SEW EURODRIVE

Addendum to the Operating Instructions

AC Motors

DR.71.J – DR.100.J

With LSPM Technology

Edition 09/2014

21281793/EN

Contents

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1 General information

INFORMATION

This addendum to the operating instructions for DR.71 − 315 AC motors only looks at the specific aspects of DR..J motors.

Please use the data specified in this addendum. This document does not replace the detailed, applicable operating instructions for "DR.71 − 315 AC Motors".

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2 Danger due to magnetic fields

The rotor of the motor is equipped with permanent magnets. Before disassembly, note that the rotor emits a strong magnetic field. During operation, additional electromagnetic fields are generated.

In Germany, workplaces at which persons are exposed to electromagnetic fields must comply with accident prevention regulation BGV B 11 "Electromagnetic Fields". In other countries, the corresponding national an local regulations and provisions must be complied with.

The magnetic fields that emanate from the permanent magnets of the disassembled rotor generate strong forces of attraction in magnetizable materials, such as other motor components or tools. The attraction of other objects can cause severe injuries by crushing.

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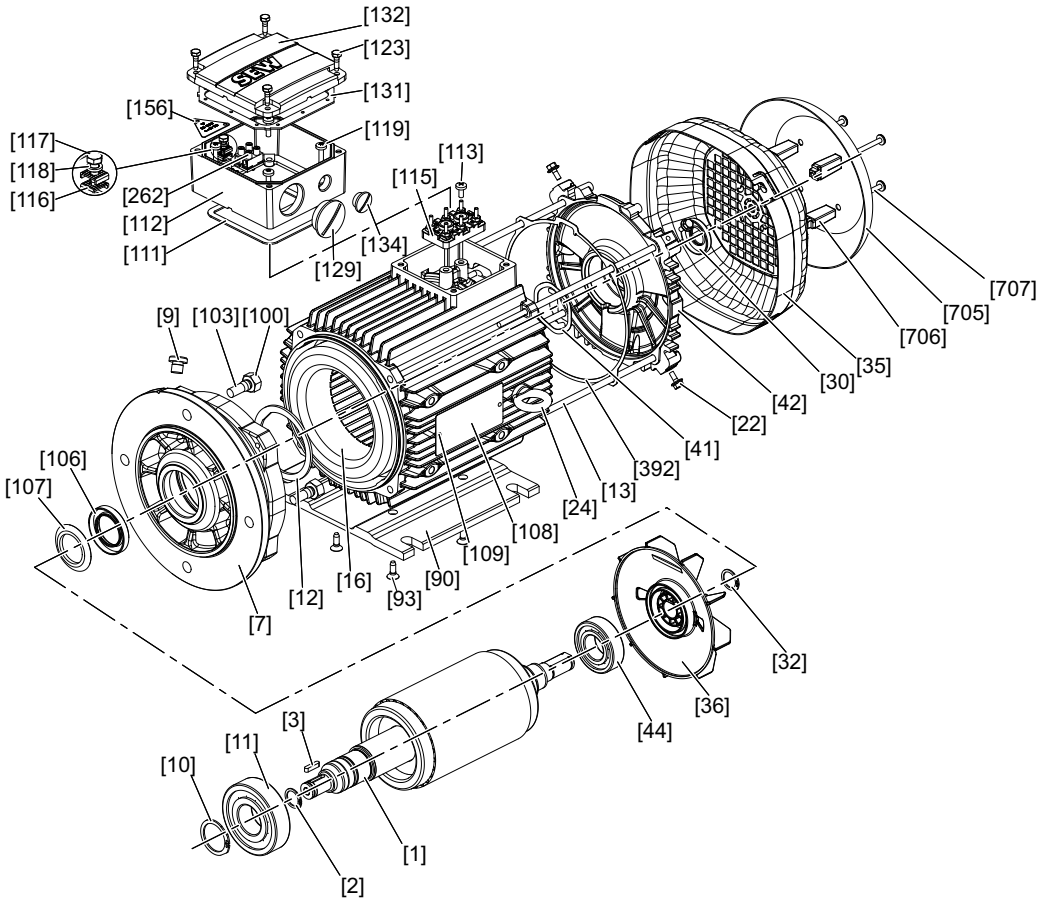
3 Motor design

3.1 Basic structure



18014398682814731

[1] Rotor
[2] Retaining ring
[3] Key
[7] Flanged endshield
[9] Screw plug
[10] Retaining ring
[11] Deep grooved ball bearing
[12] Retaining ring
[13] Cap screw
[16] Stator
[22] Hex head screw
[24] Eyebolt
[30] Oil seal
[32] Retaining ring
[35] Fan guard
[36] Fan
[41] Equalizing ring
[42] B-side endshield
[44] Deep groove ball bearing
[90] Bed plate
[93] Pan head screws
[100] Hex nut
[103] Stud
[106] Oil seal
[107] Oil flinger
[108] Nameplate
[109] Grooved pin
[111] Gasket for lower part
[112] Terminal box lower part
[113] Pan head screw
[115] Terminal board
[116] Terminal clip
[117] Hex head screw
[118] Lock washer
[119] Pan head screw
[123] Hex head screw
[129] Screw plug with O-ring
[131] Gasket for cover
[132] Terminal box cover
[134] Screw plug with O-ring
[156] Label
[262] Connection terminal, complete
[392] Gasket
[705] Canopy
[706] Spacer
[707] Pan head screw

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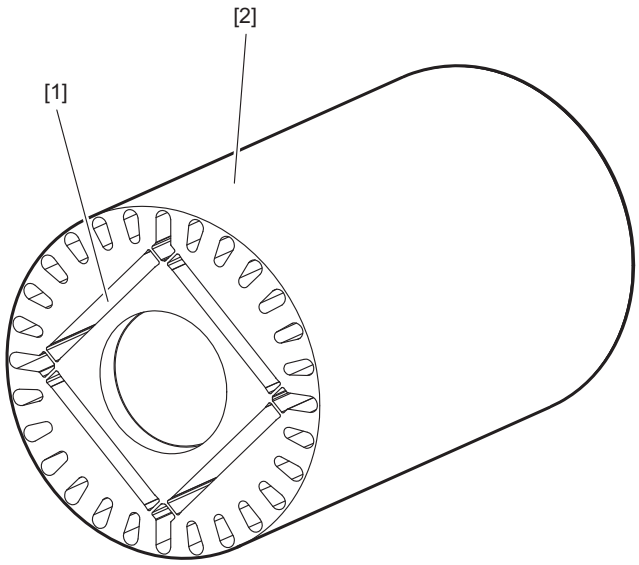
Arrangement of magnets in the rotor:



12836699659

[1] Magnets [2] Rotor core

3.2 Nameplates

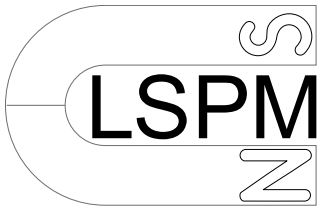
NOTICE

Using a voltage or connection type other than those specified on the nameplate can damage the motor.

Damage to the motor.

Only use the motor with the specified connection type.

Data specified on the motor nameplate:



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The symbol on the nameplate marks motors with LSPM technology and indicates that permanent magnets are installed.

The LSPM technology allows for load-independent, synchronous speed up to the synchronous breakdown torque $M_{K\,syn}$.

M_{Ksyn}/M_n Maximum permitted overload factor

- M_{Ksyn} = synchronous breakdown torque, max. permitted torque
- M_N = nominal torque

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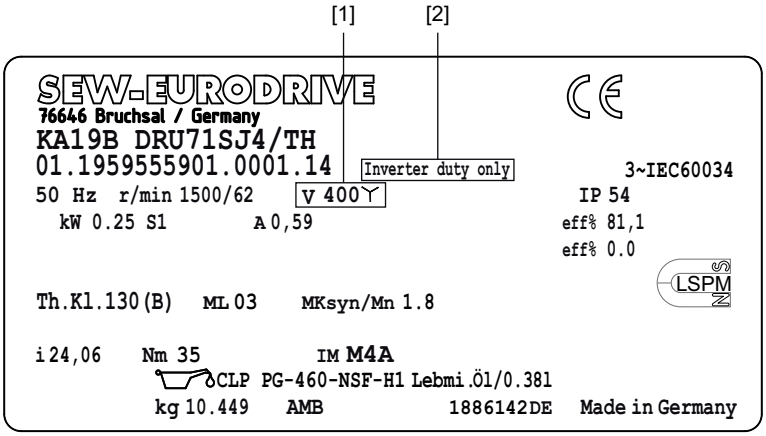
3.2.1 Nameplate for 50 Hz frequency inverter operation

The following figure shows an example nameplate for a motor that is exclusively operated on a frequency inverter.



12842757259

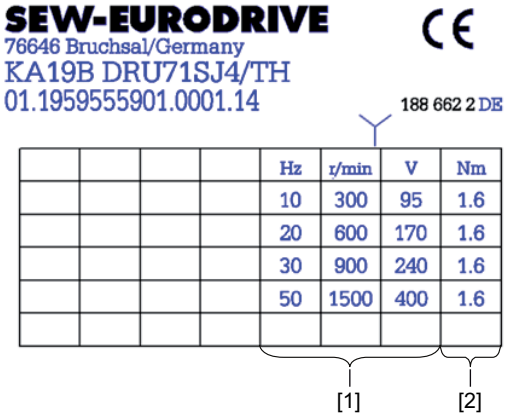
[1] Nominal voltage 400 V ≙ 230/400 V motor in 50 Hz, only in star connection

[2] Inverter operation only

Additional nameplate for 50 Hz frequency inverter operation

If no frequency inverter is installed on the motor, an additional nameplate is attached to the motor terminal box.

The following figure shows an example of an additional nameplate:



12842761867

[1] V/f characteristic

[2] Constant torque in the setting range from 1 to 5

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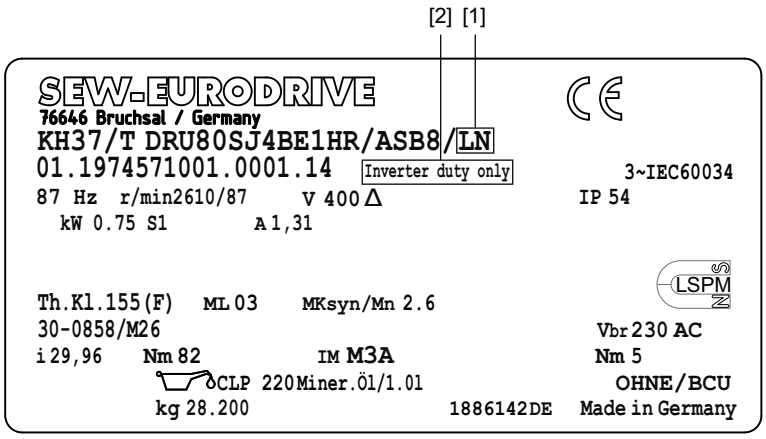
3.2.2 Nameplate for 87 Hz frequency inverter operation

In the 87 Hz variant, the power rating is one step higher than for the 50 Hz variant of the same frame size.

The following figure shows an example nameplate for a motor that is exclusively operated on a frequency inverter.



12842764939

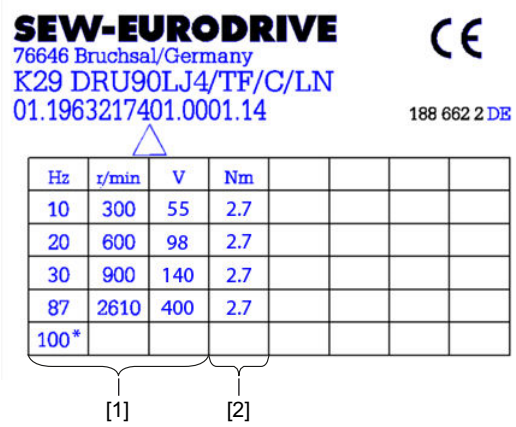
[1] Low-noise fan guard (LN), for 87 Hz standard variant

[2] Nominal voltage 400 V ≙ 230/400 V motor in 87 Hz, only in delta connection

Additional nameplate for 87 Hz frequency inverter operation

If no frequency inverter is installed on the motor, an additional nameplate is attached to the motor terminal box.

The following figure shows an example of an additional nameplate:



12843407883

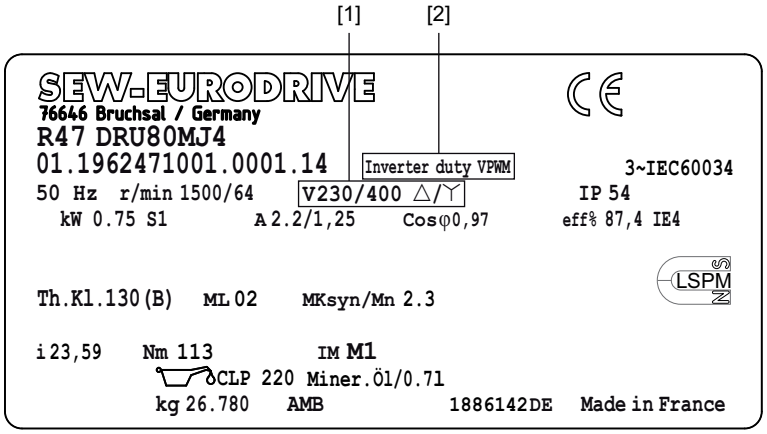
[1] V/f characteristic

[2] Constant torque in the setting range from 1 to 8.7

*Only for some motor sizes in 100 Hz. For input speeds exceeding 2610 rpm, please contact SEW-EURODRIVE.

3.2.3 Nameplate for line-powered motor

The following figure shows a nameplate example for a line-powered motor.



12843412107

[1] Nominal voltage

[2] Line and inverter operation are permitted

3.3 Options and accessories

As part of the modular DR.. motor system, the DR..J type motor with LSPM technology can be used with the available options for this motor system.

All additional features but two can be used from the existing modular motor system for the corresponding frame sizes.

The following additional features are **not** available for the motor type DR..J with LSPM technology:

- Backstop/RS
- Add-on encoder

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4 Startup

Despite proper functioning of the drive, the startup of DR.. motors with rotor designation "J" may cause noise and vibration due to their technology.

DR..J AC motors may not be used in vertical and horizontal applications (hoist) with an inclination exceeding 10%.

Regenerative operation:

Moving the output element generates a voltage at the open motor terminals.

⚠ CAUTION

Electric shock due to regenerative operation

Minor injuries.

- Do not touch the pin contacts in the plug connector.
- Install a touch guard if the mating connector is not plugged in to the plug connector.

NOTICE

If the synchronous breakdown torque of the motor is exceeded (M_{Ksyn}), the motor goes from synchronous to asynchronous operation. In asynchronous operation, strong vibrations and impulses occur.

This can damage the motor, the gear unit, and the plant.

- The maximum limit torque (M_{Ksyn}) and the maximum current (I_{Max}) may not be exceeded, not even for acceleration.
- Do not operate the motor in asynchronous mode.

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4.1 Startup with frequency inverters

The DR..J motors are designed for inverter operation with the following settings:

- Operating mode: scalar V/f
- Slip compensation: off
- Additional voltage/boost: activated To achieve maximum torque at low speed, the output voltage of the inverter must be manually increased in the lower speed range. Depending on the load and desired acceleration, the nominal motor voltage can be adjusted in the range of 10% to 30%.
- Observe the V/f operating points of the motor (see additional nameplate at the terminal box).

NOTICE

Exceeding or falling below the specified speed during motor operation can damage the motor.

Possible damage to property.

- Limit the maximum speed at the inverter. For information on the procedure, refer to the documentation of the inverter.
- Limit the maximum current at the inverter.
- No continuous duty below 300 rpm.
- The speed range below 300 rpm must be passed through within 1 second during acceleration or deceleration.
- The maximum limit torque (M_{Ksyn}) and the maximum current (I_{Max}) must not be exceeded, not even during acceleration.

INFORMATION

Current spikes can occur during starting or when falling out of synchronization.

In this case, you must adjust the current limits at the frequency inverter.

Multi-motor or group drive:

When operating several motors on one frequency inverter, a rigid coupling of the drives is not permitted. Only motors of the same power rating and the same type may be used. A power reserve must be provided for when dimensioning the frequency inverter. The inverter power must be at least 25% higher than the sum of the power ratings of the individual drives.

4.1.1 Motor operated on a frequency inverter from SEW-EURODRIVE

The DR..J motor can be operated as individual or group drive on the following inverters from SEW-EURODRIVE:

- MOVIMOT®
- MOVIFIT® FC
- MOVITRAC® B
- MOVITRAC® LTP-B.

4.1.2 Motor operated on a third-party frequency inverter

DR..J motors can also be operated on frequency inverters from other manufacturers.

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The special characteristics of LSPM motors must be taken into account for this.

Observe the operating points on the additional nameplate.

4.2 Line operation

For designated use of DR..J type motors with LSPM technology on the supply system, the motor must synchronize with the operating frequency after an asynchronous start and go to synchronous operation. This process is referred to as pulling into synchronism.

Operation on the supply system is only possible under certain conditions:

- Pulling in is only possible with low external inertia (mass acceleration factor $J_{ext}/J_{mot} < 5$).
- The higher the mass acceleration factor, the higher the pull-in torque. The pull-in limits are motor-specific. For detailed information, please contact SEW-EURODRIVE.
- In some cases, the pull-in torque is below the nominal torque of the motor.
- With higher inertia, the pull-in torque (M_I) can decrease significantly.
- During a line start, oscillations, pulsating torques and impulses occur due to the design of the motor. This can lead to additional stress on the gear unit.
  - Add an allowance to the service factor on the input end: $f_{BZ} = 1.6$.
  - $f_{Bmin} \geq f_B \times f_{BZ}$
- The permitted maximum operating frequency is 5 operations per hour.

If the Z fan option is selected, the external inertia (J_{ext}) increases, which has a negative effect on the pull-in behavior.

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5 Inspection/maintenance

NOTICE

The disassembled rotor emits a strong magnetic field. Attraction of other magnetizable materials.

Possible damage to property.

- When you disassemble the rotor for inspection or maintenance, protect it from metallic objects, such as tools.
- Protect the rotor from dirt, such as metal chips.
- Clean the rotor before you re-install it.

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6 Technical data

6.1 DRE..J motors

6.1.1 Frequency inverter operation with 400 V / 50 Hz

Motor type DRE	P_N kW	M_N Nm	n_N rpm	I_N A	IE class	η_{100} %	M_{Ksyn}/M_N at 10 Hz, 20 Hz, 50 Hz	J_{Mot} 10^{-4} kgm^2	J_{Mot_BE} 10^{-4} kgm^2	m_{Mot} kg	m_{Mot_BE} kg	Standard brake type	Standard braking torque Nm	U_{p0} V
DRE 71SJ 4	0.37	2.35	1500	0.87	-	77.1	1.1 1.2 1.3	5.14	6.44	7.8	10.2	BE05	5	150
DRE 71MJ 4	0.55	3.5	1500	1.32	-	79.1	1.3 1.5 1.6	7.28	8.58	9.1	11.7	BE1	7	163
DRE 71MJ 4	0.75	4.75	1500	1.76	IE2	80.1	1.1 1.2 1.3	7.28	8.58	9.1	11.7	BE1	10	156
DRE 80SJ 4	1.1	7	1500	2.1	IE2	82.3	1.1 1.2 1.3	15.41	19.91	11.5	15.2	BE2	14	270
DRE 80MJ 4	1.5	9.5	1500	2.8	IE2	83.9	1.3 1.5 1.6	22.08	26.58	14.3	18	BE2	20	270
DRE 90MJ 4	2.2	14	1500	4.2	IE2	85.5	1.3 1.5 1.6	35.49	41.49	18.6	24.5	BE5	28	248
DRE 90LJ 4	3	19.1	1500	5.8	IE2	86.5	1.5 1.7 1.8	43.73	49.73	21.4	27.3	BE5	40	262
DRE 100MJ 4	4	25.5	1500	7.8	IE2	87.3	1.5 1.7 1.8	56.05	62.05	26	31.9	BE5	55	248

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6.1.2 Frequency inverter operation with 400 V / 87 Hz

Motor type DRE	P_N kW	M_N Nm	n_N rpm	I_N A	M_{Ksyn}/M_N at 10 Hz, 20 Hz, 87 Hz	J_{Mot} 10^{-4} kgm²	J_{Mot_BE} 10^{-4} kgm²	m_{Mot} kg	m_{Mot_BE} kg	Standard brake type	Standard braking torque Nm	U_{p0} V
DRE 71SJ 4	0.55	2	2610	1.29	1.3 1.4 1.5	5.14	6.44	7.8	10.2	BE05	5	151
DRE 71MJ 4	0.75	2.75	2610	1.79	1.7 1.9 2.0	7.28	8.58	9.1	11.7	BE1	7	164
DRE 71MJ 4	1.1	4	2610	2.55	1.3 1.5 1.5	7.28	8.58	9.1	11.7	BE1	10	157
DRE 80SJ 4	1.5	5.5	2610	2.9	1.4 1.6 1.7	15.41	19.91	11.5	15.2	BE2	14	271
DRE 80MJ 4	2.2	8	2610	4.1	1.6 1.8 1.9	22.08	26.58	14.3	18	BE2	20	271
DRE 90MJ 4	3	11	2610	5.7	1.7 1.9 2.0	35.49	41.49	18.6	24.5	BE5	28	249
DRE 90LJ 4	4	14.6	2610	7.6	1.9 2.2 2.3	43.73	49.73	21.4	27.3	BE5	28	264
DRE 100MJ 4	5.5	20	2610	10.7	1.9 2.1 2.2	56.05	62.05	26	31.9	BE5	40	249

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6.1.3 Line operation with 400 V / 50 Hz

Motor type DRE	P_N kW	M_N Nm	n_N rpm	I_N A	cos φ	IE class	$\eta_{50\%}$ $\eta_{75\%}$ $\eta_{100\%}$ %	I_A/I_N	M_A/M_N M_{Ksyn}/M_N
DRE 71SJ 4	0.37	2.35	1500	0.87	0.78	-	73.0 76.8 77.1	3.6	1.8 1.4
DRE 71MJ 4	0.55	3.5	1500	1.32	0.74	-	72.8 77.8 79.1	4.3	2.4 1.7
DRE 71MJ 4	0.75	4.75	1500	1.76	0.77	IE2	76.4 80.0 80.1	3.6	2.1 1.4
DRE 80SJ 4	1.1	7	1500	2.1	0.90	IE2	81.2 83.4 82.3	4.2	1.8 1.4
DRE 80MJ 4	1.5	9.5	1500	2.8	0.90	IE2	82.8 84.6 83.9	5.2	2.5 1.7
DRE 90MJ 4	2.2	14	1500	4.2	0.87	IE2	85.2 86.4 85.5	5.0	2.5 1.7
DRE 90LJ 4	3	19.1	1500	5.8	0.86	IE2	85.7 87.2 86.5	5.3	2.6 1.9
DRE 100MJ 4	4	25.5	1500	7.8	0.84	IE2	86.0 87.5 87.3	5.6	2.3 1.9

Additional data

Motor type DRE	P_N kW	M_N Nm	n_N rpm	M_l/M_N at $J_{ext}=½\times J_{Mot}$ $J_{ext}=J_{Mot}$ $J_{ext}=5\times J_{Mot}$	J_{Mot} 10^{-4} kgm²	J_{Mot_BE} 10^{-4} kgm²	m_{Mot} kg	m_{Mot_BE} kg	Standard brake type	Standard braking torque Nm	U_{p0} V
DRE 71SJ 4	0.37	2.35	1500	1.1 1.0 0.6	5.14	6.44	7.8	10.2	BE05	5	150
DRE 71MJ 4	0.55	3.5	1500	1.1 1.0 0.6	7.28	8.58	9.1	11.7	BE1	7	163
DRE 71MJ 4	0.75	4.75	1500	1.0 0.9 0.5	7.28	8.58	9.1	11.7	BE1	10	156
DRE 80SJ 4	1.1	7	1500	1.2 1.0 0.6	15.41	19.91	11.5	15.2	BE2	14	270
DRE 80MJ 4	1.5	9.5	1500	1.6 1.4 0.9	22.08	26.58	14.3	18	BE2	20	270
DRE 90MJ 4	2.2	14	1500	1.4 1.2 0.8	35.49	41.49	18.6	24.5	BE5	28	248
DRE 90LJ 4	3	19.1	1500	1.6 1.4 0.9	43.73	49.73	21.4	27.3	BE5	40	262
DRE 100MJ 4	4	25.5	1500	1.5 1.4 1.0	56.05	62.05	26	31.9	BE5	55	248

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6.2 DRP..J motors

6.2.1 Frequency inverter operation with 400 V / 50 Hz

Motor type DRP	P_N kW	M_N Nm	n_N rpm	I_N A	IE class	$\eta_{100\,\%}$ %	M_{Ksyn}/M_N at 10 Hz, 20 Hz, 50 Hz	J_{Mot} 10^{-4} kgm²	J_{Mot_BE} 10^{-4} kgm²	m_{Mot} kg	m_{Mot_BE} kg	Standard brake type	Standard braking torque Nm	U_{p0} V
DRP 71SJ 4	0.37	2.35	1500	0.87	-	79.3	1.1 1.2 1.3	5.14	6.44	7.8	10.2	BE05	5	150
DRP 71MJ 4	0.55	3.5	1500	1.32	-	81.8	1.3 1.5 1.6	7.28	8.58	9.1	11.7	BE1	7	163
DRP 80SJ 4	0.75	4.75	1500	1.35	IE3	84.1	1.4 1.6 1.7	15.41	16.91	11.5	14.5	BE1	10	300
DRP 80MJ 4	1.1	7	1500	2.05	IE3	85.6	1.5 1.7 1.8	22.08	26.58	14.3	18	BE2	14	285
DRP 90MJ 4	1.5	9.5	1500	2.85	IE3	87.2	1.8 2.0 2.1	35.49	40.19	18.4	23	BE2	20	262
DRP 90LJ 4	2.2	14	1500	4.05	IE3	88.3	1.9 2.1 2.2	43.73	49.73	21.4	27.3	BE5	28	270
DRP 100MJ 4	3	19.1	1500	5.3	IE3	89.1	1.8 2.0 2.1	56.05	62.05	26	31.9	BE5	40	277
DRP 100LJ 4	4	25.5	1500	7.3	IE3	90.4	1.9 2.1 2.2	63.24	69.24	29	34.9	BE5	55	270

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6.2.2 Frequency inverter operation with 400 V / 87 Hz

Motor type DRP	P_N kW	M_N Nm	n_N rpm	I_N A	M_{Ksyn}/M_N at 10 Hz, 20 Hz, 87 Hz	J_{Mot} 10^{-4} kgm²	J_{Mot_BE} 10^{-4} kgm²	m_{Mot} kg	m_{Mot_BE} kg	Standard brake type	Standard braking torque Nm	U_{p0} V
DRP 71SJ 4	0.55	2	2610	1.29	1.3 1.4 1.5	5.14	6.44	7.8	10.2	BE05	5	151
DRP 71MJ 4	0.75	2.75	2610	1.79	1.7 1.9 2.0	7.28	8.58	9.1	11.7	BE1	7	164
DRP 80SJ 4	1.1	4	2610	1.97	1.7 1.9 2.0	15.41	16.91	11.5	14.5	BE1	10	301
DRP 80MJ 4	1.5	5.5	2610	2.8	1.9 2.1 2.2	22.08	26.58	14.3	18	BE2	14	286
DRP 90MJ 4	2.2	8	2610	4.2	2.1 2.4 2.5	35.49	40.19	18.4	23	BE2	20	264
DRP 90LJ 4	3	11	2610	5.5	2.4 2.7 2.8	43.73	49.73	21.4	27.3	BE5	28	271
DRP 100MJ 4	4	14.6	2610	7	2.4 2.6 2.8	56.05	62.05	26	31.9	BE5	28	279
DRP 100LJ 4	5.5	20	2610	10	2.0 2.7 2.8	63.24	69.24	29	34.9	BE5	40	271

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6.2.3 Line operation with 400 V / 50 Hz

Motor type DRP	P_N kW	M_N Nm	n_N rpm	I_N A	cos φ	IE class	$\eta_{50\%}$ $\eta_{75\%}$ $\eta_{100\%}$ %	I_A/I_N	M_A/M_N M_{Ksyn}/M_N
DRP 71SJ 4	0.37	2.35	1500	0.87	0.78	-	74.5 78.4 79.3	3.6	1.8 1.4
DRP 71MJ 4	0.55	3.5	1500	1.32	0.73	-	76.4 80.7 81.8	4.3	2.4 1.7
DRP 80SJ 4	0.75	4.75	1500	1.35	0.94	IE3	82.0 84.3 84.1	5.6	2.8 1.8
DRP 80MJ 4	1.1	7	1500	2.05	0.89	IE3	82.4 85.3 85.6	6.3	2.8 1.9
DRP 90MJ 4	1.5	9.5	1500	2.85	0.85	IE3	84.3 86.8 87.2	6.8	3.4 2.3
DRP 90LJ 4	2.2	14	1500	4.05	0.87	IE3	86.1 88.1 88.3	6.2	2.7 2.4
DRP 100MJ 4	3	19.1	1500	5.3	0.90	IE3	88.2 89.3 89.1	6.7	2.6 2.3
DRP 100LJ 4	4	25.5	1500	7.3	0.87	IE3	89.2 90.5 90.4	6.7	3.3 2.4

Additional data

Motor type DRP	P_N kW	M_N Nm	n_N rpm	M_i/M_N at $J_{ext}=½\times J_{Mot}$ $J_{ext}=J_{Mot}$ $J_{ext}=5\times J_{Mot}$	J_{Mot} 10^{-4} kgm²	J_{Mot_BE} 10^{-4} kgm²	m_{Mot} kg	m_{Mot_BE} kg	Standard brake type	Standard braking torque Nm	U_{p0} V
DRP 71SJ 4	0.37	2.35	1500	1.1 1.0 0.6	5.14	6.44	7.8	10.2	BE05	5	150
DRP 71MJ 4	0.55	3.5	1500	1.1 1.0 0.6	7.28	8.58	9.1	11.7	BE1	7	163
DRP 80SJ 4	0.75	4.75	1500	1.3 1.1 0.6	15.41	16.91	11.5	14.5	BE1	10	300
DRP 80MJ 4	1.1	7	1500	1.8 1.5 1.0	22.08	26.58	14.3	18	BE2	14	285
DRP 90MJ 4	1.5	9.5	1500	1.7 1.4 0.9	35.49	40.19	18.4	23	BE2	20	262
DRP 90LJ 4	2.2	14	1500	1.7 1.5 1.0	43.73	49.73	21.4	27.3	BE5	28	270
DRP 100MJ 4	3	19.1	1500	1.6 1.4 1.0	56.05	62.05	26	31.9	BE5	40	277
DRP 100LJ 4	4	25.5	1500	1.6 1.4 1.0	63.24	69.24	29	34.9	BE5	55	270

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6.3 DRU..J motors

6.3.1 Frequency inverter operation with 400 V / 50 Hz

Motor type DRU	P_N kW	M_N Nm	n_N rpm	I_N A	IE class	η_{100} %	M_{Ksyn}/M_N at 10 Hz, 20 Hz, 50 Hz	J_{Mot} 10^{-4} kgm²	J_{Mot_BE} 10^{-4} kgm²	m_{Mot} kg	m_{Mot_BE} kg	Standard brake type	Standard braking torque Nm	U_{p0} V
DRU 71SJ 4	0.18	1.15	1500	0.43	IE4	80.8	1.9 2.1 2.2	5.14	6.44	7.8	10.2	BE05	2.5	180
DRU 71SJ 4	0.25	1.59	1500	0.59	IE4	81.1	1.5 1.7 1.8	5.14	6.44	7.8	10.2	BE05	3.5	165
DRU 71MJ 4	0.37	2.35	1500	0.78	IE4	84.2	1.8 2.0 2.1	7.28	8.58	7.8	10.2	BE05	5	195
DRU 80SJ 4	0.55	3.5	1500	0.97	IE4	86.0	1.7 1.9 2.0	15.41	16.91	11.5	14.5	BE1	7	315
DRU 80MJ 4	0.75	4.75	1500	1.26	IE4	87.4	1.8 2.0 2.1	22.08	23.58	14.3	17.3	BE1	10	322
DRU 90MJ 4	1.1	7	1500	1.96	IE4	89.2	2.0 2.3 2.4	35.49	40.19	18.4	23	BE2	14	285
DRU 90LJ 4	1.5	9.5	1500	2.75	IE4	90.1	2.1 2.4 2.5	43.73	48.43	21.4	26	BE2	20	285
DRU 100MJ 4	2.2	14	1500	4.1	IE4	91.2	2.1 2.4 2.5	56.05	62.05	26	31.9	BE5	28	285
DRU 100LJ 4	3	19.1	1500	5.4	IE4	91.8	2.1 2.4 2.5	63.24	69.24	29	34.9	BE5	40	277

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6.3.2 Frequency inverter operation with 400 V / 87 Hz

Motor type DRU	P_N kW	M_N Nm	n_N rpm	I_N A	M_{Ksyn}/M_N at 10 Hz, 20 Hz, 87 Hz	J_{Mot} 10^{-4} kgm²	J_{Mot_BE} 10^{-4} kgm²	m_{Mot} kg	m_{Mot_BE} kg	Standard brake type	Standard braking torque Nm	U_{p0} V
DRU 71SJ 4	0.25	0.91	2610	0.6	2.4 2.6 2.7	5.14	6.44	7.8	10.2	BE05	1.8	181
DRU 71SJ 4	0.37	1.35	2610	0.87	1.8 2.0 2.1	5.14	6.44	7.8	10.2	BE05	3.5	166
DRU 71MJ 4	0.55	2	2610	1.15	2.1 2.4 2.5	7.28	8.58	7.8	10.2	BE05	5	196
DRU 80SJ 4	0.75	2.75	2610	1.31	2.2 2.5 2.6	15.41	16.91	11.5	14.5	BE1	7	316
DRU 80SJ 4	0.95	3.5	2610	1.67	1.8 2.0 2.0	15.41	16.91	11.5	14.5	BE1	7	316
DRU 80MJ 4	1.1	4	2610	1.83	2.1 2.4 2.5	22.08	23.58	14.3	17.3	BE1	10	324
DRU 90MJ 4	1.5	5.5	2610	2.65	2.6 2.9 3.1	35.49	40.19	18.4	23	BE2	14	286
DRU 90LJ 4	2.2	8	2610	4.05	2.5 2.8 3.0	43.73	48.43	21.4	26	BE2	20	286
DRU 100MJ 4	3	11	2610	5.6	2.7 3.0 3.2	56.05	62.05	26	31.9	BE5	28	286
DRU 100LJ 4	4	14.6	2610	7.1	2.4 3.1 3.3	63.24	69.24	29	34.9	BE5	28	279

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6.3.3 Line operation with 400 V / 50 Hz

Motor type DRU	P_N kW	M_N Nm	n_N rpm	I_N A	cos φ	IE class	$\eta_{50\%}$ $\eta_{75\%}$ $\eta_{100\%}$ %	I_A/I_N	M_A/M_N M_{Ksyn}/M_N
DRU 71SJ 4	0.18	1.15	1500	0.43	0.75	IE4	74.1 78.8 80.8	5.2	2.5 2.4
DRU 71SJ 4	0.25	1.59	1500	0.59	0.75	IE4	74.5 79.5 81.1	4.5	2.3 1.9
DRU 71MJ 4	0.37	2.35	1500	0.78	0.82	IE4	80.1 83.5 84.2	4.8	2.2 2.3
DRU 80SJ 4	0.55	3.5	1500	0.97	0.94	IE4	81.9 85.2 86.0	6.6	2.9 2.2
DRU 80MJ 4	0.75	4.75	1500	1.26	0.97	IE4	84.6 87.1 87.4	7.8	3.1 2.3
DRU 90MJ 4	1.1	7	1500	1.96	0.90	IE4	86.0 88.5 89.2	8.1	3.8 2.5
DRU 90LJ 4	1.5	9.5	1500	2.75	0.86	IE4	86.5 89.2 90.1	8.9	3.8 2.5
DRU 100MJ 4	2.2	14	1500	4.1	0.85	IE4	88.0 90.5 91.2	8.6	3.6 2.5
DRU 100LJ 4	3	19.1	1500	5.4	0.88	IE4	89.4 91.4 91.8	9.2	4.6 2.5

Additional data

Motor type DRU	P_N kW	M_N Nm	n_N rpm	M_I/M_N at $J_{ext}=½\times J_{Mot}$ $J_{ext}=J_{Mot}$ $J_{ext}=5\times J_{Mot}$	J_{Mot} 10^{-4} kgm²	J_{Mot_BE} 10^{-4} kgm²	m_{Mot} kg	m_{Mot_BE} kg	Standard brake type	Standard braking torque Nm	U_{p0} V
DRU 71SJ 4	0.18	1.15	1500	1.2 1.1 0.7	5.14	6.44	7.8	10.2	BE05	2.5	180
DRU 71SJ 4	0.25	1.59	1500	1.1 1.0 0.6	5.14	6.44	7.8	10.2	BE05	3.5	165
DRU 71MJ 4	0.37	2.35	1500	1.3 1.2 0.7	7.28	8.58	7.8	10.2	BE05	5	195
DRU 80SJ 4	0.55	3.5	1500	1.4 1.2 0.7	15.41	16.91	11.5	14.5	BE1	7	315
DRU 80MJ 4	0.75	4.75	1500	1.8 1.6 1.0	22.08	23.58	14.3	17.3	BE1	10	322
DRU 90MJ 4	1.1	7	1500	1.7 1.4 0.9	35.49	40.19	18.4	23	BE2	14	285
DRU 90LJ 4	1.5	9.5	1500	1.8 1.6 1.0	43.73	48.43	21.4	26	BE2	20	285
DRU 100MJ 4	2.2	14	1500	1.7 1.5 1.1	56.05	62.05	26	31.9	BE5	28	285
DRU 100LJ 4	3	19.1	1500	1.7 1.5 1.1	63.24	69.24	29	34.9	BE5	40	277

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7 Malfunctions

7.1 Motor malfunctions

Fault	Possible cause	Measure
Noise level	• No pulling in possible • Falling out of synchronization due to overload	Reduce load
	• Wrong inverter setting • Incorrect inverter operating mode	Check inverter settings and adjust them (boost, ramp times)
Motor does not start up	• Wrong inverter setting • Incorrect inverter operating mode	Check inverter settings and adjust them (boost, ramp times)
	Load too high	Reduce load
Strong motor vibrations	• No pulling in possible • Falling out of synchronization due to overload	• Reduce load • Check inverter settings

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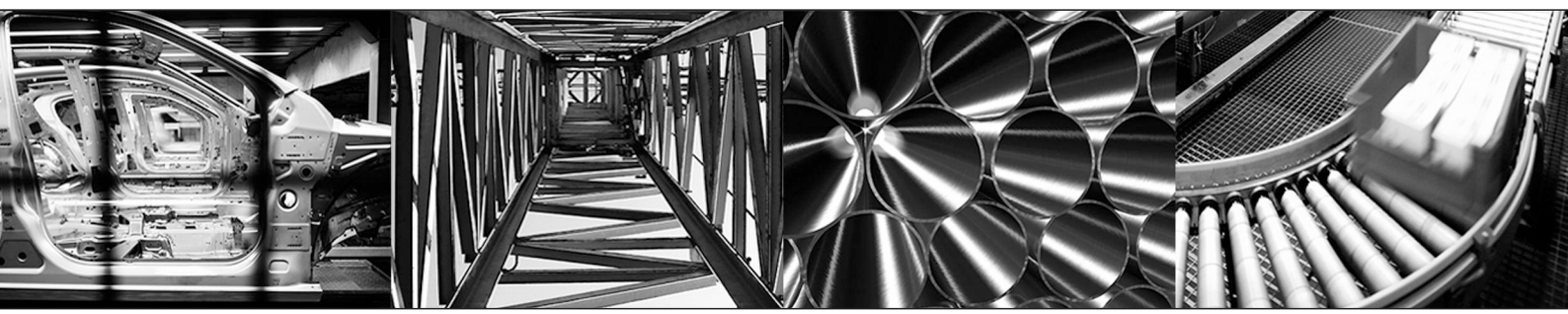

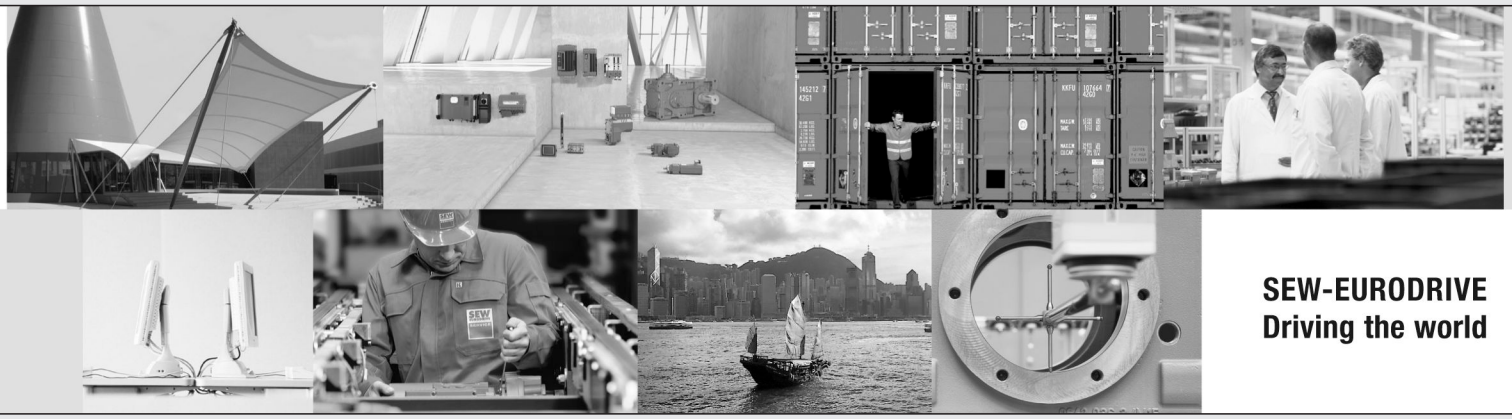

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