## Safety-First F-Gas Refrigerant Approach

Pfannenberg's Safety-First approach to F-Gas compliance ensures you meet evolving low-GWP requirements without compromising industrial safety. We prioritize non-flammable refrigerants for indoor applications to reduce risk. Our engineering-driven Safety Check evaluates real operating conditions and delivers transparent risk assessments aligned with global standards. The result is compliant, future-ready cooling with safety engineered in, with no trade-offs and no shortcuts.



## Global availability

### Sales and Service Hubs Including:

Hamburg (DE) - HQ
Rotherham (UK)
Fidenza (IT)
Lancaster N.Y. (US)
Singapore (SG)
Suzhou (CN)
Indaiatuba (BR)
Łódź (PL)

### R&D and Manufacturing Hubs:

Hamburg (DE) - HQ
Fidenza (IT)
Lancaster N.Y. (US)
Suzhou (CN)
Indaiatuba (BR)

In addition, we at Pfannenberg work in partnership with sales representatives and regional agents worldwide in order to be able to present our product portfolio to you.

## Protecting People, Machines and the Environment


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LEARN MORE

Pfannenberg
ELECTRO-TECHNOLOGY FOR INDUSTRY

ver. BU1_028_5.26



# BATTERY ENERGY STORAGE
## THERMAL MANAGEMENT

One-stop thermal management solutions for BESS systems.

## Powering BESS Performance Through Smart Thermal Management

Battery Energy Storage Systems (BESS) thrive when temperature is under control. Stable thermal conditions are essential to ensure safety, maximize efficiency and protect long-term performance. Inside BESS containers, heat is a critical factor—directly influencing battery lifetime, system availability and operational reliability. With the growing scale and complexity of energy storage applications, advanced cooling is no longer optional—it's a key enabler of success.

## Complete Portfolio for Every BESS Application

Pfannenberg offers a full range of thermal management solutions designed to cover the entire BESS landscape—from compact systems to large utility-scale installations. Our portfolio includes air cooling and liquid cooling solutions, complemented by filter fans and heaters, ensuring reliable operation across both indoor and outdoor environments. Whether for containerized systems, off-grid applications or large-scale infrastructure, we provide the flexibility and scalability needed to meet any project requirement with confidence.

## Global Expertise. Proven in the Field.

With decades of experience in thermal management and a strong track record in BESS applications, Pfannenberg is a trusted partner for battery manufacturers, system integrators and end users worldwide. We combine deep engineering know-how with application-specific solutions and reliable technical support.

Backed by one of the largest installed bases in the global BESS market and supported by our strong global service presence, we ensure fast, reliable assistance wherever our customers operate. The result is consistent performance in demanding environments—enabling safe, efficient and resilient energy storage systems.

**Thermal stability is crucial for battery performance and durability.**

Battery safety must be prioritized.



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# Cooling Solutions for
# **Small and Compact BESS**

Advanced battery systems, designed to boost energy efficiency and independence for both commercial businesses and private households, are now as compact as an electrical cabinet. Our top-mounted air cooling or integrated liquid cooling solutions are the perfect way to control the temperature of the battery packs inside.





### DTT Rooftop Cooling Units

- Safe air flow
- Up to -20°C
- Corrosion protection



### DMC 8.0 Chillers

- Side or partially recessed mounting
- Modbus or EtherNet
- Inverter driven fan and compressor



### IMC 8.0 Chillers

- Fully integrated in the BESS
- Communication via Modbus RTU
- Inverter fan and compressor

# Cooling Solutions for
# **Off-Grid BESS**

Our innovative thermal solution, designed specifically for liquid-cooled batteries in stand-alone off-grid Battery Energy Storage System (BESS) applications, ensures efficient and sustainable operation of BESS power stations. This supports the replacement of diesel generators in various settings, including events, construction sites, and electric vehicle charging hubs.





THE smarter E AWARD WINNER

### VLV 4 | 12 Off-Grid Chillers

- Up to 1500 VDC on request
- No need for an additional external power or transformer Compact dimensions
- Integrated Heater for optimal battery operation at low ambient temp
- Variable fan speed for silence mode
- Ad hoc integration with BMS via Modbus
- Stand alone chiller easy to integrate inside the cabinet with high prevalence EC fans
- Wide operation range -25°C +45°C
- Compliance with shock test according to IEC 60721 1-2-3 suitable for transportation

# Cooling Solutions for
# **Containerized BESS**

BESS containers can be equipped with our advanced liquid cooling and air-cooling solutions, precisely regulating battery temperatures to prevent overheating and maintain optimal performance. This drives efficient charge and discharge cycles, maximizing energy output. Our solutions can be integrated or deployed as pad-mounted units, offering flexible installation across a wide range of sites.






### DTI 8000P Series

- Low ambient package & Modbus equipped
- F-Gas ready
- UL 60335 certified



### EB 2.0 L Chillers

- Frequency-driven pump and fan
- High flow rate with temperature stability of ±1 K
- Temperature control with cooling, heating, and stand-by mode



### SPC 700 Slim Chillers

- 70 kW cooling capacity with 490 mm width Front air direction only
- High flow rate with temperature stability of ±1 K
- Temperature control with cooling, heating, and stand-by mode



Thermal solution for auxiiaries and inverters of BESS. Check the below text connecting with reliability of all electrical and elctronic components used in the BESS to support the batteries.



### DTS 3000

- Large airflow distance in/out
- Outdoor rated NEMA
- Type 3R/4
- UL approved



### DTx 8000XL

- High cooling capacity up to 20kW
- High airflow for high density systems
- Service friendly



### PF Filterfans™

- IP 55
- Up to 925 $m^3/h$
- UL approved
- Type 12



### HPR Hose Proof Rainhood

- High protection
- Very shallow depth
- Sliding mounting



### PFH-T Heaters

- Compact size
- Variable mounting
- Variable flow direction