

## Technical Brochure

# Explosion-proof test chamber ExtremeEvent



mage similar (contains options)

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#### **INTENDED USE** | ExtremeEvent

This device is designed for temperature and destructive tests of electrical components, electrical energy storage devices and pressurized hydrogen based products. During these tests, the test specimen is exposed to thermal / mechanical / electrical conditions outside the specification range, through which, for example, influences on the material properties and functional safety can be investigated.

The product is a protective system according to ATEX Directive 2014/34/EU (Explosion Protection Regulation), which is built for tertiary explosion protection and marked as follows:

II 3G Gc (test chamber tertiary explosion-proof)



#### **STANDARDS |** LITHIUM-IONEN-BATTERIETESTS

Below listed standards are applicable for rechargeable cells, batteries and energy storage systems. Selected safety tests from these standards, which may cause a possible tertiary explosion or a hazardous environment, could be performed with the ExtremeEvent. For specific product and test applicability, please contact us.

IEC
IEC 62660-2,3,4
IEC 62619
IEC 63056, 63057
IEC 62281
IEC 62133-1,2
IEC 60086-4
IEC 62933-5-2

IEEE / ISO / UL	
ISO 6469 – 1	
UL 2580	
UL 9540 A	
UL 1973	
UL 2054	
UL 2271	
UL 1642	

SAE / UN
SAE J2464
UN ECE R136
UN T 38.3
UN ECE-R100.02

Others (Region Specific)
FreedomCAR SAND 2005-3123 (USA)
FreedomCAR SAND 099-0497(USA)
USABC (USA)
QC/T 743 (China)
GB 31467.3 (China)
KMVSS Article 18-3 (South Korea)
AIS-048 (India)

#### **STANDARDS | FOR ARC-TESTING OF ELECTRICAL EQUIPMENT**

The listed standards apply to electrical equipment, including circuit breakers, arc fault protection devices and more. Selected tests involving high currents, which could cause arc flashes can be performed with the ExtremeEvent. For specific test and product applicability, please contact us.

Circuit breakers
IEC 60947-2
IEC 60898-1
IEC 61008-1
IEC 61009-1
UL 489
UL 1053

#### Fuses

IEC 60269-1		
UL 248		
IEC 60282-1		

#### Switches

IEC 60947:3	
UL 98	

Arc-fault protective devices
IEC 62606
UL 1699
IEC TR 61641
IEC TR 61439

#### **Contactor units**

IEC 60947-4-1

IEC 60947-4-2

UL 508

## Transformers

IEC 60076-5

IEEE C57.12.00

Capacitor banks

IEC 60871-1

UL 810

#### **Capacitor banks**

IEC 61643-11

UL 1449

Others
IEEE 404
IEC 60502-4
UL 891
UL 1008

#### STANDARDS | PRESSURISED HYDROGEN (AND BLENDS) BASED PRODUCTS

The listed standards apply to products based on pressurized hydrogen, including fuel cells, storage cylinders/tanks, valves, and high pressure control elements. Selected tests involving explosion, leakage, or those that could create hazardous environment can be performed with the ExtremeEvent. For specific test and product applicability, please contact us.

Fuel cells
IEC 62282-3-100
IEC 62282-5-100
IEC 62282-6-101
IEC 62282-2
IEC 62282-4-101

Other components (valves, hoses)
ISO 17268
ISO 16110-1
ISO 19880-5
ISO 19880-3
ISO 19882
ISO 12619-2

Gas cylinders / fuel containers
EN 12245
ISO/ TS 15869
ISO 16111
ISO 19881
EN 11439
EC 79
ECE R134

#### **OUR STANDARD FINDER**

#### The right support for every test.

Various industry and factory standards are safely met. You can find a selection of test specifications and standards by using the specially developed standards finder on our website. The standards finder will help you find the right product to suit your needs.



Click here to find the right support:

Enter standard	Add +

ExtremeEvent partially fulfills the above mentioned standards. To assess the feasibility of the test with your specimen and determine the necessary optional components for fulfilling the required tests, please contact us.

Regarding temperature tests, the reference point for test values and tolerance specifications is the supply air into the ExtremeEvent chamber, which is realized by the flexible or fixed pipe of the external temperature control unit. Verifying documentation for individual test values is optionally available at additional cost.

## **STRUCTURE |** ExtremeEvent



## **INSTALLATION DRAWINGS** | ExtremeEvent



	A1	A2	A3	A4	A5	A6	A7	A8	B1	B2	B3	B4	C1	C2	С3	C4	C5
	Test chamber <sup>1</sup>					Test space			Standard access ports R & L 2,3 & T1								
Test space	Dimensions in mm																
1000 Litres	2677	1765	1664	1100	690	1200	1276	2708	1000	1000	1000	835	130	225	750	975	1007

## TECHNICAL DATA | ExtremeEvent

DIMENSIONS, LOAD, WEIGHT								
	He	eight	mm	1310				
External dimension <sup>1</sup>			idth	mm	1200			
			epth	mm	1200			
		He	eight	mm	1000			
Test chamber dimensions		w	idth	mm	1000			
		De	epth	mm	1000			
Test space volume	Liters	1000						
Test space floor load <sup>2</sup>	kg	400						
Total weight without load and addit	kg	1150						
POWER SUPPLY								
Nominal Voltage	3/N/PE AC 230 V ±10 %, 50 Hz							
APPLICATIONS LIMITS AND INFORMATION IN CASE OF EXPLOSION								
Maximum pressure surge load of the	bar	1.04						
Maximum permissible pressure rise (stoichiometric hydrogen-air mixture	bar∙m/s	550						
Response pressure of the pressure r	mbar	180220						
Response pressure of the pressure r	mbar	180220						
Permissible temperature range for t pressure release flaps made of comp	°C	-42+200						
Permissible temperature range for t pressure release flaps made of steel	°C	-42+200						
Permissible temperature elevation of (temporary, <60 min)	°C	500						
Permissible temperature elevation of continuous operation (without additionation)	°C	300						
PERFORMANCE DATA ON THE BASIS OF EXPLOSION TESTS <sup>6</sup>								
Maximum pressure surge load of the explosion with pressure relief flaps r	mbar	500						
Maximum pressure surge load of the explosion with pressure relief flaps r	mbar	650						
PERFORMANCE DATA BASED	ON ELECTRIC	ARC FAULT TE	STS <sup>7</sup>					
	current (kA)	duration (ms)	energy (kJ)					
Maximum surge load of test	28.6	56.6	200	mbar	500			
chamber in case of arc fault test	43.8	56.0	561	mbar	570			
	52.2	56.9	697	mbar	660			

Subject to technical changes.

## Basic Equipment | ExtremeEvent

EXTERNAL HOUSING							
Material	Galvanised sheet steel						
Paint	RAL 9002 light gray, solvent-free, powder-coated						
Door	Pressure-resistant door lock, LED lighting, sight glass with wear plate for prevent blinding, access port						
Feet	Adjustable, vibration absorbing						
Flap mechanism <sup>8</sup>	<ul> <li>Steel or composite material (optional)</li> <li>Self-activated</li> </ul>						
Base rack	Drain pipe for cleaning and decontaminating the chamber before further use						
TEST CHAMBER CONTAINER	3						
Test space	<ul> <li>Tertiary explosion proof, fire-proof design</li> <li>Replaceable inner chamber cover for protection against soiling of chamber.</li> </ul>						
Test space lightning	The LED lighting (12 W) is integrated on the outside of the sight glass						
Material bottom	Stainless steel 1.4404 (V4A), surface II B matt						
Material walls	Stainless steel 1.4404 (V4A), surface II B matt						
Sealing material	Textile glass, heat resistant up to 650 °C						
Access ports	rights <sup>9</sup> : 2 pieces of stainless steel (ca. $Ø$ 115 mm)						
	left <sup>9</sup> : 2 pieces of stainless steel (Ø 115 mm)						
	front: 1 piece, approx. Ø 115 mm stainless steel, cover plate (fire protected)						
Access port for air conditioning	2 pieces (right), approx. Ø 200 mm stainless steel cover						
SAFETY							
Test equipment safety	<ul> <li>Flap mechanism for pressure release in case of explosion</li> <li>Pressure resistant mechanical star locks Tertiary explosion protection</li> <li>Fire resistant access ports and re-enforced inner walls</li> </ul>						

Subject to technical changes based on customer requirements!

## EXPLAINATION OF NOTES | Technical Data

- <sup>1</sup> Applicable for positions without access ports
- <sup>2</sup> Max. load as surface load
- <sup>3</sup> Including gas cylinders and housing of the flap mechanism (upper frame construction)
- <sup>4</sup> Maximum pressure surge load may not be exceeded in any circumstance.

- $^{\rm 6}$  Ignition of a stoichiometric hydrogen-air mixture in the test chamber
- $^{7}$  Voltage given: 1500 V. Test conducted with flaps made of composite material.
- <sup>8</sup> The flap mechanism remains closed before and during the test. It opens and closes automatically in the event of a pressure increase in the test chamber.
- $^{9}$  Production-related tolerances of up to ±3 mm are possible
- <sup>9</sup> Valid for full opening of the pressure relief flaps. Partial opening of the flaps even at significantly lower test chamber pressures.

<sup>&</sup>lt;sup>5</sup> The requirements for pressure release must be taken into account (intended use). The specified speed of pressure rise refers to standard conditions according to W. Bartknecht (ball volume V=5 I, ignition energy E=10 J).

#### **OPTIONS** | ExtremeEvent

#### ADDITIONAL EQUIPMENT FOR THERMAL TESTS

#### Technical information

Air circulated heating / refrigeration unit with internal or external temperature control for conditioning of the test chamber.

- ─ Deep and over temperature: -40°C to +150°C
- ¬ Over temperature: up to +200°C

Connection of external temperature control unit with flexible or fixed piping system

- Separation of the air conditioning unit using pneumatic slide valves

ATEX protection of external temperature control unit is possible after consultation regarding overall explosion safety concept.

Integrated with the S!MPATI<sup>®</sup> software for temperature profile control and communication.



Subject to technical changes based on customer requirements!

#### ADDITIONAL EQUIPMENT FOR ELECTRICAL TESTS

#### **Technical information**

Customized access ports made with silicone rubber and EPDM can be provided for conducting of electrical safety tests such as short circuit test, overcharge test and over-discharging test. Designed to be gas tight, fire resistant and shock proof, they can accommodate customized sizes of single and multiple cables. Integration of copper rail for connection with external resistance is possible as well.



#### ADDITIONAL EQUIPMENT FOR MECHANICAL BENCH TESTS

#### **Technical information**

Modification test chamber base access ports for the integration of components for mechanical tests. Integration of a testing machine / press in the test chamber for the purpose of mechanical tests

- Mechanical integrity tests, crash tests, nail penetration test
- Maximum load: 10...450 kN
- Stroke length: up to 300 mm or more if necessary
- test speed: 0,00005 ... 1000 mm/min
- ¬ Programmable load profile
- Measuring, control and regulation electronics (Zwick-Roell GmbH & Co. KG)
- Control by RS 232 / Profinet interface possible





Subject to technical changes based on customer requirements!

#### **TEST ROOM**

#### Flap mechanism in composite material

For applications which need low electrical / thermal conductivity and more sensitive pressure activation, the flap mechanism is also provided with a light weight composite material.





#### High-speed camera system



A camera system with a high frame rate that records slow-motion videos can be implemented.

#### **Electrical door lock**

The components of the electric door locking device are mounted on the test chamber and on the test chamber door. Monitoring of the test chamber door is activated when the test is started and a signal is issued to the customer's control unit or the control unit of the external device.

#### High pressure water mist system

Dual hose pipes connected with a water pump, create a high pressure mist inside the test space, effectively extinguishing the fire. The complete installation includes the high pressure water pump, water tank, piping along with the hose nozzles

#### Exchangeable test room inlet



Replaceable inner cover to reduce the problem of soiling in the test chamber.

#### CONNECTIONS

#### Inertization

Integrated in the rack of the ExtremeEvent, the system is designed to flood the test chamber with nitrogen  $(N_2)$  gas in extreme events, ensuring safety and stability. It includes  $N_2$  flushing capabilities with solenoid valves, a supply line, and volumetric flow metering for precise control. Designed for an air exchange rate of 20 times per hour or more, it offers both manual and controlled activation.



#### Fixed pining for external temperature control unit and other equipment

Connection of the external air-conditioning unit or a filtering unit can be realized with fixed piping, for unexpected explosion events. Consisting of straight pipes and if necessary with 90° bends, the piping system could also consist of an explosion isolation valve (designed as per ATEX). The piping system, which is made of stainless steel could be customized in length.





#### WEBSeason & S!MPATI | Simple control and monitoring

Whether you're using the SIMPATI PC software or the WEBseason system-integrated operating software, you can program, control, and monitor your tests from anywhere, at any time – even using your tablet or smartphone. Both are unified software and hardware solutions for all **weiss**technik brand systems.

**S!M**PATI is the **PC software** for controlling, recording and analysing up to 99 **weiss**technik systems within your network environment. The functionality can be expanded with add-ons such as **S!M**PATI **Time**Labs<sup>®</sup> for camera recording.

WEBseason is the integrated operating software for the Event series. WEBSeason's innovative web-based interface allows you to programme, control and monitor your system's tests anytime, anywhere - even from a tablet or smartphone.



#### Interfaces from WEBSeason & S!MPATI



#### SIMPATI | The benchmark in communication

**S!M**PATI<sup>®</sup> features an optimised menu navigation and practical evaluation options. This was developed to program, monitor and network climatic test chambers and sets new standards in operating efficiency and performance.

#### Visualisation with greater clarity

**S!MPATI** controls, archives and evaluates tests. The software offers a range of new features to make work even faster, easier and clearer. For example, through the Zoom and measurement functions of the new evaluation, as well as the option to integrate or export images from the test cabinet using **S!M**PATI TimeLabs<sup>®</sup> (optional). The menu navigation is optimised for the needs of the laboratory.

Warnings and information are easily accessible and can also be delivered by mail. If required, the laboratory floor plan can be uploaded to provide a realistic view of the test facility layout. The system overview makes it easy to control, programme and evaluate all test chambers centrally from one computer.

**S!MPATI®** is suitable for all current **weiss**technik devices and downward compatible to almost all models going back to 1987. Thirdparty systems can also be integrated and the OPC-UA communication standard is supported, for example for Industry 4.0 applications.

The **S!M**PATI TimeLabs software module is used to retrieve and record images from a camera. **S!M**PATI measurement data and images are recorded simultaneously and displayed in correlation with the evaluation software included in S!MPATI. The recording rate can be adjusted. Up to 1500 images are stored in a Windows directory.



### Our highlights:

- Up to 99 systems can be networked together
- to ensure optimum use of your test equipment
- Almost identical operation of different test facilities
- Email alerts in the event of faults
- $\neg$  provides various communication interfaces to other systems
- ¬ OPC-UA support for Industry 4.0 applications
- ¬ Free of charge for 6 months



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- Connect from any web-based device
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- 3-level password protection
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- Diagnostic system for operating times and malfunctions

#### THE PRODUCT CONFIGURATOR | Your digital advisor

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