Franklin Electric
FUELING SYSTEMS



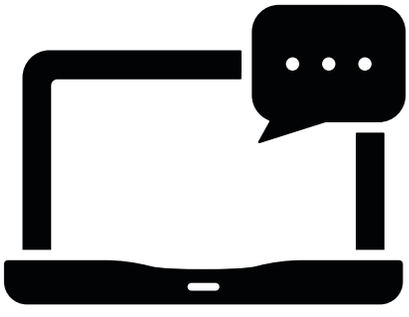
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OUR TEAM IS HERE FOR YOU



The FFS PRO® Support Center is your go-to online support tool. Submit and review support tickets, find answers to common questions, and access all of our industry-leading support materials.

For support visit franklinfueling.com/support-center

CUSTOMER SERVICE: +1 866 887 9904 | TECHNICAL SERVICE: +1 800 984 6266

CORROSION CONTROL



1. EVO™ 600 or EVO™ 6000
2. Multiplexing Sensor Hub™
3. Corrosion Control™ Detection Sensor & Desiccant Pack Sensor
4. Corrosion Control™ Desiccant Pack
5. Corrosion Control™ Advanced Protection Submersible Turbine Pump
6. Corrosion Control™ Water Separator


6
5
2
4
3
CORROSION

CORROSION CONTROL™ WATER SEPARATOR

The Corrosion Control™ Water Separator provides proactive in-tank corrosion control by removing tank-bottom corrosion contributors including water and acid. The Water Separator uses the flow of fuel created by a 4" FE PETRO® Submersible Turbine Pump (STP) to generate a vacuum which suctions the tank bottom. The separator vessel collects any water/acid mixture and the clean fuel is directed back into the tank. The water/acid mixture is then removed by a service technician, keeping the tank clear of the harmful corrosion causing mixture.



HIGHLIGHTS

- Compatible with any new or existing FE PETRO® 4" STP.
- Mounts to any 4" riser including either an STP riser or probe riser.
- Element-free vessel has no filter to change, eliminating ongoing replacement costs.
- All stainless steel construction for corrosion resistance.
- Comprised of UL recognized components.
- Height adjustable tank bottom suctioning kit can accommodate tanks up to 10' in diameter.
- Automated control and monitoring is provided via an EVO™ 600/6000.
- The EVO™ runs the Water Separator for 45 minutes after each delivery as well as once a day during a non-peak time to remove any water/acid mixture that drops to the tank bottom.
- During scheduled operation, the EVO™ opens the Water Separator's solenoid valve to allow fuel to begin flowing through the separator vessel while a flow switch monitors the system for positive flow.
- An integrated LL3 Probe monitors separator operation and provides a notification to empty the vessel via the EVO™.
- Short profile to fit in many different sumps.

SPECIFICATIONS

Vessel capacity	¾ gallon of water/acid (2.8 L)
Eductor flow	8 GPM flow to drive suction pickup (30 Lpm)
Suction pickup	¼ GPM (0.9 Lpm)
Containment Sump Requirements	Minimum of 30" (0.76 m) of height inside the tank sump
	Accessible 4" port in the tank manway
	At least 11" (280 mm) envelope for vessel and adjacent piping
	High-voltage conduit for solenoid wiring
	Intrinsically safe conduit for Water Separator probe
Tank Gauge Requirements	EVO™ 600 or EVO™ 6000
	EVO™ Series latest firmware version
	Access to in-tank product level readings (for delivery events and recirculation runtime)
	1 open Relay Module port (for solenoid)
	1 open UDP Module input, Probe module input, or MSH input (for vessel probe)

SYSTEM COMPONENTS

Add these Corrosion Control™ System items to your site to proactively prevent and detect corrosion.



EVO™ 600 OR EVO™ 6000



CORROSION DETECTION SENSOR



MULTIPLEXING SENSOR HUB™



DESICCANT PACK

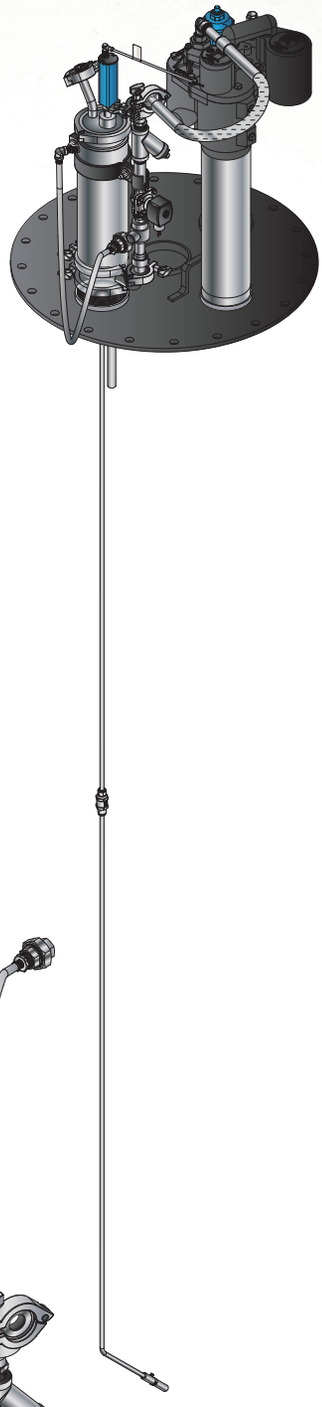


ADVANCED PROTECTION STP

ORDERING INFORMATION

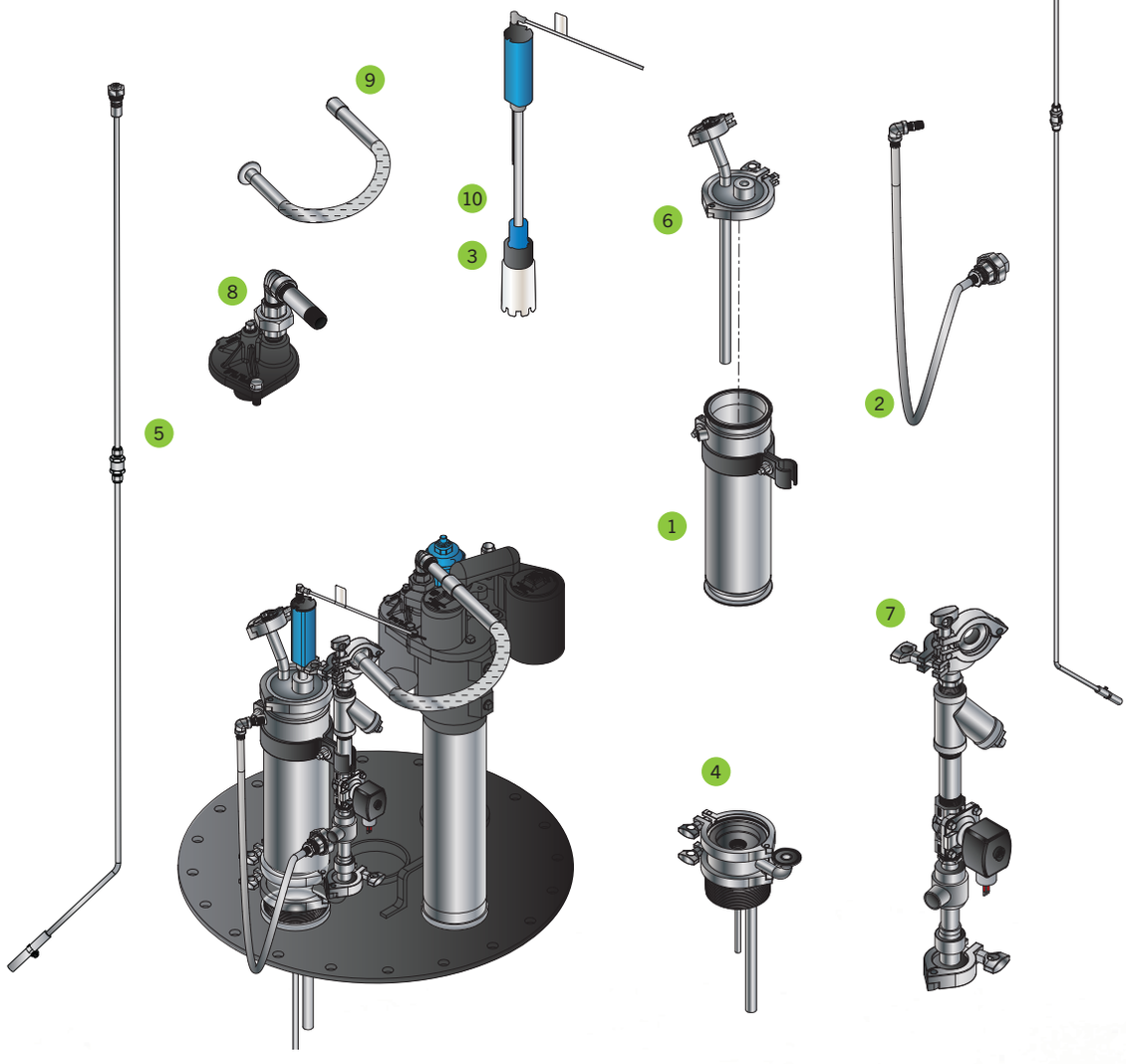
Corrosion Control™ Water Separator

Model	Description
407985903-I	Corrosion Control™ Water Separator (BSPT), includes items #1 through #11 below
407945910	Water removal hand pump
403963001	13" cable ties, 100 pack



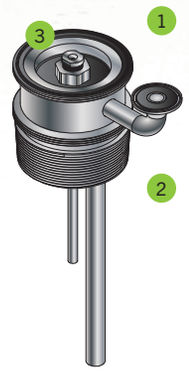
Corrosion Control™ Water Separator Component Kits

Item	Model	Description
1	407945914	Water Separator Vessel Kit
2	407945917	Water Separator-to-Eductor Kit
3	407945919	Water Separator Float Kit
4	407945931	Water Separator Suction Adapter Kit
5	407945922	Water Separator Suction Tube Kit
6	407945925	Water Separator Vessel Cover Kit
7	407945936	Eductor Manifold Kit
8	407945928	STP-to-Eductor Kit
9	FF07X24EZX05F	¾" x 24" Flexible Connector (EZ FIT x Female)
10	FMP-LL3-16-WS	16" LL3 MAG Probe Kit
11	407945918	Installation Hardware (not shown)



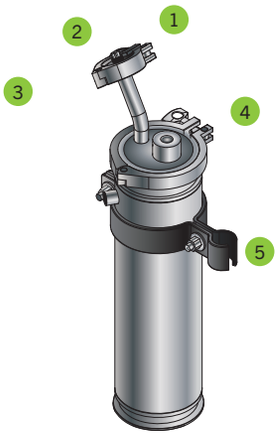
ORDERING INFORMATION CONTINUED

Water Separator Suction Adapter Kit Replacement Parts



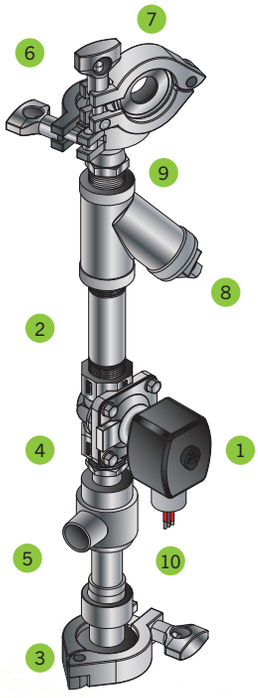
Item	Model	Description
1	EZ40CLAMP	4" EZ FIT clamp
2	407493004	4" EZ FIT gasket
3	10000017049	Water Separator Check Valve (comes with kit p/n 407945922)

Water Separator Vessel & Cover Kit Replacement Parts



Item	Model	Description
1	EZ10CLAMP	1" EZ FIT clamp
	407493001	1" EZ FIT gasket
2	10000002180	1" EZ FIT removal cap
3	403499001	¼" NPT pipe plug
4	EZ40CLAMP	4" EZ FIT clamp
	407493004	4" EZ FIT gasket
5	407945920	Eductor clamp kit

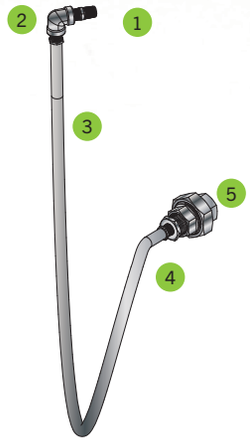
Eductor Manifold Kit Replacement Parts



Item	Model	Description
1	10000018608	3/4" Solenoid valve, 220V
2	Purchase locally	¾" NPT x 4" stainless steel nipple
3	EZ10CLAMP	1" EZ FIT clamp
	407493001	1" EZ FIT gasket
4	Purchase locally	¾" NPT stainless steel coupling
5	407939001	¾" eductor, stainless steel
6	EZ10CLAMP	1" EZ FIT clamp
	407765001	1" EZ IT orifice plate
7	407995001	1" EZ FIT X EZ FIT elbow
8	407941001	¾" Y strainer
	407774901	¾" Y strainer replacement screen only
	403499002	⅜" NPT pipe plug
9	407953004	Bushing adapter
10	EZ10X07FSS	EZ FIT x 3/4" FNPT, Stainless Steel Adapter

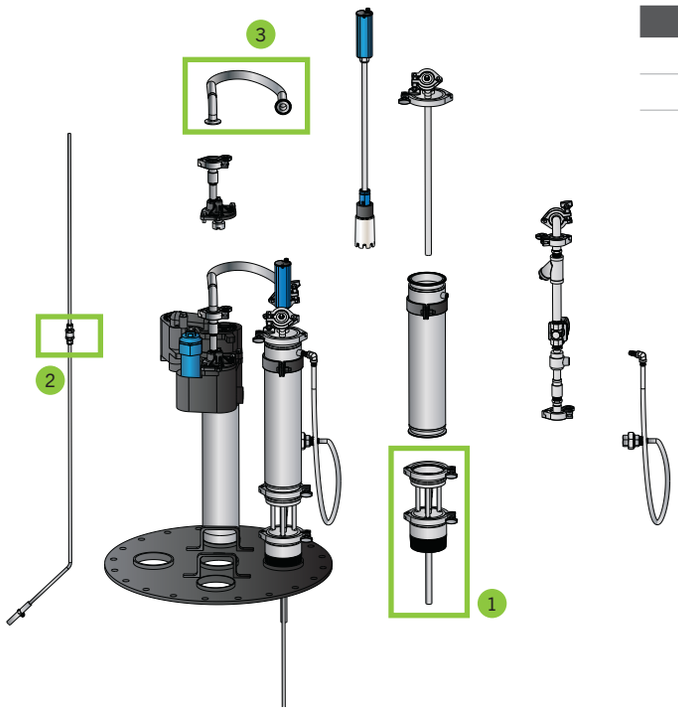
ORDERING INFORMATION CONTINUED

Water Separator-To-Eductor Kit Replacement Parts



Item	Model	Description
1	407764001	¼" NPT flow orifice
2	Purchase locally	¼" NPT stainless steel elbow
3	407984001	¼" X 36" long flex connector
4	Purchase locally	¼" NPT x ¾" NPT stainless steel bushing
5	Purchase locally	¾" NPT stainless steel union

Legacy/Replacement Parts



Item	Model	Description
1	407945911	Plunger Valve
2	10000002278	Check Valve
3	FF07X24EZXEZ90	Flexible connector, ¾" x 24", EZ FIT x EZ FIT 90° elbow

CORROSION CONTROL™ EVO™ SERIES UPGRADE KITS

Leverage the power of your existing EVO™ 550 or EVO™ 5000 and upgrade to the latest evolution in automatic tank gauging. See details below for the newest features and enhancements.



See page 76 for full information about the EVO™ 600/6000.

HIGHLIGHTS

- **User interface efficiency:**
  - Additional one-touch buttons.
  - Shallow menu structure allows users to do more with fewer clicks.
  - FFS PRO® Connect remote web access.
- **Security features:**
  - Create unlimited user roles with customized system access.
  - Individual user logins with tracking capability.
  - EVO™ console sends out information while remaining safely behind your firewall.
  - Utilizes TLS/SSL protocols to ensure data encryption between browser and EVO™ console.
- **Faster processing speed & reboots:**
  - Reduced time required to reboot after system changes.
  - An all new faster processor enables the EVO™ console to reboot in just seconds after firmware updates, keeping stations open and operational.
- **Facilitates site upgrades:**
  - Bring your station to the next level with a Corrosion Control™ water separator (CWS) for your existing site without purchasing a new EVO™ console.
  - Our Multiplexing Sensor Hub™ (FMP-MSH) enables CWS installations avoiding interruptions to fueling operations or adding costly new wiring.

ORDERING INFORMATION

EVO™ Series Upgrade Kits

Model	Description
EVO-600UPG	Upgrade kit for EVO™ 550 to EVO™ 600, includes control module, comm port cover, and EVO 600™ jewel
EVO-6000UPG	Upgrade kit for EVO™ 5000 to EVO™ 6000, includes control module, comm port cover, and EVO 6000™ jewel
EVO-600UPG-W	Upgrade kit for EVO™ 550 to EVO™ 600 with Wifi, includes control module, comm port cover, Wifi hardware, and EVO 600™ jewel
EVO-6000UPG-W	Upgrade kit for EVO™ 5000 to EVO™ 6000 with Wifi, includes control module, comm port cover, Wifi hardware, and EVO 6000™ jewel

SYSTEM COMPONENTS

Add these Corrosion Control™ System items to your site to proactively prevent and detect corrosion.



WATER SEPARATOR



CORROSION DETECTION SENSOR



MULTIPLEXING SENSOR HUB™



DESICCANT PACK



ADVANCED PROTECTION STP

CORROSION CONTROL™ ADVANCED PROTECTION SUBMERSIBLE PUMPS

Available as a factory installed option on STPAG and IST biofuel compatible Submersible Turbine Pumps (STPs), Corrosion Control™ Advanced Protection defends STPs from accelerated corrosion.



Corrosion Control™ Advanced Protection STP shown with MLD+ and Intake Filter Screen (sold separately).

HIGHLIGHTS

- Powder-coated and E-coated finishes protect exterior cast surfaces from accelerated corrosion.
- Stainless steel fasteners, riser, variable length column pipe and coupler protect against corrosion and provide long service life.
- UL and cUL listed.

ORDERING INFORMATION

Advanced Protection STPs shipped from the factory will list the combined part number. Complete part numbers have a specific order and are created using the following guidelines:

STP XXXXX Y-A-B

STP = Basic Model Designation (IST for variable speed models)

XXXXX = **Factory Installed Options** (Model designations may include one or more of the following characters in alphabetical order.)

AP = Corrosion Control™ Advanced Protection with coated exterior cast surfaces, stainless steel fasteners and piping, alcohol-gasoline compatible)

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

H = High pressure deadhead output (150 and 200 models only)

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

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

R = Model R check valve
(24 psi relief (1.65 bar) /22 psi (1.51 bar) reset for PLLD)*

Y = **Pump Motor Horsepower Rating**

200B or 200C = 2 hp fixed speed

75B or 75C = 3/4 hp fixed speed

150B or 150C = 1½ hp fixed speed

VS2 = 2 hp variable speed**

VS4 = 4 hp variable speed***

A = **Model Length**

VL1 = Variable length range #1

VL2 = Variable length range #2

VL3 = Variable length range #3

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 to1524 mm in 25.4 mm increments (additional charge for risers 787 mm or longer).

**If not otherwise specified, all STP models are supplied with standard model check valve (40 psi relief (2.75) /35 psi (2.41) reset for MLD, TS-LS300, and TS-LS500).*

***Implied on IST models unless VS4 is specified.*

**** IST models only.*

SYSTEM COMPONENTS

Add these Corrosion Control™ System items to your site to proactively prevent and detect corrosion.



EVO™ 600 OR EVO™ 6000



WATER SEPARATOR



MULTIPLEXING SENSOR HUB™



CORROSION DETECTION SENSOR



DESICCANT PACK

ORDERING INFORMATION

Corrosion Control™ Advanced Protection Submersible Turbine Pumps Common Configurations

Model	Description	Model Length Range Number	Model Length* Range
ISTAPVS4-VL1	4 hp AP variable speed	VL1	1613 mm– 2355 mm
ISTAPVS4-VL2	4 hp AP variable speed	VL2	2401 mm–3962 mm
ISTAPVS4-VL3	4 hp AP variable speed	VL3	3214 mm–5556 mm
ISTAP-1	2 hp AP variable speed	VL1	1486 mm–2228 mm
ISTAP-2	2 hp AP variable speed	VL2	2274 mm–3835 mm
ISTAP-3	2 hp AP variable speed	VL3	3087 mm–5429 mm
STPAP200B-VL1	2 hp AP fixed speed, single phase	VL1	1632 mm–2374 mm
STPAP200B-VL2	2 hp AP fixed speed, single phase	VL2	2420 mm–3981 mm
STPAP200B-VL3	2 hp AP fixed speed, single phase	VL3	3233 mm–5575 mm
STPAP200C-VL1	2 hp AP fixed speed, three phase	VL1	1575 mm–2317 mm
STPAP200C-VL2	2 hp AP fixed speed, three phase	VL2	2363 mm–3924 mm
STPAP200C-VL3	2 hp AP fixed speed, three phase	VL3	3175 mm–5518 mm
STPAP150B-VL1	1-1/2 hp AP fixed speed, single phase	VL1	1556 mm–2298 mm
STPAP150B-VL2	1-1/2 hp AP fixed speed, single phase	VL2	2344 mm–3905 mm
STPAP150B-VL3	1-1/2 hp AP fixed speed, single phase	VL3	3156 mm–5499 mm
STPAP150C-VL1	1-1/2 hp AP fixed speed, three phase	VL1	1531 mm –2273 mm
STPAP150C-VL2	1-1/2 hp AP fixed speed, three phase	VL2	2318 mm–3879 mm
STPAP150C-VL3	1-1/2 hp AP fixed speed, three phase	VL3	3131 mm–5473 mm
STPAP75B-VL1	3/4 hp AP fixed speed, single phase	VL1	1499 mm –2241 mm
STPAP75B-VL2	3/4 hp AP fixed speed, single phase	VL2	2286 mm–3848 mm
STPAP75B-VL3	3/4 hp AP fixed speed, single phase	VL3	3099 mm–5441 mm
STPAP75C-VL1	3/4 hp AP fixed speed, three phase	VL1	1480 mm–2222 mm
STPAP75C-VL2	3/4 hp AP fixed speed, three phase	VL2	2267 mm–3829 mm
STPAP75C-VL3	3/4 hp AP fixed speed, three phase	VL3	3080 mm–5422 mm

Notes:

1. *STPAP/ISTAP models are listed for compatibility 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 above ISTAPVS4 4 hp models can only be powered by an EcoVFC™ with three-phase incoming power supply. All above ISTAP2 hp models can be powered by a MagVFC™ with single-phase incoming power or an EcoVFC™ with three-phase incoming power.*
4. *All above STPAP single phase models (75B, 150B, 200B) require single-phase, 200–250 VAC, 50 Hz incoming power. All above STPAP three phase models (75C, 150C, 200C) require three-phase, 380-415 VAC, 50 Hz incoming power.*
5. *4" riser pipe, if supplied locally, must be 4½" OD by 3/16" WT tubing.*
6. *For riser pipe lengths 787 mm to 1524 mm, adder charge applies (call customer service for lead times).*

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

Factory Installed Approvals

May specify one in model number at time of order.

Model	Description
(ATXF)	STP with ATEX flameproof approval for EN markets
(RT)	STP 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
R	Model R check valve, factory installed, for Veeder-Root® PLLD Line Leak

Field Installed Options

Model	Description
5874202800	MagVFC™, 2 hp or 4 hp variable frequency controller, one required per IST
5874202900	EcoVFC™, 2 Hp or 4 Hp Variable Frequency Controller, 380 V, one required per STP
400137937	Syphon check valve, alcohol-gasoline compatible
400818922	STP-CBBS, single-phase control box, with switch and lockout, 240 Volt coil
402312932	STP-DHIB + SPGC-220 Guardian Series™ Single-Phase Controller bundle
402313922	STP-DHIB-CBBS, combo DHI with factory-wired STP-CBBS single-phase control box
402459931	Model 65 psi check valve (for secondary of manifolded STPs with Veeder-Root® PLLD)
402507930	Secondary syphon kit (when two syphon primes are required for one STP)
5800100220	SPGC-220 Guardian Series™ Single Phase Controller, 220 Volt
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 supply, 220 Volt hook)
401220965	STP-CBB3C, three-phase 380-415 VAC magnetic starter

CORROSION CONTROL™ DESICCANT PACK

The Corrosion Control™ Desiccant Pack provides economical, proactive in-sump corrosion protection by absorbing humidity from the sump environment before it can turn into corrosion-causing moisture. Keep your system running at peak performance and avoid costly maintenance, equipment replacement, downtime, and system failure caused by excessive corrosion.



HIGHLIGHTS

- Protects submersible pumps, fittings, and other tank sump hardware from the formation of corrosion which can lead to equipment deterioration.
- Compact, economical, simple design with no replacement parts or servicing necessary.
- Includes stainless steel hanging grommet and cable ties.
- Desiccant blend is formulated specifically for petroleum applications to ensure maximum moisture absorption is contained within an easy-to-service and dispose-of package.
- Tested for a typical service life of 4 to 6 months in a 75-100 cubic foot tank sump.
- Each pack comes individually packaged in a foil barrier bag to ensure long storage life.
- Fits through 4" multi-port inspection openings for easy install.

SPECIFICATIONS

Enclosure material	Tyvek® spunbond olefin fiber
Desiccant blend	400-450 grams calcium chloride/starch
Grommet	#4 stainless steel
Height	24"
Width	4 ¾"
Diameter	3 ¼"

ORDERING INFORMATION

Corrosion Control™ Desiccant Pack

Model	Description
FMP-DPS-U	Desiccant Pack Sensor with single and multi-pack hanger and installation kit
407750906	Corrosion Control™ Desiccant Pack, includes (6) packs and (6) cable ties
403963001	13" cable ties, 100 pack
TSP-KS	Unistrut® mounting kit

Note: The FMP-DPS-U communicates with EVO™ 600/6000 using the Universal Device Protocol Module (FMP-UDP9) or Probe Module (TS-PRB).

Tyvek® is a registered trademark of E.I. du Pont de Nemours and Company.
Unistrut® is a registered trademark Unistrut Corporation.

SYSTEM COMPONENTS

Add these Corrosion Control™ System items to your site to proactively prevent and detect corrosion.



EVO™ 600 OR EVO™ 6000



WATER SEPARATOR



MULTIPLEXING SENSOR HUB™



CORROSION DETECTION SENSOR



ADVANCED PROTECTION STP

CORROSION CONTROL™ CORROSION DETECTION SENSOR (CDS)

As part of the Corrosion Control™ System, the Corrosion Detection Sensor (CDS) provides automated notification of a corrosive environment in the tank ullage space. Keep the fuel system running at peak performance and avoid costly maintenance, equipment replacement, downtime, and system failure caused by excessive corrosion.



HIGHLIGHTS

- Sensor will detect the presence of corrosion on a sacrificial sample and provide an alarm.
- Protects the tank ullage from the formation of corrosion which can lead to fuel system deterioration.
- Displays a level reading for corrosion index via the EVO™ Series Automatic Tank Gauge (EVO™ console) with programmable alarm types including:
  - Corrosive Environment Present
  - Corrosion Sensor Sample Error
  - Corrosion Sample Needs Replacement
- Compatible with all blends of gasoline, diesel, and Ethanol.
- EVO™ console compatibility:
  - EVO™ 200 and EVO™ 400
  - EVO™ 550 and EVO™ 5000
  - EVO™ 600 and EVO™ 6000

ORDERING INFORMATION

Corrosion Control™ Corrosion Detection Sensor

Model	Description
FMP-CDS-U	Corrosion Detection Sensor (all EVO™ Series)
FMSP-RDS1	Replacement detection screen, qty 1
FMSP-RDS10	Replacement detection screen, qty 10

Note: this sensor communicates with the EVO™ console via a TS-PRB probe module (EVO™ 550, EVO™ 5000, EVO™ 600, and EVO™ 6000) or via an IS channel (EVO™ 200 & EVO™ 400).

SPECIFICATIONS

Applications	Monitoring for a corrosive environment within a tank ullage space.	
Operation	Corrosion detection sensor	Can be installed in the ullage space of tanks or in dispenser or STP sumps.
	Intrinsically safe sensor	Utilized an included quick disconnect cable to wire to any EVO™ Series EVO™ console via the probe module (EVO™ 550/5000, EVO™ 600/6000) or any Intrinsically Safe (IS) channel (EVO™ 200/400).
	Sensor materials	The sensor utilizes a sacrificial metal screen which is used to detect the formation of corrosion. This screen can be removed and replaced upon the formation of corrosion.

SYSTEM COMPONENTS

Add these Corrosion Control™ System items to your site to proactively prevent and detect corrosion.



EVO™ 600 OR EVO™ 6000



WATER SEPARATOR



MULTIPLEXING SENSOR HUB™



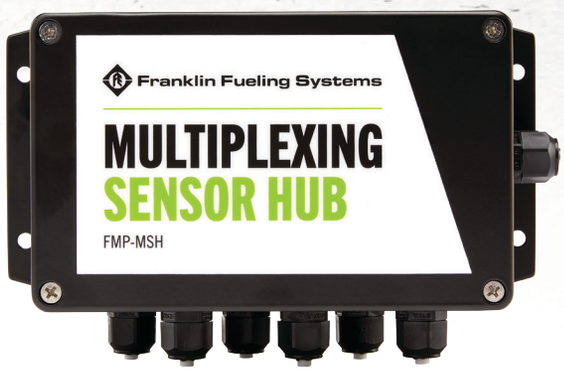
DESICCANT PACK



ADVANCED PROTECTION STP

MULTIPLEXING SENSOR HUB™

The Multiplexing Sensor Hub™ (MSH) allows you to use a single 4-wire cable to connect up to six devices to an EVO™ 600 or EVO™ 6000 automatic tank gauge (EVO™ console).



HIGHLIGHTS

- For retrofit applications: the MSH can use existing 4-wire probe and sensor cables to add additional probes or sensors, providing expanded monitoring capabilities without the need to break concrete to run additional cable.
- For new applications: the MSH delivers labor and materials savings by reducing the amount of conduit and cable required for monitoring devices within a containment sump.
- Ideal for use in adding a Corrosion Control™ Water Separator and corrosion detection sensors (FMP-CDS-U) to an existing tank sump and provides all necessary input capabilities for this system.
- Six input channels provide a wide assortment of device communication capabilities:
  - **Channel 1**: Always on, for FMP-LL3 digital inventory and leak detection probes.
  - **Channel 2-5**: Multiplexed, for 2-wire universal device protocol (UDP) communication devices.
  - **Channel 5**: Additional capability for 2-wire devices.
  - **Channel 6**: For any dry-contact single pole single throw (SPST) switch, a flow switch, two-wire device, or temperature sensor based on a 10k thermistor.

SPECIFICATIONS

Inputs	(1) LL3 probe, (4) UDP devices, (1) switch/temperature sensor
Output to EVO™600/6000	(1) RS-485
Connections	The FMP-MSH requires a minimum of four wires connected directly to an EVO™ 600 with an RS485 module
Type of connections	Power, ground, A, and B communication for the RS485 module. If a sump has two input field cables that are both 2-conductor cables, the A and B connections should be wired in the same cable that must be a twisted pair.
	Power and ground should be on the other cable. If it is a new installation, Belden™ cable #7962A, or a cable with equivalent parameters, is recommended. The FMP-MSH can power and accept input from 6 different probes or sensors.
Approvals & Certifications	UL listed, ATEX/IECEx

Input Capabilities

The FMP-MSH is capable of supporting the following devices:

Channel 1	Channel 2	Channel 3	Channel 4	Channel 5	Channel 6
FMP-LL3	FMP-DDS-U	FMP-DDS-U	FMP-DDS-U	FMP-DDS-U	FMP-ULS
--	FMP-DTS-U	FMP-DTS-U	FMP-DTS-U	FMP-DTS-U	FMP-UHS
--	FMP-EIS-U	FMP-EIS-U	FMP-EIS-U	FMP-EIS-U	FMP-HFS2
--	FMP-DIS-U	FMP-DIS-U	FMP-DIS-U	FMP-DIS-U	10k Temp. Sensor
--	FMP-HIS-U	FMP-HIS-U	FMP-HIS-U	FMP-HIS-U	--
--	FMP-CDS-U	FMP-CDS-U	FMP-CDS-U	FMP-CDS-U	--
--	FMP-LL3-18*	FMP-LL3-18*	FMP-LL3-18*	FMP-LL3-18*	--
--	--	--	--	FMP-ULS	--

**The FMP-LL3-18 is integrated into the Corrosion Control™ Water Separator to detect water level in the vessel.*

ORDERING INFORMATION

Model	Description
FMP-MSH	Multiplexing Sensor Hub™

Belden™ is a trademark of Belden Technologies, Inc.

SYSTEM COMPONENTS

Add these Corrosion Control™ System items to your site to proactively prevent and detect corrosion.



EVO™ 600 OR EVO™ 6000



WATER SEPARATOR



CORROSION DETECTION SENSOR



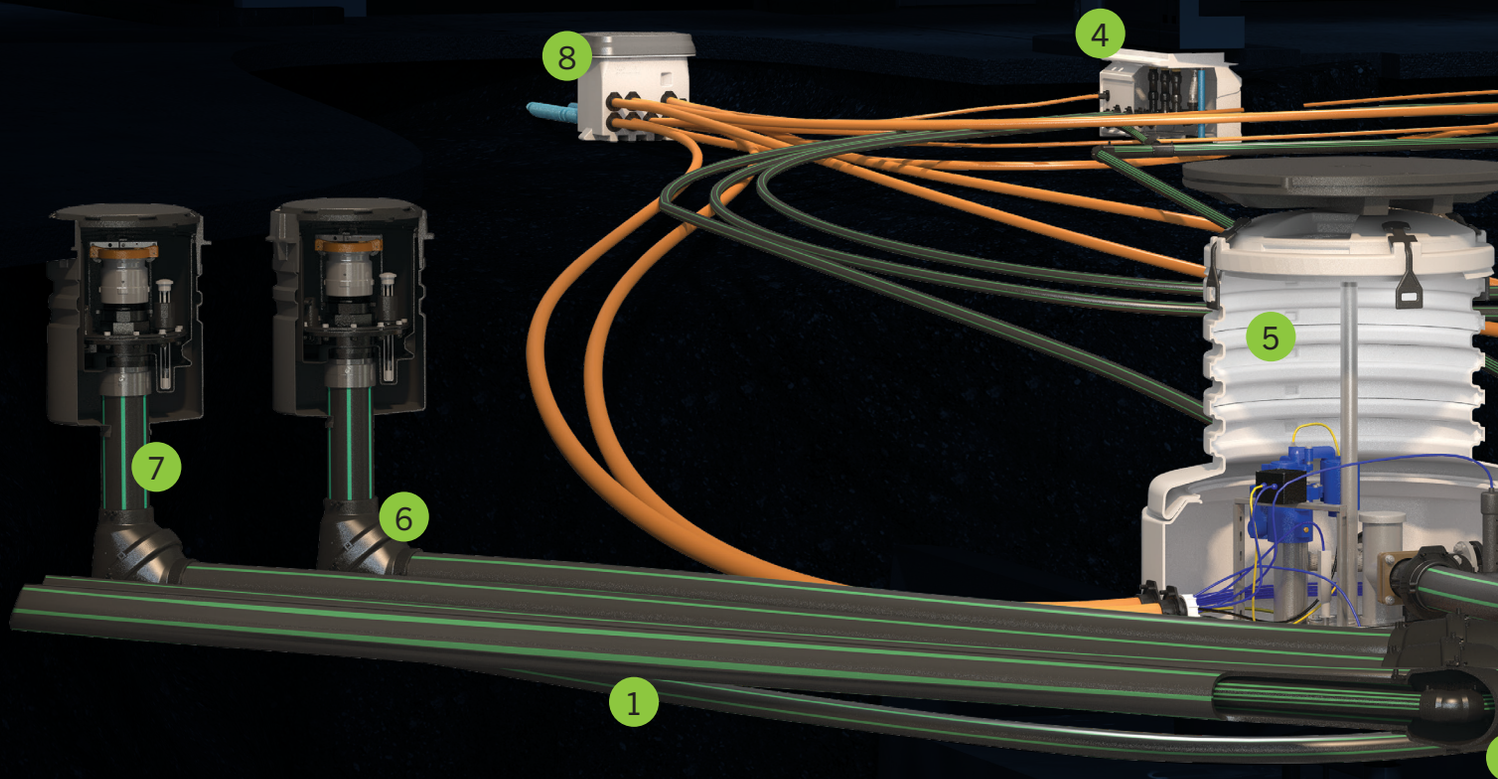
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ADVANCED PROTECTION STP

PIPING & CONTAINMENT

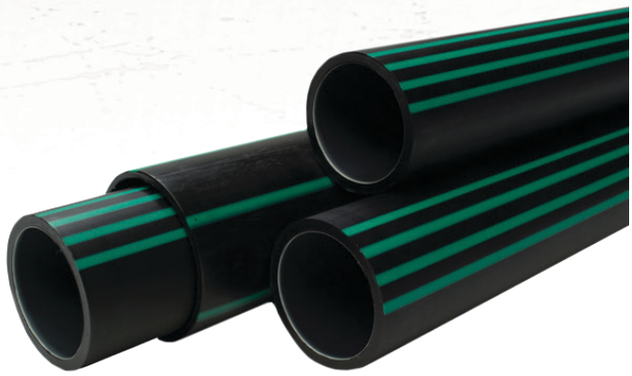
1. Semi-Rigid Electrofusion Pipe
2. 75 mm & 32 mm Electrical Conduit
3. Electrofusion Entry Seals
4. Polyethylene Under Dispenser Containment
5. Polyethylene Tank Chambers
6. Gemini Secondary Containment
7. Secondary Contained Termination Fittings
8. Transition Chamber




3
2
6

UPP® SEMI-RIGID PIPEWORK SYSTEM

Since its introduction over forty years ago, as the world's first electrofusion pipework system for fuel applications, UPP® semi-rigid pipework has become known globally as the standard for liquid tight pipework systems. UPP® pipework utilises the advanced electrofusion welding process to effectively bond system components together into one leak proof system.



HIGHLIGHTS

- UPP® pipe features an innovative clear inner lining made of natural EVOH resin to provide maximum pipe strength and superior vapour permeation and hydrocarbon barrier qualities.
- UPP® pipe is the first to receive an exception Class T1 temperature rating with its EN14125 approval, a true testament to its strength.
- The end of a piping run can be fitted with a wide variety of termination fittings to accommodate any application.
- Fittings are specifically designed to eliminate the number of bolt holes, rubber seals, band clamps and any potential leak paths.
- The UPP® electrofusion welding process is safe and simple to complete in any climate and virtually any weather condition.
- An installer simply prepares the components, fits them together attaching welder leads to the fitting, and then presses a single button on the welding unit to initiate the process.
- The welder unit itself calculates the exact settings required to complete the weld, regardless of the pipework diameter or temperature, leaving no settings for the installer to input.

SPECIFICATIONS

UPP® EN14125: 2013 Standard Primary Pipe	
Material	PE100 with EVOH resin barrier
Primary pressure rating	10/145 (bar/psi)
Primary colour	Black with two clusters of four green stripes, clear inner liner
Temperature rating	Class T1 Rating (EN14125:2013) -40° C to 50° C
Primary vacuum rating	-0.9/-26.6 (-bar/"Hg)

UPP® EN14125: 2013 Standard Secondary Pipe	
Material	PE100
Secondary pressure rating	5/72 (bar/psi)
Secondary colour	Black with six green stripes
Temperature rating	Class T1 Rating (EN14125:2013) -40° C to 50° C
Secondary vacuum rating	-0.6/17.8 (-bar/"Hg)

UPP® EN14125: 2013 Standard Fill Pipe	
Material	PE100 with EVOH resin barrier
Primary pressure rating	6/87 (bar/psi)
Primary colour	Black with two clusters of four green stripes, clear inner liner
Temperature rating	Class T1 Rating (EN14125:2013) -40° C to 50° C

UPP® EN14125: 2013 Standard Coaxial (Secondary) Pipe	
Material	PE100 with EVOH resin barrier
Primary pressure rating	10/45 (bar/psi)
Primary colour	Black two clusters of four green stripes, clear inner liner
Primary vacuum rating	-0.9 (bar)
Secondary pressure rating	5/72 (bar/psi)
Temperature rating	Class T1 Rating (EN14125:2013) -40° C to 50° C
Secondary vacuum rating	-0.6/-17.8 (bar/psi)

ORDER INFORMATION

UPP® EN14125:2013 Standard Primary Pipe

Model	Ø (mm)	Unit (m)	SDR	Primary ID (mm)	Bend Radius (m)
001-032-100-E	32	100 Coil	11	26	0.5
001-050-006-E	50	5.8 Stick	13.6	40.8	0.75
001-050-050-E	50	50 Coil	13.6	40.8	0.75
001-050-100-E	50	100 Coil	13.6	40.8	0.75
001-063-006-E	63	5.8 Stick	13.6	53.6	0.9
001-063-008-E	63	8 Stick	13.6	53.6	0.9
001-063-100-E	63	100 Coil	13.6	53.6	0.9
001-090-006-E	90	5.8 Stick	13.6	76.6	2.25
001-090-050-E	90	50 Coil	13.6	76.6	2.25
001-110-006-E	110	5.8 Stick	13.6	93.8	2.75
001-160-005-E	160	5.8 Stick	--	--	--
001-160-011-E	160	11.5 Stick	--	--	--

UPP® EN14125:2013 Standard Fill Pipe

Model	Ø (mm)	Unit (m)	SDR	Primary ID (mm)	Bend Radius (m)
001-110-006-FILL-E	110	5.8 Stick	17	96.8	2.75

UPP® EN14125:2013 Standard Coaxial (Secondary) Pipe

Model	Ø (mm)	Unit (m)	SDR	Primary ID (mm)	Bend Radius (m)
001-040-032-050-E	40/32	50 Coil	11 / 17	26	0.6
001-040-032-100-E	40/32	100 Coil	11 / 17	26	0.6
001-063-050-030-E	63/50	30 Coil	13.6 / 26	40.8	0.9
001-063-050-100-E	63/50	100 Coil	13.6 / 26	40.8	0.9
001-075-063-010-E	75/63	10 Stick	13.6 / 26	53.6	1.12
001-075-063-030-E	75/63	30 Coil	13.6 / 26	53.6	1.12
001-075-063-050-E	75/63	50 Coil	13.6 / 26	53.6	1.12

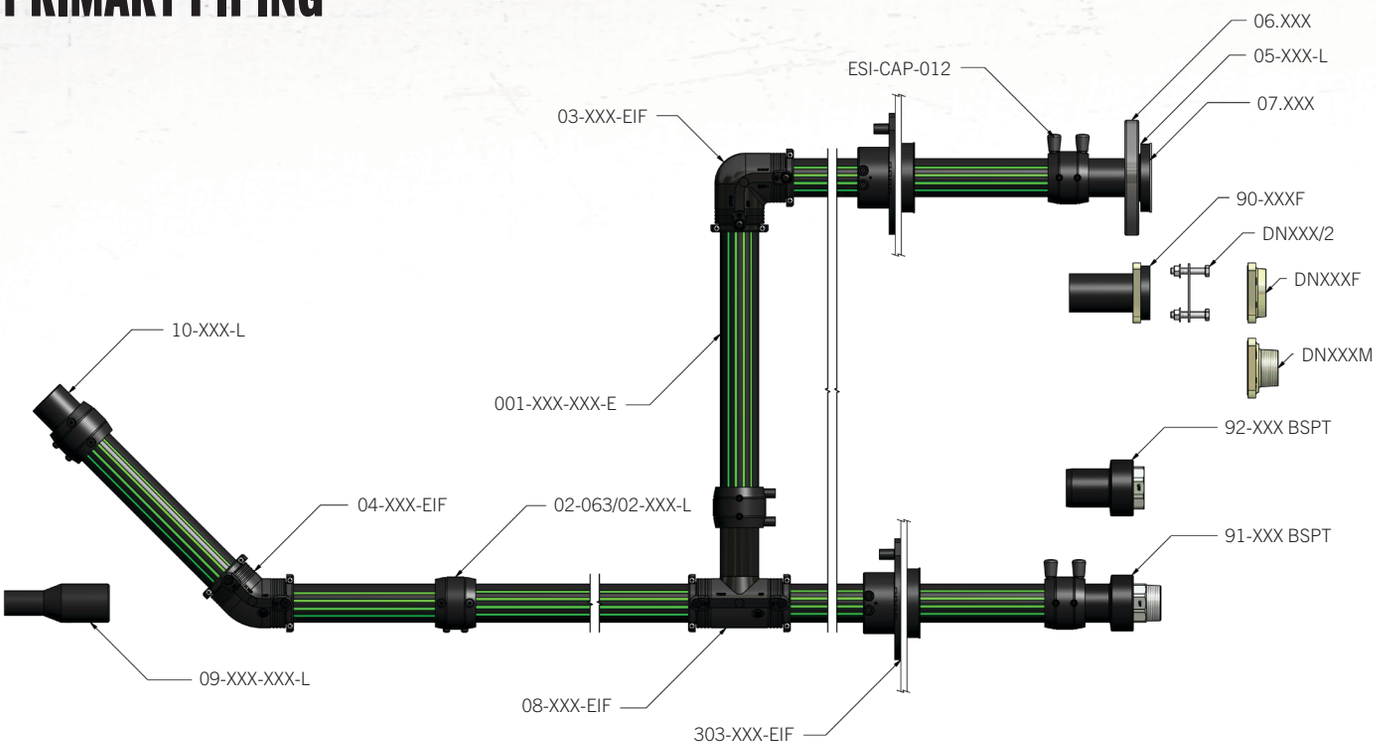
UPP® EN14125:2013 Standard Secondary Sleeve

Model	Ø (mm)	Unit (m)	SDR	Bend Radius (m)
000-063-006-SC-E	63	5.8 Stick	26	0.9
000-075-006-SC-E	75	5.8 Stick	26	1.12
000-075-008-SC-E	75	8 Stick	26	1.12
000-110-006-SC-E	110	5.8 Stick	26	2.75
000-125-006-SC-E	125	5.8 Stick	26	3.1

UPP® EN14125:2013 KIWA Pipe

Model	Ø (mm)	Unit (m)	SDR	Primary ID (mm)	Bend Radius (m)
001-050-006-K	50	5.8 stick	11	40.8	0.75
001-050-050-K	50	50 coil	11	40.8	0.75
001-050-100-K	50	100 coil	11	40.8	0.75
001-063-006-K	63	5.8 stick	13.6	53.6	0.9
001-063-100-K	63	100 coil	13.6	53.6	0.9
001-090-006-K	90	5.8 stick	13.6	76.6	2.25
001-110-006-K	110	5.8 stick	13.6	93.8	2.75

PRIMARY PIPING



Model	Description	Unit (m)
001-032-100-E	Extra Pipe–32 mm	100 coil
001-050-006-E	Extra Pipe–50 mm	5.8 stick
001-050-050-E		50 coil
001-050-100-E		100 coil
001-063-006-E	Extra Pipe–63 mm	5.8 stick
001-063-008-E		8 stick
001-063-100-E		100 coil
001-090-006-E	Extra Pipe–90 mm	5.8 stick
001-090-050-E		50 coil
001-110-006-E	Extra Pipe–110 mm	5.8 stick
001-110-006-FILL-E	Extra Pipe FILL–110 mm	5.8 stick
001-110-050-FILL-E		50 coil
001-160-011-E	Extra Pipe–160 mm	11.5 stick



Model	Description
02-032-L	32 mm Fusion coupler–long
02-050-L	50 mm Fusion coupler–long
02-063	63 mm Fusion coupler–long
02-090-L	90 mm Fusion coupler–long
02-110-L	110 mm Fusion coupler–long
02-160-L	160 mm Fusion coupler–long





Model	Description
03-050-L	50 mm Plain elbow
03-063-L	63mm Plain elbow
03-090-L	90 mm Plain elbow
03-110-L	110 mm Plain elbow
03-160-L	160 mm Plain elbow



Model	Description
03-032-EIF	32 mm Electrofusion elbow
03-050-EIF	50 mm Electrofusion elbow
03-063-EIF	63 mm Electrofusion elbow
03-090-EIF	90 mm Electrofusion elbow
03-110-EIF	110 mm Electrofusion elbow



Model	Description
04-050-L	50 mm Plain elbow
04-063-L	63 mm Plain elbow
04-090-L	90 mm Plain elbow
04-110-L	110 mm Plain elbow
04-160-L	160 mm Plain elbow



Model	Description
04-032-EIF	32 mm Electrofusion
04-050-EIF	50 mm Electrofusion
04-063-EIF	63 mm Electrofusion
04-090-EIF	90 mm Electrofusion
04-110-EIF	110 mm Electrofusion



Model	Description
05-032-L	32 mm Stub
06.32	32 mm Flange circular PN DN22
07.32	32 mm Gasket for stub
05-050-A	50 mm Stub, ANSI
05-050-L	50 mm Stub
06.50	50 mm Flange circular PN16 DN40
07.50	50 mm Gasket for stub
05-063-L	63 mm Stub
06.63	63 mm Flange circular PN16 DN50
07.63	63 mm Gasket for stub
05-090-L	90 mm Stub
06.90	90 mm Flange circular PN16 DN80
07.90	90 mm Gasket for stub
05-110-L	110 mm Stub
06.110	110 mm Flange circular PN16 DN100
07.110	110 mm Gasket for stub
05-160-L	160 mm Stub
06.160	160 mm Flange circular PN16 DN150
07.160	160 mm Gasket for stub



Model	Description
08.32	32 mm Tee equal
08-050-L	50 mm Tee equal
08-063-L	63 mm Tee equal
08-090-L	90 mm Tee equal
08-090-063-L	90/63 mm Reducer tee equal
08-110-L	110 mm Tee equal
08.110.063-L	100/63 mm Reducer tee equal
08-160-L	160 mm Tee equal



Model	Description
08-032-EIF	32 mm Electrofusion tee equal
08-050-EIF-S	50 mm Electrofusion tee equal
08-063-EIF-S	63 mm Electrofusion tee equal
08-090-EIF-S	90 mm Electrofusion tee equal
08-110-EIF	110 mm Electrofusion tee equal



Model	Description
09-063-050-EIF	63/50 mm Fusion reducer
09-090-063-EIF	90/63 mm Fusion reducer
09-110-090-EIF	110/90 mm Fusion reducer



Model	Description
09-050-032-L	50/32 mm Plain reducer
09-063-032-L	63/32 mm Plain reducer
09-063-050-L	63/50 mm Plain reducer
09-090-050-L	90/50 mm Plain reducer
09-090-063-L	90/63 mm Plain reducer
09-110-063-L	110/63 mm Plain reducer
09-160-110-L	160/110 mm Plain reducer



Model	Description
10-032-L	32 mm End cap
10-050-L	50 mm End cap
10-063-L	63 mm End cap
10-090-L	90 mm End cap
10-110-L	110 mm End cap



Model	Description
302-040	40 mm Fusion seal
303-050-EIF	50 mm Fusion seal with integrated coupler
303-063-EIF	63 mm Fusion seal with integrated coupler
304-110-090-TP-3	90 mm Fusion seal with integrated coupler and test port
304-110-EIF	110 mm Fusion seal with integrated coupler
308	8" Fusion seal for 90/110/160 mm



Model	Description
11.32UF	32 mm x 1" BSP



Model	Description
11-503F BSPT	Compression elbow 50 mm x 1½''BSPT female



Model	Description
11-508 BSPT	Compression tee 50 mm x 1½''BSP female



Model	Description
11.321	32 mm x 1" BSP male
11-501M BSPT	Compression termination 50 mm x 1½''BSPT male
11-631M BSPT	Compression termination 63 mm/2''diameter - BSPT
11-631M-1 BSPT	Compression termination 63 mm/1½''diameter - BSPT
12-050 BSPT	Compression termination 50 mm/1½" diameter - BSPT male only compatible with SDR11 Ø50 mm UPP pipe
12-063 BSPT	Compression termination 63 mm/2" diameter - BSPT male
12-063-1 BSPT	Compression termination 50 mm/1½" diameter - BSPT male
12-090 BSPT	Compression termination 90 mm/3" diameter - BSPT male
12-110 BSPT	Compression termination 110 mm/4" BSPT diameter - BSPT male



11.321

12-XXX

Model	Description
91-032 BSPT	Termination 32 mm x 1" BSPT male
91-050 BSPT	Termination 50 mm x 1½" BSPT male
91-050 NPT	Termination 50 mm x 1½" NPT male
91-063 BSPT	Termination 63 mm x 2" BSPT male
91-063 NPT	Termination 63 mm x 2" NPT male
91-063-1 BSPT	Termination 63 mm x 1½" BSPT male
91-063-1 NPT	Termination 63 mm x 1½" NPT male
91-090 BSPT	Termination 90 mm x 3" BSPT male
91-090 NPT	Termination 90 mm x 3" NPT male
91-110 BSPT	Termination 110 mm x 4" BSPT male
91-110 NPT	Termination 110 mm x 4" NPT male



Model	Description
92-032 BSPT	Termination 32 mm x 1" BSPT female
92-050 BSPT	Termination 50 mm x 1½" BSPT female
92-050 NPT	Termination 50 mm x 1½" NPT female
92-050 UF BSPT	Union termination 50 mm x 1½" BSPT female
92-050 UF NPT	Union termination 50 mm x 1½" NPT female
92-063 BSPT	Termination 63 mm x 2" BSPT female
92-063 NPT	Termination 63 mm x 2" NPT female
92-063 UF BSPT	Union termination 63 mm x 2" BSPT female
92-063-1 BSPT	Termination 63 mm x 1½" BSPT female
92-063-1 NPT	Termination 63 mm x 1½" NPT female
92-063UF NPT	Union termination 63 mm x 2" NPT female
92-090 BSPT	Termination 90 mm x 3" BSPT female
92-090 SS BSPT	Stainless steel termination 90 mm x 3" BSPT female
92-090 NPT	Termination 90 mm x 3" NPT female
92-110 BSPT	Termination 110 mm x 4" BSPT female
92-110 NPT	Termination 110 mm x 4" NPT female



Model	Description
91-032 SS BSPT	Stainless steel termination 32 mm x 1" BSPT male
91-050 SS BSPT	Stainless steel termination 50 mm x 1½" BSPT male
91-063 SS BSPT	Stainless steel termination 63 mm x 2" BSPT male



Model	Description
92-032 SS BSPP	Stainless steel termination 32 mm x 1" BSPP female
92-050 SS BSPP	Stainless steel termination 50 mm x 1½" BSPP female
92-063 SS BSPP	Stainless steel termination 63 mm x 2" BSPP female



Model	Description
90-050F	Flanged termination 50 mm
DN40/2	Gasket & bolt set for coupling flange DN40 50mm
DN40F	Coupling flange 50 mm BSPP female
DN40M	Coupling flange 50 mm BSPT male
90-063F	Flanged termination 63 mm
DN50/2	Gasket & bolt set for coupling flange DN50 63 mm
DN50F	Coupling flange 63 mm BSP female
DN50M	Coupling flange 63 mm BSPT male
DN50M NPT	Coupling flange 63 mm NPT male
90-090F	Flanged termination 90 mm
DN80/2	Gasket & bolt set for coupling flange D 80 90 mm
DN80F	Coupling flange 90 mm BSP female
DN80M	Coupling flange 90 mm BSPT male
90-110F	Flanged termination 110 mm
DN100/2	Gasket & bolt set for coupling flange DN100 110 mm
DN100F	Coupling flange 110 mm BSP female



Model	Description
BV(2)	Ball valve 63 mm BSP F/F ¼ turn - galvanized steel



Model	Description
ESI-CAP-012	Weld pin protection cap
91-050-TOOL	Plate spanner 50A/F 91-050 for all male 50 mm sizes
92-050-TOOL	Plate spanner 55A/F 92-050 for all female 50 mm sizes
11.50G	Spare gasket for 50 UF fittings 50 mm
408046001	O-ring NBR 35 x 2.5 for 12-050 50 mm
91-063-TOOL	Plate spanner 62A/F 91-063 for all male 63 mm sizes
92-063-TOOL	Plate spanner 67A/F 92-063 for all male 63 mm sizes
11.63G	Spare gasket for 6 UF fittings 63 mm
408045001	O-ring NBR 48 x 3 for 12 - 63 x 63 mm
11-63X OL	Spare olive for 11 - 63 x 63 mm
11-50X OL	Spare olive for 11 - 50 x 50 mm
408044001	O-ring NBR 69.5 x 3 for 12-090 90 mm
CW-125-PIPE	Chain wrench 125 mm pipe max 90 mm
408043001	O-ring NBR 89.5 x 3 for 12 - 110 x 110 mm

O-Ring



Gasket



Weld Cap



Olive



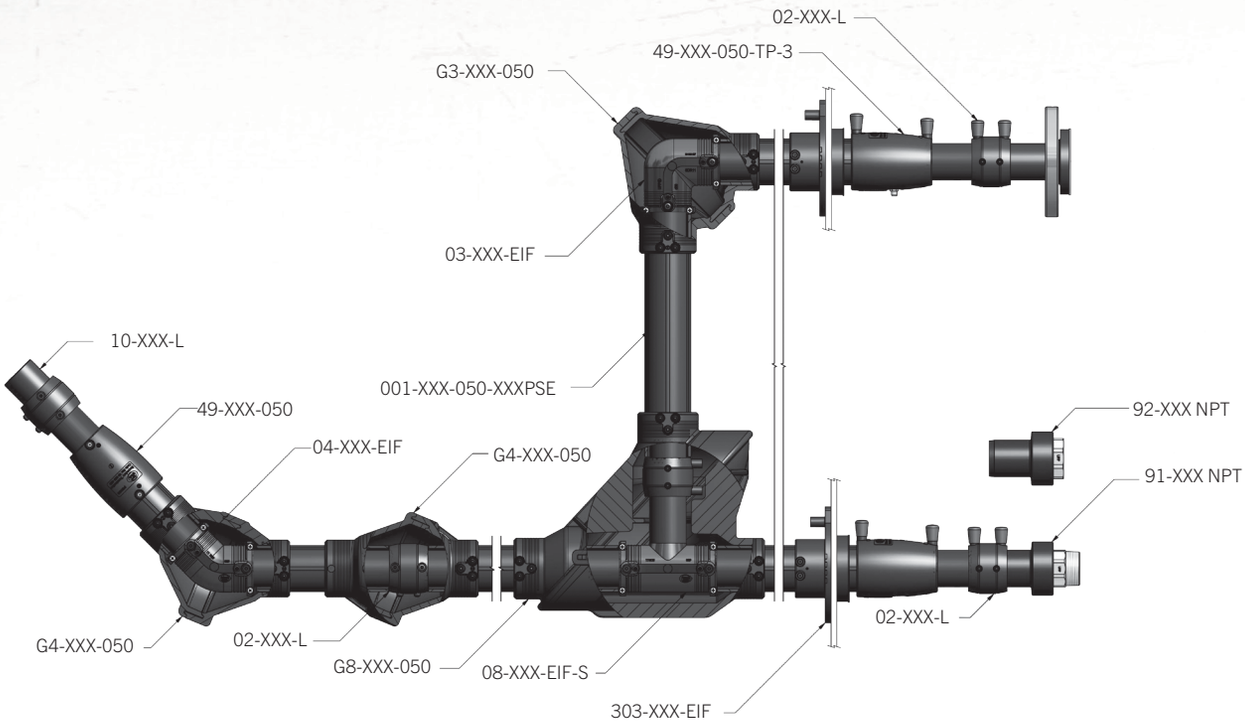
Male Spanner



Female Spanner



SECONDARY PIPING



Model	Description & Pack size	Diameter Ø mm)
001-040-032-050-E	Extra coaxial pipe & 50 m coil	40/32
001-040-032-100-E	Extra coaxial pipe & 100 m coil	40/32
001-063-050-030-E	Extra coaxial pipe & 30 m coil	63/50
001-063-050-100-E	Extra coaxial pipe & 100 m coil	63/50
001-075-063-010-E	Extra coaxial pipe & 10 m stick	75/63
001-075-063-030-E	Extra coaxial pipe & 30 m coil	75/63
001-075-063-050-E	Extra coaxial pipe & 50 m coil	75/63
000-063-006-SC-E	Secondary pipe & 5.8 m stick	63
000-075-006-SC-E	Secondary pipe & 5.8 m stick	75
000-075-008-SC-E	Secondary pipe & 8 m stick	75
000-110-006-SC-E	Secondary pipe & 5.8 m stick	110
000-125-006-SC-E	Secondary pipe & 5.8 m stick	125





Model	Description	Diameter Ø (mm)
02.40(SC)	Fusion coupler secondary	40
02.63(SC)	Fusion coupler secondary	63
02.75(SC)	Fusion coupler secondary	75
02.110(SC)	Fusion coupler secondary	110
02.125(SC)	Fusion coupler secondary	125
02.160(SC)	Fusion coupler secondary	160



Model	Description	Ø (mm)
09.110.75(SC)	Reducer secondary	110/75
09.160.125(SC)	Reducer secondary	160/125
13.75.40(SC)	Reducer secondary	75/40



Model	Description
302-040	Fusion seal 40 mm
303-063-EIF	Fusion seal 63 mm with integrated coupler
303-075-EIF	Fusion seal 75 mm with integrated coupler
303-075-EIF-2	Fusion seal 75 mm with integrated coupler, 4 mm weld pins
304-110-050-TP-3	Fusion entry seal with secondary coupler 110 x 50 mm with test port
304-110-063-TP-3	Fusion entry seal with secondary coupler 110 x 63 mm with test port
304-110-075-TP-3	Fusion entry seal with secondary coupler 110 x 75 mm with test port
304-110-090	Fusion seal with 110 & 90 mm coupler
304-110-090-TP-3	Fusion seal with 110 & 90 mm coupler with test port
304-110-EIF	Fusion seal 110 mm with integrated coupler
305-125-110	Fusion seal with 125 & 110 mm coupler
305-125-110-TP-3	Fusion seal 125 & 110 mm coupler with test port
305-125-EIF	Fusion seal 125 mm with integrated coupler



w/ TP



Seal

Model	Description
49-040-032	40/32 mm Fusion reducer secondary
49-040-032-TP-3	40/32 mm Fusion reducer secondary with test port
49-063-050	63/50 mm Fusion reducer secondary
49-063-050-TP-3	63/50 mm Fusion reducer secondary with test port
49-075-063-1	75/63 mm Fusion reducer secondary
49-075-063-TP-3	75/63 mm Fusion reducer secondary with test port
49-110-063(SC)	110/63 mm Sliding reducer secondary
49-110-075(SC)	110/75 mm Sliding reducer secondary
49-110-090	110/90 mm SC welding reducer
49-110-090-TP-3	110/90 mm SC welding reducer with test port
49-125-110	125/110 mm SC welding reducer
49-125-110-TP-3	125/110 mm SC welding reducer with test port



40, 63, 75 mm design



110 and 125 design

Model	Description
91-063-050 BSPT	63/50 mm Male, BSPT thread
91-063-050-TP BSPT	63/50 mm Male, BSPT thread, with test port
91-075-063-1-TP BSPT	75/63 mm Male, 1½" BSPT thread with test port
91-075-063-TP BSPT	75/63 mm Male, 2" BSPT thread, with test port
91-110-090-TP BSPT	110/90 mm Male, BSPT thread, with test port
91-125-110-TP BSPT	125/110 mm Male, BSPT thread, with test port



Model	Description
92-063-050 BSPT	63/50 mm Female, BSPT thread
92-063-050-TP BSPT	63/50 mm Female, BSPT thread, with test port
92-075-063-1 BSPT	75/63 mm Female, 1½" BSPT thread
92-075-063-TP BSPT	75/63 mm Female, 2" BSPT thread, with test port
92-110-090 BSPT	110/90 mm Female, BSPT thread
92-110-090-TP BSPT	110/90 mm Female, BSPT thread, with test port
92-125-110 BSPT	125/110 mm Female, BSPT Thread
92-125-110-TP BSPT	125/110 mm Female, BSPT thread, with test port



Model	Description
G3-040-032	40 mm SC Gemini® 90° elbow
G3-063-050	63 mm SC Gemini® 90° elbow
G3-075-063	75 mm SC Gemini® 90° elbow
G3-110-090	110 mm SC Gemini® 90° elbow
G3-125-110	125 mm SC Gemini® 90° elbow



Model	Description
G4-040-032	40/32 mm SC Gemini® elbow or SC Gemini® inline joint
G4-063-050	63/50 mm SC Gemini® elbow or SC Gemini® inline joint
G4-075-063	75/63 mm SC Gemini® elbow or SC Gemini® inline
G4-110-090	110/90 mm SC Gemini® elbow or SC Gemini® inline joint
G4-125-110	125/90 mm SC Gemini® elbow or SC Gemini® inline joint



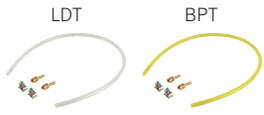
Model	Description
G8-040-032	40 mm SC Gemini® tee
G8-063-050	63 mm SC Gemini® tee
G8-075-063	75 mm SC Gemini® tee
G8-110-090	110 mm SC Gemini® tee



Model	Description
10-040-SC	End cap 40 mm secondary
10-075-SC	End cap 75 mm secondary
10.110(SC)	End cap 110 mm secondary



Model	Description
LDT 60-1	Leak detection tube kit - not for use with STB-100 product offering
LDT60-2	Leak detection tube kit - not for use with STB-100 product offering, tube only, no fittings
BPT-200	Leak detection tube kit - for use with STB-100 product offering



Model	Description
ESI-CAP-012	Weld pin protection cap



UPP® ELECTROFUSION PIPEWORK

FUEL/CHEMICAL COMPATIBILITY CHART TO EN14125:2013 (RETAIL SPECIFIC)

Automotive Fuels
- Gasohol (E1 to E10)
- Premium Unleaded Gasoline
- Regular Unleaded Gasoline
- Premium Leaded Gasoline
- Diesel

Bio-Fuels & Blends
- Ethanol 100% (Ethyl alcohol)
- E85 - Ethanol 85% + Unleaded Fuel 15%
- E70 - Ethanol 70% + Unleaded Fuel C 30%
- Ethanol 50% + reference Fuel C 50%
- Ethanol 30% + reference Fuel C 70%
- Ethanol 10% + reference Fuel C 90%
- Biodiesel 10% to 100%

Methanol Mixtures
- Methanol 100%
- Methanol 50% + Reference Fuel C 50%
- Methanol 15% + Reference Fuel C 85%

Test Fuels & Fuel Additives
- UL971 – MV, CT, HB, AM
- ASTM Fuel C 100%
- EN14125:2013 Fuel 1
- EN14125:2013 Fuel 2
- No.2 Fuel Oil
- MTBE 10% + reference Fuel C 90%
- MTBE 15% + reference Fuel C 85%
- Toluene
- AdBlue*

** Requires stainless steel transition fittings.*

Aviation & Marine Fuels
- Jet A1 (Avtur)
- JP8 (F-34)
- Methmix
- Avgas
- Kerosene

TRENCHES (WIDTH, DEPTH & FALL BACK)

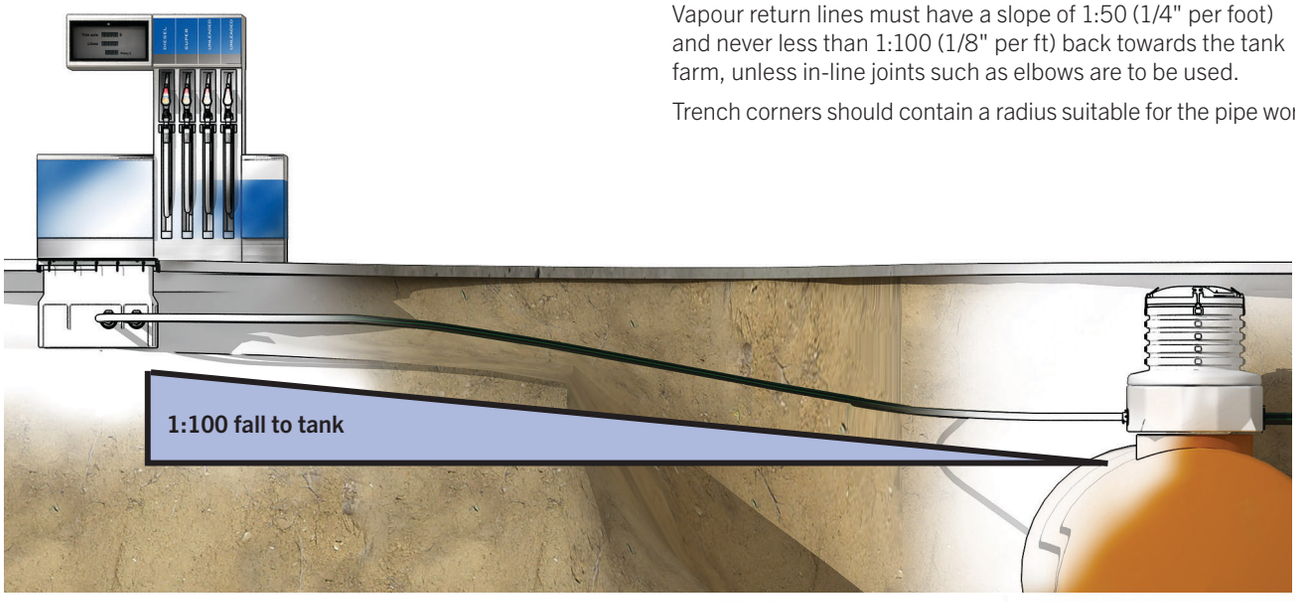
It is important to construct proper trenches before laying UPP® pipe. Trenches should be wide and deep enough to comfortably allow pipe runs, recommended spacing, and backfill materials.

Recommended burial depth of UPP® pipe is a minimum of 300 mm (12").

All trenches should be sloped back towards the storage tanks with a recommended gradient of 1:100.

Vapour return lines must have a slope of 1:50 (1/4" per foot) and never less than 1:100 (1/8" per ft) back towards the tank farm, unless in-line joints such as elbows are to be used.

Trench corners should contain a radius suitable for the pipe work.

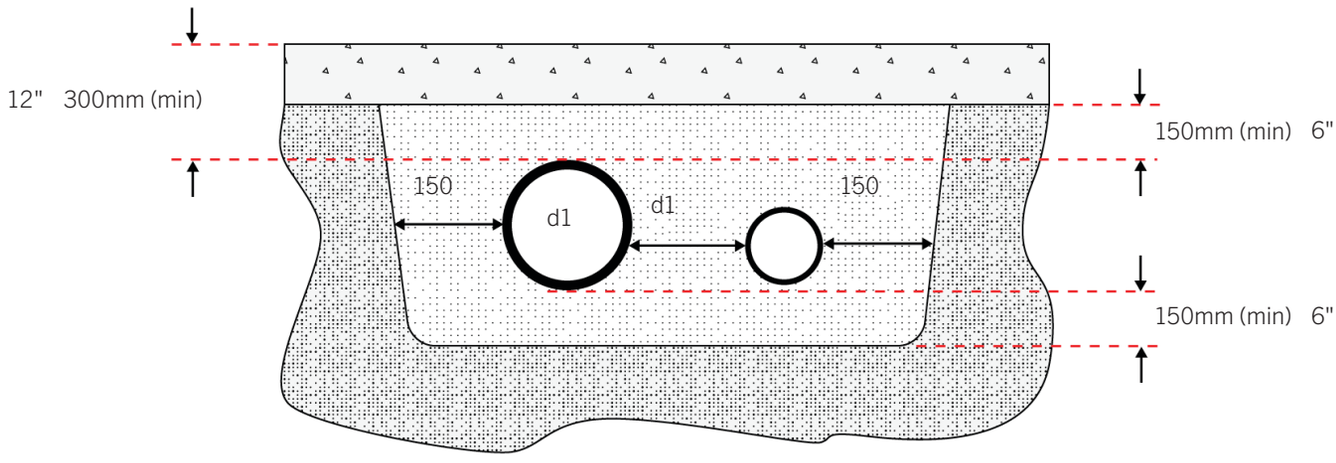


BEDDING

- A recommended 150 mm (6") bed of backfill material should be laid underneath the prior to pipe installation and there must never be voids under or around the pipe.
- When laying duct onto a concrete base a 150 mm (6") thick bed of compacted sand should be laid on the concrete, below the duct. (Absolute minimum amount of sand should be 50 mm (2") of compacted sand).
- All beds should be laid so that the pipe will not dip or sag when it is installed.
- Underground pipe runs may be continuous or have electrofusion welded joints. Any mechanical joints or compression fittings must be inspectable and located within a containment chamber or sump.
- UPP® pipe exceeding 12 m (40 ft) should be laid in a series of large snake-like curves and not in straight lines. Uncoiled pipe, when laid, will settle in a natural curve.
- Generally any thermal expansion will be accounted for by following our guidelines for spacing, backfilling and ensuring runs are not dead straight.
- Pipes should be separated from each other by at least the diameter of the largest pipe.
- If pipe-runs cross each other they must be separated by at least as much backfill material as the diameter of the largest pipe or protected by using at least 25 mm (1") of styrofoam.
- If used above ground, UPP® pipe should be protected against mechanical, climatic and fire damage by wrapping it in radiation or thermal shielding tape. Additional supports and anchor points may also be required.
- Contact Franklin Electric Technical Services for more details concerning above ground installations.

PIPE SPACING

- Bed/backfill with pea-shingle, sand or crushed rock.
- Separate pipes by the diameter of the largest pipe in the run.
- For spacers and support use:
  - Expanded polystyrene (Styrofoam).
  - Pipe off-cuts.
  - Timber/block/brick (as temporary measures).



PRESSURE/VACUUM RATING

The values listed below have been qualified by third party approvals testing.

UPP® Extra & EN14125:2013 Pipes	Rated Pressure		Rated Vacuum		Typical Burst Pressure	
	Bar	Psi	Bar	"Hg	Bar	Psi
Primary Pipe	10	145	-0.9	-26.6	40	580
Secondary Pipe	5	58	-0.6	-17.7	20	290
Fill Pipe	6	87	n/a	n/a	30	435
Electrical Conduit	10	145	-0.9	-26.6	40	580
Corrugated Duct	n/a					

BEND RADIUS

Q: Because UPP® is semi-rigid, what bend radius is possible during installation?

A: This is largely temperature dependent, but in general you may use these values for single or double wall UPP® delivered as coils:

		50 mm	63 mm	90 mm	110 mm
Warm Weather	15 x Ø	80 cm	1 m	1.5 m	3 m
Cold Weather	25 x Ø	140 cm	1.6 m	2.5 m	4 m
Very Cold Weather	35 x Ø	190 cm	2.2 m	3.5 m	5 m

For UPP® in 5.8 m straight lengths welded together and then curved to suit the required layout you can expect:

		50 mm	63 mm	90 mm	110 mm
Warm Weather	30 x Ø	1.5 m	2 m	3 m	4 m
Cold Weather	60 x Ø	3 m	3 m	5 m	6 m
Very Cold Weather	80 x Ø	4 m	4 m	7 m	8 m

INTERSTITIAL VOLUME

When using leak detection equipment it is often necessary to know the interstitial volume of double wall pipes to decide the amount of compressed gas or type of pumped detection unit required. Below are the volumes per metre of UPP® pipework.

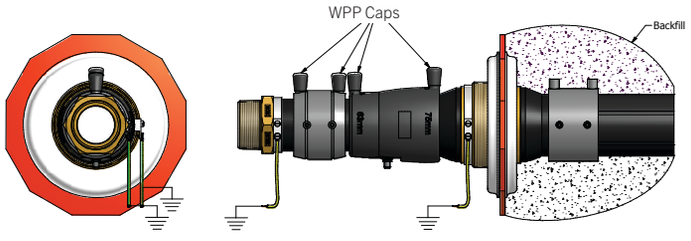
Double Wall Pipe							
Interstitial Volume	40/32 mm	63/50 mm	75/63 mm	110/90 mm	125/110 mm	160/90 mm	160/110 mm
	(1")	(1½")	(2")	(3")	(4")	(3")	(4")
Litres / m	0.24	0.66	0.62	2.15	0.97	10.79	7.64
Cubic Inches / ft	4.40	12.29	11.52	39.93	18.01	200.73	142.12

ELECTROFUSION SAFETY

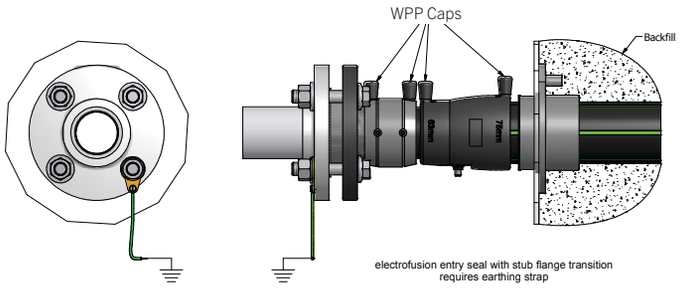
- UPP® welding units must never be operated in Zone 1 or Zone 0 areas (Hazardous area definitions are from IP Model Code of Safe Practice Part 15 and are available in the APEA Blue Book 2nd Edition).
- UPP welding units are not suitable for use in Zone 2 (regardless where welding leads and fitting are) and shouldn't be used in any hazardous areas.
- Ensure welding units are connected to a power supply that meets the requirements detailed in the user manual and are within the requirements of any local authority or regional legislation.
- UPP® piping complies with all the requirements imposed by EN14125:2013 concerning electrostatic safety.
- The risk assessment against electrostatic hazard has demonstrated that the use of insulating material such as that used in UPP® piping results in a safe choice.
- The safety of UPP® systems rely upon the small capacitance and hence the small energy that they can accumulate. This energy, has been demonstrated to be well below the Minimum Ignition Energy or MIE required to ignite petrol or alcohol blended fuel.
- Extensive studies simulating fuel flow situations much more severe than what can be found in underground pipework at petrol filling stations have demonstrated that UPP® pipe cannot be a source of spark ignition. For this reason UPP® pipe can be considered an inherently safe system with respect to the electrostatic risk.
- The most important recommendation, common to any type of piping system is to connect safely to ground all metallic components. Metallic components, and more general conductive materials, thanks to their high capacitance can have the potential to store high amount of electrostatic energy (sparks discharge can only be observed over conductive elements).
- All exposed metal parts used in UPP® System installations should be adequately grounded to a dedicated earth electrode and brought to a potential equal to that of other metal parts in the close proximity.

All UPP® metal transition fittings in the fill box, at the tank top and under the dispenser should be adequately earthed according to local electrical regulations. If in doubt the resistance of grounding should be ≥ 100kΩ ≤ 1MΩ. Earthing cables should be plastic covered copper conductors of at least 4mm^2 cross sectional area and should be connected to an exclusive earth electrode.

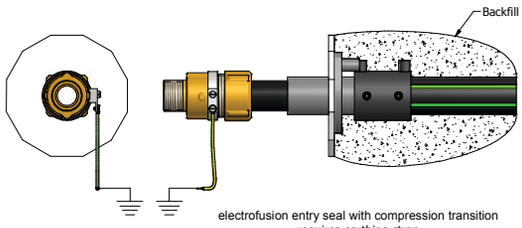
Note: The metal fittings at the tank manhole should be at equal potential so additional cables may be required to interconnect the metal fittings.
The drawings show how to ground various types of UPP® metal transition fittings:



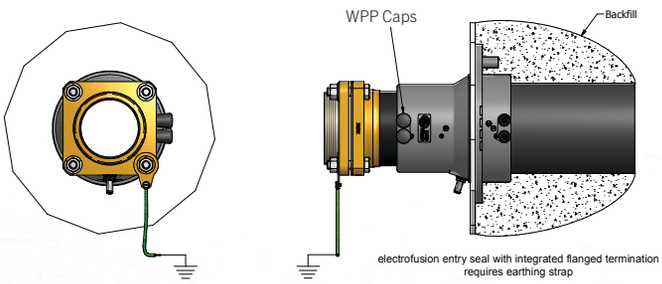
fibreglass entry seal with threaded transition
requires earthing straps



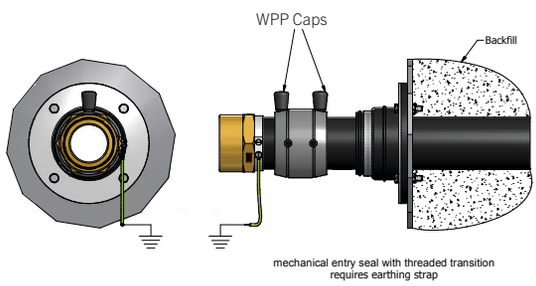
electrofusion entry seal with stub flange transition
requires earthing strap



electrofusion entry seal with compression transition
requires earthing strap



electrofusion entry seal with integrated flanged termination
requires earthing strap



mechanical entry seal with threaded transition
requires earthing strap

WELD PIN PROTECTION CAPS

Paragraph 5.6.2 of EN 14125:2004 requires that the terminal pins of electrofusion couplers which are not buried in the ground shall be closed with plastic caps. The purpose is to prevent any perceived risk of ignition hazard resulting from a static electricity discharge in accordance with EN 14125:2004.

Franklin Electric Ltd has designed a multi-purpose cap to suit all electrofusion fittings in the UPP® System range. The design and materials have been third-party tested and certified as fit-for-purpose.

The caps are only required to be fitted when the coupler is in air (not buried) and when an explosive atmosphere is or may be present, i.e. inside chambers & sumps which are classified as Zone 0, 1 or 2.

- Refer to IP 15—IP Model Code of Safe Practice Part 15 Area classification code for installations handling flammable fluids, 2nd edition - for a definition of these hazardous areas.

Weld Pin Protection Caps are compatible with all UPP® fusion elements such as those for primary and secondary pipework and electro-fusion entry seals. The UPP® System weld pin protection caps have the same fuel resistance as UPP® containment products in which they are deigned to be used.

1. Caps should be fitted AFTER tightness testing is completed.
2. Press one cap firmly over each shroud surrounding the pin.
3. Tap cap with light hammer to ensure it is fully seated.
4. Inspect all of the chamber / sump area to ensure that all unburied electro-fusion fittings have been securely fitted with weld pin protection caps.





CABLETIGHT™ WIRE MANAGEMENT SYSTEM

The UPP® brand CableTight™ wire management system provides a true end-to-end solution for electrical, sensor, and data wiring containment. All of the benefits of the field-proven electrofusion welded pipework system are applied to this crucial part of the forecourt installation to ensure a fully liquid-tight underground system. The offering includes a system for 32 mm conduit, 75 mm conduit, 110 mm ducting, direct bury, and rigid conduit applications.



HIGHLIGHTS

- Electrofusion entry seals with integrated slotted compression disks and grommets create a leak proof system by eliminating liquid or vapour penetration.
- Multi-cable entry seal is ideal for consolidating groups of 5 mm to 17 mm diameter wires into one entry point.
- Rigid conduit entry fitting handles one to three 3/4" bore rigid conduit entries.
- Direct bury entry fittings are ideal for applications where cable of 5 mm to 16 mm diameter are directly buried in the ground, such as grounding wires and armoured power cables.
- Slotted multi-cable compression disk design allows wires to be positioned into place without having to pull them through each hole for significantly easier wire pulling.

SPECIFICATIONS

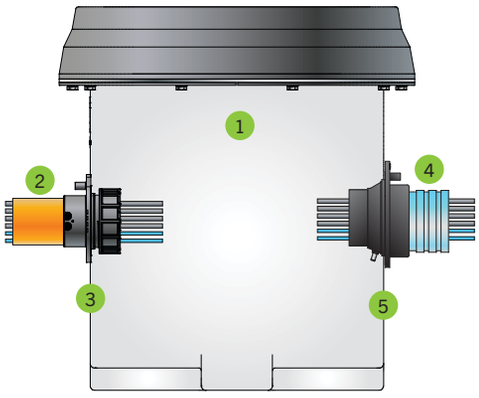
Conduit and ducting Internal bore diameters	25 mm (32 mm conduit), 65 mm (75mm conduit), 106 mm (110 mm ducting)
Max vapour seal penetration in containment	60 mm (75 mm conduit), 50 mm (32 mm conduit), 50 mm (32 mm conduit), 50 mm (direct bury)
Transition chamber materials	Combination of the LLDPE chamber of a D400 load rated composite access cover and frame (factory tested to -30 mbar)
Transition chamber dimensions	W 900 mm x D 800mm x H 862mm
Approvals	Conduit approval to AS/NZS 2053. 1:2001

Components

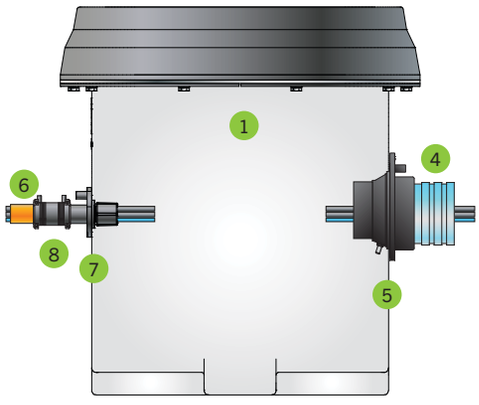
Systems and their various components installed.

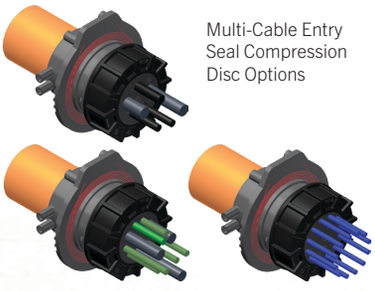
1. Transition chamber with cover
2. 75 mm conduit
3. 75 mm multi-cable entry seal
4. 110 mm ducting
5. 110 mm entry seal
6. 32 mm conduit
7. 32 mm entry seal
8. 32 mm coupler

75 mm and 110 mm Contained

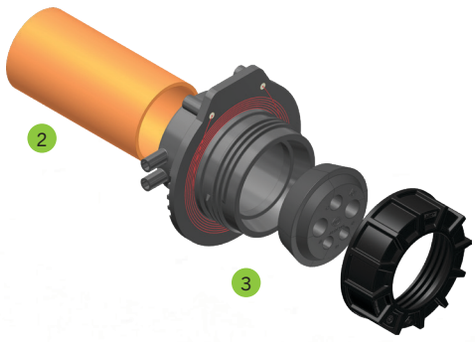


32 mm and 110 mm Contained





Multi-Cable Entry Seal Compression Disc Options





Range of compression discs and grommets sold separately

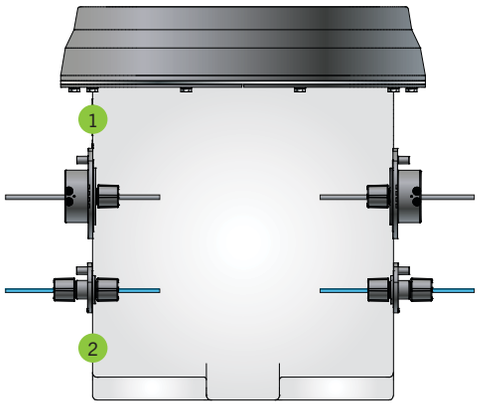
SPECIFICATIONS CONTINUED

Components

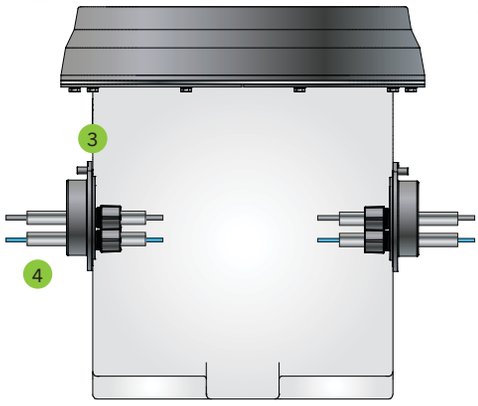
Systems and their various components installed.

1. Double direct bury entry seal
2. Single direct bury entry seal
3. Triple rigid conduit entry seal
4. Rigid conduit (locally supplied)

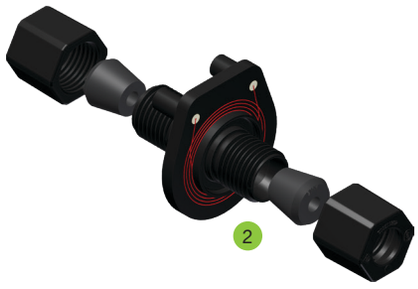
Direct Bury System



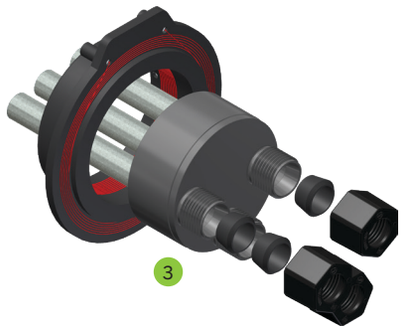
Rigid Conduit System







Range of grommets sold separately.



Grommets included

Transition Chamber



ORDER INFORMATION

75 mm CableTight™ Wire Management System

Ideal for accommodating multiple cables in a wide range of diameters.



75 mm Conduit

Model	Description
001-075-050-EC-E	75 mm conduit, orange, 50 m coil

Multi-Cable Entry Seal

The multi-cable entry seal is ideal for consolidating groups of 5 mm to 17 mm diameter wires into one entry point. Entry seals come without compression disks. Compression disks must be ordered separately. All compression disk cable entries are marked with nominal diameter and will accommodate a range of wire diameters (see ranges in descriptions below).



Compression disks not included.

Model	Description
303-075-EC	Electrofusion multi-cable entry seal, for 75 mm conduit
408040001	Replacement compression nut for 303-075-EC



Model	Description
408103001	12 cable compression disk–(12) 5-8 mm cable entries

Typical use: Tank sensor wiring. Corresponding plug: 408134001



Model	Description
408113001	9 cable compression disk–(3) 12-15 mm cable entries, (6) 7-10 mm cable entries

Typical use: Tank power wiring (pressure applications). Corresponding plugs: (3) 408130001, (6) 408133001



Model	Description
408102001	5 cable compression disk–(2) 14–17 mm cable entries, (1) 11–14 mm cable entry, (2) 9–12 mm cable entries

Typical use: Dispenser power and data wiring. Corresponding plugs: (2) 408129001, (1) 408131001, (2) 408132001



Model	Description
408122001	Blank compression disc for 75 mm entry fitting

Typical use: Line integrity testing and future expansion.





Cable Entry Plugs

Used to seal off unused cable entries in compression disks.



Model	Description
408165001	3 mm cable entry plug
408134001	6 mm cable entry plug
408133001	9 mm cable entry plug
408132001	11 mm cable entry plug

Model	Description
408131001	12 mm cable entry plug
408130001	14 mm cable entry plug
408129001	16 mm cable entry plug
408164001	18 mm cable entry plug

75 mm Installation Tools



Model	Description
303-CLAMP-1	Welding clamp for 303-075-EC
HS3	102 mm hole saw

ORDER INFORMATION



32 mm CableTight™ Wire Management System

Ideal for accommodating single large and multiple smaller diameter cables.

32 mm Conduit

Model	Description
001-032-100-EC-E	32 mm conduit, orange, 100 m coil

32 mm Conduit Entry Seal



Grommets not included

Entry seals come without compression grommets. Compression grommets must be ordered separately. All compression grommet cable entries are marked with maximum diameter and will accommodate a range of wire diameters (see ranges in descriptions below).

Model	Description
302-032-EC	Electrofusion entry seal, for 32 mm conduit
408112001	Replacement compression nut for 302-032-EC

Model	Description
02-032-L	Electrofusion coupler, for 32 mm conduit



Model	Description
408107006	3 cable compression grommet–(3) 5–6 mm cable entries

Typical use: Sensors, line leak detection, interstitial tank and pipe monitoring, tank gauge wiring.
408107006 Corresponding plug: 408134001



Model	Description
408107005	Cable compression grommet - (1) 7-9mm cable entry

Typical use: Tank grounding wiring. Corresponding plug: 408133001



Model	Description
408107004	Cable compression grommet–(1) 911 mm cable entry

Typical use: Card reader in dispenser or outdoor payment terminal wiring. Corresponding plug: 408132001



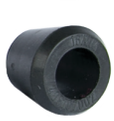
Model	Description
408107003	Cable compression grommet–(1) 12–14 mm cable entry

Typical use: Tank or dispenser power wiring. Corresponding plug: 408130001



Model	Description
408107002	Cable compression grommet–(1) 14–16 mm cable entry

Typical use: Dispenser hook signal wiring. Corresponding plug: 408129001



Model	Description
408107007	Blank compression grommet

Typical use: Line integrity testing and future expansion.

Cable Entry Plugs

Used to seal off unused cable entries in compression grommets.

Model	Description
408165001	3 mm cable entry plug
408134001	6 mm cable entry plug
408133001	9 mm cable entry plug
408132001	11 mm cable entry plug

Model	Description
408131001	12 mm cable entry plug
408130001	14 mm cable entry plug
408129001	16 mm cable entry plug
408164001	18 mm cable entry plug



32 mm Installation Tools

Model	Description
302-CLAMP	Welding clamp for 302-032-EC
HSCS2	51 mm hole saw



ORDER INFORMATION

Direct Bury Wire Management System

Ideal for accommodating direct bury cables requiring a liquid-tight containment entry.

Direct Bury Entry Seals

Direct bury entry seals are ideal for applications where cable is directly buried in the ground. Entry seals come without compression grommets. Compression grommets must be ordered separately. All compression grommet cable entries marked with maximum diameter and will accommodate a range of wire diameters (see ranges in descriptions below).



Grommets not included

Model	Description
302-DBC	Electrofusion single direct bury entry seal, (1) entry
303-2DBC	Electrofusion double direct bury entry seal, (2) entries
408112001	Replacement compression nut for 302-DBC and 303-2DBC



Model	Description
408107006	3 cable compression grommet - (3) 5-6mm cable entries

Typical use: Sensors, line leak detection, interstitial tank and pipe monitoring, tank gauge wiring. Corresponding plug: 408134001



Model	Description
408107005	Cable compression grommet - (1) 7-9mm cable entry

Typical use: Tank grounding wiring. Corresponding plug: 408133001



Model	Description
408107004	Cable compression grommet - (1) 9-11mm cable entry

Typical use: Card reader in dispenser or outdoor payment terminal wiring. Corresponding plug: 408132001



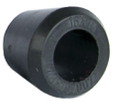
Model	Description
408107003	Cable compression grommet - (1) 12-14mm cable entry

Typical use: Tank or dispenser power wiring. Corresponding plug: 408130001



Model	Description
408107002	Cable compression grommet - (1) 14-16mm cable entry

Typical use: Dispenser hook signal wiring. Corresponding plug: 408129001



Model	Description
408107007	Blank compression grommet

Typical use: Line integrity testing and future expansion.

Cable Entry Plugs

Used to seal off unused cable entries in compression grommets.

Model	Description
408165001	3mm cable entry plug
408134001	6mm cable entry plug
408133001	9mm cable entry plug
408132001	11mm cable entry plug
408131001	12mm cable entry plug
408130001	14mm cable entry plug
408129001	16mm cable entry plug
408164001	18mm cable entry plug

Direct Bury Installation Tools



Model	Description
303-CLAMP-1	Welding clamp for 303-2DBC
HS3	110mm hole saw
302-CLAMP	Welding clamp for 302-DBC
HSCS2	63mm hole saw

ORDER INFORMATION



Grommets included, conduit not included

Rigid Conduit Entry Seal

The rigid conduit entry seals handles one to three 3/4" (nominal 26.7 mm O/D) rigid conduit entries where local regulations require steel conduit.

Model	Description
305-3X27MM-CON	Electrofusion triple rigid conduit entry seal, for 3/4" (nominal 26.7 mm O/D) rigid conduit, (3) entries
408128001	Cable plug for 3/4" entry fitting

Rigid Conduit Installation Tools



Model	Description
305-EXT-CLAMP	Welding clamp for 305-3X27MM-CON
HS6	160 mm hole saw

110 mm Ducting



Model	Description
DUCT-400-250	110 mm ducting, blue, 75 m coil

110 mm Ducting Entry Seal

The 110 mm ducting entry seals is ideal for large bundles of cables running from the transition chamber back to the main kiosk.



Model	Description
304-110-TP	Electrofusion entry seal, for 110 mm ducting

110 mm Ducting Installation Tools



Model	Description
304-CLAMP	Welding clamp for 304-110-TP
HS5	140 mm hole saw

Transition Chamber

Built specifically for wire management, the rugged transition chamber provides an easy access point for the electrician for maintenance or future expansion.



Model	Description
ECH-760-660-D400	Transition chamber, 700 mm x 600 mm
408109001	Removable segregation panel
VTL-750X650	Transition chamber test lid assembly, 750 mm x 650 mm



Model	Description
PCR-LIFT	Transition chamber access cover lifting tool

ELECTRICAL CONDUIT

The old days of installing potentially corrosive metallic electrical conduit are over. The technologically advanced UPP® brand electrical conduit from Franklin Electric features several key upgrades that metallic conduit just can't provide—keeping your investment safe underground for years to come.



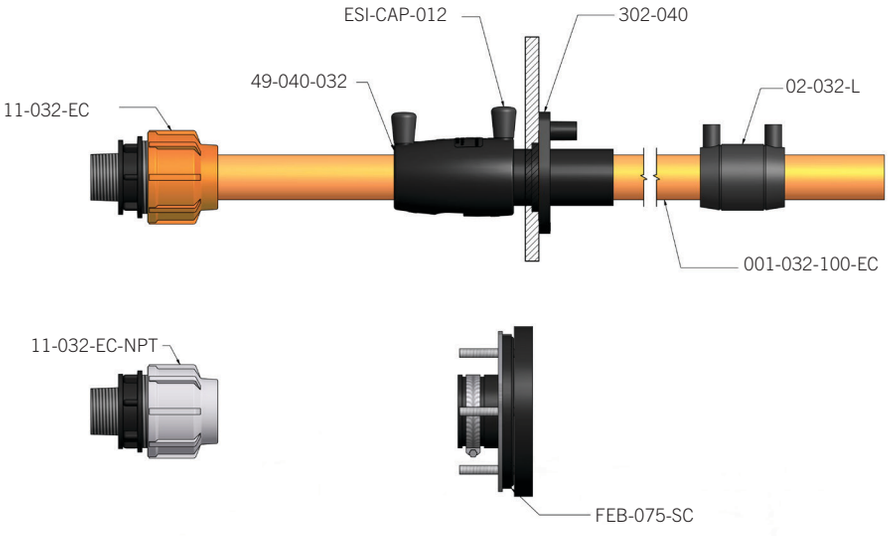
HIGHLIGHTS

- UPP® brand electrical conduit is manufactured from a superior quality high density polyethylene material using an extrusion process which provides an extremely smooth inner bore.
- UPP® electrical conduit is available in 100 meter coils, meaning you can skip time-consuming connections like the ones you have to make with limited length metallic pipe.
- The electrical conduit electrofusion entry seal allows you to effectively joining your electrical system directly to your containment spaces, eliminating any potential leak paths.
- UPP® brand electrical conduit features a non-corrosive high density polyethylene construction.
- Termination compression fittings tighten into the UPP® electrical conduit, allowing you to simply thread on a standard seal off fitting. Options for both BSPT and NPT threads are available.

SPECIFICATIONS

Two diameter sizes available	32 mm
Certification by ERA	To AS/NZS 2053.1.2001
Welding System	Electrofusion welding system
Colour	Day-glow orange for maximum visibility
Internal bore	25 mm

32 MM 1" LINED ELECTRICAL CONDUIT



ORDER INFORMATION

Product Code	Description	Unit	Diameter Ø (mm)
001-032-100-EC-E	UPP® electrical conduit orange	100 m coil	32
000-032-100-EC-E	UPP® electrical conduit orange, unlined	100 m coil	32

Note: Ideal for boiler house applications or small stand-by generators. OFTEC Listed. Also ideal for AdBlue.



Model	Description	Diameter Ø (mm)
02-032-L	UPP® fusion coupler long	32



Model	Description	Diameter Ø (mm)
49-040-032	Fusion reducer 40 x 32 mm secondary	40/32



Model	Description	Diameter Ø (mm)
302-040	Fusion seal 40 mm	40



Model	Description
ESI-CAP-012	Weld pin protection cap



Model	Description	Diameter Ø (mm)
11-032-EC	Orange termination 1" BSP	32



Model	Description	Diameter Ø (mm)
11-032-EC-NPT	Grey termination 1" NPT	32



Model	Description	Diameter Ø (mm)
11-032-EC-075	Blue termination–32 mm ¾" NPT	32



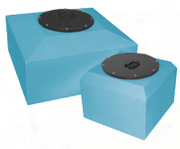
Model	Description	Diameter Ø (mm)
10-032-EC	Compression fitting end cap	32



Model	Description	Diameter Ø (mm)
11.321	Compression termination–BSPT male	32



Model	Description
IPS-2424	Electrical draw pit 24" x 24"
IPS-3636	Electrical draw pit 36" x 36"



UPP® 110 MM DUCTING SYSTEM

With a thick and robust wall, the new duct is equally flexible and can be welded to electrofusion entry seals and other 110 mm electrofusion fittings. The duct will provide a water tight chase for pipes or electrical cables when fully welded. This product is for use as an electrical duct or gravel guard for fuel pipework.



HIGHLIGHTS

The following in-house testing has been satisfactorily carried out on the duct:

- Electrofusion trials.
- Cold temperature bending tests at -29° C.
- Ball impact test at -29° C.
- Pressure testing at 2 bar for 1 week.
- Drop test of coil from 2 m.

ORDER INFORMATION

Model	Description
00-110-050-DUCT	110 mm flexible PE duct coil 50 m
02.110	UPP® fusion coupler 110 mm
02.125(SC)	UPP® fusion coupler 125 mm secondary
09.125.110(SC)	UPP® reducer 125 x 110 mm secondary
10.125(SC)	UPP® end cap 125 mm secondary
49-125-110	UPP® terminating reducer 125 x 110 mm secondary
49-125-110-TP	UPP® terminating reducer 125 x 110 mm sec with test port
304-110-TP	UPP® fusion entry seal with coupler 110 mm with test port (no boot)
305-R-1	UPP® 305–5" fusion ring extended spigot
ESI-CAP-012	Weld pin protection cap

FUSION DUCTED ENTRY BOOT FOR XP PIPE DUCTING



APT® brand fusion ducted entry boots provide a watertight seal between XP Pipe and polyethylene constructed containment sumps. Utilizing the electrofusion welding process, the entry boot, ducting, and sump become one solid structure, creating a watertight entry into the containment space.

HIGHLIGHTS

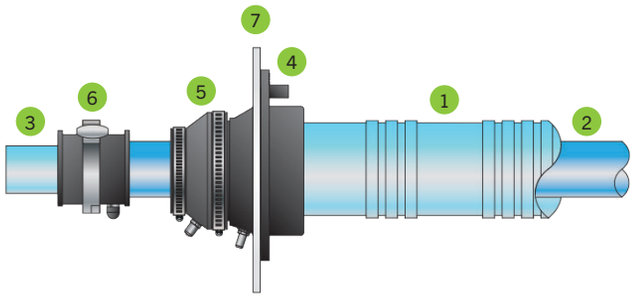
- The two-piece design includes the entry boot and a reducer fitting which seals off the secondary XP Pipe layer inside of the sump.
- Creates watertight entries into containment sumps.
- Features integrated test ports on both the entry boot and reducer fitting.
- The electrofusion welding process is safe and simple to complete in any climate and virtually any weather condition.
- The welding process uses the lightweight, portable electrofusion welder unit to form watertight connections.
- Ducting is recommended for future-proofing sites to accommodate pipe changes or as a pull chase for future station expansion.
- Available for use with 1½", 1¾", and 2" XP Pipe diameters.

Components

1. XP ducting
2. XP pipe (secondary layer outside of sump)
3. XP pipe (primary layer exposed inside sump)
4. Fusion ducted entry boot
5. Reducing boot (included with fusion ducted entry boot)
6. Rigid split test boot
7. Polyethylene sump wall

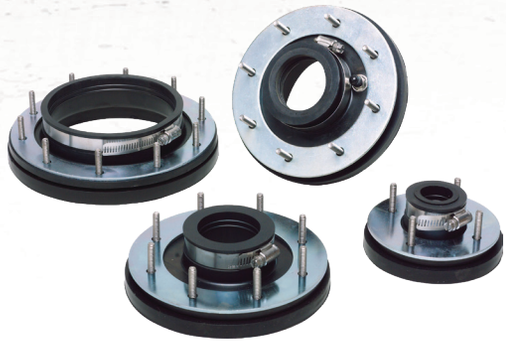
ORDER INFORMATION

Model	Description
FWEB-150-SC	Fusion ducted entry boot for 1½" XP Pipe
FWEB-175-SC	Fusion ducted entry boot for 1¾" XP Pipe
FWEB-200-SC	Fusion ducted entry boot for 2" XP Pipe
EF1-230V	230 Volt hand-held electrofusion welder
408032001	Step up transformer for hand-held welder unit
304-CLAMP	Entry boot installation clamp tool
SCR.HAR	Hand scraper installation tool



FLEXIBLE ENTRY BOOTS

APT® flexible entry boots are two-piece boots that double the sealing power of your entry boots. Stainless steel studs and corrosion resistant nuts and backing rings make for the highest quality entry boot. Franklin Electric offers a complete line of sizes for single and secondary containment pipe. Also available in a ducted boot version to accommodate the use of APT® DCT-400 corrugated ducting for easy retractability.

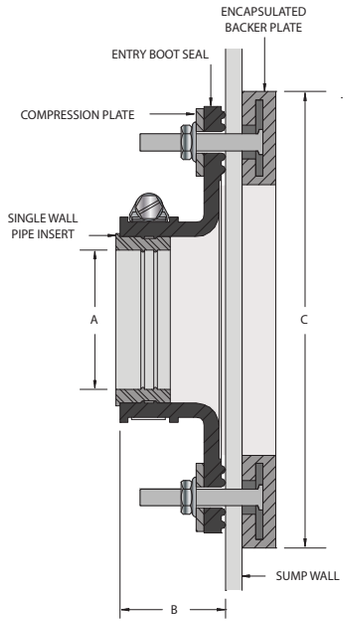


HIGHLIGHTS

- Designed to be used with APT® product piping, the entry boots are also ideal for use with rigid piping and electrical conduits.
- Flexible entry boots available in sizes from ½" through 4".
- Ducted entry boots available in sizes from 1½" through 2½". APT® offers these ducted entry boots in an air testable version for easy testing of the 4" corrugated ducting.
- Boot size designations correspond directly to the pipe size being used.
- Any boot for a single wall pipe can be converted to a boot for a double wall pipe by simply removing the insert in the pipe opening.
- Entry boot can be serviced from inside the sump, eliminating the need for sump excavation.
- Made from oil- and gasoline-resistant nitrile rubber.
- Will work on round sumps of 36" or larger diameter.

SPECIFICATIONS

Model	A (mm)	B (mm)	C (mm)	Mtg. Hole Size (mm)	Mtg. Studs
FEB-075-SC	33	38	121	51	4
FEB-100-D	33	38	121	51	4
FEB-100-SC	43	38	121	51	4
FEB-150-D	44	38	172	90	8
FEB-175-SC	61	38	172	90	8
FEB-200-D	63	38	172	90	8
FEB-200-SC	73	38	172	90	8
FEB-300-R	90	38	172	90	8
FEB-400-R	114	38	204	140	10
FEB-400-F	125	38	204	140	10



ORDER INFORMATION

Model	Description	Pack	UPP® Pipe Diameter Ø (mm)	Hole Diameter (mm)	Hole Saw
FEB-075-SC	Flexible entry boot for 1" electrical conduit	1	32	51	HSCS2
FEB-100-D	Flexible entry boot for 3/4" and 1" electrical conduit	1	32	51	HSCS2
FEB-100-SC	Flexible entry boot for 40 mm UPP®	1	40	51	HSCS2
FEB-150-D	Flexible entry boot for 50 mm UPP®	1	50	83	HSP3
FEB-175-SC	Flexible entry boot for 63 mm UPP®	1	63	83	HSP3
FEB-200-D	Flexible entry boot for 63 mm UPP®	1	63	83	HSP3
FEB-200-SC	Flexible entry boot for 75 mm UPP®	1	75	83	HSP3
FEB-300-R	Flexible entry boot for 90 mm UPP®	1	90	102	HS3
FEB-400-R	Flexible entry boot for 110 mm UPP®	1	110	140	HS5
FEB-400-F	Flexible entry boot for 125 mm UPP®	1	125	140	HS5

PETROSEAL RUBBER ENTRY BOOT

PetroSeal entry boots are two-piece boots for 50 mm to 160 mm UPP® pipework. Using band clips and a backing ring to ensure a perfect fit and the highest quality entry boot.

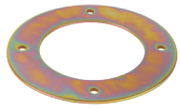
ORDER INFORMATION

Model	Description	Diameter Ø (mm)
PS3	PetroSeal for UPP®	50/63/75

If this is to be used for 75 mm then you will also need to order our part SS4–band clip for 75 mm



Model	Description	Diameter Ø (mm)
PS3/R	Backing ring for PS3	n/a



Model	Description	Diameter Ø (mm)
SS 4	Band clip for PS3	70–90



Model	Description	Diameter Ø (mm)
PS6	PetroSeal for UPP®	90/110/160

If this is to be used for 160 mm then you will also need to order our part SS8–band clip for 160 mm.



Model	Description	Diameter Ø (mm)
PS6/R	Backing ring for PS6	--



Model	Description	Diameter Ø (mm)
SS 5	Band clip for PS6 (76–127 mm)	90/110



Model	Description	Diameter Ø (mm)
SS 8	Band clip for PS6/308 (165–216 mm)	160



302-040 ENTRY SEAL



These electrofusion entry seals weld directly to the walls of polyethylene chambers or sumps. They have been specifically designed to reduce the number of fittings necessary to provide watertight seals between the underground tank sump/chamber and the UPP® primary or secondary contained pipe and electrical conduit or duct. The nature of the seal means that after installation it becomes one with the sump, with zero leak paths, creating a 100% leak tight system. The seals are polyethylene based allowing electrofusion of UPP® pipework systems directly to the penetration, negating the need for mechanical boots and creating a homogeneous structure of the sump, boot and pipe.

HIGHLIGHTS

- Electrofusion seal for 40/32 mm pipe.
- 302-040 seal complements 32 mm pipe range.
- 40 mm secondary (double wall) pipe welds directly to seal spigot using 02.40(SC) fusion coupler.
- 32 mm primary (single wall) continues through penetration and into PE sump/chamber and is fusion sealed with 49-040-032 (ordered separately).

ORDER INFORMATION

Model	Description	Diameter Ø (mm)
302-040	Fusion seal	40

304 AND 305 SERIES ENTRY SEALS



These electrofusion entry seals weld directly to the walls of polyethylene chambers or sumps. They have been specifically designed to reduce the number of fittings necessary to provide watertight seals between the underground tank sump/chamber and the UPP® primary or secondary contained pipe and electrical conduit or duct. The nature of the seal means that after installation it becomes one with the sump, with zero leak paths, creating a 100% leak tight system. The seals are polyethylene based allowing electrofusion of UPP® pipework systems directly to the penetration, negating the need for mechanical boots and creating a homogeneous structure of the sump, boot, and pipe. The spigot on both sides of the 305 allow for EIF welding. The seal is fully vacuum and pressure testable ensuring 100% leak-free seals and sumps.

HIGHLIGHTS

- Space saving, welded entry seal.
- For use with 50 mm (1½"), 63mm (2"), 90mm (3") and 110 mm (4") SW or DW pipe.
- With or without test port.

ORDER INFORMATION

Model	Description	Diameter Ø (mm)
304-110-050-TP	Fusion entry seal with secondary coupler with test port	50
304-110-063-TP	Fusion entry seal with secondary coupler with test port	63
304-110-075-TP	Fusion entry seal with secondary coupler with test port (pictured)	75



Model	Description	Diameter Ø (mm)
304-110-090	Fusion entry seal	110/90
304-110-090-TP	Fusion entry seal with test port (pictured)	110/90



Model	Description	Diameter Ø (mm)
304-110-TP	Fusion entry seal with coupler with test port (no boot)	110



Model	Description	Diameter Ø (mm)
304-110-EIF	Fusion seal with integrated coupler	110



Model	Description	Diameter Ø (mm)
305	5" Fusion seal	50/63/75

If this is to be used for 75 mm then you will also need to order our part SS4 - Jubilee clip for 75 mm.



Model	Description	Diameter Ø (mm)
305-R-1	5" Fusion ring extended	125



ORDER INFORMATION CONTINUED

Model	Description	Diameter Ø (mm)
305-SB	Seal boot kit	50/63/75



Model	Description	Diameter Ø (mm)
305-090-SB	Seal boot kit	90



Model	Description	Diameter Ø (mm)
305-125-EIF	Fusion seal with integrated coupler	125



Model	Description	Diameter Ø (mm)
DCT-400-F	Seal boot kit	110



Model	Description	Diameter Ø (mm)
305 ELECTRICAL	5" Fusion seal - electrical entry	12/18/ 32/41
305 ELECTRIC SB	Spare boot 305 electrical	12/18/ 32/40



Model	Description	Diameter Ø (mm)
305-125-110	Fusion entry seal	125/110
305-125-110-TP	Fusion entry seal with test port	125/110



308 SERIES ENTRY SEALS



These electrofusion entry seals weld directly to the walls of polyethylene chambers or sumps. They have been specifically designed to reduce the number of fittings necessary to provide water tight seals between the underground tank sump/chamber and the UPP® primary or secondary contained pipe and electrical conduit or duct. The nature of the seal means that after installation it becomes one with the sump, with zero leak paths, creating a 100% leak tight system. The seals are polyethylene based allowing electrofusion of UPP® pipework systems directly to the penetration, negating the need for mechanical boots and creating a homogeneous structure of the sump, boot and pipe. The spigot on both sides of the 308 allow for EIF welding. The seal is fully vacuum and pressure testable ensuring 100% leak free seals and sumps.

HIGHLIGHTS

- Large diameter access.
- For use with 50 mm (1½"), 63 mm (2"), 75 mm (SC), 90 mm (3"), 110 mm (4") and 160 mm (6") pipe.

ORDER INFORMATION

Model	Description	Diameter Ø (mm)
308	8" Fusion seal	90/110/160

If this is to be used for 160 mm then you will also need to order our part SS8 - band clip for 160 mm.



Model	Description	Diameter Ø (mm)
308-R	8" Fusion ring	200



Model	Description	Diameter Ø (mm)
308-SB	Seal boot kit	90/110/160



Model	Description	Diameter Ø (mm)
308-075	8" Fusion seal with rubber boot	50/63/75

If this is to be used for 75 mm then you will also need to order our part SS4–band clip for 75 mm.



PETROTITE® PE TANK CHAMBER

The PetroTite® PE tank chamber (DC4830) is bolted at the riser/base joint which will give a joint of the same quality as that to the tank for a fully watertight seal.



HIGHLIGHTS

- Vacuum testable. Specific testing at critical points ensures a leak-proof installation.
- Tank access remains dry and protected.
- Compatible with all UPP® electrofusion entry seals providing a welded UPP® containment system, eliminating mechanical entry seal joints and leaks.
- The two-piece design enables easy access during installation, while the compact design allows for economy in shipping.

ORDER INFORMATION

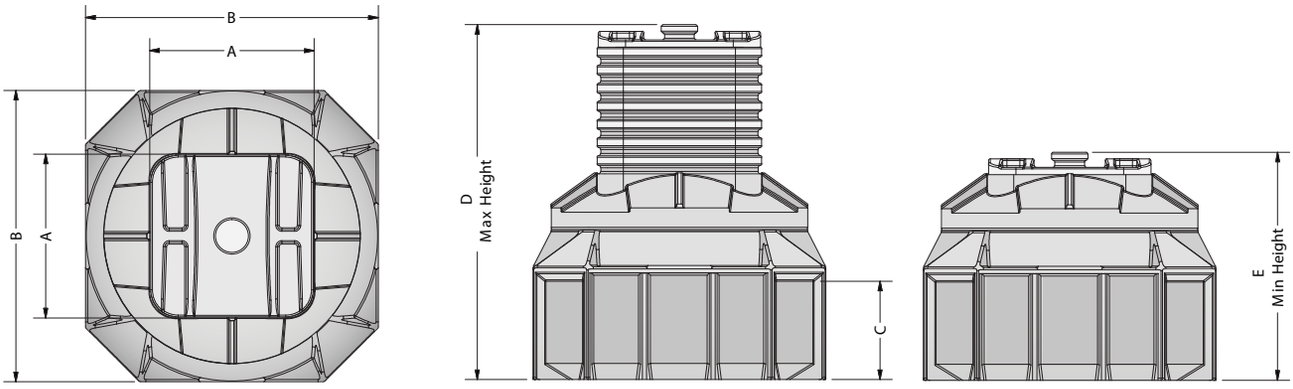
Model	Description
DC4830SB	PetroTite® PE chamber 1.2 x 1.2 m
DC4828 (BASE)	PetroTite® PE chamber BASE ONLY 1.2 x 1.2 m
DC4830SBG	Gasket kit for DC4830SB - base & waist
DC4830-L *	PetroTite® PE chamber lid
DC4830-R *	PetroTite® PE chamber riser

Note: the gasket kit DC4830SBG is included with the DC4830SB
** May require lead time. Consult factory for availability.*

SPECIFICATIONS

Base suits square or round containment collars on tank:	
Square ☐	970 mm max (38.2")
Round Ø	1150 mm max (45.3")

Model	A	B	C	D	E
DC4830SB	770	1370	460	1668	1072



PETROTITE® PE FUSION TANK CHAMBER

The PetroTite® PE fusion tank chamber is available in deep or shallow risers.

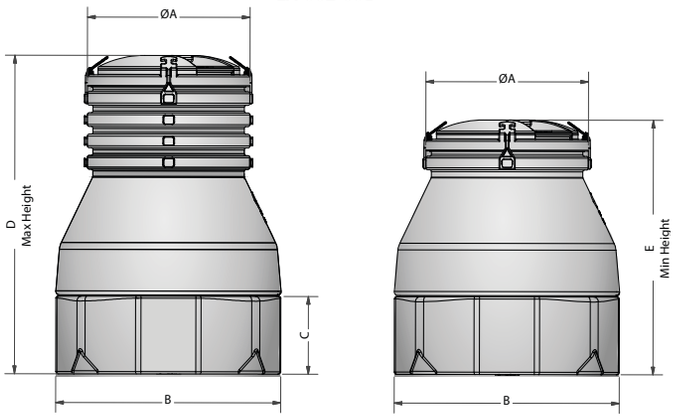


SPECIFICATIONS

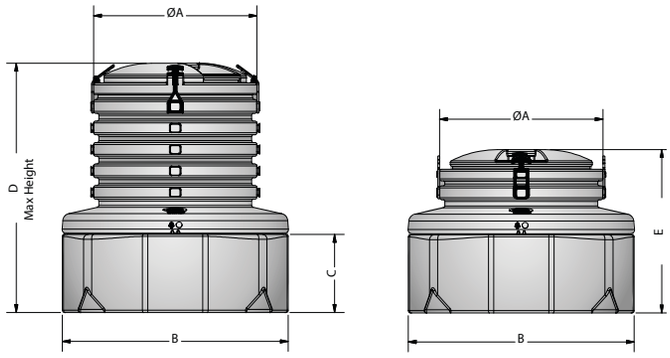
Base suits square or round containment collars on tank:	
Square ☐	970 mm max (38.2")
Round Ø	1150 mm max (45.3")

Model	Welding Lead Code	A	B	C	D	E
LA-002-001	EF1-C7A	880	1176	400	1641	1310
LA-002-002		880	1176	400	1279	831

LA-002-001



LA-002-002



ORDER INFORMATION

Model	Description	Size (mm)	Neck Opening (Ø mm)	Overall Height (mm)
LA-002-001	PE chamber, deep/small bore	1641 x 1176	780	max = 1641, min = 1310
LA-002-002	PE chamber, shallow/small bore	1279 x 1176	780	max = 1279 , min = 831

Model	Description
OCH-1400-BD *	Deep Chambers Base
OCH-1400-BS *	Shallow Chambers Base
OCH-1400-RL *	Large opening Chambers Riser
OCH-1400-LW *	Lid, watertight, large bore

Note: Toggles OCH-1400-T1 included.
** May require lead time. Consult factory for availability.*



A welding harness tool OCH-1400-H is required to install this product and must be ordered separately. This can be found under Associated Items on the menu.

Accessories

Model	Description
OCH-1400-T	Toggle for OCH
OCH-1400-LC	Mechanical toggle for OCH

OPTIMUM FUSION TANK CHAMBER



With the PetroTite® Standard and Optimum fusion chambers the riser section electrofuses to the base, removing the need for multiple bolt holes and foam gaskets in this area, therefore dramatically reducing the number of potential leak paths.

With its simplified assembly, this electrofusion system reduces the installation time. Welding of the chamber can be performed using UPP® electrofusion equipment in approximately six minutes.

Once welded and cooled, the base and riser of the OCH models become one homogeneous unit with no mechanical joints and no leak points. The chamber can then be vacuum tested to ensure that it is 100% leak-tight.

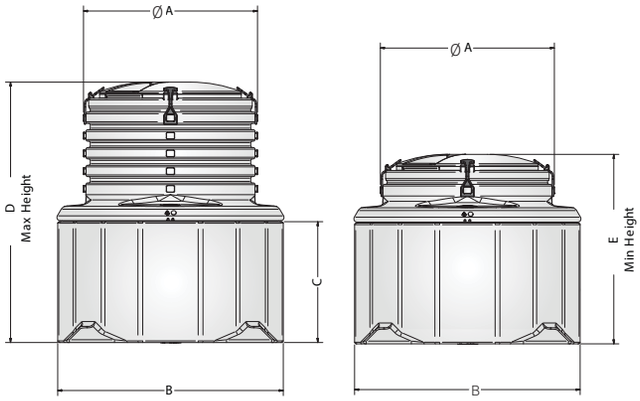
The Optimum chamber is available with either deep or shallow bases, and both will allow for a very easy installation of pipework before the riser is fused into place.

SPECIFICATIONS

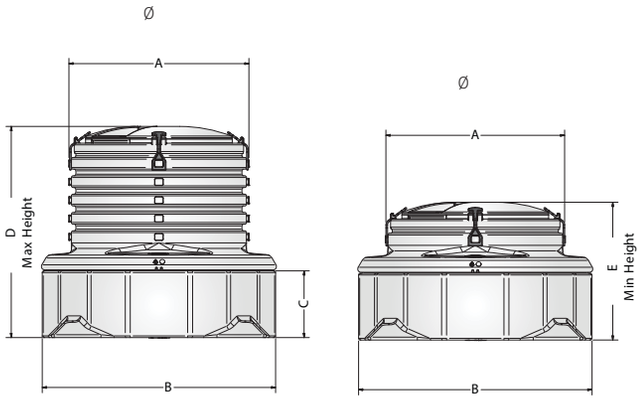
Consult FFS Technical Support for square and round manway collar sizing to ensure internal dimensions of tank chamber are not exceeded by tank collar clamping plates.	
Square ☐	970 mm max (38.2")
Round Ø	1150 mm max (45.3")

Model	Welding Lead Code	A	B	C	D	E
OCH-1400-D	EF1-C7A	1080	1400	750	1616	1176
OCH-1400-S		1080	1400	400	1266	826

OCH-1400-D



OCH-1400-S



ORDER INFORMATION

Model	Description	Size (mm)	Neck Opening (Ø mm)	Overall Height (mm)
OCH-1400-D	PE chamber deep burial 1400	1400 x 1616	980	max = 1616, min = 1176
OCH-1400-S	PE chamber shallow burial 1400	1400 x 1266	980	max = 1266, min = 826

Model	Description
OCH-1400-BD *	Deep Chambers Base
OCH-1400-BS *	Shallow Chambers Base
OCH-1400-RL *	Large opening Chambers Riser
OCH-1400-LW *	Lid, watertight, large bore

Note: Toggles OCH-1400-T1 included.
** May require lead time. Consult factory for availability.*



A welding harness tool OCH-1400-H is required to install this product and must be ordered separately. This can be found under Associated Items on the menu.

Accessories

Model	Description
OCH-1400-T	Toggle for OCH
OCH-1400-LC	Mechanical toggle for OCH

OPTIMUM FUSION SMALL RISER TANK CHAMBER

The Optimum chamber is available with either Deep or Shallow bases, and both will allow for a very easy installation of pipework before the riser is fused into place.

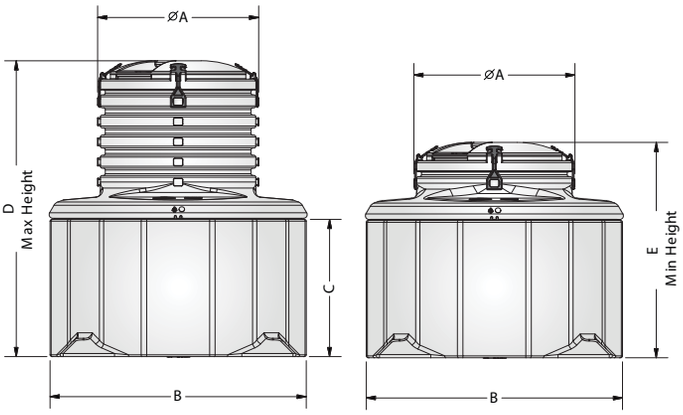


SPECIFICATIONS

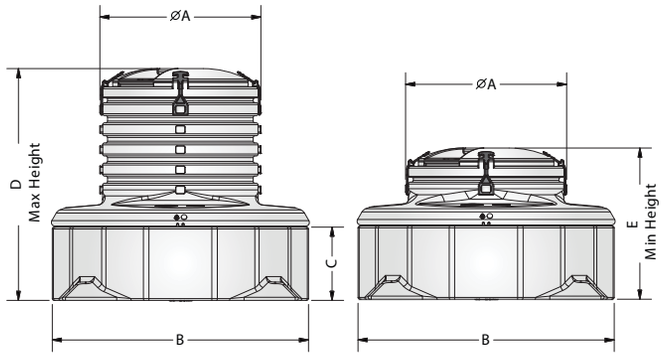
Base suits square or round containment collars on tank:	
Square ☐	1270 x 1270 mm max (50")
Round Ø	1380 mm max (54.3")

Model	Welding Lead Code	A	B	C	D	E
OCH-1400-DS	EF1-C7A	880	1400	750	1616	1176
OCH-1400-SS		880	1400	400	1266	826

OCH-1400-DS



OCH-1400-SS



ORDER INFORMATION

Model	Description	Size (mm)	Neck Opening (Ø mm)	Overall Height (mm)
OCH-1400-DS	PE chamber deep/small bore	1400 x 1616	780	max = 1616 min = 1176
OCH-1400-SS	PE chamber shallow/small bore	1400 x 1266	780	max = 1266 min = 826

Model	Description
OCH-1400-BD *	Deep chambers base
OCH-1400-BS *	Shallow chambers base
OCH-1400-RS *	Small opening chambers riser
LA-007-001 *	PE chamber, watertight lid

Note: Toggles OCH-1400-T1 included.
** May require lead time. Consult factory for availability.*



A welding harness tool OCH-1400-H is required to install this product and must be ordered separately. This can be found under Associated Items on the menu.

Accessories

Model	Description
OCH-1400-T	Toggle for OCH
OCH-1400-LC	Mechanical toggle for OCH

FUSION TANK CHAMBERS



With the PetroTite® standard and optimum fusion chambers the riser section electrofuses to the base, removing the need for multiple bolt holes and foam gaskets in this area, dramatically reducing the number of potential leak paths.

With its simplified assembly, this electrofusion system reduces the installation time. Welding of the chamber can be performed using UPP® electrofusion equipment in approximately six minutes.

Once welded and cooled, the base and riser of the LA models become one homogeneous unit with no mechanical joints and no leak points. The chamber can then be vacuum tested to ensure that it is 100% leak-tight.

The LA Chamber is available in deep or shallow risers.

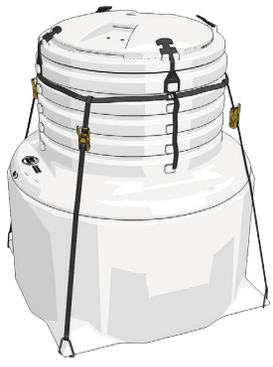
HIGHLIGHTS

- With the PetroTite® standard and Optimum fusion chambers the riser electrofuses to the chamber base – no bolts, no leaks. Quick installation with no bolt holes.
- Vacuum testable. Specific testing at critical points ensures a leak-proof installation.
- Tank access remains dry and protected even in high water table areas.
- Compatible with all UPP® electrofusion entry seals. Fully welded UPP® system, eliminating mechanical joints and leaks.
- The two-piece design enables easy access during installation while the compact design allows for economy in shipping.

ORDER INFORMATION

Model	Description
OCH-1400-H *	PE-chambers harness
OCH-1400-T1 *	Replacement toggles for OCH-chambers
OCH-1400-BG *	Base seal for chambers
OCH-1400-G *	Gasket watertight lid large bore
CLAMP(OCH)	CLAMP OCH riser–base
LA-007-003 *	Gasket watertight lid small bore
EF1-110V	EF1 welders110 V
EF1-230V	EF1 welders 230 V
OCH-1400-LC	Mechanical toggle for OCH

** May require lead time. Consult factory for availability.*



OUTSIDE N. AMERICA UDC COMPATIBILITY CHART

Supplied from FFS, Wittlich, Germany. Contact FFS Wittlich customer service for availability and lead times.

Model		Medium Depth Sump	Deep Depth Sump	Frame	Stabiliser Bar
Bennet					
3K Series	P0783, P0784, P0785, P0786, P0831, P0828, P0829, P0830, P0951, P0982	LMM-2010	LMD-2010	Included	SBK-2
Compaq					
Legend	MD6	LMM-4111	LMD-4111	Included	SBK-25
Dresser Wayne					
Vista™	3/V590D, 3/V591D, 3/V595D, 3/V490D, 3/V490D/U, 3/V590D/U, 3/V595D/U, 3/V399D, 3/V390D, 3/V390D/U, V395P/U, V590P/U, V590D/U, V395D/U, 1/V395D/U, 1/V590D/U, 1/V590D, X1/V590D, V395D, X/V395D, V590D, X/V590D	LMM-4111	LMD-4111	Included	SBK-25
Ovation™	R11, R13, B12/R22, B23	DS3915	DS3915	Included	SBK-3
Global Star	H Frame	DS4620	DS4620	DS4620-F-WGHF	DS-SBA-20
	CXX-11 1 product, CXX-21 2 product, CXX-31 3 product	DS3818	DS3818	DS3818-F-CX31	DS-SBA-18
	CXX-44 4 product	DS5518	DS5518	DS5518-F-CX44	DS-SBA-18
3/G Prefix	3/G2201D, 3/G2221D/GHK, 3/G2227D/GJKR, 3/G3387D, 3/G3388, 3/G3389D, 3/G3384D	LMM-2715	LMD-2715	Included	SBK-3
	3/G3397D, 3/G3399D, 3G/3390D, 3/G3490D, 3/G3498D	LMM-4115	LMD-4115	Included	SBK-3
Helix	2000 and 4000 series	LMM-2915	LMM-2915	Included	SBK-3
	5000 series	LMM-4115	LMM-4115	Included	SBK-3
Gilbarco™					
Encore™	550/500, 500S	DS3617 ENCORE	DS3617 ENCORE	Included	SBK-3
SK700	2/1/2 - 2 hose	DS3420	DS3420	DS3420-F-SK72	DS-SBA-20
	4/2/4 - 4 hose	DS3420	DS3420	DS3420-F-SK74	DS-SBA-20
	6/3/6 - 6 hose	DS4620	DS4620	DS4620-F-SK76	DS-SBA-20
	8/4/8 - 8 hose	DS4620	DS4620	DS4620-F-SK78	DS-SBA-20
	10/5/10 - 10 hose	DS5518	DS5518	DS5518-F-SK710	DS-SBA-20
Advantage™	1 and 2 Grade	LMM-2915	N/A	Not Required	SBK-3
	3 and 4 Grade	LMM-4115	LMD-4115	Included	SBK-3
	Quad/Dual	LMM-2915	N/A	Included	SBK-3
	X+0 (36" frame)	LMM-2915	N/A	Included	SBK-3
China	TC3202-202, TB3202-202	DS4620	DS4620	DS4620-F-3202	DS-SBA-20
Neotec					
M-5200	M5225	LMM-2010	N/A	Included	SBK-2
Petrotech					
	EURO 4000B DBL PMP	DS3617	DS3617		SBK-3
	EURO 4000B SNGL PMP	DS3617	DS3617		SBK-3
	P5000 3P6H	DS5518	DS5518		DS-SBA-18
Prowalco					
Salesmaker	Salesmaker 10 hose	DS5518	DS5518		DS-SBA-18
	SM1080W	DS3617	DS3617		SBK-3
	SM1011WHV	LMM-2615	LMD-2615	Included	SBK-3
	SM1020, SM1020WHV, SM1021WHV, SM1921WHV STD, SM1021W, SM1021WHVSIDOFL, SM1020WHVSIDOFL, SM1020WHVSIDOSL, SM1040W, SM1040WHD, SM1041WHD, SM1041W, SM1010, SM1010WHV, SM1020WSIDOFL, SM1021WSIDOFL, SM1031W	LMM-2715	LMD-2715	Included	SBK-3
	SM1060W	LMM-4115	LMD-4115	Included	SBK-3
	SM1061W	LMM-4115	LMD-4115	Included	SBK-3
Somo					
Multi Ex	4S, 4S2H, 6S	LMM-4111	LMD-4111	Included	SBK-25
Tatsuno					
Sunny XE	Sunny XE Wide Body	DS4620	DS4620	DS4620-F-TSXE-W	DS-SBA-20
Sunny XE	Sunny XE Narrow Body	DS3420	DS3420	DS3420-F-TSXE-N	DS-SBA-20
Sunny - X	3 product	LMM-4111	LMD-4111	Included	SBK-25
Multi - X	3 product	LMM-4111	LMD-4111	Included	SBK-25
Tokheim™					
Quantium™	410T	DS4620	DS4620	DS4620-F-Q410	DS-SBA-20
	510T 2 product	DS3420	DS3420	DS3420-F-Q5T2	DS-SBA-20
	510T 3 product	DS4620	DS4620	DS4620-F-Q5T3	DS-SBA-20
	510T 4 product, 2 column	DS4620	DS4620	DS4620-F-Q5T4	DS-SBA-20
	510T 4 product, 3 column	DS4620	DS4620	DS4620-F-Q5T4-3	DS-SBA-20
	510T 4 product, 4 column	DS4620	DS4620	DS4620-F-Q5T4-4	DS-SBA-20
	510T 5 product	DS5518	DS5518	DS5518-F-Q5T5	DS-SBA-18
	430S	LMM-2811	LMD-2811	Included	SBK-25
	330S	LMM-2407	N/A	Included	SBK-1
	230T	LMM-2010	LMD-2010	Included	SBK-25

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LARGE MOUTH DISPENSER SUMP



The large mouth dispenser sump modular design provides versatility and ease of installation. There are six polyethylene bases in three lengths and two depths. These bases have a large 22" wide by 24", 36" or 48" long openings, easing the installation of entry boots and piping connections. The ribbed riser can be cut down in 3" increments in the field to achieve proper pipe slopes with respect to grade. A variety of large mouth tops (LMTs) are available to match nearly every dispenser model. The lids are corrosion-resistant painted steel to which shear valves and dispenser frames are mounted.

HIGHLIGHTS

- 22" wide by 24", 36" or 48" long opening on base gives plenty of room for boot, fitting and monitor installation.
- Available in medium and deep burial depths to properly maintain slope.
- The base widens to a spacious 26" where entry boots and pipe connections are made.
- Height modifications are accomplished by trimming off the base at the ribs.
- Stabiliser bar kits (SBKs) mount into welded strut channels for shear valve mounting. One SBK is required for each shear valve and must be purchased separately.

SPECIFICATIONS

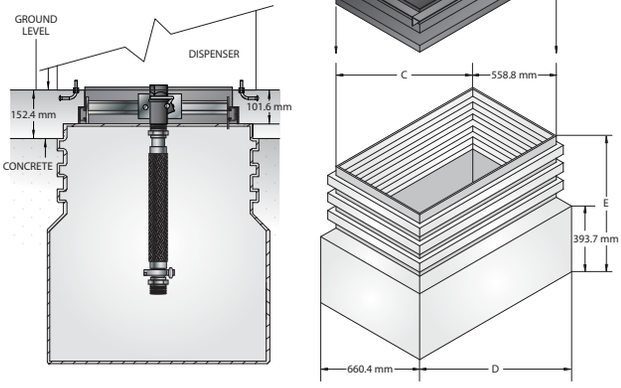
Model	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	
					(LMM)	(LMD)
LMM-2010	520	254	610	711	711	-
LMM-2407	603	191	914	1016	711	-
LM(M/D)-2715	686	191	914	1016	711	1092
LM(M/D)-2811	724	191	914	1016	711	10921
LMM-2915	756	400	914	1016	711	-
LMM-2915-HLX	756	387	914	1016	711	N/A
LMM-3915-HLX	1010	387	1219	1321	711	1092
LM(M/D)-4111	1054	279	1219	1321	711	1092
LM(M/D)-4115	1054	400	1219	1321	711	1092

ORDER INFORMATION

Model	Description
LMM-2010	Medium/deep dispenser sump 20" x 10"
LMM-2407	Medium/deep dispenser sump 24" x 7.5"
LM(M/D)-2715	Medium /deep dispenser sump 27" x 15"
LM(M/D)-2811	Medium /deep dispenser sump 28" x 11"
LMM-2915	Medium/deep dispenser sump 29" x 15"
LMM2915-HLX	Medium dispenser sump for Wayne Helix 2000 or Helix 4000
LMM-3915-HLX	Medium dispenser sump for Wayne Helix 5000
LM(M/D)-4111	Medium/deep dispenser sump 41" x 11"
LM(M/D)-4115	Medium/deep dispenser sump 41" x 15"

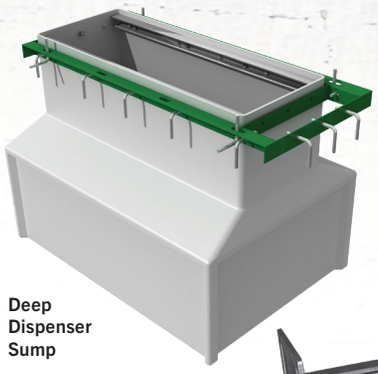
Model	Description
SBK-1	Stabiliser bar kit for 2407
SBK-2	Stabiliser bar kit for 2010
SBK-25	Stabiliser bar kit for 4111
SBK-3	Stabiliser bar kit for 2915 & 4115

Measures to outside edge of the stabiliser bar kit.



WAYNE™ OVATION™ DISPENSER SUMP

Our dispenser sumps, with patented welded entry boot and piping systems, give you what you need; years of worry-free, maintenance free performance. All our UPP® sumps are manufactured from virgin polyethylene with a steel painted frame and galvanised steel stabiliser bar and they are compatible with the UPP® electrofusion entry system.



Deep Dispenser Sump



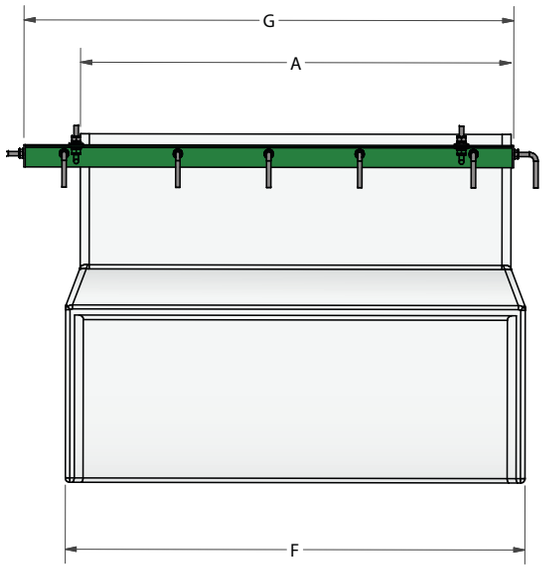
Stabiliser Bar Kit

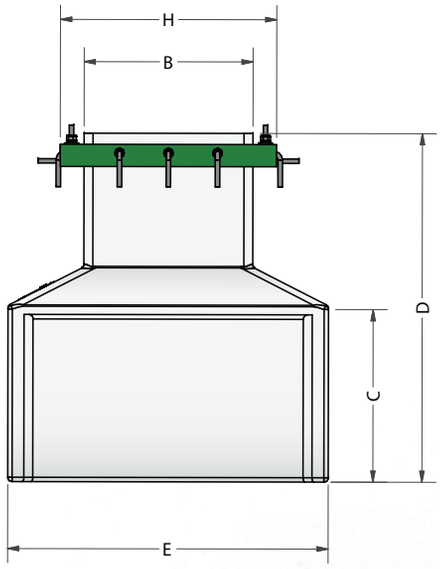
HIGHLIGHTS

- Rigid and thick one-piece PE body with reinforced contoured structure.
- No leak paths - one system when using UPP® Electrofusion (EIF) entry seals.
- Conduits can enter the dispenser through mounting frame without penetrating the sump wall.
- Integrated rain lip option.
- Large clear entry seal face.
- The PetroTite® ribbed dispenser sumps neck can be trimmed to adjust sump burial depth.
- Stabiliser bars feature pre-drilled shear valve mounting plate and spring channel nuts.

SPECIFICATIONS

Model	A	B	C	D	E	F	G	H
DS3915-OVATION	966	379	389	782	719	1031	1096	485





ORDER INFORMATION

Model	Description	Overall Base Dimensions (mm)
DS3915-OVATION	Deep dispenser sump 39" x 15" for Wayne™ Ovation™	1031 x 719

Model	Description	Length (mm)*
SBK-25	Stabiliser bar kit for DS3915	254 (min)–362 (max)

UPP® DISPENSER SUMPS



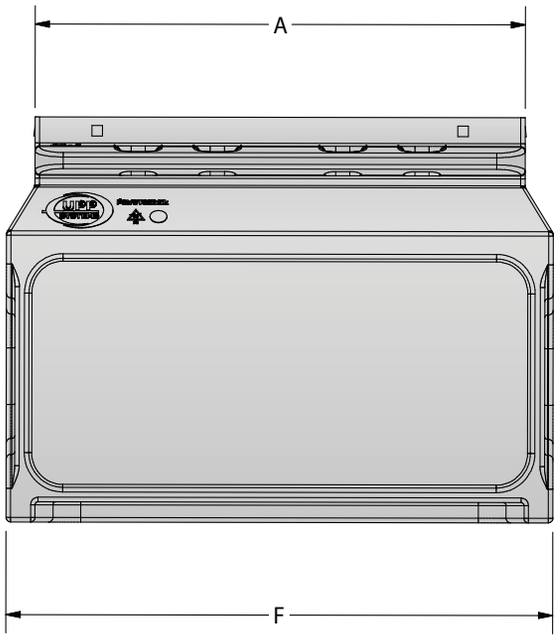
UPP® dispenser sumps feature a rigid 8 mm thick HDPE body with reinforced contoured structure and integrated rain lip allowing them to stand up to harsh forecourt conditions such as ground movement or hydrostatic pressure. The neck of UPP® dispenser sumps can be trimmed to adjust for varying sump burial depths ensuring an efficient installation. In addition, the durable steel UPP® dispenser sump top frames feature conduit entry points which allow conduit to enter the dispenser through the top frame without having to penetrate the sump wall. The galvanized steel stabiliser bars feature pre-drilled shear valve mount plates and spring channel nuts for quick mounting. UPP® electrofusion entry boots allow you to connect UPP® pipework directly to the dispenser sump, creating a solid, one-piece construction and eliminating potential leak paths.

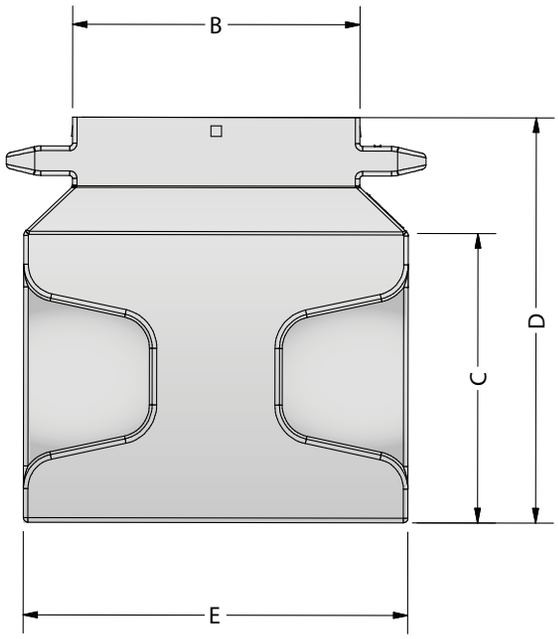
HIGHLIGHTS

- Rigid and thick one-piece PE body with reinforced contoured structure.
- No leak paths – one system when using UPP® electrofusion (EIF) entry seals.
- Conduits can enter the dispenser through mounting frame without penetrating the sump wall.
- Integrated rain lip option.
- Large clear entry seal face.
- The PetroTite® ribbed dispenser sumps neck can be trimmed to adjust sump burial depth.
- Stabiliser bars feature pre-drilled shear valve mounting plate and spring channel nuts.

SPECIFICATIONS

Model	A	B	C	D	E	F
DS3818	1034	495	610	785	880	1034
DS5518	1397	495	610	785	880	1397
DS3420	867	508	500	700	680	967
DS4620	1173	508	500	700	680	1273





ORDER INFORMATION

Model	Description	Overall Base Dimensions (mm)
DS3617 ENCORE	Deep Dispenser Sump 36''x 17''for Gilbarco™ Encore™	996 x 719



Model	Description	Length (mm)
SBK-3	Stabiliser bar kit for DS3617 ENCORE	343 (min)–540 (max)



Model	Description	Overall Base Dimensions (mm)
DS3818	Deep dispenser sump 38" x 18"	1034 x 880
DS5518	Deep dispenser sump 55" x 18"	1397 x 880



Model	Description	Length (mm)
DS-SBA-18	18" Wide access stabiliser bar kit	483 x 140



Model	Description	Overall Base Dimensions (mm)
DS3420	PE wide access sumps 34" x 20"	967 x 680
DS4620	PE wide access sumps 46" x 20"	1273 x 680



Model	Description	Length (mm)
DS-SBA-20	20" wide access stabiliser bar kit	496 x 140



Model	Description	Neck Opening (mm)
DS3420-F-SK72	Gilbarco™ SK700 2 hose mounting frame	863 x 508
DS3420-F-SK74	Gilbarco™ SK700 4 hose mounting frame	863 x 508
DS4620-F-SK76	Gilbarco™ SK700 6 hose mounting frame	1168 x 508
DS4620-F-SK78	Gilbarco™ SK700 8 hose mounting frame	1168 x 508
DS4620-F-Q410	Gilbarco™ Encore™ 510 mounting frame	1168 x 508
DS5518-F-SK710	Gilbarco™ Encore™ 510 mounting frame	1168 x 508



Model	Description	Neck Opening (mm)
DS3420-F-Q5T2	Tokheim™ Q500 2 product mounting frame	863 x 508
DS4620-F-Q5T3	Tokheim™ Q500 3 product mounting frame	1168 x 508
DS4620-F-Q5T4	Tokheim™ Q500 4 product mounting frame	1168 x 508
DS5518-F-Q5T5	Tokheim™ Q500 5 product mounting frame	1397 x 457



Model	Description	Neck Opening (mm)
DS3818-F-CX31	Wayne™ CXX.11, 21, 31 mounting frame	965 x 457
DS4620-F-WGHF	Wayne™ Global mounting frame	1168 x 508
DS5518-F-CX44	Wayne™ CX44 mounting frame	1397 x 457



BELOW GRADE TANK SUMP



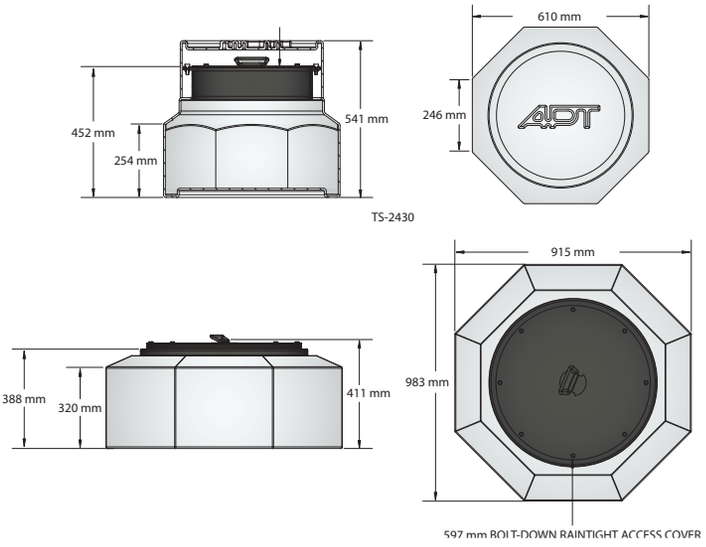
APT® TS-2430, TS-3630, and TS-4230 tank sumps are ideally suited for low cost retro fits and shallow burial applications. The TS-2430 is ideal for line branching points and for containing piping splices. The 36" or 42" bases provide ample space for submersibles and fittings. The bolt-on gasket-lid combination fits economically under a 30" manway.

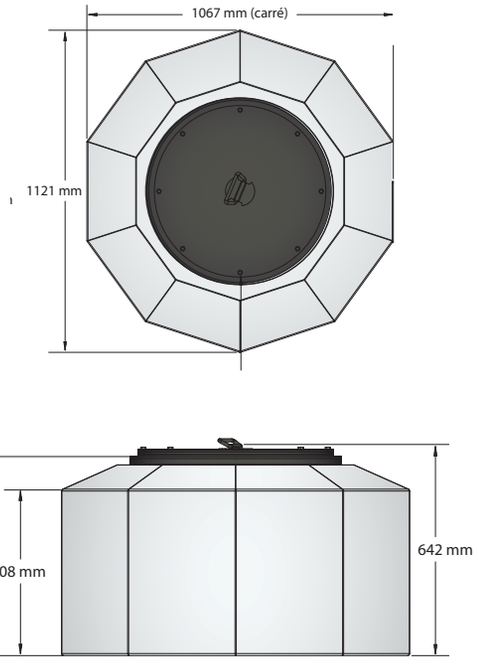
HIGHLIGHTS

- TS-2430 utilizes an 18" bolt-down watertight lid.
- TS-3630 and TS-4230 utilize a 597 mm bolt-down watertight lid.
- High density polyethylene construction is durable and chemical-resistant.
- All TS-Series sumps allow fittings to be installed with ease, while tapered design allows for installation under an economical 30" manway.
- Bolt-down cover can be easily removed for routine inspections.
- One-piece design enhances water resistance.

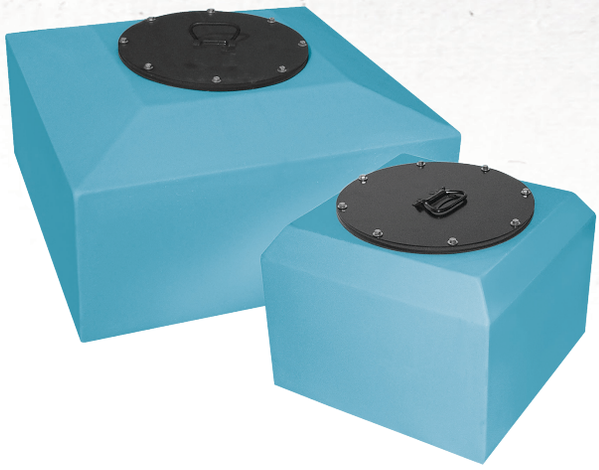
ORDER INFORMATION

Model	Description
TS-2430	Transition sump, shallow burial, 24" base, fits under a 30" manway
TS-3630	Tank sump, shallow burial, 36" base, fits under a 30" manway
TS-4230	Tank sump, medium burial, 42" base, fits under a 30" manway
TS-KIT	TS-3630/4230 retro fit kit, replacement lid assembly for screw-on polyethylene lids
99985555	Replacement gasket





BELOW GRADE INTERMEDIATE PIPING SUMP



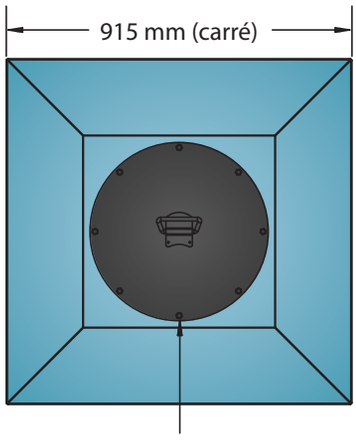
The APT® intermediate piping sump is a multifunctional component in the underground flexible piping system. The IPS-2424 and IPS-3636 can be used as a containment sump for fittings when utilizing a tee between dispenser islands, for contained piping splices, or for line branching points. These sumps are ideal for a low point sensor chamber between USTs and dispenser islands where required.

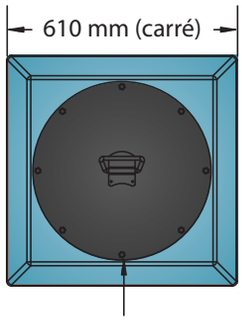
HIGHLIGHTS

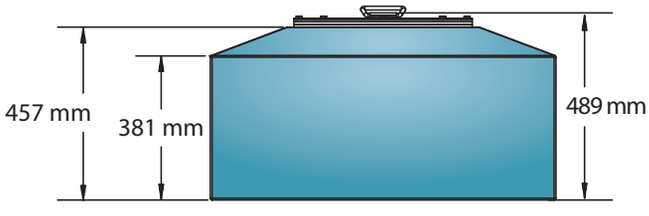
- 18" bolt-down watertight lid.
- Design is engineered to be multi-functional.
- Sumps are constructed from high density polyethylene, making them durable and chemical-resistant.
- Two sizes available—24" × 24" square and 36" × 36" square.
- Tapered top allows both intermediate piping sumps to fit securely under a 24" manway.
- One-piece design ensures environmental security and water resistance.

ORDER INFORMATION

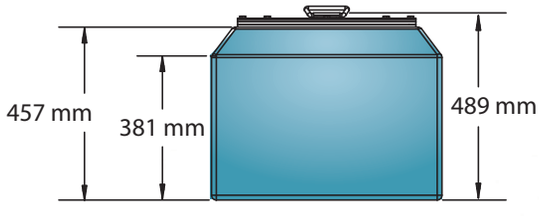
Model	Description
IPS-2424	Intermediate piping sump, 24" × 24", fits under a 24" manway
IPS-3636	Intermediate piping sump, 36" × 36", fits under a 36" manway
99985554	Replacement gasket
73510102	Replacement cover







IPS-3636



IPS-2424

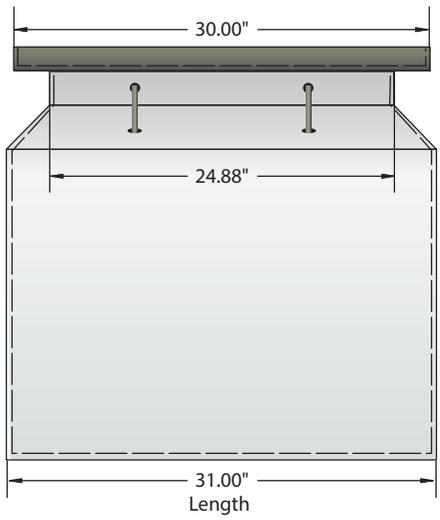
GRADE LEVEL TRANSITION SUMPS

The AST above or below ground transition sump is the practical, environmentally sound solution for remote dispensing from aboveground storage tanks. Steel and flexible piping enter the sump through the APT® flexible entry boot. Inside the sump, the steel piping easily connects to flexible piping for a fueltight, continuous run to dispensers or an intermediate sump.



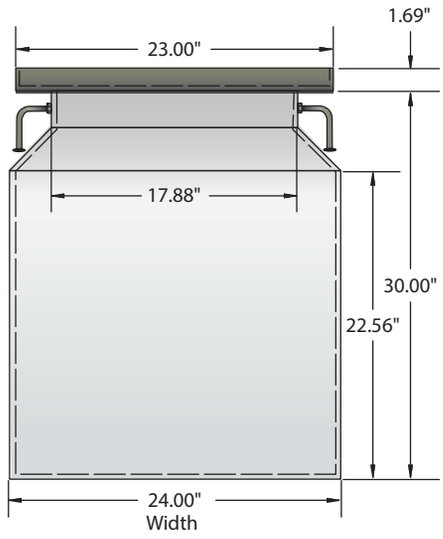
HIGHLIGHTS

- Transition sumps help meet environmental regulations by isolating metal piping from the soil.
- Transition sumps can be installed either inside or outside containment dikes.
- 30" burial depth allows the transition sump to be used as the system low point for leak detection.
- Load rated composite cover.
- Flexible entry boot provides a fueltight and watertight seal around the metal piping and flexible piping as it enters the sump lid and side wall.
- H-20 load rating. Pipe entries installed in lids negate the load rating.



ORDER INFORMATION

Model	Description
AST-2922	Aboveground storage tank transition sump
99985553	Replacement gasket
25202923	Replacement AST-2922 lid, grey
IP-400-B	Inspection replacement port, FEB style with replacement well cap



WELDERS

The EF1 UPP® electrofusion unit from Franklin Electric works with all UPP® electrofusion fittings and products. UPP® welders feature state-of-the-art electronics which allow for a more compact, user-friendly design.






HIGHLIGHTS

- The EF1 welder is IP65 rated and has been tested around the world under exacting site conditions and has proved to be an easy-to-use, efficient and invaluable addition to the tool box. Its robust construction, dust proof features and enhanced graphic feed-back of the electrofusion progress offer real benefit to the operator.
- The unit's improved self-diagnostic capabilities also ensure increased reliability and tolerance in a variety of climatic conditions. It comes complete with welding leads in a lightweight carry bag for the 230 V and a robust case for the 110 V.
- The EF1 unit automatically recognizes the fitting when connected with the correct welding cable. It also checks the ambient temperature using a sensor positioned in the housing and adjusts the energy level to balance with the local environment. It then applies the correct amount of energy for a successful weld.

SPECIFICATIONS

CE Certified

Supplied Cables	Colour	Dia	Length
Primary cable–standard	Red	4 mm	5.5 m
Secondary containment cable	Green	2 mm	5.5 m
Bridging cable (for multiple welds)	Red	4 mm	5.5 m
Fusion chamber cable	White	2.3 mm	5.5 m
Power supply cable	4 m (13')		

Welding Unit Specifications

Welding Unit Specifications		
UPP® stock code number	EF1-230 V	EF1-110 V
Operating voltage	230 V (+/-15%)	110 V (+/-15%)
Operating frequency	40 to 70 Hz	
Operating temperature	-15° to 45° C (5° F to 113° F)	
Shipping dimensions	460 mm x 210 mm x 210 mm	420 mm x 340 mm x 80 mm
Shipping weight	3.6 kg	13.24 kg

ORDER INFORMATION

Cables & Transformer

Model	Description	Colour
EF1-110V	EF1 welder Set 110 V	Orange
EF1-230V	EF1 welder Set 230 V	Orange
EF1-PC 4MM	Welding cable–primary 4 amp, 4 mm pins red	Orange / Red
EF1-SC 2MM	Welding cable–secondary 5 amp, 2 mm pins green	Green
EF1-C7A	Welding cable–chamber 7 amp, 4 mm pins white	White
EF1-PC 2MM	Welding cable–primary 2 mm Red	Orange / Red
EF1-BC 4MM	Bridging cable–primary 4 amp, 4 mm pins red	Orange / Red
EW/BC/SC	Welding cable–secondary for E3, E4 & E7 welders only green	Green
EW1/C	Welding cable–primary 2 mm for E3, E4 & E7 welders only red	Orange

This unit is designed to weld UPP® pipes and fittings only and must not be used in conjunction with any other polyethylene pipework systems. The UPP® systems welder uses a constant current welding system unlike other systems which use constant voltage. Non-UPP® fittings may not be fused correctly with a risk of leakage. Information shown is accurate at the time of going to print. Franklin Electric reserves the right to change product specifications at any time.*

UPP® TOOL BOX



ORDER INFORMATION

Model	Description	Colour
IB 1000 (EX EW)	Tool box UPP® with tools no welder - please order separately	Black

Contents:		
Rotary scraper 25-110 mm 1 - 4"	SCR-025-125	1
Pipe cutter 50 - 125 mm pipe	P.CUT	1
Cutting wheel for P.CUT pipe cutter	CW1	1
Holesaw 51 mm for SB2.C01, SB2-CO1-5, FEB-075-SC, FEB-100-D, FEB-100-SC & 302 Entry Seals	HSCS2	1
Holesaw 102 mm for 303 & FEB-300-R entry seals	HS3	1
Holesaw 140 mm for 305 entry seal	HS5	1
Holesaw 160 mm for 305-125-110 entry seals	HS6	1
Holesaw 83 mm for PS3	HSP3	1
Holesaw 168 mm for PS6	HSP6	1
Mandrel for all holesaws	MAN1	1
Angled clamp for straight & elbow joints	CLAMP (A)	1
Straight clamp for straight joints (32 - 110mm)	CLAMP (S)	2
Clamp for UPP® fusion seals 302	302-CLAMP	1
Clamp for UPP® fusion seals 303	303-CLAMP-1	1
Clamp for UPP® fusion seals 304	304-CLAMP	1
Clamp for UPP® fusion seals 305	305-CLAMP-1	1
Clamp for UPP® fusion seals 305-125-110	305-EXT-CLAMP	1
Plate spanner 62A/F 91-063	91-063-TOOL	1
Plate spanner 67A/F 92-063	92-063-TOOL	1
Chain wrench 125mm pipe max	CW-125-PIPE	1
Mallet	MAL1	1
Flexishaft driver	F.DRIVER	1
Hand held scraper 1½"	SCR.HAR	1
Blades for hand held scraper (8 Blades)	SCR.HAR(B)	1
Pipe marker pen	MARKER	1
UPP® installation manual	-	1

UPP® TOOLS

Model	Description	For Sizes
91-050-TOOL	Plate spanner tool for use with 50 mm male 90 series termination fittings	All male 50 mm sizes
92-050-TOOL	Plate spanner tool for use with 50 mm female 90 series termination fittings	All female 50 mm sizes
91-063-TOOL	Plate spanner tool for use with 63 mm male 90 series termination fittings	All male 63 mm sizes
92-063-TOOL	Plate spanner tool for use with 63 mm female 90 series termination fittings	All female 63 mm sizes
CW-125-PIPE	Chain wrench tool for use with male and female 90 mm and 110 mm sizes, 125 mm pipe max	All male and female 90 mm and 110 mm sizes



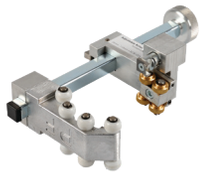
Model	Description	Material
P.CUT SMALL	UPP® pipe cutter 32–50 mm	Aluminium & Steel
CW2	Cutting wheel for P.CUT SMALL	Steel
P.CUT	UPP® pipe cutter 50–125 mm	Aluminium & Steel
P.CUT MED	UPP® pipe cutter 110–160 mm	Aluminium & Steel
CW1	Cutting wheel for P.CUT & P.CUT MED	Steel



Model	Description
RS-40	40 mm (1" secondary) pipe scraper tool
RS-50	50 mm (1½" primary) pipe scraper tool
RS-63	63 mm (2" primary or 1½" secondary) pipe scraper tool
RS-75	75 mm (2" secondary) pipe scraper tool
RS-90	90 mm (3" primary) pipe scraper tool
RS-110	110 mm (4" primary or 3" secondary) pipe scraper tool
RS-125	125 mm (4" secondary) pipe scraper tool
RS-160	160 mm (6" secondary) pipe scraper tool



Model	Description
SCR-025-125	UPP® rotary scraper 25-110mm 1"–4"
SCR-090-225	UPP® rotary scraper 90-225mm 3"–9"
SCR-BLADE-025-225	UPP® rotary scraper spare blade 1"–9"



Model	Description
SCR.HAR	UPP® hand scraper
SCR.HAR(B)	Blades for SCR.HAR (8 Blades)



Model	Description
SCR.K(1)	Scraper kit for legacy UPP® 50/63/90/110 mm
SCR.B	Replacement blade for SCR.K(1) Shallow Cut
SCR.K(1)-E	Scraper kit for current UPP® 50/63/90/110 mm
SCR.K(1) SHAFT	Drive shaft for SCR.K(1)
SCR.M110-FILL	Scraper mandrill for 110 mm fill pipe
MDR.K-E	Mandrill kit for legacy scraper
MDR.063-E	Mandrel for 63 mm pipe (SDR13.6)
MDR.090-E	Mandrel for 90 mm pipe (SDR13.6)
MDR.110-E	Mandrel for 110 mm pipe (SDR13.6)



Model	Description
ROTOSCRAPER32MM	Turbo Rotary Scraper for 32 mm UPP® Pipe
ROTOSCRAPER50MM	Turbo Rotary Scraper for 50 mm Primary UPP® Pipe
ROTOSCRAPER63MM	Turbo Rotary Scraper for 63 mm Primary UPP® Pipe



Model	Description
CLAMP (S)	UPP® pipe clamp–straight 32 - 110 mm
CLAMP (A)	UPP® pipe clamp–angled 32 - 110 mm
302-CLAMP	Clamp for fusion seals 302
303-CLAMP-1	Clamp for fusion seals 303
304-CLAMP	Clamp for fusion seals 304
305-CLAMP-1	Clamp for fusion seals 305
305-EXT-CLAMP	Clamp for fusion seals 305-125-110
308-CLAMP	Clamp for fusion seals 308



Model	Description
TH50	Towing head for UPP® primary pipe 50 mm
TH63SC	Mud tight towing head for UPP® SC pipe 63x50 mm
TH75SC	Mud tight towing head for UPP® SC pipe 75x63 mm
TH50-SDR8	Towing head for UPP® UL & EN Pipe 50 mm
TH63SC-SDR8	Towing head for UPP® UL & EN Pipe 63 mm



Model	Description
MAN1	Mandrill for all holesaws
HSCS2	Holesaw 51 mm for FEB-075-SC, FEB-100-D, FEB-100-SC & 302 entry seals
HSP3	Holesaw 83 mm for PS3, FEB-150-D, FEB-175-SC, FEB-200-D & FEB-200-SC entry seals
HS 3	Holesaw 102 mm for 303 & FEB-300-R entry seals
HS075	Holesaw 105 mm for FEB-D-075-1 entry seal
HS 5	Holesaw 140 mm for FEB-400-R, FEB-400-F, FEB-D-110-1 & 305 entry seals
HS 6	Holesaw 160 mm for 305-125-110 entry seals
HSP6	Holesaw 168 mm for PS6 entry seals
HS 8	Holesaw 210 mm for 308's entry seals



Model	Description
MAL1	Wooden Mallet
MARKER	Pipe marker
F.DRIVER	Flexishaft driver for band clamps–8 mm
D/TAPE	UPP® warning tape–100 m roll
EMERY	Emery cloth 50 m roll ONLY
FEB-110-TOOL	GRP entry fitting wrench 125 mm

Seal / Holesaw / Clamp Matrix

Seal Code	Holesaw	Diameter (mm)	Diameter (inches)	Clamp	Clamp Colour
302-040	HSCS2	51	2	302-CLAMP	Orange
303-050-EIF	HS3	102	4	303-CLAMP/ 303-CLAMP-1	Blue
303-063-EIF	HS3	102	4	303-CLAMP/ 303-CLAMP-1	Blue
303-075-EIF	HS3	102	4	303-CLAMP-1	Blue
304-110-050-TP	HS5	140	5½	304-CLAMP	Yellow
304-110-063-TP	HS5	140	5½	304-CLAMP	Yellow
304-110-075-TP	HS5	140	5½	304-CLAMP	Yellow
304-110-090	HS5	140	5½	304-CLAMP	Yellow
304-110-090-TP	HS5	140	5½	304-CLAMP	Yellow
305	HS5	140	5½	305-CLAMP-1	Green
305-R-1	HS5	140	5½	305-CLAMP-1	Green
305-125-110	HS6	160	6 5/16	305-EXT-CLAMP	Red
305-125-110-TP	HS6	160	6 5/16	305-EXT-CLAMP	Red
308	HS8	210	8 ¼	308-CLAMP	Silver
308-R	HS8	210	8 ¼	308-CLAMP	Silver

PS3	HSP3	83	3¾
PS6	HSP6	168	6 5/8
FEB-D-075-1	HS075	105	41/8
FEB-D-110-1	HS5	140	5½
FEB-S-125	HS5	140	5½

Seal Code	Holesaw	Diameter (mm)	Diameter (inches)
FEB-075-SC	HSCS2	51	2
FEB-100-D	HSCS2	51	2
FEB-100-SC	HSCS2	51	2
FEB-150-D	HSP3	83	3½
FEB-175-SC	HSP3	83	3½
FEB-200-D	HSP3	83	3½
FEB-200-SC	HSP3	83	3½
FEB-300-R	HS3	102	4
FEB-400-R	HS5	140	5½
FEB-400-F	HS5	140	5½


302-CLAMP


303-CLAMP-1


304-CLAMP


305-CLAMP-1


305-EXT-CLAMP


308-CLAMP

EMEA ELECTROFUSION WELDER REPAIR AND CALIBRATION PROGRAM

Franklin Electric offers repair and calibration check services for UPP® electrofusion welders through the Ipswich, UK facility. These services are offered as a convenient option separate from similar services obtained directly from the welder manufacturer for non-warranty units. Franklin Electric will coordinate repair and calibration services with the original manufacturer. This program will not affect the original manufacturer's warranty.

Contact your local field service engineer or sales representative regarding requests to process repairs and calibrations.

QUALIFYING MODELS

Electrofusion welder models accepted by Franklin Electric for repair and/or calibration check include the following:



Model: EF1-110V
Electrofusion Case Welder



Model: EF1-230V
Electrofusion Handheld Welder

Any electrofusion welder models not shown are not supported for repair or calibration check by the facility. Consult Franklin Electric for replacement and upgrade options.

Franklin Electric
FUELING SYSTEMS



DO MORE!

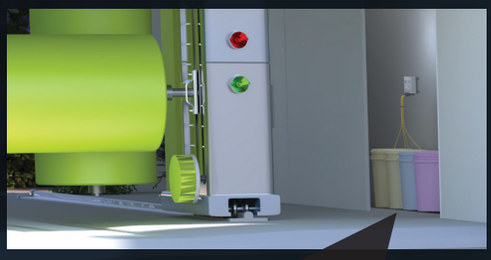
WITH EVO™ SERIES

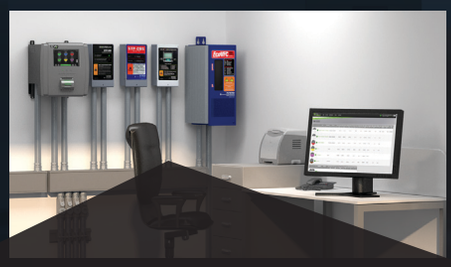
With more features than any other Automatic Tank Gauge in its class, the highly capable EVO™ Series can do so much more to streamline both fuel system and C-Store operations.

WHAT MORE CAN EVO™ DO?
Scan to learn more.

FUEL MANAGEMENT SYSTEMS

1. EVO™ Series Console
2. FFS PRO® Connect EVO™ Series Remote Access
3. Discriminating Dispenser or Tank Sump Sensors
4. Leak Detection and Inventory Control Probes
5. Float Kits for All Common Applications
6. Probe Installation Kits



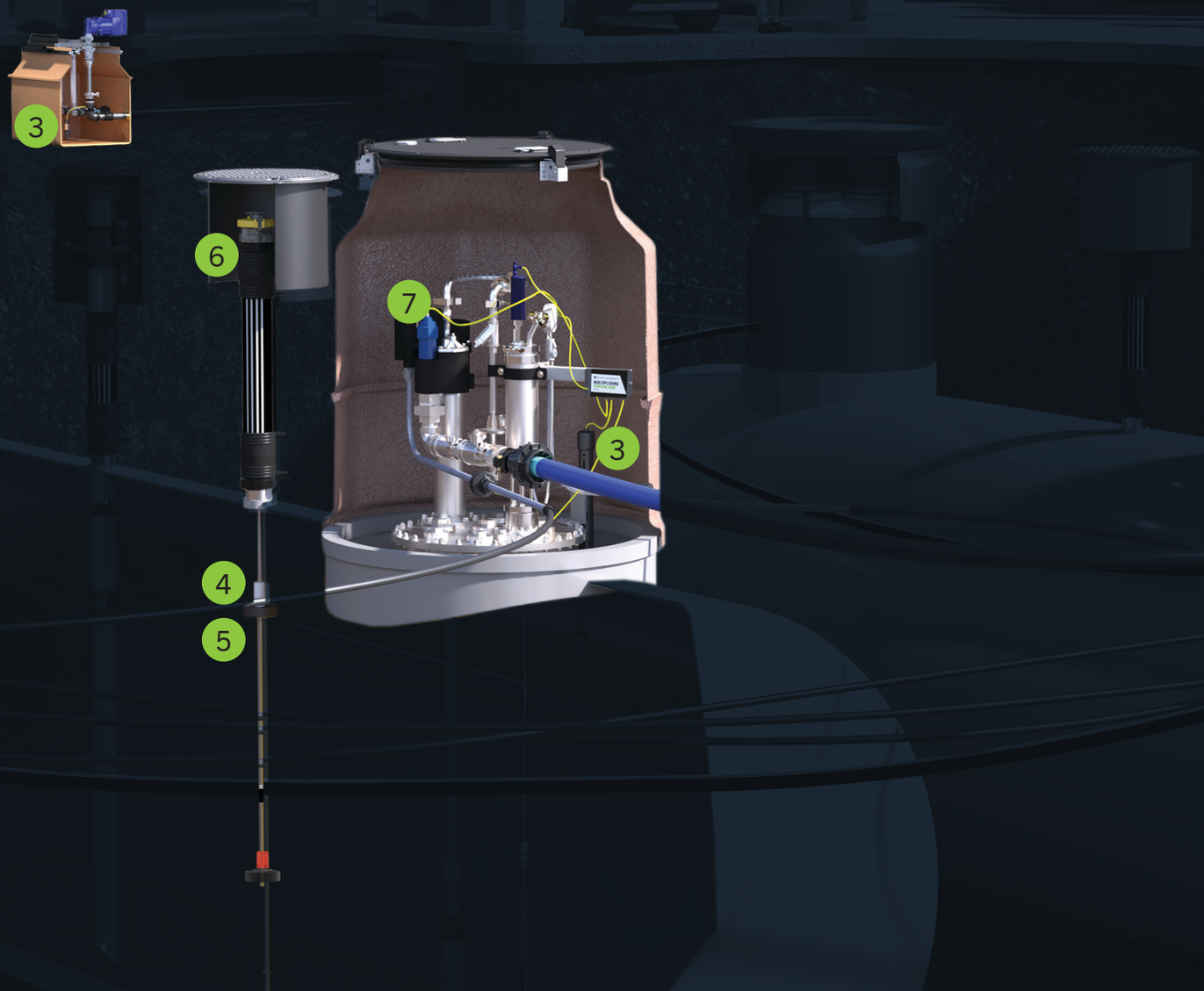






7 Electronic Line Leak Detection

8 EVO™ EDGE Car Wash Monitoring



FIND THE RIGHT EVO™ CONSOLE FOR YOUR SITE



EVO™ 200

- 6 — Maximum Tank Capacity
- 6 — Maximum Sensor Capacity
- 6 — Total # of Inputs
- Turbine Pump Interface

Optional features below dashed line

- FFS PRO® Connect
- Inventory Reconciliation
- Tank Autocalibration
- Flow Rate Monitoring



EVO™ 400

- 14 — Maximum Tank Capacity
- 14 — Maximum Sensor Capacity
- 14 — Total # of Inputs
- Turbine Pump Interface
- FFS PRO® Connect
- Inventory Reconciliation
- Tank Autocalibration
- Flow Rate Monitoring

** Additional capacity available when combined with FMP-EXPC Expansion Modules and/or FMP-MSH Multiplexing Sensor Hubs™.*



EVO™ 600

- 48 Maximum Tank Capacity*
- 48 Maximum Sensor Capacity*
- 72 Total # of Inputs
- Turbine Pump Interface
- FFS PRO® Connect[1]

Optional features below dashed line

- Inventory Reconciliation
- Tank Autocalibration
- Flow Rate Monitoring
- Corrosion Control™ Integration
- Electronic Line Leak Detection
- Secondary Containment Monitoring
- DEF/AdBlue® Recirculation



EVO™ 6000

- 72 Maximum Tank Capacity*
- 108 Maximum Sensor Capacity*
- 132 Total # of Inputs
- Turbine Pump Interface
- FFS PRO® Connect[1]

Optional features below dashed line

- Inventory Reconciliation
- Tank Autocalibration
- Flow Rate Monitoring
- Corrosion Control™ Integration[1]
- Electronic Line Leak Detection
- Secondary Containment Monitoring[2]
- DEF/AdBlue® Recirculation

SELECTING AN EVO™ CONSOLE

When you fully understand both your current site needs and where you might be headed in the future, you are able to make a sound ATG selection. Be sure to address your compliance needs and operational requirements when considering which ATG is right for you. The EVO™ Series offers you different options with right-sized features to meet the requirements of your specific application, size, and compliance needs.

Which ATG is right for your application?



	EVO™ 200
Maximum tank capacity	6
Maximum sensor input capacity	6
Total # of inputs	6
Line capacity	-
AC input channels	-
4-20 mA input channels	-
Relay output channels	2
Dry contact input channels	2
Colour LCD Size	7" (17.78 cm)
Printer options	External
FFS Pro® Connect remote user interface	✓
Internal audible alarm	✓
Email/SMS notifications	✓
Inventory and delivery management	✓
Sump and Interstitial sensors	✓
Static and continuous tank testing	✓
High/low product, water, and temperature alarm set points	✓
Inventory reconciliation/tank autocalibration	✓
Flow rate monitoring	✓
Density and mass measurement	✓
Phase separation detection	✓
Turbine Pump Interface	✓
Back-up generator monitoring	✓
Conditional programming	✓
MODBUS® compatibility	✓
Static and statistical electronic link leak detection	-
Compatible with Multiplexing Sensor Hub™	-
Compatible with Corrosion Control™ Water Separator	-
Secondary containment monitoring	-
AdBlue®/DEF recirculation system	-

		
EVO™ 400	**EVO™ 600**	**EVO™ 6000**
14	48, 132*	72, 168*
14	48, 204*	108, 264*
14	72, 276*	132, 336*
-	24, 48*	24, 48*
-	36, 72*	36, 72*
-	24, 48*	24, 48*
2	26, 50*	26, 50*
2	2	2
7" (17.78 cm)	7" (17.78 cm)	7" (17.78 cm)
External	Internal & External	Internal & External
✓	✓	✓
✓	✓	✓
✓	✓	✓
✓	✓	✓
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**When combined with FMP-EXPC Expansion Modules and/or FMP-MSH Multiplexing Sensor Hubs™.*

EVO™ 200 & EVO™ 400 AUTOMATIC TANK GAUGES



EVO™ 200 & EVO™ 400 provide highly accurate inventory management and containment monitoring for small to mid-size fuel systems. With pre-configured hardware and customizable software options, the EVO™ 200 & EVO™ 400 provide straightforward tank level monitoring and compliance. Their simple setup and operation, remote connectivity, and advanced security features protect your fuel system while keeping you directly connected to vital site data whenever, and wherever. The highly-intuitive, full-colour, icon-based touchscreen provides user-friendly on-site access to inventory, alarm, and compliance data.

HIGHLIGHTS

- Included Features: Inventory monitoring, Turbine Pump Interface™ (TPI) capability for enhanced and automated submersible turbine pump control, static tank testing, and containment compliance monitoring.
- Optional Features: 24-hour Statistical Continuous Automatic Leak Detection (SCALD®), tank autocalibration, inventory reconciliation, and flow rate monitoring.
- Both the EVO™ 200 & EVO™ 400 feature the capability to interface with probes and sensors in any combination up to 6 (EVO™ 200) or 14 (EVO™ 400).
- Customizable user roles and log-in security features protect against unwanted access while keeping track of user activity within your system.
- Streamlined setup and programming includes hardware auto-detection and wiring confirmation, multipoint tank charting, network printer auto-detection, and the ability to download and upload entire programming profiles from one to another.
- Intuitive full-colour 7" (17.78 cm) LCD touch screen interface provides simplified on-site access features including:
    - Up to Six (6) One Touch Buttons that are custom programmed to carry out common automated tasks with a single tap.
    - A Quick Jump Menu that allows you to quickly maneuver from application to application using a single button.
    - Programmable product colours for each tank.
- FFS PRO® Connect allows you to remotely connect to your EVO™ from any web-enabled device.
- Optional WiFi allows secure and protected on-site viewing of inventory levels for fuel delivery drivers.
- Supports MQTT protocol, the standard for IoT messaging, for enhanced security of data transmission

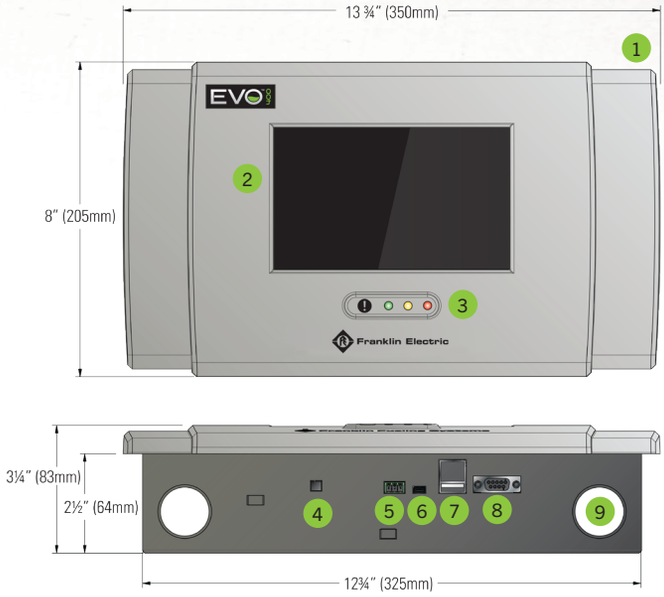
SPECIFICATIONS

Maximum tanks monitored	6 (EVO™ 200) / 14 (EVO™ 400)
Maximum sensor input capacity	6 (EVO™ 200) / 14 (EVO™ 400)
Lines capacity	6 (EVO™ 200) / 14 (EVO™ 400)
Dry contact input channels	2
Relay output channels	2
Connectivity	Ethernet, RS-232, RS-485, standard USB, Mini-B USB, and WiFi (optional)
Display type	7" (17.78 cm) colour LCD touch screen
Printer type	External (network or USB)
Alarm	Internal audible alarm
LEDs	Alarm, warning, and power
Tank chart correction point	7,500
Applicable liquids	Petroleum, chemicals, and waste
Level units	Inches, centimetres, and millimetres
Volume units	Gallons or litres (mass with density option)
Power requirements	110 to 240 VAC, 50/60 Hz, 2.6 Amps
Operating temperature	32° F to 104° F (0° C to 40° C)
Humidity	0-95% non-condensing
Dimensions	H: 8" (205 mm), W: 13 ¾" (350 mm) D: 3 ¼" (83 mm)
Alarm set points	High/low product, water, and temperature
Technical advantages	Inventory reconciliation/tank autocalibration/flow rate monitoring (optional)
Measurements	Density, mass, and phase separation measurement
Notifications	Email and SMS
Programming	Conditions
Monitoring	Back-up generator
Support	MODBUS™
Approvals & Certifications	– UL, cUL, ATEX, IECEx, GSA IT Security – Third party certification of leak detection capabilities – Third party verified "MATURE" security posture level

SPECIFICATIONS CONTINUED

Components

1. Cover
2. LCD touch screen
3. LED indicators
4. Annunciator (audible alarm)
5. RS-485/TPI
6. Mini-B USB port
7. Ethernet / USB port
8. RS-232
9. Top and bottom knockouts
10. Mounting holes
11. Flip up panel (touch screen)
12. Termination blocks
13. Main board



ORDERING INFORMATION

Ordering Guide

EVO™ model, software, and hardware options may be listed separately or combined when ordering. Systems shipped from the factory will list the combined part number. Complete part numbers have a specific order and are created using the following guidelines:

EVOX DW - TR

EVOX = Base Model Options

EVO200 = EVO™ 200 base model, up to 6 channels

EVO400 = EVO™ 400 base model, up to 14 channels

DW = Hardware Options (choose all that apply)

D = Display (colour LCD touch screen)

W = WIFI

TRFC = Software Options (choose all that apply)

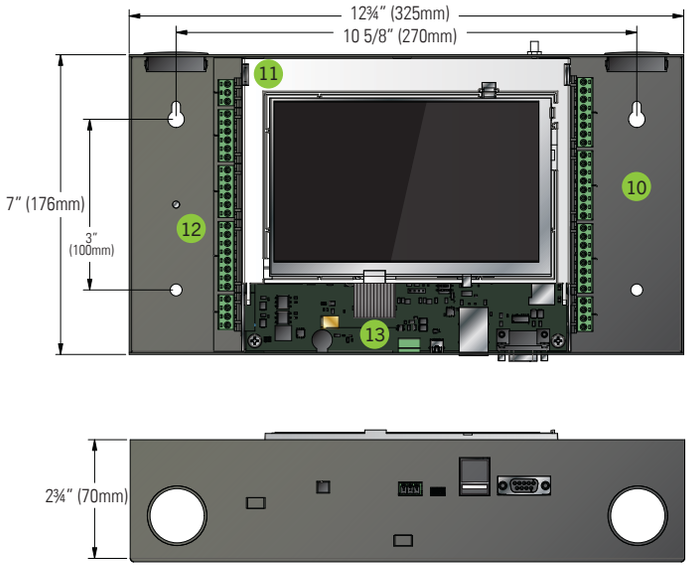
T = SCALD® 24-hour tank testing

R or F

R = Reconciliation/Autocalibration

F = Reconciliation/Autocalibration with flow rate monitoring

C = Enhanced logic conditions including value, counter, value compare, and latch



Ex: EVO400DW-TF = EVO™ 400 base model, up to 14 channels with display, with WIFI, with SCALD®, and with reconciliation/autocalibration and flow rate monitoring.

DO MORE WITH EVO™

Leverage the power of an EVO™ to help operate and maintain your fuel system and network operations as efficiently as possible.



TURBINE PUMP INTERFACE™



INVENTORY RECONCILIATION



TANK AUTOCALIBRATION



FLOW RATE MONITORING

EVO™ 200 & EVO™ 400 Base Models

Model	Description
EVO200	EVO™ 200 base model automatic tank gauge
EVO400	EVO™ 400 base model automatic tank gauge

EVO™ 200 & EVO™ Hardware & Software Field Upgrades

The following software and hardware options can be added to customize your EVO™ once it's been installed in the field.

Internal Software Field Upgrades

Model	Description
TS-TT	Statistical Continuous Automatic Leak Detection (SCALD®) 24-hour tank testing
TS-TRAC	Tank inventory reconciliation and autocalibration
TS-TRAC-F	Reconciliation/autocalibration and flow rate monitoring software
TS-FLOW	Flow rate monitoring
TS-CON	Enhanced logic conditions including value, counter, value compare, latch, and DEF/AdBlue® recirculation

Hardware Field Upgrades

Model	Description
FMP-LCD	Display upgrade for an existing EVO™ 200 / EVO™ 400
FMP-WIFI	WiFi upgrade for an existing EVO™ 200, EVO™ 400, EVO™ 600, or EVO™ 6000, includes 4.5" antenna
FMP-ETP	External thermal printer, includes USB cable, power cord, one roll of thermal printer paper, and wall mount hardware

Note: The external printer measures 5.6" w x 5.2" h x 8.0" d (142 mm x 132 mm x 204 mm) and can be mounted to wall next to the EVO™ using the included hardware.

EVO™ 200 and EVO™ 400 Spare/Replacement Parts

Spare/Replacement Internal Boards

Model	Description
FMSP-24MB	Spare/Replacement EVO™ 200 and EVO™ 400 Main Board
FMSP-SOM	Spare/Replacement SOM, standard features only, no software options
FMSP-SOM-R	Replacement SOM, factory programmed with existing software options
FMSP-UDP400	Spare/Replacement EVO™ 200 input board
FMSP-UDP400	Spare/Replacement EVO™ 400 input board

Note: The serial number of the existing EVO™ must be provided when ordering the FMSP-SOM-R.

Spare/Replacement Hardware

Model	Description
FMSP-LCD	Spare/Replacement LCD Display for an EVO™ 200 / EVO™ 400
FMP-WIFI	Replacement WiFi hardware for an existing EVO™ 200, EVO™ 400, includes 4.5" antenna
FMP-24FUSE	EVO™ 200 and EVO™ 400 replacement fuse kit
24TRMBLK	EVO™ 200 and EVO™ 400 replacement terminal blocks
FMSP-24CVR	EVO™ 200 and EVO™ 400 without LCD replacement cover
FMSP-24CVRWD	EVO™ 200 and EVO™ 400 with LCD replacement cover
228100002	Spare/Replacement Wide Ribbon Cable - Display to Main Board

Printer Paper Supplies

Model	Description
FMP-EPPC	Case of 25 thermal external printer paper rolls
228100002	Ribbon Cable - Display to Main Board

EVO™ 600 & EVO™ 6000 AUTOMATIC TANK GAUGES

EVO™ 600 & EVO™ 6000 provide highly accurate inventory management and full-featured compliance monitoring for any size fuel system. Being module-based, the EVO™ Series is highly configurable for site-specific probe and sensor requirements. Their simple setup and operation, remote connectivity, and advanced security features protect your fuel system while keeping you directly connected to vital site data whenever, and wherever. The highly-intuitive, full-colour, icon-based touch screen provides user-friendly on-site access to inventory, alarm, and compliance data.



HIGHLIGHTS

- Allows you to make informed, data-driven inventory management decisions while keeping your site in compliance and protected from security threats.
- Included Features: Inventory monitoring, Turbine Pump Interface™ (TPI) capability for enhanced and automated submersible turbine pump control, static tank testing, and containment compliance monitoring.
- Optional Features: 24-hour Statistical Continuous Automatic Leak Detection (SCALD®), tank autocalibration, inventory reconciliation, secondary containment monitoring, and flow rate monitoring.
- Patented AutoLearn™ electronic line leak detection capability including Statistical Line Leak Detection for high throughput sites.
- Streamlined setup and programming includes hardware auto-detection and wiring confirmation, multipoint tank charting, network printer auto-detection, and the ability to download and upload entire programming profiles from one EVO™ to another.
- FFS PRO® Connect allows you to remotely connect to your EVO™ from any web-enabled device.
- Intuitive full-colour 7" (17.78 cm) LCD touch screen interface provides simplified on-site access features including:
  - Up to Six (6) One Touch Buttons that are custom programmed to carry out common automated tasks with a single tap.
  - A Quick Jump Menu that allows you to quickly maneuver from application to application using a single button.
  - Programmable product colours for each tank.
- Optional WiFi allows secure and protected on-site viewing of inventory levels for fuel delivery drivers.
- Compatible with the Multiplexing Sensor Hub™ (FMP-MSH).
- Compatible with Corrosion Control™ Water Separator.
- Supports MQTT protocol, the standard for IoT messaging, for enhanced security of data transmission.

DO MORE WITH EVO™ SERIES

Leverage the power of an EVO™ to help operate and maintain your fuel system and network operations as efficiently as possible.



TURBINE PUMP INTERFACE™



ELECTRONIC LINE LEAK DETECTION



CORROSION CONTROL™ INTEGRATION



FLOW RATE MONITORING

- Inventory Reconciliation
- Tank Autocalibration
- Secondary Containment Monitoring
- DEF/AdBlue® Recirculation

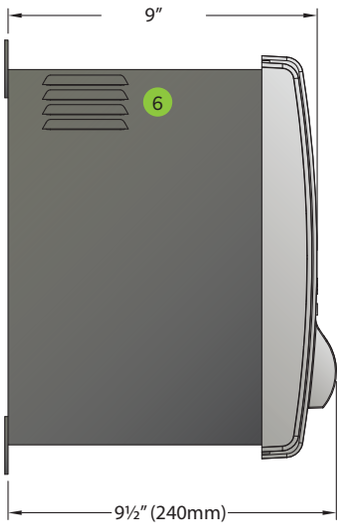
SPECIFICATIONS

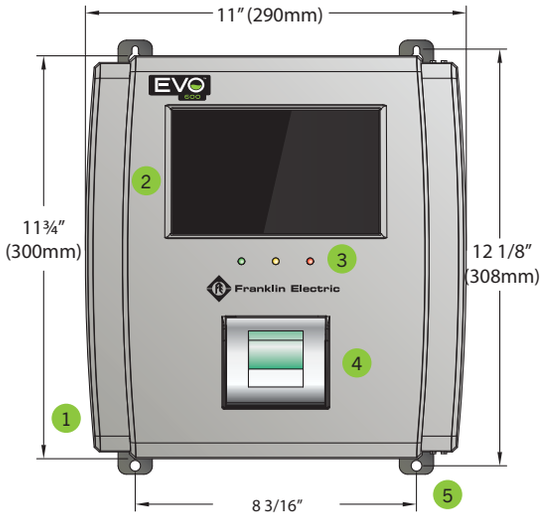
Maximum tanks monitored (stand-alone)	48 (EVO™ 600) / 72 (EVO™ 6000)
Maximum tanks monitored, with accessories	132* (EVO™ 600) / 168* (EVO™ 6000)
Maximum sensor input capacity (stand-alone)	48 (EVO™ 600) / 108 (EVO™ 6000)
Maximum sensor input capacity, with accessories	180* (EVO™ 600) / 244* (EVO™ 6000)
Maximum total inputs (stand-alone)	72 (EVO™ 600) / 132 (EVO™ 6000)
Maximum total inputs, with accessories	276* (EVO™ 600) / 336* (EVO™ 6000)
Maximum AC input channels (stand-alone)	36 (EVO™ 600) / 36 (EVO™ 6000)
Maximum AC input channels, with accessories	72* (EVO™ 600) / 72* (EVO™ 6000)
Maximum relay output channels (stand-alone)	26 (EVO™ 600) / 26 (EVO™ 6000)
Maximum relay output channels, with accessories	50* (EVO™ 600) / 50* (EVO™ 6000)
Dry contact input channels	2
Connectivity	Ethernet (qty 2). RS-232, RS-485, standard USB, Mini-B USB
Display type	7" (17.78 cm) colour LCD touch screen
Printer type	Thermal (also network or USB)
Alarm	Internal audible alarm
LEDs	Alarm, warning, and power
Applicable liquids	Petroleum, chemicals, and waste
Level units	Inches, centimeters, and millimeters
Volume units	Gallons or liters (mass with density option)
Power requirements	110 to 240 VAC, 50/60 Hz, 1.5 Amps
Operating temperature	32° to 104° F (0° to 40° C)
Humidity	0-90% non-condensing
EVO™ 600 Dimensions	H: 11.75"(300 mm), W: 10¼"(260 mm), D: 9"(229 mm)
EVO™ 6000 Dimensions	H: 11.75"(300 mm), W: 16½"(419 mm), D: 9"(229 mm)
Alarm set points	High/low product, water, and temperature
Technical Advantages	Inventory reconciliation, tank autocalibration, flow rate monitoring
Measurements	Density, mass, and phase separation measurement
Notifications	Email and SMS
Programming	Back-up generator monitoring/conditions
Advanced Logic Control	DEF/AdBlue® recirculation system
Support	MQTT, MODBUS™, XML, Veeder-Root®
Approvals & Certifications	– UL, cUL, ATEX, IECEx, GSA IT Security – Third party certification of leak detection capabilities – Third party verified "MATURE" security posture level

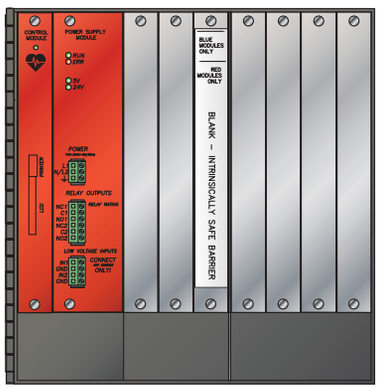
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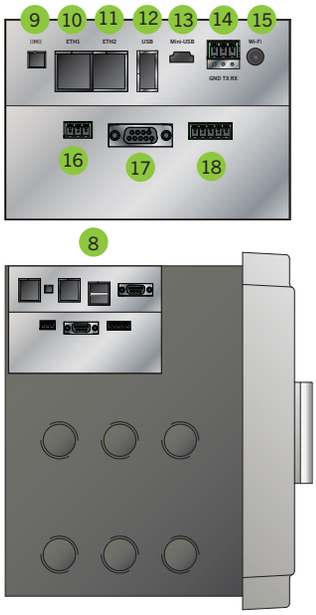
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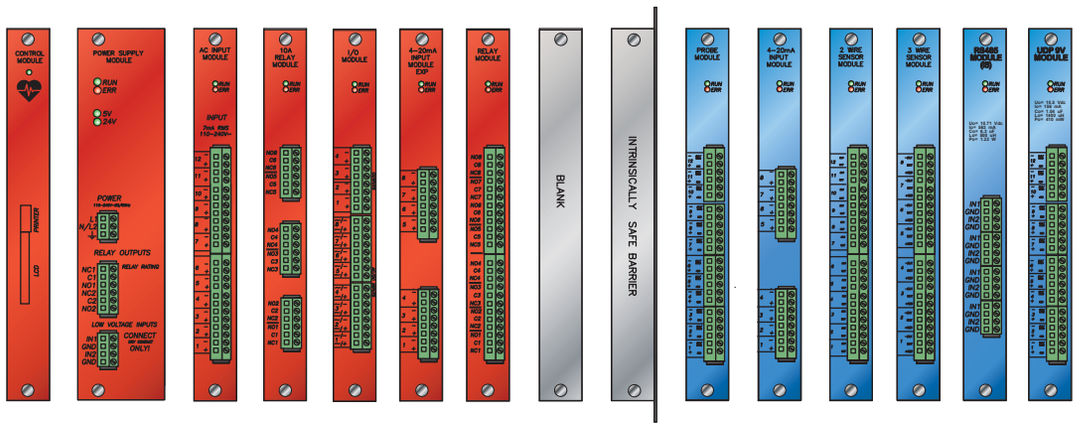
1. Cover
2. LCD Touch Screen
3. LED Indicators
4. Printer
5. Mounting Tabs
6. Cooling Vents
7. Module Slots
8. Communication Ports
9. Annunciator (audible alarm)
10. Ethernet Port 1
11. Ethernet Port 2
12. USB Port (Type-A)
13. USB Port (Mini-B)
14. RS-232 Comm Port 1
15. WiFi
16. Bus Extension
17. RS-232 Comm Port 2
18. RS-485 / TPI
19. Controller Module
20. Power Supply Module
21. AC Input Module (TS-ACI)
22. 10 Amp Relay Module (TS-10ARLY)
23. I/O Module (TS-IO)
24. 4-20mA Module EXP (TS-420EXP)
25. Relay Module (TS-RLY)
26. Blank
27. Intrinsically Safe Barrier
28. Probe Module (TS-PRB)
29. 4-20mA Module (TS-420IB)
30. 2-Wire Sensor Module (TS-2WSNS)
31. 3-Wire Sensor Module (TS-3WSNS)
32. RS-485 Module (FMP-485IS)
33. UDP Module (FMP-UDP9)











- There can only be three types of one module, except for the UDP Module, which allows for up to six in an EVO™ or Expansion Console.
- If you require more than three types of one module (other than the UDP Module) in an EVO™ or Expansion Console, please contact your FFS sales representative to review your needs.
- The intrinsically safe barrier must be installed in the third slot or greater. (The third slot after the Power Supply Module.)

MODULE SELECTION GUIDE







	Relay Module (TS-RLY)	10 Amp Relay Module (TS-10ARLY)	4-20 mA Module NIS (TS-420EXP)	AC Input Module NIS (TS-ACI)	Input Output Module (TS-IO)
Inputs	-	-	8	12	8 (3-240 VAC/DC)
Outputs	8	6	-	-	4 (4-20 mA)
EVO™ 600/600 Compatibility	✓	✓	✓	✓	✓
EVO™ 550/5000 Compatibility	✓	✓	✓	✓	✓
Maximum Allowed Modules per EVO™ Console	3	3	3	3	3
Maximum Allowed Modules with EVO-EXPC / EVO-EXPC2 Expansion Module	6	6	6	6	6
Franklin Electric Device Compatibility	**SCM** TS-SCCM **WATER SEPARATOR** 407985903 **OVERFILL ALARM** TS-RK	-	**ELLD** TS-LSU500E	-	-
Typical Application	Secondary containment control, submersible pump control, water separator control, and overfill alarm control	Dispenser shutdown control	LS500 transducer pressure monitoring, third party 4-20mA device monitoring	Dispenser hook signal monitoring	Remote monitoring control, building monitoring system interfacing

Modules that are non- intrinsically safe

Modules that are intrinsically safe








UDP Module (FMP-UDP9)	RS-485 Module (FMP-485IS)	4-20 mA Module IS (TS-420IB)	Probe Module (TS-PRB)	3-Wire Sensor Module (TS-3WSNS)	2-Wire Sensor Module (TS-2WSNS)
12	4	8	12	8	12
-	-	-	-	-	-
✓	✓	✓	✓	✓	✓
-	-	✓	✓	✓	✓
6	3	3	3	3	3
12	6	6	6	6	6
PROBES FMP-LL3-XXX FMP-LL3-XXX-I **SENSORS** FMP-UHS FMP-ULS FMP-CDS-U FMP-DDS-U FMP-DDS-UD FMP-DIS-U FMP-DPS-U FMP-DTS FMP-EIS-U FMP-HIS-U FMP-HIS-XL-U	**MSH** FMP-MSH	**ELLD** TS-LSU500 FMP-LSU500 **SCM** TS-SCCM **SENSORS** TS-VPS **DEF RECIRCULATION** FMP-TEM	**PROBES** FMP-LL3-XXX FMP-LL3-XXX-I TSP-LL2-XXX TSP-LL2-XXX-I **SENSORS**** FMP-CDS-U FMP-DDS-U FMP-DDS-UD FMP-DIS-U FMP-DPS-U FMP-DTS-U FMP-EIS-U FMP-HIS-U FMP-HIS-XL-U TSP-DMS-XX **VAPOR FLOW** TS-VFM	**SENSORS** FMP-DDS* FMP-DIS* FMP-DTS* FMP-EIS* FMP-HFS FMP-HFS2 FMP-HIS* FMP-HIS-XL* FMP-UHS* FMP-ULS* TSP-DVS TSP-HLS-XX TSP-HLS-XX/SS	**SENSORS** FMP-HFS FMP-HFS2 FMP-UHS* FMP-ULS* TSP-HLS-XX TSP-HLS-XX/SS
Liquid level monitoring, discriminating / non-discriminating liquid detection, corrosion control monitoring	Connecting to Multiplexing Sensor Hubs™	LS500 transducer pressure monitoring, vapor recovery monitoring, secondary containment monitoring, third party 4-20mA device monitoring	Liquid Level monitoring, discriminating / non-discriminating liquid detection, corrosion control monitoring, vapor flow monitoring	Discriminating / non-discriminating liquid detection, overfill prevention	Non-discriminating liquid detection, overfill prevention

**EVO™ 600/6000, EVO™ 500/5000 are backwards compatible with the TSP-XXX versions of the sensors.*

***FMP-XXX-U sensors are not compatible with EVO™ 550/5000*

ORDERING INFORMATION

Ordering Guide

EVO™ model, software and hardware options can be listed separately or combined when ordering. Systems shipped from the factory will list the combined part number. Complete part numbers have a specific order and are created using the following guidelines:

EVOX DPWIE / TRFLGC

EVOX = Base Model Options

EVO600 = EVO™ 600 base model

EVO6000 = EVO™ 6000 base model

DPWIE = Hardware Options (choose all that apply)

D = Display

P = Printer

W = WiFi

I = Dispenser Interface Module

TRFLGSC = Software Options (choose all that apply)

T = SCALD® 24-hour tank testing

R or F = (R) Reconciliation/Autocalibration or

(F) Reconciliation/Autocalibration with Flow Rate Monitoring

L or G = (L) Electronic Line Leak Detection or

(G) Generator Electronic Line Leak Detection

S = Secondary Containment Monitoring

C = Enhanced logic conditions including value, counter, value compare, latch, and DEF/AdBlue® recirculation.

Example: EVO600DPWI/TRL = EVO™ 600 base model with display, printer, WiFi, Dispenser Interface Module, SCALD®, Reconciliation/Autocalibration, and line leak detection.

Dispenser Interface Module Cables

Model	Description
TSP-BDCBL	Bennett® 515 only cable
TSP-GDCBL	Gilbarco® cable
TSP-GSDCBL	Gilbarco® G-Site™ cable
TSP-WDCBL	Wayne® cable

EVO™ 600/6000 Interface Modules

The EVO™ 600/6000 come standard with a Power Supply Module and a Controller Module. Additional interface modules can be installed. Interface modules ordered with an EVO™ will be installed at the factory. If you would like them to not be installed, please order the spare/replacement version of the module. The following guidelines must be followed:

- EVO™ 600: Six total modules can be installed with a maximum of four intrinsically safe modules and a maximum of three of any one kind of module, except for the UDP Module, which allows for a maximum of four modules.
- EVO™ 6000: Eleven total modules can be installed with a maximum of nine intrinsically safe modules and a maximum of three of any one kind of module, except for the UDP Module, which allows for a maximum of six modules.

Note: Do not include the Power Supply and Controller Modules when calculating total modules allowed.

Maximum UDP Modules Allowed to Run Concurrently with Probe Modules in a Single EVO™ Console or Expansion Console

The UDP Module is intended to replace the Probe Module for all new system orders. If you are planning to add UDP Modules to an existing EVO™ 600/6000 with Probe Modules, please adhere to the following table:

Existing Probe Modules	Allowable UDP Modules
0	6
1	4
2	2
3	0

ORDERING INFORMATION CONTINUED

Intrinsically Safe Modules

Model	Description
FMP-485IS	RS-485 Module	4 MSH inputs (allows for 24 total inputs)	Compatible with FMP-MSH multiplexing sensor hubs™ (EVO™ 600/6000 only)
FMSP-485IS	Spare/Replacement RS-485 Module
FMP-UDP9	UDP Module	12 inputs	Compatible with FMP-LL3-XXX and FMP-LL3-XXX-I probes, FMP-UHS and FMP-ULS sensors, and FMP-XXX-U sensors (EVO™ 600/6000 only)
FMSP-UDP9	Spare/Replacement UDP Module
TS-2WSNS	2-Wire Sensor Module	12 inputs	Compatible with FMP-HFS2, FMP-UHS*, FMP-ULS*, TSP-HLS-XX, and TSP-HLS-XX/SS sensors
TSSP-2WSNS	Spare/Replacement 2-Wire Sensor Module
TS-3WSNS	3-Wire Sensor Module	8 inputs	Compatible with FMP-DDS*, FMP-DIS*, FMP-DTS*, FMP-EIS*, FMP-HIS*, FMP-HIS-XL*, FMP-UHS*, FMP-ULS*, TSP-DVS, TSP-HLS-XX, and TSP-HLS-XX/SS sensors
TSSP-3WSNS	Spare/Replacement 3-Wire Sensor Module
TS-PRB	Probe Module	12 inputs	Compatible with TSP-LL2-XXX, TSP-LL2-XXX-I, FMP-LL3-XXX, and FMP-LL3-XXX-I probes; TSP-DMS-XX and FMP-XXX-U sensors; and TS-VFM vapor flow meters
TSSP-PRB	Spare/Replacement Probe Module
TS-420IB	4-20 mA Module	8 inputs	Intrinsically Safe	Compatible with FMP-LSU500 and TS-LSU500 transducers and FMP-TEM, TS-VPS, and TS-SCCM sensors
TSSP-420IB	Spare/Replacement 4-20mA Module, Intrinsically Safe

Note: EVO™ 600/6000 are backwards compatible with the TSP-XXX versions of sensors denoted with "".*

Non-Intrinsically Safe Modules

Model	Description
TS-10ARLY	10 Amp Relay Module	6 outputs	10 Amp	Compatible with high power dispenser shutdown control functions
TSSP-10ARLY	Spare/Replacement 10 Amp Relay Module
TS-420EXP	4-20 mA Module	8 inputs	Explosion-Proof	Compatible with TS-LSU500E transducers
TSSP-420EXP	Spare/Replacement 4-20mA Module, Explosion-Proof
TS-ACI	AC Input Module	12 inputs	Compatible with dispenser hook signal monitoring functions
TSSP-ACI	Spare/Replacement AC Input Module
TS-IO	Input Output Module	4 4-20 mA outputs	8 3-240 VAC/DC inputs	Compatible with remote monitoring control and building monitoring system interfacing functions
TSSP-IO	Spare/Replacement Input Output Module
TS-RLY	Relay Module	8 outputs	2 Amp	Compatible with submersible pump control, water separator control, secondary monitoring control, and overfill alarm control functions
TSSP-RLY	Spare/Replacement Relay Module

Expansion Consoles

The EVO-EXPC2 must follow the same guidelines as the EVO™ 600, and the EVO-EXPC must follow the same guidelines as the EVO™ 6000.

Model	Description
EVO-EXPC	Secondary console to add eleven additional plug-in modules to the primary EVO™ 600/6000, comes without a display or printer
EVO-EXPC2	Secondary console to add six additional plug-in modules to the primary EVO™ 600/6000, comes without a display or printer

EVO™ 600/6000 Hardware & Software Field Upgrades

The following software and hardware options can be added to customize your EVO™ once it's been installed in the field.

Hardware Field Upgrades

Model	Description
EVO-DISPREP	Display upgrade for an EVO™ 600/6000, EVO™ 550/5000 with existing Interface Board REV 4 or lower
EVO-TMPTR	Thermal internal printer assembly upgrade for an existing EVO™ 600/6000, EVO™ 550/5000, comes with one roll of printer paper
EVO-DIMIB	Internal Dispenser Interface Module upgrade for an existing EVO™ 600/ 6000, dispenser interface cable must be ordered separately
EVO-LCD	Display upgrade for an EVO™ 600/6000 with existing Interface Board REV 5 or higher (for REV 4 or lower, use EVO-DISPREP)

ORDERING INFORMATION CONTINUED

Internal Software Field Upgrades

Model	Description
TS-TT	Statistical Continuous Automatic Leak Detection (SCALD®) 24-hour tank testing
TS-TRAC	Tank inventory reconciliation and autocalibration
TS-TRAC-F	Reconciliation/autocalibration and flow rate monitoring
TS-FLOW	Flow rate monitoring
TS-ELLD	Electronic line leak detection
TS-ELLD-G	Electronic line leak detection for generator applications
TS-SCM	Secondary containment monitoring
TS-CON	Enhanced logic conditions including value, counter, value compare, latch, and DEF/AdBlue® recirculation

EVO™ 600 & EVO™ 6000 Spare/Replacement Parts

Spare/Replacement Modules

Model	Description
EVO-6CM	Spare EVO™ 600/6000 Controller Module, standard features only, no software options
EVO-6CM/R	Replacement EVO™ 600/6000 Controller Module, factory programmed with existing software options
EVO-6CM-W/R	Replacement EVO™ 600/6000 Controller Module with WiFi hardware, factory programmed with existing software options
TSSP-EXPPS	Spare/Replacement Expansion Console Power Supply Module
TSSP-PS	Spare/Replacement Power Supply Module
TSSP-T550MB	Spare/Replacement Backplane Module

Note: The serial number of the existing EVO™ must be provided when ordering the EVO-6CM/R and EVO-6CM-W/R.

Spare/Replacement Hardware

Model	Description
EVO-IFBR	Spare/Replacement Interface Board for EVO™ 600/6000
EVO-LCD	Spare/Replacement LCD Display for existing EVO™ 600/6000 with existing Interface Board REV 5 or higher (for REV 4 or lower, use EVO-DISPREP)
EVO-DISPREP	Spare/Replacement LCD Display and Interface Board for EVO™ 600/6000, EVO™ 550/5000
EVO-TMPTR	Spare/Replacement thermal internal printer assembly for EVO™ 600/6000, EVO™ 550/5000, comes with one roll of printer paper
EVO-6CVR	Spare/Replacement Cover for EVO™ 600/6000
EVO-DIMIB	Spare/Replacement Internal Dispenser Interface Module for an EVO™ 600/6000
TSSP-TRMBLK	Spare package of 10 assorted terminal blocks
600-0251	Spare/Replacement Wide Ribbon Cable - Controller Module to Interface Board
600-0252	Spare/Replacement Thin Ribbon Cable - Controller Module to Interface Board
600-0253	Spare/Replacement Wide Ribbon Cable - Display to Interface Board

Note: The serial number of the existing EVO™ must be provided when ordering the EVO-6CM-W/R.

Dispenser Interface Module Cables

Model	Description
TSP-BDCBL	Bennett® 515 only cable
TSP-GDCBL	Gilbarco® cable
TSP-GSDCBL	Gilbarco® G-Site™ cable
TSP-WDCBL	Wayne® cable

ORDERING INFORMATION CONTINUED

Printer Paper Supplies

Model	Description
TS-TP2	One box of 5 rolls of thermal printer paper for EVO™ 600/6000, EVO™ 550/5000
TS-TP2C	One case with 20 boxes of 5 rolls of thermal printer paper for EVO™ 600/6000, EVO™ 550/5000

EVO™ Series Upgrade Kit

Get all of the EVO™ 600/6000 capabilities, including Corrosion Control features and more, on an existing EVO™ 550/5000 with the easy-to-install EVO™ Series Upgrade Kit.

Model	Description
EVO-600UPG/U	Upgrade kit for EVO™ 550 to EVO™ 600, includes Controller Module, comm port cover, & EVO™ 600 jewel
EVO-6000UPG/U	Upgrade kit for EVO™ 5000 to EVO™ 6000, includes Controller Module, comm port cover, & EVO™ 6000 jewel
EVO-600UPG	Upgrade kit for EVO™ 550 to EVO™ 600, includes Controller Module, comm port cover, & EVO™ 600 jewel, factory programmed with existing software options
EVO-6000UPG	Upgrade kit for EVO™ 5000 to EVO™ 6000, includes Controller Module, comm port cover, & EVO™ 6000 jewel, factory programmed with existing software options
EVO-600UPG-W	Upgrade kit for EVO™ 550 to EVO™ 600 with WiFi, includes Controller Module, comm port cover, WiFi hardware, and EVO™ 600 jewel, factory programmed with existing software options
EVO-6000UPG-W	Upgrade kit for EVO™ 5000 to EVO™ 6000 with WiFi, includes Controller Module, comm port cover, WiFi hardware, and EVO™ 6000 jewel, factory programmed with existing software options

Note: The serial number of the existing EVO™ must be provided when ordering the EVO-600UPG, EVO-6000UPG, EVO-600UPG-W, and EVO-6000UPG-W.

Veeder-Root® is a trademark of Danaher Corporation.
MODBUS® is a registered trademark of Schneider Electric USA, Inc.
Bennett® is a registered trademark of Bennett Pump Company.
Gilbarco® is a registered trademark of Gilbarco Inc.
Wayne® is a registered trademark of Dresser Equipment Group Inc.

EVO™ SERIES ELECTRONIC LINE LEAK DETECTION



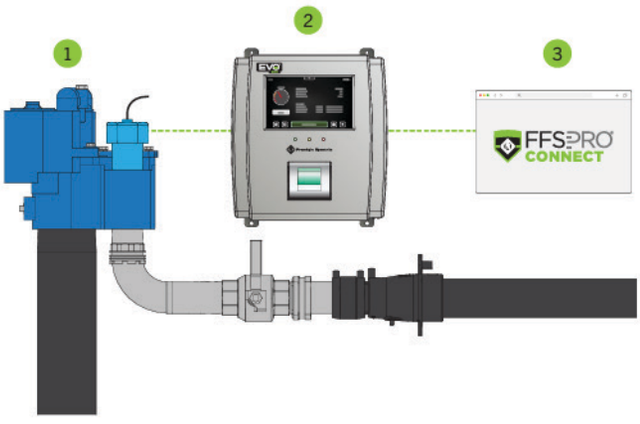
EVO™ Series Electronic Line Leak Detection (ELLD) is designed to provide early detection of leaks in pressurized fuel lines. The system features automatic submersible pump shutdown in the event of a leak, minimizing the risks of costly spills and environmental cleanup. This pressure-based system utilizes learned line characteristics learned to monitor for changes in pressure to declare the line as tight or determine if a leak is present.

HIGHLIGHTS

- Optional software feature of EVO™ 600 and EVO™ 6000.
- Utilizes pressure transducer installed in the submersible pump.
- Compatible with submersible pumps generating 25 psi or more.
- Automatically learns the pressure characteristics of each line.
- Automated 3 gph (11 lph), 0.2 gph (0.8 lph), and 0.1 gph (0.4 lph) compliance testing.
- Performs a 3 gph leak and pressure test after every dispense cycle or 45 min. Positive shutdown of the pump on test failure.
- Performs a 0.2 gph monthly and 0.1 gph annual precision leak test during the thermally stable periods of dispensing. Optional positive shutdown of the pump on test failure.
- Positive pump shutdown in the event of a gross leak (can be disabled for generator applications), optional for monthly and annual precision testing.
- Performs pressure up, catch pressure, other additional checks.
- Compatible with flexible, steel, fiberglass, or combination of pipe.
- Remote access to line pressure, test, and alarm information.
- Dispenser Hook Isolation (DHI) and Turbine Pump Interface™ (TPI) pump control options.
- EVO™ leverages AUTO-LEARN® technology to automatically program the unique pressure characteristics of each pipework system. This ensures precise, customized leak detection, reducing the risk of false alarms and enhancing overall system accuracy.
- With Statistical Line Leak Detection (SLLD), EVO™ allows sites with constant fuel flow to perform 0.2 gph leak testing even during peak operation. This is ideal for busy fuel stations where quiet periods are rare, ensuring continuous compliance without disrupting operations.
- EVO™ streamlines the regulatory process by automating 3 gph, 0.2 gph, and 0.1 gph line leak detection compliance testing. This feature ensures that your system meets environmental standards effortlessly, with the EVO™ automatically performing the necessary tests at regular intervals.

SPECIFICATIONS

1. The EVO™ Pressure Transducer is typically installed in the leak detector port of the submersible pump manifold. During the AUTO-LEARN® setup process, EVO™ learns the pressure decay curve characteristics of a calibrated leak.
2. During non-pumping periods, the EVO™ will conduct line leak testing by comparing the line pressure changes to those learned during the AUTO-LEARN® process. A deviation in pressure, such as a drop beyond predefined thresholds, will be declared as a leak and shut down the associated submersible pump.
3. With declaration of a leak, the system will notify the operator via the EVO™ display with additional email or SMS notification through the FFS PRO® Connect Web Browser Interface.



SPECIFICATIONS (CONT.)

Pressure Transducer

Dimensions	4" (102 mm) x 2" NPT
Operating temperature	-40° F to 149° F (-40° C to 66° C)
Operating pressure	0 to 100 psi (0 to 689 kPa)
Sensor port fitting	2" female NPT
Sensor material	Anodized aluminum body and stainless steel sensor
Approvals & Certifications	– UL, cUL, ATEX, IECEx – Third party certification of leak detection capabilities

Minimum Pressure Requirements

Item	Value
Minimum Pump Off Pressure	– 15 psi (1.034 bar) for gross 3.0 gph (11.4 lph) hourly tests – 17.5 psi (1.207 bar) for monthly 0.2 gph (0.8 lph) precision tests – 22.5 psi (1.551 bar) for annual 0.1 gph (0.4 lph) precision tests – 20 psi (1.379 bar) for learning lines

Line Volume Requirements - Gross Test

Pipework System	Gallons	Liters
Rigid / hybrid (rigid + flexible)*	2.5 - 1202.02	9.5 - 2359.1
UPP® pipework (semi-rigid)	2.5 - 623.2	9.5 - 1185.5
APT® XP pipework (flexible)	2.5 - 313.17	9.5 - 4550.1

Line Volume Requirements - Gross & Precision Test

Pipework System	Gallons	Liters
Rigid / hybrid (rigid + flexible)*	2.5 - 559.02	9.5 - 2116.1
UPP® pipework (semi-rigid)	2.5 - 161.46	9.5 - 611.2
APT® XP pipework (flexible)	2.5 - 81.19	9.5 - 4550.1

ORDERING INFORMATION

Site Requirements

- EVO™ 600/6000
- TS-ELLD software options (TS-ELLD-G software option for generator-specific applications)
- TS-ACI, TS-420IB, *TS-RLY Modules

** TS-RLY Module is not required when utilizing Turbine Pump Interface™ (TPI) communications. Franklin Electric intelligent pump controllers required for TPI.*

EVO™ Series Electronic Line Leak Detection Kits

Model	Description
FMP-LS500/1	1-line ELLD kit, includes (1) pressure transducer, (1) leak generator kit (TS-ALCAL), (1) needle valve kit (TS-ALNIP)
FMP-LS500/2	2-line ELLD kit, includes (2) pressure transducer, (1) leak generator kit (TS-ALCAL), (2) needle valve kit (TS-ALNIP)
FMP-LS500/3	3-line ELLD kit, includes (3) pressure transducer, (1) leak generator kit (TS-ALCAL), (3) needle valve kit (TS-ALNIP)
FMP-LS500/4	4-line ELLD kit, includes (4) pressure transducer, (1) leak generator kit (TS-ALCAL), (4) needle valve kit (TS-ALNIP)
FMP-LSU500	Replacement pressure transducer
TS-ALCAL	Leak generator kit
TS-ALNIP	Needle valve kit for standard fuels
TS-AFALNIP	Needle valve kit for E85 fuel

EXPLOSION-PROOF TRANSDUCERS

For sites without intrinsically-safe conduits available, explosion-proof transducers may be used that share the conduit of pump wiring.

SPECIFICATIONS

Pressure Transducer

Dimensions	6 ¼" (159 mm) x 2" NPT
Operating temperature	-40° F to 149° F (-40° C to 66° C)
Operating pressure	0 to 100 psi (0 to 689 kPa)
Sensor port fitting	2" female NPT
Sensor material	Anodized aluminum body and stainless steel sensor
Approvals & Certifications	– UL, cUL, ATEX, IECEx – Third party certification of leak detection capabilities

Minimum Pressure Requirements

Item	Value
Minimum Pump Off Pressure	– 15 psi (1.034 bar) for gross 3.0 gph (11.4 lph) hourly tests – 17.5 psi (1.207 bar) for monthly 0.2 gph (0.8 lph) precision tests – 22.5 psi (1.551 bar) for annual 0.1 gph (0.4 lph) precision tests – 20 psi (1.379 bar) for learning lines

Pipe Length Requirements

Pipe Diameter ID (in/cm)	Rigid (ft)	Rigid (m)	Flexible (ft)	Flexible (m)	Hybrid* (ft)	Hybrid* (m)	UPP® (ft)	UPP® (m)
1.0 (2.5)	62 - 7651	19 – 2332	62 – 2338	19 – 712	62 – 10191	19 – 3106	62 – 4313	19 – 1314
1.5 (3.8)	28 – 3400	9 – 1037	28 – 1039	9 – 316	28 – 4529	9 – 1380	28 – 1917	9 – 584
1.75 (4.4)	21 – 2498	7 – 762	21 – 763	7 – 232	21 – 3327	7 – 1014	21 – 1408	7 – 429
2.0 (5.1)	16 – 1912	5 – 583	16 – 584	5 – 178	16 – 2547	5 – 776	16 – 1078	5 – 328
2.5 (6.4)	10 – 1224	4 – 374	10 – 374	4 – 113	10 – 1630	4 – 496	10 – 690	4 – 210
3.0 (7.6)	7 – 850	3 – 260	7 – 259	3 – 78	7 – 1132	3 – 345	7 – 479	3 – 145
4.0 (10.2)	4 – 478	2 – 146	4 – 146	2 – 44	4 – 636	2 – 193	4 – 269	2 – 81
5.0 (12.7)	3 – 306	1 – 94	3 – 93	1 – 28	3 – 407	1 – 124	3 – 172	1 – 52

Line Volume Requirements - Gross Test

Pipework System	Gallons	Liters
Rigid pipework	2.5 - 312.2	9.5 - 1181.9
Flexible pipework	2.5 - 95.4	9.5 - 361.1
Hybrid pipework	2.5 - 415.8	9.5 - 1574.0
UPP® pipework	2.5 - 176.0	9.5 - 666.2

ORDERING INFORMATION

Site Requirements

- EVO™ 550/5000 or EVO™ 600/6000
- TS-ELLD software options (TS-ELLD-G software option for generator-specific applications)
- TS-ACI, TS-420EXP, *TS-RLY Modules

** TS-RLY Module is not required when utilizing Turbine Pump Interface™ (TPI) communications. Franklin Electric intelligent pump controllers required for TPI.*

EVO™ Series Explosion-Proof Electronic Line Leak Detection Kits

Model	Description
TS-LS500E/2	2-line ELLD kit, includes (1) pressure transducer, (1) leak generator kit (TS-ALCAL), (2) needle valve kit (TS-ALNIP)
TS-LS500E/3	3-line ELLD kit, includes (2) pressure transducer, (1) leak generator kit (TS-ALCAL), (3) needle valve kits (TS-ALNIP)
TS-LS500E/4	4-line ELLD kit, includes (3) pressure transducer, (1) leak generator kit (TS-ALCAL), (4) needle valve kits (TS-ALNIP)
TS-AFALNIP	Needle valve kit for E85 fuel

EVO™ LINE LEAK DETECTION

EVO™ LLD is a stand-alone precision electronic line leak detection solution designed to provide early detection of leaks in fuel lines. The system features automatic submersible pump shutdown in the event of a leak, minimizing the risks of costly spills and environmental cleanup.



HIGHLIGHTS

- Operates as a stand-alone kit solution, inclusive of all features and hardware, for ordering and installation simplicity.
- Facilitates automated 3 gph, 0.2 gph, and 0.1 gph line leak detection compliance testing.
- The AUTO-LEARN® feature enhances the setup process by automatically learning line characteristics, eliminating the manual entry of pipe lengths and diameters. This automated approach prevents human error and allows for unparalleled leak detection accuracy.
- AUTO-LEARN® safeguards the system against local manipulation as users are unable to falsify setup parameters to wrongly dismiss alarms, ensuring a secure and tamper-proof setup.
- The Statistical Line Leak Detection (SLLD) feature provides a supplementary leak detection method to standard testing by continuously gathering line pressure data and employing a statistical analysis algorithm to identify leaks.
- Running in parallel with standard line leak testing, SLLD offers a solution for busy sites that are unable to accommodate the periods of no fueling required for standard line leak testing to achieve 0.2 gph (0.8 lph) precision leak testing.
- Positive submersible pump shutdown in the event of a leak.
- Monitors flexible, steel, and/or fiberglass pipelines in any combination up to certified maximum values.
- Works with submersible pumps generating 25 psi (1.7 bar) or more.
- Remote access to line pressure, test, and alarm information via the FFS PRO® Web Interface.

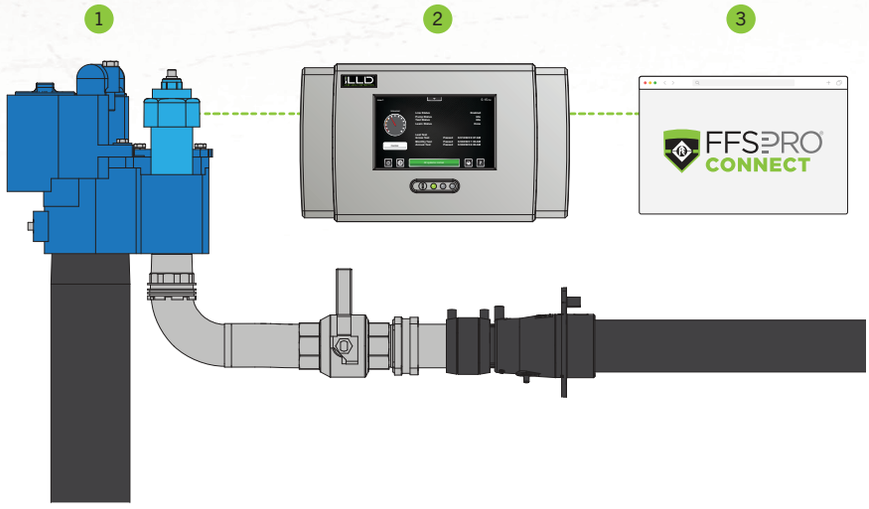
SPECIFICATIONS

Transducer dimensions	6 ¼" (159 mm) x 2" NPT
Operating temperature	-40° F to 149° F (-40° C to 66° C)
Operating pressure	0 to 100 psi (0 to 6.89 bar)
Transducer cable	10 ft (3.0 m) long three conductor cable with shield and polyurethane jacket
Max. cable length	1,500 ft (457 m) maximum transducer to EVO™ LLD console distance
Sensor port fitting	2" female NPT
Sensor material	Anodized aluminium body and stainless steel sensor
Fuel compatibility	Diesel with or without biodiesel blends up to 5% (B5), diesel with biodiesel blends between 6%-20% (B6-B20), diesel with biodiesel blends between 97%-100% (B99-B100), gasoline with ethanol blends up to 10% (E10), mid-range ethanol/gasoline blends of (E15-20), high-range ethanol/gasoline blends (E51-83) commercially sold as E85.
Testing	– Performs a 3.0 gph (11 lph) leak and pressure test after every dispense cycle or 45 min. Optional positive shutdown of the affected submersible pump on test failure. – Performs a 0.2 gph (0.8 lph) monthly and 0.1 gph (0.4 lph) annual precision leak rest during the thermally stable periods of dispensing. Optional possible shutdown of the affected submersible pump on test failure. – Performs pressure up, catch pressure, and other additional checks. Alarm only on test failure.
Approvals & Certifications	– UL, cUL, ATEX, IECEx – Third party certification of leak detection capabilities

SPECIFICATIONS CONTINUED

Operation

1. The EVO™ LLD Pressure Transducer is typically installed in the leak detector port of the submersible pump manifold. During the AUTO-LEARN® setup process, the EVO™ LLD learns the pressure decay curve characteristics of a calibrated leak.
2. During non-pumping periods, the EVO™ LLD will conduct line leak testing by comparing the line pressure changes to those learned during the AUTO-LEARN® process. A deviation in pressure, such as a drop beyond predefined thresholds, will be declared as a leak and shut down the associated submersible pumps.
3. With declaration of a leak, the system will notify the operator via the EVO™ LLD display with additional email or SMS notification through the FFS PRO® Connect Web Browser Interface.



ORDERING INFORMATION



Model	Description
EVO-LLDS/2	2-line EVO™LLD kit complete with console, (2) pressure transducers, installation wiring
EVO-LLDS/3	3-line EVO™ LLD kit complete with console, (3) pressure transducers, installation wiring
EVO-LLDS/4	4-line EVO™ LLD kit complete with console, (4) pressure transducers, installation wiring

Included in the kit: EVO™ LLD console, pressure transducer(s), pressure transducer cable(s), needle valve kit(s), 3.0 gph (11.4 lph) leak generator kit.

Belden™ is a trademark of Belden Technologies, Inc.

SECONDARY CONTAINMENT MONITORING

The secondary containment monitoring (SCM) system is designed to detect leaks in double-wall piping, tanks, and sumps. The system utilizes the siphon/vacuum port of a submersible turbine pump to draw a vacuum on these interstitial spaces. The vacuum levels are then continuously monitored to detect any potential leaks in these double-wall containments.



HIGHLIGHTS

- Up to four different containments can be connected to each submersible turbine pump using a combination of single and dual channel TS-SCCM secondary containment control modules and secondary syphon ports.
- The secondary containment control module collects information on all interstitial spaces.
- Gathers system status, replenish rate, alarm, and diagnostic information.
- Utilizes AUTO-LEARN® technology to learn the actual interstitial space being monitored based on the vacuum flow rate through a calibrated orifice for precise leak detection.
- Alarms when vacuum cannot be maintained or when liquid is detected in secondary space.
- Optional positive submersible turbine pump shut-down upon alarm.
- Compatible with FE PETRO® brand submersible turbine pumps as well as Red Jacket® STPs.
- All components necessary for installation including syphon check valve,vacuum hose, fittings and other installation accessories are available from Franklin Electric.

Note: Product only compatible with EVO™ 550, EVO™ 5000, EVO™ 600, and EVO™ 6000.

SPECIFICATIONS

Operating vacuum level	-2 to -6 in Hg
Software	– Available software option on EVO™ 550, EVO™ 5000, EVO™ 600, and EVO™ 6000 – TS-420IB, TS-RLY and TS-ACI modules and the TS-SCM software option must be ordered and installed in the tank gauge.
Requirements	– Requires TS-SCCM secondary containment control module consisting of pressure sensor(s) and solenoid valve(s). – Requires syphon check valve to connect to STP manifold. – Containments to be monitored must terminate inside the submersible turbine pump containment. – Installer must verify the vacuum limitation of each containment with its manufacturer prior to installation.
Operation	Secondary containment monitoring uses the siphon port of the submersible turbine pump to draw and maintain a vacuum on the secondary containments of lines, sumps, tanks and vapor lines. During installation a calibrated leak is introduced during the AUTO-LEARN® process which allows the system to learn the vacuum characteristics of each containment space. The vacuum level is continuously monitored and compared to established leak rates to ensure that the secondary containment is tight.
Approvals & Certifications	– Meets all requirements of California AB2481. – National Work Group approved.

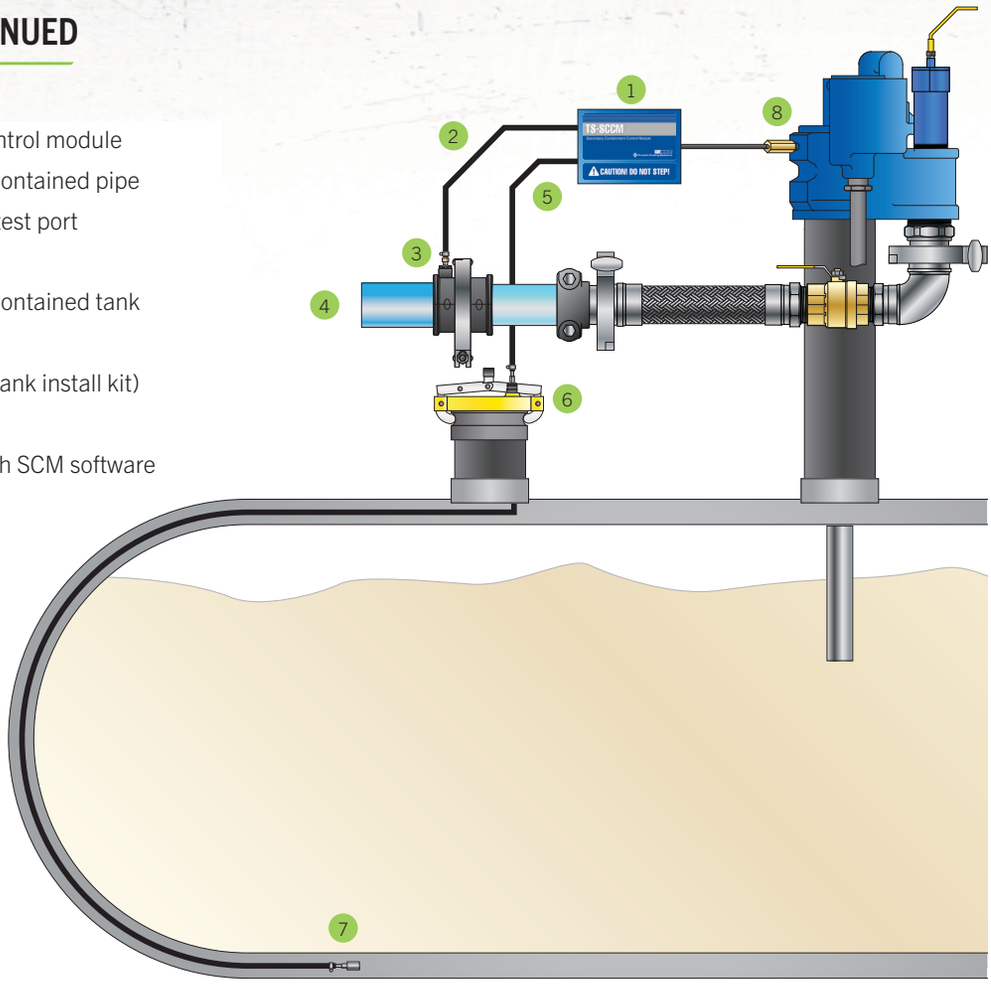
SPECIFICATIONS CONTINUED

Components

1. Secondary containment control module
2. Vacuum line to secondary contained pipe
3. Pipe fitting with integrated test port
4. Secondary contained pipe
5. Vacuum line to secondary contained tank
6. Tank installation kit
7. Line weight (included with tank install kit)
8. Syphon check valve
9. EVO™ 600 or EVO™ 6000 with SCM software



9



ORDERING INFORMATION

Secondary Containment Control Modules

Model	Description
TS-SCCM/1	Single channel secondary containment control module
TS-SCCM/2	Dual channel secondary containment control module
TS-SCMCAL	Leak generator kit, one per station
VS-SCCM/1	220 VAC single channel secondary containment control module
VS-SCCM/2	220 VAC dual channel secondary containment control module

Accessories

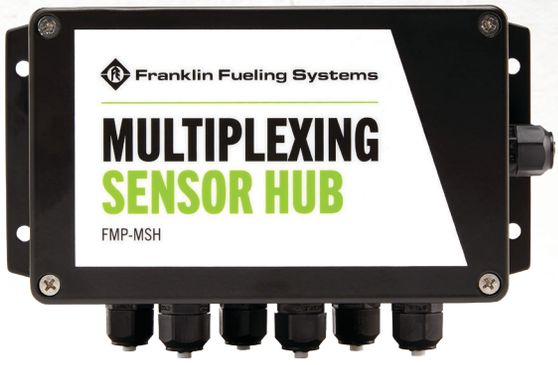
Model	Description
TSP-SCBRB	¼" NPT barbed fittings (Qty 5)
TSP-SCBRBT	¼" NPT barbed T-fitting
TSP-SCCLP	Hose clamps (Qty 5)
TSP-SCTB25	25'vacuum hose
TSP-SCTB50	50'vacuum hose
TSP-SCTB100	100'vacuum hose
TSP-SCVLV	Schreader valves (Qty 5)
400137908	Syphon check valve, alcohol-gasoline compatible (when ordered with STP/IST)
TSP-SCVLV	Schrader valves (Qty 5)

Installation Kits

Model	Description
TSP-SCLSI	Product, vapour line and sump containment install kit
TSP-SCTK2	Tank containment install kit for 2" NPT risers, in-tank hose sold separately
TSP-SCTK2B	Tank containment install kit for 2" BSP risers, in-tank hose sold separately
TSP-SCTK4	Tank containment install kit for 4" NPT risers, in-tank hose sold separately
TSP-SCTK4B	Tank containment install kit for 4" BSP risers, in-tank hose sold separately

MULTIPLEXING SENSOR HUB™

The Multiplexing Sensor Hub™ (MSH) allows station owners to add the Corrosion Control™ Water Separator, Corrosion Detection Sensor, and other sensors to existing sites without having to break concrete to run new conduit and wires. The MSH utilizes existing cabling to power and connect up to six total devices to an EVO™ 600 or EVO™ 6000.



HIGHLIGHTS

- For retrofit applications: the MSH can use existing cabling to add additional probes or sensors, providing expanded monitoring capabilities without the need to break concrete to run additional cable.
- For new applications: the MSH delivers labor and materials savings by reducing the amount of conduit and cable required for monitoring devices within a containment sump.
- Ideal for use in adding a Corrosion Control™ Water Separator, Desiccant Pack Sensor, and/or Corrosion Detection Sensor to an existing tank sump, providing all necessary input capabilities for this system.
- Six input channels provide a wide assortment of device communication capabilities:
  - **Channel 1**: For FMP-LL3 digital inventory and leak detection probes.
  - **Channel 2-5**: Multiplexed, for 2-wire universal device protocol (UDP) communication devices.
  - **Channel 5**: Additional capability for 2-wire devices.
  - **Channel 6**: For any dry-contact single pole single throw (SPST) switch, flow switch, two-wire device, or temperature sensor based on a 10k thermistor.

Input Capabilities

The FMP-MSH is capable of supporting the following devices:

Channel 1	Channel 2	Channel 3	Channel 4	Channel 5	Channel 6
FMP-LL3	FMP-DDS-U	FMP-DDS-U	FMP-DDS-U	FMP-DDS-U	FMP-ULS
	FMP-DTS-U	FMP-DTS-U	FMP-DTS-U	FMP-DTS-U	FMP-UHS
	FMP-EIS-U	FMP-EIS-U	FMP-EIS-U	FMP-EIS-U	FMP-HFS2
	FMP-DIS-U	FMP-DIS-U	FMP-DIS-U	FMP-DIS-U	10k Temp. Sensor
	FMP-HIS-U	FMP-HIS-U	FMP-HIS-U	FMP-HIS-U	
	FMP-CDS-U	FMP-CDS-U	FMP-CDS-U	FMP-CDS-U	
	FMP-DPS-U	FMP-DPS-U	FMP-DPS-U	FMP-DPS-U	
	FMP-LL3-XX-WS*	FMP-LL3-XX-WS*	FMP-LL3-XX-WS*	FMP-LL3-XX-WS*	
				FMP-ULS	
				FMP-UHS	

**The FMP-LL3-XX-WS is integrated into the Corrosion Control™ water separator to detect water level in the vessel.*

SPECIFICATIONS

Inputs	(1) LL3 probe, (4) UDP devices, (1) switch/ temperature sensor, (1) RS-485 sensor
Output	EVO™ 600/6000: (1) RS-485
Theory of Operation	– The FMP-MSH requires a minimum of four wire connections to the EVO™ RS-485 Module: – Power – Ground – A Communication – B Communication – If a sump has at least two existing input field cables, such as a 2-conductor probe cable and a 2-conductor sensor cable, conductors from both cables may be used to provide the four conductors required for the MSH to EVO™ connection. – The A and B conductors must be wired together in a shielded, twisted cable; and the Power and Ground conductors must be within the same shielded, twisted cable. – If there is not sufficient existing wiring, Belden Cable 7962A may be used.
Approvals & Certifications	UL listed, ATEX / IECEx

ORDERING INFORMATION

Model	Description
FMP-MSH	Multiplexing Sensor Hub™

DIGITAL INVENTORY & LEAK DETECTION PROBES

Digital inventory and leak detection probes provide accurate tank level monitoring and reporting with optional leak detection capabilities. These probes employ digital communications and magnetostrictive position measurement technology for highly accurate tank readings.



Inventory & Leak Detection Probe (Shown with optional precision density diesel float kit)

Inventory Probe (Shown with optional 4" gas float kit)

HIGHLIGHTS

- Models available for inventory control or inventory control with leak detection.
- Capable of precise leak detection, density measurement, and inventory monitoring.
- Suitable for use with gasoline, diesel, DEF/AdBlue®, and other manufacturer approved products.
- Bottom mounted installation for fast and simple install.
- Screw-in electrical connector provides quick installation or removal, eliminating the need to re-splice wires.
- Highly accurate digital communication between the probe and the tank gauge.
- Probes are available in many sizes that are suitable for all common tanks.
- Easily installed into 2", 3" or 4" riser pipes.

SPECIFICATIONS

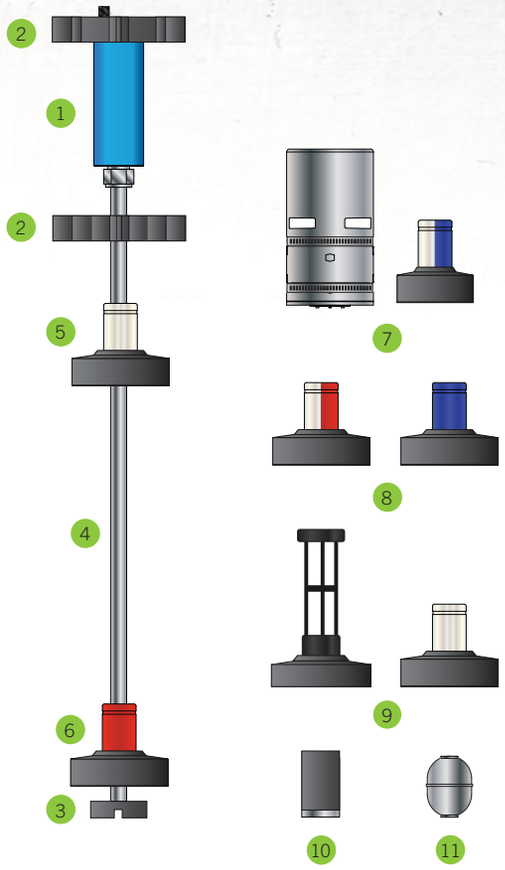
Operating Temperature	-40° F to 140° F (-40° C to 60° C)
Storage Temperature	-40° F to 158° F (-40° C to 70° C)
Non-linearity	±0.025% of full scale
Repeatability	±0.001"
Temperature Sensors	5 thermistors located in the shaft (leak detection probes)
Temperature Resolution	±0.02° F (±0.01° C)
Probe Cable	10'long three conductor cables with shields and polyurethane jacket
Float Compatibility	Up to 3 floats for product, water, phase separation detection, or density measurement
ATG Compatibility	EVO™ Series, TS-5, TS-550, TS-5000, Colibri®, TS-1001/2011/750/504/508
Fuel Compatibility	Diesel with or without biodiesel blends up to 5% (B5), diesel with biodiesel blends between 6% - 20% (B6 - B20), diesel with biodiesel blends between 97% - 100% (B99 - B100), gasoline with ethanol blends up to 10% (E10), mid-range ethanol/gasoline blends of (E15-20), high-range ethanol/gasoline blends (E51-83) commercially sold as E85
Approvals & Certifications	UL & cUL listed, ATEX, IECEx

SPECIFICATIONS CONTINUED

Components

1. Probe head
2. Guides
3. Bottom mount fitting
4. Probe shaft
5. 2" or 4" gas or diesel product float (sold as kit with water float)
6. 2" or 4" gas or diesel water floats (sold as kit with product float)
7. Precision or standard density float kit
8. Phase separation float kit
9. Low level water float kit for diesel
10. LPG float
11. Chemical float

Note: All float kits sold separately.



Operation

An electromagnetic field is created inside the probe head and forms around a long waveguide within the probe shaft when position measurements are taken. The electromagnetic field interacts with the magnetic field of the float(s) and produces a shock wave in the waveguide that travels at a known speed. When the shock wave is detected at the probe head, the probe creates a signal that corresponds precisely to the product level. Product expansion calculations are enabled by temperature sensors that are located at various points in the probe shaft.

Minimum Detectable Water Level

Float Type	Minimum Detectable Water Level
TSP-IGF4 / TSP-IGFD3 Gasoline Floats	0.75" (1.91 cm)
TSP-IDF4 / TSP-IGF4D3 Diesel Floats	0.75" (1.91 cm)
TSP-IGF4P Phase Separation Float	0.44" (1.12 cm)
FMP-IDF4E Low Level Water for Diesel Float	0.25" (0.64 cm)

Applications

- The leak detection probes are typically used for underground storage tanks and petroleum applications when static or SCALD leak detection is required.
- The inventory control probes are typically used for aboveground storage tanks, chemical or oil waste, or underground storage tanks that do not require in-tank leak detection.

ORDERING INFORMATION

Leak Detection Probes

Model	Description
FMP-LL3-29	2'digital leak detection probe
FMP-LL3-41	3'digital leak detection probe
FMP-LL3-53	4'digital leak detection probe
FMP-LL3-65	5'digital leak detection probe
FMP-LL3-69	5'4" digital leak detection probe
FMP-LL3-77	6'digital leak detection probe
FMP-LL3-81	6'4" digital leak detection probe
FMP-LL3-89	7'digital leak detection probe
FMP-LL3-101	8'digital leak detection probe
FMP-LL3-113	9'digital leak detection probe
FMP-LL3-125	10'digital leak detection probe
FMP-LL3-131	10'6" digital leak detection probe
FMP-LL3-137	11'digital leak detection probe
FMP-LL3-149	12'digital leak detection probe

Inventory Control Probes

Model	Description
FMP-LL3-29-I	2'digital inventory control probe
FMP-LL3-41-I	3'digital inventory control probe
FMP-LL3-53-I	4'digital inventory control probe
FMP-LL3-65-I	5'digital inventory control probe
FMP-LL3-69-I	5'4" digital inventory control probe
FMP-LL3-77-I	6'digital inventory control probe
FMP-LL3-81-I	6'4" digital inventory control probe
FMP-LL3-89-I	7'digital inventory control probe
FMP-LL3-101-I	8'digital inventory control probe
FMP-LL3-113-I	9'digital inventory control probe
FMP-LL3-125-I	10'digital inventory control probe
FMP-LL3-131-I	10'6" digital inventory control probe
FMP-LL3-137-I	11'digital inventory control probe
FMP-LL3-149-I	12'digital inventory control probe

Note: Additional probe lengths are available. Please contact your Territory Sales Manager for more information.

SENSORS

No matter what the monitoring application is, Franklin Electric offers a sensor solution tailored to the specific requirements of each application.



SENSOR SELECTION GUIDE

Does your application require the need to tell the difference between fuel and water?

Discriminating Sensors are able to detect and send an alarm signal if the presence of liquid is detected inside and can also differentiate between liquid and hydrocarbons.

Does your application only require the need detect any type of liquid?

Non-Discriminating Sensors are able to detect and send an alarm signal if the presence of liquid is detected inside of a containment space.

What type of Automatic Tank Gauge (ATG) are you connecting to?

Select the appropriate model number of sensor that's compatible with your ATG using the chart below.

										
Sensor	**Discriminating Dispenser Sump Sensor**	**Discriminating Turbine Sump Sensor**	**Discriminating Magnetostrictive Sump Sensor**	**Universal Liquid Sensor**	**Universal Hydrostatic Sensor**	**Electro-Optic Interstitial Sensor**	**Discriminating Interstitial Sensor**	**Hydrostatic Interstitial Sensor**	**Corrosion Detection Sensor**	**Desiccant Pack Sensor**
Discriminating Capability	✓	✓	✓	-	-	-	✓	-	-	-
Non-Discriminating	-	-	-	✓	✓	✓	-	✓	-	-
Turbine Sump Applications	-	✓	✓	✓	-	-	-	-	✓	✓
Dispenser Sump Applications	✓	-	✓	✓	-	-	-	-	✓	-
Tank Interstitial Space Applications	-	-	-	-	✓	✓	✓	✓	-	-
Tank Ullage Applications	-	-	-	-	-	-	-	-	✓	-
Position Sensitive (Tamper Protection)	-	-	✓	-	-	-	-	-	-	-
Hydrostatic Monitoring Capability	-	-	-	-	✓	-	-	✓	-	-
EVO™ 200 / 400 Model Number	FMP-DDS-U	FMP-DTS-U	TSP-DMS	FMP-ULS	FMP-UHS	FMP-EIS-U	FMP-DIS-U	FMP-HIS-U FMP-HIS-XL-U	FMP-CDS-U	FMP-DPS-U
EVO™ 550 /5000 Model Number*	FMP-DDS	FMP-DTS	TSP-DMS	FMP-ULS	FMP-UHS	FMP-EIS	FMP-DIS	FMP-HIS FMP-HIS-XL	-	-
EVO™ 600 / 6000 Model Number*	FMP-DDS, FMP-DDS-U	FMP-DTS FMP-DTS-U	TSP-DMS	FMP-ULS	FMP-UHS	FMP-EIS FMP-EIS-U	FMP-DIS FMP-DIS-U	FMP-HIS FMP-HIS-XL FMP-HIS-U FMP-HIS-XL-U	FMP-CDS-U	FMP-DPS-U
Typical Application	Dispenser sump applications requiring discriminating capabilities	Turbine sump applications requiring discriminating capabilities	Containment sump applications requiring discriminating capabilities with tamper protection regulations in place	Containment sump and steel double wall tank applications	Brine-filled double wall containment sump and tank applications	Dry double wall steel and wrap-around fiberglass tank applications	Dry double wall steel and wrap-around fiberglass tank applications requiring discriminating capabilities	Brine-filled double wall tank applications requiring high brine vs. low brine detection	Monitoring for corrosive environments	Monitoring remaining life of the Desiccant Pack(s)

EVO™ 600/6000, EVO™ 550/5000 may support additional sensors. Sensors with "-U" that are used with the EVO™ 600/6000 wire to either a Universal Device Protocol Module (FMP-UDP9) or a Probe Module (TS-PRB). FMP-DDS, FMP-TDS, FMP-EIS, FMP-DIS, FMP-HIS and FMP-HIS-XL all require a 3-Wire Sensor Module (TS-3WSNS).

DISCRIMINATING DISPENSER SUMP SENSOR (DDS)



The DDS is a discriminating dispenser sump sensor that detects the presence of liquid and hydrocarbons in dispenser containment sumps.

HIGHLIGHTS

- Uses magnetic float switches to detect liquid at two levels.
- Innovative polymer strip detects hydrocarbons along sensor.
- Compatible with common fuels and chemicals.
- Detects liquid at 1½" (38 mm) from base.
- Digitally encoded status information sent from microcomputer to the EVO™ console.
- Alarms to indicate liquid in sump, hydrocarbon detected, sump full, and sensor malfunction.
- Variety of mounting methods possible depending on location. Bracket provided for quick installation.
- An additional wire connection is available for adding a 2-wire simple apparatus to the FMP-DDS-UD sensor.
  - Software in the EVO™ Series will recognize the additional simple apparatus and monitor both inputs.

ORDERING INFORMATION

Model	Description
FMP-DDS-UD	Discriminating dispenser sump sensor with simple apparatus connection (EVO™ 200/400, EVO™ 600/6000)
FMP-DDS	Discriminating dispenser sump sensor (EVO™ 550/5000, EVO™ 600/6000)
TSP-KS	Unistrut™ mounting kit

Note: The FMP-DDS-UD communicates with EVO™ 600/6000 using the Universal Device Protocol Module (FMP-UDP9) or Probe Module (TS-PRB). The FMP-DDS communicates with the EVO™ 550/5000 and EVO™ 600/6000 using the 3-Wire Sensor Module (TS-3WSNS).

DISCRIMINATING TURBINE SUMP SENSOR (DTS)



The DTS is a discriminating turbine sump sensor that detects the presence of liquid and hydrocarbons in tank containment sumps.

HIGHLIGHTS

- Uses magnetic float switches to detect liquid at two levels.
- Innovative polymer strip detects hydrocarbons along sensor.
- Compatible with common fuels and chemicals.
- Detects liquid at 1½" (38 mm) from base.
- Digitally encoded status information sent from microcomputer to the EVO™ console.
- Alarms to indicate liquid in sump, hydrocarbon detected, sump full, and sensor malfunction.

ORDERING INFORMATION

Model	Description
FMP-DTS-U	Discriminating turbine sump sensor (EVO™ 200/400, EVO™ 600/6000)
FMP-DTS	Discriminating turbine sump sensor (EVO™ 550/5000, EVO™ 600/6000)
TSP-KS	Unistrut™ mounting kit

Note: The FMP-DTS-U communicates with EVO™ 600/6000 using the Universal Device Protocol Module (FMP-UDP9) or Probe Module (TS-PRB). The FMP-DTS communicates with the EVO™ 550/5000 and EVO™ 600/6000 using the 3-Wire Sensor Module (TS-3WSNS).

DISCRIMINATING MAGNETOSTRICTIVE SENSOR (DMS)



The DMS sensor is a fast-acting, discriminating sensor that utilizes magnetostrictive position measurement technology to provide reliable monitoring of dispenser pans and containment sumps. Utilizing one float to measure water level and one float to measure product level, the DMS allows for the system to have programmable water and product alarm points. The DMS also has anti-tamper capability that notifies the system if the sensor is moved from its installed position.

HIGHLIGHTS

- Utilizes proven magnetostrictive technology.
- Water warning, water alarm, and product alarm.
- Tamper protection feature will alarm if sensor is moved from installed position.
- Alarms and recovers quickly when liquids are present.

ORDERING INFORMATION

Model	Description
TSP-DMS-12	Discriminating magnetostrictive sensor, monitors 12" (305 mm) of liquid & measures 22" (559 mm) in length (all EVO™ Series)
TSP-DMS-24	Discriminating magnetostrictive sensor, monitors 24" (610 mm) of liquid & measures 34" (864 mm) in length (all EVO™ Series).
TSP-KS	Unistrut™ mounting kit

Note: The TSP-DMS communicates with the EVO™ 550/5000 and EVO™ 600/6000 using the Probe Module (TS-PRB).

UNIVERSAL LIQUID SENSOR (ULS)



Based on float-switch technology and made of chemically resistant materials, the ULS is a low-cost sensor that can be installed in sumps, dispenser pans, steel double wall tanks or other locations where the presence of liquid indicates a leak has occurred.

HIGHLIGHTS

- Highly reliable float technology and closed output circuit ensures that leaks are detected.
- Chemical-resistant materials assure compatibility with most liquids.
- ½" NPT thread is provided on the compression gland fitting attached to the sensor's cable, allowing it to be suspended from standard electrical boxes and fittings. The sensor may be positioned vertically by adjusting cable length.
- For steel interstitial tanks, ULS is lowered into the opening provided on the tank and is suspended by optional TSP-KI2 installation kit. Other mounting methods available depending upon application and location.

ORDERING INFORMATION

Model	Description
FMP-ULS	Universal liquid sump sensor (all EVO™ Series)
TSP-ULS	Universal liquid sump sensor (for use with S940 only)
TSP-KI2	Interstitial sensor riser cap kit for 2" (51 mm) riser pipes

Note: The FMP-ULS communicates with EVO™ 600/6000 using the Universal Device Protocol Module (FMP-UDP9). The FMP-ULS also communicates with the EVO™ 550/5000 and EVO™ 600/6000 using the 2-Wire Sensor Module (TS-2WSNS) or the 3-Wire Sensor Module (TS-3WSNS).

UNIVERSAL HYDROSTATIC SENSOR (UHS)



The UHS uses float switch technology to continuously monitor liquid-filled double wall containment sumps and tanks. Normally submerged, the single float UHS will provide an indication if there is a loss of monitoring liquid.

HIGHLIGHTS

- Highly reliable float technology and closed output circuit ensures that leaks are detected.
- Chemical-resistant materials.
- The sensor can be installed into the reservoir of a liquid filled double wall containment sump. The sensor must be installed in a vertical position at a level where it is normally submerged.
- The UHS sensor will alert if the liquid level drops below the bottom of the sensor.

ORDERING INFORMATION

Model	Description
FMP-UHS	Universal hydrostatic sensor (all EVO™ Series)
TSP-UHS	Universal hydrostatic sensor (for use with S940 only)
HM-KIT	Hydrostatic monitoring installation kit. Includes: flexible brine tube, sensor housing clamp, sensor housing, sensor cap, and hardware

Note: The FMP-UHS communicates with EVO™ 600/6000 using the Universal Device Protocol Module (FMP-UDP9). The FMP-UHS also communicates with the EVO™ 550/5000 and EVO™ 600/6000 using the 2-Wire Sensor Module (TS-2WSNS) or the 3-Wire Sensor Module (TS-3WSNS).

ELECTRO-OPTIC INTERSTITIAL SENSOR (EIS)



Utilizing electro-optic technology and made of chemically resistant polysulfone plastic, the EIS may be installed in sumps, double wall tanks, or other locations where the presence of liquid indicates a leak has occurred.

HIGHLIGHTS

- Highly accurate electro-optic technology and closed output circuit ensures that leaks are detected.
- Chemical-resistant materials.
- Can be installed in fiberglass or steel double wall tanks.
- Utilizes light-emitting diodes and prisms to indicate if a leak has occurred.
- For fiberglass tanks, the EIS is pulled into the interstitial space using a "fish" string or wire. For steel interstitial tanks, the EIS is lowered directly to the bottom of the interstitial space through a 2" NPT fitting provided for that purpose on the tank. Optional installation kits are available which include a riser cap and other parts required to complete installation.

ORDERING INFORMATION

Model	Description
FMP-EIS-U	Electro-optic interstitial sensor (EVO™ 200/400, EVO™ 600/6000)
FMP-EIS	Electro-optic interstitial sensor (EVO™ 550/5000, EVO™ 600/6000)
TSP-KI2	Interstitial sensor riser cap kit for 2" riser pipes
TSP-KW4	Interstitial sensor riser cap kit for 4" riser pipes

Note: The FMP-EIS-U communicates with EVO™ 600/ 6000 using the Universal Device Protocol Module (FMP-UDP9) or Probe Module (TS-PRB). The FMP-EIS communicates with the EVO™ 600/6000, EVO™ 550/5000 using the 3-Wire Sensor Module (TS-3WSNS).

HORIZONTAL FLOAT SWITCH SENSOR (HFS)

The HFS is a 2-wire, non-discriminating liquid sensor designed for liquid detection in dry fiberglass tank interstitial spaces.



HIGHLIGHTS

- Highly reliable magnetic-float/reed-switch technology.
- Chemical-resistant materials.
- Easily fits tight interstitial spaces.
- Rounded design makes it easy to remove for cleaning and reinstall after an alarm condition has been triggered or for maintenance and testing.
- For fiberglass tanks, the sensor is pulled into the interstitial space using a "fish" string wire. Optional installation kits are available which include a riser cap and other parts required to complete the installation.

ORDERING INFORMATION

Model	Description
FMP-HFS2	Horizontal float switch sensor (EVO™ 550/5000, EVO™ 600/6000)
TSP-KI2	Interstitial sensor riser cap kit for 2" riser pipes
TSP-KW4	Interstitial sensor riser cap kit for 4" riser pipes

Note: The FMP-HFS2 communicates with the EVO™ 550/5000 and EVO™ 600/6000 using the 2-Wire Sensor Module (TS-2WSNS) or the 3-Wire Sensor Module (TS-3WSNS). The FMP-HFS2 cannot communicate with the Universal Device Protocol Module (FMP-UDP9) or the Probe Module (TS-PRB).

DISCRIMINATING INTERSTITIAL SENSOR (DIS)

The DIS installs in the interstitial space of steel and fiberglass double wall tanks and sumps and detects the presence of various liquids in tanks as well as sumps and other locations.



HIGHLIGHTS

- Uses light beam traveling through probe to determine if sensor is wet.
- Microprocessor inside sensor interprets readings and communicates data to the EVO™ Series.
- Fail-safe digital communications with built-in alarm if sensor malfunctions.
- Alarms indicate petroleum present, water present, and sensor malfunction.
- For fiberglass tanks, the DIS is pulled into the interstitial space using a "fish" string or wire.
- For steel interstitial tanks, the DIS is lowered directly to the bottom of the interstitial space through a 2" NPT fitting provided for that purpose on the tank. Optional installation kits are available which include a riser cap and other parts required to complete installation.

ORDERING INFORMATION

Model	Description
FMP-DIS-U	Discriminating interstitial sensor (EVO™ 200/ 400, EVO™ 600/6000)
FMP-DIS	Discriminating interstitial sensor (EVO™ 550/5000, EVO™ 600/6000)
TSP-KI2	Interstitial sensor riser cap kit for 2" riser pipes
TSP-KW4	Interstitial sensor riser cap kit for 4" riser pipes

The FMP-DIS-U communicates with EVO™ 600/6000 using the Universal Device Protocol Module (FMP-UDP9) or Probe Module (TS-PRB). The FMP-DIS communicates with the EVO™ 550/5000 and EVO™ 600/6000 using the 3-Wire Sensor Module (TS-3WSNS).

HYDROSTATIC INTERSTITIAL SENSOR (HIS)

The HIS detects leaks in double wall tanks where the interstitial space is filled with a liquid brine solution. The polyester, Nitrile, and epoxy construction is compatible with all types of brine.



HIGHLIGHTS

- Versatile sensor for virtually all fiberglass double wall tanks equipped for hydrostatic leak detection.
- Microcomputer monitors liquid at varying levels within tanks and relays digitally encoded status information via the fail-safe sensor digital communication system to an EVO™, alerting of any alarm conditions.
- For installation, lower the HIS to the bottom of the brine reservoir of double wall tank. The normal brine level should reside half way up the sensor. Sensors include the TSP-KV4 vented 4" riser cap.

Note: The FMP-HIS-U/ FMP-HIS-XL-U communicates with EVO™ 600/6000 using the Universal Device Protocol Module (FMP-UDP9) or Probe Module (TS-PRB). The FMP-HIS/ FMP-HIS-XL communicates with the EVO™ 550/5000 and EVO™ 600/6000 using the 3-Wire Sensor Module (TS-3WSNS).

**One TSP-KV4 is already included with each HIS or HIS-XL sensor.*

ORDERING INFORMATION

Model	Description
FMP-HIS-U	Hydrostatic interstitial sensor, 11" (EVO™ 200/400, EVO™ 600/6000)
FMP-HIS-XL-U	Hydrostatic interstitial sensor, 21" (EVO™ 200/400, EVO™ 600/6000)
FMP-HIS	Hydrostatic interstitial sensor, 11"* (EVO™ 550/5000, EVO™ 600/6000)
FMP-HIS-XL	Hydrostatic interstitial sensor, 21"* (EVO™ 550/5000, EVO™ 600/6000)
TSP-KV4*	Hydrostatic sensor vented riser pipe cap kit for 4" riser pipes

CORROSION CONTROL™ DESICCANT PACK SENSOR (DPS)

As part of the Corrosion Control™ System, the Desiccant Pack Sensor provides remote monitoring of the remaining life of the Desiccant Pack via an EVO™ for efficient maintenance. The Desiccant Pack absorbs humidity from the sump environment before it turns into corrosion-causing moisture.



HIGHLIGHTS

- The Desiccant Pack Sensor provides the percent of remaining life of the Desiccant Pack.
- The Desiccant Pack Sensor hangers allow for multiple mounting options and can accommodate 1, 2, or 4 Desiccant Packs.
- EVO™ Series compatibility:
  - EVO™ 200/400
  - EVO™ 600/6000
- EVO™ data displayed:
  - Desiccant % remaining.
  - Sensor status (Ok, Desiccant Near Saturation, Desiccant Saturated - Service Needed, Desiccant Missing, Desiccant Sensor Overload).
  - Trend (Active Drying - Desiccant is actively absorbing water from environment or Passive Drying - Desiccant is holding required humidity level).

ORDERING INFORMATION

Model	Description
FMP-DPS-U	Desiccant Pack Sensor with single and multi-pack hanger and installation kit
407750906	Corrosion Control™ Desiccant Pack, includes (6) packs and (6) cable ties

CORROSION CONTROL™ CORROSION DETECTION SENSOR (CDS)



As part of the Corrosion Control™ System the Corrosion Detection Sensor (CDS) provides automated notification of a corrosive environment in the tank ullage space. This notification helps keep the fuel system running at peak performance and avoid costly maintenance, equipment replacement, downtime, and system failure caused by excessive corrosion.

HIGHLIGHTS

- Detects the presence of corrosion on a sacrificial sample and provides an alarm.
- Protects the tank ullage from the formation of corrosion which can lead to fuel system deterioration.
- Displays a level reading for corrosion index via the EVO™ with programmable alarm types including:
  - Corrosive Environment Present
  - Corrosion Sensor Sample Error
  - Corrosion Sample Needs Replacement
- Compatible with all blends of gasoline, diesel, and Ethanol.
- EVO™ Series compatibility:
  - EVO™ 200/400
  - EVO™ 600/6000

ORDERING INFORMATION

Corrosion Control™ Corrosion Detection Sensor

Model	Description
FMP-CDS-U	Corrosion Detection Sensor (EVO™ 200/400, EVO™ 600/6000)
FMSP-RDS1	Replacement detection screen, qty 1
FMSP-RDS10	Replacement detection screen, qty 10

Note: The FMP-CDS-U communicates with EVO™ 600/6000 using the Universal Device Protocol Module (FMP-UDP9) or Probe Module (TS-PRB).

HIGH PRODUCT LEVEL SENSOR (HLS)

The HLS level sensor is an overfill prevention switch that may be adjusted to operate over a wide range of levels. The HLS is based on float-switch technology and is made of chemical resistant materials to assure compatibility with most liquids.



HIGHLIGHTS

- Each sensor is supplied with jacketed cable 5'in length.
- The normally-closed output circuit provides supervised operation, ensuring that broken wires and similar failures will not go undetected.
- A small magnetically-activated read switch is located inside the body of the sensor. Tiny magnets are positioned inside a lightweight float which is free to move up and down along the shaft so that the magnets are below the read switch. When the sensor is immersed in liquid, the float rises and the magnet activates the read switch, signaling to the EVO™ that the high limit has been reached.

Note: The FMP-HLS communicates with the EVO™ 550/5000 and EVO™ 600/6000 using the 2-Wire Sensor Module (TS-2WSNS) or the 3-Wire Sensor Module (TS-3WSNS). The FMP-HLS cannot communicate with the Universal Device Protocol Module (FMP-UDP9) or the Probe Module (TS-PRB).

ORDERING INFORMATION

Model	Description
TSP-HLS-15	High product level sensor, 15" long, installed in tank (EVO™ 550/5000, EVO™ 600/6000)
TSP-HLS-15/SS	High product level sensor, stainless steel 15" long, installed in tanks containing alternative fuels (EVO™ 550/5000, EVO™ 600/6000)
TSP-HLS-30	High product level sensor, 30" long, installed in tank (EVO™ 550/5000, EVO™ 600/6000)
TSP-HLS-30/SS	High product level sensor, stainless steel 30" long, installed in tanks containing alternative fuels (EVO™ 550/5000, EVO™ 600/6000)

Note: The FMP-DPS-U communicates with EVO™ 600/6000 using the Universal Device Protocol Module (FMP-UDP9) or Probe Module (TS-PRB).

SENSOR INSTALLATION ACCESSORIES

INTERSTITIAL SENSOR RISER CAP INSTALLATION KIT

Installation kit for installing the sensors in dry interstitial spaces with 2" (5 cm) riser pipe openings. The cap is compression-fit into the riser pipe via the use of a lever.



HIGHLIGHTS

- Supplied with a cord grip and butt splices for wiring connections.
- Provided with security holes that fit a padlock to prevent unauthorized access into the riser pipe.

ORDERING INFORMATION

Model	Description
TSP-KI2	Interstitial sensor riser cap kit for 2" (5 cm) riser pipes

HYDROSTATIC SENSOR VENTED RISER CAP INSTALLATION KIT

Vented installation kit for use with the FMP-HIS-U or FMP-HIS-XL-U sensor installed in a 4" (10 cm) reservoir opening on double wall fiberglass tanks. The cap is compression-fit into the riser pipe via the use of a lever.



HIGHLIGHTS

- Supplied with a cord grip and butt splices for wiring connections.
- Provided with security holes that fit a padlock to prevent unauthorized access into the riser pipe.

ORDERING INFORMATION

Model	Description
TSP-KV4	Hydrostatic sensor vented riser cap kit for 4" (10 cm) riser pipes

INTERSTITIAL RISER CAP INSTALLATION KIT

Installation kit for installing sensors in a dry tank interstitial with a 4" (10 cm) riser.
The interstitial/monitoring cap is compression-fit into the riser pipe via the use of a lever.



HIGHLIGHTS

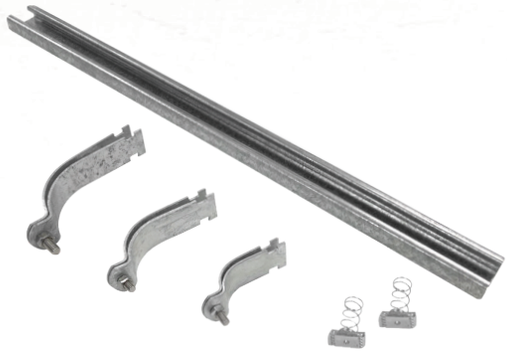
- Supplied with a cord grip and butt splices for wiring connections.
- Provided with security holes that fit a padlock to prevent unauthorized access into the riser pipe.

ORDERING INFORMATION

Model	Description
TSP-KW4	Interstitial pipe riser cap kit for 4" (10 cm) riser pipes

UNISTRUT® MOUNTING KIT

Installation kit for installing the DDS, DTS, and DMS sensors in sumps.



HIGHLIGHTS

- Easily customized to fit virtually any sump by cutting the Unistrut® assembly to desired length.
- Provided with 2", 3", and 4" pipe clamps for mounting to sump piping.
- Sensor location easily adjusted by the unique sliding feature of the Unistrut® assembly.

ORDERING INFORMATION

Model	Description
TSP-KS	Unistrut® mounting kit

DIRECT BURIAL SPLICE CONNECTOR KITS

For direct burial cable applications or when weatherproof junction boxes are not used.

HIGHLIGHTS

Each direct burial splice connector kit includes a receptacle, three splice connectors, and epoxy for the dispensing tool.



ORDERING INFORMATION

Model	Description
TSP-DB1	One direct burial splice connector kit
TSP-DB10	Pack of 10 direct burial splice connector kits
TSP-DBTOOL	Epoxy dispensing tool

SPLICE CONNECTORS

Save time and ensure accurate wire connections with splice connectors. Available in 22-14 AWG, the splice connector employs a specially designed wire insulation displacement contact to make a reliable electrical connection to each wire.



HIGHLIGHTS

- Three ports accept two or three conductors for splicing.
- Includes a factory-installed sealant to protect against corrosion and seal out moisture.
- Self-stripping, flame retardant, and moisture resistant.

ORDERING INFORMATION

Model	Description
TSP-KW30	22-14 AWG (blue) splice connectors, 30 pack

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DC400 DISPENSING CUTOFF SYSTEM



The DC400 dispensing cutoff system is a stand-alone, solid state two-part system which includes a controller and sensor, designed to automatically shut down product flow if liquid is detected inside containment spaces. Ideal for retrofit applications, the DC400 allows for easy compliance with new and evolving regulations, without the added expenses of shutting down your site to break concrete for new conduit and wiring installation. The DC400 can be mounted inside any turbine sump to provide complete pump shut down or mounted directly into dispenser sumps, allowing only the affected dispenser to be shut down as liquid is detected.

HIGHLIGHTS

- Automatically stops fuel from dispensing in the event of liquid detection.
- Easily installed in either turbine or dispenser sumps.
- Ideal for retrofit applications as system connects to existing turbine or dispenser wiring, eliminating the need to pull new wires or break concrete.

Application

- Containment sump liquid detection resulting in dispensing cutoff.*

Installation

- Simply mount the 404-4 controller inside any containment sump and connect it to the existing turbine or dispenser wiring. (Dispenser installations require an electrical junction box with an open conduit hub).
- Connect the liquid sensor using the supplied watertight splice kit. Suspend it so it is just touching the bottom of the containment sump.

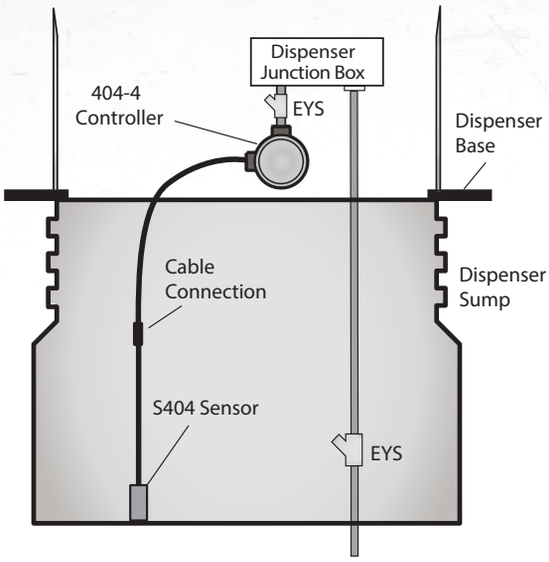
Note: Not for use with 3-phase motors or Variable Frequency Drive installations.

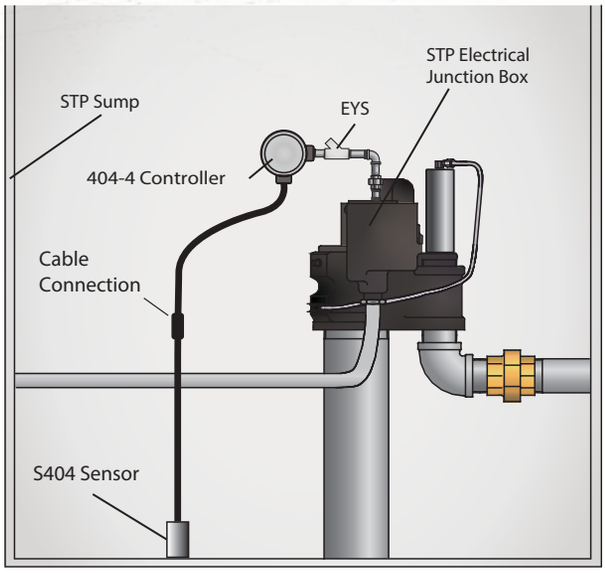
SPECIFICATIONS

404-4 Controller	Compatible with S404 liquid sensor*
404-4 Controller dimensions	6.6" × 6.2" × 3.2"
404-4 Input power	90-250 VAC, 50/60 Hz, 0.25 A
404-4 Relay contacts	12A, 2 hp @ 250 VAC, 12A, 1.5 hp @ 120 VAC
Operating temperature	-4° F to 140° F (-20° C to +60° C)
Enclosures	All sensors intrinsically safe, controller explosion-proof
Detection time	<1 second
S404 Sensor minimum detectable water limit	0.98" (25 mm)
Capabilities	– Cutoff power to submersible pumps or dispensers when liquid is detected in containment sumps. – Automatic reset on liquid removal.

**Previous versions of the 404-4, S406, and S404 are not compatible. Both the controller and sensor must be replaced if either requires it. Core credit available for legacy items.*

SPECIFICATIONS CONTINUED





ORDERING INFORMATION

Model	Description
DC404	S404 liquid sensor and controller
DC404C	S404 liquid sensor and controller for Canadian applications
TS-FE	FE PETRO® STP electric junction box adapter
TS-RJ	Red Jacket™ STP electric junction box adapter
TS-RJQ	Red Jacket™ Quantum™ STP electric junction box adapter

Note: Electric junction box adapters are for STP installations.

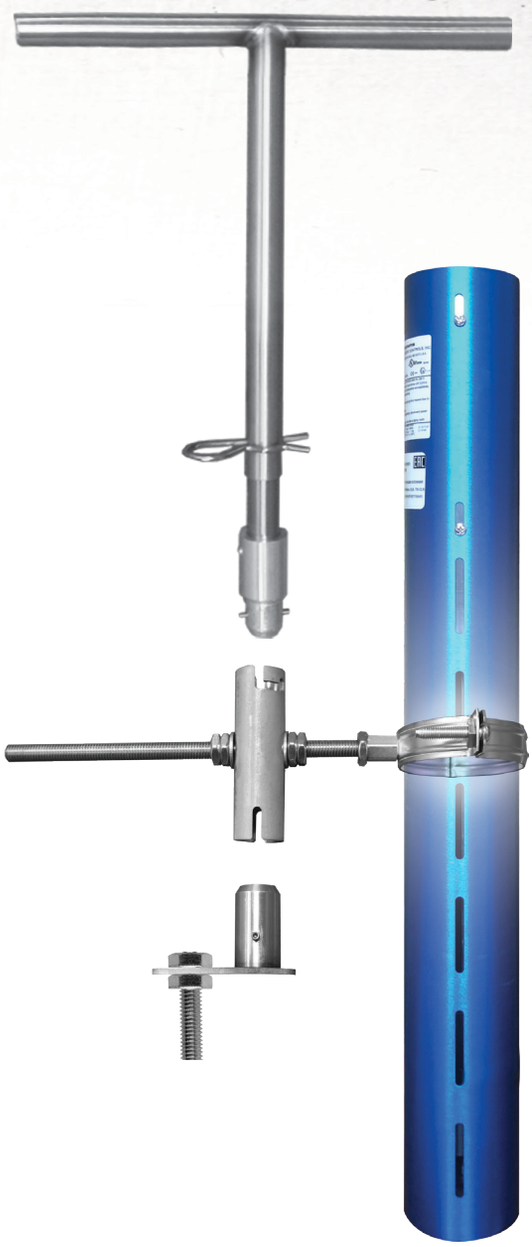
DC400 Replacement Parts

Model	Description
404-4	Controller
404-4C	Controller for Canadian applications
S404	Float switch sensor

Note: Replacement parts not compatible with legacy DC400 systems. Both controller and sensor must be replaced. Order DC404 system to replace legacy components.

EASY-ACCESS SENSOR BRACKET SYSTEM

The Easy-Access Sensor Bracket System eliminates the high risk activity of confined space entry by enabling sensors to be removed from both tank sumps and dispenser sumps at grade level for safe maintenance and testing.

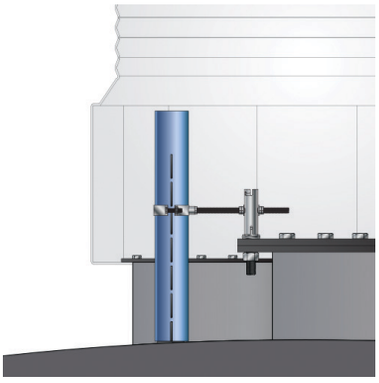


HIGHLIGHTS

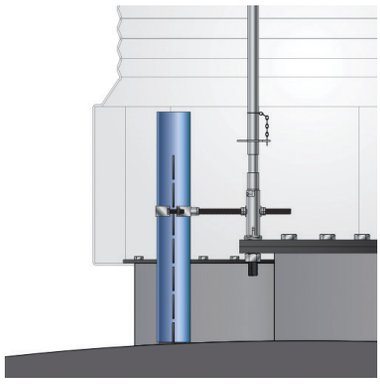
- System includes a removable sensor mounting bracket, extendable lifting handle (sold separately), and optional conversion kit for use in dispenser sumps (sold separately).
- Models available with compatibility for all versions of Franklin Electric's ULS, DDS, DTS, and DMS sensors.
- Suitable for use with alternative sensors with similar dimensions. Please contact Franklin Electric Technical Support for questions regarding sensor compatibility beyond those sensors listed.
- Delivers labor cost savings with faster, one-person inspections that do not require the additional safety precautions associated with a two-person confined space entry including mechanical retrieval.
- Securely bolts to any new or existing tank manway with included M16 x 80 mm bolt to stabilize the sensor and optimize its position to ensure that the sensor sits at the lowest point of the containment.
- Provides a wide range of sensor height adjustment.
- Lifting handle extends from 43" (109 cm) to 79" (200 cm), accommodating both medium and deep bury containment.
- Stainless steel bracket components provide compatibility with all fuel types including standard fuel, biofuel, and alcohol blend fuels.

SPECIFICATIONS

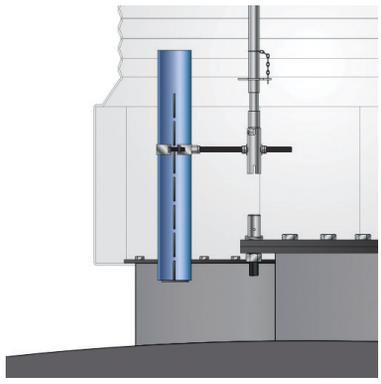
Operation



Sensor installed in bracket



Engage lifting handle from grade



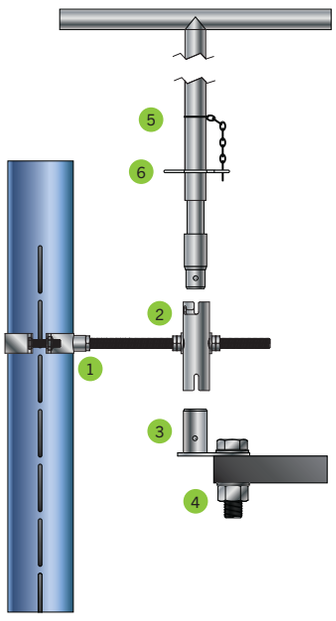
Lift to grade for inspection

SPECIFICATIONS CONTINUED

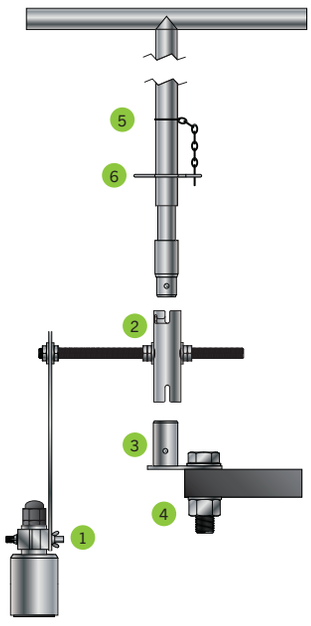
Components

1. Sensor clamp
2. Sensor bracket holder
3. Bracket seat
4. Mounting bolt
5. Extendable lifting handle
6. Spring clip to fix handle length
7. Conversion kit arm (bolts to stabilizer bar kit)

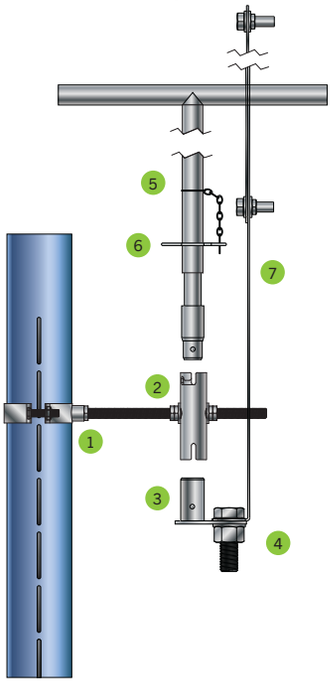
DTS, DDS, DMS Easy-Access Sensor Bracket



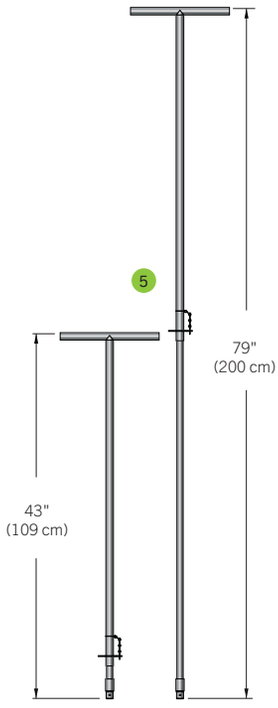
ULS Easy-Access Sensor Bracket



Easy-Access Sensor Bracket Conversion Kit for Dispenser Sumps

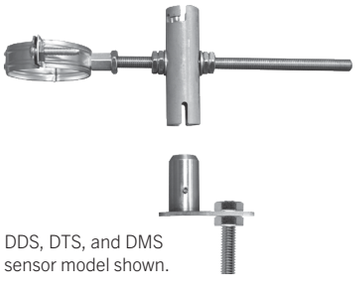


Easy-Access Sensor Lifting Handle



ORDERING INFORMATION

Easy-Access Sensor Brackets



DDS, DTS, and DMS sensor model shown.

Model	Description
FMP-SIB-DMS	Easy-Access Sensor Bracket for all models of the DDS, DTS, and DMS sensors
FMP-SIB-ULS	Easy-Access Sensor Bracket for all models of the ULS sensors



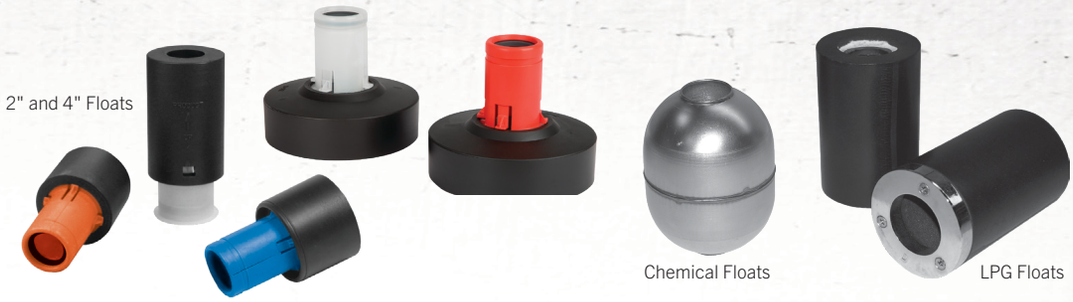
Model	Description
FMP-SIB-UDC	Easy-Access Sensor Bracket conversion kit for dispenser sumps

Note: The conversion kit must be installed with the FMP-SIB-DMS or FMP-SIB-ULS Easy-Access Sensor Bracket.



Model	Description
FMP-SIB-HDL	Easy-Access Sensor Bracket lifting handle, extends from 43" (109 cm) to 79" (200 cm)

FLOAT KITS



HIGHLIGHTS (2" AND 4" FLOATS)

- Designed for applications involving 2", 3" or 4" riser pipes.
- Each float set contains a product and water float.
- Compatible with a wide variety of petroleum products.
- Water floats are coloured red for gasoline and blue for diesel to assure compatibility with most liquids.
- Constructed of nitrile rubber and PVDF. Water floats contain either stainless steel or nickle plated brass ballast.

HIGHLIGHTS (CHEMICAL FLOATS)

- Suitable for use in a wide variety of chemical applications, consult factory for chemical compatibility issues.
- #316 stainless steel product float with 2-1/16" OD (Ø52,4 mm)
- Use one float per probe.
- Float can be used with compatible liquids that have a specific gravity greater than 0.64.
- Collapse pressure 500 psi/g minimum.

HIGHLIGHTS (LPG FLOATS)

- Designed for applications involving tank openings of at least 2".
- Single float used for monitoring the level of LPG (propane) fuel.
- Suitable for monitoring pressurized products.
- For use in USTs or ASTs with TSP-LL2 or TSP-LL2-I probes.
- TSP-LPG/EU float can be used with locally supplied tank isolation sleeves.

Model	Description
TSP-IDF2	2" float set for diesel tanks
TSP-IGF2	2" float set for gasoline tanks
TSP-IDF4	4" float set for diesel tanks
TSP-IGF4	4" float set for gasoline tanks
TSP-LPGF	2" float for LPG tanks, with or without isolation sleeve
TSP-SSP	2-1/16" OD, #316 stainless steel float for chemical applications only

Note: Order one float set for each FFS Mag probe.

Bottom Mount Kits	
Model	**Description**
TSP-C2A	Mag probe install kit for 2' risers
TSP-C2B	Mag probe install kit for 2' risers with BSP threads
TSP-C4A	Mag probe install kit for 4' risers
TSP-C4B	Mag probe install kit for 4' risers with BSP thread

PHASE SEPARATION FLOAT KITS



The water and phase separation detection float kit allows you to effectively manage product levels as well as alert you of water or phase separation levels in your tanks. A single float is used to detect the presence of both water or phase separated fuel to ensure the prevention of either from reaching customer's vehicles.

HIGHLIGHTS

- Available in 2" and 4" float kit options.
- Optional float kit for gasoline and ethanol blend users.
- Product float determines fuel level.
- Water float will rise with the presence of water or phase separated fuel.
- Simple single-float solution for both water and phase separation.
- Free software upgrade available for T5 Series fuel management systems and Colibri automatic tank gauges.
- Allows you to easily shut down a submersible pump before water or phase separation reaches the customer's vehicle.

SPECIFICATIONS

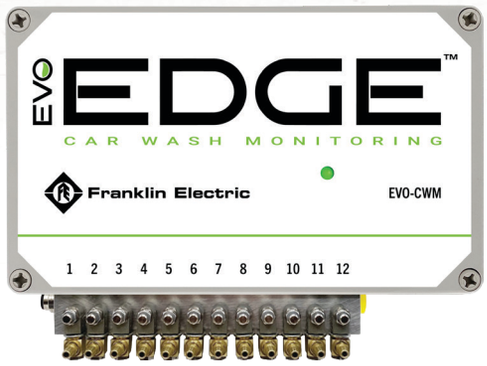
Designed for	Applications using 2" or 4" risers
Kit contains	Each float kit contains both product float and water and phase separation float
Compatibility	Appropriate for use with gaso line and Ethanol blends up to E15
	Compatible with all FFS probes
Available for	Options available for EVO™ 200, EVO™ 400, EVO™ 550, EVO™ 5000, EVO™ 600, EVO™ 6000.

ORDERING INFORMATION

Model	Description
TSP-IGF2P	2" phase separation float kit for gasoline and up to E15
TSP-IGF4P	4" phase separation float kit for gasoline and up to E15

EVO™ EDGE CAR WASH MONITORING

The EVO™ EDGE Car Wash Monitoring System delivers real-time car wash chemical inventory management. The system is compatible with all common car wash chemicals including soaps, waxes, pre-soaks, and degreasers.
The non-intrusive installation allows for easy retrofitting on any type of car wash chemical container with zero obstruction during a refill.



HIGHLIGHTS

- Via the FFS PRO® Connect Web Browser Interface, operators get automated alerts and remote access to inventory information including volume, delivery information, usage rate, and forecasting that provides the estimated days of remaining inventory.
- Capable of monitoring all common car wash chemical liquids, regardless of the chemical container type or supplier, freeing operators to work with any chemical provider of their choosing.
- Inventory level information can be accessed remotely via any web browser or fed directly into an operator's existing business management software.
- Data can be presented in a grid of colour-coded inventory container levels with icon-driven status indicators or viewed in a detailed table, with the ability to download or email in the form of PDF reports.
- User-customized alarms and email notifications keep operators up-to-date with inventory levels.
- The non-intrusive installation process involves a simple, top or side-mounted air hose fitting for each chemical container (up to 12).
- The one-time install can be left in place for the life of the container with no interaction required during a refill. The central data collecting manifold can be installed without any specialized tools or need for electrical contractors.
- Automatically learns usage rates for each chemical and provides the predicted days of remaining inventory to help streamline re-ordering.
- Highly accurate delivery level readings during each refill event provide operators with an easy way to cross-check chemical delivery bills to ensure they get what they pay for.

SPECIFICATIONS

Max. containers monitored	12
Connectivity	Ethernet, USB Type A, USB Type B
Alarm notification options	Email, SMS
LEDs	Normal (green), warning (yellow), alarm (red)
Applicable liquids	Soaps, waxes, pre-soaks, degreasers
Level units	Inches, centimetres, millimetres
Volume units	Gallons, litres (mass with density options)
Power requirements	110 to 240 VAC, 50/60 Hz, 1.5 Amps
Operating Humidity	20-90%
Dimensions	H: 7.3" (100 mm), W: 11.6" (295 mm), D: 4.0" (100 mm)
Alert options	High/low chemical volume, low usage rate, unexpected increase, low forecast days of remaining inventory
Report options	Alarm, event, inventory, delivery, usage rates
Communication security	SSL/TLS, MQTT, optional multifactor authentication
Approvals & Certifications	UL, cUL, ATEX, IECEx

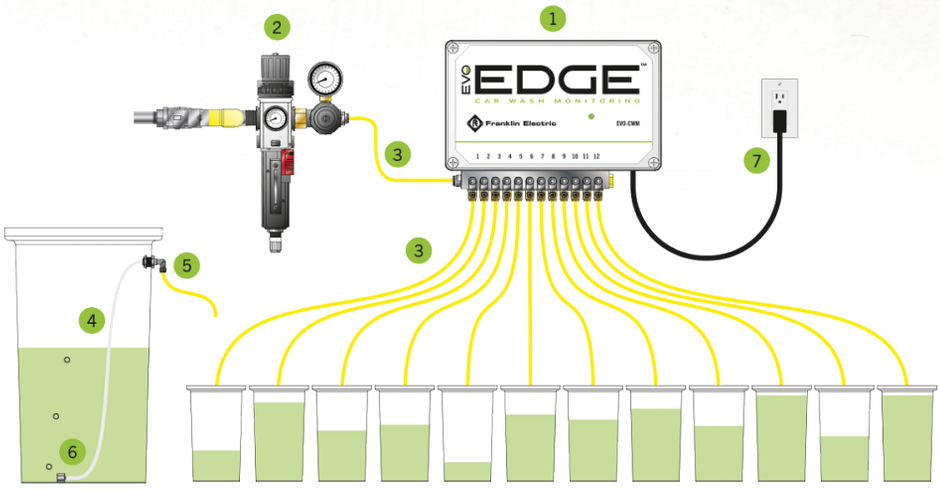
ORDERING INFORMATION

Model	Description
EVO-CWM	EVO™ EDGE Car Wash Monitoring System, includes all hardware for up to 12 containers
EVO-CWM-REG	EVO™ EDGE Air Regulator Assembly

SPECIFICATIONS CONTINUED

Components

1. EVO™ EDGE manifold
2. Air pressure regulator
3. Air tubing
4. Container tubing
5. Air hose fitting
6. Barbed anchor fitting
7. Standard plug



Operation

Each car wash chemical container is fitted with a small air hose connection. The system utilizes a unique method to capture inventory levels by measuring the pressure it takes to force an air bubble through the chemical. This method allows the system to operate without probes or floats, leaving no moving parts to replace or maintain.

Real-Time Data

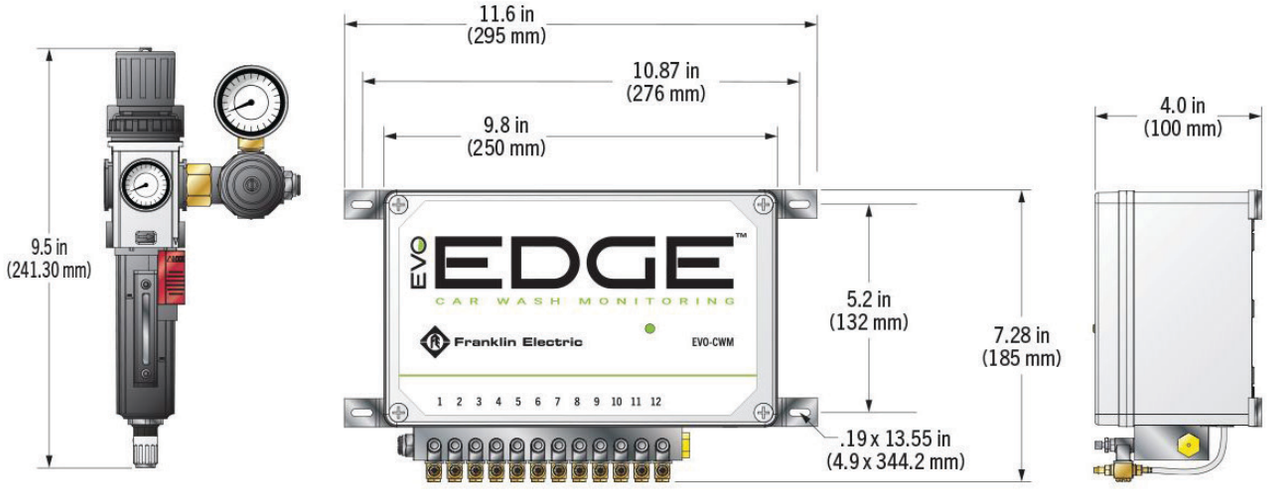
Conduct data-driven decision making regarding inventory and delivery timings with real-time access to:

- Volume / Levels
- Percent Full
- Usage Rate
- Delivery volumes
- Forecast Days to Run Out

Customized Notifications

User-customized alarms via email or SMS notification keep operators up-to-date with events. Alert options include:

- High / Low Chemical Volume
- Delivery Detection
- Low Usage Rate
- Unexpected Increase
- Low Forecast Days of Remaining Inventory



SERVICE STATION HARDWARE

1. Product Shear Valves
2. Vapour Shear Valves
3. Defender Series® Spill Containers
4. Access Covers
5. Defender Series® Overfill Prevention Valves
6. Vapour Recovery Caps
7. Vapour Recovery Swivel Adapter
8. Fill Caps
9. Fill Swivel Adapter
10. Drop Tubes
11. Defender Series® P/V Vent with In-Line Vault




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300 4" VAPOUR CHECK VALVE ADAPTER

The vapour check valve adapter permits coupling to the vapour return line from the underground tank in dual point systems. The poppet design seals off the vapour path when not coupled.



HIGHLIGHTS

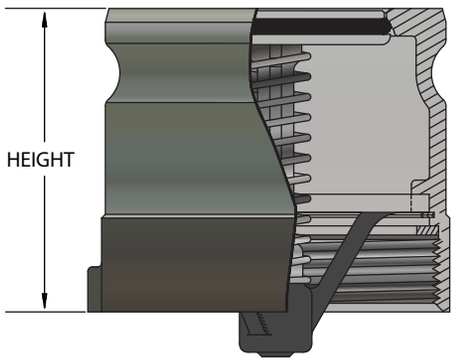
- Body constructed of anodised aluminium or brass.
- Fits all 4" vapour recovery elbows.

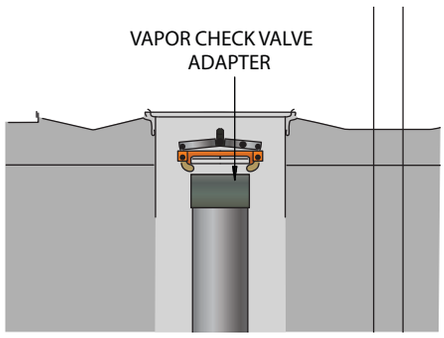
ORDER INFORMATION

Model	Hose Size	Riser Thread	Height		Body Material	Weight	
			mm	In.		Kg	Lbs.
30030001	4"	3" NPSM	139	5.44	Anodised aluminium	1.95	4.3
30030031*	4"	3" BSPP	139	5.44	Anodised aluminium	1.95	4.3
30021001	4"	4" NPSM	107	4.19	Anodised aluminium	1.95	4.3
30021031*	4"	4" BSPP	107	4.19	Anodised aluminium	1.95	4.3

Model	Description
77020102	3" replacement gasket for 300300
77020103	4" replacement gasket for 300210

** BSPP thread on the 30030031 and 30021031, NPSM thread on others.*





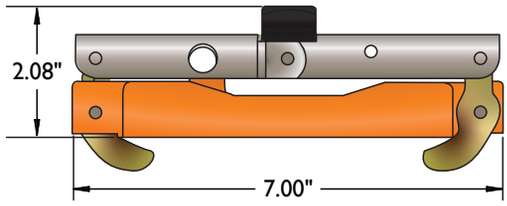
304 4" VAPOUR ADAPTER CAP



The vapour cap secures the vapour check valve preventing dust and debris build-up. It also protects the vapour poppet of a dual point fill system. Orange in colour to indicate vapour recovery lines and lockable to prevent misuse, our vapour cap fits all 4" male quick couplings. The cam action creates a solid push down and pull up movement for fast, easy removal and replacement of cap.

HIGHLIGHTS

- Two body styles to choose from—glass-filled nylon or epoxy coated aluminium.
- Padlock capability.
- Iron-copper infiltrated 4" cams.
- Corrosion-resistant steel hatches.
- Orange body for easy identification.



304-200-01

ORDER INFORMATION

Model	Material	Weight	
		Kg	Lbs.
30420007	Glass filled PBT	0.53	1.19
30430103	Aluminium, AGB	0.63	1.38

Model	Description
95021501	Replacement gasket for 30430101

306 4" COAXIAL ADAPTERS



The EBW® coaxial vapour recovery adapter provides an inexpensive way to convert conventional underground storage tank fill risers to coaxial vapour recovery for Stage I vapour recovery requirements where the cap can remain on the adapter during vapour testing. When used in conjunction with EBW® coaxial drop tubes, the coaxial vapour recovery adapter allows product to flow through the centre while vapours escape around the edge of the drop tube back to the delivery truck.

HIGHLIGHTS

- Constructed of hard-coated aluminium.
- Set screw on the adapter prevents movement on the riser pipe ensuring a tight seal.
- Bodies constructed of hard-coat anodized aluminium for compatibility with E-85 and biodiesel.

ORDER INFORMATION

Model	Material	Weight	
		Kg	Lbs
30630001	Non-poppeted coax V.R. adaptor-NPT	1.52	0.69
30630021	Non-poppeted coax V.R. adaptor-BSPT	1.59	0.69
708335901	Poppeted coax V.R. adaptor	3.3	1.5
708336901	Poppeted coax & drop tube kit	Call	Call

708335901 poppeted coaxial vapour recovery adaptor must use 708332901 drop tube.

308 BALL FLOAT VENT VALVES



The EBW® ball float vent valves are used in conjunction with extractor vent valves in the Stage I vapour riser or tank vent line on underground storage tanks. The ball float vent valve will restrict vapour venting should a full tank condition occur and protects against product mixing and vapour locks due to vent pipe flooding. The bleed hole allows for delivery hose drainage after an overfill.

The valve includes a brass installation cage and will fit all EBW® extractor vent fittings. All ball floats are made of materials fully compatible with alcohol/gas blends and biofuels (E-85, Biodiesel, B-20).

HIGHLIGHTS

2" Ball Float Advantages

- Epoxy coated steel nipple to prevent dissimilar metals from contacting each other.
- Stainless steel ball float is corrosion-resistant for long life.

SPECIFICATIONS

WARNING

EBW™ Series float vents should not be used with suction pump systems. For use on gravity drop systems only. Do not use with pump-off unloading. Do not use with coaxial Stage I vapour recovery drop tubes.

ORDER INFORMATION

2" Ball Floats

Model	Nipple Length		Bleed Hole		Thread
	In	mm	In.	mm	
308020003	3	76.2	0.06	1.524	NPT
308020205	5.12	130.04	0.06	1.524	NPT
308020107	7	177.8	0.06	1.524	NPT
308020112	12	304.8	0.06	1.524	NPT
308020116	16	406.4	0.06	1.524	NPT
308023003	3	76.2	0.06	1.524	BSPT
308023107	7	177.8	0.06	1.524	BSPT
308023112	12	304.8	0.06	1.524	BSPT
308023116	16	406.4	0.06	1.524	BSPT
308024115	15	381	0.06	1.524	BSPT
3080241117	17	431.8	0.06	1.524	BSPT
308024119*	19	482.6	0.06	1.524	BSPT

**Does not include installation cage.*

Installation Cages

Model	Size		Thread
	In	mm	
30822802	2	50.8	NPT
30822803	3	76.2	NPT

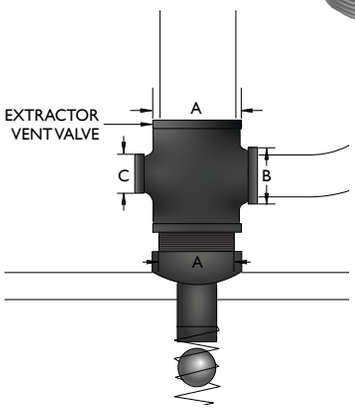
300 SERIES EXTRACTOR VENT VALVES

EBW® extractor vent valves are designed to fit into a 4" tank opening on an underground storage tank. Several outlet sizes are available to accommodate manifolded tank lines and Stage II vapour recovery installations.



HIGHLIGHTS

- E-coated bodies are fully compatible for alcohol/gas blends and biodiesel.



SPECIFICATIONS

Model	Description 4" X A X B	A		B		C		Weight	
		In	mm	In	mm	In	mm	Lbs	Kg
31040011	4" × 2" extractor valve w/o adaptor-NPT	4.00	102.00	2.00	51.00	n/a	n/a	13.00	5.90
31140011	4" × 3" extractor valve w/o adaptor-NPT	4.00	102.00	3.00	76.00	n/a	n/a	13.00	5.90
33040011	4" × 3" × 2" extractor valve w/o adaptor-NPT	4.00	102.00	3.00	76.00	2.00	51.00	18.00	8.16
33140011	4" × 3" × 3" extractor valve w/o adaptor-NPT	4.00	102.00	3.00	76.00	3.00	76.00	15.00	6.80
34040011	4" × 2" × 2" extractor valve w/o adaptor-NPT	4.00	102.00	2.00	51.00	2.00	51.00	17.00	7.71
34040041	4" × 2" × 2" extractor valve w/o adaptor-BSPP	4.00	102.00	2.00	51.00	2.00	51.00	17.00	7.71
31040042	4" × 2" extractor valve w/o adaptor-BSPT	4.00	102.00	2.00	51.00	n/a	n/a	13.00	5.90
31140042	4" × 3" extractor valve w/o adaptor-BSPT	4.00	102.00	3.00	76.00	n/a	n/a	13.00	5.90
33040042	4" × 3" × 2" extractor valve w/o adaptor-BST	4.00	102.00	3.00	76.00	2.00	51.00	18.00	8.16

ORDER INFORMATION



Hard Coated Aluminum Plug with O-ring Seal

Plug used for isolating vent piping from tank during testing.

Model	Description	Weight	
		Lbs	Kg
39120101	4" test plug	3.60	1.63

Adaptors for use with EBW Ball Floats

Model	Description	Weight	
		Lbs	Kg
30822802	ADPT 2" NPT, AGB, spare	1.15	0.52
30822803	ADPT 3" NPT, AGB, spare	1.65	0.75

4" Brass Pipe Cap

Model	Description	Weight	
		Lbs	Kg
76020101	Brass, NPSM	4.60	2.09
76020131	Brass, BSPP	4.60	2.09
770201023	4" Spare gasket	4.60	2.09

5'Extractor Wrench

Five-foot extractor wrench works on all EBW extractor vent valves for removing extractor cage assemblies and inserting test plugs.

Model	Description	Weight	
		Lbs	Kg
32110001	5'extractor wrench	14.00	6.35



305 3" FLOAT VENT VALVES

Model	Description
30530521	3" × 3" × 2" BSPT for manifolded vents SS ball, aluminium



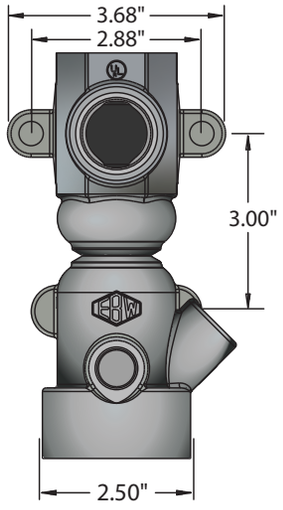
362 SERIES VAPOUR SHEAR VALVE

The EBW® 362 vapour shear valve is designed for use as an emergency breakaway on Stage II vapour recovery lines in fuel dispensers. The double poppet design allows spring-loaded poppets inside the valve to seal vapours within both the dispenser riser and vapour piping in the event of dispenser displacement, providing maximum environmental protection.



HIGHLIGHTS

- Dual poppets seal vapours in dispenser riser and in vapour line for maximum environmental protection.
- One 1" test port and two ⅜" test ports eliminate extra T-joints in vapour line which reduces potential leak points and provides more flexibility for Stage II vapour recovery installation.
- Durable zinc plated body is resistant to corrosion.
- Standard U-bolt and boss mount allow for quick and easy installation.
- Base thread includes 1½" female.
- California State Fire Marshal approved.



ORDER INFORMATION

Model	Description
36220603	1" × 1½" NPT thread vapour shear valve
36220621	1" x 1½" BSPT thread vapour shear valve

Note: When not using FFS stabiliser bar kits with vapour shear valves, the vapour shear fastener kit will also need to be included on the order. The vapour shear fastener kit comes with hex-head bolts.

Model	Description
90069	Vapour shear fastener kit

Vapour shear fastener kit is needed when used with non-FFS stabiliser bars.

662 SERIES PRODUCT SHEAR VALVE



EBW® brand emergency shear valves immediately stop product flow in the event of fire or collision at the dispenser. A patented adapter shears clean upon impact, causing the poppet to seal on the valve body preventing fuel spillage. When fire occurs, a fusible link releases the fulcrum arm, engaging the poppet. Standard 1½" NPT openings allow minimal flow restriction and a pre-drilled test plug is included for line pressure testing. The valve can be boss or U-bolt mounted. Easy-to-replace adapters slide on and off valve base without lifting the dispenser. Adapters are available in male, female or union connections. Single poppet models stop product flow from the pump. Double poppet models stop flow from the pump and dispenser piping.

HIGHLIGHTS

- Fusible link closes poppet in the event of a fire (165.0° F and 73.9° C).
- Single and double poppet.
- Main poppet seals in valve body, preventing accidents when replacing adapters.
- E-coated body corrosion protection.
- Meets NFPA 30A requirements.
- AGB compatible (E-85, gasoline and Biodiesel).
- UL 842A and UL 842B approved for E-85 alcohol/gas blends and biodiesel.

ORDERING INFORMATION

Model	Description
662500901	Single poppet, union, 1½" NPT, E-coat AGB
662500902	Single poppet, female, 1½" NPT, E-coat AGB
662500903	Single poppet, male, 1½" NPT, E-coat AGB
662510902	Single poppet, female, 1½" BSPT, E-coat AGB
662510903	Single poppet, male, 1½" BSPT, E-coat AGB
662501901	Double poppet, union, 1½" NPT, E-coat AGB
662501902	Double poppet, female, 1½" NPT, E-coat AGB
662501903	Double poppet, male, 1½" NPT, E-coat AGB
662511902	Double poppet, female, 1½" BSPT, E-coat AGB
662511903	Double poppet, male, 1½" BSPT, E-coat AGB

SPECIFICATIONS

Top and body material	E-coat cast iron
Poppet and O-ring	Fluorocarbon
Stem and poppet spring	Stainless steel
Automatic shut-off valve	The closing feature of an automatic shut-off valve must be checked at least once per year by manually tripping and holding linkage
Approvals & Certifications	- UL and ULC listed - UL 842 A&B approved for ethanol and biodiesel - ATEX approved, SIRA 13Atex9035U

Note: The closing feature of an automatic shut-off valve must be checked at least once per year by manually tripping and holding linkage.

NFPA-WARNING

Annually test auto shut-off. Electrical supply to the submersible pump must always be disconnected before servicing meters, dispensers, or emergency shut-off valves. Do not apply more than 50 psi to valve with poppet in its closed position. Valve seat and disc damage may occur.

EMERGENCY SHUT-OFF VALVE ACCESSORIES

Holds the single or double poppet shut-off valve rigidly in place, ensuring proper shearing.

Model	Description	Weight	
		Lbs.	Kg
66213801	U-bolt kit	0.3	0.14
90074	Fulcrum arm kit	0.1	0.05
66225001	Fusible link assembly	0.1	0.05

EMERGENCY SHUT-OFF VALVE REPLACEMENT TOPS

Model	Description	Poppet	Shear Valve Adapter Used	Thread
662500202	Shear valve top female 1.5" NPT	Single	662500902	NPT
662510202	Shear valve top female 1.5" BSPT	Single	662510902	BSPT

Model	Description	Poppet	Shear Valve Adapter Used	Thread
662500203	Shear valve top male 1.5" NPT	Single	662500903	NPT
662510203	Shear valve top male 1.5" BSPT	Single	662510903	BSPT

SHEAR VALVES FOR DEF/ADBLUE®

FLEX-ING® brand 1½" diesel exhaust fluid shear valves shut off the flow of DEF/AdBlue®, in the event of a vehicle collision with a dispenser, preventing an excessive and uncontrolled release into the environment. The optional e-coated mounting bracket allows installation both in containment sumps beneath the dispenser as well as direct mounting to the concrete forecourt.



HIGHLIGHTS

- Integrated wrench flats for easy installation.
- Mounting bracket kit allows for in-sump containment or flush mounting.
- Available with either 1½" NPT or BSPT inlet (bottom) and 1" NPT or BSPT outlet (top) options.

ORDERING INFORMATION

Model	Description
663100001	DEF/AdBlue® shear valve, 1½" NPT inlet, 1" outlet
663100021	DEF/AdBlue® shear valve, 1½" BSPT inlet, 1" outlet
66320000	Mounting bracket for DEF/AdBlue® shear valve including U-bolt, nuts and bracket guides

SPECIFICATIONS

Body	Stainless steel
Mounting bracket	E-coated steel
Height	3 ¾" (95.25 mm)
Break force	Under 650 pound-feet (884 N-m)
	Break force within parameters established by UL842 for product shear valves
Installation	Must be installed with locally supplied 1" rigid pipe threaded into outlet

FILL SWIVEL ADAPTERS

The fill swivel adapter helps prevent leaks caused by constant fill delivery elbow movement on the riser adapter. The top section rotates during normal deliveries, preventing the bottom section from loosening on the riser pipe which could cause a vapour or product leak around the adapter.



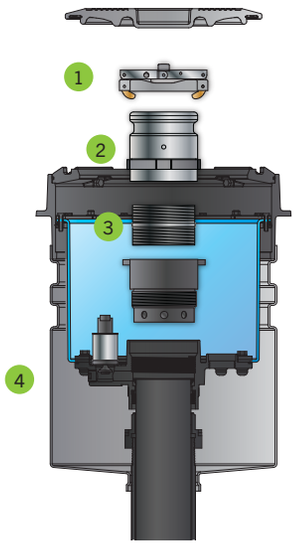
HIGHLIGHTS

- Adds approximately 4" to riser height to fit under most existing fill and vapour manway covers.
- Swivels on two rows of corrosion-resistant chromium steel ball bearings for long life in high volume stations.
- All vapour seals are fluorocarbon and inert in motor fuels.
- Stainless steel models provide additional fuel compatibility and are CARB Phase I EVR approved under executive order VR-101.
- Available in packages including fill and vapour adapter.
- Available in kits including riser, cap, and swivel adapter.

SPECIFICATIONS

Components

1. Cap
2. Swivel adapter
3. Riser nipple
4. Spill container



ORDERING INFORMATION

Fill Swivel Adapters



Model	Description
SWF-100-SS**	Fill swivel adapter, 4" NPT, stainless steel
SWF-100-B*	Fill swivel adapter, 4" NPT, brass
SWFV-PKGSS**	Vapour and fill swivel adapter kit, 4" NPT, stainless steel
SWFV-PKG*	Vapour and fill swivel adapter kit, 4" NPT, brass
85039	Replacement gasket for all swivel adapters

**EVR Phase 1 Certification VR-101.*
***EVR Phase 1 Certification VR-101 for gas and E85.*

Fill Swivel Adapter Kits

Be sure to select the appropriate kit for your specific spill container type.



Model	Description
70541202	Fill swivel adapter kit for 5 gallon Defender Series® (grade level and below grade level) and EBW® Series (grade level) spill containers, includes stainless steel fill swivel adapter, 3" riser nipple, vapour top cap.
70541201	Fill swivel adapter kit for 5 gallon PHIL-TITE™ and EBW® Series (below grade) spill containers, includes stainless steel fill swivel adapter, 5" riser nipple, vapour top cap.
70541503	Fill swivel adapter kit for 15 gallon EBW® Series (below grade) spill containers, includes stainless steel fill swivel adapter, 12" riser nipple, vapour top cap.

VAPOUR SWIVEL ADAPTERS

The vapour swivel adapter helps prevent leaks caused by constant delivery elbow movement on the riser adapter. The top section rotates during normal deliveries, preventing the bottom section from loosening on the riser pipe which could cause a vapour or product leak around the adapter. Its poppet design seals off the vapour path when not coupled.



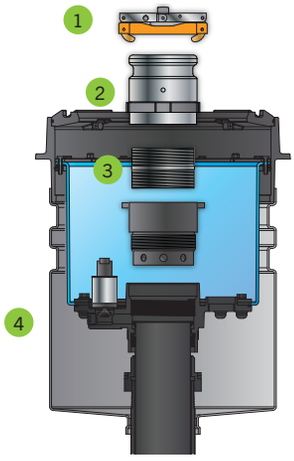
HIGHLIGHTS

- Adds approximately 4" to riser height to fit under most existing fill and vapour manway covers.
- Swivels on two rows of corrosion-resistant chromium steel ball bearings for long life in high volume stations.
- All vapour seals are fluorocarbon and inert in motor fuels.
- Stainless steel models provide additional fuel compatibility and are CARB Phase I EVR approved under executive order VR-101.
- Available in packages including vapour and fill adapter.
- Available in kits including riser, cap, and swivel adapter.

SPECIFICATIONS

Components

1. Cap
2. Swivel adapter
3. Riser nipple
4. Spill container



ORDERING INFORMATION

Vapour Swivel Adapters



Model	Description
SWV-100-SS**	Vapour swivel adapter, 4" NPT, stainless steel
SWV-100-B*	Vapour swivel adapter, 4" NPT, brass
SWFV-PKGSS**	Vapour and fill swivel adapter kit, 4" NPT, stainless steel
SWFV-PKG*	Vapour and fill swivel adapter kit, 4" NPT, brass
85039	Replacement gasket for all swivel adapters

**EVR Phase 1 Certification VR-101.*
***EVR Phase 1 Certification VR-101 for gas and E85.*

Vapour Swivel Adapter Kits

Be sure to select the appropriate kit for your specific spill container type.



Model	Description
70541302	Vapour swivel adapter kit for 5 gallon Defender Series® (grade level and below grade level) and EBW® Series (grade level) spill containers, includes stainless steel vapour swivel adapter, 3" riser nipple, vapour top cap.
70541301	Vapour swivel adapter kit for 5 gallon PHIL-TITE™ and EBW® Series (below grade) spill containers, includes stainless steel vapour swivel adapter, 5" riser nipple, vapour top cap.
70541303	Vapour swivel adapter kit for 15 gallon EBW® Series (below grade) spill containers, includes stainless steel vapour swivel adapter, 12" riser nipple, vapour top cap.

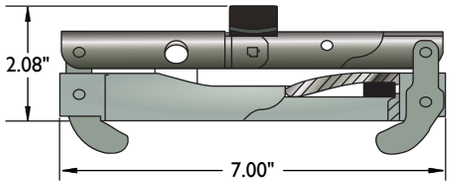
777 4" TOP SEAL FILL CAPS

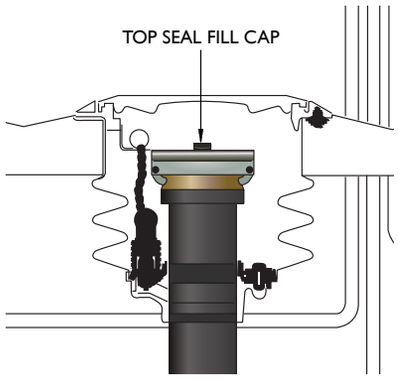


EBW® top seal fill caps are used to prevent vapours from escaping the fill riser pipe on the underground storage tank when it is not being filled. The geometry of the linkage provides self-centring characteristics for dependable sealing. The easy-to-operate T-handle provides a convenient method of removal and replacement — simply pull to remove and push to replace.

HIGHLIGHTS

- Glass-filled nylon and aluminium body styles available.
- Stainless steel latches.
- Padlock capability.
- Form fitting replaceable gasket, moulds itself to the contour of the adapter to form a positive seal for added protection.





ORDERING INFORMATION

Model	Description	Weight	
		Kg	Lbs.
77720102*	Fill Cap 4" glass-filled PBT	0.45	1
777201901	Fill Cap 4" glass-filled PBT, 20 pack	--	--
95021501	Fill Cap Replacement Gasket 4"	--	--

** Biofuel approved model (E85 and biodiesel), CARB: Phase 1 Certification VR-101.*
Note: 77720102 replaces 77720101

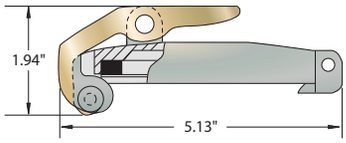
779 3" TOP SEAL FILL CAPS

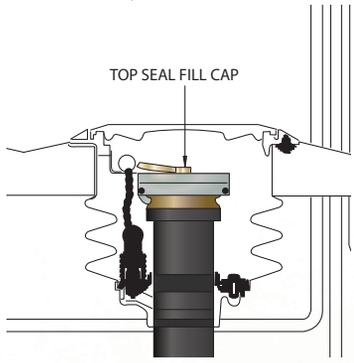


This durable 3" top seal single lever cap provides a tight positive seal on all 3" adapters.

HIGHLIGHTS

- Extruded brass cam arm.
- Cap body made of corrosion-resistant epoxy coated aluminium.





ORDERING INFORMATION

Model	Description	Weight	
		Lbs.	Kg
77920001	3" top seal fill cap	1	0.45

Model	Description
77420203	Replacement Buna-N gasket

778 TOP SEAL FILL PIPE ADAPTER



Top seal fill pipe adapters are installed on the fill riser pipe in spill containment manways on an underground storage tank. The adapters are used to connect delivery drop elbows to the fill pipe for fuel deliveries. Adapters can be ordered with or without wrenching lugs to suit your installation preference. EBW® top seal fill pipe adapters fit all top seal drop elbows and top seal fill caps.

HIGHLIGHTS

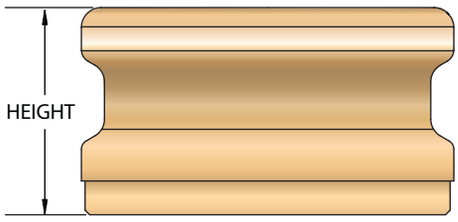
- Constructed of ASTM B62 corrosion-resistant brass.
- Nitrile gasket for a secure seal onto the fill pipe.

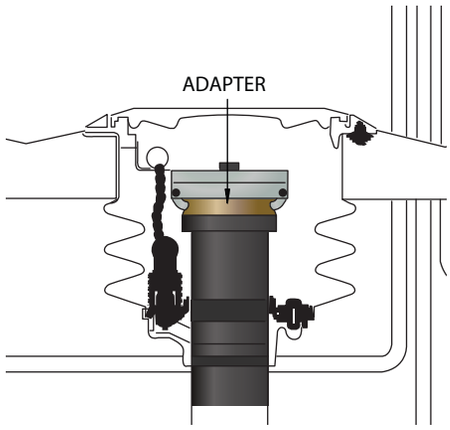
ORDERING INFORMATION

Model	Description	Height		Weight		Thread
		mm	In.	Kg	Lbs.	
78020001	3" x 3" without lugs	44.45	1.75	0.9	2	NPSM
77830231	4" x 3" with lugs	57.15	2.25	0.9	2	BSPP
77830101	4" x 4" with lugs	68.27	2.69	0.9	2	NPSM
77830135	4" x 4" with lugs–nickel plated	68.27	2.69	0.9	2	BSPP
77830132	4" x 4" without lugs	68.27	2.69	0.9	2	BSPP

Model	Description
77020102	3" replacement gasket
77020103	4" replacement gasket

*** Biofuel compatible model (E85 and biodiesel).*





DEFENDER SERIES® OVERFILL PREVENTION VALVE (OPV)



The Defender Series® overfill prevention valve (OPV) prevents the overfill of an underground storage tank during a gravity-fed product delivery. It employs a revolutionary magnetically-coupled actuator system to provide positive shutoff. This unique method of shutoff eliminates any penetrations in the valve, making it both vapour and leak tight. The Defender Series® OPV provides safe, rapid, and reliable fuel drops with simple installation, service, and remote testing capability.

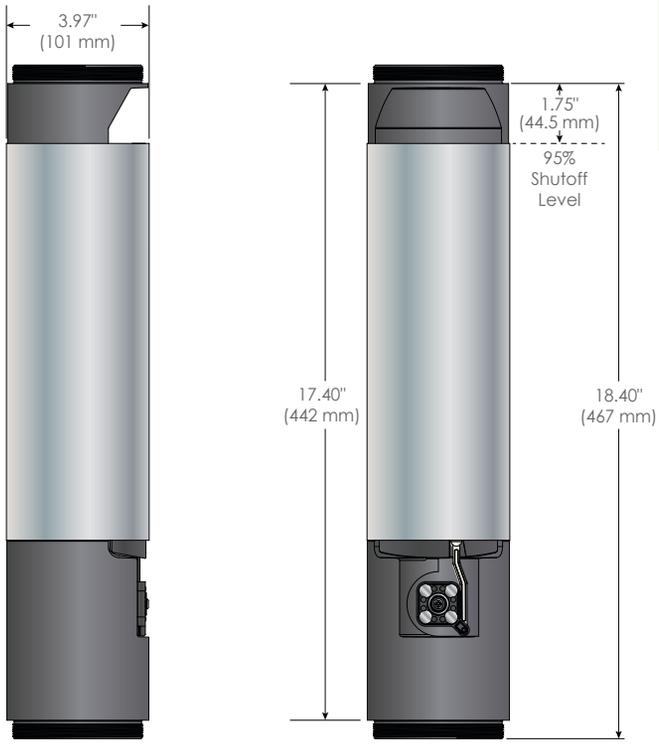
HIGHLIGHTS

- Magnetic coupler actuates the interior primary flapper assembly and secondary shut-off valve when the float rises outside of the valve, eliminating valve body penetrations and any potential product or vapour leak points.
- After cutting to length in the field, the upper drop tube is roll-crimped onto a top adapter outfitted with two O-rings and then threaded onto the top of the valve body, eliminating the need for drilling, rivets, epoxy, and flaring tools.
- Bottom drop tube is cut in the field and threaded onto the bottom of the valve ensuring straight installation.
- The roll-crimp/thread method of installing drop tubes ensures proper alignment of the drop tubes with the rest of the OPV assembly, making installation and removal of the entire assembly smooth.
- Damaged drop tubes can be easily replaced instead of having to purchase an entire new assembly.
- Fully compatible with gas, gas/alcohol blends, diesel, and biodiesel.
- Compatible with industry standard 4" drop tubes allowing retrofit into existing installations.
- The entire OPV assembly remains within the 4" inner diameter of the riser preventing interference with other tank components and also allowing removal even while the tank is full.
- Actuates in both low and high flow applications and functions within a broad range of flow rates from 25 gpm to 370 gpm (95 lpm to 1,400 lpm).
- The remote testing tool allows for remote testing of the primary functionality without having to remove the OPV from the rise.

SPECIFICATIONS

Approvals & Certifications	- ULc listed - ATEX approved - FN/KIWA certified

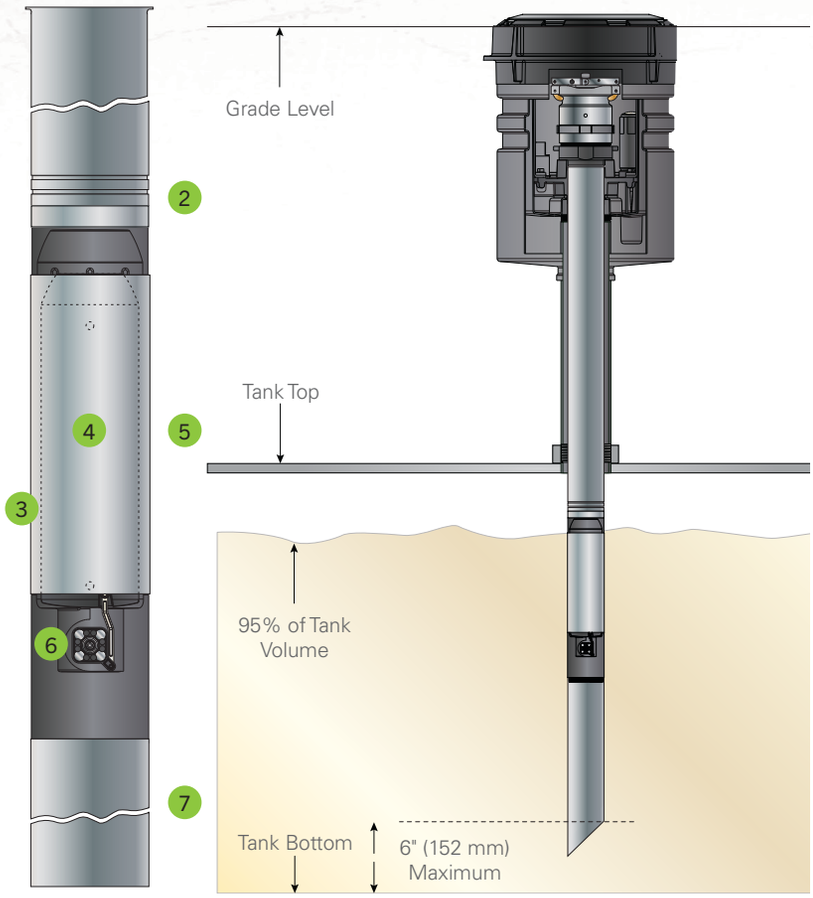
Dimensions



SPECIFICATIONS CONTINUED

Components

1. Pre-flanged aluminium top drop tube
2. Roll-crimped top fitting/drop tube
3. Protective float sleeve
4. Float (shielded by float sleeve)
5. Valve Assembly
6. Magnetically-coupled actuator
7. Threaded bottom drop tube.



ORDERING INFORMATION

Model	Description
708591901	Defender Series® overfill prevention valve with 5'top drop tube, 8'bottom drop tube for EN/KIWA
708591902	Defender Series® overfill prevention valve with 5'top drop tube, 10'bottom drop tube for EN/KIWA
708591921	Defender Series® overfill prevention valve with 5'top drop tube, 8'bottom drop tube, AGB compatible for EN/KIWA*
708591922	Defender Series® overfill prevention valve with 5'top drop tube, 10'bottom drop tube, AGB compatible for EN/KIWA*
708592901	Defender Series® overfill prevention valve with 10'top drop tube, 8'bottom drop tube for EN/KIWA
708592902	Defender Series® overfill prevention valve with 10'top drop tube, 10'bottom drop tube for EN/KIWA
708592921	Defender Series® overfill prevention valve with 10'top drop tube, 8'bottom drop tube, AGB compatible for EN/KIWA*
708592922	Defender Series® overfill prevention valve with 10'top drop tube, 10'bottom drop tube, AGB compatible for EN/KIWA*
708593901	Defender Series® overfill prevention valve, coaxial with 6.5'top drop tube, 8'bottom drop tube for EN/KIWA
708593902	Defender Series® overfill prevention valve, coaxial with 6.5'top drop tube, 10'bottom drop tube for EN/KIWA
708593923	Defender Series® overfill prevention valve, poppeted coaxial with 6.5'top drop tube, 8'bottom drop tube for EN/KIWA
708593924	Defender Series® overfill prevention valve, poppeted coaxial with 6.5'top drop tube, 10'bottom drop tube for EN/KIWA
708594901	Defender Series® overfill prevention valve only with top adapter, AGB compatible for EN/KIWA*
708594902	Defender Series® overfill prevention valve only with coaxial top adapter, AGB compatible for EN/KIWA*
708535901	Roll crimping tool
708530930	Replacement roll crimper tool roller bit for retrofit with existing tool
708534901	Remote testing tool, 11'long sectional/collapsible
708690930	ASM, overfill prevention valve, SPARE PART, EN/KIWA
708691901	Dual PT, overfill prevention valve with 5'top drop tube, 8'bottom drop tube for EN/KIWA
708691901SA	Dual PT, overfill prevention valve with 5'top drop tube, 8'bottom drop tube for EN/KIWA, Made in USA
708691902	Dual PT, overfill prevention valve, 5'top drop tube, 10'bottom drop tube for EN/KIWA
708691921	Dual PT, overfill prevention valve, 5'top drop tube, 8'bottom drop tube, AGB compatible for EN/KIWA
708691922	Dual PT, overfill prevention valve, 5'top drop tube, 10'bottom drop tube, AGB compatible for EN/KIWA
708692901	Dual PT, overfill prevention valve, 10'top drop tube, 8'bottom drop tube for EN/KIWA
708692902	Dual PT, overfill prevention valve, 10'top drop tube, 10'bottom drop tube for EN/KIW
708692902SA	Dual PT, overfill prevention valve, 5'top drop tube, 8'bottom drop tube, AGB compatible for EN/KIWA, Made in USA
708692921	Dual PT, overfill prevention valve, 10'top drop tube, 8'bottom drop tube, AGB compatible for EN/KIWA
708692922	Dual PT, overfill prevention valve, 10'top drop tube, 10'bottom drop tube, AGB compatible for EN/KIWA
708693901	Coaxial, overfill prevention valve, 6.5'top drop tube, 8'bottom drop tube for EN/KIWA
708693902	Coaxial, overfill prevention valve, 6.5'top drop tube, 10'bottom drop tube for EN/KIWA
708693923	PPT Coaxial, overfill prevention valve, 6.5'top drop tube, 8'bottom drop tube for EN/KIWA
708693924	PPT Coaxial, overfill prevention valve, 6.5'top drop tube, 10'bottom drop tube for EN/KIWA
708694901	Dual PT, overfill prevention valve, W/ADAPTERS, EN/KIWA
708694902	Coaxial, overfill prevention valve with adaptor for EN/KIWA
708694951	Cutaway, Dual PT,overfill prevention valve with adaptor for EN/KIWA, **DEMO ONLY-DO NOT INSTALL**
708694952	Kit: Cutaway, overfill prevention valve with adaptor for EN/KIWA, **DEMO ONLY-DO NOT INSTALL**

**Alcohol, gas, biofuel compatible (E-85, gasoline and biodiesel) models come with hard coated anodized drop tubes for full compatibility.*

AUTOLIMITER® II AUTOMATIC OVERFILL PREVENTION VALVE

The Autolimiter® overfill prevention valve is a self contained two-stage positive shut-off valve designed to prevent the overfill of an underground storage tank (UST) during a gravity fed product delivery. When the liquid level of the UST reaches about 92% of the tank capacity during a fill, the product in the tank raises the lower float of the valve. The primary poppet of the valve is then released and reduces flow to about 10% of normal flow. The sudden reduction in flow created by the closing of the primary poppet provides "line shock" to the fill hose notifying the transport delivery driver the tank is nearing 95% capacity. The transport delivery driver can then stop filling the tank, disconnect and drain the delivery hose. The upper float will close off the product flow when the product level reaches 95% of the tank capacity.



HIGHLIGHTS

- Two-stage, spring-loaded shut-off flapper reduces line shock.
- Vertical float design allows for valve to be removed even when tank is full.
- Inspection test port.
- Bottom tube threads on (except for -04 models).

ORDERING INFORMATION

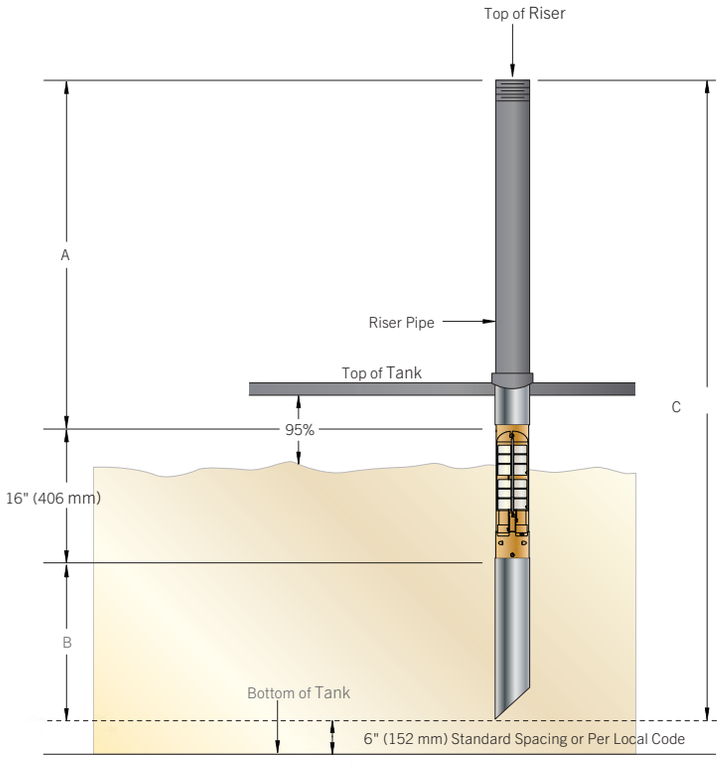
Model	Description
70849404	Overfill Prevention Valve only 4" without Drop Tube (valve only)

SPECIFICATIONS

Installation	- The Autolimiter® II is designed solely for underground storage tanks. For gravity drops only. - This product is for use in tight fill applications only. - EVR Phase 1 models require T-6100-FT installation tool.

WARNING

No attempt should be made to utilize this product with aboveground storage tanks. The valve would not function, creating a very dangerous condition.



Note: EVR valves require faring tool.

WARDEN® AST OVERFILL PREVENTION VALVE

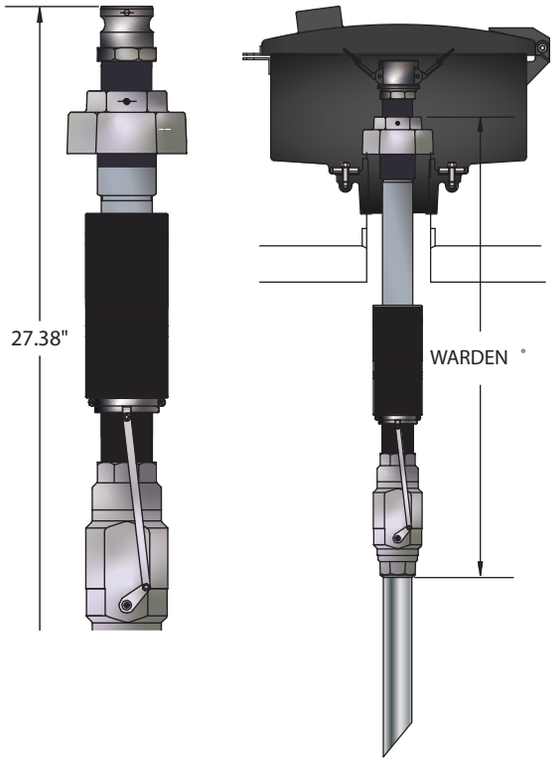


The EBW Warden® is designed to provide a positive shut-off during a pressurised fill delivery on an aboveground storage tank. It eliminates spills and overfills, avoiding costly clean-up expenses and ground contamination. The Warden® is fully adjustable to provide shut-off in various height and capacity aboveground tanks. It is designed to fit into a 4" fill riser, making installation on new and existing locations simple and quick. Designed with inverted floats for use in small or large rectangular tanks. Requires 4" minimum ullage.

Note: The Warden® is recommended for use with clean product only. Contaminated product may cause erratic operation or valve failure.

HIGHLIGHTS

- Cylindrical float design eliminates interference with tank walls and cross braces.
- 6.9 bar working pressure rating.
- Flow rate 757 L/min at 1.38 bar.
- No minimum flow rate.
- Ships complete with upper nipple and tight fill adapter with crossbar to prevent open fills.
- Simply thread onto a 4" riser pipe to install. Length of upper tube determines shut-off point.



SPECIFICATIONS

Valve body	Aluminium 356-T6
Poppet	Aluminium 356-T6
Shaft	Stainless steel
Float	High density polyethylene
Nipple	Epoxy coated black iron pipe

ORDERING INFORMATION

Model	Description	Weight	
		Lbs.	Kg
70942001	Warden®, 4" overfill with inverted floats	12.5	5.67
77421220	2" dust cap	1.25	0.57

REMOTE FILL KIT

The EBW® remote fill kit is needed when your tank location does not allow the space for a tanker truck or a convenient means to fill your tanks during high traffic periods. The remote fill can also be utilised for day or night filling, allowing delivery away from the main building during the day and close to the building during nighttime hours.



HIGHLIGHTS

- More flexibility with station and equipment design.
- Allows for sticking tank through main fill adapter.

ORDERING INFORMATION

Model	Length of Top Tube with Kit		Weight	
	In	M	Lbs	Kg
70832002	72	1.8	6.4	2.9

DROP TUBES

EBW® drop tubes are available in two wall thicknesses. The thin wall (.035 and .042 thickness) models offer easy handling and installation. The heavy wall (.062 thickness) models offer more durability. The drop tube fits directly into the underground tank riser pipe in dual point vapour recovery and conventional non-vapour recovery fill systems. Fuel is efficiently delivered at a faster rate, and allows submerged filling, which generates less vapours and evapouration. The drop tubes are furnished with a straight cut bottom, which can be cut to length on the job site.



HIGHLIGHTS

- Flared end with Buna-N gasket for positive seating.

SPECIFICATIONS

For use	With outside clamping drop elbows on adapter only. Do not use with inside expanding drop elbows
Tubes per box	2" size shipped six tubes per box

ORDERING INFORMATION

Model	Description	Tubes per Box	Size	Size	Wall Thickness		OD		Weight	
			mm × m	In × Ft	mm	In	mm	In	Kg	Lbs
782204102	Drop Tube, Aluminium 4" x 10' Pack of 2	2	102 × 3.05	4 × 10	1.58	0.062	99	3.88	10	22

REMOTE FILL SPLICE KIT FOR DEFENDER SERIES® OPV

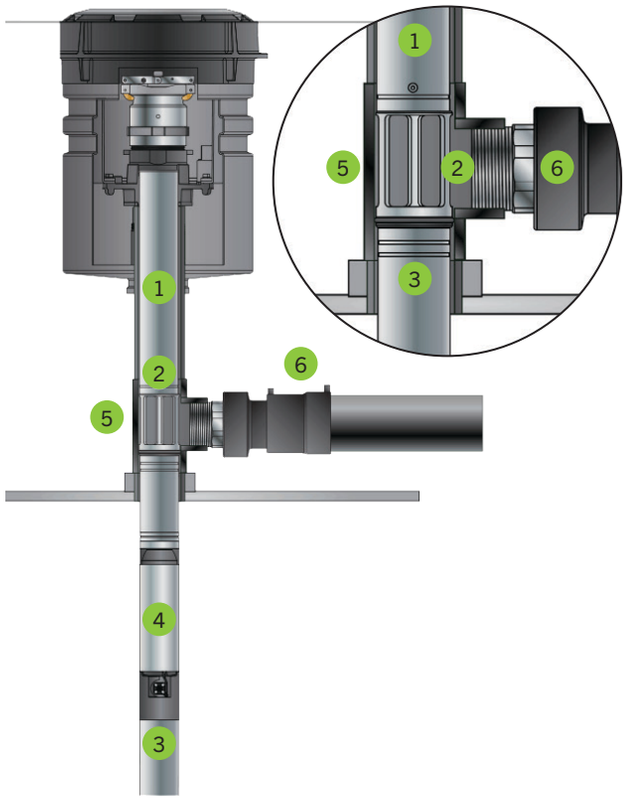


The Defender Series® remote fill splice kit allows you to modify a standard drop tube for remote fill applications. The open tube design provides access to a Defender Series® overfill prevention valve (OPV) for remote testing without having to remove the assembly. The kit contains installation hardware as well as a gasketed splice which is then roll-crimped inside of the drop tube using the Defender Series® OPV installation tool. An external O-ring provides a vapour tight seal inside the riser tee. The kit provides the same biofuel compatibility as the Defender Series® OPV.

SPECIFICATIONS

Components

1. Top drop tube (included with OPV)
2. Defender Series® remote fill splice kit
3. Bottom drop tube (included with OPV)
4. Defender Series overfill prevention valve (included with OPV)
5. 4" x 4" x 4" tee (locally supplied)
6. Remote fill line



Model	Description
708556901	Defender Series® remote fill splice kit, includes splice and O-rings

SEALING DIP CAP

The sealing dip cap prevents the overflowing of a tank through uncapped tank dipstick risers. The 3" sealing dip cap incorporates a spring-loaded, self-closing internal valve which seals when the sealing cap is removed and the dipstick is not in place. This innovative safety feature provides overflow protection whether the sealing cap and the dipstick are removed, or the sealing cap is in position with an attached dipstick stored in the tank.



HIGHLIGHTS

- Threads onto 3" NPT or BSPT riser pipes, with adapter available for 2" NPT or BSPT riser pipes.
- Substantial safety improvement for tanks which are frequently dipped.
- Lockable latch to hold sealing cap in place.
- Dipstick can be attached to the sealing cap and stored inside the tank.
- Compact design for minimal height.
- Biofuel compatible.
- Easy to retrofit on existing dipstick riser pipes with minimal site disruption.

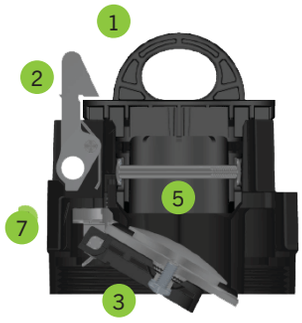
ORDERING INFORMATION

Model	Description
405718901	3" BSPT sealing dip cap
405718902	3" NPT sealing dip cap
405755901	2" BSPT riser adapter for 3" BSPT sealing dip cap model 405718901
405756901	2" NPT riser adapter for 3" BSPT sealing dip cap model 405718901

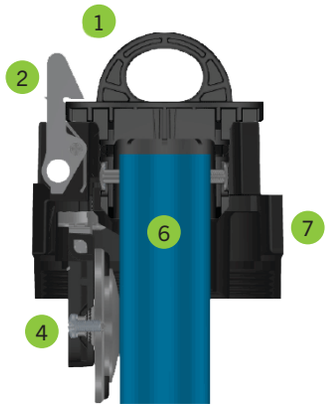
SPECIFICATIONS

Components

1. Sealing cap
2. Lockable latch
3. Self-closing valve (closed)
4. Self-closing valve (open)
5. Dipstick mounting bracket
6. Mounted dipstick
7. Dip cap body



Sealing cap in place



Attached dipstick inserted

SELECTING A SPILL CONTAINER

When you fully understand both your current site needs and where you might be headed in the future, you are able to make a sound decision on which type of spill container is right for your application. Be sure to consider your compliance needs, operational requirements, and weather/environmental conditions when selecting between a Defender Series® grade level or below grade spill container. Use this side-by-side comparison of the two spill container options to assist in making your selection.





	GRADE LEVEL	BELOW GRADE
Single wall containment option	✓	
Double wall containment option	✓	✓
Upgrade from single wall to double wall spill containment	✓	
Integrated monitor option (visual inspection testing)	✓	✓
Integrated electronic sensor option (continual ATG monitoring)	✓	✓
Push-pull drain option	✓	✓
Installs with 1" (2.5 cm) slope to grade level	✓	
Installs flush with grade level		✓
Snow plow ring	✓	
Flush fiberglass composite manway cover		✓
Cast iron gasketed lid	✓	
Gasketed lock-down lid with locking tabs		✓
Containment housed inside a ribbed roto-molded PE gravel guard	✓	
Containment protected by a solid steel manway skirt		✓

DEFENDER SERIES® SPILL CONTAINERS

Defender Series® five gallon spill containers combine years of knowledge and experience in forecourts across the globe to represent the best defense in spill containment. Proactively protecting a site from the dangers of fugitive emissions during fuel delivery can save station owners both time and money by avoiding remediation due to fuel leakage. Available in both grade level and below grade level models to meet the needs of your application and preference, the complete lineup of Defender Series® spill containers provides a durable, easy-to-install, and simple-to-maintain spill containment solution for any environment and any application.



HIGHLIGHTS

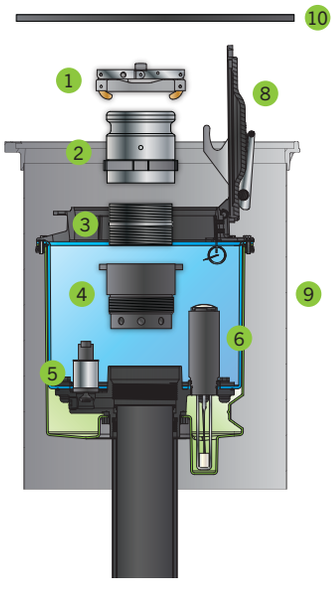
- Available in both grade level and below grade level models to meet the needs of your application and preference.
- Double wall protection complete with integrated visual interstitial integrity monitor or electronic sensor monitoring options for the secondary containment space (single wall grade level option available).
- Visual interstitial monitor facilitates efficient monthly inspections of the integrity of the secondary containment space during walk-through inspections.
- Electronic sensor monitor provides active integrity monitoring of the secondary containment space, providing immediate alarm of liquid when paired with an automatic tank gauge.
- Drop tube adapter ensures a vapour tight seal and easy in and out of drop tube/overfill prevention valve during installation or maintenance.
- Drain valve option, designed to meet CARB leak rate requirements, drains any spilled fuel into the tank.
- Grade level spill containers feature a rugged concrete ring, sturdy snow plow ring, and cast iron lid to deflect forecourt traffic. Their integrated liquid dam and gasketed lid prevent water entry. The container is housed inside a ribbed roto-molded PE gravel guard.
- Below grade spill containers feature a flush fiberglass composite manway lid allowing forecourt traffic to pass cleanly over its top. The gasketed lock-down cover seals water out. The container is protected by a solid steel manway skirt.
- Grade level spill containers offer variable installation height adjustment making it easy to ensure proper installation.
- Below grade spill containers install easily, and cleanly into the included 18" manway for simple installation.
- Easily upgrade from single to double wall without breaking concrete.

SPECIFICATIONS

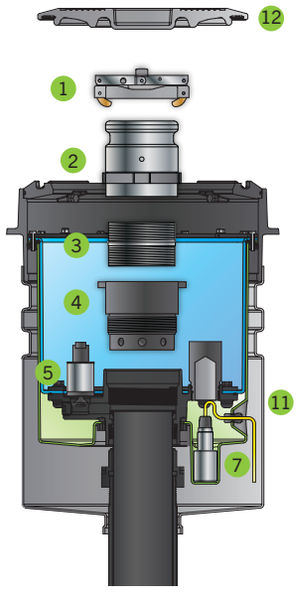
Components

- Primary containment
- Secondary containment
- 1 Adapter cap
- 2 Swivel adapter
- 3 Nipple
- 4 Drop tube adapter
- 5 Drain
- 6 Visual monitor
- 7 Electronic sensor monitor
- 8 Lock down lid
- 9 18" manway
- 10 Fiberglass manway lid
- 11 Gravel guard
- 12 Cast iron gasketed lid

Below Grade

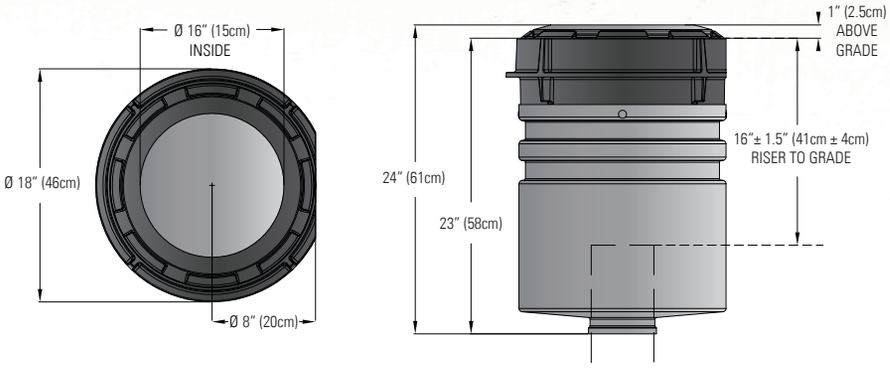


Grade Level

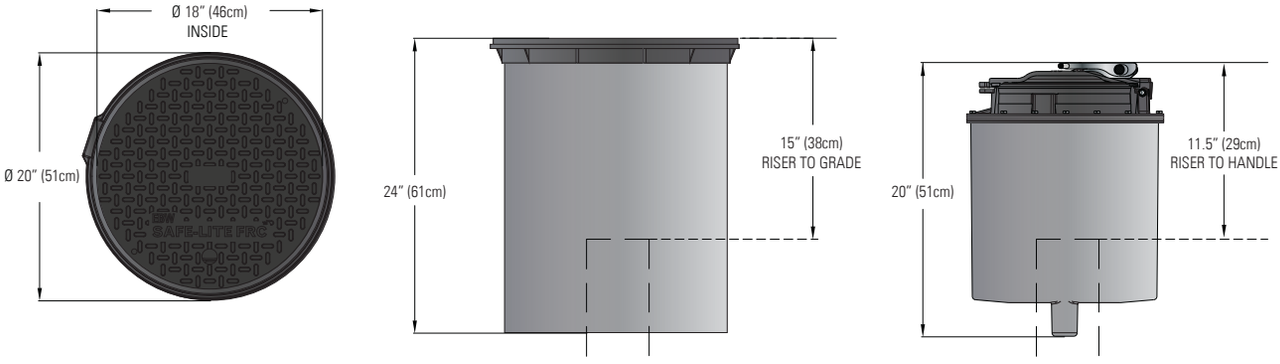


SPECIFICATIONS CONTINUED

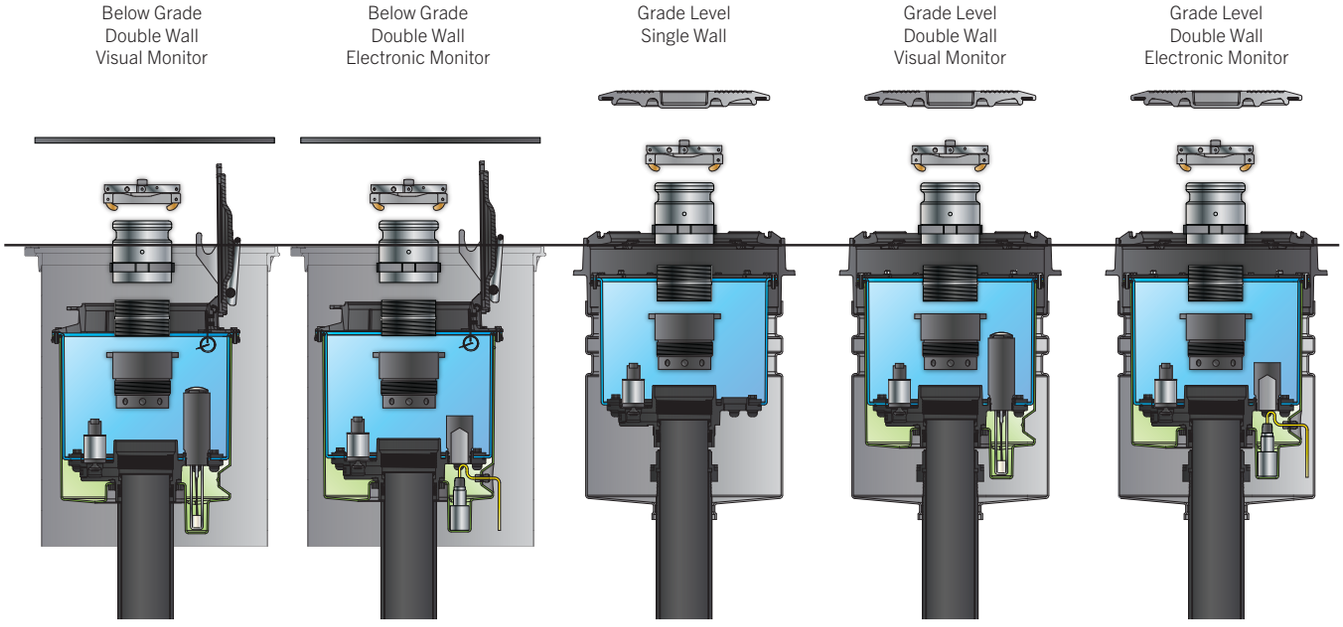
Grade Level Spill Container Dimensions



Below Grade Spill Container Dimensions



Configurations



SPECIFICATIONS CONTINUED

Approvals & Certifications	- ULC Listed (grade level CI-GKT versions only) - CARB approved (grade level only) - Exceeds H20 and HS20 load standards (maximum axle load requiring support for the 32,000 or 16,000 pounds for each set of dual tire wheels

ORDERING INFORMATION

Ordering Guide

Complete spill container part numbers have a specific order and are created using the following guidelines:

XXX	Containment options
545	Grade level single wall
555	Grade level double wall
556	Below grade double wall
YYY	**Interstitial monitoring options**
0	No sensor
1	Visual monitor (float gauge)
2	Electronic sensor motor
A	**Base thread options**
0	NPSM
1	NPT
2	BSPT

B	Drain options
1	Grade level single wall
2	Grade level double wall
C	**Lid/cover***
CI-GKT	Black epoxy-coated cast iron gasketed lid (grade level only)
BLK	Black fiberglass 18" manway cover (below grade only

** API colours available. Call factory for additional lid options.*

Example: 705555111CI-GKT = Defender Series® grade level double wall spill container with visual monitor, with NPT base thread, with drain and with black cast iron gasketed lid.

Example: 705556211BLK = Defender Series® below grade double wall spill container with electronic sensor monitor, with NPT base thread, with drain and with black fiberglass manway cover (manway included).

Defender Series® Spill Containers Common Configurations

Model	Description
705545001CI-GKT	Defender Series® grade level, single wall, NPSM thread, with drain, with black epoxy-coated cast iron gasketed lid
705545002CI-GKT	Defender Series® grade level, single wall, NPSM thread, without drain, with black epoxy-coated cast iron gasketed lid
705545011CI-GKT	Defender Series® grade level, single wall, NPT thread, with drain, with black epoxy-coated cast iron gasketed lid
705545012CI-GKT	Defender Series® grade level, single wall, NPT thread, without drain, with black epoxy-coated cast iron gasketed lid
705545021CI-GKT	Defender Series® grade level, single wall, BSPT thread, with drain, with black epoxy-coated cast iron gasketed lid
705545022CI-GKT	Defender Series® grade level, single wall, BSPT thread, without drain, with black epoxy-coated cast iron gasketed lid
705555101CI-GKT	Defender Series® grade level, double wall, NPSM thread, with drain, with visual monitor, with black epoxy-coated cast iron gasketed lid
705555102CI-GKT	Defender Series® grade level, double wall, NPSM thread, without drain, with visual monitor, with black epoxy-coated cast iron gasketed lid
705555111CI-GKT	Defender Series® grade level, double wall, NPT thread, with drain, with visual monitor, with black epoxy-coated cast iron gasketed lid
705555112CI-GKT	Defender Series® grade level, double wall, NPT thread, without drain, with visual monitor, with black epoxy-coated cast iron gasketed lid
705555211CI-GKT	Defender Series® grade level, double wall, NPT thread, with drain, with electronic sensor monitor, with black epoxy-coated cast iron gasketed lid
705555212CI-GKT	Defender Series® grade level, NPT thread, without drain, with electronic sensor monitor, with black epoxy-coated cast iron gasketed lid
705556111BLK	Defender Series® below grade, double wall, NPT thread, with drain, with visual monitor, with black fiberglass manway cover (18" manway included)
705556112BLK	Defender Series® below grade, double wall, NPT thread, no drain, with visual monitor, with black fiberglass manway cover (18" manway included)
705556211BLK	Defender Series® below grade, double wall, NPT thread, with drain, with electronic sensor monitor, with black fiberglass manway cover (18" manway included)
705556212BLK	Defender Series® below grade, double wall, NPT thread, no drain, with electronic sensor monitor, with black fiberglass manway cover (18" manway included)
705559901**	Defender Series® grade level cutaway display, double wall, with drain, with visual monitor

***For display and demonstration purposes only. Six to eight week lead time.*

Defender Series® Spill Container Installation Tools

Model	Description
T-7001	T-handle wrench
T-7106	Double-ended installation tool
T-7107	Double wall vacuum test kit (for double wall models only)

ORDERING INFORMATION CONTINUED

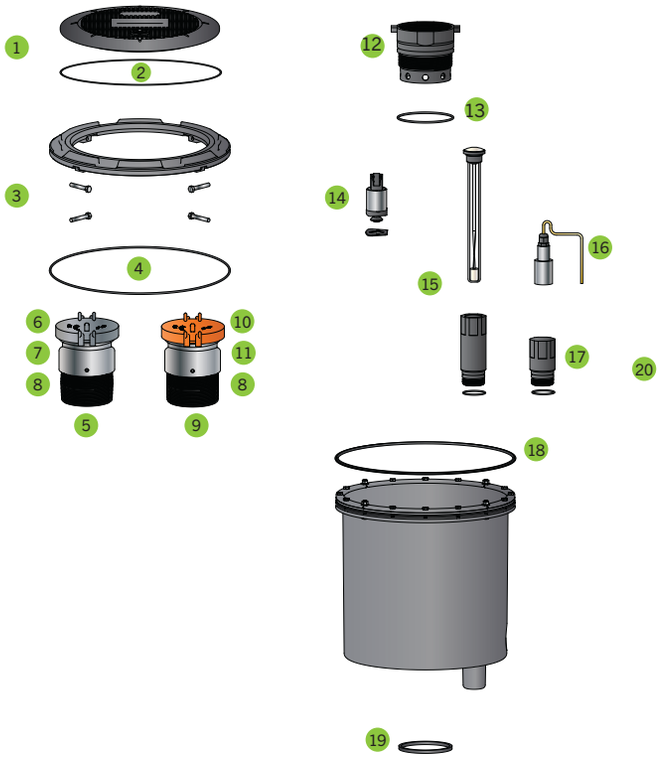
Grade Level Single Wall Replacement Parts

#	Model	Description
1	70544011	Cover, cast iron w/gasket (black)
2	70551911	Cover gasket
3	70553001	Plow ring assembly
4	602009007	Plow ring gasket
5	70541202	Fill riser, cap, and adapter kit
6	77720102	Top seal fill cap
7	SWF-100-SS	Fill swivel adapter
8	70521307	4" x 2.88" close nipple
9	70541302	Vapour riser, cap, and adapter kit
10	30430103	Top seal vapour cap
11	SWV-101-SS	Vapour swivel adapter
12	70550901EC	DT riser clamp assembly
13	1103939	DT riser gasket
14	70533729	Pull-to-push drain valve kit
15	70550311	Spill container seal ring gasket
16	602256001	Tank riser gasket
17	705545001SP	Spill container, NPSM, with drain
	705545002SP	Spill container, NPSM, no drain
	705545011SP	Spill container, NPT, with drain
	705545012SP	Spill container, NPT, no drain



Grade Level Double Wall Replacement Parts

#	Model	Description
1	70544011	Cover, cast iron w/gasket (black)
2	70551911	Cover gasket
3	70553001	Plow ring assembly
4	602009007	Plow ring gasket
5	70541202	Fill riser cap and adapter kit
6	77720102	Top seal fill cap
7	SWF-100-SS	Fill swivel adapter
8	70521307	4" x 2.88" close nipple
9	70541302	Vapour riser, cap, and adapter kit
10	30430103	Top seal vapour cap
11	SWV-101-SS	Vapour swivel adapter
12	70550901EC	DT riser clamp assembly
13	1103939	DT riser gasket
14	70533729	Pull-to-push drain valve kit
15	70553301	I^2 monitor and inspection port kit
16	TSP-ULS	Electronic leak detection sensor
17	70553302	Sensor inspection port
18	70550311	Spill container seal ring gasket
19	602256001	Tank riser gasket
20	705555101SP	Spill container, I2, NPSM, with drain
	705555102SP	Spill container, I2, NPSM, no drain
	705555111SP	Spill container, I2, NPT, with drain
	705555112SP	Spill container, I2, NPT, no drain
	705555201SP	Spill container, sensor, NPSM, with drain
	705555202SP	Spill container, sensor, NPSM, no drain
	705555211SP	Spill container, sensor, NPT, with drain
	705555212SP	Spill container, sensor, NPT, no drain



ORDERING INFORMATION CONTINUED

Below Grade Double Wall Replacement Parts

#	Model	Description
1	78130401	Cover, 18", fiberglass (black)
2	705587901	Lock down cover assembly
3	70541202	Fill riser cap and adapter kit
4	77720102	Top seal fill cap
5	SWF-100-SS	Fill swivel adapter
6	70521307	4" x 2.88" close nipple
7	70541302	Vapour riser, cap, and adapter kit
8	30430103	Top seal vapour cap
9	SWV-101-SS	Vapour swivel adapter
10	70550901EC	DT riser clamp assembly
11	1103939	DT riser gasket
12	70533729	Pull-to-push drain valve kit
13	70553301	I² monitor and inspection port kit
14	TSP-ULS	Electronic leak detection sensor
15	70553302	Sensor inspection port
16	70550311	Spill container seal ring gasket
17	602256001	Tank riser gasket



EBW® SERIES SPILL CONTAINERS

EBW® Series spill containers provide an economical solution for the collection of spilled product during normal tank filling of underground storage tanks. They are available in both grade level and below grade level models to meet the needs of your application and preference. The complete lineup of EBW® Series spill containers provides a basic, easy-to-install, and simple-to-maintain spill containment solution.



HIGHLIGHTS

- Available in both grade level and below grade level models to meet the needs of your application and preference.
- Single wall containment protection.
- The flexible polyethylene container is designed to move with natural ground movements.
- Drain and pump options facilitate easy return of spilled fuel back into the tank.
- A cast iron base provides stability (NPT or BSPT).
- Threaded base for new installations.
- Slip-on grade level models for retrofit applications use a gasket flanged bolt system to secure the spill container to the riser pipe and are designed to eliminate the need to remove the riser pipe from the tank when installing.
- Covers available in a variety of colours to clearly identify product contained in the tank and prevent cross drops.

Grade Level Spill Containers

- 5 gallon capacity.
- Grade level spill containers feature a durable cast iron deflector ring which provides protection from heavy traffic and truck plows while diverting water away from the spill container top.
- The container is equipped with a gravel guard to prevent backfill material from filling in around the movable shell, mitigating issues with ground movement.
- Composite, cast iron, or aluminum cover options.

Below Grade Level Spill Containers

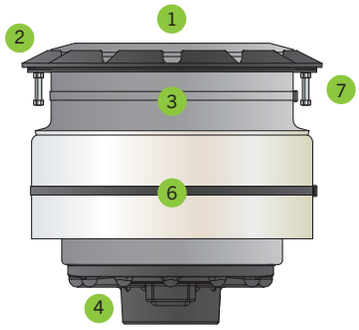
- 5 gallon and 15 gallon capacity options.
- Below grade level spill containers feature a hinged, locking, watertight cover that prevents water from entering the containment.
- They include an 18" wide, 8" deep cast iron manway with either a composite or steel lid that allows forecourt traffic to pass cleanly over its top.

SPECIFICATIONS

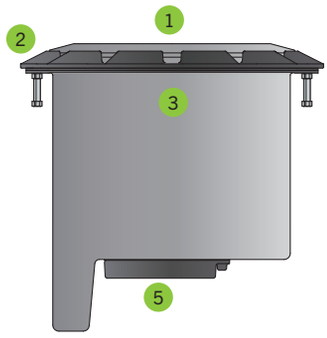
Components

1. Cover
2. Cast iron deflector ring
3. Flexible polyethylene shell
4. Cast iron threaded base
5. Cast iron slip-on base
6. Gravel guard
7. Concrete anchors
8. Locking cover
9. 18" Cast iron manway

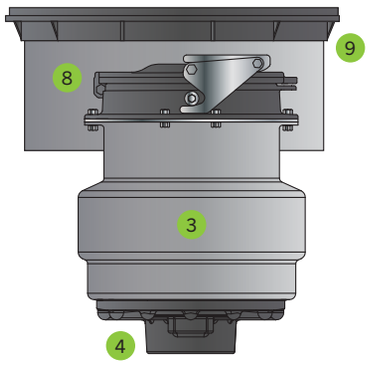
Grade Level



Grade Level Retrofit

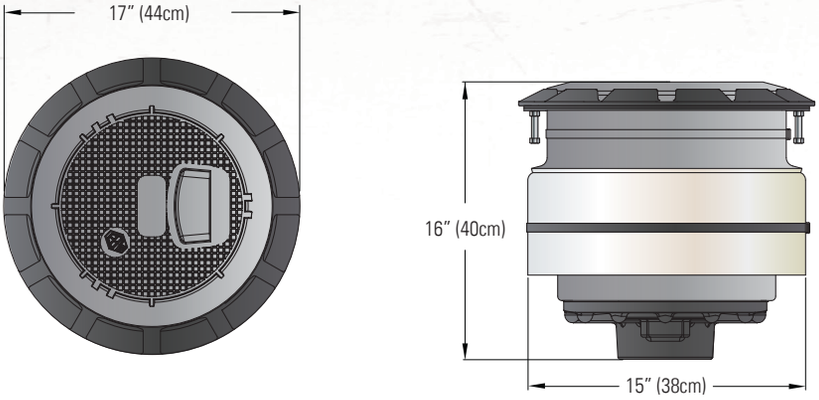


Below Grade

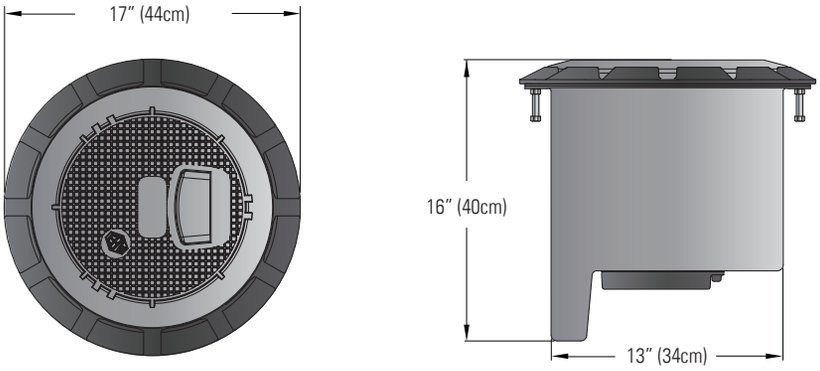


SPECIFICATIONS CONTINUED

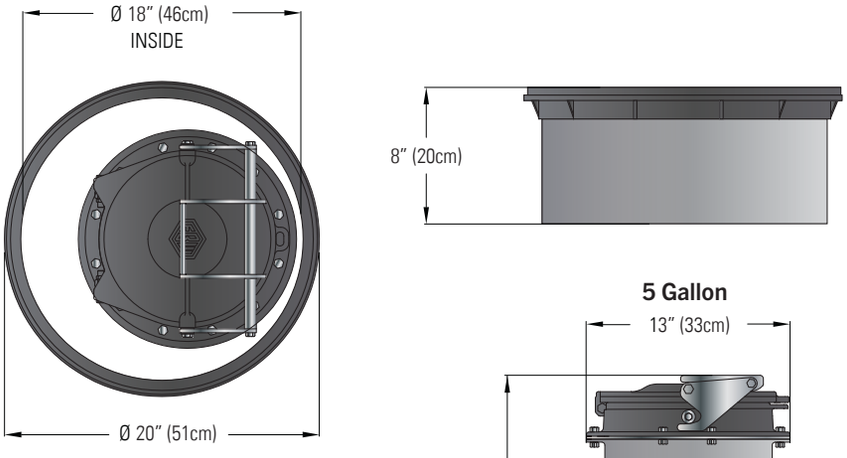
Grade Level Spill Container Dimensions



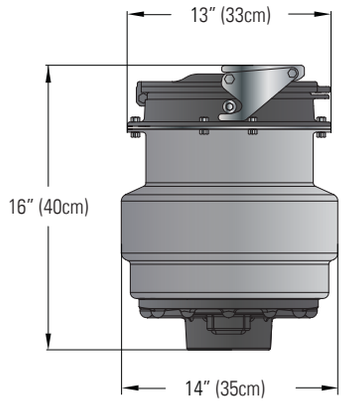
Grade Level Retrofit Spill Container Dimensions



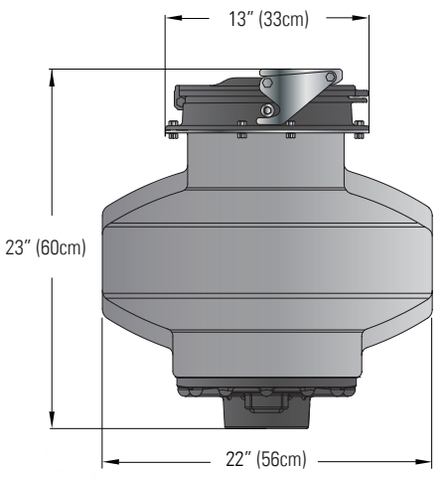
Below Grade Spill Container Dimensions



5 Gallon



15 Gallon



SPECIFICATIONS CONTINUED

Grade Level Spill Containers Materials	
Base	Cast iron
Container	Polyethylene
Deflecto ring	Cast iron
Cover	Fiber reinforced composite (FRC), cast iron, or aluminum
Below Grade Level Spill Containers Materials	
Base	Cast iron
Container	Polyethylene
Deflector ring	Cast iron
Cover	Fiber reinforced composite (FRC), or steel

Approvals & Certifications	- Spill containers and manways exceed DOT H20 requirements - ULC listed, MH21091* - CARB Phase 1 EVR approved, VR-101

**See ordering information for a listing of specific spill container models that hold this approval/certification.*

ORDERING INFORMATION

EBW® Series Grade Level Spill Containers



Model	Description	Capacity	Weight
70547001ALUM	Grade level spill container, with drain, NPT threads, aluminium cover	19 L/5 gal	30.6 kg/67.55 lbs
70547002ALUM	Grade level spill container, without drain, NPT threads, aluminium cover	19 L/5 gal	--
70547021ALUM	Grade level spill container, with drain, BSPT threads, aluminium cover	19 L/5 gal	30.6 kg/67.55lbs
70547001BLK	Grade level spill container, with drain, NPT threads, black composite cover	19 L/5 gal	25 kg/54 lbs
70547002BLK	Grade level spill container, without drain, NPT threads, black composite cover	19 L/5 gal	--
70547021BLK	Grade level spill container, with drain, BSPT threads, black composite cover	19 L/5 gal	25 kg/54 lbs
70547901CI-GKT**	Grade level spill container, with drain, NPT threads, cast iron cover with gasket	19 L/5 gal	25.4 kg/56 lbs
70547902CI-GKT**	Grade level spill container, without drain, NPT threads, cast iron cover with gasket	19 L/5 gal	30.8 kg/68 lbs
70549001BLK***	Grade level spill container, with drain, NPT threads, black composite cover (CARB approved)	57 L /15 gal	28 kg/62 lbs
70549002BLK***	Grade level spill container, without drain, NPT threads, black composite cover (CARB approved)	19 L/5 gal	19.3 kg/42 lbs

***ULC listed, MH21091*

****CARB Phase 1 EVR approved, VR-101*

EBW® Series Grade Level Retrofit Spill Containers



Model	Description	Capacity	Weight
70240001BLK	Grade level retrofit spill container, with pump, slide-on base, black composite cover	19 L/5 gal	17.2 kg/37.9 lbs
70240002BLK	Grade level retrofit spill container, without pump, slide-on base, black composite cover	19 L/5 gal	--
70240401CI-GKT[1]	Grade level retrofit spill container, with pump, slide-on base, cast iron cover with gasket	19 L/5 gal	17.2 kg/38 lbs
70240402CI-GKT[1]	Grade level retrofit spill container, without pump, slide-on base, cast iron cover with gasket	19 L/5 gal	16.8 kg/37 lbs

[1]*ULC listed, MH21091*

EBW® Series Grade Level Spill Container Covers

Replace the last letters in any standard spill container part number for these cover options.

Model	Description
BLK	Black composite
WHT	White composite
RED	Red composite
YEL	Yellow composite
ORG	Orange composite
BRN	Bronze composite

Model	Description
WHT-X	White with black cross composite
RED-X	Red with white cross composite
ALUM	Aluminium
CI	Cast iron
CI-GKT	Cast iron with gasket

ORDERING INFORMATION CONTINUED

EBW® Series Below Grade Spill Containers





Model	Description	Capacity	Weight
70547401BLK*	Below grade spill container, with drain, NPT threads, 18" x 8" manway with black composite cover	19 L / 5 gal	41.7kg / 92lbs
70547402BLK*	Below grade spill container, without drain, NPT threads, 18" x 8" manway with black composite cover	19 L / 5 gal	42.6kg / 94lbs
70549201BLK**	Below grade spill container, with drain, NPT threads, 18" x 8" manway with black composite cover (CARB approved)	19 L / 5 gal	41.7kg / 92lbs
70549202BLK**	Below grade spill container, without drain, NPT threads, 18" x 8" manway with black composite cover (CARB approved)	19 L / 5 gal	42.6kg / 94lbs
71547401BLK*	Below grade spill container, with drain, NPT threads, 18" x 8" manway with black composite cover	57 L /15 gal	43.5kg / 96lbs
71547402BLK*	Below grade spill container, without drain, NPT threads, 18" x 8" manway with black composite cover	57 L /15 gal	43.5kg / 96lbs
71549201BLK**	Below grade spill container, with drain, NPT threads, 18" x 8" manway with black composite cover (CARB approved)	57 L /15 gal	50.8kg / 112lbs
71549202BLK**	Below grade spill container, without drain, NPT threads, 18" x 8" manway with black composite cover (CARB approved)	57 L /15 gal	50.8kg / 112lbs

**ULC listed, MH21091*
***CARB Phase 1 EVR approved, VR-101*

EBW® Series Manway Covers

Replace the last letters in any standard spill container part number for these cover options.

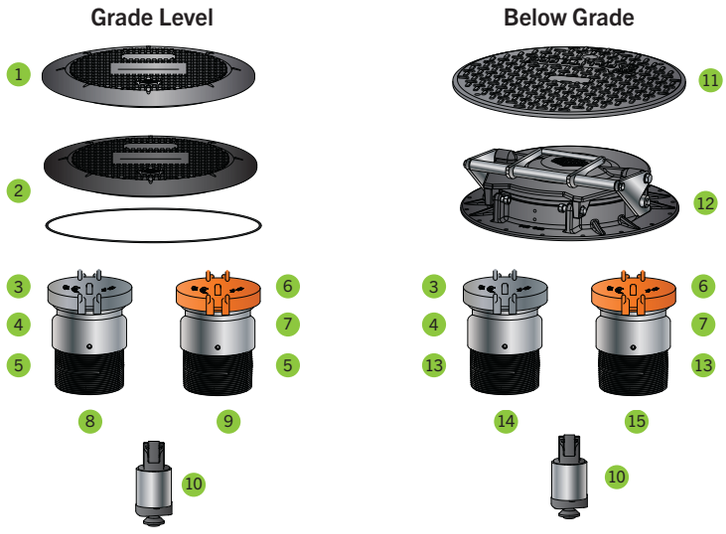
Model	Description
BLK	Black composite
WHT	White composite
RED	Red composite

Model	Description
YEL	Yellow composite
ORG	Orange composite
STL	Steel

EBW® Series Spill Container Replacement Parts

#	Model	Description
1	70542301	Cover, composite (black)
2	70544011	Cover, cast iron w/gasket (black)
3	77720102	Top seal fill cap
4	SWF-100-SS	Fill swivel adapter
5	70521307	4" x 3" close nipple
6	30430103	Top seal vapour cap
7	SWV-101-SS	Vapour swivel adapter
8	70541202	Fill riser, cap, and adapter kit for grade level spill containers
9	70541302	Vapour riser, cap, and adapter kit for grade level spill containers
10	70533219***	Pull-to-push drain valve kit
11	78130401	Cover, 18", fiberglass (black)
12	71040114 71040201	Lock down cover w/ base Lock down cover w/o base
13	70521305	4" x 5" close nipple
14	70541201	Fill riser, cap, and adapter kit for below grade spill containers
15	70541301	Vapour riser, cap, and adapter kit for below grade spill containers

****CARB approved model (P/N 70533719) also available.*



ROUND ACCESS COVERS & SKIRTS

These manways have a proven track record of trouble-free operation. Their durable construction withstands the heaviest traffic and meets the requirements of a D.O.T. H20 load rating.



HIGHLIGHTS

- Cast iron cover and rings – EBW® 7½" round manways have ribbed cast iron covers and cast iron rings to withstand heavy loads and traffic.
- Heavy duty skirts – EBW® 7½" round manways have heavy duty cast iron skirts. 12" and 18" round manways have a 16 gauge welded steel skirt and are available in different depths to fit your needs.
- Coloured cover options – EBW® 18" round manways can be ordered with optional FRC coloured covers in standard API colour codes. The FRC covers also include a recessed area for optional API colour coded identification plates.
- Highway 20 Rated (D.O.T. H20) – All EBW® spill containers and manways exceed the D.O.T. H20 requirement.

ORDERING INFORMATION

Model	Manway Size		Cover	Skirt Depth		Weight	
	In	mm		In	mm	Lbs	Kg
78120808	7.5	191	Cast iron	8	203	22	10
78121212CI	12	305	Cast iron	12	305	36	16
78121212CI-H	12	305	Cast iron with handle	12	305	36	16
78121224CI	12	305	Cast iron	24	610	70	32
78141808BLK	18	457	FRC	8.5	216	30	14
78141808GRY	18	457	FRC	8.5	216	30	14
78141812BLK	18	457	FRC	12	305	33	15
78141812GRY	18	457	FRC	12	305	33	15
78141818BLK	18	457	FRC	18	457	39	18
78147865	18	457	FRC bolted	8.5	216	30	14

Replacement Round Manway Covers

Model, with drain	Manway Size		Cover	Weight	
	In	mm		Lbs	Kg
78130201	12	305	FRC black	10	5
78130207	12	305	FRC orange	10	5
78130401	18	457	FRC black	10	5
78130601	18	457	0.375" steel	33	15
78140001	12	305	Cast iron	17	8
78140201	7.5	191	Cast iron	6	3
78140701	12	305	Cast iron with handle	18	8.1
78133401	18	457	Bolt-down FRC black	10	15

STEEL ACCESS COVERS

Available in 18" and 24" round.

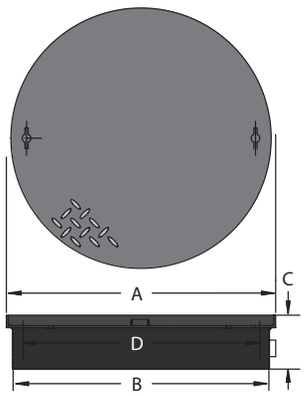


HIGHLIGHTS

- Covers meet or exceed D.O.T. H20 load rating.
- Painted rustproof black.

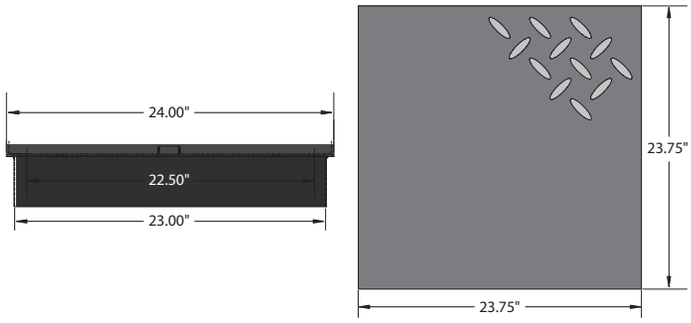
ORDERING INFORMATION

Model	Dimensions		Skirt Size		Cover	Weight	
	In	cm	In	cm		Lbs	Kg
78141808STL	18	45.72	8	20.32	Non-bolted	39	17.6
78141812STL	18	45.72	12	30.48	Non-bolted	41	18.6
78141818STL	18	45.72	18	45.72	Non-bolted	44	19.95
SR1809 WT	18	45.72	9	22.86	Bolted	40	18.14
SR2409 HD	24	60.96	9	22.86	Non-bolted	70	31.75



SPECIFICATIONS

Model	A		B		C		D	
	In	cm	In	cm	In	cm	In	cm
78141808STL	19	48.26	18	45.72	8.5	21.59	17.93	45.54
78141812STL	19	48.26	18	45.72	12	30.48	17.93	45.54
78141818STL	19	48.26	18	45.72	18	45.72	17.93	45.54
SR1809 WT	17.5	44.45	16.75	42.55	9	22.86	16.25	41.28
SR2409 HD	23.5	59.69	22.75	57.79	9	22.86	22.25	56.52



COMPOSITE MANHOLES



At a fraction of the weight of typical steel manholes, FLEX-ING® brand composite manholes give you all the benefits of a solid, well-constructed manhole with none of the difficulties you've come to expect from steel. A single technician can easily remove the lightweight cover while the composite construction and design allow the cover to stand up to the harshest forecourt conditions.

HIGHLIGHTS

Solid Construction, No Compromise
We don't compromise with cheap wood or foam fillers. FLEX-ING® brand Composite Manholes are constructed of many layers of high quality fibreglass bonded together with premium resin and then hand-finished with the utmost attention to quality. The end result is a durable, lightweight cover that not only meets, but exceeds most testing standards.

Greater Wall Thickness
FLEX-ING® brand composite manholes feature a domed shape. At their centre, our manholes taper up from 1" to 1¼" in wall thickness while most competitive models remain at a uniform 1" wall thickness. This extra wall thickness provides minimal deflection and an extended service life.

Quality Construction
A shallow handle hole and chest-style handle with backer plate keep the wall thickness higher around this high-impact area of the cover. 38" and 42" come standard with spring loaded handle and are available with cam lock for rain tight applications. Additionally FLEX-ING® brand composite manholes feature a 12 gauge skirt construction that is also powder coated for extreme protection.

SPECIFICATIONS

Materials	Constructed of many layers of high quality fibreglass bonded together with premium resin and then hand finished with the utmost attention to quality
Wall thickness	At their centre. our manholes taper up from 1" to 1 ¼" in wall thickness while most compatible models remain at a uniform 1" wall thickness. This extra wall thickness provides minimal deflection and an extended service life.
Features	A shallow handle hole and chest-style handle with backer plate keep the wall thickness higher around this high-impact area of the cover
	38" and 42" come standard with spring loaded handle and are available with Cam lock for rain tight applications
	12 gauge skirt construction that is also powder coated for extreme protection
	Exceeds H20 and HS20 load standards (maximum axle load requiring support for the 32,000 or 16,000 pounds for each set of dual tire wheels
	Slip resistant

Model	Diameter	Lid Thickness	Frame ID	Skirt Height	Skirt ID	Opening
38" manholes	39.00"	1.00"	39.75"	10.50"	37.00"	35.25"
42" manholes	43.94"	1.00"	44.50"	10.50"	42.00"	41.25"

ORDERING INFORMATION

Model	Description
14U-3810	38" Composite manhole lid, ring, and 10" skirt
14URT-3810	38" Raintight composite manhole lid, ring, and 10" skirt
14U-RT3810CL	38" Raintight composite manhole with 10" skirt and cam locks
14U-3810C	38" Composite manhole lid only
14U-4210	42" Composite manhole lid, ring, and skirt (10")
14URT-4210	42" Raintight composite manhole lid, ring, and skirt (10")
14U-RT4210CL	42" Raintight composite manhole with skirt (10") and cam locks
14U-4210C	42" Composite manhole lid only

FIBER REINFORCED COMPOSITE MANWAYS



EBW® SAFE-LITE FRC manway covers are ultra lightweight. Engineered and tested to exceed the D.O.T. H20 load ratings. Covers weigh almost one-third less than steel which dramatically reduces injury potential during cover removal. Available in 12", 30", 36", and 42" sizes. The slide action cover further reduces the chance of injury by eliminating the need to bend down to remove or replace the cover.

HIGHLIGHTS

- Exceeds D.O.T. Requirements - Engineered for high-strength and tested to over 50,000 lbs. load (2½ times D.O.T. requirement) without failure.
- Fatigue Resistant—Product has undergone 30 year life simulation testing, with 11,000 loading cycles of 20,000 lbs. each.
- Lightweight—FRC composite covers weigh almost one-third less than steel. Lighter weight reduces back injuries, increases ease of access to manway and decreases shipping costs.
- Skirt Ring—Made of 1/4" rolled angle iron. Skirt is 14 gauge steel, built to handle the heaviest traffic.
- Slide Action Cover—Cover is removed and replaced by placing the slide action handle into the plate on the cover. No bending down to remove the cover.
- Cover Options—Bolted, non-bolted and slide on models. All covers are supplied with handles. Other colours available; call for details.

ORDERING INFORMATION

Model	Description	Cover OD
78148206	36" Access cover (only) - slide action, grey	39.5"
78148512GRY	36" Access cover complete with skirt and frame assembly	--
78134101	Handle for slide action cover removal	--

M.H.ASS'Y,36" SLID - 78148512GRY is not supplied with gasket. Gasket must be ordered separately. Gasket part number is NONBOLT KIT.

COMPOSITE ACCESS COVERS



UPP® brand composite access covers feature a lightweight, watertight design for safe and easy access to underground containment. Their large diameter openings provide a wide access point for larger containment spaces. The full composite construction of both the lid and the ring provide complete corrosion resistance. For the ultimate in easy access, dip models feature an integrated inspection port at the centre of the cover lid. Additionally, the locking mechanism seal the cover down to prevent it from spinning out and thwart unwanted access.

HIGHLIGHTS

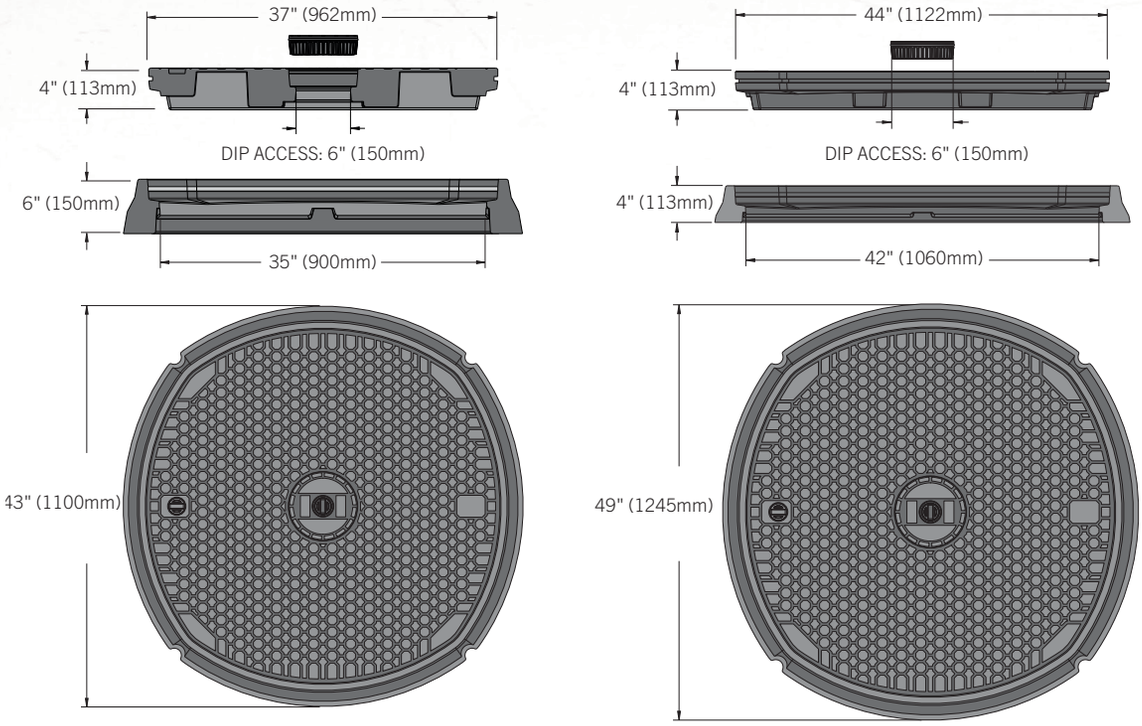
- Two size ranges are available to accommodate varying applications and access opening size requirements including a 35" (900 mm) diameter access opening and a larger 42" (1,060 mm) diameter access opening.
- Complete composite construction is corrosion resistant even in the harshest forecourt conditions as well as resistant to chemical corrosion from petroleum and alcohols.
- Composite construction resists warping and delamination.
- Extremely hard wearing and durable, will not spin out, buckle or lose shape due to pressure forces from vehicles.
- Lockable design provides increased on-site security and safety.
- Anti-slip surface for increased safety.
- Integrated cover O-ring creates a watertight seal between the cover and frame.
- Dip models available with integrated inspection port.
- Locking mechanism key included.
- All component parts are resistant to chemical attack, diesel, petrol, salt and water or a combination over the lifespan of the cover (surface discolouration is acceptable in service).
- Access cover lifting handles make cover removal safe and easy (sold separately).
- Access cover skirts available (sold separately).

SPECIFICATIONS

35" (900 mm) Composite Access Cover	
Load rating	EN124:1994 Class C250 & D400
Clear opening	35 7⁄16" (900 mm) diameter
Cover external dimension	37 7⁄8" (962 mm) diameter
Frame external dimension	43 5⁄16" (1,100 mm) diameter
Cover weight	88 lb (40kg)
Frame weight	29 lbs (13 kg)
Tread	Embedded aggregate - uni-directional, complies with EN124:1994
Material	Advanced fiberglass composite
42" (1,060 mm) Composite Access Cover	
Load rating	EN124:1994 Class C250 & D400
Clear opening	41 3⁄4" (1,060 mm) diameter
Cover external dimension	44 3⁄16" (1,122 mm) diameter
Frame external dimension	49 1⁄16" (1,245 mm) diameter
Cover weight	88 lb (40kg)
Frame weight	29 lbs (13 kg)
Tread	Embedded aggregate - uni-directional, complies with EN124:1994
Material	Advanced fiberglass composite

SPECIFICATIONS CONTINUED

Dimensions



ORDERING INFORMATION

Composite Access Cover

Model	Description
PCR090	35" (900 mm) composite access cover, C250 rating
PDR090	35" (900 mm) composite access cover, D400 rating
PCR090-DIP	35" (900 mm) composite access cover with integrated dip inspection port, C250 rating
PCR106	42" (1,060 mm) composite access cover, C250 rating
PCR106-DIP	42" (1,060 mm) composite access cover with integrated dip inspection port, C250 rating
PDR106-1	42" (1060 mm) composite access cover, D400 rating
PDR106-1-DIP	42" (1060 mm) composite access cover with integrated dip inspection port, D400 rating
PCR-DIPCAP	Replacement dip cap for composite access covers
PCR-LIFT	Lifting handle tool for composite access covers
PCR-LOCK	Locking mechanism for composite access covers
PCR-PLUG	Locking mechanism replacement dust plug
SDFLX40FC	Sealant (to seal access cover frame to skirt)



Lifting Handle Tool

35" (900 mm) Composite Access Cover Accessories

Model	Description
PDR090-S	Replacement gasket for 35" (900 mm) composite access covers (between lid and frame)
PXR090-OCH-SK	35" (900 mm) fiberglass skirt, for use with OCH tank chambers

42" (1,060mm) Composite Access Cover Accessories

Model	Description
PCR106-S	Replacement gasket for 42" (1,060 mm) composite access covers (between lid and frame)
PCR106-OCH1400-SK	42" (1,060 mm) fiberglass skirt, for use with OCH tank chambers
PCR106-TSM4542-SK	42" (1,060 mm) fiberglass skirt, for use with TSM tank chambers

MONITORING WELL MANWAYS

EBW® brand 8", 10", and 14" monitoring well manways are equipped with strong cast iron, bolt-down lids to provide limited access to entering the manway. A watertight seal prevents contamination and a heavy-duty cast iron rim protects the manway from forecourt traffic. The lid features a distinctive triangle and the words "Do Not Fill—Test Well" which are both cast into the cover to meet API specifications.



SPECIFICATIONS

8" manway height/weight	13" (330 mm) / 18 Lbs (8 Kg)
10" manway height/weight	12" (305 mm) / 25 Lbs (11 Kg)
14" manway height/weight	12" (330 mm) / 41 Lbs (19 Kg)

ORDERING INFORMATION

Model	Description
80840001	8" cast iron monitoring well
81030201	10" cast iron monitoring well
81430201	14" cast iron monitoring well

MONITORING WELL CAP PLUGS

EBW® brand monitoring well cap plugs expand on the inside diameter of the screen pipe casing to form a vapour and watertight seal. An integrated locking mechanism prevents unauthorized access. The locking mechanism features a captured bolt, eliminating potential drop-out. The cap is a distinctive yellow colour and features the words "Do Not Fill—Monitor Well" which is moulded into the cap.



SPECIFICATIONS

Body	Corrosion-proof plastic
Gasket	Buna-N

ORDERING INFORMATION

Model	Description
77210601	2" monitoring well cap plug (51 mm)
77210201	4" monitoring well cap plug (102 mm)
77210901	6" monitoring well cap plug (152 mm)

MONITORING WELL SCREEN PIPE

EBW® brand monitoring well screen pipes facilitate groundwater testing by allowing groundwater to pass through horizontal slots in the pipe. The screen pipe features precision cut slot apertures that provide a measured and uniform barrier to ingress with no sharp edges to damage the filter sock or oversized apertures that can allow bulging and perforation of the filter sock.



SPECIFICATIONS

Screen pipe installation	The screen pipe mist be installed with the included bottom cap to prevent any bypass of the well screen pipe apertures and filter wrap
	The screen pipe is intended to be installed together with a filter wrap

ORDERING INFORMATION

Model	Description
77320001	2" x 13'monitoring well screen pipe (51 mm x 396 cm)
77320002	4" x 13'monitoring well screen pipe (102 mm x 396 cm)
77320003	6" x 13'monitoring well screen pipe (152 mm x 396 cm)
77320004	4" x 15'monitoring well screen pipe (102 mm x 457 cm)

MONITORING WELL FILTER WRAP

EBW® brand monitoring well filter wrap is used on the outside of monitoring well screen pipe to further prevent fine soil from entering and blocking the slots.



SPECIFICATIONS

Body	Spun bound polypropylene
Micron rating	250 microns
Availability	Available in 100'(3048 cm) rolls

ORDERING INFORMATION

Model	Description
77310002	2" x 100'monitoring well filter wrap (51 mm x 3048 cm)
77310004	4" x 100'monitoring well filter wrap (102 mm x 3048 cm)

MONITORING WELL PACKAGES

The EBW® brand offering of monitoring well equipment includes all of the necessary hardware components necessary to operate and properly maintain a monitoring well. When combined with the INCON® brand TS-MWS monitoring well brite sensor, you have the ability to accurately detect the presence of hydrocarbon floating on groundwater. This can be programmed to trigger a number of alarm actions, allowing you to react immediately.



SPECIFICATIONS

Manway options	8", 10", 14"
Cap plug options	2", 4", 6"
Screen pipe options	2", 4", 6"
Screen pipe filter wrap options	2" and 4"
Monitoring	Monitoring well discriminating liquid sensor

ORDERING INFORMATION

Model	Description
808-4-K	(1) 808-400-01 8" manway, (1) 772-102-01 4" cap plug, and (1) 773-200-02 4" screen pipe
810-6-K	(1) 810-302-01 10" manway, (1) 772-109-01 6" cap plug, and (1) 773-200-03 6" screen pipe

Note: Filter wrap and liquid sensor sold separately.

PROBE ACCESS MANHOLE

FLEX-ING® brand probe access manholes offer an ideal solution for housing fuel management systems electronics and providing tank access with isolation from backfill.



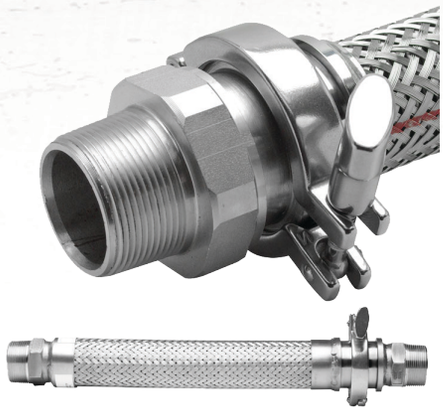
SPECIFICATIONS

Height	14.88" (377.95 mm)
Cover diameter	21.87" (550.50 mm)
Bottom diameter	14.88" (377.95 mm)
Mounting bolts	⅜" hex head mounting bolts with built-in washers bolt into anchors with coupling

ORDERING INFORMATION

Model	Description
20URTATG	Probe access manhole
81830701	Replacement cover with plain lid top

FLEXIBLE CONNECTORS FOR DEF/ADBLUE®



FLEX-ING® brand diesel exhaust fluid flexible connectors allow you to easily connect a pipework system to other systems components such as submersible pumps. Installers love their ease of installation while station owners have come to depend on their durability and how easy they make regular maintenance. The all-stainless steel construction provides complete compatibility with DEF (Diesel Exhaust Fluid)/ AdBlue®. With tons of available options, Franklin Fueling Systems has the right connector to fit any application.

HIGHLIGHTS

- The corrugated DEF/AdBlue® contact layers feature a 25% thicker metal construction and gain flexibility from having more corrugations per foot rather than thinner walls.
- Enclosing the corrugated DEF/AdBlue® contact layer is a stainless steel braid that is manufactured from only high-grade stainless steel.
- The EZ FIT union style coupling system is specifically designed to make connections in confined spaces simple and tight.
- Each EZ FIT male and female union style coupling comes complete with couplers and gaskets.

SPECIFICATIONS

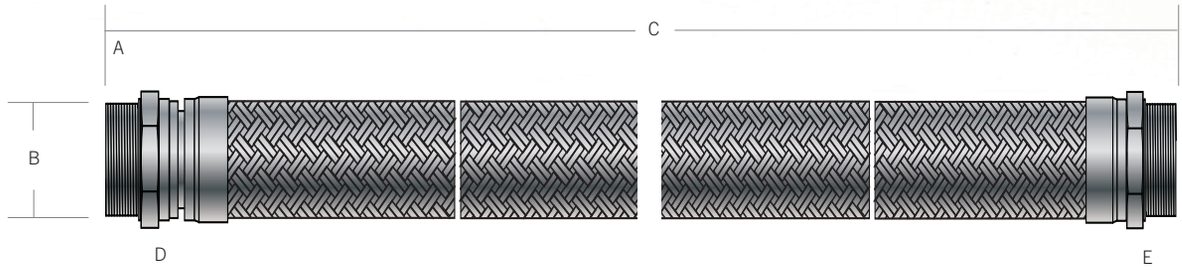
Features	All metal construction means one flexible connector for both above and below ground applications
	An 18-8 alloy outer wrap, 321 Stainless Steel inner core provides a long service life
	Thick, schedule 80 hex end fittings protect against deformation of the ends
Quality check	100% pressure tested to assure quality
Working pressure	50 Psi working pressure
Parts included	EZ FIT clamp and gasket are included with each assembly
Compatibility	Stainless steel fittings and EPDM gaskets are fully DEF/AdBlue® compatible

ORDERING INFORMATION

Use these diagrams below along with the ordering guide at the bottom of the page to help you build your flexible connector model numbers.

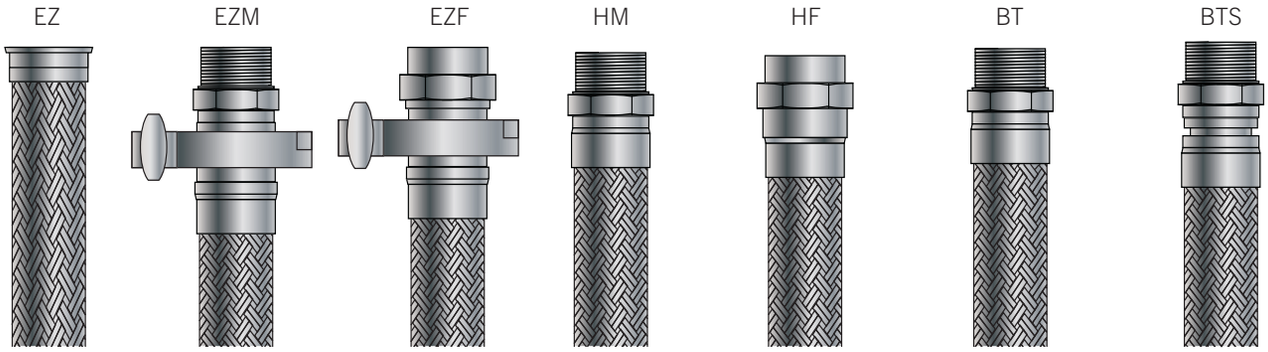
Ordering Options Diagram

Use the options and descriptions in the ordering guide along with this diagram to assist in building your model numbers.



End Fitting Options

Use the options and descriptions in the ordering guide along with the diagrams below to select your end fitting types (two total).



Ordering Guide
DEF A X B C X D

- DEF = DEF/AdBlue® flexible connector
  - All materials are fully compatible with DEF/AdBlue® including stainless steel fittings and EPDM seals.
- A = Hose Diameter
  - 07 = ¾"
  - 10 = 1"
  - 15 = 1½"
  - 20 = 2"
  - 30 = 3"
- B = Overall length in Inches
  - Use two-digit format
- C & D = End fitting options
  - EZ = EZ FIT flange only
  - EZM = EZ FIT male NPT (Each EZ FIT union style coupling comes complete with couplers and gaskets)
  - EZF = EZ FIT female NPT (Each EZ FIT union style coupling comes complete with couplers and gaskets)
  - M = Hex male fixed NPT
  - F = Hex female fixed NPT
  - BT = Hex male fixed BSPT
  - BTF = Hex female fixed BSPT

Example: DEF20X18MXEZM = DEF flexible connector, 2" hose diameter, 18" overall length, with one hex male fixed NPT fitting on one end and one EZ FIT male NPT fitting on the other (includes EZCLAMP and EZ20GASKET-EPDM).

ORDERING INFORMATION CONTINUED

Flexible Connectors with Differing Hose and End Fitting Diameters

All end fittings are, by default, the same diameter as the hose. If you require a flexible connector where the end fitting diameter does not match the hose diameter, the size must be indicated numerically in front of the corresponding fitting (see below):

Rules:

- End fitting diameters can not be smaller than hose diameters.
- Only one hose fitting per flexible connector can be of a different diameter than the hose diameter.
- End fitting diameter must only be one size larger than hose (1" hose could use 1½" fitting, 1½" hose could use 2" fitting, etc.)

Example: DEF15X18MX2M = DEF flexible connector, 1½" hose diameter, 18" overall length, with one 1½" hex male fixed NPT fitting on one end and one 2" male NPT fitting on the other.

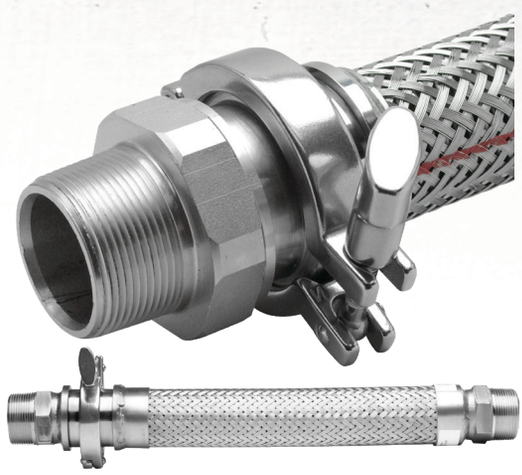
Common Models

You can also select from the following most-common flexible connector model numbers.

Model	Description
DEF10X10MXEZM	DEF flexible connector, 1" hose diameter, 254 mm overall length, with one hex male fixed NPT fitting on one end and one EZ FIT male NPT fitting on the other
DEF10X12MXEZM	DEF flexible connector, 1" hose diameter, 305 mm overall length, with one hex male fixed NPT fitting on one end and one EZ FIT male NPT fitting on the other
DEF10X12MXM	DEF flexible connector, 1" hose diameter, 305 mm overall length, with one hex male fixed NPT fitting on one end and one hex male fixed NPT fitting on the other
DEF10X15MXM	DEF flexible connector, 1" hose diameter, 381 mm overall length, with one hex male fixed NPT fitting on one end and one hex male fixed NPT fitting on the other
DEF10X18MXM	DEF flexible connector, 1" hose diameter, 457 mm overall length, with one hex male fixed NPT fitting on one end and one hex male fixed NPT fitting on the other
DEF15X18MXEZM	DEF flexible connector, 1½" hose diameter, 457 mm overall length, with one hex male fixed NPT fitting on one end and one EZ FIT male NPT fitting on the other
DEF15X18MXM	DEF flexible connector, 1½" hose diameter, 457 mm overall length, with one hex male fixed NPT fitting on one end and one hex male fixed NPT fitting on the other
DEF20X12MXM	DEF flexible connector, 2" hose diameter, 305 mm overall length, with one hex male fixed NPT fitting on one end and one hex male fixed NPT fitting on the other
DEF20X18MXEZM	DEF flexible connector, 2" hose diameter, 457 mm overall length, with one hex male fixed NPT fitting on one end and one EZ FIT male NPT fitting on the other
DEF20X18MXM	DEF flexible connector, 2" hose diameter, 457 mm overall length, with one hex male fixed NPT fitting on one end and one hex male fixed NPT fitting on the other
DEF20X24MXEZM	DEF flexible connector, 2" hose diameter, 610 mm overall length, with one hex male fixed NPT fitting on one end and one EZ FIT male NPT fitting on the other
DEF20X24MXM	DEF flexible connector, 2" hose diameter, 610 mm overall length, with one hex male fixed NPT fitting on one end and one hex male fixed NPT fitting on the other
DEF20X30MXF	DEF flexible connector, 2" hose diameter, 762 mm overall length, with one hex male fixed NPT fitting on one end and one hex female fixed NPT fitting on the other

FLEXIBLE CONNECTORS

FLEX-ING® brand flexible connectors have become the industry standard and benchmark for quality as a means to easily connect a pipework system to other system components such as submersible pumps or shear valves. As an integral part of any system, installers enjoy how easy they make connections in tight spaces while station owners have come to depend on their durability and their simplification of regular maintenance. End fittings are available in either nickel plated steel or stainless steel construction. FLEX-ING® flexible connectors offer multiple diameter and length options as well as a wide offering of end fitting connections so you can create the right flexible connector to fit virtually any application.



HIGHLIGHTS

- Standard on all flexible connectors, the stainless steel corrugated fuel contact layers feature a thick construction and gain flexibility from having more corrugations per foot rather than thinner walls.
- Enclosing the corrugated fuel contact layer is a stainless steel braid that is manufactured from only high-grade stainless steel.
- Standard end fittings are nickel plated steel with stainless steel construction options available on any flexible connector that does not include a swivel end fitting.
- Available in a multitude of end connections to ensure the right fit for any application – including tees, elbows, and fiberglass transitions.
- All metal construction means one flexible connector for both above and below ground applications (may not be direct buried).
- Schedule 80 hex end fittings protect against deformation of the ends during installation.
- The EZ FIT union style coupling system is specifically designed to make connections in confined spaces simple and tight.
- EZ FIT union style couplings come complete with couplers and gaskets (flange only fittings excluded).

SPECIFICATIONS

Requirements	Meets USA NFPA 30-A fire code requirements
Outer shell	304 stainless steel
Inner core	321 stainless steel
End fittings	Nickel plated steel or stainless steel
Pressure tested	100% pressure tested to 100 PSI to assure quality
Approvals / Certifications	- UL 2039 listed for above and below ground installation for use with gasoline, gas alcohol blends (up to E85), diesel, and Biodiesel - UL 2039 approved for 50 psi working pressure

End Fitting Options

1. EZ Fit flange only*
2. EZ Fit male*
3. EZ Fit female*
4. EZ Fit fiberglass (glued)
5. Male swivel
6. Female swivel
7. Hex male fixed (NPT)*
8. Hex female fixed (NPT)
9. Hex male fixed (BSPT)
10. Hex male swivel (BSPT)
11. 90° male swivel
12. EZ Fit tee
13. Flat faced round flange*
14. Raised faced round flange*

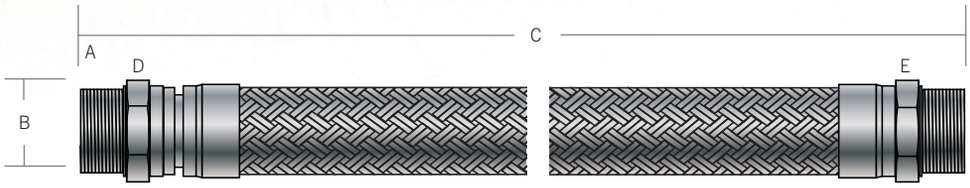
**Also available in stainless steel.*



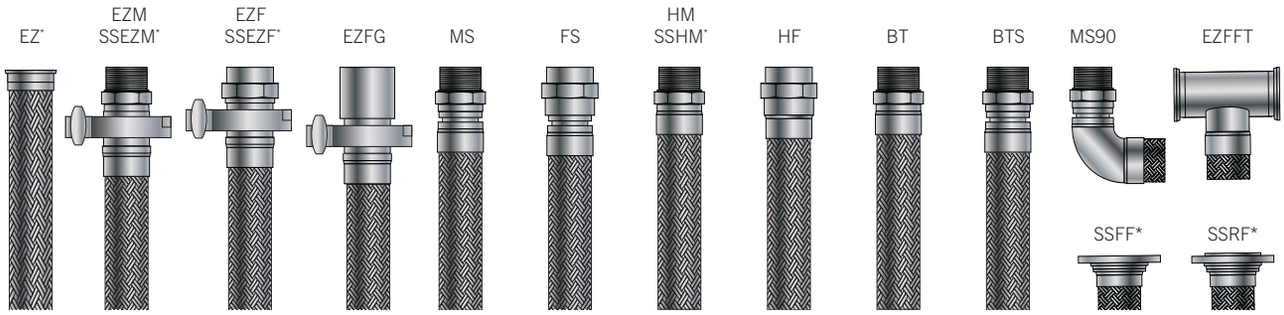
ORDERING INFORMATION

Use the diagrams below along with the Ordering Guide at the bottom to help you build your flexible connector model numbers.

Ordering Options Diagram



End Fitting Options



**These models feature full stainless steel construction.*

Ordering Guide

Complete flexible connector part numbers have a specific order and are created using the following guidelines. Please note that full stainless steel models are available on any flexible connector that does not include swivel end fittings.

A B X C D X E

A = Product Type

FF = IFIREFLEX Flexible Connector

B = Hose Diameter

07 = ¾"
10 = 1"
15 = 1½"
20 = 2"
30 = 3"
40 = 4"

C = Overall Length in Inches

Use two-digit format

Examples:

FF20X18MSXHM = Flexible connector with swivel end fitting(s), 2" hose diameter, 18" overall length, with one male swivel end fitting and one fixed Hex male end fitting.

FF20X18SSEZMXSSHM = Flexible connector, 2" hose diameter, 18" overall length, with one stainless steel EZ Fit male end fitting and one stainless steel fixed hex male end fitting, full stainless steel construction.

D & E = End Fitting Options (non-swivel options available in stainless steel)

EZ = EZ FIT flange only (stainless steel)

EZM = EZ FIT male NPT (**SSEZM** = stainless steel)

EZF = EZ FIT female NPT (**SSEZF** = stainless steel)

EZFG = EZ FIT fiberglass glue pipe

MS = Male swivel NPT

FS = Female swivel NPT

HM = Hex male fixed NPT (**SSHM** = stainless steel)

HF = Hex female fixed NPT

BT = Hex male fixed BSPT

BTS = Male swivel BSPT

MS90 = 90° with male swivel NPT

EZFFT = EZ Fit Tee

SSFF = Flat faced round flange (stainless steel only)

SSRF = Raised faced round flange (stainless steel only)

Note: Each EZ FIT union style coupling comes complete with couplers and gaskets.

All end fittings are, by default, the same diameter as the hose. If you require a flexible connector where the end fitting diameter does not match the hose diameter, the size must be indicated numerically in front of the corresponding fitting as in the following example.

Example: FFUL15X18HMX2HM = Flexible connector with fixed end fittings, 1½" hose diameter, 18" overall length, with one 1½" hex male fixed end fitting, and one 2" hex male fixed end fitting.

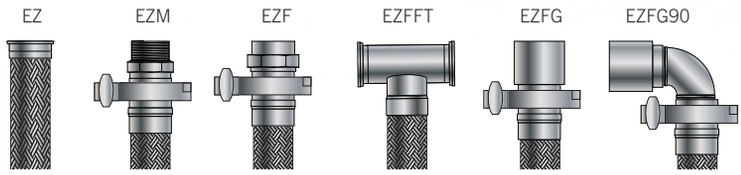
Rules:
1) End fitting diameters can not be smaller than hose diameters.
2) Only one hose fitting per flexible connector can be of a different diameter than the hose diameter.
3) End fitting diameter must only be one size larger than hose (1" hose could use 1½" fitting, 1½" hose could use 2" fitting, etc.).
4) EZ Fit end fittings are available in 1", 2", and 3" only.
5) Additional end fitting types are available. Please contact Customer Service with inquiries.

ORDERING INFORMATION CONTINUED

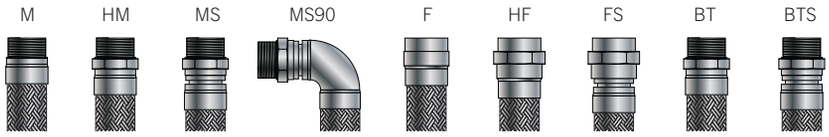
End Fitting Options

Use the diagrams below along with the Ordering Guide to help build flexible connector model numbers.

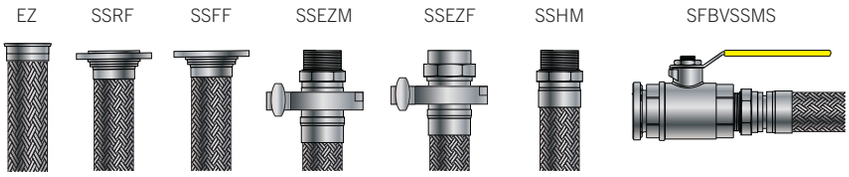
EZ Fit System



Nickel Plated Steel



Stainless Steel



	Model	Description	¾"	1"	1½"	2"	3"	4"
EZ Fit System	EZ	EZ Fit flange only (Stainless steel only)	✓	✓		✓	✓	
	EZM	EZ Fit with male NPT		✓	✓	✓	✓	
	EZF	EZ Fit with female NPT		✓	✓	✓	✓	
	EZFFT	EZ Fit tee			✓	✓		
	EZFG	EZ Fit with fiberglass glue pipe			✓	✓	✓	
	EZFG90	EZ Fit with fiberglass glue pipe 90° elbow			✓	✓	✓	
Nickel Plated Steel	M	Male fixed non-hex NPT					✓	✓
	HM	Male fixed hex NPT	✓	✓	✓	✓		
	MS	Male swivel hex NPT	✓	✓	✓	✓		
	MS90	Male swivel hex 90° elbow NPT			✓	✓		
	F	Female fixed non-hex NPT	✓	✓	✓	✓	✓	
	HF	Female fixed hex NPT			✓	✓		
	FS	Female swivel hex NPT			✓	✓		
	BT	Hex Male Fixed BSPT			✓	✓		
	BTS	Male Swivel BSPT			✓	✓	✓	
Stainless Steel	SSRF	Raised face flange, stainless steel		✓	✓	✓	✓	✓
	SSFF	Flat face flange, stainless steel			✓	✓	✓	✓
	SSEZM	EZ Fit with male NPT, stainless steel		✓	✓	✓	✓	
	SSEZF	EZ Fit with female NPT, stainless steel			✓	✓	✓	
	SSHM	Male fixed hex NPT, stainless steel	✓	✓	✓	✓		
	SFBVSSMS	Flat face flange ball valve with male swivel, stainless steel				✓		

✓ = Available

ORDERING INFORMATION CONTINUED

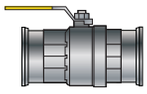
EZ Fit Accessories

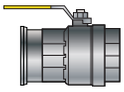


Model	Description
EZFITXEZFIT	2" EZ Fit × EZ Fit connector, stainless steel

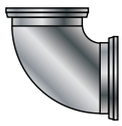


Model	Description
EZBLANK	2" EZ Fit blank, stainless steel
EZ30BLANK	3" EZ Fit blank, stainless steel

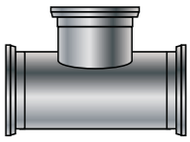




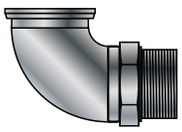
Model	Description
EZXEZX20BV	2" EZ Fit × 2" EZ Fit ball valve
EZX20BV	2" EZ Fit × 2" ball valve, brass
EZXEZX20BVSS	2" EZ Fit × 2" EZ Fit ball valve, stainless steel
EZX20BVSS	2" EZ Fit × 2" ball valve, stainless steel
EZ30XEZ30X30BV	3" EZ Fit × 3" EZ Fit ball valve, brass
EZ30XEZ30X30SSBV	3" EZ Fit × 3" EZ Fit ball valve, stainless steel



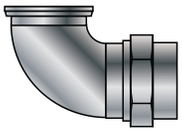
Model	Description
EZXEZ90	2" EZ Fit × 2" EZ Fit 90° elbow, stainless steel
EZ30XEZ3090	3" EZ Fit × 2" EZ Fit 90° elbow, stainless steel



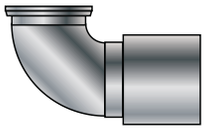
Model	Description
EZXEZXEZTEE	2" EZ Fit × 2" EZ Fit × 2" EZ Fit 1½" tee, stainless steel
EZ20XEZ20TEEFF	2" EZ Fit × 2" EZ Fit × 2" EZ Fit, 2" tee, stainless steel
EZ30XEZ30XEZ30T	3" EZ Fit × 3" EZ Fit × 3" EZ Fit tee, stainless steel



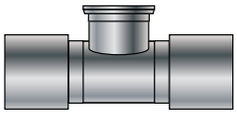
Model	Description
EZX15HM90	2" EZ Fit × 1½" hex male 90° elbow, nickel plated
EZX20HM90	2" EZ Fit × 2" hex male 90° elbow, nickel plated
EZX20HM90SS	2" EZ Fit × 2" hex male 90° elbow, stainless steel
EZX30M90	3" EZ Fit × 3" male 90° elbow, nickel plated



Model	Description
EZX20HF90	2" EZ Fit × 2" female 90° elbow, nickel plated
EZX30F90	3" EZ Fit × 3" female 90° elbow, nickel plated



Model	Description
EZX20FG90	2" EZ Fit × 2" fiberglass glue pipe 90° elbow, nickel plated
EZX30FG90	3" EZ Fit × 3" fiberglass glue pipe 90° elbow, nickel plated

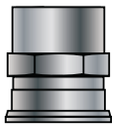


Model	Description
EZX20FGTEE	2" EZ Fit × 2" fiberglass glue pipe tee, nickel plated
EZX30FGTEE	3" EZ Fit × 3" fiberglass glue pipe tee, nickel plated

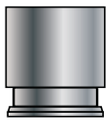
ORDERING INFORMATION CONTINUED



Model	Description
EZX15HMPL	2" EZ Fit × 1½" hex male, nickel plated
EZX15HMSS	2" EZ Fit × 1½" hex male, stainless steel
EZX20HMPL	2" EZ Fit × 2" hex male, nickel plated
EZX20HMSS	2" EZ Fit × 2" hex male, stainless steel
EZX30MP	3" EZ Fit × 3" male, nickel plated



Model	Description
EZX15HFSS	2" EZ Fit × 1½" hex female, stainless steel
EZX20HFPL	2" EZ Fit × 2" hex female, nickel plated
EZX20HFSS	2" EZ Fit × 2" hex female, stainless steel



Model	Description
EZX20FGPL	2" EZ Fit × 2" fiberglass glue pipe, nickel plated
EZX20FGSS	2" EZ Fit × 2" fiberglass glue pipe, stainless steel
EZX30FGPL	3" EZ Fit × 3" fiberglass glue pipe, nickel plated



Model	Description
EZ10CLAMP	1" EZ Fit clamp
EZCLAMP	2" EZ Fit clamp
EZ30CLAMP	3" EZ Fit clamp



Model	Description
407493001	1" EZ Fit gasket
407493002	2" EZ Fit gasket
407493003	3" EZ Fit gasket

ORDERING INFORMATION CONTINUED

Flexible Connectors with Differing Hose and End Fitting Diameters

All end fittings are, by default, the same diameter as the hose. If you require a flexible connector where the end fitting diameter does not match the hose diameter, the size must be indicated numerically in front of the corresponding fitting as in the following example.

Example: FFUL15X18HMX2HM = Flexible connector with fixed end fittings, 1½" hose diameter, 18" overall length, with one 1½" hex male fixed end fitting, and one 2" hex male fixed end fitting.

Rules:
1) End fitting diameters can not be smaller than hose diameters.
2) Only one hose fitting per flexible connector can be of a different diameter than the hose diameter.
3) End fitting diameter must only be one size larger than hose (1" hose could use 1½" fitting, 1½" hose could use 2" fitting, etc.).
4) EZ Fit end fittings are available in 1", 2", and 3" only.
5) Additional end fitting types are available. Please contact Customer Service with inquiries.

You can also select from the following most-common flexible connector model numbers.

Common Models

Vertical Connection into Bottom of 362 Series Vapour or 662 Series Product Shear Valve

Model	Description	Metric Length
FF15X12BTXBTS	FIREFLEX 1½" X 12" Fixed male by swivel male-BSPT	300 mm
FF15X14BTXBTS	FIREFLEX 1½" X 14" Fixed male by swivel male-BSPT	350 mm
FF15X16BTXBTS	FIREFLEX 1½" X 16" Fixed male by swivel male-BSPT	400 mm
FF15X18BTXBTS	FIREFLEX 1½" X 18" Fixed male by swivel male-BSPT	450 mm
FF15X18BTSXBTS	FIREFLEX CN, 1½" Fixed male by swivel male-BSPT 18" L	450 mm
FF15X24BTSXBTS	FIREFLEX CN, 1½" Fixed male by swivel male-BSPT 24" L	600 mm
FF20X18BTXBTS	FIREFLEX 2" X 18" Fixed male by swivel male-BSPT	450 mm
FF20X24BTXBTS	FIREFLEX 2" X 24" Fixed male by swivel male-BSPT	600 mm
FF20X30BTXBTS	FIREFLEX 2" X 30" Fixed male by swivel male-BSPT	750 mm

Connection at Pump Manifold—All NPT

Model	Description	Metric Length
FF20X15HMXMS90	FIREFLEX 2" X 15" Fixed Hex male x welded 90 elbow w/ swivel male-NPT	375 mm
FF20X18HMXMS90	FIREFLEX 2" X 18" Fixed Hex male x welded 90 elbow w/ swivel male-NPT	450 mm
FF20X24HMXMS90	FIREFLEX 2" X 24" Fixed Hex male x welded 90 elbow w/ swivel male-NPT	600 mm

Connection at Pump Manifold—NPT Pump End, BSPT Pipe End

Model	Description	Metric Length
FF20X24BTXMS90	FIREFLEX 2" X 24" fixed hex male-BSPT x welded 90 elbow w/ swivel male-NPT	600 mm

ANTI SYPHON VALVES

EBW® anti syphon valves are recommended for all above ground storage applications to prevent fuel from exiting the storage tank in the event of a broken line or leak. The anti syphon valves shut off product flow when lines are broken, preventing fuel spillage and fire hazards. Each valve has an adjusting mechanism allowing for various liquid head pressure settings within the valve range. The adjusting mechanism is lockable after the preferred setting is made. EBW® anti syphon valves are set to maximum head pressure when shipped from the factory. The anti syphon valve also includes a pressure relief valve, eliminating thermal expansion of fluid in the lines.



HIGHLIGHTS

- Hydrostatic pressure adjusting mechanism with durable weather cap
- Built in thermal expansion pressure relief valve
- 3/4" and 1" models are ideal for fuel oil and generator applications
- Can be used in pressure systems
- NFPA 30
- API/RP 2000

ORDERING INFORMATION

Model	Description
60530001	¾" NPT anti syphon valve, 0'to 12'head pressure
60630001	1" NPT anti syphon valve, 0'to 12'head pressure
61630003	1½"NPT anti syphon valve, 0'to 5'head pressure
61630001	1½" NPT anti syphon valve, 5'to 12'head pressure
61630002	1½" NPT anti syphon valve, 12'to 25'head pressure
63630011	2" NPT anti syphon valve, 5'to 12'head pressure, AGB compatible
63630012	2" NPT anti syphon valve, 12'to 25'head pressure, AGB compatible
63630031	2" BSPT anti syphon valve, 5'to 12'head pressure, AGB compatible
63630032	2" BSPT anti syphon valve, 12'to 25'head pressure, AGB compatible

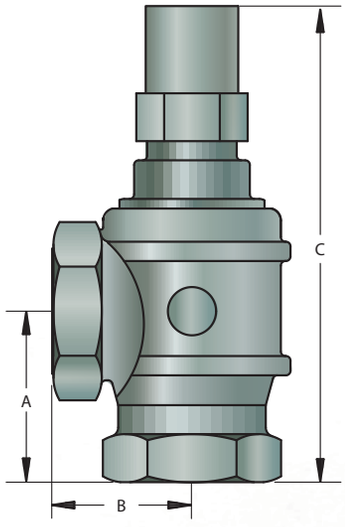
**Alcohol, gas, biofuel compatible (E-85, gasoline and biodiesel) models come with E-coated body for full compatibility.*

SPECIFICATIONS

Body	Ductile iron-zinc plated
Spring	Zinc plated steel
Adjustment screw	Stainless steel
Disc	Fluorocarbon seal
Approvals	UL listed

Model	Size		Thread	Weight	
	In.	mm		Lbs.	kg
60530001	0.75	19.02	NPT	3.4	1.54
60630001	1	25.4	NPT	3.2	1.45
61630003	1.5	38.1	NPT	4.6	2.09
61630001	1.5	38.1	NPT	4.6	2.09
61630002	1.5	38.1	NPT	4.6	2.09
63630011**	2	50.8	NPT	7.2	3.27
63630012**	2	50.8	NPT	7.2	3.27
63630031**	2	50.8	BSPT	7.08	3.22
63630032**	2	50.8	BSPT	7.08	3.22

***Alcohol, gas, biofuel compatible*



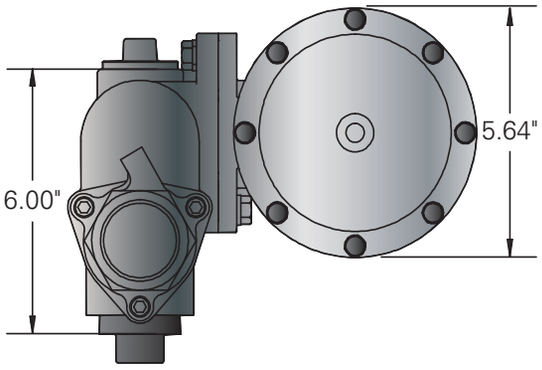
PRESSURE REGULATOR VALVES

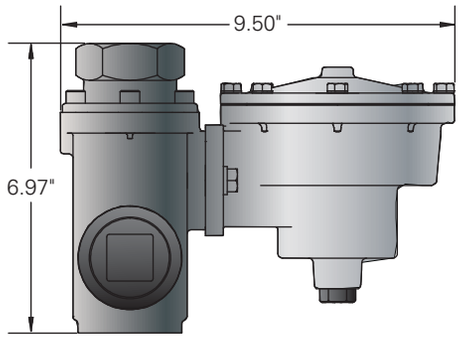


The EBW® 664 pressure regulator valve is designed to be used in conjunction with suction type dispensers connected to an aboveground storage tank. The pressure regulator valve prevents fuel from flowing to the pumping unit and flowing out the vent tube of the self-contained dispenser when the pump is not activated. The pressure regulator valve is a vacuum actuated valve which will not allow product flow until the suction of the pumping unit opens the valve. The valve closes by means of an internal spring when pumping is complete.

HIGHLIGHTS

- Hydrostatic pressure adjusting mechanism with durable weather cap.
- Built in thermal expansion pressure relief valve.
- Shear section is standard, eliminating need for an additional shear valve.
- NFPA 30
- API/RP 2000





SPECIFICATIONS

Body	Cast iron
Seals	Fluorocarbon
Filter	Stainless steel
Poppet	Fluorocarbon

ORDERING INFORMATION

Model	Description	Weight	
		Lbs	Kg
66430201	Male-NPT	19	8.62
66430202	Union	19.3	8.75
66430203	Female-NPT	19	8.62
66430206	Female-Poppeted	19	8.62
66430226	Female-BSPT	19	8.62

Model	Description
66222001	Male replacement adapter
66222101	Union replacement adapter
66222201	Female replacement adapter for 66430203
66421101	Female Replacement Adaptor for 66430206
66430401	Mounting bracket

DEFENDER SERIES® PRESSURE / VACUUM VENT WITH FLAME ARRESTOR OPTION



Defender Series® Pressure/Vacuum (P/V) Vents regulate the pressure at which vapour is allowed to escape from the underground storage tank and the vacuum at which outside air is allowed to enter the tank. The P/V Vent's internal rolling diaphragm delivers consistent and controlled cracking for both low leak and high-pressure conditions while the superior construction of UV-resistant materials extends the overall service life. The in-line vault provides added protection and facilitates at-grade servicing and testing. This eliminates the added expense of lift trucks as well as the potential safety concerns of conducting work at height.

HIGHLIGHTS

Pressure / Vacuum Vent

- The P/V vent is constructed of high-grade, UV-resistant materials and premium internal components designed and tested to last.
- A vent cap with stainless steel mesh debris shield protects the system from water and insect intrusion.
- The one-turn locking mechanism provides easy installation and removal for servicing.
- High tolerance for over-pressure situations.
- Compatible with all fuel types.
- A rolling diaphragm achieves low leak rates and high flow rates with a tight and consistent seal.
- Vent Stack Adapter available with 2" NPT or 2" BSPT threaded inlet.
- Compatible with manifolded vent applications.

In-Line Vault

- The cast ductile iron enclosure houses the P/V vent for added security and protection from the environment while also placing it at grade-level for safer, cost-effective maintenance and testing.
- The vault includes a UV-resistant vent cap with a stainless steel mesh debris shield for the top of the vent stack.
- The stainless steel gasketed faceplate includes a swivel pin that holds it in place during service.
- Tamper-resistant screws secure the faceplate to the vault.
- Eliminates wrenching at height.
- Integrated drain plug facilitates draining of condensate.

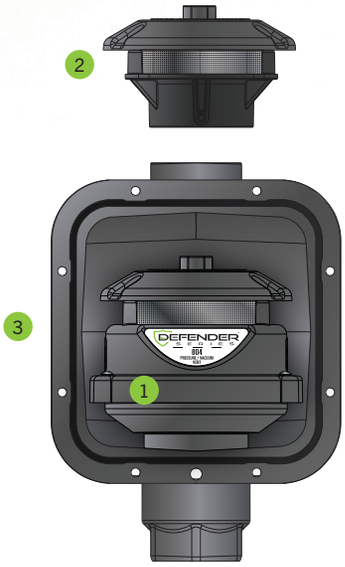
SPECIFICATIONS

Pressure setting	US Model	6.2 to 14.9 mbar
	EN Model	35 mbar maximum
	CN Model	20 to 30 mbar
Vacuum setting	US Model	-14.9 to 24.9 mbar
	EN Model	-2 mbar maximum
	CN Model	-15 to -20 mbar
Pressure leak rate	≤ .05 CFH at +	
Vacuum leak rate	≤ .21 CFH at -4" WC	
Maximum flow rate	8,000 SCFH at 2 PSI	
Operating temperature	-22° F to 122° F (-30° C to 50° C)	
Materials		
P/V vent body	UV-resistant polymer	
Seals	UL listed elastomers	
Screens	Stainless steel	
Vent (rain) cap	UV-resistant polymer	
In-line vault body	E-coated cast ductile iron	
In-line vault cover	Stainless steel	
Approvals & Certifications	UL2583 listed	
	Three models to meet the cracking pressure requirements for regions following the US, UK, and China standards	
	Flame Arrestor meets EN 16852	

SPECIFICATIONS CONTINUED

Components

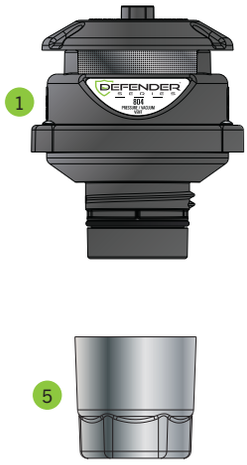
1. P/V vent
2. Vent cap
3. In-line vault
4. In-line vault faceplate
5. Defender Series® vent stack adapter
6. Flame Arrestor option (fits both adapters and vault applications with 804101 P/V vent models)



In-Line Vent Stack Application



End-of-Line Application



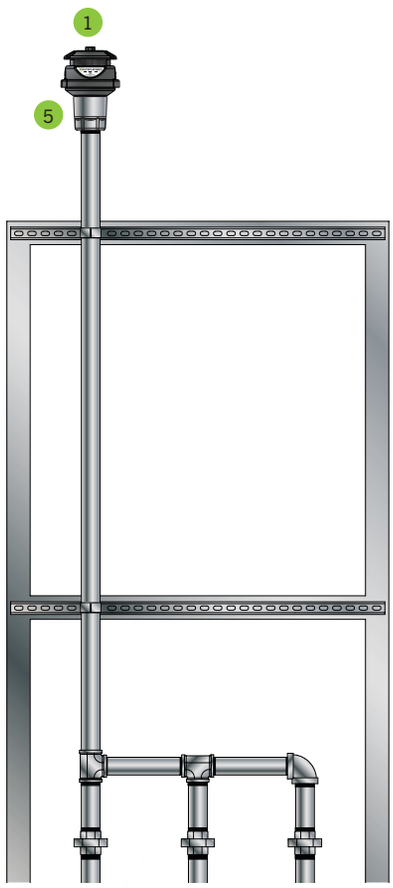
Flame Arrestor (Optional)



Installation Options

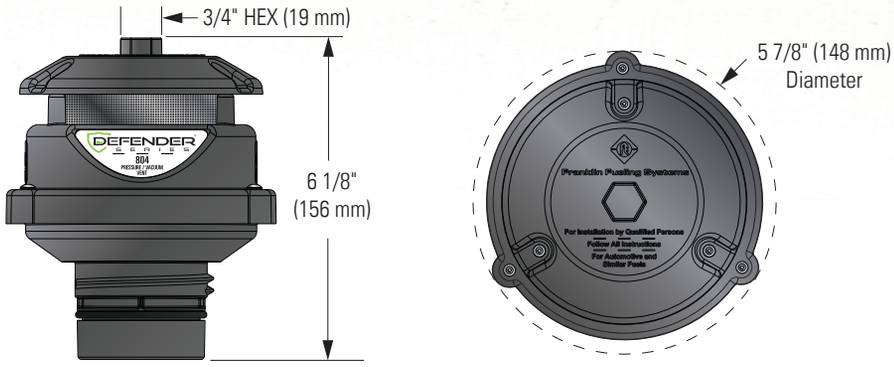
Install in-line at grade with the in-line vault and vent cap or end-of-line with the Defender Series® vent stack adapter. All installation methods are compatible with manifolded vent lines as well.



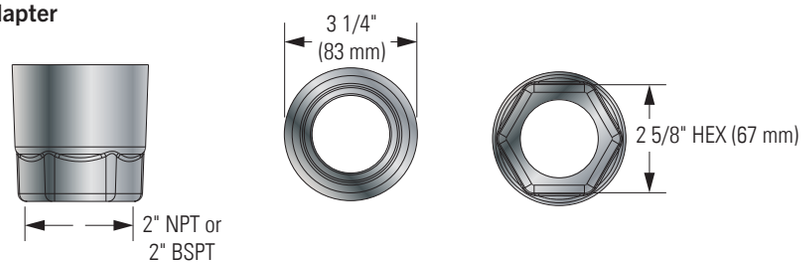


SPECIFICATIONS CONTINUED

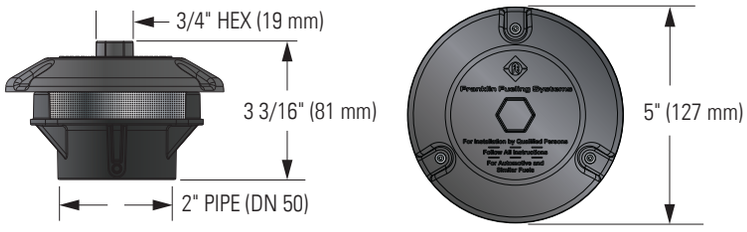
Pressure/Vacuum Vent



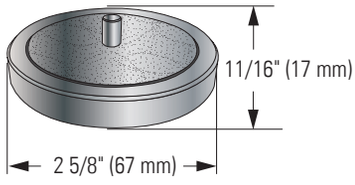
Vent Stack Adapter



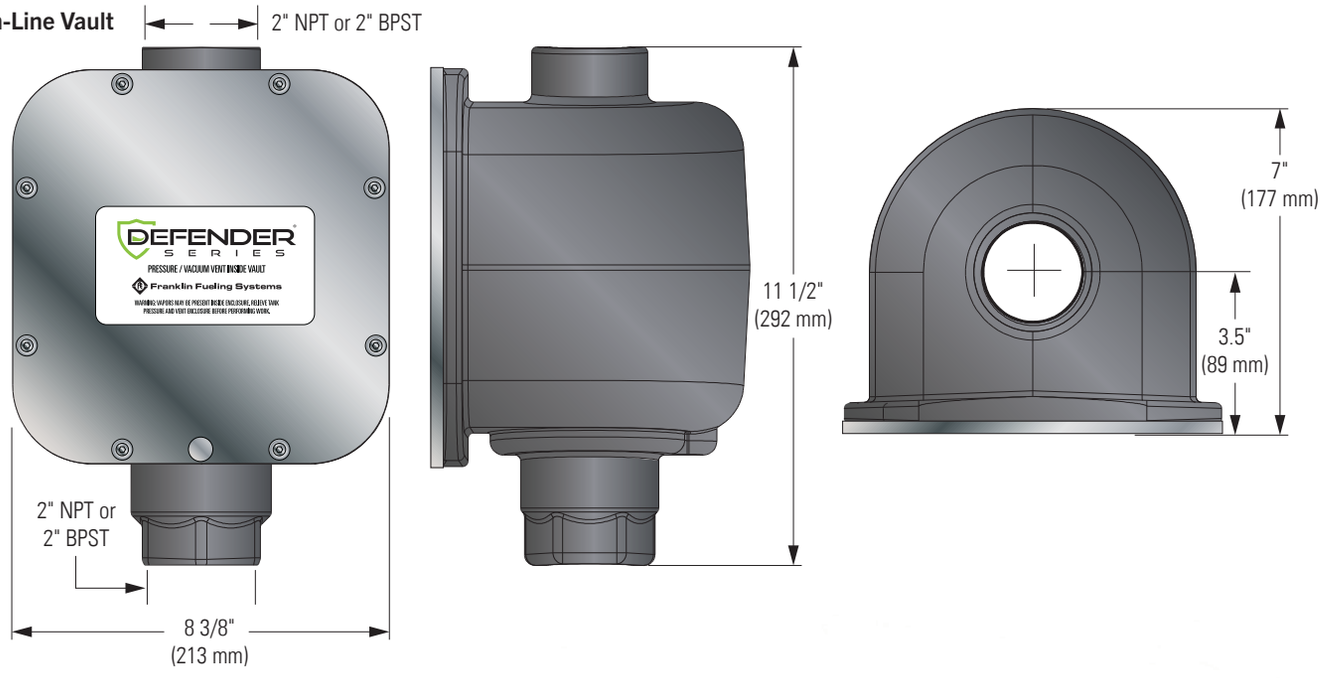
Vent Cap



Flame Arrestor



In-Line Vault



ORDERING INFORMATION

In-Line Vault



Model	Description
DPVV-EVR	(1) CARB certified Defender Series® P/V Vent with (1) In-line vault and (1) rain cap



Model	Description
804110909	Vault Assembly with 2" NPT Inlet/Outlet threads
804110910	Vault Assembly with 2" BSPT Inlet/Outlet threads

Vault Assembly includes vault body, cover, cover seal, and cover fasteners only (P/V Vent Valve and Flame Arrestor options sold separately).

P/V Vent Valves



Model	Description
804101901	P/V Vent Valve with US cracking pressures
804101902	P/V Vent Valve with EN cracking pressures
804101903	P/V Vent Valve with CN cracking pressures

P/V Vent Valves include vent valve, sealing o-ring, and inlet screen only (Adapters, Vaults, and Flame Arrestor options sold separately).

Adapters & Replacement Parts
In-Line Vault







Model	Description
804110906	End of Line Adapter with 2" NPT Inlet threads
804110907	End of Line Adapter with 2" BSPT Inlet threads
804110908	Flame Arrestor Kit (includes arrestor and replacement P/V sealing o-ring)
804110902	Vault faceplate gasket
804110903	(2) replacement tamper-resistant screws for vault faceplate
804110905	Vault L-key wrench (T40 tip size)
804110904	Vault service plug, prevents vapors from escaping during maintenance
804023901	Vent (rain) cap

TANK VENTS

EBW® tank vents are designed to provide an open path for vapours from an underground or aboveground storage tank to the atmosphere.



HIGHLIGHTS

- Dome-shaped top design drains off moisture including rain, snow and ice.
- 30 mesh prevents dirt and debris from entering vent lines.

SPECIFICATIONS

Body	Aluminium
Lid	Zinc plated steel
Seal	Brass

ORDERING INFORMATION

Model	Description	Pack		Weight	
		mm	In	Kg	Lbs
804023901	Vent cap aluminium upward discharge 2" screw fixing	51	2	0.42	1
80020301	Vent cap aluminium upward discharge 3" screw fixing	76	3	0.54	1.19

DOWNWARD TANK VENTS

EBW® tank vents are designed to provide an open path for vapours from an underground or aboveground storage tank to the atmosphere.



HIGHLIGHTS

- Dome-shaped top design drains off moisture including rain, snow and ice.
- 30 mesh prevents dirt and debris from entering vent lines.
- Designed with two sets of female threads to engage a 1½" or 2" [MC] BSPT male thread vent riser in same enclosure.

SPECIFICATIONS

Body	Aluminium
Lid	Zinc plated steel
Seal	Brass

ORDERING INFORMATION

Model	Description	Pack Size	Kg	Lbs
VENT CAP 2	Vent Cap Aluminium Down Discharge 1.5"/2" BSPT	24	0.54	1.19

Designed with two sets of female threads to engage a 1½" or 2" [MC] BSPT male thread vent riser in same enclosure.

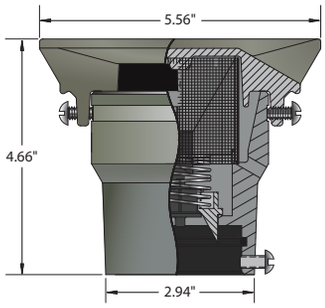
PRESSURE VACUUM VENTS



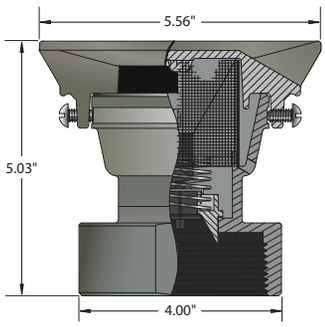
EBW® pressure vacuum vents are used on storage tank vent pipes to discharge vapours upward into the atmosphere. The top casting is dome-shaped to quickly drain off moisture including rain, snow and ice. Body and cover are cast aluminium. 2" and 3" models have vent rates of 8000 cubic feet per hour, and produce 8.0 ounces of pressure and 0.5 ounces of vacuum.

HIGHLIGHTS

- Two model types available: NPT/BSPT threads or O-ring with locking screw.
- NFPA 30°



800-303



800-304

SPECIFICATIONS

Body	Aluminium
Poppet	Acetal
Spring	Stainless steel
Screws	Zinc plated steel
Screen	Brass
Vents	These vents should not be used on UST with a throughput of 100,000 gallons or more per month (per 40 CFR 63 subpart CCCCCC)

ORDERING INFORMATION

Model	Description	Size		Weight	
		mm	In.	Kg	Lbs.
80230302	P/V Valve Aluminium Upward Discharge 2" Screw Fixing	51	2	0.83	1.84

NPT ANGLE CHECK VALVE



Angle check valves are used on suction system fuel lines to maintain prime. EBW® angle check valves are installed at the top of an underground storage tank suction line. Single poppet models are typically used where access to the valve is readily available.

SPECIFICATIONS

Body	Zinc plated cast iron
Seat	Brass
Poppet	Brass
NPT	Brass
Spring	Stainless steel

ORDERING INFORMATION

Model	Pack	Poppet Type	Weight	
	In		Kg	Lbs
63520101	2	Single	3.3	7.25

DEFENDER SERIES® BUNDLE PACKAGES

Combine Defender Series® spill containers, overfill prevention valves (OPVs), risers, caps, and adapters into a single part number and receive a 10% discount* compared to purchasing all components separately.



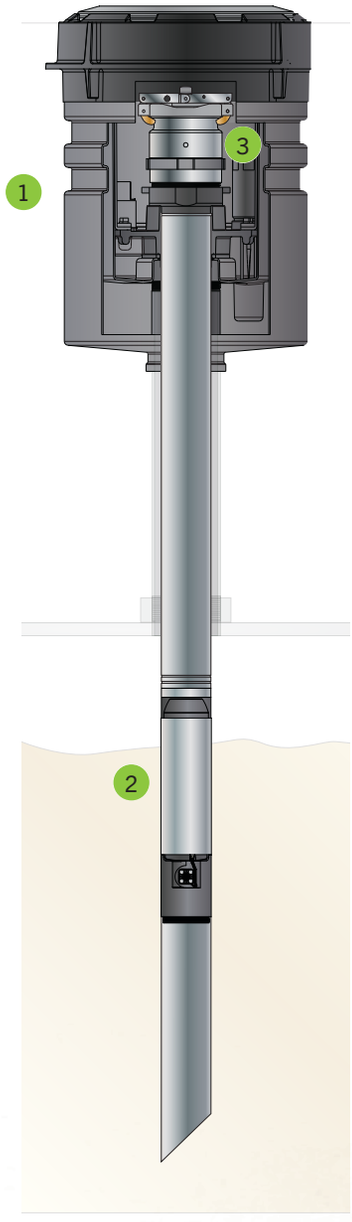
HIGHLIGHTS

- Get a premium Defender Series® solution from grade level to tank for fill point and overfill release prevention.
- Components are designed together to work as an optimized system.
- An easy fill point solution to help comply with new UST federal regulations.

ORDERING INFORMATION

Components

1. Defender Series® spill container
2. Defender Series® overfill prevention valve
3. Riser, cap, and adapter



Ordering Guide
A B C

A = Spill Container

Select from the spill container MODEL numbers below

B = Overfill Prevention Valve

Select the ALPHA character below which corresponds with the appropriate OPV

C = Riser, Cap, and Adapter

1 = Stainless steel swivel fill adapter, cap, and nipple

2 = No riser, cap, or adapter

** Item 70541202 includes the SWF-100-SS Swivel Fill Adaptor, 70521307 – Close nipple 4" NPT 2.88" and 77720102 – Top seal cap 4", AGB*

Example: 705545001A1 = Defender Series® 5 gallon spill container, single wall, NPSM thread, with drain, with gray epoxy-coated cast iron gasketed lid with Defender Series® overfill prevention valve with 5'top drop tube, 8'bottom drop tube with Stainless steel swivel fill adapter, cap, and nipple

ORDERING INFORMATION CONTINUED

Defender Series® Spill Containers

Model	Description
705545001	Defender Series® 5 gallon spill container, single wall, NPSM thread, with drain, with gray epoxy-coated cast iron gasketed lid
705545002	Defender Series® 5 gallon spill container, single wall, NPSM thread, without drain, with gray epoxy-coated cast iron gasketed lid
705545011	Defender Series® 5 gallon spill container, single wall, NPT thread, with drain, with gray epoxy-coated cast iron gasketed lid
705545012	Defender Series® 5 gallon spill container, single wall, NPT thread, without drain, with gray epoxy-coated cast iron gasketed lid
705545021	Defender Series® 5 gallon spill container, single wall, BSPT thread, with drain, with gray epoxy-coated cast iron gasketed lid
705545022	Defender Series® 5 gallon spill container, single wall, BSPT thread, without drain, with gray epoxy-coated cast iron gasketed lid
705555101	Defender Series® 5 gallon spill container, double wall, NPSM thread, with drain, with I2 monitor, with gray epoxy-coated cast iron gasketed lid
705555102	Defender Series® 5 gallon spill container, double wall, NPSM thread, without drain, with I2 monitor, with gray epoxy-coated cast iron gasketed lid
705555111	Defender Series® 5 gallon spill container, double wall, NPT thread, with drain, with I2 monitor, with gray epoxy-coated cast iron gasketed lid
705555112	Defender Series® 5 gallon spill container, double wall, NPT thread, without drain, with I2 monitor, with gray epoxy-coated cast iron gasketed lid
705555121	Defender Series® 5 gallon spill container, double wall, BSPT thread, with drain, with I2 monitor, with gray epoxy-coated cast iron gasketed lid
705555201	Defender Series® 5 gallon spill container, double wall, NPSM thread, with drain, with TSP-ULS sensor, with gray epoxy-coated cast iron gasketed lid
705555202	Defender Series® 5 gallon spill container, NPSM thread, without drain, with TSP-ULS sensor, with gray epoxy-coated cast iron gasketed lid
705555211	Defender Series® 5 gallon spill container, double wall, NPt thread, with drain, with TSP-ULS sensor, with gray epoxy-coated cast iron gasketed lid
705555212	Defender Series® 5 gallon spill container, NPT thread, without drain, with TSP-ULS sensor, with gray epoxy-coated cast iron gasketed lid

Defender Series® Overfill Prevention Valves

Model	Alpha	Description
708591901	A	Defender Series® overfill prevention valve with 5'top drop tube, 8'bottom drop tube
708591902	B	Defender Series® overfill prevention valve with 5'top drop tube, 10'bottom drop tube
708591921	C	Defender Series® overfill prevention valve with 5'top drop tube, 8'bottom drop tube, AGB compatible*
708591922	D	Defender Series® overfill prevention valve with 5'top drop tube, 10'bottom drop tube, AGB compatible*
708592901	E	Defender Series® overfill prevention valve with 10'top drop tube, 8'bottom drop tube
708592902	F	Defender Series® overfill prevention valve with 10'top drop tube, 10'bottom drop tube
708592921	G	Defender Series® overfill prevention valve with 10'top drop tube, 8'bottom drop tube, AGB compatible*
708592922	H	Defender Series® overfill prevention valve with 10'top drop tube, 10'bottom drop tube, AGB compatible*
708593901	I	Defender Series® overfill prevention valve, coaxial with 6.5'top drop tube, 8'bottom drop tube
708593902	J	Defender Series® overfill prevention valve, coaxial with 6.5'top drop tube, 10'bottom drop tube
708593923	K	Defender Series® overfill prevention valve, poppeted coaxial with 6.5'top drop tube, 8'bottom drop tube, AGB compatible*
708593924	L	Defender Series® overfill prevention valve, poppeted coaxial with 6.5'top drop tube, 10'bottom drop tube, AGB compatible*

**Alcohol, gas, biofuel compatible (E-85, gasoline and biodiesel) models come with hard coated anodized drop tubes for full compatibility.*

SPILL CONTAINER, OVERFILL PREVENTION VALVE, AND MANWAY TOOLS & ACCESSORIES

ORDERING INFORMATION

Defender Series® Spill Container Tools



Model	Description
T-0074	Defender Series® spill container tool kit includes T-handle (T-7001), spill container tool (T-7106), and swivel adapter tool (T-7102)



Model	Description
T-7001	T-handle, attaches to all installation adapter tools



Model	Description
T-7106	Defender Series® spill container tool, used to install and remove both below grade and grade level spill containers



Model	Description
T-7102	Orange swivel adapter tool, used to remove or install Franklin Electric swivel adapters and M/F 4x4 riser adapters



Model	Description
T-7107	Defender Series® spill container double wall vacuum test tool



Model	Description
T-7100	Red non-swivel adapter tool, used to install and remove legacy non-swivel adapters



Model	Description
T-7103	Blue OPW swivel adapter tool, used to install and remove OPW swivel adapters



Model	Description
T-7104	Green swivel adapter torque testing tool, used to torque test any swivel adapter

ORDERING INFORMATION CONTINUED

Defender Series® Overfill Prevention Valve Tools



Model	Description
708535901	Roll crimping installation tool includes roller bit
708530930	Roller bit
CW1	Cutting bit



Model	Description
708534901	Defender Series® overfill prevention valve remote testing tool
708534902	Defender Series® coaxial overfill prevention valve remote testing tool

PHIL-TITE™ Spill Container Tools



Model	Description
T-7043	PHIL-TITE™ spill container tool kit includes T-handle (T-7001), spill container tool (T-7002-A), and swivel adapter tool (T-7102)



Model	Description
T-7001	T-handle, attaches to all installation adapter tools



Model	Description
T-7002-A	PHIL-TITE™ spill container tool, used to install and remove spill containers



Model	Description
T-7102	Orange swivel adapter tool, used to remove or install Franklin Electric swivel adapters and M/F 4x4 riser adapters



Model	Description
T-7002HD	Heavy duty T-handle with counterweights, attaches to all installation adapter tools, includes PHIL-TITE™ spill container tool (T-7002-A)

Manway Cover Tools



Model	Description
T-7200	Cast iron cover removal tool



Model	Description
PCR-LIFT	Lifting handle tool for composite access covers

Chain Wrench Tools



Model	Description
32110001	¾" chain wrench, 60" length for removing and installing, 14.00 Lbs/6.40 Kg
90110101	¾" chain wrench, 26" length for removing and installing, 3.00 Lbs/1.40 Kg

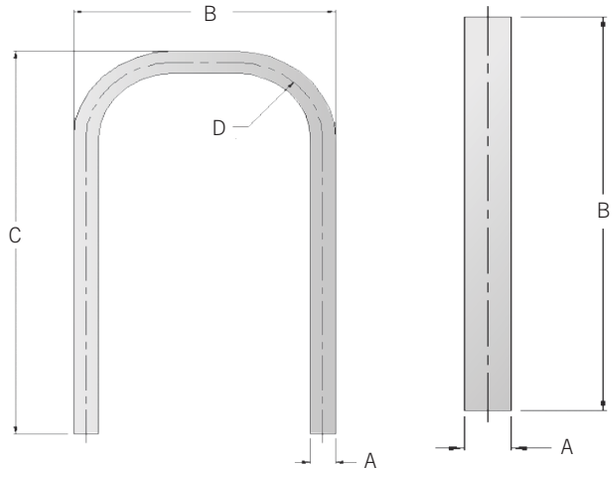
PIPE GUARDS & BOLLARDS

Protect property and avoid costly damage to dispensers with these schedule 40 pipe guards and bollards.



HIGHLIGHTS

- Available in straight pipe or double radius.
- Schedule 40 pipe construction.
- Primer finished, ready for your custom paint.
- Stainless steel mill finish available upon request.
- Bollards available with or without caps.



ORDERING INFORMATION

U-Shaped Pipe Guards

Model	A	B	C	D
BGU35565414	3.5"	36"	54"	14"
BGU35415314	3.5"	41"	53"	14"
BGU35485014	3.5"	48"	50"	14"
BGU40365614	4.0"	36"	56"	14"
BGU40415314	4.0"	41"	53"	14"
BGU40417414	4.0"	41"	74"	14"
BGU40435414	4.0"	43"	54"	14"
BGU40485114	4.0"	48"	51"	14"

Bollards

Model	A	B
BGS4042	4.0"	42"
BGS4063	4.0"	63"
BGS4072	4.0"	72
BGS6063	6.0"	63
BGS6072	6.0"	72"
BGS6084	6.0"	84"

Note: Do not store primed units outside as primer alone will not prevent rust when exposed to elements

REMOTE FILL BOX

These stainless steel remote fill boxes house valves, fittings and connectors required for the remote filling of underground storage tanks. The remote fill boxes are available in a variety of configurations, connection sizes and mounting styles and can be ordered as pre-plumbed (including valves, fittings, and connectors) or not plumbed.



HIGHLIGHTS

- Lockable door.
- Hand pump with shut-off valve.
- Inlet connection with quick couplers and dust caps.
- Internal pre-plumbed check valves, fittings and shut-off valves.
- Wall or post-mount brackets.
- Optional vapour recovery bracket.
- Available with 2" or 3" threaded connections.
- Carbon steel version also available.

ORDERING INFORMATION

Model	Description	Height	Depth	Width
RFBP-TOP	3" pre-plumbed box, top inlet	643 mm	648 mm	515 mm
RFBP-REAR	3" pre-plumbed box, rear inlet	643 mm	648 mm	515 mm
RFBNP-TOP	3" box only (not plumbed), top inlet	643 mm	648 mm	515 mm
RFBNP-REAR	3" box only (not plumbed), rear inlet	643 mm	648 mm	515 mm

FFSPRO
SITE BUILDER

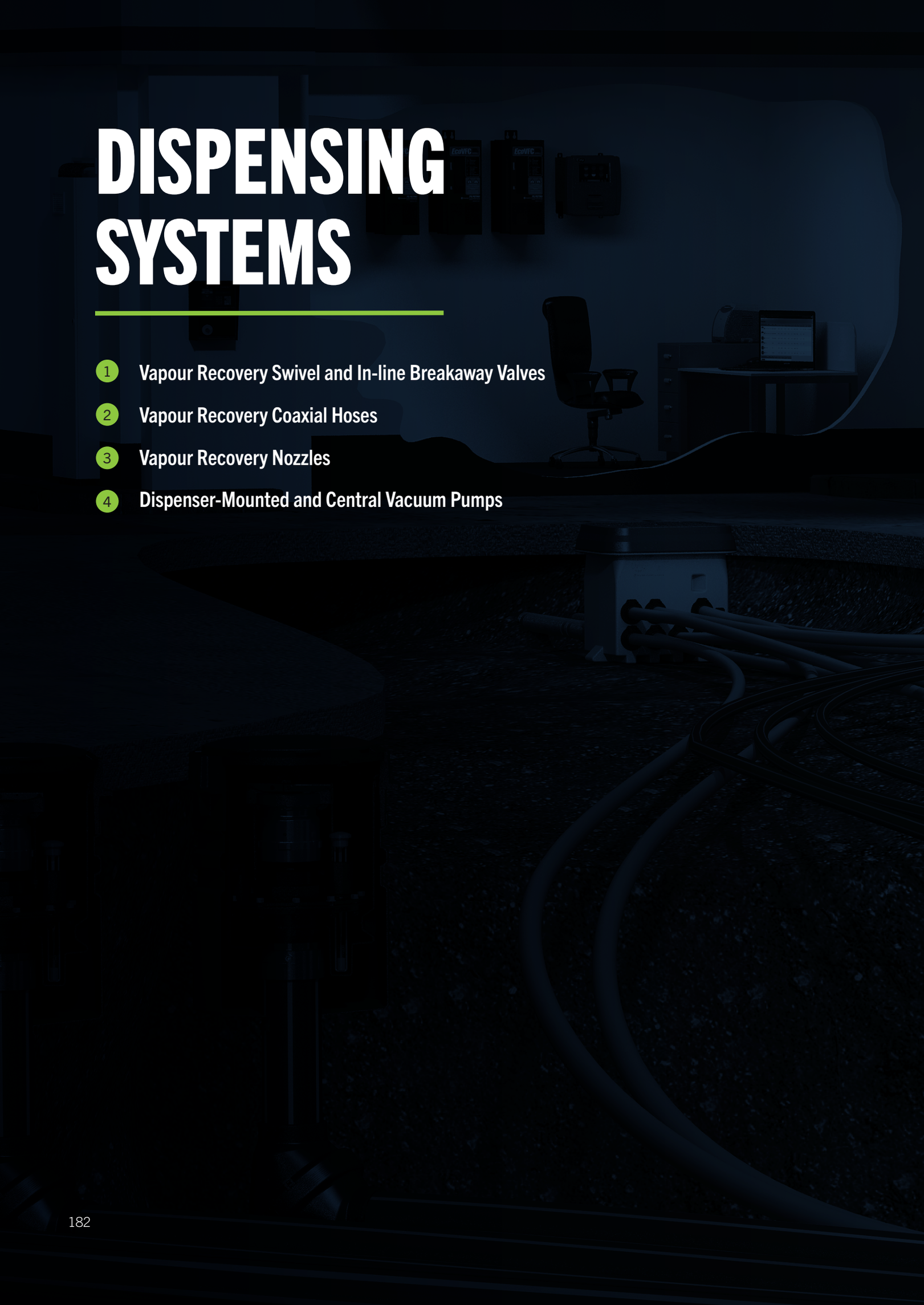


SERVICE STATION HARDWARE

QUOTE LIKE A PRO!

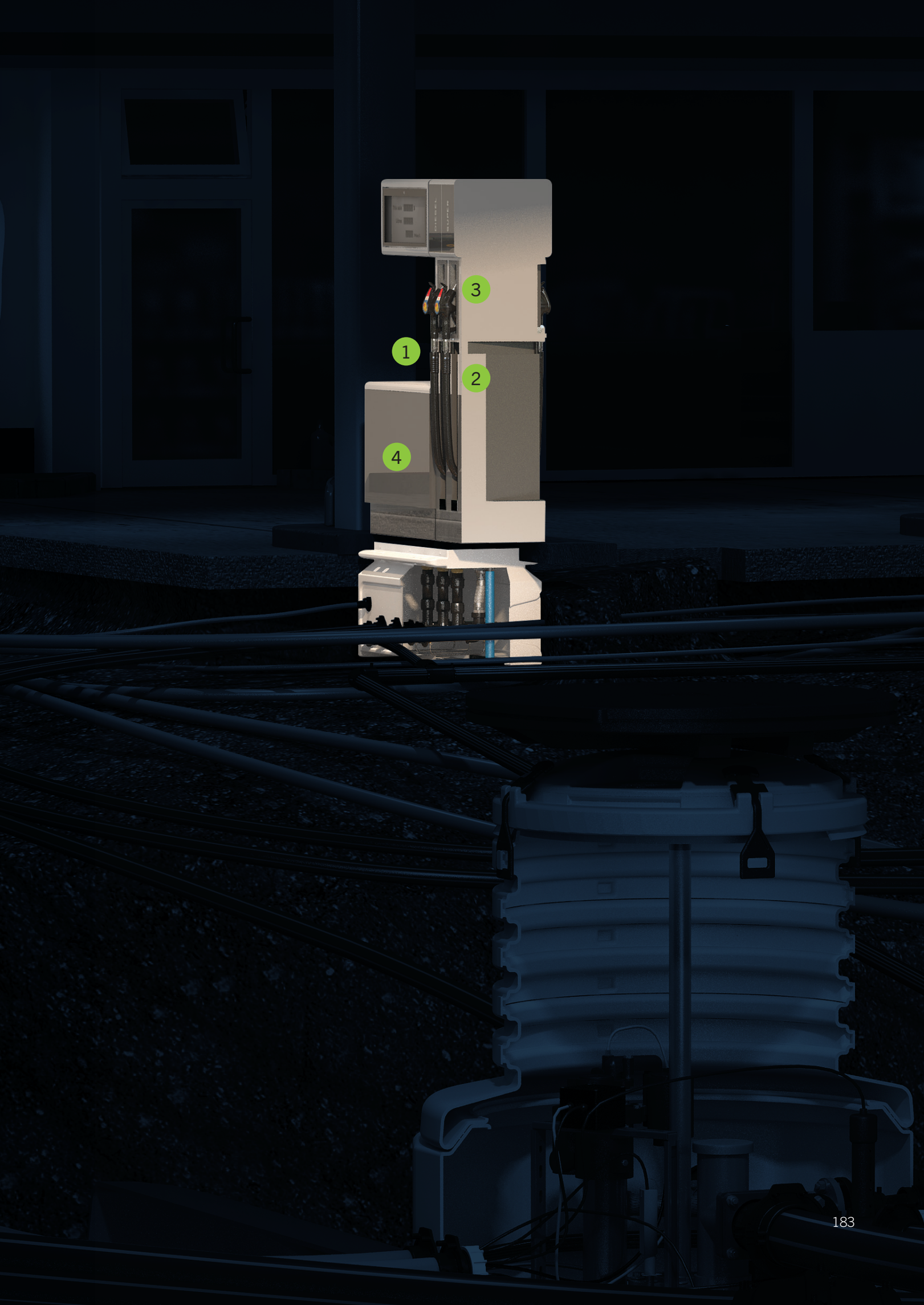
Build a complete bill of materials, totally customized to your customer's specifications, in just minutes. FFS PRO® Site Builder visually guides you through the equipment selection process for a complete underground fuel system, delivering everything you need to convert your selections into a purchase order.

To get started, visit **builder.ffspro.com**



DISPENSING SYSTEMS

1. Vapour Recovery Swivel and In-line Breakaway Valves
2. Vapour Recovery Coaxial Hoses
3. Vapour Recovery Nozzles
4. Dispenser-Mounted and Central Vacuum Pumps


3
1
2
4

EN CERTIFIED VAPOUR RECOVERY HOSE

HEALY™ 21 mm vapour recovery hoses are available with both swivel and fixed end fitting options and come in a wide assortment of custom length options to meet the needs of any application. Their textile hose reinforcement allows for maximum flexibility suitable for use with hose retractor applications. HEALY™ vapour recovery hoses come standard with anti-kink sleeves on both ends of the hose to protect the hose from kinking and provide a long service life.



HIGHLIGHTS

- Stainless steel end fittings with optional integrated swivel for easy connection and freedom of movement.
- Standard anti-kink sleeves provide flexibility near hose end fittings while preventing the hose from kinking or collapsing.

SPECIFICATIONS

Compatibility	For unleaded fuels with up to 15% Ethanol content
Tube Construction	NBR, black, smooth
Reinforcement	Textile spiral construction
Cover Construction	CR, black, smooth, electrically conductive
Internal Diameter	21 mm
Wall Width	5.5 mm
External Diameter	32 mm
Fittings	Stainless steel
Work Pressure (max.)	16 bar
Bend Radius	130 mm
Temperature Rating	-30° C to 60° C
Approvals	EN13483

ORDER INFORMATION

Complete part numbers have a specific order and are created using the following guidelines:

21 - A - B - C - SW

- 21 = Hose Diameter (21 mm)
- A = Hose Colour (B for Black)
- B = Hose Length (feet and inches)
- C = Hose Fittings
  - S = Swivel
  - F = Fixed
  - 5 = Metric (M34)
- SW = Softwall Hose

Example: 21B-140-S5F5-SW = HEALY™ vapour recovery hose, 21 mm diameter, 14 feet long, with swivel metric fittings by fixed metric fittings.

VAPOUR RECOVERY BREAKAWAY VALVES

HEALY™ vapour recovery breakaway valves ensure proper drive-off protection for vapour recovery refueling applications. Their lightweight, compact design allow for easy installation directly between the nozzle and hose. The integrated swivel action provides easy nozzle rotation during vehicle refueling while also helping to reduce hose wear and kinking.



HIGHLIGHTS

- Installs directly between the hose and nozzle.
- Compatible with high hose and retractor applications.
- Heat-treated stainless steel construction.
- Separate with axial or up to 30° angular force.
- All rubber-to-machined metal connections ensure optimal sealing surfaces.
- Non-reusable design prevents unauthorized reconnection of breakaway valves by unqualified personnel or end user.
- Multiple models and thread size options available to accommodate the needs of any application.
- Clearly marked flow direction ensures proper installation.
- Easily installed without specialised tools. Simply mount the breakaway valve directly into the nozzle and tighten using a torque wrench to 30 Nm.

SPECIFICATIONS

Nozzle flow rate compatibility	Up to 45 lpm
Working pressure compatibility	0.5 bar up to 3.5 bar
Separation force	Between 800 N and 1,500 N force
For use with motor fuels including	Gasoline, gasoline with up to 15% ethanol, and diesel fuel
Temperature rating	-30° C to 55° C
Fuel release	< 10 mL after separation
Internal pressure	BAV factory tested to 5.3 bar, SG factory tested to 3.5 bar
Electric conductivity	Factory tested to < 100k Ohm
Approvals & Certifications	ATEX approved

ORDER INFORMATION

Model	Inlet Connection (Hose Side)	Outlet Connection (Nozzle Side)	Description
628980	M34 x 1.5 female	M34 x 1.5 male coaxial	HEALY™ vapour recovery breakaway valve with integrated swivel, stainless steel

CONVENTIONAL BREAKAWAY VALVES

HEALY™ conventional breakaway valves ensure proper drive-off protection for conventional refueling applications. Their lightweight, compact design allow for easy installation directly between the nozzle and hose. The integrated swivel action provides easy nozzle rotation during vehicle refueling while also helping to reduce hose wear and kinking.



HIGHLIGHTS

- Installs directly between the hose and nozzle.
- Compatible with high hose and retractor applications.
- Heat-treated stainless steel construction.
- Separate with axial or up to 30° angular force.
- All rubber-to-machined metal connections ensure optimal sealing surfaces.
- Non-reusable design prevents unauthorized reconnection of breakaway valves by unqualified personnel or end user.
- Multiple models and thread size options available to accommodate the needs of any application.
- Clearly marked flow direction ensures proper installation.
- Easily installed without specialised tools. Simply mount the breakaway valve or directly into the nozzle and tighten using a torque wrench to 30 Nm.

SPECIFICATIONS

Nozzle flow rate compatibility	Up to 45 lpm
Working pressure compatibility	0.5 bar up to 3.5 bar
Separation force	Between 800 N and 1,500 N force
For use with motor fuels including	Gasoline, gasoline with up to 15% ethanol, diesel fuel
Temperature rating	-30° C to 55° C
Fuel release	< 10 mL after separation
Internal pressure	BAV factory tested to 5.3 bar, SG factory tested to 3.5 bar
Electric conductivity	Factory tested to < 100k Ohm

ORDER INFORMATION

Model	Inlet Connection (Hose Side)	Outlet Connection (Nozzle Side)	Description
628970	1" BSPP female	1" BSP male	HEALY™ breakaway valve with integrated swivel, stainless steel
628971	M34 x1.5 female	M34 x 1.5 male	HEALY™ breakaway valve with integrated swivel, stainless steel
628984	1" BSPP female	M34 x 1.5 male	HEALY™ breakaway valve with integrated swivel, stainless steel
628985	1" BSPP male	M34 x 1.5 male	HEALY™ breakaway valve with integrated swivel, stainless steel

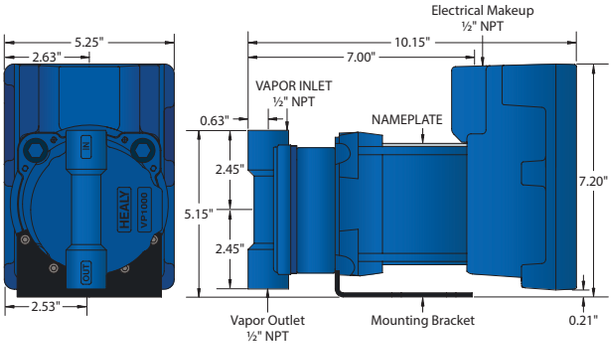
VP1000 SERIES DISPENSER MOUNTED VACUUM SOURCE



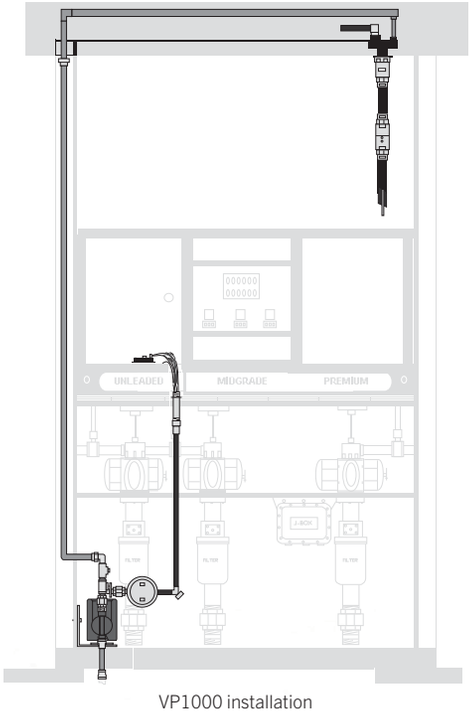
One vacuum pump per dispenser supplies both sides, reducing long term maintenance costs. The VP1000 has been designed to satisfy the vapour recovery needs of a blender or non-blender dispenser. Simple installation with no excavation minimises downtime and labour. The VP1000 connects to the dispenser with a simple interface module without costly software changes or electronic board replacement. This is the most cost-effective dispenser-mounted vacuum-assist system on the market today.

HIGHLIGHTS

- Compatible with new and existing dispensers.
- Underground tank certification.



ALL DIMENSIONS ARE APPROXIMATE AND REFERENCE ONLY.



VP1000 installation

SPECIFICATIONS

VP1000 Dispenser Mounted Vacuum Source Kits	Each kit includes vapour and electrical conduits as listed below. One VP1000 per dispenser supplies both sides.

ORDER INFORMATION

CARB Certified for Use With	Executive Order Number	Tank Type
HEALY™ 600 bootless nozzle	G-70-183	UST
HEALY™ 800 ORVR nozzle	G-70-191	UST
HEALY™ 900 EVR nozzle	VR-201	UST

ORDER INFORMATION CONTINUED

VP1000 Dispenser Mounted Vacuum Source Kits (Non-Inclusive)

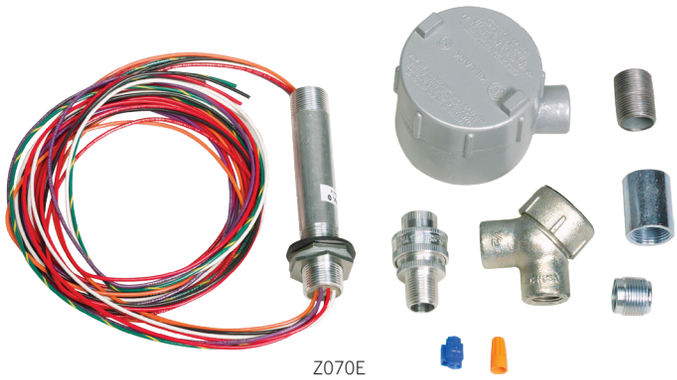
Kits do not include vapour and electrical conduits. Use Z070E and Z071V kits listed below.
One VP1000 per dispenser supplies both sides.

Model	Description
VP1000A	For use with all dispenser types, use if a model-specific VP1000D-V is not available. Includes VP1000-5 vacuum pump, 1360A interface module and 1404 universal hardware/mounting kit
VP1000E	International only, VP1000-220, 1380A and 1404

Universal Vapour and Electrical Kits

For use with the VP1000 kits listed above.

Model	Description
Z070E	Electrical installation kit for VP1000 Series vacuum source, for use with VP1000A-J
Z071V	Vapour piping installation kit for VP1000 Series vacuum source, for use with VP1000A-J
Z069E	International only, 220V electrical installation kit for VP1000E



Z070E



Z071V

VP1000 Replacement Parts

Model	Description
1316	6" potted conduit assembly
1346	3" potted conduit assembly, used in Z078E, Z079E, Z080E and Z084E
1360	Wire harness, universal
1360A	1360 wire harness with interface module, universal
1404	Universal mounting kit
144401	VP1000 front cover assembly (98008 o-ring sold separately)
13602	Spare fuse 5 A, 250 Volt
MC100-1	Universal interface module only
VP1000-5	Vacuum pump only, 110 Volt
VP1000VRC-G	VP1000 vacuum pump service kit containing glass fibre-filled vane, five vanes and pump cover O-ring
VP1000-220	International vacuum pump only, 220 Volt
VP1000-220-IC	International vacuum pump only, 220 Volt
MC200-1	International control module only, 220 Volt
131602901	International 6" potted conduit assembly, 220 Volt
1380	International wire harness, universal 220 Volt
1380A	International 1380 wire harness with interface module, universal 220 Volt
MC100-1 PLUG	Replacement jumper plug for interface module
98008	O-ring for VP1000 front cover
144402	VP1000 front cover assembly (international only)

Wayne™ is a registered trademark of Wayne Fueling Systems, LLC
Gasboy™ is a registered trademark of Gilbarco Inc.
Tokheim™ Premier™ is a registered trademark of Dover Corporation.
Gilbarco™ Encore™ is a registered trademark of Gilbarco Inc.

9000 MINI-JET CENTRAL VACUUM PUMP

The popular, non-electric mini-jet offers the ultimate in versatility utilizing an existing STP's product flow to create vacuum for vapour recovery. One mini-jet can handle eight fuelling positions with four nozzles in simultaneous full flow operation. Additional mini-jets can be added for larger sites. Provides high reliability and low maintenance. High vacuum level assures clearing of flooded vapour hoses.



HIGHLIGHTS

- No electrical hook-up.
- No moving parts creating vacuum.
- Installs in standard existing STP tank sump.

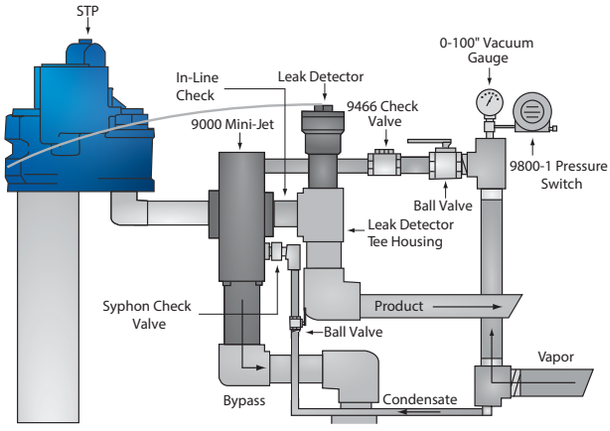
SPECIFICATIONS

CARB Certified for Use With	Executive Order Number	Tank Type
HEALY™ 600 bootless nozzle	G-70-165	UST

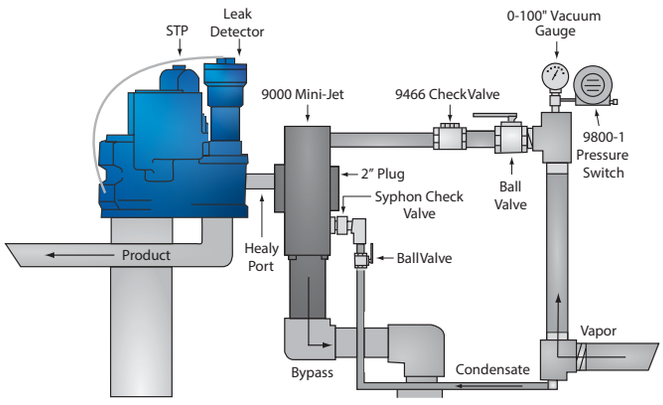
ORDER INFORMATION

Model	Description
9000-02	9000 mini-jet, non-electric with syphon port, can handle eight fuelling positions with four nozzles in simultaneous full flow
650-104-02	9000 mini-jet check valve strainer assembly (replaces 912A)
940A	Vacuum regulator upgrade kit
965	O-ring (1 per cover)
CV4	O-ring, for strainer assembly

Note: Central vacuum source installations may require the use of a monitor assembly.



IN-LINE installation



HEALY™ PORT installation

VP500 VANE CENTRAL VACUUM VANE PUMP

Provides the ultimate in central vacuum versatility. 115/230 VAC — 50/60 Hz application. High vacuum level assures clearing of flooded vapour hoses. Available in two versions. VP500B for mounting in a STP sump. Handles 10 fuelling positions with five nozzles in simultaneous full flow operation.



HIGHLIGHTS

- Flexible installation options
- Low cost installation and operation
- Unsurpassed low maintenance

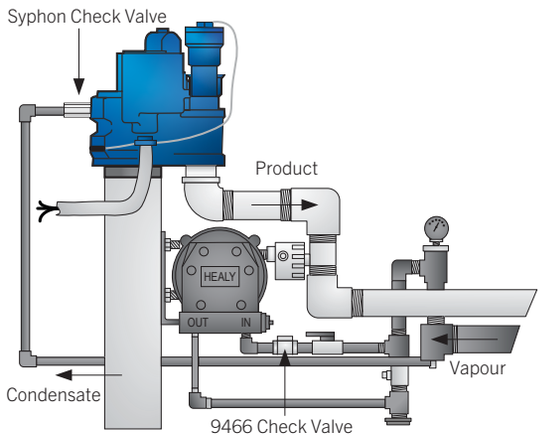
SPECIFICATIONS

CARB Certified for use with	HEALY™ 600 bootless nozzle
Executive order number	G-70-165
Tank type	UST

ORDER INFORMATION

Model	Description
VP500B	VP500 vane pump with U-bolts and angle bracket for mounting, handles 10 fuelling positions with five nozzles in simultaneous full flow
VP500	Replacement VP500 vane pump with regulator and flame arrestor assembly
VP500VR-3	VP500 vane and rotor replacement kit, pin drive
5007A	Regulator assembly
9214	VP500 flame arrestor

Note: Central vacuum source installation may require the use of a monitor assembly



600 SERIES BOOTLESS

The HEALY™ 600 Series bootless vapour recovery nozzle is the international standard for Stage II components. For use on new or existing dispensers, it can be installed with both central or dispenser mounted vacuum sources.



HIGHLIGHTS

- Features the easy-to-use bootless design which captures the vapours through the nozzle spout rather than a boot.
- For use on new or existing dispensers.
- Includes easy-to-replace vapour escape guard to prevent splashback and significantly reduces spout wear.
- With the internal vapour flow control, vapour flow is matched to liquid flow by the nozzle itself, rather than by complex electronic controls or variable speed pumps in the dispenser.
- This internal vapour flow control helps simplify installation, reduce system costs, and can significantly reduce downtime, system diagnostics, and maintenance costs.
- External parts are field-replaceable.
- The lightweight and bootless design makes this a very user-friendly Stage II Vapour Recovery nozzle.

SPECIFICATIONS

Weight	3lbs (1.4 Kg)
Flow rate	10 gpm (37.85 lpm)
Approvals/Certifications	- UL listed (UL 2586) - CARB approved

CARB Certified for Use With	Executive Order Number	Tank Type
9000 mini-jet	G-70-165	UST
VP500 vane pump	G-70-165	UST
VP1000 Series vacuum pump	G-70-183	UST

ORDER INFORMATION

Model	Description
600-02G9 FS	600 bootless nozzle, unleaded, full-service with black scuffguard*
600-02G9 RFS	Rebuilt 600 bootless nozzle, unleaded, full-service with black scuffguard*
600-02G9 SS	600 bootless nozzle, unleaded, self-service with black scuffguard*
600-02G9 RSS	Rebuilt 600 bootless nozzle, unleaded, self-service with black scuffguard*
469	600 nozzle handle cover
600 Core	600 nozzle core, in reusable condition for rebuild
6030	600 nozzle scuffguard, black
6030BL	600 nozzle scuffguard, blue
6030G	600 nozzle scuffguard, green
6030GD	600 nozzle scuffguard, gold
6030R	600 nozzle scuffguard, red
6030W	600 nozzle scuffguard, white
6030Y	600 nozzle scuffguard, yellow
405219903	600 nozzle vapour escape guard and 6119 boot clamp, black
405220903	600 nozzle spout kit includes 6206-G4 spout assembly, 6206-OR O-ring kit, 6118 vapour escape guard, and 6119 boot clamp
405221901	600 nozzle hold-open clip kit includes 6238-2 hold-open clip, 239-L rear guard rivet, 6249 spring, 6130-4 lever assembly, 240-SS pal nut, 219 front guard rivet, 6358 handguard and 235-C lever cover

**Nozzles are supplied with black scuffguards unless otherwise specified. To order a nozzle with a scuffguard colour other than black, place appropriate "X" code after "G3" in model number, as follows: BL for blue, GD for gold, G for green, R for red, W for white or Y for yellow.*

COAXIAL VAPOUR RECOVERY HOSE

HEALY™ brand ¾" coaxial hose is designed for use in vapour recovery refueling applications to improve air quality and emissions. This premium hose provides long-lasting service with multi-fuel compatibility.



HIGHLIGHTS

- Premium abuse-resistant cover compound with enhanced ozone resistance for service longevity.
- Coaxial HEALY™ straight thread (swivel and non-swivel), metric M-34 thread (swivel and non-swivel) and balance-type swivel thread fitting options available.

ORDERING INFORMATION

Complete model numbers have a specific order and are created using the following guidelines:

75B - A B - C D

75B = ¾" Vapour Recovery Hose

A = Hose Length Feet

Use two-digit format

B = Hose Length Inches

0 = None

5 = 6" (for curb length hoses only)

8 = 8" (for whip length hoses only)

C and D = End Fitting Options

F2 = Fixed HEALY™ straight thread

S2 = Swivel HEALY™ straight thread

F3 = Fixed metric M-34 thread

S3 = Swivel metric M-34 thread

S4 = Swivel balance-type thread

Curb hose example 1: 75B-115-F3F2 = ¾" vapour recovery hose, 11 feet 6 inches length, one fixed metric M-34 thread fitting and one fixed HEALY™ straight thread fitting.

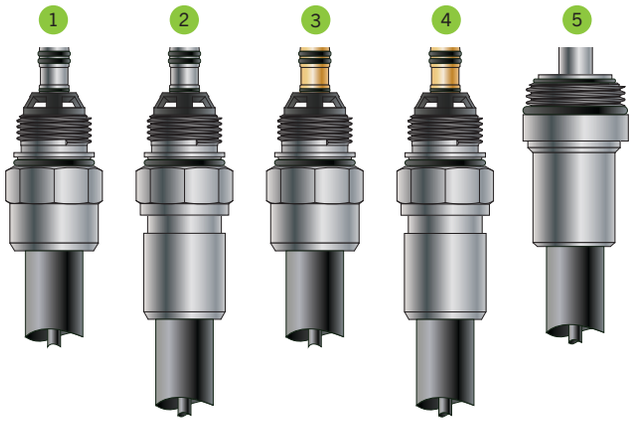
Whip hose example 1: 75B-008-F3F2 = ¾" vapour recovery hose, 0 feet 8 inches length, one fixed metric M-34 thread fitting and one fixed HEALY™ straight thread fitting.

SPECIFICATIONS

Tube	Nitrile synthetic rubber with flurothermoplastic barrier layer
Cover	Synthetic rubber
Reinforcement	3lbs (1.4 Kg)
End fittings	Stainless steel
Approvals & Certifications	- Meets UL330 - UL listed (Swivel and Fixed)

End Fitting Options

1. Fixed HEALY™ straight thread (F2)
2. Swivel HEALY™ straight thread (S2)
3. Fixed metric M-34 thread (F3)
4. Swivel metric M-34 thread (S3)
5. Swivel Balance-type thread (S4)



HOSE RETRIEVER SYSTEM

FLEX-ING™ brand hose retrievers are used to keep excess hose raised off the ground at sites which typically use long hoses such as truck refuelling sites. The hose retriever prevents safety hazards, kinks, tangles and prolongs the life of the hose. Combine the hose retriever with the hose retriever base plate and hose support for a complete hose retriever system.



HIGHLIGHTS

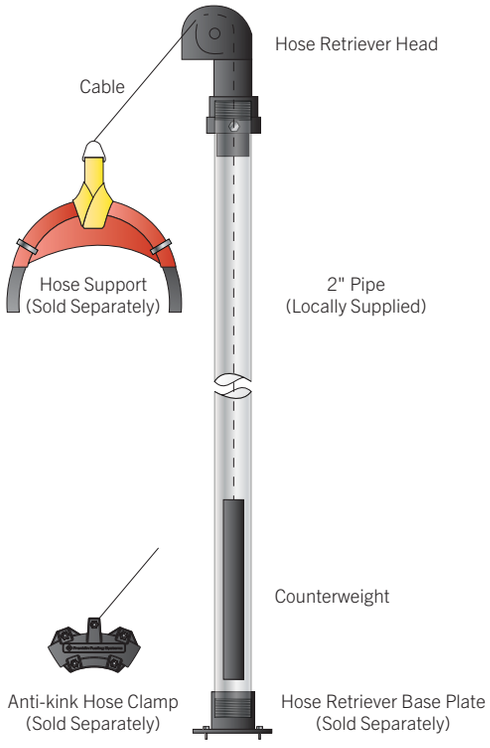
- Rust-resistant epoxy-coated cast iron body.
- Swivel head with 360° rotation for service in any direction and 2" NPT female inlet threads directly onto locally supplied 2" pipe.
- Hose retriever kit (HRTRVR) includes 20'of 1/8" stainless steel aircraft cable, 20lLbs. steel counterweight, plated steel pulley, two adjustable stainless steel clamps, and all necessary hardware for easy installation.
- Hose retriever base plate and hose clamp or hose support available to complete the hose retriever system.
- Installs on a locally supplied 2" pipe.
- Hose retriever base plate allows you to avoid breaking concrete for installation.

SPECIFICATIONS

Head and body	Cast iron
Cable	Stainless steel
Base	Steel
Recommended Installation height (if installed with hose retriever base)	10'6"
Recommended Installation height (if installed without hose retriever base)	17' maximum pipe length with minimum of 18" buried in concrete

ORDER INFORMATION

Model	Description
HRTRVR	Hose retriever kit including head with 2" NPT inlet, cable, counterweight, pulley and clamps
HRTRVRBASE	Hose retriever base plate, 2" NPT inlet
HB100	1" hose diameter hose support
407924901	Anti-kink hose clamp for 5/8" and 3/4" hoses





HOSE SUPPORT

The hosebun hose support features a polyurethane saddle designed to suspend hoses while accommodating the manufacturer's minimum bend radius and protects the hose from kinking which prolongs the life of the hose.

ORDER INFORMATION

Model	Description
HB100	1" hose diameter hosebun hose support



HOSE RETRACTOR

The hose retractor keeps excess conventional or vapour recovery hose raised off the ground. Mounted adjacent to the dispenser, the retractor prevents safety hazards, kinks, tangles and prolongs the life of the hose. The hose retractor features a corrosion-resistant cast aluminium body and base, two ball bearing pulleys, 3/16" nylon retractor rope, steel counterweight, and includes all necessary hardware for easy installation. The hose retractor is also available with hose clamps.

ORDER INFORMATION

Model	Description
HRTRTR	80" tall hose retractor, 20 lbs counterweight, 30 lbs.

Hosebun is not included with the hose retractor.



HOSE RETRIEVER

The hose retriever is used to keep excess hose raised off the ground at sites which typically use long hoses, such as truck fuelling sites. Threaded onto a 17'2" pipe (not included), the retriever prevents safety hazards, kinks, tangles and prolongs the life of the hose. The hose retriever features a rust-resistant epoxy-coated cast iron body, a swivel head with 360º rotation, 20'1/8" stainless steel aircraft cable, 20 lbs steel counterweight, plated steel pulley, two adjustable stainless steel hose clamps and includes all necessary hardware for easy installation.

ORDER INFORMATION

Model	Description
HRTRVR	37" tall hose retriever

DURADEF™ NOZZLE WITH MIS-FILL SPOUT FOR DEF/ADBLUE®



The FLEX-ING™ brand DuraDEF™ nozzle features a specially encapsulated aluminium casting which is lightweight yet completely DEF/AdBlue® compatible. It provides the performance and construction specifications required for DEF/AdBlue® delivery in a familiar, user-friendly design. This nozzle features a mis-fill prevention spout that prevents DEF from being dispensed unless the spout is engaged with a miss-fill prevention device (MPD). The MPD is available separately.

HIGHLIGHTS

- High strength aluminium body and stainless steel spout.
- Protective vinyl scuff guard.
- Available with or without hold-open clip.
- Spout designed for use with mis-fill prevention device.
- Internal components are manufactured from stainless steel or plastic for full DEF/AdBlue® compatibility.
- Sealed in a plastic bag to ensure no contamination.
- Meets all required specifications set by ISO 22241 for DEF/AdBlue® delivery.
- Mis-fill device available separately.

SPECIFICATIONS

Inlet	3/4" BSPP
Spout	19 mm stainless steel
Seals and poppet disc	Viton® A
Packing	PTFE
Weight/length/height	2.5lbs./13.5"/9"
Body casting	Coated aluminum
Handguard and vac cap	Nylon
Lever	Electroless nickel plated steel and nylon
Scuff guard	Vinyl
Body cap	Coated zinc

ORDER INFORMATION

Model	Description
DURADEF-MPD	DuraDEF nozzle with mis-fill prevention spout, hold-open clip, light blue scuff guard
DURADEF-MPD-O	DuraDEF nozzle with mis-fill prevention spout no hold-open clip, light blue scuff guard
DEF-MPD	Mis-fill prevention device for 3/4" spout

DURADEF™ NOZZLE FOR DEF/ADBLUE®

The FLEX-ING™ brand DuraDEF™ nozzle features a specially encapsulated aluminium casting that makes it lightweight yet completely compatible with DEF (Diesel Exhaust Fluid)/AdBlue®. This nozzle provides the performance and construction specifications required for DEF/AdBlue® delivery with a lightweight, more user-friendly design.



HIGHLIGHTS

- High strength aluminium body and stainless steel spout.
- Protective vinyl scuff guard available in green, yellow, red, blue, black and light blue to match station branding.
- Available with or without hold-open clip.
- Internal components are manufactured from stainless steel or plastic for full DEF/AdBlue® compatibility.
- Sealed in a plastic bag to ensure no contamination.
- Meets all required specifications set by ISO 22241 for DEF/AdBlue® delivery.

SPECIFICATIONS

Inlet	3/4" BSPP
Spout	19 mm stainless steel
Seals and poppet disc	Viton® A
Packing	PTFE
Weight/length/height	2.5lbs./13.5"/9"
Body casting	Coated aluminum
Handguard and vac cap	Nylon
Lever	Electroless nickel plated steel and nylon
Scuff guard	Vinyl
Body cap	Coated zinc

ORDER INFORMATION

FLDEF A B C D - E - F

FLDEF = DEF/AdBlue® Hose

B = Hose Diameter

- 02 = 3/4"

C = Hose Length Feet

- Use three-digit format

D = Hose Length Inches

- Use two-digit format

E & F = End Fitting Options

- 2N = 3/4" NPT
- 2P = 3/4" BSPP
- 3P = 1" BSPP

Model	Description
DURADEF-LB	Light Blue DuraDEF nozzle with locking clip
DURADEF-LB-O	Light Blue DuraDEF nozzle without locking clip

HOSE FOR DEF/ADBLUE®

FLEX-ING™ brand diesel exhaust fluid hose features a specially formulated low-extraction EPDM rubber tube making it completely compatible with DEF/AdBlue®. The flexible softwall construction provides superior handling for both standard and reel applications. Each curb hose length features dual anti-kink sleeves at each end to protect the hose from accelerated wear and kinking. The anti-kink sleeves are factory installed over the end fitting ferrule to ensure maximum wear protection.



HIGHLIGHTS

- Peroxide cured tube provides superior extraction levels and significantly reduces contamination.
- Premium polyester braided construction reduces volumetric expansion.
- Integrated static wire.
- All curb hoses over 2'in length are outfitted with factory installed anti-kink sleeves on both ends.
- BSPP outlets include a fluoroelastomer flat seal to ensure compression tightness.

SPECIFICATIONS

Tube	Specially formulated low-extraction EPDM rubber, peroxide cured
Reinforcement	Polyester braid
Cover	Specially formulateed EPDM
Temperature	-40° F to 257° F (-40° C to 125° C)
Approvals	Meets ISO 22241 standard ensuring desirable characteristics of AUS 32 (DEF) are met, such as quality, safety, reliability, and contamination

ORDER INFORMATION

FLDEF A B C - D - E

FLDEF = DEF/AdBlue® Hose

A = Hose Diameter

- 2 = 3/4"

B = Hose Length Feet

- Use three-digit format

C = Hose Length Inches

- Use two-digit format

D & E = End Fitting Options

- 2N = 3/4" NPT
- 2P = 3/4" BSPP
- 3P = 1" BSPP
- 3PF = 1" BSPP Female Swivel

Example: FLDEF200906-2N-2N = Def/Adblue® hose, 3/4" diameter, 9 feet 6 inches length, 3/4" NPT fitting on both ends.



BREAKAWAY VALVE FOR DEF/ADBLUE®

FLEX-ING™ brand diesel exhaust fluid 3/4" breakaway valves provide in-line protection for hanging hardware in the event of a drive off. These breakaway valves feature a stainless steel design and internal components that make them completely compatible with DEF/AdBlue®. Upon separation the check valve in each half of the breakaway valve seals instantly, preventing fuel from escaping at both ends.



HIGHLIGHTS

- Consistent separation force.
- The ball check valves seal both halves of the breakaway valve instantly upon separation.
- Machined from solid stainless steel bar stock.
- The two halves of the breakaway valve are sealed before the check valves open creating a completely dry break.

SPECIFICATIONS

Body and valve	Stainless steel
Check valve	PTFE
Seals	Viton®
Ring cover	Nylon (integrated)
Max. working pressure	3.5 bar (50 PSI)
Breaks rings break force	325 lbs
Height	83 mm (3.25”)

ORDER INFORMATION

Model	Description
BRK34SS-N	3/4" NPT DEF breakaway valve
BRK34SS-P	3/4" BSPP DEF breakaway valve

SWIVEL BREAKAWAY VALVE FOR DEF/ADBLUE®



FLEX-ING™ brand diesel exhaust fluid swivel breakaway valves provide in-line protection for hanging hardware in the event of a drive off. These breakaway valves feature a stainless steel body that makes them extremely durable and completely compatible with DEF/AdBlue®. The breakaway valve design ensures proper drive-off protection and allows for easy installation directly between the nozzle and hose. The integrated swivel action provides easy nozzle rotation during vehicle filling while also helping to reduce hose wear and kinking.

HIGHLIGHTS

- High strength stainless steel body with internal components that are completely compatible with DEF/AdBlue®.
- Breakaway valves separate with axial or up to 30° angular force.
- Fluid release limited to less than 10 ml upon breakaway valve separation.
- Atmospheric inner seal protects from corrosion.
- Integrated swivel action provides easy nozzle rotation during vehicle filling while also helping to reduce hose wear and kinking.
- Available with either ¾" NPT and ¾" BSPP nozzle outlet and standard 1" BSPP female inlet.
- BSPP nozzle outlet includes a fluoroelastomer flat seal to ensure compression tightness between the breakaway valve and the nozzle inlet.

SPECIFICATIONS

Body	Stainless steel
Separation force	Between 180 lbs. and 340 lbs. force (800 N and 1,500 N force)
Temperature rating	-22° F to 131° F (-30° C to 55° C)
Internal pressure	Factory tested to 76.8 PSI (5.3 bar)
Electric conductivity	Factory tested to < 100k Ohm
Nozzle flow rate	Up to 79 lpm (21 gpm)
Working pressure compatibility	0.5 bar up to 3.5 bar

ORDER INFORMATION

Model	Description
OMNIDEF1X34N	3/4" NPT nozzle outlet, 1" BSPP female inlet DEF swivel breakaway valve
OMNIDEF1X34P	3/4" BSPP nozzle outlet, 1" BSPP female inlet DEF swivel breakaway valve
OMNIDEF1PXM34	M34 (metric) nozzle outlet, 1" BSPP female inlet DEF swivel breakaway valve

SUBMERSIBLE PUMPING SYSTEMS

1. Submersible Turbine Pumps
   - A. Variable Speed Submersible Pumps (2 Hp, 4 Hp)
   - B. Fixed Speed Submersible Pumps (2 Hp, 1-1/2 Hp, 3/4 Hp)
   - C. Variable Length (VL1, VL2, VL3)
   - D. High Capacity Submersible Pumps and Controllers (3 hp and 5 hp)
2. Mechanical Leak Detectors (MLD)
3. Variable Frequency Controller (EcoVFC™, MagVFC™)






2

ADVANCED PROTECTION SUBMERSIBLE TURBINE PUMPS

Available as a factory installed option on STPAG and IST® biofuel compatible submersible turbine pumps, Advanced Protection defends STPs from accelerated corrosion caused by the acetic byproduct of microbial activity.



HIGHLIGHTS

- Powder-coated and E-coated finishes protect exterior cast surfaces from accelerated corrosion.
- Stainless steel fasteners, riser, variable length column pipe and coupler protect against corrosion and provide long service life.

ORDER INFORMATION

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 (IST® for variable speed models)
- XXXXX = Factory installed options (Model designations may include one or more of the following characters in alphabetical order.)
  - AP = Advanced protection with coated exterior cast surfaces, stainless steel fasteners and piping, alcohol-gasoline compatible)
  - F = Floating suction adapter (1½" NPT female adapter)
  - H = High pressure deadhead output (150 and 200 models only)
  - 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
  - 75B = 3/4 hp fixed speed, single phase
  - 75C = 3/4 hp fixed speed, three phase
  - 150B = 1 1/2 hp fixed speed, single phase
  - 150C = 1 1/2 hp fixed speed, three phase
  - 200B = 2 hp fixed speed, single phase
  - 200C = 2 hp fixed speed, three phase
  - VS2 = 2 hp variable speed**
  - VS4 = 4 hp variable speed***
- A = Model length
  - VL1 = Variable length range #1
  - VL2 = Variable length range #2
  - VL3 = Variable length range #3
- 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).

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

***Implied on IST® models unless VS4 is specified.*

**** IST® models only.*

(Advanced Protection STP shown with MLD+ and IFS, sold separately)

ORDERING INFORMATION CONTINUED

Corrosion Control™ Advanced Protection Submersible Turbine Pumps Common Configurations

Model	Description	Model Length Range Number	Model Length* Range
ISTAPVS4-VL1	4 hp AP variable speed	VL1	1613 mm– 2355 mm
ISTAPVS4-VL2	4 hp AP variable speed	VL2	2401 mm–3962 mm
ISTAPVS4-VL3	4 hp AP variable speed	VL3	3214 mm–5556 mm
ISTAP-1	2 hp AP variable speed	VL1	1486 mm–2228 mm
ISTAP-2	2 hp AP variable speed	VL2	2274 mm–3835 mm
ISTAP-3	2 hp AP variable speed	VL3	3087 mm–5429 mm
STPAP200B-VL1	2 hp AP fixed speed, single phase	VL1	1632 mm–2374 mm
STPAP200B-VL2	2 hp AP fixed speed, single phase	VL2	2420 mm–3981 mm
STPAP200B-VL3	2 hp AP fixed speed, single phase	VL3	3233 mm–5575 mm
STPAP200C-VL1	2 hp AP fixed speed, three phase	VL1	1575 mm–2317 mm
STPAP200C-VL2	2 hp AP fixed speed, three phase	VL2	2363 mm–3924 mm
STPAP200C-VL3	2 hp AP fixed speed, three phase	VL3	3175 mm–5518 mm
STPAP150B-VL1	1-1/2 hp AP fixed speed, single phase	VL1	1556 mm–2298 mm
STPAP150B-VL2	1-1/2 hp AP fixed speed, single phase	VL2	2344 mm–3905 mm
STPAP150B-VL3	1-1/2 hp AP fixed speed, single phase	VL3	3156 mm–5499 mm
STPAP150C-VL1	1-1/2 hp AP fixed speed, three phase	VL1	1531 mm –2273 mm
STPAP150C-VL2	1-1/2 hp AP fixed speed, three phase	VL2	2318 mm–3879 mm
STPAP150C-VL3	1-1/2 hp AP fixed speed, three phase	VL3	3131 mm–5473 mm
STPAP75B-VL1	3/4 hp AP fixed speed, single phase	VL1	1499 mm –2241 mm
STPAP75B-VL2	3/4 hp AP fixed speed, single phase	VL2	2286 mm–3848 mm
STPAP75B-VL3	3/4 hp AP fixed speed, single phase	VL3	3099 mm–5441 mm
STPAP75C-VL1	3/4 hp AP fixed speed, three phase	VL1	1480 mm–2222 mm
STPAP75C-VL2	3/4 hp AP fixed speed, three phase	VL2	2267 mm–3829 mm
STPAP75C-VL3	3/4 hp AP fixed speed, three phase	VL3	3080 mm–5422 mm

Notes:

1. *STPAP/ISTAP models are listed for compatibility 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 above ISTAPVS4 4 hp models can only be powered by an EcoVFC™ with three-phase incoming power supply. All above ISTAP2 hp models can be powered by a MagVFC™ with single-phase incoming power or an EcoVFC™ with three-phase incoming power.*
4. *All above STPAP single phase models (75B, 150B, 200B) require single-phase, 200–250 VAC, 50 Hz incoming power. All above STPAP three phase models (75C, 150C, 200C) require three-phase, 380-415 VAC, 50 Hz incoming power.*
5. *4" riser pipe, if supplied locally, must be 4½" OD by 3/16" WT tubing.*
6. *For riser pipe lengths 787 mm to 1524 mm, adder charge applies (call customer service for lead times).*

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

Factory Installed Approvals

May specify one in model number at time of order.

Model	Description
(ATXF)	STP with ATEX flameproof approval for EN markets
(RT)	STP 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
R	Model R check valve, factory installed, for Veeder-Root® PLLD Line Leak
H	High pressure deadhead output (150 and 200 models only)

Field Installed Options

Model	Description
5874202800	MagVFC™, 2 hp or 4 hp variable frequency controller, one required per IST
400137908	Syphon check valve (when ordered with STP)
400818921	STP-CBS, single-phase control box with lockout switch, 110 Volt coil
402312932	STP-DHIB + SPGC-220, bundle
402313921	STP-DHI-CBS, combo DHI with factory wired STP-CBS
402459931	Model 65 psi check valve (for secondary of manifolded STPs with Veeder-Root® PLLD)
402507930	Secondary syphon kit (when two syphon primes are required for one STP)
5800100220	SPGC-220 Guardian Series™ Single Phase Controller, 220 Volt
5800300200	STP-DHIB, dispenser hook isolation for 220 Volt dispenser handle switches, up to eight each
5874202900	EcoVFC™, 380-415 VAC, 50-60 Hz, one required per IST
5800103380	TPGC-380 Guardian Series™ Three Phase Controller (380 Volt supply, 220 Volt hook)

BIOFUEL COMPATIBLE SUBMERSIBLE TURBINE PUMPS

As the demand for biofuels continues to grow, FE PETRO® brand Alcohol-Gas (AG) optioned submersible turbine pumps are at the forefront of motor fuel compatibility. Service station customers demand it, make sure you can provide it. Make sure you have the appropriate equipment to meet the biofuel needs of your customers.



HIGHLIGHTS

The Proper Approvals
FE PETRO® brand STPAG and IST® models of submersible turbine pumps (STPs) are currently the only STPs UL listed for use with gasoline up to 85% ethanol (E85) and diesel fuel with up to 20% biodiesel (B20) or 100% biodiesel according to UL79A and UL79B respectively.

Built On Our Standard Pumps
FE PETRO® brand AG optioned submersible turbine pumps feature fuel compatibility built on the framework of our standard models. Replacement items like check valves and pump motor assemblies are directly interchangeable, eliminating the need to stock duplicate items for standard and AG optioned STPs.

Stop Biofuel Debris
As biofuel use continues to grow, so does the potential for increased debris inside the storage tank. To stop this debris from entering the pumping system, use an FE PETRO® brand Intake Filter Screen (IFS). The IFS can be factory installed on STPs and Pump Motor Assemblies (PMAs) or they can be field-retrofitted onto existing FE PETRO® or competitive 4" PMAs.

Filtration For The Entire System
When installed, an IFS adds only about 1" to the length of the PMA and provides filtration down to about the size of a grain of sand (0.009" openings). Through the IFS design, the output performance of the STP/PMA is maintained to that of a standard end bell construction while providing the added filtration for the entire pumping system.

ONLY FE PETRO®

FE PETRO® brand submersible pumping systems set the standard for performance, efficiency, and safety. Check out its unique set of system features.



VARIABLE SPEED

With faster fill times during peak hours and power savings during non-peak hours, FE PETRO® 2 hp and 4 hp variable speed submersible pumping systems allow you to maximize profits while mitigating operating expenses.

HIGHLIGHTS

- 2 hp variable speed systems provide faster flow rates compared to fixed speed systems for virtually the same total cost of ownership.
- Variable speed systems ramp pressure up and down for a consistent user experience and prevent system wear from line shock.



THE MAGSHELL™

It's always been about filling cars faster. The patented MagShell™ is designed to do just that. By expanding the pump motor shell, the MagShell™ increases the area for product flow by 45%.

HIGHLIGHTS

- The additional flow capability is equivalent to having one more nozzle operating during peak hours.
- Faster throughput during peak hours equates to greater fuel sales potential.
- MAGSHELL® option available in 2hp and 4 hp models.



FUEL COMPATIBILITY

Market demands for alternative fuel compatibility continue to change. As standards change, FE PETRO® systems are at the forefront, gaining the new approvals our customers need.

HIGHLIGHTS

- FE PETRO® systems are UL listed with both UL79A (up to 85% ethanol) and UL79B (up to 20% or 100% Biodiesel).
- Compatibility upgrades for FE PETRO® systems are built within the framework of the standard design, meaning no need to stock duplicate items for common service parts.



EASY REPLACEMENT

The rock solid design of FE PETRO® pumps has remained virtually unchanged since day one, meaning we can, and still do, service our pumps installed since 1988 with backward compatibility.

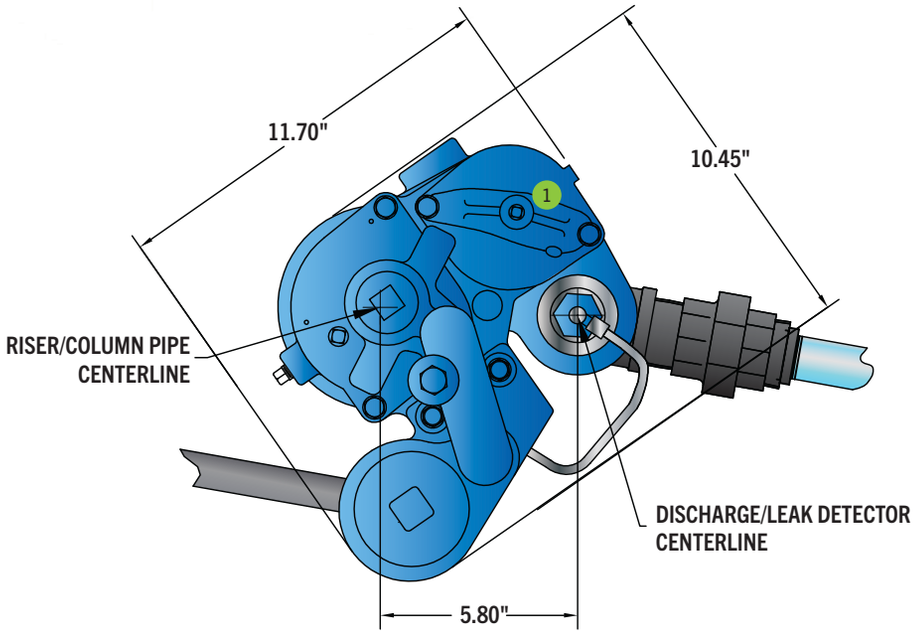
HIGHLIGHTS

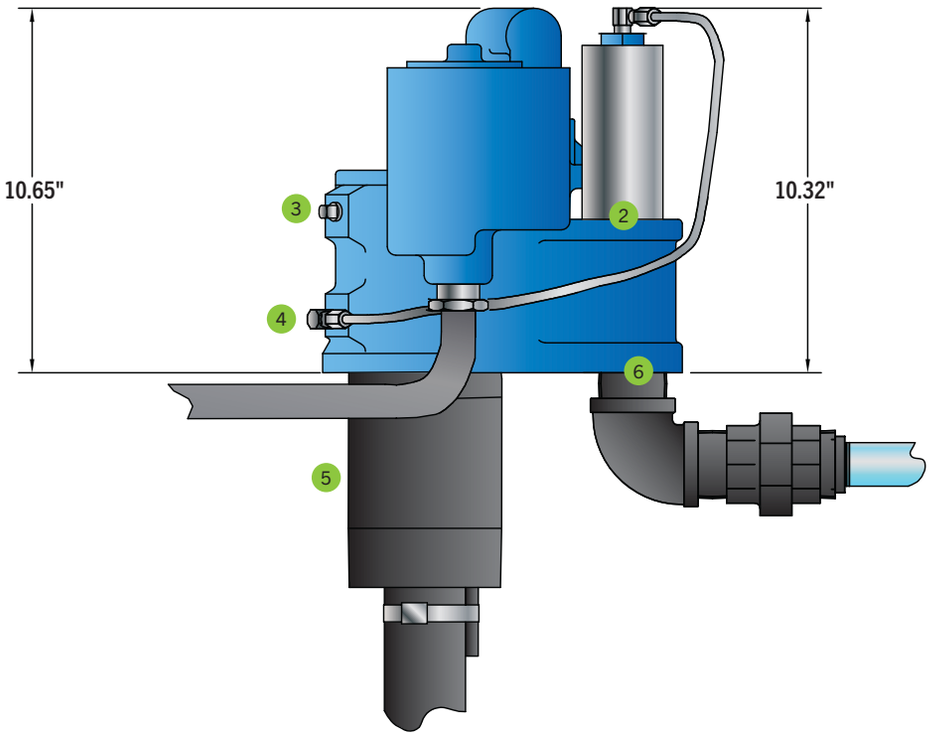
- Upgrade from fixed speed to variable speed with complete and cost-effective MAGSHELL™ equipped variable speed conversion kits.
- 2 hp fixed speed pump motor assemblies available with MAGSHELL™ in both standard and high pressure models to easily upgrade your existing STP.

4" SUBMERSIBLE TURBINE PUMPS

4" Submersible Pump Manifold Components & Key Dimensions

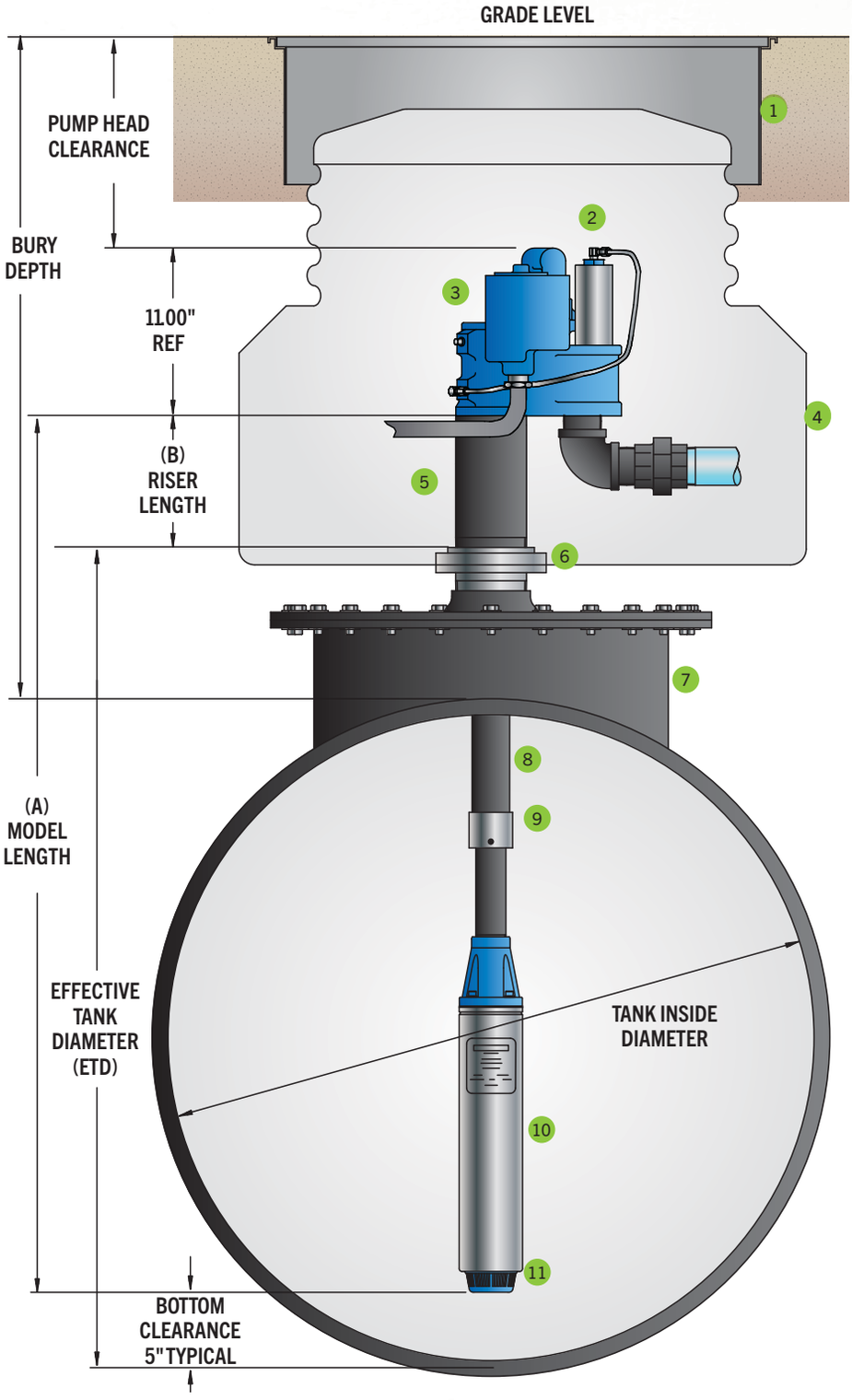
1. Line Test Port, ¼" NPT
2. Leak Detector Port, 2" NPT
3. Syphon Port, ¼" NPT
4. Tank Port, ¼" NPT
5. Riser Pipe, 4" NPT
6. Discharge Outlet, 2" NPT





4" Submersible Pump Components & Key Dimensions

1. Manhole
2. Leak Detector
3. Manifold
4. Containment Sump
5. 4" Riser
6. Tank Adapter
7. Tank Manway
8. Column Pipe
9. Variable Length Coupler
10. Pump Motor Assembly (PMA)
11. End Bell



Notes:

1. Effective tank diameter (ETD) = Inside tank diameter (to top of 4" bung), including tank manway and/or sump adapter.

2. Model length (A) = ETD plus riser length minus bottom clearance minus 1" thread engagement.

3. Riser length (B) = Bury depth (to top of tank) minus pump head clearance minus tank manway and/or minus sump adapter.

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.

MagVFC™/EcoVFC™ Design Highlights
The MagVFC™ 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 MagVFC™ 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.

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.

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 MagVFC™ or EcoVFC™ between 1.65 bar and 2.9 bar deadhead.
- Available with MAGSHELL®, which results in 45% increased flow area around motor.

SPECIFICATIONS

Power Requirements	IST® models can only be powered by a MagVFC™ or the EcoVFC™ controllers.
Single phase incoming power supply	2 hp models can operate with single phase incoming power supply to the MagVFC™
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 MagVFC™ can be 200-250 VAC, 50 Hz and 360-440 VAC, 50 Hz for the EcoVFC™.
	MagVFC™ 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
	MagVFC™ or EcoVFC™ max. line draw: 20 Amps.

ORDER INFORMATION

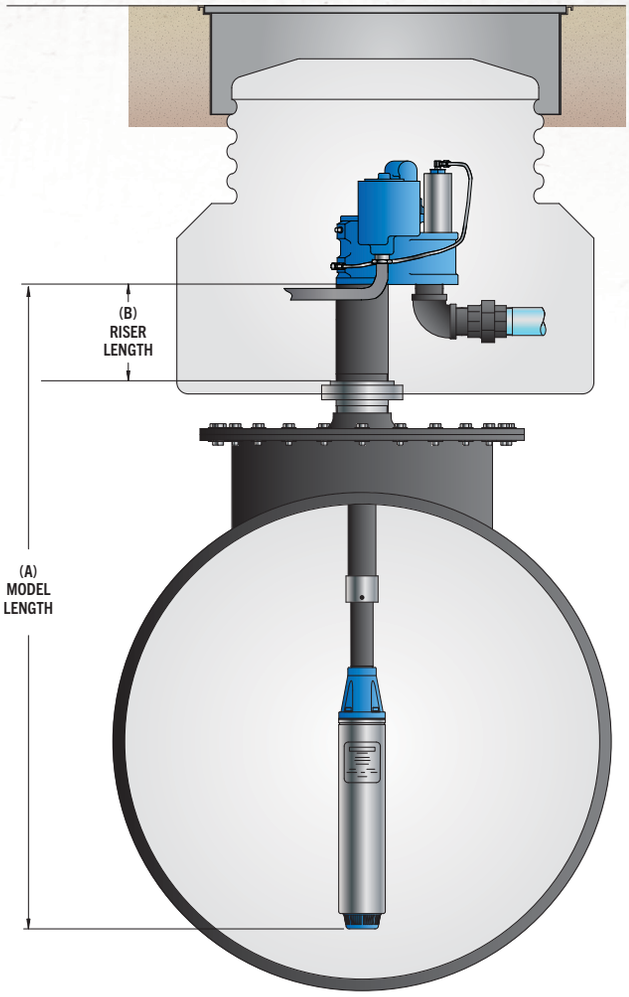
Intelligent STP Model Designation System
A typical turbine model designation has up to five components to define the pump being supplied as follows:

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.*

ORDER INFORMATION CONTINUED

Intelligent Submersible Turbine Pumps

Variable speed, variable length, AG compatible.

Model	Description	Model Length Range Number	Model Length* Range
IST®1	2 hp AG variable speed	VL1	1486 mm—2228 mm
IST®2	2 hp AG variable speed	VL2	2274 mm—3835 mm
IST®3	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

Notes:

1. *All above models are compatible with fuel mixtures containing up to 85% ethanol with gasoline, diesel fuels with up to 20% biodiesel, 100% biodiesel, 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. *4 hp models require EcoVFC™ with three-phase incoming power supply, 2 hp models can be powered by MagVFC™ or EcoVFC™.*
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.*

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

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 IST® 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	MagVFC™, 200-250 VAC, 50-60 HZ one required per IST®
5874202900	EcoVFC™, 360-440Hz 50-60 Hz one required per IST®
400137937	Syphon check valve, alcohol-gasoline compatible
402459931	Model 4.48 bar check valve (AG compatible for slave of manifolded ISTs® with Veeder-Root® (*) PLLD)
402507930	Secondary syphon kit (when two syphon primes are required for one IST®)
5800300200	STP-DHIB, dispenser hook isolation for 240 volt dispenser handle switches, up to 8 each

VARIABLE SPEED SUBMERSIBLE TURBINE PUMPS

Maximise 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 maximise 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 Master-Slave, 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 MagVFC™ or EcoVFC™ between 1.65 bar and 2.9 bar deadhead.
- Available with MAGSHELL® which results in 45% increased flow area around motor.

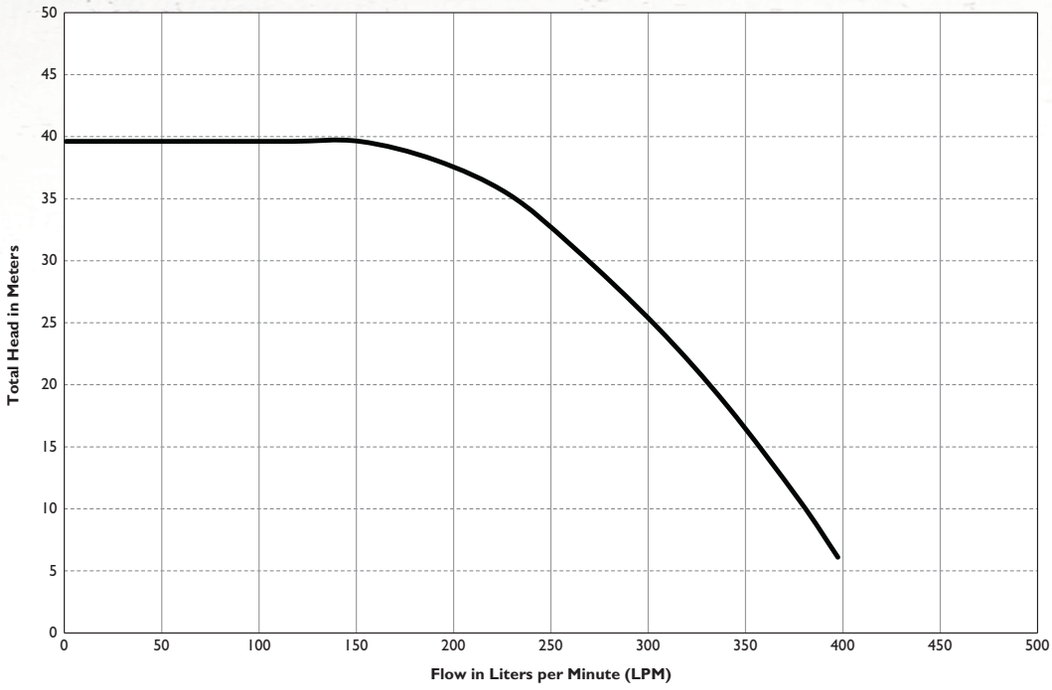
Power Requirements

- Variable speed pumps can only be controlled by a MagVFC™ or EcoVFC™ variable frequency controller:
- VS2 models can operate with single-phase incoming power supply to the MagVFC™.
- 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 MagVFC™ and 360-440 VAC, 50 Hz for the EcoVFC™.
- MagVFC™ 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.
- MagVFC™ or EcoVFC™ max. line draw: 20 Amps.

SPECIFICATIONS

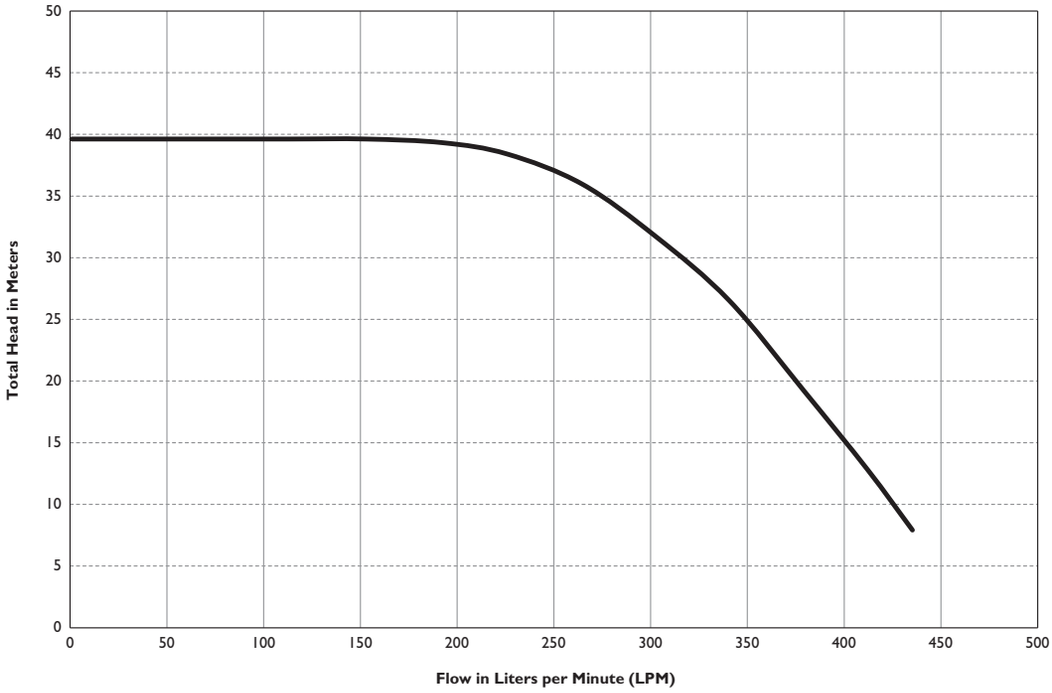
Variable Speed Models	In variable length only
Check Valve	70 mm diameter fluorocarbon and steel backing washer
Pressure Relief Valve	Available in four pressure relief settings, integral to check valve. Standard model relieves at 2.76 bar and resets above 2.41 bar.
Syphon	Venturi-type syphon supplies 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 Turbine Performance Chart (STPMVS2)



Note: Performance based on pumping gasoline (0.76 specific gravity). Pressure is taken at the manifold discharge outlet. MagShell® Variable Speed 2 hp was powered by MagVFC™ with Single-Phase, 50 Hz, 220 Volt incoming supply or Eco VFC™ with Three-Phase, 50 Hz, 410 Volt incoming power supply.

4 hp Variable Speed Turbine Performance Chart (STPMVS4)



Note: Performance based on pumping gasoline (0.76 specific gravity). Pressure is taken at the manifold discharge outlet. MagShell® variable speed 4 hp was powered by Eco VFC with three-phase, 50 Hz, 410 Volt incoming supply.

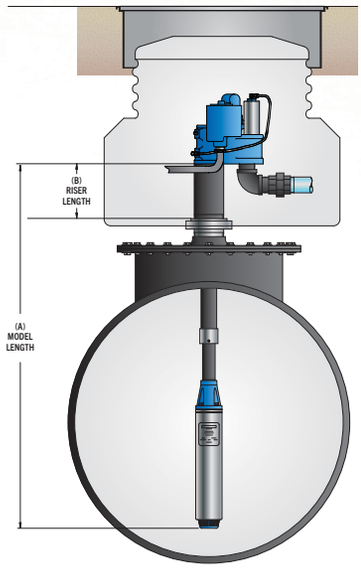
ORDER INFORMATION

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.*

ORDER INFORMATION CONTINUED

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

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 MagVFC™ 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	MagVFC™, 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.

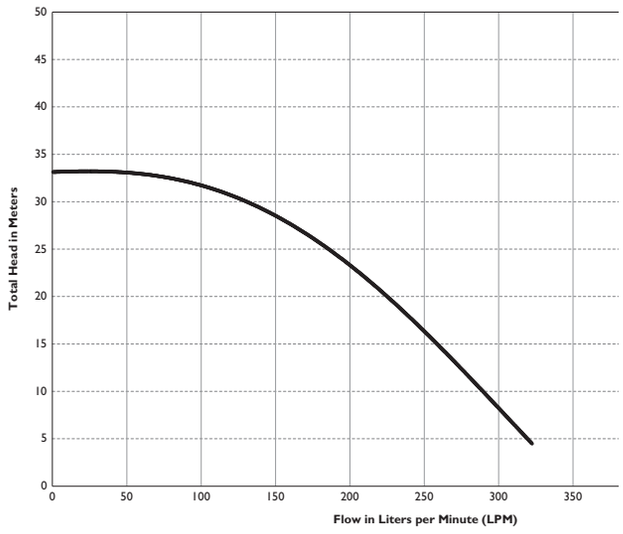
SPECIFICATIONS

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.
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.

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.
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.

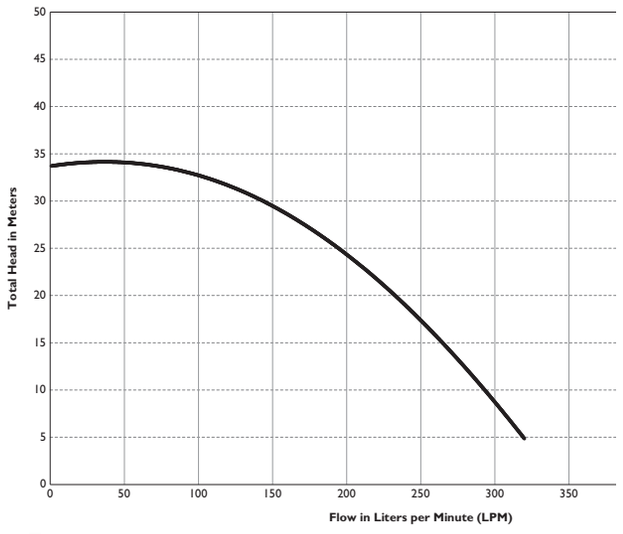
2 hp Fixed Speed Turbine Performance Chart

(STP200B)



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.

(STP200C)



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

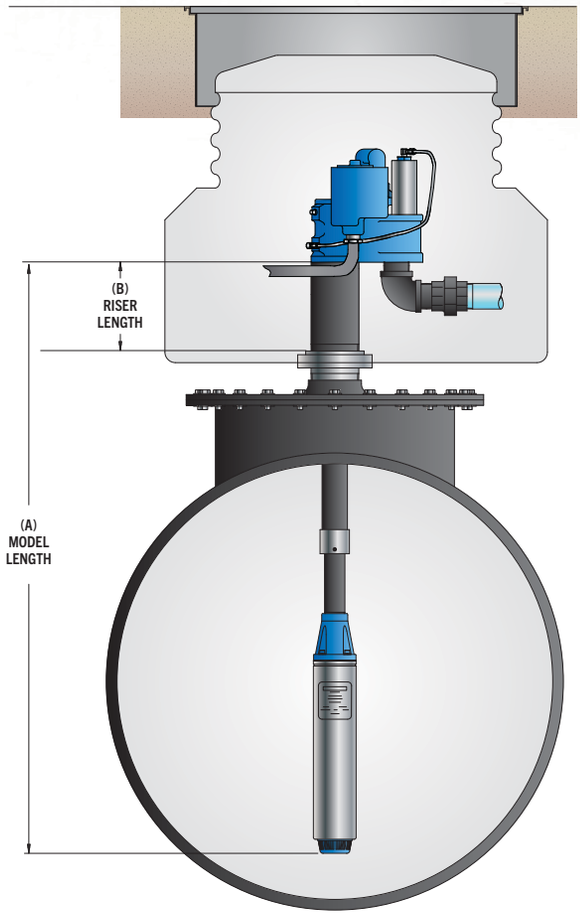
- STP = Basic model designation
- XXXXX = Factory installed options
  - STP model designations may include one or more of the following characters in alphabetical order:
  - AG = Alcohol-gasoline compatible (up to 85% ethanol, up to 20% biodiesel, or 100% biodiesel).
    Note: Standard models up to 10% 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

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Red Jacket is a trademark of Veeder-Root Company.

1 ½ 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.

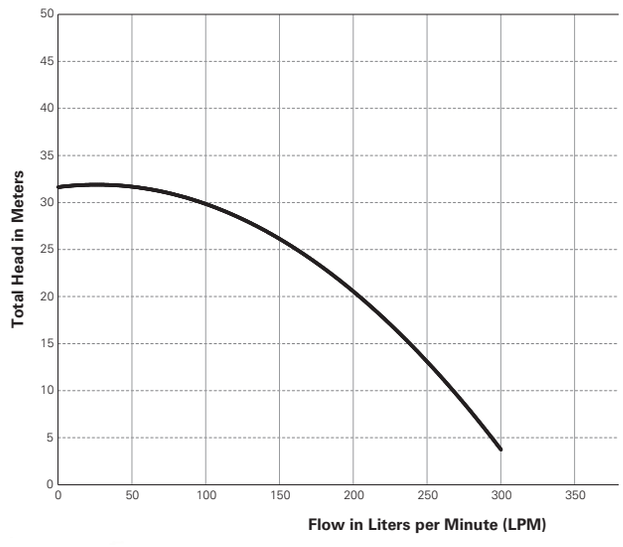
SPECIFICATIONS

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.
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.

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.
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.

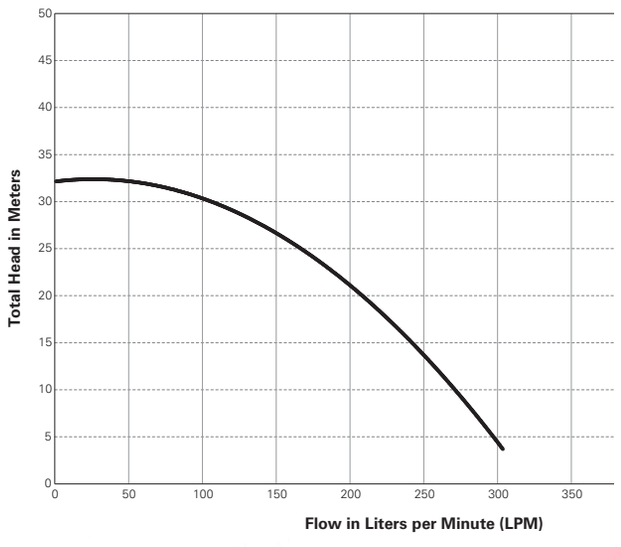
1½ HP Fixed Speed Turbine Performance Chart

(STP150B)



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.

(STP150C)



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

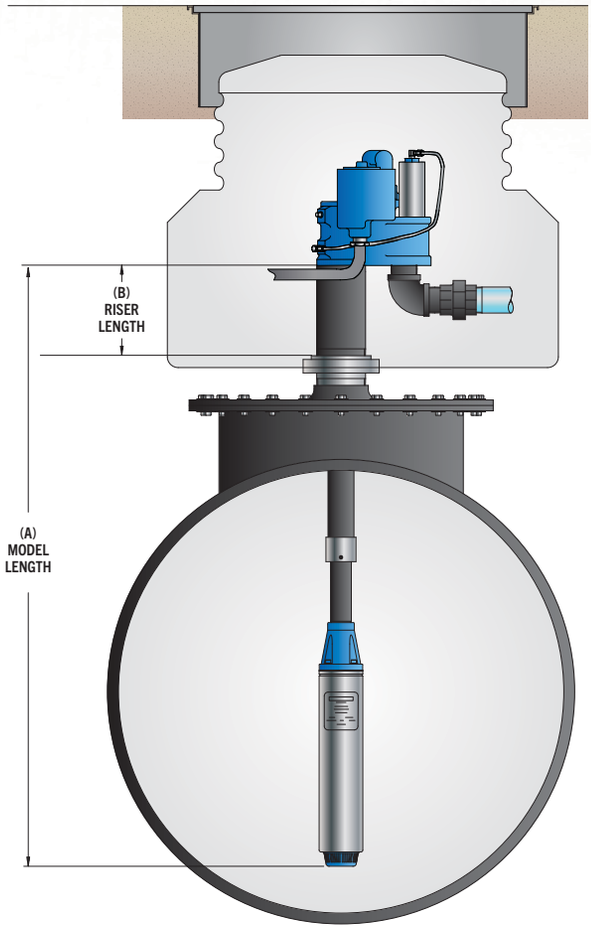
- STP = Basic model designation
- XXXXX = Factory installed options
  - STP model designations may include one or more of the following characters in alphabetical order:
  - AG = Alcohol-gasoline compatible (up to 85% ethanol, up to 20% biodiesel, or 100% biodiesel).
    Note: Standard models up to 10% 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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¾ 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

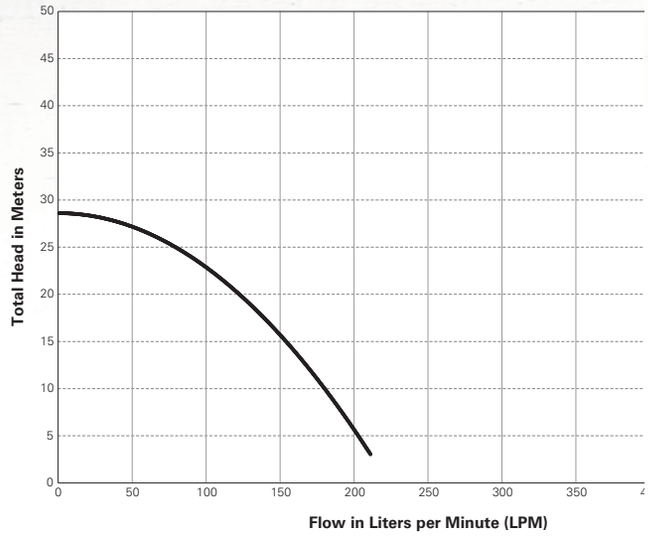
- Max. liquid viscosity: 70 SSU at 60° F (15° C).
- Standard models are listed for fuel mixtures containing up to 10% ethanol with gasoline, and 20% MTBE, 20% ETBE, or 17% TAME with gasoline.
- STPAG models are compatible with fuel mixtures containing diesel fuel with up to 20% biodiesel, 100% biodiesel, 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

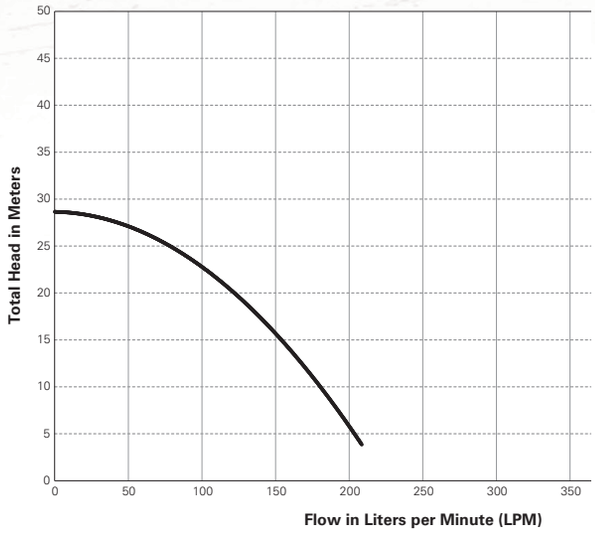
3/4 hp Fixed Speed Turbine Performance Chart

(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

¾ 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

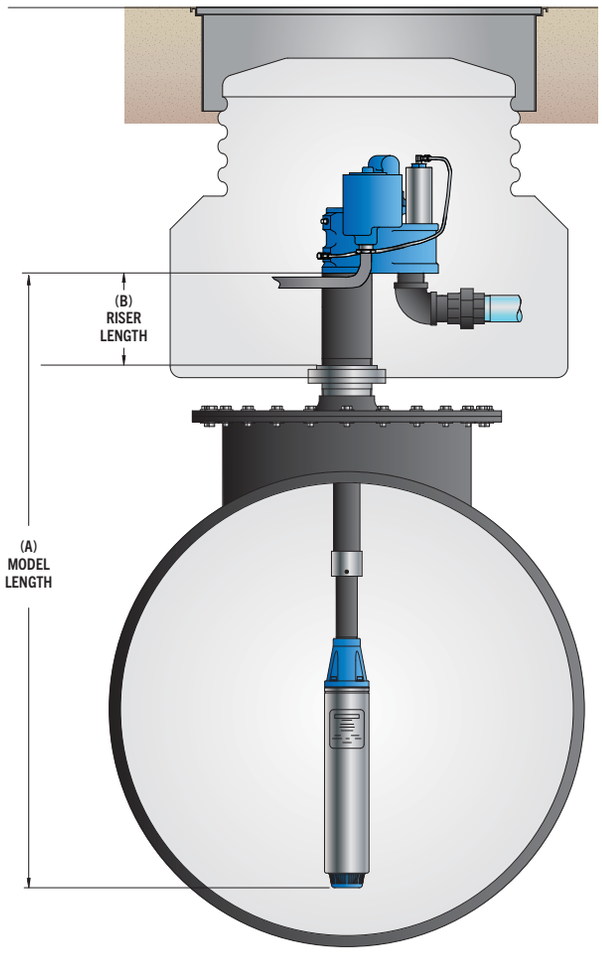
- STP = Basic model designation
- XXXXX = Factory installed options
  - STP model designations may include one or more of the following characters in alphabetical order:
  - AG = Alcohol-gasoline compatible (up to 85% ethanol, up to 20% biodiesel, or 100% biodiesel).
    Note: Standard models up to 10% 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:

1. *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.*
2. *All models are supplied with a standard check valve unless factory option "R" is specified.*
3. *4" riser pipe, if supplied locally, must be 4½" OD by 3/16" WT tubing.*
4. *75B models require single-phase, 200-250 VAC, 50 Hz power. 75C models require three-phase, 380-415 VAC, 50 Hz power.*
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
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

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

MECHANICAL LEAK DETECTORS (MLD+)

FE PETRO® brand MLD+ mechanical leak detectors provide precise leak detection for standard fuel and biofuel applications on 4" submersible turbine pumps (STPs). This lineup of advanced mechanical leak detectors features reliable line leak detection capabilities and maximum product flow rates. The MLD+ features a compact, yet rugged design to reduce installation height and provide accurate, hassle-free operation.



HIGHLIGHTS

- Two models to meet the needs of your standard fuel applications include the MLD+G (blue cover—copper vent tubing) for gasoline with up to 10% Ethanol and the MLD+D (gold cover—copper vent tubing) for diesel with up to 5% biodiesel.
- Two models to meet the needs of your biofuel applications include the MLD+AG (blue cover, stainless vent tubing) for gasoline with up to 85% ethanol and the MLD+BD (gold cover—stainless vent tubing) for diesel with up to 20% biodiesel or 100% biodiesel.
- Piston style construction with reduced volume allows the MLD+ to react quickly and provide more accurate leak detection capabilities.
- A specialised metering pin unique to only the MLD+ provides precision leak detection for any type of pipework system including flexible, rigid or a combination of the two.
- Burnished piston chamber provides smooth operation and long service life.
- Colour coded covers easily identify the model to the application (gold for diesel and blue for gasoline).
- Opens completely to allow maximum product flow during fueling operation and remains open with discharge pressure as low as 1 psi (0.07 bar).
- Compatible with FE PETRO® brand STPs, as well as competitive STPs and line leak detector housings.

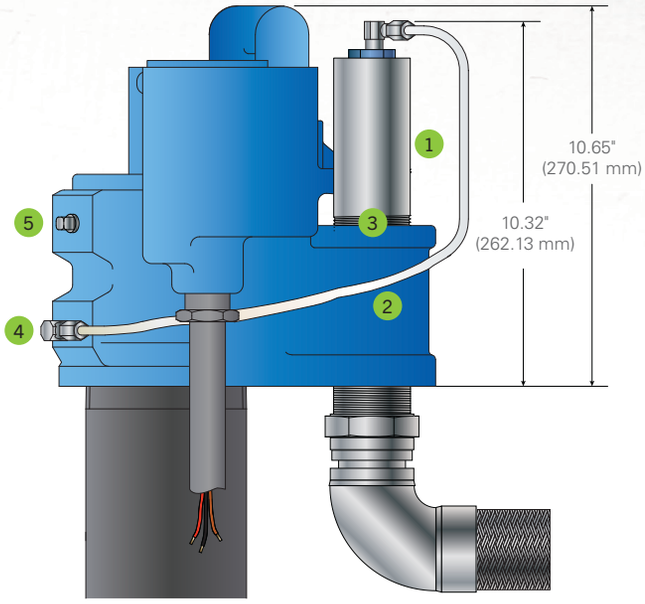
SPECIFICATIONS

Line Leaks	All models are capable of detecting line leaks equivalent to 3 gph at 10 psi (11.4 lph @ 0.70 bar) when installed properly with the appropriate fuels - all models will signal detection leaks by restricting product delivery to less than 3 gpm (11.4 lpm) and taking more than 4 seconds to open.
Delivery and discharge pressure	All models will remain in the open position during product delivery to manifold, with discharge pressure as low as 1 psi (0.07 bar) – all models will reset to "tripped when line pressure delay is below 3 psi (0.21 bar) with pump off.
Leak detection	Detects leaks up to 10 ft (3 meters) above the point of installation.
Max. liquid viscosity	70 SSU at 60° F (15° C)
Gasoline models (blue cover -- MLD+G and MLD+AG)	Are also listed for fuel mixtures containing 20% MTBE, 20% ETBE, or 17% TAME with gasoline as well as diesel fuels, fuel oils, kerosene, Avgas, and jet fuels.
Diesel models (gold cover -- MLD+D and MLD+BD)	Are also listed for kerosene applications.
Approvals & Certifications	- cULus listed. - Third party certified to comply with US EPA requirements 280.41 (B) and 280.44 (A) for continuous monitoring of pressurized piping. - Consult factory for other applicable approvals.

SPECIFICATIONS

Installation

1. MLD+
2. MLD+ vent tube
3. Line leak detector housing (2" NPT)
4. Tank port (vent tube must be connected here)
5. Syphon port



ORDER INFORMATION

Standard Fuel MLD+ Mechanical Leak Detectors

Model	Description
403168901	STP-MLD+G for gas, single pack (blue cover, copper vent tube, brass fittings)
403168903	STP-MLD+G for gas, three pack
403170901	STP-MLD+D for diesel, single pack (gold cover, copper vent tube, brass fittings)
403170903	STP-MLD+D for diesel, three pack

Biofuel MLD+ Mechanical Leak Detectors

Model	Description
403169901	STP-MLD+AG for alcohol-gas, single pack (blue cover, stainless steel tube and fittings)
403169903	STP-MLD+AG for alcohol-gas, three pack
403171901	STP-MLD+BD for biodiesel, single pack (gold cover, stainless steel tube and fittings)
403171903	STP-MLD+BD for biodiesel, three pack

Notes:

1. *MLD+G 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. *MLD+D models are listed for compatibility with diesel fuels with up to 5% biodiesel and kerosene applications only.*
3. *MLD+AG models are listed for fuel mixtures containing up to 85% ethanol with gasoline and 20% MTBE, 20% ETBE, or 17% TAME with gasoline as well as diesel fuels, fuel oils, kerosene, Avgas, and jet fuels.*
4. *MLD+BD models are listed for diesel with up to 20% biodiesel or 100% biodiesel and kerosene applications only.*
5. *All above models will only mount in the 2" NPT leak detector port of a 4" submersible turbine, including competitive models, or in a leak detector adapter tee (sold separately below).*
6. *MLD+ models are listed for use with rigid pipelines up to 625 litre capacity, with flexible pipelines up to 416 litre capacity, and with combination rigid/flexible pipelines up to 1,041 litre capacity*

MLD+ Mechanical Leak Detector Repair Parts & Accessories

Model	Description
400440101	Vent tube (for use with MLD+G and MLD+D)
400449903	Hardware pack (fittings and documentation for MLD+G and MLD+D)
403123001	Vent tube, stainless steel (for use with MLD+AG and MLD+BD)
400449904	Hardware pack (fittings and documentation for MLD+AG and MLD+BD)
400518001	Leak detector adapter tee

VARIABLE SPEED CONVERSION KITS

The advantages you gain from upgrading from fixed speed to variable speed are undeniable. With Franklin Electric variable speed conversion kits you can achieve higher, consistent flow rates, in turn boosting your profits, while eliminating the wear and tear hydraulic hammer can cause. Installation is easy with a variable speed pump motor assembly, MagVFC™ variable frequency controller and four-wire contractor's plug. All in one variable speed kits are compatible with both FE PETRO® brand 4" Submersible Turbine Pumps, as well as other competitive systems. The MagVFC™ works with the existing system to increase flow as more fueling points go live, delivering the flow you need as you need it. Your customers will know the difference between sites that provide steady flow and faster fueling during peak business hours and those sites that don't.



HIGHLIGHTS

The MagVFC™ or EcoVFC variable speed controller ramps the STP up and down as needed to provide optimal flow rates at fuelling points. The result is a more consistent customer experience.

- Upgrading to variable speed can increase flow rates, in turn increasing profits as more customers are able to fill faster.
- Affordable upgrade, the conversion requires a minimal investment compared to purchasing complete variable speed submersible turbine pumps as you are reusing the majority of existing system components.
- Easy installation, consisting of swapping out the pump motor and controller, as well as modifying the submersible length and wiring if applicable.
- Increased flow is automatically delivered as more nozzles go live which keeps the product flowing, the forecourt moving and business coming in.

ORDER INFORMATION

Model	Description
400693911	EcoVFC™ & variable speed conversion kit with 2 hp variable speed with non-MAGSHELL®
400693901	MagVFC™ & variable speed conversion kit with 2 hp variable speed non-MAGSHELL®
402671911	EcoVFC™ & variable speed conversion kit with 4 hp variable speed with non-MAGSHELL®
402671901	MagVFC™ & variable speed conversion kit with 4 hp variable speed non-MAGSHELL®

Note: Kits include variable speed pump motor assembly, MagVFC™ variable frequency controller, four-wire contractor's plug and installation instructions. For upgrade of competitive 4" submersible turbine pumps, additional competitive parts may be required.

SPECIFICATIONS CONTINUED

Standard Features	All IST® models include variable speed, variable length options, and alcohol-gasoline compatibility
Check valve	70 mm diameter fluorocarbon seal constructed on cast aluminium body and steel backing washer.
Pressure relief valve	Available in four pressure relief settings, integral to check valve. Standard model Believes at 2.76 bar and resets above 2.41 bar.
Syphon	Venturi-type syphon primer supplied with every submersible. Syphon check valve and secondary syphon sold separately
Air Eliminator	Every submersible includes tank return path with one-way check valve to provide active air elimination
Electrical disconnect	Electrical yoke for positive contractor disconnect
Approvals & Certifications	- Consult factory for applicable approvals - ISO 9001 Certified Manufacturer

TURBINE PUMP INTERFACE

Turbine Pump Interface (TPI) is a powerful tool that creates a network between your Submersible Turbine Pump (STP) controllers and EVO™ Series ATGs. Through TPI, the tank gauge can be programmed to respond to faults in the submersible pumping system and react with intelligence that pump controllers alone cannot.



PUMP IN WATER AUTOMATION

When the water level in a tank approaches the pump intake, the tank gauge will enter alarm mode and automatically shut down the pump, protecting the system and consumers from water being pumped from that tank.

LEVELING & PRIORITY MODES

When managing two storage tanks of the same product ‘Leveling Mode’ can keep both tanks at the same percentage full without the use of a syphon bar between the two tanks.

REMOTE PUMP INTERACTION

By networking the intelligent controllers to the fuel management system via TPI, a technician can remotely connect to the site to review the logged event history and view the status.

GUARDIAN SERIES™ FIXED SPEED PUMP CONTROLLER

The Guardian Series™ single-phase controller takes a major leap forward in fixed speed Submersible Turbine Pump (STP) control. Built upon the solid FE PETRO® brand smart controller platform, Guardian Series™ controllers feature an enhanced user interface, greater functionality, and higher performance compared to standard control boxes.



HIGHLIGHTS

- Compatible with FE PETRO® single-phase 2 Hp, 1½ Hp, ⅓ Hp, and ¾ Hp fixed speed STPs, as well as comparable competitive STPs.
- 3½ digit LCD provides readable running and fault status for quick troubleshooting.
- Separate "Reset" and "Silence/Calibrate" push buttons provide clear interaction with the controller.
- Automatically logs the last five abnormal conditions seen in the pumping system. This data is retained in non-volatile memory. Service technicians can quickly view a history of abnormal conditions, which is particularly useful when troubleshooting intermittent conditions.
- Over voltage protection and enhanced underload detection protects pumping system equipment.
- With a single press of the "Calibrate" button, the controller will automatically learn the electrical characteristics of the STP for easy setup or retrofit.

SPECIFICATIONS

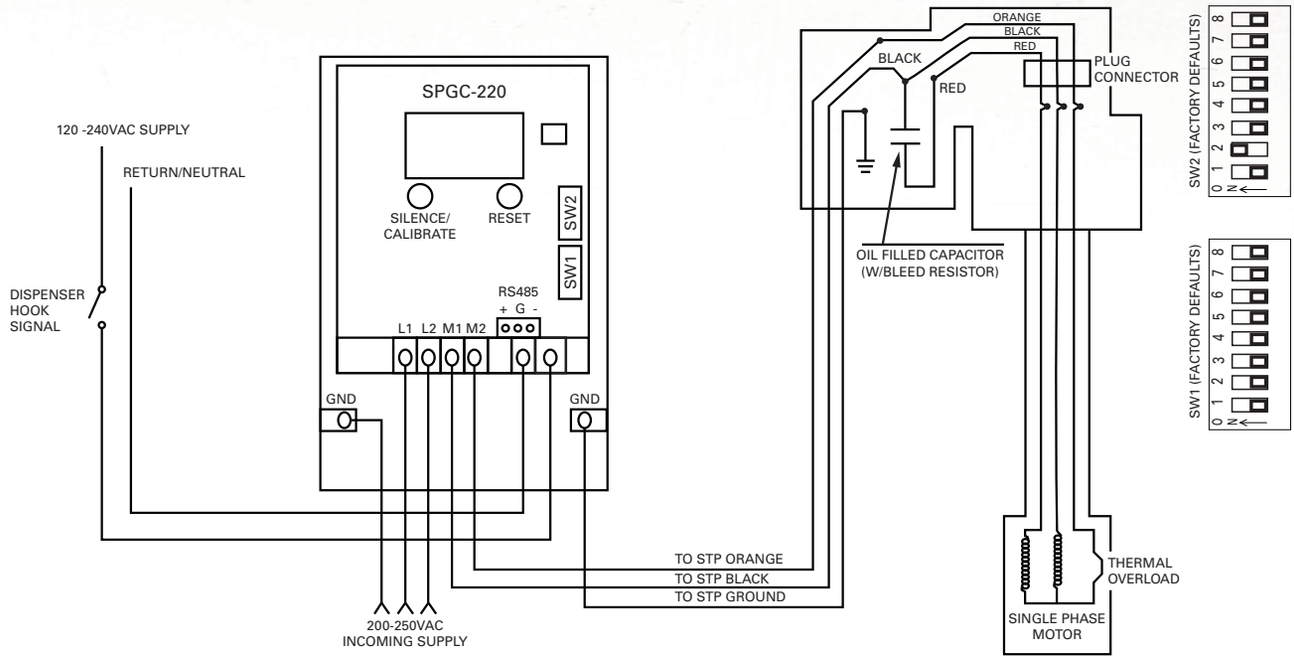
Dimensions	8 ½" x 5" x 3" (215 mm x 127 mm x 76 mm)
Motor contact rating	2 Hp, 200-250 VAC, 50/60 Hz, Single phase
Switch hook rating	Switch hook rating: 120-240 VAC, 50/60 Hz
Accessories	An integrated RS 485 comport is provided to connect Guardian Series™ Controllers to EVO™ Consoles for enhances functionality via Turbine Pump Interface (TPI).
Approvals & Certifications	- ULc listed. - CE certified. - ISO 9001:2015 certified manufacturer.

Capabilities

Capability	Standard Relay Box (STP-CBS)	Smart Controller (STP-SCI)	Guardian Series™ Controller (SPGC-220)
Pump Compatibility	up to 2 Hp	up to 2 Hp	**up to 2 Hp**
Horsepower Selection	Not Required	Not Required	**Not Required**
Standard THHN Wiring	YES	YES	**YES**
Primary/Secondary Pump Operation	NO	YES	**YES**
Alternating Pump Operation	NO	YES	**YES**
Communication Display	NO	YES, yellow flashing light	**YES, yellow flashing light**
Incoming Power Display	NO	YES, solid green light	**YES, displays "IdLE"**
Pump Running Display	YES, red pilot light	YES, green flashing light	**YES, flashes "run"**
Fault History Readout	NO	YES, flash last five faults	**YES, displays last five faults**
Fault Diagnostics	NO	YES, red flashing light	**YES, red backlight display**
Underload (dry run) Detection	NO	YES, 1 red flash	**YES, flashes "UL"**
Low Incoming Voltage Protection	NO	YES, 2 red flashes	**YES, flashes "LI"**
High Incoming Voltage Protection	NO	YES, surge protection	**YES, flashes "HI"**
Overload (running) Detection	NO	YES, 3 red flashes	**YES, flashes "OL"**
Overload (startup) Detection	NO	YES, 3 red flashes	**YES, flashes "Lr"**
Open Circuit Detection	NO	YES, 4 red flashes	**YES, flashes "OC"**
Extended Run Protection	NO	YES, 9 red flashes	**YES, flashes "Er"**
Relay Failure Protection	NO	YES, 10 red flashes	**YES, flashes "rEL"**
Audible Fault Alarm	NO	YES, reset/silence button	**YES, separate silence button**

SPECIFICATIONS

Wiring Diagram



Note: See product installation instructions for further details. Wiring must conform to all federal, state, and local codes. Control panels are for non-hazardous indoor use only.

ORDERING INFORMATION



Guardian Series™ Single Phase Controller

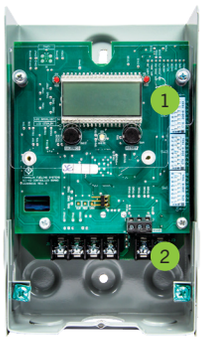
Model	Description
5800100220	SPGC-220 Guardian Series™ Single-Phase Controller, 220 Volt
402312931	STP-DHI + SPGC-220 Guardian Series™ Single-Phase Controller bundle (220 Volt supply, 110 Volt hook)
402312932	STP-DHIB + SPGC-220 Guardian Series™ Single-Phase Controller bundle (220 Volt supply, 240 Volt hook)

Notes:

1. Compatible with all single-phase FE PETRO® and competitive model STPs.

2. One controller required for each submersible (up to 2 Hp).

3. Compatible for use in primary/secondary configurations with STP-SCI models.



Replacement Parts

Item	Model	Description
1	225000932	SPGC-220 upper (user input) replacement board
2	225005932	SPGC-220 lower (power, relay) replacement board

STP-DHIB DISPENSER HOOK ISOLATION

The FE PETRO® dispenser hook isolation device prevents electrical feedback between dispenser hook circuits as required by most electrical codes.



HIGHLIGHTS

- Optically isolates inputs from up to eight dispensers preventing damage to dispenser relay boards caused by cross-phasing.
- Prevents electrical feedback between dispenser hook circuits during periods of maintenance and service as required by NEC 514-3, 2002 and other international codes.
- Can be supplied factory-wired in tandem with the FE PETRO® smart controller or the FE PETRO® standard control box.
- Eliminates false STP run due to voltage leakage of multiple dispensers connected in parallel.
- Fuse-protected output to submersible pump controller.
- The STP-DHIB can retrofit to any existing site.

ORDER INFORMATION

Model	Description
402312922	STP-DHIB-SCI combo DHI with factory-wired STP-SCI
402313922	STP-DHIB-CBBS, combo DHI with factory-wired STP-CBBS single-phase control box
5800300200	STP-DHIB, isolates up to eight, 120 Volt dispenser handles

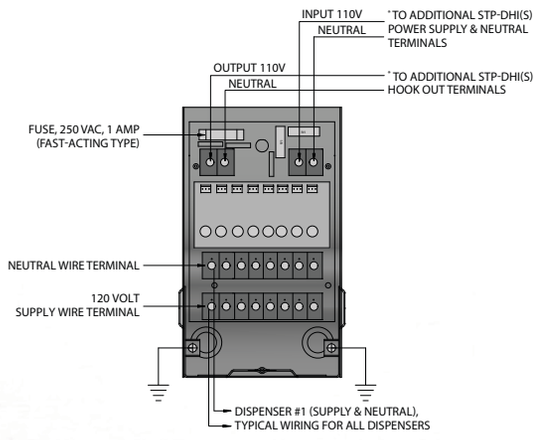
DHIB models are compatible with FE PETRO® submersible pump controllers and competitive pump controller makes accepting 240 Volt dispenser hook signal.

DHIB models can be connected together for products with more than eight dispenser handle inputs.

DHI Repair Parts and Accessories

Model	Description
223243103	DHI fast-acting fuse, 250 VAC, 1 Amp
223885931	DHIB circuit board, 240 Volt dispenser hook signal

DHIB with 240 VAC Dispenser Hook Signal Wiring Diagram



**Wiring is polarity-sensitive when multiple units are connected together.*

SPECIFICATIONS

Enclosure size	8 ½" x 5" x 3" (215 mm x 127 mm x 76 mm)
Inputs	Eight optically isolated inputs from dispenser
STP-DHIB	One STP-DHIB required per product grade for up to eight dispensers
	240 V 30 V A input from supply, eight 240 V 10 mA inputs from dispensers
Output fuse rating	250 V 1A, fast acting
Surge protection	300 Volt surge protection
Max.ambient temperature rating	120° F
LEDs	LEDs indicate when source power is applied and dispenser hook signals are present
Compatibility	Compatible with any submersible pump controller
Approvals & Certifications	- Consult factory for applicable approvals - ISO 9001 Certified Manufacturer

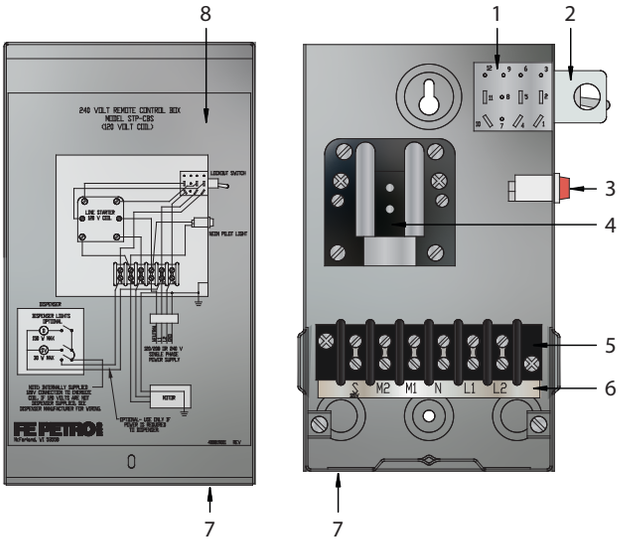
STP-CBBS CONTROL BOX

The FE PETRO® standard single-phase control box latches line power to the submersible when the relay is energized by a dispenser signal. Compatible with FE PETRO® and competitive makes of single-phase, fixed speed submersible turbines up to 2 hp.



HIGHLIGHTS

- Incorporates an "ON/OFF" power switch.
- Relay energized with 240 Volt dispenser/hook signal.
- Franklin Electric is an ISO 9001 certified manufacturer.
- Consult factory for applicable approvals.



ORDER INFORMATION

Model	Description
400818922	STP-CBBS, single-phase control box, with switch and lockout, 240 Volt coil
402313921	STP-DHIB-CBBS, combo dispenser hook isolation with factory wired STP-CBBS

Notes:

1. *CBBS models are compatible for use on all single-phase FE PETRO® submersibles and competitive makes.*
2. *One CBBS required per submersible, relay rated for 30 Amps up to 2 hp.*
3. *Incorporates pump "ON."*
4. *Relay rated for 240 Volt pumps up to 2 hp, 30 Amps.*

STP-CBBS Repair Parts and Accessories

Model	Description
403274001	Power switch (replaces p/n 400575001)
400574001	Power switch bracket
400158902	Light assembly, 240 Volt
400215933	Relay, 30A, 240 Volt coil
400278006	Six position terminal strip
402410002	CBBS terminal strip label
400817901	Cover and enclosure
400819002	CBBS wiring diagram

INTAKE FILTER SCREEN

An intake filter screen (IFS) provides fuel filtration for the entire system down to about the size of a grain of sand (0.009" openings). It's designed to keep harmful debris, sediment, and tank corrosion from entering the pumping system and creating service events including dispenser filter changes. The output performance of the pump is maintained to that of the standard blue end bell while only adding about 1" to the overall length.



HIGHLIGHTS

- Prevents debris from entering the pumping system and causing system damage or slowdowns.
- The output performance of the pump is maintained to that of the standard blue end bell while only adding about 1" to the overall length.
- An IFS self-cleans itself, so you don't have to worry about pulling the pump to clean it.
- An IFS can be easily retrofit installed on existing FE PETRO® submersible pumps as well as competitive 4" pumps. You can also have it factory-installed on any new submersible pump.

ORDER INFORMATION

Factor Installed

- Add "K" to factory installed options in model number designations.

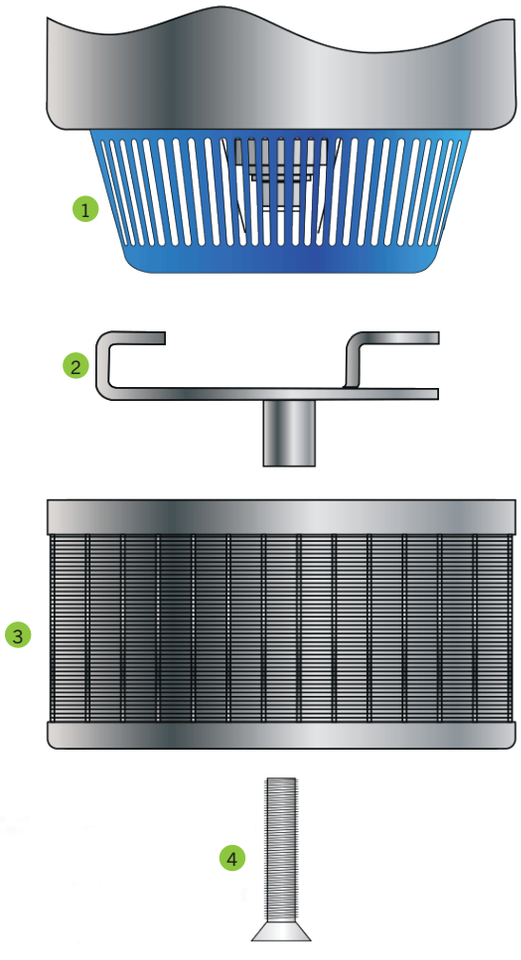
Retrofit

Model	Description
400660901	Intake filter screen single pack
400660912	Intake filter screen 12 pack carton

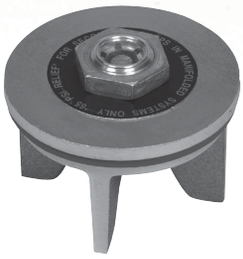
SPECIFICATIONS

Installation

1. PMA end bell
2. Filter clip
3. Filter screen
4. Mounting screw

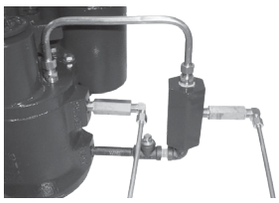


ACCESSORIES



For use in slave(s) 4" STP manifolded pump installations. Not available factory installed.

Model	Description
402459931	Model 65 psi (4.5 bar) relief check valve (AG compatible)



Primary Syphon

Secondary Syphon

For use when two syphon primers are required for one 4" STP. One to syphon for condensate pod, one for syphoning two or more tanks of like product.

Model	Description
402507930	Secondary syphon kit

Replacement Pump Motor Assemblies

Model	Description
PMA75B	3/4 hp pump motor assembly, single-phase (521 mm)
PMA75C	3/4 hp pump motor assembly, three-phase (502 mm)
PMA150B	1½ hp pump motor assembly, single-phase (578 mm)
PMA150C	1½ hp pump motor assembly, three-phase (553 mm)
PMA200B	2 hp pump motor assembly, single-phase (654 mm)
PMA200C	2 hp pump motor assembly, three-phase (597 mm)

Factory Installed Approvals

(May specify one in model number at time of PMA order)

Model	Description
(ATXF)	Submersible Turbine Pumps with ATEX Flameproof approval for EN markets

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

Replacement Variable Speed Pump Motor Assemblies

Model	Description
PMAVS2	2 hp variable speed pump motor assembly (508 mm)
PMAVS4	4 hp variable speed pump motor assembly (635 mm)

Factory Installed Options

(Specified in model number at time of PMA order)

Model	Description
AG	Alcohol-gasoline compatible
F	Floating suction adapter, 1½" NPT female, must be factory installed
H	High Pressure 3.1 bar deadhead output (150 & 200 models only)—adds up to 12 mm to length of PMA
K	IFS (intake filter screen) factory assembled to pump motor assembly—adds 25 mm to length of PMA
M	Magshell® (2 & 4 hp models only)

4" STP Extractable Sections (less manifold, riser and PMA)*

Model	Description
STPEXT-VL1	Variable length #1 extractable
STPEXT-VL2	Variable length #2 extractable
STPEXT-VL3	Variable length #3 extractable
STPAGEXT-VL1	AG variable length #1 extractable
STPAGEXT-VL2	AG variable length #2 extractable
STPAGEXT-VL3	AG variable length #3 extractable
STPAPEXT-VL1	AP variable length extractable
STPAPEXT-VL2	AP variable length extractable
STPAPEXT-VL3	AP variable length extractable

** Consult Factory for lead times of extractables*

STP-SCI Smart Controller

Model	Description
225000930	SCI lower board control
225005930	SCI upper board relay

MagVFC™ and Eco-VFC™

Model	Description
223919930	MagVFC™/EcoVFC™ fan assembly
225040930	MagVFC™/EcoVFC™ user interface board
228289930	MagVFC™/EcoVFC™ normally open relay

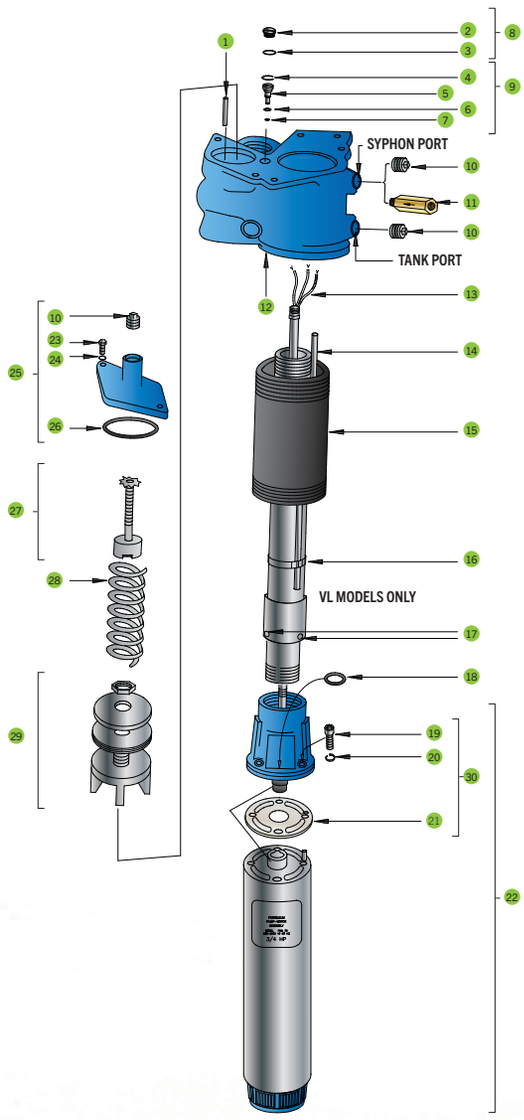
STP-DHIB Dispenser Hook Isolation Box

Model	Description
223243103	250 AC fast-acting fuse
223885931	240 Volt circuit board (includes fuse)

PMA, Riser and Check Valve for Variable Length and Fixed Length Pumps

Item	Model	Description	Qty.
1	400125001	3/16" × 1⅝" spiral pin	1
2	400615001	Manual relief plug (400615002 AG Compatible)	1
3	400211114	O-ring, plug	1
4	400627001	Retaining ring	1
5	400616001	Manual relief screw (400616002 AG compatible)	1
6	400333012	Relief screw, top O-ring	1
7	400333007	Relief screw, bottom O-ring	1
8	400628901	Manual relief plug assembly, includes items #2 and #3 (400628902 AG compatible)	1
9	400629901	Manual relief screw assembly, includes items #4, #5, #6 and #7 (400629902 AG compatible)	1
10	400259001	1/4" NPT pipe plug, may be purchased locally	3
	403499001	1/4" NPT pipe plug, may be purchased locally (stainless steel, for AP models)	
11	400137937	Syphon check valve	-
12	400221930	Discharge manifold, includes #1, #8, #9 and two #10	1
	400221931	Discharge manifold (includes item #1, #8, #9, & #10) (for AP models)	
13	151213930 151213932	156" lead assembly 240" lead assembly	1
14	Purchase locally	Stationary vapour tube, 3/8 OD × 7/20 WT	-
15	4001689XX (XX = length)	Riser, 4½" OD × 3/16" WT steel tubing 7"-19" 20"-30" 31"-49" (consult factory for lead times) 50"-60" (consult factory for lead times)	1
	4035229XX (XX = length)	Riser, 4½" OD × 4.12" ID (stainless steel, for AP models) consult factory for lead time 7"-19" 20"-30" 31"-49" 50"-60" (consult factory for lead times)	
16	Purchase locally	1/2" steel banding	-
17	400600002	5/16-24 × 7/16" set screw for variable lengths only	3
	403432002	5/16-24 × 7/16" set screw for VL models only (stainless steel, for AP models)	
18	400333015	Lead assembly O-ring	4
19	400264009	5/16-18 × 1⅛" socket head cap screw, may be purchased locally	4
	403506001	5/16-18 × 1⅛" socket head cap screw, may be purchased locally (stainless steel, for AP models)	
20	400263004	5/16" high-collar lock washer, may be purchased locally	1
	403505001	5/16" high-collar lock washer, may be purchased locally (stainless steel, for AP models)	
21	402449001	PMA gasket (402449003 AG Compatible)	1
22	PMA XXX	Pump motor assembly, includes item #34 (XXX indicates options and horsepower)	2

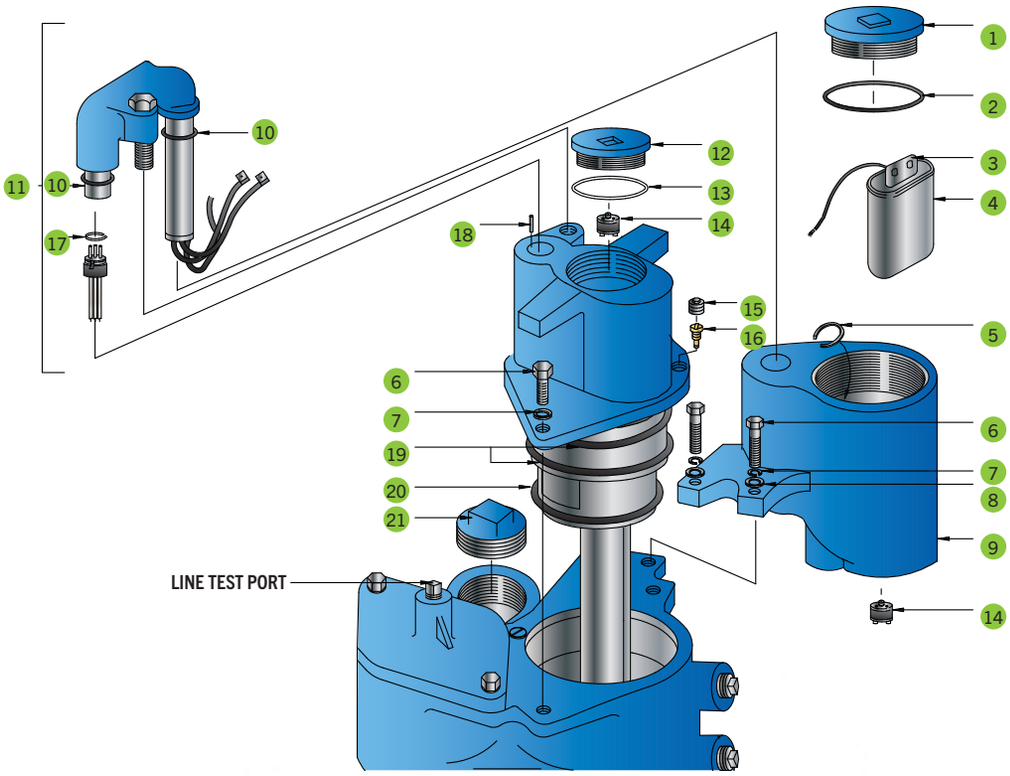
Item	Model	Description	Qty.
23	400981001	3/8-16 × 1" Hex head screw	2
	403504001	3/8-16 x 1" Hex head screw (stainless steel, for AP models)	
24	400285002	3/8" standard lock washer, may be purchased locally	1
	1117703	3/8" standard lock washer (stainless steel, for AP models)	
25	400197930	Manifold assembly cover, includes #10, #26, two #23 and two #24	1
	400197931	Manifold Assembly Cover (includes item #10, #23, #24, & #26 for AP models)	
26	400333238	AG compatible O-ring	1
27	400147930	Clamp valve assembly	1
28	400174930	Check valve spring	1
29	400988931	Standard check valve, includes item #26 (400988934 AG compatible)	1
	400988932	Model R check valve, includes item #26 (400988935 AG compatible)	
	400988933	Model W check valve, includes item #26 (400988936 AG compatible)	
	402459931	Model 65 PSI check valve (AG compatible for slave STPs only)	
30	152350902	PMA hardware pack, includes #21, and four #19 and #20 (152350904 AG compatible)	-
Not shown	400216905	AG compatible O-ring kit, includes items #3, #6, #7 and #26 on this page and items #2, #10, #13, #17, #20 and #21 on page 35	-



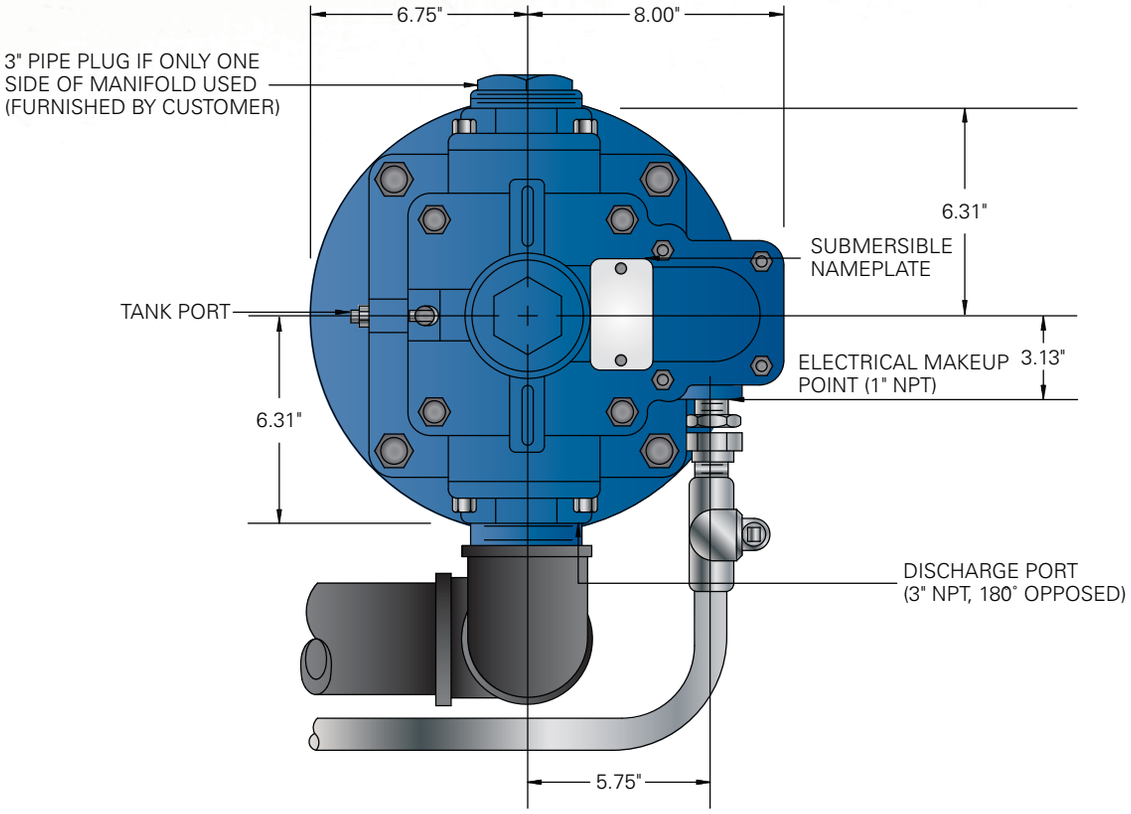
Discharge Manifold Assembly

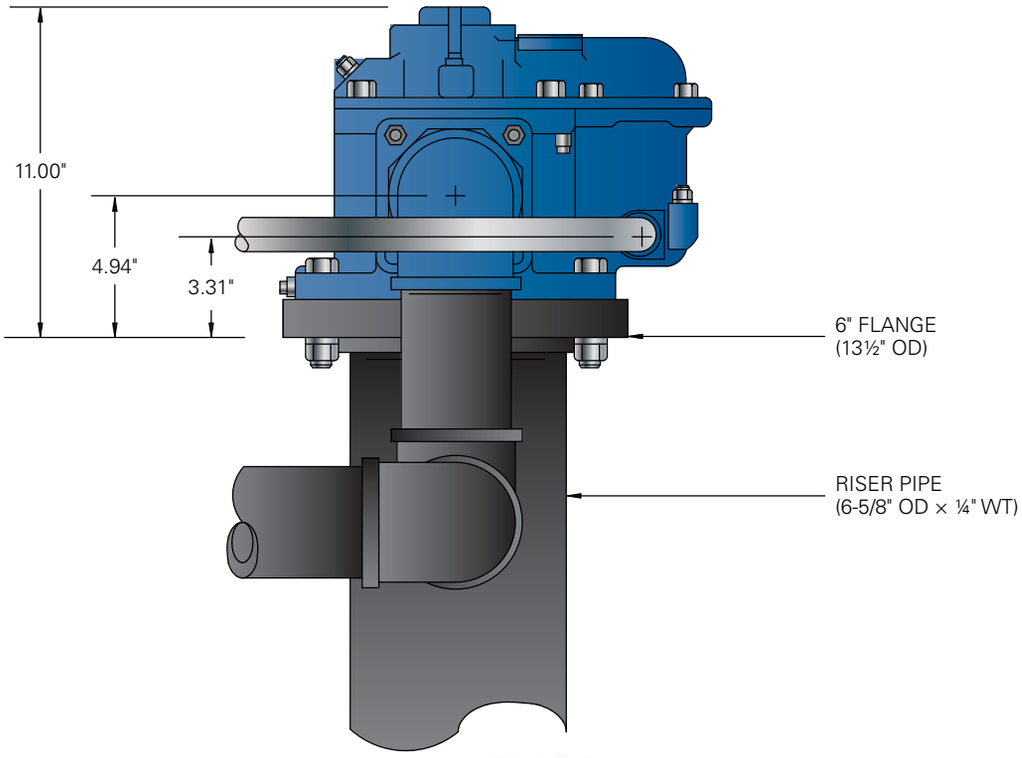
Item	Model	Description	Qty.
1	400192930	Junction box cover, includes item #2 (400192931 for AP models)	1
2	400210233	O-ring	1
3	400655001	Capacitor boot	1
4	400170933	Capacitor assembly for 3/4 to 1½ hp, 50 Hz, 15 µfd, 440 Volt single-phase; includes one black lead	1
	400170935	Capacitor assembly for 2 hp, fixed speed, 50 Hz, 40 µfd, 440 Volt single-phase; includes one black lead	
5	400257001	Retaining ring	1
6	400258002	3/8-16 × 1¼" Hex head bolt, may be purchased locally	4
	602011016	3/8-16 x 1¼" Hex head bolt (stainless steel, for AP models)	
7	400285002	3/8 standard lock washer, may be purchased locally	4
	1117703	3/8 standard lock washer (stainless steel, for AP models)	
8	400280001	3/8 standard flat washer, may be purchased locally	2
	403500001	3/8 standard flat washer (stainless steel, for AP models)	

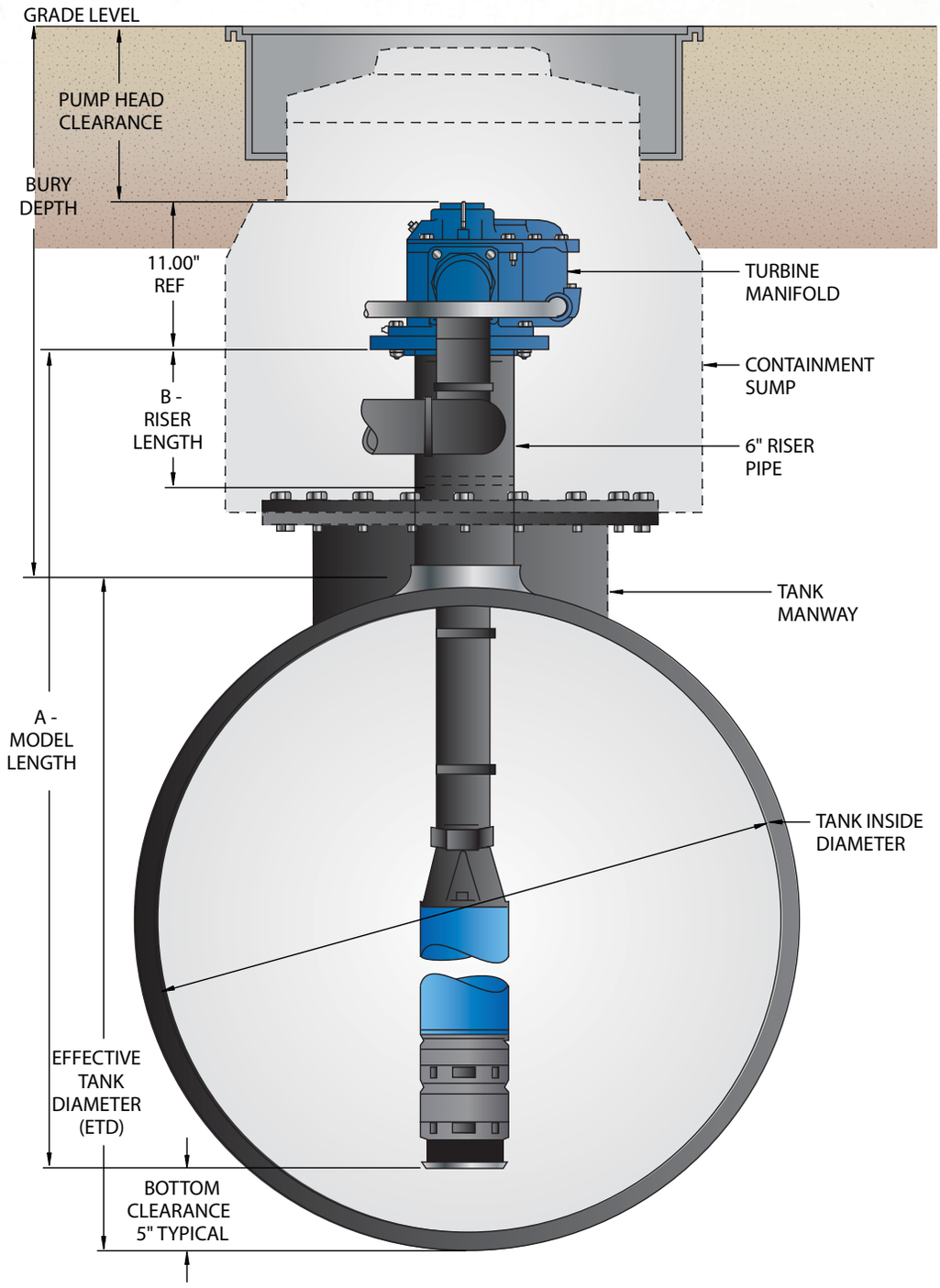
Item	Model	Description	Qty.
9	400651930	Junction box assembly, includes two #6, #7 and #8	1
	400651931	Junction box assembly (includes item #6, #7, & #8, for AP models)	
10	400210212	O-ring	2
11	400200930	Wire connector kit, includes male/female connectors, two #10, one #5, and #18	1
	400200931	Wire connector kit, includes male/female connectors, two #10, one #5, and #18 for AP models	
12	400589930	Cover, includes item #13 (400589931 for AP models)	1
13	400210229	O-ring	1
14	400236903	Contractor's plug	2
15	400259002	3/8" NPT pipe plug, may be purchased locally	1
	403499002	3/8" NPT pipe plug (stainless steel for AP models)	
16	400562901	Syphon jet assembly (400562903 AG Compatible)	1
17	400211046	O-ring	1
18	400249001	Retaining ring	1
19	400250002	1/8" dia. × 1/2" roll pin	1
20	400333343	AG compatible O-ring	2
21	400333340	AG compatible O-ring	1
22	400259005	2" NPT square head plug	1
	403499003	2" NPT square head plug (stainless steel, for AP models)	



6" HIGH CAPACITY TURBINE PUMPS







Note: 1. Effective tank diameter (ETD) = Inside tank diameter (to top of 6" bung), including tank manway and/or sump adapter.
2. Model length (A) = ETD plus riser length minus bottom clearance minus 2" thread engagement.
3. Riser length (B) = Bury depth (to top of tank) minus pump head clearance minus tank manway and/or minus sump adapter.

3 AND 5 HP 50HZ SUBMERSIBLE TURBINE PUMPS



Available with either 3 or 5 hp, the FE PETRO® high capacity pump delivers efficient, reliable and quiet performance when high volumes or high speed deliveries of gasoline or diesel fuel are required.

HIGHLIGHTS

High Performance
FE PETRO®'s multi-stage centrifugal pump is coupled with a dependable Franklin Electric motor to provide higher heads, faster fuel delivery and lower cost operation. Motors are all three-phase for smooth operation and are available in various voltages. Units come standard with a 6" diameter riser pipe to mount the pump to the tank.

Ease of Maintenance
If service is required, FE PETRO® products are designed to put the operator back in business fast. Maintenance on the pump motor assembly can be performed without having an electrician on site. Large diameter pins and sockets provide automatic open circuits and disconnecting of the wiring when the extractable portion of the pump is removed. Properly spaced lifting eyes facilitate the removal of the unit without disturbing the discharge piping. The pump motor assembly is easily removed from the discharge head by removing four bolts and using standard pusher bolts. Replacement pump motor assemblies are available for comparably sized competitive pumps.

Reliability
Quality engineering and simplicity of design work to ensure years of reliable performance from every high capacity unit. The continuous duty, three-phase Franklin Electric motor with carbon bearings and stainless steel journals is FE PETRO®'s standard. The impellers, made of moulded acetal, and diffusers of hard coated aluminium, with a stainless steel pump shaft, assure trouble-free operation in motor fuels. Dual (180º opposed) 3" horizontal discharge ports provide easy installation, and two built-in line check valves reduce installation costs. Two line pressure relief valves protect the dispensers, meters and piping from abnormal pressures due to thermal expansion. The mesh screen on the pump inlet prevents large particles from entering the unit and the unit is compatible with existing high capacity leak detector technology. New units are easily connected to field wiring without disassembly.

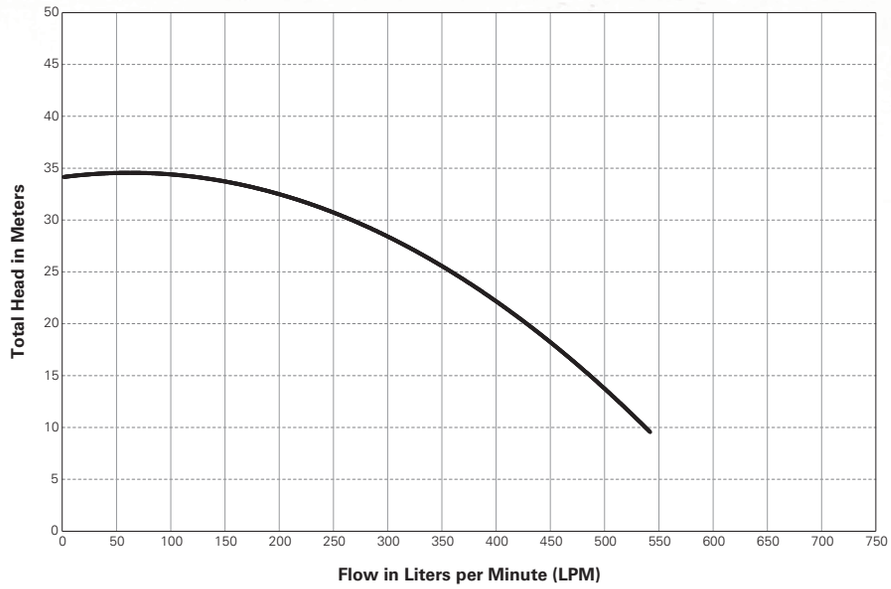
Satisfaction
Each and every high capacity pump is built to your tank and bury specifications and the complete assembly is performance tested to ensure that your needs are met. All high capacity pumps are UL listed and meet the requirements of UL 79.

SPECIFICATIONS

Pressure relief valve	Cartridge design available in two pressure relief settings, external to check valve. Standard model relieves at 2.76 bar and resets above 2.41 bar.
Syphon	External venturi-type syphone primer supplied as submersible accessory
Air eliminator	Every submersible includes tank return path to provide active air elimination
Power requirements	50 Hz high capacity pump models require three-phase, 380-415 VAC incoming power
	50 Hz high capacity pump models are available in 3 hp and 5 hp versions
	TPGC-380 three-phase Guardian controllers and STPCBB3C and STP-CBB5C three-phase control boxes are available for high capacity pump control.
Pump motor	Fixed speed, 2875 rpm, multi-stage centrifugal type pump motor with built-in, automatic, thermal overload protection
Liquid compatibility	Standard models are listed for fuel mixtures containing up to 10% ethanol or methanol, and 20% MTBE, 20% ETBE, or 17% TAME with gasoline
	HCP 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 Viton® compound
Max. liquid viscosity	70 SSU at 60° F (15° C)
Approvals & Certifications	- Consult factory for applicable approvals. - Franklin Electric is an ISO 9001 Certified Manufacturer.

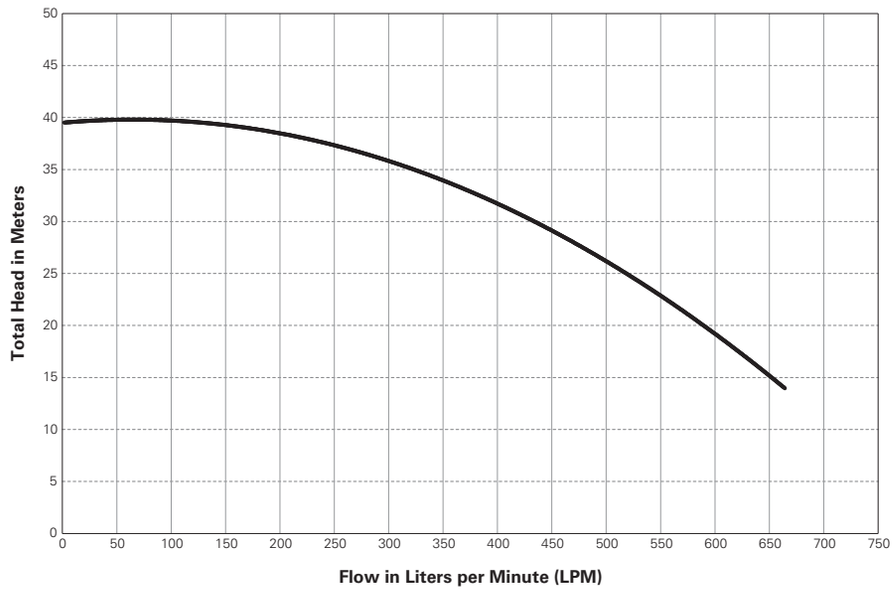
SPECIFICATIONS CONTINUED

3 hp Fixed Speed High Capacity Performance Chart (STP3C)



Note: Performance based on pumping solvent (0.78 specific gravity). Pressure is taken at the manifold discharge outlet. Fixed Speed 3 HP was powered by Three-Phase, 50 Hz, 415 Volt incoming supply.

5 hp Fixed Speed High Capacity Performance Chart (STP5C)



Note: Performance based on pumping solvent (0.78 specific gravity). Pressure is taken at the manifold discharge outlet. Fixed Speed 5 HP was powered by Three-Phase, 50 Hz, 415 Volt incoming supply.

ORDER INFORMATION

High Capacity 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

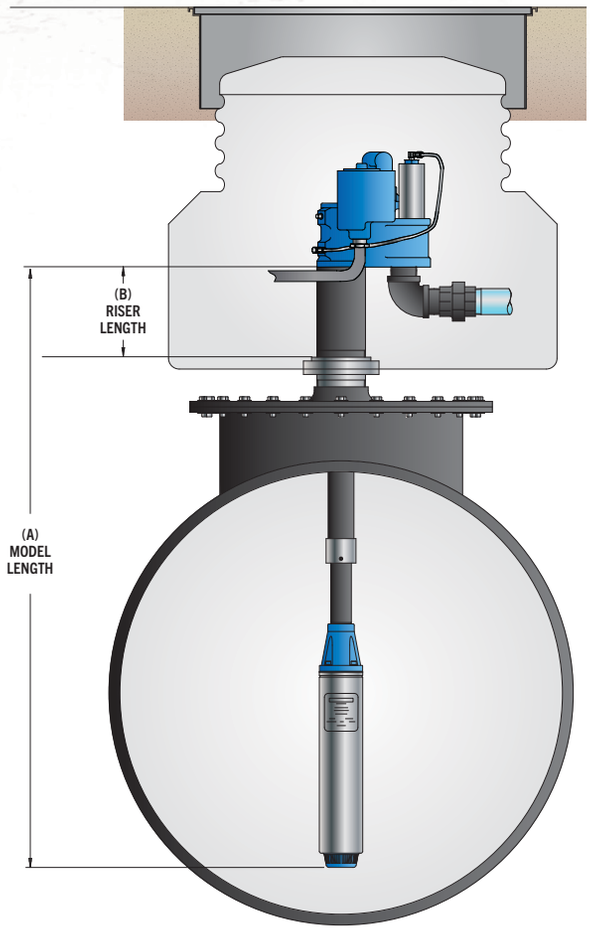
- STP = Basic Model Designation

Note: Standard models up to 10% ethanol capable.

- XXXXX = Factory Installed Options
  - HCP model designations may include one or more of the following characters in alphabetical order: AG = Alcohol-gasoline compatible (85% ethanol capable).
    Note: Standard models 0% to 10% ethanol capable
  - F = Floating suction adapter (3" NPT male adapter)
  - *R = Model R check valve (1.65 bar relief/1.51 bar reset for PLLD)

**Note: If not otherwise specified, all HCP 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/Electrical Rating
  - 3C = 3 Hp, 380-415 VAC, 50 Hz three phase
  - 5C = 5 Hp, 380-415 VAC, 50 Hz three phase
- A = Model Length
  - Model length is expressed as three numeric characters that indicate the length of the HCP from the turbine manifold bottom to the pump motor inlet in inches, available from 1524 mm to 5080 mm (additional charge for models 3353 mm and longer).
- 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 152mm to 1524 mm in 76 mm increments (additional charge and lead time for risers 686 mm or longer).



High Capacity Turbine Pumps (available as fixed length models only)**

Model	Description
STP3C*	6" STP three phase, 380-415 VAC, 50 Hz
STP5C*	6" STP three phase, 380-415 VAC, 50 Hz

**Please call customer service for lead time on this item.*

1. *STP models are listed for compatibility with fuel mixtures containing up to 10% ethanol with gasoline, up to 5% biodiesel with diesel fuels, 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 above models require 380-415 VAC, three-phase, 50 Hz incoming power.*
4. *6" riser pipe, if supplied locally, must be 6⅝" OD by 1/4" WT tubing.*
5. *For riser pipe lengths 686 mm to 1524 mm, additional charge applies. Call Customer Services for lead times.*

*** Model length (A) defined as the dimension from turbine manifold bottom to pump motor inlet. Model length (A) can be a minimum of 1524 mm to a maximum of 5080 mm. Adder (p/n 401190911) applies if model length (A) is 3353 mm to 4318 mm or adder (p/n 401190914) applies if model length (A) is 4319 mm to 5080 mm (charges are for additional packaging STP). Call Customer Services for lead times.*

Factory Installed Options

Model	Description
F	Floating suction adapter, 3" male NPT (must be ordered with STP)
R	Model R relief valve factory installed, for Veeder-Root® (*) PLLD

Field Installed Options

Model	Description
401165930	Syphon system
STP-CBB3C	3 hp, 380-415 VAC, 50 Hz, three-phase motor starter, 240 VAC coil
STP-CBB5C	5 hp, 380-415 VAC, 50 Hz, three-phase motor starter, 240 VAC coil
TPGC-380	Three-phase 380-415 VAC Guardian controller

6" STP Extractable
Less manifold, riser and PMA.

Model	Description
HCPEXT-XXX	6" fixed length extractable (XXX indicates model length, minimum 1524 mm and maximum 5080 mm)***

**** Fixed Length adders apply for extractable model lengths 3353 mm to 5080 mm. Call Customer Services for lead times.*

HIGH CAPACITY LINE LEAK DETECTORS

The High Capacity MLD product line is based on our standard STP-MLD unit design. The High Capacity MLD's compact design allows installation in the same containment sump as the submersible pump, greatly reducing the amount of unprotected leak points between the submersible and the MLD.



HIGHLIGHTS

Low Line Restriction
Piston design offers the maximum flow rate possible by keeping flow restriction through the leak detector at an absolute minimum. Piston has a full 41.3 mm of travel to move the leak detector poppet fully out of the flow path when product is being pumped.

Faster Installation
MLD-HC can be installed after purging air on new installations.

Piston Design
Piston cylinder has 94.2 cubic centimetres of volume to help minimise nuisance tripping due to thermal contraction during cold weather.

MLD-HC Seal
Threads seal using O-rings instead of thread sealant. This seal design makes for simple installation and removal of MLD-HC without large wrenches in the tight working environment of the containment sump.

SPECIFICATIONS

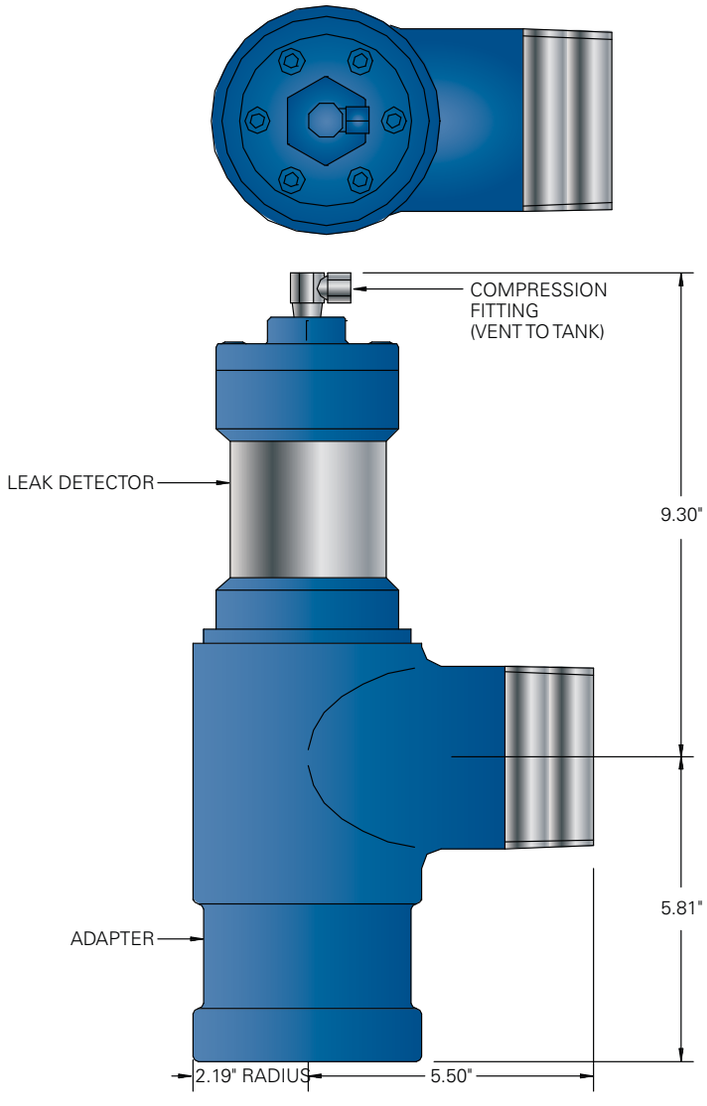
Leak detection	Detects leaks of 11.4 lph or greater at 0.69 bar
EPA compliance	Third party evaluated to comply with US EPA requirements 280.41 (b) and 280.44 (A) for continuous monitoring of pressurized piping
Size	7 ¾" x 15" (197 mm x 381 mm)
Weight	28lbs. (12.7 kg).
Dynamic line pressure	The MLD-HC will remain in the open flow position with dynamic line pressure at 0.14 bar at the outlet
Maxi. static head pressure (without affecting operation)	12' (3.7 m) from MLD-HC to dispensing point
Min. height required (from 3'(76.2 mm))	NPT port centreline for top clearance is 9 ½" (241 mm). Not position sensitive. Can be installed horizontally to reduce clearance to 3" (76.2 mm)
Compatibility	Compatible with all blends of motor fuels including alcohol blends from 0 to 10% ethanol, 20% MTBE or ETBE with 80% gasoline or 83% gasoline as well as diesel, fuel oil, Avgas, jet fuel, or kerosene
Two models available	STP-MLD-HC for gasoline
	STP-MLD-HCD for diesel
Approvals & Certifications	- Consult factory for applicable approvals. - Franklin Electric is an ISO 9001 Certified Manufacturer.

ORDER INFORMATION

Model	Description
401315902	STP-MLD-HC leak detector complete with Adapter "T" (blue for gasoline)
401320902	STP-MLD-HCD leak detector complete with Adapter "T" (tan for diesel)
401315901	Replacement high capacity leak detector ONLY (blue for gasoline)
401320901	Replacement high capacity leak detector ONLY (tan for diesel)
401316930	Replacement cover assembly
401325901	Replacement Adapter "T" with cover assembly
400449902	MLD-HC hardware pack, includes fittings and documentation

Refer to high capacity MLD installation manual for complete fuel compatibility specifications.

1. *MLD-HC 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. *MLD-HCD models are listed for compatibility with diesel fuels and kerosene applications only.*
3. *All above models will only mount in Adapter "T" (p/n 401325901)*



GUARDIAN SERIES™ FIXED SPEED THREE PHASE CONTROLLER

The Guardian Series™ Three Phase controller takes a major leap forward in fixed speed Submersible Turbine Pump (STP) control. Built upon the fixed speed Single Phase Guardian Controller platform, three phase fixed speed pump controllers feature an enhanced user interface, greater functionality, and higher performance compared to standard control boxes.



HIGHLIGHTS

- Compatible with most FE PETRO® three phase 3 Hp and 5 Hp fixed speed STPs, as well as comparable competitive STPs.
- 3½" digital LCD provides readable running and fault status for quick troubleshooting.
- Separate "Reset" and "Silence/Calibrate" push buttons provide clear interaction with the controller.
- Automatically logs the last five abnormal conditions seen in the pumping system. This data is retained in non-volatile memory. Service technicians can quickly view a history of abnormal conditions, which is particularly useful when troubleshooting intermittent conditions.
- Over voltage protection and enhanced underload detection protects pumping system equipment.
- With a single press of the "Calibrate" button, the controller will automatically learn the electrical characteristics of the STP for easy setup or retrofit.

SPECIFICATIONS

Dimensions	91/16" x 73/4" x 51/2" (230 mm x 196 mm x 140 mm)
Motor Contact Rating	- TPGC-220 rated 5 Hp, 208-240 VAC, 60 Hz, Three Phase - TPGC-380 rated 5 Hp, 380 VAC, 50 Hz, Three Phase
Switch Hook Rating	120-240 VAC, 50/60 Hz
Communication Port	An integrated RS 485 com port is provided to connect Guardian Series™ Controllers to EVO™ Series for enhanced functionality via Turbine Pump Interface (TPI).
Approvals & Certifications	- ULc listed - CE certified - ISO 9001:2015 certified manufacturer

ORDER INFORMATION

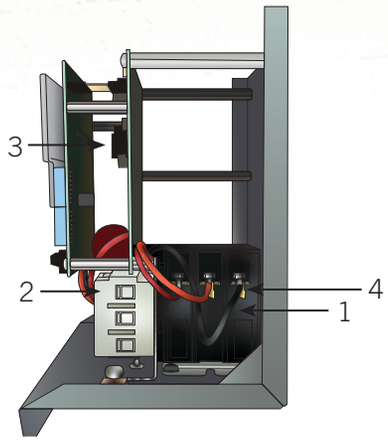
Model Number	Description
5800103220	TPGC-220 Guardian Series™ Three Phase Controller (220 Volt supply, 110 Volt hook)
5800103380	TPGC-380 Guardian Series™ Three Phase Controller (380 Volt supply, 220 Volt hook)

Notes:

1. Compatible with most three phase FE PETRO® and competitive STPs except 460 VAC and 575 VAC models.

2. One controller required for each submersible (up to 5 Hp).

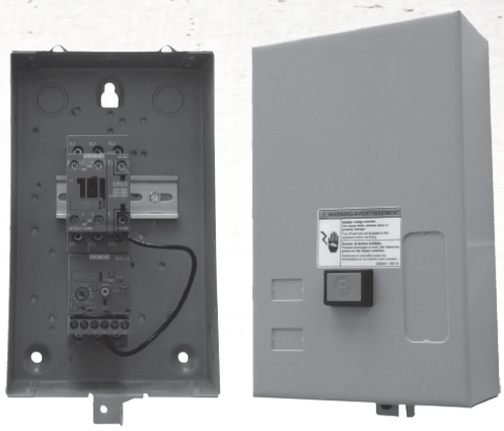
3. Compatible for use in primary/secondary configurations with STP-SCIII models in compatibility mode.



Replacement Parts

Model	Description
225000932	SPGC-220 upper (user input) replacement board
223689931	TPGC-380 Lower (Power) Board
223689930	TPGC-220 Lower (Power) Board
228727102	Contactor, 3PST-NO (220VAC Coil)

STP-CBB3C & STP-CBB5C MAGNETIC STARTERS



The FE PETRO® magnetic starter incorporates ambient compensated relays with quick trip heaters and three leg protection to assure proper pump motor protection.

SPECIFICATIONS

Compatibility	Compatible with three-phase FE PETRO® submersibles and most compatible models
Relay rating	5 hp
Relay coil hook signal rating	240 Volts for all versions
Incorporation	Incorporates three-leg contactor and adjustable overload relay with reset button
Approvals & Certifications	- Consult factory for applicable approvals. - Franklin Electric is an ISO 9001 Certified Manufacturer.

ORDER INFORMATION

CB 3/5 Repair Parts

Model	Description
401220965	STP-CBB3C three phase control box, 3 hp 380-415 Volt pump control
401220966	STP-CBB5C three phase control box, 5 hp 380-415 Volt pump control

Replacement Pump Motor Assemblies*

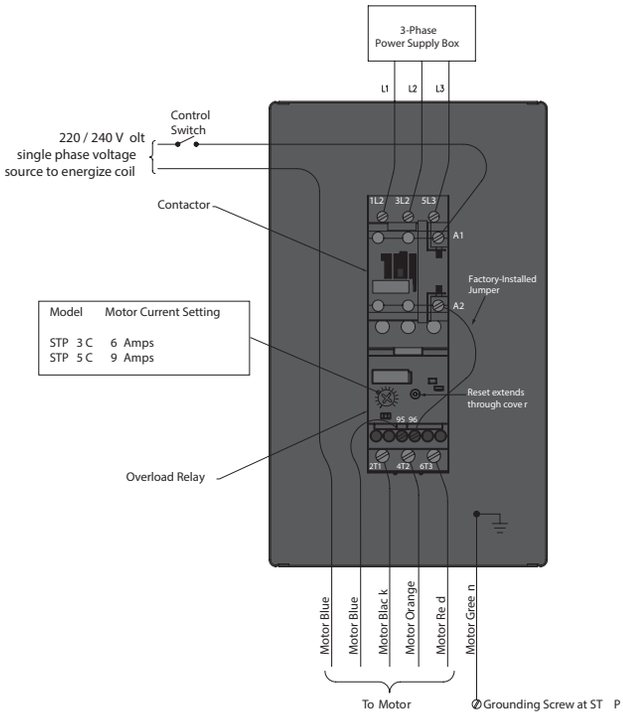
Model	Description
PMA3C *	3 hp 380-415 Volt 6" pump motor assembly
PMA5C *	5 hp 380-415 Volt 6" pump motor assembly

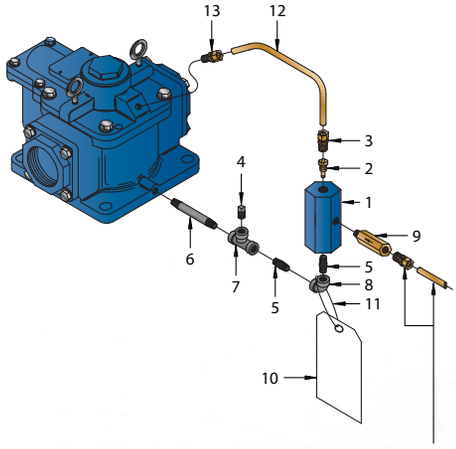
**For pump motor assemblies with floating suction adapters (3" male NPT connections), specify "F" in the model number and adder charge applies (must be ordered with PMA).*

Please call Customer Service for lead item on these items

Syphon System

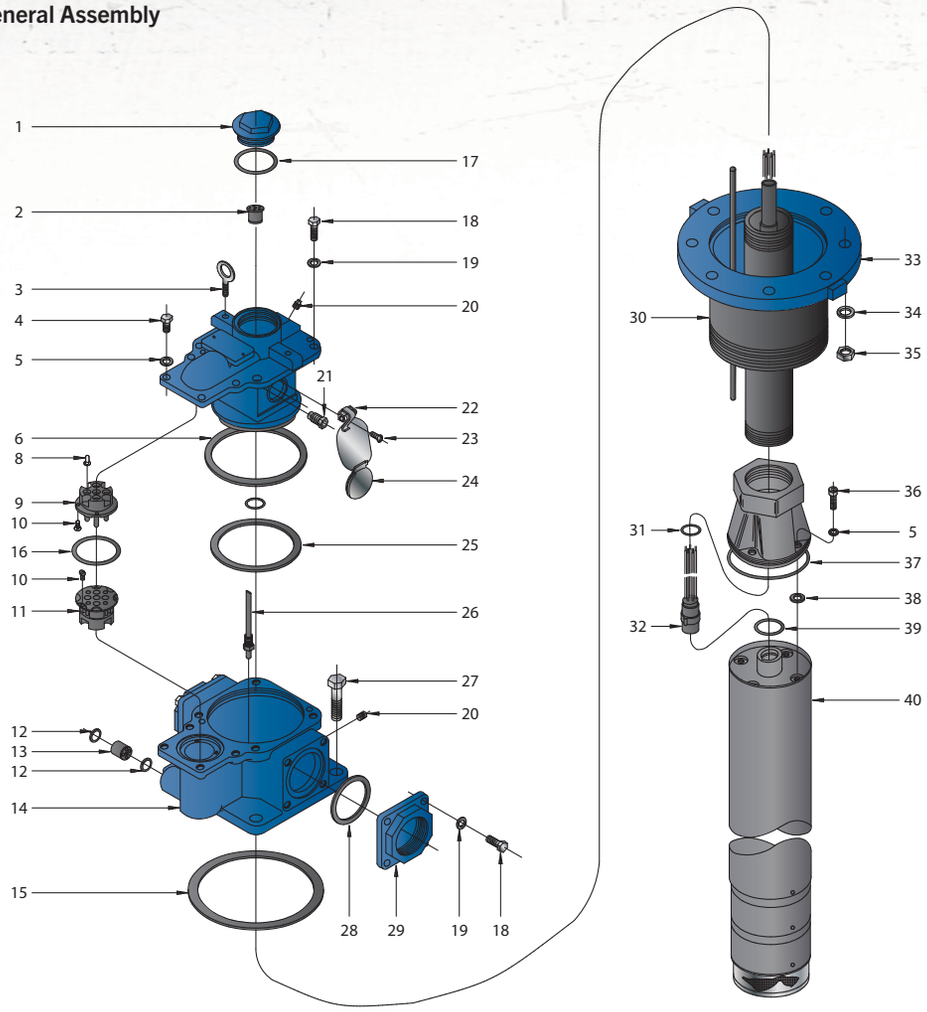
Item	Model	Description
1	402505001	Syphon block
2	400562901	Syphon jet assembly
3	400430004	3/8"P × 3/8" T compression fitting
4	400259001	¼" pipe plug
5	400114001	¼" close nipple, two required per system
6	400114003	¼" nipple × 3" long
7	402510001	¼" threaded tee
8	402511001	¼" threaded elbow, 90º
9	400137937	Syphon check valve
10	402544001	Caution tag
11	400982001	Security seal
12	402553902	Copper tube (HC pump)
13	400430003	1/4"P × 3/8"T compression fitting
NS	401165930	Syphon unit complete, includes all items above





CONNECT 1/4" NPT × 3/8" TUBE FITTING TO CHECK VALVE AND 3/8" OD COPPER TUBING TO HIGHEST POINT IN SYPHON LINE (FURNISHED BY CUSTOMER)

High Capacity General Assembly



Item	Model	Qty	Description
1	401148101	1	Connection box cover
2	400236909	1	Seal off plug assembly
3	401149001	2	Eye bolt
4	400258001	4	3/8-16 × 1" large Hex head cap screw
5	400285002	8	3/8" lock washer
6	401236002	1	Upper manifold seal
8	400273004 400273006	6 4	12 gauge wire terminal 14 gauge wire terminal
9	401142901	1	Plug assembly
10	401091001	6	6-32 × 3/8" large round head machine screw, three required per connector
11	401137901	1	Receptacle assembly
12	401238001	2	Bushing ring
13	401239001	1	Seal plug
14	401112101	1	Discharge manifold
15	401163001	1	6" flange gasket
16	400333235	1	O-ring
17	400210234	1	O-ring
18	400258005	12	1/2-13 × 1¼" large Hex head cap screw
19	400285005	12	1/2" lock washer
20	400259001	2	1/4" pipe plug
21	401032901 401330901 401330902	2 1 1	Model 550 Relief (old standard pressure, tire valve) Standard relief (units built since S/N 0302XXXX) Model "R" relief (units built since S/N 0302XXXX)

Item	Model	Qty	Description
22*	401154001	2	Valve spring and bracket
23	400523001	4	10-24 × 3/8" long Sems fastener, two required per bracket
24*	401150101	2	Inset valve assembly (check valve)
25	401236001	1	Lower manifold seal
26	401158903	1	Air eliminator assembly
27	400258006	4	3/4-10 × 3" large Hex head cap screw
28	401162001	2	3" flange gasket
29	401113101	2	3" companion flange
30	4011910XX 6-5/8" OD × 1/4" WT (XX = length)	1	6" riser pipe 9" riser pipe 12" riser pipe 15" riser pipe 18" riser pipe 21" riser pipe 24" riser pipe
31	400333218	1	O-ring
32	151593906	1	192" lead assembly
33	401161101	1	6" flange
34	400285006	4	3/4" lock washer (993517)
35	400274004	4	3/4-10 Hex nut
36	400264011	4	3/8-16 × 1-1/4" large SHCS
37	400333255	1	O-ring
38	402406001	4	Rubber washer
39	400333225	1	O-ring
40	PMA XXX	1	Pump motor assembly, includes #37, #39, and four #5, #36, and #38 (XXX indicates options and horsepower)

**401154001 and 401150101 must be replaced together.*

PUMP MOTOR ASSEMBLIES FOR DEF/ADBLUE®

FE PETRO® brand diesel exhaust fluid pump motor assemblies (PMAs) feature a stainless steel close-coupled design powered by a field-proven Franklin Electric motor.



HIGHLIGHTS

- Stainless steel, encapsulated motor ensures longevity and impermeability to DEF seepage.
- Heavy-duty shaft provides superior alignment and resistance to stress.
- Double mechanical shaft seals protect the oil-filled bearing chamber from DEF seepage, assuring minimal wear and proper bearing lubrication.
- Stainless steel hydraulics provide superior performance and efficiency.
- Multiple models available to meet global requirements of voltage and frequency.
- All models are suitable for vertical installation where the pump motor is suspended off the bottom of the tank by the discharge piping.

ORDER INFORMATION

DEF - PMA YYY Z

- DEF = Pump Compatible with DEF
- PMA = Pump Motor Assembly
- YYY = Pump Motor Hp Rating
  - 150 = 1½ Hp fixed speed (1.1 kW)
- Z = Motor Electrical Rating
  - B = Single phase, 50 Hz, 210-250 VAC (rated 6.9 Amps, requires 30 microfarad run/start capacitor rated 440 VAC)
  - C = Three phase, 50 Hz, 380-415 VAC (rated 2.6 Amps)

Note: Three phase models require overload protection in motor starter. Single phase models have thermal overload protection built into the motor.

50Hz DEF PMA

Model	Description
403383953	DEF-PMA 150B: single phase, 50hz, 200-250 VAC, 1.5 Hp
403383963	DEF-PMA 150C: three phase, 50hz, 380-415 VAC, 1.5 Hp

SPECIFICATIONS

Materials	Stainless steel construction including impellers/diffusers, inlet/outlet, outer shell
Pump type	All models are 5" (130 mm) outside diameter centrifugal type pump
Power cable	23' (7 m) black polyethylene jacketed plug in power cable
50 Hz pump motor	Three-stage pump with 2" BSPT female outlet
Motor rating	Continuous operation with motor cooling provided by product flow and protected from dry running
Bypass relief valve	By pass relief valve with cracking pressure of 30-40 psi (2.1-2.8 bar) and 4 gpm (15 lpm) minimum flow required at the discharge of all models
Max. cracking pressure	Non-return check valve with maximum cracking pressure of 3 psi (0.2 bar) required between product piping and bypass relief valve of all models
Liquid compatibility	All models are intended for use with Diesel Exhaust Fluid (DEF). DEF is a non-flammable, non combustible liquid that has a specific gravity of 1.09 at 68° F, and is made per ISO 22241-1 specifications with 32.5% urea and distilled or deionized water. As defined by ISO 22241-1, DEF is the same as AUS 32 (aqueous urea solution)

SUBMERSIBLE TURBINE PUMP KITS FOR DEF/ADBLUE®

Our FE PETRO® brand diesel exhaust fluid submersible turbine pump (STP) kits come with everything you need for pumping DEF/AdBlue®. DEF STPs are offered in easy-to-order variable length complete packages or as individual kits for fixed length applications. Powered by the legendary Franklin Electric motor, our DEF STPs are built specifically for DEF applications with a host of application specific features you won't find on anything else out there.



HIGHLIGHTS

Designed Just for DEF
Building on the field-proven DEF PMA, our DEF STPs are designed with innovative technology to suit the specific needs of DEF/AdBlue® applications. Unlike others, our entire offering is designed specifically for use in DEF.

- The PMA offers a stainless steel encapsulated motor with mechanical shaft seals to protect the motor bearings, isolating the motor from product and preventing any contamination of DEF wetstock.
- DEF STP kits feature stainless steel hardware and Viton® or EPDM elastomers for compatibility and longevity.

Performance is Everything
With demand for DEF varying from site to site, we've made it easy for you to select a single STP that is designed to perform at maximum efficiency no matter the demand of your application.

- The DEF STP's output caters for both large and small applications without excessive nozzle pressure that can make the trigger hard to squeeze and cause them to shut off prematurely.
- Stainless steel hydraulic impeller provides superior performance and efficiency through the life of the STP.

We've Made it Simple
The complete variable length DEF STP includes everything you need in a pre-configured package for ease of ordering and ease of installation.

- The full variable length kits make it easy to install in most applications while the fixed length kits provide the flexibility to install or retrofit any application.
- Models for both 50 Hz and 60 Hz markets, as well as single phase and three phase applications.

Pump Motor Assembly

- Field-proven Franklin Electric encapsulated motor ensures longevity and impermeability to DEF seepage.
- Heavy-duty shaft provides superior alignment and resistance to stress.
- Double mechanical shaft seals protect the oil-filled bearing chamber from DEF seepage, assuring minimal wear and proper bearing lubrication.
- Stainless steel hydraulics provide superior performance and efficiency.
- EPDM jacketed power cable provides DEF compatibility and longevity.
- All models are suitable for vertical installation where the pump motor is suspended off the bottom of the tank by the discharge piping.

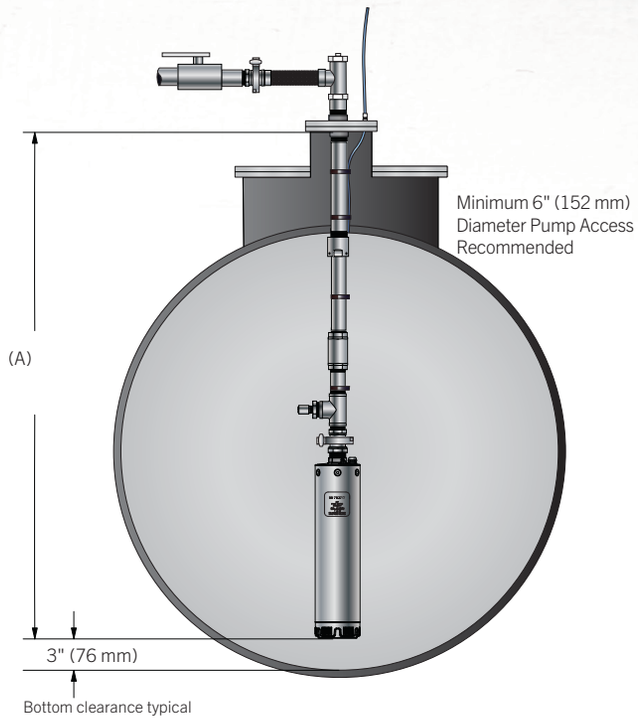
Submersible Turbine Pump Kit
Submersible turbine pump kits come complete with variable length column pipe kit, check valve kit, bypass kit, EZ FIT pump motor assembly connection kit, and pump motor assembly.

- Submersible turbine pump kits also available for locally supplied fixed length column pipe applications.
- Bypass relief valve creates a continues bypass of fluid to keep the motor cool.
- Check valve maintains line pressure while the pump is not in operation.
- EZ FIT PMA connection makes disconnection and reconnection of the PMA quick and easy.
- Each EZ FIT connection comes complete with coupler and gasket to ensure tight connection.

SPECIFICATIONS

Pump Motor Assembly	
Materials	Stainless steel construction including impellers/diffusers, inlet/outlet, and outer shell
Pump type	All models are 5.1" (130 mm) outside diameter centrifugal type pump.
Power cable	23' (7 m) black polyethylene jacketed power cable
50 Hz pump motor	Three-stage pump with 2" BSPT female outlet
Motor rating	Continuous operation with motor cooling provided by product flow and protected from dry running
Submersible Turbine Pump Kit	
Materials	All stainless steel hardware and Viton® or EPDM seals
Bypass relief valve cracking pressure	Bypass relief valve cracking pressure of 30-40 psi (2.1-2.8 bar) and 4 gpm (15 lpm) minimum flow at the discharge of all models
Non-return check valve cracking pressure	3 psi (0.2 bar) between product piping and bypass relief valve of all models
Liquid compatibility	All models are intended for use with Diesel Exhaust Fluid (DEF). DEF is a non-flammable, non-combustible liquid that has a specific gravity of 1.09 at 68°F (20°C), and is made per ISO 22241-1 specifications with 32.5% urea and distilled or deionized water. As defined by ISO 22241-1, DEF is the same as AUS 32® (aqueous urea solution) and also commonly known as AdBlue®

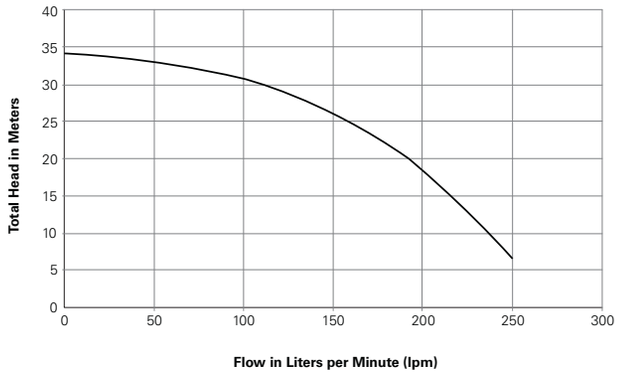
Variable Length Range (A)



Model Length Range	Model Length Designation
71"–104" (1,800 mm–2,640 mm)	VL1
104"–168" (2,640 mm–4,265 mm)	VL2

DEF Pump Motor Performance

DEF-PMA150B (Single Phase) and DEF-PMA150C (Three Phase)



Note: Performance is based on pumping water (1.00 specific gravity). Pressure is taken at the discharge outlet of the pump motor .

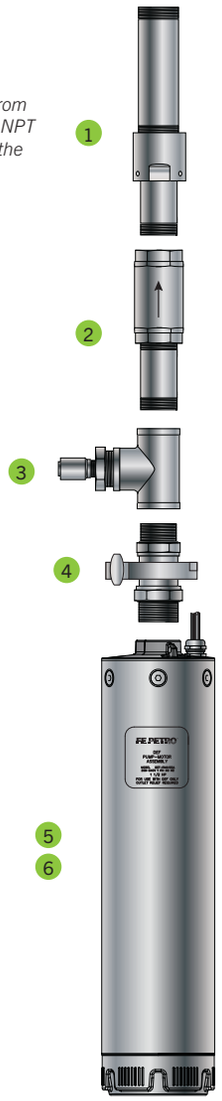
SPECIFICATIONS CONTINUED

Variable Length Components:

Each variable length submersible turbine pump kit comes complete with variable length column pipe kit (VL1 or VL2), check valve kit, bypass kit, EZ FIT pump motor assembly connection kit, and pump motor assembly (single or three phase).

1. Variable length column pipe kit, 2" to 1½" NPT (not sold separately)
2. Check valve kit
3. Bypass kit
4. Pump motor assembly connection kit
5. 6 Pump motor assembly (single or three phase)

Variable length column pipe kit reduces from 2" BSP column pipe at the top to an 1½" NPT column pipe at the bottom connection to the check valve kit



ORDER INFORMATION

Variable Length Diesel Exhaust Fluid Submersible Turbine Pump Kits

Each variable length submersible turbine pump kit comes complete with variable length column pipe kit (VL1 or VL2), check valve kit, bypass kit, EZ FIT pump motor assembly connection kit, and pump motor assembly (single or three phase).

Model	Description
403472901	50 Hz, single phase, VL1 71" - 104" (1,800 mm - 2,640 mm) variable length diesel exhaust fluid submersible turbine pump kits (includes components #1 - #5)
403473901	50 Hz, single phase, VL2 104" - 168" (2,640 mm - 4,265 mm) variable length diesel exhaust fluid submersible turbine pump kits (includes components #1 - #5)
403475901	50 Hz, three phase, VL1 71" - 104" (1,800 mm - 2,640 mm) variable length diesel exhaust fluid submersible turbine pump kits (includes components #1 - #4 and #6)
403476901	50 Hz, three phase, VL2 104" - 168" (2,640 mm - 4,265 mm) variable length diesel exhaust fluid submersible turbine pump kits (includes components #1 - #4 and #6)

Variable Length Diesel Exhaust Fluid Submersible Turbine Pump Replacement Kits

Item	Model	Description
2	403463901	Check valve kit (includes 1½" NPT non-return check valve, 1½" NPT x 4" long nipple on inlet, and 2" NPT female x 2" BSP male adapter on outlet)
3	403461901	Bypass kit (includes ½" NPT bypass relief valve, ½" NPT x 1½" NPT bushing in 1½" NPT tee)
4	403455901	Pump motor assembly connection kit (includes 2" BSP male inlet x 1½" NPT male outlet EZ FIT connection
5	403383953	50 Hz, single phase pump motor assembly (DEF-PMA150B)
6	403383963	50 Hz, three phase pump motor assembly (DEF-PMA150C)

Variable Length Accessories & Repair Parts

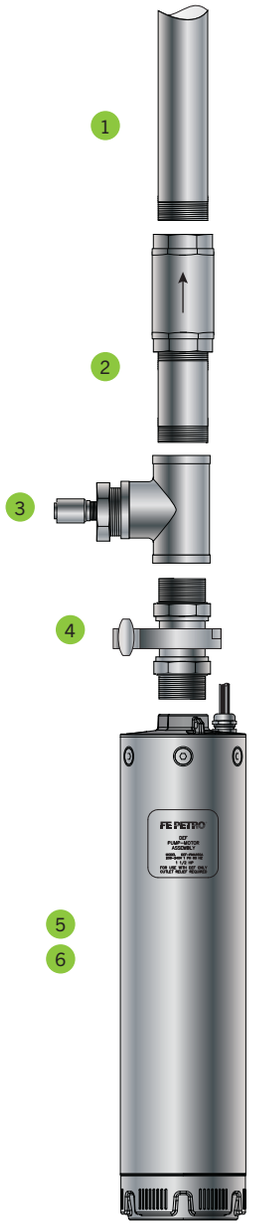
Model	Description
403713922	Single phase electrical kit, includes STP-CBBS (200-250 volt pump control with 240 volt coil, p/n 400818922) & 30uF/440V capacitor (p/n 400170937, for use with DEF-PMA150B)
401220966	Three phase 380-415 volt pump control box with over-load protection and 240 volt coil (STP-CBB3C)
403459901	2" NPT female x 2" BSP male thread adapter (part of component #1, adapter only)
403408931	1½" NPT non-return check valve (part of component #2, valve only)
403409931	½" NPT bypass relief valve (part of component #3, valve only)
403468901	DEF-PMA hardware pack (part of components #5 or #6, includes cable grip, cable ties, and documentation)
400170937	Capacitor, 30 uF/440 V (for use with DEF-PMA150B)
5800100220	SPGC-220 for Single Phase
5800103380	TPGC-380 for Three Phase

SPECIFICATIONS CONTINUED

Individual assembly kits can be ordered for fixed length submersible turbine pump kit applications.

1. Column pipe, 2" NPT (locally supplied)
2. Check valve kit
3. Bypass kit
4. Pump motor assembly connection kit
5. 6 Pump motor assembly (single or three phase)

2" BSP fixed length column pipe supplied locally (length to suit application).



ORDER INFORMATION CONTINUED

Fixed Length Diesel Exhaust Fluid Submersible Turbine Pump Kits

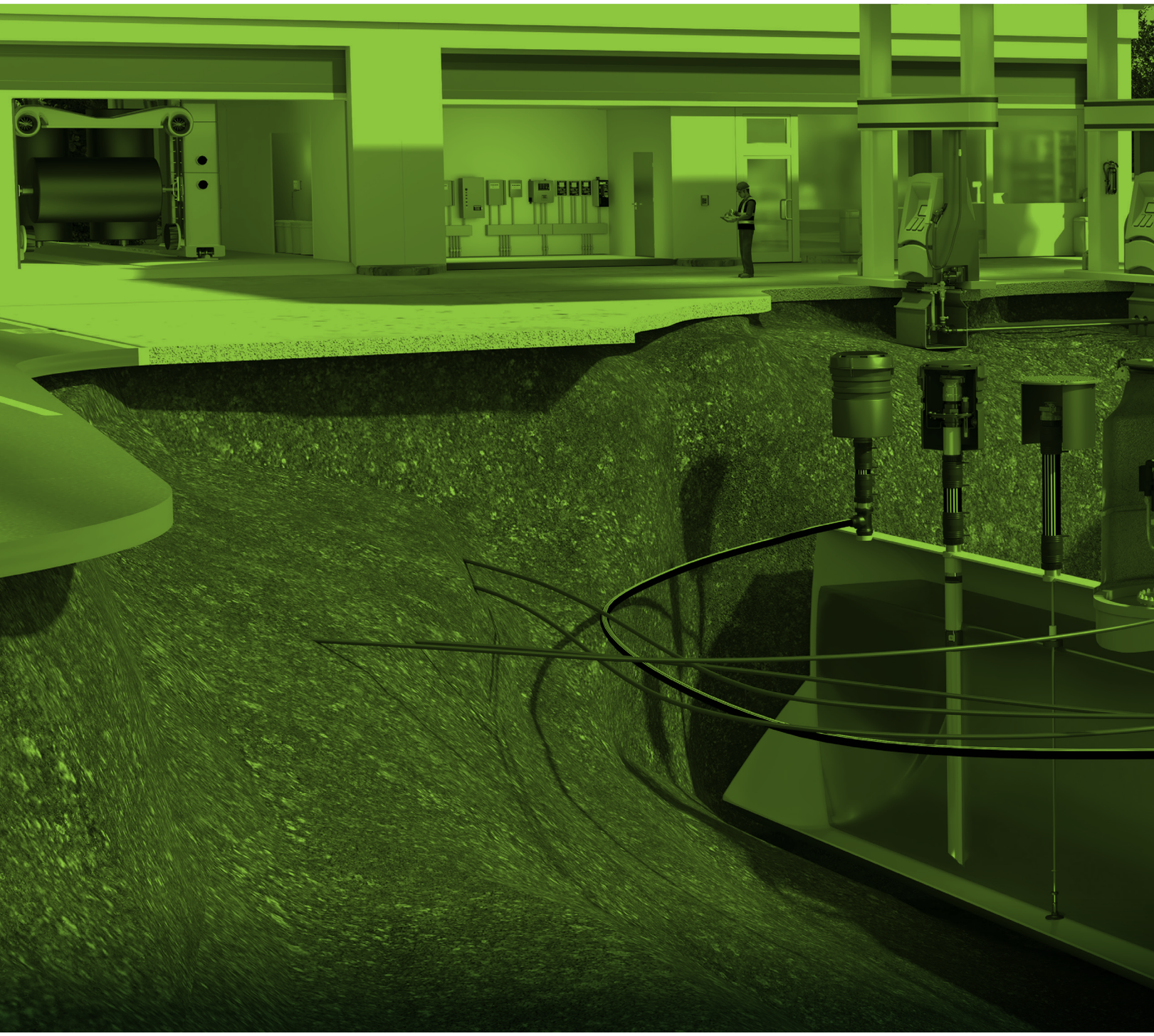
Individual assembly kits can be ordered for fixed length submersible turbine pump kit applications.

Item	Model	Description
2	403465901	Check valve kit (includes 2" NPT non-return check valve, 2" NPT x 4" long nipple on inlet, and 2" NPT male x 2" BSP female adapter on outlet)
3	403462901	Bypass kit (includes ½" NPT bypass relief valve, 1/2" NPT x 2" NPT bushing in 2" NPT tee)
4	403457901	Pump motor assembly connection kit (includes 2" BSP male inlet x 2" NPT male outlet EZ FIT connection
5	403383953	50 Hz, single phase pump motor assembly (DEF-PMA150B)
6	403383963	50 Hz, three phase pump motor assembly (DEF-PMA150C)

Fixed Length Accessories & Repair Parts

Model	Description
403713922	Single phase electrical kit, includes STP-CBBS (200-250 volt pump control with 240 volt coil, p/n 400818922) & 30 uF/440 V capacitor (p/n 400170937, for use with DEF-PMA150B)
401220966	Three Phase 380-415 volt pump control box with over-load protection and 240 volt coil (STP-CBB3C)
403460901	2" NPT Male x 2" BSP Female Thread Adapter (part of component #2, adapter only)
403458901	2" NPT x 4" long Pipe Nipple (part of component #2, nipple only)
403408932	2" NPT non-return check valve (part of component #2, valve only)
403409931	1/2" NPT bypass relief valve (part of component #3, valve only)
403468901	DEF-PMA hardware pack (part of component #5 or #6, includes cable grip, cable ties, and documentation)
400170937	Capacitor, 30 uF/440 V (for use with DEF-PMA150B)
5800100220	SPGC-220 for Single Phase
5800103380	TPGC-380 for Three Phase

Franklin Electric
FUELING SYSTEMS



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