SURFACE COMBUSTION UNIT (SCU)

The Cooperheat Surface Combustion Unit (SCU) is an economical and highly efficient infra-red gas radiant heater that provides a radiant heat source for pre-heating metal fabrications. The SCU is available in a range of sizes.

Applications

- Pre heat of rotating circumferential seams on fabrications, vessels and storage tanks etc, using floor mounted stands.
- Preheat of longitudinal welded seams.
- Preheat of sections of fabrications, vessels and storage tanks etc, requiring repair.
- Preheat of castings.
- Expansion of rotor rings for removal.

Infra-red energy is radiated by the hot face of the SCU. Liquefied Petroleum Gas (LPG) or high pressure natural gas enters the rear of the unit drawing in air, mixing inside the plenum chamber and then burns efficiently on the front face of the perforated ceramic tiles. Complete combustion is achieved without flaming. Compared with open flame gas burners, the SCU can save one-third or more of the gas input as there is the absence of flame management. The simplest setup involves one burner connected to a bottle of propane and positioned near the work piece at a distance of 50mm. An optional piezoelectric device can be used to ignite the gas-air mixture on the burner. Other burners may be added to the circuit by means of rapid connect / disconnect couplings. Revolving seams may be temperature controlled using an optical pyrometer and a control unit.

Overview

Open flame burners are still used in some workshops for pre-heating heavy components. Therefore, environmental protection and energy conservation becomes increasingly relevant.

Bottled or piped propane or natural gas enters the rear of the burner by means of a self-sealing, quick release coupling. Combustion air is entrained by gas as it passes through the injector. A deflector in the burner case spreads out the mixture over the full hot face which is made up of rectangular ceramic plaques, each containing hundreds of tiny holes. As the gas/air mixture emerges on the front plate of the plaques, it is ignited with an electric spark and continues to burn on the plaque surface. The plaques become intensely hot therefore being made from a modern ceramic material will withstand 1,000°C (1,800°F) on the hot face and yet run cold on the back face where the gas/air mixture enters.

A domed, expanded Inconel mesh grill which protects the plaques from mechanical damage also helps to retain combustion loss to the hot face. When positioned 50mm to75mm (2"to 3") away from the work piece to be heated, 15 kW (50 thousand BTU/hr) of energy will be directed at it's surface by a 600mm x 150mm SCU. Heat transfer is mainly by radiation therefore the 1,000°C (1,800°F) radiating surface of the burner permits rapid heating to be achieved. A range of Cooperheat stands and accessories can be supplied as optional extras.

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Components for Surface Combustion Unit (SCU)	
Description	Stock Reference
SCU Burner 300 x 150mm (12" x 6") Hot face	6262/P/1
SCU Burner 300 x 300mm (12" x12") Hot face	6262/P/2
SCU Burner 600 x 150mm (24" x 6") Hot face	6262/P/3
SCU Burner 900 x 150mm (36" x 6") Hot face	6262/P/4
Series Link Fitting	6262/19
Thermal-Magnetic Flame Failure	6262/20
Piezo Spark Ignition Kit	6262/25
Replacement set of six SCU plaques & gaskets	6262/P/15
Twin Outlet Manifold & Pressure Regulator	6263/2
4 Outlet Manifold & Pressure Regulator	6263/4
1.5m link hose with fitted couplings	6264/L/1/C
6m link hose with fitted couplings	6264/L/6/C
10m supply hose with fitted couplings	6264/S/1/C

Schematic of Typical Two Burner Surface Combustion Unit (SCU) Gas Preheat System