IEP TECHNOLOGIES
HOERBIGER Safety Solutions

PRODUCT INFORMATION SHEET

BESS-eX®

EXPLOSION VENTING FOR ENERGY STORAGE APPLICATIONS



Description

Battery Energy Storage Systems (BESS) represent a significant part of the shift towards a more sustainable and green energy future for the planet. BESS units can be used in a variety of situations, ranging from temporary, standby and off-grid applications through to larger permanent installations designed to support electricity grids through provision of load managed stored renewably generated energy at times of high demand. However, along with the obvious attractions of this growing technology, there is a need to fully assess the safety concerns of operating large scale walk in and containerized installations, particularly the risk of fire and explosions.

In any situation where flammable gases and vapors or combustible dusts are present, it is vital to control or mitigate the risk of fire and explosions which may be caused by excessive heat and various other ignition sources. Incidents have already occurred in several BESS facilities across the globe, prompting investigations into the causes and effects, and the development of safety standards and guidelines is ongoing in relation to this comparatively new field. BESS installations can incorporate several different battery types, and the most common risks associated with these include:

- Thermal runaway - battery failure giving rise to extreme heat which eventually leads to fire or explosion.
- Hydrogen development - in some batteries the risk of explosion exists due to the presence of excess hydrogen and other combustible vapors during off-gassing.
- Control system failure – dangerous overheating can occur if the battery management system malfunctions or one or more components fail.
- Toxic gases generated from battery fires and explosions also require special attention in the design of BESS safety systems.

Features

- Suitable for static over/under pressure conditions up to 50 percent of the rated rupture pressure
- Cross-rib and folded edges for long-life durability and venting efficiency
- Integrated flange gasket
- Insulated panels for installation in harsh climate locations
- IP-67 and corrosion resistant stainless steel construction
- Optional burst sensors

BESS-eX Vents



**Cutaway showing insulation*



Storage Container with BESS-eX® Vents in normal working conditions



Storage Container with BESS-eX® Vents post explosion conditions

©2025 IEP Technologies

BESS-eX®

EXPLOSION VENTING FOR ENERGY STORAGE APPLICATIONS



Application

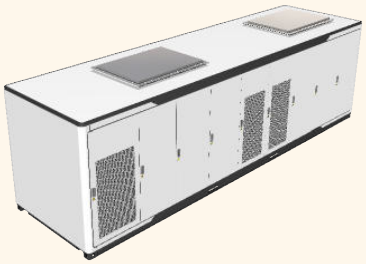
Typically the most cost effective option in terms of installation and maintenance, IEP Technologies' Passive Protection devices take the form of explosion relief vent panels which safely divert the deflagration to a safe place (atmosphere) and in doing so prevent the rapidly developing explosion pressure from causing container rupture, structural damage, and possible injuries to personnel. Vent sizing is based on a number of different factors, including explosivity characteristics of the vapors that may be off-gassed from the specific type of batteries, container strength (including door latches and hinges), opening pressure of the vent panels, and free area atop the storage unit for vent panels to reside. A qualified professional should be used when determining the size and quantity of vent panels to be used for BESS units and various designs, sizes and profiles are available to suit all installations and locations, including "flameless venting" devices if the explosion cannot be safely vented to atmosphere.

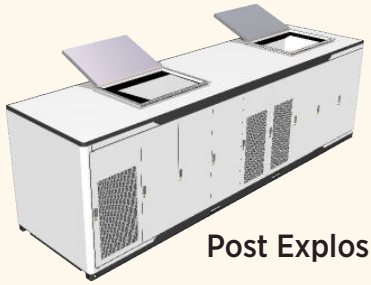
Standards

NFPA 855-2020: Standard for the Installation of Stationary Energy Storage Systems, and other global industry standards provide specific guidance in the safe design, testing, operation, and maintenance of BESS installations. In terms of explosion protection options these fall into two categories – Passive and Active Protection. NFPA 855 does provide a third alternative of using Gas Detection with Emergency Ventilation under certain circumstances where this is approved by the Authority Having Jurisdiction (AHJ) based on large scale testing. A protection strategy using Gas Detection with Emergency Ventilation along with Passive or Active Protection will increase the overall safety of the protection system.

BESS-eX® Vent Application

Normal Conditions





Post Explosion Condition

Contact Information

IEP Technologies - Austria
(HOERBIGER Safety Solutions)
Tel: +43 1 2244 0

IEP Technologies - Finland
Tel: +358 10 325 358 0

IEP Technologies – France
Tel: +33 1 5803 3980

IEP Technologies – Germany
Tel: +49 2102 5889 0

IEP Technologies - Italy
(HOERBIGER Safety Solutions)
Tel: +39 045 2370762

IEP Technologies - Sweden
(HOERBIGER Safety Solutions)
Tel: +46 70 564 3306

IEP Technologies – Switzerland
Tel: +41 62 207 10 10

IEP Technologies – Turkey
Tel: +90 232 484 4412

IEP Technologies – UK
Tel: +44 1242 283 060

IEP Technologies – USA
Tel: +1-855-793-8407

IEP Technologies – Latin America
(HOERBIGER Safety Solutions)
Tel: +55 (11) 4446 7400

IEP Technologies – China
(HOERBIGER Safety Solutions)
Tel: +86 21 6485 0855

IEP Technologies – South East Asia
(HOERBIGER Safety Solutions)
Tel: +65 6890 0770

©2025 IEP Technologies