

Need flexible VFDs to create more competitive systems?

Intelligent drives to empower your applications



iC7-Automation highlights

- Integrated Industrial IoT security with OPC UA
- Precision motor control
- Modular control architecture
- High power density with a small footprint
- Efficient cooling management
- Fast and efficient system integration
- Modular concept for design flexibility
- Integrated synchronization and positioning functionality
- Easy-to-use logic blocks and states offer unprecedented flexibility beyond parametrization

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Need flexibility to create more competitive systems?

The iC7 series of intelligent AC drives puts the power of compactness and integrated intelligence in your hands, so you can boost machine performance in new ways.

With the best heat management available anywhere, this drive delivers high torque performance in a small footprint, so you can get much more power into small spaces.

Integrated intelligence enables the drive to function as your most powerful sensor, meaning you can regulate your process highly efficiently, saving money with fewer external devices. For quick and trouble-free system integration the drives come with built-in EMC and harmonic filters. Enjoy superior

EMC performance even for installations with long motor cables. Manage your process data in the cloud or your internal network with world-class stringent security. The drive supports OPC-UA for cybersecure connection to cloud, get full data traceability with end-to-end integrated digitized quality control throughout the drive lifetime – from design and testing, to installation and service.

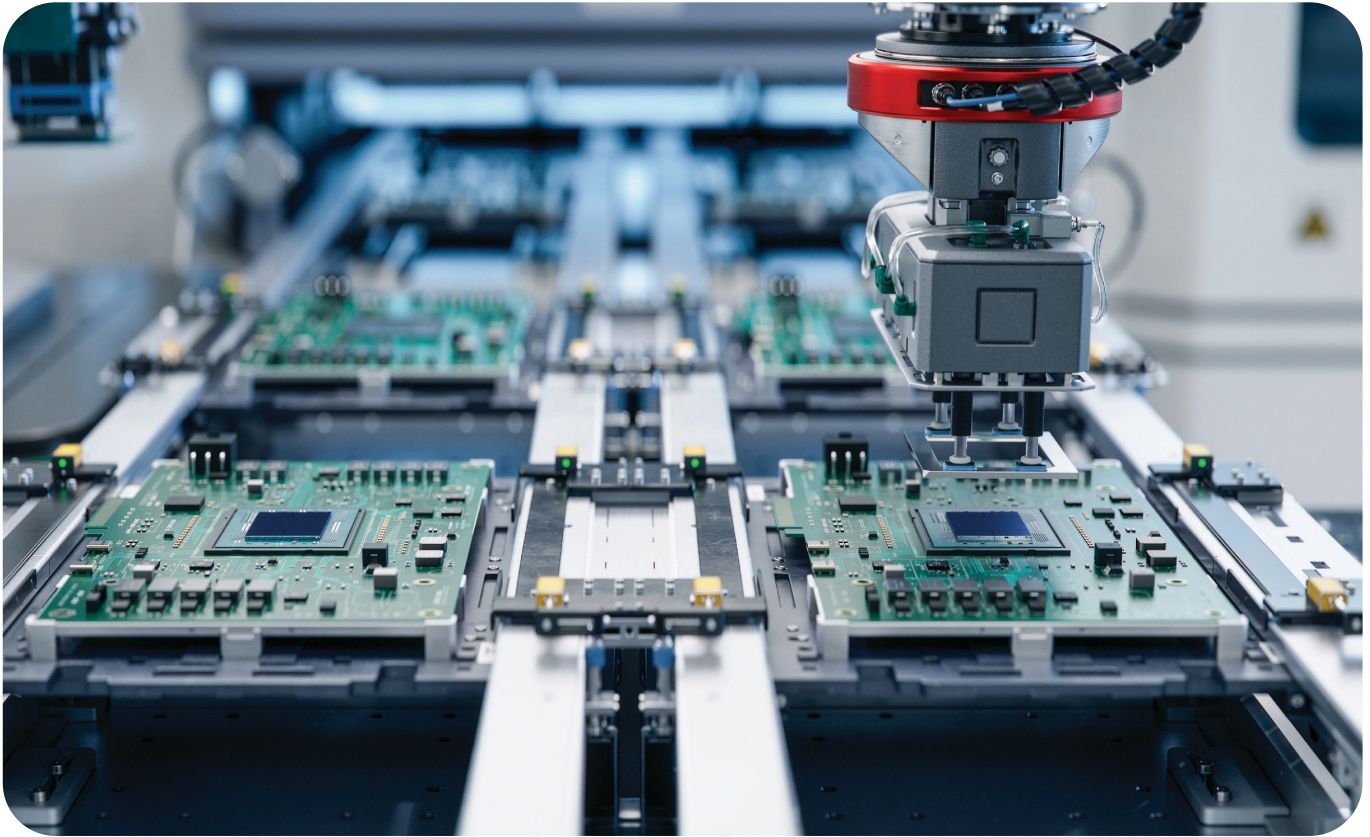
iC7 series intelligently serves demanding applications in food and beverage industries, including:

- Bottle sorters and washers
- High-speed cutters
- Centrifuges and decanters
- Dosing pumps and mixers
- Palletizers and packers

These drives also support heavy-duty applications such as

- Tunnel boring machines
- Crushers
- Cranes and hoists
- Mixers
- Extruders
- Air compressors
- High-power pumps and fans
- Progressive cavity pumps
- Electric submersible pumps
- Beam pumps and mud pumps
- Top drives
- Rotary tables
- Drawwork
- Many more applications





Secure-by-design

Your drive is equipped with market-leading hardware-based protection against unauthorized access with a built-in crypto chip on the control unit.

The drive supports OPC UA with no need for additional hardware. This capability is a key enabler for cyber-secure Industrial IoT, permitting secure communication via direct cloud connection.



Security

Functional safety to match your needs

STO and SS1-t SIL3, PI e as standard makes certification easier. A flexible offering allows the addition of functional safety via fieldbus, as required. PROFIsafe is the first of these protocols available, with more to come.

Enclosed drives are equipped with emergency stop button on the door, to activate STO.

User interfaces

A new range of user interfaces integrate well-known features and functionality. Integration of features in MyDrive® tools is supported.

Adjust the user interface to your preferred language, including Chinese.

Halo indicator

Normal = white

Fault = red

Warning = orange



More built-in sensors for enhanced control

The iC7 drive has an increased number of built-in sensors. This enables improved control performance, increased protection of application and drive, and capability to support Industrial IoT solutions.

Superior sensorless control

In open or closed loop, the iC7 drive delivers superior shaft performance even at low speed.

New motor? There's no need to change out the drive. Connect the motor and this drive will automatically self-tune and optimize: induction motor (IM), permanent magnet motor (PM), or high-efficiency synchronous reluctance motor (SynRM).

Motor set-up and control is intuitive and easy.

Motor Control

Filters and accessories

For a complete installation, a range of integrated and separate filter options are available.

Filters

Engineering support

Danfoss provides an extensive selection of support material and tools to help in engineering, such as:

- Digital tools, such as MyDrive® Select, MyDrive® Harmonics and MyDrive® Energy
- EPLAN P8 macros
- Dimensional and electrical drawings

Simulation reduces time to market

Remove the constraints of the physical environment and open up new opportunities using iC7 simulation models which perfectly mirror the converter or drive.

You can predict performance, test scenarios, streamline commissioning, and collaborate across teams and locations in an open environment.

Reliably validate interoperability of systems, using high-fidelity hardware-in-the-loop (HIL) simulation support from Danfoss.

The iC7 platform is founded on model-based design, which ensures the simulation models are always valid: up to date and accurate.

These models comply with the FMI standard and are easy to integrate in your simulation platform.

A good place to start your simulation journey is the MyDrive® Simulation tool.



-  **MyDrive® Simulation**
-  **MyDrive® Virtual**
-  **MyDrive® HIL**

Supported by MyDrive® tools

You can use MyDrive® tools on the device of your choice, supporting the entire lifecycle of the iC7 drive; from selection and dimensioning, through programming and commissioning, to maintenance and support during operation.

MyDrive® Insight





Quality in focus

Reliable and predictable operation has been a key driver. With an ISO 9001-certified and IATF 16949-compliant quality system combined with use of 6-Sigma principles, quality and reliability are at absolute market-leading standards.

Reliability is assured by design based on application load profiles and data collected from intensive simulations and feedback from testing.

Automated assembly enables close control and monitoring of critical processes. The finished drives are 100% full-load tested ensuring reliability before leaving the factory.

Scalable and flexible control

Enjoy a new level of performance thanks to the rapid-response control of iC7 drives.

The control capability is scalable and equipped with EtherNet-based fieldbus and STO inputs as standard. Add more I/Os as needed, to match your applications.

For frequency converters, an optional basic I/O board offers typical I/O connectivity, and if more is needed, then you can add up to 4 options (for enclosed drives, add up to 6 options).

For air-cooled system modules, an expandable bus includes I/O, fieldbus, and expanded safety options. There is space for up to 10 control options.

Configure multiple fieldbus protocols from the factory.

New fieldbus? No need for hardware. You can change the application or fieldbus on your drive without changing the hardware. This gives you the ultimate in drive flexibility.

For easy customization, just add the license token to the drive in the field. Customizations available:

- 136S1100 Motion (OS701)¹⁾
- 136S1002 PROFINET RT (OS7PR)
- 136S1004 Modbus/TCP (OS7MT)
- 136S1003 EtherNet/IP (OS7IP)
- 136S1005 EtherCAT (OS7EC)
- 136S1006 OPC UA (OS7UC)

¹⁾ Frequency converters and enclosed drives only

Switch fieldbus without changing boards

Change fieldbus in the field, simply using a license key. There is no need to change out boards. These protocols are available for activation by license key: PROFINET RT, Modbus TCP, EtherNet/IP, EtherCAT and OPC UA.

Connect to a computer via the extra Ethernet port, enabling you to use MyDrive® commissioning or service tools.

Features to enhance competitiveness



Feature	Benefit
Secure-by-design	Reduce risk of downtime due to unauthorized access
Integrated Ethernet communication interfaces	Save costs and time in installation
STO and SS1-t SIL 3, PI e as standard	Save costs and time in installation
Fieldbus compatibility includes EtherCAT, Modbus RTU, and OPC UA. Switch easily between protocols using a license key	Extremely fast and secure communication with no need to exchange hardware
High number of integrated sensors	Improve performance and control accuracy
Highly accurate motor control	Save costs and improve performance
Modular control architecture	Improve performance by adapting to your application's needs
High power density	Save space and reduce cooling costs
Compact side-by-side mounting	Save space and reduce installation costs

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Application software – for a perfect match



Industry application

Designed for maximum machine performance and flexibility, the integrated Industry tasks is the versatile choice for all applications requiring high-performance speed and torque control. Furthermore, it focuses on the control of external control loops: an advanced process controller enables full auto tuning.

Industry application is always available in the drive. No license key required.

- Touch Probe functionality
- Scaling and use of physical units
- Easy to order and activate: simply enter the license key

Common features of both applications

- High-performance open- and closed loop motor control with advanced automatic motor adaptation
- Wide range of customization, from signal naming to application software modifications.

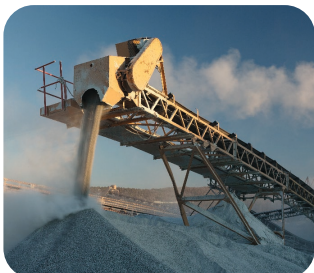


Motion application

Choose the Motion application to achieve optimal performance for single-axis linear or rotary positioning and synchronization tasks.

It gives you:

- Absolute and relative positioning
- Synchronization
- Multiple types of Homing
- Superimposed movement



 **Read more about applications**



Active Front-end application

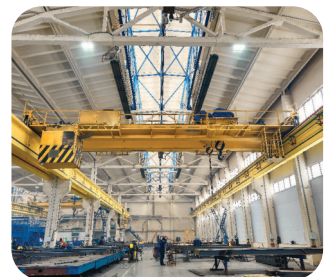
The Active Front-end application ensures a stable DC-bus for inverter modules, as well as effortless interaction with the grid, even in less-than-ideal grid conditions. It is designed for grid compliance and establishes grid-friendly harmonic content. It also safeguards energy recovery back to grid when excess energy from the process is available. It delivers robust control which is easy to customize and commission, with quick start-up and parametrization using wizards.

- Robust DC-link regulation
- Ultra-low harmonic current distortion THDi
- Unity power factor
- Support for grid voltage feedback option
- Power and current limitation
- Automatic AC-grid synchronization

Non-regenerative front-end application

The non-regenerative front-end (NFE) application ensures a one-way power supply for motor drives. It ensures a stable DC-link voltage for efficient operation, with power flowing from the grid to the DC bus. It includes an AC choke for reduced harmonics and an integrated pre-charging function for safety.

- Cost-effective
- Reliable DC supply
- Reduced harmonics
- Safe pre-charging
- Compact design
- Easy installation
- Lower costs





iC7-Automation variants

iC7-Automation is available in several variants to suit a broad range of applications:

- Frequency converters – optimized for wall-mounted, cabinet-mounted or free-standing installation
- Air-cooled system modules – ideal for ultra-compact cabinet integration
- Enclosed drives – optimized for minimal footprint and ease of use and serviceability



iC7-Automation	Frequency converters	Air-cooled system modules		Enclosed drives
Voltage	3 x 380-500 V AC -15%/+10%	380-500 V AC -15%/+10%	525-690 V AC -15%/+10%	3 x 380-500 V AC -15%/+10%
Output current	1.3-1260 A	385-4870 A	261-4720 A	206-2510 A
Protection rating	IP 20, UL Open Type IP21, UL Type 1 IP54, UL Type 12	IP00, UL Open Type		IP21, IP54

Danfoss FlexConcept®

– quicker and more cost effective

Effective, ongoing cost reduction requires drive solutions that significantly reduce running costs and the adoption of the latest, high-efficiency technology by both the operator and the system manufacturer.

They should also aim to optimize installation, commissioning, maintenance and service costs by optimizing staff resources and maximizing system availability.

The Danfoss FlexConcept® provides the user with perfectly adapted components for energy-efficient drives in all system areas. It comprises the central and decentral products iC7-Automation, VLT® OneGearDrive®, VLT® Decentral Drive FCD 302, and VLT® AutomationDrive FC 302.

The solution

Danfoss FlexConcept®

The objectives

High efficiency
Flexibility
Cost optimization
Reduction of variants

The elements

VLT® OneGearDrive®
– Hygienic
– Standard

iC7-Automation
VLT® AutomationDrive FC 302
VLT® Decentral Drive FCD 302
– Hygienic
– Standard

4 points of cost optimization

High efficiency

All the drives used in the Danfoss FlexConcept® stand out for their high level of efficiency and energy savings. The ultra premium efficient PM motor meets the highest efficiency class defined in IEC TS 60034-30-2 in a smaller frame size than current induction motors. Efficiency is maximized in the system as a whole by the matched design of the motors and the drives.

Fewer variants

Conveyor solutions can be offered with a vastly reduced number of variants by careful motor selection and optimal AC drive adoption, even in large systems.

This in turn affords a smaller spare parts inventory, particularly for larger systems, along with reduced storage costs and faster component availability compared to current standard drive solutions.

Lower training and maintenance costs

Training expenditure and maintenance staff requirements are greatly reduced by the unified operating design and standard operating scope of drives from Danfoss, in addition to the simple connection of the VLT® OneGearDrive® Hygienic drive motors via stainless steel connectors.

Flexibility

Easily and reliably combine components with existing solutions from other manufacturers on both centralized and decentralized systems.

The open system architecture of the Danfoss FlexConcept® means that standard, geared and PM motors can all be controlled and operated at high efficiency by Danfoss drives.

Danfoss FlexConcept®

– centralized or decentralized solutions

The choice of a centralized or decentralized drives solution is not always clear cut. Both solutions offer advantages depending on the system structure.

The choice of solution relies upon a variety of factors such as spatial and environmental conditions, the extent of the system and the acceptability to the end user. Economic aspects also figure, such as cabinet or control room costs compared to cabling expenditure.

Application-dependent design

Ultimately, the application dictates the system design. It is essential to engage with the drives supplier to conduct an accurate, detailed system cost analysis. Since service staff and technicians will have to gain familiarity with the technology adopted, acceptability by the end user is critical.

Both solutions include the option of shifting the system intelligence to the individual drives. Such a shift increases efficiency depending on the drives functionality required.

Central or decentral

Danfoss FlexConcept® perfectly meets the needs of both centralized and decentralized systems, ensuring the use of components perfectly adapted to the system structure.

VLT® drives are compact and available with enclosure ratings from IP00 to IP69K. All Danfoss FlexConcept® drives benefit from unified operation and are matched to common filters and coils and provide the same interfaces and use the same parameterization software.

The geared motor units are available with FDA compliant aseptic paint designed for the food and beverage industry. For direct use in hygiene-critical production areas, all the components are resistant to aggressive detergents in the range pH2..14 to guarantee optimal hygiene with long-term reliability.

For retrofit applications, all Danfoss FlexConcept® components are compatible with existing industry standard system components, including PM motors.

A cost-effective integrated solution

Danfoss FlexConcept® provides system manufacturers and end users with a fully integrated drive solution. Costs are reduced at the planning stage since documentation, training, and spare parts and storage requirements are all reduced, thanks to the unified drive operating structure.



MyDrive® Suite – Digital tools empower you

Need help to design your application, or select, set up, and maintain your drive?
Danfoss provides a palette of digital tools to give you the information you need, at your fingertips.
No matter which stage of the project you are at.

Select and dimension your drives

- Select the right AC drive based on motor and load characteristics
- Find general product, industry, and application information for drives from Danfoss

MyDrive® Select

Select and dimension your drive and motor based on calculated motor load currents as well as current, temperature and ambient limitations. MyDrive® Select matches your business needs with Danfoss Drives products.

MyDrive® Portfolio

This smart device app gives you a full overview of all Danfoss Drives products and their documentation.

Set up and service your drives

- Set up your drives to operate according to your requirements
- Monitor drive performance throughout the entire lifecycle of your drive

MyDrive® Insight

Get easy access to parametrize your Danfoss AC drives or power converters, locally or remotely.
Use MyDrive® Insight for commissioning, monitoring, and troubleshooting.

The integrated logic controller provides flexible logic blocks to support system integrators and OEMs in environment-based programming, which is flexible enough to replace a small PLC.

Validate performance of your drives

- Analyze the performance of your drives in relation to harmonics content
- Calculate the energy savings to be achieved when using drives
- Validate compliance to norms and standards

MyDrive® Harmonics

Estimate the benefits of adding harmonic mitigation solutions from the Danfoss product portfolio and calculate predicted system harmonic distortion.

This tool provides a quick indication of installation compliance with the most recognized harmonic norms, and mitigation recommendations.

MyDrive® Energy

Estimate the energy savings and CO₂ reduction achievable by installing Danfoss drives to perform variable speed control of electric motors. Calculate efficiency class and part load efficiency for drives from Danfoss. MyDrive® Energy supersedes the tools MyDrive® ecoSmart and VLT® EnergyBox.

MyDrive® Simulation

MyDrive® Simulation is an online simulation tool for iC7 series drives and power converters.

Create, run and analyze simulations in an intuitive and collaborative environment with no need to download and install software.



DrivePro® Services

Delivering a customized service experience!



Every AC drive application is different. DrivePro® Services is a collection of **tailor-made products designed around your needs.**

From optimized spare part packages to condition-monitoring solutions, we deliver customized service offerings to **support your business through the different lifecycle stages of your AC drive.**



DrivePro® 360Live

Achieve excellence with precision of maintenance. An installed base management solution to register and effectively optimize drives maintenance.



DrivePro® Extended Warranty

Even the best performing AC drives need protection. DrivePro® Extended Warranty offers a wide range of warranty options and provides the longest coverage in the industry up to 72 months.



DrivePro® Site Assessment

Optimize your maintenance strategy with a complete onsite survey and risk analysis of all your AC drives collected in one detailed report. Together with a Danfoss expert, you can build a tailored plan for future maintenance, retrofits, and upgrades.



DrivePro® Start-up

DrivePro® Start-up includes a full range of operating health checks and parameters adjustments. Based on a manufacturer's commissioning checklist, our experts will inspect and test your AC drive and its motor performance to ensure the best configuration of your AC drives.



DrivePro® Spare Parts

Maximize uptime and maintain peak performance throughout the lifetime of your AC drives with DrivePro® Spare Parts by making sure you are equipped with the original spare parts from Danfoss Drives.



DrivePro® Exchange

Maintain uptime with a fast alternative to repair when there is a time critical situation. If an AC drive fails, the DrivePro® Exchange service can quickly exchange any AC drive to a new unit of the same type to ensure as little production delay as possible.*

** DrivePro® Exchange is available for iC7-Automation Frequency Converter only*

To learn which products are available in your region, please reach out to your local Danfoss Drives sales office or visit our website.



**Read more
about DrivePro®**



**Local
contacts**

 [Learn more about iC7-Automation](#)

Frequency Converters

Need flexibility to create more competitive systems?

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With the best heat management available anywhere, this drive delivers high torque performance in a small footprint, so you can get much more power into small spaces.

Integrated intelligence enables the drive to function as your most powerful sensor meaning you can regulate your process highly efficiently, saving money by reducing external devices.

For quick and trouble-free system integration the frequency converter comes with built-in EMC and harmonic filters.

Manage your process data in the cloud or your internal network with world-class stringent security.

You get full data traceability with end-to-end integrated digitized quality

control throughout the drive lifetime from design and testing through to installation and service.

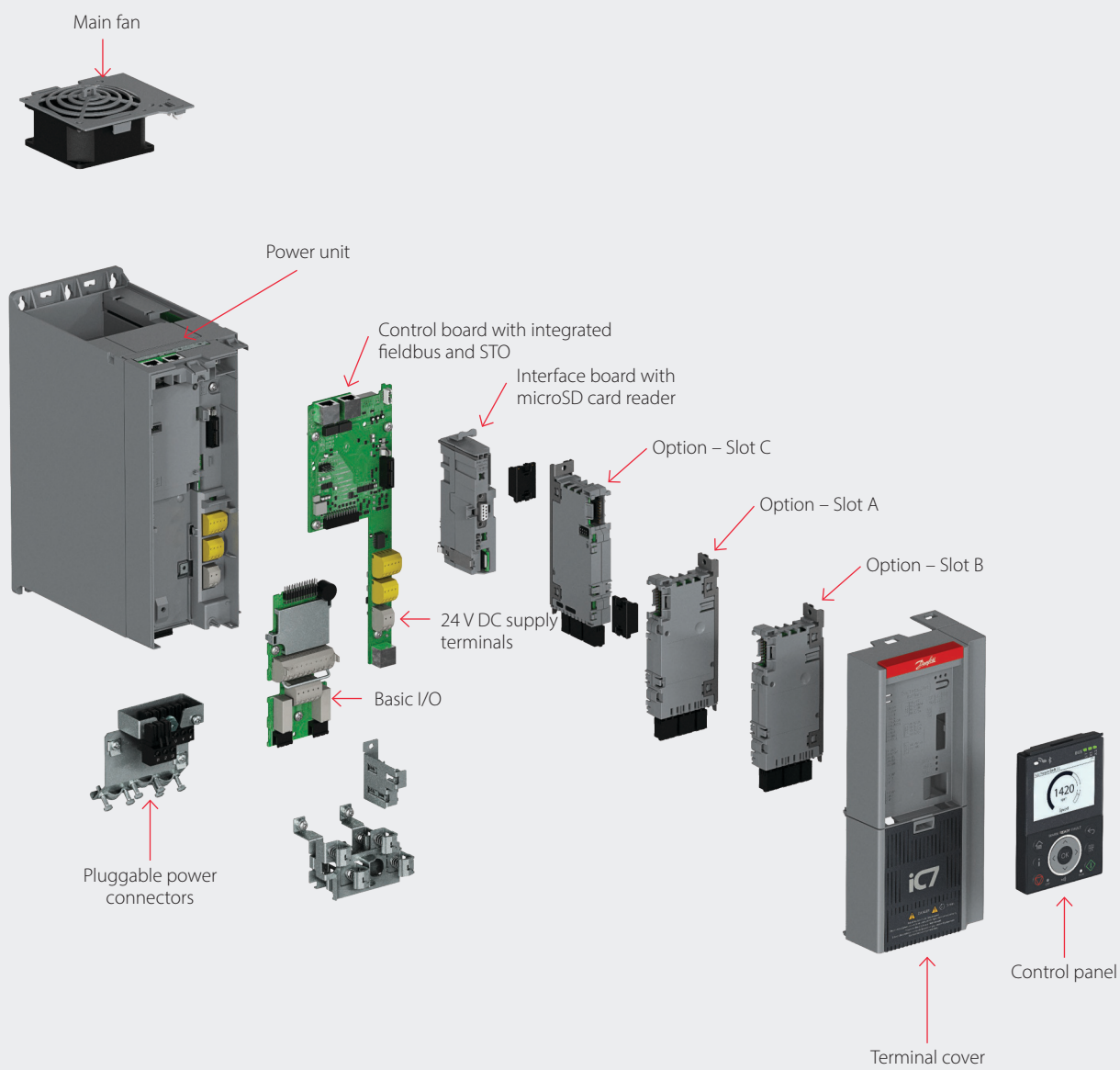
Frequency converters in the iC7 series are optimized for wall-mounted, cabinet-mounted or free-standing installation, and meet requirements for operation at ambient temperatures up to 60 °C.

HIGHLIGHTS

- > Modular and configurable drive
- > STO and SS1-t SIL3 as standard
- > Functional safety by fieldbus: PROFIsafe
- > Scalable control platform
- > Powerful hardware-based security including end-to-end encrypted data transfer
- > Connectivity with multiple fieldbuses. Activate new fieldbus by license key
- > Industrial IoT-ready with secure OPC UA
- > High-torque machine performance
- > Superior motor control
- > Ultra compact







Configured to your needs

The iC7 drive is configured and delivered to meet your exact requirements, saving expensive installation time. Everything can be integrated: EMC and harmonic filter, brake chopper and DC terminals. Fuse and disconnect are also available built-in, for IP21/UL Type 1 and IP54/UL Type 12 enclosures.

Control is highly configurable and preconfigured at the factory or can easily be upgraded in the field.

Enclosures fit for installation

Install this space-saving drive easily in cabinets and protected rooms:

- Bookstyle IP20/UL Open Type optimized in width for side-by-side mounting without clearance, to save cabinet space
(Frames FA02-FA12)
- Designed for flexible installation with minimum use of space
 - IP21/UL Type 1 for frames FK06-FK12
 - IP54/UL Type 12 for frames FB09-FB12

High power density cooling

You get high power density thanks to superior heat management using heat-pipe technology and high-performance heat sinks. Closed air ducts enable flexible mounting, and back-channel cooling supports removal of heat to the surroundings without extra cooling equipment. Remove fans easily for cleaning and service.

Fast installation and service

Focus on ease of installation and service has been a key driver during development, with intensive installation testing during the design phase to ensure easy installation and user access.

Control connectors are pluggable. Power connectors are also pluggable for units up to 43 A (22 kW). Connectors are color-coded and clearly marked for easier identification.

Power connectors are rated for use of copper cable at full current plus 25%, matching updated installation standards.

Environmental exposure

The iC7 drive delivers exceptional performance under demanding operating conditions, and its design criteria match the environments described in the IEC60721 standard.

The ability to operate at rated temperatures ranging from -30°C to 50°C (up to 60°C with derating) ensures the drive meets a broad range of application requirements. With an altitude capability of up to 4400 m (14400 ft) above sea level, you can install this drive in virtually any location. For additional protection, specify the optional coated printed circuit boards increasing corrosion resistance.

This robust drive matches the required vibration resistance for operation in cabinets, in control rooms and on machines.

Next-level reliability

- Rated temperature -30 to +50 °C (up to 60 °C with derating)
- Altitude 4400 m
- Optional coated PCBs for increased protection

Supports these communication protocols with no additional hardware



EtherNet/IP™

EtherCAT®



OPC UA

Features and benefits



Feature	Benefit
Compact side-by-side mounting	Save space and reduce installation costs
Compact bookshelf design reduces footprint	Reduce space requirement and air-conditioning load
Isolated cooling channel minimizes required installation space	Reduce space requirement and air-conditioning load
Integrated options such as functional extensions, common-mode filters, fuses and disconnects mean no extra external devices are required	Save cost and time in installation
Installer-friendly design includes pluggable control terminals, pluggable power terminals ¹⁾ , and replaceable fans	Save cost and time in installation and service
Robust by design, high uptime and quality	Reliable in heavy-duty service
Modular concept	Maximum design flexibility
Synchronization and positioning integrated into the Motion application	Easy to enable using license key
OPC UA	Easy integration in your cloud or HMI
Easy to use logic blocks and states	Unprecedented flexibility beyond parametrization

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Key specifications

Input	
Voltage rating	380-500 V AC, -15%/+10%
Supply frequency	50/60 Hz
Switching on input	1-2 times pr. minute
Grid type	TN, TT, IT, Delta
Output	
Output frequency	0-590 Hz ¹⁾
Switching on output	Unlimited
Overload capacity	110% and 150/160%
Protection ratings	
Frames FAxx	IP20 – UL Open Type
Frames FKxx	IP21 – UL Type 1
Frames FBxx	IP54 – UL Type 12
Environmental conditions ²⁾	
Rated temperature	-30 to 50 °C (-22 to 122 °F) ³⁾
Nominal temperature 24 hours	-30 to 45 °C (-22 to 113 °F) ³⁾
Maximum temperature with derating	60 °C (140 °F)
Rated altitude	1000 m (3300 feet)
Maximum altitude	4400 m (14400 feet) with derating
Relative humidity	3K22, (3K3) 1], maximum 95% non-condensing
Particles (IEC 60721-3-3:2019)	Solid particles (nonconductive particles/dust) 3S6, (3S2) ²⁾
Chemically active substances (IEC 60721-3-3:2019, ISO 9223:2012)	– C3 (P1) – Medium corrosivity – Non coated (3C2) ²⁾ – C4 (P2) – High corrosivity (3C3) ²⁾ – Coated in IP54/IP55/UL Type 12 enclosure or for IP20/UL Open Type and IP21/UL Type 1 following installation guidance.
Shock & vibration (IEC 60721-3-3:2019)	3M12 (3M4) ²⁾

Functional Safety I/O	
STO	Dual-channel, with galvanic isolation
STO feedback	Single channel, with galvanic isolation
External supply	
Rating	24 V/2 A
Basic I/O	
Digital inputs	4+2 ⁴⁾
– Logic	NPN/PNP selectable – 0/24 V
– Pulse/Encoder input	0-110 kHz
Digital outputs	2 ⁴⁾
– Logic	NPN/PNP selectable – 0/24 V
– Pulse output	0-100 kHz
Analog inputs	2
Voltage mode	0-10 or ±10V, scalable
Current mode	0/4-20 mA
Relay output	2
Function	NO/NC
Rating	250 V AC 2 A, 24 VDC 2 A
Analog output	0/4-20 mA

¹⁾ Higher output frequencies are possible. Contact Danfoss for advice.

²⁾ The environments used as reference for the design criteria are described in standard IEC 60721-3-3:2019, unless otherwise specified. For references based on IEC/EN 61800-2, see the value in brackets or refer to the Design Guide, section 8.3.8.4

Example
"C3 (P1) – Medium corrosivity – Non coated" refers to IEC 60721-3-3:2019
"(3C2)" refers to the older IEC 60721-3-3:2019

³⁾ Frames Fx09-Fx12: For low overload conditions, the maximum permissible ambient air temperatures without derating are 40° C (104° F) average over 24 hours duration; and 45° C (113° F) for 1 hour duration, respectively.

⁴⁾ 2 of the inputs can be reconfigured to outputs

EMC category (model code)	Frame	EN/IEC 61800-3 compliance class					
		Conducted emission			Radiated emission		
		C1	C2	C3	C1	C2	C3
		Cable length [m (ft)]					
F1 – Combined C1 and C2 filter	Fx02–Fx08	50 (164)	150 (492)	150 (492)	No	Yes	Yes
F2 – C2 filter	Fx02–Fx08	–	150 (492)	150 (492)	No	Yes	Yes
	Fx09-Fx12	–	150 (492)	150 (492)	No	Yes	Yes
F3 – C3 filter	Fx02–Fx05	–	–	250 (820)	No	No	Yes
	Fx06–Fx08	–	–	300 (984)	No	No	Yes
	Fx09–Fx12	–	–	150 (492)	No	No	Yes

For information on functional extension option slots, go to page 14

Ratings Fx02-Fx12 – High overload

Designation	Rated output current						Typical shaft output power		Frame
	3 x 380-440 V			3 x 441-500 V			400 V	460 V	
	I _L	I _H	I _{H2}	I _L	I _H	I _{H2}	PH	PH	
	[A]	[A]	[A]	[A]	[A]	[A]	[kW]	[HP]	
01A3	1.3	1.3	0.9	1.2	1.2	0.8	0.37	0.5	Fx02
01A8	1.8	1.8	1.3	1.6	1.6	1.1	0.55	0.75	
02A4	2.4	2.4	1.8	2.1	2.1	1.6	0.75	1.0	
03A0	3.0	3.0	2.4	2.7	2.7	2.1	1.1	1.5	
04A0	4.0	4.0	3.4	3.4	3.4	3.0	1.5	2.0	
05A6	5.6	5.6	4.3	4.8	4.8	3.4	2.2	3.0	
07A2	7.2	7.2	5.6	6.3	6.3	4.8	3.0	4.0	
09A2	9.2	9.2	8.0	8.2	8.2	6.3	4.0	5.0	
12A5	12.5	12.5	10	11	11	7.6	5.5	7.5	
16A0	16	16	13	14.5	14.5	11	7.5	10	Fx03
24A0	24	24	17	21	21	14.5	11	15	Fx04
31A0	31	31	25	27	27	21	15	20	
38A0	38	38	32	34	34	27	18.5	25	Fx05
43A0	43	43	38	40	40	34	22	30	
61A0	61	61	46	55	55	40	30	40	Fx06
73A0	73	73	61	66	66	55	37	50	
90A0	90	90	73	81	81	66	45	60	Fx07
106A	106	106	90	96	96	81	55	75	
147A	147	147	106	133	133	96	75	100	Fx08
170A	170	170	147	156	156	133	90	125	
206A	206	170	147	196	166	156	90	125	Fx09
245A	245	206	170	240	196	166	110	150	
302A	302	245	206	302	240	196	132	200	
385A ¹⁾	385	302	245	364	302	240	160	250	
395A	395	302	245	364	302	240	160	250	
480A	480	385	302	456	364	302	200	300	Fx10
588A	588	480	385	520	456	364	250	350	
658A	658	588	480	590	520	456	315	450	Fx11
736A	736	658	588	658	590	520	355	500	
799A	799	695	658	730	653	590	400	550	
893A	893	799	736	784	700	653	450	550	
1000	1000	880	799	896	784	700	500	650	Fx12
1120	1120	1000	893	1028	896	784	560	750	
1260	1260	1100	1000	1150	1028	896	630	850	

¹⁾ 385A is without brake or disconnect. If brake or disconnect is required, select 395A

I_L: Rated continuous output current with 110% overload capacity – 1 min every 10 min

I_H: Rated continuous output current with 150/160% overload capacity – 1 min every 10 min

I_{H2}: Rated continuous output current with 150/160% overload capacity with increased duty – 1 min every 5 min

P_H: Typical nominal motor power with 150/160% overload capacity

Ratings Fx09-Fx12 – Low overload ¹⁾

Designation	Rated output current						Typical shaft output power		Frame
	3 x 380-440 V			3 x 441-500 V			400 V	460 V	
	I _L	I _H	I _{H2}	I _L	I _H	I _{H2}	P _L	P _L	
	[A]	[A]	[A]	[A]	[A]	[A]	[kW]	[HP]	
206A	206	170	147	196	166	156	110	150	Fx09
245A	245	206	170	240	196	166	132	200	
302A	302	245	206	302	240	196	160	250	
385A ¹⁾	385	302	245	364	302	240	200	300	
395A	395	302	245	364	302	240	200	300	Fx10
480A	480	385	302	456	364	302	250	350	
588A	588	480	385	520	456	364	315	450	
658A	658	588	480	590	520	456	355	500	Fx11
736A	736	658	588	658	590	520	400	550	
799A	799	695	658	730	653	590	450	600	
893A	893	799	736	784	700	653	500	650	Fx12
1000	1000	880	799	896	784	700	560	750	
1120	1120	1000	893	1028	896	784	630	850	
1260	1260	1100	1000	1150	1028	896	710	950	

¹⁾ 385A is without brake or disconnect. If brake or disconnect is required, select 395A

I_L: Rated continuous output current with 110% overload capacity – 1 min every 10 min

I_H: Rated continuous output current with 150/160% overload capacity – 1 min every 10 min

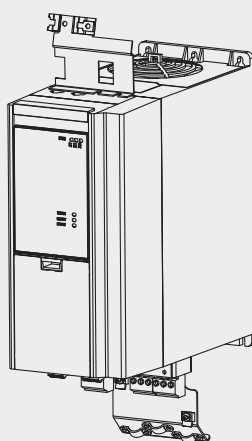
I_{H2}: Rated continuous output current with 150/160% overload capacity with increased duty – 1 min every 5 min

P_L: Typical nominal motor power with 110% overload capacity

Options

Functional extensions	Description
General Purpose I/O OC7C0	General purpose I/O extension board: 3 digital inputs 2 digital outputs 2 analog inputs 1 analog output
Relay Option OC7R0	Relay I/O extension board, with 3 relays
Encoder/Resolver Option OC7M0	Encoder/Resolver extension board supports 1 or 2 encoders, rotary and linear (TTL, HTL, SinCos, SSI, HIPERFACE®, HIPERFACE DSL®, EnDat, BiSS, resolver)
Temperature Measurement OC7T0	The Temperature Measurement option adds 5 temperature sensor inputs with compensation input. Supported sensors are Pt100, Pt1000, Ni1000, and KTY81
Digital 230 V AC Input OC7D0	The Digital 230 V AC Input OC7D0 option adds 5 digital inputs for 42–240 V AC





Dimensions and weight

Frame		FA02a	FA03a	FA04a	FA05a	FA06	FK06	FA07	FK07	FA08	FK08
[mm]	Width	90	114	130	165	200	210	230	240	255	270
	Height	270	270	399	399	555	670	600	770	746	980
	Depth	221	221	262	269	294	297	308	327	368	365
[kg]	Weight	4.7	5.7	11.6	14.1	26	28	35	38	55	60
[in]	Width	3.5	4.5	5.1	6.5	7.9	8.3	9.1	9.5	10.0	10.6
	Height	10.6	10.6	15.7	15.7	21.9	26.4	23.6	30.3	29.4	38.6
	Depth	8.7	8.7	10.3	10.6	11.6	11.7	12.1	12.9	14.0	14.4
[lb]	Weight	10.4	12.6	25.6	31.1	57	61	77	83	121	132

Frames FA02b to FA05b: Add 26 mm (1 in) to depth.
Outer dimensions include mounting flange, without EMC shield plates.
Weight is maximum weight.

Frame		FA09	FK09a/ FB09a	FK09c/ FB09c	FA10	FK10a/ FB10a	FK10c/ FB10c	FA11	FK11/FB11	FA12	FK12/FB12
[mm]	Width	250	325	325	350	420	420	508	602	604	698
	Height	909	1001	1421	1122	1232	1779	1578	2043	1578	2043
	Depth	370	378	381	370	378	381	482	513	482	513
[kg]	Weight	81	84	107	127	137	174	225	272	298	320
[in]	Width	9.8	12.8	12.8	13.8	16.5	16.5	20	23.7	23.9	698
	Height	35.8	39.4	55.9	44.2	48.5	70.0	62.1	80.4	62.1	2043
	Depth	14.8	14.9	15.0	14.6	14.9	15.0	19.0	20.2	19.0	513
[lb]	Weight	179	184	236	280	302	384	496	600	654	320

Weight is maximum weight.

+Bxxx Control board features

Function	Model code	Selection description	Fx02-05	Fx06-08	Fx09-12
Communication interface, X1/ X2	+BAMT	Modbus TCP OS7MT	■	■	■
	+BAPR	PROFINET RT OS7PR	■	■	■
	+BAIP	EtherNet/IP OS7IP	■	■	■
	+BAEC	EtherCAT OS7EC	■	■	■
Additional communication	+BBUC	OPC UA OS7UC	■	■	■
Functional safety	+BEF1	Safe Torque Off – Not upgradable	■	■	■
	+BEF2	STO, SS1-t, fieldbus	■	■	
Standard I/O	+BDXX	None	■	■	■
	+BDBA	Basic I/O (4 x DI, 2 x combined DI/DO, 2 x AI, 1 x AO, 2 x relay)	■	■	■
Control panel	+BF001]	Blind Panel OPX00	■	■	
	+BF20	Control Panel 2.8 OPX20	■	■	■

+Cxxx Control options

Functional extension option slots							
Frame	FA02a	FA02b	FA03a FA04a	FA03b FA04b	FA05a	FA05b	FA06-FA12
Number of option slots	1	2	1	3	1	4	4
Option slot A	■	■	■	■	■	■	■
Option slot B		■		■		■	
Option slot C				■		■	■
Option slot D						■	■
Option slot E							■

Control options (character >21)

+CBXX	None – Not upgradable ¹⁾
+C_X0	None ²⁾
+C_C0	General Purpose I/O OC7C0
+C_R0	Relay Option OC7R0
+CAM0	Encoder/Resolver Option OC7M0 ³⁾
+C_T0	Temperature Measurement OC7T0
+C_D0	Digital 230 VAC Input OC7D0

¹⁾ Only selectable for option slot B

²⁾ +CBX0 will not appear in the model code if "None" is selected for option slot B

³⁾ Encoder/Resolver Option must be in option slot A

+Dxxx Application software and additional functionality

Function & code		Fx02-05	Fx06-08	Fx09-12
Additional drive feature	+DD1X None ¹⁾	■	■	■
	+DD11 Motion	■	■	■

¹⁾ +DD1X will not appear in the model code if "None" is selected for option slot B

 Available for iC7-Automation drives

Air-cooled System Modules

Is fast integration your first priority?

Optimize installation footprint, speed and reduce costs more than you dreamed possible, with the revolutionary iC7 series air-cooled system modules.

High power density combined with industry-leading heat-pipe thermal management means you achieve a smaller footprint and reduce space requirements in your electrical room. The slim profile enables you to fit more modules within a fixed-width cabinet. Shrink your system, with smaller enclosures or fewer enclosure sections, and filters which integrate beneath the module.

Integration and scalability are extremely easy, because each unit is designed and tested in thermal independence. This reduces your engineering, assembly, and testing time.

Thermal excellence saves your operating costs with the unique segregated IP54 cooling channel, and reduced heat load in your installation. With the iC7 series air-cooled system modules, you enjoy industry benchmark cooling efficiency, even including the thermal

load of optionally integrated filters and chokes. Configure your choice of common-mode and dU/dt filter options in the integration unit located beneath the module.

With the integration unit, access is so easy: simply pull out the power unit, with no need to remove the power cable. Power terminals are located at the front for easy access.

HIGHLIGHTS

- > Highly compact power unit design requires less space for installation
- > Build high-power drive systems easily, using state-of-the-art paralleling architecture
- > Integration unit with built-in filters reduces integration cost
- > Fast power unit replacement with no need for motor cable removal
- > Front-mounted motor cable terminals
- > Lightweight power units facilitate faster and easier servicing
- Modular and scalable control concept
- Efficient heat management with back-channel cooling reduces investment needs in e-room
- STO and SS1-t (SIL3) for full power range



Modular architecture

Setting the standard for modular control

A flexible, modular, control architecture means you can tailor the control functionality exactly to your needs. You can purchase exactly the control options you need, or replace PLC components, I/O and external safety components.

This modularity gives you not only more flexibility, but more secure integration of drives in the control system and IT architecture. You achieve faster set-up, and smarter monitoring, data gathering and analytics thanks to support for multiple communication network types.

The purchase cost is lower since you only buy the necessary control options, saving excess unused functionality. The drive can reduce your costs further by substituting for a low-end PLC controller/system. Program execution close to the process opens new possibilities in fast process control thanks to reduced delays. Built-in security protects your IPR and service business.

Features

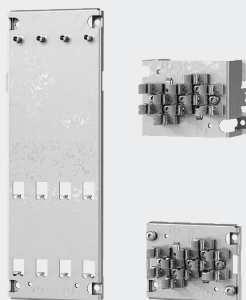
- Expandable bus includes I/O, fieldbus, and expanded safety options
- Up to 10 control options
- Slot-independent options
- Integrated microSD card slot
- Integrated STO and SS1-t (SIL3) functional safety, or choose PROFIsafe functional safety by fieldbus
- Use the same options for iC7 series air-cooled system modules, liquid-cooled system modules and enclosed drives

Technical information

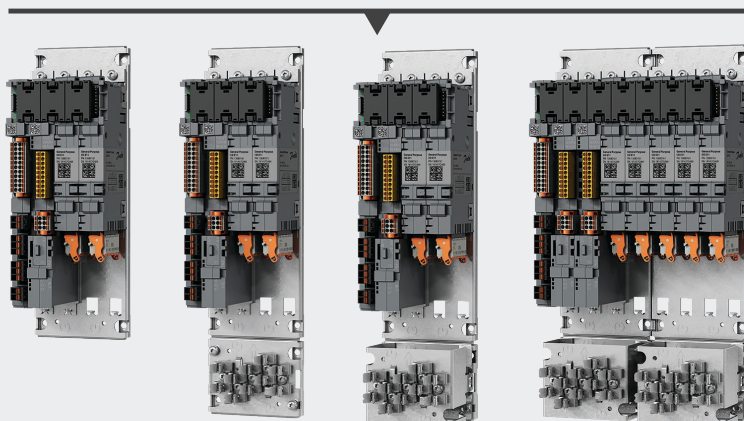
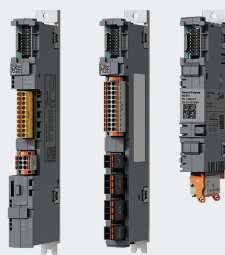
- Integrated Ethernet port
- Dual-channel STO SIL3 integrated as standard
- Modbus TCP as standard and other fieldbus protocols optional
- Basic I/O: 6 x DI, 2 x DO, 2 x AI +/-10V/0-20 mA, 1 x AO (0-10/4-20 mA), 2 x NO/NC RO, 1 x NO RO, 1 x Thermistor
- One optical fiber pair as communication link with power module or star coupler board
- For more options such as voltage measurement, temperature measurement, relay option, and encoder option, refer to the Functional extensions fact sheet.

Functional extensions

Control mounting plate mechanics



Control and option boards



Features and benefits

Air-cooled module



Inverter module
IM10



Inverter module
with short
integration
unit IR10



Inverter module
with standard
integration
unit IR10



Inverter module
IM11



Inverter module
with short
integration
unit IR11



Inverter module
with standard
integration
unit IR11



AFE module
AM10/11



AFE module
with integration unit AR10/AR11



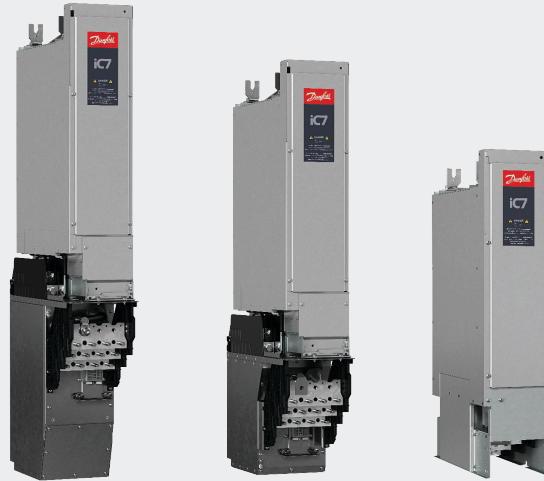
LCL filter
LCL 10/11

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
Paralleling of 3-phase modules with no output filter required	– Modular and scalable solutions for high powers – Simplified spare unit handling
Lightweight	– Fast integration and serviceability – High vibration robustness
Optional integration unit for output filter integration, enabling back-channel cooling	– Compact size enables you to pack more power into the space available – Fast integration
Pull-out of power unit without removing motor or mains cables, included with integration unit	– Fast integration and serviceability
AuxBus internal network for temperature monitoring of filters	– Exceptional reliability and robustness for increased uptime
Segregated IP54 cooling channel and dedicated PCB area	– Extremely reliable in heavy-duty service, for increased uptime
Integrated functional safety: STO and SS1 (SIL3) for full power range	– Low-complexity functional safety
Fieldbus compatibility includes EtherCAT, Modbus RTU, and OPC UA. Switch easily between protocols using a license key	– Extremely fast and secure communication with no need to exchange hardware

Key specifications: Air-cooled system modules

Mains connection, AFE/NFE modules	AFE	NFE
Nominal AC voltage	– Voltage class 05: 3 x 380-500 V AC (-15% ... +10%) – Voltage class 07: 3 x 525-690 V AC (-15% ... +10%)	– Voltage class 05: 3 x 380-500 V AC (-15% ... +10%) – Voltage class 07: 3 x 525-690 V AC (-15% ... +10%)
Nominal DC voltage	– Voltage class 05: 465-740 V DC – Voltage class 07: 640-1100 V DC	– 1.35 x AC voltage
Mains frequency	– 45-66 Hz	– 45-66 Hz
Mains network	– TN-S, TN-C, IT and TT	– TN-S, TN-C, IT and TT (Supply voltage limited to 500 V AC for corner-grounded networks)
Displacement power factor (DPF)	– 1	– > 0.96
Total harmonic distortion THDi (nominal situation and undistorted network)	– < 5%	– < 40%
Short-circuit current rating, with the specified fuses or circuit breakers	– The maximum short-circuit current $I_{cc} \leq 100$ kA	The maximum short-circuit current $I_{cc} \leq 100$ kA
Overvoltage category according to IEC 61800-5-1	– Category III	– Category III
Voltage imbalance	– AFE: + 3%	– AFE: + 3%
Motor connection (Inverter)		
Output voltage	– Voltage class 05: 400/460/500 V – Voltage class 07: 0-525/575/690 V	
Nominal DC voltage	– Voltage class 05: 465-740 V DC – Voltage class 07: 640-1100 V DC	
Output frequency	– 1-590 Hz	
Switching frequency	– Inverter: 2-6 kHz DPWM, default 2 kHz DPWM – AFE: 3 kHz CMRPWM	
Field weakening point	– 1-600 Hz	
Motor control principles	– U/f control – VVC+ (Vector Voltage Control) – FVC+ (Flux Vector Control)	
Motor and generator types supported	– Induction/asynchronous motor – Non-salient permanent magnet motor	
Cable length	– Up to 150 m (492 ft) symmetrical and shielded motor cable	
EMC (IEC61800-3)		
Immunity	– Fulfils IEC/EN61800-3 (2018), 2nd environment	
Emissions	– IEC/EN61800-3 (2018), category C4, default for the IP00/UL Open Type drive – IEC/EN61800-3 (2018), category C3, if the drive is installed according to the instructions of the manufacturer	
Environmental conditions		
Protection rating drive modules	– IP00/UL Open Type	
Ambient operating temperature	– -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. – 0 °C to 40 °C (32 °F to 104 °F) (at IN) with derating up to +55 °C (131 °F)	
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	– 0–4000 m (0–13100 ft) above sea level: in case network is not corner-grounded (Voltage class 5). – Above 1000 m (3300 ft): derating of maximum ambient operating temperature by 1 °C per each 100 m is required.	
Vibration (IEC60068-2-6)	– Displacement amplitude 0.5 mm (peak) at 5–22 Hz – Maximum acceleration amplitude 1 G at 22–150 Hz	
Shock (IEC60068-2-27)	– Max 15G, 11 ms (in package)	
Environmental operating conditions (IEC 60721-3-3)	– Climatic conditions: Class 3K5 – Chemically active substances: IEC 60721-3-3 Edition 3.0/ISO 3223 Second Edition, class C4 – Biological conditions: Class 3B1 – Mechanical conditions: Class 3M3 – Mechanically active substances: Class 3S2 – Special climatic conditions (heat radiation): Class 3Z1	
Product safety compliance		
Compliance	– IEC/EN 61800-5-1 + A1; IEC/EN 64477-1 + A1; CSA C22.2 No. 274; UL listed: UL 61800-5-1	

Inverter module



Inverter module

The inverter module is a bidirectional DC-fed power inverter for the supply and control of AC motors and generators.

The inverter module is intended for the regulation of motor speed in response to system feedback or to remote commands from external controllers. A drive system consists of the system modules, the motor, and equipment driven by the motor. The inverter module is also intended for system and motor status surveillance.

Benefits of the Inverter module

- Designed for maximum machine performance and flexibility
- Versatility for drive applications requiring a wide range of drive features for different motor types for either closed loop or open loop control methods
- Inverter module with integration unit offers optional built-in dU/dt filters and/or high-frequency common-mode filters. These ensure space savings and easy cabinet integration.

Ratings

- 690 V variants offer high power capability to support large motors with less current, meaning smaller cables and lower heat losses, therefore higher efficiency. 690 V systems reduce current, allowing for smaller components and better space utilization.
- Scalability means you can use the inverter as part of a common DC bus system with AFE, NFE, or braking units, giving flexibility to tailor the setup.
- 385-4870 A I_L , +10% overload 1 min/5 min at 380-500 V AC motor voltage
- 261-4720 A I_L , +10% overload 1 min/5 min at 525-690 V AC motor voltage
- Output frequency: 0-599 Hz
- Switching frequency: 1.5-10 kHz. Nominal 3 kHz

Highlights

- Most compact inverter module on the market thanks to integration of filters
- IP54/Type 12 segregated main cooling channel supporting back-channel cooling solutions
- Designed for enclosure integration and quick serviceability

- Integration of common-mode and dU/dt filters in the integration unit
- Slide-in philosophy for power unit installation means you can remove the power unit without disconnecting the motor cable

Motor control

- Highly dynamic performance: Highest possible machine accuracy due to superior shaft performance, also for sensorless operation
- Superior low-speed performance also in sensorless operation
- The motor always runs at maximum possible torque for the given current – ensuring highest possible motor efficiency: Maximum Torque Per Ampere (MTPA)
- Fast commissioning using Automatic Motor Adaption (AMA) at standstill maximizes energy efficiency with any motor
- More integrated sensors for better performance
- Flexible choice of control features optimized to your application, thanks to integrated application software
- Connect to any motor and the drive will adapt: induction motor (IM), permanent magnet motor (PM), or high-efficiency synchronous reluctance motor (SynRM)

Inverter module

400 V AC, 465-650 V DC

Model code	AC current						Typical motor power 400 V AC		DC current	Frame
	I_N	$I_L (1/5)$	$I_L-OL (1/5)$	$I_H (1/5)$	$I_H-OL (1/5)$	$I_{max} (3s)$	P_L	P_H	I_N-D_C	IP00
	[A]	[A]	[A]	[A]	[A]	[A]	[kW]	[kW]	[A]	
iC7-60SAIN05-385A	394	385	424	320	480	544	200	160	410	IM/IR10
iC7-60SAIN05-480A	490	480	528	399	599	679	250	200	510	IM/IR10
iC7-60SAIN05-590A	603	590	649	490	735	833	315	250	641	IM/IR10
iC7-60SAIN05-658A	672	658	724	547	821	930	355	250	721	IM/IR11
iC7-60SAIN05-730A	746	730	803	606	909	1031	400	315	813	IM/IR11
iC7-60SAIN05-820A	838	820	902	681	1022	1158	450	355	913	IM/IR11
iC7-60SAIN05-880A	899	880	968	731	1097	1243	500	400	1015	IM/IR11
iC7-60SAIN05-1000	1021	1000	1100	830	1245	1411	560	450	1138	2xIM/IR10
iC7-60SAIN05-1100	1123	1100	1210	913	1370	1553	630	500	1280	2xIM/IR10
iC7-60SAIN05-1260	1287	1260	1386	1050	1575	1785	710	560	1441	2xIM/IR11
iC7-60SAIN05-1450	1481	1450	1595	1210	1815	2057	800	630	1625	2xIM/IR11
iC7-60SAIN05-1710	1746	1710	1881	1420	2130	2414	900	710	1826	2xIM/IR11
iC7-60SAIN05-1760	1797	1760	1936	1470	2205	2499	1000	800	2030	3xIM/IR11
iC7-60SAIN05-1960	2001	1960	2156	1630	2445	2771	1100	900	2234	3xIM/IR11
iC7-60SAIN05-2150	2195	2150	2365	1790	2685	3043	1200	1000	2436	3xIM/IR11
iC7-60SAIN05-2510	2563	2510	2761	2090	3135	3553	1400	1100	2841	3xIM/IR11
iC7-60SAIN05-2640	2695	2640	2904	2200	3300	3740	1500	1200	3045	4xIM/IR11
iC7-60SAIN05-2880	2940	2880	3168	2400	3600	4080	1600	1300	3247	4xIM/IR11
iC7-60SAIN05-3280	3349	3280	3608	2730	4095	4641	1800	1500	3652	4xIM/IR11
iC7-60SAIN05-3600	3675	3600	3960	2990	4485	5083	2000	1600	4058	5xIM/IR11
iC7-60SAIN05-4060	4145	4060	4466	3370	5055	5729	2200	1800	4465	5xIM/IR11
iC7-60SAIN05-4320	4410	4320	4752	3590	5385	6103	2400	1900	4871	6xIM/IR11
iC7-60SAIN05-4870	4972	4870	5357	4050	6075	6885	2700	2200	5478	6xIM/IR11

I_L : Low overload base current, allows for 110% overload for 1 minute duration every 5 minutes

I_H : High overload base current, allows for 150% overload for 1 minute duration every 5 minutes

OL: Overload

Inverter module

460 V AC, 650-740 V DC

Model code	AC current						Typical motor power 460 V AC		DC current	Frame
	I_N	$I_L (1/5)$	$I_L-OL (1/5)$	$I_H (1/5)$	$I_H-OL (1/5)$	$I_{max} (3s)$	P_L	P_H	I_N-D_C	IP00
	[A]	[A]	[A]	[A]	[A]	[A]	[HP]	[HP]	[A]	
iC7-60SAIN05-385A	394	385	424	320	480	544	300	300	380	IM/IR10
iC7-60SAIN05-480A	490	480	528	399	599	679	350	350	443	IM/IR10
iC7-60SAIN05-590A	543	531	585	441	662	750	450	450	570	IM/IR10
iC7-60SAIN05-658A	603	590	649	490	735	833	500	500	632	IM/IR11
iC7-60SAIN05-730A	672	658	724	547	821	930	550	550	695	IM/IR11
iC7-60SAIN05-820A	746	730	803	606	909	1031	600	600	758	IM/IR11
iC7-60SAIN05-880A	838	820	902	681	1022	1158	700	700	883	IM/IR11
iC7-60SAIN05-1000	940	920	1012	764	1146	1299	750	750	948	2xIM/IR10
iC7-60SAIN05-1100	1052	1030	1133	855	1283	1454	850	850	1073	2xIM/IR10
iC7-60SAIN05-1260	1174	1150	1265	960	1440	1632	950	950	1200	2xIM/IR11
iC7-60SAIN05-1450	1328	1300	1430	1080	1620	1836	1100	1100	1389	2xIM/IR11
iC7-60SAIN05-1710	1603	1570	1727	1310	1965	2227	1300	1300	1641	2xIM/IR11
iC7-60SAIN05-1760	1787	1750	1925	1470	2205	2499	1500	1500	1892	3xIM/IR11
iC7-60SAIN05-1960	1940	1900	2090	1580	2370	2686	1600	1600	2021	3xIM/IR11
iC7-60SAIN05-2150	2083	2040	2244	1700	2550	2890	1700	1700	2146	3xIM/IR11
iC7-60SAIN05-2510	2389	2340	2574	1950	2925	3315	1900	1900	2397	3xIM/IR11
iC7-60SAIN05-2640	2532	2480	2728	2060	3090	3502	2100	2100	2650	4xIM/IR11
iC7-60SAIN05-2880	2685	2630	2893	2190	3285	3723	2200	2200	2775	4xIM/IR11
iC7-60SAIN05-3280	3114	3050	3355	2540	3810	4318	2500	2500	3155	4xIM/IR11
iC7-60SAIN05-3600	3573	3500	3850	2910	4365	4947	2900	2900	3658	5xIM/IR11
iC7-60SAIN05-4060	3859	3780	4158	3140	4710	5338	3200	3200	4036	5xIM/IR11
iC7-60SAIN05-4320	4176	4090	4499	3400	5100	5780	3400	3400	4289	6xIM/IR11
iC7-60SAIN05-4870	4625	4530	4983	3760	5640	6392	3700	3700	4667	6xIM/IR11

I_L : Low overload base current, allows for 110% overload for 1 minute duration every 5 minutes

I_H : High overload base current, allows for 150% overload for 1 minute duration every 5 minutes

OL: Overload

Inverter module

500 V AC, 650-740 V DC

Model code	AC current						Typical motor power 500 V AC		DC current	Frame
	I_N	$I_L (1/5)$	$I_L-OL (1/5)$	$I_H (1/5)$	$I_H-OL (1/5)$	$I_{max} (3s)$	P_L	P_H	I_N-D_C	IP00
	[A]	[A]	[A]	[A]	[A]	[A]	[kW]	[kW]	[A]	
iC7-60SAIN05-385A	394	385	424	320	480	544	250	200	408	IM/IR10
iC7-60SAIN05-480A	490	480	528	399	599	679	315	250	513	IM/IR10
iC7-60SAIN05-590A	543	531	585	441	662	750	355	250	577	IM/IR10
iC7-60SAIN05-658A	603	590	649	490	735	833	400	315	651	IM/IR11
iC7-60SAIN05-730A	672	658	724	547	821	930	450	355	731	IM/IR11
iC7-60SAIN05-820A	746	730	803	606	909	1031	500	400	812	IM/IR11
iC7-60SAIN05-880A	838	820	902	681	1022	1158	560	450	910	IM/IR11
iC7-60SAIN05-1000	940	920	1012	764	1146	1299	630	500	1024	2xIM/IR10
iC7-60SAIN05-1100	1052	1030	1133	855	1283	1454	710	560	1153	2xIM/IR10
iC7-60SAIN05-1260	1174	1150	1265	960	1440	1632	800	630	1300	2xIM/IR11
iC7-60SAIN05-1450	1328	1300	1430	1080	1620	1836	900	710	1461	2xIM/IR11
iC7-60SAIN05-1710	1603	1570	1727	1310	1965	2227	1100	900	1787	2xIM/IR11
iC7-60SAIN05-1760	1787	1750	1925	1470	2205	2499	1200	1000	1949	3xIM/IR11
iC7-60SAIN05-1960	1940	1900	2090	1580	2370	2686	1300	1100	2112	3xIM/IR11
iC7-60SAIN05-2150	2083	2040	2244	1700	2550	2890	1400	1100	2273	3xIM/IR11
iC7-60SAIN05-2510	2389	2340	2574	1950	2925	3315	1600	1300	2598	3xIM/IR11
iC7-60SAIN05-2640	2532	2480	2728	2060	3090	3502	1700	1400	2760	4xIM/IR11
iC7-60SAIN05-2880	2685	2630	2893	2190	3285	3723	1800	1500	2922	4xIM/IR11
iC7-60SAIN05-3280	3114	3050	3355	2540	3810	4318	2000	1700	3246	4xIM/IR11
iC7-60SAIN05-3600	3573	3500	3850	2910	4365	4947	2400	1900	3897	5xIM/IR11
iC7-60SAIN05-4060	3859	3780	4158	3140	4710	5338	2600	2100	4221	5xIM/IR11
iC7-60SAIN05-4320	4176	4090	4499	3400	5100	5780	2800	2300	4546	6xIM/IR11
iC7-60SAIN05-4870	4625	4530	4983	3760	5640	6392	3100	2600	5033	6xIM/IR11

I_L : Low overload base current, allows for 110% overload for 1 minute duration every 5 minutes

I_H : High overload base current, allows for 150% overload for 1 minute duration every 5 minutes

OL: Overload

Inverter module

525 V AC, 640-900 V DC

Model code	AC current						Typical motor power 525 V AC		DC current	Frame
	I_N	$I_L (1/5)$	$I_L-OL (1/5)$	$I_H (1/5)$	$I_H-OL (1/5)$	$I_{max} (3s)$	P_L	P_H	I_N-D_C	IP00
	[A]	[A]	[A]	[A]	[A]	[A]	[kW]	[kW]	[A]	
iC7-60SAIN07-261A	267	261	288	217	326	369	160	132	249	IM/IR10
iC7-60SAIN07-325A	332	325	358	270	405	459	200	160	311	IM/IR10
iC7-60SAIN07-365A	373	365	402	300	450	510	250	200	387	IM/IR10
iC7-60SAIN07-416A	425	416	458	345	518	587	315	250	489	IM/IR10
iC7-60SAIN07-465A	475	465	512	386	579	657	315	250	489	IM/IR11
iC7-60SAIN07-525A	536	525	578	436	654	742	355	315	549	IM/IR11
iC7-60SAIN07-590A	603	590	649	490	735	833	400	355	620	IM/IR11
iC7-60SAIN07-650A	664	650	715	540	810	918	450	400	696	2xIM/IR10
iC7-60SAIN07-730A	746	730	803	605	908	1029	500	450	774	2xIM/IR10
iC7-60SAIN07-820A	838	820	902	680	1020	1156	560	500	867	2xIM/IR10
iC7-60SAIN07-945A	965	945	1040	785	1178	1335	710	560	1098	2xIM/IR11
iC7-60SAIN07-1060	1083	1060	1166	880	1320	1496	800	630	1238	2xIM/IR11
iC7-60SAIN07-1180	1205	1180	1298	980	1470	1666	900	710	1392	2xIM/IR11
iC7-60SAIN07-1300	1328	1300	1430	1080	1620	1836	1000	800	1547	3xIM/IR11
iC7-60SAIN07-1500	1532	1500	1650	1245	1868	2117	1100	900	1702	3xIM/IR11
iC7-60SAIN07-1770	1807	1770	1947	1470	2205	2499	1300	1100	2011	3xIM/IR11
iC7-60SAIN07-1950	1991	1950	2145	1620	2430	2754	1400	1200	2165	4xIM/IR11
iC7-60SAIN07-2360	2410	2360	2596	1960	2940	3332	1700	1400	2629	4xIM/IR11
iC7-60SAIN07-2600	2655	2600	2860	2160	3240	3672	1900	1600	2938	5xIM/IR11
iC7-60SAIN07-2950	3012	2950	3245	2450	3675	4165	2200	1800	3402	5xIM/IR11
iC7-60SAIN07-3250	3318	3250	3575	2700	4050	4590	2400	2000	3711	6xIM/IR11
iC7-60SAIN07-3540	3614	3540	3894	2940	4410	4998	2600	2200	4020	6xIM/IR11
iC7-60SAIN07-3800	3879	3800	4180	3150	4725	5355	2800	2300	4329	7xIM/IR11
iC7-60SAIN07-4130	4216	4130	4543	3430	5145	5831	3100	2500	4793	7xIM/IR11
iC7-60SAIN07-4400	4492	4400	4840	3650	5475	6205	3300	2700	5102	8xIM/IR11
iC7-60SAIN07-4720	4819	4720	5192	3920	5880	6664	3500	2900	5411	8xIM/IR11

I_L : Low overload base current, allows for 110% overload for 1 minute duration every 5 minutes

I_H : High overload base current, allows for 150% overload for 1 minute duration every 5 minutes

OL: Overload

Inverter module

575 V AC, 640-900 V DC

Model code	AC current						Typical motor power 575 V AC		DC current	Frame
	I _N	I _{L (1/5)}	I _{L-OL (1/5)}	I _{H (1/5)}	I _{H-OL (1/5)}	I _{max (3s)}	P _L	P _H	I _{N-DC}	IP00
	[A]	[A]	[A]	[A]	[A]	[A]	[HP]	[HP]	[A]	
iC7-60SAIN07-261A	267	261	288	217	326	369	250	200	255	IM/IR10
iC7-60SAIN07-325A	332	325	358	270	405	459	300	250	304	IM/IR10
iC7-60SAIN07-365A	373	365	402	300	450	510	350	300	354	IM/IR10
iC7-60SAIN07-416A	425	416	458	345	518	587	400	350	404	IM/IR10
iC7-60SAIN07-465A	475	465	512	386	579	657	450	400	456	IM/IR11
iC7-60SAIN07-525A	536	525	578	436	654	742	500	450	505	IM/IR11
iC7-60SAIN07-590A	603	590	649	490	735	833	600	500	607	IM/IR11
iC7-60SAIN07-650A	664	650	715	540	810	918	650	550	657	2xIM/IR10
iC7-60SAIN07-730A	746	730	803	605	908	1029	750	600	759	2xIM/IR10
iC7-60SAIN07-820A	838	820	902	680	1020	1156	800	700	809	2xIM/IR10
iC7-60SAIN07-945A	965	945	1040	785	1178	1335	950	800	960	2xIM/IR11
iC7-60SAIN07-1060	1083	1060	1166	880	1320	1496	1100	900	1112	2xIM/IR11
iC7-60SAIN07-1180	1205	1180	1298	980	1470	1666	1200	1000	1212	2xIM/IR11
iC7-60SAIN07-1300	1328	1300	1430	1080	1620	1836	1300	1100	1313	3xIM/IR11
iC7-60SAIN07-1500	1532	1500	1650	1245	1868	2117	1500	1300	1514	3xIM/IR11
iC7-60SAIN07-1770	1807	1770	1947	1470	2205	2499	1800	1500	1818	3xIM/IR11
iC7-60SAIN07-1950	1991	1950	2145	1620	2430	2754	2000	1700	2019	4xIM/IR11
iC7-60SAIN07-2360	2410	2360	2596	1960	2940	3332	2400	2000	2421	4xIM/IR11
iC7-60SAIN07-2600	2655	2600	2860	2160	3240	3672	2700	2200	2725	5xIM/IR11
iC7-60SAIN07-2950	3012	2950	3245	2450	3675	4165	3100	2600	3129	5xIM/IR11
iC7-60SAIN07-3250	3318	3250	3575	2700	4050	4590	3400	2800	3431	6xIM/IR11
iC7-60SAIN07-3540	3614	3540	3894	2940	4410	4998	3700	3100	3734	6xIM/IR11
iC7-60SAIN07-3800	3879	3800	4180	3150	4725	5355	4000	3300	4036	7xIM/IR11
iC7-60SAIN07-4130	4216	4130	4543	3430	5145	5831	4300	3600	4340	7xIM/IR11
iC7-60SAIN07-4400	4492	4400	4840	3650	5475	6205	4600	3800	4642	8xIM/IR11
iC7-60SAIN07-4720	4819	4720	5192	3920	5880	6664	5000	4100	5046	8xIM/IR11

I_L: Low overload base current, allows for 110% overload for 1 minute duration every 5 minutes

I_H: High overload base current, allows for 150% overload for 1 minute duration every 5 minutes

OL: Overload

Inverter module

690 V AC, 690-1100 V DC

Model code	AC current						Typical motor power 690 V AC		DC current	Frame
	I_N	$I_L (1/5)$	$I_L-OL (1/5)$	$I_H (1/5)$	$I_H-OL (1/5)$	$I_{max} (3s)$	P_L	P_H	I_N-D_C	IP00
	[A]	[A]	[A]	[A]	[A]	[A]	[kW]	[kW]	[A]	
iC7-60SAIN07-261A	267	261	288	217	326	369	250	200	296	IM/IR10
iC7-60SAIN07-325A	332	325	358	270	405	459	315	250	372	IM/IR10
iC7-60SAIN07-365A	373	365	402	300	450	510	355	250	418	IM/IR10
iC7-60SAIN07-416A	425	416	458	345	518	587	400	315	472	IM/IR10
iC7-60SAIN07-465A	475	465	512	386	579	657	450	355	530	IM/IR11
iC7-60SAIN07-525A	536	525	578	436	654	742	500	400	589	IM/IR11
iC7-60SAIN07-590A	603	590	649	490	735	833	560	450	660	IM/IR11
iC7-60SAIN07-650A	664	650	715	540	810	918	630	500	742	2xIM/IR10
iC7-60SAIN07-730A	746	730	803	605	908	1029	710	560	836	2xIM/IR10
iC7-60SAIN07-820A	838	820	902	680	1020	1156	800	630	942	2xIM/IR10
iC7-60SAIN07-945A	965	945	1040	785	1178	1335	900	710	1059	2xIM/IR11
iC7-60SAIN07-1060	1083	1060	1166	880	1320	1496	1000	800	1177	2xIM/IR11
iC7-60SAIN07-1180	1205	1180	1298	980	1470	1666	1100	900	1295	2xIM/IR11
iC7-60SAIN07-1300	1328	1300	1430	1080	1620	1836	1200	1000	1412	3xIM/IR11
iC7-60SAIN07-1500	1532	1500	1650	1245	1868	2117	1400	1200	1647	3xIM/IR11
iC7-60SAIN07-1770	1807	1770	1947	1470	2205	2499	1600	1400	1882	3xIM/IR11
iC7-60SAIN07-1950	1991	1950	2145	1620	2430	2754	1800	1500	2118	4xIM/IR11
iC7-60SAIN07-2360	2410	2360	2596	1960	2940	3332	2200	1800	2589	4xIM/IR11
iC7-60SAIN07-2600	2655	2600	2860	2160	3240	3672	2400	2000	2824	5xIM/IR11
iC7-60SAIN07-2950	3012	2950	3245	2450	3675	4165	2800	2300	3294	5xIM/IR11
iC7-60SAIN07-3250	3318	3250	3575	2700	4050	4590	3000	2600	3529	6xIM/IR11
iC7-60SAIN07-3540	3614	3540	3894	2940	4410	4998	3300	2800	3882	6xIM/IR11
iC7-60SAIN07-3800	3879	3800	4180	3150	4725	5355	3600	3000	4235	7xIM/IR11
iC7-60SAIN07-4130	4216	4130	4543	3430	5145	5831	3900	3300	4588	7xIM/IR11
iC7-60SAIN07-4400	4492	4400	4840	3650	5475	6205	4200	3500	4941	8xIM/IR11
iC7-60SAIN07-4720	4819	4720	5192	3920	5880	6664	4500	3700	5293	8xIM/IR11

I_L : Low overload base current, allows for 110% overload for 1 minute duration every 5 minutes

I_H : High overload base current, allows for 150% overload for 1 minute duration every 5 minutes

OL: Overload



AFE modules



AFE module and LCL filter

The AFE unit is a bi-directional low harmonic supply unit for motor drive applications. Active front end is typically used as a supply to a common DC bus drive line-ups or high power single drives when low harmonics or regeneration of power back to the grid is needed/valued. The main functionality of the AFE is to maintain stable DC-link voltage reference. The AFE transfers power between the grid and the DC bus both ways depending on the load of the DC bus.

To enable low-harmonic and regenerative capabilities, install LCL Filter OF7Z3 on the grid side of each AFE power unit, according to frame.

Benefits of the AFE

- Regenerative energy is fed back to the grid, improving the payback time of the investment. Regeneration at full power is available at any time.
- The AFE can boost the DC-link voltage within the voltage window of the converter hardware. Its advantage is that the DC-voltage available for motor inverters is not limited even under non-ideal grid conditions.

- Power quality is excellent since the grid current is sinusoidal with very low harmonics (<5% THDi) and power factor is unity ($\cos \varphi = 1$). Avoid oversizing incoming supply transformers, as for traditional diode rectifiers, to reduce investment cost and space.

Ratings

- The 690 V voltage class supports large systems and is ideal for high-power industrial applications like marine, mining, or heavy manufacturing
- 317-4900 A_{ILr} +10% overload 1 min/5 min – 380-500 V AC/ 465-740 V DC
- 236-4240 A_{ILr} +10% overload 1 min/5 min – 525-690 V AC/ 640-1100 V DC
- 45-66 Hz Grid frequency
- THDi <5%
- Fundamental power factor $\cos \varphi = 1$, adjustable reactive current set point

Highlights

- Most compact AFE on the market
- Meets the most stringent harmonics requirements thanks to high DC and AC power quality
- Robust and reliable in varying ambient conditions

- IP54/Type 12 segregated main cooling channel supporting back-channel cooling solutions
- Designed for enclosure integration and quick serviceability
- Direct connection between LCL filter and AFE input terminals
- Slide-in philosophy for easy power unit and LCL filter installation and removal

DC-bus and grid control

- Fast primary control ensures stable DC voltage even under non-ideal grid conditions for accurate motor control.
- AFE is able to boost DC voltage to guarantee full motor voltage even when the supply voltage is below nominal.
- Low harmonic operation meets even the stringest power quality requirements for drive systems.
- Reactive reference can be used to compensate other low power factor equipment in the network.
- Build large drive systems with simple system architecture: Connect power units in parallel and control them with a single control unit
- Increase process uptime thanks to built-in redundancy in AFEs consisting of multiple power units

Active front-end modules (AFE)

AFE 400 V AC, 465-650 VDC

Model code	AC ratings				DC ratings			Frame	LCL
	S_N	$I_{N(1/5)}$	$I_{L(1/5)}$	$I_{H(1/5)}$	I_{N-DC}	P_L	P_H	IP00	IP00
	[KVA]	[A]	[A]	[A]	[A]	[kW]	[kW]		
iC7-60SA3A05-317AE00	220	324	317	263	371	216	179	AM/AR10	LCL10
iC7-60SA3A05-400AE00	278	409	400	327	469	272	223	AM/AR10	LCL10
iC7-60SA3A05-514AE00	357	525	514	426	602	349	290	AM/AR10	LCL10
iC7-60SA3A05-580AE00	402	593	580	464	677	394	316	AM/AR11	LCL11
iC7-60SA3A05-650AE00	451	664	650	525	760	442	357	AM/AR11	LCL11
iC7-60SA3A05-730AE00	506	746	730	591	852	496	402	AM/AR11	LCL11
iC7-60SA3A05-816AE00	566	833	816	678	953	555	461	AM/AR11	LCL11
iC7-60SA3A05-920AE00	638	940	920	735	1075	625	500	2xAM/AR10	2xLCL10
iC7-60SA3A05-1030E00	714	1052	1030	850	1203	700	578	2xAM/AR10	2xLCL10
iC7-60SA3A05-1210E00	839	1236	1210	980	1413	822	666	2xAM/AR11	2xLCL11
iC7-60SA3A05-1410E00	977	1440	1410	1140	1647	958	775	2xAM/AR11	2xLCL11
iC7-60SA3A05-1630E00	1130	1664	1630	1360	1903	1107	924	2xAM/AR11	2xLCL11
iC7-60SA3A05-1860E00	1289	1899	1860	1575	2172	1263	1070	3xAM/AR11	3xLCL11
iC7-60SA3A05-2120E00	1469	2165	2120	1838	2475	1440	1248	3xAM/AR11	3xLCL11
iC7-60SA3A05-2450E00	1698	2501	2450	2030	2861	1664	1379	3xAM/AR11	3xLCL11
iC7-60SA3A05-2800E00	1940	2859	2800	2231	3268	1902	1515	4xAM/AR11	4xLCL11
iC7-60SA3A05-3270E00	2266	3338	3270	2710	3817	2221	1840	4xAM/AR11	4xLCL11
iC7-60SA3A05-3650E00	2529	3726	3650	2888	4260	2479	1961	5xAM/AR11	5xLCL11
iC7-60SA3A05-4080E00	2827	4165	4080	3390	4761	2771	2302	5xAM/AR11	5xLCL11
iC7-60SA3A05-4500E00	3118	4594	4500	3544	5251	3056	2407	6xAM/AR11	6xLCL11
iC7-60SA3A05-4900E00	3395	5002	4900	4070	5719	3327	2764	6xAM/AR11	6xLCL11

I_L : Low overload base current, allows for 110% overload for 1 minute duration every 5 minutes

I_H : High overload base current, allows for 150% overload for 1 minute duration every 5 minutes

Active front-end modules (AFE)

AFE 480 V AC, 650-740 V DC

Model code	AC ratings				DC ratings			Frame	LCL
	S_N	$I_{N(1/5)}$	$I_{L(1/5)}$	$I_{H(1/5)}$	I_{N-DC}	P_L	P_H	IP00	IP00
	[KVA]	[A]	[A]	[A]	[A]	[kW]	[kW]		
iC7-60SA3A05-317AE00	257	316	309	256	361	252	209	AM/AR10	LCL10
iC7-60SA3A05-400AE00	316	388	380	298	445	310	243	AM/AR10	LCL10
iC7-60SA3A05-514AE00	385	473	463	385	542	378	314	AM/AR10	LCL10
iC7-60SA3A05-580AE00	433	531	520	424	608	424	346	AM/AR11	LCL11
iC7-60SA3A05-650AE00	487	598	585	470	684	477	383	AM/AR11	LCL11
iC7-60SA3A05-730AE00	541	664	650	511	759	530	417	AM/AR11	LCL11
iC7-60SA3A05-816AE00	608	747	731	607	853	596	495	AM/AR11	LCL11
iC7-60SA3A05-920AE00	686	843	825	639	964	673	521	2xAM/AR10	2xLCL10
iC7-60SA3A05-1030E00	774	950	930	770	1086	758	628	2xAM/AR10	2xLCL10
iC7-60SA3A05-1150E00	898	1103	1080	880	1262	880	717	2xAM/AR11	2xLCL11
iC7-60SA3A05-1280E00	1040	1276	1250	1030	1460	1019	840	2xAM/AR11	2xLCL11
iC7-60SA3A05-1630E00	1214	1491	1460	1210	1705	1190	986	2xAM/AR11	2xLCL11
iC7-60SA3A05-1860E00	1389	1705	1670	1363	1949	1361	1111	3xAM/AR11	3xLCL11
iC7-60SA3A05-2120E00	1588	1950	1910	1533	2230	1557	1250	3xAM/AR11	3xLCL11
iC7-60SA3A05-2450E00	1821	2236	2190	1820	2557	1785	1483	3xAM/AR11	3xLCL11
iC7-60SA3A05-2800E00	2087	2563	2510	1874	2930	2046	1527	4xAM/AR11	4xLCL11
iC7-60SA3A05-3270E00	2428	2981	2920	2430	3408	2380	1980	4xAM/AR11	4xLCL11
iC7-60SA3A05-3650E00	2736	3359	3290	2726	3840	2681	2222	5xAM/AR11	5xLCL11
iC7-60SA3A05-4080E00	3035	3726	3650	3030	4260	2974	2469	5xAM/AR11	5xLCL11
iC7-60SA3A05-4500E00	3334	4094	4010	3152	4681	3268	2569	6xAM/AR11	6xLCL11
iC7-60SA3A05-4900E00	3650	4482	4390	3640	5124	3577	2966	6xAM/AR11	6xLCL11

I_L : Low overload base current, allows for 110% overload for 1 minute duration every 5 minutes

I_H : High overload base current, allows for 150% overload for 1 minute duration every 5 minutes

Active front-end modules (AFE)

AFE 525 V AC, 640-900 V DC

Model code	AC ratings				DC ratings			Frame	LCL
	S_L	$I_{N(1/5)}$	$I_{L(1/5)}$	$I_{H(1/5)}$	I_{N-DC}	P_L	P_H	IP00	IP00
	[KVA]	[A]	[A]	[A]	[A]	[kW]	[kW]		
iC7-60SA3A07-236A	215	241	236	196	276	211	175	AM/AR10	LCL10
iC7-60SA3A07-300A	273	307	300	249	351	268	222	AM/AR10	LCL10
iC7-60SA3A07-334A	304	341	334	278	390	298	248	AM/AR10	LCL10
iC7-60SA3A07-380A	346	388	380	316	444	339	282	AM/AR10	LCL10
iC7-60SA3A07-425A	387	434	425	353	497	379	315	AM/AR11	LCL11
iC7-60SA3A07-475A	432	485	475	394	556	424	352	AM/AR11	LCL11
iC7-60SA3A07-530A	482	542	530	440	620	473	393	AM/AR11	LCL11
iC7-60SA3A07-595A	542	608	595	494	696	531	441	2xAM/AR10	2xLCL10
iC7-60SA3A07-670A	610	684	670	556	783	598	496	2xAM/AR10	2xLCL10
iC7-60SA3A07-760A	692	776	760	631	888	678	563	2xAM/AR10	2xLCL10
iC7-60SA3A07-850A	773	868	850	706	993	758	630	2xAM/AR11	2xLCL11
iC7-60SA3A07-945A	860	965	945	784	1104	843	699	2xAM/AR11	2xLCL11
iC7-60SA3A07-1060A	964	1083	1060	863	1238	945	770	2xAM/AR11	2xLCL11
iC7-60SA3A07-1190A	1083	1215	1190	988	1390	1061	881	3xAM/AR11	3xLCL11
iC7-60SA3A07-1325A	1205	1353	1325	1100	1547	1181	981	3xAM/AR11	3xLCL11
iC7-60SA3A07-1590A	1446	1624	1590	1295	1857	1417	1155	3xAM/AR11	3xLCL11
iC7-60SA3A07-1780A	1619	1817	1780	1477	2078	1587	1317	4xAM/AR11	4xLCL11
iC7-60SA3A07-2120A	1928	2165	2120	1725	2475	1890	1538	4xAM/AR11	4xLCL11
iC7-60SA3A07-2380A	2165	2430	2380	1975	2777	2121	1761	5xAM/AR11	5xLCL11
iC7-60SA3A07-2650A	2410	2706	2650	2160	3093	2362	1925	5xAM/AR11	5xLCL11
iC7-60SA3A07-2970A	2701	3032	2970	2465	3466	2647	2197	6xAM/AR11	6xLCL11
iC7-60SA3A07-3180A	2892	3247	3180	2590	3711	2834	2309	6xAM/AR11	6xLCL11
iC7-60SA3A07-3350A	3047	3420	3350	2781	3910	2986	2479	7xAM/AR11	7xLCL11
iC7-60SA3A07-3710A	3374	3788	3710	2988	4330	3307	2663	7xAM/AR11	7xLCL11
iC7-60SA3A07-4000A	3638	4084	4000	3320	4668	3565	2959	8xAM/AR11	8xLCL11
iC7-60SA3A07-4240A	3856	4329	4240	3403	4948	3779	3033	8xAM/AR11	8xLCL11

I_L : Low overload base current, allows for 110% overload for 1 minute duration every 5 minutes

I_H : High overload base current, allows for 150% overload for 1 minute duration every 5 minutes

Active front-end modules (AFE)

AFE 600 V AC, 640-980 V DC

Model code	AC ratings				DC ratings			Frame	LCL
	S_L	$I_{N(1/5)}$	$I_{L(1/5)}$	$I_{H(1/5)}$	I_{N-DC}	P_L	P_H	IP00	IP00
	[KVA]	[A]	[A]	[A]	[A]	[kW]	[kW]		
iC7-60SA3A07-236A	246	241	236	196	277	241	200	AM/AR10	LCL10
iC7-60SA3A07-300A	312	307	300	249	351	306	254	AM/AR10	LCL10
iC7-60SA3A07-334A	348	341	334	278	391	341	284	AM/AR10	LCL10
iC7-60SA3A07-380A	395	388	380	316	445	388	322	AM/AR10	LCL10
iC7-60SA3A07-425A	442	434	425	353	497	433	360	AM/AR11	LCL11
iC7-60SA3A07-475A	494	485	475	394	555	484	402	AM/AR11	LCL11
iC7-60SA3A07-530A	551	542	530	440	619	540	449	AM/AR11	LCL11
iC7-60SA3A07-595A	619	608	595	494	695	606	504	2xAM/AR10	2xLCL10
iC7-60SA3A07-670A	697	684	670	556	783	683	567	2xAM/AR10	2xLCL10
iC7-60SA3A07-760A	790	776	760	631	888	775	643	2xAM/AR10	2xLCL10
iC7-60SA3A07-850A	884	868	850	706	993	866	720	2xAM/AR11	2xLCL11
iC7-60SA3A07-945A	983	965	945	784	1104	963	799	2xAM/AR11	2xLCL11
iC7-60SA3A07-1060A	1102	1083	1060	863	1237	1080	879	2xAM/AR11	2xLCL11
iC7-60SA3A07-1190A	1237	1215	1190	988	1390	1212	1007	3xAM/AR11	3xLCL11
iC7-60SA3A07-1325A	1377	1353	1325	1100	1547	1350	1121	3xAM/AR11	3xLCL11
iC7-60SA3A07-1590A	1653	1624	1590	1295	1856	1620	1319	3xAM/AR11	3xLCL11
iC7-60SA3A07-1780A	1850	1817	1780	1477	2078	1813	1505	4xAM/AR11	4xLCL11
iC7-60SA3A07-2120A	2204	2165	2120	1725	2474	2160	1757	4xAM/AR11	4xLCL11
iC7-60SA3A07-2380A	2474	2430	2380	1975	2778	2424	2012	5xAM/AR11	5xLCL11
iC7-60SA3A07-2650A	2754	2706	2650	2160	3093	2699	2200	5xAM/AR11	5xLCL11
iC7-60SA3A07-2970A	3087	3032	2970	2465	3466	3025	2511	6xAM/AR11	6xLCL11
iC7-60SA3A07-3180A	3305	3247	3180	2590	3711	3239	2638	6xAM/AR11	6xLCL11
iC7-60SA3A07-3350A	3482	3420	3350	2781	3910	3412	2833	7xAM/AR11	7xLCL11
iC7-60SA3A07-3710A	3856	3788	3710	2988	4329	3779	3044	7xAM/AR11	7xLCL11
iC7-60SA3A07-4000A	4157	4084	4000	3320	4668	4074	3382	8xAM/AR11	8xLCL11
iC7-60SA3A07-4240A	4407	4329	4240	3403	4948	4319	3466	8xAM/AR11	8xLCL11

I_L : Low overload base current, allows for 110% overload for 1 minute duration every 5 minutes

I_H : High overload base current, allows for 150% overload for 1 minute duration every 5 minutes

Active front-end modules (AFE)

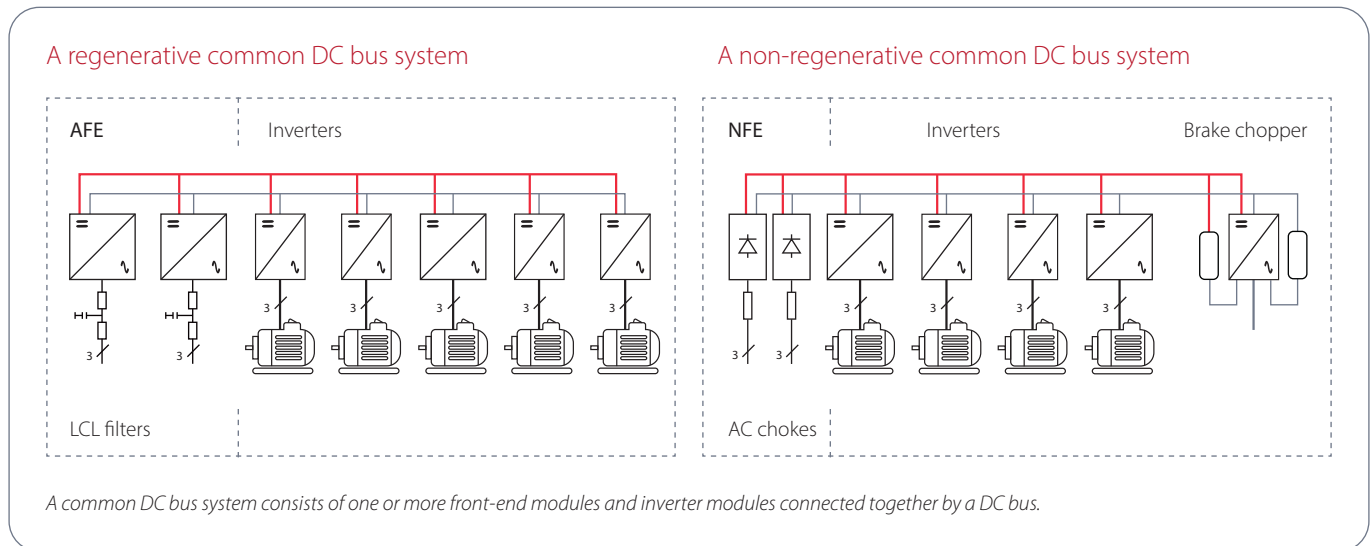
AFE 690 V AC, 690-1100 V DC

Model code	AC ratings				DC ratings			Frame	LCL
	S_L	$I_{N(1/5)}$	$I_{L(1/5)}$	$I_{H(1/5)}$	I_{N-DC}	P_L	P_H	IP00	IP00
	[KVA]	[A]	[A]	[A]	[A]	[kW]	[kW]		
iC7-60SA3A07-236A	283	241	236	196	277	277	230	AM/AR10	LCL10
iC7-60SA3A07-300A	359	307	300	249	351	352	292	AM/AR10	LCL10
iC7-60SA3A07-334A	400	341	334	278	391	392	326	AM/AR10	LCL10
iC7-60SA3A07-380A	455	388	380	316	445	446	371	AM/AR10	LCL10
iC7-60SA3A07-425A	508	434	425	353	497	498	414	AM/AR11	LCL11
iC7-60SA3A07-475A	568	485	475	394	555	557	462	AM/AR11	LCL11
iC7-60SA3A07-530A	634	542	530	440	619	621	516	AM/AR11	LCL11
iC7-60SA3A07-595A	712	608	595	494	695	697	579	2xAM/AR10	2xLCL10
iC7-60SA3A07-670A	801	684	670	556	783	785	652	2xAM/AR10	2xLCL10
iC7-60SA3A07-760A	909	776	760	631	888	891	740	2xAM/AR10	2xLCL10
iC7-60SA3A07-850A	1016	868	850	706	993	996	827	2xAM/AR11	2xLCL11
iC7-60SA3A07-945A	1130	965	945	784	1103	1107	919	2xAM/AR11	2xLCL11
iC7-60SA3A07-1060A	1267	1083	1060	863	1238	1242	1011	2xAM/AR11	2xLCL11
iC7-60SA3A07-1190A	1423	1215	1190	988	1389	1394	1158	3xAM/AR11	3xLCL11
iC7-60SA3A07-1325A	1584	1353	1325	1100	1547	1552	1289	3xAM/AR11	3xLCL11
iC7-60SA3A07-1590A	1901	1624	1590	1295	1856	1863	1517	3xAM/AR11	3xLCL11
iC7-60SA3A07-1780A	2128	1817	1780	1477	2078	2085	1730	4xAM/AR11	4xLCL11
iC7-60SA3A07-2120A	2534	2165	2120	1725	2475	2483	2021	4xAM/AR11	4xLCL11
iC7-60SA3A07-2380A	2845	2430	2380	1975	2778	2788	2314	5xAM/AR11	5xLCL11
iC7-60SA3A07-2650A	3168	2706	2650	2160	3093	3104	2530	5xAM/AR11	5xLCL11
iC7-60SA3A07-2970A	3550	3032	2970	2465	3466	3479	2888	6xAM/AR11	6xLCL11
iC7-60SA3A07-3180A	3801	3247	3180	2590	3711	3725	3034	6xAM/AR11	6xLCL11
iC7-60SA3A07-3350A	4004	3420	3350	2781	3910	3924	3258	7xAM/AR11	7xLCL11
iC7-60SA3A07-3710A	4434	3788	3710	2988	4330	4346	3500	7xAM/AR11	7xLCL11
iC7-60SA3A07-4000A	4781	4084	4000	3320	4668	4685	3889	8xAM/AR11	8xLCL11
iC7-60SA3A07-4240A	5068	4329	4240	3403	4949	4966	3986	8xAM/AR11	8xLCL11

I_L : Low overload base current, allows for 110% overload for 1 minute duration every 5 minutes

I_H : High overload base current, allows for 150% overload for 1 minute duration every 5 minutes

Non-regenerative front-end (NFE) modules



The non-regenerative front-end (NFE) unit is a unidirectional supply unit for motor drive applications. It is typically used as a supply to a common DC bus line-up or individual high-power drives where regeneration of power back to the grid is not required. The main functionality of the NFE is to maintain a stable DC-link voltage while ensuring efficient and robust operation of the connected drives. Power flows one way only – from the grid to the DC bus. The iC7-Automation NFE unit comes with an inbuilt AC choke for reduced harmonics and improved power quality, and an integrated pre-charging function for safe and controlled charging of the DC link.

Benefits of the NFE

- Simple and cost-effective solution for applications with no regenerative braking requirement
- Reliable DC supply ensures stable operation of all connected inverters
- Integrated AC choke reduces current harmonics and increases system robustness

- Integrated re-charging functionality ensures safe DC-link charging without external components
- Compact design saves space and simplifies system integration
- Easy engineering and installation with fewer components than regenerative solutions
- Lower investment and maintenance costs, thanks to proven rectifier technology

Ratings

- The 690 V voltage class supports large systems and is ideal for high-power industrial applications like marine, mining, or heavy manufacturing
- 694-6260 A_{IL}, +10% overload 1 min/5 min – 380-500 V AC/ 465-740 V DC
- 504-5750 A_L, +10% overload 1 min/5 min – 525-690 V AC/ 640-1100 V DC
- 45-66 Hz Grid frequency

Highlights

- Compact non-regenerative front end for easy system integration
- Built-in AC choke and pre-charging circuitry as standard
- Proven, robust rectifier technology ensuring reliable performance
- Meets typical grid requirements for non-regenerative installations
- Designed for straightforward service with slide-in unit handling
- Optimized cooling concept for long lifetime and dependable operation
- Scalable with multiple NFEs connected in parallel to supply one DC bus
- Redundancy feature to ensure high process uptime

Non-regenerative front-end (NFE) modules

NFE 380-440 V AC, 400 V AC

Model code	AC ratings				DC ratings			Frame
	S_L	$I_{N(1/5)}$	$I_{L(1/5)}$	$I_{H(1/5)}$	I_N-D_C	P_L	P_H	IP00
	[KVA]	[A]	[A]	[A]	[A]	[kW]	[kW]	
iC7-60SA3N05-694A	481	709	694	576	812	429	356	NR11
iC7-60SA3N05-869A	603	888	869	721	1017	537	446	NR11
iC7-60SA3N05-1094	758	1117	1094	908	1280	676	562	NR11
iC7-60SA3N05-1600	1109	1634	1600	1280	1871	989	791	2xNR11
iC7-60SA3N05-2090	1448	2134	2090	1730	2443	1291	1070	2xNR11
iC7-60SA3N05-2400	1920	2450	2400	1920	2804	1483	1187	3xNR11
iC7-60SA3N05-3130	2169	3196	3130	2600	3658	1934	1607	3xNR11
iC7-60SA3N05-4170	2890	4257	4170	3460	4873	2577	2139	4xNR11
iC7-60SA3N05-5210	3610	5319	5210	4330	6088	3219	2676	5xNR11
iC7-60SA3N05-6260	4338	6391	6260	5200	7313	3868	3214	6xNR11

I_L : Low overload base current, allows for 110% overload for 1 minute duration every 5 minutes

I_H : High overload base current, allows for 150% overload for 1 minute duration every 5 minutes

NFE 440-480 V AC, 480 V AC

Model code	AC ratings				DC ratings			Frame
	S_L	$I_{N(1/5)}$	$I_{L(1/5)}$	$I_{H(1/5)}$	I_N-D_C	P_L	P_H	IP00
	[KVA]	[A]	[A]	[A]	[A]	[kW]	[kW]	
iC7-60SA3N05-694A	577	709	694	661	812	515	428	NR11
iC7-60SA3N05-869A	723	888	869	826	1016	644	535	NR11
iC7-60SA3N05-1094	910	1117	1094	1041	1280	811	674	NR11
iC7-60SA3N05-1600	1331	1634	1600	1467	1871	1186	950	2xNR11
iC7-60SA3N05-2090	1738	2134	2090	1980	2442	1550	1283	2xNR11
iC7-60SA3N05-2400	1920	2450	2400	2198	2805	1780	1424	3xNR11
iC7-60SA3N05-3130	2603	3196	3130	2976	3658	2321	1928	3xNR11
iC7-60SA3N05-4170	3467	4257	4170	3960	4872	3092	2566	4xNR11
iC7-60SA3N05-5210	4332	5319	5210	4956	6087	3863	3211	5xNR11
iC7-60SA3N05-6260	5205	6391	6260	5951	7314	4642	3856	6xNR11

I_L : Low overload base current, allows for 110% overload for 1 minute duration every 5 minutes

I_H : High overload base current, allows for 150% overload for 1 minute duration every 5 minutes

Non-regenerative front-end (NFE) modules

NFE 480-500 V AC, 500 V AC

Model code	AC ratings				DC ratings			Frame
	S_L	$I_{N(1/5)}$	$I_{L(1/5)}$	$I_{H(1/5)}$	I_N-D_C	P_L	P_H	IP00
	[KVA]	[A]	[A]	[A]	[A]	[kW]	[kW]	
iC7-60SA3N05-694A	602	709	694	660	812	537	445	NR11
iC7-60SA3N05-869A	753	888	869	826	1017	671	557	NR11
iC7-60SA3N05-1094	948	1117	1094	1040	1279	845	702	NR11
iC7-60SA3N05-1600	1386	1634	1600	1466	1870	1236	989	2xNR11
iC7-60SA3N05-2090	1810	2134	2090	1981	2442	1614	1337	2xNR11
iC7-60SA3N05-2400	1920	2450	2400	2199	2805	1854	1484	3xNR11
iC7-60SA3N05-3130	2711	3196	3130	2977	3657	2418	2009	3xNR11
iC7-60SA3N05-4170	3612	4257	4170	3960	4872	3221	2673	4xNR11
iC7-60SA3N05-5210	4512	5319	5210	4956	6086	4024	3345	5xNR11
iC7-60SA3N05-6260	5422	6391	6260	5952	7313	4835	4017	6xNR11

I_L : Low overload base current, allows for 110% overload for 1 minute duration every 5 minutes

I_H : High overload base current, allows for 150% overload for 1 minute duration every 5 minutes

NFE 525-550 V AC, 525 V AC

Model code	AC ratings				DC ratings			Frame
	S_L	$I_{N(1/5)}$	$I_{L(1/5)}$	$I_{H(1/5)}$	I_N-D_C	P_L	P_H	IP00
	[KVA]	[A]	[A]	[A]	[A]	[kW]	[kW]	
iC7-60SA3N07-504A	459	515	504	482	590	409	341	NR11
iC7-60SA3N07-634A	577	648	634	607	741	515	430	NR11
iC7-60SA3N07-806A	733	823	806	768	943	654	544	NR11
iC7-60SA3N07-1007	916	1028	1007	963	1177	817	682	NR11
iC7-60SA3N07-1100	1001	1123	1100	1054	1286	893	747	2xNR11
iC7-60SA3N07-1500	1364	1532	1500	1431	1753	1217	1014	2xNR11
iC7-60SA3N07-1960	1783	2001	1960	1866	2290	1590	1322	2xNR11
iC7-60SA3N07-2300	2092	2348	2300	2175	2688	1866	1541	3xNR11
iC7-60SA3N07-2900	2638	2961	2900	2748	3388	2352	1947	3xNR11
iC7-60SA3N07-3850	3501	3931	3850	3663	4499	3123	2596	4xNR11
iC7-60SA3N07-4800	4365	4900	4800	4579	5608	3893	3245	5xNR11
iC7-60SA3N07-5750	5229	5870	5750	5437	6718	4664	3853	6xNR11

I_L : Low overload base current, allows for 110% overload for 1 minute duration every 5 minutes

I_H : High overload base current, allows for 150% overload for 1 minute duration every 5 minutes

Non-regenerative front-end (NFE) modules

NFE 550-600 V AC, 600 V AC

Model code	AC ratings				DC ratings			Frame
	S_L	$I_{N(1/5)}$	$I_{L(1/5)}$	$I_{H(1/5)}$	I_N-D_C	P_L	P_H	IP00
	[KVA]	[A]	[A]	[A]	[A]	[kW]	[kW]	
iC7-60SA3N07-504A	524	515	504	482	589	468	390	NR11
iC7-60SA3N07-634A	659	648	634	608	741	588	492	NR11
iC7-60SA3N07-806A	838	823	806	768	942	748	622	NR11
iC7-60SA3N07-1007	1047	1028	1007	962	1177	934	779	NR11
iC7-60SA3N07-1100	1144	1123	1100	1054	1286	1020	853	2xNR11
iC7-60SA3N07-1500	1559	1532	1500	1431	1754	1391	1159	2xNR11
iC7-60SA3N07-1960	2037	2001	1960	1866	2291	1817	1511	2xNR11
iC7-60SA3N07-2300	2391	2348	2300	2176	2688	2132	1762	3xNR11
iC7-60SA3N07-2900	3014	2961	2900	2747	3388	2688	2225	3xNR11
iC7-60SA3N07-3850	4002	3931	3850	3663	4498	3569	2967	4xNR11
iC7-60SA3N07-4800	4989	4900	4800	4578	5608	4450	3708	5xNR11
iC7-60SA3N07-5750	5976	5870	5750	5436	6718	5330	4403	6xNR11

I_L : Low overload base current, allows for 110% overload for 1 minute duration every 5 minutes

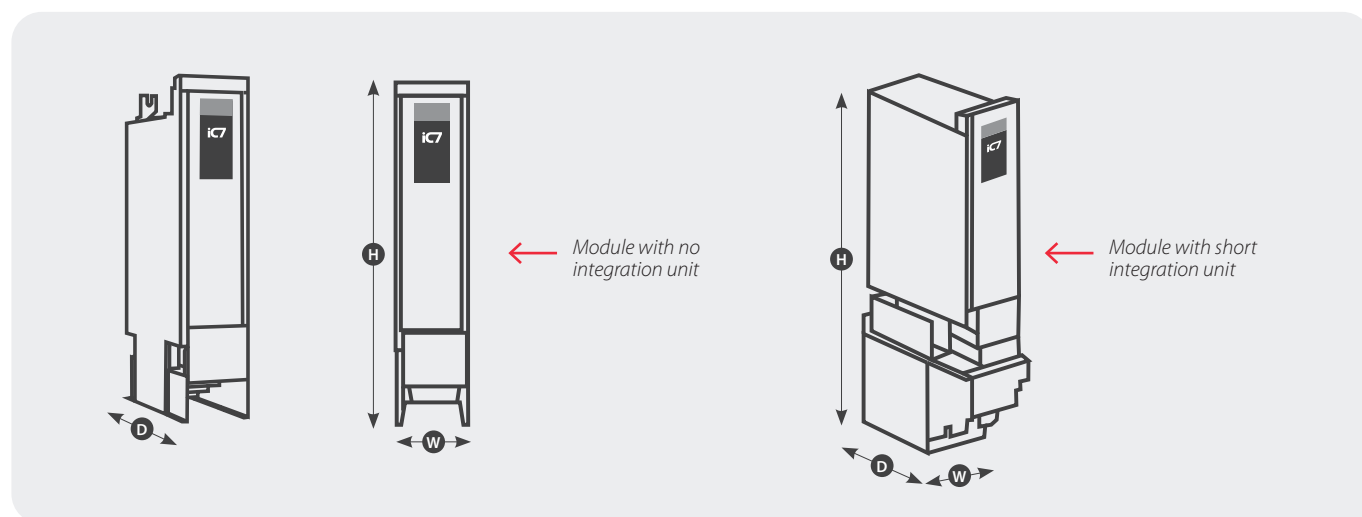
I_H : High overload base current, allows for 150% overload for 1 minute duration every 5 minutes

NFE 600-690 V AC, 690 V AC

Model code	AC ratings				DC ratings			Frame
	S_L	$I_{N(1/5)}$	$I_{L(1/5)}$	$I_{H(1/5)}$	I_N-D_C	P_L	P_H	IP00
	[KVA]	[A]	[A]	[A]	[A]	[kW]	[kW]	
iC7-60SA3N07-504A	603	515	504	481	590	538	448	NR11
iC7-60SA3N07-634A	758	648	634	607	741	676	565	NR11
iC7-60SA3N07-806A	964	823	806	768	942	860	715	NR11
iC7-60SA3N07-1007	1204	1028	1007	962	1177	1074	896	NR11
iC7-60SA3N07-1100	1315	1123	1100	1054	1286	1173	981	2xNR11
iC7-60SA3N07-1500	1793	1532	1500	1432	1754	1599	1333	2xNR11
iC7-60SA3N07-1960	2343	2001	1960	1866	2290	2090	1738	2xNR11
iC7-60SA3N07-2300	2749	2348	2300	2175	2688	2452	2026	3xNR11
iC7-60SA3N07-2900	3466	2961	2900	2748	3389	3092	2559	3xNR11
iC7-60SA3N07-3850	4602	3931	3850	3662	4499	4104	3411	4xNR11
iC7-60SA3N07-4800	5737	4900	4800	4578	5608	5117	4264	5xNR11
iC7-60SA3N07-5750	6872	5870	5750	5437	6718	6130	5064	6xNR11

I_L : Low overload base current, allows for 110% overload for 1 minute duration every 5 minutes

I_H : High overload base current, allows for 150% overload for 1 minute duration every 5 minutes



Dimensions and weight: Inverter and AFE modules, LCL filters

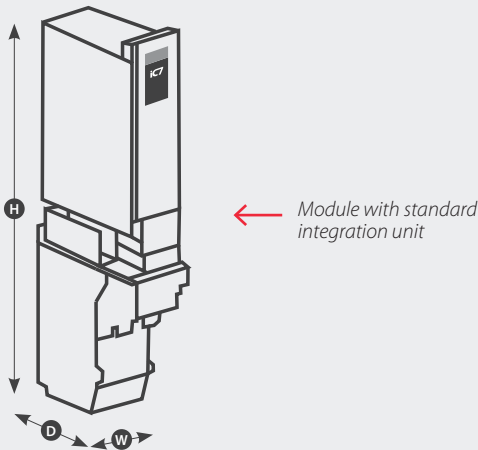
Module type		Inverter		AFE		LCL filters
Frame		IM10	IM11	AM10	AM11	LCL10/LCL11
[mm]	Width	170	210	170	210	260
	Height	990	990	990	990	1530
	Depth	502	502	502	502	553
[kg]	Weight	65	75	65	75	–
[in]	Width	6.7	8.3	6,7	8.3	10.2
	Height	39	39	39	39	60.2
	Depth	19.8	19.8	19.8	19.8	21.8
[lb]	Weight	143	165	143	165	–

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

Dimensions and weight: Inverter, AFE and NFE modules with short integration unit

Module type		Inverter with integration unit		AFE with integration unit		NFE with integration unit
Frame		IR10	IR11	AR10	AR11	NR11
[mm]	Width	235	235	235	235	235
	Height	1302	1302	921	921	921
	Depth	553	553	553	553	553
[kg]	Weight	90	100	72	82	125-145
[in]	Width	9.3	9.3	9.3	9.3	9.3
	Height	51.3	51.3	36.3	36.3	36.3
	Depth	21.8	21.8	21.8	21.8	21.8
[lb]	Weight	198	221	159	181	276-320

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



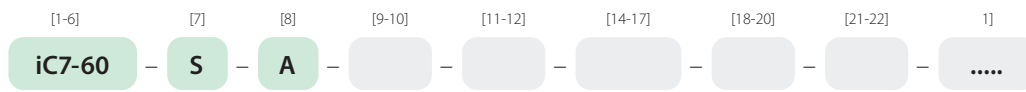
Dimensions and weight:
Inverter, AFE, and NFE modules with standard integration unit

Module type		Inverter with integration unit		AFE with integration unit		NFE with integration unit
Frame		IR10	IR11	AR10	AR11	NR11
[mm]	Width	235	235	235	235	235
	Height	1530	1530	1530	1530	1530
	Depth	553	553	553	553	553
[kg]	Weight	92	102	78	88	125-145
[in]	Width	9.3	9.3	9.3	235	235
	Height	60.2	60.2	60.2	1530	1530
	Depth	21.8	21.8	21.8	553	553
[lb]	Weight	202.8	224.9	172	194	276-320

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

Model code overview: iC7-Automation system modules

For more detailed information, refer to the Design Guide



[1-6] Product group (character 1-6)

iC7-60 Indication of product group performance

[7] Product category (character 7)

S System Module

[8] Cooling method (character 8)

A Air-cooled

[9-10] Product type (character 9-10)

3A 3~ regenerative, AFE

3H 3~ low harmonic AFE

IN Inverter module

3N Non-regenerative front-end, NFE

[11-12] Voltage rating (character 11-12)

05 380-500 V AC

07 525-690 V AC

[14-17] Nominal Amp rating ²⁾ (character 14-17)

-317A 317 A

-400A 400 A

-514A 514 A

... ..

-4900 4900 A

¹⁾ +codes identifying options

²⁾ See rating tables on pages 23-29

[18-20] Protection rating (character 18-20)

E00 IP00

[21-22] EMC Class (character 21-22)

F3 C3 category: industrial environment

F4 C4 category: System Component (IT Network)

[1] +code group

+Axxx Optional power hardware

+Bxxx Control hardware

+Cxxx Control options

+Dxxx Application software and additional functionality

+Exxx Customized settings (for reference only)

+AExx Optional power hardware: Integration unit options

Model code	Selection description	Inverters	AFE and NFE
+AEXX	None	X	X ³⁾
+AE01	Short, no filter	X	X
+AEC1	Short, with CM filter	X	–
+AE10	Standard, no filter	X	X
+AEU1	Standard, with dU/dt filter	X	–
+AEU2	Standard, with dU/dt and CM filter	X	–
+AEC2	Standard, with CM filter	X	–

³⁾ +AEXX not available for NFE

+BAxx Control hardware: Communication interface, X1/X2

Model code	Selection description	Inverters	AFE and NFE
+BAEL	Ethernet port, no protocol	X	X
+BAPR	PROFINET RT OS7PR	X	X
+BAMT	Modbus TCP OS7MT	X	X
+BAIP	Ethernet/IP OS7IP	X	X

+BExx Control hardware: Functional safety

Model code	Selection description	Inverters	AFE and NFE
+BEXX	None, not upgradable	X	X
+BEF2	STO, SSI-t	X	–

+Cxxx Control options (Option slots A to J)

Model code	Selection description	Inverters	Active Front Ends
+CXXX	None, without mounting plate	X	X
+CXX0	None	X	X
+CXC0	General Purpose I/O OC7C0	X	–
+CXC1	I/O and Relay Option OC7C1	X	X
+CXR0	Relay Option OC7R0	X	–
+CXM0	Encoder/Resolver Option OC7M0	X	–
+CXT0	Temperature Measurement OC7T0	X	X

See full list of options for each +code group in Design Guide

X indicates a standard selection
A dash (–) indicates that the selection is not available

Model code overview: LCL filters for AFE System modules

For more detailed information, refer to the Design Guide



[1-5] Product series <i>(character 1-5)</i>	
OF7Z3	LCL-Filter
[6] Product category <i>(character 6)</i>	
S	System Module
[7-9] Cooling method <i>(character 7-9)</i>	
-AF	Forced air
[10-12] Voltage class <i>(character 10-12)</i>	
-05	380-500 V AC
-07	525-690 V AC
[13-17] Current rating (I_{L1/5}) <i>(character 13-17)</i>	
-514A	514 A
-816A	816 A
-820A	820 A
[18-20] Thermal protection <i>(character 18-20)</i>	
-A1	AusBus thermal protection
[21-22] Enclosure class <i>(character 21-24)</i>	
-E00	IP00/Open Type
-C54	IP54/UL Type 12 cooling channel
[23-25] EMC class <i>(character 25-27)</i>	
-F3	C3 compliance
-F4	C4 compliance

 Available for iC7-Automation drives

Enclosed Drives

Need more freedom for streamlined integration?

iC7 series Enclosed Drives open up new application opportunities with flexible system integration in a wide range of industries.

Optimized for compact footprint, ease of use and fast serviceability, you can apply these drives to enhance motor control. A range of variants and options equip you to make precisely the right choices ensuring high performance and local compliance, including harmonic compliance.

Most importantly, you can count on the Enclosed Drives for exceptional reliability, being founded in fully traceable end-to-end quality processes.

Compact

Sophisticated heat management is a key factor endowing the Enclosed Drives with a compact footprint. These drives are equipped with heatpipe-based thermal management, optional back-channel cooling, and segregated main and auxiliary cooling channels. All of these technologies reduce the drive dimensions, enable reduction of air-conditioning load, and even enable you to cut down on space in the electrical room.

Versatile

iC7 Enclosed Drives are available in standard cabinet sizes, configured in the right variant to suit your application:

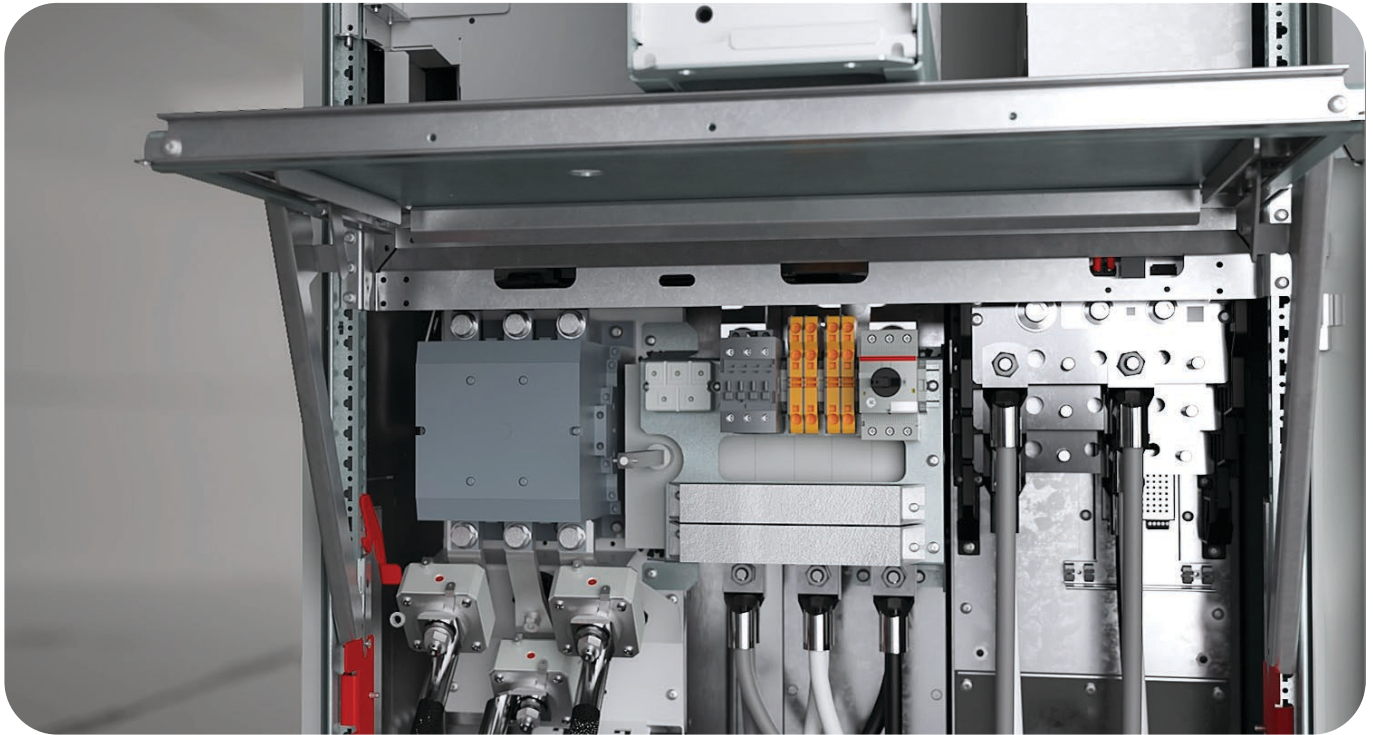
- 6-pulse, low-harmonic, and regenerative variants
- Wide range of options

HIGHLIGHTS

- > Streamlined system integration
- > Fast and safe service access
- > 6-pulse, low-harmonic, and regenerative variants
- > Intelligent heat management
- > Modular control
- > Small footprint thanks to cutting-edge heat management
- > Wide range of cabinet options
- > STO and SS1-t (SIL3) for full power range plus optional STO button on door







Scalability and speedy service

High power density cooling

You get high power density thanks to superior heat management using heatpipe technology and high-performance heat sinks. Closed air ducts enable flexible mounting, and back-channel cooling supports removal of heat to the surroundings without extra cooling equipment. Remove fans easily for cleaning and service.

Environmental exposure

The iC7 drive delivers exceptional performance under demanding operating conditions, according to the environmental standard IEC60721.

The ability to operate at ambient temperatures ranging from -15 °C to 40 °C (50 °C with derating) ensures

the drive meets a broad range of application requirements. With an altitude capability of up to 3000 m (9800 ft) above sea level, you can install this drive in virtually any location.

This robust drive matches the required vibration resistance for operation in cabinets, in control rooms and on machines.

Fast and safe serviceability

Access cables easily with no need to remove the power module.

Service access is extremely convenient and fast with integrated service table, and optional hoist bracket on top of the cabinet. Remove the power module easily, with no need to remove motor cabling. The control compartment door-in-door concept aids safe and fast work and you can swing out the control compartment frame easily to access the power modules.

Modular architecture: Setting the standard for modular control

Flexible modular control architecture means you can tailor the control functionality exactly to your needs. You can purchase exactly the control options you need. You can also use drive options as an alternative to external components such as PLC components, I/O and external safety components.

This modularity gives you not only more flexibility, but more secure integration of drives in the control system and IT architecture. You achieve faster set-up, and smarter monitoring, data gathering and analytics thanks to support for multiple communication network types.

The purchase cost is lower since you only buy the necessary control options, saving excess unused functionality. The drive can reduce your costs further by substituting for a low-end PLC controller/system, thanks to its IEC 61131-based control architecture.

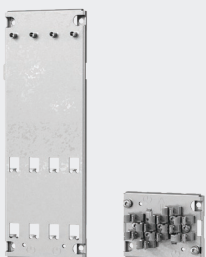
Features

- Expandable bus includes I/O, fieldbus, and expanded safety options
- Choose between a variety of control options
- Options are slot-independent with 6 option board slots available
- Integrated microSD card slot
- Integrated STO and SS1-t SIL3 functional safety for full power range
- Optional STO emergency stop button activates STO
- Programmable
- Use the same options interchangeably in all drives in the iC7 series

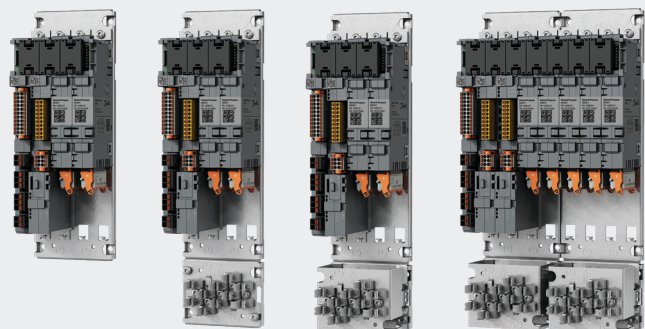
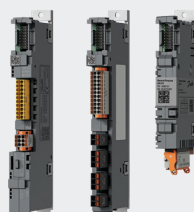
Technical information

- Integrated Ethernet communication interfaces
- Dual-channel STO SIL3 integrated as standard
- Optional fieldbus protocols
- Standard I/O:
6xDI, 2xDO, 2xAI +/-10V/0-20 mA, 1xAO (0-10/4-20 mA), 2xNO/NC RO, 1xNO RO, 1 x Thermistor input
- Optical fiber as communication link with power module(s)

Control mounting plate mechanics



Control board and option boards



Features and benefits



Feature	Benefit
Robust by design, high uptime and quality	– Reliable in heavy-duty service
Segregated main cooling channel, (IP21 or IP54) and dedicated PCB area	– Extremely reliable in heavy-duty service
Wide range of pre-designed options	– Flexible to meet any application need
Heat management using heat pipe technology and segregated main cooling channel	– High power density, reduced footprint
Integrated options such as functional extensions, output filters, fuses and disconnects mean no extra external devices are required	– Save cost and time in installation
Installer-friendly design includes pluggable control terminals, easy-access power terminals, and easily replaceable fans	– Save cost and time in installation and service
Modular and scalable solutions for high powers Simplified spare unit handling	– Fast integration and serviceability
Pull-out of power unit without removing motor or mains cables, included with integration unit	– Fast and easy serviceability
Safe door-in-door access to the control compartment	– Safe and fast serviceability
Integrated functional safety: STO and SS1 (SIL 3) for full power range plus optional STO button on door	– Low-complexity functional safety

Ensuring you shine in the marketplace is our goal.
Learn how Danfoss supports your success [here](#) 

Key specifications

6-pulse, low-harmonic or regenerative enclosed drives

Input	
Voltage rating	380-500 V AC, +10%/-15%
Current range	6-pulse: 206-588 A Low-harmonic & regenerative: 385-2510 A
Supply frequency	50/60 Hz
Switching on input ¹⁾	6-pulse: 1-2 times per minute Low-harmonic and regenerative: Switch on twice at 60 s interval, followed by 10 minutes cooling-down period
Grid type	TN, TT, IT, Delta
Output	
Output frequency	0-599 Hz
Switching on output	Unlimited
Overload capacity	110/150% for 1 minute every 5 minutes ²⁾
Environmental conditions	
Protection rating	IP21/UL Type 1, IP54
Rated temperature	-15 to 40 °C (5 to 104 °F)
Maximum temperature with derating	50 °C (122 °F)
Rated altitude	1000 m (3300 feet) or up to 3000 m (9800 ft) with derating
Relative humidity	5-95% non condensing
Harmonic mitigation and THDi	
iC7-Automation, low harmonic and regenerative enclosed drives	Total harmonic distortion (nominal situation and undistorted network): THDi <5%

Functional Safety I/O	
STO	Dual-channel, with galvanic isolation
STO feedback	Single channel, with galvanic isolation
External supply	
Rating	24 V/2 A
Basic I/O	
Digital inputs ³⁾	6, single-ended
Relay outputs	3 • 2 x NO, NC • 1 x NO • 250 V AC 3 A max. (50/60 Hz) • 24 V DC 2
Analog inputs	2 • -20/0 to +20 mA or • -10/0 to +10 V
Analog output	1 • 0-20 mA or • 0-10 V resistive load
Thermistor input	1, isolated
Compliance	
Compliance	IEC 61800-5-1

¹⁾ Refer to Design Guide for more information.

²⁾ 1 minute every 10 minutes, for frames FE9 and FE10

1 minute every 5 minutes, for all other frames

³⁾ 2 of the inputs can be reconfigured to outputs

Control options

Functional extensions	Description
General Purpose I/O OC7C0	General purpose I/O extension board (3xDI, 2xDO, 2xAI, 1xAO)
Relay Option OC7R0	Relay I/O extension board, with 3 relays
Encoder/Resolver Option OC7M0	Encoder/Resolver extension board (TTL, HTL, SinCos, SSI, HIPERFACE, EnDat, BiSS, resolver)
Temperature Measurement OC7T0	Temperature measurement extension board with 5 channels
I/O and Relay Option OC7C1	I/O extension

Ratings 6-pulse enclosed drives

380-440, 50/60 Hz, 3~

Model code	I_N	I_L	I_{L-OL}	$I_{peak} (3s)$	$P_{typ} 400 V$	I_H	I_{H-OL}	$P_{typ} 400 V$	Frame
	[A]	[A]	[A]	[A]	[kW]	[A]	[A]	[kW]	
iC7-60EA3N05-206A	206	206	227	289	110	170	255	90	FE9
iC7-60EA3N05-245A	245	245	270	351	132	206	309	110	FE9
iC7-60EA3N05-302A	302	302	333	417	160	245	368	132	FE9
iC7-60EA3N05-385A	385	385	424	514	200	302	453	160	FE9
iC7-60EA3N05-480A	480	480	528	655	250	385	578	200	FE10
iC7-60EA3N05-588A	588	588	647	816	315	480	720	250	FE10

I_L : Low overload base current, allows for 110% overload for 1 minute duration every 10 minutes for frames FE9 and FE10; 1 min every 5 min for all other frames

I_H : High overload base current, allows for 150% overload for 1 minute duration every 10 minutes for frames FE9 and FE10; 1 min every 5 min for all other frames

OL: Overload

440-480, 50/60 Hz, 3~

Model code	I_N	I_L	I_{L-OL}	$I_{peak} (3s)$	$P_{typ} 460 V$	I_H	I_{H-OL}	$P_{typ} 460 V$	Frame
	[A]	[A]	[A]	[A]	[hp]	[A]	[A]	[hp]	
iC7-60EA3N05-206A	196	196	216	283	150	166	249	125	FE9
iC7-60EA3N05-245A	240	240	264	334	200	196	294	150	FE9
iC7-60EA3N05-302A	302	302	333	408	250	240	360	200	FE9
iC7-60EA3N05-385A	364	364	401	514	300	302	453	250	FE9
iC7-60EA3N05-480A	456	456	502	619	350	364	546	300	FE10
iC7-60EA3N05-588A	520	520	572	776	450	456	684	350	FE10

I_L : Low overload base current, allows for 110% overload for 1 minute duration every 10 minutes for frames FE9 and FE10; 1 min every 5 min for all other frames

I_H : High overload base current, allows for 150% overload for 1 minute duration every 10 minutes for frames FE9 and FE10; 1 min every 5 min for all other frames

OL: Overload

480-500, 50/60 Hz, 3~

Model code	I_N	I_L	I_{L-OL}	$I_{peak} (3s)$	$P_{typ} 500 V$	I_H	I_{H-OL}	$P_{typ} 500 V$	Frame
	[A]	[A]	[A]	[A]	[kW]	[A]	[A]	[kW]	
iC7-60EA3N05-206A	196	196	216	283	132	166	249	110	FE9
iC7-60EA3N05-245A	240	240	264	334	160	196	294	132	FE9
iC7-60EA3N05-302A	302	302	333	408	200	240	360	160	FE9
iC7-60EA3N05-385A	364	364	401	514	250	302	453	200	FE9
iC7-60EA3N05-480A	456	456	502	619	315	364	546	250	FE10
iC7-60EA3N05-588A	520	520	572	776	355	456	684	315	FE10

I_L : Low overload base current, allows for 110% overload for 1 minute duration every 10 minutes for frames FE9 and FE10; 1 min every 5 min for all other frames

I_H : High overload base current, allows for 150% overload for 1 minute duration every 10 minutes for frames FE9 and FE10; 1 min every 5 min for all other frames

OL: Overload

Ratings low-harmonic & regenerative enclosed drives

380-440, 50/60 Hz, 3~

Model code	I _N	I _L	I _{L-OL}	I _{peak} (3s)	P _{typ} 400 V	I _H	I _{H-OL}	P _{typ} 400 V	Frame
	[A]	[A]	[A]	[A]	[kW]	[A]	[A]	[kW]	
iC7-60EA3A05-385A	394	385	424	510	200	300	450	160	AE10+IE10
iC7-60EA3A05-480A	490	480	528	655	250	385	578	200	AE10+IE10
iC7-60EA3A05-590A	603	590	649	816	315	480	720	250	AE10+IE10
iC7-60EA3A05-658A	672	658	724	930	355	547	821	250	AE11+IE11
iC7-60EA3A05-730A	746	730	803	1031	400	606	909	315	AE11+IE11
iC7-60EA3A05-820A	838	820	902	1158	450	681	1022	355	AE11+IE11
iC7-60EA3A05-880A	899	880	968	1243	500	731	1097	400	AE11+IE11
iC7-60EA3A05-1000	1021	1000	1100	1411	560	830	1245	450	2xAE10+2xIE10
iC7-60EA3A05-1100	1123	1100	1210	1553	630	913	1370	500	2xAE10+2xIE10
iC7-60EA3A05-1260	1287	1260	1386	1785	710	1050	1575	560	2xAE11+2xIE11
iC7-60EA3A05-1450	1481	1450	1595	2057	800	1210	1815	630	2xAE11+2xIE11
iC7-60EA3A05-1710	1746	1710	1881	2414	900	1420	2130	710	2xAE11+2xIE11
iC7-60EA3A05-1960	2001	1960	2156	2771	1100	1630	2445	900	3xAE11+3xIE11
iC7-60EA3A05-2150	2195	2150	2365	3043	1200	1790	2685	1000	3xAE11+3xIE11
iC7-60EA3A05-2340	2389	2340	2574	3315	1300	1950	2925	1000	3xAE11+3xIE11
iC7-60EA3A05-2510	2563	2510	2761	3553	1400	2090	3135	1100	3xAE11+3xIE11

3H = 3~ low harmonic AFE

3A = 3~ regenerative, AFE

I_L: Low overload base current, allows for 110% overload for 1 minute duration every 5 minutes

I_H: High overload base current, allows for 150% overload for 1 minute duration every 5 minutes

OL: Overload

440-480, 50/60 Hz, 3~

Model code	I _N	I _L	I _{L-OL}	I _{peak} (3s)	P _{typ} 460 V	I _H	I _{H-OL}	P _{typ} 460 V	Frame
	[A]	[A]	[A]	[A]	[hp]	[A]	[A]	[hp]	
iC7-60EA3A05-385A	372	364	401	510	300	300	450	250	AE10+IE10
iC7-60EA3A05-480A	466	456	502	619	350	364	546	300	AE10+IE10
iC7-60EA3A05-590A	531	520	572	776	450	456	684	350	AE10+IE10
iC7-60EA3A05-658A	603	590	649	833	500	490	735	350	AE11+IE11
iC7-60EA3A05-730A	672	658	724	930	550	547	821	450	AE11+IE11
iC7-60EA3A05-820A	746	730	803	1031	600	606	909	500	AE11+IE11
iC7-60EA3A05-880A	838	820	902	1158	700	681	1022	550	AE11+IE11
iC7-60EA3A05-1000	940	920	1012	1299	750	764	1146	600	2xAE10+2xIE10
iC7-60EA3A05-1100	1052	1030	1133	1454	850	855	1283	650	2xAE10+2xIE10
iC7-60EA3A05-1260	1174	1150	1265	1632	950	960	1440	750	2xAE11+2xIE11
iC7-60EA3A05-1450	1328	1300	1430	1836	1100	1080	1620	850	2xAE11+2xIE11
iC7-60EA3A05-1710	1603	1570	1727	2227	1300	1310	1965	1100	2xAE11+2xIE11
iC7-60EA3A05-1960	1940	1900	2090	2686	1600	1580	2370	1300	3xAE11+3xIE11
iC7-60EA3A05-2150	2083	2040	2244	2890	1700	1700	2550	1300	3xAE11+3xIE11
iC7-60EA3A05-2340	2195	2150	2365	3043	1800	1790	2685	1500	3xAE11+3xIE11
iC7-60EA3A05-2510	2389	2340	2574	3315	1900	1950	2925	1600	3xAE11+3xIE11

3H = 3~ low harmonic AFE

3A = 3~ regenerative, AFE

I_L: Low overload base current, allows for 110% overload for 1 minute duration every 5 minutes

I_H: High overload base current, allows for 150% overload for 1 minute duration every 5 minutes

OL: Overload

Ratings low-harmonic & regenerative enclosed drives

480-500 V, 50/60 Hz, 3~

Model code	I_N	I_L	I_{L-OL}	$I_{peak} (3s)$	$P_{typ} 500 V$	I_H	I_{H-OL}	$P_{typ} 500 V$	Frame
	[A]	[A]	[A]	[A]	[kW]	[A]	[A]	[kW]	
iC7-60EA3A05-385A	372	364	401	510	250	300	450	200	AE10+IE10
iC7-60EA3A05-480A	466	456	502	619	315	364	546	250	AE10+IE10
iC7-60EA3A05-590A	531	520	572	776	355	456	684	315	AE10+IE10
iC7-60EA3A05-658A	603	590	649	833	400	490	735	315	AE11+IE11
iC7-60EA3A05-730A	672	658	724	930	450	547	821	355	AE11+IE11
iC7-60EA3A05-820A	746	730	803	1031	500	606	909	400	AE11+IE11
iC7-60EA3A05-880A	838	820	902	1158	560	681	1022	450	AE11+IE11
iC7-60EA3A05-1000	940	920	1012	1299	630	764	1146	500	2xAE10+2xIE10
iC7-60EA3A05-1100	1052	1030	1133	1454	710	855	1283	560	2xAE10+2xIE10
iC7-60EA3A05-1260	1174	1150	1265	1632	800	960	1440	630	2xAE11+2xIE11
iC7-60EA3A05-1450	1328	1300	1430	1836	900	1080	1620	710	2xAE11+2xIE11
iC7-60EA3A05-1710	1603	1570	1727	2227	1100	1310	1965	900	2xAE11+2xIE11
iC7-60EA3A05-1960	1940	1900	2090	2686	1300	1580	2370	1100	3xAE11+3xIE11
iC7-60EA3A05-2150	2083	2040	2244	2890	1400	1700	2550	1100	3xAE11+3xIE11
iC7-60EA3A05-2340	2195	2150	2365	3043	1500	1790	2685	1200	3xAE11+3xIE11
iC7-60EA3A05-2510	2389	2340	2574	3315	1600	1950	2925	1300	3xAE11+3xIE11

3H = 3~ low harmonic AFE

3A = 3~ regenerative, AFE

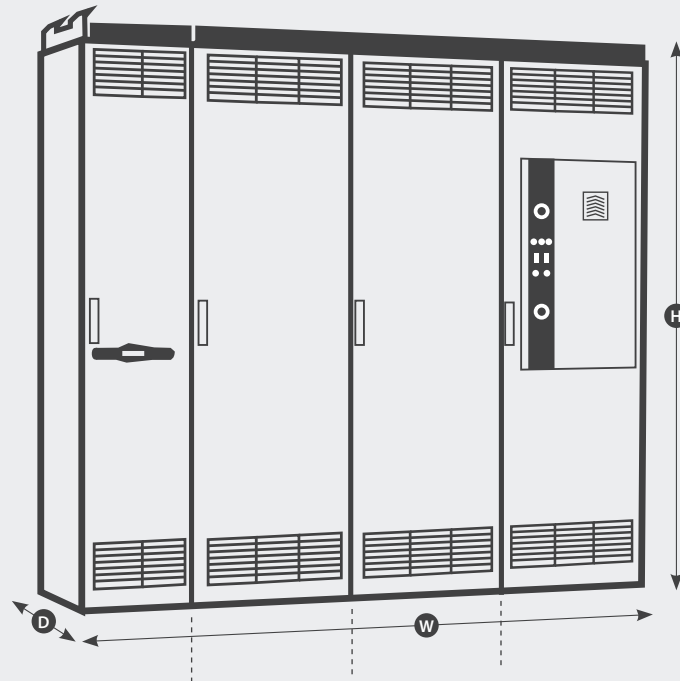
I_L : Low overload base current, allows for 110% overload for 1 minute duration every 5 minutes

I_H : High overload base current, allows for 150% overload for 1 minute duration every 5 minutes

OL: Overload

Cabinet options

Mains input device	+GAXX	None
	+GACO	Mains contactor and switch
	+GAMS	Mains switch
	+GACB	Air circuit breaker fixed
Grounding device provision	+GCXX	None
	+GCEP	Provision for grounding device
	+GCES	Grounding switch
Motor heater control	+IAXX	None
	+IAMH	Yes
Cabinet heater	+IBXX	None
	+IBCH	Yes
Motor fan control	+ICXX	None
	+ICFC	Motor fan control
	+ICF1	Motor fan ctrl/supply 2.5-4 A
	+ICF2	Motor fan ctrl/supply 4-6.3 A
	+ICF3	Motor fan ctrl/supply 6.3-10 A
	+ICF4	Motor fan ctrl/supply 10-16 A
Motor brake control	+IDXX	None
	+IDBC	Motor brake control
Control power supply	+IFXX	None
	+IFCS	24 VDC
Service socket	+IGXX	None
	+IGS0	230 VAC socket CEE 7/3
	+IGS1	115 VAC socket, US
	+IGS2	230 VAC socket, UK
Auxillary voltage supply	+IHXX	None
	+IHAT	AC voltage transformer
	+IHAS	AC supply terminals
Door signal lights	+IIXX	None
	+IICD	Run, ready, fault
Emergency stop button	+ILXX	None
	+ILSS	STO/SS1 push button on door
Mains cabling direction	+KCIB	Bottom-entry
	+KCIT	Top-entry
	+KDOB	Bottom-entry
	+KDOT	Top-entry
Cable entry plate	+KFXX	With standard glands
	+KFCP	Blank plate without holes (UL)
Output filter	+MAXX	None
	+MAC2	Common-mode Filter
	+MAU1	dU/dt Filter
	+MAU2	dU/dt + CM Filter
Air-cooling options	+OAXX	Standard
	+OAOF	Cooling air outlet flange
	+OABC	Back-channel cooling
Maintenance options	+QAXX	None
	+QALS	Lifting support for power unit



Dimensions

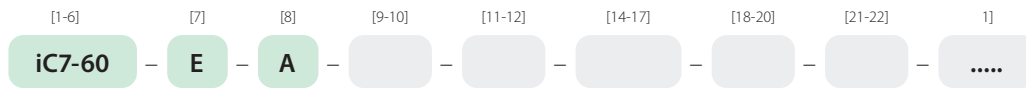
		6-pulse enclosed drives		Low-harmonic & regenerative enclosed drives				
Frame		FE09	FE10	AE10 + IE10	AE11 + IE11	2 x AE10 + 2 x IE10	2 x AE11 + 2 x IE11	3 x AE11 + 3 x IE11
[mm]	Width	400	600	800	1200	2200	2400	3200
	Height	2300 ¹⁾	2300 ¹⁾	2300 ^{1) 2)}	2300 ^{1) 2)}	2300 ^{1) 2)}	2300 ^{1) 2)}	2300 ^{1) 2)}
	Depth	600	600	600	600	600	600	600
[in]	Width	15.7	23.6	31.5	47.2	86.6	94.5	126
	Height	90.6 ¹⁾	90.6 ¹⁾	90.6 ^{1) 2)}	90.6 ^{1) 2)}	90.6 ^{1) 2)}	90.6 ^{1) 2)}	90.6 ^{1) 2)}
	Depth	23.6	23.6	23.6	23.6	23.6	23.6	23.6

¹⁾ With 200 mm/7.8 in plinth and lifting rails, without lifting rails - 100 mm/4.0 in

²⁾ If IP21 cabinet total height is 2400 mm/94.5 in

Model code overview: iC7-Automation enclosed drives

For more detailed information, refer to the Design Guide



[1-6] Product group (character 1-6)	
iC7-60	Indication of product group performance
[7] Product category (character 7)	
E	Enclosed Drives
[8] Cooling method (character 8)	
A	Air-cooled
[9-10] Product type (character 9-10)	
3N	6-pulse rectifier
3A	3~ regenerative (AFE)
3H	3~ low harmonic (AFE)
[11-12] Voltage rating (character 11-12)	
05	380-500 V AC
[13-17] Nominal Amp rating ²⁾ (character 14-17)	
-206A	206 A
-245A	245 A
-300A	300 A
...	...
-2510	2510 A

¹⁾ +codes identifying options

²⁾ See rating tables on pages 40

[18-20] Protection rating (character 18-20)		Enclosed drives
E21	IP21	■
E54	IP54	■
[21-22] EMC Class (character 21-22)		
F2	C2 category: Public & industrial environment	
F3	C3 category: industrial environment	■
F4	C4 category: System Component (IT Network)	■
[1] +code group		
+Axxx	Optional power hardware	
+Bxxx	Control hardware	
+Cxxx	Control options	
+Dxxx	Application software and additional functionality	
+Exxx	Customized settings (for reference only)	

+MAXx Output filter options

Model code	Selection description	Enclosed drives
+MAXX	None	X
+MAC2	Common mode filter	X
+MAU1	dU/dt filter	X
+MAU2	dU/dt and CM filter	X

+BAxx Control hardware: Communication interface, X1/X2

Model code	Selection description	Enclosed Drives
+BAEL	Ethernet port, no protocol	X
+BAPR	PROFINET RT OS7PR	X
+BAMT	Modbus TCP OS7MT	X
+BAIP	Ethernet/IP OS7IP	X

+Cxxx Control options (Option slots A to F)

Model code	Selection description	Open slots A-E (Inverter)	Open slot F (Active Front End)
+CXXX	None, without mounting plate	X	–
+CXX0	None	X	–
+CXC0	General Purpose I/O OC7C0	X	–
+CXC1	I/O and Relay Option OC7C1	X	–
+CXR0	Relay Option OC7R0	X	–
+CXM0	Encoder/Resolver Option OC7M0	X ³⁾	–
+CXT0	Temperature Measurement OC7T0	X	–

X indicates a standard selection
A dash (–) indicates that the selection is not available

³⁾ Encoder/Resolver option only in slot A and B
See full list of options for each +code group in Design Guide



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Some functionalities listed in this fact sheet are for future implementation

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