

**Parameter list for the initial operation of EMOD PM motors 3000 rpm
from 0.37 KW to 22 KW with frequency converter Danfoss
Automation Drive FC 302**

	EMOD PM motor	Entity	0,37 KW	0,55 KW	0,75 KW
Type			HEF PM 71/62-35PT	HEF PM 71/62-35PT	HEF PM 71/62-70ET
Motor number					
EMOD-number					
IEC installation size			71	71	71
Coolant temperature	°C		40	40	40
Protection type			IP 55	IP55	IP55
Insulation class			F	F	F
Rated voltage	V		400	400	400
Connection			Y	Y	Y
Nominal output	kW		0,37	0,55	0,75
Nominal current	A		0,65	0,97	1,28
Frequency	Hz		150	150	150
Nominal speed	rpm		3000	3000	3000
Nominal torque	Nm		1,18	1,75	2,38
Efficiency factor	cos Phi		0,98	0,96	0,98
Efficiency	%		83,5	85,1	86,4
Mode of operation			S1	S1	S1
Maximum torque for two minutes	Nm		1,89	2,8	3,8
Maximum speed	rpm		3750	3750	3750
Line resistance U1-U2	Ohm		10,56	10,81	10,81
Open-circuit voltage for 1000 rpm	V		130	135	137
Main reactance	Ohm		27,325	26,263	22,229
Stator leakage reactance	Ohm		20,091	19,31	16,345
Main inductance	mH		28,993	27,866	23,586
Leakage inductance	mH		21,317	20,489	17,343
Iron loss resistance	Ohm		4417	4313	4200
Design	IM		B5/V1	B5/V1	B5/V1
Flange I flanQes 0	mm		160	160	160
Shaft end	mm				
Mass moment of inertia	kgm2		0,0004	0,0004	0,0004



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Para Nr.	Danfoss frequency converter	Power in kW			
		0.37	0.55	0.75	
	VLT FC - 302				
	Article number				
	Serial number				
00-01	Language		English	English	English
00-02	Hz/rpm changeover		rpm	rpm	rpm
01-22	Motor voltage	V	440	440	440
01-10	Motor type		PM, Non-salient pole	PM, Non-salient pole	PM, Non-salient pole
01-01	Motor control principle		Flux without sensor	Flux without sensor	Flux without sensor
01-24	Nominal current motor	A	0,65	0,97	1,28
01-25	Nominal speed motor	rpm	3000	3000	3000
01-26	Nominal torque motor	Nm	1,18	1,75	2,38
01-30	Line resistance/ Stator resistance	Ohm	10,56	10,81	10,81
01-37	Main inductance/ Inductance D-axis	mH	28,993	27,866	23,586
01-39	Number of poles		6	6	6
01-40	Nominal voltage for speed- 1000 rpm/ G-EMK	V	130	135	137
01-69	Inertia max	kgm ²	0,004	0,004	0,004
01-68	Inertia min	kgm ²	0,0004	0,0004	0,0004
01-90	Thermal motor protection		Thermistor Disconnection	Thermistor Disconnection	Thermistor Disconnection
01-93	Thermistor connection		Connector block 54	Connector block 54	Connector block 54 Connection Thermistor contacts to connector box 50
04-19	Max. output frequency	Hz	160	160	160
04-13	Max. speed	rpm	3000	3000	3000
04-14	Max. frequency	Hz	150	150	150
04-18	Max. current limit of nominal current	%	120	120	120
04-16	max. torque limit mot.	%	120	120	120
04-17	max. torque limit gen.	%	120	120	120
03-41	Ramp up time	sek	10	10	10
03-42	Ramp down time	sek	10	10	10
03-03	Max. nominal value	rpm	3000	3000	3000
03-03	Max. nominal value	Hz	150	150	150
07-02	P amplification		0,01	0,01	0,01
07-03	I time	msek	300	300	300
07-06	T-filter	msek	5	5	5
14-01	Pulse frequency	kHz	7	7	7
04-10	Direction of rotation		Both directions	Both directions	Both directions
05-11	Connector block 19		Revising	Revising	Revising
05-12	Connector block 27		no operation	no operation	no operation

**Parameter list for the initial operation of EMOD PM motors 3000 rpm
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EMOD PM motor	Entity	1.1 kW	1.5 kW	2.2 kW	
		HEF PM 71/63- 70ET	HEF PM 90/63-70ET	HEF PM 90/63-70ET	
Type					
Motor number					
EMOD-number					
IEC installation size		71	71	90	
Coolant temperature	°C	40	40	40	
Protection type		IP 55	IP55	IP55	
Insulation class		F	F	F	
Rated voltage	V	400	400	400	
Connection		Y	Y	Y	
Nominal output	kW	1,1	1,5	2,2	
Nominal current	A	1,9	2,43	3,8	
Frequency	Hz	150	150	150	
Nominal speed	rpm	3000	3000	3000	
Nominal torque	Nm	3,5	4,77	7	
Efficiency factor	cos Phi	0,93	0,95	0,92	
Efficiency	%	90	91	91	
Mode of operation		S1	S1	S1	
Maximum torque for two minutes	Nm	5,6	74,6	11,2	
Maximum speed	rpm	3750	3750	3750	
Line resistance U1-U2	Ohm	3,65	3,58	1,48	
Open-circuit voltage for 1000 rpm	V	139	135	123	
Main reactance	Ohm	13,662	13,132	8,441	
Stator leakage reactance	Ohm	8,101	7,787	4,363	
Main inductance	mH	14,496	13,933	8,956	
Leakage inductance	mH	8,595	8,262	4,629	
Iron loss resistance	Ohm	2307	1580	1606	
Design	IM	B5/V1	B5/V1	B5/V1	
Flange I flanQes 0	mm	200	200	200	
Shaft end	mm				
Mass moment of inertia	kgm ²	0,0008	0,0008	0,00212	



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Automation Drive FC 302**

Para Nr.	Danfoss frequency converter	Power in kW			
		1.1	1.5	2.2	
	VLT FC - 302				
	Article number				
	Serial number				
		1.1	1.5	2.2	
00-01	Language	English	English	English	
00-02	Hz/rpm changeover	rpm	rpm	rpm	
01-22	Motor voltage	440	440	440	
01-10	Motor type	PM, Non-salient pole	PM, Non-salient pole	PM, Non-salient pole	
01-01	Motor control principle	Flux without sensor	Flux without sensor	Flux without sensor	
01-24	Nominal current motor	1,9	2,43	3,8	
01-25	Nominal speed motor	3000	3000	3000	
01-26	Nominal torque motor	3,5	4,77	7	
01-30	Line resistance/ Stator resistance	3,65	3,58	1,48	
01-37	Main inductance/ Inductance D-axis	14,496	13,933	8,956	
01-39	Number of poles	6	6	6	
01-40	Nominal voltage for speed- 1000 rpm/ G-EMK	139	135	123	
01-69	Inertia max	0,008	0,008	0,0212	
01-68	Inertia min	0,0008	0,0008	0,00212	
01-90	Thermal motor protection	Thermistor Disconnection	Thermistor Disconnection	Thermistor Disconnection	
01-93	Thermistor connection	Connector block 54	Connector block 54	Connector block 54	Connection Thermistor contacts to connector box 50
04-19	Max. output frequency	160	160	160	
04-13	Max. speed	3000	3000	3000	
04-14	Max. frequency	150	150	150	
04-18	Max. current limit of nominal current	120	120	120	
04-16	max. torque limit mot.	120	120	120	
04-17	max. torque limit gen.	120	120	120	
03-41	Ramp up time	10	10	10	
03-42	Ramp down time	10	10	10	
03-03	Max. nominal value	3000	3000	3000	
03-03	Max. nominal value	150	150	150	
07-02	P amplification	0,01	0,01	0,01	
07-03	I time	300	300	300	
07-06	T-filter	5	5	5	
14-01	Pulse frequency	kHz 7	7	7	
04-10	Direction of rotation	Both directions	Both directions	Both directions	
05-11	Connector block 19	Revising	Revising	Revising	
05-12	Connector block 27	no operation	no operation	no operation	

**Parameter list for the initial operation of EMOD PM motors 3000 rpm
from 0.37 KW to 22 KW with frequency converter Danfoss
Automation Drive FC 302**

EMOD PM motor	Entity	3 kW	4 kW	5.5 kW
Type		HEF PM 90/63- 70ET	HEF PM 90/63-105ET	HEF PM 90/63- 105ET
Motor number				
EMOD-number				
IEC installation size		90	90	90
Coolant temperature	°C	40	40	40
Protection type		IP 55	IP 55	IP55
Insulation class		F	F	F
Rated voltage	V	400	400	400
Connection		Y	Y	Y
Nominal output	kW	3	4	5,5
Nominal current	A	5,1	6,7	8,9
Frequency	Hz	150	150	150
Nominal speed	rpm	3000	3000	3000
Nominal torque	Nm	9,55	12,73	17,5
Efficiency factor	cos Phi	0,93	0,93	0,97
Efficiency	%	91,5	93	92,8
Mode of operation		S1	S1	S1
Maximum torque for two minutes	Nm	15,2	20,34	28
Maximum speed	rpm	3750	3750	3750
Line resistance U1-U2	Ohm	1,48	0,811	0,81
Open-circuit voltage for 1000 rpm	V	122	124	124
Main reactance	Ohm	8,441	5,628	5,628
Stator leakage reactance	Ohm	4,363	2,646	2,646
Main inductance	mH	8,956	5,971	5,971
Leakage inductance	mH	4,629	2,807	2,807
Iron loss resistance	Ohm	1606	1066	1069
Design	IM	B5/V1	B5/V1	B51/V1
Flange I flanQes 0	mm	250	250	250
Shaft end	mm			
Mass moment of inertia	kgm ²	0,00212	0,003	0,003



**Parameter list for the initial operation of EMOD PM motors 3000 rpm
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Automation Drive FC 302**

Para Nr.	Danfoss frequency converter	Power in kW			
		3	4	5.5	
	VLT FC - 302				
	Article number				
	Serial number				
		3	4	5.5	
00-01	Language	English	English	English	
00-02	Hz/rpm changeover	rpm	rpm	rpm	
01-22	Motor voltage	440	440	440	
01-10	Motor type	PM, Non-salient pole Flux without sensor	PM, Non-salient pole Flux without sensor	PM, Non-salient pole Flux without sensor	
01-01	Motor control principle				
01-24	Nominal current motor	5,1	6,7	8,9	
01-25	Nominal speed motor	3000	3000	3000	
01-26	Nominal torque motor	9,55	12,73	17,5	
01-30	Line resistance/ Stator resistance	1,48	0,811	0,81	
01-37	Main inductance/ Inductance D-axis	8,956	5,971	5,971	
01-39	Number of poles	6	6	6	
01-40	Nominal voltage for speed- 1000 rpm/ G-EMK	122	124	124	
01-69	Inertia max	0,0212	0,03	0,03	
01-68	Inertia min	0,00212	0,003	0,003	
01-90	Thermal motor protection	Thermistor Disconnection	Thermistor Disconnection	Thermistor Disconnection	
01-93	Thermistor connection	Connector box 54	Connector box 54	Connector box 54	Connection Thermistor contacts to connector box 50
04-19	Max. output frequency	160	160	160	
04-13	Max. speed	3000	3000	3000	
04-14	Max. frequency	150	150	150	
04-18	Max. current limit of nominal current	120	120	120	
04-16	max. torque limit mot.	120	120	120	
04-17	max. torque limit gen.	120	120	120	
03-41	Ramp up time	10	10	10	
03-42	Ramp down time	10	10	10	
03-03	Max. nominal value	3000	3000	3000	
03-03	Max. nominal value	150	150	150	
07-02	P amplification	0,01	0,01	0,01	
07-03	I time	300	300	300	
07-06	T-filter	5	5	5	
14-01	Pulse frequency	kHz	7	7	7
04-10	Direction of rotation	Both directions	Both directions	Both directions	
05-11	Connector block 19	Revising	Revising	Revising	
05-12	Connector block 27	No operation	No operation	No operation	



**Parameter list for the initial operation of EMOD PM motors 3000 rpm
from 0.37 KW to 22 KW with frequency converter Danfoss
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EMOD PM motor	Entity	7.5 kW	11 kW	15 kW
Type		HEF PM 90/63- 140ET	HEF PM 90/63- 140ET	HEF PM 112/63- 175ET
Motor number				
EMOD-number				
IEC installation size		90	112	112
Coolant temperature	°C	40	40	40
Protection type		IP55	IP55	IP55
Insulation class		F	F	F
Rated voltage	V	400	400	400
Connection		Y	Y	Y
Nominal output	kW	7,5	11	15
Nominal current	A	12,5	17,6	24,3
Frequency	Hz	150	150	150
Nominal speed	rpm	3000	3000	3000
Nominal torque	Nm	23,87	35	47,75
Efficiency factor	cos Phi	0,93	0,97	0,95
Efficiency	%	93,1	93	94
Mode of operation		S1	S1	S1
Maximum torque for two minutes	Nm	38,2	28,1	28,1
Maximum speed	rpm	3750	3750	3750
Line resistance U1-U2	Ohm	0,536	0,254	0,171
Open-circuit voltage for 1000 rpm	V	123	130	128
Main reactance	Ohm	4,22	3,289	2,538
Stator leakage reactance	Ohm	1,885	1,143	0,85
Main inductance	mH	4,478	3,49	2,693
Leakage inductance	mH	2	1,213	0,902
Iron loss resistance	Ohm	802	556	429
Design	IM	B5/V1	B5/V1	B5/V1
Flange I flanQes 0	mm	250	250	250
Shaft end	mm			
Mass moment of inertia	kgm2	0,003	0,0117	0,0146



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Para Nr.	Danfoss frequency converter				
	VLT FC - 302				
	Article number				
	Serial number				
	Power in kW		7.5	11	15
00-01	Language		English	English	English
00-02	Hz/rpm changeover		rpm	rpm	rpm
01-22	Motor voltage		440	440	440
01-10	Motor type		PM, Non-salient pole	PM, Non-salient pole	PM, Non-salient pole
01-01	Motor control principle		Flux without sensor	Flux without sensor	Flux without sensor
01-24	Nominal current motor		12,5	17,6	24,3
01-25	Nominal speed motor		3000	3000	3000
01-26	Nominal torque motor		23,87	35	47,75
01-30	Line resistance/ Stator resistance		0,536	0,254	0,171
01-37	Main inductance/ Inductance D-axis		4,478	3,49	2,693
01-39	Number of poles		6	6	6
01-40	Nominal voltage for speed- 1000 rpm/ G-EMK		123	130	128
01-69	Inertia max		0,03	0,117	0,146
01-68	Inertia min		0,003	0,0117	0,0146
01-90	Thermal motor protection		Thermistor Disconnection	Thermistor Disconnection	Thermistor Disconnection
01-93	Thermistor connection		Connector box 54	Connector box 54	Connector box 54
04-19	Max. output frequency		160	160	160
04-13	Max. speed		3000	3000	3000
04-14	Max. frequency		150	150	150
04-18	Max. current limit of nominal current		120	120	120
04-16	max. torque limit mot.		120	120	120
04-17	max. torque limit gen.		120	120	120
03-41	Ramp up time		10	10	10
03-42	Ramp down time		10	10	10
03-03	Max. nominal value		3000	3000	3000
03-03	Max. nominal value		150	150	150
07-02	P amplification		0,01	0,01	0,01
07-03	I time		300	300	300
07-06	T-filter		5	5	5
14-01	Pulse frequency	kHz	7	7	7
04-10	Direction of rotation		Both directions	Both directions	Both directions
05-11	Connector block 19		Revising	Revising	Revising
05-12	Connector block 27		No operation	No operation	No operation

**Parameter list for the initial operation of EMOD PM motors 3000 rpm
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Automation Drive FC 302**

EMOD PM motor	Entity	18.5 kW	22 kW
Type		HEF PM 132/63- 160ET	HEF PM 132/63- 200ET
Motor number			
EMOD-number			
IEC installation size		132	132
Coolant temperature	°C	40	40
Protection type		IP55	IP 55
Insulation class		F	F
Rated voltage	V	400	400
Connection		Y	Y
Nominal output	kW	18,5	22
Nominal current	A	30,7	36,4
Frequency	Hz	150	150
Nominal speed	rpm	3000	3000
Nominal torque	Nm	58,9	70
Efficiency factor	cos Phi	0,93	0,93
Efficiency	%	93	93,4
Mode of operation		S1	S1
Maximum torque for two minutes	Nm	94,2	112
Maximum speed	rpm	3750	3750
Line resistance U1-U2	Ohm	0,0898	0,068
Open-circuit voltage for 1000 rpm	V	128	120
Main reactance	Ohm	1,176	0,942
Stator leakage reactance	Ohm	0,458	0,354
Main inductance	mH	1,248	0,999
Leakage inductance	mH	0,486	0,376
Iron loss resistance	Ohm	210	168
Design	IM	B5/V1	B5/V1
Flange I flanQes 0	mm	300	300
Shaft end	mm		
Mass moment of inertia	kgm ²	0,0451	0,0563



**Parameter list for the initial operation of EMOD PM motors 3000 rpm
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Para Nr.	Danfoss frequency converter				
	VLT FC - 302				
	Article number				
	Serial number				
	Power in kW		18.5	22	
00-01	Language		English	English	
00-02	Hz/rpm changeover		rpm	rpm	
01-22	Motor voltage		440	440	
01-10	Motor type		PM, Non-salient pole Flux without sensor	PM, Non-salient pole Flux without sensor	
01-01	Motor control principle				
01-24	Nominal current motor		30,7	36,4	
01-25	Nominal speed motor		3000	3000	
01-26	Nominal torque motor		58,9	70	
01-30	Line resistance/ Stator resistance		0,0898	0,068	
01-37	Main inductance/ Inductance D-axis		1,248	0,999	
01-39	Number of poles		6	6	
01-40	Nominal voltage for speed- 1000 rpm/ G-EMK		128	120	
01-69	Inertia max		0,451	0,563	
01-68	Inertia min		0,0451	0,0563	
01-90	Thermal motor protection		Thermistor Disconnection	Thermistor Disconnection	
01-93	Thermistor connection		Connector box 54	Connector box 54	Connection Thermistor contacts to connector box 50
04-19	Max. output frequency		160	160	
04-13	Max. speed		3000	3000	
04-14	Max. frequency		150	150	
04-18	Max. current limit of nominal current		120	120	
04-16	max. torque limit mot.		120	120	
04-17	max. torque limit gen.		120	120	
03-41	Ramp up time		10	10	
03-42	Ramp down time		10	10	
03-03	Max. nominal value		3000	3000	
03-03	Max. nominal value		150	150	
07-02	P amplification		0,01	0,01	
07-03	I time		300	300	
07-06	T-filter		5	5	
14-01	Pulse frequency	kHz	7	7	
04-10	Direction of rotation		Both directions	Both directions	
05-11	Connector block 19		Revising	Revising	
05-12	Connector block 27		No operation	No operation	

Information

Supplementary sheet for the initial installation of a frequency converter (DANFOSS) Type: VLT Aqua- Drive FC 300 with permanent magnet motor

This supplementary sheet is an addition to the operation manual and helps to carry out the initial operation.

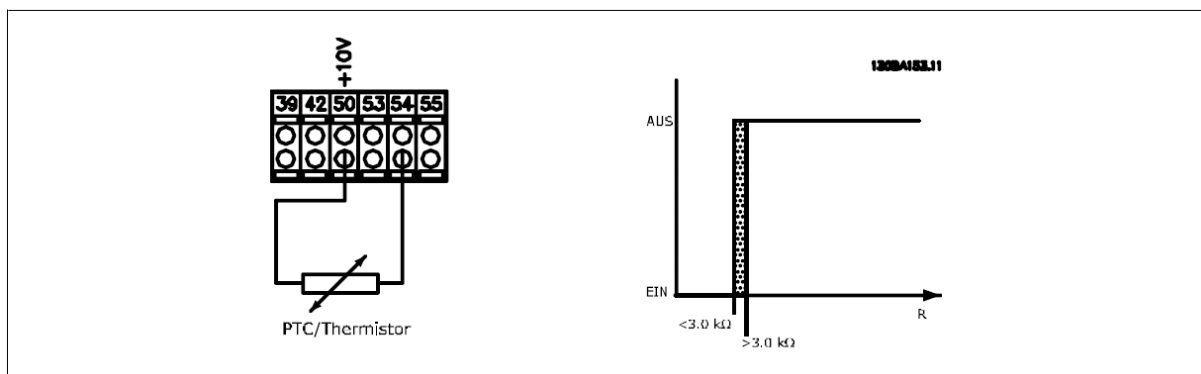
It isn't possible to adjust the permanent magnet motors automatically since the motor can be badly damaged.

For further details look at Programming guide VLT Automation Drive FC 300
(Download: www.danfoss.com)

Keyword: "Automatic motor adjustment" beginning with version MG.33.M7.03

For a safe operation you should connect the thermistor to connector box 50 and 54 (**already preprogrammed in the frequency converter**)

Connection scheme:



Look at the initialized parameter list which you will find enclosed to frequency converter DANFOSS FC 302.

You can download further parameter lists and a link to DANFOSS (→ technical literature) under www.herborner-pumps.com.