

H₂ Deoxo Cum Dryer Purification System



H₂ Deoxo Cum



Brief Description

The H₂ gas is produced through the electrolysis process of water. Electrolysis is the process of splitting water molecules into hydrogen and oxygen via an electrochemical reaction, driven by electrical, thermal, or renewable energy sources.

The hydrogen gas produced in this manner contains impurities such as oxygen and water vapor, which must be purified before being used in various applications. Our H₂ Purification System (HPS) serves as the medium for purifying the hydrogen produced from the electrolyzer, ensuring it meets the required purity standards.

Working Process

The H₂ Purification System (HPS) is designed to purify hydrogen gas produced through electrolysis. The process begins by removing excess moisture from the gas using the 1st Moisture Separator. (MS1). The gas is then preheated before entering the De-Oxo Unit.

Once preheated, the H₂ gas enters the De-Oxo Unit

De-Oxo

Conditions for the De-Oxo Reaction:

- High Temperature: De-Oxo reactions typically require high temperatures.
- Catalysts: A catalyst, such as palladium, is essential to facilitate the reaction.

In the De-Oxo reactor, the oxygen content in the hydrogen gas reacts with hydrogen molecules in the presence of a catalyst, forming water. The reaction is exothermic, meaning it generates heat, and the temperature at the outlet depends on the oxygen content in the inlet gas.

After this, the gas is cooled and passes through the second moisture separators (MS2) to remove any remaining moisture, the purified hydrogen is dried in Adsorber-A using desiccants, while Adsorber-B undergoes regeneration. The gas is then filtered to remove any remaining contaminants before being directed for use. The system operates in a 20-minute cycle, alternating between drying and regeneration phases, and is controlled by a PLC & HMI-based control panel. This ensures continuous, high-purity hydrogen production for various applications.