Need intelligent power conversion for outdoor duty?

Highlights

- 3-phase string Power Conversion System (PCS) for 1500 V DC applications
- Independent AC and DC paralleling provides redundancy and flexibility to adjust PCS power for diverse battery configurations
- Transformerless paralleling topologies and EMC compliance
- Grid-forming, black start, and grid-following
- Rugged IP65 housing for outdoor use
- Highest quality and reliability based on IATF 16959 automotive quality standards
- Comprehensive simulation offering ensures smooth grid connection process

Features of iC7-Hybrid String PCS	Benefits
Transformerless	Installation cost reduction
Integrated pre-charge, including complete pre-charge and auxiliary power supplies	Enables black start in microgrids Reduces system integration effort
Wide voltage range 400-690 V AC / 565-1500 V DC	Flexibility for wide range of grid and battery voltages for transformerless connection
Automatic power reversal will provide blackout prevention in grid-forming mode.	Resilience for high grid stability
Developed using FMI-compatible model-based design	Easy to integrate into your simulation platform Each simulation model is a true digital twin and always up-to date
Online transition between grid-following and grid-forming control modes during run state	Fast response, easy power management
Cybersecure-by-design	Compliant with cyber security regulations

The iC7-Hybrid String PCS is an intelligent power conversion system (PCS) ready for outdoor application (IP65). It is a superior solution for battery energy storage applications, since it allows for string topology for the batteries.

It allows independent charge/discharge of batteries and use of old and new batteries in the same system using a single AC connection. These capabilities result in higher capacity utilization, reduced downtime, superior serviceability, flexibility, and scalability – to name a few highlights.

The PCS can be installed directly in an outdoor environment without additional protection. All the necessary auxiliary components are integrated, including protection such as switches, DC-fuses and surge protection, thereby eliminating the need for additional system integration or outdoor cabinets.

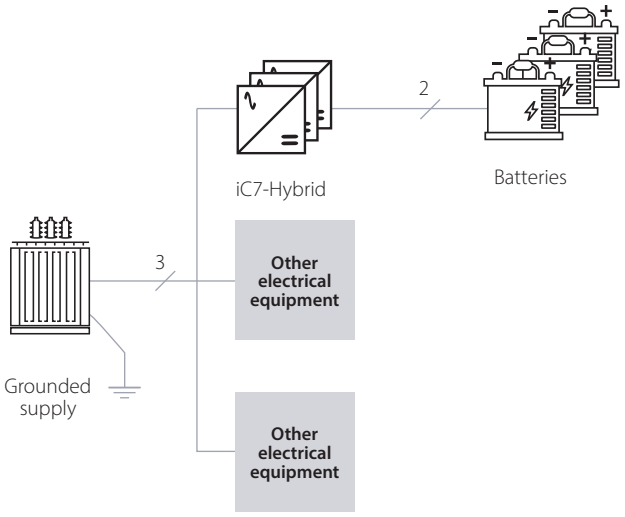
Learn more about iC7-Hybrid

Transformerless topology

The transformerless technology developed by Danfoss allows connection to industrial networks without a dedicated transformer, for grounded and floating systems.
This provides a true installation cost reduction for behind-the-meter applications.

Common mode voltage filtering technology ensures clean grid and clean DC power for battery connection.

Grounded network



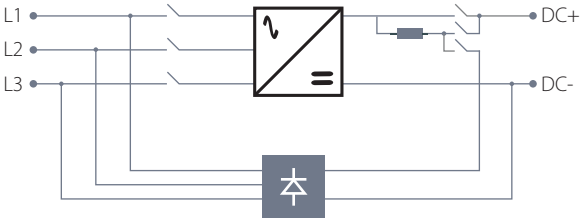
Integrated AC and DC pre-charge [1]

The product includes pre-charge and auxiliary power systems for both AC and DC supply, enabling black start in microgrid.

All electrical protection and service switches are integrated in the IP65 outdoor housing.

[1] AC precharge functionailty is pending.

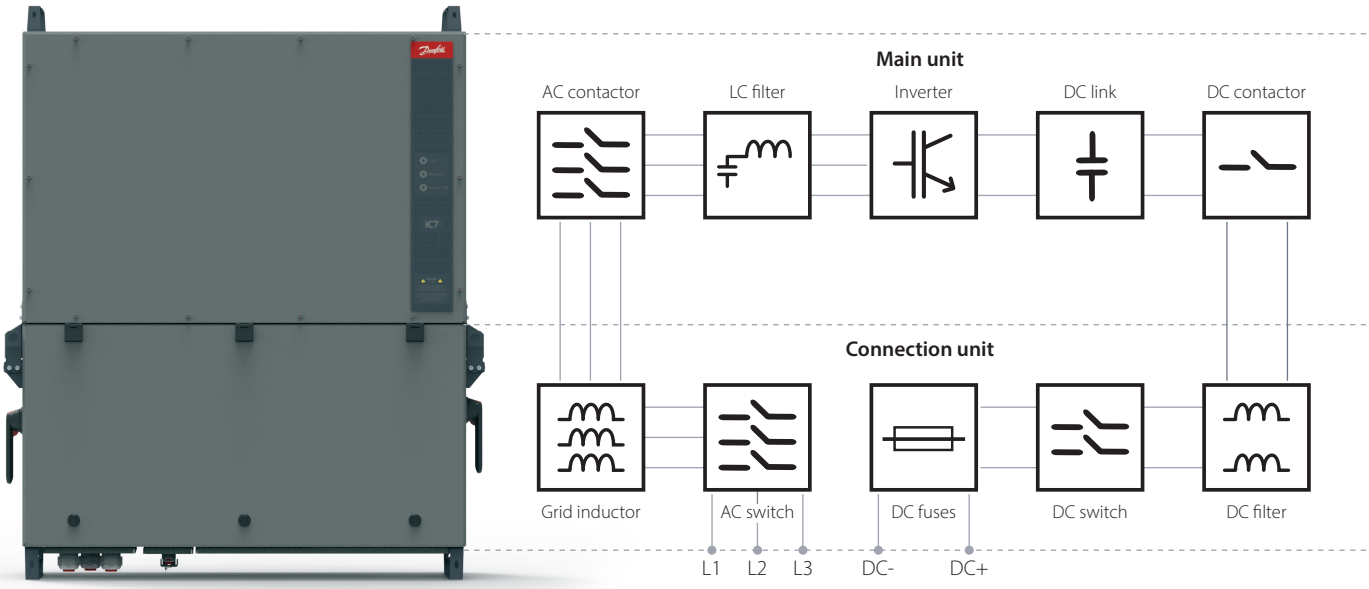
Integrated pre-charge



Integrated protection: Powering reliability

Reliability is key in energy storage systems, and comprehensive protection is essential for ensuring this reliability. By integrating surge protection devices (SPDs), DC-fuses, and safety isolation switches for service, all housed in an IP65 rated outdoor enclosure, we safeguard sensitive components from electrical threats. This ensures system uptime while maintaining safety and compliance with regulatory standards. The iC7-Hybrid String PCS features this integrated protection, eliminating the need for external devices.

iC7-Hybrid String PCS 300 kVA 1500 V – with full integration

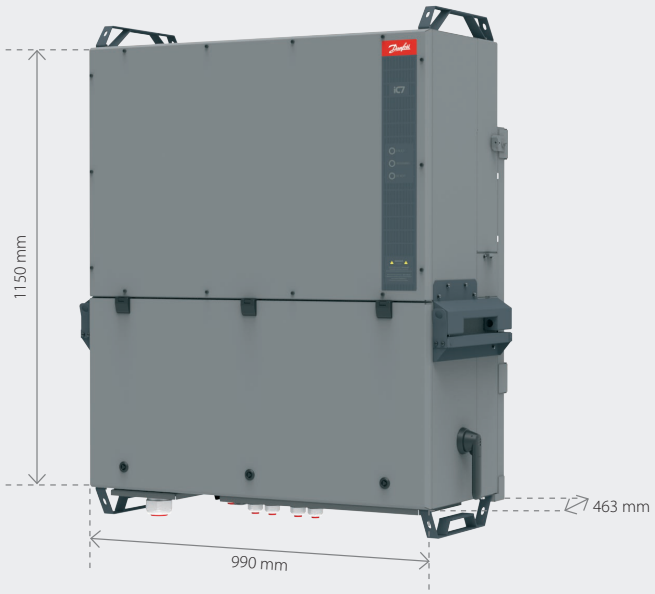


Key specifications

AC connection	
Rated power (@ ≤ +40°C)	300 kVA
Maximum power (@ ≤ +30°C)	333 kVA
Rated voltage	400-690 V AC -15+10%
Voltage range at rated power (@ ≤ +30°C)	-15% to +10%
Rated AC current (@ ≤ +40°C)	252 A
Maximum AC current (@ ≤ +30°C)	279 A
THD (at rated power)	< 3%
Power factor range	0.0-1.0 (lagging/leading)
Grid frequency	44-66 Hz
Grid connection type	TN-S, TN-C, IT
Paralleled units on same transformer	12
DC connection	
Battery voltage range	650-1500 V DC [1]
Maximum voltage	1500 V DC
Maximum current	345 A
DC short-circuit current rating	50 kA/100 kA
Number of DC connections	1-2
Paralleled DC connections	Yes (contact for more information)
Efficiency	
Maximum efficiency	98.5%

[1] Assuming up +10% voltage variation. Lower AC voltage allows wider DC voltage range.
[2] Available soon

Compliance	
EMC immunity	IEC/EN 61000-6-2
EMC emissions	CISPR 11, IEC/EN 61000-6-4[2]
Marking	CE
Electrical safety	IEC-62477-1 UL1741 [2]
Grid codes	EN 50549-1:2019, EN 50549-2:2019 and EN 50549-10:2022 VDE-AR-N 4110 and VDE-AR-N 4120 ENTSO-e (Regulation 2016/631) UL 1741 SB [2]
Cybersecurity	
Cybersecurity compliance	– Product certification IEC 62443-4-2, with Security Level Capability 2 (SL-C 2) – Product development process IEC 62443-4-1
Environment	
Enclosure rating	IP65/NEMA 4
Ambient temperature for rated power	+40°C
Operating ambient temperature range	-40 °C to +60 °C
Typical/maximum acoustic noise level	< 73 dB(A)/< 80 dB(A)
Humidity	Outdoor conditions
Cooling	Forced air, variable speed
Dimensions and weight	
Total dimensions (H, W, D)	1286 mm x 1076 mm x 463 mm
Weight	Main unit: 129 kg Connection unit: 112 kg Mounting rack: 10 kg
Maximum operation altitude	4000 m *(For derating above 1000 m altitude, refer to the Design Guide)*



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