

Type *iPV*

**Propane Vapor
Supply and Distribution Systems**

integrated energy solutions by



Clean burning gas is the most versatile fuel used in our homes and industry today. Customers have grown accustomed to its reliable supply, low environmental impact, and the functional and aesthetic benefits of piped gas distribution systems.

However, where customers choose to live and work is not always where a piped gas infrastructure exists. Extending natural gas to an area may be cost prohibitive, while installation of a fuel tank at every user is unacceptable.

Type **iPV** propane vapor systems were developed to meet gas utility and real estate development needs for a piped gas supply and distribution system. They represent an integrated, pre-engineered approach to the subject of gas energy supply. Type **iPV** systems offer safe, reliable and easy to use technology.

integrated



All type **iPV** systems are pre-engineered by Standby Systems, a leading designer in natural and propane gas systems for over 30 years.

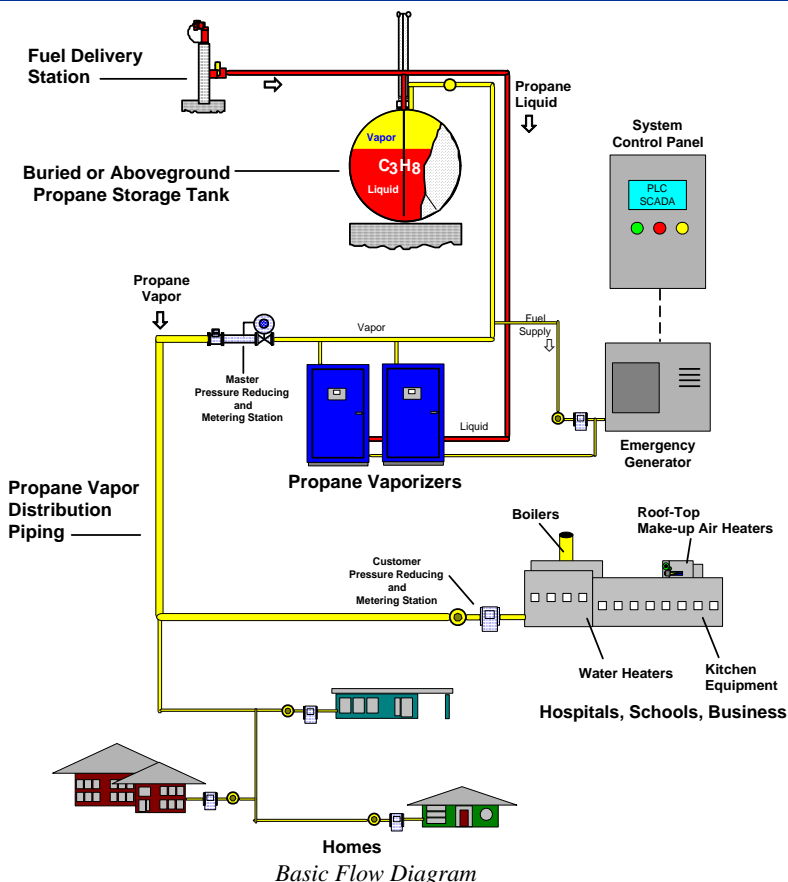
Because they are pre-engineered, you're assured components will work together the way they should, ...and you'll find them easy to install, operate and maintain.

iPV propane vapor systems can be equipped with a variety of storage configurations, output capacities and safety features. Optional packages allow users to customize their system to fit individual needs. Complete design and supply of piping distribution systems is also available.

iPV System Operation

iPV systems have a simple operating scheme

- ◆ Liquid propane is delivered into storage tanks through a truck fuel delivery station.
- ◆ Propane liquid is withdrawn from the storage tanks and, if required, the pressure is raised via motor driven pump.
- ◆ Liquid is heated in a gas-fired vaporizer and converted to a super-heated vapor.
- ◆ The propane pressure is reduced and its total flow is metered. It is then distributed via a buried plastic pipe distribution system for customer use.



A small **iPV** propane vapor system is shown in the following pictures. It includes four 1,000 gallon aboveground storage tanks, redundant pumps and vaporizers, and a plastic distribution system. It was installed for a natural gas utility as a temporary fuel supply at a golf community development located 17 miles from the nearest natural gas supply connection. The entire installation occupied a single development lot. As the development grew, natural gas was brought in and the homes were converted for natural gas use. The propane vapor system was removed and the lot sold for development.



Propane is delivered by small bobtail truck directly into the storage tanks. Larger storage tanks would be capable of accepting full transport deliveries of propane at lower cost. In many cases these larger tanks are buried or mounded.

The propane is then transferred to the vaporizers through a redundant pumping system located beneath the tanks. With buried tank systems, the pump is not used.

Twin (redundant) propane vaporizers are used to boil the propane.

Propane from the vaporizers is then reduced in pressure via a small monitoring regulator assembly and distributed via standard PE distribution system piping sized large enough for both propane vapor and the future natural gas, if that is planned.

This system was capable of delivering up to 29 MMBtu/hr at a pressure of 10 psig.



All **iPV** systems come with a control panel designed to integrate all equipment. Standard features include integrated PLC based control with remote connectivity, and a comprehensive emergency shutdown (ESD) system. Constant attendance of equipment is not required. A propane fueled emergency generator, with auto transfer switch, protects against power outages.

Optional features include electronic tank inventory measurement, expanded safety systems and remote system operation.

iPV Features

❖ Propane Storage

Both aboveground and underground storage options are available in a variety of sizes to meet your needs. All tanks are constructed to the exacting requirements of ASME.

Refer to the selection table for available tank sizes and corresponding days of storage.



❖ Fuel Delivery

iPV truck delivery stations offer a perfect blend of safety and efficiency. Standard on all iPV systems over 4,000 gallons of gross storage, truck delivery stations are designed for acceptance of both full transport trucks and smaller bobtail vehicles.

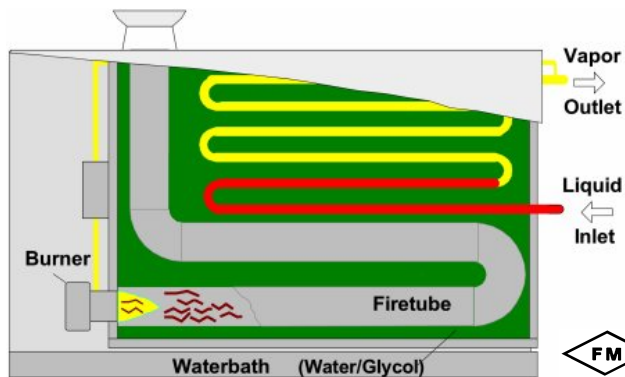
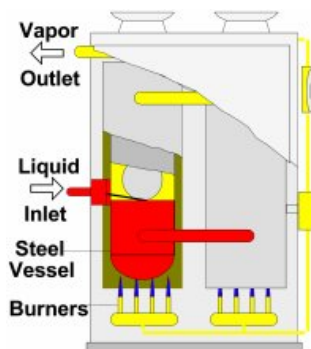


❖ Vaporizer

Vaporization on the smallest iPV systems is handled using specially equipped direct-fired vaporizers. On larger systems a waterbath style vaporizer is used. Waterbath vaporizers use a heat exchanger immersed in a heated water/glycol mixture to boil the incoming liquid propane to a gas. It's a simple and very reliable system.

While designed for outdoor installation, a walk-in enclosure is standard for the burner end of waterbath vaporizers. The enclosure also houses the system control panel.

iPV systems are available to meet a wide range of capacities and pressures.



iPV Features

❖ Controls

The **iPV** UL approved control panel is the electrical hub of the system. This panel incorporates all power distribution devices interlocked with the systems comprehensive Emergency Shut-Down controls.

System power is brought to this panel and distributed to individual system components. A back-up generator provides uninterruptible power. All field wiring is between terminal blocks with drawings detailing each step of installation.



❖ Safety



A comprehensive **Emergency Shut-Down (ESD)** system provides every **iPV** user with a level of safety unprecedented in the industry.

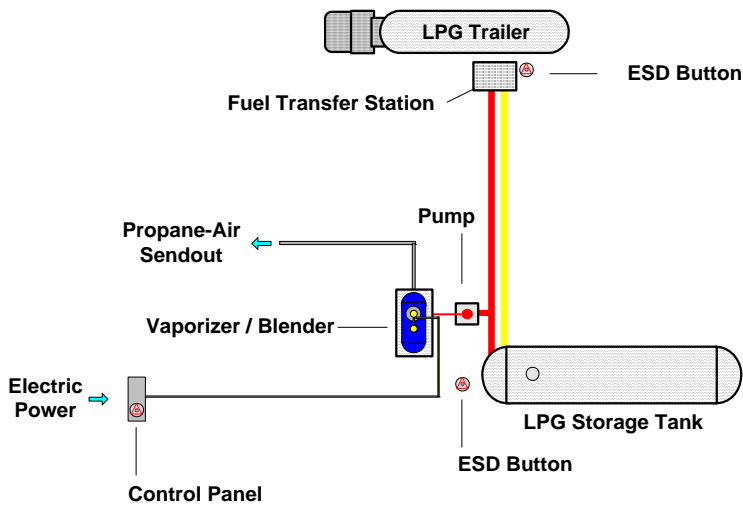
ESD systems include actuated valves at key points to quickly seal and isolate the system upon activation. Multiple remote shutdown stations allow for operator interaction from several areas.



Gas Detection

Three combustible gas detection points are provided using state-of-the-art infrared technology that can activate the ESD system should propane levels be sensed above 25% of the lower explosive limit (LEL). Detection system can be configured to auto-dial preset phone numbers or annunciate through interconnection with owners SCADA system.

installation



Because the **iPV** system is integrated, it comes designed for simple installation and years of trouble free operation.

Extensive documentation includes standard installation drawings and detailed equipment instructions to make installing the **iPV** both easy and economical.



❖ Technical Support

At any stage of installation, **iPV** purchasers have access to Standby's technical support by simply calling our installation support line.

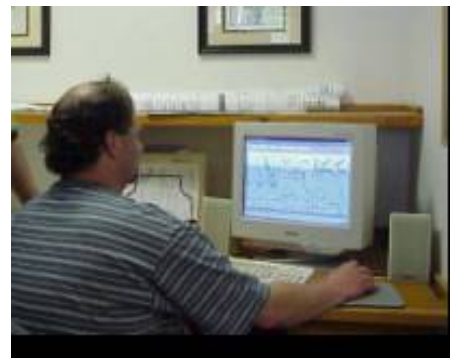
❖ System startup and training



With purchase of optional service package **i4**, a factory-trained technician will travel to your site, meet with contractors and review installation details. When installation is complete, the technician will return to start and test your system and provide training to system operators.

In some cases additional engineering is required to integrate the **iPV** into your facilities. Standby offers complete engineering support services to help you with specific needs and can also oversee installation with a team of construction management professionals.

❖ Engineering Support



iPV system selection

Basic System: The basic **iPV** system includes all hardware required for a complete operational propane vapor system. It does not include interconnecting pipe and wiring materials, installation or site-specific engineering. However, all of these items are available at extra cost.

To select an **iPV** package, just follow the four steps below or simply call and we can assist you as needed.

1. Move down the peak capacity column until the value exceeds the value desired.
2. Go to the right of this capacity and select the peak daily use in MMBtu/Day
3. Go left on this line to read the model number of the system you selected.
4. Now select the options that you desire and call us for a current system price.

iPV System Model #	Peak Capacity MMBtu/Hr	Vaporizer Capacity (Ea) GPH	No. ** Vaporizers	Peak Daily Use MMBtu/Day	Propane* Use / Day Gallons	Storage Options				Volts Phase Amps
						Tank Size (W.C.)	No. Tanks	Days Storage	Storage Type***	
iPV11_264_30	11	120	2	264	2,880	30,000	1	8.9	UG	120/1/0.5
iPV11_264_18	11	120	2	264	2,880	18,000	1	5.3	UG	120/1/0.5
iPV11_211_12	11	120	2	211	2,304	12,000	1	4.4	UG	120/1/0.5
iPV11_158_12	11	120	2	158	1,728	12,000	1	5.9	UG	120/1/0.5
iPV11_105_6.5	11	120	2	105	1,152	6,565	1	4.8	UG	120/1/0.5
iPV22_527_30	22	120	3	527	5,760	30,000	1	4.4	UG	120/1/0.5
iPV22_422_30	22	120	3	422	4,608	30,000	1	5.5	UG	120/1/0.5
iPV22_316_18	22	120	3	316	3,456	18,000	1	4.4	UG	120/1/0.5
iPV22_211_12	22	120	3	211	2,304	12,000	1	4.4	UG	120/1/0.5
iPV29_703_45	29	320	2	703	7,680	45,000	1	5.0	UG	120/1/10.9
iPV29_562_45	29	320	2	562	6,144	45,000	1	6.2	UG	120/1/10.9
iPV29_422_30	29	320	2	422	4,608	30,000	1	5.5	UG	120/1/10.9
iPV29_281_18	29	320	2	281	3,072	18,000	1	5.0	UG	120/1/10.9
iPV44_1054_60	44	480	2	1,054	11,520	60,000	1	4.4	UG	120/1/10.9
iPV44_843_60	44	480	2	843	9,216	60,000	1	5.5	UG	120/1/10.9
iPV44_632_45	44	480	2	632	6,912	45,000	1	5.5	UG	120/1/10.9
iPV44_422_30	44	480	2	422	4,608	30,000	1	5.5	UG	120/1/10.9
iPV59_1405_45	59	640	2	1,405	15,360	45,000	2	5.0	UG	120/1/13.4
iPV59_1124_45	59	640	2	1,124	12,288	45,000	2	6.2	UG	120/1/13.4
iPV59_1124_60	59	640	2	1,124	12,288	60,000	1	4.2	UG	120/1/13.4
iPV59_843_45	59	640	2	843	9,216	45,000	1	4.2	UG	120/1/13.4
iPV59_562_30	59	640	2	562	6,144	30,000	1	4.2	UG	120/1/13.4
iPV73_1757_60	73	800	2	1,757	19,200	60,000	2	5.3	UG	120/1/15.5
iPV73_1405_45	73	800	2	1,405	15,360	45,000	2	5.0	UG	120/1/15.5
iPV73_1054_60	73	800	2	1,054	11,520	60,000	1	4.4	UG	120/1/15.5
iPV73_703_45	73	800	2	703	7,680	45,000	1	5.0	UG	120/1/15.5
iPV73_703_30	73	800	2	703	7,680	30,000	1	3.3	UG	120/1/15.5
iPV88_2108_45	88	960	2	2,108	23,040	45,000	3	5.0	UG	120/1/15.5
iPV88_2108_60	88	960	2	2,108	23,040	60,000	2	4.4	UG	120/1/15.5
iPV88_1687_45-3	88	960	2	1,687	18,432	45,000	3	6.2	UG	120/1/15.5
iPV88_1687_45-2	88	960	2	1,687	18,432	45,000	2	4.2	UG	120/1/15.5
iPV88_1265_45	88	960	2	1,265	13,824	45,000	2	5.5	UG	120/1/15.5
iPV88_1265_60	88	960	2	1,265	13,824	60,000	1	3.7	UG	120/1/15.5
iPV88_843_60	88	960	2	843	9,216	60,000	1	5.5	UG	120/1/15.5
iPV88_843_45	88	960	2	843	9,216	45,000	1	4.2	UG	120/1/15.5
iPV126_3020_60-4	126	1375	2	3,020	33,000	60,000	4	6.2	UG	120/1/16.9
iPV126_3020_60-3	126	1375	2	3,020	33,000	60,000	3	4.6	UG	120/1/16.9
iPV126_2416_60-3	126	1375	2	2,416	26,400	60,000	3	5.8	UG	120/1/16.9
iPV126_2416_60-2	126	1375	2	2,416	26,400	60,000	2	3.9	UG	120/1/16.9
iPV126_1812_60	126	1375	2	1,812	19,800	60,000	2	5.2	UG	120/1/16.9
iPV126_1812_45	126	1375	2	1,812	19,800	45,000	2	3.9	UG	120/1/16.9
iPV126_1208_45	126	1375	2	1,208	13,200	45,000	2	5.8	UG	120/1/16.9
iPV126_1208_60	126	1375	2	1,208	13,200	60,000	1	3.9	UG	120/1/16.9

* Propane use per day based on peak day consumption.

** No. of vaporizers required with one redundant unit available.

*** UG / Underground tanks standard. Above ground tanks also available

Optional Packages

- i1 Enhanced Control** provides the user remote monitoring and control capabilities. It also allows interconnection with users SCADA network or development wide security and maintenance systems. Enhanced control can be customized to meet whatever needs the customer may have by special order.
Remote monitoring of system parameters, tank inventory management
- i2 Enhanced Safety** adds flame detection to your system. Two flame detectors are supplied for installation at the truck unloading station and the vaporizer area.
- i3 Enhanced Security** Meet your security needs with motion detection, lockable enclosures, etc. Attractive aluminum enclosures and blinds improve overall attractiveness of the system and infrared motion detection is added to improve security. Security can also be expanded to include small cameras.
- i4 Advanced Service** The advanced service option provides the purchaser with complete site specific engineering and drawings, two trips to the installation site. One to review procedures for installing the system and the other for system start-up and testing, and to train operators.

iPV system features

- ◆ Pre-engineered integrated systems approach - assures matching capabilities, uniform quality throughout, maximum safety, reliability, serviceability, and useful life.
- ◆ Standby Systems exclusive Operator Control Panel integrates all equipment control and monitoring.
- ◆ Capable of remote monitoring and control.
- ◆ Comprehensive fire-safe valves ensure system integrity.
- ◆ Standard PLC control provides easy operation and a wealth of maintenance information.
- ◆ Fully enclosed fuel transfer stations available for added security and aesthetics.
- ◆ Remote fuel level monitoring with auto notification capability available.

iPV system benefits

- ◆ Small system footprint - minimizes real estate requirements.
- ◆ Superior design and construction means high reliability.
- ◆ Distribution system design allows for orderly future conversion to natural gas.
- ◆ Large competitive base of propane fuel suppliers to choose from.
- ◆ Easy to install, easy to operate.
- ◆ Low maintenance means low cost of ownership.



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