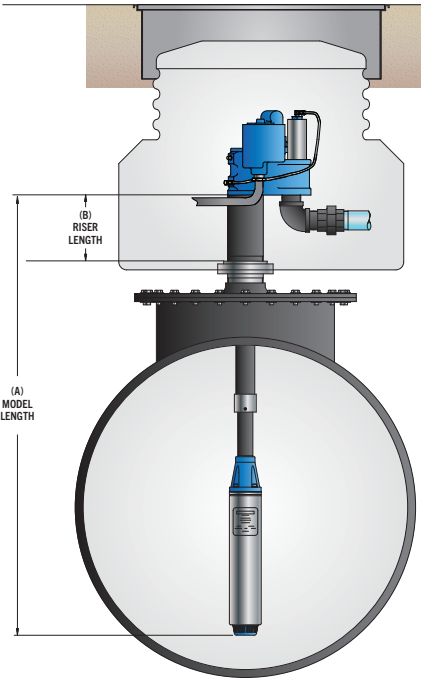
- VS2** = 2 Hp variable speed
- VS4 = 4 Hp variable speed

A = Model length (see table)

- VL1 = STP variable length range #1
- VL2 = STP variable length range #2
- VL3 = STP variable length range #3

B = Riser pipe length (diagram above)

Riser pipe length is expressed as two numeric characters that indicate the total length of the riser in inches. Riser pipes are available from 178 mm to 1524 mm in 25.4 mm increments (additional charge for risers 787 mm or longer).



Part	Model Length* Range	Model Length Range Number
2 Hp	1486 mm—2228 mm	VL1
	2274 mm—3835 mm	VL2
	3087 mm—5429 mm	VL3
4 Hp	1613 mm—2355 mm	VL1
	2401 mm—3962 mm	VL2
	3214 mm—5556 mm	VL3

*If not otherwise specified, all models are supplied with standard model check valve (2.76 bar relief/2.41 bar reset for MLD, TS-LS300, and TS-LS500).

**If not otherwise specified, 2 Hp variable speed pump motor horsepower rating is implied for IST® models.

Variable Speed Submersible Turbine Pumps

Variable speed, variable length.

Model	Description	Model Length Range Number	Model Length Range*
STPVS2-VL1	2 hp variable speed	VL1	1486 mm—2228 mm
STPVS2-VL2	2 hp variable speed	VL2	2274 mm—3835 mm
STPVS2-VL3	2 hp variable speed	VL3	3087 mm—5429 mm
STPVS4-VL1	4 hp variable speed	VL1	1613 mm—2355 mm
STPVS4-VL2	4 hp variable speed	VL2	2401 mm—3962 mm
STPVS4-VL3	4 hp variable speed	VL3	3214 mm—5556 mm

ORDER INFORMATION CONTINUED

Variable Speed Intelligent Submersible Turbine Pumps

Variable speed, variable length, and AG compatible.

Model	Description	Model Length Range Number	Model Length Range*
IST1	2 hp AG variable speed	VL1	1486 mm—2228 mm
IST2	2 hp AG variable speed	VL2	2274 mm—3835 mm
IST3	2 hp AG variable speed	VL3	3087 mm—5429 mm
ISTVS4-VL1	4 hp AG variable speed	VL1	1613 mm—2355 mm
ISTVS4-VL2	4 hp AG variable speed	VL2	2401 mm—3962 mm
ISTVS4-VL3	4 hp AG variable speed	VL3	3214 mm—5556 mm

1. All STP models are listed for compatibility with fuel mixtures containing up to 10% ethanol with gasoline, up to 5% biodiesel with diesel fuels, and 20% MTBE, 20% ETBE or 17% TAME with gasoline.

2. All IST® models are compatible with fuel mixtures containing diesel fuel with up to 20% biodiesel, 100% biodiesel, up to 85% ethanol with gasoline, and 20% MTBE, 20% ETBE or 17% TAME with gasoline.

3. All models are supplied with a standard check valve unless factory option "R" is specified.

4. 4 hp models require EcoVFC™ with three-phase incoming power supply, 2 hp models can be powered by VFGC or EcoVFC™.

5. 4" riser pipe, if supplied locally, must be 4½" OD by 3/16" WT tubing.

6. For riser pipe length 787 mm to 1524 mm additional charge applies (call customer service for lead times).

*Model length (A) defined as the dimension from turbine manifold bottom to pump motor inlet.

Factory Installed Approvals

Specify one in model number at time of STP order.

Model	Description
(ATXF)	Submersible turbine pumps with ATEX flameproof approval for EN markets
(RT)	Submersible turbine pumps with ROSTEST approval for Eastern European markets

Note: If not otherwise specified, all models are supplied to UL approval as standard. Consult Factory for other local approvals.

Factory Installed Options

Specified in model number at time of STP order.

Model	Description
F	Floating suction adapter, 1½" NPT female, must be factory installed
K	IFS (intake filter screen) factory assembled to pump motor assembly
M	Magshell™ (flow enhancing, expanded PMA shell)
R	Model R check valve, factory installed, for Veeder-Root®™ PLLD line leak

Field Installed Options

Intelligent submersible turbine pump specific accessories.

Model	Description
5874202800	VFGC, 200-250 VAC, 50-60 Hz, one required per STP or IST®
5874202900	EcoVFC™, 360-440 VAC, 50-60 Hz, one required per STP or IST®
400137937	Syphon check valve, alcohol-gasoline compatible
402459931	Model 65 psi (4.5bar) relief check valve (AG compatible for slave of manifolded STPs or ISTs® with Veeder-Root® PLLD)
402507930	Secondary syphon kit (when two syphon primes are required for one STP or IST®)
5800300200	STP-DHIB dispenser hook isolation for 240 volt dispenser handle switches, up to eight each

2 HP FIXED SPEED SUBMERSIBLE TURBINE PUMPS

Marketers concerned about fuelling times, efficiency, serviceability, reliability and overall quality find it an easy choice to specify FE PETRO® brand submersible turbine pumps (STPs). An STP has to be reliable, it has to be safe, and it has to perform. That's why thousands of station owners around the world have trusted FE PETRO® STPs and the Franklin Electric motors that drive them to keep their business flowing for over 30 years. With best-in-class flow rates and backed by a long history of dependability FE PETRO® STPs simply do their job without fail, delivering fuel to customers day after day without a hitch.

HIGHLIGHTS

Faster Fuelling Times

Available on FE PETRO® brand 2 Hp models, a MagShell® expands the pump motor shell to increase the flow area around the motor by 45%. The expanded flow area creates significantly higher flow rates compared to a traditional pump motor shell. This additional flow capability is equivalent to having one more nozzle open during peak operating times.

Active Air Eliminator

FE PETRO® brand STPs come standard with active air elimination, which eliminates air through the highest point in the pump head at all times when the pump is running, assuring air does not pass into discharge piping.

Manual Pressure Relief

As a standard FE PETRO® feature a vent screw is provided to bleed line pressure to zero when necessary. By turning this screw, product is diverted back to the tank, dropping line pressure to zero. This reduces fuel discharged into the sump manhole or dispenser pan during servicing, further protecting service technicians and the environment.

Simple Servicing

If ever required, the pump can be easily removed from the tank by unthreading three bolts. There is no need to disconnect the syphon system or to remove the leak detector from the system to service the STP.



Variable Length

The VL2 pump fits 94% of all known tank diameters and tank bury depth combinations. The VL1 and VL3 are available to handle installations shorter or longer than this range. The telescoping connection is a patented FE PETRO® feature. Pump length can be set by making one simple measurement and setting the pump length without affecting the UL listing.

Reliable Check Valve

The STP uses the proven FE PETRO® line check valve. At 70 mm in diameter, this valve reduces pressure loss at high flow rates resulting in faster fuelling times. FE PETRO® line check valves are offered in multiple configurations to best suit your line leak application.

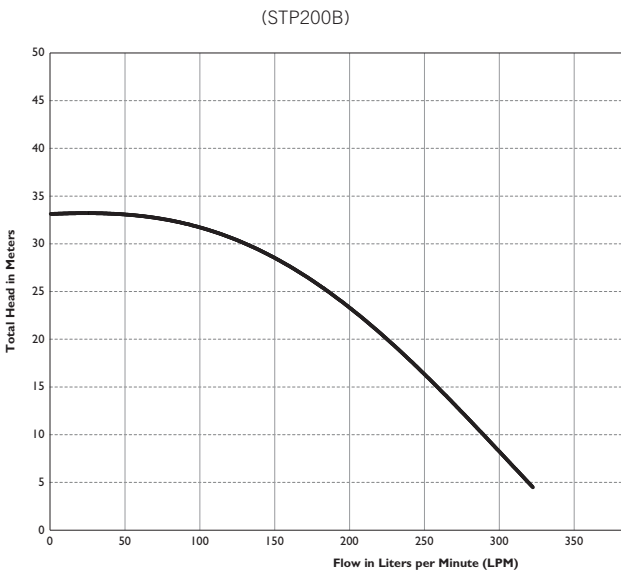
Outlast, Outperform with Franklin Electric Inside

FE PETRO® STPs are powered by the legendary Franklin Electric motor and built for long term performance. Franklin Electric-powered submersible pumps provide maximum uptime and a proven track record in the fuelling industry that spans more than four decades. They feature best-in-class flow rates and a long history of dependability.

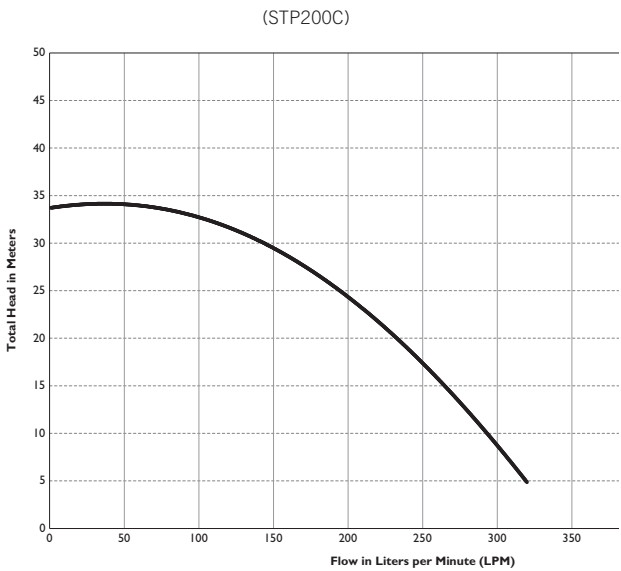
SPECIFICATIONS

Power Requirements	- 200B models require single-phase, 200-250 VAC, 50 Hz incoming power. - 200B models incorporate a starting and running capacitor, with internal bleed resistor, rated 440 Volt, 40 microfarad. - SPGC-220 single-phase Guardian controllers and STP-CBBS single-phase control boxes are available for 200B control. - 200C models require three-phase, 380-415 VAC, 50 Hz incoming power. - TPGC-380 three-phase Guardian controller and STP-CBB three-phase magnetic starter available for 200C control.	Pump Motor	- 2 hp fixed speed, 2875 rpm, multi-stage centrifugal type pump motor with integral, automatic, thermal overload protection. - Available with MagShell® for 45% increased flow area around motor.
Liquid Compatibility	- Max. liquid viscosity: 70 SSU at 60° F (15° C). - Standard STP models are listed for fuel mixtures containing up to 10% ethanol with gasoline, and 20% MTBE, 20% ETBE or 17% TAME with gasoline. - STPAG (AG compatible) models are for fuel mixtures containing diesel fuel with up to 20% biodiesel, 100% biodiesel, up to 85% ethanol with gasoline and 20% MTBE, 20% ETBE or 17% TAME with gasoline. - 2 hp fixed speed models can also be used for fuel mixtures containing up to 5% biodiesel with diesel fuels, fuel oils, kerosene, Avgas and jet fuels in a non-gelled pourable state. - All wetted elastomers are made of a high grade, fluorocarbon compound.	Models	2 hp fixed speed models are available in variable length and fixed length options
		Check valve	70 mm diameter fluorocarbon seal constructed on cast aluminum body and steel backing washer.
		Pressure relief valve	Available in four pressure relief settings, integral to check valve. Standard model relieves at 2.76 bar and resets above 2.41 bar.
		Syphon	Venturi-type syphon primer supplies with every submersible. Syphon check valve and secondary syphon sold separately.
		Air eliminator	Every submersible includes a tank return path with one-way check valve to provide active air elimination.
		Electrical disconnect	Electrical yoke for positive contractor disconnect during service.
		Approvals & Certifications	- Consult factory for applicable approvals. - Franklin Electric is an ISO 9001 Certified Manufacturer.

2 Hp Fixed Speed Turbine Performance Chart



Note: Performance based on pumping solvent (0.78 specific gravity). Pressure is taken at the manifold discharge outlet. Fixed Speed 2.00 HP was powered by Single-Phase, 50 Hz, 250 Volt incoming supply.



Note: Performance based on pumping solvent (0.78 specific gravity). Pressure is taken at the manifold discharge outlet. Fixed Speed 2.00 HP was powered by Three-Phase, 50 Hz, 415 Volt incoming supply.

ORDER INFORMATION

2 Hp Fixed Speed Submersible Turbine Pump Model Designation System

A typical turbine model designation has up to five components to define the pump being supplied as follows:

STP XXXXX Y - A - B

STP = Basic model designation

XXXXX = Factory installed options

STP model designations may include one or more of the following characters in alphabetical order:

AG = Alcohol-gasoline compatible (up to 85% ethanol, up to 20% biodiesel, or 100% biodiesel).

Note: Standard models up to 10% ethanol capable.

F = Floating suction adapter (1½" NPT female adapter)

H = High pressure (3.1 bar deadhead (no flow) output)

K = Intake filter screen (IFS, factory installed to PMA)

M = MagShell® (flow enhancing, expanded PMA shell)

*R = Model R check valve (1.65 bar relief/1.52 bar reset for PLLD)

**Note: If not otherwise specified, all STP models supplied with standard model check valve (2.76 bar relief/2.41 bar reset for MLD, TS-LS300 & TS-LS500).*

Y = Pump motor horsepower rating

200B = 2 hp fixed speed, 50 hz, 1-phase

200C = 2 hp fixed speed, 50 hz, 3-phase

A = Model length

VL1 = Variable length range #1

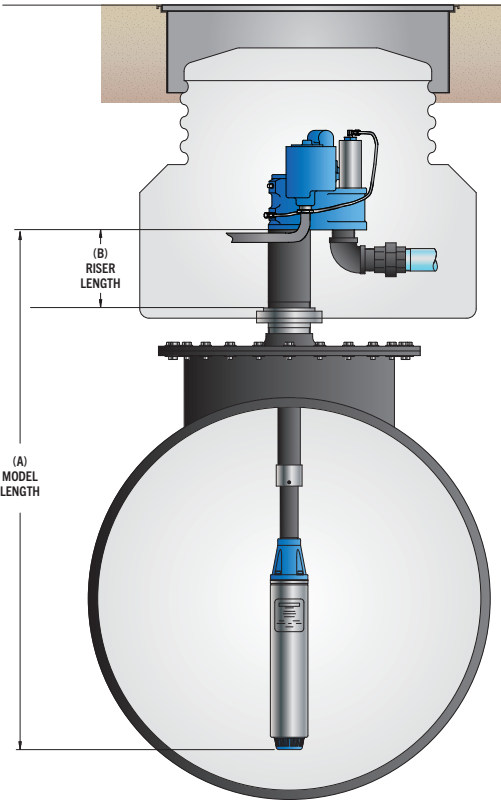
VL2 = Variable length range #2

VL3 = Variable length range #3

Note: VL2 models fit 94% of all known installations.

B = Riser pipe length

Riser pipe length is expressed as two numeric characters that indicate the total length of the riser in inches. Riser pipes are available from 178 mm to 1524 mm in 25.4 mm increments (additional charge for risers 787 mm or longer).



Model Length (A)

Part	Model Length* Range	Model Length Range Number
200B	1632 mm—2374 mm	VL1
	2420 mm—3981 mm	VL2
	3233 mm—5575 mm	VL3
200C	1575 mm—2317 mm	VL1
	2363 mm—3924 mm	VL2
	3175 mm—5518 mm	VL3

2 Hp Fixed Speed Submersible Turbine Pumps

Model	Description	Model Length Range Number	Model Length* Range
STP200B-VL1	2 hp fixed speed, single-phase	VL1	1632 mm—2374 mm
STP200B-VL2	2 hp fixed speed, single-phase	VL2	2420 mm—3981 mm
STP200B-VL3	2 hp fixed speed, single-phase	VL3	3233 mm—5575 mm
STP200C-VL1	2 hp fixed speed, three-phase	VL1	1575 mm—2317 mm
STP200C-VL2	2 hp fixed speed, three-phase	VL2	2363 mm—924 mm
STP200C-VL3	2 hp fixed speed, three-phase	VL3	3175 mm—5518 mm

ORDER INFORMATION CONTINUED

Alcohol-Gas (AG) 2 Hp Fixed Speed Submersible Turbine Pumps

Alcohol-Gasoline Model	Description	Model Length Range Number	Model Length* Range
STPAG200B-VL1	2 hp AG fixed speed, single-phase	VL1	1632 mm—2374 mm
STPAG200B-VL2	2 hp AG fixed speed, single-phase	VL2	2420 mm—3981 mm
STPAG200B-VL3	2 hp AG fixed speed, single-phase	VL3	3233 mm—5575 mm
STPAG200C-VL1	2 hp AG fixed speed, three-phase	VL1	1575 mm—2317 mm
STPAG200C-VL2	2 hp AG fixed speed, three-phase	VL2	2363 mm—3924 mm
STPAG200C-VL3	2 hp AG fixed speed, three-phase	VL3	3175 mm—5518 mm

- Notes:

 1. STP models are compatible with fuel mixtures containing up to 10% ethanol with gasoline, up to 5% biodiesel with diesel fuels, and 20% MTBE, 20% ETBE or 17% TAME with gasoline. STPAG models are compatible with fuel mixtures containing diesel fuel with up to 20% biodiesel, 100% biodiesel, up to 85% ethanol with gasoline, and 20% MTBE, 20% ETBE or 17% TAME with gasoline.
 2. All models are supplied with a standard check valve unless factory option "R" is specified.
3. All 200B models require single-phase, 200-250 VAC, 50 Hz incoming power. All 200C models require three-phase, 380-415 VAC, 50 Hz incoming power
 4. 4" riser pipe, if supplied locally, must be 4½" OD by 3/16" WT tubing.
 5. For riser pipe lengths 787mm to 1524mm, additional charge applies (call customer service for lead times).

*Model length (A) defined as the dimension from turbine manifold bottom to pump motor inlet.

Factory Installed Approvals

May specify one in model number at time of STP order.

Model	Description
(ATXF)	Submersible turbine pumps with ATEX Flameproof approval for EN markets
(RT)	Submersible turbine pumps with ROSTEST approval for Eastern European markets

Note: If not otherwise specified, all models are supplied to UL approval as standard.
Consult Factory for other local approvals.

Factory Installed Options

Specified in model number at time of STP order.

Model	Description
F	Floating suction adapter, 1½" NPT female, must be factory installed
H	High Pressure 3.1 bar deadhead output
K	IFS (intake filter screen) factory assembled to pump motor assembly
M	Magshell™ (flow enhancing, expanded PMA shell)
R	Model R check valve, factory installed, for Veeder-Root® PLLD Line Leak

Field Installed Options

2 hp fixed speed specific accessories.

Model	Description
400137937	Syphon check valve, alcohol-gasoline compatible
5800100220	SPGC-220 Guardian Series™ Single-Phase Controller, 220 Volt
400818922	STP-CBBS, single-phase control box with lockout switch, 240 Volt coil
402312932	STP-DHIB + SPGC-220 bundle
402313922	STP-DHIB-CBBS, combo DHIB with factory wired STP-CBBS
402459931	Model 65 PSI (4.5 bar) relief check valve (AG compatible for slave of manifolded STPs with Veeder-Root® PLLD)
402507930	Secondary syphon kit (when two syphon primes are required for one STP)
401220965	STP-CBB3C, three phase 380-415 VAC magnetic starter
5800300200	STP-DHIB, dispenser hook isolation for 240 Volt dispenser handle switches, up to eight each
5800103380	TPGC-380 Guardian Series™ Three-Phase Controller, 380 Volt

1 1/2 HP FIXED SPEED SUBMERSIBLE TURBINE PUMPS

Marketers concerned about fuelling times, efficiency, serviceability, reliability, and overall quality find it an easy choice to specify FE PETRO® brand submersible turbine pumps (STPs). An STP has to be reliable, it has to be safe, and it has to perform. That's why thousands of station owners around the world have trusted FE PETRO® STPs and the Franklin Electric motors that drive them to keep their business flowing for over 30 years. With best-in-class flow rates and backed by a long history of dependability FE PETRO® STPs simply do their job without fail, delivering fuel to customers day after day without a hitch.

HIGHLIGHTS

Active Air Eliminator

FE PETRO® brand STPs come standard with active air elimination, which eliminates air through the highest point in the pump head at all times when the pump is running, assuring air does not pass into discharge piping.

Safety and Ease of Maintenance

FE PETRO® brand STPs include a contractor electrical disconnect, which requires loosening only one bolt, allowing motor wiring to be disconnected without venting the dangerous tank vapours into the sump when servicing FE PETRO® submersible products.

Manual Pressure Relief

As a standard FE PETRO® feature a vent screw is provided to bleed line pressure to zero when necessary. By turning this screw, product is diverted back to the tank, dropping line pressure to zero. This reduces fuel discharged into the sump manhole or dispenser pan during servicing, further protecting service technicians and the environment.

Simple Servicing

If ever required, the pump can be easily removed from the tank by unthreading three bolts. There is no need to disconnect the syphon system or to remove the leak detector from the system to service the STP.



Variable Length

The VL2 pump fits 94% of all known tank diameters and tank bury depth combinations. The VL1 and VL3 are available to handle installations shorter or longer than this range. The telescoping connection is a patented FE PETRO® feature. Pump length can be set by making one simple measurement and setting the pump length without affecting the UL listing.

Reliable Check Valve

The STP uses the proven FE PETRO® line check valve. At 70 mm in diameter, this valve reduces pressure loss at high flow rates resulting in faster fuelling times. FE PETRO® line check valves are offered in multiple configurations to best suit your line leak application.

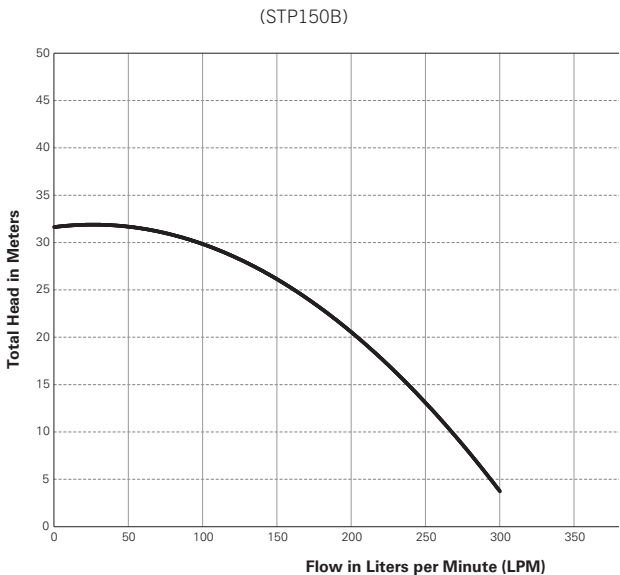
Outlast, Outperform with Franklin Electric Inside

FE PETRO® STPs are powered by the legendary Franklin Electric motor and built for long term performance. Franklin Electric-powered submersible pumps provide maximum uptime and a proven track record in the fuelling industry that spans more than four decades. They feature best-in-class flow rates and a long history of dependability.

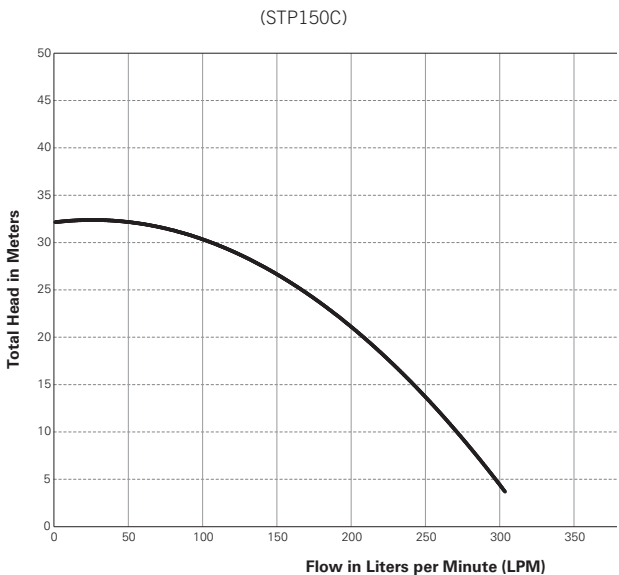
SPECIFICATIONS

Liquid Compatibility	- Max. liquid viscosity: 70 SSU at 60° F (15°C). - Standard models are listed for fuel mixtures containing up to 10% ethanol with gasoline, and 20% MTBE, 20% ETBE, or 17% TAME with gasoline. - STPAG models are compatible for fuel mixtures containing diesel fuel with up to 20% biodiesel, 100% biodiesel, up to 85% ethanol with gasoline, and 20% MTBE, 20% ETBE, or 17% TAME with gasoline. - 1½ hp fixed speed models can also be used for fuel mixtures containing up to 5% biodiesel with diesel fuels, fuel oils, kerosene, Avgas and jet fuels in a non-gelled, pourable state. - All wetted elastomers are made of a high grade, fluorocarbon compound.	Pump Motor	1½ hp fixed speed, 2875 rpm, multi-stage centrifugal type pump motor with integral, automatic, thermal overload protection.
		Models	1½ hp fixed speed models are available in variable length and fixed length options.
		Check valve	70 mm diameter fluorocarbon seal constructed on cast aluminum body and steel backing washer.
		Pressure relief valve	Available in four pressure relief settings, integral to check valve. Standard model relieves at 2.76 bar and resets above 2.41 bar.
		Syphon	Venturi-type syphon primer supplies with every submersible. Syphon check valve and secondary syphon sold separately.
		Air eliminator	Every submersible includes a tank return path with one-way check valve to provide active air elimination.
Power Requirements	- 150B models require single-phase, 200-250 VAC, 50 Hz incoming power. - 150B models incorporate a starting and running capacitor, with internal bleed resistor, rated 440 Volt, 15 microfarad. - SPGC-220 single-phase Guardian controllers and STP-CBBS single-phase control boxes are available for 150B control. - 150C models require three-phase, 380 – 415 V, 50 Hz incoming power. - TPGC-380 three-phase Guardian controllers and STP-CBB three-phase magnetic starters available for 150C control.	Electrical disconnect	Electrical yoke for positive contractor disconnect during service.
		Approvals & Certifications	- Consult factory for applicable approvals. - Franklin Electric is an ISO 9001 Certified Manufacturer.

1½ HP Fixed Speed Turbine Performance Chart



Note: Performance based on pumping solvent (0.78 specific gravity). Pressure is taken at the manifold discharge outlet. Fixed Speed 1.5 HP was powered by Single-Phase, 50 Hz, 250 Volt incoming supply.



Note: Performance based on pumping solvent (0.78 specific gravity). Pressure is taken at the manifold discharge outlet. Fixed Speed 1.50 HP was powered by Three-Phase, 50 Hz, 415 Volt incoming supply.

ORDER INFORMATION

1½ hp Fixed Speed Submersible Turbine Pump Model Designation System

A typical turbine model designation has up to five components to define the pump being supplied as follows:

STP XXXXX Y - A - B

STP = Basic model designation

XXXXX = Factory installed options

STP model designations may include one or more of the following characters in alphabetical order:

AG = Alcohol-gasoline compatible (up to 85% ethanol, up to 20% biodiesel, or 100% biodiesel).

Note: Standard models up to 10% ethanol or methanol capable.

F = Floating suction adapter (1½" NPT female adapter)

H = High pressure (3.1 bar deadhead (no flow) output)

K = Intake filter screen (IFS, factory installed to PMA)

*R = Model R check valve (1.65 bar relief/1.52 bar reset for PLLD)

**Note: If not otherwise specified, all STP models supplied with standard model check valve (2.76 bar relief/2.41 bar reset for MLD, TS-LS300 and TS-LS500).*

Y = Pump motor horsepower rating

150B = 1½ hp fixed speed, 50 Hz, 1-phase

150C = 1½ hp fixed speed, 50 Hz, 3-phase

A = Model length

VL1 = Variable length range #1.

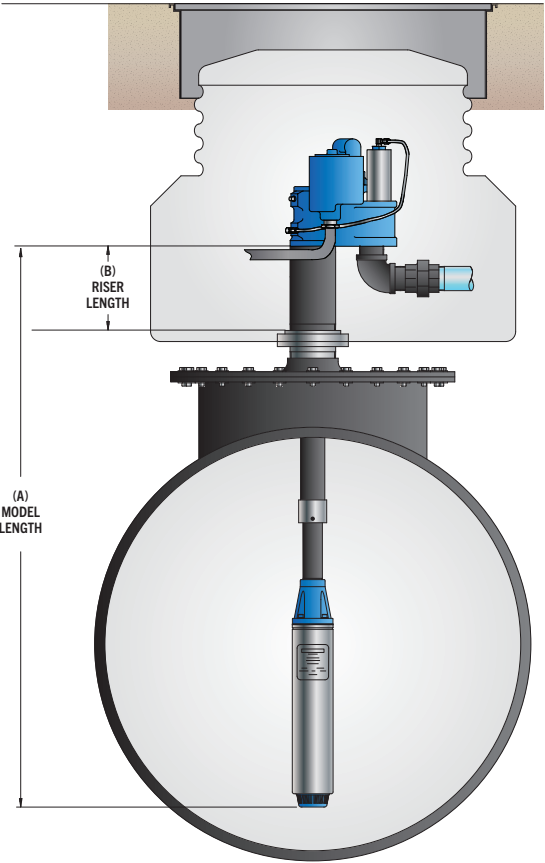
VL2 = Variable length range #2.

VL3 = Variable length range #3.

Note: VL2 models fit 94% of all known installations.

B = Riser pipe length

Riser pipe length is expressed as two numeric characters that indicate the total length of the riser in inches. Riser pipes are available from 178 mm to 1524 mm in 25.4 mm increments (additional charge for risers 787mm or longer).



Part	Model Length* Range	Model Length Range Number
150B	1556 mm—2298 mm	VL1
	2344 mm—3905 mm	VL2
	3156 mm—5499 mm	VL3
150C	1531 mm—2273 mm	VL1
	2318 mm—3879 mm	VL2
	3131 mm—5473 mm	VL3

1½ HP Fixed Speed Submersible Turbine Pumps

Model	Description	Model Length Range Number	Model Length* Range
STP150B-VL1	1½ hp fixed speed, single-phase	VL1	1556 mm—2298 mm
STP150B-VL2	1½ hp fixed speed, single-phase	VL2	2344 mm—3905 mm
STP150B-VL3	1½ hp fixed speed, single-phase	VL3	3156 mm—5499 mm
STP150C-VL1	1½ hp fixed speed, three-phase	VL1	1531 mm—2273 mm
STP150C-VL2	1½ hp fixed speed, three-phase	VL2	2318 mm—3879 mm
STP150C-VL3	1½ hp fixed speed, three-phase	VL3	3131 mm—5473 mm

ORDER INFORMATION CONTINUED

Alcohol-Gas (AG) 1½ Hp Fixed Speed Submersible Turbine Pumps

Alcohol-Gasoline Model	Description	Model Length Range Number	Model Length* Range
STPAG150B-VL1	1½ hp AG fixed speed, single-phase	VL1	1556 mm—2298 mm
STPAG150B-VL2	1½ hp AG fixed speed, single-phase	VL2	2344 mm—3905 mm
STPAG150B-VL3	1½ hp AG fixed speed, single-phase	VL3	3156 mm—5499 mm
STPAG150C-VL1	1½ hp AG fixed speed, three-phase	VL1	1531 mm—2273 mm
STPAG150C-VL2	1½ hp AG fixed speed, three-phase	VL2	2318 mm—3879 mm
STPAG150C-VL3	1½ hp AG fixed speed, three-phase	VL3	3131 mm—5473 mm

Notes:

1. STP models are compatible with fuel mixtures containing up to 10% ethanol with gasoline, up to 5% biodiesel with diesel fuels, and 20% MTBE, 20% ETBE or 17% TAME with gasoline. STPAG models are compatible with fuel mixtures containing diesel fuel with up to 20% biodiesel, 100% biodiesel, up to 85% ethanol with gasoline, and 20% MTBE, 20% ETB, or 17% TAME with gasoline.

2. All models are supplied with a standard check valve unless factory option "R" is specified.

3. All 150B models require single-phase, 200-250 VAC, 50 Hz incoming power. All 150C models require three-phase, 380-415 VAC, 50 Hz incoming power

4. 4" riser pipe, if supplied locally, must be 4½" OD by 3/16" WT tubing.

5. For riser pipe lengths 787 mm to 1524 mm, additional charge applies (call customer service for lead times).

*Model length (A) defined as the dimension from turbine manifold bottom to pump motor inlet.

Factory Installed Approvals

May specify one in model number at time of STP order.

Model	Description
(ATXF)	Submersible turbine pumps with ATEX flameproof approval for EN markets
(RT)	Submersible turbine pumps with ROSTEST approval for Eastern European markets

Note: If not otherwise specified, all models are supplied to UL approval as standard.

Consult Factory for other local approvals.

Factory Installed Options

Specified in model number at time of STP order.

Model	Description
F	Floating suction adapter, 1½" NPT female, must be factory installed
H	High pressure 3.1 bar deadhead output
K	IFS (intake filter screen) factory assembled to pump motor assembly
R	Model R check valve, factory installed, for Veeder-Root® PLLD Line Leak

Field Installed Options

1½ hp fixed speed specific accessories.

Model	Description
400137937	Syphon check valve, alcohol-gasoline compatible
5800100220	SPGC-220 Guardian Series™ Single-Phase Controller, 220 Volt
400818922	STP-CBBS, single-phase control box with lockout switch, 240 Volt coil
402312932	STP-DHIB + SPGC-220 bundle
402313922	STP-DHIB-CBBS, combo DHIB with factory wired STP-CBBS
402459931	Model 65 PSI (4.5 bar) relief check valve (AG compatible for slave of manifolded STPs with Veeder-Root® PLLD)
402507930	Secondary syphon kit (when two syphon primes are required for one STP)
5800103380	TPGC-380 Guardian Series™ Three-Phase Controller, 380 Volt
401220965	STP-CBB3C, three-phase 380-415 VAC magnetic starter
5800300200	STP-DHIB, dispenser hook isolation for 240 Volt dispenser handle switches, up to eight each

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Red Jacket is a trademark of Veeder-Root® Company

3/4 HP FIXED SPEED, 50HZ SUBMERSIBLE TURBINE PUMPS

Marketers concerned about fueling times, efficiency, serviceability, reliability and overall quality find it an easy choice to specify FE PETRO® brand submersible turbine pumps (STPs). An STP has to be reliable, it has to be safe, and it has to perform. That's why thousands of station owners around the world have trusted FE PETRO® STPs and the Franklin Electric motors that drive them to keep their business flowing for over 30 years. With best-in-class flow rates and backed by a long history of dependability FE PETRO® STPs simply do their job without fail, delivering fuel to customers day after day without a hitch.

HIGHLIGHTS

- Active air elimination, which eliminates air through the highest point in the pump head at all times when the pump is running.
- Contractor electrical disconnect, which requires loosening only one bolt, allowing motor wiring to be disconnected without venting the dangerous tank vapours into the sump when servicing.
- Manual pressure relief vent screw to divert product back into tank during maintenance.
- The VL2 pump fits 94% of all known tank diameters and tank bury depth combinations. The VL1 and VL3 are available to handle installations shorter or longer than this range.
- The STP uses the proven FE PETRO® line check valve. At 70 mm in diameter, the line valve reduces pressure loss at high flow rates resulting in faster fuelling times.
- The pump motor is ¾ hp fixed speed, 2875 rpm, multi-stage centrifugal type pump motor with integral, automatic, thermal overload protection.

Liquid Compatibility

- Max. liquid viscosity: 70 SSU at 60° F (15° C).
- Standard models are listed for fuel mixtures containing up to 10% ethanol with gasoline, and 20% MTBE, 20% ETBE, or 17% TAME with gasoline.
- STPAG models are compatible with fuel mixtures containing diesel fuel with up to 20% biodiesel, 100% biodiesel, up to 85% ethanol with gasoline, and 20% MTBE, 20% ETBE, or 17% TAME with gasoline.
- ¾ hp fixed speed models can also be used for fuel mixtures containing up to 5% biodiesel with diesel fuels, fuel oils, kerosene, Avgas and jet fuels in a non-gelled, pourable state.
- All wetted elastomers are made of a high grade, fluorocarbon compound.



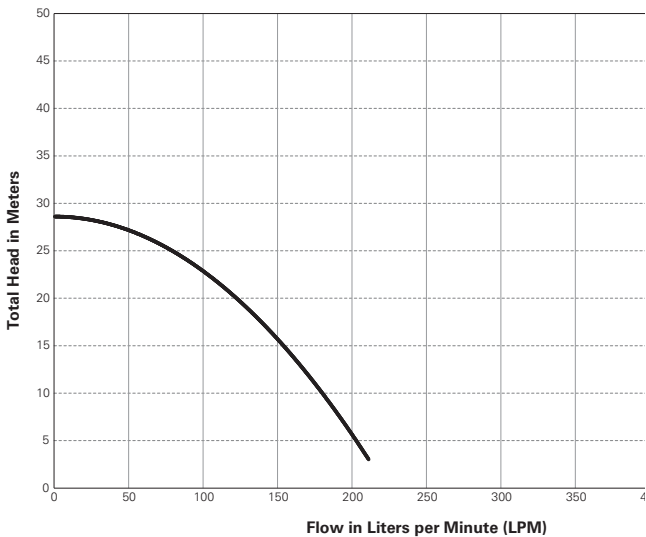
SPECIFICATIONS

Power Requirements	- 75B models require single-phase, 200-250 VAC, 50 Hz incoming power. - 75B models incorporate a starting and running capacitor, with internal bleed resistor, rated 440 Volt, 15 microfarad. - SPGC-220 single-phase Guardian controllers and STP-CBBS single-phase control boxes are available for 75B control. - 75C models require three-phase, 380-415 VAC, 50 Hz incoming power. - TPGC-380 three-phase Guardian controllers and STP-CBB three-phase magnetic starters available for 75C control.
Models	¾ hp fixed speed models are available in variable length and fixed length options
Syphon	Venturi-type syphon primer supplied with every submersible. Syphon check valve and secondary syphon sold separately
Approvals & Certifications	- Consult factory for applicable approvals. - ISO 9001 Certified Manufacturer

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Red Jacket is a trademark of Veeder-Root® Company.*

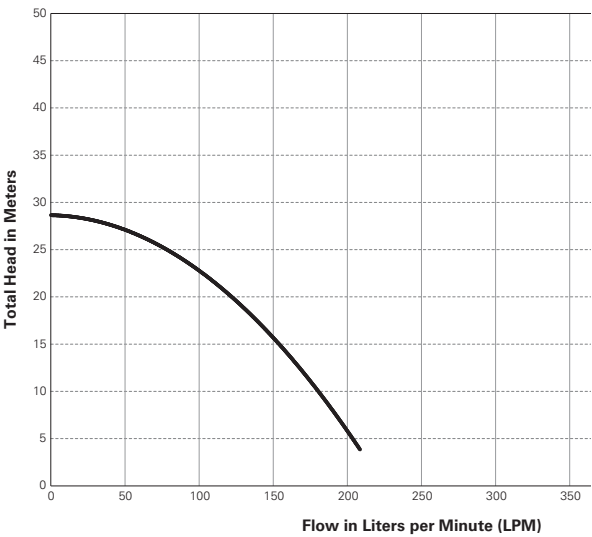
SPECIFICATIONS CONTINUED

3/4 hp Fixed Speed Turbine Performance Chart
(STP75B)



Note: Performance based on pumping solvent (0.78 specific gravity). Pressure is taken at the manifold discharge outlet. Fixed Speed 0.75 HP was powered by Single-Phase, 50 Hz, 250 Volt incoming supply.

(STP75C)



Note: Performance based on pumping solvent (0.78 specific gravity). Pressure is taken at the manifold discharge outlet. Fixed Speed 0.75 HP was powered by Three-Phase, 50 Hz, 415 Volt incoming supply.

ORDER INFORMATION

3/4 hp Fixed Speed STP Model Designation System

A typical turbine model designation has up to five components to define the pump being supplied as follows:

STP XXXXX Y - A - B

STP = Basic model designation

XXXXX = Factory installed options

- STP model designations may include one or more of the following characters in alphabetical order:
- AG = Alcohol-gasoline compatible (up to 85% ethanol, up to 20% biodiesel, or 100% biodiesel).
Note: Standard models up to 10% ethanol capable.
- F = Floating suction adapter (1½" NPT female adapter)
- K = Intake filter screen (IFS, factory installed to PMA)
- *R = Model R check valve (1.65 bar relief/1.52 bar reset for PLLD)
- *Note: If not otherwise specified, all STP models supplied with standard model check valve (2.76 bar relief/2.41 bar reset for MLD, TS-LS300 and TS-LS500).

Y = Pump motor horsepower rating

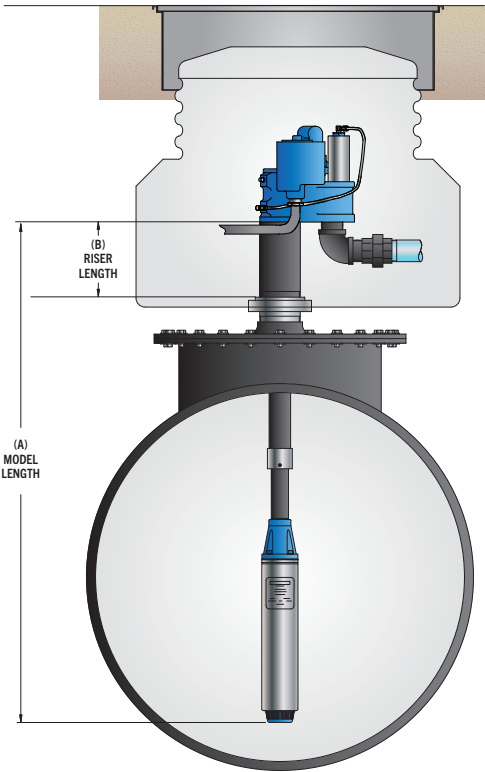
- 75B = 3/4 hp fixed speed, single-phase
- 75C = 3/4hp fixed speed, three-phase

A = Model Length**

- VL1 = Variable length range #1
- VL2 = Variable length range #2
- VL3 = Variable length range #3
- Note: VL2 models fit 94% of all known installations.

B = Riser pipe length

Riser pipe length is expressed as two numeric characters that indicate the total length of the riser in inches. Riser pipes are available from 178 mm-1524 mm in 25.4 mm increments (additional charge for risers 787 mm or longer).



Part	Model Length* Range	Model Length Range Number
75B	1499 mm—2241 mm	VL1
	2286 mm—3848 mm	VL2
	3099 mm—5441 mm	VL3
75C	1480 mm—2222 mm	VL1
	2267 mm—3829 mm	VL2
	3080 mm—5422 mm	VL3

ORDER INFORMATION CONTINUED

3/4 Hp Fixed Speed Submersible Turbine Pumps

Model	Description	Model Length Range Number	Model Length* Range
STP75B-VL1	3/4 hp fixed speed, single-phase	VL1	1499 mm—2241 mm
STP75B-VL2	3/4 hp fixed speed, single-phase	VL2	2286 mm—3848 mm
STP75B-VL3	3/4 hp fixed speed, single-phase	VL3	3099 mm—5441 mm
STP75C-VL1	3/4 hp fixed speed, three-phase	VL1	1480 mm—2222 mm
STP75C-VL2	3/4 hp fixed speed, three-phase	VL2	2267 mm—3829 mm
STP75C-VL3	3/4 hp fixed speed, three-phase	VL3	3080 mm—5422 mm

Alcohol-Gas (AG) 3/4 Hp Fixed Speed Submersible Turbine Pumps

Alcohol-Gasoline Model	Description	Model Length Range Number	Model Length* Range
STPAG75B-VL1	3/4 hp AG fixed speed, single-phase	VL1	1499 mm—2241 mm
STPAG75B-VL2	3/4 hp AG fixed speed, single-phase	VL2	2286 mm—3848 mm
STPAG75B-VL3	3/4 hp AG fixed speed, single-phase	VL3	3099 mm—5441 mm
STPAG75C-VL1	3/4 hp AG fixed speed, three-phase	VL1	1480 mm—2222 mm
STPAG75C-VL2	3/4 hp AG fixed speed, three-phase	VL2	2267 mm—3829 mm
STPAG75C-VL3	3/4 hp AG fixed speed, three-phase	VL3	3080 mm—5422 mm

- Notes:

 - STP models are compatible with fuel mixtures containing up to 10% ethanol with gasoline, diesel fuel, 20% MTBE, 20% ETBE or 17% TAME with gasoline. STPAG models are compatible with fuel mixtures containing diesel fuel with up to 20% biodiesel, 100% biodiesel, up to 85% ethanol with gasoline, and 20% MTBE, 20% ETBE or 17% TAME with gasoline.
 - All models are supplied with a standard check valve unless factory option "R" is specified.
- 4" riser pipe, if supplied locally, must be 4½" OD by 3/16" WT tubing.
 - 75B models require single-phase, 200-250 VAC, 50 Hz power. 75C models require three-phase, 380-415 VAC, 50 Hz power.
 - For riser pipe lengths 787 mm to 1524 mm, additional charge applies (call customer service for lead times).

*Model length (A) defined as the dimension from turbine manifold bottom to pump motor inlet.

Factory Installed Approvals

May specify one in model number at time of STP order.

Model	Description
(ATXF)	Submersible turbine pumps with ATEX Flameproof approval for EN markets
(RT)	Submersible turbine pumps with ROSTEST approval for Eastern European markets

Note: If not otherwise specified, all models are supplied to UL approval as standard.
Consult Factory for other local approvals.

ORDER INFORMATION CONTINUED

Factory Installed Options

Specified in model number at time of STP order.

Model	Description
F	Floating suction adapter, 1½" NPT female, must be factory installed
K	IFS (intake filter screen) factory assembled to pump motor assembly
R	Model R check valve, factory installed, for Veeder-Root® PLLD Line Leak

Field Installed Options

¾ hp fixed speed specific accessories.

Model	Description
400137937	Syphon check valve, alcohol-gasoline compatible
5800100220	SPGC-220 Guardian Series™ Single-Phase Controller, 220 Volt
400818922	STP-CBBS, single-phase control box with lockout switch, 240 Volt coil
402312932	STP-DHIB + SPGC-220 bundle
402313922	STP-DHIB-CBBS, combo DHIB with factory wired STP-CBBS
402459931	Model 65 PSI (4.5 bar) relief check valve (AG compatible for slave of manifolded STPs with Veeder-Root® PLLD)
402507930	Secondary syphon kit (when two syphon primes are required for one STP)
5800103380	TPGC-380 Guardian Series™ Three-Phase Controller, 380 Volt
401220965	STP-CBB3C, three-phase 380-415 VAC magnetic starter
5800300200	STP-DHIB, dispenser hook isolation for 240 Volt dispenser handle switches, up to eight each