SEW EURODRIVE

Catalog

AC Motors

DRS71 – 315, DRE80 – 315, DRP90 – 315, DRL71 – 225
DT56, DR63, DV250/280

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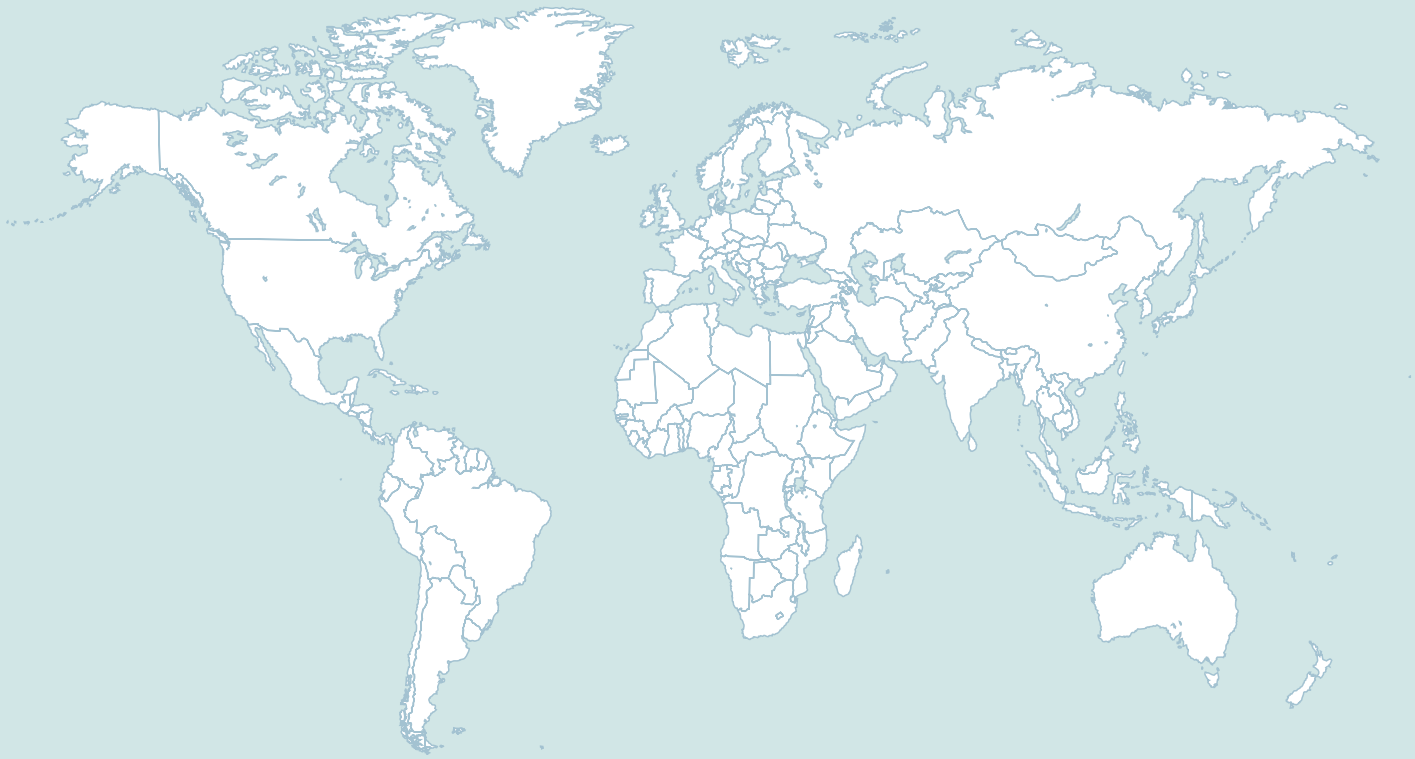


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1 Introduction

1.1 The SEW-EURODRIVE Group of Companies

Global presence

Driving the world – with innovative drive solutions for all branches and for every application. Products and systems from SEW-EURODRIVE are used in a multitude of applications – worldwide. SEW-EURODRIVE products are found in a variety of industries, including automotive, building materials, food and beverage as well as metal-processing. The decision to use drive technology 'made by SEW-EURODRIVE' stands for safety in functionality and investment.

We are represented in the most important branches of industry all over the world: with 12 manufacturing plants, 67 assembly plants in 46 countries and our comprehensive range of services, which we consider an integrative service that continues our commitment to outstanding quality.

Always the right drive

The SEW-EURODRIVE modular concept offers millions of combinations. This wide selection enables you to choose the correct drive for all applications, each based on the required speed and torque range, space available and the ambient conditions. Gear units and gearmotors offering a unique and finely tuned performance range and the best economic prerequisites to face your drive challenges.

The gearmotors are powered by MOVITRAC® frequency inverters, MOVIDRIVE® inverters and MOVIAXIS® multi-axis servo inverters, a combination that blends perfectly with the existing SEW-EURODRIVE program. As in the case for mechanical systems, the development, production and assembly is also carried out completely by SEW-EURODRIVE. In combination with our drive electronics, these drives will provide the utmost in flexibility.

Products of the servo drive system, such as low backlash servo gear units, compact servomotors or MOVIAXIS® multi-axis servo inverters provide precision and dynamics. From single-axis or multi-axis applications all the way to synchronized process sequences, servo drive systems by SEW-EURODRIVE offer a flexible and customized implementation of your application.

For economical, decentralized installations, SEW-EURODRIVE offers components from its decentralized drive system, such as MOVIMOT®, the gearmotor with integrated frequency inverter or MOVI-SWITCH®, the gearmotor with integrated switching and protection function. SEW-EURODRIVE hybrid cables have been designed specifically to ensure cost-effective solutions, independent of the philosophy behind or the size of the system. The latest developments from SEW-EURODRIVE: MOVITRANS® system components for contactless energy transfer, MOVIPRO®, the decentralized drive control and MOVIFIT®, the new decentralized intelligence.

Power, quality and sturdy design combined in one standard product: With high torque levels, industrial gear units from SEW-EURODRIVE realize major movements. The modular concept will once again provide optimum adaptation of industrial gear units to meet a wide range of different applications.

Your ideal partner

Its global presence, extensive product range and broad spectrum of services make SEW-EURODRIVE the ideal partner for the machinery and plant construction industry when it comes to providing drive systems for demanding applications in all branches of industries and applications.

1.2 Products and systems from SEW-EURODRIVE

The products and systems from SEW-EURODRIVE are divided into 4 product groups. These 4 product groups are:

1. Gearmotors and frequency inverters
2. Servo drive systems
3. Decentralized drive systems
4. Industrial gear units

Products and systems used in several group applications are listed in a separate group "Products and systems covering several product groups". Consult the following tables to locate the products and systems included in the respective product group:

1. Gearmotors and frequency inverters		
Gear units/gearmotors	**Motors**	**Frequency inverters**
• Helical gear units/helical gearmotors • Parallel shaft helical gear units/parallel shaft helical gearmotors • Helical-bevel gear units/helical-bevel gearmotors • Helical-worm gear units/helical-worm gearmotors • SPIROPLAN® right-angle gearmotors • Drives for electrified monorail systems • Geared torque motors • Pole-changing gearmotors • Variable speed gear units/variable speed gearmotors • Aseptic gearmotors • ATEX compliant gear units/gearmotors • ATEX compliant variable speed gear units/variable speed gearmotors	• Asynchronous AC motors/AC brakemotors • Multi-speed AC motors/AC brakemotors • Energy-efficient motors • Explosion-proof AC motors/AC brakemotors • Torque motors • Single-phase motors/single-phase brakemotors • Asynchronous linear motors	• MOVITRAC® frequency inverters • MOVIDRIVE® inverters • Control, technology and communication options for inverters

2. Servo drive systems		
Servo gear units/servo gearmotors	**Servomotors**	**Servo drive inverters/servo inverters**
• Low backlash planetary gear units/planetary gearmotors • Low backlash helical-bevel servo gear units/helical-bevel gearmotors • Explosion-proof servo gear units/servo gearmotors	• Asynchronous servomotors/servo brakemotors • Synchronous servomotors/servo brakemotors • Explosion-proof servomotors/servo brakemotors • Synchronous linear motors	• MOVIDRIVE® servo inverters • MOVIAXIS® multi-axis servo inverters • Control, technology and communication options for servo drive inverters and servo inverters

3. Decentralized drive systems		
Decentralized drives	**Communication and installation**	**Contactless energy transfer**
• MOVIMOT® gearmotors with integrated frequency inverter • MOVIMOT® motors/brakemotors with integrated frequency inverter • MOVI-SWITCH® gearmotors with integrated switching and protection function • MOVI-SWITCH® motors/brakemotors with integrated switching and protection function • Explosion-proof MOVIMOT® and MOVI-SWITCH® gearmotors	• Fieldbus interfaces • Field distributors for decentralized installation • MOVIFIT® product range – MOVIFIT®-MC to control MOVIMOT® drives – MOVIFIT®-SC with integrated electronic motor switch – MOVIFIT®-FC with integrated frequency inverter	• MOVITRANS® system – Stationary components for energy supply – Mobile components for energy consumption – Line cables and installation material

4. Industrial gear units
• Helical gear units • Bevel-helical gear units • Planetary gear units

Products and systems covering several product groups
• Operator terminals • MOVI-PLC® drive-based control system

In addition to products and systems, SEW-EURODRIVE offers a comprehensive range of services. These include:

- Technical consulting
- Application software
- Seminars and training
- Extensive technical documentation
- International customer service

Visit our homepage at

→ **www.sew-eurodrive.com**

The website provides comprehensive information and services.

1.3 Additional documentation

Contents of this publication

This catalog/price catalog provides a detailed description of the following product groups from SEW-EURODRIVE:

- AC motors of the DR series
- Asynchronous servomotors of the DRL series
- AC motors of the DT56, DR63, DV250/280 series
- Options and accessories for motors

The catalog/price catalog contains the following information:

- Unit designations
- Product descriptions
- Project planning information
- Technical data
- Technical data of options and additional features
- Important information on the dimensions sheets
- Dimension sheets
- Information on brakes from SEW-EURODRIVE
- Information on prefabricated cables
- Price catalog – Prices and option pricing of options and accessories

Additional documentation

Information about motor/inverter combinations and dynamic and thermal limit characteristic curves necessary for project planning are listed in the 'AC Motors' manual. This manual contains additional content relevant for this catalog.

Content of the manual:

- Motor/inverter assignment DRL-MOVIDRIVE®
- Dynamic and thermal limit characteristic curves DRL-MOVIDRIVE®

- Motor/inverter assignment DRL-MOVIAXIS®; PWM = 4 kHz; U_{Zk} = 565 V and U_{Zk} = 750 V
- Dynamic and thermal limit characteristic curves DRL-MOVIAXIS®; PWM = 4 kHz; U_{Zk} = 565 V and U_{Zk} = 750 V

- Motor/inverter assignment DRL-MOVIAXIS®; PWM = 8 kHz; U_{Zk} = 565 V and U_{Zk} = 750 V
- Dynamic and thermal limit characteristic curves DRL-MOVIAXIS®; PWM = 8 kHz; U_{Zk} = 565 V and U_{Zk} = 750 V

Additional documentation

The following price catalogs/catalogs are available from SEW-EURODRIVE in addition to this motor catalog:

- DR gearmotors
- CMP servomotors
- Synchronous servo gearmotors

The price catalogs and catalogs offer the following information:

- Product descriptions
- Unit designations
- Project planning instructions for drives and gear units
- Visual representation of mounting positions
- Explanation on the order information
- Design and operating notes
- Important information on tables and dimension sheets
- Description of the different types
- Overview of all permitted combinations
- Selection tables for gearmotors
- Gearmotor dimension sheets
- Technical data
- Price catalog – Prices and option pricing of options and accessories

Please note that the complete range of technical documentation is available on our home page:

www.sew-eurodrive.com

1.4 Product names and trademarks

The brands and product names in this catalog are trademarks or registered trademarks of the titleholders.

1.5 Copyright

2 General Product Description

2.1 DR. series AC motors

Noise

The noise levels of all motors from SEW-EURODRIVE are well within the maximum permitted noise levels set forth in IEC/EN 60034-9.

Coating

DR motors

The DR motors are painted with "blue/gray" machine paint RAL 7031 as per DIN 1843 as standard. The asynchronous servomotors of the DRL series are also available in "black" machine paint, RAL 9005 as per DIN 1843, at no extra cost. Special coatings and other colors are available on request.

Surface and corrosion protection

If required, all motors from SEW-EURODRIVE can also be supplied with special surface protection for applications in extremely humid and chemically aggressive environments.

Air admission and accessibility

The motors / brakemotors must be mounted on the driven machine in such a way that both axially and radially there is enough space left for unimpeded air admission and for maintenance of the brake. Please also refer to the notes in the motor dimension sheets.

Brakemotors

On request, the motors can be supplied with an integrated mechanical brake. The SEW-EURODRIVE brake is an electromagnetic disk brake with a DC coil that releases electrically and brakes using spring force. Due to its operating principle, the brake is applied if the power fails. It meets the basic safety requirements. The brake can also be released mechanically if equipped with manual brake release. For this purpose, the brake is supplied with either a hand lever with automatic reset or an adjustable setscrew. The brake is controlled by a brake controller that is either installed in the motor wiring space or the control cabinet.

A characteristic feature of the brakes is their very short design. The brake bearing end shield is a part of both the motor and the brake. The integrated construction of the SEW-EURODRIVE brakemotor permits particularly compact and sturdy solutions.

Inverter operation

DRS/DRE/DRP motors can be combined with the proven SEW-EURODRIVE frequency inverter series MOVIDRIVE®, MOVITRAC®, MOVIFIT® and MOVIMOT®, and as of now also with MOVIPRO®.

The asynchronous DRL servomotors are operated with the inverters of the MOVIDRIVE® series and the multi-axis servo inverters of the MOVIAXIS® series.

International markets

On request, SEW-EURODRIVE supplies UL registered motors or CSA certified motors with connection conditions according to CSA and NEMA standard.

For the Japanese market, SEW-EURODRIVE offers motors conforming to JIS standard. Contact your sales representative to assist you in such cases.

2.2 Energy-efficient motors of the DR motor series

SEW energy-efficient motors tap the full potential

Since 2002, SEW-EURODRIVE has been using rotors with a cast copper cage for the production of energy-efficient motors.

The advantages of this innovative copper die-cast technology used for the DR motor series is beneficial to the entire motor spectrum.

The design, which is optimized in size and material, allows for combining standard motors, energy-efficient motors and premium motors in one series for the first time.

This means that using different motor types or series is a thing of the past as well as using different additional features and options.

In view of existing and foreseeable national and international legislation and regulations, the DR motors have been developed and designed as a modular energy saving system. They apply all the advantages of a modular system with re-usage and multiple usage of parts to achieve the required efficiency levels safely and easily.

Voluntary agreement

CEMEP, the association of European electric motor manufacturers, has reached an agreement with the European Commission's General Directorate for Energy that all 2 and 4-pole low-voltage AC motors from 1 to 100 kW will be classified on the basis of their efficiency, and that this classification will be identified on the nameplate and in catalogs. The classification distinguishes between EFF3, EFF2 and EFF1 classes.

EFF3 refers to motors without any particular efficiency requirement. EFF2 indicates improved efficiency motors and EFF1 is for high-efficiency motors.

Since 1997, SEW-EURODRIVE has participated in creating the voluntary agreement. We actively advocated an extension of the voluntary agreement in 2005, and we countersigned the agreement in 2006.

The efficiency values are determined according to the method described in IEC 60034 T2 (1972), assuming 0.5 % additional losses.

EFF2

The DRS AC motors of sizes 80M to 225MC meet the requirements of efficiency class EFF2.

EFF1

The DRE AC motors of sizes 90M to 225MC meet the requirements of efficiency class EFF1.

Premium

The voluntary agreement from 1998 does not include any premium class motors yet. The 4-pole DRP AC motors of sizes 90M to 225MC surpass the requirements of efficiency class EFF1 significantly.

This means they are energy-efficient motors of the Premium efficiency class.

The European manufacturers of asynchronous AC motors agreed to stop labeling the motors according to the Voluntary Agreement in spring 2009, and to classify them instead according to IEC 60034-30 with IE1, IE2 and IE3.

EuP directive

The European Commission enacted a directive in 2005 which contains regulations concerning the permitted energy consumption of products. Lot 11 of the directive 2005/32/EC - Energy Using Products - also includes asynchronous AC motors.

After the publication of the results of a study by order of the EU commission about the best possible design of asynchronous AC motors, implementing regulations were drawn up in winter 2008/2009 in Brussels.

They prohibit the sale of motors with standard efficiency levels and stipulate a minimum efficiency equivalent to IE2 as of June 16, 2011. Two more stages for increasing the minimum efficiency levels of asynchronous AC motors to the Premium level were determined as well.

As of January 2015, motors with a power rating of 7.5 kW and higher will have to meet level IE3, and as of January 1, 2017, motors with a power rating of 0.75 kW and higher must meet level IE3 in supply system operation. Motors of class IE2 operated on a frequency inverter are exempt from this.

The implementing regulation for the EuP directive refers to the new parts of IEC 60034. In part T30 (see below), the international classification and minimum efficiency values are described. The new T2-1 part regulates the method for determining the numerical value of the efficiency.

The DRE and DRP energy-efficiency motors comply with the specifications and values derived from IEC 60034 2-1 and -30.

The motors are no longer labeled with the EFF1 logo.

IEC 60034 T2-1 (2007)

Part 2-1 of IEC 60034 still describes the measuring method for determining the efficiency of an asynchronous AC motor.

What is new in part 2-1 is how additional losses are determined. The across-the-board approach of 0.5% is no longer used. A power-based value of 3.5% for small power ratings down to 0.5% for large motors has replaced it.

These numbers seem to indicate that the motor performance has worsened, even though only the across-the-board proportion was changed. No motor component was modified and the energy consumption is still the same.

IEC 60034 T30

After different standards have coexisted for years, part 30 of IEC 60034 now constitutes an internationally uniform efficiency classification.

Similar to the IP label for the degree of protection, this classification will be based on IE. The abbreviation IE stands for "International Efficiency".

Currently, there are three classes:

- IE1= Standard Efficiency = EFF2
- IE2= High Efficiency = EFF1
- IE3= Premium Efficiency

Minimum efficiency levels are defined for classes IE1, IE2 and IE3 at 50 Hz and at 60 Hz, 2-, 4- and 6-pole, in the power range 0.75 kW to 375 kW. This is the first time such a standard is available for consumers, manufacturers and legislature.

The values for the efficiency levels in accordance with IEC 60034-30 are listed in the technical data overview for DRS, DRE or DRP motors (see page 44 ff).

MEPS 2006

The minimum efficiency (MESP) stipulated by law both in Australia and New Zealand has come into effect on April 1, 2006 in Australia and on June 1, 2006 in New Zealand.

It regulates numerical values and measuring methods for the efficiency of 2-, 4-, 6- and 8-pole motors from 0.75 kW (1 hp) to 185 kW (250 hp).

There are no regulations up to 0.55 kW; the DRS motors up to this power rating are therefore permitted.

For 0.75 kW and higher, the specified efficiency values correspond to those of the European EFF1 motors.

The DRE motors and the advanced DRP motors meet the legal requirements and have been approved by the authorization agency.

Indivisible gearmotors are exempt from the regulations. SPIROPLAN® W30 gearmotors (also WA30, WF30, WAF30) and R17 helical gearmotors (also RF17, RZ17) with motors from 0.75 kW to 1.1 kW in DRS design can therefore be supplied in line with the regulations.

For an overview of permitted motors on the Internet, go to http://www.energyrating.gov.au/appsearch/motors.asp and select SEW-EURODRIVE.

USA, Canada

Registering AC motors with UL (Underwriters Laboratories) offers advantages for the US-American market, since this ensures a lower fire insurance premium.

For the Canadian market, a CSA (Canadian Standard Association) approval is mandatory.

The motors of the DR series have the following approvals:

- UL (as recognized component UR) and
- CSA.

DRS motors

This means the following designs of 4-pole DRS motors can be supplied to the USA and Canada.

Motor design	USA	Canada
IEC foot-mounted motors (IM B3 and similar)	0.37 kW - 3.7 kW (0.5 hp - 5 hp)	0.37 kW - 3.7 kW (0.5 hp - 5 hp)
IEC flange-mounted motors (IM B5 and similar)	0.37 kW - 55 kW (0.5 hp - 75 hp)	0.37 kW - 3.7 kW (0.5 hp - 5 hp)
Gearmotors	0.37 kW - 55 kW (0.5 hp - 75 hp)	0.37 kW - 3.7 kW (0.5 hp - 5 hp)
	DRS motors in foot-mounted design from 0.75 kW – 3.7 kW (1 hp – 5 hp) are in NEMA design C and therefore exempt from the energy saving regulations.	

DRE and DRP motors

The energy-efficient motor approval for the 4-pole DRE and DRP motors for the USA and Canada has been granted.

Motor design	USA	Canada
IEC foot-mounted motors (IM B3 and similar)	Mandatory according to EPAct 1992 DRE: 4 kW - 45 kW (5.5 hp - 60 hp) DRP: 4 kW - 37 kW (5.5 hp - 50 hp)	DRE: 4 kW - 45 kW (5.5 hp - 60 hp) DRP: 4 kW - 37 kW (5.5 hp - 50 hp)
IEC flange-mounted motors (IM B5 and similar)	Not mandatory, possible for: DRE: 0.75 kW - 45 kW (1 hp - 60 hp) DRP: 0.75 kW - 37 kW (1 hp - 50 hp)	DRE: 4 kW - 45 kW (5.5 hp - 60 hp) DRP: 4 kW - 37 kW (5.5 hp - 50 hp)
Gearmotors	Not mandatory, possible for: DRE: 0.75 kW - 45 kW (1 hp - 60 hp) DRP: 0.75 kW - 37 kW (1 hp - 50 hp)	DRE: 4 kW - 45 kW (5.5 hp - 60 hp) DRP: 4 kW - 37 kW (5.5 hp - 50 hp)
	Foot-mounted DRE/DRP motors from 0.75 kW to 3.7 kW (1 hp – 5 hp) are voluntary.	

The regulations will be tightened

- on December 19, 2010 in the USA
- on January 1, 2011 in Canada.

This catalog/price catalog only contains the data tables of 50 Hz motors. Please contact your SEW-EURODRIVE representative for additional information.

Brazil

In Brazil, new energy efficiency regulations will take effect on December 8, 2009.

Until then, all DRS motors can be supplied. As of December 2009, delivered motors with power ratings of 0.75 kW (1 CV) and higher must have an improved efficiency. The DRE motors meet these requirements.

This catalog/price catalog only contains the data tables of 50 Hz motors. Please contact your SEW-EURODRIVE representative for additional information.

South Korea

In South Korea, the energy saving regulation comes into effect on January 1, 2010.

As of this date, delivered motors with power ratings of 0.75 kW (1 hp) and higher must have an improved efficiency. The DRE motors meet these requirements.

As the motors must be labeled accordingly, we ask you to specify this when ordering DRE motors for delivery to South Korea.

This catalog only contains the data tables of 50 Hz motors. Please contact your SEW-EURODRIVE representative for additional information.

People's Republic of China

Asynchronous AC motors delivered to China must comply with minimum efficiency regulation that became effective on January 18, 2008.

Until July 1, 20011, a motor of class EFF2/IE1 is sufficient. After that, the motor must be in class EFF1/IE2.

As the motors must be labeled accordingly, we ask you to specify this when ordering DRE motors for delivery to China.

Approval of the DR motors is pending. Please contact your SEW-EURODRIVE representative for additional information.

2.3 Asynchronous servomotors of the DRL series

Asynchronous servomotors are the link between the classical asynchronous AC motors for supply system and inverter operation and the highly dynamic synchronous servomotors with permanent magnets.

DRL motors

Asynchronous servomotors of the DRL series are a drive package made up from the many options of the modular DR motor system.

In its basic variant, the drive package always contains

- Encoder, sine signals and electronic nameplate,
- Thermal motor protection
- Dynamics package
- Various connection options
- Winding optimized with respect to speed

Depending on the application· and requirements, the following elements can be added:

- Forced cooling fan
- Connection via plug connectors instead of terminals
- Temperature sensing
- And many more

Alternatives can be selected instead of the elements of the basic variant, e.g. an absolute encoder instead of the sine encoder.

Dynamics

AC motors operated on the supply system usually have an overload capacity of 160% – 180% of the rated 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 theoretically 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.

As a rule, the synchronous servomotors and the corresponding inverters are designed for a high short-time overload. 400% of the rated torque can usually be reached and are permitted.

The mechanical design of asynchronous servomotors of the DRL series is of such a high quality that dynamic overload values can be reached which exceed the classical values of an asynchronous motor operated on a supply system or inverter and almost match the values of a synchronous servomotor.

SEW-EURODRIVE offers the DRL motors in two dynamics packages:

Package	Overload capacity to rated torque
Dynamics 1 (D1)	190 % - 220 %
Dynamics 2 (D2)	300 % - 350 %

The nameplate of the motor specifies the respective dynamics package.

Speeds

SEW-EURODRIVE offers the DRL servomotors with 4 rated speeds:

- 1200 rpm
- 1700 rpm
- 2100 rpm
- 3000 rpm

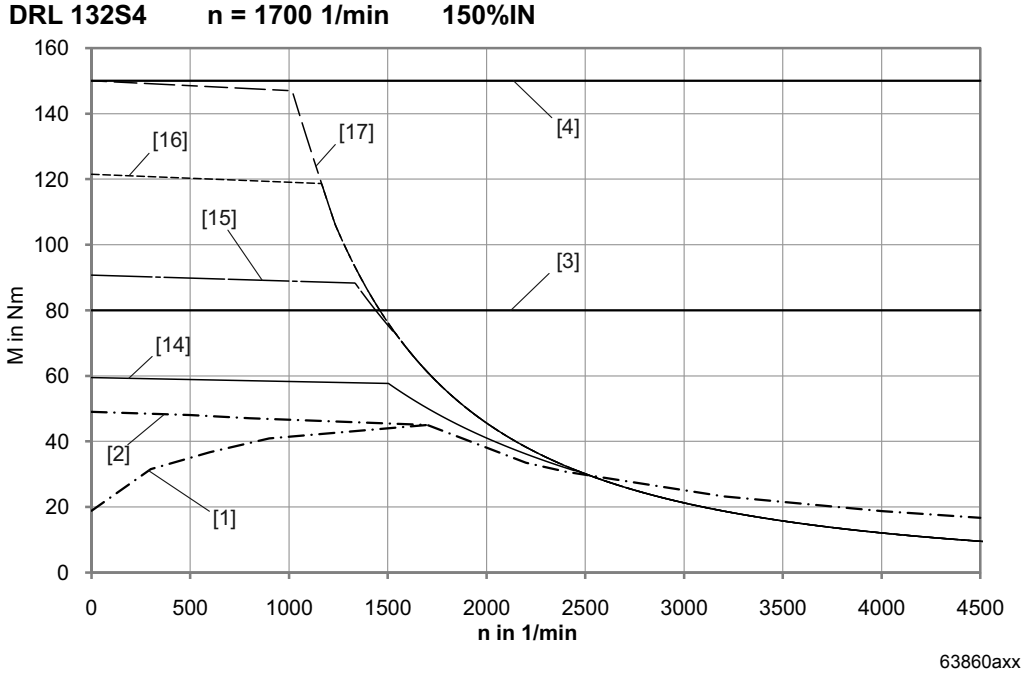
In inverter operation, field weakening begins at the rated speed.

Inverter combinations

The DRL motors are optimally adapted to operation on MOVIDRIVE® inverters and MOVIAXIS® multi-axis servo inverters.

Usually, the selection diagrams offer several inverter sizes. The size of the inverter which fits perfectly is based on the application data and project planning.

Sample selection diagram for the MOVIDRIVE® inverter (dynamic and thermal limit characteristic curve):



[1]	S1 characteristic curve	[14]	7.5 kW inverter output
[2]	S1 characteristic curve with forced cooling fan	[15]	11 kW inverter output
[3]	Maximum limit torque of dynamics package 1	[16]	15 kW inverter output
[4]	Maximum limit torque of dynamics package 2	[17]	22 kW inverter output

Startup

Startup of DRL motors on the MOVIDRIVE® inverter is particularly user-friendly with encoders that have an electronic nameplate.

The nameplate of the following encoders contains all drive-relevant data that is uploaded from the encoder to the inverter before the startup procedure.

- Incremental encoders ES7S, EG7S
- Absolute encoders AS7W, AG7W.

2.4 Corrosion and surface protection

General information

SEW-EURODRIVE offers various optional protective measures for operating motors under special environmental conditions.

The protective measures comprise two groups:

- KS corrosion protection
- OS surface protection

For motors, optimum protection is offered by a combination of corrosion protection KS and surface protection OS.

In addition, special optional protective measures for the output shafts are also available.

KS corrosion protection

Corrosion protection KS for motors comprises the following measures:

- All retaining screws that are loosened during operation are made of stainless steel.
- The nameplates are made of stainless steel.
- A top coating is applied to various motor parts.
- The flange contact surfaces and shaft ends are treated with a temporary anti-corrosion agent.
- Additional measures for brakemotors.

A sticker labeled "KORROSIONSSCHUTZ" (corrosion protection) on the fan guard indicates special treatment has been applied.

	TIP
	The following motor options are not available with KS corrosion protection: • Forced cooling fan/V • Shaft-centered encoders /ES, /ES7, /EG, /EG7, /EV7, /AS, /AS7, /AG, /AG7, /AV7

OS surface protection

In addition to standard surface protection, motors and gear units also available with surface protection OS1 to OS4. The special procedure 'Z' can also be performed in addition. The special procedure "Z" means that large surface recesses are sprayed with a rubber filling prior to painting.

Surface protection	Layers		Regular coat thickness [µm]	Suitable for
	Variant 1[1)]	Variant 2[1)]		
Standard	• 1 x dip primer • 1 x one-component top coat		70	• Normal ambient conditions • Relative humidity below 90% • Max. surface temperature 120°C • Corrosivity category C1[2)]
OS1	• 1 x dip primer • 1 × two-component base coat • 1 × two-component top coat	• 1 x dip primer • 1 × two-component high-solid top coat	120 - 180	• Low environmental impact • Relative humidity max. 95% • Max. surface temperature 120°C • Corrosivity category C2[2)]
OS2	• 1 x dip primer • 1 × two-component high-solid base coat • 1 × two-component base coat • 1 × two-component top coat	• 1 x dip primer • 1 × two-component high-solid base coat • 1 × two-component high-solid top coat	160 - 250	• Medium environmental impact • Relative humidity up to 100% • Max. surface temperature 120°C • Corrosivity category C3[2)]
OS3	• 1 x dip primer • 1 × two-component high-solid base coat • 2 × two-component base coat • 1 × two-component top coat	• 1 x dip primer • 1 × two-component high-solid base coat • 1 × two-component base coat • 1 × two-component high-solid top coat	210 - 320	• High environmental impact • Relative humidity up to 100% • Max. surface temperature 120°C • Corrosivity category C4[2)]
OS4	• 1 x dip primer • 2 × two-component epoxy base coat • 2 × two-component top coat	• 1 x dip primer • 2 × two-component epoxy base coat • 1 × two-component high-solid top coat	260 - 380	• Very high environmental impact • Relative humidity up to 100% • Max. surface temperature 120°C • Corrosivity category C5-1[2)]

1) The variant used currently depends on the color of the top coating.

2) In accordance with DIN EN ISO 12944-2

2.5 Operating temperatures

The motors of the DR series are designed for use in a temperature range from -20 °C to +40 °C.

Contact SEW-EURODRIVE if the motors are operated outside this temperature range!

2.6 The motors at a glance

DR. motors, 50 Hz, 2-pole

Motor type	DRS			DRE			DRP			J_{Mot} [10^{-4} kgm^2]
	P_N [kW] M_N[Nm]	n_N [rpm]	IE class	P_N [kW] M_N[Nm]	n_N [rpm]	IE class	P_N [kW] M_N[Nm]	n_N [rpm]	IE class	
DR.71M2	0.55 1.87	2810	-	-	-	-	-	-	-	7.1
DR.80S2	0.75 2.55	2800	IE1	-	-	-	-	-	-	14.9
DR.80M2	1.1 3.7	2840	IE1	0.75 2.5	2890	IE2	0.75 4.95	2890	IE3	21.5
DR.90M2	1.5 5.1	2830	IE1	1.1 3.65	2870	IE2	1.1 3.95	2870	IE3	35.5
	-	-	-	1.5 5.1	2830	IE2	-	-	-	
DR.90L2	2.2 7.4	2820	IE1	-	-	-	-	-	-	43.5
DR.100M2	3 10.1	2820	IE1	2.2 7.3	2880	IE2	1.5 5.1	2830	IE3	56
	-	-	-	-	-	-	2.2 7.3	2880	IE3	
DR.100L2	-	-	-	3 10.1	2850	IE2	-	-	-	68
DR.100LC2	4 13.2	2900	IE1	-	-	-	3 9.8	2920	IE3	90
DR.112M2	4 13.2	2900	IE1	4 13.2	2900	IE2	3 9.8	2920	IE3	113
DR.132S2	5.5 18.2	2890	IE1	5.5 18.2	2890	IE2	4 13.1	2910	IE3	146
DR.132M2	7.5 24.7	2900	IE1	7.5 24.3	2920	IE2	-	-	-	255
	9.2 30.4		IE1	-	-	-	-	-	-	
DR.132MC2	-	-	-	9.2 30.4	2900	IE2	5.5 17.8	2950	IE3	340

DR. motors, 50 Hz, 4-pole

Motor type	DRS			DRE			DRP			J_{Mot} [10^{-4} kgm^2]
	P_N [kW] M_N[Nm]	n_N [rpm]	IE class	P_N [kW] M_N[Nm]	n_N [rpm]	IE class	P_N [kW] M_N[Nm]	n_N [rpm]	IE class	
DR.56M4	See technical data of DT56M4 page 397			-	-	-	-	-	-	See page 397
DR.56L4	See technical data of DT56L4 page 397			-	-	-	-	-	-	
DR.63S4	See technical data of DR63S4 page 397			-	-	-	-	-	-	
DR.63M4	See technical data of DR63M4 page 397			-	-	-	-	-	-	
DR.63L4	See technical data of DR63L4 page 397			-	-	-	-	-	-	
DR.71S4	0.37 2.56	1380	-	-	-	-	-	-	-	4.9
DR.71M4	0.55 3.81	1380	-	-	-	-	-	-	-	7.1
DR.80S4	0.75 5.12	1400	IE1	-	-	-	-	-	-	14.9
DR.80M4	1.1 7.44	1410	IE1	0.75 4.99	1435	IE2	-	-	-	21.5
DR.90M4	1.5 10.3	1395	IE1	1.1 7.4	1420	IE2	0.75 4.94	1450	IE3	35.5
DR.90L4	2.2 15	1400	IE1	1.5 10	1430	IE2	1.1 7.29	1440	IE3	43.5
DR.100M4	3 20.5	1400	IE1	2.2 14.7	1425	IE2	1.5 9.95	1440	IE3	56
DR.100L4	-	-	-	-	-	-	2.2 14.6	1440	IE3	68
DR.100LC4	4 26.4	1445	IE1	3 19.7	1455	IE2	-	-	-	90
DR.112M4	4 26.6	1435	IE1	3 19.7	1455	IE2	3 19.7	1455	IE3	146
DR.132S4	5.5 36.3	1445	IE1	4.0 26.2	1460	IE2	-	-	-	190
DR.132M4	7.5 49.6	1445	IE1	5.5 36.1	1455	IE2	4 26.1	1465	IE3	255
DR.132MC4	9.2 60	1465	IE1	7.5 48.7	1470	IE2	5.5 35.6	1475	IE3	340
DR.160S4	9.2 60.2	1460	IE1	7.5 48.9	1465	IE2	5.5 35.6	1475	IE3	370
DR.160M4	11 71.9	1460	IE1	9.2 59.8	1470	IE2	7.5 48.7	1470	IE3	450
DR.160MC4	15 97.4	1465	IE1	11 71.2	1475	IE2	9.2 59.6	1475	IE3	590
DR.180S4	15 98.1	1460	IE1	11 71.5	1470	IE2	9.2 59.6	1475	IE3	900
DR.180M4	18.5 121	1465	IE1	15 97.4	1470	IE2	11 71.2	1475	IE3	1110
DR.180L4	22 143	1465	IE1	18.5 120	1470	IE2	15 97.1	1475	IE3	1300
DR.180LC4	30 195	1470	IE1	22 142	1480	IE2	18.5 119	1480	IE3	1680
DR.200L4	30 194	1475	IE1	30 194	1475	IE2	22 142	1482	IE3	2360

Table continued on next page.

Motor type	DRS			DRE			DRP			
	P_N [kW] M_N[Nm]	n_N [rpm]	IE class	P_N [kW] M_N[Nm]	n_N [rpm]	IE class	P_N [kW] M_N[Nm]	n_N [rpm]	IE class	J_{Mot} [10^{-4} kgm^2]
DR.225S4	37 240	1475	IE1	37 239	1477	IE2	30 194	1480	IE3	2930
DR.225M4	45 290	1480	IE1	45 291	1478	IE2	37 238	1482	IE3	3430
DR.225MC4	55 355	1480	IE1	-	-	-	-	-	-	4330
DR.250M4	See technical data of DV250M4 page 397			See technical data of DVE250M4 page 398			-	-	-	See page 397
DR.280S4	See technical data of DV280S4 page 397			See technical data of DVE280S4 page 398			-	-	-	
DR.280M4	See technical data of DV280M4 page 397			See technical data of DVE280M4 page 398			-	-	-	
DR.315K4	110 709	1482	IE1	110 708	1483	IE2	90 579	1484	IE3	18400
DR.315S4	132 848	1486	IE1	132 848	1487	IE2	110 707	1486	IE3	22500
DR.315M4	160 1030	1483	IE1	160 1030	1484	IE2	132 847	1488	IE3	27900
DR.315L4	200 1290	1481	IE1	200 1289	1482	IE2	160 1027	1488	IE3	31900

DR. motors, 50 Hz, 6-pole

Motor type	DRS			DRE			DRP			
	P_N [kW] M_N[Nm]	n_N [rpm]	IE class	P_N [kW] M_N[Nm]	n_N [rpm]	IE class	P_N [kW] M_N[Nm]	n_N [rpm]	IE class	J_{Mot} [10^{-4} kgm^2]
DR.71S6	0.25 2.65	895	-	-	-	-	-	-	-	4.9
DR.71M6	0.37 3.9	905	-	-	-	-	-	-	-	7.1
DR.80S6	0.55 5.7	915	-	-	-	-	-	-	-	14.9
DR.80M6	0.75 7.8	915	IE1	-	-	-	-	-	-	21.5
DR.90L6	1.1 11.3	930	IE1	0.75 7.6	940	IE2	0.75 7.6	940	IE3	43.5
DR.100M6	1.5 15.5	925	IE1	1.1 11.2	940	IE2	-	-	-	56
DR.100L6	-	-	-	1.5 15.2	940	IE2	1.1 11.1	950	IE3	68
DR.112M6	2.2 22	955	IE1	2.2 22	955	IE2	1.5 14.8	965	IE3	146
DR.112M6	3 30.5	945	IE1	-	-	-	-	-	-	146
DR.132S6	4 40.5	940	IE1	3 30	955	IE2	2.2 22	965	IE3	190
DR.132M6	-	-	-	4 40	960	IE2	3 29.5	970	IE3	255
DR.160S6	5.5 55	960	IE1	-	-	-	-	-	-	520
DR.160M6	7.5 75	955	IE1	5.5 54	965	IE2	4 39	975	IE3	630

Pole-changing motors

DRS..8/2

Motor type DRS..	P_N [kW]	n_N [rpm]	cosφ	J_{Mot} [10^{-4} kgm^2]
DRS71S8/2	0.06 0.25	685 2870	0.62 0.69	4.9
DRS71M8/2	0.1 0.4	670 2850	0.62 0.79	7.1
DRS80S8/2	0.15 0.6	655 2680	0.59 0.89	14.9
DRS80M8/2	0.22 0.9	680 2780	0.6 0.8	21.4
DRS90M8/2	0.3 1.3	710 2880	0.55 0.8	35.4
DRS90L8/2	0.45 1.8	710 2890	0.55 0.81	43.7
DRS100M8/2	0.6 2.4	715 2900	0.55 0.83	56
DRS112M8/2	0.8 3	710 2730	0.53 0.83	146
DRS132M8/2	1.1 4.6	710 2785	0.56 0.91	253

DRS..8/4

Motor type DRS..	P_N [kW]	n_N [rpm]	cosφ	J_{Mot} [10^{-4} kgm^2]
DRS112M8/4	1,2 2,2	675 1390	0,58 0,87	146
DRS132S8/4	1,6 3,3	680 1385	0,55 0,87	190
DRS132M8/4	2,1 4,2	680 1390	0,59 0,87	253
DRS160S8/4	2,7 5,5	725 1470	0,54 0,84	370
DRS160M8/4	3,8 7,5	730 1470	0,54 0,84	448
DRS180S8/4	5,5 10	730 1465	0,55 0,87	895
DRS180L8/4	7,5 15	735 1470	0,55 0,87	1300
DRS200L8/4	11 22	735 1475	0,52 0,85	2360
DRS225S8/4	14 28	735 1475	0,52 0,85	2930
DRS225M8/4	18 34	740 1475	0,53 0,86	3430

DRL motors

Motor type	M_N[Nm]				M_{pk} (D1) [Nm]	M_{pk} (D2) [Nm]	J_{Mot} [10^{-4} kgm^2]
	1200 [rpm]	1700 [rpm]	2100 [rpm]	3000 [rpm]			
DRL71S4	2.7	2.7	2.6	2.5	5	8.5	4.9
DRL71M4	4.0	4.0	3.8	3.6	7	14	7.1
DRL80M4	9.5	9.5	9.5	8.8	14	30	21.5
DRL90L4	15	15	15	14	25	46	43.5
DRL100L4	26	26	25	21	40	85	68
DRL132S4	42	42	41	35	80	150	190
DRL132MC4	56	56	52	42	130	200	340
DRL160M4	85	85	85	79	165	280	450
DRL160MC4	90	90	88	83	185	320	590
DRL180M4	135	135	130	105	250	430	1110
DRL180L4	165	165	160	130	320	520	1300
DRL180LC4	175	175	170	140	420	600	1680
DRL225S4	250	245	235	195	520	770	2930
DRL225MC4	290	280	265	220	770	1100	4330

3 General Project Planning Notes

3.1 Standards and regulations

Conformity with standards

AC (brake)motors and servo (brake)motors from SEW-EURODRIVE conform to the relevant standards and regulations, in particular:

- IEC 60034-1, EN 60034-1
  Rotating electrical machinery, rating and performance.
- IEC 60034-2-1, EN 60034-2-1
  Rotating electrical machines, determining losses and efficiency.
- IEC 60034-9, EN 60034-9
  Rotating electrical machines, noise limits.
- IEC 60034-14, EN 60034-14
  Rotating electrical machines, vibration levels.
- IEC 60034-30
  Rotating electrical machines, classification of efficiency levels IE1, IE2, IE3.
- EN 60529, IEC60034-5, EN60034-5
  IP degrees of protection for enclosures.
- IEC 60072
  Dimensions and performance of rotating electrical machinery.
- EN 50262
  Metric threads of cable glands.
- EN 50347
  Standardized dimensions and power ranges.

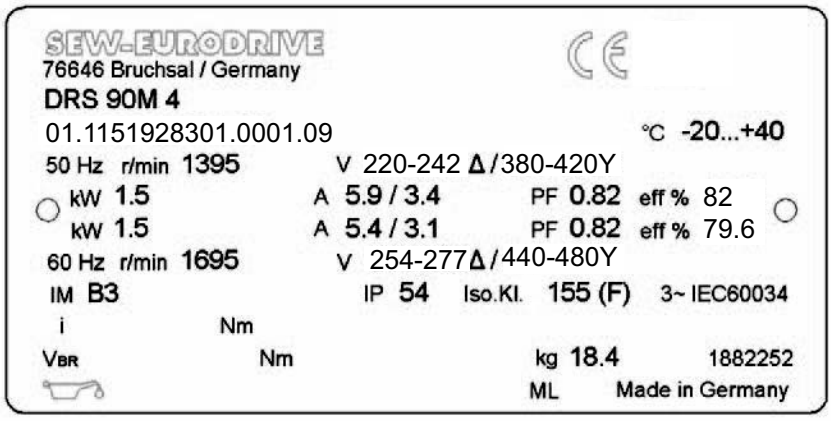
Rated data

The specific data of an asynchronous AC motor (AC squirrel cage motor) are:

- Size
- Rated power
- Cyclic duration factor
- Rated speed
- Rated current
- Rated voltage
- Power factor cos φ
- Degree of protection
- Thermal class
- efficiency class

This data is given on the nameplate of the motor, see page 28. In accordance with IEC 60034 (EN 60034), the nameplate data apply to a maximum ambient temperature of 40 °C and a maximum altitude of 1000 m above sea level.

Example: DR motor nameplate.



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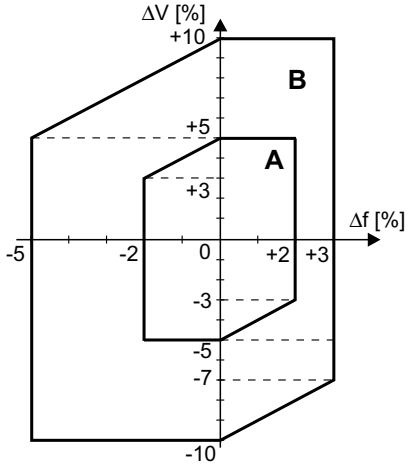
Tolerances

According to IEC 60034 (EN 60034), the following tolerances are permitted for electric motors with rated voltage (also applies to the rated voltage range):

Voltage and frequency		Tolerance A or tolerance B
Efficiency η	$P_N \leq 50$ kW $P_N > 50$ kW	$-0.15 \times (1-\eta)$ $-0.1 \times (1-\eta)$
Power factor cos φ		$-\frac{1 - \cos\varphi}{6}$
Slip	$P_N < 1$ kW $P_N \geq 1$ kW	± 30 % ± 20 %
Starting current		+ 20 %
Tightening torque		- 15 % - + 25 %
Breakdown torque		- 10 %
Mass moment of inertia		± 10 %

Tolerance A, tolerance B

Tolerances A and B describe the permitted range within which the frequency and voltage are allowed to deviate from their respective rated points. The origin identified with "0" indicates the respective rated points for frequency and voltage.



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In the tolerance range A, the motor must be able to deliver the rated torque in continuous duty (S1). The other characteristic values and the heat development may deviate slightly from the rated voltage and rated frequency values.

In the tolerance range B, the motor must be able to deliver the rated torque but not in continuous duty. The increase in temperature and deviations from the rated data are higher than in tolerance range A. Avoid frequent operation of the motor at the limits of tolerance range B.

Undervoltage

It is not possible to achieve the values in the catalog such as power, torque and speed in the event of undervoltage due to weak supply systems or an insufficiently large motor cable. This is particularly true for motor startup where the starting current amounts to a multiple of the rated current.

3.2 Switching and protective equipment of the DR motor series

EMC measures

AC motors, AC brakemotors and MOVIMOT® drives from SEW-EURODRIVE are components for installation in machinery and systems. The designer of the machine or system is responsible for complying with the EMC directive 2004/108/EC. Please refer to the publication "Drive Engineering - Practical Implementation, EMC in Drive Engineering" for detailed information about this topic. For specific information on MOVIMOT® drives, refer to the "Drive System for Decentralized Installation" system manual.

Supply system operation

SEW-EURODRIVE AC (brake) motors satisfy the EMC generic standards EN 50081 and EN 50082 when used in accordance with their designated use in continuous supply system operation.

Switching operation

For switching operation of the motor, take suitable measures for suppressing interference from the switchgear.

Inverter operation

For inverter operation, refer to the installation and EMC instructions provided by the inverter manufacturer.

Please also note the information in section "Operation on inverters" on page 100 ff and the following project planning guidelines:

Brakemotors on the inverter

Install the brake cables of brakemotors separately from the other power cables, maintaining a distance of at least 200 mm. Joint installation is only permitted if either the brake cable or the power cable is shielded.

Connecting tachometers to inverters

Observe the following instructions when connecting the tachometer:

- Use a shielded cable with twisted pair conductors only.
- Connect the shield to the PE potential on both ends over a large surface area.
- Install signal cables separately from power cables or brake cables (min. distance 200 mm).

Please also note the information in section "Operation on inverters" on page 100 ff .

Connecting positive temperature coefficient thermistor (TF) to the inverter

Install the connecting lead of the positive temperature coefficient (PTC) thermistor TF separately from other power cables, maintaining a distance of at least 200 mm. Collective installation is only permitted if either the TF cable or the power cable is shielded.

Motor protection

Selecting the correct protection device is a significant factor in determining the operational reliability of the motor. We distinguish between protection devices that are current-dependent and those that depend on the motor temperature. Current-dependent protection devices include fuses or motor circuit breakers.

Temperature dependent protection devices are PTC thermistors or bimetallic switches (thermostats) in the winding. PTC thermistors or bimetallic switches respond when the maximum permitted winding temperature is reached. The advantage is that temperatures are measures where they actually occur.

Motor circuit breakers

Motor circuit breakers offer adequate protection against overload in standard operation with a low switching frequency, brief start-ups and starting currents that are not excessive. The motor circuit breaker is set to the rated motor current.

Motor circuit breakers are not adequate as the sole means of protection given switching operation with a high switching frequency (> 60 per h) and for high inertia starting. In these cases, SEW-EURODRIVE recommends to use positive temperature coefficient thermistors TF in addition.

TF PTC thermistor

Three positive temperature coefficient thermistors **TF** (PTC, characteristic curve according to DIN 44080) are connected in series in the motor and connected from the terminal box to the TF/TH input of the inverter or to a trip switch in the control cabinet. Motor protection with positive temperature coefficient (PTC) thermistors TF provide comprehensive protection against thermal overload. Motors protected in this way can be used for high inertia starting, switching and braking operation as well as with fluctuating power supply systems. A motor circuit breaker is usually installed in addition to the TF. SEW-EURODRIVE recommends always using motors equipped with TF for inverter operation.

TH bi-metallic switch

Three bimetallic switches **TH**, connected in series in the motor, are looped directly into the motor monitoring circuit from the terminal box.

Trigger temperature

Thermal motor protection is realized by TF temperature sensors or TH bimetallic switches built into the end winding of the motors. The trigger temperature is slightly lower than the limit value of the thermal classification to achieve maximum motor protection. Temperature sensor TF and bimetallic switch TH are available with the following trigger temperatures:

Thermal class	Trigger temperature (rated response temperature with TF) (Rated switching temperature for TH)	
	DRS, DRE, DRP	DRL
155 (F)	150 °C	150 °C
180 (H)	170 °C	-

KTY temperature sensor

KTY temperature sensors are used to determine the temperature at the installation location and is usually measured in the winding.

For modern, highly dynamic inverter drives, the temperature of the motor model stored in the inverter (procedure similar to CFC) is corrected to achieve higher dynamic properties. In this case, it is necessary to detect the winding temperature, e.g. with KTY sensors.

Fuses

Fuses do not protect the motor from overload. Their only purpose is short-circuit protection.

Various protection equipment

The following tables show the qualification of the various protection devices for different causes of tripping.

○ = No thermal protection ◑ = Limited motor protection (requires verification) ● = Thermal protection is given	Temperature sensor (TF)	Bimetallic switch (TH)	Protective circuit breaker
Continuous operation at the load limit, slight overload permanently present (max. 200 % I_N)	●	●	●
Heavy start	●	◑	◑
Blocked motor	◑	◑	◑
Switching operation (number of cycles too high)	●	●	◑
Phase failure	●	●	●
Voltage and frequency deviation	●	●	●
Forced cooling fan failure	●	●	○

Secure switching of inductances

Note the following notes for switching of inductances:

Switching of motor windings with a high number of poles

If the cable is installed unfavorably, switching of low-speed motor windings can generate voltage peaks. Voltage peaks can damage windings and contacts. Install varistors in the incoming cable to avoid such problems.

Switching of brake coils

Varistors must be used to avoid harmful switching overvoltages caused by switching operations in the DC circuit of disk brakes.

Brake control systems from SEW-EURODRIVE are equipped with varistors as standard. Use contactors with contacts in utilization category AC3 or better to EN 60947-4-1 for switching of brake coils.

Suppressor circuit on the switching devices

According to EN 60204 (Electrical Equipment of Machines), motor windings must be equipped with interference suppression to protect the numerical or programmable logic controllers. Because problems are primarily caused by switching operations, we recommend installing suppressor circuits on the switching devices.

4 Unit designations

4.1 Unit designations for the DR. motor series

AC motor series

Designation	
DRS..	Motor, Standard efficiency IE1, 50 Hz
DRE..	Energy-efficient motor, High efficiency IE2, 50 Hz
DRP..	Energy-efficient motor, Premium efficiency IE3, 50 Hz
DRL..	Asynchronous servomotor
DRK..[1)]	Single-phase operation with running capacitor
DRM..[1)]	Torque motor: Torque motor for operation at speed n = 0
71 - 315	Sizes: 71 / 80 / 90 / 100 / 112 / 132 / 160 / 180 / 200 / 225 / 315
K - L	Lengths: K= very short / S = short / M = medium / L = long MC/LC = Rotors with copper cage
2, 4, 6, 8/2, 8/4	Number of poles

1) In preparation

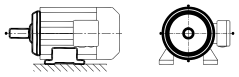
Unit designation DR: Output variants

Designation	Option
/FI	IEC foot-mounted motor with specification of shaft height
/FG	7 Series integral motor, as stand-alone motor
/FF	IEC flange-mounted motor with bore holes
/FT	IEC flange motor with threads
/FL	General flange-mounted motor (other than IEC)
/FM	7 series integral gearmotor with IEC feet, with specification of shaft height if required
/FE	IEC flange-mounted motor with bore holes and IEC feet, with specification of shaft height
/FY	IEC flange-mounted motor with thread and IEC feet, with specification of shaft height if required
/FK	General flange-mounted motor (other than IEC) with feet, with specification of shaft height if required
/FC	C-face flange-mounted motor, dimensions in inch

Output types of the motors

Foot-mounted motor

Unit designation /FI



SEW motor with IEC feet and A endshield

Description

The /FI foot-mounted motor is designed as a motor with a shaft end and feet to IEC specifications. The shaft and feet dimensions for 4-pole motors are based on the power rating of the DRS motor.

Different feet and shaft dimensions are available for motors with efficiency rating requirements (DRE, DRP).

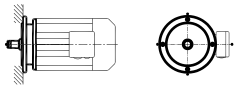
According to EN50347, each power rating is assigned the corresponding shaft height. Some DR motors allow for implementing a higher power rating in a smaller size (e.g. DRS100LC4 with 4 kW).

If an application requires the EN compliant shaft height, the motor can be equipped with another foot height instead.

If the power assigned to the motor differs from EN50347, the shaft height will be indicated in the unit designation. For example: DRS100LC4/FI112M.

7 series gearmotor

Unit designation /FG



Motors for gear unit mounting

Description

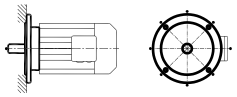
Motors sold as stand-alone motor with preparation for mounting to a gear unit are assigned the designation /FG. This designation is eliminated if the motor is mounted together with the gear unit (as conventional gearmotor).

The /FG flange mounted motor is the gear unit mounting version of the motor. The flange dimensions are implemented according to the SEW work standards for gear unit mounting.

The pinion shaft end is dimensioned according to the motor power rating. It is therefore possible that DRS, DRE and DRP motors have different pinion shaft ends within one motor size and length.

IEC flange-mounted motor with boreholes

Unit designation /FF



IEC flange-mounted motor with bores

Description

The design /FF is a variant with through bores in the flange, comparable to IEC type of construction B5.

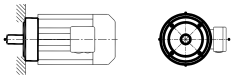
The flange dimensions for 4-pole motors with Standard Efficiency (DRS), High Efficiency (DRE) or Premium Efficiency (DRP) are based on the power rating according to the standard.

Flange combinations deviating from the standard are given the unit designation /FL (see below).

If the motor size deviates from the standard, the flange size is added accordingly: e.g.: DRS90L4/FF100M

IEC flange-mounted motor with threads

Unit designation /FT



IEC flange motor with threads

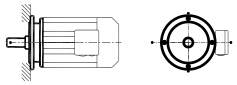
Description This type is for example comparable with the IEC type B14.

The flange dimensions for shaft dimensions of 4-pole motors with standard efficiency level (DRS) are designed according to the standard EN 50 347 2001.

Other shaft dimensions are available for energy-efficient motors or for power enhanced motors with copper rotor.

Flange-mounted motor (deviating from IEC)

Unit designation /FL



Flange-mounted motor with dimensions deviating from IEC

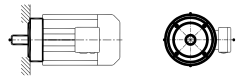
Description This flange-mounted motor is a motor variant deviating from IEC.

The /FL option enables the customer to choose an IEC flange that does not correspond to the power assigned to the motor (see IEC standard flange assignment /FF).

The shaft collar is not necessarily at the same level as the flange bolt surface.

"C-face" flange-mounted motor

Unit designation /FC

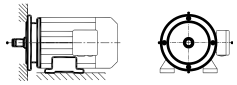


Description The "C-face" flange-mounted motor is a motor type with tapped holes in the flanged end shield similar to an FT type (B14).

The flange and shaft dimensions for 4-pole DRS motors with standard efficiency level are designed in compliance with the NEMA standard (in inches).

7 series gearmotor with feet

Unit designation /FM



Integral motor on 7 series with feet

Only motors sold as stand-alone motors with preparation for being mounted to a gear unit are assigned the designation /FM. This designation is eliminated if the motor is mounted together with the gear unit.

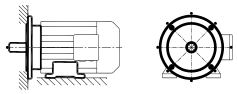
Description /FM is the gear unit mounting version of the motor with feet. It is the combination of the options /FG and /FI.

The flange dimensions are implemented according to the SEW work standards for gear unit mounting.

The pinion shaft end is dimensioned according to the motor power rating. It is therefore possible that DRS, DRE and DRP motors have different pinion shaft ends within one motor size and length.

Foot-/flange-mounted motor

Unit designation /FE



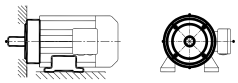
Motor with flange, bores and feet according to IEC

Description The foot- and flange-mounted motor is an IEC variant of the motor and is, for example, comparable with the IEC type B35.

The foot and flange dimensions for 4-pole motors with Standard Efficiency (DRS), High Efficiency (DRE) or Premium Efficiency (DRP) are based on the power rating according to the standard.

IEC flange-mounted motor with threads and feet

Unit designation /FY



Motor with flange, threads and feet according to IEC

Description The foot- and flange-mounted motor is an IEC variant of the motor and is, for example, comparable with the IEC type B34.

The foot and flange dimensions for 4-pole motors with Standard Efficiency (DRS), High Efficiency (DRE) or Premium Efficiency (DRP) are based on the power rating according to the standard.

Mechanical attachments

Designation	Option
BE..	Spring-loaded brake with specification of size
HR	Manual brake release of the brake, automatic disengaging function
HF	Manual brake release, lockable
/RS	Backstop
/MSW	MOVI-SWITCH®
/MI	Motor identification module for MOVIMOT®
/MM03 - MM40	MOVIMOT®
/MO	MOVIMOT® option(s)

Temperature sensor/temperature detection

Designation	Option
/TF	Temperature sensor (positive coefficient thermistor or PTC resistor)
/TH	Thermostat (bimetallic switch)
/KY	One KTY84 - 130 sensor
/PT	One / three PT100 sensor(s)

For detailed information, refer to page 300 ff.

Encoder

Designation	Option
/ES7S /EG7S /EH7S /EV7S	Mounted speed sensor with sin/cos interface
/ES7R /EG7R /EH7R	Mounted speed sensor with TTL (RS-422) interface, V = 9 - 26 V
/EI7C	Mounted speed sensor with HTL interface
/EI76 /EI72 /EI71	Mounted speed sensor with HTL interface and 6 / 2 / 1 period(s)
/AS7W /AG7W	Mounted absolute encoder, RS-485 interface (multi-turn)
/AS7Y /AG7Y /AH7Y	Mounted absolute encoder, SSI interface (multi-turn)
/ES7A/EG7A	Mounting adapter for encoders from the SEW portfolio
/XV.A	Mounting adapter for non-SEW encoders
/XV..	Mounted non-SEW encoders

For detailed information, refer to page 285 ff.

Connection variants

Designation	Option
/IS	Integrated plug connector
/ASB.	HAN 10ES plug connector on terminal box with two-clamp closure (cage clamps on motor end)
/ACB.	HAN 10E plug connector on terminal box with two-clamp closure (crimp contacts on motor end)
/AMB. /ABB. /ADB. /AKB.	HAN Modular 10B plug connector on terminal box with two-clamp closure (crimp contacts on motor end)
/ASE.	HAN 10ES plug connector on terminal box with single-clamp closure (cage clamps on motor end)
/ACE.	HAN 10ES plug connector on terminal box with single-clamp closure (crimp contacts on motor end)
/AME. /ABE. /ADE. /AKE.	HAN Modular 10B plug connector on terminal box with single-clamp closure (crimp contacts on motor end)
/ASK.	HAN 10ES ECOFAST® plug connector on terminal box with single-clamp closure (cage clamp on motor end), additionally with mounting screws for optional carrier plate
/KCC	Terminal strip with cage clamps (for DR.71 - DR.132)
/KC1	C1 profile compliant connection of the DR80 overhead trolley drive (VDI guideline 3643) (for DR71, 80)

For detailed information, refer to page 305 ff.

Ventilation

Designation	Option
/V	Forced cooling fan
/Z	Additional inertia (flywheel fan)
/AL	Metal fan
/U	Non-ventilated (without fan)
/OL	Non-ventilated (closed B side)
/C	Protection canopy for the fan guard
/LF	Air filter
/LN	Low-noise fan guard (for DR.71 – 132)

For detailed information, refer to page 311 ff.

Bearing

Designation	Option
/NS	Relubrication device (for DR.315 only)
/ERF	Reinforced bearing A-side with roller bearing (for DR.315 only)
/NIB	Insulated bearing B-side (for DR.315 only)

For detailed information, refer to page 322 ff.

Condition monitoring

Designation	Option
/DUB	Diagnostic unit brake = brake monitoring
/DUV	Diagnostic unit vibration = vibration sensor

For detailed information about /DUB refer to page 281 ff, zu , and for /DUV refer to page 319 ff.

Explosion-proof motors

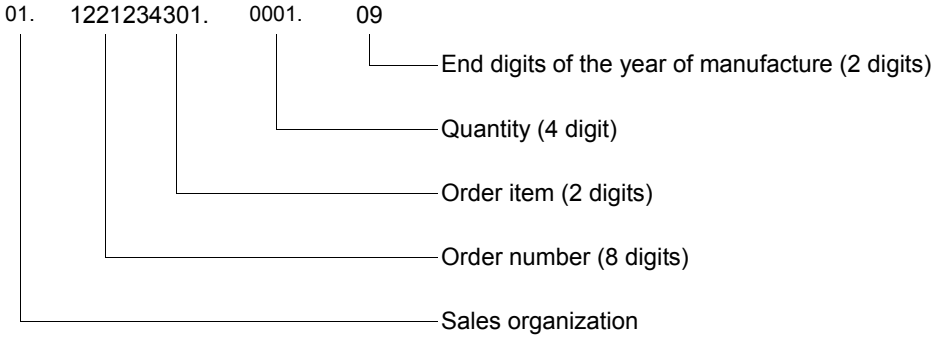
Designation	Option
/2GD	Motors according to 94/9/EC, category 2 (gas / dust)
/3GD	Motors according to 94/9/EC, category 3 (gas / dust)
/3D	Motors according to 94/9/EC, category 3 (dust)
/VE	Forced cooling fan for motors according to 94/9/EC, category 3 (gas / dust)

Other additional features

Designation	Option
/DH	Condensation drain hole
/RI	Reinforced winding insulation
/2W	Second shaft end on the motor/brakemotor

For detailed information, refer to page 322 ff.

4.2 Serial number



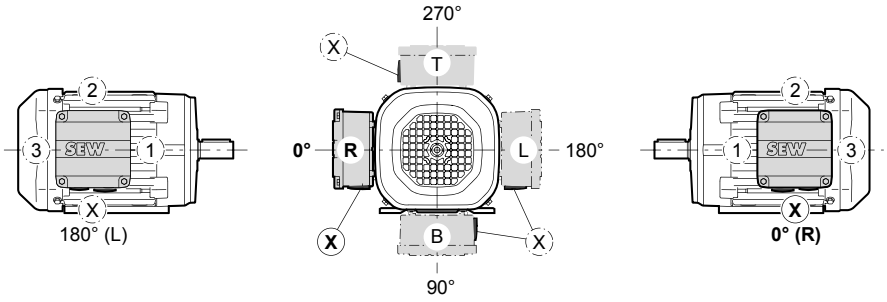
4.3 Examples for the unit designation of DR series AC motors

Motor variant	Unit designation of the motor variant									
Other additional features										
2. shaft end	-	/2W								
Reinforced winding insulation	-	/RI								
Condensation hole	-	/HD								
Explosion-proof motors										
Explosion protection	-	/2GD	/3GD	/3D						
Condition monitoring										
Brake monitoring		/DUB	/DUV							
Bearing										
Insulated bearing (only 315)	-	/NIB								
Relubrication (only 315)	-	/NS								
Higher overhung load (only 315)	-	/ERF								
Fan										
Low noise fan guard	-	/LN								
Fan guard	-	/C	/LF							
Fan	-	/Z	/AL	/U	/OL					
Forced cooling fan	-	/V	/VE							
Connection alternatives										
Connection alternatives	-	/IS	/AB..	/AC..	/AD..	/AK..	/AM..	/AS..	/KCC	/KC1
Encoders										
Built-in encoder	-	/EI7C	/EI76	/EI72	/EI71					
Encoder	-	/ES7.	/EG7.	/EH7.	/EV7.	/AS7.	/AG7.	/AH7.	/XV..	
Temperature sensor/temperature detection										
Thermal motor protection	-	/TF	/TH							
Temperatures detection	-	/KT	/PT							

Motor variant		Unit designation of the motor variant										
Mechanical attachments												
Decentralized installation	-	/MI	/MO	/MSW	/MM03	/MM05	/MM07	/MM11	/MM15	/MM22	/MM30	/MM40
Backstop	-	/RS										
Manual brake release	-	HF	HR									
Brake	-	BE05	BE1	BE2	BE5	BE11	BE20	BE30	BE32	BE120	BE122	
Output design												
Output design	**/FF**	/FG	/FM	/FI*	/FT	/FC	/FE*	/FY*	/FL	/FK*	*= shaft height	
AC motor series												
Number of poles	**4**	2	6	12	8/2	8/4						
Length	**S**	M	L	MC	LC							
Size	**71**	80	90	100	112	132	160	180	200	225	3154	
Unit designation	**S**	E	P	K	M	L						
Series	**DR**											

4.4 Mounting position designations of the motors

Position of motor terminal box and cable entry



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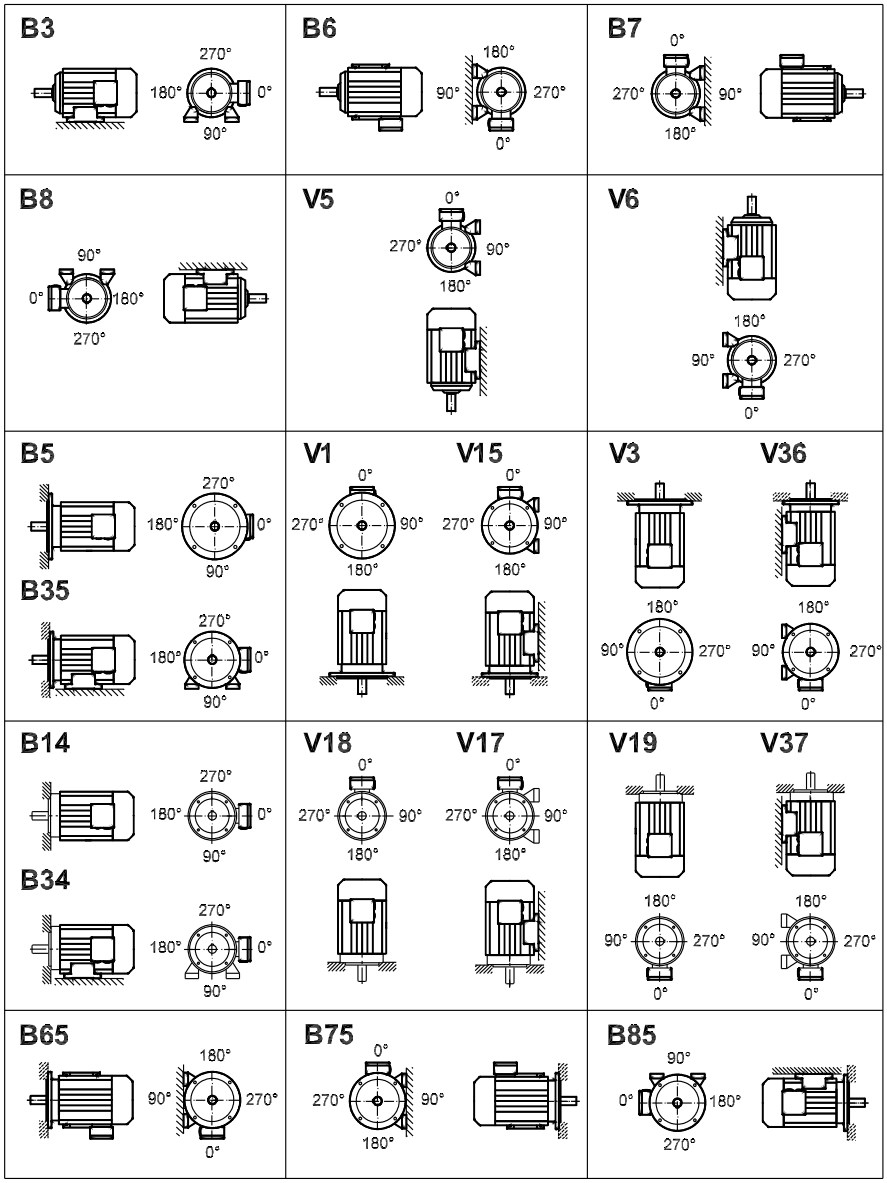
Mounting positions

Mounting positions for AC motors



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