



# APPLICATION NOTE

## NORTHDOME® INTEGRATION INTO WOBBE INDEX AND BTU ANALYZERS

### The challenges of fuel gas density measurement

Since the liberalization of the gas market, the importance of fuel gases (i.e. natural gas) in industrial applications has increased significantly. Non-traditional sources result in a gas composition that can vary greatly.



Sources of gas can be traditional dry gas from natural gas wells, wet shale gas, biogas and synthetic natural gas made from a blend of propane and air.



Significant variation of gas composition and energy content (combustion potential) creates added complexities in the design of burner control systems.



The percentage of non-combustible gas (CO<sub>2</sub> and N<sub>2</sub>) in fuel gas can vary from 1% to 20% depending on the source. There is even talk about adding hydrogen to the natural gas distribution market as a way to capture excess electric power from renewable sources.



Figure 1. NORTHDOME® sensor by AVENISENSE



The NORTHDOME sensor® is the perfect solution for integrating into a Wobbe index analyzer to provide a real-time feed-forward measurement of fuel gas density and energy content (combustion energy output) to enable improved control of combustion process.

The NORTHDOME gas density sensor is the perfect solution for use in calorimeters due to the small size of the sensor, a low pressure drop as gas flows through the sensor and the ability to measure gas densities over a wide range found in these new gas sources



# NORTHDOME® HIGHLIGHTS



Figure 2. Example of NORTHDOME® integration into Wobbe index.

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**Easy integration**  
 Thanks to its small footprint, NORTHDOME® is easy to integrate into gas quality analyzers, process lines and labs.
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**Robustness**  
 NORTHDOME® is built in a robust design, factory calibrated and certified for use in hazardous area (ATEX, IECEx).
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**Fast response-time**  
 Unmatched response-time ( $\leq 4$  sec T90) of NORTHDOME® sensor enables effective process optimization.
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**Measurement range**  
 Ability to measure gas densities over wide ranging. From pure hydrogen application to heavier hydrocarbon gas measurements.

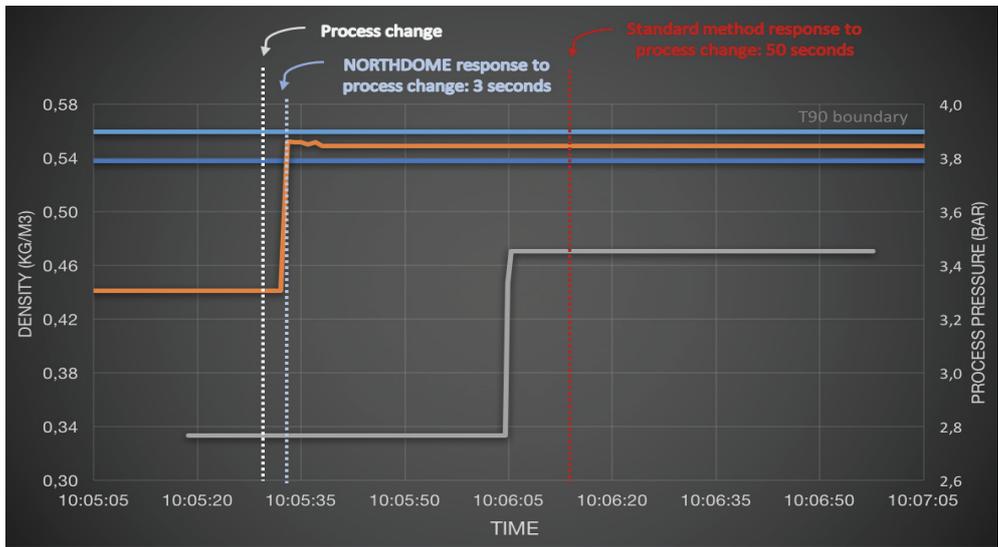
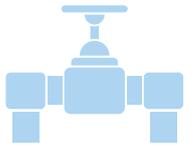
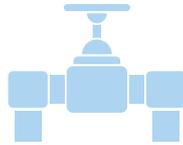


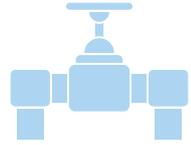
Figure 3. The graph shows that NORTHDOME® adapts instantaneously to pulses (<2s) thanks to the reduced dimensions of its measurement chamber, together with a fast response sensing element.



Precise combustion monitoring



Increased savings



Reduced environmental impact