

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



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 serviceabil-

| 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 VAC / 565-1500 VDC | 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 |

ity, 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

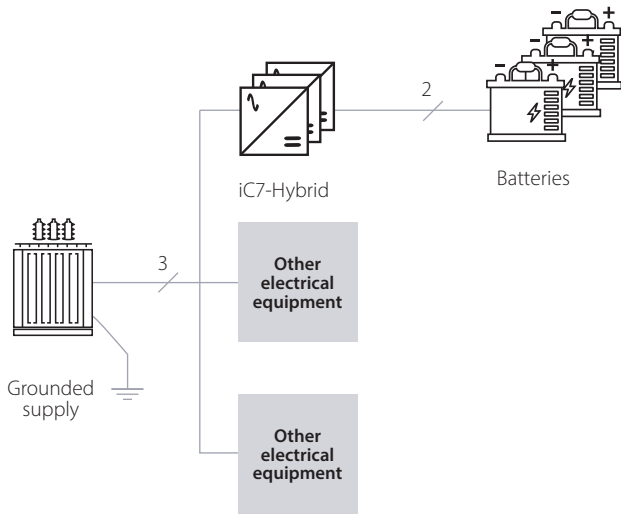
components are integrated, including protection such as switches, DC-fuses and surge protection, thereby eliminating the need for additional system integration or outdoor cabinets.

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



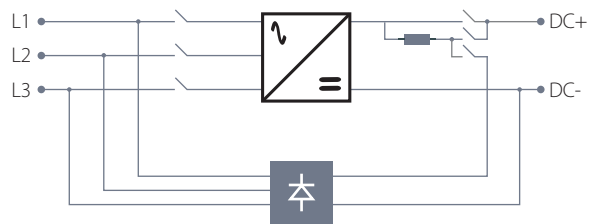
Integrated AC and DC pre-charge ¹⁾

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 functionality is pending.

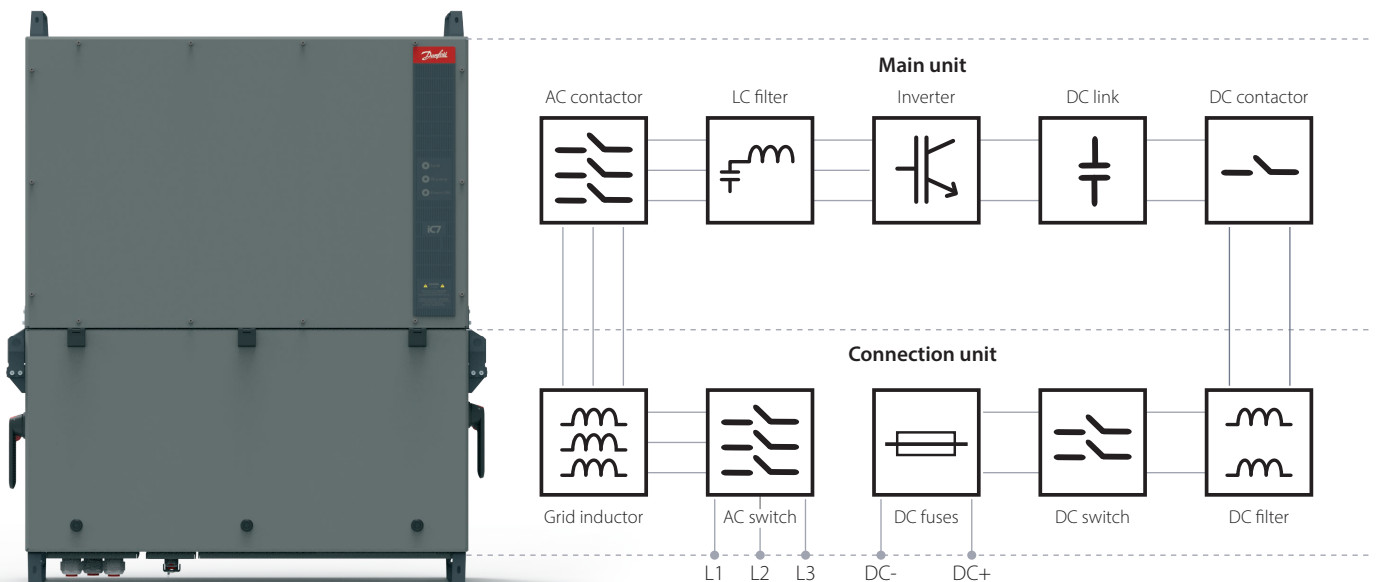
Integrated pre-charge



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



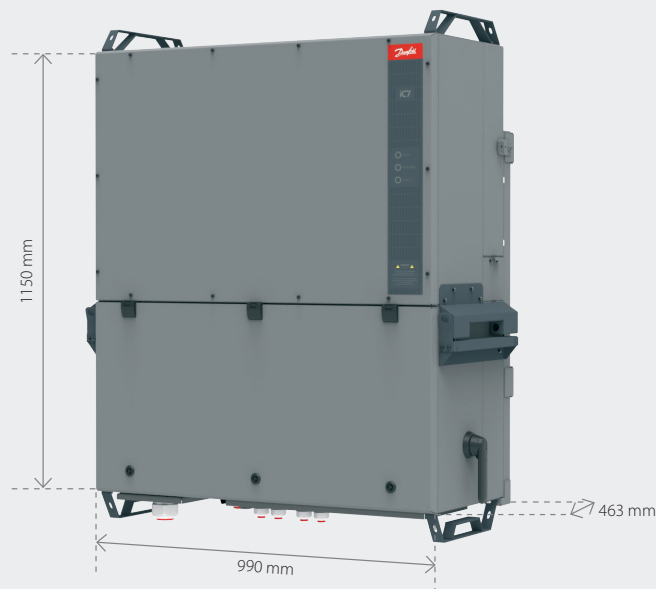
Key specifications

| 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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