

Air Separation Units

Magnos28 – A revolution in oxygen purity measurement

—
 ABB Automation GmbH
 Measurement & Analytics
 Stierstädter Straße 5
 60488 Frankfurt am Main
 Germany
 Fax: +49 69 7930-4566
 Mail: cga@de.abb.com

abb.com/measurement



One of the key target applications of the Magnos28 digital microwiring paramagnetic oxygen analyzer is air separation unit process control.

Measurement made easy

Introduction

The Magnos28 is available with various measurement ranges, for example, one which is of extremely high relevance to industrial gases production: 99.5 to 100 vol% oxygen.

- Immediate 32bit analogue to digital conversion takes place immediately after the physical sensor. This provides signal processing with minimized noise – a prerequisite for high resolution measurements.

—
 We reserve the right to make technical changes or modify the contents of this document without prior notice. With regard to purchase orders, the agreed particulars shall prevail. ABB does not accept any responsibility whatsoever for potential errors or possible lack of information in this document.

We reserve all rights in this document and in the subject matter and illustrations contained therein. Any reproduction, disclosure to third parties or utilization of its contents – in whole or in parts – is forbidden without prior written consent of ABB.
 © Copyright 2019 ABB.
 All rights reserved.

Air Separation Units

Magnos28 – A revolution in oxygen purity measurement

01 Measuring point on Air Separation Unit

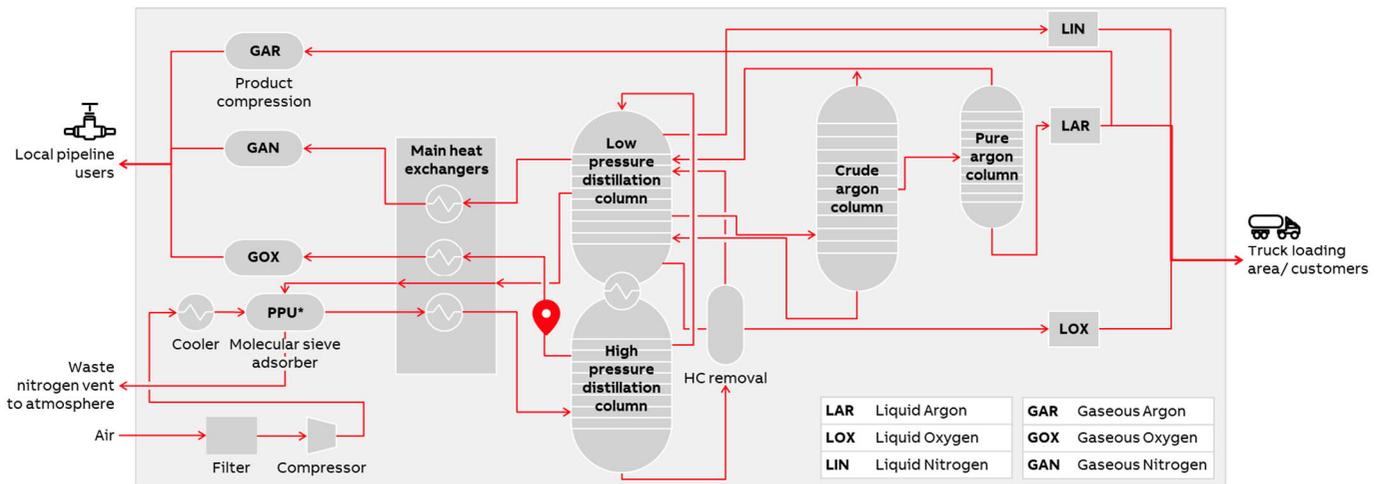
A digital revolution in oxygen measurement
 When ABB developed the Magnos28 digital microwiring paramagnetic oxygen analyzer one of the key target applications was air separation unit process control. The instrument is available with various measurement ranges, for example, one which is of extremely high relevance to industrial gases production: 99.5 to 100 vol% oxygen. Immediate 32bit analogue to digital conversion takes place immediately after the physical sensor. This provides signal processing with minimized noise – a prerequisite for high resolution measurements.

The 32-bit resolution allows for both a wide dynamic range and high suppressed ranges. This means that the data that would normally be gathered in a 0 to 100 vol% measurement range is compressed into that tiny 0.5% band between 99.5 and 100 vol%... that's how ultra-sensitive the Magnos28 can be.

The performance in this suppressed measurement range is enhanced by the introduction of a pressure sensor in the instrument. This compensates the oxygen concentration reading and means that the effects of air pressure changes on the sensor sensitivity are reduced to almost zero.

The Magnos28 oxygen analyzer is also highly sensitive in the low percentage oxygen range between 0 and 5 vol% oxygen. One of the most critical process control measurements in this zone is the measurement of oxygen in waste-nitrogen. Hitting the sweet spot for this process control measurement drives energy cost savings directly to the bottom line and minimises the loss of oxygen which would be wastefully vented to atmosphere.

01



—
02 Basic air separation unit

Migration to Magnos28

AlzChem, located in Germany, is an innovative manufacturer of specialty chemicals. They produce air gases for a range of production operations on an ASU. The operating costs are primarily electrical power and labour, which can become burdensome to site efficiency targets if process variables on the ASU are not continuously scrutinized and optimized.

To measure oxygen concentrations on the ASU, AlzChem has been using paramagnetic oxygen analyzers for many years. In a recent field trial, they tested the Magnos28 oxygen sensor in parallel with an established device. Over a period of several weeks, the results of this field test showed that the Magnos28 provided improved accuracy and tighter repeatability. Furthermore, the very low drift on the instrument also reduces the calibration frequency which minimises the labour cost for calibration and testing.

Jürgen Wimmer, who is responsible for plant inspection at AlzChem, is highly satisfied with the results of the field trial:

“We always work on continuous improvement to get the best-in-class manufacturing processes for our innovative products. The Magnos28 oxygen analyzer uses the latest technology with its unique design and manufacturing process.

Therefore, it was a natural choice for us to test the Magnos28 in our air separation unit. We established that the oxygen measurement from the Magnos28 is more accurate, more precise and within tighter tolerances compared to the instrument that was previously in use. We are convinced of the improved repeatability and stability of the measurement and confident that this will lead to improved performance and lower operating costs on our ASU”.

02

