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FREQUENCY CONVERTER DANFOSS FC101
NOVENCO CONFIGURATION USER GUIDE

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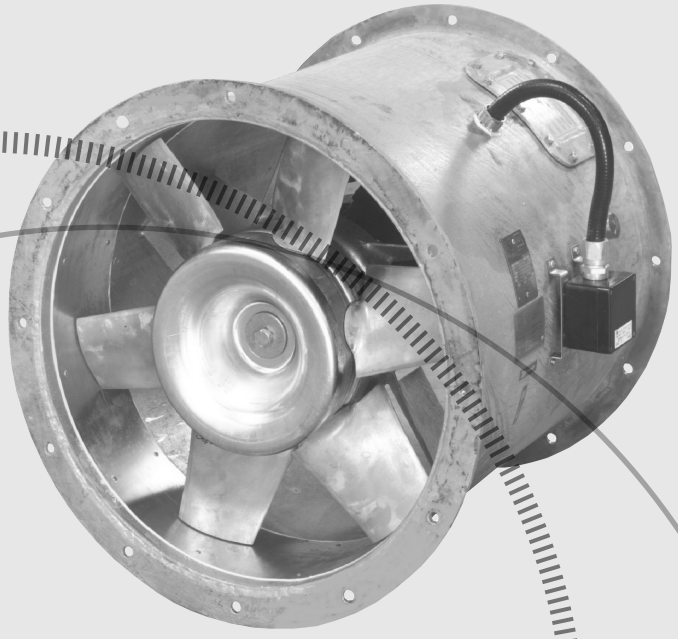

ENGLISH

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Frequency converter Danfoss FC 101
Novenco configuration user guide

Contents

1 General

The procedures in this guide serve as examples of how to setup and configure the Danfoss FC101 frequency converter drives in combination with Novenco fans driven by permanent magnet motors.

400 VAC motors covered by guide

- Domel 10 pole, 2.2 kW
  Novenco item no. 926418-0
- Domel 10 poles, 4.1 kW
  Novenco item no. 926478-0
- Domel 10 poles, 4.3 kW
  Novenco item no. 926479-0
- Domel 10 poles, 6.5 kW
  Novenco item no. 926480-0
- Domel 10 poles, 7.9 kW
  Novenco item no. 926481-0
- Domel 12 poles, 10 kW
  Novenco item no. 926482-0
- Lafert 8 poles, 3 kW
  Novenco item no. 926526-0
- Lafert 8 poles, 5.5 kW
  Novenco item no. 926528-0
- Lafert 8 poles, 7.5 kW
  Novenco item no. 926529-0
- Domel 12 poles, 17.5 kW
  Novenco item no. 926985-0
- Domel 12 poles, 31 kW
  Novenco item no. 926990-0

The guide is a supplement to the installation and maintenance guide delivered with the Novenco fans. Refer also to the motor manufacturers documentation. See appendix A. Literature list.

Procedures and methods in this guide should be followed to maintain the validity of the warranty.

The guide applies to Novenco fans type NovAx™ ACL-ACN-ACW and ZerAx® AZL-AZN-AZW.

The installation of the system must be complete and approved by the responsible installer, before setup can begin.

2 Installation and connection

The premise of this guide is the correct installation and connection of the fans, motors and frequency converters. The wire specifications must comply with the quality prescribed in the documentation for the frequency converters.

3 Setup with start-up wizard

Please refer to the Danfoss FC101 documentation for information on how to navigate and operate the display.

Basis for the setup are the factory defaults of the FC101. Reset the frequency converter to factory defaults, if it is unsure what the settings are. This is done by setting parameter 14-22 to 2. The converter is then reset at the next power up.

The wizard is re-entered via the Quick Menu.

Setting up the FC101

1. Power up the frequency converter.
2. Choose the preferred language.
3. Launch the wizard.
4. Set the control fields.

   Identify the motor type, motor size and Novenco item no. in the below tables and complete the steps.

   Refer to the motor and fan nameplates. In case of differences between the values in this guide and the nameplates, those from the nameplates must be used.

Parameters	Field names	Motor types				Comments
		Domel 10p, 2.2 kW, 926418-0	Domel 10p, 4.1 kW, 926478-0	Domel 10p, 4.3 kW, 926479-0	Domel 10p, 6.5 kW, 926480-0	
0-03	Regional settings	0	0	0	0	International
0-06	Grid type	380-440 V/50 Hz	380-440 V/50 Hz	380-440 V/50 Hz	380-440 V/50 Hz	Set voltage level
1-10	Motor construction/Motor type	1	1	1	1	PM, non-salient SPM
1-22	Motor voltage	400 V AC	400 V AC	400 V AC	400 V AC	Nominal value
1-24	Motor current	4.6 A	9.1 A	12 A	16.6 A	Full-load current
1-25	Motor nominal speed	3160 RPM	1980 RPM	1700 RPM	1410 RPM	
1-26	Motor construction rated torque	5.4 Nm	16 Nm	24 Nm	40 Nm	
1-30	Stator resistance (Rs)	1.41 Ω	0.68 Ω	0.32 Ω	0.18 Ω	
1-39	Motor poles	10 poles	10_poles	10 poles	10 poles	
1-40	Back EMF at 1000 RPM	95 V	144 V	157 V	192 V	
1-37	d-axis inductance (Ld)	14.0 mH	13.0 mH	11.0 mH	10.0 mH	
30-22	Locked rotor	0	0	0	0	0 = Off
30-23	Locked rotor detection time	0.1 s	0.1 s	0.1 s	0.1 s	
4-19	Max output freq.	400 Hz	400 Hz	208 Hz	400 Hz	
1-42	Motor cable length	[In meters]	[In meters]	[In meters]	[In meters]	
4-12	Motor speed low lim.	50 Hz	50 Hz	50 Hz	50 Hz	50 Hz = 600 RPM
4-14	Motor speed high lim.	No. [Hz]	No. [Hz]	No. [Hz]	No. [Hz]	See technical specifications from AirBox calculation
3-41	Ramp 1 ramp up time	10 s	10 s	10 s	10 s	Avoid too fast ramp
3-42	Ramp 1 ramp down time	10 s	10 s	10 s	10 s	Avoid too fast ramp
1-73	Flying start	1	1	1	1	1 = Enabled
6-19	Terminal 53 mode	1	1	1	1	1 = Voltage control signal
6-10	Terminal 53 low volt	0.07 V	0.07 V	0.07 V	0.07 V	
6-11	Terminal 53 high volt	10 V	10 V	10 V	10 V	
3-02	Minimum ref.	50	50	50	50	50 Hz = 600 RPM
3-03	Maximum ref.	No. [Hz]	No. [Hz]	No. [Hz]	No. [Hz]	Same as step 21., parameter 4-14
5-40	Function relay 1	No.	No.	No.	No.	Alarm relay
5-40	Function relay 2	No.	No.	No.	No.	Warning relay
1-29	Automatic motor adaption (AMA)	1	1	1	1	1 = Enable AMA This optimises motor performance and exits the wizard.

Table 1 Parameter settings for first group of motors

Parameters	Field names	Motor types				Comments
		Domel 10p, 7.9 kW, 926481-0	Domel 12p, 10 kW, 926482-0	Lafert 8p, 3 kW, 926526-0	Lafert 8p, 5.5 kW, 926528-0	
0-03	Regional settings	0	0	0	0	International
0-06	Grid type	380-440 V/50 Hz	380-440 V/50 Hz	380-440 V/50 Hz	380-440 V/50 Hz	Set voltage level
1-10	Motor construction/Motor type	1	1	1	1	PM, non-salient SPM
1.22	Motor voltage	400 V AC	400 V AC	400 V AC	400 V AC	Nominal value
1-24	Motor current	18.6 A	22.0 A	5.8 A	11.4 A	Full-load current
1-25	Motor nominal speed	1730 RPM	1600 RPM	4500 RPM	4500 RPM	
1-26	Motor construction rated torque	38 Nm	60 Nm	6.4 Nm	11.7 Nm	
1-30	Stator resistance (Rs)	0.15 Ω	0.26 Ω	0.78 Ω	0.33 Ω	
1-39	Motor poles	10 poles	12 poles	8 poles	8 poles	
1-40	Back EMF at 1000 RPM	156 V	197 V	65 V	66 V	
1-37	d-axis inductance (Ld)	6.4 mH	3.77 mH	7.74 mH	4.0 mH	
30-22	Locked rotor	0	0	0	0	0 = Off
30-23	Locked rotor detection time	0.1 s	0.1 s	0.1 s	0.1 s	
4-19	Max output freq.	400 Hz	400 Hz	400 Hz	400 Hz	
1-42	Motor cable length	[in meters]	[in meters]	[in meters]	[in meters]	
4-12	Motor speed low lim.	50 Hz	25 Hz	25 Hz	25 Hz	25 Hz = 375 RPM 50 Hz = 600 RPM
4-14	Motor speed high lim.	No. [Hz]	No. [Hz]	No. [Hz]	No. [Hz]	See technical specifications from AirBox calculation
3-41	Ramp 1 ramp up time	10 s	10 s	30 s	30 s	Avoid too fast ramp
3-42	Ramp 1 ramp down time	10 s	10 s	30 s	30 s	Avoid too fast ramp
1-73	Flying start	1	1	1	1	1 = Enabled
6-19	Terminal 53 mode	1	1	1	Voltage mode	1 = Voltage control signal
6-10	Terminal 53 low volt	0.07 V	0.07 V	0.07 V	0.07 V	
6-11	Terminal 53 high volt	10 V	10 V	10 V	10 V	
3-02	Minimum ref.	50	25	25	25	25 Hz = 375 RPM 50 Hz = 600 RPM
3-03	Maximum ref.	No. [Hz]	No. [Hz]	No. [Hz]	No. [Hz]	Same as step 21., parameter 4-14
5-40	Function relay 1	No.	No.	No.	No.	Alarm relay
5-40	Function relay 2	No.	No.	No.	No.	Warning relay
1-29	Automatic motor adaption (AMA)	1	1	1	1	1 = Enable AMA This optimises motor performance and exits the wizard.

Table 2 Parameter settings for second group of motors

Parameters	Field names	Motor types			Comments
		Lafert 8p, 7.5 kW, 926529-0	Domel 12p, 17.5 kW, 926985-0	Domel 12p, 31 kW, 926990-0	
0-03	Regional settings	0	0	0	International
0-06	Grid type	380-440 V/50 Hz	380-440 V/50 Hz	380-440 V/50 Hz	Set voltage level
1-10	Motor construction/Motor type	1	1	1	PM, non-salient SPM
1-22	Motor voltage	400 V AC	400 V AC	400 V AC	Nominal value
1-24	Motor current	15.1 A	35 A	54 A	Full-load current
1-25	Motor nominal speed	4500 RPM	2790 RPM	1990 RPM	
1-26	Motor construction rated torque	15.9 Nm	60 Nm	120 Nm	
1-30	Stator resistance (Rs)	0.25 Ω	0.1 Ω	0.07 Ω	
1-39	Motor poles	8 poles	12 poles	12 poles	
1-40	Back EMF at 1000 RPM	69 V	115 V	161 V	
1-37	d-axis inductance (Ld)	3.22 mH	1.3 mH	1.2 mH	
30-22	Locked rotor	0	0	0	0 = Off
30-23	Locked rotor detection time	0.1 s	0.1 s	0.1 s	
4-19	Max output freq.	400 Hz	400 Hz	400 Hz	
1-42	Motor cable length	[in meters]	[in meters]	[in meters]	
4-12	Motor speed low lim.	25 Hz	20 Hz	20 Hz	20 Hz = 200 RPM 25 Hz = 375 RPM
4-14	Motor speed high lim.	No. [Hz]	No. [Hz]	No. [Hz]	See technical specifications from AirBox calculation
3-41	Ramp 1 ramp up time	30 s	30 s	30 s	Avoid too fast ramp
3-42	Ramp 1 ramp down time	30 s	30 s	30 s	Avoid too fast ramp
1-73	Flying start	1	1	1	1 = Enabled
6-19	Terminal 53 mode	1	1	1	1 = Voltage control signal
6-10	Terminal 53 low volt	0.07 V	0.07 V	0.07 V	
6-11	Terminal 53 high volt	10 V	10 V	10 V	
3-02	Minimum ref.	25	20	20	20 Hz = 200 RPM 25 Hz = 375 RPM
3-03	Maximum ref.	No. [Hz]	No. [Hz]	No. [Hz]	Same as step 21., parameter 4-14
5-40	Function relay 1	No.	No.	No.	Alarm relay
5-40	Function relay 2	No.	No.	No.	Warning relay
1-29	Automatic motor adaption (AMA)	1	1	1	1 = Enable AMA This optimises motor performance and exits the wizard.

Table 3 Parameter settings for third group of motors

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If the Automatic Motor Adaption (AMA) test (parameter 1-29) fails, try running it again as a minimum test.

5 Optional step
Set the following parameters.

Parameters	Field names	Settings	Comments
4-41	Warning freq. high	No. [Hz]	Same as step 21., parameter 4-14
6-15	Terminal 53 high ref./feedb. value	No. [Hz]	Same as step 21., parameter 4-14
14-22	Operating mode	2	Converter resets at next power up.

Table 4 Common parameters

6 Restart the frequency converter.

This enters normal operation.

4 Important

4.1 Copyright

4.2 Trademarks

5 Declaration of conformity

Refer to the declaration information in the documentation for the fans and frequency converters.

Appendices

A. Literature list

- Danfoss Programming guide
  VLT® HVAC basic drive FC101
  Publication no. MG18B302, 04/2018
- Danfoss Design guide
  VLT® HVAC basic drive
  Publication no. MG18C302

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