



FLARE PILOT SYSTEM

Flare ignition failure is one of the worst nightmares an onshore or offshore petroleum/petrochemical plant can experience.

Unburned hydrocarbon gases vented to atmosphere may cause an explosive hazard leading to loss of equipment and injury to people.

It is well known that safety of flaring depends on the performance of flare pilots.

As flare pilot failure can compromise safety and performance of the entire flare system, it is extremely important to detect the pilot flame quickly and accurately.

These reasons make the pilot ignition system and pilot flame monitoring one of the crucial component of any flare system.

TCD Italia has developed a wide range of tested and proven flare pilots system suitable to satisfy all flaring scenarios even in extreme weather conditions.



PILOT BURNERS

The TCD Italia flare pilots are suitable to be lit via a traditional FFG (Flame Front Generator) system and/or via a HE (High Energy) electronic system.

The number and capacity of pilots installed on a flare burner depend on the flare tip type and diameter.

The special pilot nozzle and Venturi mixer have been proved over many years of operational experience to be safe, stable and reliable for all types of flare with wind speed over 200 Km/hr.

The complete pilot assembly is fabricated from alloy steel (usually 310S) to ensure a long service life.

Pilot flame monitoring is usually achieved via a "K" type thermocouple installed in the pilot nozzle.

The thermocouple signals are run back to the control panel (usually installed inside the ignition panel frame) where temperature relays are used to determine the pilot flame status (red and green lamps on the front of local control panel as well as free volt contacts are available for operators' use).

Each pilot flare is usually rated at 2,5 Nm³/h of fuel gas, at 1,5 barg pressure.



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IGNITION SYSTEM

TCD Italia has the complete range of ignition system designed for manual or automatic operation or a combination of both.

These systems are able to ignite the TCD Italia flare burner pilots from remote location (over 800 m from flare) and they can be identified as follows:

- Conventional Flame Front Generator (**FFG**)
- High Energy Ignition (**HE**)

FLAME FRONT GENERATOR SYSTEM (Forced Draft)

The principle of Flame Front Generator is fairly simple.

A tube (usually 1" dia.) is filled with a flammable mixture of gas/air and an ignition source is applied at one end of the tube.

The resulting flame eats its way through the mixture until it reached the other end of the tube, where it acts as the ignition source for a pilot burner.

The ignition system consists of fuel gas and instrument/plant air supplied to an ignition chamber in the correct quantities via valves and orifices.

The mixture is then ignited by an electrical spark.

The flame travels through the ignition line and ignites the pilot (tests have proved that a heat release of 40.000 Kcal/h combined with a mixture velocity of approx. 15 m/s are suitable for flame front generation through a 1" tube).

Each pilot can be ignited separately for either manual or automatic operation.

Flame front generation equipment is usually installed in a carbon steel structural frame including a sun/weather canopy.

Pilot fuel gas and purge gas spools can be located on the same framework if required.

The framework usually includes the pilot flame status with local visual alarms.

All the electrical apparatuses are certified for the special area classification and weatherproof protection.



FLAME FRONT GENERATOR SELF-INSPIRATING SYSTEM

TCD Italia can provide a system where compressed air is not available.

The self-inspiring ignition system utilizes fuel gas at a moderate pressure (1,53 barg) to inspire ambient air into a Venturi mixer.

The resulting gas/air mixture passes through an ignition chamber and the relevant ignition line (in this system the ignition line dia. is 2 or 3 inches) up to the pilot nozzle.

The self-inspiring system can be designed up to 150 m pipe length.

The self-inspiring system can be supplied for either manual or automatic operation.

The natural draft ignition system is usually installed in a carbon steel structured frame.

The framework usually includes the pilot flame status with local visual alarms and free contact for client's use.

All the electrical apparatuses are certified for the specified area classification and weatherproof protection.

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HIGH ENERGY IGNITION SYSTEM

The TCD Italia high energy ignited pilot consists of a direct electric ignition of the flare pilot.

The sparking head is enclosed in a stainless steel tube positioned on pilot nozzle.

All the electronics are located remote from the flare pilot. The high energy spark is not influenced by local factors such as dirt, humidity, ice, aggressive gases or oil and consequently this system is particularly suited to flare pilots both onshore and offshore applications.

The high energy ignition rod located on the flare pilot is connected to the high energy ignition card via a multi-core cable.

The spark is produced by the low voltage capacitor (2,5 kV) that can be powered from any available AC supply or even from low voltage DC supplies.

The high energy ignition system can be supplied in explosion proof and/or weatherproof version.

COMBINED IGNITION SYSTEM

Besides the pilots ignited by a flame front system and the high energy ignited pilots, TCD Italia can supply pilot burners which are a combination of the two kinds of ignition.

In a combined system the high energy is usually utilized as main ignition source in an automatic mode and the flame front as a back-up system.

