

Hydrogen and syngas production

Uras26 – measuring CO₂ level at adsorber inlet on HyCO

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Uras26 for trouble-free continuous measurement of carbon dioxide and carbon monoxide after the catalytic reformer reaction.

Measurement made easy

Introduction

A change in the methane feedstock purity; contaminants that degrade the catalyst performance; a gradual deterioration of condition of the molecular sieve adsorber material or progressive accumulation of gases in the recycle stream can all create process changes.

- Operators who have chosen the ABB Uras26 can relax in the knowledge that their plant is running with the most trusted NDIR in the world.

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01 Measuring point on
Steam Methane Reformer

Keeping Hydrogen and syngas production operations on track

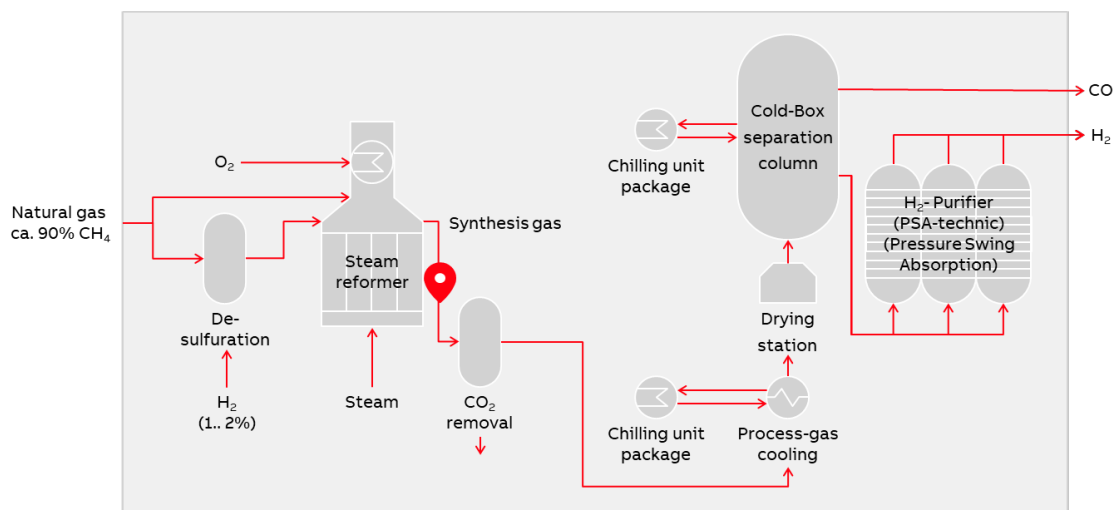
Steam methane reformers which produce hydrogen or syngas are generally considered to be a trouble-free utility on many industrial gases, chemical and refinery sites.

However, as with many processes, when they work well, they are simple – but when a disturbance emerges, trouble-shooting can be challenging and requires a mix of the best analytical equipment and the brightest brains. The brightest brains will need to come from your team, but for the best gas analyzers you can rely on ABB.

The SMR process configuration uses a reactor which is packed with catalyst to convert methane and steam to hydrogen, carbon monoxide and carbon dioxide. The gases from this reaction are separated using a pressure-swing adsorption unit (PSA) which operates in a cyclical semi-continuous process. Some of the gases from the PSA are re-cycled through the reactor and others become the purified hydrogen, carbon monoxide or syngas product.

On the face of it, there is nothing to go wrong. But those that know the details know otherwise. For example: a change in the methane feedstock purity; contaminants that degrade the catalyst performance; a gradual deterioration of condition of the molecular sieve adsorber material or progressive accumulation of gases in the recycle stream can all create process changes. Keeping track of these issues over the long term is a job for repeatable and accurate TCD, NDIR and GC instrumentation.

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02 Steam Methane
Reformer with Pressure
Swing Adsorbers

Good gas analyzers are good for business. Also, composition measurement is essential to ensure that process operating conditions are stable and optimised minute-by-minute. A typical measurement point is after the catalytic reactor and before the PSA beds. The gases here are hot and will contain methane, CO, CO₂, hydrogen and moisture at different concentrations. As the saying goes, anybody can pilot a ship when the sea is calm, but at process start up or periods of capacity ramp up or turn down things can often get stormy. These are the periods when the measurement range, repeatability and responsiveness of the gas analyzers are critical and an investment in the best available technology will pay back quickly and minimise frustration or uncertainty.

For trouble-free continuous measurement of carbon dioxide and carbon monoxide after the catalytic reformer reaction, operators who have chosen the ABB Uras26 can relax in the knowledge that their plant is running with the most trusted NDIR in the world. More than 30,000 installations speak for themselves - ABB has the track record to give you confidence in your equipment.

Instrumentation engineers and procurement teams can also feel confident that their decision is financially sound because the operating and calibration costs of the Uras26 can be as little as 5% of those for alternative technologies. This low cost of ownership is enabled by the use of gas-filled cells which permit automated calibration with no need for specialty gas mixture cylinders. With such an easy calibration process, the sensor is always spot on the mark meaning that process conditions can be set at their optimum without any concerns that analyser drift will move your production away from the sweet spot for your business.

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