SUBEIS Ignition System

SUBMERSIBLE ELECTRONIC IGNITION SYSTEM > INSTRUCTIONS

Models Covered in this Instruction Set

Standard Capacity Models

- SSC-FS
  290k BTU | 24VAC | NG or LP
- SSC30-FS
  290k BTU | 30VDC | NG or LP

High Capacity Models

- SHC-FS
  510k BTU | 24VAC | NG or LP
- SHC30-FS
  510k BTU | 30VDC | NG or LP

MUST INSTALL IN WATER

The Fire By Design SUBEIS is designed to be installed and operated in water. Installing and operating the SUBEIS unit outside of water will damage the wiring to the Pilot Burner requiring purchase of a new Pilot Burner.

WARNING: For Outdoor Use Only

STOP: If you cannot read or understand these instructions, do **NOT** attempt to install or operate this appliance.

STOP:

IF YOU SMELL GAS

- Shut off gas to the appliance
- Extinguish any open flame
- If odor continues, keep away from the appliance and immediately call your gas supplier or fire department

INSTALLER: Leave this manual with the appliance.

CONSUMER: Retain this manual for future reference.

Proposition 65 Warning

Operating, servicing and maintaining this appliance can expose you to chemicals including

Carbon Monoxide and Lead which are known to the State of California to cause cancer, birth defects or other reproductive harm. For more information go to www.Prop65Warnings.ca.gov

WARNING

Improper installation, adjustment, alteration, service or maintenance can cause injury or property damage. Read the installation, operating and maintenance instructions thoroughly before installing or servicing this equipment

WARNING

For use with NATURAL or LP GAS Only

NO SOLID FUELS TO BE USED WITH THIS SYSTEM

WARNING

Do not store or use gasoline or other flammable vapors and liquids in vicinity of this or any other appliance.

An LP-cylinder not connected for use shall not be stored in the vicinity of this or any other appliance.

CARBON MONOXIDE HAZARD

This appliance can produce carbon monoxide which has no odor.

Using it in an enclosed space can kill you.

Never use this appliance in an enclosed space such as a camper, tent, car or home.

Installation must conform with local codes or, in the absence of local codes, with the

National Fuel Gas Code, ANSI Z223.1 / NFPA 54, or International Fuel Gas Code.

The appliance, when installed, must be electrically grounded in accordance with local codes or, in the absence of local codes, with the National Electric Code, ANSI/NFPA 70, if applicable.

AVERTISSEMENT

Ne pas entreposer ni utiliser de l'essence ni d'autres vapeurs ou liquides inflammables dans le voisinage de l'appareil, ni de tout autre appareil.

Une bouteille de propane qui n'est pas raccordée en vue de son utilisation, ne doit pas être entreposée dans le voisinage de cet appareil ou de tout autre appareil.

AVERTISSEMENT

Une installation, un ajustement, une modification, une réparation ou un entretien inapproprié peuvent être la cause de blessures ou de dommages. Veuillez lire attentivement les instructions d'installation, d'utilisation et d'entretien avant d'installer ou de réparer ce matériel.

AVERTISSEMENT

Ne pas utiliser cet appareil s'il a été plongé, même partiellement, dans l'eau. Appeler un technicien qualifié pour inspecter l'appareil et remplacer toute partie du système de commande et toute commande qui a été plongée dans l'eau.

AVERTISSEMENT

Pour utilisation

à l'extérieur seulement.

AVERTISSEMENT

Pour utilisation avec naturel ou propane ne gaz seulement Aucun combustibles solides pour être utilisés avec ce système.

DANGER

S'il y a une odeur de gaz:

Coupez l'admission de gaz de l'appariel.

Éteindre toute flamme nue.

Si l'odeur persiste, éloignez-vous de l'appareil et appelez immédiatement

le fournisseur de gaz ou le service d'incendie.

MONOXYDE DE CARBONE

Cet appareil peut produire dumonoxyde de carbone, un gaz inodore.

L'utililisation de cet appareil dans des espases clos peut entrainer la mort.

Ne jamais utilizer cet appareil dans un espace clos comme un vehicule de damping, une tente, une automobile ou une maison.

Table of Contents

4 What's in the SUBEIS System?
4 Gas Requirements
4 Electrical Requirements
5 Daisy Chain Wiring
5 Water Level for Pilot Burner
5 Clearance to Combustibles
6 Submersible Manifolds
7 SUBEIS Installation
11 SUBEIS Completed Diagrams
12 Remote Positioning of the AWEIS
12 Operation of the SUBEIS Burner System
13 Maintenance of the SUBEIS Burner System
13 Troubleshooting the SUBEIS Burner System
14 Replacement Parts
15 Automated Pool Control Wiring
17 Manifold Gas Fitting Direction
18 Return Policy & Warranty

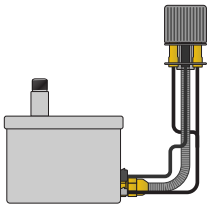
Icon Legend

290K BTU - Hardwired 24VAC/30VDC Models

510K BTU - Hardwired 24VAC/30VDC Models

What's in the SUBEIS System?

Below is a list of the base contents that come with each SUBEIS system. If you purchased a different model that includes a type of enclosure, please refer to that specific model number instruction set.



Standard Capacity SUBEIS

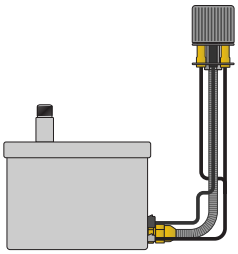
1. 1/2" SUBEIS Ignition Control Module - FS
2. 12" Fire On Water Pilot Burner Assembly - FS
3. 50VA 24VAC Transformer
4. Grease Wire Nuts & Grease Tubes for waterproofing wires (Not Applicable for 30VDC)

Options & Additional Items

Add-On: 185VA 30VDC Power supply

Add-On: Submersible Manifold (page 6)

Add-On: Splash Guard (if water will get on the pilot)



High Capacity SUBEIS

1. 3/4" SUBEIS Ignition Control Module - FS
2. 12" Fire On Water Pilot Burner Assembly - FS
3. 50VA 24VAC Transformer
4. Grease Wire Nuts & Grease Tubes for waterproofing wires (Not Applicable for 30VDC)

Options & Additional Items

Add-On: 185VA 30VDC Power supply

Add-On: Submersible Manifold (page 6)

Add-On: Splash Guard (if water will get on the pilot)

Gas Requirements

Fuel Type: Before making gas connections ensure appliance being installed is compatible with the available gas type. *Check the label on the appliance to confirm appliance gas type requirement.*

Gas Pressure: Proper input gas pressures are required for optimum appliance performance.

Pressure	Natural Gas	Propane
Minimum	28" W.C. - 1 psi	28" W.C. - 1 psi
Maximum	56" W.C. - 2 psi	56" W.C. - 2 psi

Gas Pressure required for the SUBEIS to operate properly:

Minimum: 1.0 psi (28" W.C.)

Maximum: 2.0 psi (56" W.C.)

The SUBEIS will not operate properly on standard residential Low Pressure gas (typically 0.25 psi (6" – 9" W.C.) Check your gas pressure prior to ordering or installing the SUBEIS. If you do not have the proper gas pressure consult your local gas company to find out how to get the gas pressure increased.

Electrical Requirements

ELECTRICAL REQUIREMENTS
Standard + High Capacity SUBEIS

The Standard Capacity Submersible Electronic Ignition System operates on 24 VAC or 30VDC

DO NOT Attempt to Power using 120 Volts AC Power – Damage **WILL RESULT**

Acceptable Input Voltages to Supplied 24 Volt AC Transformer

120 | 210 | 220 | 240 | 480 Volt AC

Read label on the supplied transformer for proper connection information

Recommended Wire Size: 12-gauge wire for all installations.

NOTE: For any 30VDC applications, it will require a 30VDC Power Supply

30 VDC Power Supply
Model: PS-30V185

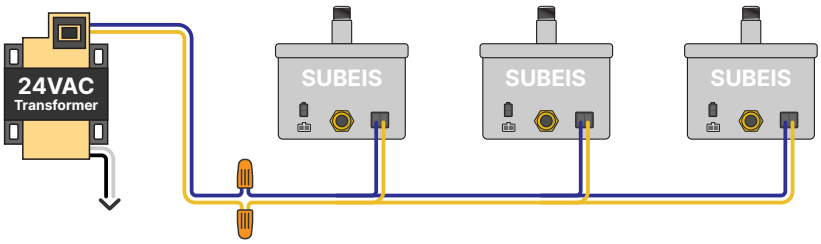
Daisy Chain Wiring of Multiple SUBEIS

The Fire by Design 24 Volt AC SUBEIS has a **Blue** and a **Yellow** wire protruding from it, while 30 Volt DC versions have a **Black** and a **Red** wire. These are the power wires.

When daisy chaining multiple SUBEIS, the polarity between the SUBEIS **MUST** be the same.

To achieve this, all the **Blue** or **Black** wires must be connected to the same wire from the power supply and all the **Yellow** or **Red** wires connected to the other wire from the power supply as shown in this illustration.

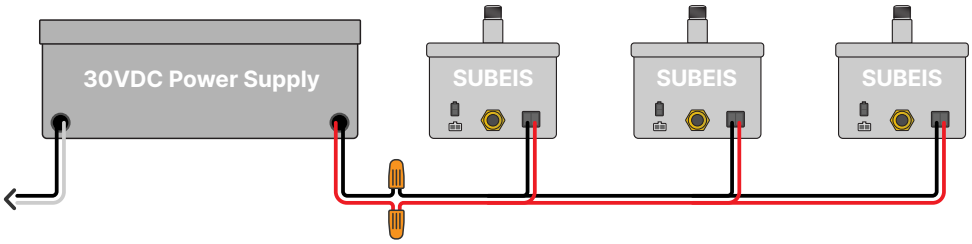
24VAC Transformer + Multiple SUBEIS



According to Fire by Design specifications & warranty, a maximum of 3 SUBEIS can be daisy chained together.

Do not daisy chain more than 3 SUBEIS.

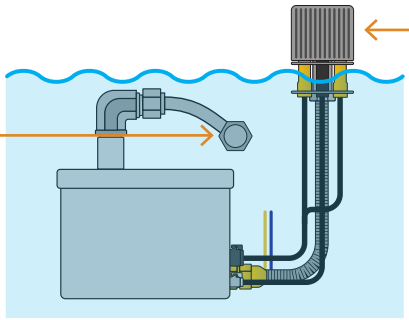
30VDC Power Supply + Multiple SUBEIS



NOTE: When daisy chaining multiple SUBEIS with a 30VDC power supply, you must use a 320W power supply.

Model: PS-30V320

Proper Water Level for Pilot Burner & Manifold



In order to operate properly, the manifold must be submerged 3 inches below the water surface. Please ensure the holes of the manifold are facing downward.

In order for the SUBEIS to operate properly do not let the water level rise above the bottom of the burner cage - this can effect the thermopile's and turn the system off.

Clearance to Combustibles

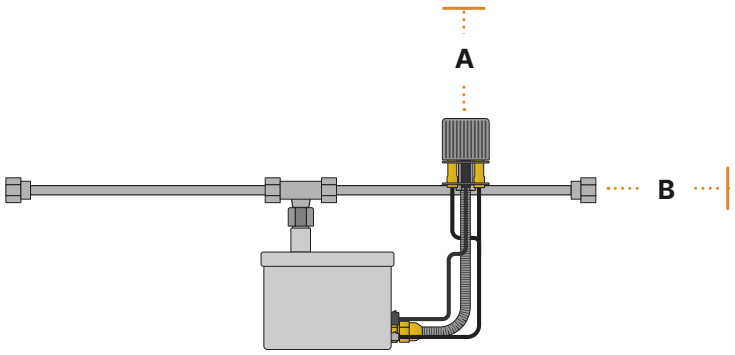
FIRE RISK

Please provide adequate clearance to combustible materials as shown below:

Clearance to Combustibles

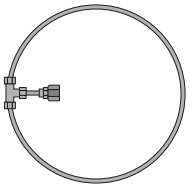
A - Bottom of Valve Box to Combustible Ceiling
96" (8ft)

B - Top of Burner to Combustible Wall
36" (3ft)



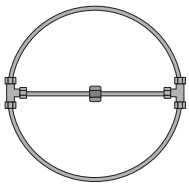
Submersible Manifolds

We offer many different submersible manifolds for our SUBEIS ignition system. Below is a list of all the different manifolds available. Below all the manifolds is a separate cheat chart for determining the pressure required.



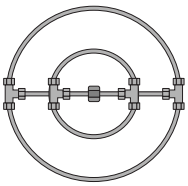
Hoop Manifold

Model	Size	PSI (min)	BTU	Inlet
WBSF9	9"	1	67,000	1/2"
WBSF10	10"	1	75,000	1/2"
WBSF12	12"	1	91,000	1/2"
WBSF18	18"	1	118,750	1/2"
WBSF24	24"	1	158,250	1/2"
WBSF30	30"	1	197,750	1/2"
WBSF36	36"	1	235,500	1/2"
WBSF48	48"	2	314,000	1/2"



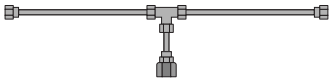
Center Feed Manifold

Model	Size	PSI (min)	BTU	Inlet
WBCLF9	9"	1	67,000	1/2"
WBCLF10	10"	1	75,000	1/2"
WBCLF12	12"	1	91,000	1/2"
WBCLF15	15"	1	129,250	1/2"
WBCLF18	18"	1	155,250	1/2"
WBCLF24	24"	1	207,000	1/2"
WBCLF36	36"	2	310,500	1/2"
WBCLF48	48"	2	414,000	1/2"



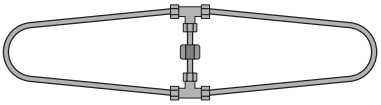
Double Ring Manifold

Model	Size	PSI (min)	BTU	Inlet
WBDR18	18"	1	214,000	1/2"
WBDR24	24"	1	285,500	1/2"
WBDR30	30"	2	356,750	1/2"
WBDR36	36"	2	428,250	1/2"
WBDR48	48"	2	649,500	1/2"



T Manifold

Model	Size	PSI (min)	BTU	Inlet
WBL18	18"	1	37,500	1/2"
WBL24	24"	1	50,000	1/2"
WBL30	30"	1	62,500	1/2"
WBL36	36"	1	75,000	1/2"
WBL48	48"	1	100,000	1/2"
WBL60	60"	1	125,000	1/2"
WBL72	72"	1	150,000	1/2"
WBL84	84"	1	175,000	1/2"
WBL96	96"	1	200,000	1/2"
WBL108	108"	1	225,000	1/2"
WBL120	120"	1	225,000	1/2"
WBL144	144"	1	264,000	1/2"



H Manifold

Model	Size	PSI (min)	BTU	Inlet
WBH12	12"	1	50,000	1/2"
WBH18	18"	1	75,000	1/2"
WBH24	24"	1	100,000	1/2"
WBH30	30"	1	125,000	1/2"
WBH36	36"	1	150,000	1/2"
WBH48	48"	1	200,000	1/2"
WBH60	60"	1	250,000	1/2"
WBH72	72"	2	300,000	1/2"

Determine Minimum Pressure

Linear Feet	Pressure Required
0 ft - 12 ft	1 PSI
12 ft - 20 ft	2 PSI

Support Legs for Manifolds

For manifolds measuring 6' or more from the center gas inlet it is highly recommended to add support legs.

This ensures that the manifold maintains the same height in the water throughout the entire length of the manifold.

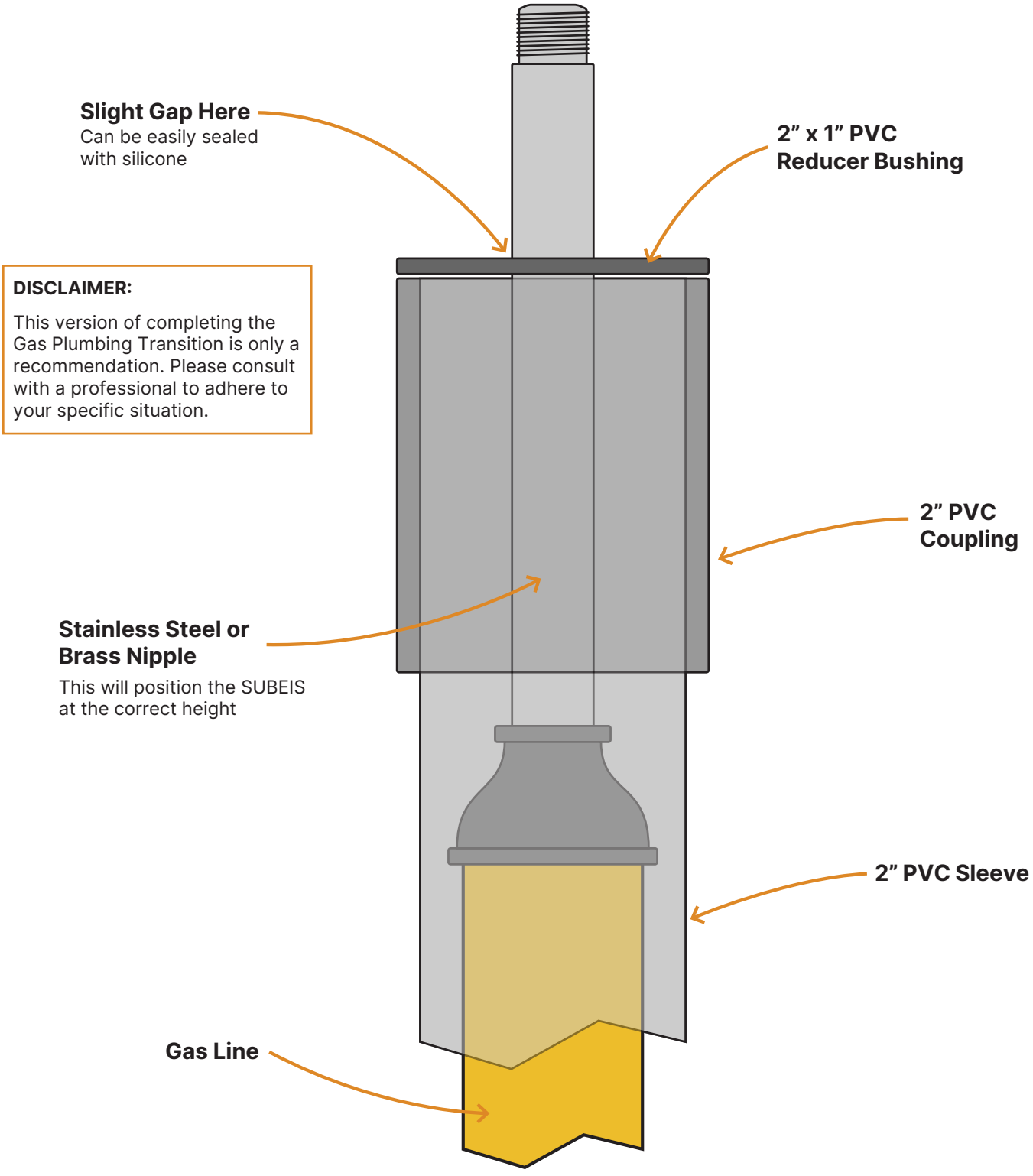
Manifold support legs are available in different lengths.

Gas Plumbing Transition

In order to connect the incoming gas to the SUBEIS Ignition System, you will need to transition the gas plumbing to the input on the SUBEIS ignition system. Below is an illustration showing the preferred method of transitioning from a gas line (housed inside a PVC sleeve) to the submerged SUBEIS system.

NOTE: The illustration below is not the only method to perform this transition, but it is preferred. Please consult with a licensed plumber in order to adhere to local codes and regulations.

We will go over the actual connection in the Installation section of this instruction set.



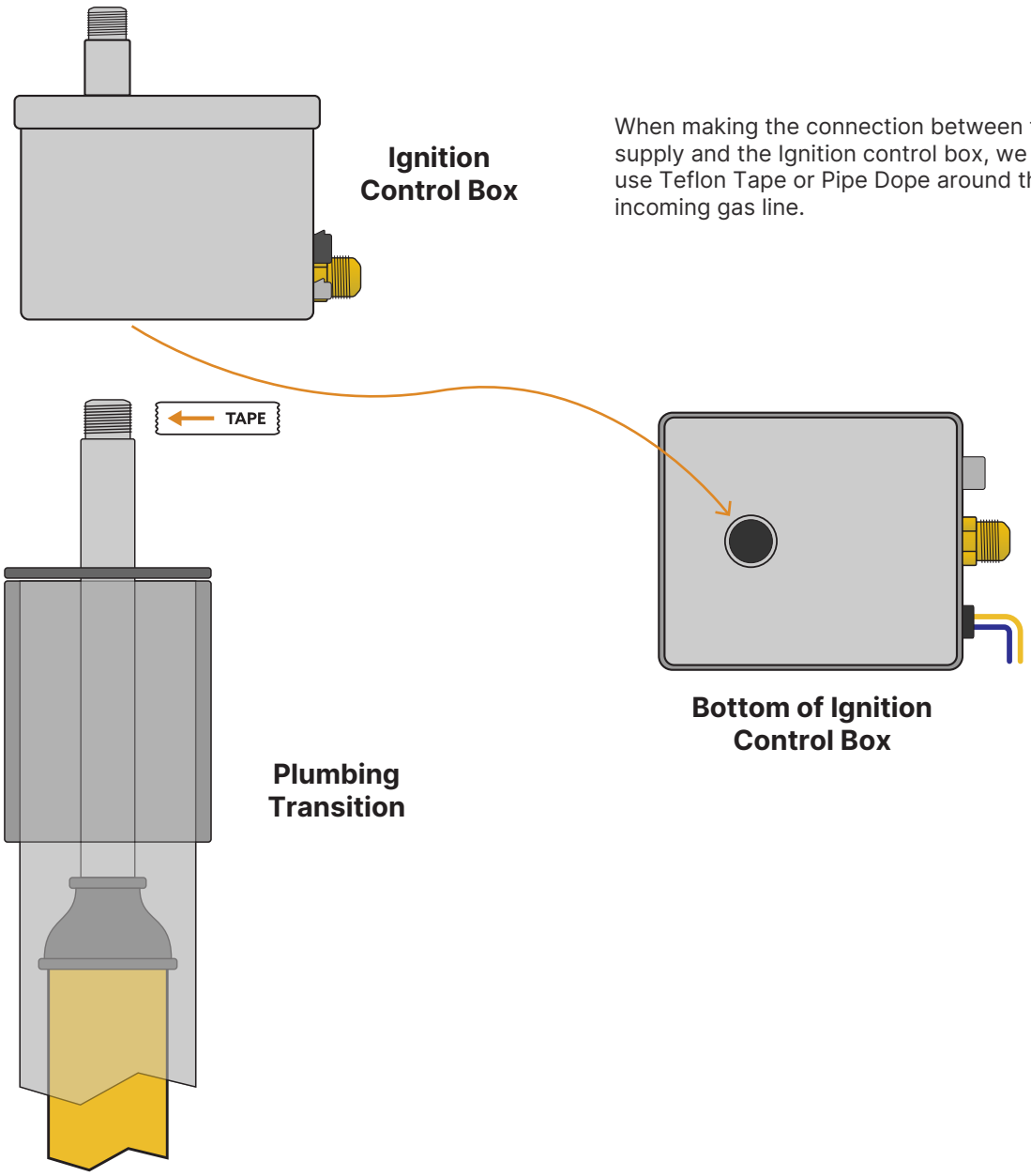
SUBEIS Installation

STOP: The installation should be done by a **Qualified Service Technician** that is **Locally Licensed**

NOTE: For this installation instruction, we will be using a Linear Manifold. If you have a different style manifold, you can still follow this installation process, but please refer to **page 6** for your specific manifold positioning.

Step 1 - Attaching the SUBEIS Ignition Control Module to the Incoming Gas Plumbing

We recommend installing the SUBEIS Ignition Control Module to the incoming gas plumbing before attaching all other components, as installing a completely assembled ignition control box & manifold at the same time could be overwhelming and cause damage.



When making the connection between the incoming gas supply and the Ignition control box, we recommend you use Teflon Tape or Pipe Dope around the threads of the incoming gas line.

Step 2 - Attaching the Pilot Burner Assembly to the Control Box

Below are identifying images of the Pilot Burner Assembly and the Ignition Control Box. They ship separated in order to prevent damage during shipping. There is an igniter Molex, a thermopile Molex, a 1/4 Flare Fitting, and wires to connect to the incoming power source.

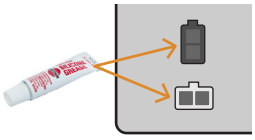
Igniter & Thermopile Electrical Molex Connections

There are two electrical Molex connectors attached to the Pilot Burner Assembly - **these connectors are different from one another.** Ensure they are connected to the correct port on the Ignition Control Box.

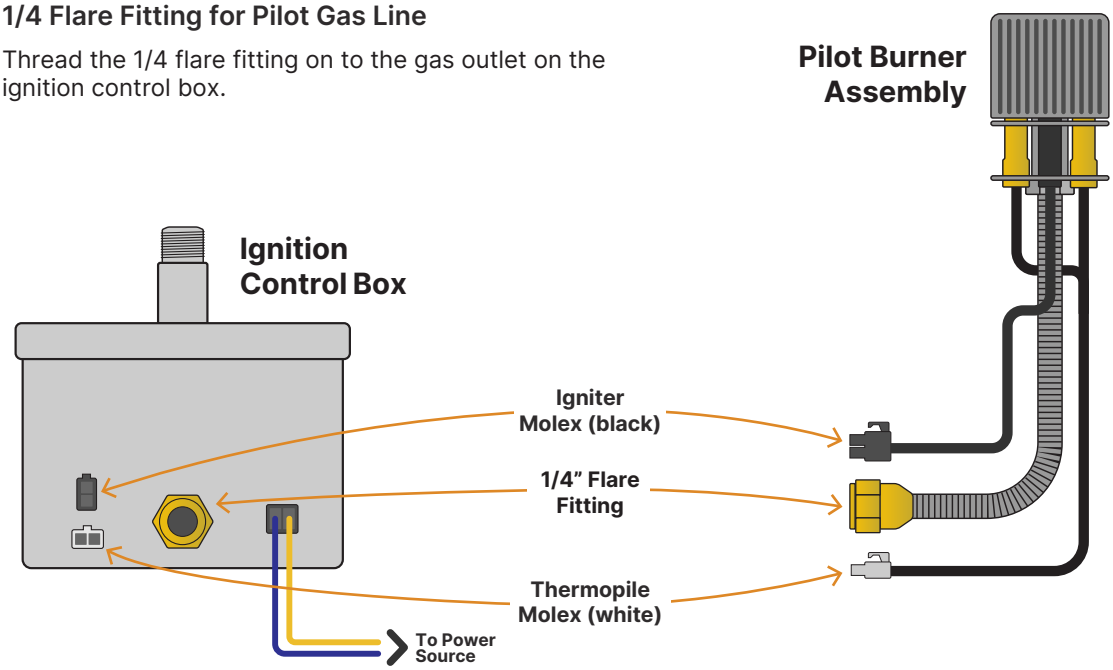
1/4 Flare Fitting for Pilot Gas Line

Thread the 1/4 flare fitting on to the gas outlet on the ignition control box.

Included with the SUBEIS is a small tube of **Silicone Grease**. Squeeze some of this grease into the two connectors (Black & White) on the side of the Control Box - then plug the connectors into their respective ports.



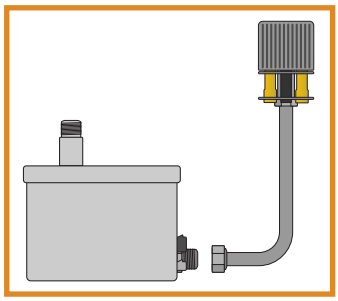
NOTE: If maintenance is ever done on the unit, you must re-apply the Silicone Grease to the molex connectors.



OPTION - Alternate Pilot Gas Line

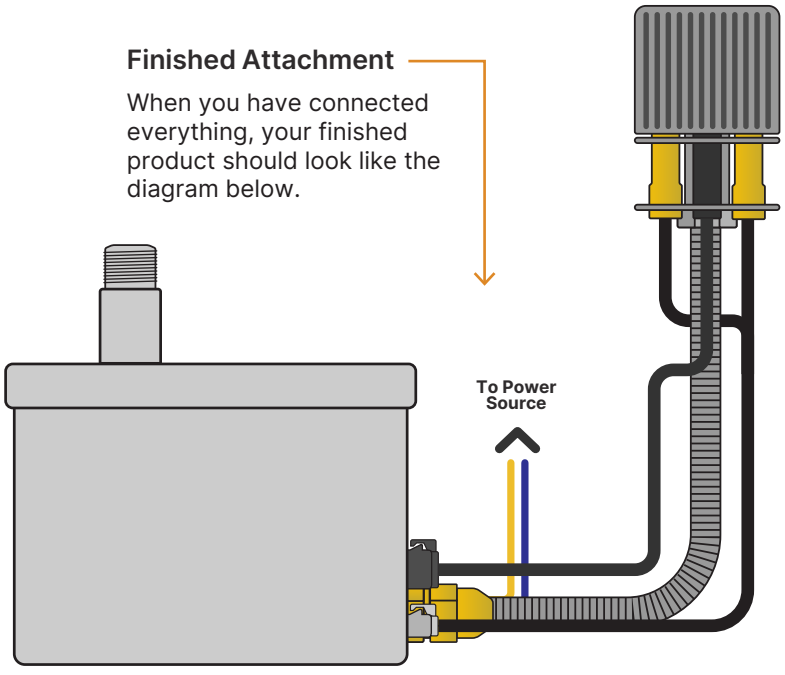
We offer a different style of Pilot Gas Line, a solid stainless steel line with a compression fitting.

You can follow the same installation process with this option.



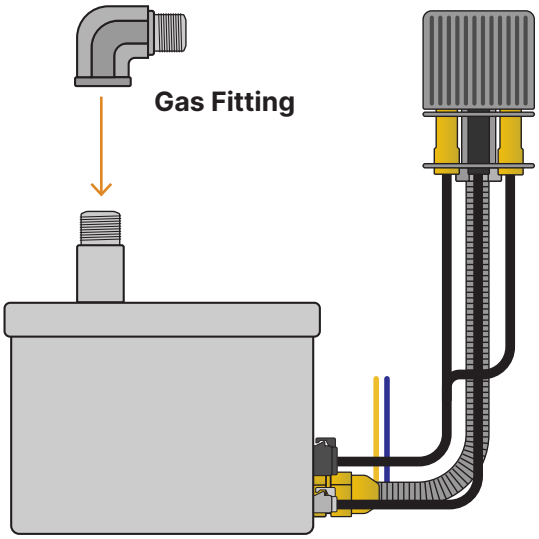
Finished Attachment

When you have connected everything, your finished product should look like the diagram below.



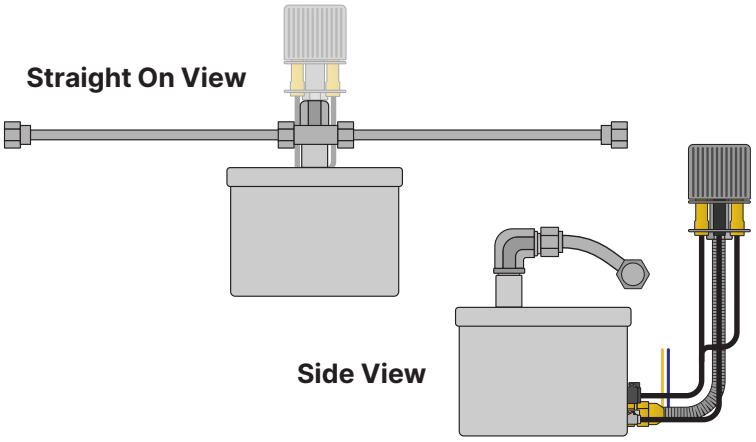
Step 3 - Installing the Submersible Manifold

Install the Submersible Manifold Gas Fitting onto the outlet of the SUBEIS Ignition Control Box.

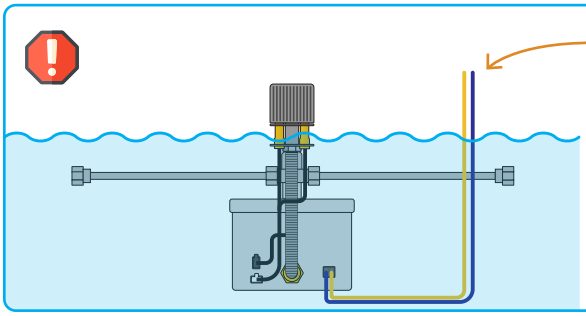


The direction the fitting should face is determined by which type of Manifold you have. Please see **Page 17** of a list of all approved manifolds along with their gas fitting direction.

The diagrams below depict an installed **Linear** Manifold



Step 4 - Connecting the Incoming Power to the SUBEIS Ignition Control Module



Connecting Power Wires Outside of Water

24VAC Models

It is recommended when connecting the incoming power to the SUBEIS Ignition Control Module the connection be done outside of the water

30VDC Models

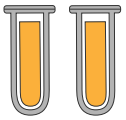
It is **REQUIRED** when connecting the incoming power to the SUBEIS Ignition Control Module the connection be done outside of the water

Ask us about customizing the length of your electrical wires for both 24VAC & 30VDC Models (Maximum 150ft)

Connecting Power Wires When Connections are to be Submerged

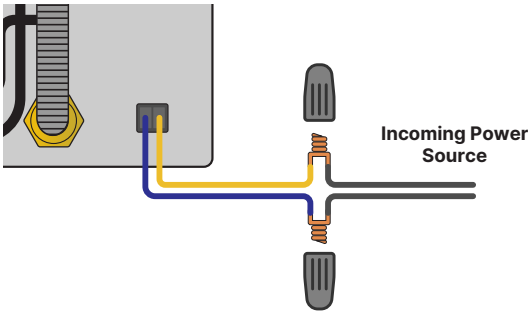
There are two items included with your SUBEIS needed for the electrical connection. They are identified to the right.

Electrical Grease Wire Nuts

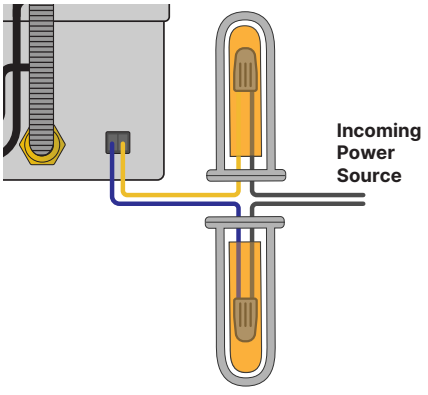


Grease Caps

To make the electrical connection to your power source, connect the wires from your power source to the wires from the Ignition Control Box and twist them as you would normally do when connecting wires. Then install the Electrical Grease Wire Nuts onto the twisted wires.

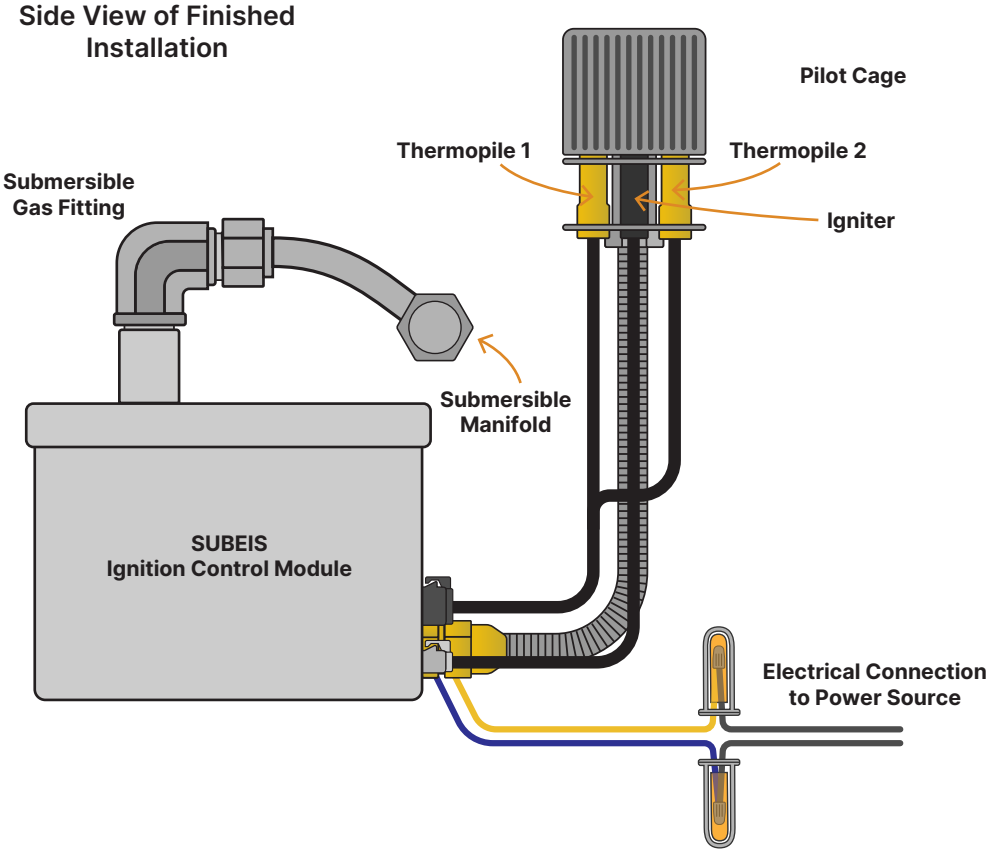


Next open up the hinged lid of the “Grease Caps” and insert the Grease Wire Nut down into the grease in the cap as far down as it will go. Then close the hinged lid until it locks into place.

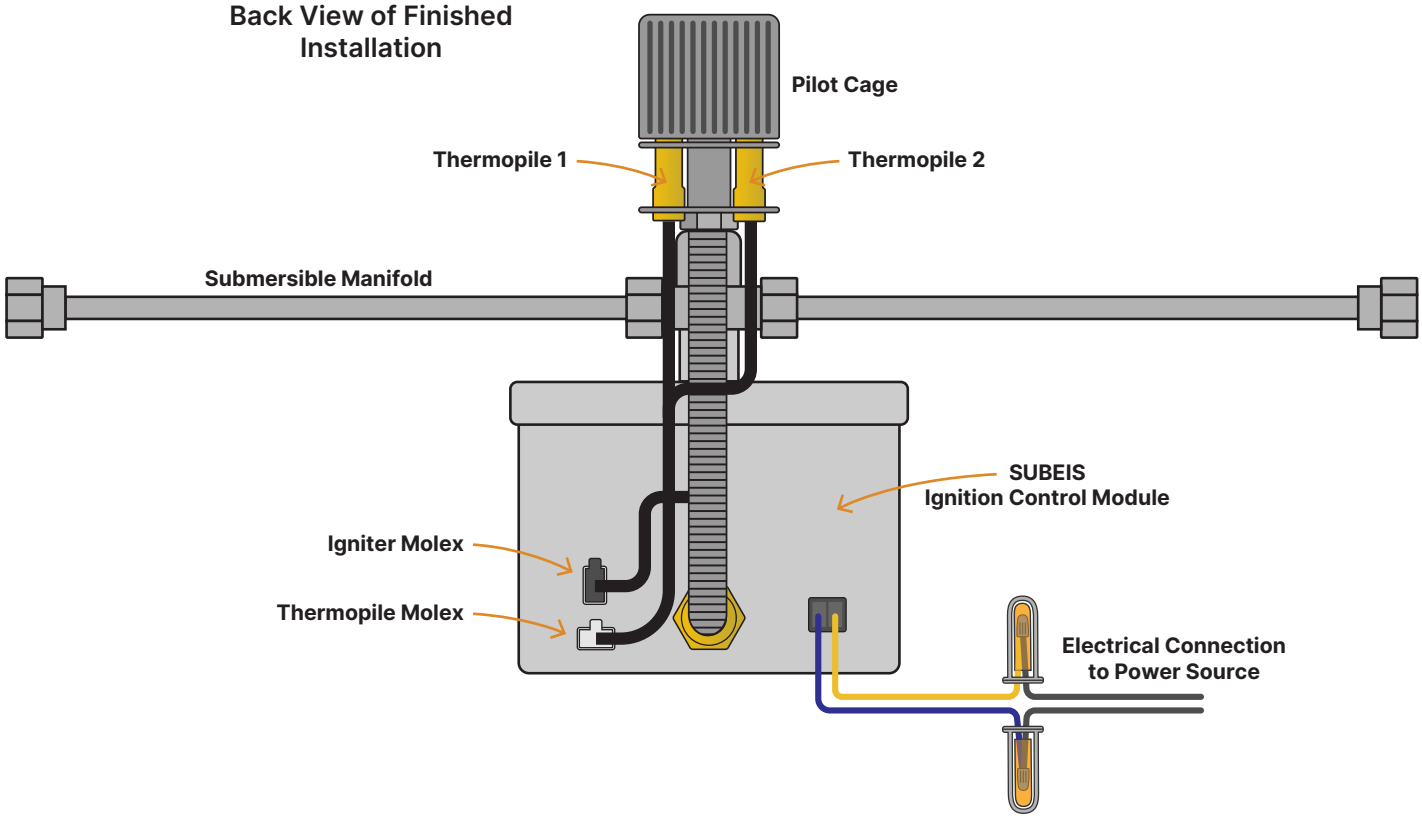


Finished Installation Diagram

Side View of Finished Installation



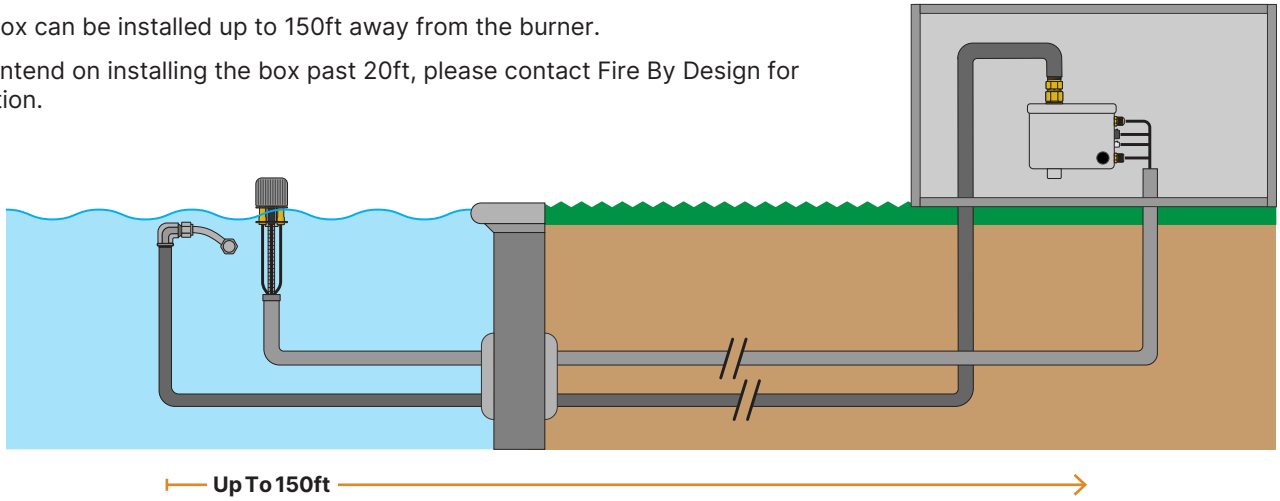
Back View of Finished Installation



Remote Positioning of the SUBEIS

The SUBIES Box can be installed up to 150ft away from the burner.

NOTE: If you intend on installing the box past 20ft, please contact Fire By Design for more information.



Operation of the SUBEIS Burner System

WARNING!
This appliance should be inspected before use and at least annually by a Qualified Service Technician that is Locally Licensed.

Any guard or protective device removed for servicing must be replaced prior to operation. Keep the appliance area clear and free from combustible materials, gasoline and other flammable vapors and liquids.

HOT! - DO NOT TOUCH - SEVERE BURNS MAY RESULT - CLOTHING IGNITION MAY RESULT!

Carefully supervise children in same area as appliance. Alert children and adults to hazards of high temperatures. Clothing or other flammable materials should not be hung or placed near the appliance

Fire Feature Start Up & Shut Down

Hardwired 24/30V Models | Fire Feature Start Up

Prior to turning appliance on visually inspect fire feature to ensure debris such as leaves or other combustible material has not collected inside the feature which could burn and emit embers once the fire feature is turned on. Also ensure any person standing close to the fire feature is aware you will be turning the fire feature on prior to actually turning it on.

Turn the fire feature on by turning on the electrical device used to power the fire feature.

Below is the Sequence of Operation for Hardwired 24/30V Models:

- Power is applied.
- Hot surface igniter (glow plug) becomes hot, and 4 seconds later the Pilot Gas Valve opens.
- Within 10 seconds of power application, the Pilot Flame should be visible (at night only).
- Within 10 seconds of Pilot Flame Ignition, the burner should ignite.

Hardwired 24/30V Models | Fire Feature Shut Down

Fire Feature Shut Down for Hardwired 24/30V Models:

- Turn off the electrical device used to power the fire feature.

WARNING! **If fire feature fails to turn off completely (small flames still visible) - Turn off gas supply using the manual gas shut-off.**

Maintenance of the SUBEIS Burner System

WARNING! Maintenance should be done by a **Qualified Service Technician.** The appliance should be inspected before use and at least annually.

WARNING! Ensure gas & power are shut off and the appliance is cool before servicing. Any guard or protective device removed for servicing must be replaced prior to operation.

Hardwired 24/30V & Battery Powered Models

Prior to Each Use:

- Inspect for debris in the Fire Feature & inside the enclosure. Remove any debris prior to use.

Semi-Annually:

- Visually inspect Pilot Burner for debris / insect infestation (spider webs).
- Visually inspect burner holes for debris / insect infestation.
- Clean either of the above if necessary using compressed air.

Annually:

- Visually inspect Pilot Burner for excess corrosion due to heat and moisture.
- Turn fire feature on to ensure proper operation.

Troubleshooting the SUBEIS Burner System

Hardwired 24/30V Models | **Stainless Steel Tip Maintenance Guide**

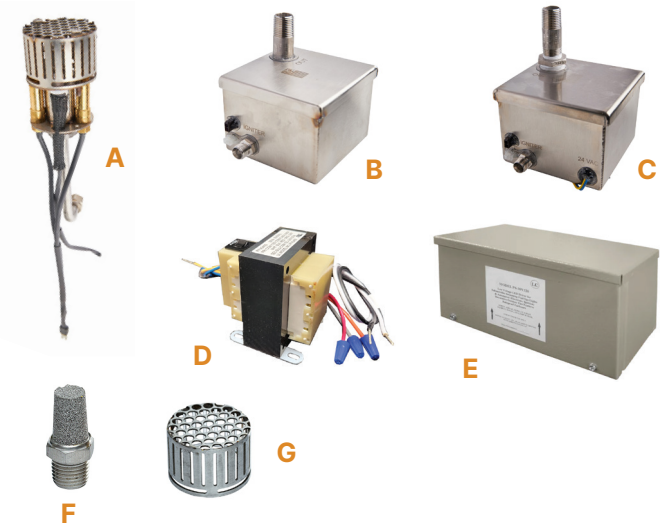
This QR Code will always take you to the most recent Stainless Steel Tip Maintenance guide.

You can also type in the URL directly: **https://fbdqr.com/ss-tip**

Replacement Parts for the SUBEIS Burner System

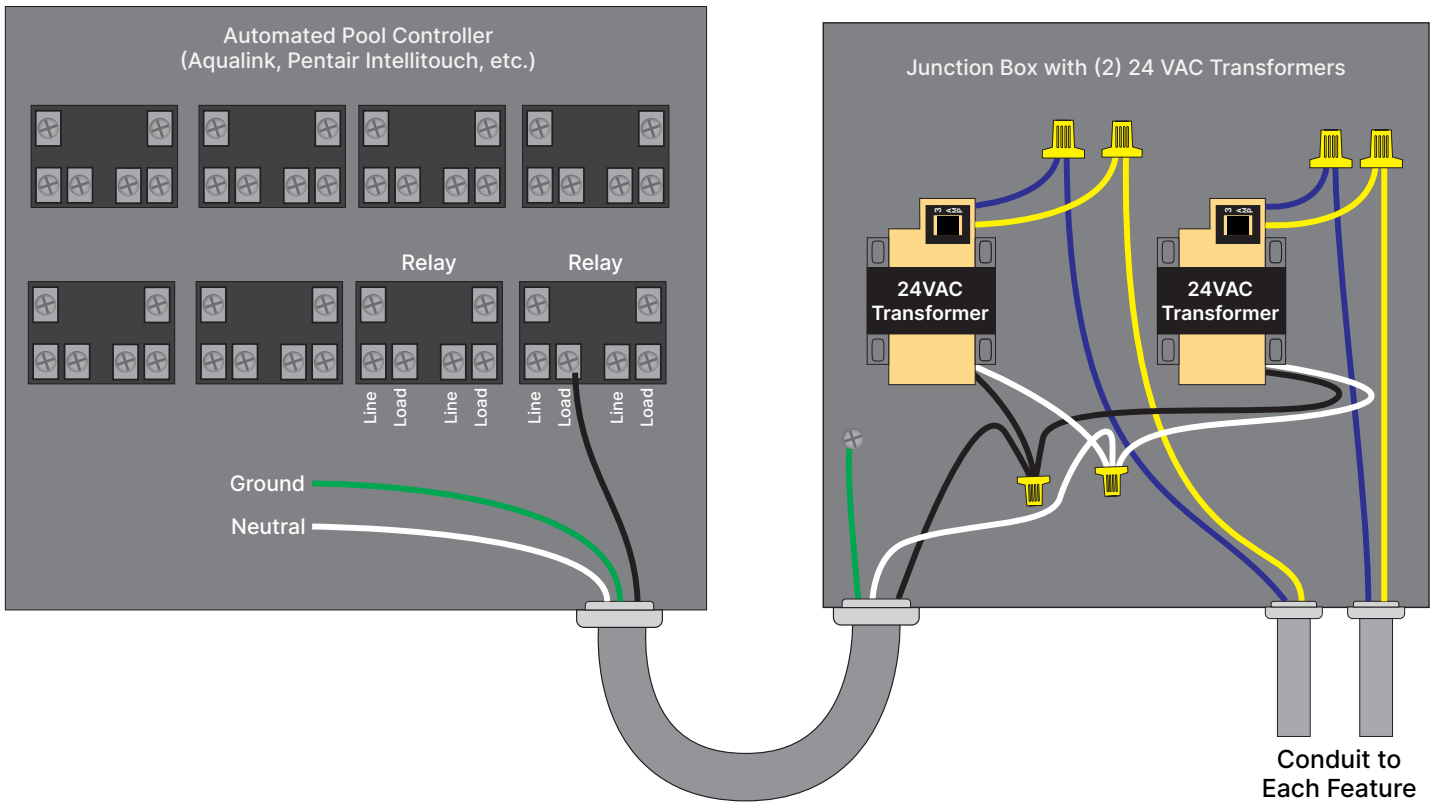
Hardwired 24/30V Models | Replacement Parts

Identifier	Part #	Description
A	PBAFOW	Pilot Burner Assembly Fire on Water
B	SSCBX-FS	SUBEIS Standard Capacity Box
C	SHCBX-FS	SUBEIS High Capacity Box
D	50VA-24VAC	24VAC Transformer
E	PS-30V185	30 VDC Power Supply
F	TBRNR-SSFOW	SUBEIS Fire on water Stainless Steel Tip
G	TWC	Wind Cage for Fire on Water Pilot Burner

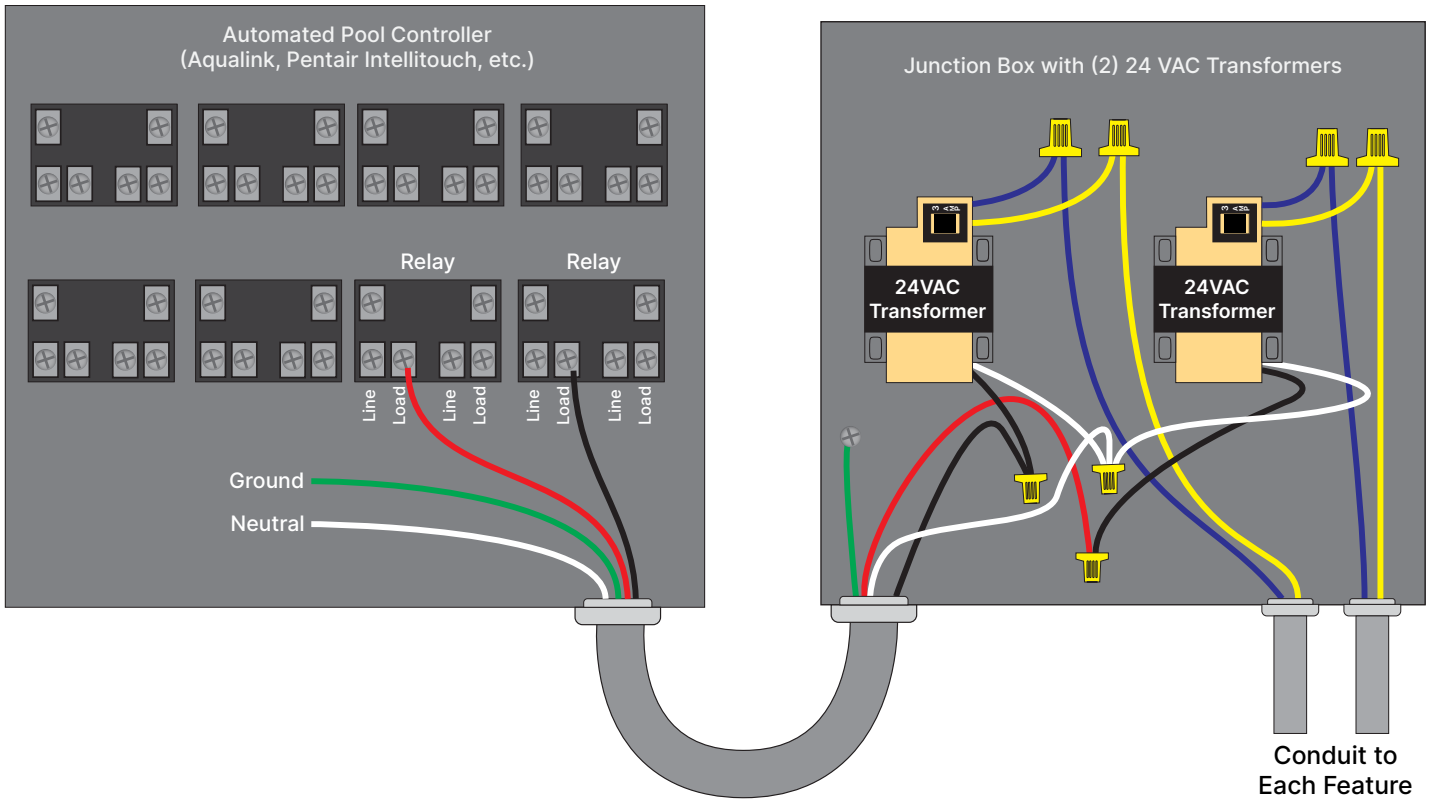


Automated Pool Controller Wiring

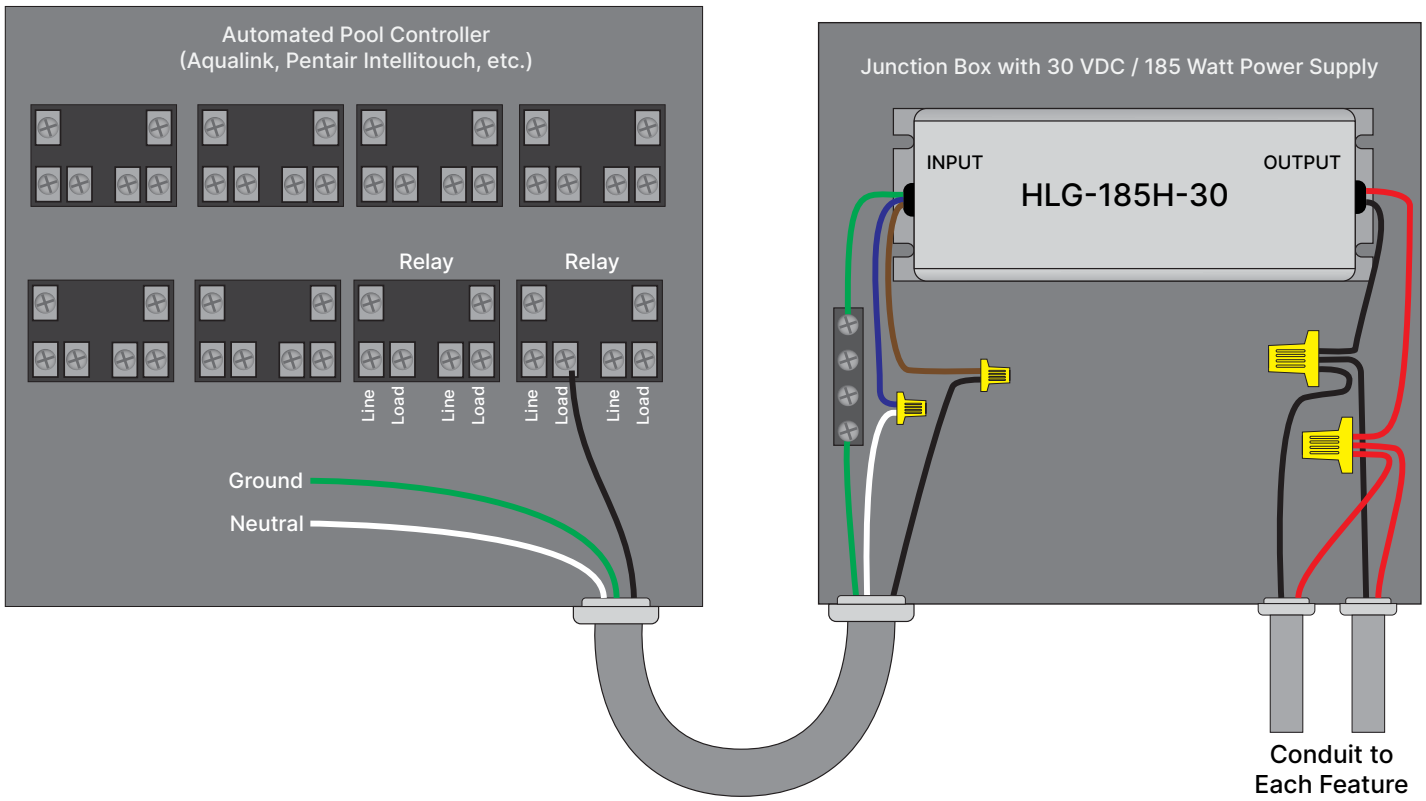
Wiring to Pool Controller when 2 Features **Turn ON at the same time | 24 Volt AC Systems**



Wiring to Pool Controller when 2 Features **Turn ON Separately | 24 Volt AC Systems**



Wiring to Pool Controller when 2 Features **Turn ON at the same time** | **30 Volt DC Systems**



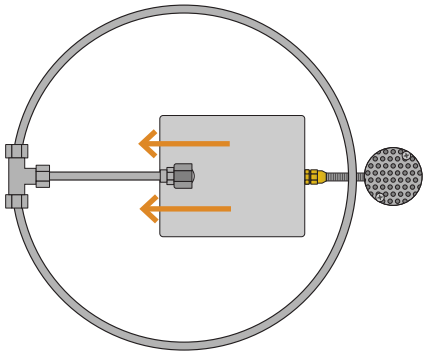
NOTE: In order to turn 2 or more feature ON separately, EACH fire feature requires its own 30 VDC Power supply. One 30 VDC Power Supply is shown above.

Manifold Gas Fitting Direction

Below you will find all approved manifolds with their gas fitting direction. Please use this chart to ensure your manifold is installed in the correct orientation.

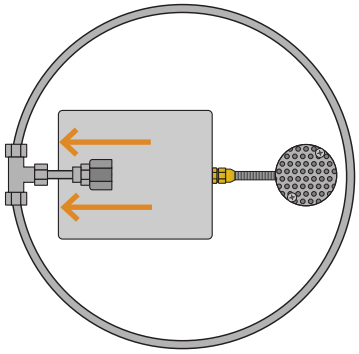
Ring Manifold

Gas Fitting facing **AWAY** the Pilot Burner



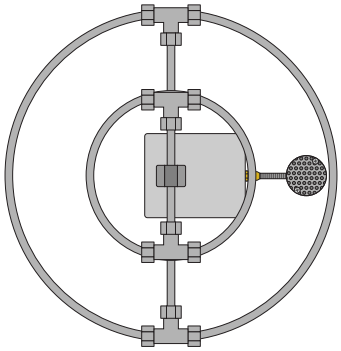
Hoop Manifold

Gas Fitting facing **AWAY** the Pilot Burner



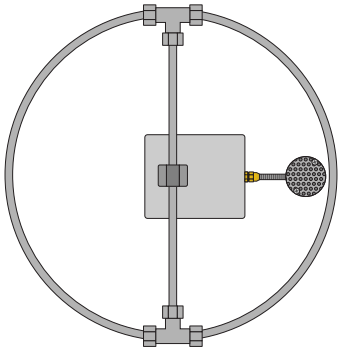
Double Ring Manifold

No Gas Fitting required. Install directly on to the SUBEIS box.



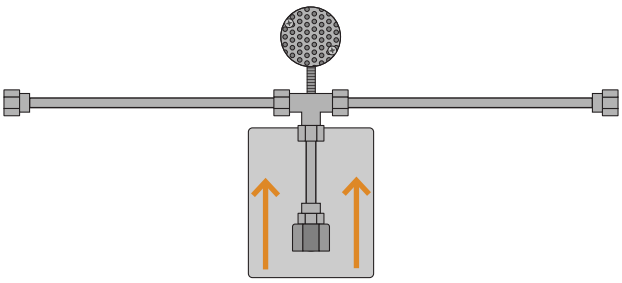
Center Line Manifold

No Gas Fitting required. Install directly on to the SUBEIS box.



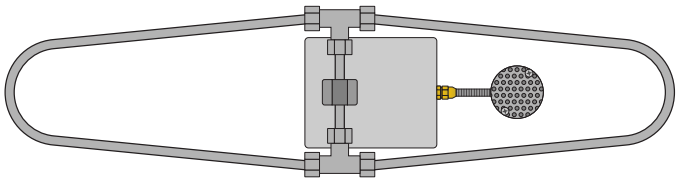
Linear Manifold

Gas Fitting facing **TOWARDS** the Pilot Burner



H Manifold

No Gas Fitting required. Install directly on to the SUBEIS box.



Return Policy

All orders from Fire by Design (FBD) may be returned within 30 days for a full refund. In order to return or exchange (under the warranty guidelines described in the Fire by Design Limited Warranty section of this instruction set) all or part of your order, you must contact us for a Return Merchandise Authorization number (RMA#). Call toll free (877) 807-8923 to obtain an RMA# from a FBD representative.

All returned merchandise must be in the original packaging including manuals, accessories, cables, etc. with the authorization (RMA#) clearly printed on the outside of the package. Return requests must be made within 30 days of the receipt date. Any shipping and/or handling charges on the original order cannot be refunded. At our discretion, we may levee a restocking fee of 15% of the cost of items returned.

FBD is not responsible for shipping costs or damage on returned items. Units to be returned should be packed carefully. Please be advised that packages sent by normal US Postal Service cannot be tracked to ensure delivery.

Since FBD cannot provide credit for a return without confirming its receipt, we recommend that you use a delivery service that can be tracked and or insured.

Fire by Design | Limited Warranty

Fire by Design warrants its products to be free from defective material and workmanship for the period of time indicated below for each product line. The warranty time periods listed below are from the original date of purchase. Fire by Design agrees to repair or replace, at its sole discretion, a defective product if returned to Fire by Design within the warranty period and accompanied by proof of purchase. This warranty does not extend to any Fire by Design products which have been subject to misuse, neglect, accident, incorrect wiring or to use in violation of operating instructions furnished by us, nor extend to any units altered or repaired for warranty defect by anyone other than Fire by Design or at Fire by Design's direction. This warranty does not cover any incidental or consequential damages and is in lieu of all other warranties expressed or implied and no representative or person is authorized to assume for us any other liability in connection with the sale of our products. Some states do not allow limitations on how long an implied warranty lasts, and/or the exclusion or limitation of incidental or consequential damages so the above limitations and exclusions may not apply to the original CUSTOMER. This warranty gives you specific rights and you may also have other rights, which vary, from state to state. If you have any questions concerning this warranty call (877) 807-8923.

Bowls

All Decorative GFRC, Stainless, Copper or Aluminum Bowls are warranted for (2) years from delivery date against any manufacturing defect or structural failure. Small stress cracks and surface crazing are a natural occurrence in concrete and not covered by warranty.

Fire Rings

All 304 Stainless Steel Rings, 316 Stainless Steel Burners (Marine Grade) and High Output Burners have a Lifetime Warranty.

Burner Pans

All 304 Stainless Steel Burner Pans warranted for (5) years. All Aluminum Burner Pans have a Lifetime Warranty.

Electronic Ignition Systems (Field Serviceable AWEIS SC, HC, XHC, SUBEIS, BP AWEIS)

All Field Serviceable AWEIS and SUBEIS systems are warranted for (1) year from date of purchase for Commercial Applications and (3) years from date of purchase for Residential Applications provided the product has not been modified, abused, misused or improperly installed, maintained or repaired during such period. Fire by Design, at its discretion, will either repair or replace the defective product. If one of the Field Serviceable parts of an AWEIS or SUBEIS fails a replacement part will be provided at no charge to the customer. Labor cost to replace the failed field serviceable is not covered under this warranty. If a part other than a Field Serviceable part fails that part will be replaced or repaired at no charge to the customer.

Vulcan Fire Module & Tiki Torches

Vulcan Fire Modules and Automated Tiki Torches are warranted for (1) year from the date of purchase.

The original purchasing information such as an invoice or product serial number is required on all warranty returns.