
How to retrofit
VLT® Micro Drive FC 51
with iC2-Micro
Danfoss

iC2-Micro in brief



iC2-Micro
Perfect match for a wide and varied range of industrial and HVAC applications, with compact size

Voltage rating	T4: 3 x 380-480 V AC S2: 1 x 200-240 V AC T2: 3 x 200-240 V AC S1: 1 x 100-120 V AC -15%/+10%
Power rating (Nominal current)	T4: 0.37-22 kW / 0.5-30 hp (1.2-43 A) S2: 0.37-2.2 kW / 0.5-3 hp (2.2-9.6 A) T2: 0.37-11 kW / 0.5-15 hp (2.4-46.2 A) S1: 0.37-1.1 kW / 0.5-1.5 hp (2.4-4.8 A)
Protection rating	IP20 (IP21 as option)
EMC compliance	T4: C4 and C2 S2: C4 and C1 T2: C4 S1: C4

Compatible with VLT® Micro Drive FC 51
- EMC performance
- Physical dimensions

High overload
- 150% 60 s
- 200% 1 s at start

Built-in control panel with potentiometer
- Multi-language texts in the control panel as an option

Integrated RS485 Modbus

Global approvals

Easy to retrofit

iC2-Micro

- Serves the same voltage types and power ranges as VLT® Micro Drive FC 51
- Has the same dimensions as the VLT® Micro Drive FC 51, or even smaller[1]
- Fits the existing mounting holes of the VLT® Micro Drive FC 51[1]
- Internal parameter numbers are consistent with the VLT® Micro Drive FC 51 parameter list. The registered address is used for communication, so there is no need to change the PLC program file upon retrofit
- Delivers better performance and more powerful functions to enable a broader range of adaptations



Easy retrofit

iC2-Micro is designed to be compatible with the VLT® Micro Drive FC 51 for a fast, streamlined retrofit

[1] Dependent on different variants, refer to the slides *'Dimensions and weights'*

Key specifications comparison

Attribute	VLT® Micro Drive FC 51	iC2-Micro
3-phase 380-480 V	0.37 – 22 kW	0.37 – 22 kW
1-phase 200-240 V	0.18 – 2.2 kW	0.37 – 2.2 kW
3-phase 200-240 V	0.25 – 3.7 kW	0.37 – 11 kW
1-phase 100-120 V	N.A.	0.37 – 1.1 kW
Enclosure	IP20/Open type	IP20/Open type
Motor type	Only IM	IM, PM (SPM and IPM)
Motor identification and tuning	Automatic Motor Tuning (AMT)	Automatic Motor Adaptation (AMA)
Output frequency	Induction motor • 0-200 Hz (VVC+ mode) • 0-400 Hz (U/f mode)	Induction motor • 0-200 Hz (VVC+ mode) • 0-500 Hz (U/f mode) PM motor • 0-400 Hz (VVC+ mode)
Ramp time	0.05-3600 sec	0.01-3600 sec
Overload capacity	150% for 1 minute	150% for 1 minute
Overload torque at start	N.A.	200%/1s
Maximum motor cable length (unshielded)	50 m (164 ft)	75 m (246 ft)
EMC filter	Built-in RFI filter	Two versions: • Built-in EMC filter • Without built-in EMC filter
Cooling fan	Fixed fan without fan control	Replaceable fan with fan on/off control

Attribute	VLT® Micro Drive FC 51	iC2-Micro
Natural cooling	N.A.	Frame size MA01c
Ambient temperature	40 °C (104 °F) at full load Max. 50 °C (122 °F) with derating	50 °C (122 °F) at full load Max. 55 °C (131 °F) with derating
HMI	Detachable numerical control panel as option: • VLT® Control Panel LCP 11 without potentiometer • VLT® Control Panel LCP12 with potentiometer • Supports cabinet door installation using remote mounting kit	Built-in control panel with potentiometer as default. Control Panel 2.0 OP2 as external control panel option: • Multi-language texts display • Easy for commissioning • Parameters setting and copy • Support two kinds of cabinet mounting kits
PC tool	VLT® Motion Control Tool MCT 10	MyDrive® Insight
Off-line configuration	N.A.	With adapter option, support off-line configuration
Torque control	N.A.	Torque open loop control
Process controller	PI controller	PID controller
RS485 port baud rate	Max. 38,400 baud communication speed	Max. 115,000 baud communication speed
RJ45 port	N.A.	RS485-based and used for connecting external control panel and PC tool.
Safety standards	EN/IEC 61800-5-1 Edition 2.1 UL 508C	EN/IEC 61800-5-1 Edition 3.0 UL 61800-5-1
UL LZGH2/8 certification	N.A.	Certified in accordance with UL/IEC 60335-2-40 and CSA C22.2 No.0335-2-40

Key improvements and new features of iC2-Micro
– when compared to VLT® Micro Drive FC 51



Improvements in iC7-Micro

- UL61800-5-1 versus UL508C compliance
- Cooling fan: on/off versus always running
- Replaceable cooling fan versus fixed
- Max. cable length – 75 m vs. 50 m
- DI/DO (Maximum output 40 mA) versus DO – 20 mA output
- Improved motor identification and tuning, AMA versus AMT
- Pulse input with 32 kHz versus 5 kHz
- Process control: PI and PID versus PI only
- RS-485 (115 K communication speed) versus 38.4 K
- Full load without derating at 50 °C versus 40 °C
- Spring-type IO terminals versus screw type
- Improved mechanical brake performance
- Two variants for C2 and C4 (EMC)
- Better output frequency resolution
- Improved potentiometer
- Improved linearity of analog inputs

New functionalities in iC2-Micro

- PM motor control
- Quick access for setup wizard and application Selections
- Natural cooling within smallest enclosure for S1andS2 drives
- MyDrive® Insight compatibility
- Breakaway current 200% 1s
- Latch start reverse
- Sleep mode
- Protection- locked motor detector
- Input phase loss trip
- Scanning QR code for more information
- Clockwise direction
- Kinetic backup
- Torque open loop control
- Built-in control panel with potentiometer
- UL LZGH2/8 certificate
- Digital potentiometer
- Dead zone function
- PCD User Define
- Variable duty cycle pulse signal as the reference
- Off-line configuration with quick adapter option
- and more...

Ordering model code

VLT® Micro Drive FC 51

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
F	C	-	0	5	1	P	2	K	2	T	4	E	2	0	H	3	B	X	C	X	X	X	S	X	X	X
										T	2				H	X	X									
										S	2															

Product group and series
FC 051

Power rating*

Protection rating
E20 IP20/Open Type

Mains voltage
T4 3 x 380-480 V AC
T2 3 x 200-240 V AC
S2 1 x 100-120 V AC

RFI filter
H3 RFI filter A1/B
HX No RFI filter

Brake chopper
B Integrated
X None

Display
X No local control panel

Coating PCB
C Coated PCB

Mains option
X No option

Adaption A
X No adaption

Adaption B
X No adaption

Software
SXXX Latest software



NOTE: See power rating on next slides

Classified as Business

Ordering model code

iC2-Micro Frequency Converter

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
										0	1									F	0					

Product group
iC2-30

Product category
FA Frequency converter air cooled

Product type
3N Three phases
1N Single phase

Mains voltage
04 380-480 V AC
02 200-240 V AC
01 100-120 V AC

Current rating*

Protection rating
E20 IP20/Open Type

EMC category
F4 C4 category
F2 C2 category
F0 C1 category

Brake chopper
+ACXX None
+ACBC Integrated



NOTE: See power rating on next slides

Classified as Business

Variants

3-phase 380-480 V AC

VLT® Micro Drive FC 51	Power rating [kW/hp]	0.37/0.5	0.75/1.0	1.5/2.0	2.2/3.0	3.0/4.0	4.0/5.5	5.5/7.5	7.5/10	11/15	15/20	18.5/25	22/30
	Nominal current [A]	1.2	2.2	3.7	5.3	7.2	9.0	12.0	15.5	23.0	31.0	37.0	43.0
	Frame size	M1		M2		M3				M4		M5	
	Drive type	PK37	PK75	P1K5[2]	P2K2	P3K0	P4K0	P5K5	P7K5	P11K	P15K	P18K	P22K
	EMC	With RFI filter - Class A1/B and without RFI filter[1] (EN 55011)											
	Built-in brake chopper	X						✓					
iC2-Micro	Frame size	MA01a			MA02a			MA03a		MA04a		MA05a	
	Drive type	01A2	02A2	03A7	05A3	07A2	09A0	12A0	15A5	23A0	31A0	37A0	43A0
	EMC	With EMC filter - C2 and without EMC filter - C4 (EN/IEC 61800-3)											
	Built-in brake chopper	X						✓					

[1] FC 51 drives without RFI filter are available in China and India only
[2] FC 51 P1K5 without RFI filter drive variant is in frame size M1.

Variants

1-phase 200-240 V AC

	Power rating [kW/hp]	0.18/0.24	0.37/0.5	0.75/1.0	1.5/2.0	2.2/3.0
	Nominal current [A] [1]	1.2	2.2	4.2	6.8	9.6
VLT® Micro Drive FC 51	Frame size		M1		M2	M3
	Drive type	PK18	PK37	PK75	P3K7	P2K2
	EMC	With RFI filter - Class A1/B and without RFI filter[1] (EN 55011)				
	Built-in brake chopper		X		✓	
iC2-Micro	Frame size	N.A.	MA01c		MA02c	MA02a
	Drive type	N.A.	02A2	04A2	06A8	09A6
	EMC	N.A.	With EMC filter - C2 and without EMC filter - C4 (EN/IEC 61800-3)			
	Built-in brake chopper	N.A.	X			

[1] FC 51 drives without filter only available in China and India market

Classified as Business

Variants

3-phase 200-240 V AC

	Power rating [kW/hp]	0.25/0.33	0.37/0.5	0.75/1.0	1.5/2.0	2.2/3.0	3.7/5.0	5.5/7.5	7.5/10	11/15
	Nominal current [A] [1]	1.5	2.4	4.2	7.8	11.0	15.2	24.2	31.0	46.2
VLT® Micro Drive FC 51	Frame size	M1			M2	M3		N.A.		
	Drive type	PK18	PK37	PK75	P3K7	P2K2	P3K7	N.A.		
	EMC	With RFI filter - Class A1/B (EN 55011)						N.A.		
	Built-in brake chopper	X				✓		N.A.		
iC2-Micro	Frame size	N.A.	MA01a		MA02a	MA03a		MA04a		MA05a
	Drive type	N.A.	02A4	04A2	07A8	11A0	15A2	24A2	31A0	46A2
	EMC	N.A.	Without EMC filter - C4 (EN/IEC 61800-3)							
	Built-in brake chopper	N.A.	X			✓				

[1] Nominal current of iC2-Micro for some power ratings are higher than FC 51. Please check the technical literature for the details.

Variants

1-phase 100-120 V AC

	Power rating [kW/hp]	0.37/0.5	1.1/1.5
	Nominal current [A]	2.4	4.8
VLT® Micro Drive FC 51	Frame size	N.A.	
	Drive type	N.A.	
	EMC	N.A.	
	Built-in brake chopper	N.A.	
iC2-Micro	Frame size	MA01c	MA02c
	Drive type	02A4	04A8
	EMC	Without EMC filter - C4 (EN/IEC 61800-3)	
	Built-in brake chopper	X	

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EMC compatibility and motor cable length

	Conducted emission. Maximum shielded cable length at 4 kHz			Radiated emission	
VLT® Micro Drive FC 51	EN 55011				
	Class B	Class A1	Class A2	Class A2	Class A1
1 x 200-240 V AC	5 m	15 m	25 m	Yes	No
3 x 200-240 V AC 3 x 380-400 V AC	–	15 m	25 m	Yes	No

iC2-Micro	EN/IEC 61800-3				
	Category C1	Category C2	Category C4	Category C2	Category C4
1 x 100-120 V AC 3 x 200-240 V AC	–	–	50 m	–	Yes
1 x 200-240 V AC	5 m	–	50 m	Yes	Yes
3 x 380-400 V AC	–	15 m	50 m	Yes	Yes

Standards and requirements	EN55011 Facility operators must comply with EN55011	Class B Housing and light industries	Class A Group 1 Industrial environment	Class A Group 2 Industrial environment	Not applicable
	EN/IEC 61800-3 Converter manufacturers must conform to EN61800-3	Category C1 1st environment, home and office	Category C2 1st environment, home and office	Category C3 2nd environment, unrestricted distribution	Category C4 2nd environment, restricted distribution

	The drive is designed to operate with optimum performance within the maximum motor cable lengths:	
	Shielded	Unshielded
VLT® Micro Drive FC 51	15 m	50 m
iC2-Micro	50 m	75 m

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Dimensions and weights

VLT® Micro Drive FC 51

Enclosure size	Power [kW (hp)]			
	1 x 200-240 V AC	3 x 380-480 V AC	3 x 200-240 V AC	1 x 100-120 V AC
M1	0.18-0.75 (0.24-1.0)	0.37-0.75 (0.5-1.0)	0.25-0.75(0.33-1.0)	-
M2	1.5 (2.0)	1.5[1]-2.2 (2.0-3.0)	1.5 (2.0)	-
M3	2.2 (3.0)	3.0-7.5 (4.0-10)	2.2-3.7 (3.0-5.0)	-
M4	-	11-15 (15-20)	-	–
M5	–	18.5-22 (22-30)	-	–



Enclosure size	Height [mm (in)]		Width [mm (in)]		Depth [mm (in)]	Maximum weight
	A	a	B	b	C	[kg (lb)]
M1	150 (5.9)	140.4 (5.5)	70 (2.8)	55 (2.2)	148 (5.8)	1.1 (2.4)
M2	176 (6.9)	166.4 (6.5)	75 (3.0)	59 (2.3)	168 (6.6)	1.6 (3.5)
M3	238.5 (9.4)	226 (8.9)	90 (3.5)	69 (2.7)	194 (7.6)	3.0 (6.6)
M4	292 (11.5)	272.4 (10.7)	125 (4.9)	97 (3.8)	241 (9.5)	6.0 (13.2)
M5	335 (13.2)	315 (12.4)	165 (6.5)	140 (5.5)	248 (9.8)	9.5 (20.7)

[1] FC 51 drive type P1K5 without RFI filter is in frame size M1.

Dimensions and weights

iC2-Micro Frequency Converter

Enclosure size	Power [kW (hp)]			
	1 x 200-240 V AC	3 x 380-480 V AC	3 x 200-240 V AC	1 x 100-120 V AC
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)	5.5-7.5 (7.5-10)	–
MA05a	–	18.5-22 (22-30)	11 (15)	–



Enclosure size	Height [mm (in)]		Width [mm (in)]		Depth [1] [mm (in)]	Maximum 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	335 (13.2)	315 (12.4)	165 (6.5)	140 (5.5)	248 (9.8)	9.4 (20.7)

[1] The potentiometer on the local control panel extends 6.5 mm (0.26 in) from the drive

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Comparison of dimensions

VLT® Micro Drive FC 51									
Frame size	Power [kW]				Height [mm]		Width [mm]		Depth [mm]
	1x 100-120 V	1x 200-240 V	3x 200-240 V	3x 380-400 V	A	a	B	b	C
M1		0.18-0.75			150	140.4	70	55	148
M2		1.5			176	166.4	75	59	168
M3		2.2			238.5	226	90	69	194
M1			0.25-0.75	0.37-0.75	150	140.4	70	55	148
M2			1.5	1.5, 3, 2.2	176	166.4	75	59	168
M3			2.2-3.7	3, 4, 5.5, 7.5	238.5	226	90	69	194
M4				11-15	292	272.4	125	97	241
M5				18.5-22	335	315	165	140	248

iC2-Micro									
Frame size	Power [kW]				Height [mm]		Width [mm]		Depth [mm]
	1x 100-120V	1x 200-240V	3x 200-240V	3x 380-400V	A	a	B	b	C
MA01c	0.37	0.37-0.75			150	140.4	70	55	143
MA02c	1.1	1.5			176	150.5	75	59	157
MA02a		2.2			186	176.4	75	59	175
MA01a			0.37-0.75	0.37, 0.75, 1.5	150	140.4	70	55	158
MA02a			1.5	2.2, 3, 4	186	176.4	75	59	175
MA03a			2.2-3.7	5.5-7.5	238.5	226	90	69	200
MA04a			5.5-7.5	11-15	292	272.4	125	97	244.5
MA05a			11	18.5-22	335	315	165	140	248

- S2 drives: Dimensions of iC2-Micro are smaller than FC 51.
- T4 1.5kW: iC2-Micro MA01a is smaller than FC 51 M2.
- T4 3kW and 4kW: iC2-Micro MA02a is smaller than FC 51 M3.
- T4 2.2kW: Height of iC2-Micro in MA02a is slightly greater than FC 51 in M2. But the width remains identical, so there is no impact on the upper mounting holes.
- T4 MA01a~MA04a: Depth of iC2-Micro is slightly deeper than FC 51, but footprint is the same as FC 51.

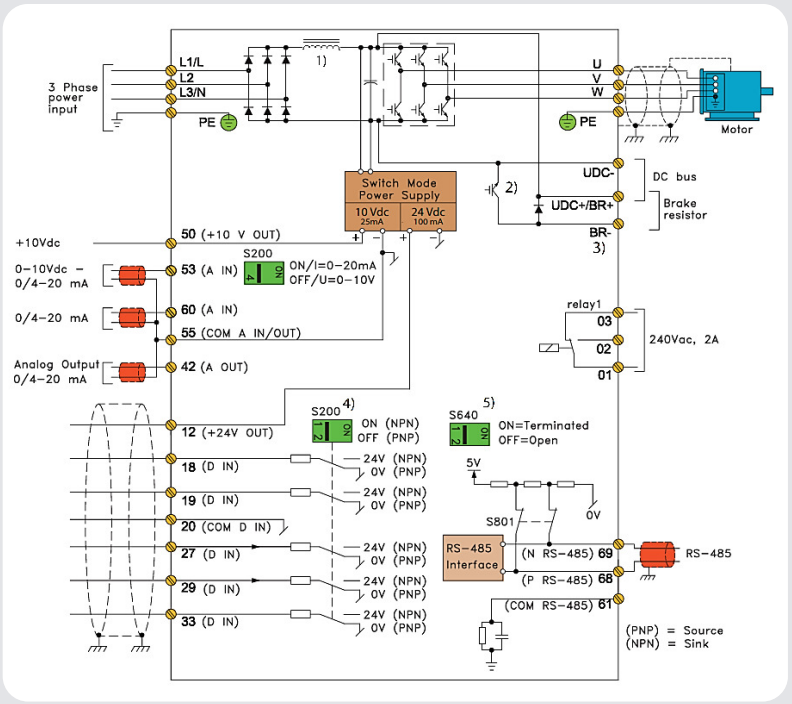
Connections

	VLT® Micro Drive FC 51		iC2-Micro Frequency Converter	
I/O terminals	Terminal number	Type	Terminal number	Type
	T12	+24V	T12	+24V
	T18	DI1	T13	DI1
	T19	DI2	T14	DI2
	T20	GND	T15	DIO
	T27	DI3	T17	DI3
	T29	DI4	T18	DI4
	T33	DI5	T20	GND
	T42	AO1	T31	AO1
	T50	+10V	T32	+10V
	T53	AI1	T33	AI1
	T55	GND	T34	AI2
	T60	AI2	T35	GND
	Note: • Terminal type: Screw type • Digital output: T42 could be set as digital output. Max. output current is 20 mA • Pulse input: T33 could be set as pulse input (20–5000 Hz) • Pulse output: N.A. • Analog input switching mode: By hardware switch (voltage or current) • PNP and NPN switch: By hardware switch		Note: • Terminal type: Spring type • Digital output: T15 could be set as digital output. Max. output current is 40 mA • Pulse Input: T18 could be set as pulse input (1 Hz-32 kHz) • Pulse output: T15 could be set as pulse output (1 Hz-32 kHz) • Analog input switching mode switch: By software parameter (voltage or current) • PNP and NPN switch: By software parameter	
Relay	01, 02, 03		01, 02, 03	
RS485	T61 (COM), T68 (P), T69 (N)		T61 (COM), T68 (P), T69 (N)	
Mains	L1 (L), L2, L3 (N)		L1 (L), L2, L3 (N)	
Motor	U, V, W		U, V, W	
Load sharing and brake	UDC-, UDC+/BR+, BR-		UDC-, UDC+/BR+, BR-	

Connections

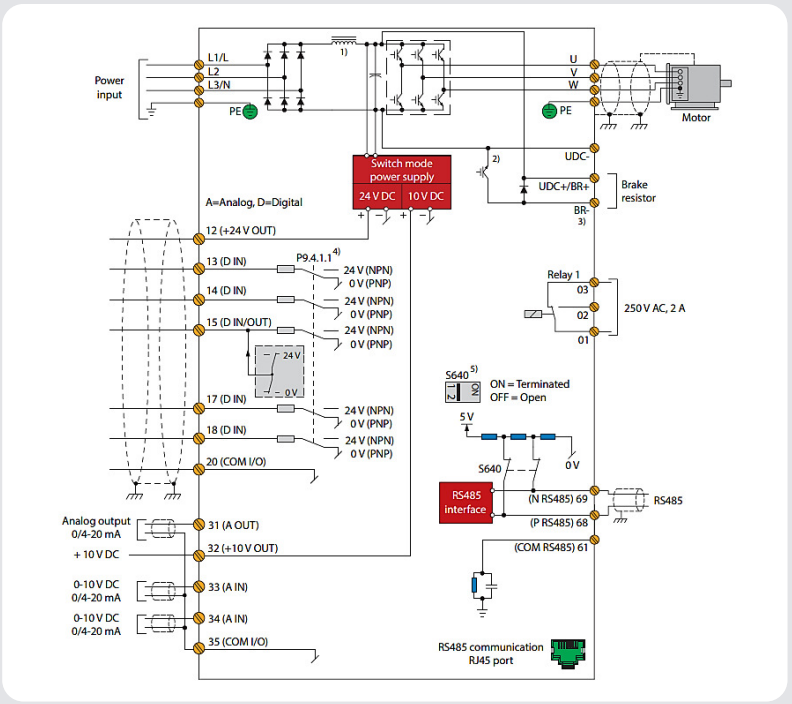
VLT® Micro Drive FC 51





1. Single DC choke in T4 18.5 kW (25 hp) and 22 kW (30 hp)
2. Built-in brake chopper available for drives in power range of T4/S2/T2 1.5 kW (2.0 hp) and above
3. Brakes (BR+ and BR-) are not applicable for enclosure size M1
4. Select the PNP or NPN mode via switch S200 (PNP=Source, NPN=Sink)
5. Use switch S640 (bus terminal) to enable termination on the RS485 port (terminals 68 and 69)

iC2-Micro



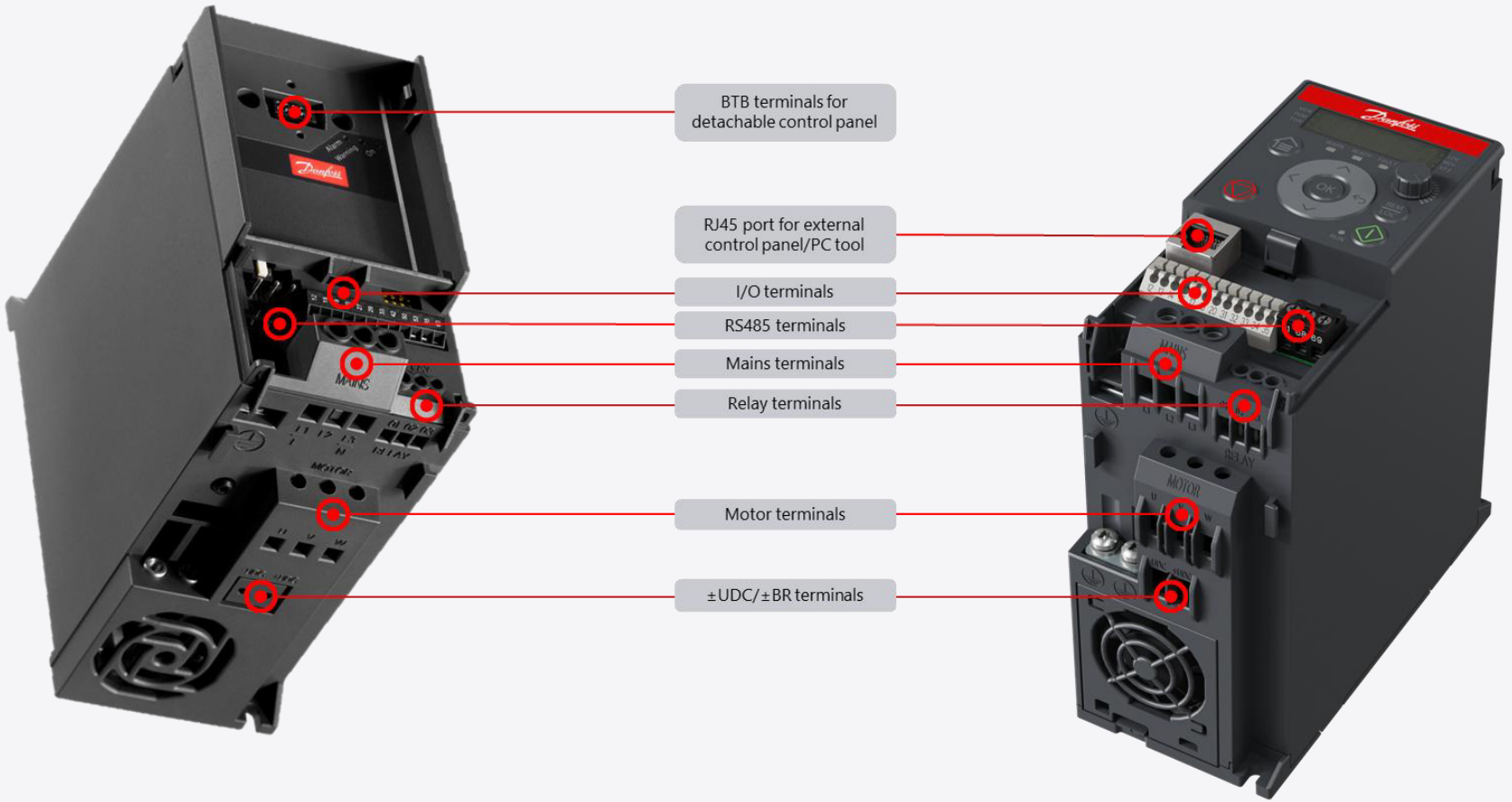


1. Single DC choke in T4 18.5 kW (25 hp) and 22 kW (30 hp), and T2 11 kW (15 hp)
2. Built-in brake chopper available for drives in power range of T4 2.2 kW (3.0 hp) and above, and T2 1.5 kW (2 hp) and above
3. No BR terminals for S1, S2, T4 0.37-1.5 kW (0.5-2.0 hp) and T2 0.37-0.75 kW (0.5-1.0 hp) drives
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)

Connections

VLT® Micro Drive FC 51

iC2-Micro



HMI

VLT® Micro Drive FC 51







Two detachable control panel options, with and without potentiometer

- Numerical display
- Clear indications
- Hot-swappable
- Parameter copy and download
- Parameter numbers and values visible simultaneously
- Remote mounting kit option

VLT® Local Control Panel LCP 11 without potentiometer ...32B0100
VLT® Local Control Panel LCP 12 with potentiometer 132B0101
Remote mounting kit including 3m cable 132B0102

NOTE: FC 51 is supplied without control panel as default. Order the control panel separately.

iC2-Micro

Intuitive built-in control panel as default

- 6-digit, 7-segment LED display
- Status indicators
- Clear navigation buttons
- Built-in frequency setting potentiometer

External control panel option, Control Panel 2.0 OP2

- 2.0" monochrome display
- Multi-language support
- Easy set-up and commissioning, drive status monitoring, event visualization
- Hot-swappable
- Parameter copy and download
- Easy connection with RJ45 port
- Cabinet door installation with an optional mounting kit provides IP55 protection





Control Panel 2.0 OP2 .....132G0234
Surface mounting kit OA2 .....132G0235
Flush mounting kit OA2 .....132G0236
Control panel cable 1.5m OA2 .....132G0237
Control panel cable 3m OA2 .....132G0238

HMI, continued

VLT® Micro Drive FC 51



Parameter number

Selected parameter value

[Menu] key to select 'Status' or 'Menu'

Set-up number

Motor direction

Unit indications (A, V, Hz, RPM, %, s, HP and kW)

Navigation and confirm keys

Potentiometer (available in LCP 12)

Status indicators
- Green LED: The frequency converter is on
- Yellow LED: Indicates a warning
- Flashing red LED: Indicates an alarm.

Operation keys and related indicator
- [Hand On]: Starts the motor and enables control of FC 51 via control panel
- [Off/Reset]: Stops the motor. / Resets the alarm.
- [Auto On]: Under the control either via control terminals or serial communication.

iC2-Micro

Status indicators
- MON: Shows the drive status
- PGM: In programming status
- TOR: In torque mode

[Home/Menu] key
- Toggles between status display and main menu
- Long press to access the shortcut menu



Status indicators
- LOC: In local mode
- REV: Motor direction
- ST2: Multiple setups indication

Potentiometer

Navigation, back and confirm keys



Set-up number

Main display
- Selected value display
- Parameter information
- Status indication

[i] key: Info key

[Stop/Reset] key:
- Stops the motor
- Resets the alarm

Red LED:
- Indicates stop

- Middle icon and number: Reference
- Arrow icon: Motor direction
- LOC/REM: Local or remote mode

Status indicators
- WARN: When a warning occurs
- READY: Drive is ready
- FAULT: Flashes when a fault occurs

[REM/LOC] key: Toggles between remote and local mode

[Start] key:
- Starts the drive in local mode

Green LED:
- On: Indicates in operation
- Flashing: In the motor-stopping process; or the drive received a RUN command, but no frequency output

Application software overview: VLT® Micro Drive FC 51

Parameter group 1st level	Parameter group 2nd level
0-** Operation / Display	0-0* Basic Settings
	0-1* Set-up Operations
	0-3* LCP Readout
	0-4* LCP Keypad
	0-5* Copy/Save
	0-6* Password
1-** Load / Motor	1-0* General Settings
	1-2* Motor Data
	1-3* Adv. Motor Data
	1-5* Load Indep. Setting
	1-6* Load Depen. Setting
	1-7* Start Adjustments
	1-8* Stop Adjustments
	1-9* Motor Temperature

Parameter group 1st level	Parameter group 2nd level
2-** Brakes	2-0* DC-Brake
	2-1* Brake Energy Funct.
	2-2* Mechanical Brake
3-** Reference / Ramps	3-0* Reference Limits
	3-1* References
	3-4* Ramp 1
	3-5* Ramp 2
	3-8* Other Ramps
4-** Limits / Warnings	4-1* Motor Limits
	4-4* Adj. Warnings 2
	4-5* Adj. Warnings
	4-6* Speed Bypass

Parameter group 1st level	Parameter group 2nd level
5-** Digital In / Out	5-1* Digital Inputs
	5-3* Digital Outputs
	5-4* Relays
	5-5* Pulse Input
6-** Analog In / Out	6-0* Analog I/O Mode
	6-1* Analog Input 1
	6-2* Analog Input 2
	6-8* LCP potmeter
	6-9* Analog Output
7-** Controllers	7-2* Process Ctrl. Feedb
	7-3* Process PI Ctrl.
8-** Communication	8-0* Comm. General Settings
	8-3* FC Port Settings

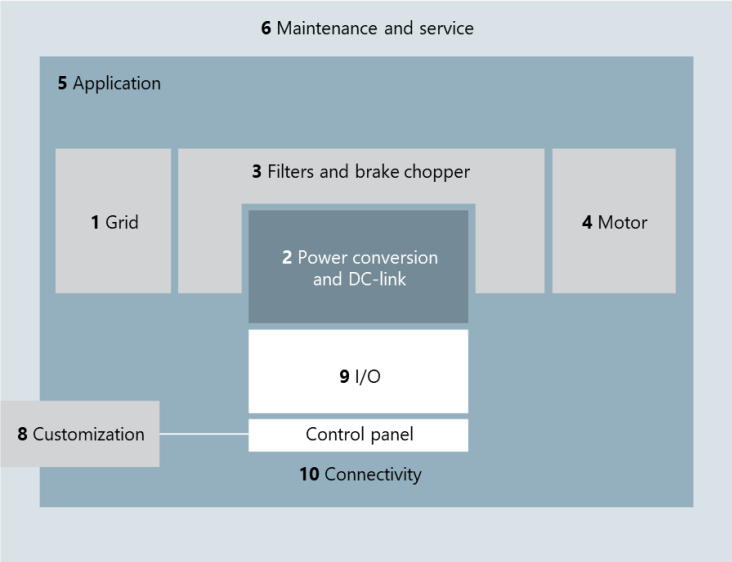
Parameter group 1st level	Parameter group 2nd level
	8-4* FC MC Protocol Set
	8-5* Digital / Bus
	8-8* FC Port Diagnostics
	8-9* Bus Jog / Feedback
13-** Smart Logic	13-0* SLC Settings
	13-1* Comparators
	13-2* Timers
	13-4* Logic Rules
	13-5* States
14-** Special Functions	14-0* Inverter Switching
	14-1* Mains Monitoring
	14-2* Trip Reset
	14-4* Energy Optimising
	14-9* Fault Settings

Parameter group 1st level	Parameter group 2nd level
15-** Drive Information	15-0* Operating Data
	15-3* Fault Log
	15-4* Drive Identification
	15-9* Parameter Info
16-0* General Status	16-0* General Status
	16-1* Motor Status
	16-3* Drive Status
	16-5* Ref. and Feedb.
	16-6* Inputs and Outputs
	16-8* Fieldbus/FC Port
	16-9* Diagnosis Readouts
18-** Extended Motor Data	18-8* Motor Resistors

Application software overview: iC2-Micro

Parameter structure is consistent across all products in iC series.

- Generic settings such as Grid, Power conversion and DC-link, Filters and Brake Chopper, and Motor are accessed via parameter groups (menu indexes) 1–4.
- Most of the application-specific parameters are accessed via parameter groups (menu index) 5 Application.
- Features and functions related to the application such as Maintenance and Service and Customization are in parameter groups (menu indexes) 6 and 8 respectively.
- The basic setup for external control signals and communication interfaces is done in parameter groups (menu indexes) 9 and 10 respectively.
- Features and related parameters are grouped in individual parameter groups. Each feature has a parameter group of its own.
- Status information for each parameter group is available separately for easy access



Index	Parameter group
1	Grid
2	Power conversion and DC-link
3	Filters and Brake Chopper
4	Motor
5	Application
6	Maintenance and Service
8	Customization
9	I/O
10	Connectivity

Application software overview: iC2-Micro, continued

Consistent parameter structure for iC series products

Parameter group 1st level	Parameter group 2nd level
1 Grid	1.2 Grid Settings
	1.3 Grid Protection
2 Power Conversion and DC-link	2.1 Status
	2.3 Protection
	2.4 Modulation
	2.5 DC-Link Control
	2.7 Output Current Limit

NOTE: Some parameter groups have sub-menus at the third level.

Parameter group 1st level	Parameter group 2nd level
3 Filters and Brake Chopper	3.1 Status
	3.2 Brake Chopper
	3.3 Brake Resistor
4 Motor	4.1 Status
	4.2 Motor Data
	4.4 Motor Control
	4.6 Protection
5 Application	5.1 Status
	5.2 Protection
	5.4 Operation Mode

Parameter group 1st level	Parameter group 2nd level
	5.5 Control
	5.6 Start Settings
	5.7 Stop Settings
	5.8 Speed Control
	5.9 Inching
	5.10 Torque Control
	5.11 Mechanical Brake Control
	5.12 Process Control
	5.13 Digital Potentiometer
	5.27 Fieldbus Process Data

Parameter group 1st level	Parameter group 2nd level
6 Maintenance and Service	6.1 Status
	6.2 Software Information
	6.5 Cooling Fan
	6.6 Parameter Handling
	6.7 Drive Identification
8 Customization	8.1 Custom Readout
	8.4 Smart Logic Controller

Parameter group 1st level	Parameter group 2nd level
9 I/O	9.3 I/O Status
	9.4 Digital Inputs / Outputs
	9.5 Analog Inputs / Outputs
10 Connectivity	10.1 FC Port Settings
	10.2 FC Port Diagnostics

Parameter correlation

Parameter Number (PNU)

The Parameter Number (PNU) in iC2-Micro is the unique identifier of a parameter, which matches the parameter ID in VLT® drives, including VLT® Micro Drive FC 51.

iC2-Micro Application Guide:

- The Parameter Number (PNU) is specified in the parameter description section.
- The last chapter - Appendix of Parameters List indicates parameter indexes, parameter names, parameter data types and corresponding Parameter Number (PNU) for iC2-Micro.

Example:

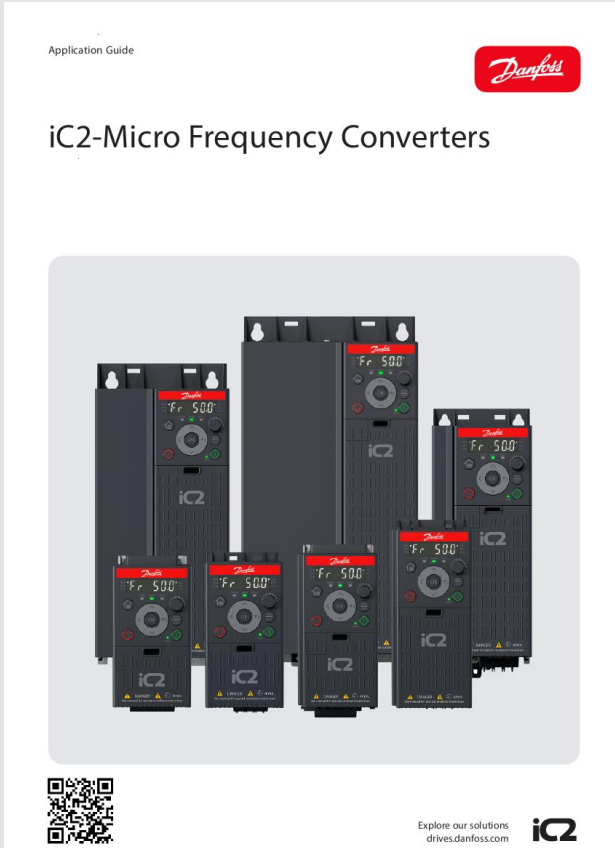
P 5.8.1 Rotation Direction

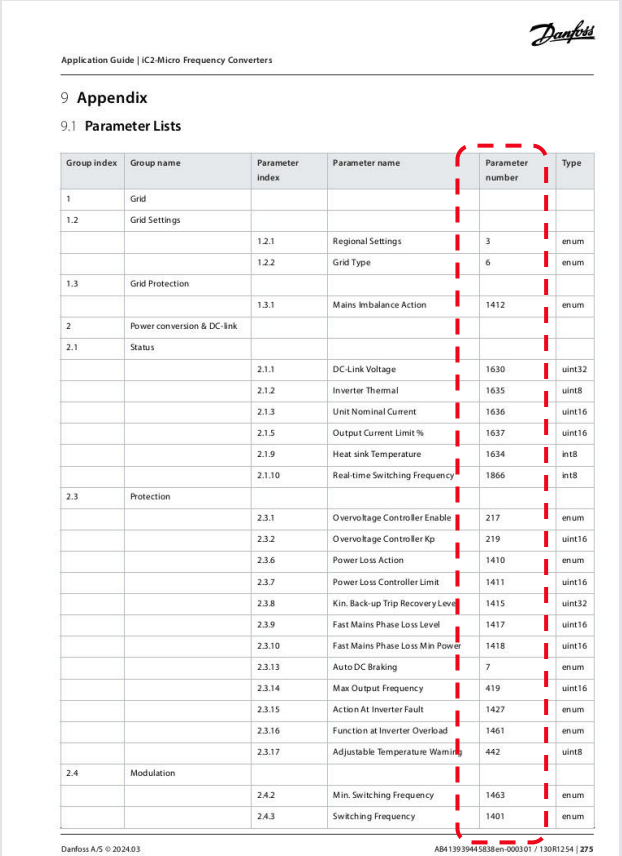
Use this parameter to select the motor speed directions required. Use this parameter to prevent unwanted reversing.

Default value:	2 [Both directions]	**Parameter type:**	Selection
Parameter number:	410	**Unit:**	–
Data type:	enum	**Access type:**	Read/Write

The following are the selections for the parameter.

Selection number	Selection name	Selection description
0	Clockwise	Only operation in a clockwise direction is allowed.
2	Both directions	Operation in both clockwise and counterclockwise directions are allowed.

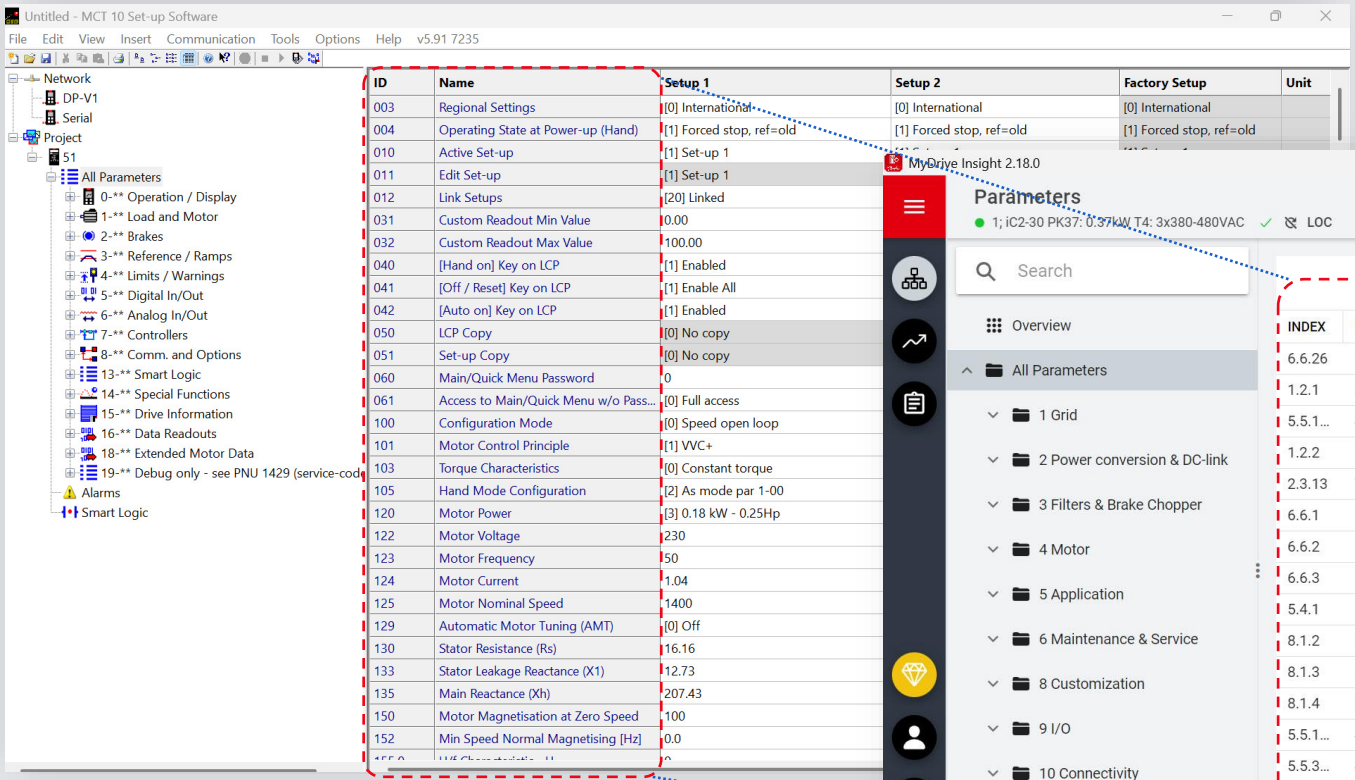




Group index	Group name	Parameter index	Parameter name	Parameter number	Type
1	Grid				
1.2	Grid Settings				
		1.2.1	Regional Settings	3	enum
		1.2.2	Grid Type	6	enum
1.3	Grid Protection				
		1.3.1	Mains Imbalance Action	1412	enum
2	Power conversion & DC-link				
2.1	Status				
		2.1.1	DC-Link Voltage	1630	uint32
		2.1.2	Inverter Thermal	1635	uint8
		2.1.3	Unit Nominal Current	1636	uint16
		2.1.5	Output Current Limit %	1637	uint16
		2.1.9	Heat sink Temperature	1634	int8
		2.1.10	Real-time Switching Frequency	1866	int8
2.3	Protection				
		2.3.1	Overvoltage Controller Enable	217	enum
		2.3.2	Overvoltage Controller Kp	219	uint16
		2.3.6	Power Loss Action	1410	enum
		2.3.7	Power Loss Controller Limit	1411	uint16
		2.3.8	Kin. Back-up Trip Recovery Level	1415	uint32
		2.3.9	Fast Mains Phase Loss Level	1417	uint16
		2.3.10	Fast Mains Phase Loss Min Power	1418	uint16
		2.3.13	Auto DC Braking	7	enum
		2.3.14	Max Output Frequency	419	uint16
		2.3.15	Action At Inverter Fault	1427	enum
		2.3.16	Function at Inverter Overload	1461	enum
		2.3.17	Adjustable Temperature Warning	442	uint8
2.4	Modulation				
		2.4.2	Min. Switching Frequency	1463	enum
		2.4.3	Switching Frequency	1401	enum

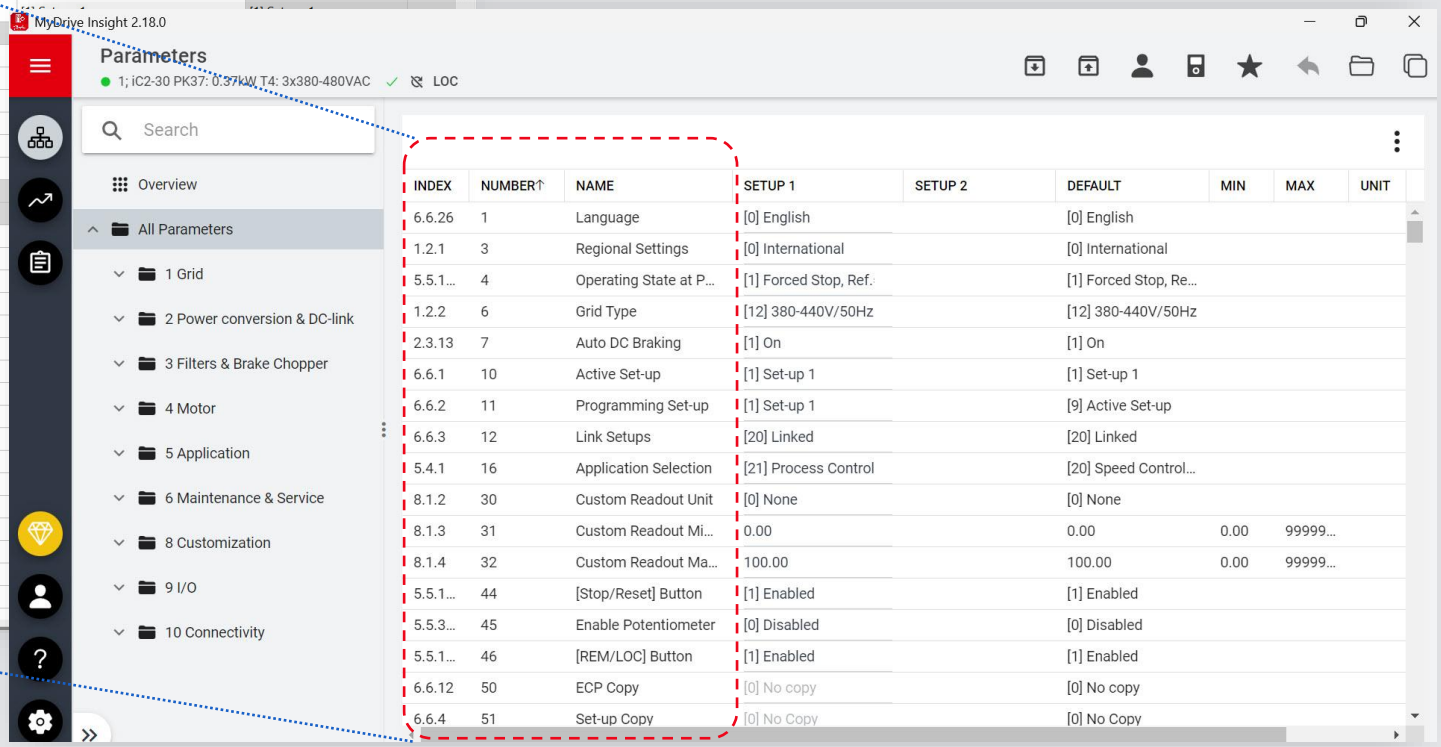
Parameter correlation

Parameter Number (PNU)



illustrate 1. MCT10 connecting with a FC 51 drives

- Parameter Number (PNU) of iC2-Micro parameters can be displayed as a dedicated column in MyDrive® Insight, even can follow the same parameter ID order as VLT® Products.



Illustrate 2. MyDrive® Insight connecting with an iC2-Micro drive

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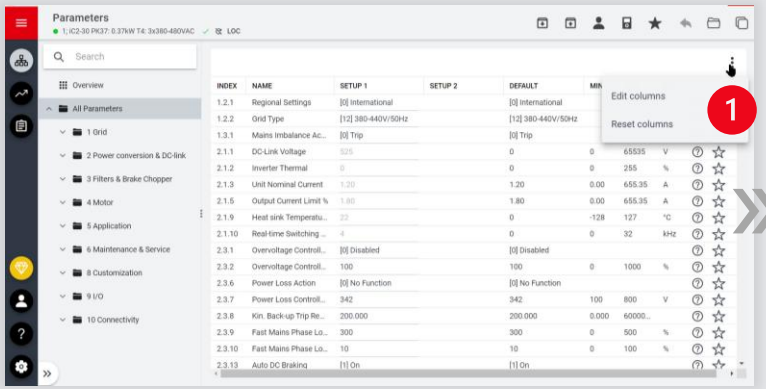
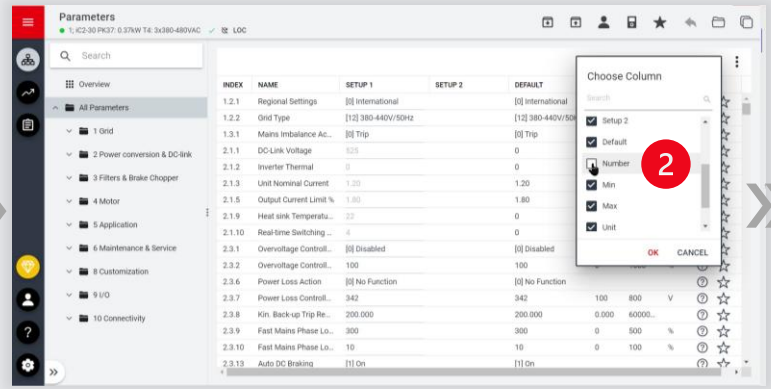
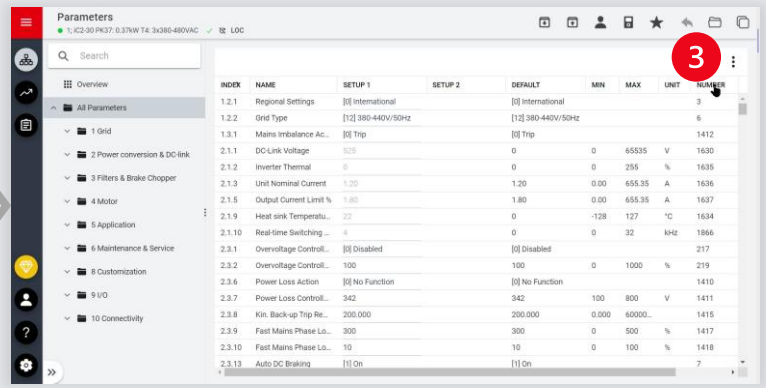
How to correlate parameter sequences in MyDrive® Insight



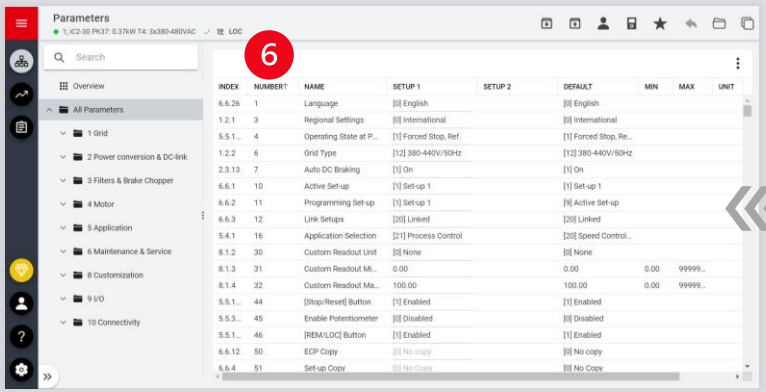
1. Click the 3 dots, and select ‘Edit Columns’



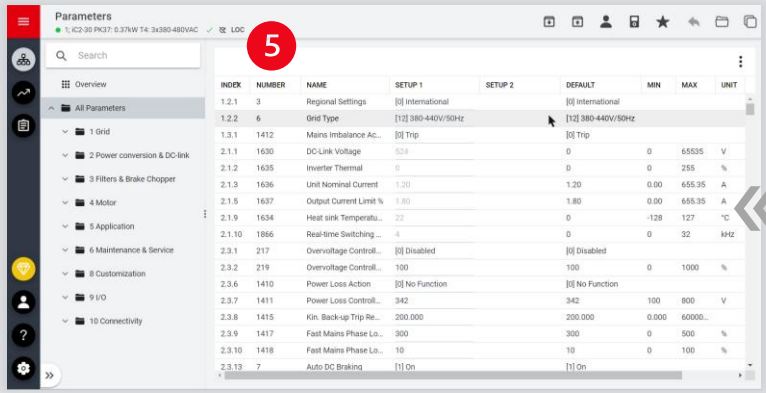
2. Select the ‘Number’



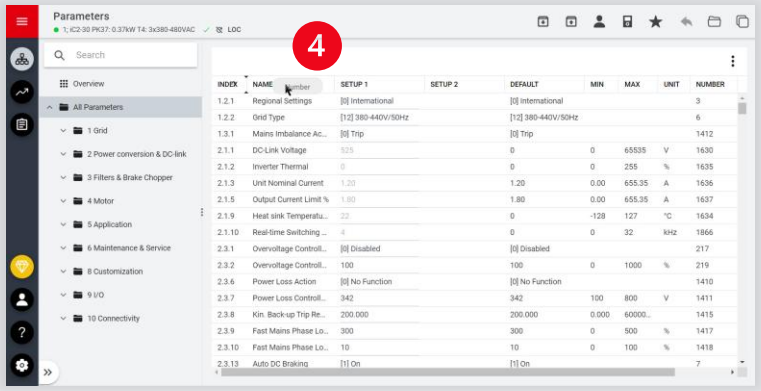
3. Long press the ‘Number’ column with the left mouse button



6. PNU numbers shown in VLT order



5. Click on the ‘Number’ column to sort it in ascending order



4. Drag the ‘Number’ column to the position in front of other columns

Parameter converter for Modbus RTU legacy FC 51[1]

The data type and scaling range of some parameters in the iC2-Micro differ from VLT® Micro Drive FC 51. This may have a certain impact when replacing the FC 51 with the iC2-Micro in scenarios involving communication programs, meaning the PLC program cannot read from or write to certain parameters.

The Parameter Converter for Modbus RTU Legacy FC 51[1] can give the iC2-Micro the same appearance as an FC 51 for seamless replacement in PLC systems. This means there will be no need to re-configure the PLC program during the retrofit.

The converter mainly covers 3 parameter types:

- Data type conversion: Mainly for the parameters which are originally 16-bit data type in FC 51 but have been changed to 32-bit in iC2-Micro. (Parameters with a 32-bit data type need two registers, while those with a 16-bit data type only need one)
- Precision scaling conversion: For parameters with higher precision and resolution in iC2-Micro
- Mapping conversion: For parameters in iC2-Micro which are different in FC 51

Select *[26] Modbus RTU Legacy FC 51* in Parameter *P10.1.1 Protocol* [1]

P 10.1.1 Protocol

Select the protocol for the integrated RS485 port.

Default value:	0 [FC]	**Parameter type:**	Selection
Parameter number:	830	**Unit:**	–
Data type:	enum	**Access type:**	Read/Write

The following are the selections for the parameter.

Selection number	Selection name	Selection description
0	FC	Communication according to the FC protocol.
2	Modbus RTU	Communication according to the Modbus RTU protocol.
26	Modbus RTU Legacy FC51	Modbus RTU protocol convertor to FC51.

[1] *Feature available in Firmware Version 1.30*

Parameter converter for Modbus RTU legacy FC 51[1], continued

- Parameter Numbers (PNUs) of iC2-Micro match the Parameter IDs of FC 51
- Parameter Number (PNU) of iC2-Micro/ Parameter ID of FC 51 are the unique identifier of a parameter for Modbus Registers
- In converter mode, the following parameters will be converted:

FC 51		iC2-Micro				Conversion
Parameter ID and name	Data type	PNU	Parameter name	Data type	Index	iC2-Micro -> FC 51
1-24 Motor Current	Uint16	124	Nominal Current	Uint32	4.2.2.3	Uint32 -> Uint16
1-30 Stator Resistance (Rs)	Uint16	130	Stator Resistance Rs	Uint32	4.2.3.1	Uint32 -> Uint16 Scaling 0.000 -> 0.00
1-33 Stator Leakage Reactance (X1)	Uint32	133	Stator Leakage Reactance Xls	Uint32	4.2.3.4	Scaling 0.000 -> 0.00
2-11 Brake Resistor (ohm)	Uint16	211	Brake Resistor Value	Uint16	3.3.2	Scaling 0.0 -> 0
5-55 Terminal 33 Low Frequency	Uint16	555	T18 Low Frequency	Uint32	9.4.4.2	Uint32 -> Uint16
5-56 Terminal 33 High Frequency	Uint16	556	T18 High Frequency	Uint32	9.4.4.1	Uint32 -> Uint16
6-80 LCP Potmeter Enable	Uint8	45	Enable Potentiometer	Uint8	5.5.3.20	PNU 45 mapping to P6-80
8-80 Bus Message Count	Uint16	880	Bus Message Count	Uint32	10.2.1	Uint32 -> Uint16
8-81 Bus Error Count	Uint16	881	Bus Error Count	Uint32	10.2.2	Uint32 -> Uint16
8-82 Slave Messages Rcvd	Uint16	882	Slave Messages Rcvd	Uint32	10.2.3	Uint32 -> Uint16
8-83 Slave Error Count	Uint16	883	Slave Error Count	Uint32	10.2.4	Uint32 -> Uint16
13-12 Comparator Value	Int32	1312	Comparator Value	Int32	8.4.3.3	Scaling 0.000 -> 0.0
13-20 SL Controller Timer	Uint32	1320	Timer	Uint32	8.4.4.1	Scaling 0.00-> 0.0
14-26 Action At Inverter Fault	Uint8	1427	Action At Inverter Fault	Uint8	2.3.15	PNU 1427 mapping to P14-26
16-10 Power [kW]	Uint16	1610	Motor Electrical Power	Uint32	4.1.3	Uint32 -> Uint16
16-11 Power [hp]	Uint16	1611	Motor Power hp	Uint32	4.1.4	Uint32 -> Uint16
16-12 Motor Voltage	Uint16	1612	Motor Voltage	Uint32	4.1.2	Uint32 -> Uint16
16-13 Frequency	Uint16	1613	Frequency	Uint32	4.1.6	Uint32 -> Uint16
16-30 DC Link Voltage	Uint16	1630	DC-Link Voltage	Uint32	2.1.1	Uint32 -> Uint16
16-63 Analog Input 53 (mA)	Uint16	1662	T33 Analog Input	Uint8	9.3.5	PNU 1662 mapping to P16-63
16-68 Pulse input 33	Uint16	1668	T18 Pulse Input [Hz]	Int32	9.3.8	Int32 -> Uint16
18-80 Stator Resistance (Rs in high resolution)	Uint32	130	Stator Resistance Rs	Uint32	4.2.3.1	PNU 130 mapping to P18-80
18-81 Stator Leakage Reactance (X1 in high resolution)	Uint32	133	Stator Leakage Reactance Xls	Uint32	4.2.3.4	PNU 133 mapping to P18-81

[1] *Feature available in Firmware Version 1.30*

Classified as Business

Accessories

VLT® Micro Drive FC 51		Category	iC2-Micro	
Code number	Part name		Code number	Part name
132B0106	Decoupling plate mounting kit, M1 and M2	Decoupling plate mounting kits	132G0202	Decoupling plate mounting kit, MA01c
132B0107	Decoupling plate mounting kit, M3		132G0203	Decoupling plate mounting kit, MA02c
			132G0204	Decoupling plate mounting kit, MA01a
132B0122	Decoupling plate mounting kit, M4, M5		132G0205	Decoupling plate mounting kit, MA02/03a
			132G0206	Decoupling plate mounting kit, MA04/05a
132B0108	IP21/Type1 conversion kit, M1	IP21/Type 1 conversion kit	132G0188	IP21/Type 1 conversion kit, MA01c
132B0109	IP21/Type1 conversion kit, M2		132G0189	IP21/Type 1 conversion kit, MA02c
			132G0190	IP21/Type 1 conversion kit, MA01a
132B0110	IP21/Type1 conversion kit, M3		132G0191	IP21/Type 1 conversion kit, MA02a
			132G0192	IP21/Type 1 conversion kit, MA03a
132B0103	NEMA 1 conversion kit, M1	NEMA 1 conversion kit	132G0195	NEMA 1 conversion kit, MA01c
132B0104	NEMA 1 conversion kit, M2		132G0196	NEMA 1 conversion kit, MA02c
			132G0197	NEMA 1 conversion kit, MA01a
132B0105	NEMA 1 conversion kit, M3		132G0198	NEMA 1 conversion kit, MA02a
			132G0199	NEMA 1 conversion kit, MA03a
132B0120	NEMA 1 conversion kit, M4		132G0200	NEMA 1 conversion kit, MA04a
132B0121	NEMA 1 conversion kit, M5		132G0201	NEMA 1 conversion kit, MA05a
132B0111	DIN rail mounting kit, M1/M2	DIN rail	N.A.	
N.A.		Connector	132G0195	Connector for common DC/brake resistor
N.A.		Adapter	132G0326	Quick Adapter USB-C/RJ45 OAX00

Find the replacement drive via Danfoss Drives MyDrive® Assistant



1

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2

Choose the Right Product

Drive selection assistance

Convert discontinued drives to new

3

DrivePro® Retrofit

The **DrivePro® Retrofit conversion tool** provides help to replace drives no longer in production with the most suitable successor drive.

Supported discontinued products

- VACON® X4/X5
- VLT® Micro Drive FC 51
- VLT® 2800

Find a replacement drive for VACON® X4/X5

Find a replacement drive for VLT® 2800

Find a replacement drive for VLT® Micro Drive FC 51

Other

4

Successor product: iC2

More compact, intelligent, and powerful than its predecessor, the iC2-Micro is designed as an easy replacement for VLT® Micro Drive FC 51. This reliable and durable drive is even easier to use and install. You can reduce system complexity and cost whilst maintaining full 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.

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