

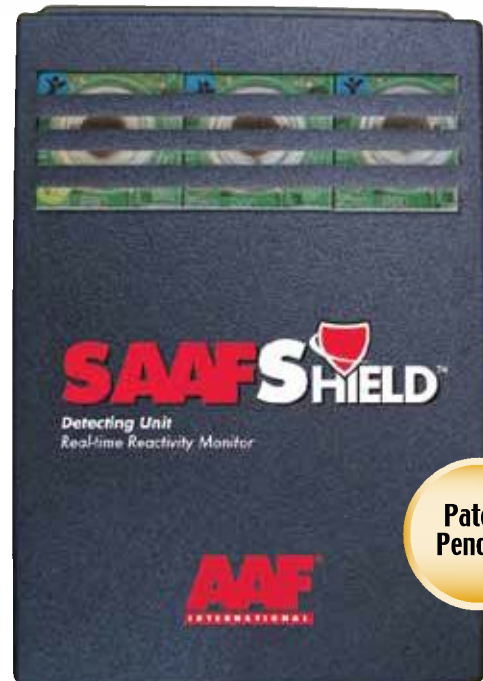


Better Air is Our Business®



Detecting Unit Real-time Reactivity Monitor

- Allows trending of corrosion data over time to determine causes of corrosion events
- Dynamic compensation of noncorrosive environmental factors (dust, RH, temperature, vibration)
- Detects corrosion in real time to determine safety of electronics or sensitive materials
- Easily deployed at multiple locations without power
- Patent pending hardware and method of corrosion measurement
- Read multiple locations with one SAAFShield Reading Unit



Patent Pending

The SAAFShield Detecting Unit is the sensing side of the SAAFShield Reactivity Monitor technology. It is part of a system that allows users to monitor corrosion in real time or on a periodic basis to determine equipment or material vulnerability to corrosion. The Detecting Unit works together with the SAAFShield Reading Unit to display and trend corrosion data over time, which allows users to evaluate operational procedures, environmental factors, or other items that occur at specific times for their impact on producing a corrosive environment. Additionally, the Detecting Unit features compensating hardware that reduces interferences of non-corrosive environmental factors on the quartz crystal microbalances. Since the Detecting Unit is non-powered, it allows a low cost option that can be easily deployed at multiple locations without power and read periodically with the SAAFShield Reading Unit. Alternatively, it can be combined with a Reading Unit to provide constant trending of corrosion data.

Environmental Compensation

The SAAFShield Detecting Unit utilizes quartz crystal microbalance technology to measure the corrosion of metal due to reactions with the environment. As the metal-coated quartz crystal corrodes, the frequency of oscillation changes. Other factors such as particulate matter in the air, temperature, and humidity can also change the oscillation frequency of the quartz crystal. The SAAFShield Detecting Unit compensating hardware removes the effects of these non-corrosive environmental factors to provide more accurate and stable frequency readings and resulting reactivity detection.



Specifications

Corrosion Sensors

Operation & Material:
6 MHz, AT cut crystal, 4000Å coating on titanium base

Operating Parameters:
Relative humidity 0 - 100% RH, non-condensing
Temperature -50 - 150°C

Service life:
Up to 4000 Å of cumulative corrosion

Electrical Properties

Communications:
Industrial grade, 26-pin ribbon connector cable with corrosion-resistant, gold-coated redundant pins (for increased reliability) and positive locking system for mounting-reading unit communication.

Compliance:
ROHS Compliant

Housing Properties

L x W x D (in.):
7.87 x 4.93 x 1.6

Material:
Thermoplastic, Black

Compliance (as supplied)

ROHS Compliant Components

Detecting Unit

Applications and Locations

The SAAFShield Detecting Unit is ideal to monitor air reactivity for sites housing electronic control equipment or other reactive materials. These applications include the following:

Commercial Facilities:

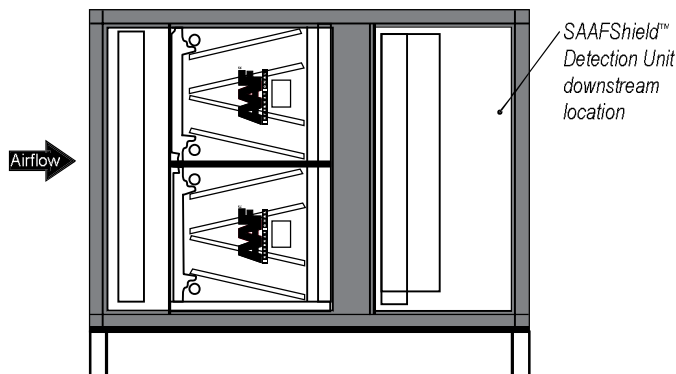
- Museums
- Archives
- Data Centers

Industrial Plants

- Pulp & Paper Mills
- Petrochemical Refineries
- Geothermal Power Plants
- Chemical and Industrial Plants
- Tire Manufacturing Plants
- Rubber Manufacturing Plants

When determining the reactivity of a room or space within a building, the SAAFShield Detecting Unit should be placed in a location representative of the air that contacts the electronics or materials being protected. If the protected items are concentrated in one area inside the space, then a location as close as possible to them is preferred. If the protected items are spread out within the space, then an approach similar to a thermostat should be used.

When determining the condition downstream of a gas-phase filter or scrubber to evaluate media performance and life, the SAAFShield Detecting Unit should be placed after the final particulate filter (see below diagram). This will protect it from the majority of particulates and allow it to monitor the condition of the outlet air. When the rate of corrosion begins increasing beyond what was normal, it is most likely time to change the media.



Applicable Standards

Traditional Corrosion Control (ISA 71.04-1985)

Applications: Paper Mills, Refineries, Industrial Plants, Wastewater Plants, Telecommunication Sites

Protected Equipment: Non-RoHS compliant circuitry in control rooms, motor control centers, or other such areas.

Class	Copper $\text{Å}/30$ days	Reliability Statement
G1 (Mild)	< 300	Sufficiently controlled such that corrosion is not a factor
G2 (Moderate)	< 1000	The effects of corrosion are measurable
G3 (Harsh)	< 2000	There is a high probability that corrosive attack will occur
GX (Severe)	> 2000	Only specially designed and packaged equipment would be expected to survive

RoHS Compliant Corrosion Control (ISA 71.04-1985 modified)

Applications: Data Centers, Tire Manufacture Facilities, Rubber Manufacture Facilities, Paper Mills, Refineries

Protected Equipment: RoHS compliant circuitry in control rooms, motor control centers, or other such areas.

Class	Copper $\text{Å}/30$ days	Silver $\text{Å}/30$ days	Reliability Statement
G1 (Mild)	< 300	< 300	Acceptable
G2 (Moderate)	< 1000	< 1000	Not acceptable - corrosive attack may occur
G3 (Harsh)	< 2000	< 2000	
GX (Severe)	> 2000	> 2000	

Archive or Museum Environments

Applications: Archives, Metal Collections, Libraries, Museums, Museum Storage, Historic Houses

Protected Material: Archival material, rare books, or other material stored in application areas

Class	Copper $\text{Å}/30$ days	Silver $\text{Å}/30$ days	Applicable Areas and Acceptability
Extremely Pure	< 90	< 40	Archives, Metal Collections, Rare Books
Pure	< 150	< 100	Libraries, Museums, Museum Storage
Clean	< 250	< 200	Historic Houses
Slightly Contaminated	< 350	< 300	Short Term Acceptable
Polluted	> 350	> 300	Not Acceptable



10300 Ormsby Park Place Suite 600
Louisville, Kentucky 40223-6169

www.aafintl.com
Customer Service 888.AAF.2003
Fax 888.223.6500



AAF has a policy of continuous product research and improvement and reserves the right to change design and specifications without notice.

ISO Certified Firm

©2011 AAF International
The USGBC Member logo and LEED® are trademarks owned by the U.S. Green Building Council and are used by permission.



Better Air is Our Business®



Reading Unit Real-time Reactivity Monitor

- Allows trending of corrosion data over time to determine causes of corrosion events
- Log data continuously through PLC or use USB thumb drive for remote locations
- Integrated temperature and humidity sensors
- Use free internet-based software to trend data logged on USB drive
- Patent pending hardware and method of corrosion measurement
- Read up to 500 SAAFShield Detecting Units with one SAAFShield Reading Unit
- Report either cumulative or incremental corrosion rates

The SAAFShield Reading Unit in combination with the Detecting Unit is part of the system that allows users to monitor atmospheric corrosion in real time or on a periodic basis. This monitoring can be used to display and trend corrosion data over time allowing users to evaluate operational procedures, environmental factors or other items that occur at specific times and their impact on producing a corrosive environment.



Specifications

Copper and Silver corrosion:
+/- 20 Å accuracy

Temperature sensor: -50 to 150°C,
+/- 0.6°C accuracy

Humidity sensor: 0-100% RH,
non-condensing, +/- 2% accuracy

Output Values

Copper and Silver cumulative corrosion rates and classifications. Copper and silver incremental corrosion rates and classifications. User-selectable monitoring time-step available, default time setting of 15 minutes. Raw data files available for off-line data analysis.

Interface

128x64 pixel dot matrix on unit display with backlight.

Alphanumeric keypad.

Universal serial bus (USB) adaptor for PC communication and storage.

Data storage via USB drive, compatible up to 16 GB.

Communications Capabilities

Industrial grade, 26-pin ribbon connector cable with gold-coated redundant pins for communication between reading and detecting units.

Communications with PLC/BMS systems via GPIO ports and UART interface. 4-channel output to report either cumulative or incremental corrosion rates.

Reporting Standards

Default standard based on ISA-71.04-1985 corrosion standard.

Operational Modes

Distributed mode: A single SAAFShield Reporting unit links with multiple SAAFShield Detecting units within a user-defined location.

Stand-alone mode: A single SAAFShield Reporting and Detecting unit are coupled together to continuously log readings at user-defined time-intervals.

Power

Supplied 24V power adapter with universal mounting pins. Backup on-board power via high energy density 9V battery and coin-cell battery.

An option for the powering system is via USB port connected to a power source.

Input AC: 100-240V, 50/60Hz

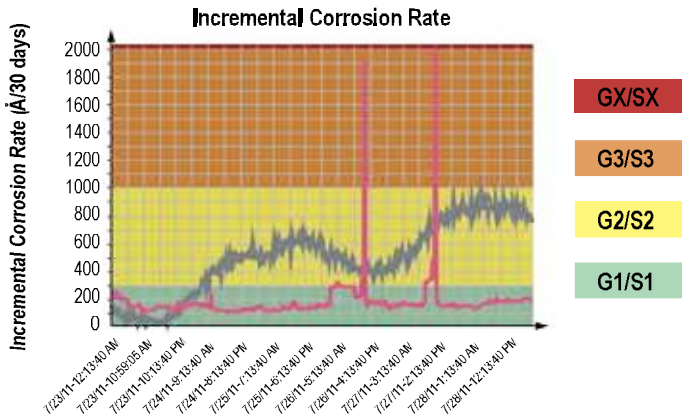
Output DC: 24VDC, 600mA

Dimensions and Materials

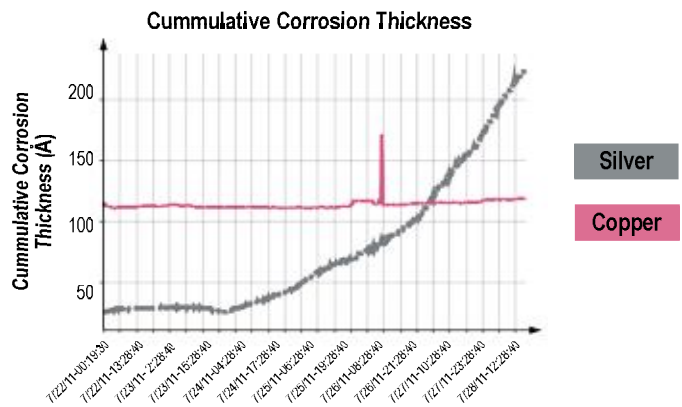
L x W x H (in.):
9.23 x 5.12 x 1.21 in

Material:
Black thermoplastic enclosure.

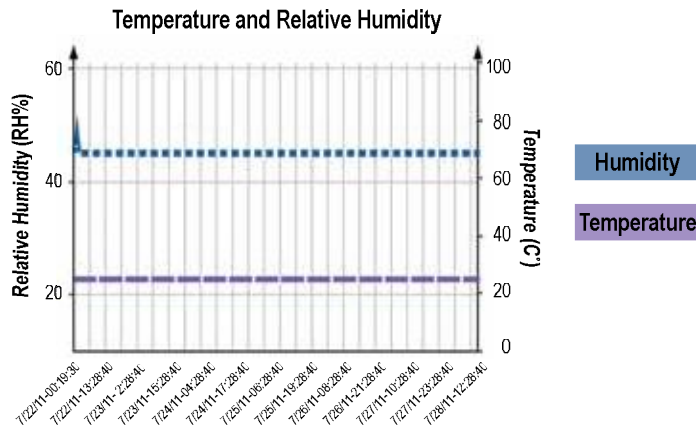
Reporting Data Example



Incremental Corrosion Rate is the amount of corrosion that has occurred in 24 hours normalized to angstroms per 30 days as correlated to ISA standard 71.04-1985.



Cumulative Corrosion Thickness is the amount of corrosion accumulated on the copper or silver sensors over the life of the sensor. Sensor lifetime thickness is 4000 angstroms.



Temperature and Relative Humidity readings are measured Celsius and percentage.

Applicable Standards

Traditional Corrosion Control (ISA 71.04-1985)

Applications: Paper Mills, Refineries, Industrial Plants, Wastewater Plants, Telecommunication Sites

Protected Equipment: Non-RoHS compliant circuitry in control rooms, motor control centers, or other such areas.

Class	Copper Å/ 30 days	Reliability Statement
G1 (Mild)	< 300	Sufficiently controlled such that corrosion is not a factor
G2 (Moderate)	< 1000	The effects of corrosion are measurable
G3 (Harsh)	< 2000	There is a high probability that corrosive attack will occur
GX (Severe)	> 2000	Only specially designed and packaged equipment would be expected to survive

RoHS Compliant Corrosion Control (ISA 71.04-1985 modified)

Applications: Data Centers, Tire Manufacture Facilities, Rubber Manufacture Facilities, Paper Mills, Refineries

Protected Equipment: RoHS compliant circuitry in control rooms, motor control centers, or other such areas.

Class	Copper Å/ 30 days	Silver Å/ 30 days	Reliability Statement
G1 (Mild)	< 300	< 300	Acceptable
G2 (Moderate)	< 1000	< 1000	Not acceptable - corrosive attack may occur
G3 (Harsh)	< 2000	< 2000	
GX (Severe)	> 2000	> 2000	

Archive or Museum Environments

Applications: Archives, Metal Collections, Libraries, Museums, Museum Storage, Historic Houses

Protected Material: Archival material, rare books, or other material stored in application areas

Class	Copper Å/ 30 days	Silver Å/ 30 days	Applicable Areas and Acceptability
Extremely Pure	< 90	< 40	Archives, Metal Collections, Rare Books
Pure	< 150	< 100	Libraries, Museums, Museum Storage
Clean	< 250	< 200	Historic Houses
Slightly Contaminated	< 350	< 300	Short Term Acceptable
Polluted	> 350	> 300	Not Acceptable



AAF has a policy of continuous product research and improvement and reserves the right to change design and specifications without notice.

ISO Certified Firm

©2011 AAF International
 The USGBC Member logo and LEED® are trademarks owned by the U.S. Green Building Council and are used by permission.