

**ASSOCIATED ENVIRONMENTAL SYSTEMS**

# BATTERY SAFETY



# BATTERY SAFETY FEATURES

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## EMERGENCY STOP

Stop button to disable the chamber function rapidly.

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## SET POINT TEMP LIMIT

Temperature control set points to prevent the user from accidentally setting the chamber's temperature outside of the determined limits.

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## HIGH/LOW TEMP LIMIT

Independent high low limit controller set to prevent damage to cells.

**\*ATP limit point is: -20°C and 80°C**



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## AUDIBLE AND VISUAL ALARM

Three color system that emits an audible alarm when the chamber is in an alarm condition.

**Green** - Chamber is ready to use, and door is unlocked.

**Blue** - Chamber is in use, and door is locked.

**Red** - Chamber is in alarm condition, and door is locked.

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## RAPID TEMP CHANGE

Safety feature in place to monitor and detect a rapid temperature change.

# BATTERY SAFETY FEATURES

## 6 REINFORCEMENT

Reinforced stainless steel interior.

## 7 TEMPERATURE LIMITED SHEATH HEATERS

Stainless steel finned tubular heaters with a temperature sensor to limit the max operating temperature.

## 8 LOW FLOW VENT/ BURST DISK

Graphite burst disc with rupture sensor that triggers system alarm.



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## 9 DOOR LOCK

Electronic rotary cam fail safe door lock with mechanical override. It is equipped with a cam position sensor indicating the lock state. AES XCHANGE logs door activity (open and close state) \*Chamber will not run with an open door.

**\*Door will not open in alarm condition**

**\*Lock rated to 1119 lbf or 4980 N**

## 10 GAS SENSORS

Sensors for monitoring chamber working volume for combustible gasses.

**\*Optional single, dual or triple gas sensors**

# BATTERY SAFETY FEATURES

CONTINUED

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## PRODUCT SENSORS

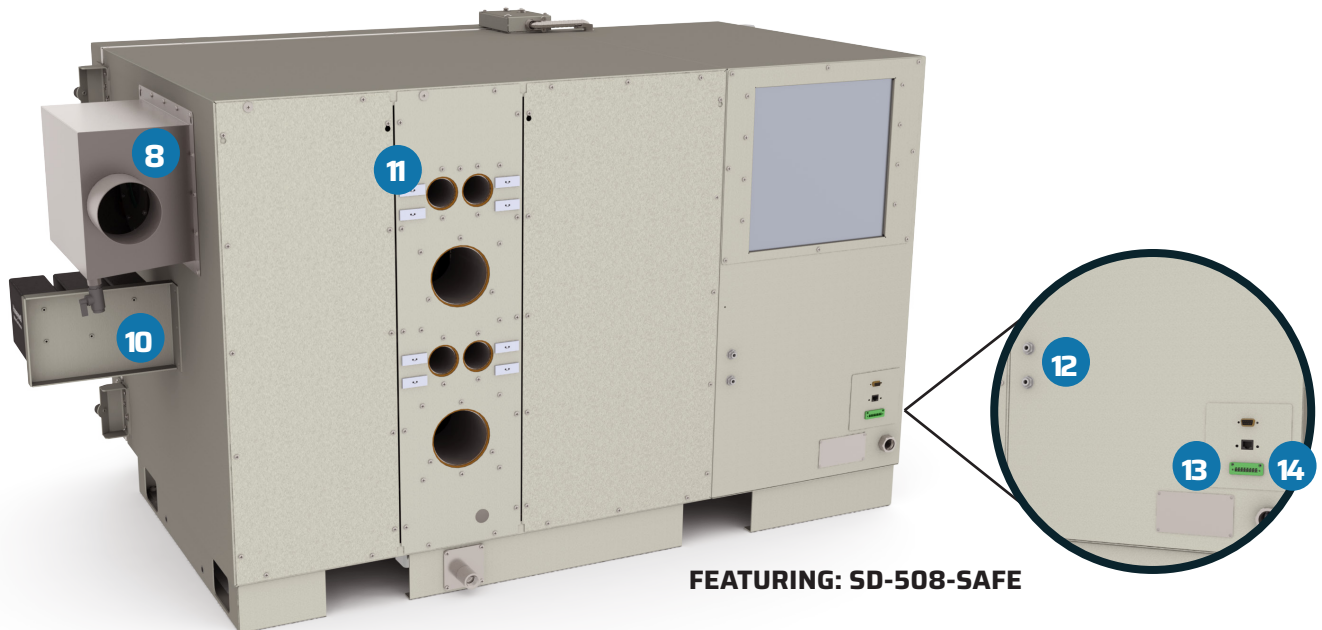
8 Thermocouple connectors installed on the rear of the chamber for customer device under test monitoring.

**\*Additional Thermocouples are optional**

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## SAFETY PURGE

Inert gas purge is triggered when the chamber is in an alarm state.



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## CHAMBER ALARM INPUT

The external terminal block sends a voltage signal that, when interrupted, will trigger an alarm state and shut down the chamber.

**\*This can be interfaced with other test equipment or DUT.**

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## CHAMBER ALARM OUTPUT

When the chamber is powered and in a safe state the contact closes. Loss of power or alarm condition opens the contacts.

**\*This Alarm output is designed to safely disable test equipment or DUT.**

# BATTERY TEST CHAMBERS

## SC/SCH-512-SAFE



### SPECIFICATIONS

<b>Volume</b>	12 cubic ft (339.802 liters)
<b>Temperature</b>	-37°C to 180°C (-34.6°F to 356°F)
<b>Pull Down Rate</b>	5°C/min
<b>Electrical Supply</b>	208 VAC, 1 PH, 60Hz
<b>Full Load Amps</b>	50 A
<b>Electrical Connectivity</b>	Attach power cable with Non-NEMA L6-50
<b>Refrigeration System</b>	Single stage
<b>Humidity Range (SCH only)</b>	10-95% RH, limited by +4°C Td (for 98% add option)

## SC/SCH-508-SAFE



### SPECIFICATIONS

<b>Volume</b>	8.6 cubic ft/243.525 liters
<b>Temperature</b>	-37°C to 180°C (-34.6°F to 356°F)
<b>Pull Down Rate</b>	5°C/min
<b>Electrical Supply</b>	208 VAC, 1 PH, 60Hz
<b>Full Load Amps</b>	50 A
<b>Electrical Connectivity</b>	Attach power cable with Non-NEMA L6-50
<b>Refrigeration System</b>	Single stage
<b>Humidity Range (SCH only)</b>	10-95% RH, limited by +4°C Td (for 98% add option)

# BATTERY TEST CHAMBERS

## SD/BHD-508-SAFE



### SPECIFICATIONS

<b>Volume</b>	8 cubic ft/226.53 liters
<b>Temperature</b>	-37°C to 180°C (-34.6°F to 356°F)
<b>Pull Down Rate</b>	1.24°C/min
<b>Electrical Supply</b>	208 VAC, 1 PH, 60Hz
<b>Full Load Amps</b>	25 A
<b>Electrical Connectivity</b>	Attach power cable with NEMA L6-30
<b>Refrigeration System</b>	Single stage
<b>Humidity Range (BHD only)</b>	10-95% RH, limited by +4°C Td (for 98% add option)

## SD-501-SAFE



### SPECIFICATIONS

<b>Volume</b>	1.01 cubic ft/28.59liters
<b>Temperature</b>	-37°C to 180°C (-34.6°F to 356°F)
<b>Rise Rate</b>	2.8°C/min
<b>Pull Down Rate</b>	3.0°C/min
<b>Electrical Supply</b>	208 VAC, 1 PH, 60Hz
<b>Full Load Amps</b>	13A
<b>Electrical Connectivity</b>	Attach power cable with NEMA 5-15p
<b>Refrigeration System</b>	Single stage



# AES SAFETY LEVELS

Standard AES Chambers
  AES SAFE Required

Severity Level	Description	Severity Classification & Effects Criteria
0	No Effect	No effect. No loss of functionality.
1	Reversible Loss of Function	No defect; no leakage; no venting, fire, or flame; no rupture; no explosion; no exothermic reaction or thermal runaway. Cell reversibly damaged. Repair of protection device needed.
2	Irreversible Defect/Damage	No leakage; no venting, fire, or flame; no rupture; no explosion; no exothermic reaction or thermal runaway. Cell irreversibly damaged. Repair needed.
3	Leakage $\Delta$ mass <50%	No venting, fire, or flame*; no rupture; no explosion. Weight loss <50% of electrolyte weight (electrolyte = solvent + salt).
4	Venting $\Delta$ mass $\geq$ 50%	No fire or flame*; no rupture; no explosion. Weight loss $\geq$ 50% of electrolyte weight (electrolyte = solvent + salt).
5	Fire or Flame	No rupture; no explosion (i.e., no flying parts).
6	Rupture	No explosion, but flying parts of the active mass.
7	Explosion	Explosion (i.e., disintegration of the cell)

**\*Gas Sensors and Additional Safety Features Available**



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**AES SAFE**