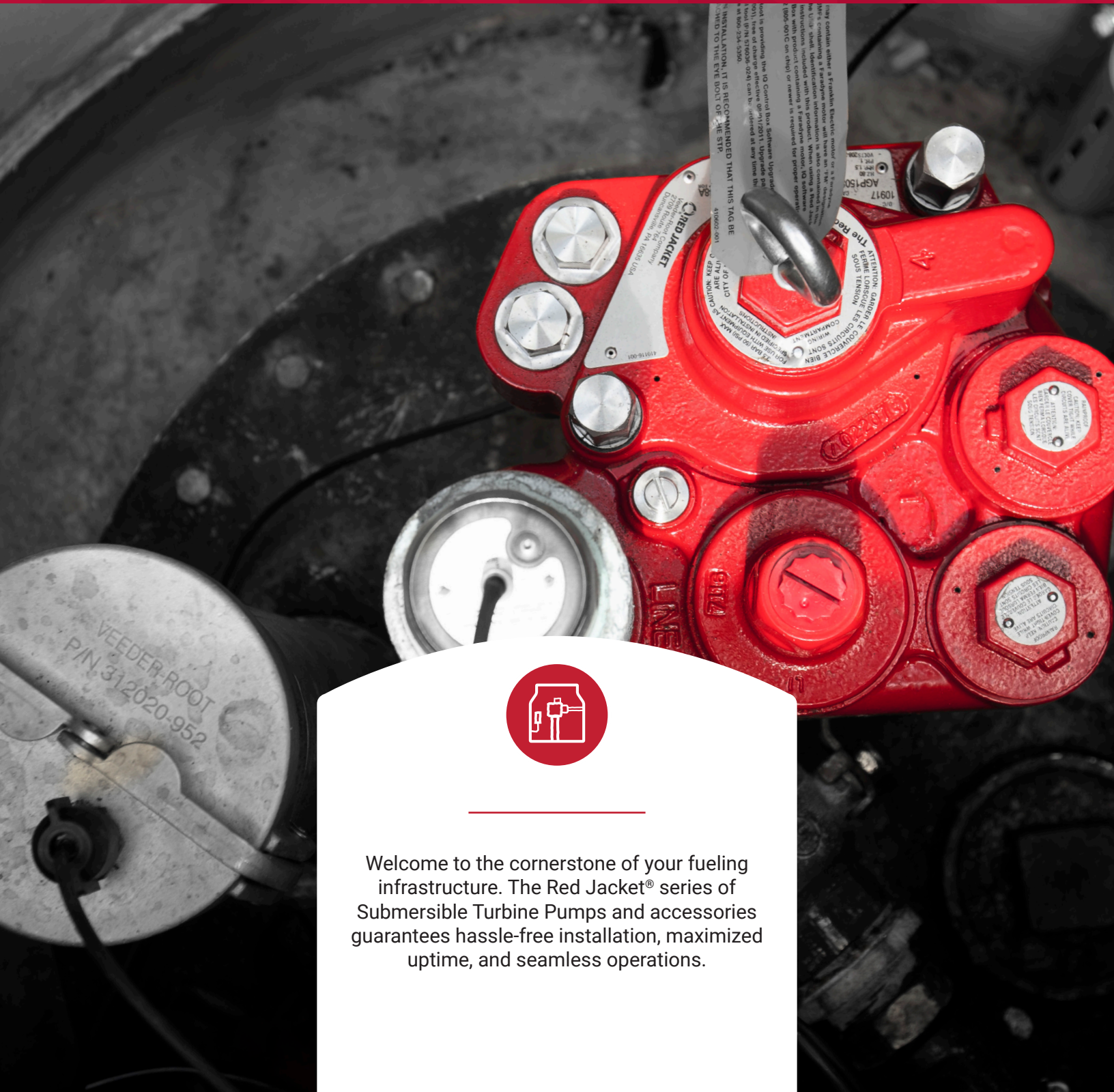


# RED JACKET®

## PRODUCT GUIDE



Welcome to the cornerstone of your fueling infrastructure. The Red Jacket® series of Submersible Turbine Pumps and accessories guarantees hassle-free installation, maximized uptime, and seamless operations.



*Gilbert's*  
FOOD & FUEL

Order At The Pump

*Gilbert's*  
FOOD & FUEL

SAVE


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# System Solutions

## The Hub of Site Operations


Veeder-Root is a leading global supplier of fuel management solutions with a tradition of excellence in the fueling industry. Our products improve profitability and abate risk for customers by delivering solutions to manage on-site operations, compliance reporting, fuel procurement, inventory reconciliation, and accounting processes. Veeder-Root products and services are installed in over 500,000 tanks globally and are responsible for 22 billion gallons of gasoline and diesel fuel annually.



### FUELING STATION ECOSYSTEM



**CONTROL ROOM**



**FORECOURT**

<ul style="list-style-type: none"> <li><span style="color: yellow;">●</span> <b>Control Room</b></li> <li>① TLS-450PLUS Automatic Tank Gauge</li> <li>② TLS-XB Expansion Box</li> <li>③ Red Jacket® IO2 Smart Controller</li> </ul>	<ul style="list-style-type: none"> <li><span style="color: red;">●</span> <b>STP Sump</b></li> <li>– Red Armor® Submersible Turbine Pump</li> <li>– Stainless Steel Riser Pipe</li> <li>– Digital Pressurized Line Leak Detector (DPLLD)</li> <li>– Magnetostrictive Containment Sump Sensor</li> </ul>	<ul style="list-style-type: none"> <li><span style="color: green;">●</span> <b>Dispenser Sump</b></li> <li>– Magnetostrictive Dispenser Pan Sensor</li> <li>– Non-Discriminating Standalone Dispenser Pan Sensor (not pictured)</li> </ul>	<ul style="list-style-type: none"> <li><span style="color: orange;">●</span> <b>Probe &amp; Interstitial Sumps</b></li> <li>– Magnetostrictive Plus Probe with In-Tank Leak Detection Capabilities</li> <li>– Solid-State Discriminating Interstitial Sensor for Fiberglass Tanks</li> </ul>
<ul style="list-style-type: none"> <li><span style="color: blue;">●</span> <b>Groundwater Well</b></li> <li>– Groundwater Sensor</li> </ul>			

## ADVANCED FUEL MANAGEMENT



**Flow Optimization**

Monitor demand at the site and stage on additional pumps to ensure optimal fuel flow at all demand conditions.



**System Redundancy**

Manifold together two Red Jacket Submersible Turbine Pumps (STPs) at sites with high demand to ensure flow rates and the ability for pumps to back each other up.



**Inventory Optimization**

Configure your fueling system to optimize inventory using multiple settings for dispensing fuel from the storage tanks.



**Connectivity**

Connect to your TLS-450PLUS Automatic Tank Gauge (ATG) to activate tanks based on fuel height in line manifolded tanks.

## The Red Jacket® STP

The Red Jacket is a Submersible Turbine Pump solution that optimizes fuel flow and dispensing, while providing industry leading reliability. Its advanced packer manifold design makes it an easy and safe STP to install and service within the industry. Available in ¾ HP to 4 HP configurations and fixed or Quick Set® adjustable lengths. As a Veeder-Root flagship product line, Red Jacket is backed by the largest network of distributors and authorized service contractors worldwide.



### WHY CHOOSE THE RED JACKET



#### Owner/Operator

- ▶ **Most Reliable**  
Minimal Downtime
- ▶ **Lower Total Cost Ownership**  
Affordable to Buy, Own, and Operate
- ▶ **Efficient Inventory Control**  
Balance Tank Levels



#### Distributor

- ▶ **Industry's Most Reliable**  
Satisfied Customers
- ▶ **Lower Purchase Cost**  
Stay Competitive
- ▶ **Hydraulic Hammer**  
No Concern



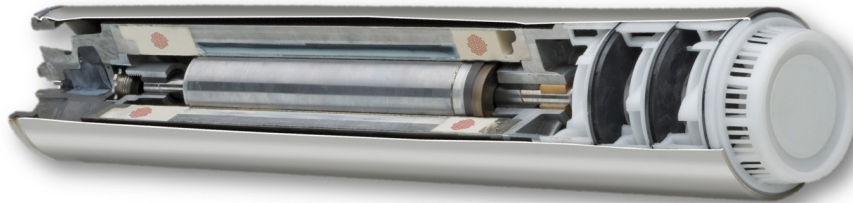
#### Contractor

- ▶ **Simple Installation**  
Easy to Service
- ▶ **Low Cost Controller**  
Affordable to Stock
- ▶ **No Electrical Interference**  
Avoid Signal Conflicts

## Superior Product Performance

### Unitized Motor & Pump (UMP)

---



#### ▶ **PROVEN RELIABILITY**

- Industry proven low field failure rates
- Bearing design and high insulation rating yield long motor life

#### ▶ **SAFETY**

- Separation of connectors helps meet the most demanding flameproof standards

#### ▶ **PERFORMANCE**

- High efficiency
- Maximum flow output
- Low power consumption

#### ▶ **INDUSTRY EXPERTISE**

- Our superior motor design delivers high efficiency, high fuel flow, and low power consumption, allowing Red Jacket to continue to offer the most advanced STPs

### The Red Jacket Packer Manifold

---

#### ▶ **FAST INSTALLATION AND SIMPLE SERVICE AND TESTING**

- Spring mechanisms reduce lifting force during maintenance
- Automatic electrical disconnect for safety during maintenance
- Automatic fuel drain to avoid product spillage during maintenance
- Contractor's Box and Capacitor Housing are isolated from the fuel path and integrated into the packer manifold to improve safety
- Easy line tests and servicing with unique check valve design
- Two vacuum ports support applications requiring multiple vacuum connections



# Reduce Service & Installation Time to Increase Uptime

Less time spent servicing is the key to site uptime with the superior design of the Red Jacket Packer Manifold.



### Automatic Electrical Disconnect

Electrical connection automatically breaks when the two retaining nuts are loosened approximately 12 mm

Automatically reconnects when the nuts are tightened



### Reduced Lifting Force

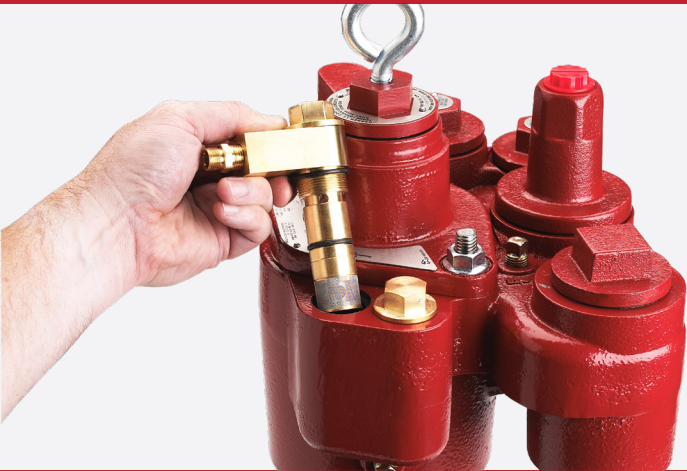
Die springs automatically break the extractable seal at approximately 12 mm, saving up to hundreds of pounds of lifting force

Packer weighs 5 kg for easier lifting



### Automatic Fuel Drain

Fuel in the manifold and non-isolated piping drains safely back to the tank preventing spills and reducing service costs

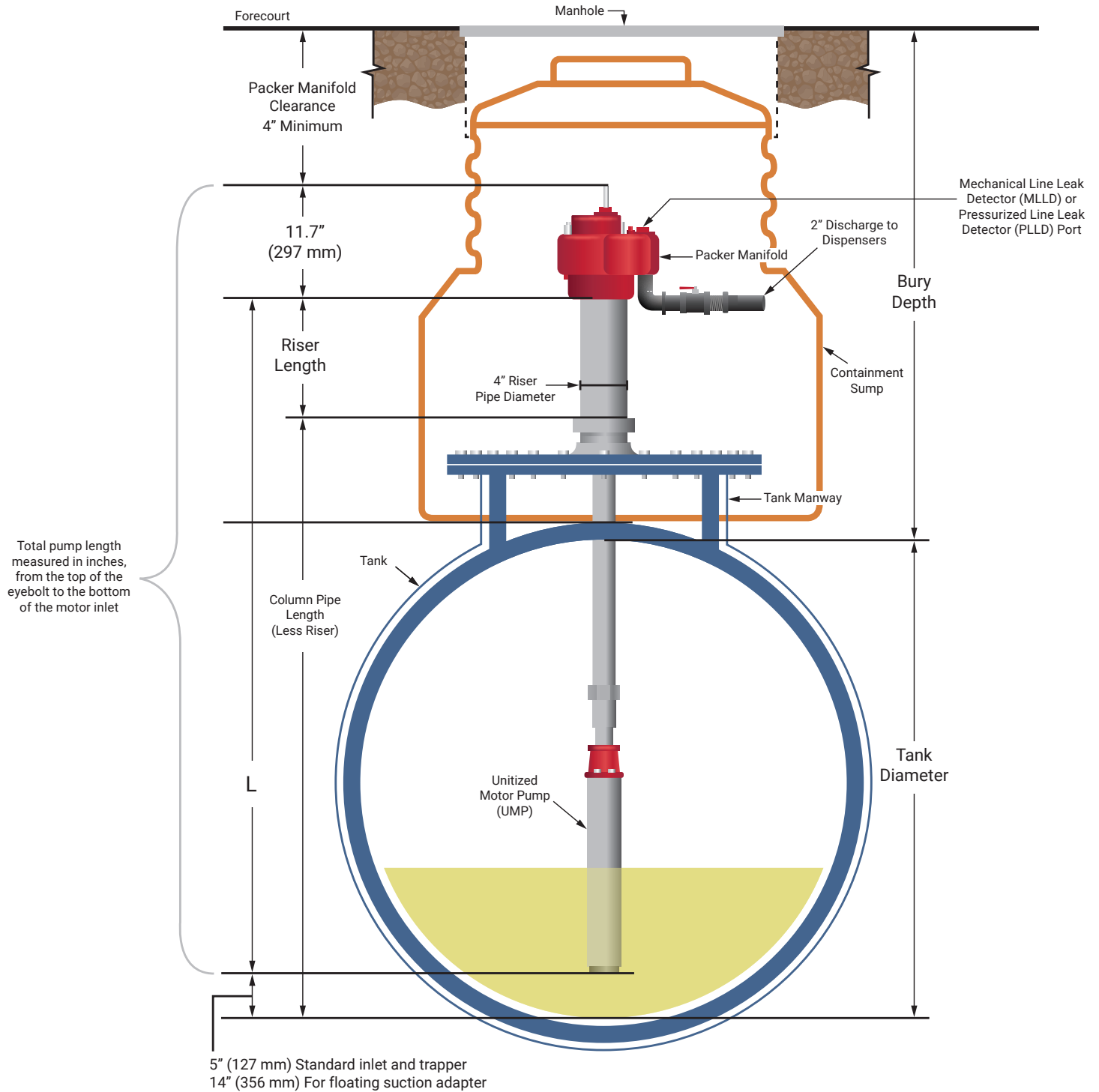


### ▶ KEY FEATURES

- Contractor's Box and Capacitor Housing are isolated from the fuel path and integrated into the packer manifold
- Easier line tests and servicing with unique check valve design
- Upstream siphon filter screen helps minimize the risk of clogging

# Ordering Guide

Red Jacket Submersible Turbine Pumps are designed with adjustable lengths to accommodate a wide range of tank diameters. **This guide illustrates how to determine the correct STP length for your application.**



# Ordering Guide

The Red Jacket® STP portfolio has seven components that make up its different model numbers, for a variety of options depending on your specific site needs<sup>1</sup>:

1. Pump Type
2. Horsepower
3. Pump Design Code
4. Electrical Code
5. Number of Stages (Impellers)
6. Quick Set® Options

## MODEL IDENTIFICATION

Example: **AGP 200 S 1 -3 RJ2**

### PUMP TYPE

- P** = Petroleum
- PL** = Petroleum Low Pressure\*
- AGP** = Alcohol
- AGPL** = Alcohol Low Pressure\*
- X3P** = 3 Impeller Petroleum\*\*
- X4P** = 4 Impeller Petroleum\*\*
- X3AGP** = 3 Impeller Alcohol\*\*
- X4AGP** = 4 Impeller Alcohol\*\*

\* 2 HP Only  
\*\* 1.5 HP Only

### HORSEPOWER

- 75** = 0.75 (3/4)
- 150** = 1.50 (1 1/2)
- 200** = 2.00 (2)
- 300** = 3.00 (3)
- 400** = 4.00 (4)
- 500** = 5.00 (5)

### PUMP DESIGN CODE

- S** = Alcohol Gas Fixed Speed
- U** = Non Alcohol Gas Fixed Speed

### ELECTRICAL CODE

<b>1</b>	1 Phase	60 Hz	208/230V	<b>17</b>	3 Phase	50 Hz	380/415V
<b>3</b>	1 Phase	50 Hz	220/230V	<b>20*</b>	3 Phase	30 - 100 Hz	230V
<b>4</b>	3 Phase	60 Hz	208/230V	* Used with Pump Design Code U Only			

### QUICK SET® LENGTH OPTIONS

- Blank** = Fixed Length Pump
- RJ1** = (74.5" - 105") The Red Jacket
- RJ2** = (104.4" - 165") The Red Jacket
- RJ3** = (164" - 225") The Red Jacket
- RA1** = (74.5" - 105") The Red Armor®
- RA2** = (104.4" - 165") The Red Armor
- RA3** = (164" - 225") The Red Armor

\* Assumes 1.5 HP

### NUMBER OF STAGES (IMPELLERS)

- Blank** = 2 Stages
- 3** = 3 Stages
- 4** = 4 Stages

**Note:** Not used – with "X" series pumps

<sup>1</sup> = This is not a customization guide just a key for the meaning of the numbers and letters in a pump model number.


An aerial, grayscale photograph of a construction site. In the upper center, a white truck is parked on a dirt path. To its left, a tracked vehicle is visible, with its tracks and four sprockets clearly marked. The ground is uneven and shows signs of heavy machinery use. Various construction materials, including bundles of pipes and wooden frames, are scattered around the site. A red banner is overlaid on the bottom left corner.

# The Red Jacket

## Product Portfolio



### 4" Pumps

- The Red Jacket STP
- The Red Jacket AG STP
- The Red Armor STP 

Pages 10 - 23



### Maxxum 6" High Capacity Pumps

- The Red Jacket 3 HP Maxxum Pump
- The Red Jacket 5 HP Maxxum Pump

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### Liquefied Petroleum Gas (LPG) Pumps

- The Red Jacket LPG Premier Pump
- The Red Jacket LPG Premier MidFlow Pump
- The Red Jacket LPG Premier HiFlow Pump

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### Leak Detection

- Mechanical Line Leak Detectors (FXV Series)
- Biofuel Mechanical Line Leak Detectors (BFX Series) 
- Digital Pressurized Line Leak Detection System

Pages 28 - 30



### STP Accessories

- The Red Jacket Stainless Steel Riser Pipes 
- The Red Jacket Trapper Intake Screen 

Pages 31 - 32



### Control Boxes

- The Red Jacket IQ2 Smart Controller
- The Red Jacket IQ Smart Control Box
- The Red Jacket Standard Control Box
- The Red Jacket ISOTROL™ 1-8 Control Box

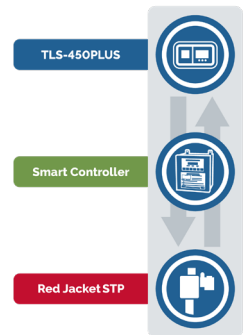
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### The Red Jacket STP Fixed Speed Conversion Kits

- Capacitor Included in Control Box
- Capacitor Installed in STP Junction Box
- Conversion Kit without Capacitor

Page 36



### Intelligent Pump Control

- Provide Insight to Your Fueling Operations
- Software for Red Jacket Submersible Turbine Pumps

Page 37

## The Red Jacket 4" STP Portfolio

The Red Jacket Submersible Turbine Pump platform delivers fast, reliable fuel flow and a low cost of ownership. With a range of motor offerings, The Red Jacket provides flow rates to meet your individual site needs, whether that is a single fueling point or more. It features Red Jacket's advanced packer manifold design, making it a simple and safe STP to install and service within the industry.

If your fueling system is used with incompatible fuel types, infrastructure degradation and corrosion could result. Therefore, as fuels containing higher amounts of ethanol (such as E15 and E85) are added to fueling sites, it is important to consider Submersible Turbine Pumps (STPs) that are compatible with renewable fuels, as well as fuels focused on improved emissions and fuel economy. **The Red Jacket STP portfolio offers solutions tailored for both traditional and renewable fuels and provides protection against corrosive environments.**



### The Red Jacket STP

The Red Jacket STP solution optimizes fuel flow and dispensing. It is the foundation model that sets the standard for high throughput, high reliability fueling applications. UL 79 certified.

*Compatible with:*

- 100% Diesel or Gasoline
- Ethanol concentrations up to 10%
- MTBE, ETBE, or TAME concentrations up to 20%

*Protection Level:*



### The Red Jacket Alcohol Gas (AG) STP

The Red Jacket AG STP has an additional 25% increase in stainless steel hardware from The Red Jacket STP. It has all the advantages of the Red Jacket Submersible Turbine Pump design, but was constructed with stainless steel on all parts exposed to the fuel path. UL 79A and UL 79B certified for use with renewable biofuels.

*In addition to fuel types supported by The Red Jacket STP, The Red Jacket AG STP is also compatible with:*

- Ethanol concentrations up to 85%
- Methanol concentrations up to 15%
- Biodiesel concentrations up to 100%
- Jet Fuel and AVGAS
- Kerosene and Fuel Oil

*Protection Level:*



### The Red Armor® STP

The Red Armor STP has an over 30% increase in stainless steel hardware from The Red Jacket AG STP. It has all the advantages of the Red Jacket Submersible Turbine Pump design, but was constructed specifically to withstand corrosive environments. UL 79A and UL 79B certified for use with renewable biofuels.

*The Red Armor STP is compatible with the same fuel types as The Red Jacket STP and AG STP, but also protects against:*

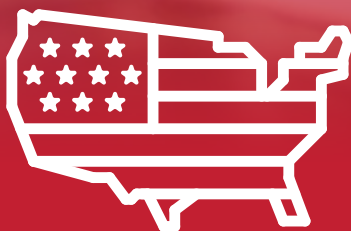
- Microbial Growth in Tank (Ultra-Low Sulfur Diesel)
- Constant Moisture Presence or Water Ingress into Sump
- Known Corrosive Environment

*Protection Level:*



*\* The Red Armor's specialty coating is the toughest performer across a battery of abrasion, immersion, and impact standards.*

# ASSEMBLED IN THE USA<sup>\*</sup>



*\* Some parts are imported or  
assembled based on distribution*

# The Red Jacket STP



## Advanced STP Design

The Red Jacket STP solution optimizes fuel flow and dispensing. The STP also features Red Jacket's advanced packer manifold design, making it a simple and safe STP to install and service within the industry. This STP solution is available in ¾ HP to 4 HP motor configurations and fixed or Quick Set® adjustable lengths.

Red Jacket's unsurpassed expertise helps your customers optimize fuel flow. Part of the industry's leading Veeder-Root suite of products, Red Jacket's family of Submersible Turbine Pumps and Pump Controllers ensure that your customers can pump fuel quickly, efficiently, and safely – whether it's motor fuel, diesel, aviation gasoline, ethanol/methanol, or kerosene – in aboveground or underground storage tanks.

### ► THE RED JACKET STP

#### Superior Motor Design:

- **Robust Bearing Alignment System** – Quiet running, low bearing wear, true running of motor shaft
- **Low Power Consumption** – Efficient motor design results in low wattage being used
- **High Quality** – Red Jacket's motor manufacturing yields advanced quality, which means more station uptime than other STPs on the market
- **High Reliability** – Unique bearing design and high insulation temperature rating yield a long motor life
- **High Safety Standards** – Connectors separation meets latest flameproof standards

#### Advanced Packer Manifold Design:

- **Built-in Isolated Contractor's Box** – Electrical connection housing is built into the manifold and is completely isolated from the fuel path
- **Easy to Install and Service** – Quick assembly, with no adjustment required to fit the yoke
- **High Electrical Safety** – Automatic electrical yoke disconnects upon removal of extractable bolts
- **Environmentally Friendly** – Automatic breaking of extractable seal upon bolt removal ensures automatic fuel drain back into tank, protecting the environment from contamination and site owners from related liability
- **Innovative Check Valve Design** – "Open" setting makes for easy line tests and servicing

#### Protection Level



## Product Specifications

### Fuel Compatibility:

- 100% Diesel
- 100% Gasoline
- Ethanol concentrations up to 10%
- MTBE, ETBE, or TAME concentrations up to 20%

### Motor Sizes Available:

- ¾ HP, 60 Hz, 1-phase
- 1 ½ HP, 60 Hz, 1-phase
- X3 1 ½ HP, 60 Hz, 1-phase, high pressure
- LP 2 HP, 60 Hz, 1-phase, low pressure
- 2 HP, 60 Hz, 1-phase
- 4 HP, 60 Hz, 3-phase

Please reach out to your Veeder-Root Account Manager for 50 Hz availability

### Protective Coatings: N/A

### Operation Environment:

- Class 1, Group D atmospheres
- Low corrosion environment
- Dry sump space (no water ingress)

### Installation Depth Range:

- Fixed Length: 3'6" to 11'6"
- Quick Set® (Adjustable Length):
  - RJ 1 = 74.5" - 105"\*
  - RJ 2 = 104.4" - 165"
  - RJ 3 = 164" - 225"

\* Assumes 1.5 HP

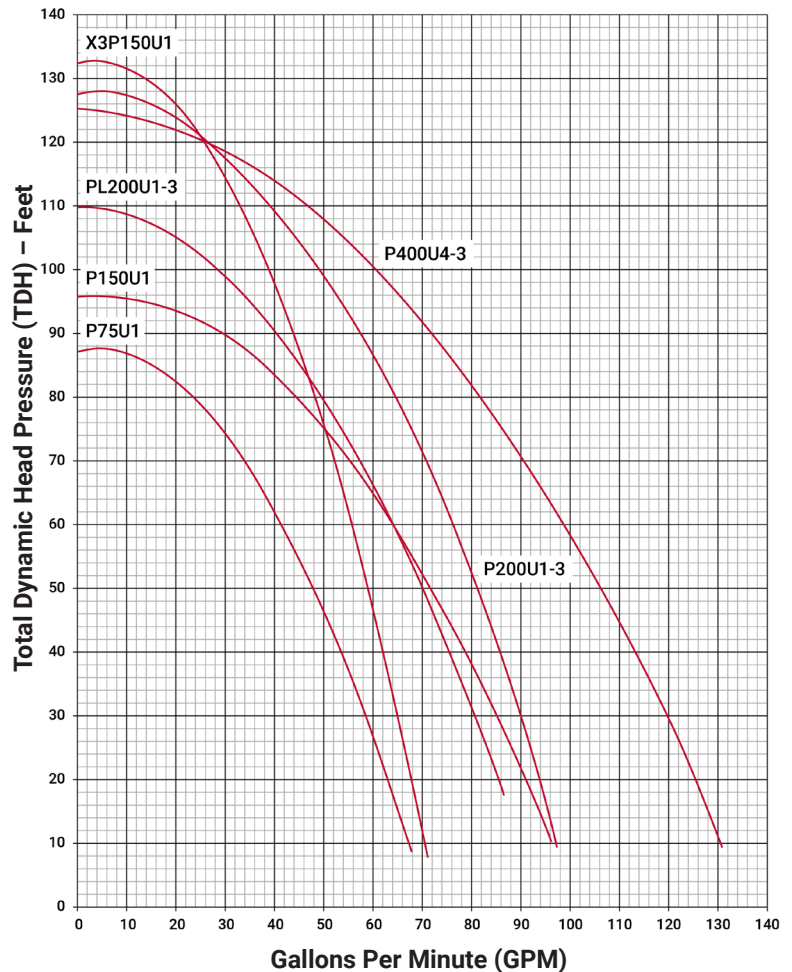
### Packer Manifold Access Ports:

- Siphon Ports:
  - 2 available, ¼" NPT
  - Vacuums generated up to 25 in Hg
- Line Pressure Port: 1 Available, ¼" NPT
- Vent Port: 1 Available, ¼" NPT

### Check Valve Compatibility:

- Standard VR ready check valve for PLLD (0410152-001)
- High pressure check valve for high pressure applications (0410152-002)

Performance @ 230V; SG = 0.78, 60 Hz



### UL Listings:

- UL 79 certified

For your local region's STP certification, contact your Veeder-Root sales representative

## The Red Jacket Alcohol Gas STP



## Created for Alternate Fuels

All the advantages of The Red Jacket STP, designed for alternative fuels – such as alcohol and ethanol. The Red Jacket AG STP is a fixed-speed alcohol gas STP that delivers optimal flow to meet site demand. The STP also features Red Jacket's advanced packer manifold design, making it a simple and safe STP to install and service within the industry. This STP solution is available in ¾ HP to 4 HP motor configurations and fixed or Quick Set® adjustable lengths.

### ▶ THE RED JACKET ALCOHOL GAS (AG) STP

The Red Jacket AG STP Packer Manifold has all the advantages of The Red Jacket Submersible Turbine Pump platform, while also including an additional 25% in stainless steel hardware of its major components. Here's what sets The Red Jacket AG STP apart:

**Compatible Fuels:** All fuels supported by The Red Jacket STP. Ethanol concentrations up to 85%, Methanol concentrations up to 15%, Biodiesel concentrations up to 100%, Jet Fuel and AVGAS, Kerosene and Fuel Oil.

#### Fuel Compatibility Improvements:

- **High Grade Elastomer O-Rings** to prevent degradation and maintain optimal seal compression to avoid leaks.
- **Check Valve Seat in stainless steel** to prevent deterioration of the component and avoid product backflow into the column pipe, stainless steel is more durable than brass.
- **Check Valve Lock Down Screw in stainless steel** to prevent corrosion deterioration, which would prevent proper interface between the screw and check valve housing.
- **Siphon Cartridge and Air Purge Screw in stainless steel** to avoid fuel contamination, such as small brass particles, breakage which wear off and ensure proper vacuum capabilities for siphoning tanks or other vacuum monitoring.

**Certified:** UL 79A and UL 79B for use with renewable biofuels

**Plus, all the Advantages of The Red Jacket STP Features**

#### Protection Level



The Red Jacket AG STP is compatible with Ethanol concentrations up to 90%, Methanol concentrations up to 100%, and MTBE, ETBE, or TAME concentrations up to 20%, and is UL 79A and UL 79B certified for use with renewable biofuels.

# Product Specifications

**Fuel Compatibility:**

- 100% Diesel
- 100% Gasoline
- Ethanol concentrations up to 85%
- MTBE, ETBE, or TAME concentrations up to 20%
- Methanol concentrations up to 15%
- Biodiesel concentrations up to 100%
- Jet Fuel and AVGAS
- Kerosene and Fuel Oil

**Motor Sizes Available:**

- 3/4 HP, 60 Hz, 1-phase
- 1 1/2 HP, 60 Hz, 1-phase
- X3 1 1/2 HP, 60 Hz, 1-phase, high pressure
- LP 2 HP, 60 Hz, 1-phase, low pressure
- 2 HP, 60 Hz, 1-phase
- 4 HP, 60 Hz, 3-phase

Please reach out to your Veeder-Root Account Manager for 50 Hz availability

**Protective Coatings:** N/A

**Operation Environment:**

- Class 1, Group D atmospheres
- Low corrosion environment
- Dry sump space (no water ingress)

**Installation Depth Range:**

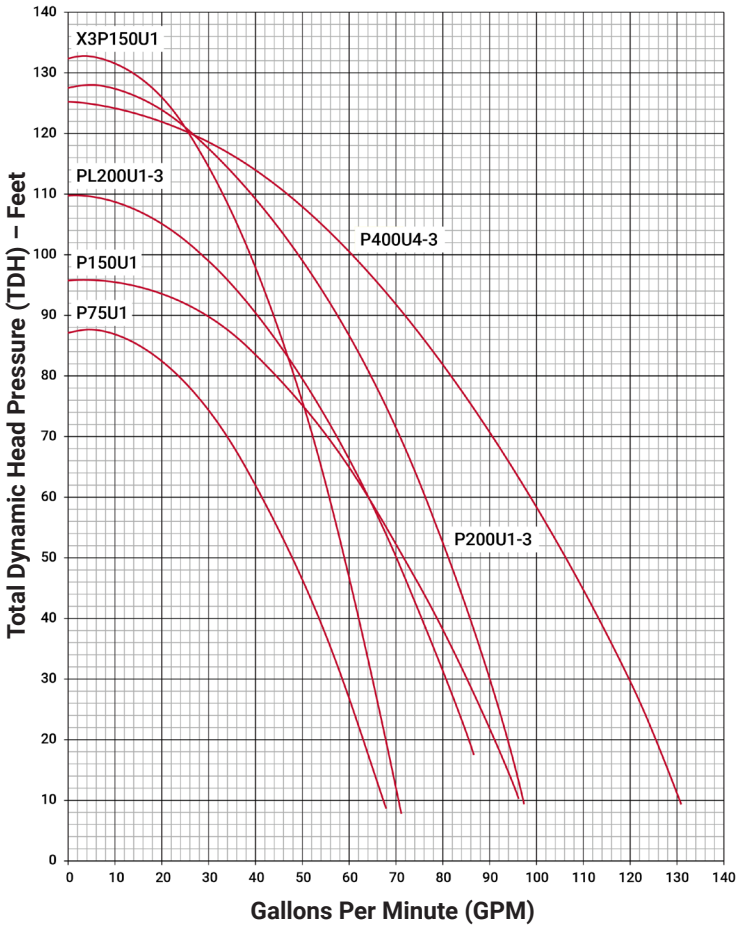
- Fixed Length: 3'6" to 11'6"
- Quick Set® (Adjustable Length):
  - RJ 1 = 74.5" - 105"\*
  - RJ 2 = 104.4" - 165"
  - RJ 3 = 164" - 225"

\* Assumes 1.5 HP

**Packer Manifold Access Ports:**

- Siphon Ports:
  - 2 available, 1/4" NPT
  - Vacuums generated up to 25 in Hg
  - Equipped with stainless siphon cartridge for survivability in corrosive fuels (0410151-002)
- Line Pressure Port: 1 Available, 1/4" NPT
- Vent Port: 1 Available, 1/4" NPT

Performance @ 230V; SG = 0.78, 60 Hz



**Check Valve Compatibility:**

- Standard VR ready check valve for PLLD (0410152-001)
- High pressure check valve for high pressure applications (0410152-002)

**UL Listings:**

- cUL
  - UL 79A and UL 79B certified for use with renewable biofuels
- For your local region's STP certification, contact your Veeder-Root sales representative

# The Red Armor® STP



## In-Sump and In-Tank Protection from Corrosion

The ultimate survivor in your fueling infrastructure, the Red Armor series of STPs is built to last in the harshest corrosive environments created by ULSD and ethanol blends. Red Armor is a fixed-speed STP that delivers optimal flow to meet site demand for corrosive environments, promoting maximum fuel flow and dispensing. The Red Armor STPs also feature Red Jacket's advanced packer manifold design, making it a simple and safe STP to install and service within the industry. This STP solution is available in ¾ HP to 4 HP motor configurations and fixed or Quick Set® adjustable lengths.

### ► THE RED ARMOR STP

The Red Jacket Red Armor STP Packer Manifold has an over 30% increase in stainless steel hardware of major components from The Red Jacket AG STP. It has all the advantages of the Red Jacket Submersible Turbine Pump design but was constructed specifically to withstand corrosive environments. If you want the best of the best, this is the STP for you. Here's why:

**Compatible Fuels:** All fuels supported by The Red Jacket STP and The Red Jacket AG STP.

**Protects Against:** Microbiologically influenced corrosion (MIC) commonly found in ethanol blended fuel sumps and diesel storage tanks containing Ultra-Low Sulfur Diesel (ULSD) and biodiesel.

**Added Protection on all Exposed Surfaces:** The Red Armor coating is applied to all cast surfaces and withstands acetic acid exposure associated with MIC. Stainless steel construction on all exposed surfaces, including the column pipe and Quick Set® connector, ensures easy maintenance of the STP.

**Certified:** UL 79A and UL 79B for use with renewable biofuels

**Plus, all the Advantages of The Red Jacket STP Features**



The Red Armor's specialty coating is the toughest performer across a battery of abrasion, immersion, and impact standards.

#### Protection Level



## Product Specifications

### Fuel Compatibility:

- 100% Diesel
- 100% Gasoline
- Ethanol concentrations up to 85%
- MTBE, ETBE, or TAME concentrations up to 20%
- Methanol concentrations up to 15%
- Biodiesel concentrations up to 100%
- Jet Fuel and AVGAS
- Kerosene and Fuel Oil

### Motor Sizes Available:

- ¾ HP, 60 Hz, 1-phase
- 1 ½ HP, 60 Hz, 1-phase
- X3 1 ½ HP, 60 Hz, 1-phase, high pressure
- LP 2 HP, 60 Hz, 1-phase, low pressure
- 2 HP, 60 Hz, 1-phase
- 4 HP, 60 Hz, 3-phase

Please reach out to your Veeder-Root Account Manager for 50 Hz availability

**Protective Coatings:** Exposed Cast Iron covered with specialized dual powder/e-coating

### Operation Environment:

- Class 1, Group D atmospheres
- High corrosion environment
- Wet or dry sump space (water ingress)

### Installation Depth Range:

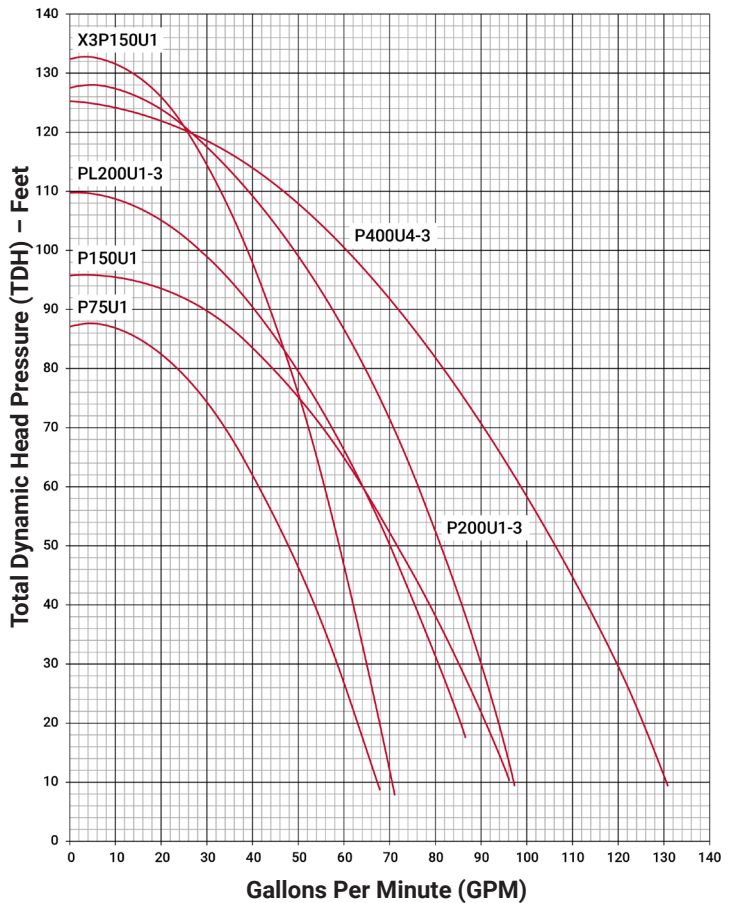
- Fixed Length: 3'6" to 11'6"
- Quick Set® (Adjustable Length):
  - RA 1 = 74.5" - 105"\*
  - RA 2 = 104.4" - 165"
  - RA 3 = 164" - 225"

\* Assumes 1.5 HP

### Packer Manifold Access Ports:

- Siphon Ports:
  - 2 available, ¼" NPT
  - Vacuums generated up to 25 in Hg
- Line Pressure Port: 1 Available, ¼" NPT
- Vent Port: 1 Available, ¼" NPT

Performance @ 230V; SG = 0.78, 60 Hz



### Check Valve Compatibility:

- Standard VR ready check valve for PLLD
- (0410152-001)
- High pressure check valve for high pressure applications
- (0410152-005)

### UL Listings:

- cUL
  - UL 79A and UL 79B certified for use with renewable biofuels
- For your local region's STP certification, contact your Veeder-Root sales representative

## Components of the Red Armor® STP



**BUILT TO LAST  
IN CORROSIVE  
ENVIRONMENTS**

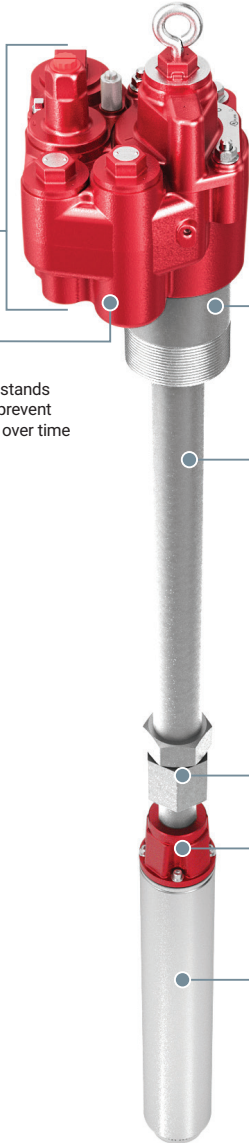
### Red Armor STP

#### Packer Manifold

- Keeps line primed via check valve
- Housing extractable for UMP replacement
- Isolates discharge line from tank

#### Specialty Coating\*

- On all cast surfaces withstands acetic acid exposure to prevent pitting and deterioration over time



#### 4" Riser Pipe

- NPT thread
- Structural stability for Packer Manifold

#### Column Pipe

- Carries product and electrical connection from UMP to Packer Manifold

#### Quick Set® Connector

- Adjusts length of column

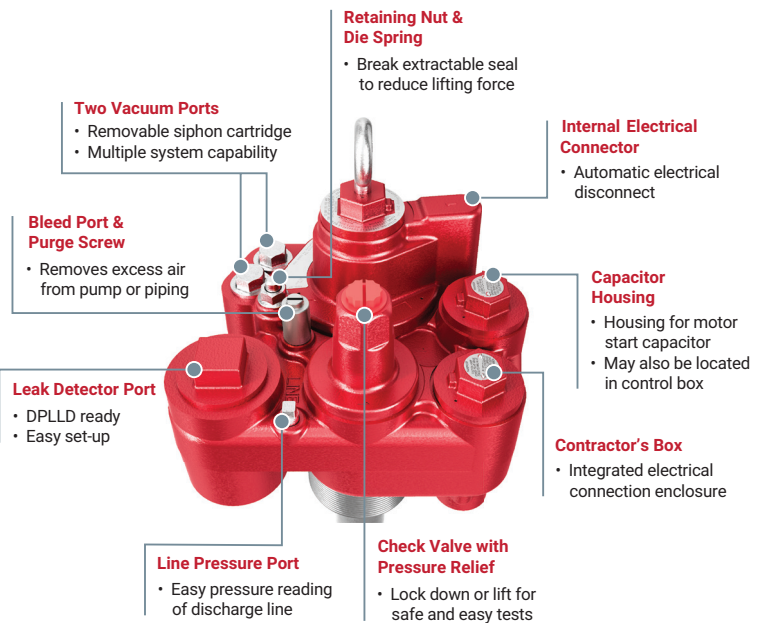
#### Discharge Head

- Transitions product discharge from 4" UMP to 2" Pipe
- Transitions electrical connection from internal conduit to UMP

#### Unitized Motor & Pump

- Moves the fluid with rotational energy

### Packer Manifold



#### Retaining Nut & Die Spring

- Break extractable seal to reduce lifting force

#### Two Vacuum Ports

- Removable siphon cartridge
- Multiple system capability

#### Internal Electrical Connector

- Automatic electrical disconnect

#### Bleed Port & Purge Screw

- Removes excess air from pump or piping

#### Capacitor Housing

- Housing for motor start capacitor
- May also be located in control box

#### Leak Detector Port

- DPLLD ready
- Easy set-up

#### Contractor's Box

- Integrated electrical connection enclosure

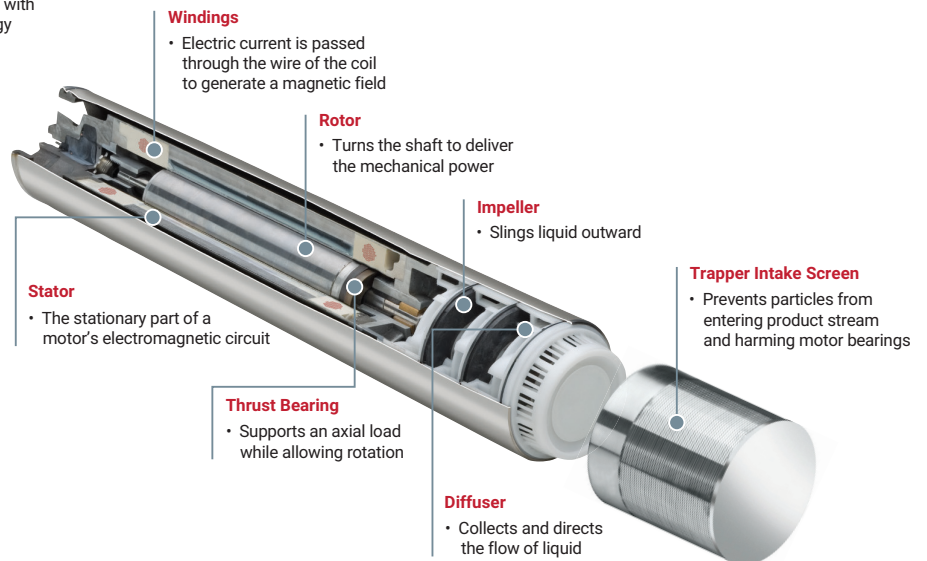
#### Line Pressure Port

- Easy pressure reading of discharge line

#### Check Valve with Pressure Relief

- Lock down or lift for safe and easy tests

### Unitized Motor & Pump (UMP)



#### Windings

- Electric current is passed through the wire of the coil to generate a magnetic field

#### Rotor

- Turns the shaft to deliver the mechanical power

#### Impeller

- Slings liquid outward

#### Stator

- The stationary part of a motor's electromagnetic circuit

#### Trapper Intake Screen

- Prevents particles from entering product stream and harming motor bearings

#### Thrust Bearing

- Supports an axial load while allowing rotation

#### Diffuser

- Collects and directs the flow of liquid



### Stainless Steel Construction

On all exposed surfaces ensures easy maintenance for the life of the pump, including: riser, nuts, springs, screws, check valve seat, eye bolt, check valve guide, column pipe, and Quick Set connector.

## Combat In-Sump Corrosion

### Why is Corrosion of In-Sump Equipment an Issue?

Corrosion of equipment in sumps causes deterioration and shortens its useful life span. As corrosion advances it has the potential to affect the integrity of piping and electrical systems, and the serviceability of submersible turbine pump equipment.

Corrosive conditions are caused when three common components are present:

1. Ethanol Vapors
2. Water
3. Bacteria



## Categories of Observed Fuel Corrosion

### Vapor Space Corrosion In-Sump

- Affects of ethanol-blended fuels
- Damages 'above-the-line' in the vapor space, ullage space in UST, and sump space

### Microbial Induced Corrosion in the UST

- Affects of ULSD fuels
- Damages 'below-the-line' wetted surfaces UST, in-tank equipment, piping, shear valves
- Accompanied by microbial 'sludge' growth



## The Red Jacket Manifolded Submersible Turbine Pumping System



### ▶ KEY BENEFITS

#### REDUNDANCY

##### The Key to Uptime:

- Automatic failover
- Service one STP while the other keeps your site running

#### EFFICIENCY

##### Working Smarter:

- 2+2 will produce a higher flow than a 4 HP STP. Whereas, a 4+4 will produce the required flow rates for Hi-Flow dispensers.
- Leverage IQ2 and helper mode to ensure consistent flow and optimized STP utilization
- Demand-based staging to even wear and reduce power consumption

#### STANDARDIZE

##### Simplify Inventory:

- Reduce overall part numbers with Red Jacket manifolded systems

## Line Manifolding The Red Jacket STPs

Increase pumping capacity by manifolded two Red Jacket STPs together in the sump and using Red Jacket IQ Control Boxes to stage the pumps on and off as demand needs dictate. For busy sites this allows them to keep pumping even while maintenance is being performed on one of the pumps.

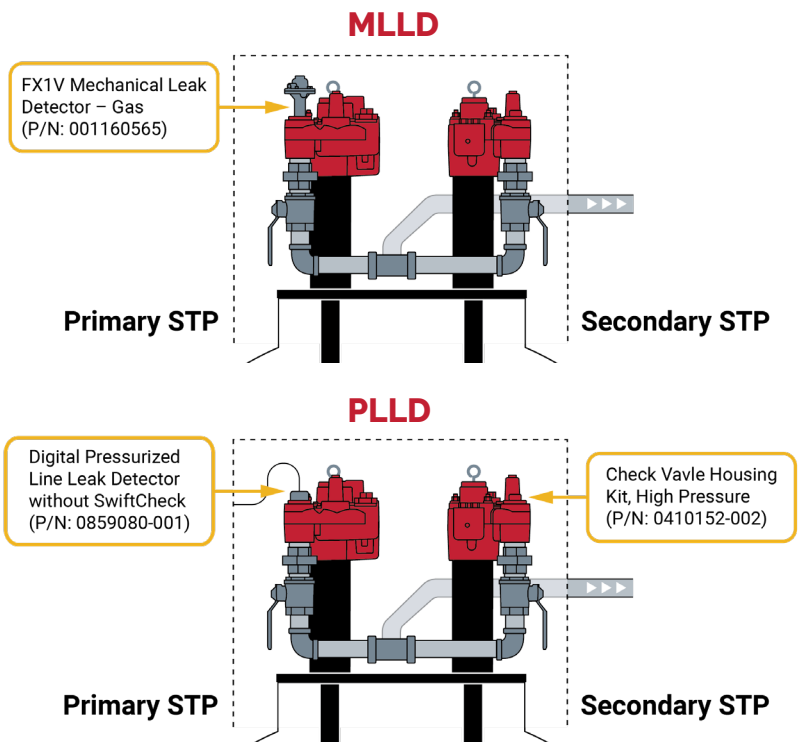
#### Manifold Tanks

**Virtual Siphons:** Allow user to define the most suitable dispensing mode

#### STP Prioritization

**Automated flow increase (Helper Mode):** Turn ON manifolded STP according to flow demand

Switch-on-the-fly will switch STPs in live mode, without waiting for an on-hook condition, essential for maintaining balance at busy sites. Integrates control with Mechanical Line Leak Detection (MLLD) or Pressurized Line Leak Detection (PLLD). For more information, reference [The Red Jacket Manifolded Submersible Turbine Pumping System \(576047-476\)](#).



## High Flow Performance. High Reliability.

The Red Jacket 4 HP Submersible Turbine Pump (STP) rounds out the 4" Veeder-Root STP portfolio, offering high throughput, high reliability, and reduced power consumption. The best in-class fixed speed technology meets the flow rate performance required per nozzle for high throughput sites. With an automatic electrical disconnection mechanism, disruptions are minimized to site operations making servicing safe, quick, and efficient to ensure site uptime.



### ► KEY FEATURES

#### HIGH PERFORMANCE

- Equivalent to 4 HP variable speed solutions
- 4" design meets the required tank riser size
- 4% less power consumption than variable speed solutions
- Quick Set® adjustable length options

#### HIGH RELIABILITY

- Designed and tested to the same quality standards as existing Red Jacket STPs that have less than 1% field failure rates
- Automatic electrical disconnect ensures quick and safe servicing
- Spring mechanisms reduce lifting force
- Automatic fuel drain allows fuel in the manifold to safely drain back to the tank
- Upstream siphon filter screen helps minimize the risk of clogging

#### FUEL COMPATIBILITY

As biofuels, vehicle technology, and ethanol infrastructures expand, Red Jacket fueling systems are there to meet your needs. The Red Jacket 4 HP STP is designed alongside our current series of packer manifolds. Whether you are pumping Unleaded (E10) or higher concentrations of Biodiesel and Ethanol, the 4 HP has it covered with The Red Jacket STP, The Red Jacket Alcohol Gas (AG) STP, and The Red Armor® STP.



**HIGH THROUGHPUT WITH REDUCED POWER CONSUMPTION**

# The Red Jacket 4 HP Submersible Turbine Pump

## Product Specifications

### Power Requirements:

- 4 HP, 230 VAC 60 Hz, 3-phase

### Operation Environment:

- Class 1, Group D atmospheres
- Wet or dry sump space (water ingress)

### Installation Depth Range:

- Quick Set (Adjustable Length):
  - RJ1 & RA1 = 81.6" – 111.6"
  - RJ2 & RA2 = 111.6" – 171.6"
  - RJ3 & RA3 = 171.6" – 231.6"

### Packer Manifold Access Ports:

- Siphon Ports:
  - 2 available, ¼" NPT
  - Vacuums generated up to 25 in Hg
- Line Pressure Port: 1 Available, ¼" NPT
- Vent Port: 1 Available, ¼" NPT

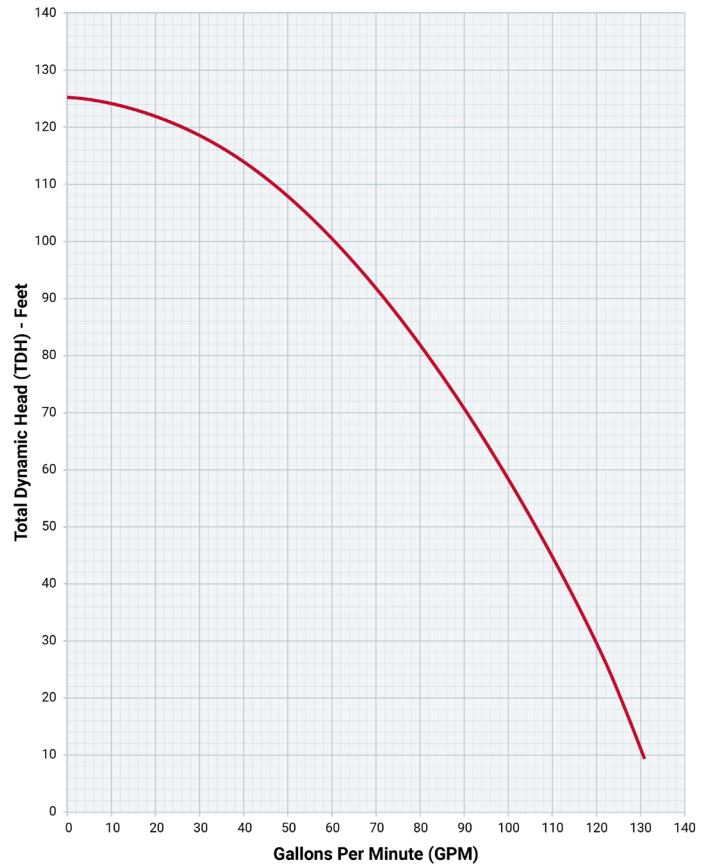
### Check Valve Compatibility:

- Check Valve Housing Kit (P/N: 0410152-001)
- Red Armor Check Valve Housing Kit (P/N: 0410152-005)

### UL Listings:

- 100% Gasoline
- 100% Diesel
- MTBE, ETBE, or TAME concentrations up to 20%
- Ethanol concentrations up to 10%
- Ethanol concentrations up to 85% (AG and Red Armor models only)
- Methanol concentrations up to 15% (AG and Red Armor models only)
- 100% Biodiesel blends (AG and Red Armor models only)
- Jet Fuel (AG and Red Armor models only)
- AVGAS (AG and Red Armor models only)
- Kerosene and Fuel Oil (AG and Red Armor models only)

Red Jacket 4 HP STP Flow Rate Performance @ 230 VAC 60 Hz; SG = 0.73  
 Model P400U4-3



## LOWER COST OF OWNERSHIP

### HIGH THROUGHPUT WITH REDUCED POWER CONSUMPTION

#### COST SAVINGS CATEGORY

#### SAVINGS LEVEL

<b>Maximize site uptime</b> with best-in-class reliability technology	\$\$\$\$
<b>Minimize power consumption</b> saving up to 4% on energy consumption (loss)	\$\$\$
<b>Mitigate check valve failures</b> due to siphon jet clogging, avoid unnecessary deliveries	\$\$\$
<b>Eliminate retest after servicing</b> , check valve, leak detector, and siphon cartridge remain in manifold when the extractable is removed	\$\$
<b>Automatic electrical disconnect</b> ensures quick and safe servicing	\$\$

## Automated Fuel Management

The TLS-450PLUS Automatic Tank Gauge (ATG) Virtual Siphon feature provides site operators the ability to control tanks' inventory levels based on operational needs.

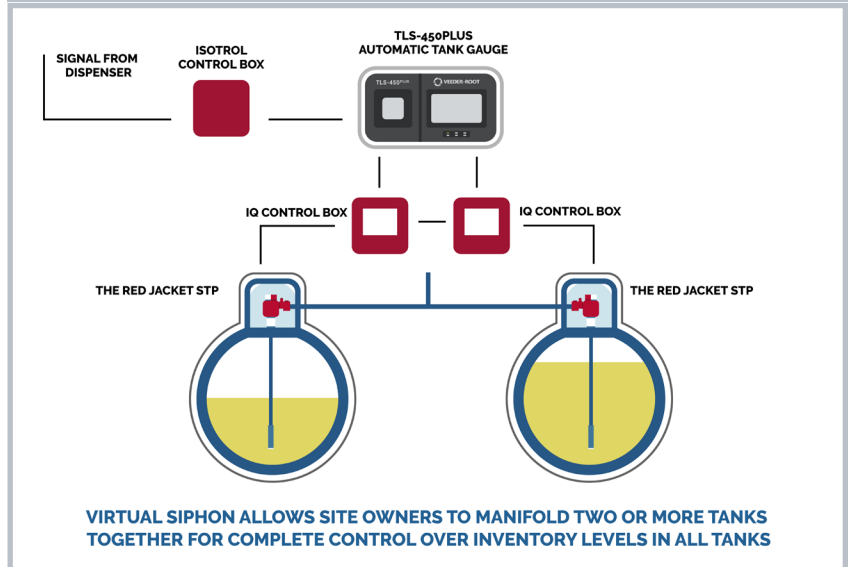
Using a line manifold system with two or more tanks allows the site operators to use the TLS-450PLUS ATG system to decide when to activate a specific tank based on the tanks fuel height, volume, or other setting specific to the pump configuration. In addition to this capability, the TLS-450PLUS will activate the unused tank while the other tank is still active to ensure no disruption of dispensing occurs during the tank switch over event.

With the Veeder-Root TLS-450PLUS ATG, Virtual Siphon is easy to program, monitor, and maintain, and provides the site with STP redundancy and backup operation.

**There are several modes for managing the fuel inventory in each tank:**

1. **Manifolded: Alternate-Volume or Alternate-Height** – The TLS-450PLUS alternates the pumps to maintain a volume or height differential
2. **Manifolded: Alternate Pump** – Pumps alternate until one tank is empty
3. **Manifolded: Sequential** – Pumps empty each tank one at a time
4. **Manifolded: All Pumps** – All pumps on until respective tanks are empty

Virtual Siphon connects your TLS-450PLUS ATG to your Red Jacket STPs using the IQ2, IQ, and Isotrol Control Boxes.

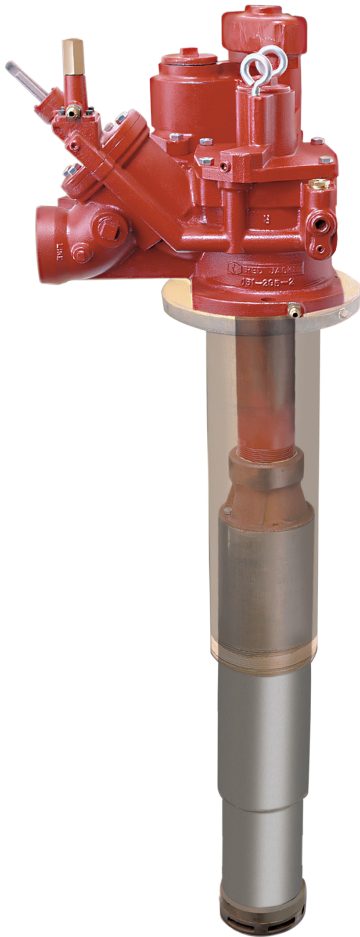


### ► KEY FEATURES

- Inventory and delivery reporting
- Consolidated delivery information for easy fuel ordering
- Maintain constant at the nozzle flow when switching from tank to tank
- Programmable switch levels to reduce STP cycling
- Continuous inventory monitoring with built in pump control logic
- Alarm and warning notifications when fuel tanks require fuel delivery intervention

**Required Equipment:** To take advantage of the Virtual Siphon feature customers must have the TLS-450PLUS ATG, Veeder-Root Electronic Line Leak Detection System and/or our pump control Universal Input-Output interface Module (UIOM).

# Maxxum<sup>®</sup> STP



## Overview

The Red Jacket Maxxum Submersible Turbine Pump is intended for 6" high flow applications and provides high industry flow rates. The Maxxum series boasts leading serviceability and safety features. With a 3 or 5 HP motor, it's specifically engineered for high throughput applications such as truck stops, where extreme demand, multiple fuel points, and long piping runs reduce fuel flow to the nozzle.

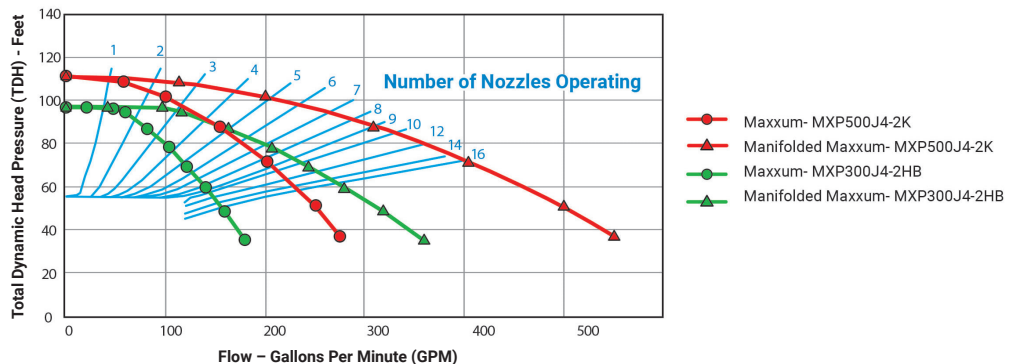
## High Industry Flow Rates

The Maxxum (formerly Big Flo) STPs and Unitized Motor Pumps (UMPs) provide high industry flow rates by reducing the number of restrictions within the flow path. The efficient design also leads to minimum power consumption, contributing to a low lifetime cost of operation. Easy access to valves and ports allows for reliable diagnostics and fast service.

### ▶ KEY FEATURES

- **Minimal Wear** – Design results in quiet operation and low levels of wear
- **Insulation Rating** – High insulation temperature rating assures long running life
- **Corrosion Protection** – Stainless components result in high protection for use with blended fuels
- **Backwards Compatible** – Maxxum UMPs are compatible with previous 3 and 5 HP Maxxum STPs
- **Explosion Proof** – Design provides high levels of safety; certified UL/cUL/IECEX/ATEX Explosion proof motor
- **Continuous Safety Improvements** – Design enhancements guided by newer international flame proofing standards

### Red Jacket 3 & 5 HP Maxxum Performance in Diesel



## Meeting Your Flow Demand with Fixed Speed Reliability

The Red Jacket series of Submersible Turbine Pumps (STPs) and accessories covers all of your site throughput needs and guarantees hassle-free installation, minimal downtime, and dependable operation.

The flow throughput performance varies from site to site due to multiple, unique variables inherent to site layout and hydraulic configurations. Below are the flow estimations of the most common site configurations.



To analyze the flow of your specific site configuration, access the “VR\_US\_Veeder-Root Red Jacket® STP Flow Analysis Configurator” on Seismic



## Auto-Retail Dispensers for 10 GPM

The information provided in the following chart is the estimated flow in Gallons Per Minute (GPM) per nozzle in Auto Retail dispensers. It helps you select the proper The Red Jacket Pump motor size based on the average active fueling positions on your site and the piping settings.

		4" PUMP FLOW RATE (GPM)								
		1.5 HP X3 STP		2 HP STP		2 + 2 HP STP		4 HP STP		4 + 4 HP STP
Active Fueling Positions	Pipe Length (Ft)	Pipe Size (In)								
		1.5"		2"		1.5"		2"		3"
4	<150	≥ 10	≥ 10	≥ 10	≥ 10	≥ 10	≥ 10	≥ 10	≥ 10	≥ 10
8	<250	7.1	7.5	9.1	9.8	≥ 10	≥ 10	9.6	≥ 10	≥ 10
12	<360	4.8	5.1	6.1	6.8	9.5	≥ 10	7.4	8.6	≥ 10
14	<400	4.1	4.3	5.3	5.9	8.2	≥ 10	6.4	7.4	≥ 10
16	<425	3.6	3.8	4.6	5.1	7.2	9.2	5.6	6.5	≥ 10
18	<475	3.2	3.4	4.1	4.5	6.4	8.2	5	5.8	≥ 10
20	<500	2.9	3	3.7	4.1	5.7	7.4	4.4	5.3	≥ 10

### Parameters

- **Tank Diameter:** 10'
- **Tank Bury Depth:** 3'
- **Pipe Type:** Flex Piping
- **Fittings:** 1 Tee and 2 Elbows per Dispenser
- **Fuel Type:** Diesel Fuel Specific Gravity (SG) = 0.84

**Note:** Actual flow rates may vary based on site design and as-built condition

## The Red Jacket STP Flow Quick Reference Guide

### High Flow Dispenser for Up to 25 GPM

The information provided in the following chart is the estimated flow in GPM per nozzle in High Flow dispensers. It helps you select the proper The Red Jacket Pump motor size based on the average active fueling positions on your site and the piping settings.



Active Fueling Positions	Pipe Length (Ft)	FLOW RATE (GPM)					
		4 + 4 HP STP 4" PUMP		3 HP STP 6" PUMP		5 HP STP 6" PUMP	
		Pipe Size (In)					
		2"	3"	2"	3"	2"	3"
4	<175	≥25	≥25	21.4	24.1	≥25	≥25
6	<250	20.7	24.9	16.8	20.1	20.5	≥25
8	<300	17.1	21.2	13.8	16.9	17.2	22.4
10	<350	14.2	18.2	11.5	14.4	14.4	19.6
12	<400	12.2	15.8	9.9	12.5	12.5	17.3

#### Parameters

- **Tank Diameter:** 10'
- **Tank Bury Depth:** 3'
- **Pipe Type:** Flex Piping
- **Fittings:** 1 Tee and 2 Elbows per Dispenser
- **Fuel Type:** Diesel Fuel SG = 0.84

**Note:** Actual flow rates may vary based on site design and as-built condition

### Ultra-High Flow Dispenser for Up to 32 GPM

The information provided in the following chart is the estimated flow in GPM per nozzle in Ultra-High Flow dispensers. It helps you select the proper The Red Jacket Pump motor size based on the average active fueling positions on your site and the piping settings.



Active Fueling Positions	Pipe Length (Ft)	FLOW RATE (GPM)			
		4 + 4 HP STP 4" PUMP		5 HP STP 6" PUMP	
		Pipe Size (In)			
		2"	3"	2"	3"
4	<175	26.4	29	25.6	28.8
6	<250	21	24.9	20.9	25.5
8	<300	17.4	21.2	17.6	22.4
10	<350	14.5	18.2	14.8	19.6
12	<400	12.5	15.8	12.8	17.3

#### Parameters

- **Tank Diameter:** 10'
- **Tank Bury Depth:** 3'
- **Pipe Type:** Flex Piping
- **Fittings:** 1 Tee and 2 Elbows per Dispenser
- **Fuel Type:** Diesel Fuel SG = 0.84

**Note:** Actual flow rates may vary based on site design and as-built condition

## Overview

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The Red Jacket® Liquified Petroleum Gas (LPG) Premier range of STPs\* meet a wide variety of site configurations and demands for high flow performance, durability, and adaptability, while maximizing profitability. Compatible with butane, propane, or any blend of the two, these multistage centrifugal pumps supply exceptional performance at peak efficiency. The LPG Premier STPs are the industry's most efficient, cost-effective explosion-proof submersible pump/motor units, designed to pump LPG.

The Premier and Premier MidFlow are designed for standard LPG refueling applications with low to intermediate flow requirements, while the Premier HiFlow is intended for high capacity installations such as commercial vehicle fueling facilities and LP cylinder filling plants.

## The High Performance Pump for a Cleaner Environment

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LPG is a mixture of gasses, primarily propane and butane and remains a vapor until pressurized to the point of liquification. The LPG Premier Series operates under sufficient pressure to retain the liquid state at optimal delivery rates.

### **This multi-stage technology provides maximum performance with efficient energy consumption:**

- 2.25 kW (3 HP) for the Premier pump
- 2.25 kW (3 HP) for the MidFlow pump
- 3.75 kW (5 HP) for the HiFlow pump

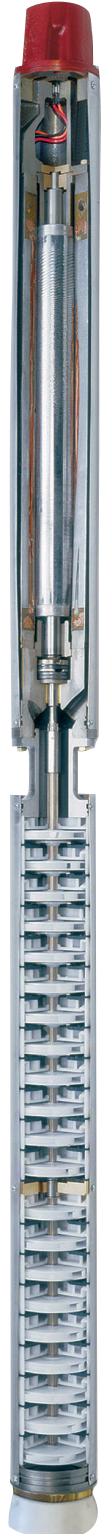
A floating impeller design eliminates unnecessary resistance and maximizes flow. All diffusers are interlocked and are enclosed in a stainless steel shell.

### **Staging consists of three ruggedized components:**

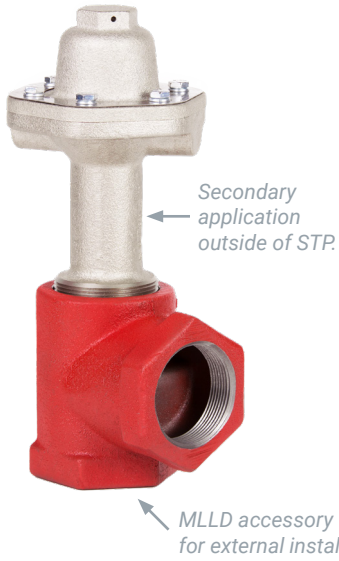
1. The diffuser
2. The diffuser plate
3. The impeller

The Premier series controls motor temperature using an innovative internal bleed (by-pass) in the motor. Motors meet all flameproof requirements per DEMKO 13 ATEX 9483031U and IECEx UL 13.0034U certificates. The minimum differential pressure requirement for The Red Jacket Premier Series LPG pumps is 400 kPa (58 PSI). The Red Jacket Premier Series LPG pumps requires at least 127 mm (5.0 inches) of submersion (or Net Positive Section Head).

*\* The LPG pumps are not available in the US. International only.*



## Red Jacket Mechanical Line Leak Detectors (MLLD)



### Overview

Red Jacket® FXV Mechanical Line Leak Detectors are permanently installed in the fuel line, and continuously performs 3 gal/h testing. If a leak is detected, fuel flow is restricted continuously to the dispensers.

### Why the MLLD?

Red Jacket FXV Mechanical Line Leak Detectors are built for superior performance and keeping operators in compliance – even in the most challenging environments. They offer a fast Mechanical line leak test for continuous monitoring – a cost-effective and reliable means to meet U.S. Federal Environmental Protection Agency (EPA) catastrophic line leak detection requirements. FXV Leak Detectors are UL listed and third-party certified to ensure quality, performance, and durability.

### ▶ KEY FEATURES

- **UL Listing:** 100% diesel, 100% gasoline, gasoline and up to 10% ethanol
- Meets EPA requirements in environments that experience extreme temperature changes
- Robust design that works effectively in the most common and difficult testing environments
- Adapts to applications using high-resiliency lines, such as flexible piping
- Handles up to 11 feet of static head
- Installs and troubleshoots without requiring special tools
- Guaranteed to detect at a rate of 3 GPH at 10 PSI (11.4 LPH at 0.69 Bar)
- Can be used with any Red Jacket or competitive submersible turbine pump

#### Fuel Compatibility for all models of the FXV Leak Detector are UL Listed:

- 100% Diesel
- 100% Gasoline
- Gasoline and up to 10% Ethanol



Gas



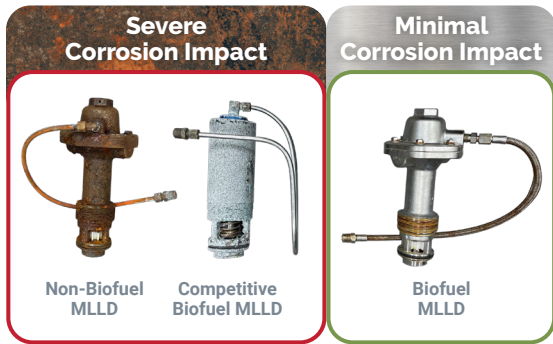
Diesel

# Red Jacket Mechanical Line Leak Detectors (MLLD)

## Overview

The Red Jacket Biofuel Mechanical Line Leak Detector (MLLD) provides additional UL Listed protection\* from higher concentrations of ethanol, biodiesel, and specialty fuels. It is the newest model of the Red Jacket MLLDs. Its upgraded design includes a stainless steel body, cap, and machined components, to withstand the harshest corrosive environments.

## Why the Biofuel MLLD?



The Red Jacket Biofuel MLLD was tested against the Red Jacket Non-Biofuel MLLD and a competitive Biofuel MLLD in a 28-Day Salt Spray evaluation, per ASTM G85. The outcome showed significant differences between both the competitive Biofuel MLLD and the Red Jacket Non-Biofuel MLLD, whereas the Red Jacket Biofuel MLLD showed minimal signs of corrosion.

### ▶ KEY FEATURES

- Meets Environmental Protection Agency (EPA) requirements in environments that experience extreme temperature changes
- Corrosion resistant with robust stainless steel construction that works effectively in the harshest testing environments
- Adapts to applications using high-resiliency lines, such as flexible pipelines
- Hassle free installation with flexible corrosion resistant, stainless steel hose
- Handles up to 11 feet / 3.4 meters of static head pressure
- No special tools required for installations and annual checks
- Compatible with any Red Jacket or competitive submersible turbine pump

## Expand Fuel Compatibility

The Biofuel MLLD is permanently installed in the fuel line and performs a 3 Gallons Per Hour (GPH) / 11.4 Liters Per Hour (LPH) test automatically. It offers the fastest mechanical line leak test available for hourly monitoring – while complying with the U.S. Federal EPA catastrophic line leak detection requirements. **If a leak is detected, fuel flow is restricted to the dispensers.**

RED JACKET MECHANICAL LINE LEAK DETECTORS				
Leak Detector Model	Gasoline		Diesel	
	10% Ethanol	Up to 85% Ethanol	Up to 5% Biodiesel	Up to 100% Biodiesel
Non-Biofuel MLLD	✓ UL Listed	✗ Not Approved	✓ UL Listed	✓ UL Listed
Biofuel MLLD	✓ UL Listed	✓ UL Listed	✓ UL Listed	✗ Not Approved

\* Compared to the traditional Red Jacket Non-Biofuel MLLD

## Digital Pressurized Line Leak Detection System

### Overview

The Veeder-Root Digital Pressurized Line Leak Detection (DPLLD) system can be used in a variety of pressurized line applications. Our patented technology performs a leak test at full pump pressure for 0.1 GPH (0.38 LPH) precision and a pressure decay test to meet the US EPA continuous 3.0 GPH (11.4 LPH) gross test requirement. When partnered with our TLS-450PLUS ATG, large volume customers can now monitor lines that exceed 1,100 gallons (4,164 liters).

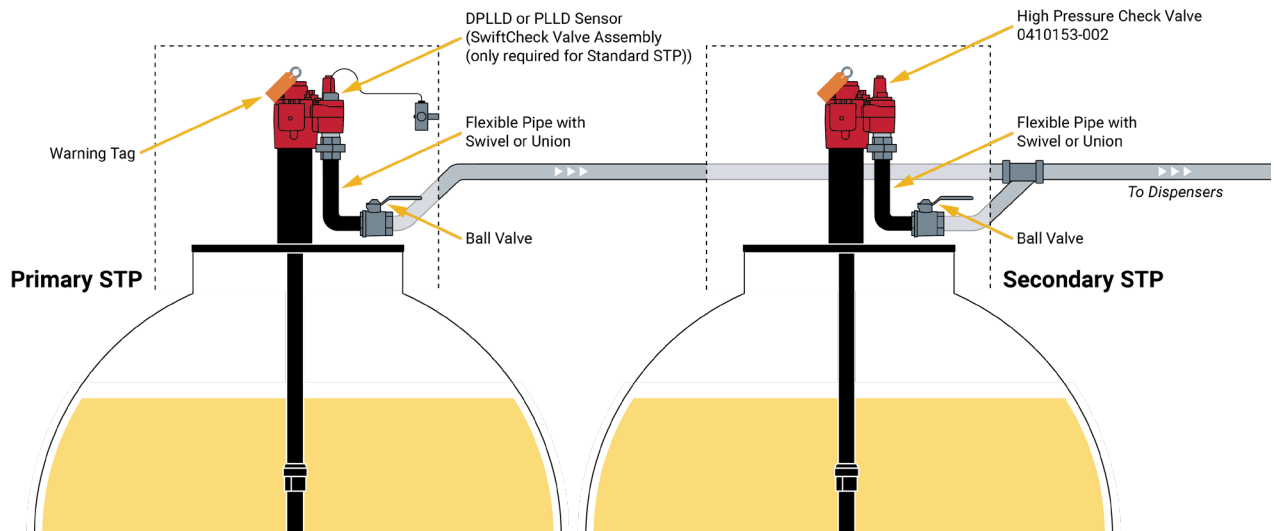
#### ► KEY FEATURES

- Proven pressure transducer technology
- No restriction of fuel flow
- Utilizes SwiftCheck Valve on early generation Red Jacket (Standard) Submersible Pumps; SwiftCheck Valve is not required when DPLLD/PLLD is installed with the Red Jacket versions
- Test lines at full pressure for quick and accurate results
- Standard 3.0 GPH (11.4 LPH), Optional 0.2 and 0.1 GPH (0.76 and 0.38 LPH) testing
- Not impacted by thermal contraction of fuel
- Installs without breaking piping or adding a new sump
- Supports a wide-range of pump and pipe types
- Several options based on TLS system
- Pressure Sensor constructed with stainless steel to meet the challenges of a highly corrosive environment



#### Fuel Compatibility for all models of the Electronic Pressurized Line Leak Detection System:

- Unleaded Gasoline
- Leaded Gasoline
- 5% Methanol
- Up to 100% Ethanol
- 15% MTBE
- Diesel
- Biodiesel (Up to B100)
- Kerosene
- Jet Fuel
- Aviation Gasoline



### Corrosion Defense

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The Red Jacket® Stainless Steel Riser Pipes are impervious to in-sump corrosion caused by acetic acid. They improve submersible turbine pump serviceability in corrosive environments and avoid water intrusion into your tank from corroding riser pipe threads.



### Take a Stand Against Rising Water

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If the sump frequently has standing water and water in the tank is an issue, consider installing 4" Red Jacket Stainless Steel Riser Pipes, Type 304, NPT thread, in all new and reconfigured submersible turbine pump applications.

Red Jacket Stainless Steel Riser Pipes address water intrusion at tank top interfaces due to accelerated corrosion of riser pipe threads in damp sumps.

Specify "omit riser" on any STP final order and add the properly sized stainless steel riser on any Red Jacket STP order to replace the standard material riser with the stainless-steel version.

**Note:** Replaces standard 4" riser pipes, 7.5", 10.5", 12.5", 15.5", 19.5", and 27.5" lengths in-stock and additional lengths available upon request.



# Trapper Intake Screen

## Overview

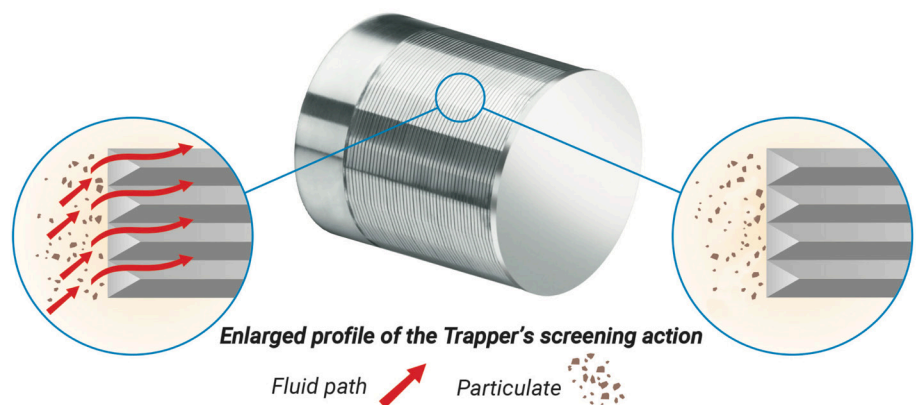
The Red Jacket® Trapper Intake Screen is the first line of defense against debris from microbial induced corrosion or other harmful particulate from entering the site fueling system.

Prolong fueling equipment life and save money with the Red Jacket Trapper Intake Screen. Unique, triangular slot design prevents accumulation and lodging of particles from underground storage tanks, maintaining peak performance of the submersible pump and keeping debris from entering the site's fueling system and dispensers. The Red Jacket Trapper Intake Screen is the perfect accessory to the industry leading line of submersible turbine pumps provided by Red Jacket.

## How The Red Jacket Trapper's Unique Screening Action Works

**Pump ON:** The triangular design of the filter allows the free flow of fluid but blocks particulate from entering the fluid system without reducing pump performance.

**Pump OFF:** Self-cleaning design allows particulate to fall away from the intake when the submersible pump is turned off.



### ► KEY FEATURES

- High-quality continuous slot design specifically engineered to fit at the end of the Red Jacket STPs. Available as a field retrofit kit for Red Jacket STPs.
- Easy, low-cost retrofit kit makes the Red Jacket Trapper Intake Screen a money saver at any Red Jacket site.
- Triangular profile screen blocks tank particulates from entering the pump.
- Self-cleaning every time the submersible pump is turned off.
- Rugged 304 stainless steel construction.
- Protects STPs from rags and other larger debris.
- Reduces submersible intake filter changes to as low as once per year per line, saving on labor and filter costs by preventing tank particulates from entering the fluid system.
- Decreases environmental liability by reducing the potential for filter seal leaks due to frequent filter changes.
- Reduces the amount of hazardous waste generated by used filters.
- Non-clog design does not require scheduled maintenance.
- Prolongs dispenser life.

# Control Boxes

ONE CONTROL BOX IS REQUIRED PER STP

SELECT YOUR OPTION

One Isotrol 1-8 Control Box is required for every eight nozzles of the same fuel grade

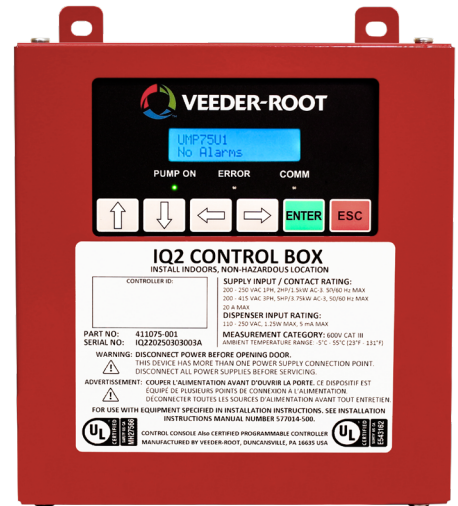


	IQ2 Control Box	IQ Control Box	Standard Control Box	Isotrol 1-8 Control Box
Single Phase / Three Phase	1 / 3	1	1	1 / 3
Basic On/Off Functionality	✓	✓	✓	-
Flow Optimization: Pump Staging	✓	✓	-	-
Basic STP Protection: Dry Run / Over Current (Locked Rotor)	✓	✓	-	-
Enhances STP Protection: Enhanced Protection Alarms: High Current, Phase Loss, High Voltage	✓	-	-	-
Power Insights (Active Power, Power Factor)	✓	-	-	-
Displays Pump Diagnostics	✓	-	-	-
Report Electric Parameters Through Serial Commands (Voltage, Current)	✓	✓	-	-
Displays Pump Diagnostics	✓	-	-	-
User Defined Helper Threshold for Flow Optimization	✓	-	-	-
Remote Reboot	✓	-	-	-
HP Ratings	3/4, 1.5, 2, 4, 5 HP	3/4, 1.5, 2 HP	3/4, 1.5, 2 HP	-
Improved Wiring Access	✓	-	-	-
Diagnostics and Configuration	LCD 2-Full-Text Lines and Buttons	Blinking Light and Jumpers	-	-
Isolates Handle Signals Between Dispensers	-	-	-	✓
Protects Against Wiring Shorts and Phasing Issues	-	-	-	✓
Dedicated ATG Output and Coil for PLLD Compatibility	-	-	-	✓

## The Red Jacket IQ2 Smart Controller

### Overview

The Red Jacket IQ2 Smart Controller provides operators with real-time status and diagnostics for monitoring their Submersible Turbine Pumps (STPs), ensuring site uptime and optimal fuel flow to customers. It features a full-text 2-line display screen providing visibility to STP status and descriptive alarms on the controller. Intelligently monitor pump performance through advanced analytical reporting.



### HIGH PERFORMANCE

**IQ2 optimizes fuel flow rates and STP operation through continuous monitoring of pump and motor parameters. With IQ2:**

- Use the Helper Mode to set power thresholds at which STPs will turn on as needed to achieve desired flow rates during peak demand
- Protect critical assets quickly with < 10 milliseconds (ms) reaction time
- Controls all The Red Jacket and Maxxum liquid fuel STP motor sizes: 3/4, 1.5, 2, 4, and 5 Horsepower (HP), single- and three-phase



### HIGH RELIABILITY

**IQ2 is designed and manufactured to the same best-in-class quality standards as the rest of the Red Jacket product line.**

- Energy measurements are continuously performed at least 100 times a second providing protection against electrical transients
- IQ2 provides the best-in-class reliability with its fixed-speed technology and offers a simplified and robust method for controlling the pumping infrastructure



### EASY INSTALLATION & SERVICEABILITY

**Wiring is easily accessible through the front panel of the controller, versus competitive options through the side of the controller, enabling technicians to more efficiently and safely service the IQ2.**

- Select the UMP model being used to set appropriate parameters, such as motor performance and alarm thresholds
- Enhanced controller interface and configuration capabilities through front panel keypad



### LOWER COST OF OWNERSHIP

The enhanced diagnostic feature set of IQ2 along with its high performance and reliability, reduces labor costs for servicing the controller and maximizes site uptime.

COST SAVINGS CATEGORY	SAVINGS LEVEL
Remote Pump Status and Diagnostics	\$\$\$\$
Fast protection for your critical assets with < 10 ms reaction	\$\$\$
Less susceptible to electrical transients	\$\$
Troubleshoot without the need to open the controller	\$



### PUMP STATUS & ADVANCED DIAGNOSTICS

Streamline service calls through precise monitoring and diagnostics of Red Jacket equipment through the IQ2 and TLS-450PLUS Automatic Tank Gauge (ATG).

## Diagnostics & Monitoring On-Site

- **Protection:** Fast reaction time to reduce risk of motor damage
  - Dry run
  - Under-voltage/over-voltage
  - Locked-rotor
  - Phase-loss
  - Self-test
  - Overload
  - Extended run protection
- **Electric parameters reports and diagnostics:** voltage, current, power, frequency
- **Enhanced power management insights:** active power, reactive power, apparent power, power factor

## Enhanced Automation & Statistics With TLS-450PLUS

Connecting the IQ2 and TLS-450PLUS enables enhanced monitoring capabilities via the IPC software.

- **Manifold tanks:**
  - Virtual Siphons: allow user to define the most suitable dispensing mode
  - STP prioritization
  - Automated flow increase (Helper Mode): turn ON manifolded STP according to flow demand
- **Controller diagnostic status:**
  - Pump status
  - Error
  - Communication
- **Historic event logs and statistics:**
  - Maximum, minimum, average voltage, and current
  - Pump usage and fault counts

## ► SPECIFICATIONS

IQ2 Smart Controller	
Dimensions (L, W, D)	10.5" x 8.24" x 7.08" (26.67 x 20.93 x 17.98 cm)
Handle Voltage	115 V or 230 V
Power Relay	<ul style="list-style-type: none"> <li>• 200 - 250 VAC 1P, 2 HP / 1.5 kW AC-3, 50/60 Hz MAX</li> <li>• 200 - 415 VAC 3P, 5 HP / 3.75 kW AC-3, 50/60 Hz MAX</li> <li>• 20 A per phase MAX</li> </ul>
Terminal Lug	Size 8 - 14 AWG wire
Network Connectivity	Up to 31 IQ2 Smart Controllers can be connected on a single network
Output Load Ratings	<ul style="list-style-type: none"> <li>• 200 - 250 VAC 1P, 2 HP / 1.5 kW AC-3, 50/60 Hz MAX</li> <li>• 200 - 415 VAC 3P, 5 HP / 3.75 kW AC-3, 50/60 Hz MAX</li> <li>• 20 A per phase MAX</li> </ul>
Dispenser Interface Ratings	<ul style="list-style-type: none"> <li>• 110 - 250 VAC, 1.25 W MAX</li> <li>• 5 mA MAX</li> </ul>
Environmental Ratings	<ul style="list-style-type: none"> <li>• Indoor Use Only in Non-Hazardous Location</li> <li>• Ambient Temperature: 23 to 131°F (-5 to 55°C)</li> <li>• Relative Humidity: 0-95% (non-condensing)</li> <li>• Altitude: 9,842' (3,000 m)</li> <li>• Mains Supply Voltage Fluctuations: ±10%</li> <li>• Overvoltage Category 600V CATIII</li> </ul>
Approvals	<ul style="list-style-type: none"> <li>• UL 1238</li> <li>• IEC 61010-1</li> </ul>



**"I need more information about the status of my STPs and I need it shown in an actionable way."**

**The IQ2 Smart Controller provides an effective way to remotely diagnose STP alarms.**

## The Red Jacket STP Fixed Speed Conversion Kits

# Focusing on Reliability & Energy Efficiency

Red Jacket's unsurpassed expertise helps your customers optimize fuel flow by focusing on reliability and energy efficiency. The Red Jacket STP Fixed Speed Conversion Kit ensures that your customers have the most optimal system to pump fuel quickly, efficiently, and safely – whether it's motor fuel, diesel, aviation gasoline, ethanol/methanol, or kerosene – in aboveground or underground storage tanks. **Convert a FE Petro® variable speed pump to a Veeder-Root Red Jacket fixed speed pump with a control box today!**



### ► CONVERSION KIT OPTIONS

In order to convert from a FE Petro variable speed pump to a Red Jacket fixed speed pump, you need one of the following conversion kits. You have the option to install the capacitor in the packer manifold or in the Standard or IQ Control Box, depending on preference.

HP Rating	Capacitor Location Options	Control Box Type	Hookswitch Voltage	Conversion Kit Part Number
2 HP	Capacitor Included in Red Jacket Control Box	Standard Control Box	120V	❶ 0410893-003
		IQ Control Box	120V	❷ 0410893-007
2 HP	Capacitor to be Installed in FE Petro STP Junction Box	Standard Control Box	120V	❸ 0410893-001
		IQ Control Box	120V	❹ 0410893-005
		IQ2 Smart Controller	110V – 250V	❺ 0410893-012
4 HP	N/A	IQ2 Smart Controller	110V – 250V	❻ 0411011-004

❶ 0410893-003



Capacitor in Standard Control Box  
0410861-001

❷ 0410893-007



Capacitor in IQ Control Box  
008800581

❹

0410893-005



IQ Control Box  
008800511

and



Capacitor Kit  
0410901-001

❺

0410893-012



IQ2 Smart Controller  
0411075-001

and



Capacitor Kit  
0410901-001

❸

0410893-001



Standard Control Box  
008800415

and



Capacitor Kit  
0410901-001

❻

0411011-004



IQ2 Smart Controller  
0411075-001

Included in All Kits

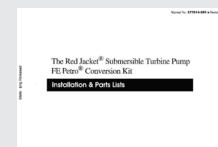


4" Pigtail 20-Foot Kit  
0410156-001

**NOTICE:**

THIS PUMP HAS BEEN MODIFIED PER V-R MANUAL 577014-365 AND NOW UTILIZES A VEEDER-ROOT UMP, PIGTAIL, AND CONTROL BOX.

Identification Plate



Installation Manual  
577014-365

## Provide Insight to Your Fueling Operations

Intelligent Pump Control (IPC) enables the TLS-450PLUS Automatic Tank Gauge (ATG) to connect with the IQ2 Smart Controller, delivering real-time Submersible Turbine Pump (STP) status, reports, statistics, and electrical parameter information. The real-time pump status feature displays current, voltage, power consumption, and flow helper mode, allowing for enhanced monitoring. IPC also supports remote control and troubleshooting to optimize your fueling operations.

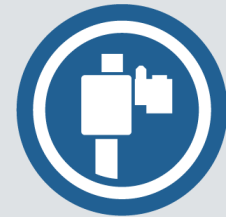
**TLS-450PLUS**



**Red Jacket® Smart STP Controller**



**Red Jacket STP**



- **The TLS-450PLUS ATG** provides the most comprehensive site data for advanced fuel asset management, including real-time updates and alerts on dispense modes, manifolding, communication, and system faults.

- **The Red Jacket Smart STP Controller** contains the intelligent circuitry that allows the communication path to flow between the ATG and STP, providing key data to support informed business decisions.

- **The Red Jacket Fixed Speed STP** optimizes the fueling process and provides real-time performance data. IPC Software with Red Jacket Diagnostics delivers the data needed for effective site operation management.

### ▶ ENHANCED CONTROL & ACTIONABLE INSIGHTS

#### Control Manifolded Tanks

- **Virtual Siphons:** Define the most suitable dispensing mode for each application.
- **STP Prioritization:** Optimize pump activation order for efficiency.
- **Automated Flow Increase (Helper Mode):** Automatically activate manifolded STPs based on flow demand to maintain optimal delivery.

#### Controller Diagnostic Status

- Real-time monitoring of pump status, errors, and communication health.

#### Historic Event Logs & Statistics

- Track maximum, minimum, and average voltage and current.
- Monitor pump usage and fault counts.
- Identify trends and irregularities in motor operation to enable timely maintenance interventions.

### ▶ PERFORMANCE OPTIMIZATION & MONITORING

#### Optimize Consistent Product Delivery at the Nozzle

- The TLS-450PLUS ATG intelligently determines when to activate specific tanks based on fuel height, volume, or pump-specific settings.

#### Real-Time Voltage & Current Data Reporting

- Monitor pump performance within ideal operational ranges to ensure reliability.

#### Visibility into STP Operation in Manifolded Configurations

- Gain detailed performance data to improve system management.

#### Preventative Maintenance & Streamlined Troubleshooting

- Proactively address issues before they escalate, reducing downtime and service costs.

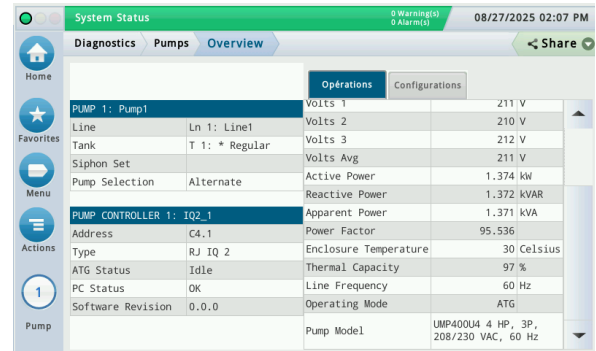
## Intelligent Pump Control

# Software for Red Jacket Submersible Turbine Pumps

## ► REMOTE DIAGNOSTICS & CONTROL

IPC supports the following categories of diagnostics for each STP Controller:

- **Current Operational Status** – Provides real-time pump operational status warnings and alarms
- **Pump Electrical Parameter** – Indicates other vital STP electrical system data
- **Pump Statistics and Activity Log** – Tracks and records pump and motor parameters to support troubleshooting



System Status		0 Warnings(s) 0 Alarm(s)		08/27/2025 02:07 PM	
Diagnostics		Pumps		Overview	
Home		Opérations		Configurations	
★		PUMP 1: Pump1		Volts 1 211 V	
★		Line		Volts 2 210 V	
★		Tank		Volts 3 212 V	
★		Siphon Set		Volts Avg 211 V	
★		Pump Selection		Active Power 1.374 kW	
★		Alternate		Reactive Power 1.372 kVAR	
★		PUMP CONTROLLER 1: IQ2_1		Apparent Power 1.371 kVA	
★		Address		Power Factor 95.536	
★		C4.1		Enclosure Temperature 30 Celsius	
★		Type		ATG Status Idle	
★		RJ IQ 2		Thermal Capacity 97 %	
★		PC Status		Line Frequency 60 Hz	
★		OK		Operating Mode ATG	
★		Software Revision		0.0.0	
★		Pump Model1		UMP400U4 4 HP, 3P, 208/230 VAC, 60 Hz	

## ► FUNCTIONALITY

- **Advanced Pump Control** – Utilizes TLS Dispense Modes
- **Line and Pump Priority** – Determines which pump or line to activate based on tank and pump feedback
- **Staging (Helper Mode)**
  - Primary – Secondary
  - Alternate
  - In-Tank Staging
  - Across Tank Staging
- **Flow Optimization**
  - Utilizes pump staging to optimize consistent delivery of product at the nozzle (Helper Mode)
  - Switch on the Fly – Provides continuous line pressure during staging from pump to pump
- **Operational Redundancy**
  - Utilizes TLS-based logic to understand when one pump needs the assistance of another pump
- **Automatic Events for Alarm and Email Notification**
  - Through the TLS-450PLUS ATG

## ► DISPENSE MODES

- **Sequential** – The Sequential dispense mode selects a tank based on tank numbers (lowest number tank used first). Fuel is pumped from the initial tank until a certain low product level is reached (e.g., “pump threshold %” of volume) before moving to the next tank.
- **Alternate by Height or by Volume** – The system will try to keep the products in the tanks level based on volume or height. Alternate by Volume is suggested when there are multiple sized tanks connected to the line.
- **Alternate by Pump** – Pump selection is based purely on pump sequence. In this mode, tank selection is ignored. Pumps are engaged in pump number order. For each new hook-signal, the next pump in sequence is engaged (e.g., P1, P2, P3, P1...).
- **Priority** – Based on tank and flow rate information.

## In-House Performance Testing & Manufacturing

Our manufacturing facilities focus on product reliability to ensure superior performance and dependability for all of our Red Jacket® Submersible Turbine Pumps. Maintaining high standards throughout the manufacturing process ensures our Red Jacket products continually and consistently meet your on-site fueling infrastructure needs.



To ensure proper performance, our engineering facilities perform a multitude of check-points and testing protocols to maintain our high levels of performance expectations:

- Endurance testing using various fuel types, including, for example, gasoline, diesel, ethanol based fuels, biodiesels, and Diesel Exhaust Fluid (DEF), which reflect real world pumping applications
- Hydraulic performance testing using gasoline, diesel fuel, DEF, or Liquid Petroleum Gas (LPG) as the test fuel, which reflects real world fuels
- Motor performance testing ( $\frac{3}{4}$  HP up to 5 HP) to determine amperage, efficiency and temperature ratings
- Electronic and mechanical leak detection testing (3 GPH and precision) uses steel, fiberglass, and flex pipe lines, which ensures compliance to EPA and/or any other regulatory leak detection performance standards
- All instrumentation is calibrated in compliance to ISO/IEC 17025 to ensure measurements are accurate and will meet or exceed UL Data Acceptance Program requirements for in-house UL, IECEx, and ATEX certification testing
- Data Acquisition using LabVIEW measurement instrumentation to continuously monitor and control testing
- Thermal cycling to assess a wide range of temperatures, representing various geographic climate applications
- Fuel compatibility of elastomers and plastics (static and dynamic) in various test fuels
- Hydrostatic testing of castings to ensure designs have four times safety margin

## Trusted Technical Expertise

### Delivering World-Class Customer Service

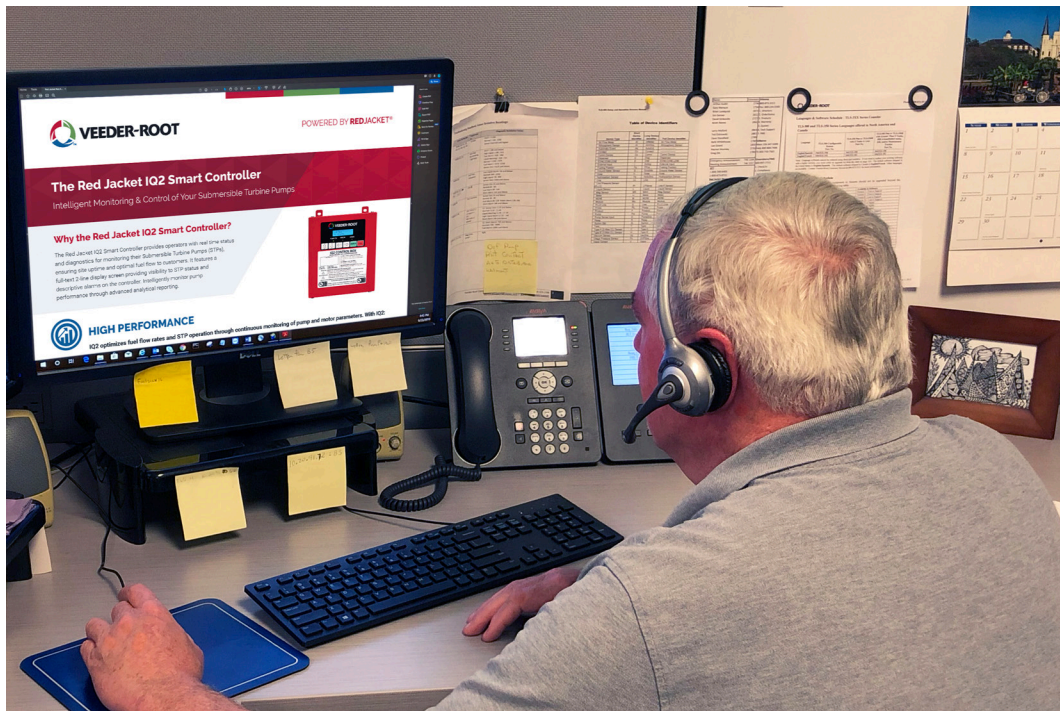
- Providing transactional accuracy to ensure customer product delivery satisfaction
- Quick-turn responsiveness to ensure customer inquiries are handled expeditiously and professionally

### Providing Exceptional Technical Support

- Dynamic and knowledgeable support team with over 80+ years of collective expertise in the fueling infrastructure industry
- Fielding, trouble-shooting, and resolving customer inquiries, installation and compliance questions
- Providing top-notch industry know-how in guiding customers toward selecting the right equipment for the right application

### Ensuring Exceptional Quality Standards

- Maintain Veeder-Root's ISO 9001:2015 and ISO 14001 Registered Quality Management System to ensure product quality standards
- Assure Veeder-Root's products are manufactured in compliance with UL/cUL Listings and the ATEX Directive
- Continuous monitoring of Veeder-Root's product performance in the field





# Notes





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