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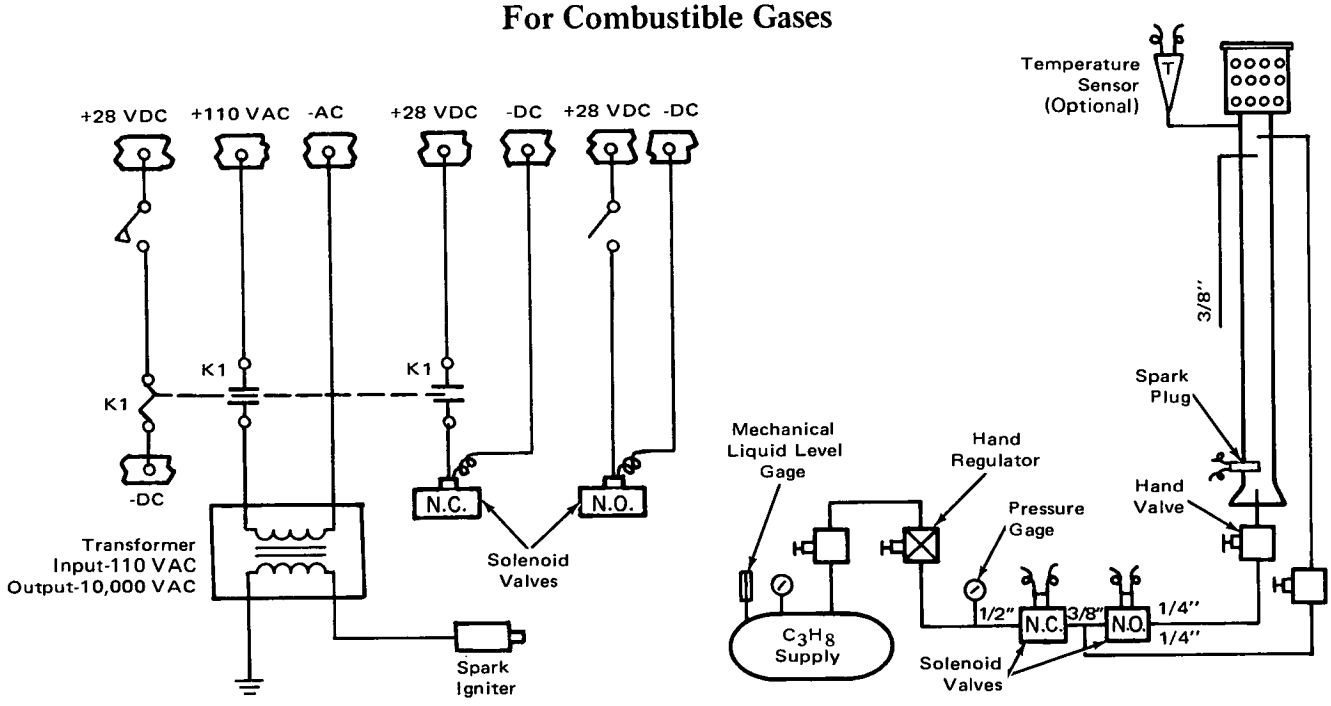
NASA TECH BRIEF

Marshall Space Flight Center

Remote Control Flare Stack Igniter For Combustible Gases



VENT STACK IGNITOR

A device has been designed and developed for igniting nonrecoverable combustible gases and sustaining the combustion of the gases evolving from various gas vent stacks. The igniter assembly is superior to other existing systems because of the simplicity of operation, low cost fabrication, installation, operational and maintain ability features, and excellent reliability in all phases of required operations. Vent stacks of any diameter can be accommodated by selecting the desired number of flare stack igniter assemblies.

The main body of the assembly is an 8-foot (2.44-m) length of 1 1/2-inch (3.8-cm) steel tubing. The tubing is mounted vertically on the vent stack by bolted straps or by welded stand-offs as desired. A common 4-inch (10-cm) by 1 1/2-inch (3.8-cm) concentric pipe reducer is welded to the lower end of the tube to facilitate lower injector mounting. The igniter (see figure) consists of a spark plug located at the lower end of the tube and a fuel injector located below the spark plug. A second fuel injector is located near the top of the main body tube. The spark igniter ignites the fuel from the lower injector, which supplies energy to ignite the upper fuel injector. A flame cage and flame deflector unit is located at the extreme upper end of the main body tube to provide flame-out protection from wind and to direct the flame in the proper direction.

Multiple assembly installation is recommended for increased reliability, although single units have been

(continued overleaf)

widely employed with much success. The salient feature of the device is that the oxidizer requirements are satisfied by aspiration on a demand basis which precludes the necessity for a stored oxidizer supply system. This eliminates the mixture problem which is common to systems which employ pressure regulated fuel and oxygen supplies. Since air is aspirated at a point 8 feet (2.44-m) below the vent stack exit, gases expelled from the vent stack will not interfere with igniter mixture ration.

The entire assembly can be fabricated from common stock material found in almost any machine shop. The spark plug and other essential parts of the electrical system are all off-the-shelf items of the low cost variety commonly used by industry. Ordinary shop tooling is used for parts fabrication and unit assembly due to the wide tolerance design features; for example, both gas injectors are common tube fittings with gas outlet holes drilled with ordinary drill bits, and hand valves are used as gas orifices to accommodate the adjustments necessary for the wide tolerance injector holes. A commercial flame rectifier unit or any ordinary thermocouple can be used as a monitoring device, either of which can be designed to signal re-ignition in case of flame-out or used strictly as a flame monitoring device for remote control operation. The use of a flame detector is optional, since it is possible to use visual means to detect the reddish flame produced by the igniter. The igniter is designed to be remotely operated from a control panel located in a safe area to preclude the use of personnel in a hazardous area.

Note:

Requests for further information may be directed to:

Technology Utilization Officer
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Reference: B72-10352

Patent status:

Inquiries about obtaining rights for the commercial use of this invention may be made to:

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