

Selection Guide | iC2-Micro

# iC2-Micro Performance that pays off

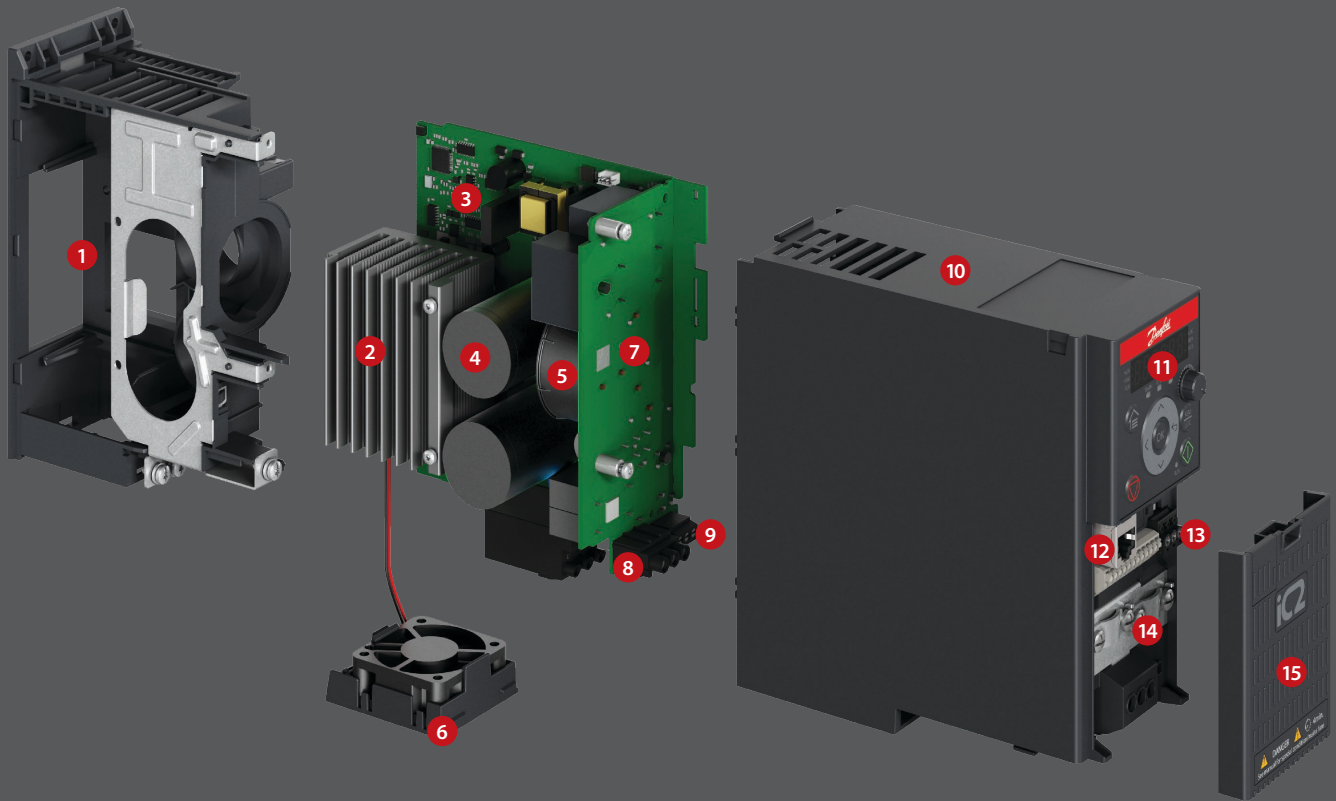
Run reliably at full load for ambient temperatures up to

**50°C**



# Not only reliable, but also compact, flexible, and user-friendly

Save space and optimize your choice of motor



- 1 Pedestal
- 2 Heatsink
- 3 Power board
- 4 DC caps
- 5 Common choke
- 6 Removable fan
- 7 RFI board including RFI filter
- 8 Terminals for mains, motor and BR/UDC

- 9 Relay output
- 10 Shell
- 11 Control panel
- 12 RJ45 port
- 13 I/O's terminal & Modbus terminal
- 14 Decoupling for I/O and RS485
- 15 Terminal cover



# iC2

## **iC2-Micro:** the **compact** and **flexible** drive

This quality general-purpose drive is a perfect match for a wide range of applications. iC2-Micro performs with unsurpassed reliability even in complex applications. It gives you user-friendliness, condensed functionality, and easy commissioning, all in a powerful compact package.

### **Next-generation**

More compact, intelligent, and powerful than its predecessor, the iC2-Micro now succeeds VLT® Micro Drive FC 51. This reliable and durable drive is also even easier to use and install. You can reduce system complexity and cost whilst maintaining full performance.

### **High performance**

This drive gives you excellent motor control and mechanical brake performance. New features include torque open loop control, locked motor detection, permanent magnet motor control, built-in control panel and, of course, connectivity with our MyDrive® Suite digital tools.

### **Your choice of motor**

iC2-Micro is compatible with the motor of your choice, either induction or PM motor, so you can put together the best system for your application.

### **Highly integrated design**

iC2-Micro contains an integrated control panel, potentiometer, RFI filter, brake chopper, and intelligent cooling to reduce the need for external components.

### **Easy retrofit**

Designed to smoothly replace VLT® Micro Drive FC 51 in established plants.

### **Fits your application**

You can use the same drive in diverse processes, since the iC2-Micro is designed to optimize a wide range of applications such as

- Pumps
- Fans
- Material handling
- Conveyors
- Mixers
- Packaging machines
- Palletizers
- Textile machinery



## iC2-Micro: the **convenient** drive

With focus on streamlined operation, iC2-Micro keeps your task simple. The iC2-Micro offers a software tool to save time, improve reliability, and reduce risk

**Commissioning and service** are easier than ever with MyDrive® Insight commissioning and monitoring tool. For fast and easy configuration and commissioning, MyDrive® Insight enables you to control the drive from a PC for operations such as starting or stopping the drive, set references, set direction, reset, and coast of the drive. Once the drive is in operation, MyDrive® Insight monitors the drive and collects data for troubleshooting, maintenance, and service. Technicians can use MyDrive® Insight not only to configure parameter settings, but also to back up and restore these settings during service.

**Access to application guide and other documentations** is faster than ever using the QR code located on the front of the drive for convenient scanning. By scanning the QR code

with a smart device, you can access the iC2-Micro webpage to quickly find technical literature, technical data, drawings etc.

**Two variants with and without EMC filter**, according to your needs. There's no need to pay for an EMC filter when it's not required! But with the integrated EMC filter you can use shielded motor cables and remain compliant with EN/IEC 61800-3, class C1 or C2 fitting for your applications. This can help you save space in the cabinet and reduce handling process.

**Intuitive control panel** simplifies commissioning, operation, and service. The control panel features a 6-digit 7-segment LED display, status indicators, clear navigation buttons, and built-in frequency setting potentiometer.

**Streamlined mounting and service** thanks to simple wiring with spring type I/O terminals and removable fan. For single-phase 200 V drives in the power range up to 0.75 kW, they even support natural cooling without a cooling fan. The detachable cooling fan design with on-off control makes maintenance easy, improves the cooling efficiency, reduces service cost, and minimizes environmental noise.

**Operates at 50 °C ambient temperature at full load** iC2-Micro is designed to perform optimally under full load at 50°C ambient temperature, and up to 55°C with derating. This gives you cost savings since there is no need to install extra cooling equipment, nor to oversize the drive.

**Save-space** thanks to the compact design optimized for book style side-by-side mounting.



### PM motor compatibility

You win the freedom to choose the best high-efficiency motor for your application. iC2-Micro provides highly efficient permanent magnet motor control in open loop under VVC+ in the whole power range.

### Integrated PID controller

The built-in PID controller ensures solid process control, such as constant pressure or constant flow operation.

### Coated PCB

Printed circuit boards coating is as standard against corrosive gases (IEC 60721-3-3). This protection provides high reliability in harsh environments, preventing failures and unnecessary downtime increasing lifetime of the drive.

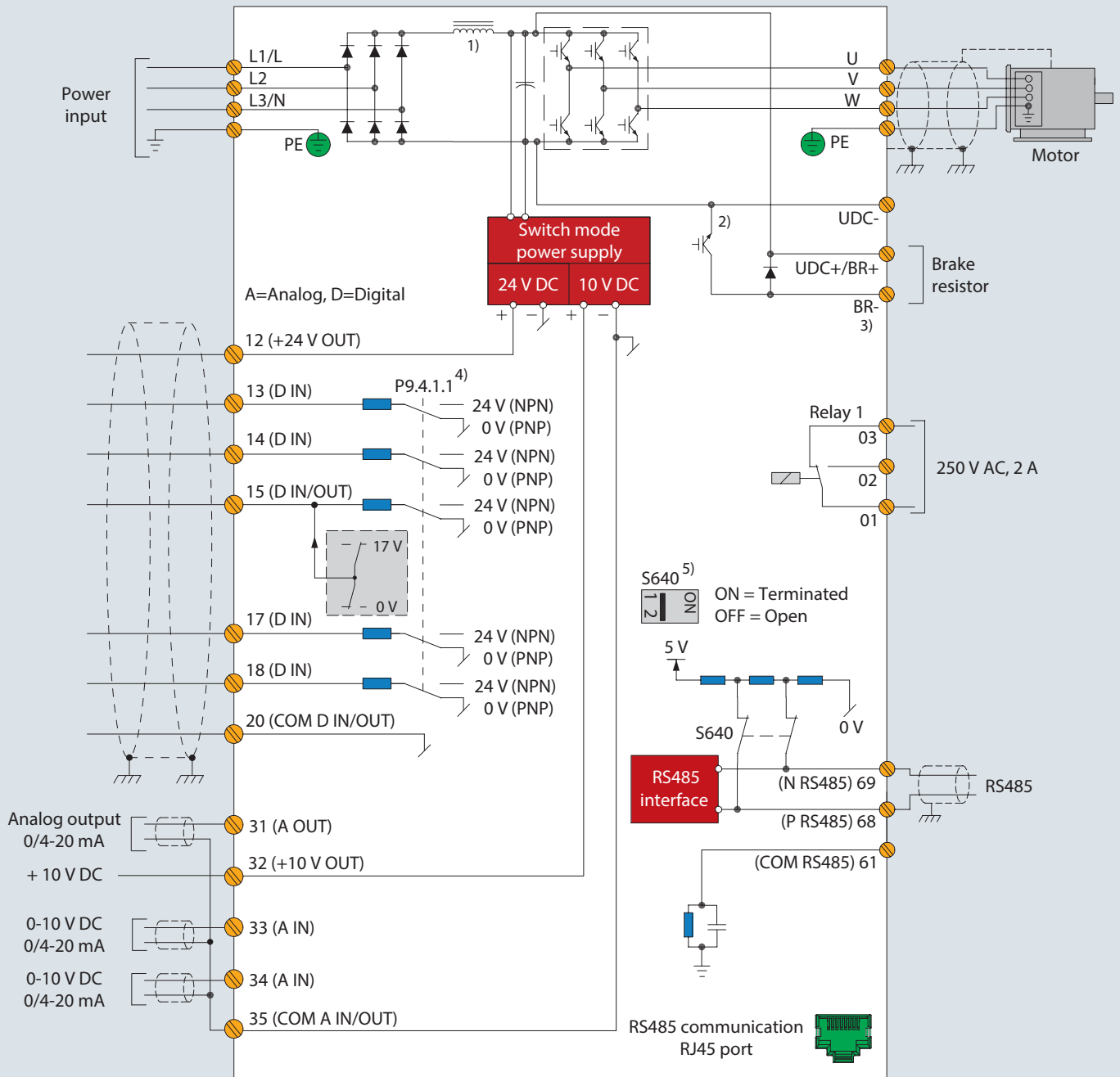
### Integrated brake chopper

A built-in brake chopper for 3-phase 380-480 V drives in the power range from 2.2 kW and above saves money and panel space.

Feature	Benefit
Spring type I/O terminals	Save installation time, avoid errors
Integrated control panel with LED display & indicators Remote control panel with extra functions (option) <sup>1)</sup>	Easy programming
RJ45 port	<ul style="list-style-type: none"> <li>– Easy connection with external control panel, PC tool and off-line configuration tool</li> <li>– RS485 based</li> </ul>
Application set-up wizards	Easy commissioning
Off-line configuration tool (option) <sup>1)</sup>	Fast and easy parameter selection, setting and copying with no mains power connection required
Potentiometer for setting setpoints locally	Cost-effective with no external wiring
Compact design	Save cabinet space
Coated Printed Circuit Boards	Improved reliability in harsh environments
Compatible with IPM and SPM motors	Freedom to choose your preferred motor
Integrated brake chopper and PID controller	Reduced cost
Flexible side-by-side mounting	Save cabinet space and cost
Operates at up to 50 °C without derating	<ul style="list-style-type: none"> <li>– Reduced cost for external cooling</li> <li>– Improved uptime</li> </ul>
2 variants, with and without EMC filter	Choose the best fit for the application
No forced air over PCB for whole power range	Improved reliability
Removable fan	Easy maintenance
Fan on / off control	Reduce noise and energy saving
Natural cooling up to single-phase 200 V 0.75 kW drives without cooling fan	Reduce noise and eliminate channel blockage risk
Condition based monitoring: motor winding and load envelope monitoring <sup>1)</sup>	Improve uptime

<sup>1)</sup> Upcoming feature

# Wiring schematic



<sup>1)</sup> Single DC choke in MA05a.

<sup>2)</sup> Built-in brake chopper is only applicable to drives in the power range of 3 x 380-480 V 2.2 kW (3.0 hp) and above.

<sup>3)</sup> No BR terminals for 1 x 200-240 V drives and 3 x 380-480 V 0.37-1.5 kW (0.5-2.0 hp) drives.

<sup>4)</sup> Select the PNP or NPN mode via parameter P9.4.1.1 Digital I/O mode (PNP=Source, NPN=Sink).

<sup>5)</sup> Use switch S640 (bus terminal) to enable termination on the RS485 port (terminals 68 and 69).

# Specification

## Mains supply (L1, L2, L3)

Supply voltage	200-240 V (-15%/+10%) 380-480 V (-15%/+10%)
Supply frequency	50/60 Hz
Displacement power factor (cos $\phi$ )	Near unity (> 0.98)
Switching frequency on input supply L1, L2, L3	Switching maximum 2 times/minute

## Output data (U, V, W)

Output voltage	0-100% of supply voltage
Switching on output	Unlimited
Ramp times	0.01-3600 s
Frequency range	Induction motor <ul style="list-style-type: none"> <li>• 0-200 Hz (VVC+ mode)</li> <li>• 0-500 Hz (U/f mode)</li> </ul> PM motor <ul style="list-style-type: none"> <li>• 0-400 Hz(VVC+ mode)</li> </ul>

## Overload capacity

Overload torque	150% for 60 s every 10 min
Overload torque at start	200% for 1 s

## Programmable digital inputs and outputs

Digital inputs/digital outputs*	5/1
Logic	PNP or NPN
Voltage level	0/24 V DC

\*Note: One digital input can be configured as digital output.

## Pulse input and output

Pulse input/Pulse output**	1/1, voltage level 0/24 V DC
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\*\*Note: One digital input can be configured as pulse input. Another digital input can be configured as pulse output.

## Programmable analog inputs and output

Analog inputs	2, voltage or current Voltage level: 0 V to +10 V (scaleable) Current level: 0/4 to 20 mA (scaleable)
Analog output	1 (current range 0/4 to 20 mA)

## Programmable relay output

Programmable relay output	1 (NO/NC 240 VAC, 2 A / 30 VDC, 2 A)
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# Electric data

## iC2-Micro mains supply 1 x 200-240 V AC

Enclosure IP20/Open Type		MA01c		MA02c	MA02a
		02A2	04A2	06A8	09A6
Typical shaft output	[kW]	<b>0.37</b>	<b>0.75</b>	<b>1.5</b>	<b>2.2</b>
	[hp]	0.5	1.0	2.0	3.0
<b>Output current</b>					
Continuous (3 x 200-240 V AC)	[A]	2.2	4.2	6.8	9.6
Intermittent (3 x 200-240 V AC)	[A]	3.3	6.3	10.2	14.4
<b>Maximum cable size</b>					
Mains, motor	[mm <sup>2</sup> /AWG]	4/10			
<b>Maximum input current</b>					
Continuous (1 x 200-240 V)	[A]	6.1	11.6	18.7	26.4
Intermittent (1 x 200-240 V)	[A]	8.3	15.6	26.4	37.0
<b>Environment</b>					
Power loss <sup>1)</sup>	[W]	16	31	46	61
Efficiency <sup>1)</sup>	[%]	97.5	97.6	97.6	97.9

## iC2-Micro mains supply 3 x 380-480 V AC

Enclosure IP20/Open Type		MA01a			MA02a		
		01A2	02A2	03A7	05A3	07A2	09A0
Typical shaft output	[kW]	<b>0.37</b>	<b>0.75</b>	<b>1.5</b>	<b>2.2</b>	<b>3.0</b>	<b>4.0</b>
Typical shaft output [hp]	[hp]	0.5	1.0	2.0	3.0	4.0	5.5
<b>Output current</b>							
Continuous (3 x 380-440 V)	[A]	1.2	2.2	3.7	5.3	7.2	9.0
Intermittent (3 x 380-440 V)	[A]	1.8	3.3	5.6	8.0	10.8	13.7
Continuous (3 x 440-480 V)	[A]	1.1	2.1	3.4	4.8	6.3	8.2
Intermittent (3 x 440-480 V)	[A]	1.7	3.2	5.1	7.2	9.5	12.3
<b>Maximum cable size</b>							
Mains, motor	[mm <sup>2</sup> /AWG]	4/10					
<b>Maximum input current</b>							
Continuous (3 x 380-440 V)	[A]	1.9	3.5	5.9	8.5	11.5	14.4
Intermittent (3 x 380-440 V)	[A]	2.6	4.7	8.7	12.6	16.8	20.2
Continuous (3 x 440-480 V)	[A]	1.7	3.0	5.1	7.3	9.9	12.4
Intermittent (3 x 440-480 V)	[A]	2.3	4.0	7.5	10.8	14.4	17.5
<b>Environment</b>							
Power loss <sup>1)</sup>	[W]	17	25	34	48	58	74
Efficiency <sup>1)</sup>	[%]	97.3	97.8	98.0	98.3	98.5	98.3

<sup>1)</sup> The value is measured at 100% rated torque-producing current and 90% rated motor stator frequency according to IEC 61800-9-2 and EN 50598-2.



# Ordering model code

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
i	C	2	-	3	0	F	A	3	N	0	4	-	0	1	A	2	E	2	0	F	4	+	A	C	X	X
								1	N	0	2									F	2		A	C	B	C
																				F	0					

<p><b>Product group</b> iC2-30</p>	<p><b>Product category</b> FA Frequency converter air cooled</p>	<p><b>Product type</b> 3N Three phases 1N Single phase</p>	<p><b>Mains voltage</b> 04 380-480 V AC 02 200-240 V AC</p>	<p><b>*Current rating</b> 01A2 1.2 A 02A2 2.2 A 03A7 3.7 A 04A2 4.2 A 05A3 5.3 A 06A8 6.8 A 07A2 7.2 A 09A0 9.0 A 09A6 9.6 A</p>	<p><b>Protection rating</b> E20 IP20/Open Type</p>	<p><b>EMC category</b> F4 C4 category F2 C2 category F0 C1 category</p>	<p><b>Brake chopper</b> +ACXX None +ACBC Integrated</p>
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\* See power rating on page 8





# Dimensions and weights



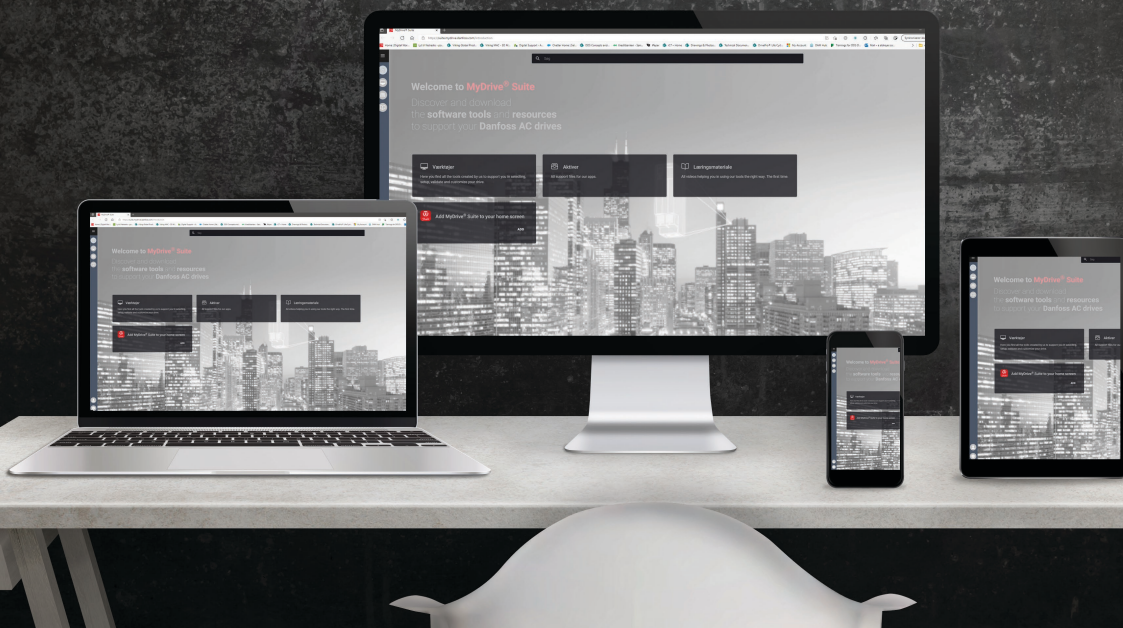
Enclosure size	Voltage type	Power rating [kW]	Height H [mm (in)]	Width W [mm (in)]	Depth D [mm (in)]	Height H1 [mm (in)]	Width W1 [mm (in)]	Weight IP20 [kg]
MA01c	1-phase 200-240 V	0.37	150 (5.9)	70 (2.8)	143 (5.6)	140.4 (5.5)	55 (2.2)	1.0
MA01c		0.75	150 (5.9)	70 (2.8)	143 (5.6)	140.4 (5.5)	55 (2.2)	1.0
MA02c		1.5	176 (6.9)	75 (3.0)	157 (6.2)	150.5 (5.9)	59 (2.3)	1.3
MA02a		2.2	186 (7.3)	75 (3.0)	175 (6.9)	176.4 (6.9)	59 (2.3)	1.6
MA01a	3-phase 380-480 V	0.37	150 (5.9)	70 (2.8)	158 (6.2)	140.4 (5.5)	55 (2.2)	1.1
MA01a		0.75	150 (5.9)	70 (2.8)	158 (6.2)	140.4 (5.5)	55 (2.2)	1.1
MA01a		1.5	150 (5.9)	70 (2.8)	158 (6.2)	140.4 (5.5)	55 (2.2)	1.1
MA02a		2.2	186 (7.3)	75 (3.0)	175 (6.9)	176.4 (6.9)	59 (2.3)	1.6
MA02a		3	186 (7.3)	75 (3.0)	175 (6.9)	176.4 (6.9)	59 (2.3)	1.6
MA02a		4	186 (7.3)	75 (3.0)	175 (6.9)	176.4 (6.9)	59 (2.3)	1.6

The power range for 3-phase 380-480 V drives will be extended to 22 kW in the near future

# Accessories

Category	Description	Code number
IP21/Type 1 conversion kit	IP21/Type 1 conversion kit, MA01c	132G0188
	IP21/Type 1 conversion kit, MA02c	132G0189
	IP21/Type 1 conversion kit, MA01a	132G0190
	IP21/Type 1 conversion kit, MA02a	132G0191
NEMA 1 conversion kit	NEMA 1 conversion kit, MA01c	132G0195
	NEMA 1 conversion kit, MA02c	132G0196
	NEMA 1 conversion kit, MA01a	132G0197
	NEMA 1 conversion kit, MA02a	132G0198
Decoupling plate mounting kit	Decoupling plate mounting kit, MA01c	132G0202
	Decoupling plate mounting kit, MA02c	132G0203
	Decoupling plate mounting kit, MA01a	132G0204
	Decoupling plate mounting kit, MA02/03a	132G0205
Connector for common DC and brake resistor	Connector for common DC/brake resistor	132G0207

# MyDrive® Suite ensures your digital tools are only one click away



**MyDrive® Suite** brings all your tools together to support you during engineering, operation and service. What is MyDrive® Suite? It's a tool providing a single point of access for the other digital tools supporting you during engineering, operation and service, thereby covering the whole life cycle of the drive.

Based on your needs, the tools are accessible via different platforms. They can be integrated into your system and business processes to enable a world-class end-to-end experience with full flexibility. Your data is synchronized between the tools, and by sharing the same data backend, information is always correct and up to date.

Our suite of software tools is designed to ensure you easy operation and the highest level of customization of your AC drives. Whether you're a beginner or a pro, you have everything you need to go from selecting to programmability of a drive.

Try MyDrive® Suite today:

 [suite.mydrive.danfoss.com](https://suite.mydrive.danfoss.com)

## Easy to use

- One tool suite
- One common look and feel
- Single login to all tools
- Seamless usage across devices and touchpoints
- Platform enables coherent workflows
- Data synchronization between tools. There is no need to enter information twice, which means your information is always correct and up to date
- Search and smart filtering
- Tutorials and documentation

## Keeps your data safe

- Data security through user levels and authentication
- End-to-end secure communication

## Fits your needs

- Data integration into your tools and systems
- APIs and open interfaces facilitate third-party applications or branded versions
- The tools are available as web app, desktop application, dedicated tablet and smartphone app, all with offline functionality. No internet connection is required once the tool is installed to your device



# Convenient and fast – 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 configure your drives

- Select the right AC drive based on motor and load characteristics
- Find general product, segment and application information of VLT® and VACON® drives

### Available tools

- **MyDrive® Select**  
Select and dimension your drive 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

### Available tools

- **MyDrive® Insight**  
Connect to one or more drives from a PC. Provides a simple and intuitive interface for easy commissioning and monitoring

## 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

### Available tools

- **MyDrive® ecoSmart™**  
Now it's easy to determine IE and IES classes according to IEC/EN 61800-9, for VLT® and VACON® drives alone and in combination with a motor. MyDrive® ecoSmart™ uses nameplate data to perform the efficiency calculations, and produces a pdf report for documentation.

Online tool:

- **ecosmart.danfoss.com**  
App: **MyDrive® ecoSmart™**

- **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.



# DrivePro® Life Cycle services

## Delivering a customized service experience!

We understand that every application is different. Having the ability to build a customized service package to suit your specific needs is essential.

DrivePro® Life Cycle Services is a collection of tailor-made products designed around you. Each one engineered to support your business through the different stages of your AC drive's life cycle.

From optimized spare-part packages to condition-monitoring solutions, our products can be customized to help you achieve your business goals.

With the help of these products, we add value to your application by ensuring you get the most out of your AC drive.

When you deal with us, we also offer you access to training, as well as the application knowledge to help you in planning and preparation. Our experts are at your service.

 [drivepro.danfoss.com](https://drivepro.danfoss.com)



# You're covered

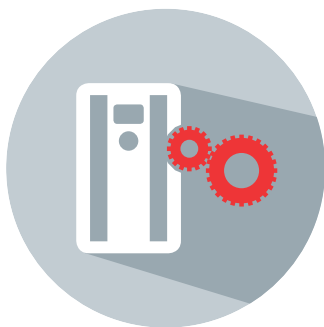
## with DrivePro® Life Cycle service products



### DrivePro® Extended Warranty

#### Long-term peace of mind

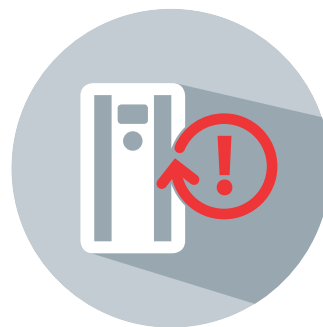
Get the longest coverage available in the industry, for peace of mind, a strong business case and a stable, reliable budget. You know the annual cost of maintaining your drives, up to six years in advance.



### DrivePro® Spare Parts

#### Plan ahead with your spare part package

In critical situations, you want no delays. With DrivePro® Spare Parts you always have the right parts on hand, on time. Keep your drives running at top efficiency, and optimize system performance.



### DrivePro® Exchange

#### The fast, most cost-efficient alternative to repair

You obtain the fastest, most cost-efficient alternative to repair, when time is critical. You increase uptime, thanks to quick and correct replacement of the drive.to-date. You receive an on-site evaluation, an upgrade plan and recommendations for future improvements.

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

 **Local contacts**

 **drivepro.danfoss.com**



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# iC2

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