

# Need an intelligent power converter for fast integration?

## Highlights

- > Modular, compact and configurable power converter platform
- > Scalable control platform
- > Powerful hardware-based security including end-to-end encrypted data transfer
- > Connectivity with multiple fieldbuses. Activate new fieldbus by license key
- > Easy cabinet integration using integration unit
- > Supported by DrivePro® services for global service capability
- > Cybersecure according to IEC 62443-4-2 Level 1



iC7-Hybrid air-cooled system modules deliver high power conversion performance in an ultra compact format. These modules give you a unique advantage in optimizing installation footprint, speeding up integration, and reducing costs more than you dreamed possible.

An IP00 system module offering enables you to add local value in the system integration, instead of being limited to a turn-key solution.

### Current and supply voltage

- DC/DC Converter  
600-1800 A – 460-740 V DCC
- Grid Converter  
317-6500 A<sub>L</sub> – 380-500 V AC  
236-4240 A<sub>L</sub> – 525-690 V AC <sup>1)</sup>

<sup>1)</sup> 690 V pending

Feature	Benefit
Efficient heat management: heat pipe technology and segregated main cooling channel (back-channel cooling)	– Compact size enables you to pack more power into the space available
Lightweight	– Fast integration and serviceability – High vibration robustness
Optional integration unit enables fast integration, enabling back-channel cooling	– Compact size enables you to pack more power into the space available – A lower air conditioning load in the e-room allows for a smaller air conditioning unit and reduces energy consumption – Fast integration
Pull-out of power unit without removing power cables, included with integration unit	– Fast integration and serviceability
Segregated IP54 cooling channel and dedicated PCB area	– Extremely reliable in heavy-duty service, for increased uptime
Logic feature in MyDrive® Insight extends features and provides increased flexibility	– Apply conditional controls, implement fault detection and diagnostics, create sequencing, modes, states, and interlocking logic

## Key specifications: Air-cooled system modules

<b>Mains connection</b>	<b>Grid converter</b>
Nominal AC voltage	<ul style="list-style-type: none"> <li>- Voltage class 05: 3 x 380-500 V AC (-15% ... +10%)</li> <li>- Voltage class 07: 3 x 525-690 V AC (-15% ... +10%)</li> </ul>
Nominal DC voltage	<ul style="list-style-type: none"> <li>- Voltage class 05: 465-740 VDC</li> <li>- Voltage class 07: 640-1100 VDC</li> </ul>
Mains frequency	- 45-66 Hz
Mains network	- TN-S, TN-C, IT and TT
Displacement power factor (DPF)	- Adjustable
Total harmonic distortion THDi (nominal situation and undistorted network)	- < 5%
Short-circuit current rating, with the specified fuses or circuit breakers	- The maximum short-circuit current $I_{cc} \leq 100$ kA
Overvoltage category according to IEC 61800-5-1	- Category III
Voltage imbalance	- + 3%
<b>DC source connection (DC/DC Converter)</b>	
Source voltage range	- 3-100% of DC-bus voltage with limited control performance 3-97% of DC-bus voltage with full control performance
Nominal DC voltage	<ul style="list-style-type: none"> <li>- Voltage class 05: 465-740 V DC</li> <li>- Voltage class 07: 640-1100 V DC</li> </ul>
Switching frequency	- 5kHz
Maximum short-circuit current from DC source	- Up to 100 kA if the time constant L/R of the fault loop impedance < 15 ms
<b>EMC (IEC61800-3)</b>	
Immunity	- Fulfils IEC/EN 61000-6-2
Emissions	- CISPR11 / EN 55011 (Class A, Group 1)
<b>Environmental conditions</b>	
Protection rating drive modules	- IP00/UL Open Type
Ambient operating temperature	<ul style="list-style-type: none"> <li>- -15°C to 0°C (5 °F to 32 °F) (no frost) The highest current rating of AM11 and IM11 must be derated 20% in freezing conditions.</li> <li>- 0°C to 40°C (32 °F to 104 °F) (at IN) with derating up to +55°C (131 °F)</li> </ul>
Storage/transportation temperature	- -40°C to +70°C (32 °F to 158 °F)
Relative humidity	- 5 to 96% RH, no dripping water or condensation allowed
Pollution degree	- PD2
Altitude	<ul style="list-style-type: none"> <li>- 0-4000 m (0-13100 ft) above sea level: in case network is not corner-grounded (Voltage class 5).</li> <li>- Above 1000 m (3300 ft): derating of maximum ambient operating temperature by 1 °C per each 100 m is required.</li> </ul>
Vibration (IEC60068-2-6)	<ul style="list-style-type: none"> <li>- Displacement amplitude 0.5 mm (peak) at 5-22 Hz</li> <li>- Maximum acceleration amplitude 1 G at 22-150 Hz</li> </ul>
Shock (IEC60068-2-27)	- Max 15G, 11 ms (in package)
Environmental operating conditions (IEC 60721-3-3)	<ul style="list-style-type: none"> <li>- Climatic conditions: Class 3K5</li> <li>- Chemically active substances: IEC 60721-3-3 Edition 3.0/ISO 3223 Second Edition, class C4</li> <li>- Biological conditions: Class 3B1</li> <li>- Mechanical conditions: Class 3M3</li> <li>- Mechanically active substances: Class 3S2</li> <li>- Special climatic conditions (heat radiation): Class 3Z1</li> </ul>
<b>Product safety compliance</b>	
Compliance	- IIEC-62477-1, UL1741 <sup>1)</sup> safety

<sup>1)</sup> Pending

# Dimensions and weight

## Grid converter modules and LCL filters

Module type		Converter		LCL filters
Frame		AM10/DM10	AM11	LCL10/LCL11
[mm]	Width	170	210	260
	Height	990	990	1530
	Depth	502	502	553
[kg]	Weight	65	75	251/349
[in]	Width	6.7	8.3	10.2
	Height	39	39	60.2
	Depth	19.8	19.8	21.8
[lb]	Weight	143	165	554/769

For more information refer to the iC7-60 Air-cooled System Modules Operating Guide

## Grid converter modules with short integration unit

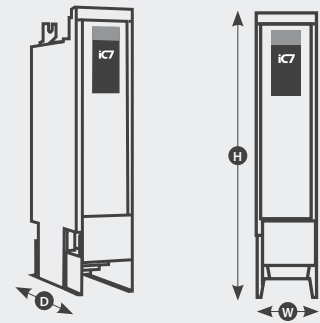
Module type		Converter with integration unit	
Frame		AR10/DR10	AR11
[mm]	Width	235	235
	Height	1302	1302
	Depth	553	553
[kg]	Weight	90	100
[in]	Width	9.3	9.3
	Height	51.3	51.3
	Depth	21.8	21.8
[lb]	Weight	198	221

Weight values are for module with empty integration unit, excluding filter weight.  
For more information refer to the iC7-60 Air-cooled System Modules Operating Guide.

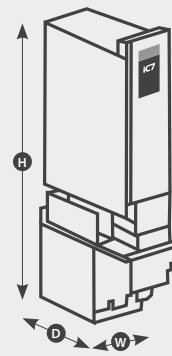
## Grid converter with standard integration unit

Module type		Converter with integration unit	
Frame		AR10/DR10	AR11
[mm]	Width	235	235
	Height	1530	1530
	Depth	553	553
[kg]	Weight	92	102
[in]	Width	9.3	9.3
	Height	60.2	60.2
	Depth	21.8	21.8
[lb]	Weight	202.8	224.9

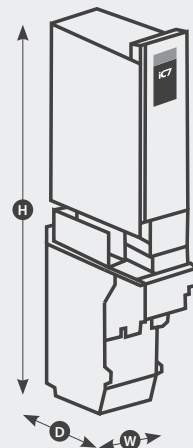
Weight values are for module with empty integration unit, excluding filter weight.  
For more information refer to the iC7-60 Air-cooled System Modules Operating Guide.



Module with no integration unit



Module with short integration unit



Module with standard integration unit



## Grid Converter application software key features

### Control references

Grid following	<ul style="list-style-type: none"> <li>- DC voltage control (AFE)</li> <li>- DC power and DC current</li> <li>- Active and reactive power</li> <li>- Limit controllers</li> </ul>
Grid forming	<ul style="list-style-type: none"> <li>- Island mode</li> <li>- Droop control (microgrid)</li> <li>- Droop control with base load</li> <li>- Active and reactive power (PQ)</li> <li>- Limit controllers</li> </ul>
Fieldbus protocols	<ul style="list-style-type: none"> <li>- Modbus TCP</li> <li>- PROFINET RT</li> <li>- EtherNet I/P</li> <li>- EtherCAT</li> </ul>

### Fit for purpose application features

<ul style="list-style-type: none"> <li>- Online transition between control modes during run state</li> <li>- Independent converter paralleling in same common AC and DC bus</li> <li>- Short circuit current injection with high overloadability</li> <li>- Support for 2 x 3-phase or DC voltage measurement option</li> <li>- Fall back to open loop in case feedback is lost</li> <li>- Blackout prevention (fall back to grid forming when limit is hit)</li> <li>- Black-start capability</li> <li>- Transformer interactive control &amp; voltage drop compensation</li> <li>- Synchronization to external grid</li> <li>- Filter &amp; transformer pre-magnetization</li> <li>- Main circuit breaker and pre-charge control</li> <li>- I/O, fieldbus, PC and control panel control place changeover during run state</li> <li>- Dedicated fieldbus control and status words &amp; fieldbus customizer</li> <li>- Resilient mode enables operation at reduced power in the event that one of the parallel system modules is out of service</li> </ul>
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### iC7-Hybrid supports these functional extensions:

- I/O and relay option
- Temperature measurement option
- Voltage measurement option