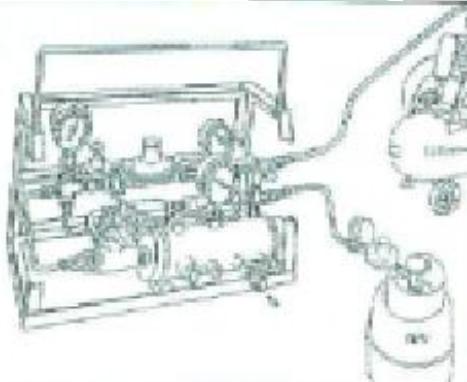


## History of PA

1975

When a City Gas company in Japan changed the calorific value of their product to class 13A they were unsure whether some of the foreign-made combustion appliances complied with the specifications. So, as they requested Ito Koki to develop the prototype synthetic city gas 13A generator and sold it in order to check if these appliances were able to operate on 13A city gas, or not.

Picture 1



As the first version did not have a cushion tank, the ratio of LPG and air in the mixed gas changed on small gas flow rate. To avoid this change (to generate stable properties LPG-Air), it needs a specific amount of gas flowing while it's working.

June, 1990

A city gas company requested that we develop the generator for a backup after an earthquake. We re-designed the generator based on the above type. We produced a prototype generator and started further development of the product.

Picture 2



We added a cushion tank and enabled the device to be fitted onto an LPG cylinder in order to carry it easily. But, since the tank was small, it had insufficient back pressure to supply the stable properties of LPG-Air for long enough periods.

June, 1992

As each city gas company supplied a different mix as their own city gas; the Japanese government proposed the “*Integrated Gas Family 21 Plan*”, which suggested that city gas companies unified their city gas type to class “13A” or “12A”, which was mainly constituted of natural gas and had high calorific values. Based on this, the Japan Gas Association and the Japan Industrial Association of Gas and Kerosene Appliances took the initiative to draw up the more detailed “*IGF21 Plan*”.

As a partial action of the plan, a working group was formed to produce equipment which helped city gas companies to change the calorific value of city gas and the first meeting was held at Japan Gas Association in Tokyo. Ito Koki participated in the working group as one of the key members and proposed the “transportable gas generating method” as one of the solutions.

Jan. 1995

The Great Hanshin Awaji Earthquake (Southern Hyogo Earthquake) occurred and the Hyogo, Osaka and Kyoto prefectures suffered major damage. The City Gas company who supplied gas to the Kobe city urban area, which suffered the most serious damage, requested Ito Koki to urgently develop larger size generators.

The Gas Business Act was amended by the Japanese Government in March 1995. This amendment allowed the use of the “Transportable Gas Generator” as counter measure equipment for disaster recovery. “Transportable Gas Generators” were immediately installed at the homes where the city gas supplies had been cut, and full practical usage of the products began.

Picture 3



Jun, 1998

The Japan Gas Association recognized the product's achievement to contribute to the city gas industry with new technology and gave the 1998 Technology Award to Ito Koki's "PA-6A Transportable Gas Generator"(7, 30m<sup>3</sup>/hr.)

Picture 4



PA-6A Transportable Gas Generator

June, 2000

In 2000 the "PA-12A/13A Transportable Gas Generator"(4, 30m<sup>3</sup>/hr) won the Technology Award from the Japan Gas Association following our successful downsizing of the generator.

Picture 5



Oct., 2004

Niigata Chuetsu Earthquake occurred.

The products were installed at hospitals and school meal center, etc..



Picture 6

July, 2007

The Niigata Chuetsu Offshore Earthquake occurred.

A Total 16 PA Generators were installed in 14 evacuation sites. They worked for 37 days. The total number of days all PA Systems worked following this disaster was 176 days.



Picture7

After this earthquake, the Japanese government organized 'The review meeting for proper city gas businesses and the best facility in the Niigata Chuetsu Offshore Earthquake'. At the meeting, they researched city gas restoration works and carried out a review about better restoration efforts after any disasters. As a result, they found that because many of the gas generators were installed in hospitals and welfare facilities, etc., (to which gas supplies had been cut by the quake) that the gas supply recovered in these facilities much more quickly. They concluded from this that the transportable gas generator is a most effective measure for recovery effort and should be promoted to spread the availability and usage of the generators more.

Jun, 2008 "PA-12A/13A Transportable Gas Generator"(4, 30m<sup>3</sup>/hr) won the Japan Gas Association **Grand Prize** in Technology Award.



Picture 8

July, 2009

A review bringing about a guideline for the operation of transportable gas generators was carried out. "Guideline for operation of transportable gas generators by local governments and others as well as gas suppliers to supply gas to facilities which serve public interests.

This guideline allows the public institutions such as local governments and/or hospitals to have the transportable gas generators for the purpose of temporary gas supply when disasters such as earthquakes occur. This guideline made it possible to install the transportable gas generators in the gas supply area without financial support from the gas supplier in the area.

450 generators (PA) were installed by utilizing the transportable gas generator's installation support project.

June, 2010

Again following City Gas suppliers' requests, Ito Koki developed a "Lightweight Separable Type PA System", which is easy to use. By re-development the generator became lighter and separable; it is possible that the generators can be easily carried by just a few people. This new type generator won the Technology Award in 2010.



Picture 9

Oct., 2010

More requests from city gas suppliers enabled Ito Koki to develop a much quieter type generator and also the 8m<sup>3</sup>/hr type. Coinciding with consumption appliances becoming bigger for duplex houses, the PA-13A8 was developed. This model occupies the same area as 4m<sup>3</sup>/hr type when it is installed, but the capacity of this model is double of 4m<sup>3</sup>/hr type. Also, the sound level of this model on gas generating decreased -7dB (53dB).



Picture 10

