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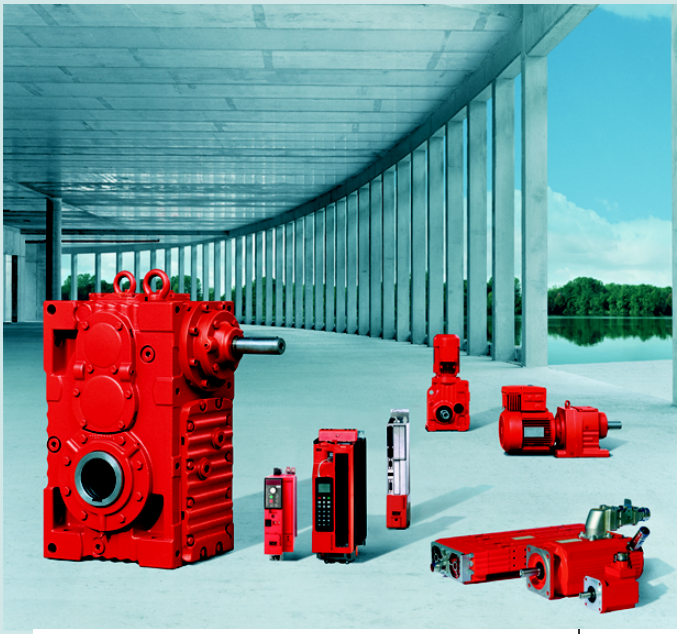
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DRIVE ACADEMY®



SEW EURODRIVE



Produc Training

Type Code

Control Cabinet Controllers and Drives

Vol. 2

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1 MOVIDRIVE®

1.1 Description

MOVIDRIVE® MDX60B/61B is the new generation of drive inverters from SEW-EURODRIVE. The new MOVIDRIVE® B series inverters feature a modular design, provide enhanced functions in the lower power range, more basic functions, and greater overload capacity.

AC drives with the latest digital inverter technology can now be used without restrictions in the 0.55 to 315 kW power range. The levels of dynamic performance and control quality that can now be achieved with MOVIDRIVE® for asynchronous AC motors were previously only possible using servo drives or DC motors. The integrated control functionality and the option to extend the drive using technology and communication options creates drive systems that are designed to be particularly cost-effective regarding application range, project planning, startup and operation.

Product family

The **MOVIDRIVE®** product family includes three series:

- MOVIDRIVE® MDX60B: Drive inverter for asynchronous AC motors without encoder feedback. The units are not option-capable.
- MOVIDRIVE® MDX61B: Drive inverter for asynchronous AC motors with or without encoder feedback, or for asynchronous and synchronous servomotors. The units are option-capable.
- MOVIDRIVE® MDR60A/61B: Regenerative power supply unit; MOVIDRIVE inverters (400/500 V units) operate in regenerative mode to feed energy back into the supply system.

MOVIDRIVE® MDX61B unit series, sizes 0 to 7

The following figure shows MOVIDRIVE® MDX61B drive inverter sizes 0 to 7



3193709067

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MOVIDRIVE® MDR60A/61B unit series, sizes 2 to 7

The following figure shows MOVIDRIVE® MDX61B regenerative power supply units, sizes 2 to 7



1454307595

Unit variants

MOVIDRIVE® MDX60/61B size 0-6 inverters are available in two variants, namely the standard variant and the application variant. MOVIDRIVE® MDX60B/61B size 7 inverters are only available as application variants with coated pcbs (-0T/L).

Standard variant

The units are equipped with integrated IPOS$^{plus®}$ positioning and sequence control as standard. MOVIDRIVE® MDX61B can be expanded with the available options.

"00" at the end of the type designation indicates the standard variant.

Application variant

In addition to the features of the standard variant, these units include the technology functions "electronic cam" and "internal synchronous operation". Furthermore, you can use all the application modules available in the MOVITOOLS® MotionStudio engineering software with the application variants.

The application variant is indicated by "0T" following the type designation.

Variants with coated printed circuit boards

The units are designed for use in harsh environments. The coating of the printed circuit boards increases their resistivity against environmental conditions.

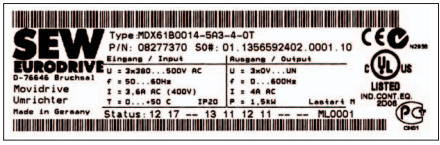
The variant with coated pcbs is indicated by "00/L" or "0T-/L" at the end of the type designation.

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1.2 MOVIDRIVE® MDX60B/61B type designation

System nameplate size 0

The **system nameplate** of MDX60B/61B size 0 is attached to the side of the unit.



1799724171

System nameplate sizes 1 - 7

The **system nameplate** is attached to MDX61B.. as follows:

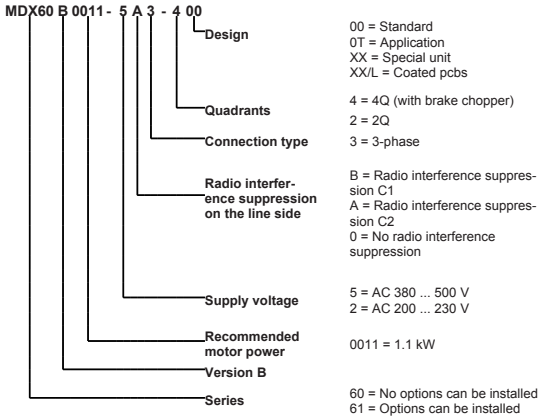
- On the side of the units of size 1- 6
- On the upper front cover of size 7



1799730315

Type designation

The following diagram shows the type designation of the MOVIDRIVE® MDX60/61B inverter:



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1.3 MOVIDRIVE® MDR60B/61B type designation

Nameplate

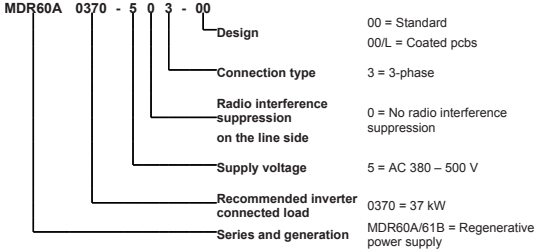
The nameplate is attached to the front of the unit.



1877000715

Type designation

The following diagram shows the type designation of the MOVIDRIVE® MDX60/61B regenerative power supply unit:



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2 MOVIAXIS®

2.1 Description

MOVIAXIS® multi-axis servo inverters have been designed for compact machine and plant automation systems at the highest stage. Productivity and intelligence are combined in an ideal way, allowing for a wide range of applications.

2.2 Structure of the nameplate

The nameplate is divided into up to 3 parts depending on the module.

- Part "I" of the nameplate indicates the type designation, production number and status.
- Part "II" of the nameplate indicates the factory-installed options and the version status.
- Part "III" of the nameplate (system nameplate) contains the technical data of the module.

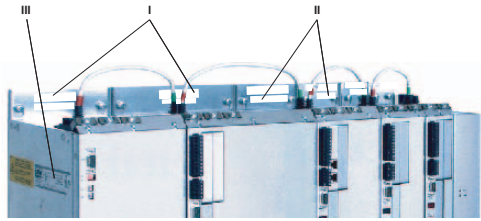
The **system nameplate** is located on the side of the unit for the supply module and axis module.

The nameplate contains a description of the version and the scope of supply of the multi-axis servo inverter at the time of delivery.

There may be deviations if

- E.g. option cards are installed or removed at a later time
- or if the unit firmware is updated.

Location of the nameplate



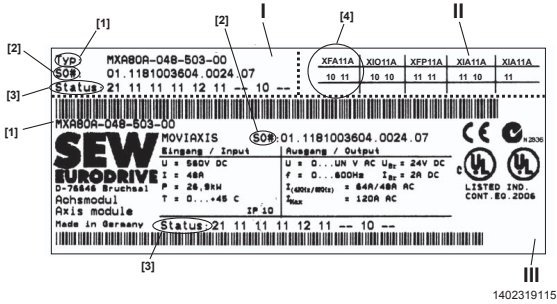
1402316683

I Part "I" of the nameplate
II Part "II" of the nameplate
III Part "III" of the nameplate (system nameplate)

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2.3 Nameplate of the axis module

The following figure shows the nameplate of the axis module:



1402319115

I Part "I" of the nameplate: Located on the upper fastening plate of the module

II Part "II" of the nameplate: Located on the upper fastening plate of the module

III Part "III" of the nameplate: Located at the side of the module housing

[1] Type designation

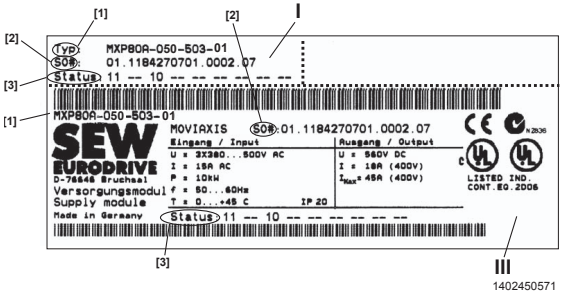
[2] Production number

[3] Status

[4] Communication slots, firmware status

2.4 Nameplate of the supply module

The following figure shows the nameplate of the supply module:



1402450571

I Part "I" of the nameplate: Located on the upper fastening plate of the module

III Part "III" of the nameplate: Located at the side of the module housing

[1] Type designation

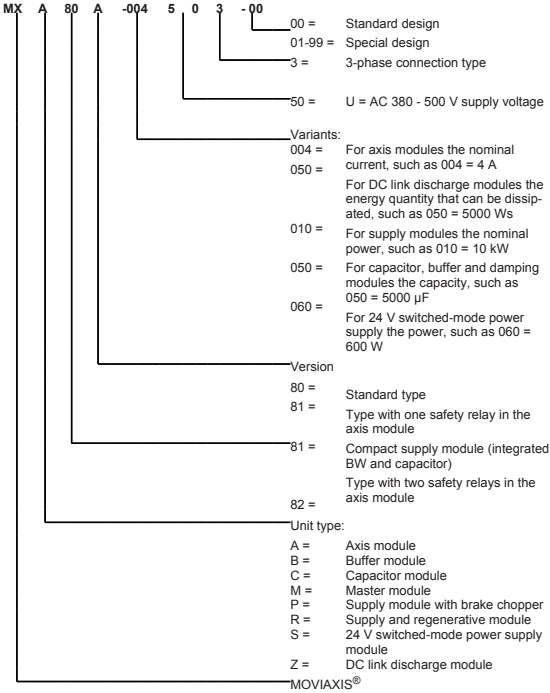
[2] Production number

[3] Status

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2.5 Type designation of MOVIAXIS® basic units

The following diagram shows the type designation:



Type designation for the axis module:

MXA80A-004-503-00 = Axis module with 4 A nominal current

Type designation for the buffer module component

MXB80A-050-503-00 = Buffer module with a capacity of 5000 µF

Type designation for additional damping module component

MXD80A-007-503-00 = Damping module with a capacity of 700 µF

Type designation for the capacitor module component

MXC80A-050-503-00 = Capacitor module with a capacity of 5000 µF

Type designation for master module with fieldbus gateway component:

MXM80A-000-000-00/UFF41B = Master module with PROFIBUS/DeviceNet
MXM80A-000-000-00/UFR41B = Master module with EtherNet/IP / PROFINET Modbus/TCP

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Type designation for master module with controller component:

MXM80A-000-000-00/DHF41B/ OMH41B	=	Master module with PROFIBUS/DeviceNet
MXM80A-000-000-00/DHR41B/ OMH41B	=	Master module with EtherNet/IP / PROFINET Modbus/ TCP
Variants: T0 – T25		

Type designation for the supply module:

MXP81A-010-503-00	=	10 kW compact supply module with integrated C and BW
MXP80A-010-503-00	=	10 kW supply module
MXR80A-075-503-00	=	50/75 kW supply and regenerative module

Type designation for the 24 V switched-mode power supply module component

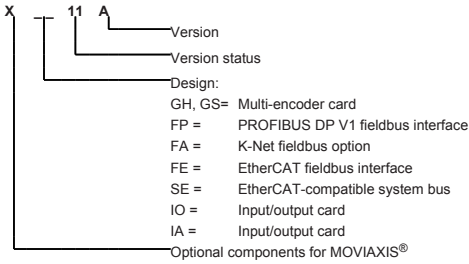
MXS80A-060-503-00	=	24 V switched-mode power supply module

Type designation for the DC link discharge module component:

MXZ80A-050-503-00	=	DC link discharge module with an energy quantity of 5000 Ws that can be dissipated

2.6 Type designation for MOVIAXIS® optional components

The following diagram shows the type designation:



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3 MOVITRAC® B

3.1 MOVITRAC® B – compact, versatile and universal

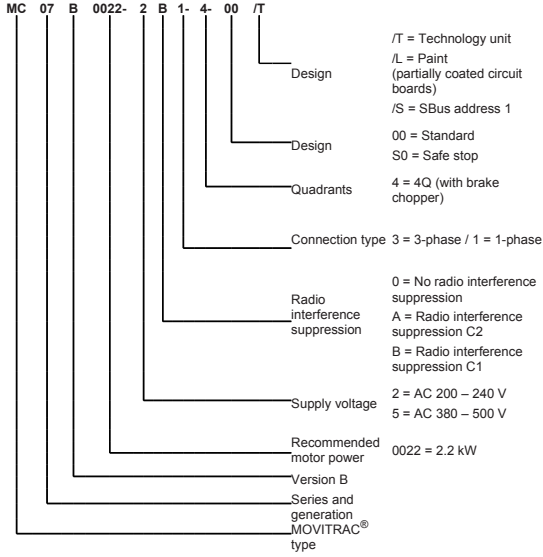
The percentage of speed-variable AC drives with inverter technology is constantly increasing and these units offer all options to optimize system and machine concepts to the process sequences in addition to machine-conserving drive technology. The expanse of these different fields of application shows that it is difficult to meet the technological and econimic requirements with one universal inverter class.

The drive electronics in asynchronous AC motors are separated into standard inverters, for simple applications, e.g. materials handling, and application inverters, for more complex technological applications, e.g. positioning and handling applications. This differentiation of the units makes for scaling to different applications while staying with a certain budget.

Operation, parameter setting, diagnostics and integration in automation concepts must offer unit-comprehensive and therefore universal engineering and communication support. Engineering tools for project planning, parameter setting and startup as well as the availability of communication interfaces (fieldbuses and Industrial Ethernet) offer users a solution-oriented and unit-independent user interface.

3.2 Type designation

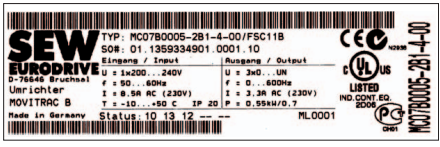
The following diagram shows a type designation:



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3.3 Nameplate

The following figure shows a nameplate:



3185547659

Input	U	Nominal line voltage
	I	Nominal line current, 100% operation
	f	Nominal line frequency
Output	U	Output voltage 100% operation
	I	Nominal output current 100% operation
	f	Output frequency
T		Ambient temperature
P motor		Recommended motor power 100% operation

The unit status for communication with SEW-EURODRIVE is indicated over the bar code at the bottom. The unit status documents the hardware and software states of the unit.

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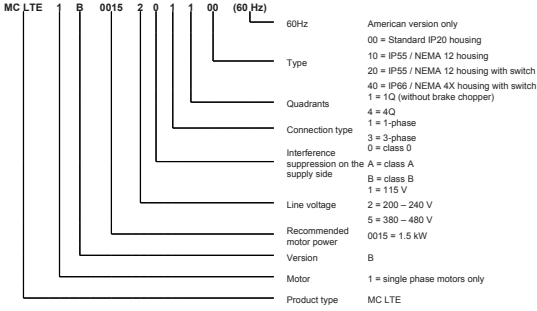
4 MOVITRAC® LTE-B

4.1 Technology

The MOVITRAC® LTE-B range consists of a series of products in 3 physical sizes designed to provide cost-effective, easy-to-use drives for 3-phase induction motors in the power range 0.37 kW to 7.5 kW.

The MOVITRAC® LTE-B uses open loop voltage and frequency control to regulate the speed of the motor. Digital control is combined with the latest IGBT power semiconductor technology to provide a compact, robust solution for general purpose drive applications. The product is designed for ease of use and installation, together with simple programming and commissioning thereby minimizing the overall costs of a drive solution.

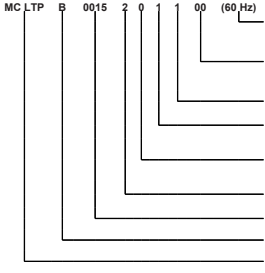
4.2 Product designation



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5 MOVITRAC® LTP-B

5.1 Product designation



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6 Asynchronous AC Motors

6.1 Description of DR. and EDR. series AC motors

Motor

The asynchronous motor consists of a stator with a three-phase winding and a laminated rotor. The rotor slots are usually lined with aluminum and short-circuited at the front ends using a short-circuit ring. Variants with die-cast copper are also available. The rated speed at supply frequency can be defined by the number of poles.

The main advantages can be described as follows:

- Long service life
- Low maintenance (no brush wear)
- Temporary high overload capacity
- Nearly constant speed (no "overspeed" in no-load operation)
- Comparatively low production costs

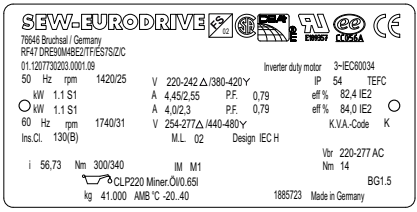
The following figure shows an DR.. series AC motor:



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6.2 Nameplate of a DRE gearmotor with brake

The following figure shows an example of a nameplate:

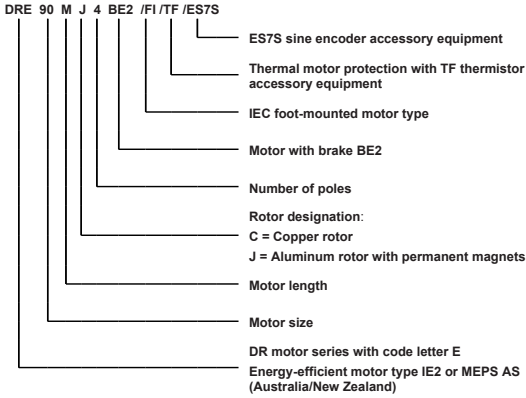


9007201693954571

The marks on the upper edge of the nameplate are only present when the motor has been certified accordingly or when it includes the relevant components.

6.3 Type designation of a DR. series AC brakemotor

The following diagram shows a type designation example:

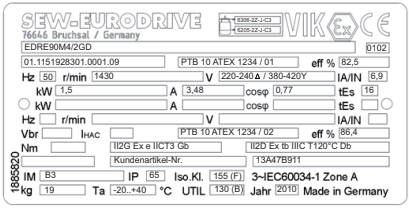


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6.4 Nameplates of EDR. motors

EDRE motor in category 2GD

The following figure shows a nameplate:

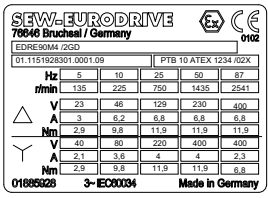


2439213579

The marks on the upper edge of the nameplate are only present when the motor has been certified accordingly or when it includes the relevant components.

EDRE motor with frequency inverter

The following figure shows a nameplate:



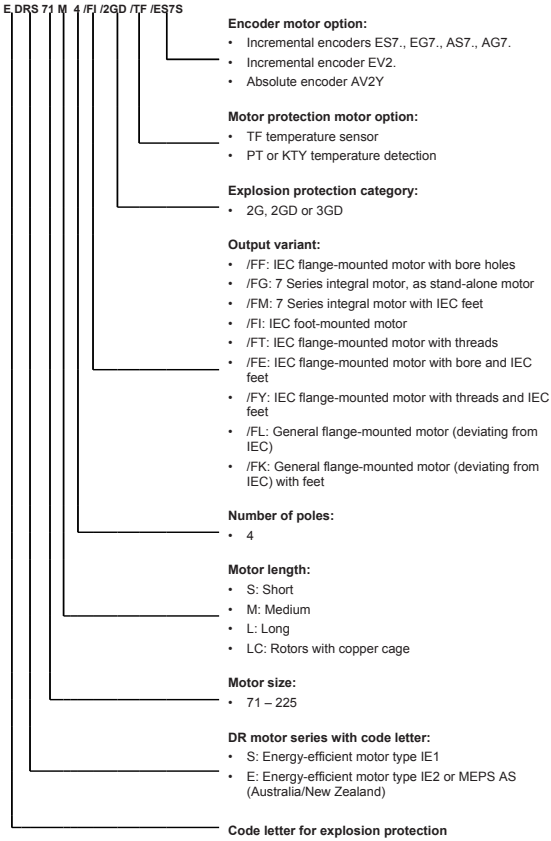
9007202350032139

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6.5 Type designations of EDR. motors

EDR.. series AC motor

The following diagram shows a type designation:



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6.6 Description of DRL asynchronous servomotors

Description

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.



2998238987

DRL motor variants

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

- An 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 detection
- 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.

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6.7 Overview of types of the DR. motor series

AC motor series

The following table shows possible AC motor variants:

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

Output variants

The following table shows possible 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-mounted 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

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Mechanical attachments

The following table shows possible 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

The following table shows possible thermal protection variants:

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)

Encoder

The following table shows possible encoder variants:

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

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Connection variants

The following table shows possible 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)
/KCC	Terminal strip with cage clamps (for DR.71 – DR.132)
/KC1	C1 profile compliant connection of the DR80 electrified monorail drive (VDI guideline 3643) (for DR71, 80)

Ventilation

The following table shows possible ventilation variants:

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)

Bearings

The following table shows possible bearing variants:

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

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Condition monitoring

The following table shows the possible monitoring units:

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

Explosion-proof motors

The following table shows possible explosion-proof AC motor variants:

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

Other additional features

The following table shows other possible features:

Designation	Option
/DH	Condensation drain hole
/RI	Reinforced winding insulation
/RI2	Reinforced winding insulation with increased resistance against partial discharge
/2W	Second shaft end on the motor/brakemotor

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7 Synchronous Servomotors

7.1 CMP / CMPZ motors

Description of CMP motors

The CMP servomotor series combines high dynamics, high torques, and precision in a compact design.

Their innovative design with the latest in winding and magnet technology offers a motor system with optimum dynamics and the best control characteristics at the smallest space. The cast stator protects the motor against vibrations and humidity.

CMP servomotors can be combined with MOVIAXIS® multi-axis servo inverters and MOVIDRIVE® inverters.



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Description of CMPZ motors

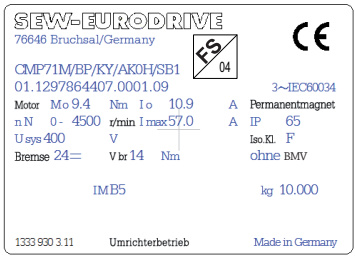
CMPZ synchronous servomotors are equipped with an internal additional flywheel mass. These motors combine high torques and precision in a compact design and provide particularly favorable control characteristics with high external masses. Furthermore, the internal higher moment of inertial allows for a smaller gear ratio.

In addition to the above mentioned features of the CMP motors, CMPZ motors are optionally available with a powerful working brake with high working capacity and optional manual brake release.

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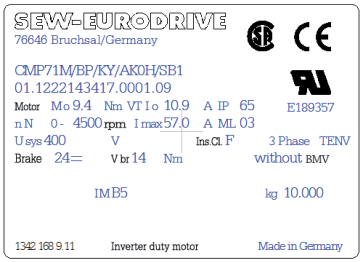
CMP motor nameplate

The following figure shows a nameplate:



The nameplate only contains the FS logo if safety-rated components are used.

The following figure shows a nameplate with UL, CSA approval:



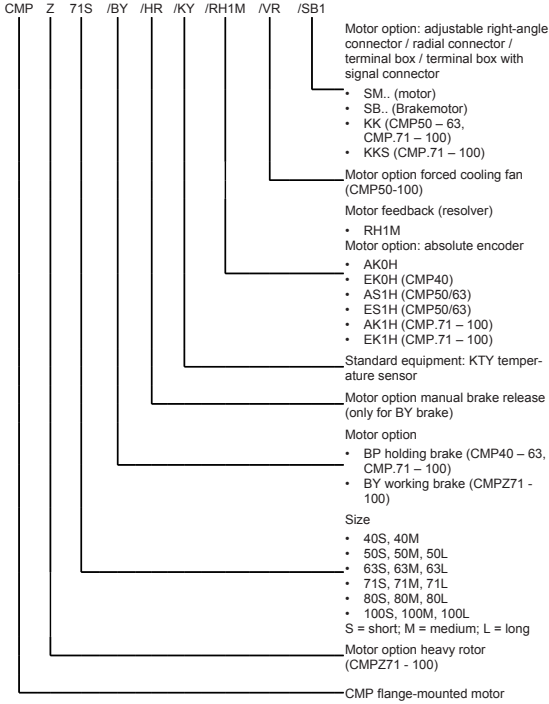
Location of the nameplate.



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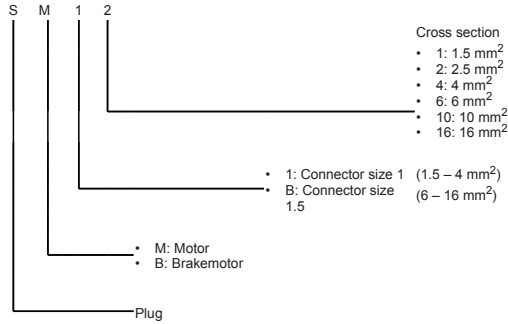
Type designation of a servomotor

The following diagram shows a type designation:



Type designation of plug connectors

The following diagram shows a type designation:

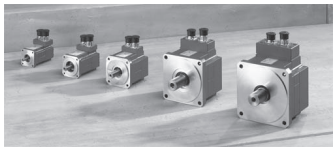


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7.2 CMDV motors

Description of CMDV motors

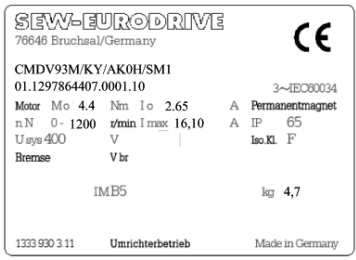
The compact CMDV servomotors come without housing and are convection cooled; they offer standstill torques from 0.3 to 32 Nm with an overload capacity of factor six. The strong bearings and the low-vibration design make these motors the ideal component for applications with small installation spaces and directly powered servo applications.



3659907979

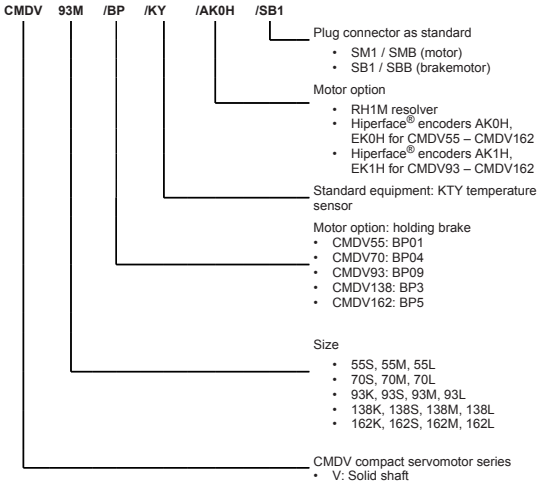
CMDV motor nameplate

The following figure shows a nameplate:



Type designation of a servomotor

The following diagram shows a type designation:

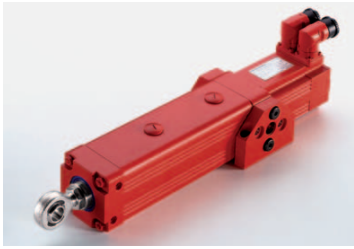


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7.3 CMS electric cylinders

Description

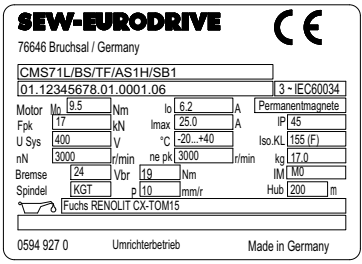
Electric cylinders of the CMS series are equipped with permanent magnet rotors and operate particularly precise, powerful and fast. Combined with drive electronics from SEW-EURODRIVE, they provide economical, energy-efficient drive solutions that ensure a high level of process reliability in system operation and are easy to integrate into existing automation facilities, such as welding systems and robotic systems.



2997873547

Nameplate

The following figure shows a nameplate:



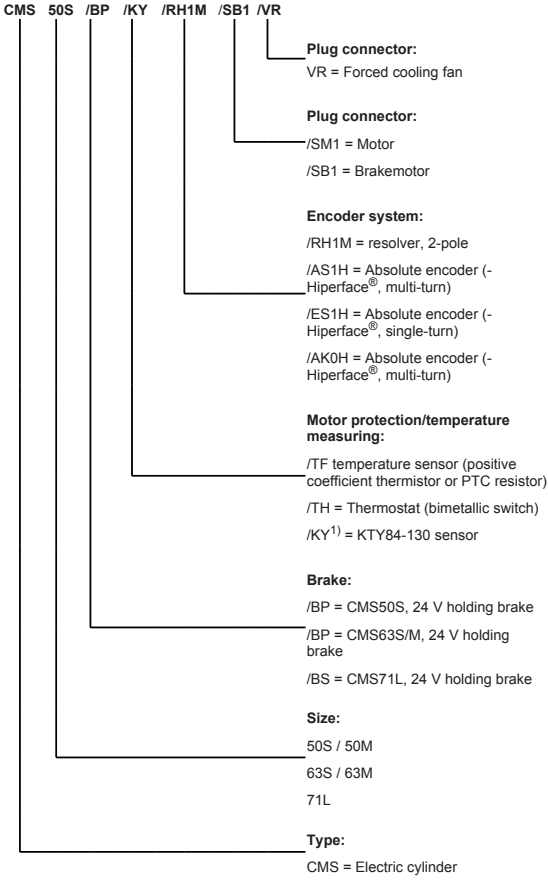
3543587339

Type	Motor type
No.	Manufacturing number
M_o	Standstill torque (thermal continuous torque at a speed of 5 to 50 rpm)
I_0	Standstill current
Fpk	Peak feed force
I_{max}	Maximum permitted motor current
IP	Degree of protection
U Sys	Motor voltage
°C	Ambient temperature range
Insul. cl.	Thermal class
nN	Rated speed
ne pk	Maximum mechanically permitted speed
kg	Weight
Brake	Rated voltage of brake/braking torque
Spindle	Spindle type
P	Spindle pitch
Stroke	Stroke length
IM	Mounting position
	Lubricant

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Type designation

The following diagram shows a type designation:



1) of CMS50 and CMS63 is available only with KTY

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7.4 SL2 synchronous linear motors

Description



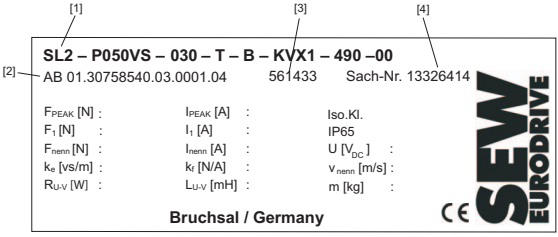
2997988619

SL2 synchronous linear motors are available in three designs for speed classes 1, 3 and 6 m/s (3, 10 and 20 ft/s): SL2 Basic, SL2 Advance System and SL2 Power System. For longer travel distances, secondaries are available in different lengths and can be easily lined up with one another. The SL2 Advance System features a motor cooling unit, which provides even better cooling than SL2 Basic. A forced-air cooling fan gives the SL2 Power System a further power boost.

Nameplate

SL2 Basic

The following figure shows a nameplate:



[1] = Type code
[2] = Customer order number
[3] = Production number
[4] = Part number

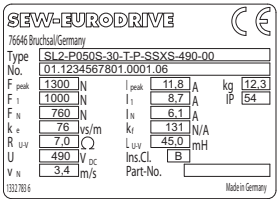
F_{PeaK} = Peak force
F_1 = Maximum force available up to v_1
F_{nenn} = Permanent force
k_e = Voltage constant
R_{U-V} = Winding resistance[1)]
I_{PEAK} = Maximum current
I_1 = Current at F_1
I_{nenn} = Nominal current
k_f = Force factor
L_{U-V} = Inductance[1)]
Iso.KL. = Insulating material class
IP = Degree of protection
U = Voltage
m = Mass
v_{nenn} = Velocity up to which the rated force is available

1) Half the conductor value (UV value) is used for startup.

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SL2 Advance System / SL2 Power System

The following figure shows a nameplate:

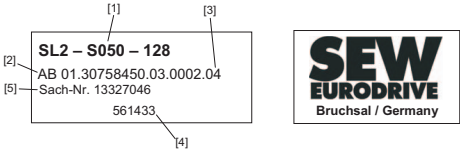


Type = Type code
No. = Customer order number
F_{PeaK} = Peak force
F_1 = Maximum force available up to v_1
F_N = Permanent force
k_e = Voltage constant
R_{U-V} = Winding resistance[1)]
U = Voltage
v_N = Velocity up to which the rated force is available
I_{PEAK} = Maximum current
I_1 = Current at F_1
I_N = Nominal current
k_f = Force factor
L_{U-V} = Inductance[2)]
Ins.Cl. = Insulating material class
Part-No. = Part number
kg = Weight
IP = Degree of protection

1) Half the conductor value (UV value) is used for startup.
2) Half the conductor value (UV value) is used for startup.

Secondary

The following figure shows a nameplate:



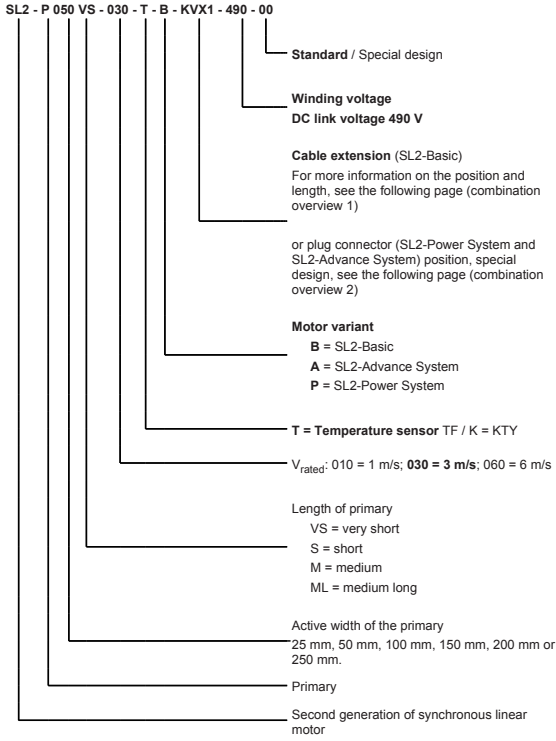
[1] = Type code
[2] = Customer order number
[3] = Date of production
[4] = Production number
[5] = Part number

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Type designation

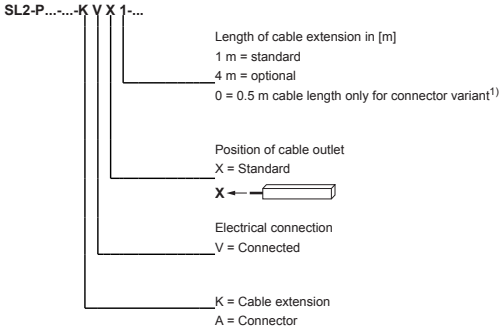
Primary

The following diagram shows a type designation:



Overview of combinations for SL2 Basic / cable extension

The following diagram shows a type designation:

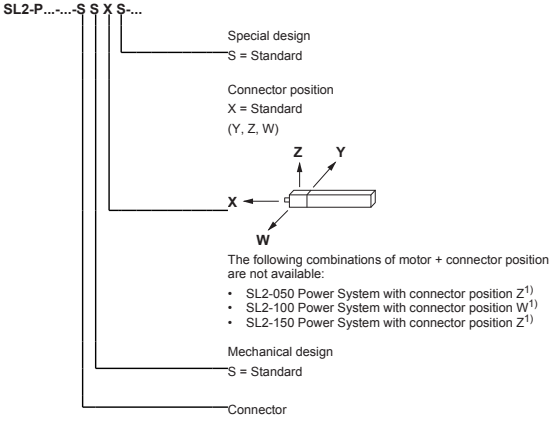


1) Connector version AVX0 refers to a 0.5 m cable extension with prefabricated connector

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Combination overview 2 for SL2-Advance and SL2-Power System / connector position

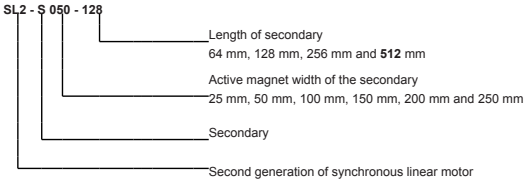
The following diagram shows a type designation:



1) Collision with M12 24 V connector

Secondary

The following diagram shows a type designation:

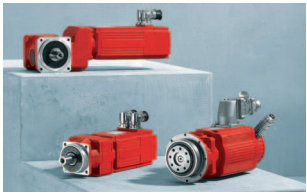


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8 Synchronous Servo Gearmotors

8.1 Description

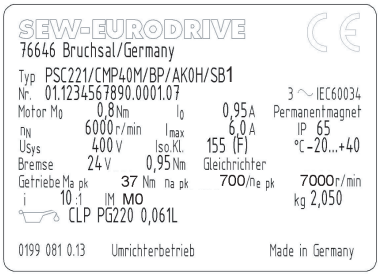
The following figure shows servo gearmotors:



8.2 Nameplate of servo gearmotors

Nameplate for PS.C.. servo gearmotors

The following figure shows a nameplate for a gearmotor:



3613171339

i		Gear unit reduction ratio	n_N	[rpm]	Rated speed
IM		Mounting position	M_o	[Nm]	Rated torque
IP		Degree of protection	I_o	[A]	Rated current
n_{epk}	[rpm]	Maximum permitted input speed	I_{max}	[A]	Maximum permitted current
n_{apk}	[rpm]	Maximum permitted output speed	f_N	[Hz]	Rated frequency
M_{apk}	[Nm]	Maximum permitted output torque	V_{max}	[V]	Maximum permitted voltage

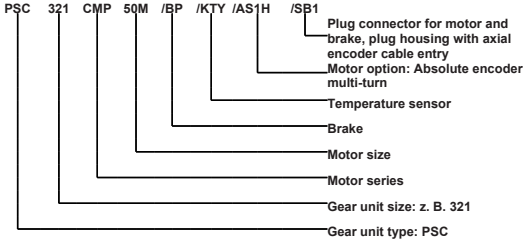
The nameplate of servo gearmotors is fixed to the servomotor.

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8.3 Type designation

Type designation of PS.C.. servo gearmotors

The following diagram shows a type designation for a gearmotor:



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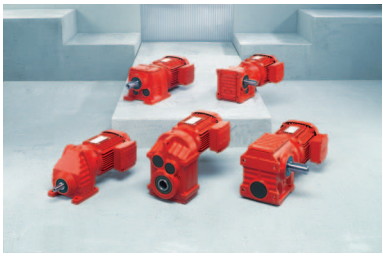
9 Gear Units and Adapters

9.1 Description of R, F, K, S, W gear units

The level of torque and permissible overhung loads is incomparably high in relation to the structural volume of the motor. This was made possible by the compact and extremely rigid housing with its low weight and optimum power flow. The sealing surfaces are free from any load because the force runs through the complete housing.

The shaft-hub connections of all gearmotors are positive to ensure maximum safety in the application. Parallel shaft, helical, and helical-bevel gearmotors are also available with reduced backlash for precise positioning tasks.

The following figure shows R, F, K, S and W gear units:



9.2 Variants and options of R, F, K, S, W gear units

Below an overview of type designations for R, F, K, S, and W gear units and their options.

Helical gear units

The following table shows possible helical gear unit variants:

Designation	
RX..	Single-stage foot-mounted
RXF..	Single-stage B5 flange-mounted
R..	Foot-mounted
R..F	Foot-mounted and B5 flange-mounted
RF..	B5 flange-mounted
RZ..	B14 flange-mounted
RM..	B5 flange-mounted with extended bearing hub

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Parallel shaft helical gear units

The following table shows possible parallel shaft gear unit variants:

Designation	
F..	Foot-mounted
FA..B	Foot-mounted and hollow shaft
FH..B	Foot-mounted and hollow shaft with shrink disk
FV..B	Foot-mounted and hollow shaft with splined hollow shaft to DIN 5480
FF..	B5 flange-mounted
FAF..	B5 flange-mounted and hollow shaft
FHF..	B5 flange-mounted and hollow shaft with shrink disk
FVF..	B5 flange-mounted and hollow shaft with splined hollow shaft to DIN 5480
FA..	Hollow shaft
FH..	Hollow shaft with shrink disk
FT..	Hollow shaft with TorqLOC hollow shaft mounting system
FV..	Hollow shaft with splining to DIN 5480
FAZ..	B14 flange-mounted and hollow shaft
FHZ..	B14 flange-mounted and hollow shaft with shrink disk
FVZ..	B14 flange-mounted and hollow shaft with splined hollow shaft to DIN 5480

Helical-bevel gear units

The following table shows possible helical-bevel gear unit variants:

Designation	
K..	Foot-mounted
KA..B	Foot-mounted and hollow shaft
KH..B	Foot-mounted and hollow shaft with shrink disk
KV..B	Foot-mounted and hollow shaft with splined hollow shaft to DIN 5480
KF..	B5 flange-mounted
KAF..	B5 flange-mounted and hollow shaft
KHF..	B5 flange-mounted and hollow shaft with shrink disk
KVF..	B5 flange-mounted and hollow shaft with splined hollow shaft to DIN 5480
KA..	Hollow shaft
KH..	Hollow shaft with shrink disk
KT..	Hollow shaft with TorqLOC hollow shaft mounting system
KV..	Hollow shaft with splining to DIN 5480
KAZ..	B14 flange-mounted and hollow shaft
KHZ..	B14 flange-mounted and hollow shaft with shrink disk
KVZ..	B14 flange-mounted and hollow shaft with splined hollow shaft to DIN 5480

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Helical-worm gear units

The following table shows possible helical-worm gear unit variants:

Designation	
S..	Foot-mounted
SF..	B5 flange-mounted
SAF..	B5 flange-mounted and hollow shaft
SHF..	B5 flange-mounted and hollow shaft with shrink disk
SA..	Hollow shaft
SH..	Hollow shaft with shrink disk
ST..	Hollow shaft with TorqLOC hollow shaft mounting system
SAZ..	B14 flange-mounted and hollow shaft
SHZ..	B14 flange-mounted and hollow shaft with shrink disk

SPIROPLAN gear units

The following table shows possible SPIROPLAN gear unit variants:

Designation	
W..	Foot-mounted
WF..	Flange-mounted
WAF..	Flange-mounted and hollow shaft
WA..	Hollow shaft
WA..B	Foot-mounted and hollow shaft
WH..B	Foot-mounted and hollow shaft with shrink disk
WHF..	Flange-mounted and hollow shaft with shrink disk
WH..	Hollow shaft with shrink disk
WT..	Hollow shaft with TorqLOC hollow shaft mounting system

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Options

The following table shows possible options for R, F, and K gear units:

Designation	
/R	Reduced backlash

The following table shows possible options for K, S and W gear units:

Designation	
/T	With torque arm

The following table shows possible options for F gear units:

Designation	
/G	With rubber buffer

Condition monitoring

The following table shows possible monitoring units:

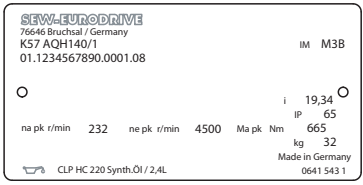
Designation	Option
/DUO	Diagnostic Unit Oil = Oil aging sensor
/DUV	Diagnostic Unit Vibration = Vibration sensor

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9.3 Nameplate/type designation

Nameplate

The following figure shows a nameplate:

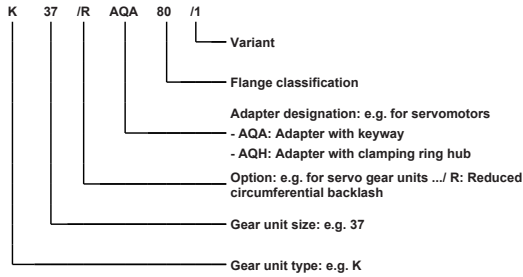


624901899

i		Gear unit reduction ratio
IM		Mounting position
IP		Degree of protection
n_{epk}	[rpm]	Maximum permitted input speed
n_{apk}	[rpm]	Maximum permitted output speed
M_{apk}	[Nm]	Maximum permitted output torque

Type designation

The following diagram shows a type designation:



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9.4 Description of BS.F, PS.F, PS.C gear units

BS.F, PS.F and PS.C gear units are characterized by higher processing speeds, increased accuracy and faster accelerations. In conjunction with consistently low circumferential backlash, high stiffness, and a high level of efficiency, these highly precise and extremely powerful servo gear units form the basis for a variety of servo gear units.

Servo gear units are also characterized by the following features:

- Direct motor mounting:

  Positive direct mounting (without terminal adapter) of the SEW servomotor series CMP, CM and DS

- Motor adapter:

  EPH motor adapters for PS.F and PS.C planetary servo gear units, ECH motor adapters for PS.C planetary servo gear units, and EBH motor adapters for BS.F helical-bevel servo gear units.

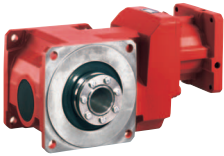
- Reduced backlash:

  Optionally for PS.F planetary servo gear units and BS.F helical-bevel servo gear units with significantly smaller circumferential backlash

- Minimized circumferential backlash:

  Optionally for PS.F planetary servo gear units with even more reduced circumferential backlash

The following figures show BS.F and PS.F gear units:





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9.5 Variants and options of BS.F, PS.F and PS.C gear units

Helical-bevel gear units BS.F

The following table shows possible BS.F helical-bevel gear unit variants:

Designation	
BSF..	Solid shaft without key
BSKF..	Solid shaft with key
BSBF..	Solid shaft with flange block shaft
BSHF..	Hollow shaft with shrink disk
BSAF..	Hollow shaft with keyway
BSKF..B	Solid shaft with key and foot/front-end mounting
BSBF..B	Solid shaft with flange block shaft and foot/front-end mounting
BSHF..B	Hollow shaft with shrink disk and foot/front-end mounting
BSAF..B	Hollow shaft with keyway and foot/front-end mounting

PS.F planetary gear units

The following table shows possible PS.F planetary gear unit variants:

Designation	
PSF..	Solid shaft without key
PSKF..	Solid shaft with key
PSBF..	Solid shaft with flange block shaft

PS.C planetary gear units

The following table shows possible PS.C planetary gear unit variants:

Designation	
PSC..	Solid shaft without key
PSKC..	B5 output flange, solid shaft with key
PSCZ..	B14 output flange, solid shaft
PSKCZ..	B14 output flange, solid shaft with key

Options

The following table shows possible options for BS.F gear units:

Designation	
../R	Reduced backlash
../T	Torque arm
../I	Hollow shaft and shrink disk at the output end

The following table shows possible options for PS.F gear units:

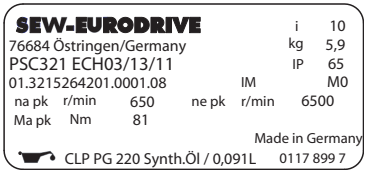
Designation	
../R	Reduced backlash
../M	Minimized backlash

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9.6 Nameplate / type designation

Nameplate of a PS.C.. planetary gear unit with ECH.. adapter

The following figure shows an example of a nameplate:

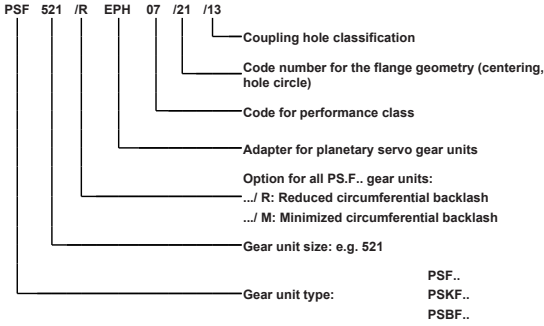


1872039435

i		Gear unit reduction ratio
IM		Mounting position
IP		Degree of protection
n_{epk}	[rpm]	Maximum permitted input speed
n_{apk}	[rpm]	Maximum permitted output speed
M_{apk}	[Nm]	Maximum permitted output torque

Type designation of PS.F.. planetary gear units with EPH.. adapter

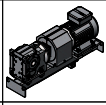
The following diagram shows an example of a type designation:



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9.7 Components on the input side

The following table provides an overview of components on the output side:

IEC or NEMA adapter AM		• For mounting motors according to IEC standard or NEMA • IEC motors: Adapter for sizes 63 – 280 NEMA motors: Adapter for sizes 56 – 365. • Positive torque transmission via fail-safe claw coupling.
AR adapter with torque limiting coupling		• Non-positive torque transmission • Adjustable slip torque • Slipping clutch in the event of overload to prevent damage
AT adapter with hydraulic centrifugal coupling		• Adapter for high-inertia starting systems • Protection against overload during the startup phase • Soft starting • Touch-safe installation • SEW motor sizes 71 – 180 can be mounted. For motor sizes 200 to 280, helical-bevel gear units are available with hydraulic centrifugal coupling on a swing base. • Preferred speeds: 1400 rpm and 2800 rpm
Adapter with hydraulic centrifugal coupling and disk brake option AT../BM(G)		• Adapter for defined deceleration. • The DC-operated electromagnetic disk brake meets the safety requirements of braking in the event of a power failure. • Various braking torques are possible. • Availble with DC or AC voltage connection • Optional manual brake release
Adapter with hydraulic centrifugal coupling on a swing base		• For motors from size 200 • Optional brake
AD input shaft assembly		• For drive via exposed shaft extension • Input shafts have metric dimensions according to IEC standard. • The end of the input shaft has a center bore • High overhung loads due to solid output shaft bearings
Input cover with motor mounting platform AD.. /P		• Space-saving installation due to adjustable motor mounting platform. • Arranged parallel to the input shaft • With thread bores for IEC standard motors
AQ adapter for servo-motors		• For mounting servomotors to R, F, K, S and W gear units • Torque is transmitted via claw coupling

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9.8 Description of gear units for electrified monorail systems

Description

Specific requirements are placed on gear units for operating electrified monorail systems (EMS). With the gear unit series HW.. and HK.., SEW-EURODRIVE supplies drives that are specifically tailored to meet the requirements for light and heavy load applications. The performance features of both groups of gear units meet the specific requirements, such as conveying capacity, conveying speed or payload.

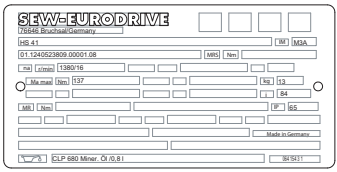
All gear units for electrified monorail systems are additionally equipped with an integrated coupling.

Both groups of gear units have the following characteristics:

- High permitted overhung loads for maximum working loads
- Energy-efficient operating principle of gear units and motors
- Reproducible stopping accuracy by using disk brakes

Nameplate

The following figure shows a nameplate:

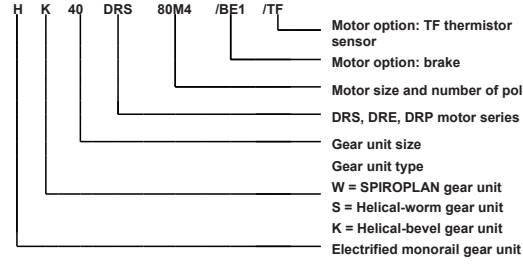


1370263435

i		= Gear unit reduction ratio
IM		= Mounting position
IP..		= Degree of protection
n_a	[rpm]	= Output speed
M_a	[Nm]	= Output torque

Type designation

The following figure shows a type designation:



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10 Industrial Gear Units

10.1 X.. series

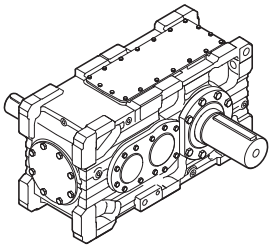
Description

Robust and universal gear unit series which can be optimally adjusted to the task due to finely stepped torque ratings. The universal modular system concept sets new standards with respect to availability and offers a broad range of application options, e.g. for conveyor systems, ball mills and agitators. Application gear units, such as for bucket conveyors, complete the range.

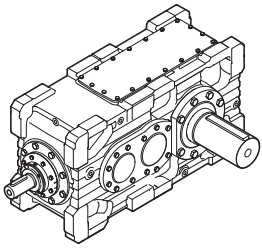
Gear unit type

SEW-EURODRIVE distinguishes between 3 gear unit types:

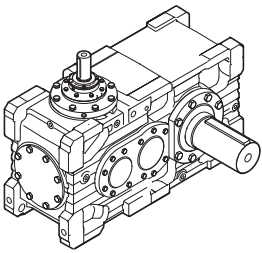
- **X.F..:** Helical gear units with parallel shafts



- **X.K..:** Bevel-helical gear units with right-angle shaft arrangement



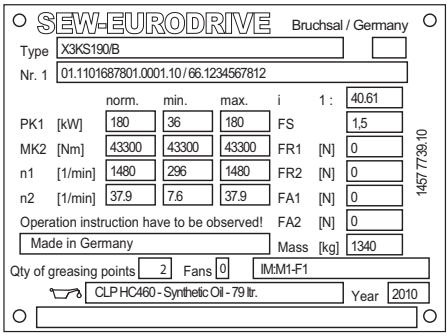
- **X.T..:** Bevel-helical gear units with right-angle shaft arrangement



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Nameplate

The following figure shows a nameplate:



9007199673386507

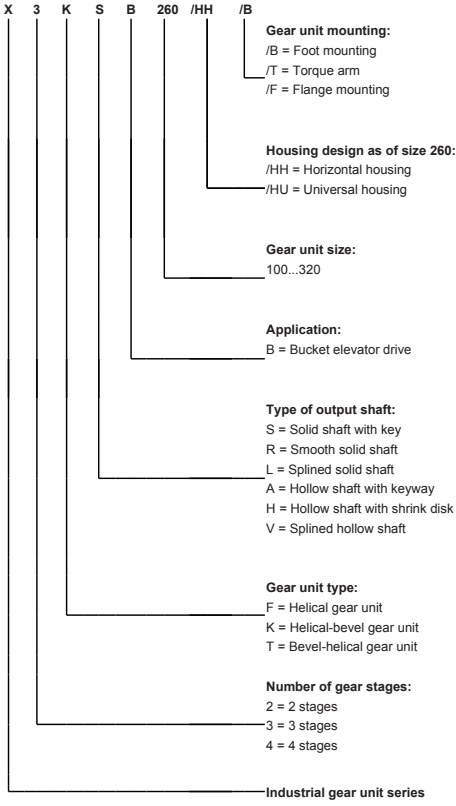
Type	Type designation
No. 1	Manufacturing number
P_{K1}	Operating power on the input shaft (HSS)
M_{K2}	Gear unit output torque
n_1	Input speed (HSS)
n_2	Output speed (LSS)
norm.	Standard operating point
min.	Operating point at minimum speed
max	Operating point at maximum speed
i	Exact gear unit reduction ratio
F_S	Service factor
F_{R1}	Actual overhung load acting on the input shaft
F_{R2}	Actual overhung load acting on the output shaft
F_{A1}	Actual axial load acting on the input shaft
F_{A2}	Actual axial load acting on the output shaft
Mass	Weight of the gear unit
Number of greasing points	Number of regreasing points
Fans	Number of installed fans
	Oil grade and viscosity class/oil quantity
Year	Year of manufacture
IM	Mounting position and mounting surface

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Type designations

Example: Gear unit

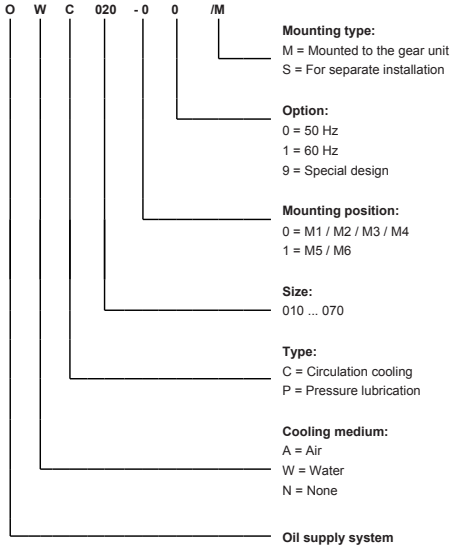
The following diagram shows a type designation:



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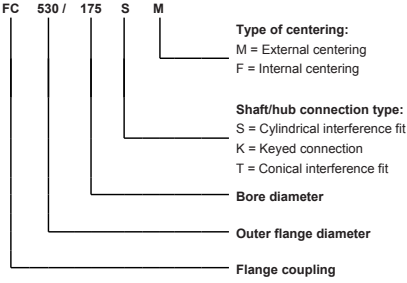
Example: Oil supply systems

The gear unit can be equipped with an oil supply system for cooling and lubrication purposes. The type designation is set up as follows:



Example: Flange couplings

The type designation of a coupling half is set up as follows:



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Abbreviations for optional accessories

The table shows the abbreviations used and what they mean.

Abbreviation	Meaning
/BF	Base frame
/BS	Backstop
/BSL	Torque-limited backstop
/CCV	Water cooling cover
/CCT	Water-cooling cartridge
/F	Mounting flange
/FC	Flange coupling
/FAN	Fan
/FAN-ADV	Fan version Advanced
/ET	Oil expansion tank
/HH	Horizontal housing
/HU	Universal housing
/HSST	Through-going input shaft
/LSST	Through-going output shaft
/MA	Motor adapter
/SB	Swing base
/SEP	Shaft end pump
/T	Torque arm
/OAC	Circulation cooling oil-air cooler with motor pump
/OWC	Circulation cooling oil-water cooler with motor pump
/OAP	Circulation cooling oil-air cooler with pressure lubrication and motor pump
/OWP	Circulation cooling oil-water cooler with pressure lubrication and motor pump
/ONP	Pressure lubrication and motor pump
/OD	Oil dipstick
/ODV	Oil drain valve
/OLG	Oil level glass
/OH	Oil heater
/VBD	V-belt drives

All options are part of the type designation except for mounting flange, torque arm, horizontal and universal housing.

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10.2 MC.. Series

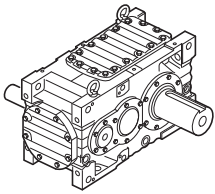
Description

MC series industrial gear units are particularly compact helical and helical-bevel gear units. The 7 sizes available in the MC series cover the 6 to 65 kNm torque range. Their parallel shaft design offers plenty of flexibility in system design and requires remarkably little space. Application range for MC gear units: e.g. in materials handling, transporting heavy loads, mixing, crane drives and shredders. A version based on this series, with extended bearing distance and reinforced output shaft, is also available.

Gear unit type

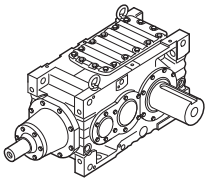
SEW-EURODRIVE distinguishes between 2 gear unit types:

- **MC.P..:** Helical gear units with parallel shafts



3546970251

- **MC.R..:** Bevel-helical gear units with right-angle shaft arrangement

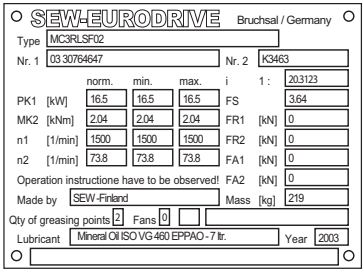


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Nameplate

The following figure shows a nameplate:

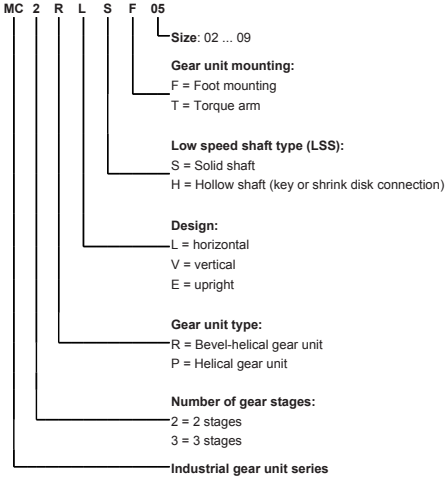


Type	Type designation
Nr. 1	Serial number 1: EURODRIVER order number (e.g. SAP order number)
Nr. 2	Serial number 2: (manufacturing number of the plant / assembly plant)
P_{K1}	Operating power on the input shaft @ n_1 norm.
	Operating power on the output shaft @ n_1 min.
	Operating power on the output shaft @ n_1 max.
M_{K2}	Operating torque on LSS @ n_1 norm.
	operating torque on LSS @ n_1 min.
	Operating torque on LSS @ n_1 max.
n_1	Input speed (HSS)
	Minimum present input speed (HSS)
	Maximum present input speed (HSS)
n_2	Output speed (LSS)
	Minimum present output speed (LSS)
	Maximum present output speed (LSS)
Made by	Gear unit assembly/production site
norm.	Normal operating point
min.	Minimum operating point
max	Maximum operating point
i	Exact gear unit reduction ratio
F_S	Service factor
F_{R1}	Radial force acting on HSS
F_{R2}	Radial force acting on LSS
F_{A1}	Axial force acting on HSS
F_{A2}	Axial force acting on LSS
Mass	Gear unit weight
Qty of greasing points:	Number of regreasing points (e.g. when using regreasable labyrinth seals or Drywell sealing system)
Fans	Number of fans installed on the gear unit
Lubricant	Oil grade and viscosity class/oil quantity
Year	Year of manufacture
IM	Design: Housing positions and mounting surface
TU	Permitted ambient temperature

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Type designation

The following diagram shows a type designation:



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10.3 P002 – P082 series

Description

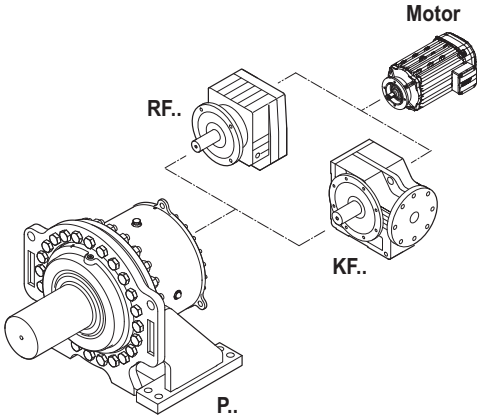
Planetary gearmotors are a combination of

- P.. planetary gear unit output stage
- Primary gear unit RF.. or KF..
- Mount-on components: Motor, coupling, adapter and backstop

There are 9 sizes of planetary gear units with rated torques from 24830 Nm to 359400 Nm.

The load distribution to several planet wheels results in a significantly higher power density and consequently in smaller dimensions compared to helical and bevel-helical gear units.

The following figure shows a sample combination of a planetary gear unit, a primary gear unit and a motor.



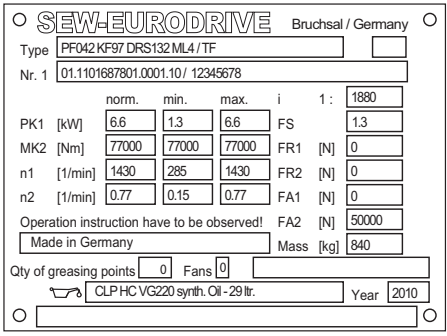
P.. Planetary gear unit
RF.. Helical gear unit (flange-mounted)
KF.. Helical-bevel gear unit (flange-mounted)

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Nameplate and type designation

Planetary gear unit

The following figure shows a nameplate:

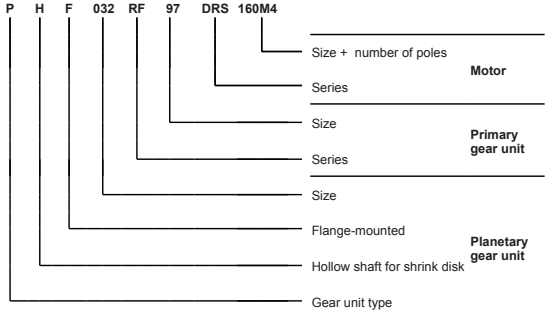


3319008779

Type	Type designation
Nr. 1	Manufacturing number
P_{K1}	Operating power on the input shaft (HSS)
M_{K2}	Gear unit output torque
n_1	Input speed (HSS)
n_2	Output speed (LSS)
norm.	Normal operating point
min.	Operating point at minimum speed
max.	Operating point at maximum speed
i	Exact gear unit reduction ratio
F_S	Service factor
F_{R1}	Actual overhung load acting on the input shaft
F_{R2}	Actual overhung load acting on the output shaft
F_{A1}	Actual axial load acting on the input shaft
F_{A2}	Actual axial load acting on the output shaft
Mass	Weight of the gear unit
Qty of greasing points	Number of regreasing points
Fans	Number of installed fans
	Oil grade and viscosity class/oil quantity
Year	Year of manufacture
IM	Mounting position and mounting surface

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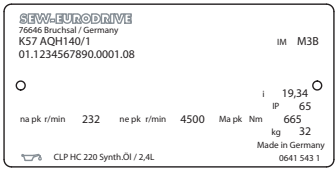
The following diagram shows a type designation:



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Primary gear unit

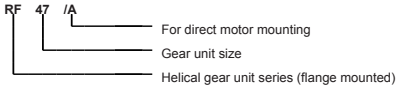
The following figure shows a nameplate:



210927627

f_b	= Service factor
$F_{Ra\ max}$	= Maximum overhung load on the output side
$F_{Re\ max}$	= Maximum overhung load on the input side (with input shaft assembly AD)
i	= Gear unit reduction ratio
IM	= Mounting position
IP..	= Degree of protection
$n_{e\ max}$	= Maximum input speed
n_a	= Output speed
M_{emax}	= Maximum input torque
M_a	= Output torque
M_R	= Overload torque when using an AR adapter
M_{RS}	= Locking torque of the backstop

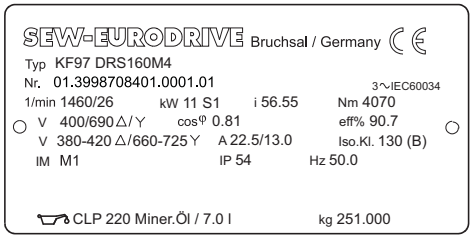
The following diagram shows a type designation:



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Primary gear unit with motor

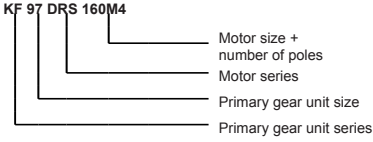
The following figure shows a nameplate:



1419791115

Type	Type designation
Nr.	Serial number of primary gearmotor
i	Gear ratio
rpm	Input/output speed
Nm	Output torque
kW	Input power of the gear unit
S1	Duty cycle
cos φ	Power factor of the motor
V	Supply voltage in delta/star connection
A	Rated motor current in delta/star connection
Hz	Line frequency
IM	Mounting position
kg	Weight of the primary gearmotor
IP	Degree of protection of the motor
Brake V	Brake connection voltage
Nm	Braking torque
	Oil grade and viscosity class/oil quantity

The following diagram shows a type designation:



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