ENGINEERING
TOMORROW

Selection Guide | iC2-Micro

iC2-Micro
Performance that pays off

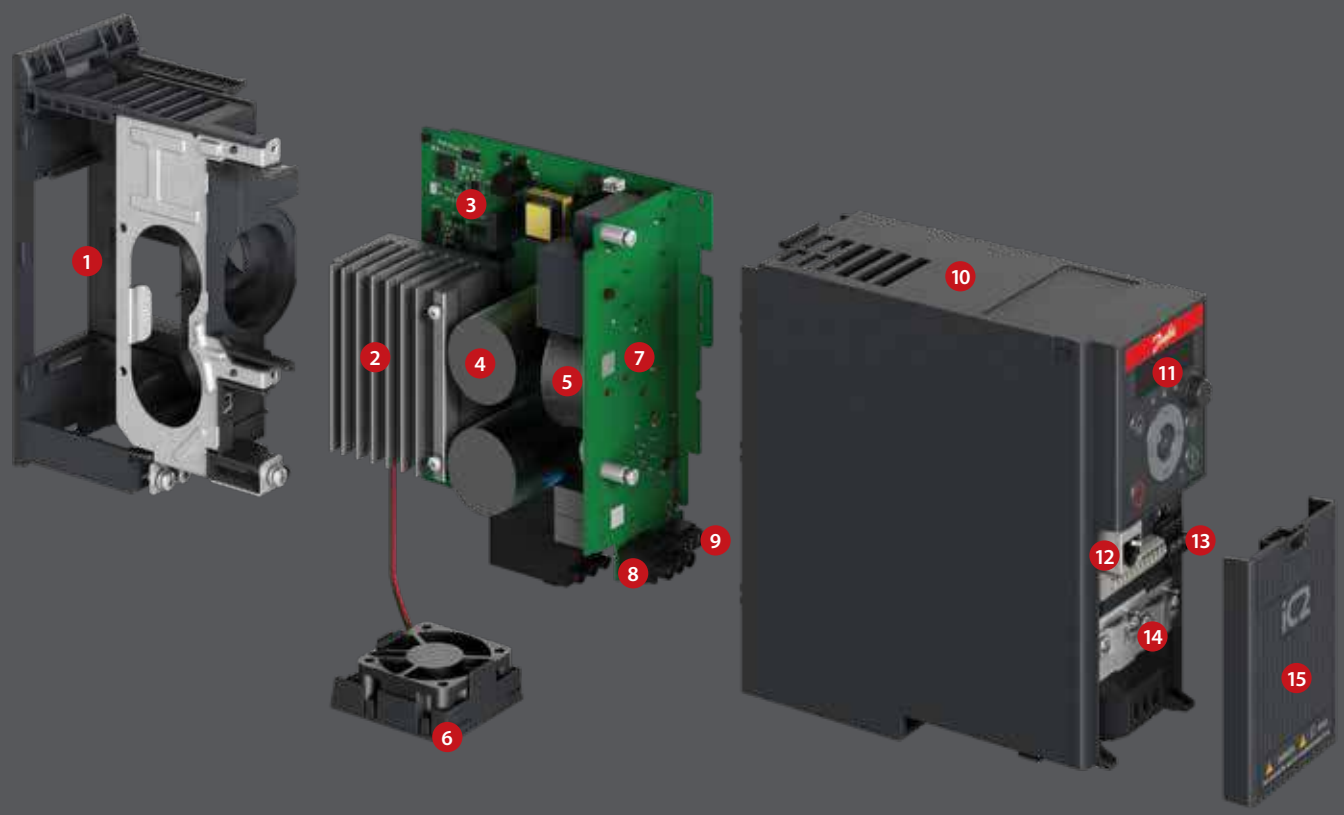
Run reliably at full load for ambient temperatures up to

50 °C

drives.danfoss.com

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-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 easily, 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.

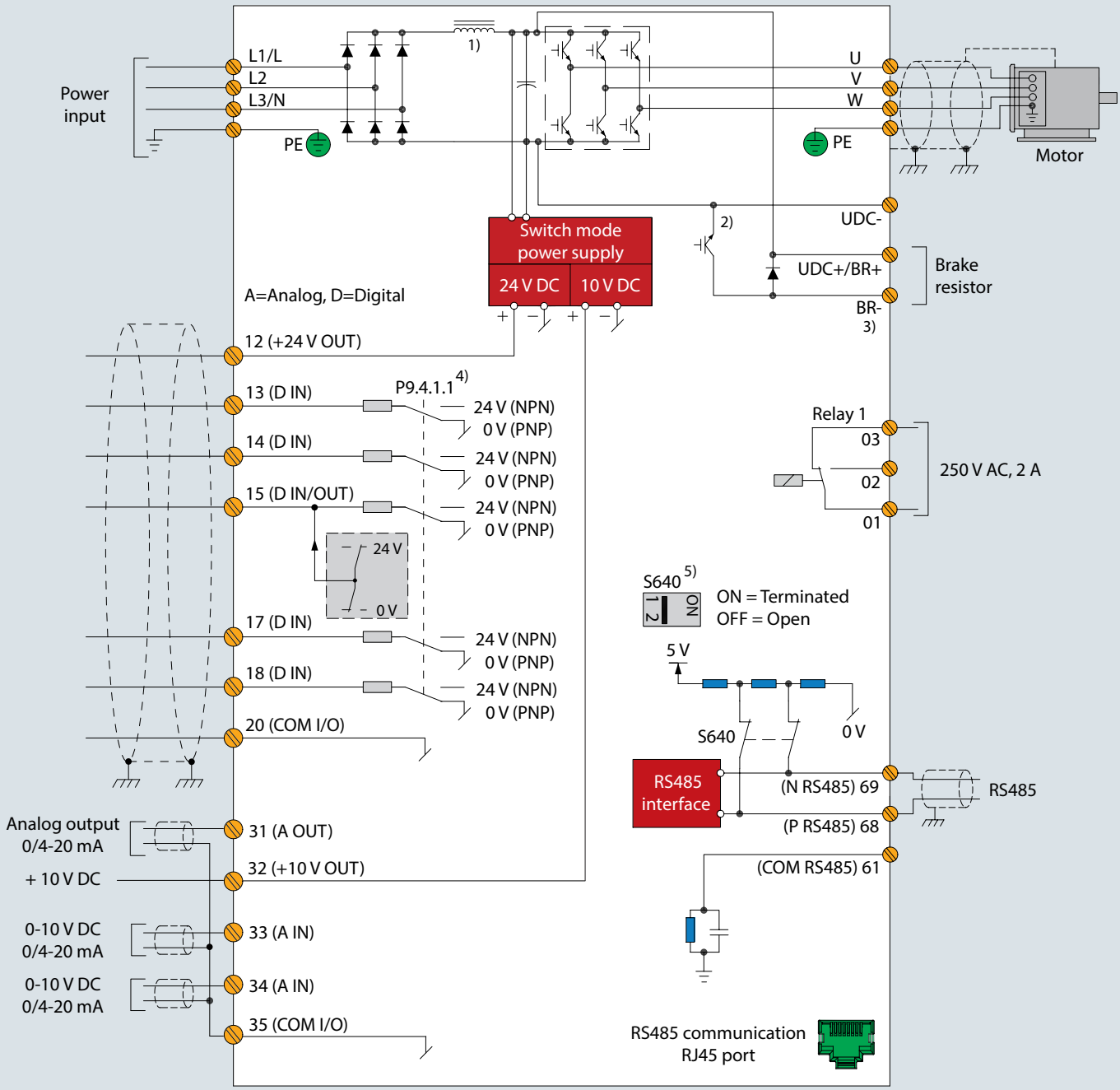
Integrated PID controller
The built-in PID controller ensures solid process control, such as constant pressure or constant flow operation.

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)*	Easy programming
RJ45 port	– Easy connection for external control panel option and PC tool – RS485 based
Application set-up wizards	Easy commissioning
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	– Reduced cost for external cooling – Improved uptime
2 variants, with and without EMC filter	Choose the best fit for the application
No forced air over PCB for whole power range	Improved reliablity
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

Wiring schematic



1] Single DC choke in 3 x 380-480 V 18.5 kW (25 hp) and 22 kW (30 hp).

2] 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.

3] 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.

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

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

Specification

Mains supply (L1, L2, L3)	
Supply voltage	100-120 V (-15%/+10%) 200-240 V (-15%/+10%) 380-480 V (-15%/+10%)
Supply frequency	50/60 Hz
Displacement power factor (cos φ)	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 • 0-200 Hz (VVC+ mode) • 0-500 Hz (U/f mode) PM motor • 0-400 Hz(VVC+ mode)
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

***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)

Electric data

iC2-Micro mains supply 1 x 200-240 V AC [1]

Enclosure IP20/Open Type		MA01c		MA02c	MA02a
		02A2	04A2	06A8	09A6
Typical shaft output	[kW]	**0.37**	**0.75**	**1.5**	**2.2**
	[hp]	0.5	1.0	2.0	3.0
Output current					
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
Maximum cable size					
Mains, motor	[mm²/AWG]	4/10			
Maximum input current					
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
Environment					
Power loss [2]	[W]	16	31	46	61
Efficiency [2]	[%]	97.5	97.6	97.6	97.9

iC2-Micro mains supply 3 x 380-480 V AC [1]

Enclosure IP20/Open Type		MA01a			MA02a		
		01A2	02A2	03A7	05A3	07A2	09A0
Typical shaft output	[kW]	**0.37**	**0.75**	**1.5**	**2.2**	**3.0**	**4.0**
	[hp]	0.5	1.0	2.0	3.0	4.0	5.5
Output current							
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
Maximum cable size							
Mains, motor	[mm²/AWG]	4/10					
Maximum input current							
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
Environment							
Power loss [2]	[W]	17	25	34	48	58	74
Efficiency [2]	[%]	97.3	97.8	98.0	98.3	98.5	98.3

[1] 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.
[2] Available 2024: 3-phase 380-480 V up to 22 kW; 1-phase 100-120 V; 3-phase 200-240 V

iC2-Micro mains supply 3 x 380-480 V AC [1]

Enclosure IP20/Open Type		MA03a		MA04a	
		12A0	15A5	23A0	31A0
Typical shaft output	[kW]	**5.5**	**7.5**	**11**	**15**
	[hp]	7.5	10	15	20
Output current					
Continuous (3 x 380-440 V)	[A]	12	15.5	23	31
Intermittent (3 x 380-440 V)	[A]	18	23.5	34.5	46.5
Continuous (3 x 440-480 V)	[A]	11	14	21	27
Intermittent (3 x 440-480 V)	[A]	16.5	21.3	31.5	40.5
Maximum cable size					
Mains, motor	[mm²/AWG]	4/10		16/6	
Maximum input current					
Continuous (3 x 380-440 V)	[A]	19.2	24.8	33	42
Intermittent (3 x 380-440 V)	[A]	27.4	36.3	47.5	60
Continuous (3 x 440-480 V)	[A]	16.6	21.4	29	36
Intermittent (3 x 440-480 V)	[A]	23.6	30.1	41	52
Environment					
Power loss [2]	[W]	104	127	213	285
Efficiency [2]	[%]	98.3	98.4	98.2	98.3

[1] 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.
[2] Available 2024: 3-phase 380-480 V up to 22 kW; 1-phase 100-120 V; 3-phase 200-240 V

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					

Product group
iC2-30

Product category
FA Frequency converter air cooled

***Current rating**
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
12A0 12.0A
15A5 15.5A
23A0 23.0A
31A0 31.0A

EMC category
F4 C4 category
F2 C2 category
F0 C1 category

Product type
3N Three phases
1N Single phase

Mains voltage
04 380-480 V AC
02 200-240 V AC

Protection rating
E20 IP20/Open Type

Brake chopper
+ACXX None
+ACBC Integrated

** See power rating on page 8-9*

Dimensions and weights

Enclosure size	Power [kW (hp)]			
	1 x 200-240 V	3 x 380-480 V	3 x 200-240 V [1]	1 x 100-120 V [1]
MA01c	0.37-0.75 (0.5-1.0)	–	–	0.37 (0.5)
MA02c	1.5 (2.0)	–	–	1.1 (1.5)
MA01a	–	0.37-1.5 (0.5-2.0)	0.37-0.75 (0.5-1.0)	–
MA02a	2.2 (3.0)	2.2-4.0 (3.0-5.5)	1.5 (2.0)	–
MA03a	–	5.5-7.5 (7.5-10)	2.2-3.7 (3.0-5.0)	–
MA04a	–	11-15 (15-20)	–	–
MA05a	–	18.5-22 (22-30) [1]	–	–

Enclosure size	Height [mm (in)]		Width [mm (in)]		Depth [2] [mm (in)]	Weight
	A	a	B	b	C	[kg (lb)]
MA01c	150 (5.9)	140.4 (5.5)	70 (2.8)	55 (2.2)	143 (5.6)	1.0 (2.4)
MA02c	176 (6.9)	150.5 (5.9)	75 (3.0)	59 (2.3)	157 (6.2)	1.3 (2.9)
MA01a	150 (5.9)	140.4 (5.5)	70 (2.8)	55 (2.2)	158 (6.2)	1.1 (2.4)
MA02a	186 (7.3)	176.4 (6.9)	75 (3.0)	59 (2.3)	175 (6.9)	1.6 (3.5)
MA03a	238.5 (9.4)	226 (8.9)	90 (3.5)	69 (2.7)	200 (7.9)	3.0 (6.6)
MA04a	292 (11.5)	272.4 (10.7)	125 (4.9)	97 (3.8)	244.5 (9.6)	6.0 (13.2)
MA05a			[1]			

[1] *Available 2024.*
[2] *The potentiometer on the local control panel extends 6.5 mm (0.26 in) from the drive.*

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
	IP21/Type 1 conversion kit, MA03a	132G0192
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
	NEMA 1 conversion kit, MA03a	132G0199
	NEMA 1 conversion kit, MA04a	132G0200
	NEMA 1 conversion kit, MA05a [1]	132G0201
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
	Decoupling plate mounting kit, MA04a/05a	132G0206
Connector for common DC and brake resistor	Connector for common DC/brake resistor	132G0207

[1] *Available 2024.*

Scan QR for product information

Using your smart device, scan the QR code on the front label of the iC2-Micro drive, to get product information fast. You will go straight to the product store where you can access:

- Product model code and series number
- Product description
- Technical specifications
- Manuals, brochures and fact sheet
- Certificates
- Engineering drawings
- Product image files
- Accessories and spare parts

Control Panel 2.0 OP2

This external control panel option gives you:

- 2" screen with more information displayed
- Multilingual display showing parameters, selections, and status for easy understanding
- Visual LEDs to clearly indicate drive status
- Parameter copy and download for easy commissioning
- Remote mounting kit option for cabinet door installation with IP55 protection rating

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

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

MyDrive®
Suite

Convenient and fast – **Digital tools** empower you

Need help to design your application, or select, set up, and maintain your drive? Danfoss provides a pallette 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.

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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 tailormade 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

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-Micro is the convenient drive that gives you a new way to optimize efficiency and cost. With its compact design, it saves panel space to reduce system cost. Since it is compatible with diverse motor technologies such as induction, IPM and SPM, you can freely select the best-fit motor for your application. It's easy to commission, since it's equipped with startup wizards and application-oriented parameter groups. What are you waiting for? Here is the compact drive that's reliable and flexible, ready to power your pumps, fans, conveyors and mixers, textile machinery, palletizers, and packaging machines.

iC2

Follow us and learn more about AC drives