



ENGINEERING
TOMORROW



Highlights

- Streamlined system integration
- Fast and safe service access
- 6-pulse and low-harmonic/regenerative variants
- Intelligent heat management
- Modular control
- Small footprint thanks to cutting-edge heat management
- Wide range of cabinet options

Safe

and fast service
access

iC7 Series Enclosed Drives

Open up for more freedom in **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:

- IEC 61800-5-1 and UL 61800-5-1 variants
- 6-pulse and low-harmonic/regenerative variants
- Wide range of options



Available for iC7-Automation drives
[iC7-Automation fact sheet](#)

iC7 drives.danfoss.com

Features and benefits

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

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. A built-in microSD card allows you to copy settings, log data, download software and activate licenses – all protected by the crypto chip ensuring end-to-end encrypted data transfer.

More sensors for improved control

iC7 series drives have an increased number of sensors for optimized control. This enables improved control performance, increased protection of application and drive, and capability to support Industrial IoT solutions.

The drive controls any kind of induction or permanent magnet motor – and with better control, motor performance in open loop is closer than ever to closed loop, eliminating cumbersome encoders in many applications.

Condition-based monitoring and prediction of possible abnormal operational conditions make it possible to plan and conduct maintenance before a failure occurs.

Functional safety to match your needs

STO SIL3, Ple with STO feedback is always included. A scalable offering allows addition of functional safety via fieldbus, and added functional safety features (Stop, Speed, Brake) with and without sensor feedback.

Filters and accessories

Filters are already installed as mandatory or optional items, with no need for the customer integrate them.

Common-mode and dU/dt filters are available as configurable integrated options.

User interfaces

A new range of user interfaces integrate well-known features and functionality with full connectivity to hand-held devices over Wi-Fi. Integration of features in MyDrive® tools is supported.

The 'halo' status indicator ensures the status of the drive is easy to recognize from a distance. An NFC chip enables readout of basic data, as well as transfer of specific settings.

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

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Versatile

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

- IEC 61800-5-1 and UL 61800-5-1 variants
- 6-pulse and low-harmonic/4 quadrant(4Q) variants
- Wide range of options

Fast and safe serviceability

Gain direct access to cables without removing the power module means there is no need to remove the 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.

Supported by MyDrive® tools

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

Engineering support

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

- Dimensioning tools, such as MyDrive® Select
- EPLAN P8 macros
- Dimensional and electrical drawings

Quality in focus

Reliable and predictable operation has been a key driver. With an IATF 16949-compliant quality system and use of 6-Sigma principles, quality and reliability are at absolute market-leading standards. Reliability is assured by the design approach such as minimized airflow through the control board section.

Factory test of finished products is performed at full load, based on learnings from the development process. Design for automated assembly enables a manufacturing setup where critical processes are monitored and kept under close control.



Rack control 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, or replace other 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.

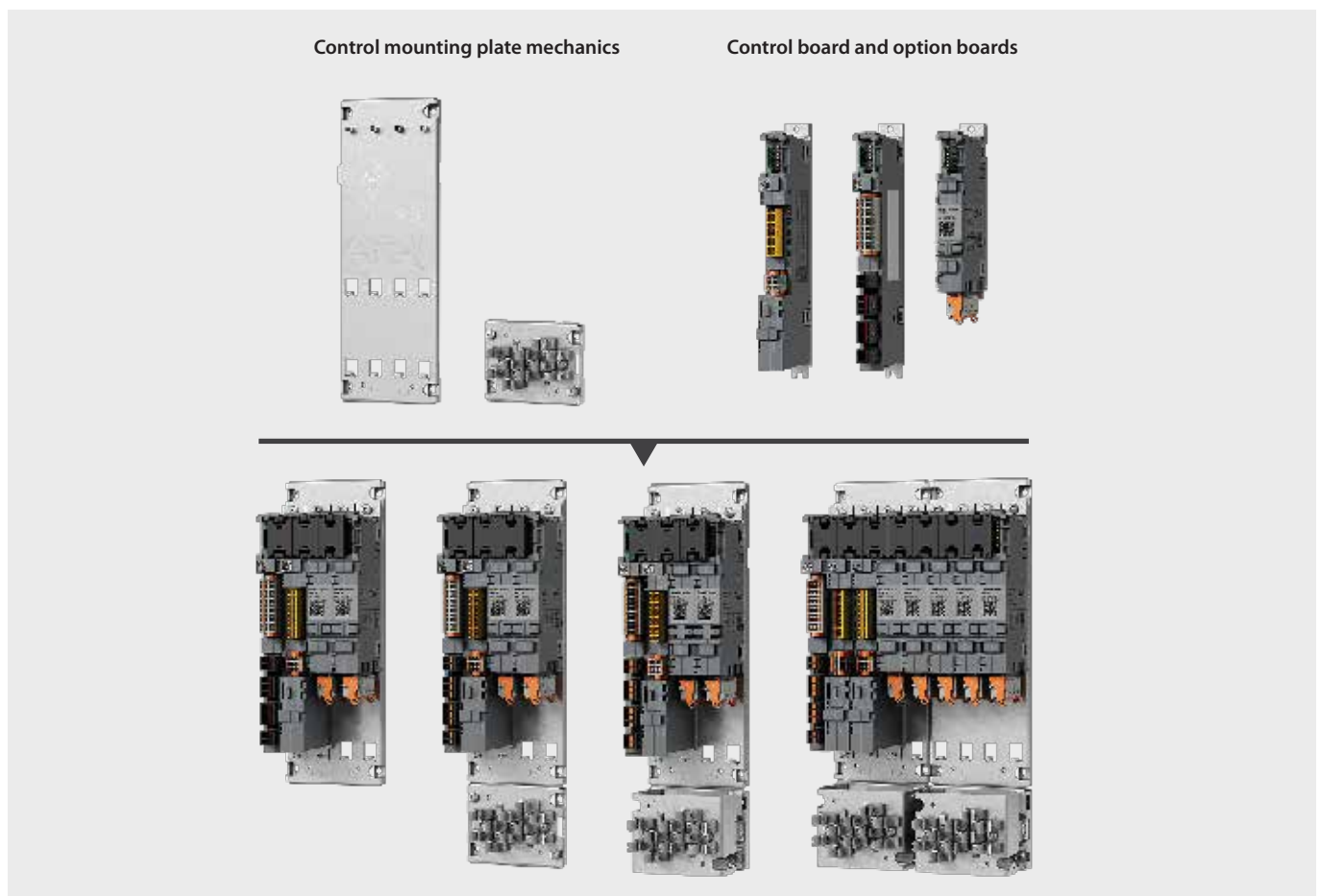
The drive can reduce your costs further by substituting for a low-end PLC controller/system, thanks to its IEC 61131-based control architecture.

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 SIL3 safety
- Programmable (IEC 61131– based)
- Use the same options interchangeably in all drives in the iC7 series

Technical information

- Integrated dual-port Ethernet and Ethernet service port
- Dual-channel STO SIL3 integrated as standard
- Optional fieldbus protocols
- Basic I/O: 6x DI, 2x DO, 2x AI +/-10V/0-20 mA, 1x AO (0-10/4-20 mA), 2x NO/NC RO, 1x NO RO, 1 x Thermistor input
- One optical fiber pair as communication link with power module



Key specifications for 6-pulse, low-harmonic or regenerative enclosed drives

Environmental	6-pulse	Low-harmonic & regenerative
Voltage rating	3 x 380-500 V AC, -20%/+10%	
Current range	206-1710 A	385-1710 A
Overload capacity	110/150% for 1 minute every 5 minutes	
Protection rating	IP21/UL Type 1, IP54/UL Type 12	

Technical data ¹⁾

Input	
Voltage rating	380-500 V AC, +10%/-15%
Supply frequency	50/60 Hz
Switching on input	6-pulse: 1-2 times per minute ²⁾
Grid type	TN, TT, IT, Delta

Output	
Output frequency	0-599 Hz
Switching on output	Unlimited
Overload capacity	110% and 150%

Environmental conditions	
Rated temperature	-15 to 40 °C (5 to 104 °F)
Maximum temperature with derating	55 °C (131 °F)
Rated altitude	1000 m (3300 feet) or up to 4000 m (13120 feet) with derating
Relative humidity	5-95% non condensing

Functional Safety I/O	
STO	Dual-channel, with galvanic isolation
STO feedback	Single channel, with galvanic isolation

External supply	
Rating	24 V/2 A

Optional basic I/O	
Digital inputs	4+2 ³⁾
- Logic	NPN/PNP selectable – 0/24V
- Pulse/Encoder input	0-110 kHz

Digital outputs	2 ³⁾
- Logic	NPN/PNP selectable – 0/24V
- 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	250V AC 2 A, 24VDC 2 A

¹⁾ Preliminary values pending validation.

²⁾ Low-harmonic and regenerative: Once per minute for 2 minutes, followed by 10 minutes cooling-down period. Refer to Design Guide for more information.

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)
Safety I/O and Encoder OC7S0	Functional safety I/O and encoder extension board (3xDI (dual channel), 2xDO (dual channel), TTL,HTL, Sin/Cos encoder input)
Temperature Measurement OC7T0	Temperature measurement extension board with 5 channels
I/O and Relay Option OC7C1	I/O extension for slots A, B, C, and D

Ratings 6-pulse enclosed drives 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_N	I_L	I_H	I_N	I_L	I_H	P_L	P_L	
	[A]	[A]	[A]	[A]	[A]	[A]	[kW]	[HP]	
iC7-60EA3N05-206A	211	206	170	201	196	166	110	150	FE9
iC7-60EA3N05-245A	251	245	206	245	240	196	132	200	FE9
iC7-60EA3N05-300A	309	302	245	309	302	240	160	250	FE9
iC7-60EA3N05-385A	394	385	302	372	364	302	200	300	FE9
iC7-60EA3N05-480A	490	480	385	466	456	364	250	350	FE10
iC7-60EA3N05-588A	601	588	480	531	520	456	315	450	FE10
iC7-60EA3N05-658A	672	658	547	603	590	490	355	500	NE11+IE11
iC7-60EA3N05-730A	746	730	606	672	658	547	400	550	NE11+IE11
iC7-60EA3N05-820A	838	820	681	746	730	606	450	600	NE11+IE11
iC7-60EA3N05-880A	899	880	731	838	820	681	500	750	NE11+IE11
iC7-60EA3N05-1000	1021	1000	830	940	920	764	560	750	NE11+2xIE10
iC7-60EA3N05-1100	1123	1100	913	1052	1030	855	630	850	NE11+2xIE10
iC7-60EA3N05-1260	1287	1260	1050	1174	1150	960	710	950	2xNE11+2xIE11
iC7-60EA3N05-1450	1481	1450	1210	1328	1300	1080	800	1100	2xNE11+2xIE11
iC7-60EA3N05-1710	1746	1710	1420	1603	1570	1310	900	1300	2xNE11+2xIE11

¹⁾ Preliminary values pending validation.

I_L : Low overload – 110% overload – 1 min every 5 min
 I_H : High overload – 150% overload – 1 min every 5 min

Ratings low-harmonic & regenerative enclosed drives ¹⁾

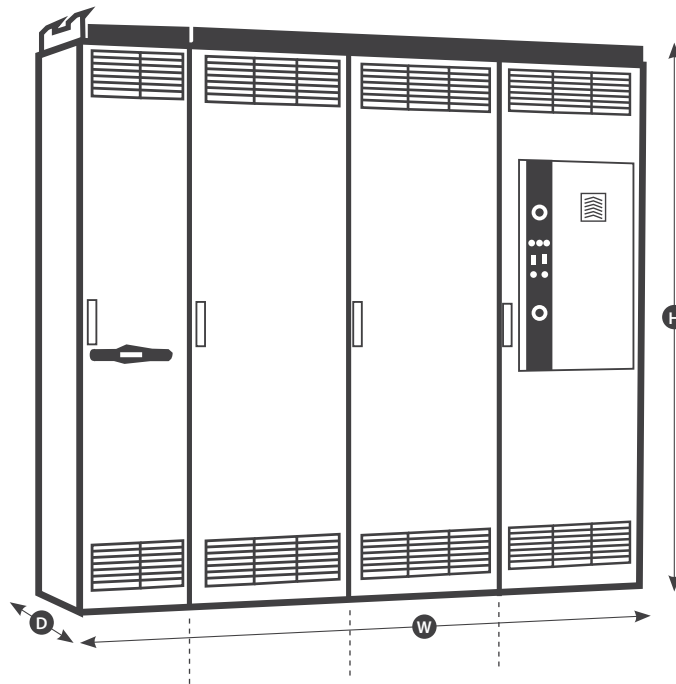
Designation	Rated output current						Typical shaft output power		Frame
	3 x 380-440 V			3 x 441/481-500 V			400 V	460 V	
	I_N	I_L	I_H	I_N	I_L	I_H	P_L	P_L	
	[A]	[A]	[A]	[A]	[A]	[A]	[kW]	[HP]	
iC7-60EA3A05-385A	394	385	300	372	364	300	200	300	AE10+IE10
iC7-60EA3A05-480A	490	480	385	466	456	364	250	350	AE10+IE10
iC7-60EA3A05-588A	601	588	480	531	520	456	315	450	AE10+IE10
iC7-60EA3A05-658A	672	658	547	603	590	490	355	500	AE11+IE11
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iC7-60EA3A05-1000	1021	1000	830	940	920	764	560	750	2xAE10+2xIE10
iC7-60EA3A05-1100	1123	1100	913	1052	1030	855	630	850	2xAE10+2xIE10
iC7-60EA3A05-1260	1287	1260	1050	1174	1150	960	710	950	2xAE11+2xIE11
iC7-60EA3A05-1450	1481	1450	1210	1328	1300	1080	800	1100	2xAE11+2xIE11
iC7-60EA3A05-1710	1746	1710	1420	1603	1570	1310	900	1300	2xAE11+2xIE11

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I_L : Low overload – 110% overload – 1 min every 10 min
 I_H : High overload – 150% overload – 1 min every 5 min

Cabinet options

Mains input device	+GAXX	None
	+GACO	Mains contactor (and disconnect switch)
	+GAMS	Mains disconnect switch
	+GACB	Air circuit breaker fixed
Earthing device provision	+GCXX	None
	+GCEP	Provision for temporary earthing device
	+GCES	Earthing switch
Motor heater control	+IAXX	None
	+IAMH	Motor heater control included
Cabinet heater	+IBXX	None
	+IBCH	Cabinet heater included
Motor fan control	+ICXX	None
	+ICFC	Motor fan control only
	+ICF1	Motor fan control and supply 2.5-4 A
	+ICF2	Motor fan control and supply 4-6.3 A
	+ICF3	Motor fan control and supply 6.3-10 A
	+ICF4	Motor fan control and supply 10-16 A
Motor brake control	+IDXX	None
	+IDBC	Motor brake control included
24 VDC power supply	+IFXX	None
	+IFCS	24 VDC power supply included
230 VAC socket	+IGXX	None
	+IGS0	230 V AC CEE 7/3 service socket
	+IGS1	115 VAC US socket
	+IGS2	240 VAC GB socket
Cabinet options power supply	+IHXX	None
	+IHAT	Auxiliary AC voltage transformer
	+IHAS	Auxiliary AC supply terminals
Emergency stop	+ILXX	None
	+ILST	STO with emergency push button on door
	+ILSS	STO/SS1 with emergency push button on door
Insulation fault monitor	+IMXX	None
	+IMIF	Insulation fault monitor included
Blank gland plate/conduit plate	+KFXX	None
	+KFCP	Conduit/gland plate included
Output filter	+MAXX	None
	+MACM	Common mode filter
	+MACD	dU/dt filter with common mode
	+MADU	dU/dt filter without common mode
Air-cooling options	+OAXX	Standard air cooling
	+OAOF	Cooling air outlet flange
	+OABC	Back-channel cooling
Maintenance options	+QAXX	None
	+QALS	Power unit service beam



Dimensions

Frame		6-pulse enclosed drives					Low-harmonic & regenerative enclosed drives			
		FE09	FE10	NE11 + IE11	NE11 + 2 x IE10	2 x NE11 + 2 x IE11	AE10 + IE10	AE11 + IE11	2 x AE10 + 2 x IE10	2 x AE11 + 2 x IE11
[mm]	Width	400	600	600 ^{1]}	800 ^{1]}	1200 ^{2]}	800	1200	2200	2400
	Height	2300 ^{3]}	2300 ^{3]}	2300 ^{3]}	2300 ^{3]}	2300 ^{3]}	2300 ^{3]} 4]	2300 ^{3]} 4]	2300 ^{3]} 4]	2300 ^{3]} 4]
	Depth	600	600	600	600	600	600	600	600	600
[in]	Width	15.7	23.6	23.6 ^{1]}	31.5 ^{1]}	47.2 ^{2]}	31.5	47.2	86.6	94.5
	Height	90.6 ^{3]}	90.6 ^{3]}	90.6 ^{3]}	90.6 ^{3]}	90.6 ^{3]}	90.6 ^{3]} 4]	90.6 ^{3]} 4]	90.6 ^{3]} 4]	90.6 ^{3]} 4]
	Depth	23.6	23.6	23.6	23.6	23.6	23.6	23.6	23.6	23.6

1] With disconnect switch +200 mm/7.8 in

2] With incoming section for input devices +600 mm/23.6 in

3] With 200 mm plinth and lifting rails/7.8in, without lifting rails -101 mm/4.0 in

4] If IP21 cabinet total height is 2400 mm/94.5 in