

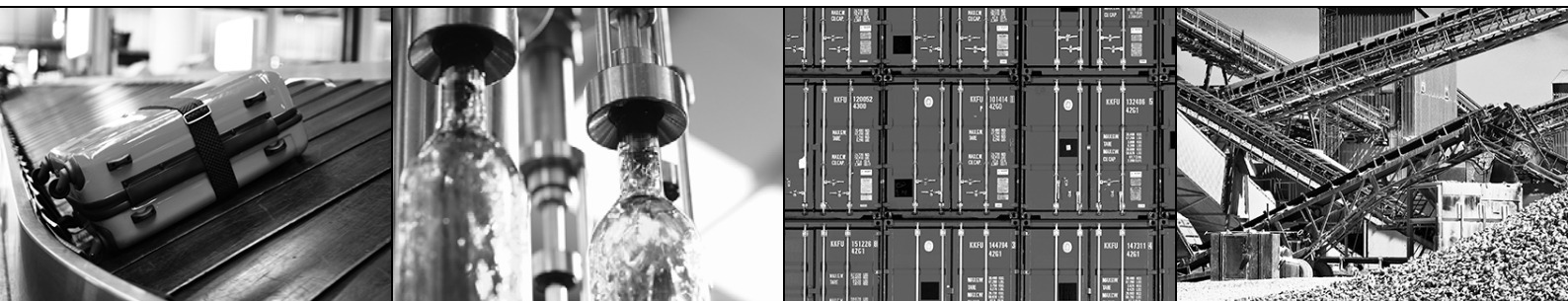


SEW
EURODRIVE

Addendum to the Operating Instructions



**AC motors EDR.71 – 180 (HazLoc-NA[®])
of division 2 on SEW inverters in CFC mode**





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1 General information

1.1 About this documentation

This documentation is an integral part of the product and contains important information on operation and service. The documentation is intended for all employees who perform assembly, installation, startup, and service work on the product.

The documentation must be accessible and legible. Ensure that persons responsible for the system and its operation, as well as persons who work independently on the unit, have read through the entire documentation and understood it. If you are unclear about any of the information in this documentation, or if you require further information, contact SEW-EURODRIVE.

Use this addendum to the operating instructions only together with the operating instructions "AC Motors EDR.71 – 225 according to Class Definition System (HazLoc-NA®)" and "MOVIDRIVE® MDX60B/61B".

1.2 Structure of the safety notes

1.2.1 Meaning of signal words

The following table shows the grading and meaning of the signal words for safety notes, notes on potential risks of damage to property, and other notes.

Signal word	Meaning	Consequences if disregarded
▲ DANGER	Imminent danger	Severe or fatal injuries
▲ WARNING	Possible dangerous situation	Severe or fatal injuries
▲ CAUTION	Possible dangerous situation	Minor injuries
NOTICE	Possible damage to property	Damage to the drive system or its environment
NOTE ON EXPLOSION PROTECTION	Important note on explosion protection	Suspension of explosion protection and resulting hazards
INFORMATION	Useful information or tip: Simplifies the handling of the drive system.	

1.2.2 Design of the section-related safety notes

Section-related safety notes do not apply to a specific action, but to several actions pertaining to one subject. The symbols used either indicate a general hazard or a specific hazard.

This is the formal structure of a safety note for a specific section:



▲ SIGNAL WORD!

Type and source of danger.

Possible consequence(s) if disregarded.

- Measure(s) to prevent the danger.



1.2.3 Design of the embedded safety notes

Embedded safety notes are directly integrated into the instructions just before the description of the dangerous action.

This is the formal structure of an embedded safety note:

- **▲ SIGNAL WORD!** Type and source of hazard.
Possible consequence(s) if disregarded.
 - Measure(s) to prevent the hazard.

1.3 *Rights to claim under warranty*

A requirement of fault-free operation and fulfillment of any rights to claim under limited warranty is that you adhere to the information in the documentation. Therefore read the documentation before you start working with the unit.

1.4 *Exclusion of liability*

You must comply with the information contained in this documentation to ensure safe operation and to achieve the specified product characteristics and performance features. SEW-EURODRIVE assumes no liability for injury to persons or damage to equipment or property resulting from non-observance of these operating instructions. In such cases, any liability for defects is excluded.

1.5 *Product names and trademarks*

All product names in this documentation are trademarks or registered trademarks of their respective titleholders.

1.6 *Copyright*

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2 Safety Notes

2.1 Other applicable documentation

The present documentation extends the operating instructions "AC Motors EDR.71 – 225 according to Class Definition System (HazLoc-NA®)" by the subject "Inverter Operation in CFC Mode".

You must only use the present addendum to the operating instructions in conjunction with the operating instructions "AC Motors EDR.71 – 225 according to Class Definition System (HazLoc-NA®)" and "MOVIDRIVE® MDX60B/61B".

Read the safety notes in the two operating instructions mentioned above before you start your work.



3 System description

3.1 EDR.-Motors

The EDRS and EDRE motors for inverter operation in CFC mode described in this documentation differ from the standard EDR. motors regarding the following properties.

In the basic design, the motors always comprise

- an encoder mounting adapter,
- the thermal motor protection,
- various connection options,
- winding optimized with respect to speed

Depending on the application and its requirements, a brake or other options can be added.

The prerequisite for using the CFC mode is the use of a motor encoder.

3.2 Dynamics

AC motors operated on the supply system usually have an overload capacity of 160% – 180% of the nominal torque during startup.

If the motor is operated on an inverter of the same power, the inverter usually provides 150% current, and thus roughly 150% torque, for 60 seconds during startup. If a larger inverter is selected, the inverter can provide a higher current and a greater torque as well. In this case, the mechanical resistance of the motor against the overload, which might reach or exceed the permitted limit values, must be checked.

The high-quality mechanic design of the EDR. series asynchronous AC motors described here allows for dynamic overload values that exceed the classic values of the asynchronous motors in line or inverter operation.

The EDR. motors are available in three designs. The motors differ regarding the overload capacity of the nominal motor torque:

Class	Overload capacity of the motor $M_{\max} < M_{CT}$
CID2	300 %
CICIID2	300 %
CIID2	450 %

The nameplate of the motor specifies the data of the respective motor design.



3.3 Motor design

SEW-EURODRIVE offers the EDR. motors for CFC mode with the following voltage designs, connection types and rated speeds:

Voltage design	Connection type	Rated speed
230 V	 / 	3000 rpm

The system voltage is 460 – 480 V at 60 Hz

3.4 Inverter combinations

The EDR. motors are adapted to the operation on the MOVIDRIVE[®] inverter in CFC mode.

Usually, the selection tables (page 15) offer several inverter sizes. The size of the inverter which fits perfectly is based on the application data and project planning.



4 Motor structure

For information on the structure of the motors, refer to the operating instructions "AC motors EDR.71 – 225 according to Class Definition System (HazLoc-NA®)".

INFORMATION



Motors that are operated in CFC mode always require with an encoder.

4.1 Data on the nameplates

Motor nameplate

SEW-EURODRIVE						
76646 Bruchsal / Germany						
R67 EDRE112M4/CICIID2/TF/XV1A						
01.4343157405.0001.13					inverter duty VPWM	
					AMB °C -20...40	
[1]	Hz 60	r/min1750/88	V 230 YY	A 12.6	[2]	
	kW3.7 S1	P.F. 0.84	K.V.A-Code J	eff% 87.5 IE2		
[3]	CT15.1Nm	r/min150.0-2700.0	CFC max 35 Nm		[5]	
[4]	Th.Kl. 155(F)	Design IEC N	S.F. 1.0	TEFC		
	kg 74.000	CLII, DIV2 GP A,B,C&D T3	CLII, DIV2 GP F&G T4A	ML 03		
	IM M1					
IP 55		3ph. IEC60034		1886118		Made in Germany

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- [1] Speed (motor/gear unit output) at 60 Hz
 - [2] Voltage and connection type
 - [3] Continuous torque MCT within the given speed range [4]
 - [4] Speed range with constant torque, $n_{Min} - n_{Max}$
 - [5] Maximum torque of the motor in CFC mode
- CFC = Current-controlled control mode of the inverter

Gear unit nameplate

SEW-EURODRIVE		76646 Bruchsal / Germany		R67 EDRE112M4/CICIID2/TF/XV1A		01.4343157405.0001.13		IM M1A	
na	r/min 1750/88	ne	r/min 1750					i	19.89
Ma Nm 400								Fb	1.5
		CLP 220 Miner.Öl/1.1 l			Made in Germany				



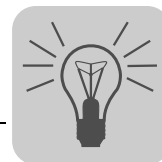
5 Mechanical installation

For information on the mechanical installation, refer to the operating instructions "AC motors EDR.71 – 225 according to Class Definition System (HazLoc-NA[®])".



6 Electrical installation

For information on the electrical installation, refer to the operating instructions "AC motors EDR.71 – 225 according to Class Definition System (HazLoc-NA[®])" and MOVIDRIVE[®] MDX60B/61B".



7 Operating modes and limit values

For information on the operating mode and limit values, refer to the operating instructions "AC motors EDR.71 – 225 according to Class Definition System (HazLoc-NA[®])".



8 Project planning

The properties of EDR. motors operated in CFC mode can be compared to servo properties. Thus the project planning and selection of the components can be performed like with asynchronous servo gearmotors.

8.1 Additional documentation

In addition to the information in this publication, SEW-EURODRIVE offers extensive documentation covering the entire topic of electrical drive engineering. These are mainly the publications of the "Drive Engineering - Practical Implementation" series as well as the manuals and catalogs for electronically controlled drives.

You will find additional links to a wide selection of our documentation in many languages for download on the SEW-EURODRIVE homepage (<http://www.sew-eurodrive.com>). The list below includes other documents that are of interest in terms of project planning. You can order these publications from SEW-EURODRIVE.

8.1.1 Technical data for motors and gear units

The following publications are available from SEW-EURODRIVE in addition to the present documentation:

- "Explosion-Proof AC Motors" catalog
- "Explosion-proof drives" catalog

8.1.2 Drive Engineering – Practical Implementation

- Project Planning for Drives
- Controlled AC Drives
- SEW encoder systems

8.1.3 Electronics documentation

- MOVIDRIVE® MDX60/61B system manual

8.1.4 Mechanical brakes

- "Explosion-Proof AC Motors" catalog



8.2 Motor/inverter assignments, EDR. motors, 460 V system voltage, 60 Hz

8.2.1 230 V EDR. motors, rated speed 3000 rpm, 人 人

CID2 / CICIID2

			MOVIDRIVE® MDX61B...-5_3 in CFC mode (P700)										
Motor			0005	0008	0011	0014	0015	0022	0030	0040	0055	0075	0110
EDRS71S4 0.18 kW	M _{max}	Nm (lb in)	2.50 (22.1)										
	n _{base}	rpm	2834										
EDRS71S4 0.25 kW	M _{max}	Nm (lb in)	3.50 (31.0)	3.50 (31.0)									
	n _{base}	rpm	2675	2749									
EDRS71S4 0.37 kW	M _{max}	Nm (lb in)	5.19 (46.0)	5.20 (46.1)	5.20 (46.1)	5.20 (46.1)	5.20 (46.1)	5.20 (46.1)					
	n _{base}	rpm	2454	2626	2746	2851	2735	2862					
EDRS71M4 0.55 kW	M _{max}	Nm (lb in)		6.67 (59.1)	7.80 (69.1)	7.80 (69.1)	7.80 (69.1)	7.80 (69.1)	7.80 (69.1)				
	n _{base}	rpm		2566	2552	2686	2514	2742	2830				
EDRE80M4 0.75 kW	M _{max}	Nm (lb in)		7.63 (67.6)	10.1 (89.5)	10.3 (91.2)	9.72 (86.1)	10.3 (91.2)					
	n _{base}	rpm		2784	2658	2981	2675	3000					
EDRE90M4 1.1 kW	M _{max}	Nm (lb in)				12.5 (111)	8.91 (78.9)	12.9 (114)	15.1 (134)	15.1 (134)			
	n _{base}	rpm				2767	2869	2753	2820	3000			
EDRE90L4 1.5 kW	M _{max}	Nm (lb in)						13.0 (115)	17.1 (151)	20.5 (182)	20.5 (182)		
	n _{base}	rpm						2844	2753	2858	3000		
EDRE100L4 2.2 kW	M _{max}	Nm (lb in)							16.8 (149)	23.6 (209)	30.5 (270)	30.5 (270)	
	n _{base}	rpm							2872	2777	2668	3000	
EDRE112M4 3.7 kW	M _{max}	Nm (lb in)									32.0 (283)	41.7 (369)	50.0 (443)
	n _{base}	rpm									2711	2609	2767
EDRE132S4 4.0 kW	M _{max}	Nm (lb in)									30.5 (270)	39.7 (352)	54.0 (478)
	n _{base}	rpm									2834	2767	2805
EDRE132M4 5.5 kW	M _{max}	Nm (lb in)										40.6 (360)	62.1 (550)
	n _{base}	rpm										2876	2732
EDRE160S4 7.5 kW	M _{max}	Nm (lb in)											59.3 (525)
	n _{base}	rpm											2812
EDRE160M4 9.2 kW	M _{max}	Nm (lb in)											59.0 (523)
	n _{base}	rpm											2872



Project planning

Motor/inverter assignments, EDR. motors, 460 V system voltage, 60 Hz

			MOVIDRIVE® MDX61B...-5_3 in CFC mode (P700)										
Motor			0150	0220	0300	0370	0450	0550	0750	0900	1100	1320	1600
EDRE112M4 3.7 kW	M _{max}	Nm (lb in)	50.0 (443)										
	n _{base}	rpm	2869										
EDRE132S4 4.0 kW	M _{max}	Nm (lb in)	54.0 (478)										
	n _{base}	rpm	3000										
EDRE132M4 5.5 kW	M _{max}	Nm (lb in)	75.0 (664)	75.0 (664)									
	n _{base}	rpm	2746	2988									
EDRE160S4 7.5 kW	M _{max}	Nm (lb in)	80.2 (710)	101 (895)	101 (895)								
	n _{base}	rpm	2718	2781	2971								
EDRE160M4 9.2 kW	M _{max}	Nm (lb in)	80.4 (712)	117 (1036)	124 (1098)	124 (1098)							
	n _{base}	rpm	2791	2654	2883	2981							
EDRE180S4 11.0 kW	M _{max}	Nm (lb in)	81.9 (725)	120 (1063)	148 (1311)	148 (1311)							
	n _{base}	rpm	2858	2746	2714	2992							
EDRE180M4 15.0 kW	M _{max}	Nm (lb in)		121 (1072)	159 (1408)	194 (1718)	200 (1771)	200 (1771)					
	n _{base}	rpm		2862	2774	2689	2886	3000					
EDRE180L4 18.5 kW	M _{max}	Nm (lb in)		117 (1036)	157 (1390)	193 (1709)	237 (2099)	250 (2214)	250 (2214)				
	n _{base}	rpm		2932	2876	2820	2746	2865	3000				



CIID2

			MOVIDRIVE® MDX61B...-5_3 in CFC mode (P700)										
Motor			0005	0008	0011	0014	0015	0022	0030	0040	0055	0075	0110
EDRS71S4 0.18 kW	M _{max} n _{base}	Nm (lb in) rpm	3.80 (33.7) 2183										
EDRS71S4 0.25 kW	M _{max} n _{base}	Nm (lb in) rpm	5.30 (46.9) 2078										
EDRS71S4 0.37 kW	M _{max} n _{base}	Nm (lb in) rpm	5.19 (46.0) 2454	6.30 (55.8) 2306	7.90 (70.0) 2085	7.90 (70.0) 2159	7.90 (70.0) 2095	7.90 (70.0) 2166					
EDRS71M4 0.55 kW	M _{max} n _{base}	Nm (lb in) rpm		6.67 (59.1) 2566	8.77 (77.7) 2380	11.4 (101) 2159	8.47 (75.0) 2405	11.8 (105) 2130					
EDRE80M4 0.75 kW	M _{max} n _{base}	Nm (lb in) rpm		7.63 (67.6) 2784	10.1 (89.5) 2658	13.2 (117) 2496	9.72 (86.1) 2675	13.6 (120) 2471	15.6 (138) 2422				
EDRE90M4 1.1 kW	M _{max} n _{base}	Nm (lb in) rpm				12.5 (111) 2767	8.91 (78.9) 2869	12.9 (114) 2753	16.8 (149) 2640	23.0 (204) 2461	23.0 (204) 2707		
EDRE90L4 1.5 kW	M _{max} n _{base}	Nm (lb in) rpm						13.0 (115) 2844	17.1 (151) 2753	23.6 (209) 2605	31.3 (277) 2433	31.5 (279) 2591	
EDRE100L4 2.2 kW	M _{max} n _{base}	Nm (lb in) rpm							16.8 (149) 2872	23.6 (209) 2777	31.5 (279) 2665	40.6 (360) 2538	
EDRE112M4 3.7 kW	M _{max} n _{base}	Nm (lb in) rpm									32.0 (283) 2711	41.7 (369) 2609	63.4 (562) 2384
EDRE132S4 4.0 kW	M _{max} n _{base}	Nm (lb in) rpm									30.5 (270) 2834	39.7 (352) 2767	60.5 (536) 2619
EDRE132M4 5.5 kW	M _{max} n _{base}	Nm (lb in) rpm										40.6 (360) 2876	62.1 (550) 2732
EDRE160S4 7.5 kW	M _{max} n _{base}	Nm (lb in) rpm											59.3 (525) 2812
EDRE160M4 9.2 kW	M _{max} n _{base}	Nm (lb in) rpm											59.0 (523) 2872



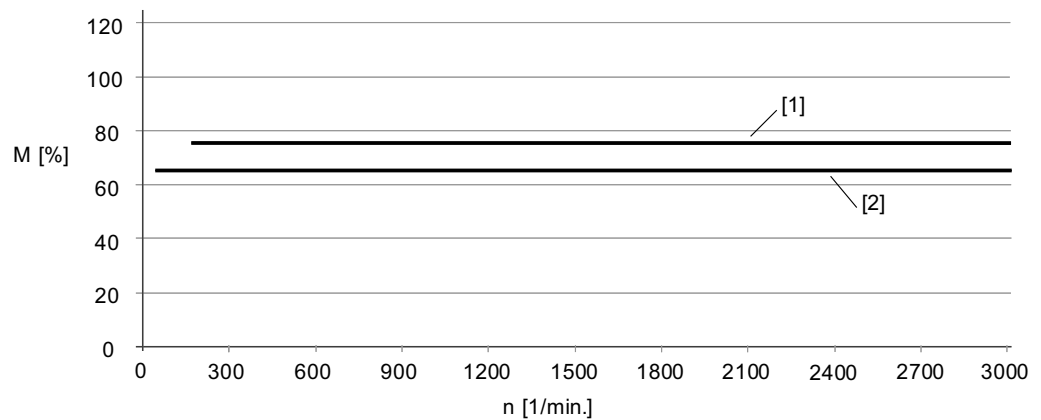
Project planning

Motor/inverter assignments, EDR. motors, 460 V system voltage, 60 Hz

			MOVIDRIVE® MDX61B...-5_3 in CFC mode (P700)											
Motor			0150	0220	0300	0370	0450	0550	0750	0900	1100	1320	1600	2000
EDRE112M4 3.7 kW	M _{max}	Nm (lb in)	77.0 (682)											
	n _{base}	rpm	2254											
EDRE132S4 4.0 kW	M _{max}	Nm (lb in)	81.1 (718)											
	n _{base}	rpm	2468											
EDRE132M4 5.5 kW	M _{max}	Nm (lb in)	83.3 (738)	114 (1010)										
	n _{base}	rpm	2588	2380										
EDRE160S4 7.5 kW	M _{max}	Nm (lb in)	80.2 (710)	116 (1027)	152 (1346)	154 (1364)								
	n _{base}	rpm	2718	2552	2387	2447								
EDRE160M4 9.2 kW	M _{max}	Nm (lb in)	80.4 (712)	117 (1036)	153 (1355)	187 (1656)	189 (1674)							
	n _{base}	rpm	2791	2654	2521	2401	2468							
EDRE180S4 11.0 kW	M _{max}	Nm (lb in)	81.9 (725)	120 (1063)	158 (1399)	193 (1709)	225 (1993)	225 (1993)						
	n _{base}	rpm	2858	2746	2630	2517	2419	2479						
EDRE180M4 15.0 kW	M _{max}	Nm (lb in)		121 (1072)	159 (1408)	194 (1718)	238 (2108)	281 (2489)	305 (2701)					
	n _{base}	rpm		2862	2774	2689	2588	2486	2479					
EDRE180L4 18.5 kW	M _{max}	Nm (lb in)		117 (1036)	157 (1390)	193 (1709)	237 (2099)	280 (2480)	348 (3082)	380 (3366)				
	n _{base}	rpm		2932	2876	2820	2746	2668	2549	2591				



8.3 Limit characteristic curves of the motors in inverter operation



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- [1] M_{CT} motor with / without brake
[2] M_{CT} motor without brake

The exact motor data are specified on the nameplate.

The thermal torque characteristic curves show the permitted maximum torque ratings for continuous operation.

The values may be exceeded for brief periods if the effective operating point lies below the thermal limit characteristic curve.



9 Startup

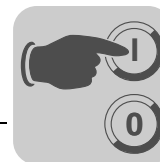
Prerequisites for startup are:

- Motion Studio version 5.9
- Project planning data

The basic data from project planning are:

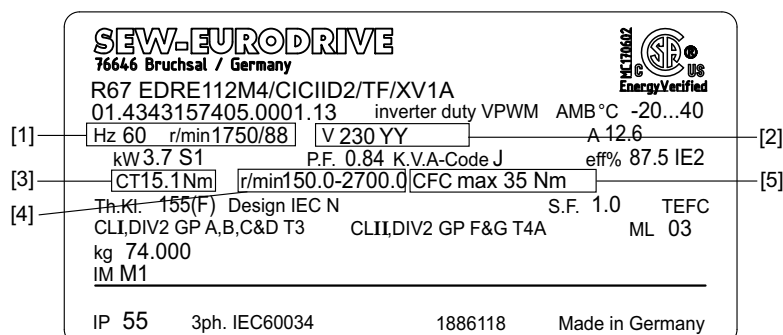
- Motor voltage: 230 V
- Connection type: Double-star
- Maximum projected speed: 2700 rpm
- Operating mode: CFC
- Maximum projected motor torque: 14 Nm
- Power of the inverter: 5.5 kW

The data is given on the nameplates of the motor and the gear unit.



9.1 Data on the nameplates

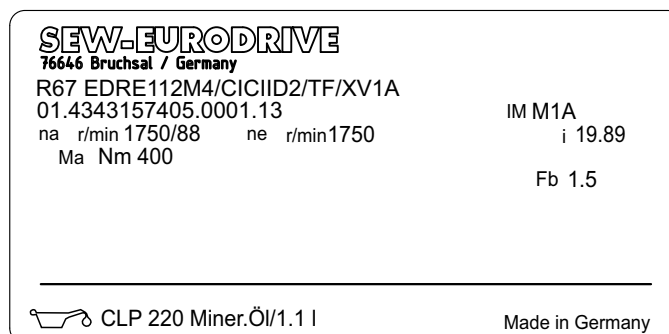
Motor nameplate



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- [1] Speed (motor/gear unit output) at 60 Hz
- [2] Voltage and connection type
- [3] Continuous torque MCT within the given speed range [4]
- [4] Speed range with constant torque, $n_{Min} - n_{Max}$
- [5] Maximum torque of the motor in CFC mode
CFC = Current-controlled control mode of the inverter

Gear unit nameplate



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9.2 Parameter setting

The maximum torque is set in parameter 304 in the MOVIDRIVE[®] parameter tree.

The following rule applies:

$$M_{\text{Max_P304}} \leq M_{\text{Max_ProjectPlanning}} \text{ or } M_{\text{CT}} \text{ or } M_{e_max}^{1)} \text{ or } M_{\text{CFCmax}} \text{ or } M_a/i$$

Hence the smallest value shall be used as limit.

The maximum torque must be limited in some applications. The criterion for the limit can be the mechanical strength of the motor shaft (in the example $M_{\text{CFCmax}} = 35 \text{ Nm}$), the maximum input speed of the gear unit (in the example M_{e_max} with explosion-proof gear units according to RL94/9/EG) or the constant torque of the motor within the given setting range (M_{CT})

The setting is based on the project planning of the drive combinations. This data must be available for drive startup.

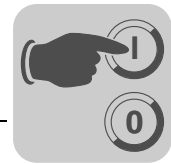
The maximum speed set in P302 is the smallest value of n_{e_max} of the gear unit (with explosion-proof gear units according to RL94/9/EG) or the highest value of the setting range (motor nameplate).

9.3 Startup

Startup



1) With explosion-proof gear unit according to RL94/9/EG, the value is given on the gear unit nameplate



Basic startup screen

The output current is displayed on this screen. The value of the output current is required for calculating the torque.

Parameter set 1 | Parameter Set 2

The inverter is currently operated with the following settings:

Basic Inverter	Motor 1
Type: 0055-5A3	Type: DT90L4
Signature: Default	Rated voltage: 400
Operating mode 1: VFC 1	Rated frequency/speed: 50 Hz
Setpoint source: UNIPOL/FIX.SETPT	Rated power/current: 1.50 kW
Control source: TERMINALS	Brake function: ON
IPQS: PSTOP	
Output current: 12.5	
Rated power: 5.50 kW	
Variant: APPLICATION	

Options	Encoder
Fieldbus: NONE	NO ENCODER
Extension: NONE	Source actual pos.: MOTOR ENC. (X15)
Encoder: NONE	

Mains Supply
Mains voltage: 400

Start-up Set 1 | Abbrechen

Start-up type

Select the command 'Execute complete start-up' for the initial start-up of the motor or if there have been major changes (replacement of motor, encoder, etc.).

Select 'Execute partial start-up' if you would like to merely make certain adjustments (mains or motor voltage, etc.).

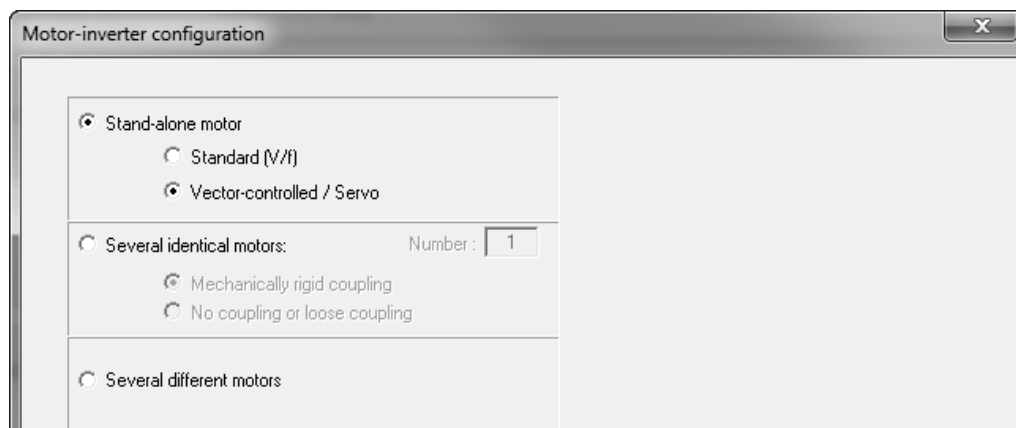
Selection

- ☒ Execute complete start-up
- ☐ Execute partial start-up
- ☐ Optimize speed controller

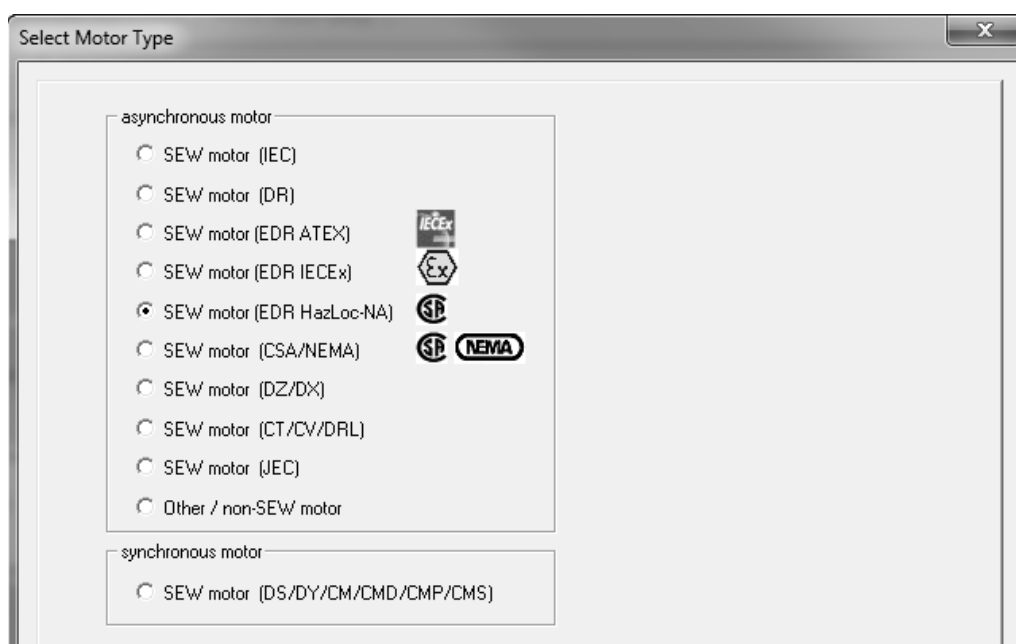


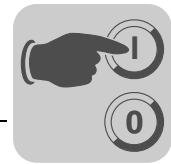
Control mode selection

The EDRE. motors are standard motors with special project planning and increased dynamics. Thus the motor properties can be compared to servo properties.



Selection of the motor series



**Selection of the motor type / the rated motor voltage / the connection type**

Perform the following settings according to the sample motor designation, see name-plate and basic project planning data (page 10).

Select the non-SEW encoder and the respective specification as encoder type.

The motor protection (PTC) must be evaluated using a suitable device. The frequency inverter must be disconnected from the supply system when the PTC trips.

SEW-motor type 1 IEC, DR, NEMA, CSA, DX, DZ, JEC

Motor type 1		EDRE112M4../CICIID2 (60Hz/3.7kW)
Motor rated voltage 1	[V]	230YY/460Y
Connection type		YY
Mains rated voltage	[V]	480
SEW encoder type		NON-SEW ENCODER
Encoder type		SINUS-ENCODER
Encoder increments	[Inc/rev]	1024
835 Response TF sensor		NO RESPONSE
530 Sensor type 1		NO SENSOR

Activate the encoder

Use Encoder

Do you want to use the encoder ?

☒ Yes, I use the encoder

☐ No, I don't use the encoder (yet)

Selecting the operating mode

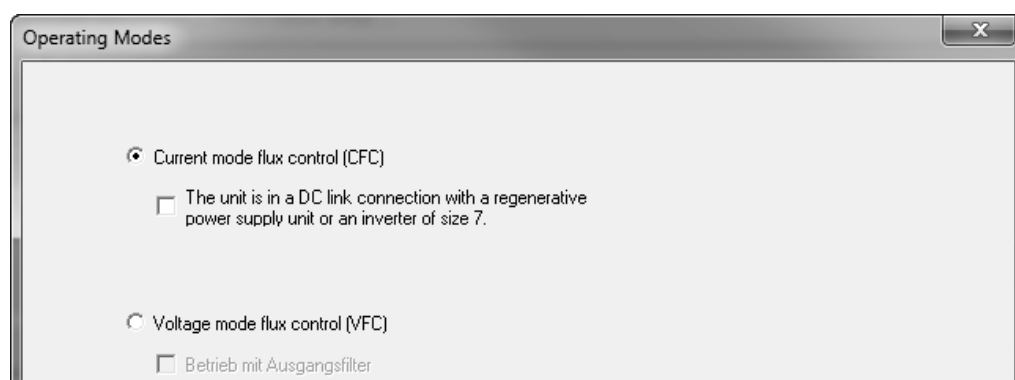
Possible applications

Operating mode

- ☒ Speed control
- ☐ Use hoist
- ☐ Use DC braking
- ☐ Use flying restart circuit
- ☐ Use synchronous operation control (DRS)
- ☐ Positioning with IPDS
- ☐ Use torque control



Select the operating mode



Operating Modes

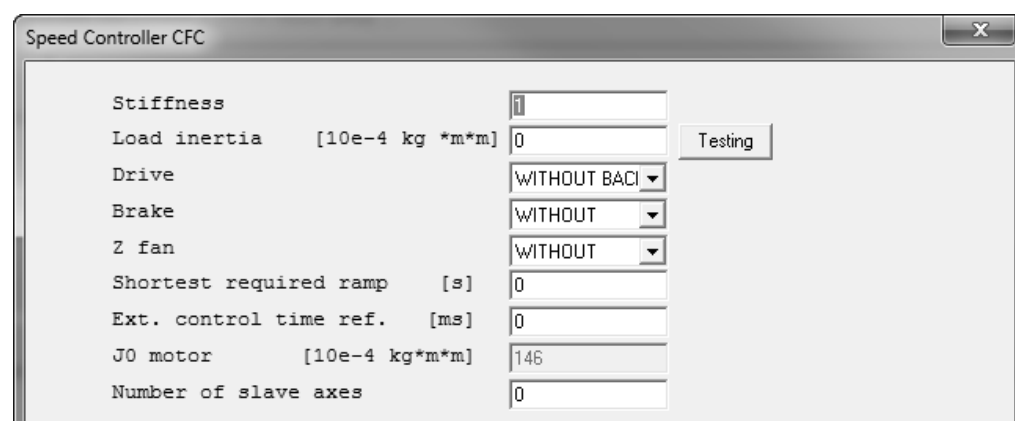
☒ Current mode flux control (CFC)

☐ The unit is in a DC link connection with a regenerative power supply unit or an inverter of size 7.

☐ Voltage mode flux control (VFC)

☐ Betrieb mit Ausgangsfilter

Enter the load data, as far as it is available



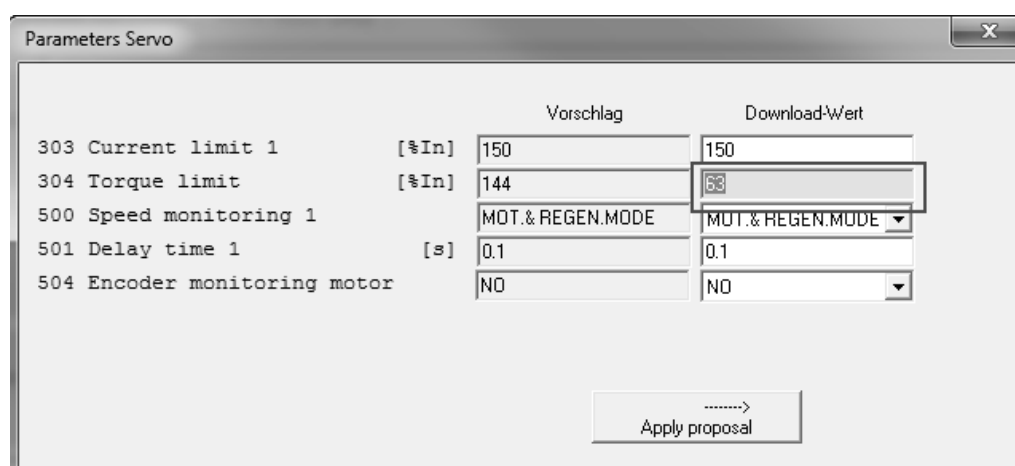
Speed Controller CFC

Stiffness		1	
Load inertia	[10e-4 kg *m*m]	0	Testing
Drive		WITHOUT BACI	
Brake		WITHOUT	
Z fan		WITHOUT	
Shortest required ramp	[s]	0	
Ext. control time ref.	[ms]	0	
J0 motor	[10e-4 kg*m*m]	146	
Number of slave axes		0	

Setting the torque limit

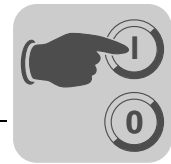
The torque limit is realized via parameter 304.

During startup, a torque limit suggestion is generated based on the motor/inverter assignment. You have to adapt this proposed value to the application, see chapter "calculating the torque limit P304" (page 29).



Parameters Servo

		Vorschlag	Download-Wert
303 Current limit 1	[%In]	150	150
304 Torque limit	[%In]	144	63
500 Speed monitoring 1		MOT.& REGEN.MODE	MOT.& REGEN.MODE
501 Delay time 1	[s]	0.1	0.1
504 Encoder monitoring motor		NO	NO



Setting the controller parameters

Parameters	Proposal	Download value
200 P gain speed controller	5.864	2
201 Time constant n-control.	3.27	10
202 Gain accel. feedforward	1.801	0
204 Filter speed actual	1.2	0
115 Filter setpoint [ms]	0	5
203 Filter accel.	1.19	0
210 P gain hold controller	7.62	0.5
910 Gain X controller	7.62	0.5

----->
Apply proposal

Setting the ramps / the maximum and minimum speed / the brake function

Set the values according to the project planning. Maximum and minimum speed must be adapted to the respective application. Refer to the nameplate (page 10) for the data.

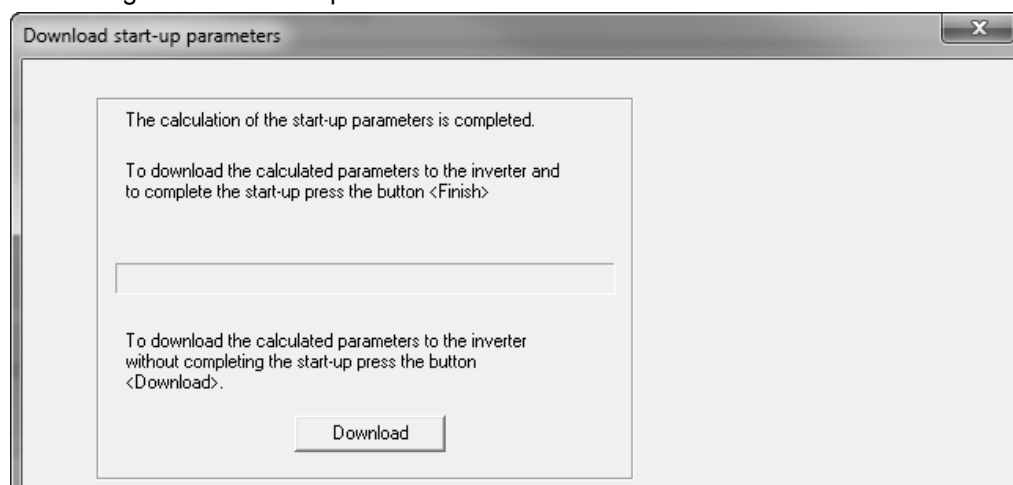
Parameters	Proposal	Download value
100 Setpoint source		UNIPOL/FIX.SETPT
101 Control signal source		TERMINALS
130 Ramp t11 UP CW [s]	0.32	2
131 Ramp t11 DOWN CW [s]	0.32	2
132 Ramp t11 up CCW [s]	0.32	2
133 Ramp t11 down CCW [s]	0.32	2
136 Stop ramp t13 [s]	0.32	2
137 Emergency ramp t14 [s]	0.32	2
301 Minimum speed 1 [rpm]	0	150
302 Maximum speed 1 [rpm]	1500	2700
730 Brake function 1	OFF	ON
731 Brake release time 1 [s]	0.1	0.1
732 Brake application time 1 [s]	0.1	0.15

----->
Apply proposal

< Zurück Weiter > Abbrechen

**Download to the inverter**

The settings from the startup are downloaded to the drive inverter.





9.4 Calculation of the torque limit P304

The torque on the motor shaft can be limited via parameter 304.

The setting is calculated via the torque constant c_T of the motor, the active current I_q and the nominal inverter current.

These values are listed in tables, see chapter "Technical data" (page 32).

9.4.1 Example

Motor	$I_{dnominal}$ A	$I_{qnominal}$ A	$I_{nominal}$ A	I_{Max} A	$M_{nominal}$ Nm	M_{max} Nm	n_{Max} rpm	c_T Nm/A
EDRE80M4.. 0.75 kW	1.52	2.46	2.89	6.33	4.12	10.3	3000	1.67
EDRE90M4.. 1.1 kW	2.60	3.66	4.49	9.52	6.04	15.1	3000	1.65
EDRE90L4.. 1.5 kW	2.91	4.87	5.67	12.5	8.23	20.5	3000	1.69
EDRE100L4.. 2.2 kW	3.64	7.08	7.96	18.2	12.1	30.5	3000	1.71
EDRE112M4.. 3.7 kW	5.23	11.3	12.5	28.6	20.2	50.0	3000	1.78
EDRE132S4.. 4.0 kW	5.58	12.7	13.9	32.2	21.6	54.0	3000	1.70
EDRE132M4.. 5.5 kW	6.17	17.1	18.2	43.3	29.9	75.0	3000	1.75
EDRE160S4.. 7.5 kW	9.10	23.8	25.5	60.0	40.5	101	3000	1.70
EDRE160M4.. 9.2 kW	10.7	28.9	30.8	73.0	49.6	124	3000	1.72
EDRE180S4.. 11.0 kW	13.4	33.4	36.0	84.3	59.3	148	3000	1.78
EDRE180M4.. 15.0 kW	15.8	45.0	47.7	113	80.7	200	3000	1.79
EDRE180L4.. 18.5 kW	22.5	55.3	59.7	141	99.5	250	3000	1.80

Parameter P304 is set in relation to the inverter output current. For the present 5,5 kW MOVIDRIVE® inverter, this is 12.5 A. The application torque is 14 Nm.

$$P304 = \frac{M_{Max_ProjectPlanning}}{k_T \times I_{nominal_FI}}$$

$$P304 = \frac{14 \text{ Nm}}{1.78 \frac{\text{Nm}}{\text{A}} \times 12.5 \text{ A}} \times 100 \%$$

$$P304 = 63 \%$$

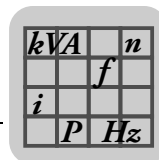
Hence P304 can be set to 63 %.

The setting of P303 "Inverter current limit" can remain the value suggested by the startup software, as the condition $P303 > P304$ is met.



10 Inspection / maintenance

For information on inspection and maintenance, refer to the operating instructions "AC motors EDR.71 – 225 according to Class Definition System (HazLoc-NA®)" and MOVIDRIVE® MDX60B/61B".

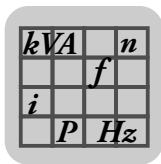


11 Technical data

11.1 Setting ranges

Connection type							
Motor type	P _n kW 60 Hz	P _n HP 60 Hz	M _n line Nm 60 Hz	n _{min} – n _{max} rpm with / without brake ¹⁾	M _{CT} Nm 60 Hz	n _{min} – n _{max} rpm without brake	M _{CT} Nm 60 Hz
EDRS71S4	0.18	0.25	1	150 - 3000	0.75	60 - 3000	0.65
EDRS71S4	0.25	0.34	1.4	150 - 3000	1.05	60 - 3000	0.91
EDRS71S4	0.37	0.5	2.1	150 - 3000	1.25	60 - 3000	1.08
EDRS71M4	0.55	0.75	3.1	150 - 3000	1.86	60 - 3000	1.62
EDRE80M4	0.75	1	4.1	150 - 3000	3.1	60 - 3000	2.7
EDRE90M4	1.1	1.5	6	150 - 3000	4.55	60 - 3000	3.9
EDRE90L4	1.5	2	8.2	150 - 3000	6.2	60 - 3000	5.4
EDRE100L4	2.2	3	12	150 - 3000	9.1	60 - 3000	7.9
EDRE112M4	3.7	5	20	150 - 3000	15.1	60 - 3000	13.1
EDRE132S4	4	5.4	22	150 - 3000	16.2	60 - 3000	14.1
EDRE132M4	5.5	7.5	30	150 - 3000	22.5	60 - 3000	19.5
EDRE160S4	7.5	10	41	150 - 3000	30.5	60 - 3000	26.5
EDRE160M4	9.2	12.5	50	150 - 3000	37	60 - 3000	32.5
EDRE180S4	11	15	59	150 - 3000	44.5	60 - 3000	38.5
EDRE180M4	15	20	81	150 - 2700	61	60 - 2700	52
EDRE180L4	18.5	25	100	150 - 2700	75	60 - 2700	65

1) brakemotor only available with CSA design

**Technical data**

EDR. motors CID2 / CICIID2, 60 Hz, 4-pole, 230 V

11.2 EDR. motors CID2 / CICIID2, 60 Hz, 4-pole, 230 V

Motor	I _{dnominal}	I _{qnominal}	I _{nominal}	I _{Max}	M _{nominal_line}	M _{max}	n _{Max}	C _T
	A	A	A	A	Nm	Nm	rpm	Nm/A
EDRS71S4.. 0.18 kW	0.527	0.724	0.895	1.88	1.00	2.50	3000	1.38
EDRS71S4.. 0.25 kW	0.669	0.934	1.15	2.42	1.40	3.50	3000	1.50
EDRS71S4.. 0.37 kW	1.03	1.55	1.86	4.01	2.08	5.20	3000	1.34
EDRS71M4.. 0.55 kW	1.41	2.14	2.56	5.55	3.11	7.80	3000	1.45
EDRE80M4.. 0.75 kW	1.52	2.46	2.89	6.33	4.12	10.3	3000	1.67
EDRE90M4.. 1.1 kW	2.60	3.66	4.49	9.52	6.04	15.1	3000	1.65
EDRE90L4.. 1.5 kW	2.91	4.87	5.67	12.5	8.23	20.5	3000	1.69
EDRE100L4.. 2.2 kW	3.64	7.08	7.96	18.2	12.1	30.5	3000	1.71
EDRE112M4.. 3.7 kW	5.23	11.3	12.5	28.6	20.2	50.0	3000	1.78
EDRE132S4.. 4.0 kW	5.58	12.7	13.9	32.2	21.6	54.0	3000	1.70
EDRE132M4.. 5.5 kW	6.17	17.1	18.2	43.3	29.9	75.0	3000	1.75
EDRE160S4.. 7.5 kW	9.10	23.8	25.5	60.0	40.5	101	3000	1.70
EDRE160M4.. 9.2 kW	10.7	28.9	30.8	73.0	49.6	124	3000	1.72
EDRE180S4.. 11.0 kW	13.4	33.4	36.0	84.3	59.3	148	3000	1.78
EDRE180M4.. 15.0 kW	15.8	45.0	47.7	113	80.7	200	2700	1.79
EDRE180L4.. 18.5 kW	22.5	55.3	59.7	141	99.5	250	2700	1.80

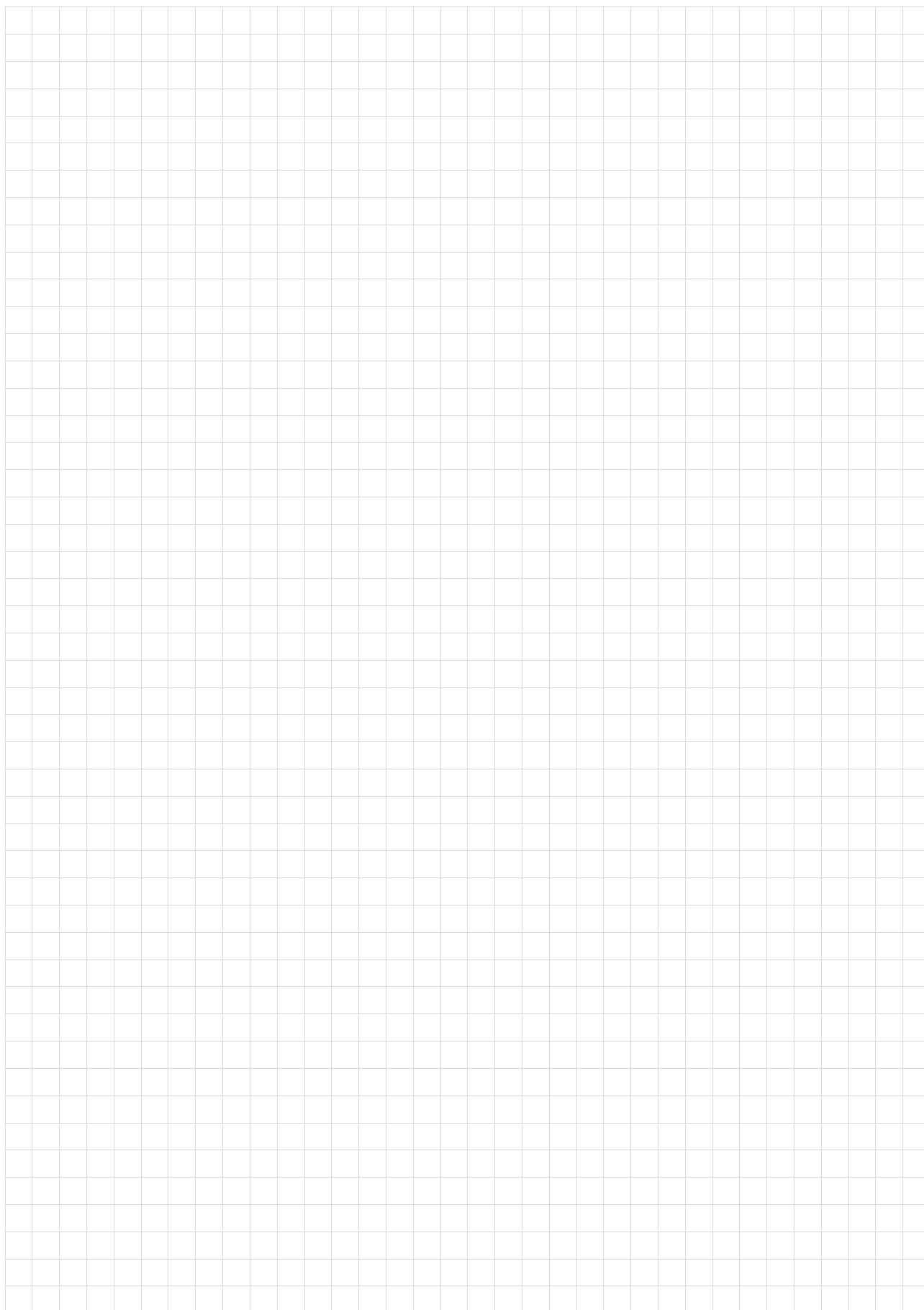
11.3 EDR. motors CIID2, 60 Hz, 4-pole, 230 V

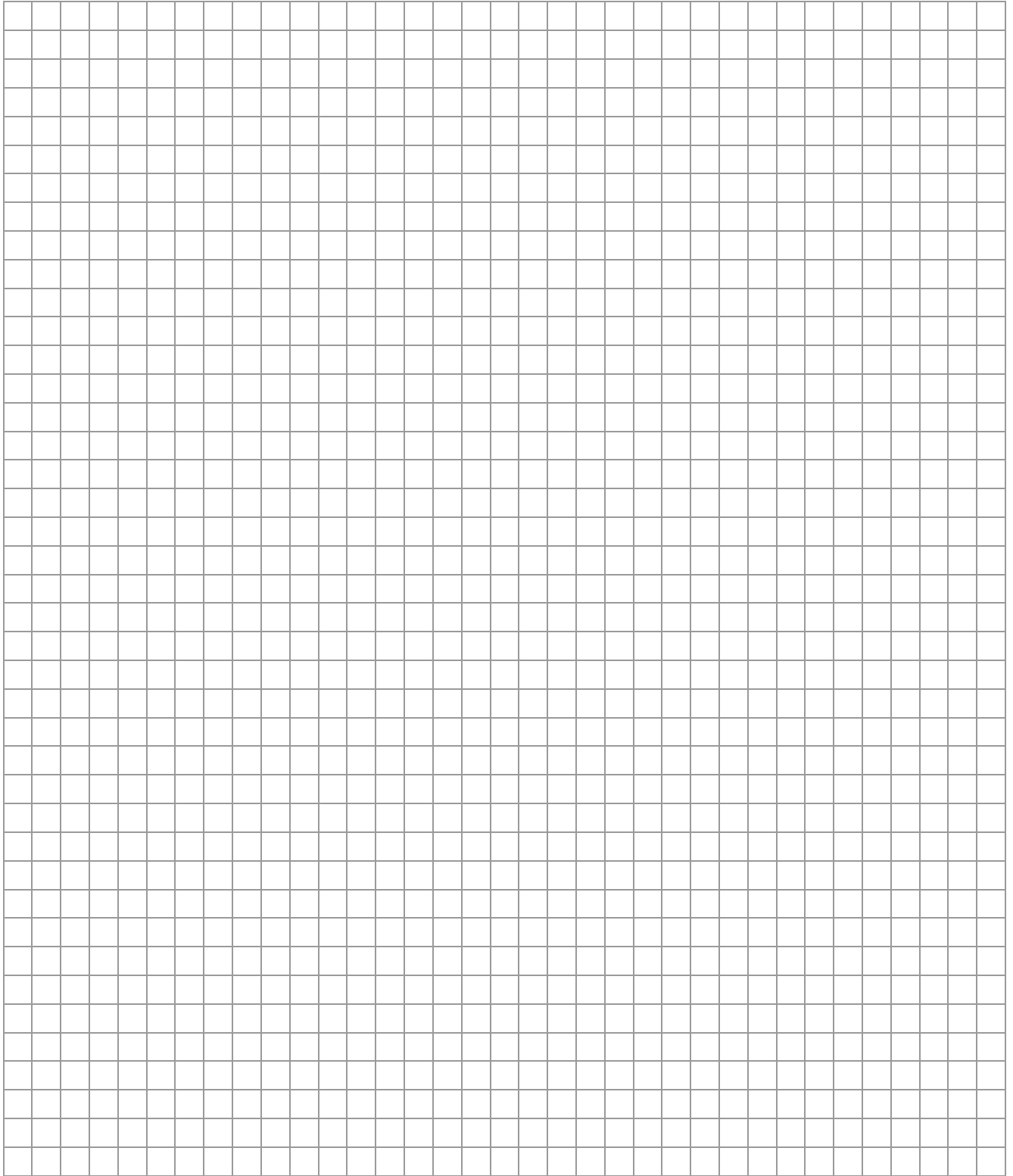
Motor	I _{dnominal}	I _{qnominal}	I _{nominal}	I _{Max}	M _{nominal_line}	M _{max}	n _{Max}	C _T
	A	A	A	A	Nm	Nm	rpm	Nm/A
EDRS71S4.. 0.18 kW	0.527	0.724	0.895	2.79	1.00	3.80	3000	1.38
EDRS71S4.. 0.25 kW	0.669	0.934	1.15	3.59	1.40	5.30	3000	1.50
EDRS71S4.. 0.37 kW	1.03	1.55	1.86	5.97	2.08	7.90	3000	1.34
EDRS71M4.. 0.55 kW	1.41	2.14	2.56	8.24	3.11	11.8	3000	1.45
EDRE80M4.. 0.75 kW	1.52	2.46	2.89	9.44	4.12	15.6	3000	1.67
EDRE90M4.. 1.1 kW	2.60	3.66	4.49	14.2	6.04	23.0	3000	1.65
EDRE90L4.. 1.5 kW	2.91	4.87	5.67	18.9	8.23	31.5	3000	1.69
EDRE100L4.. 2.2 kW	3.64	7.08	7.96	27.1	12.1	46.0	3000	1.71
EDRE112M4.. 3.7 kW	5.23	11.3	12.5	43.6	20.2	77.0	3000	1.78
EDRE132S4.. 4.0 kW	5.58	12.7	13.9	48.5	21.6	82.0	3000	1.70
EDRE132M4.. 5.5 kW	6.17	17.1	18.2	65.4	29.9	114	3000	1.75
EDRE160S4.. 7.5 kW	9.10	23.8	25.5	90.9	40.5	154	3000	1.70
EDRE160M4.. 9.2 kW	10.7	28.9	30.8	111	49.6	189	3000	1.72
EDRE180S4.. 11.0 kW	13.4	33.4	36.0	127	59.3	225	3000	1.78
EDRE180M4.. 15.0 kW	15.8	45.0	47.7	171	80.7	305	2700	1.79
EDRE180L4.. 18.5 kW	22.5	55.3	59.7	212	99.5	380	2700	1.80



12 Malfunctions

For information on malfunctions, refer to the operating instructions "AC motors EDR.71 – 225 according to Class Definition System (HazLoc-NA[®])" and MOVIDRIVE[®] MDX60B/61B".







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