

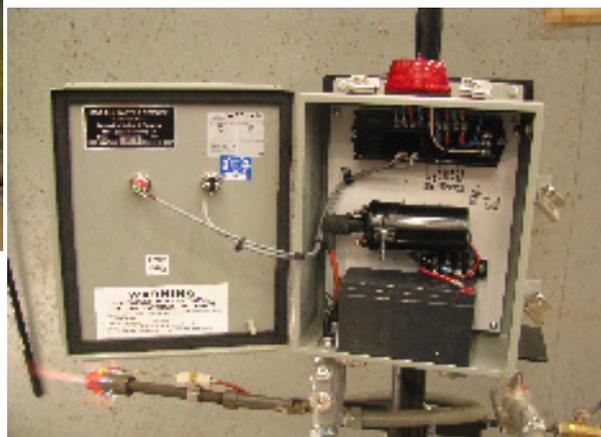
SFI

Superior Fabrication, Inc.

VOC Enclosed Flare

Installation

Guide



VOC Enclosed Flare

MEETS Requirements of CFR title 40

Superior Fabrication's VOC Flares are designed for burning waste / vent gas from storage tanks, exhaust from instruments such as level controls and pressure pilots and any other low pressure gas source. The flares are sized based on the following criteria for a minimum of 98% destruction efficiency. The VOC Flare is an Enclosed Flare, also referred to as a ground flare, as in the case of API publication 931 chapter 15. It is simply a flare that has been surrounded by barrier. Since the flare is at ground level, maintenance is much easier and safer. The enclosure also limits the affects of wind and downdrafts.

The enclosed flare meets the requirements of CFR title 40 §63.771(d)(1)(iii) as a “Flare” per §63.11 (b).

§63.11(b)(1) Operator shall monitor and operate the control device.

§63.11(b)(2) The SFI flare is a non-assisted, natural draft type.

§63.11(b)(3) The flare is operated continuously.

§63.11(b)(4) The flare is designed to have no visible emissions, except for a maximum total of 5 minutes in any 2 hour period. Test Method 22 in appendix A of part 60 is to be used in determining visible emissions.

§63.11(b)(5) The flare is equipped with a constant pilot flame monitored by a thermocouple. The thermocouple causes instant re-light should there be a pilot outage.

§63.11(b)(6) Refer to §63.11(b)(7)(i) The SFI flares are sized for 10 ft/sec based on anticipated flow rates.

There are two different configurations for dumping the liquid from the vent gas before it is burned in the Enclosed Flare. The configuration of the unit should be specified when ordering.

- 1.) The first configuration uses a Knock-Out Pot where the liquid has to be manually dumped.
- 2.) The second configuration uses an Accumulator/Booster. In this system the liquid is automatically dumped back into the tanks. This is the preferred system for daily operations.

This guide has both configuration types incorporated into it.

VOC Enclosed Flare

Set-up

- 1.) Locate location for Enclosed Flare at a distance determined by company specifications and/or government requirements.
- 2.) Set the skid with the top flush with the grade.
- 3.) Erect Flare and bolt to skid.
- 4.) Locate Fuel Gas Scrubber and pipe up according to Figure 1.
- 5.) Locate Knock-Out Pot (Manual Dump) or Accumulator/Booster (Automatic Dump) and pipe up according to Figure 2.1 (Manual Dump) or Figure 2.2 (Automatic Dump).
 - Note 1: Make sure pipe from Stock Tank to Knock-Out Pot or Accumulator/Booster is sloped at an angle of approximately 1 inch per 10 feet and is insulated.
 - Note 2: It is recommended that the condensed liquid line back to the tanks should be protected from freezing (buried, insulated, etc.).
- 6.) Put in Pilot light assembly (Figure 3) as shown in Figure 1.
- 7.) Mount Solar Panel with leg support bracket (Figure 4) or alternate pipe mounting system.
 - Note: Place on side that receives the most sunlight in a day.
- 8.) Locate the True-Lite Igniter and place on the flat surface on the side of the Enclosed Flare (refer to Figure 1).
- 9.) Wire the True-Lite Igniter to the solar panel, solenoid valve, and pilot according to True-Lite Igniter Installation (below) and Schematic A.
- 10.) After all piping and wiring is completed, supply gas to the fuel gas scrubber (125psi max).
- 11.) Open isolation valves and set regulators.
- 12.) Start up the True-Lite Igniter according to True-Lite Igniter Start-up (pg. 4).
- 13.) Once pilot is lit and operating satisfactorily, vent gas from tanks may be introduced to the system.

Note: It might take some time for the vent gas to purge the air out of the line for the flare to have enough gas to fully ignite .

True-Lite Igniter

Installation

- 1.) Mount igniter unit on flush vertical surface and bolt securely.
- 2.) Cut and install conduit and connectors.
- 3.) Cut the igniter wire and ground wire to the length needed and run it inside the conduit. Attach the ground wire to the ground terminal bolt that is located on the bottom left corner of the enclosure. Connect the igniter wire with the rubber boot to the coil inside the unit.
- 4.) If using a solar panel, run the wire through the round pre-cut hole at the bottom of the unit and attach to the positive and negative solar terminals of the terminal block marked "Solar". Shield the panel from sunlight until the battery is connected.
- 5.) Install conduit for the Magnalatch Valve and run wires through conduit. Attach to the positive and negative terminals for the valve on the terminal block marked "Valve".
- 6.) Connect electrode to the end of the igniter wire and attach the ground wire to the burner piping on the vessel. (Position electrode per sketch.) Do not ground the electrode by touching the tip of the electrode to the metal piping.
- 7.) Check wiring to ensure proper connection and connect the battery to test the unit.

Note: it is the installer's/user's responsibility to adhere to all Local, State and Federal codes for wiring and gas connections.

True-Lite Igniter Start-up

Operation

Caution: For safety, ensure flame arrestor is secure and in proper working order prior to lighting flame. It is recommended to follow API RP-12N for testing the flame arrestor and accessories.

Start-up

- 1.) Make sure the battery has a full charge and all the terminal connections are tight with no loose wiring. Keep the manual valves that control the pilot and main burner gas lines closed until ready to ignite.
- 2.) Open the valve and press the ignition button. A red LED indicator light will flash bright red while attempting to light. The igniter will fire up to 62 times during one-15 second cycle unless ignition is successful. Once the pilot is lit and in flame monitoring mode, the LED will flash dim red. If ignition fails, refer to trouble shooting guide.

True-Lite Igniter Shut-down

Shut Down

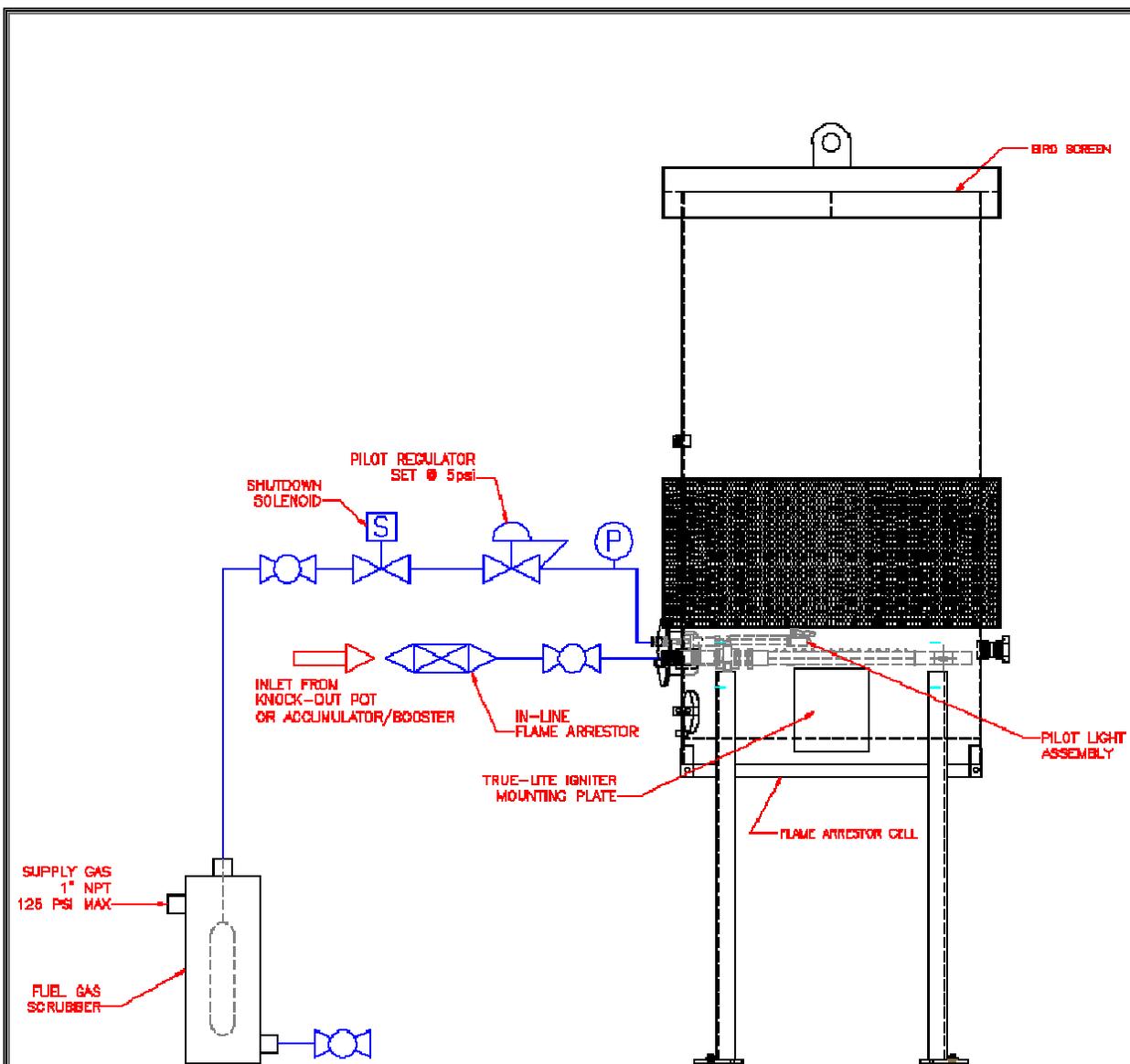
- 1.) Close the manual gas valves for the pilot and main burner. The unit will attempt to relight and will time out in 15 seconds, shutting down the system.

Accumulator/Booster Operation (Automatic Dump Only)

- 1.) When vent gas from the tanks enter the accumulator/booster, the gas goes to the flare and the liquids drop to the bottom.
- 2.) As liquids accumulate in the booster, the level will rise and trip the level control.
- 3.) The level control will open a flow control valve and pressure up the booster and “boost” the liquid enough to push it back into the stock tank.

Maintenance

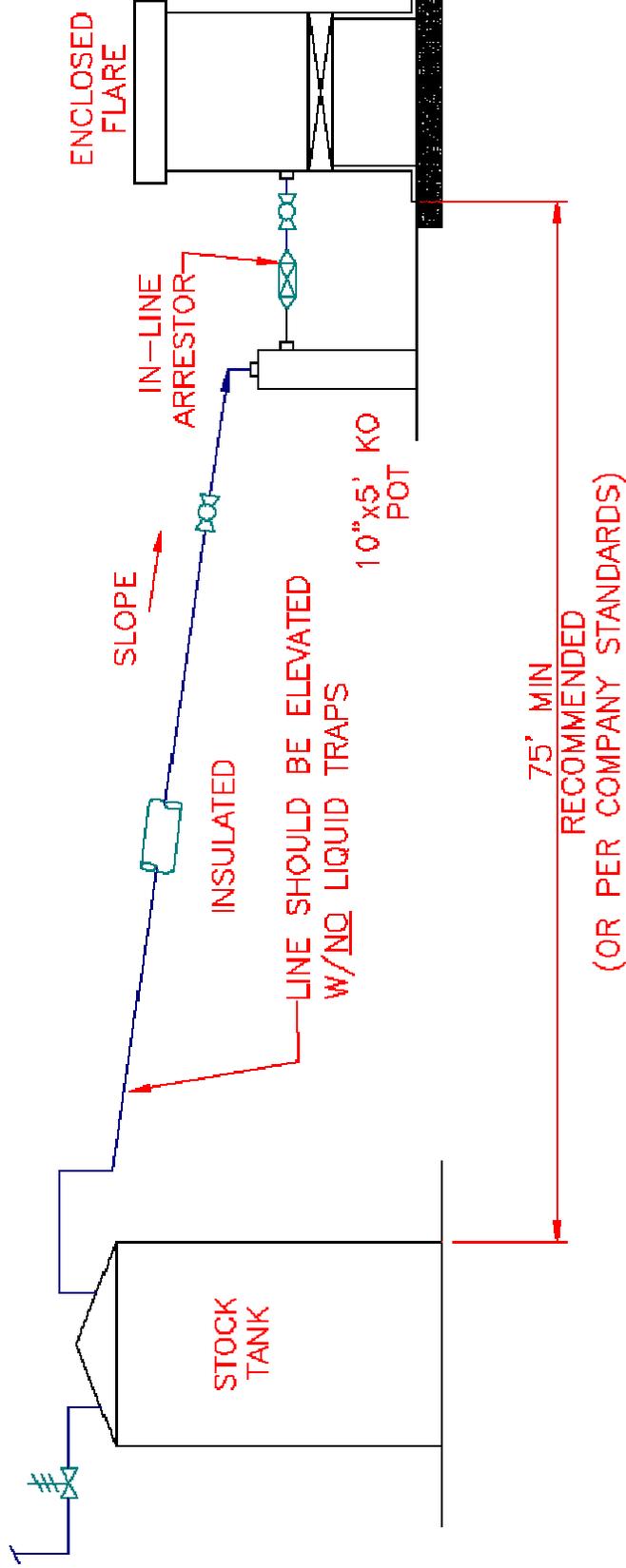
- 1.) Daily or as needed, manually drain fuel gas scrubber.
- 2.) Check levels in sight glasses.
- 3.) Check Pressures.
- 4.) Periodically clean Y-Strainers.
- 5.) Check Flame Arrestor Cell on bottom of Flare. Shutdown and clean as needed.
Note: A dirty Flame Cell can cause Flare to start smoking.
- 6.) Periodically test the True-Lite Igniter.
- 7.) Periodically remove and clean the in-line flame arrestor.



WARNING: To reduce the risk of explosion, it is imperative to have the *In-Line Flame Arrestor* installed before the system is started.

Figure 1

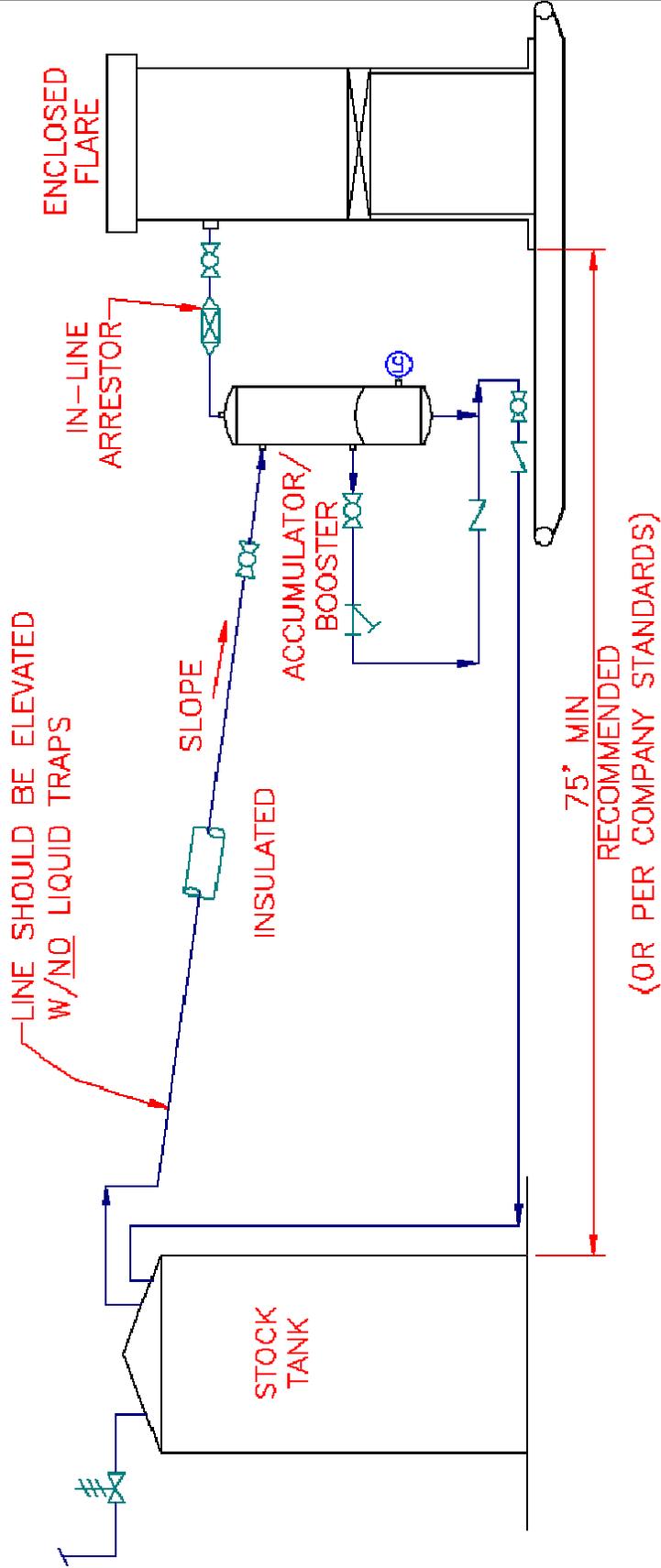
RECOMMENDED INSTALLATION
MANUAL LIQUID DUMP



RECOMMENDED RATE OF SLOPE:
1" PER 10' OF PIPE

Figure 2.1

RECOMMENDED INSTALLATION
AUTOMATIC LIQUID DUMP



RECOMMENDED RATE OF SLOPE:
1" PER 10' OF PIPE

Figure 2.2

SOLENOID
FROM TRU-LITE

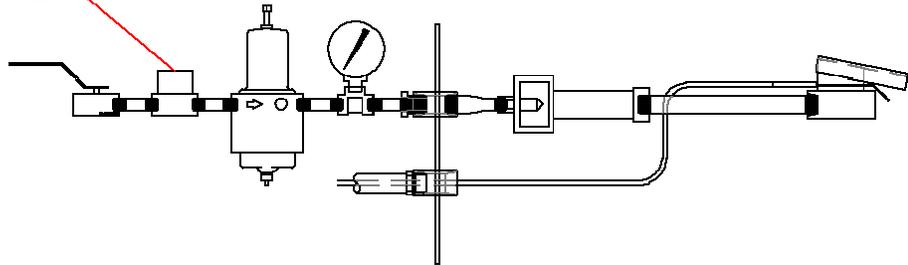
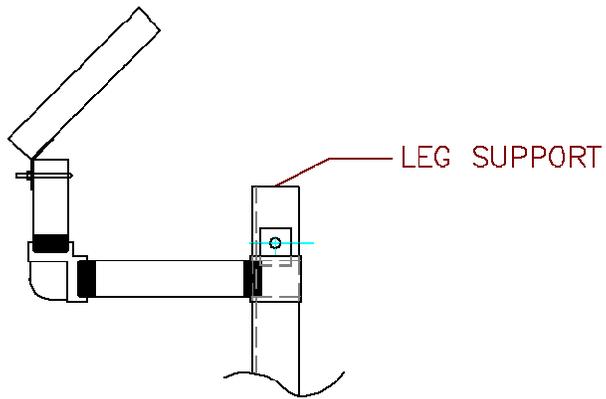


Figure 3

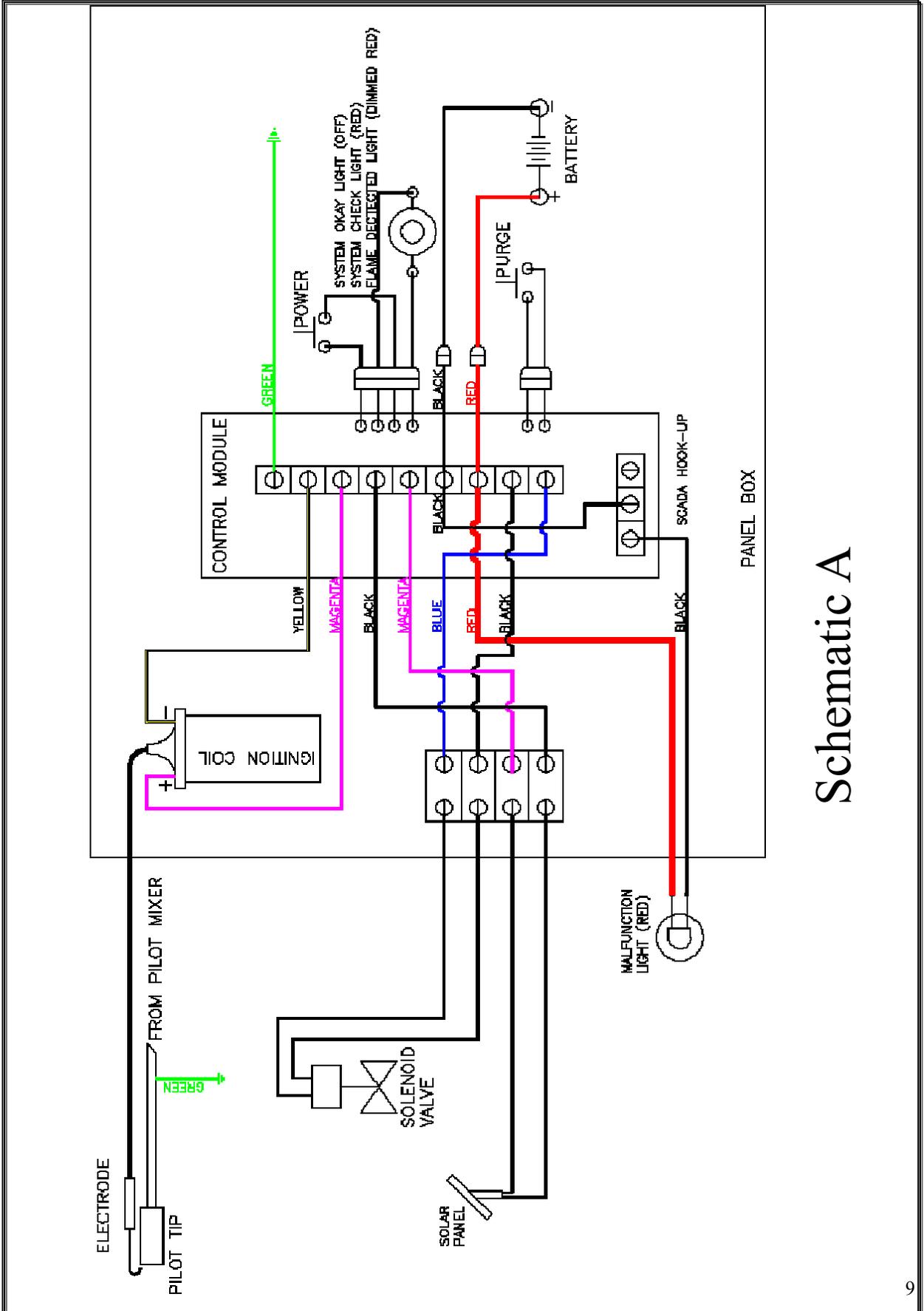


SOLAR PANEL SUPPORT

SOLAR PANEL MOUNTING
COUPLING ATTACHMENT



Figure 4



Schematic A

Troubleshooting True-Lite Igniter

Problem	Cause	Remedy
1.) Nothing happens when pushing the ignition button.	<ul style="list-style-type: none"> a.) Loose connections at battery. b.) Bad battery, low voltage. 	<ul style="list-style-type: none"> a.) Tighten all connections. b.) Install new battery or charge existing battery and check solar charger.
2.) Igniter sparks but fails to light pilot.	<ul style="list-style-type: none"> a.) Pilot gas valve shut off. b.) Air in gas line. c.) Plugged line, no gas. 	<ul style="list-style-type: none"> a.) Turn gas valve on. b.) Purge air with gas. c.) Clean out strainers, filters, orifices, etc., as needed and purge line.
3.) Igniter fails to spark.	<ul style="list-style-type: none"> a.) Improper placement of electrode. b.) Improper ground. c.) Loose or damaged wiring. d.) Loose or damaged igniter cable. e.) Wired incorrectly. 	<ul style="list-style-type: none"> a.) Reposition electrode according to sketch in installation instructions. b.) Check continuity in ground wire. c.) Tighten or replace damaged wires. d.) Check continuity of ignition cable, tighten connections. e.) Refer to schematic, correct as needed.
4.) Igniter lights pilot but continues to spark.	<ul style="list-style-type: none"> a.) Improper placement of electrode. 	<ul style="list-style-type: none"> a.) Reposition electrode according to sketch in installation instructions.

Disclaimer:

This Guide is a reference for the installation of a VOC Enclosed Flare. You should check with Federal, State, Local, and/or company specifications before doing any piping or electrical wiring.

If in need of any further technical help, please contact:

Superior Fabrication, Inc.

801 S. Eastern
 Elk City, OK 73644
 Phone: (580) 243-5693
 Fax: (580) 243-5507
 Email: superiorfab@superiorfab.com



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801 S. Eastern Elk City, OK 73644

Ph. (580) 243-5693

Fx. (580) 243-5507

E-Mail superiorfab@superiorfab.com

VOC FLARE SPECIFICATION SHEET (Volatile Organic Compounds)

Company name _____

Project location _____ Date required _____

Contact name _____

Phone _____ Fax. _____ E-mail _____

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Conditions :

(Note: If a range is given in these conditions, the worst case will be used for sizing and pricing)

Gas flow rate _____ SCFH, (Maximum rate at any time)

Will the rate be constant or variable? CONSTANT VARIABLE

Pressure at the Flare _____ (PSIG or OZ), (Source pressure less friction loss)

Gas BTU content _____ (BTU per cuft, attach gas analysis if available)

The system will include a KO pot ahead of the Flare. Do you want automatic dump or manual?

Is instrument air available? YES NO _____ PSIG

If electric power is available, what type & voltage? _____

Describe the system. Give details on distances from each gas source to the Flare along with line sizes and elevation changes. Include a sketch if needed. Indicate gas volume, pressure and BTU rating from each source. Give any specific requirements for your air quality permit.

****Sizing Note:** If this is for tank flash vapors and you would like SFI to model & simulate what the gas rate will be, please provide the following additional information:

Vessel operating Press & Temp that is dumping to the atmospheric tank. _____ PSIG at _____ F

Production Volume _____ BBL/d

Extended analysis of the condensate at the vessel pressure & temperature.

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