EMOS® PINHOLE DETECTOR
AUTOMATIC START UP AND SHUTDOWN PINHOLE DETECTION

FEATURES	BENEFITS
Automatic Detection of Membrane Pinholes during start up and shutdown	Increased safety
Classification of pinhole severity	More efficient maintenance planning
Tracking the evolution of the pinholes	Extends component life time
Detection results integrated on the main monitoring screen	No need for time consuming bubble testing
	Pinhole Detection on shutdown saves time on start ups

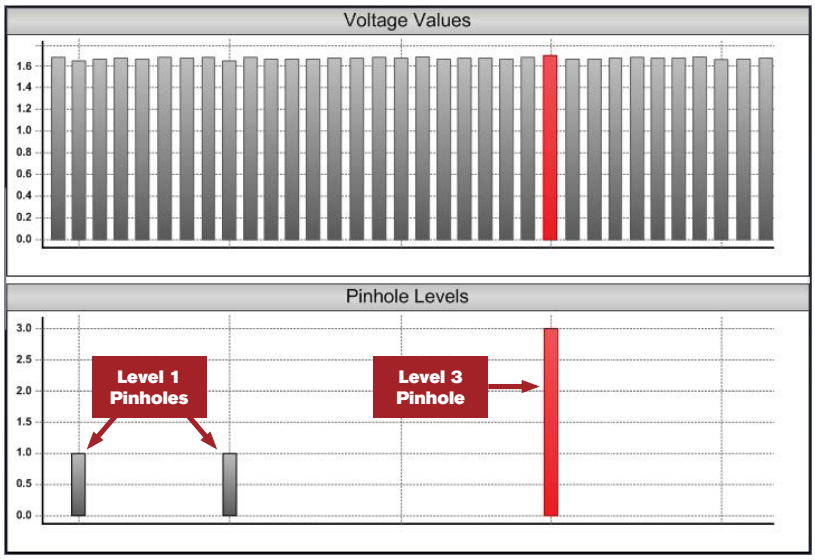
OVERVIEW

One of the worst things that can happen in the cellroom is the mixing of hydrogen and chlorine gas; the membrane acts as a barrier and prevents this from happening. If there is damage to the membrane, this brings a real risk of an explosion. An unnoticed pinhole can be a serious hazard, which must be prevented.

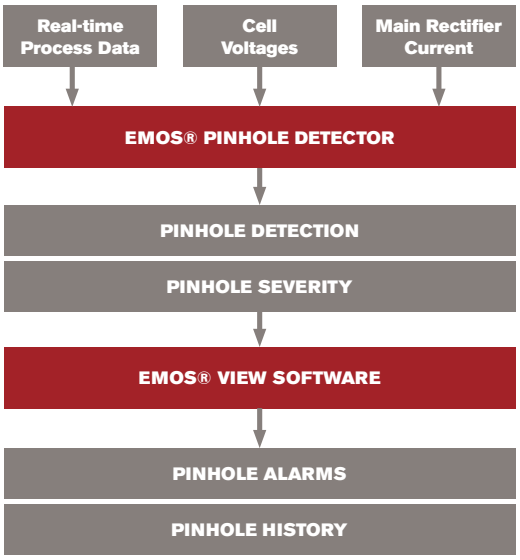
Pinholes can also allow caustic soda to pass from the cathodic compartment into the anodic compartment, which will damage the anodes and may also cause outside leakages. Pinholes will always reduce the current efficiency of the cell; caustic soda is lost and forms unwanted byproducts with the chlorine (e.g. chlorates, hypochlorites). It is necessary to detect defective membranes as early as possible to avoid both consequential damages and safety hazards.

The **EMOS® Pinhole Detector** is a software expansion to the **EMOS® Safety Software Package**. When start up or shutdown is detected, the **EMOS® Pinhole Detector** automatically analyzes the cell behavior to detect and evaluate the membranes with pinholes and classify them into 3 severity levels (1: minor; 2: medium; 3: severe). These results are displayed on the **EMOS® View** screen. The pinhole levels are also recorded to allow the end user to track the evolution.

Being able to detect pinholes at shutdown has many advantages, such as being able to have a shorter and safer start up of the electrolyzer therefore minimizing downtime and costs.



EMOS® Pinhole Detector Results displayed in EMOS® View



EMOS® Pinhole Detector Input/Output

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TECHNICAL SPECIFICATIONS

Level	Pinhole Categories	Description
Level 0	No Pinhole	May operate normaly
Level 1	Underperforming Membrane	No safety issue; may operate but monitor the cell every day
Level 2	Small Membrane Pinholes	Requires analysis from process engineer; to watch in the next SU / SD
Level 3	Severe Membrane Pinholes	Safety issue; should proceed with a controlled shutdown and replace membrane

REQUIREMENTS

Real time Process Data (OPC link with DCS)

- Flow rate – Brine Inlet
- PH – Brine Inlet
- Polarisation Current
- DCS tags

Pre Requisites

SWSTD EMOS® Safety Software Package

Other Required Information

- Concentration of Chlorine in Brine in normal operation
- Volume of Anodic & Cathodic compartments
- Value of Polarisation Current after shutdown
- Maximum Current (kA) during normal operation
- Active Area of the Membrane (m^2)

ORDERING INFORMATION

Part Number	Description
SW701	EMOS® Pinhole Detector

ADDITIONAL READING

Document No.	Description
DOC0316	EMOS® Pinhole Detector User Manual

ADDITIONAL INFORMATION

EMOS® Pinhole Detector *is part of R2's Safety Software System. Contact us for more information.*

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