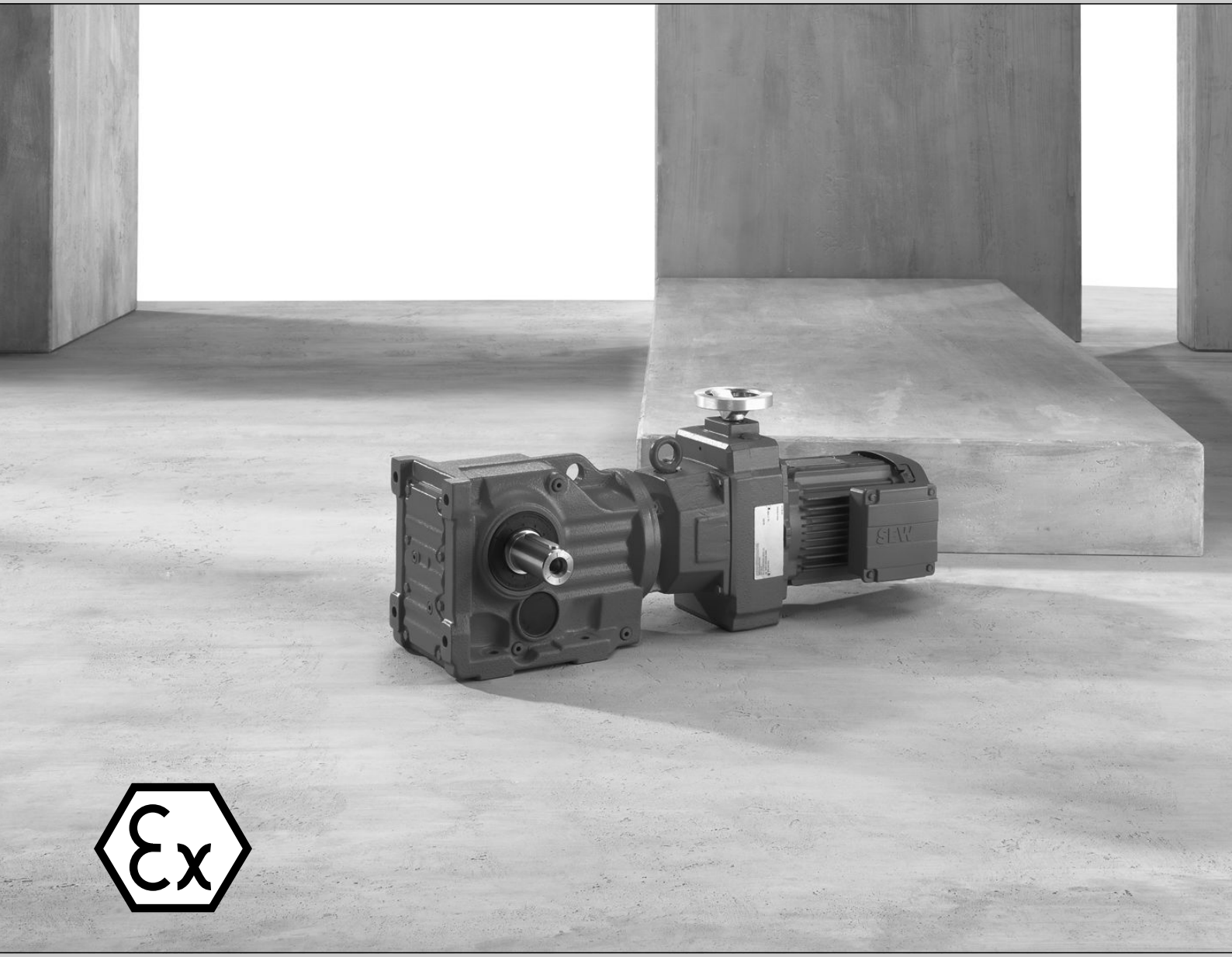
SEW EURODRIVE

Operating Instructions



Explosion-Proof VARIMOT® Variable-Speed Gear Units and Accessories

Edition 07/2015

21242593/EN

Table of contents

21242593/EN – 07/2015

21242593/EN – 07/2015

21242593/EN – 07/2015

1 General information

1.1 About this documentation

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

Make sure this documentation is accessible and legible. Ensure that persons responsible for the machinery and its operation as well as persons who work on the device independently have read through the documentation carefully and understood it. If you are unclear about any of the information in this documentation or require further information, contact SEW-EURODRIVE.

1.2 Structure of the safety notes

1.2.1 Meaning of signal words

The following table shows the grading and meaning of the signal words for safety notes.

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

1.2.2 Structure of section-related safety notes

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

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

SIGNAL WORD

Type and source of hazard.

Possible consequence(s) if disregarded.

- Measure(s) to prevent the hazard.

21242593/EN – 07/2015

Meaning of the hazard symbols

The hazard symbols in the safety notes have the following meaning:

Hazard symbol	Explanation
	General hazard
	Warning of dangerous electrical voltage
	Warning of hot surfaces
	Warning of risk of crushing
	Note on explosion protection
	Warning of automatic restart

1.2.3 Structure of embedded safety notes

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

This is the formal structure of an embedded safety note:

- ⚠ **SIGNAL WORD** Type and source of hazard.

  Possible consequence(s) if disregarded.

  – Measure(s) to prevent the hazard.

1.3 Rights to claim under limited warranty

Read the information in this documentation. This is essential for fault-free operation and fulfillment of any rights to claim under limited warranty. Read the documentation before you start working with the unit!

21242593/EN – 07/2015

1.4 Exclusion of liability

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

1.5 Product names and trademarks

The brands and product names in this documentation are trademarks or registered trademarks of their respective titleholders.

1.6 Copyright notice

21242593/EN – 07/2015

2 Safety notes

The following basic safety notes must be read carefully to prevent injury to persons and damage to property. The user must ensure that the basic safety notes are read and observed. Make sure that persons responsible for the system and its operation, as well as persons who work independently on the unit, have read through the operating instructions carefully and understood them. If you are unclear about any of the information in this documentation, or if you require further information, please contact SEW-EURODRIVE.

2.1 Preliminary information

The following safety notes are primarily concerned with the use of variable-speed gear units. If you use gearmotors, also refer to the safety notes in the corresponding operating instructions for motor and gear unit.

Also observe the additional safety notes provided in the individual chapters of this document.

2.2 Safety notes for carrying out work in potentially explosive atmospheres

⚠ WARNING

Explosion hazard.

Severe or fatal injuries.

- Bear in mind that hot, live, or moving parts of machines can lead to explosions in atmospheres with critical gas mixtures or concentrations of dust.

21242593/EN – 07/2015

2.3 General information

⚠ WARNING

Danger of electric shock, risk of crushing or burns during operation as the motors and gearmotors can have live, bare (in the event of open connectors/terminal boxes) and movable or rotating parts as well as hot surfaces.

Severe or fatal injuries.

- All work related to transport, storage, installation, assembly, connection, startup, maintenance and repair may only be carried out by qualified personnel.
- For transport, storage, installation, assembly, connection, startup, maintenance and repair it is important that you adhere to the information in the following documents:
  - Warning and safety signs on the unit
  - All the project planning documents, startup instructions and wiring diagrams related to the drive
  - System-specific regulations and requirements
  - National/regional regulations governing safety and the prevention of accidents.
- Never install damaged products.
- Never operate or energize the unit without the necessary protection covers or housing.
- Use the unit only for its intended purpose.
- Make sure installation and operation of the unit are correct.

2.4 Target group

Any mechanical work may only be performed by adequately qualified personnel. Qualified personnel in the context of this documentation are persons familiar with the design, mechanical installation, troubleshooting and servicing of the product who possess the following qualifications:

- Training in mechanical engineering, e.g. as a mechanic or mechatronics technician (final examinations must have been passed).
- They are familiar with these operating instructions.

Any electronic work may only be performed by adequately qualified electricians. Qualified electricians in the context of this documentation are persons familiar with electrical installation, startup, troubleshooting and servicing of the product who possess the following qualifications:

- Training in electrical engineering, e.g. as an electrician, electronics or mechatronics technician (final examinations must have been passed).
- They are familiar with these operating instructions.

All work in the areas of transportation, storage, operation and waste disposal must be carried out by persons who are trained appropriately.

All qualified personnel must wear appropriate protective clothing.

21242593/EN – 07/2015

2.5 Designated use

The gear units are intended for industrial systems and may only be used in accordance with the information provided in technical documentation of SEW-EURODRIVE and the information given on the nameplate. They meet the requirements set forth in Directive 94/9/EG or 2014/34/EU and comply with the applicable standards and regulations.

The gear units are components for the installation in machines and plants according to the 2006/42/EC Machinery Directive. Within the scope of the Directive, you must not operate the machine in the designated fashion until you have established that the end product complies with Machinery Directive 2006/42/EC.

Optional equipment

In addition to the general installation guidelines, the following regulations in accordance with BetrSichV (or other national regulations) must be observed for connecting additional devices:

- EN 13463-1 Non-electrical equipment for use in potentially explosive areas: Part 1 basics and requirements.
- EN 13463-5 Non-electrical equipment for use in potentially explosive areas: Part 5 Protection by constructional safety "c".
- EN 50281-2-1 Electrical operating resources for use in atmospheres containing combustible dust: Part 2-1 Examination processes - processes to determine the minimum ignition temperature of dust.
- EN 60079-0 electrical operating resources for potentially explosive atmospheres: General requirements.
- EN 60079-1 for protection type "d".
- EN 60079-7 for protection type "e".
- EN 60079-11 intrinsically safe "i".
- EN 60079-14 electrical operating resources for potentially explosive atmospheres: Project planning, selection and setup of electrical machinery.
- EN 60079-15 electrical operating resources for potentially explosive atmospheres: Equipment protection by protection type "n".
- EN 60079-17 potentially explosive atmospheres: Part 17 testing and maintenance of electrical machinery.
- EN 60079-31 Electrical operating resources for use in atmospheres containing combustible dust: Protection through housing "t".
- DIN VDE 105-9 "Operating electrical equipment" or other national regulations.
- DIN VDE 0100 "Erection of power installations with rated voltages below 1000 V" or other national regulations.

Technical data and information on the permitted conditions are given on the nameplate and in the documentation; they have to be observed under all circumstances.

21242593/EN – 07/2015

2.6 Other applicable documentation

The following publications and documents have to be observed as well:

- "Explosion-Proof AC Motors EDR..71 − 315" operating instructions
- "Explosion-proof Gear Unit Series R..7, F..7, K..7, S..7, SPIROPLAN® W" operating instructions
- "Explosion-Proof AC Motors" catalog and/or
- "Explosion-Proof Drives" catalog.

The complete range of technical documentation is available on the SEW-EURODRIVE website: **www.sew-eurodrive.com**

2.7 Transport/storage

Inspect the shipment for damage as soon as you receive the delivery. Report any transport damage to the shipping company immediately. If necessary, suspend startup.

Tighten the eyebolts securely. They are designed to only carry the weight of the gear unit/motor/gearmotor; do not attach any additional loads.

The installed lifting eyebolts are in accordance with DIN 580. The loads and regulations specified in that document must always be observed. If two or four lifting eyes or eyebolts are attached to the gear unit/motor/gearmotor, all lifting eyes or eyebolts must be used during transport. In this case, the tension force vector of the slings must not exceed a 45° angle in accordance with DIN 580.

Use suitable, sufficiently rated handling equipment if necessary. Reattach these in the case of further transportation.

If the gear unit/motor/gearmotor is not installed immediately, it must be stored in a dry and dust-free storage location. You must not store the gear unit/motor/gearmotor outdoors or on the fan guard. The gear unit/motor/gearmotor can be stored for up to 9 months without requiring any special measures before startup.

2.8 Installation

Ensure that the unit is installed and cooled according to the regulations in this documentation.

Protect the unit from excessive strain. Ensure that components are not deformed and that insulation spaces are maintained, particularly during transportation. Electric components must not be mechanically damaged or destroyed.

The following applications are prohibited unless explicitly permitted:

- Use in areas exposed to harmful oils, acids, gases, vapors, dust, radiation, etc.
- Use in applications that are subject to mechanical vibration and shock loads in excess of the requirements in EN 61800-5-1.

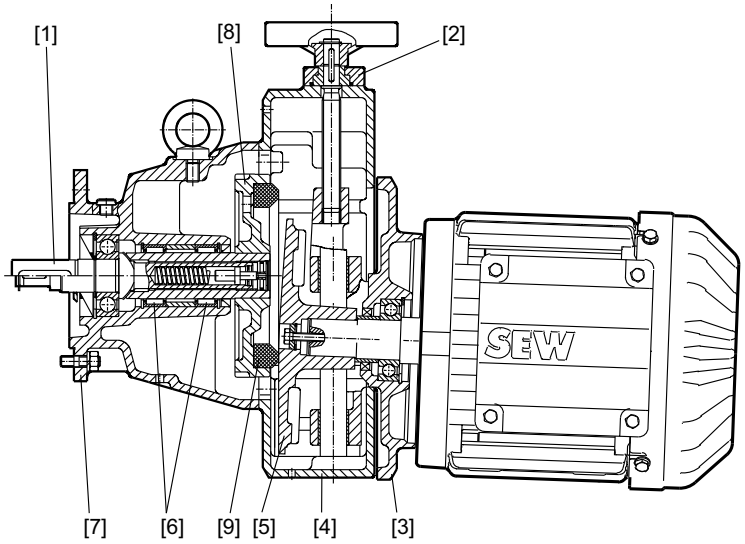
Observe the notes in chapter "Installation (→ 🗎 17)".

21242593/EN – 07/2015

3 Structure of VARIMOT® in explosion-proof design

3.1 Unit structure

The following figure shows the unit structure of the VARIMOT® in explosion-proof design.



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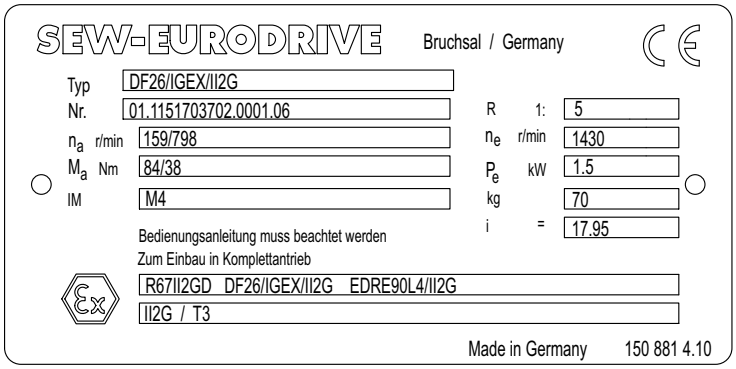
[1] Complete output shaft
[2] Plate
[3] Adjusting plate
[4] Housing cover
[5] Drive pulley
[6] Needle roller bearing
[7] Housing with tapped hole
[8] Complete hollow shaft
[9] Friction ring

21242593/EN – 07/2015

3.2 Nameplate



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Type	Type code with equipment category
No.	Customer order number
n_a	Minimum and maximum output speed
M_a	Output torque at minimum and maximum output speed
IM	Mounting position
R	Control range
n_e	Input speed
P_e	Drive power
kg	Weight of the complete drive
i	Gear unit ratio
II2G	Unit category
T. or	Temperature class for explosion-proof atmosphere gas or
T ... °C	maximum surface temperature for explosion-proof atmosphere dust

3.2.1 Ex marking

INFORMATION

In some applications, SEW-EURODRIVE variable-speed gear units must only be operated in compliance with special measures. For these cases, there is a special indication on the nameplate **"II..X"**.

The necessity for the special measures can be caused e.g. by the presence of a reduced output torque. The customer has been informed about the required special measures on the initial distribution of the variable-speed gear unit. The customer is obliged to ensure the compliance with these special measures.

3.2.2 EAC marking

On request, the explosion-proof gear units from SEW-EURODRIVE meet the requirements of the technical regulations of the Eurasian Economic customs union (Russia, Kazakhstan, Belarus, and Armenia). The EAC marking on the product certifies the conformity with the safety requirement of the Customs Union.

21242593/EN – 07/2015

3.3 Type designation

The following table shows the type code structure:

Example: D26B/H/WEX/II2G		
Series	**D**	• D = VARIMOT® variable-speed gear units • DF = VARIMOT® variable-speed gear units, flange-mounted design
Size	**26**	Size 26 Possible sizes: 16, 26, 36, 46
Design	**B**	B = for use in wet areas
Adjustment device	**/H**	• /H = angular adjustment via handwheel • /HS = angular adjustment via handwheel with position indicator • NV = device with free shaft end
Evaluation options	**/WEX**	• /WEX = speed monitor with voltage encoder in explosion-proof areas • /WEXA = speed monitor with voltage encoder and contactless, digital remote speed indication in explosion-proof areas • /IGEX = voltage encoder in explosion-proof areas
Explosion-proof design	**/II2G**	Explosion-proof design according to equipment group II: • 2G = category 2, explosive gas atmosphere • 3G = category 3, explosive gas atmosphere • 3D = category 3, explosive dust atmosphere

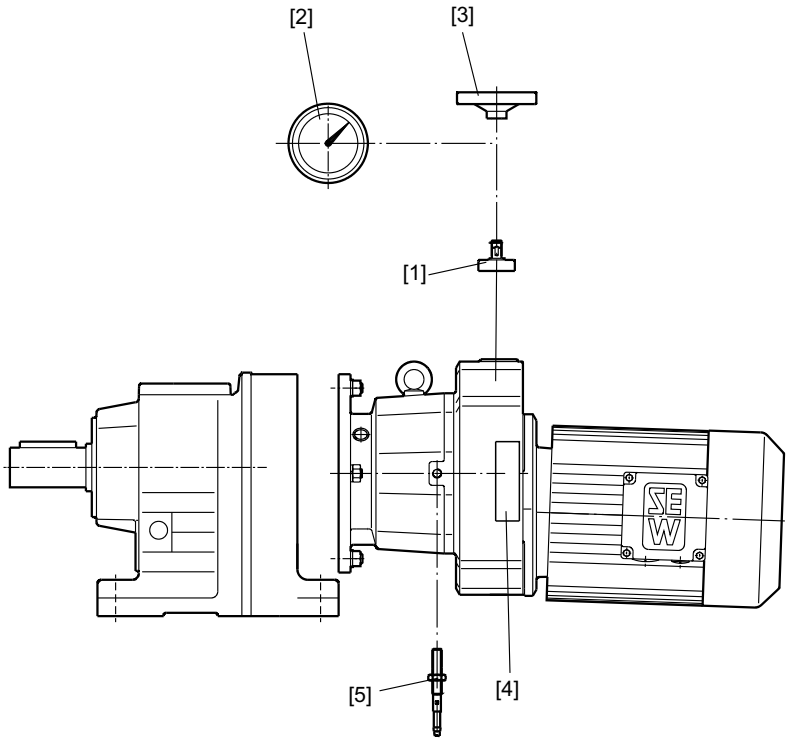
INFORMATION

Sizes 36 and 46 are only available as spare parts with the motor series DT and DV.

21242593/EN – 07/2015

3.4 Overview mounting options of explosion-proof VARIMOT®

The following figure shows the combination options for the explosion-proof VARIMOT® variable-speed gear unit.



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[1] Adjustment device with free shaft end /NV
[2] Adjustment device with handwheel and /HS position display
[3] Adjustment device with handwheel /H (standard design)
[4] Indicator scale
[5] Voltage encoder /IGEX

21242593/EN – 07/2015

4 Installation

4.1 General information

⚠ CAUTION

Risk of injury due to protruding gear unit parts.

Minor injuries.

- Keep a sufficient safety distance to gear unit and gearmotor.

NOTICE

Damage to variable-speed gear unit due to improper installation.

Damage to the variable-speed gear unit.

- It is important that you observe the notes in this chapter.

NOTICE

Damages of the friction ring due to excessive use of the adjustment function in standstill.

Damage to the friction ring.

- Adjustment at standstill is possible, however this should be avoided in operation.

INFORMATION

VARIMOT® as category 2G unit may only be used with a functioning speed monitoring. The speed monitor must be correctly mounted and set (see chapter "Speed monitoring (→ 🗎 31)").

21242593/EN – 07/2015

4.2 Explosion-proof marking

4.2.1 VARIMOT® in explosion-proof design

Approval in general without the following designs:

- Mounted BMG disk brake
- Adapter with slip clutch and slip monitor

Category	Zone	VARIMOT® in potentially explosive atmosphere
2G	1 and 2	• Size D.16. – D.46. • Operation always with speed monitor • Starting start bypass maximum 3 seconds • Temperature class T3 • Control range: – 1:4 for D.46B – 1:5 for D.16. – D.46.
2D	21	Safe operation not possible, i.e. no approval
3G	2	• Size D.16. – D.46. • Operation also permitted without speed monitor • Temperature class T3 • Control range: – 1:4 for D.46B – 1:5 for D.16. – D.46.
3D	22	• Size D.16. – D.46. • Operation also permitted without speed monitor • Maximum surface temperature 200 °C • Control range: – 1:4 for D.46B – 1:5 for D.16. – D.46.

INFORMATION

If overloading of the VARIMOT® unit in category 3G or 3D may occur in normal operation, then a VARIMOT® with activated speed monitor must be used.

4.2.2 General information

VARIMOT® variable-speed gear units in explosion-proof design are equipped with a tapped hole M12x1 as standard, to mount the voltage encoder.

Depending on equipment and dimensioning, the following designs are available according to ATEX regulations:

Category 2G

Variable-speed gear units in this design meet the requirements for equipment group II, category 2G (explosive gas atmosphere). These units are intended for use in zones 1 and 2.

21242593/EN – 07/2015

Categories 3G and 3D

Variable-speed gear units in this design units meet the design requirements of equipment group II, category 3G (explosive gas atmosphere) and 3D (explosive dust atmosphere). These units are intended for use in zones 2 and 22.

4.2.3 Ambient temperature

If no deviating data is given on the nameplate, gear units in explosion-proof design may only be used at ambient temperatures in the range from -20 °C – +40 °C.

If an attached component limits this temperature range, the data on the components nameplate applies.

INFORMATION

Any ambient temperatures deviating from this range are listed on the nameplate.

4.2.4 Temperature class

VARIMOT® variable-speed gear units of category 2G and 3G (explosive gas atmosphere) are approved for temperature class T3.

The temperature class of the variable speed gear unit is indicated on the nameplate.

4.2.5 Surface temperature

The maximum surface temperature of VARIMOT® variable speed gear units, category 3D (explosive dust atmosphere) may not exceed 200 °C.

Lower surface temperatures are only approved after further discussion with SEW-EURODRIVE and must be indicated on the nameplate. The system operator must guarantee that a possible accumulation of dust will not exceed a maximum thickness of 5 mm, in accordance with EN 50281-1-2.

4.2.6 Ambient conditions

The gear unit must be sufficiently ventilated. No external heat generation (e.g. via couplings) must be present.

4.2.7 Output power and output torque

The nominal value of output power and output torque must be adhered. The operator must make sure that no overload and/or blockage of the variable-speed gear unit output shaft are possible.

4.2.8 Special designs

Special designs (e.g. modified output shaft) may only be operated in potentially explosive atmospheres after prior approval by SEW-EURODRIVE.

21242593/EN – 07/2015

4.3 Installation requirements

Check that the following conditions have been met:

- The information on the nameplate of the variable-speed gear unit corresponds to the approved on-site explosion application range (supply system, equipment group, category, zone, temperature class or maximum surface temperature).
- The drive has not been damaged during transportation or storage.
- With **standard gear units**, make sure that:
  - The ambient temperature corresponds to the information in the technical documentation and on the nameplate.
  - No harmful oils, acids, gases, vapors, radiation etc. are present in the environment.
- With **special designs**, make sure that the drive is designed according to the ambient conditions. Observe the information on the nameplate.
- When the drive is installed in abrasive ambient conditions, protect the output end radial oil seals against wear.

4.4 Permitted overhung loads without primary gear unit

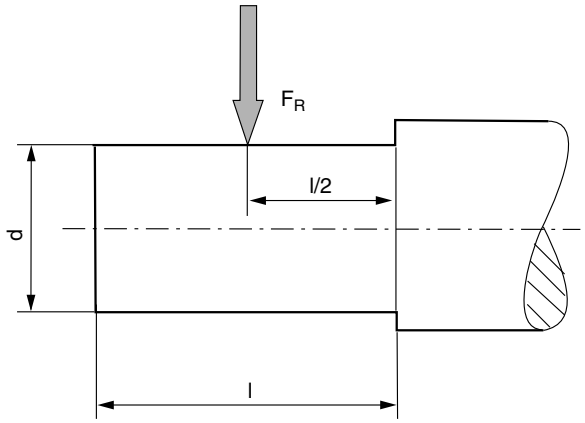
NOTICE

Damages to bearing, housing or shafts, when the explosion-proof variable-speed gear unit VARIMOT® is used without primary gear unit.

Damage to the variable-speed gear unit.

- Adhere to the approved overhung loads at the output shaft.

The following diagrams show the approved overhung loads depending on the speed. The behavior of the overhung load depicted in the diagrams refers to the force application in the center of the shaft end (see the following figure).



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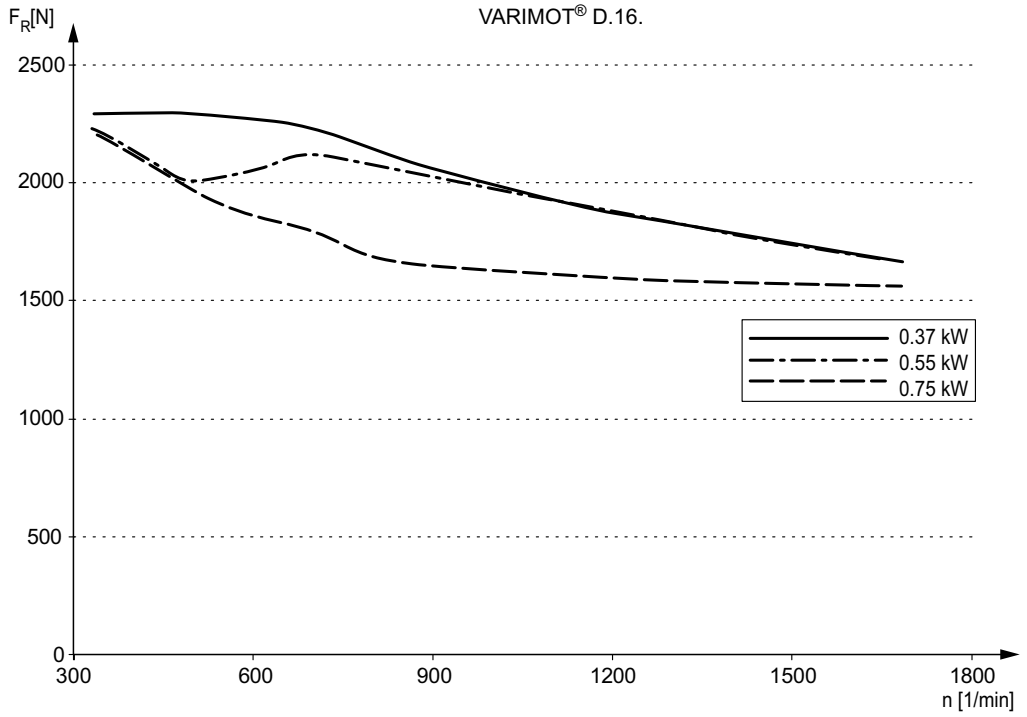
F_R Permitted overhung load at force application to the center of the shaft end

INFORMATION

If force is applied to areas other than the center of the shaft end, contact SEW-EURODRIVE for permitted overhung loads.

21242593/EN – 07/2015



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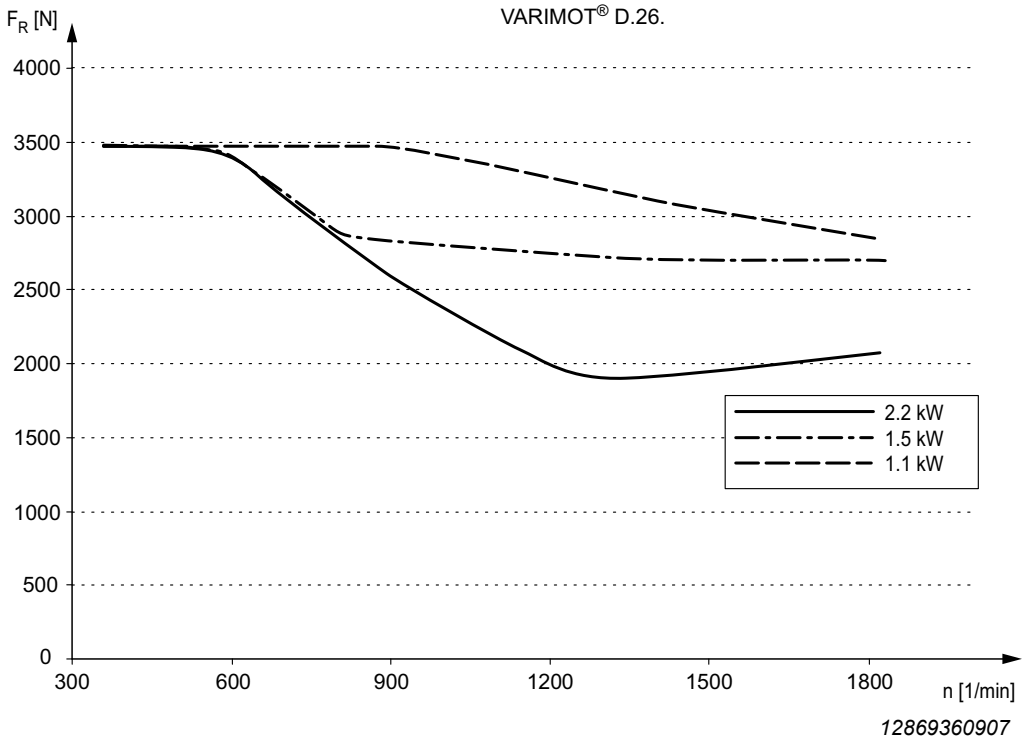

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INFORMATION

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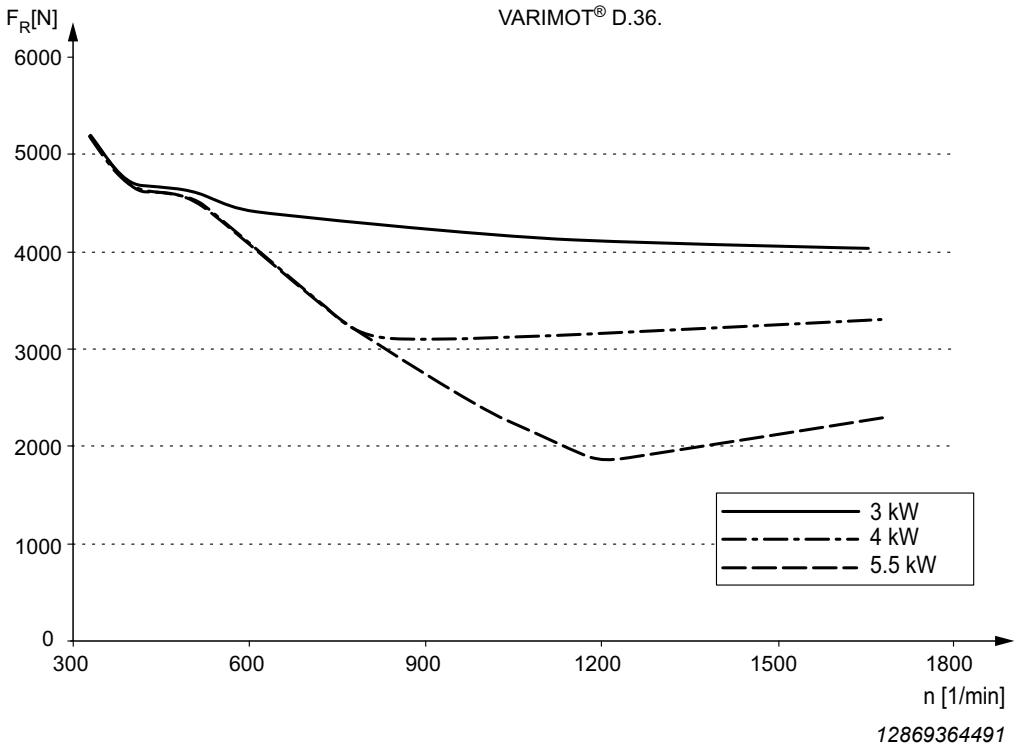
21242593/EN – 07/2015



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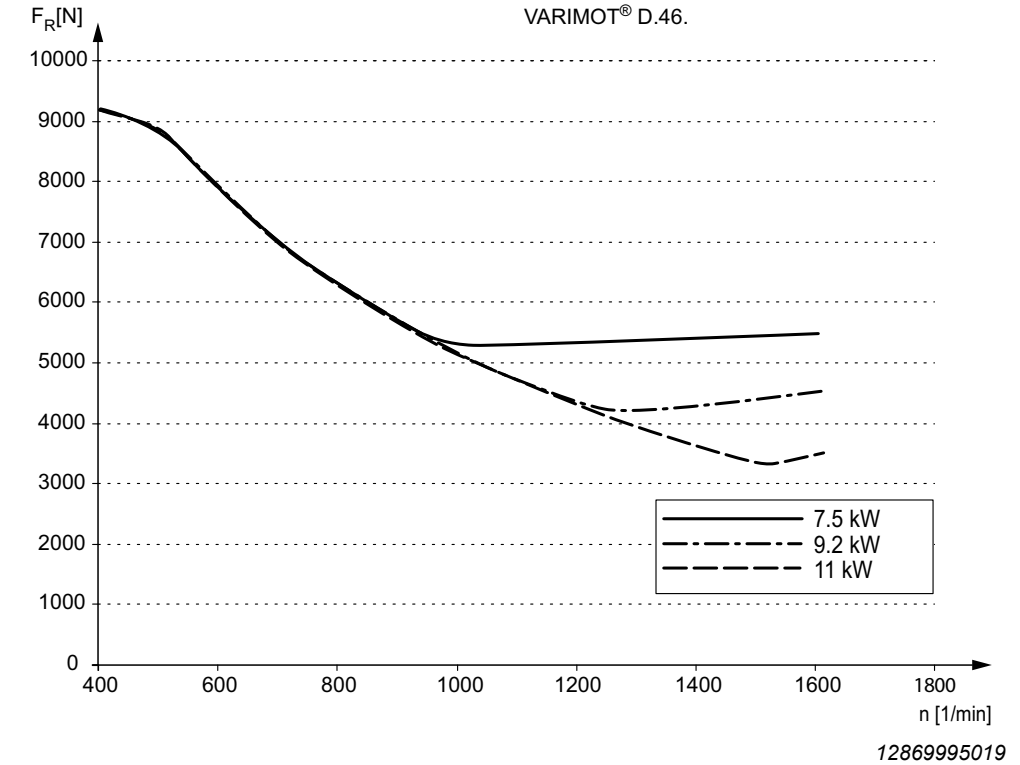

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21242593/EN – 07/2015

4.5 Preliminary work following lengthy storage

NOTICE

Ingression of solvent at the sealing lips of the oil seals when cleaning the input shaft and flange areas from anti-corrosion agent, dirt or the like.

Damage to oil seals.

- Do not let solvent ingress at the oil seals. Use a standard solvent.

Bearing greases

	Ambient temperature	Basis	Original filling	Manufacturer
Gear unit rolling bearings	-20 °C – +40 °C	synthetic	Renolit CX – TOM 15 OEM	Fuchs

INFORMATION

The service life of the lubricant in the bearings is reduced if the unit is stored for ≥ 1 year.

4.6 Required tools/resources

- Set of wrenches
- Mounting device
- Compensation elements (shims, spacer rings), if necessary
- Fasteners for input and output elements

4.7 Installation tolerances

Shaft end	Flanges
Diameter tolerance according to DIN 748 • ISO k6 for solid shafts with d, d_1 ≤ 50 mm • ISO k7 for solid shafts with d, d_1 > 50 mm • Center hole according to DIN 332, shape DR..	Centering shoulder tolerance according to DIN 42948 • ISO j6 at b_1 ≤ 230 mm • ISO h6 with b_1 > 230 mm

21242593/EN – 07/2015

4.8 Variable-speed gear unit

⚠ WARNING

Risk of crushing if the drive starts up unintentionally.

Severe or fatal injuries.

- Disconnect the gearmotor from the power supply before you start working on the unit.
- Prevent the gearmotor from starting up unintentionally (for example, by locking the key switch or removing the fuses from the current supply).
- Attach an information sign near the ON switch to warn that the gear unit is being worked on.

⚠ CAUTION

Generation of electric sparks if housing is not additionally grounded.

Generation of electric sparks.

- Additionally ground the housing. Use grounding screws at the motor.

NOTICE

Damage to variable-speed gear unit due to improper installation.

Damage to the variable-speed gear unit.

- It is important that you observe the notes in this chapter.

NOTICE

Risk of corrosion at variable-speed gear units of category 2G, 3G and 3D if breather valves are not freely accessible.

Damage to the variable-speed gear unit.

- Before startup, remove the plastic plug at the condensation drain hole situated at the lowest point.

INFORMATION

Use only input and output elements with ATEX EG declaration of conformity, if these are subject to Directive 94/9/EG and/or 2014/34/EU.

INFORMATION

For gear units in flange-mounted design and foot/flange-mounted design in connection with VARIMOT® variable-speed gear units, use quality 10.9 bolts and suitable washers for connecting the customer flange.

To improve the friction contact between flange and mounting surface, SEW-EURODRIVE recommends anaerobic gaskets or anaerobic glue.

INFORMATION

For the position display of VARIMOT® with handwheel and HS position display to work properly, mount them with the adjustment spindle in a horizontal position.

21242593/EN – 07/2015

The variable-speed gear unit or variable-speed gearmotor may only be installed/ mounted under the following conditions:

- Observe the information on the nameplate.
- Do not jolt or hammer the shaft end.
- Align the variable-speed drives carefully to avoid placing any unacceptable strain on the output shaft. Observe the permitted overhung and axial forces. Observe chapter "Project Planning" in the Gear unit/gearmotor catalog for calculating the permitted overhung and axial loads.
- Protect the gear unit from direct cold air currents.
- Ensure sufficient clearance around the unit to allow for adequate cooling air supply. Warm outlet air of other units must not be drawn in. The cooling air must not exceed a temperature of +40 °C.
- Make sure the, support construction has the following characteristics:
  - Level
  - Vibration damping
  - Torsionally rigid

  The maximum permitted flatness defect for foot and flange-mounted design for a flange of 120 mm – 600 mm is 0.2 mm – 0.55 mm (guide value in regard to DIN 1101).
- Do not twist housing legs and mounting flange against each other.
- Use plastic inserts (2 mm – 3 mm thick) if there is a risk of electrochemical corrosion between the gear unit and the driven machine. The material used must have an electrical leakage resistance < 10^9 Ω.

  Electrochemical corrosion can occur between various metals, for example, cast iron and stainless steel. Thus, also fit the screws with plastic washers.

4.8.1 Installation in damp locations or outdoors

VARIMOT® gear units are supplied in corrosion-resistant designs (design B) for use in damp areas or outdoors.

- Repair damage to the paint work e.g. at the breather valve or the lifting eyes (see "Painting the variable-speed gear unit (→ 🗎 47)").
- Units installed outdoors must be protected from the sun. Provide for suitable protective devices such as covers or roofs. Avoid heat build-up.
- The system operator must ensure that no foreign objects (e.g. falling objects or coverings) affect the operation of the gear unit.

21242593/EN – 07/2015

4.8.2 Cable entry / cable gland

In the delivery state, all cable entries are supplied with ATEX certified closing plugs.

Observe the following when routing the cables:

- To establish the correct cable entry, the closing plugs must be replaced by ATEX approved cable glands with strain relief. Select the cable glands according to the outer diameter of the respective cable.
- After the installation, close all unused cable entries by ATEX approved closing plugs.
- Coat the threads of the cable glands and filler plugs with sealing compound and tighten it properly. Then coat the thread again.
- Seal the cable entry properly.
- Thoroughly clean the sealing surfaces of the terminal box and the terminal box cover prior to reassembly. Replace any brittle seals.

4.9 Assembling input and output elements

NOTICE

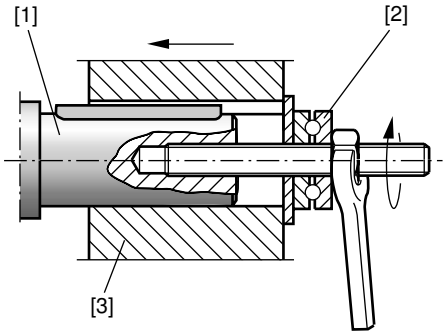
Damage to bearing, housing or shafts due to incorrect mounting.

Possible damage to property.

- Only use a mounting device for installing input and output elements (see "Using a mounting device (→ 🗎 26)"). Use the threaded centering bore at the shaft end.
- Never force belt pulleys, couplings, pinions, etc. onto the shaft end by hitting them with a hammer.
- In the case of belt pulleys, make sure the belt is tensioned correctly in accordance with the manufacturer's instructions.
- Make sure the transmission elements are balanced after fitting and do not give rise to any impermissible radial or axial forces. For the approved values, refer to the catalog "Gearmotors" or "Explosion-Proof Drives".

4.9.1 Using a mounting device

The following figure shows a mounting device for installing couplings or hubs on gear unit or motor shaft ends. Should you be able to tighten the screw without any problems, you may not need the thrust bearing on the mounting device.



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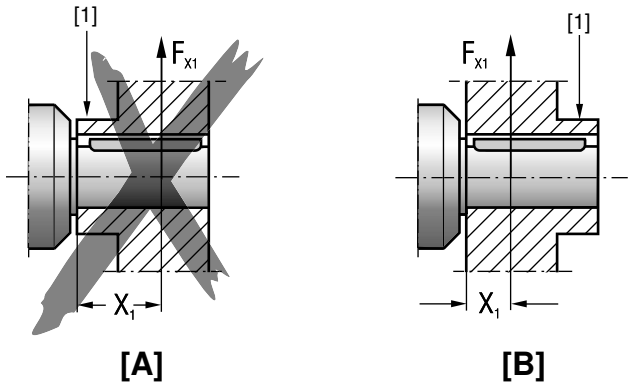
[1] Gear shaft end
[2] Thrust bearing
[3] Coupling hub

21242593/EN – 07/2015

4.9.2 Avoiding excessive overhung loads

To avoid high overhung loads, mount gears and sprockets according to figure **B**.



211364235

[1] Hub
[A] Incorrect assembly
F_{X1} Overhung load at point X1
[B] Correct assembly

4.10 Mounting of couplings

⚠ CAUTION

Risk of injury due to moving drive elements, such as belt pulleys or couplings, during operation.

Risk of jamming and crushing.

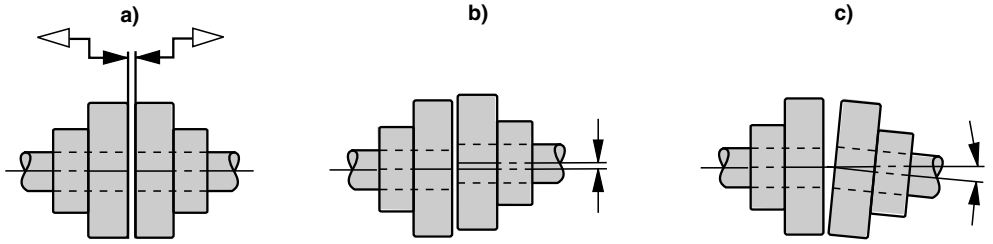
- Equip the input and output elements with a touch guard.

Adjust the following misalignments according to the coupling manufacturer's specifications when mounting couplings:

a) Maximum and minimum clearance

b) Axial misalignment

c) Angular misalignment



211395595

4.11 Accessory equipment

The following designs of speed monitoring are possible:

Optional equipment	Design
/WEXA	In this design the speed monitor (incl. evaluation electronics) with voltage encoder /IGEX and with digital remote speed indication /DA is included in the delivery.
/WEX	In this design the speed monitor (incl. evaluation electronics) with voltage encoder /IGEX is included in the delivery.
/IGEX	In this design the voltage encoder is included in the delivery. The speed monitor must be supplied and installed by the operator of the device.
/NV	Adjustment device with exposed shaft end.
/H	Adjustment device with handwheel.
/HS	Adjustment device with handwheel and setting indicator.

For further information, refer to chapter "Startup (→ 🗎 29)".

21242593/EN – 07/2015

5 Startup

5.1 General information

NOTICE

Damage to variable-speed gear unit due to improper installation.

Damage to the variable-speed gear unit.

- It is important that you observe the notes in this chapter.

NOTICE

Damage of the friction ring due to excessive use of the variable-speed gear unit in standstill.

Damage to the friction ring.

- Adjustment at standstill is possible, however this should be avoided in operation.

5.2 Startup requirements

All activities that have to be performed before startup of a gear unit in a potentially explosive atmosphere according to Directive 94/9/EC and 2014/34/EU are listed in the following.

Check prior to startup in potentially explosive atmospheres	Checked
Inspect the shipment for damage as soon as you receive the delivery. Inform the shipping company immediately about any damage. In this case do not perform the startup. Were all transport protections removed prior to startup?	
Does the following information on the gear unit nameplate correspond with the permitted conditions for potentially explosive atmospheres on site: • Equipment group • ATEX category • Temperature class • Maximum surface temperature	
Have arrangements been made to prevent explosive atmospheres, oils, acids, gases, vapors or radiation during installation of the gear unit?	
Is the ambient temperature maintained according to the lubricant table?	
Have arrangements been made for sufficient ventilation and that there will be no external heat generation (e.g. via clutches)? The cooling air must not exceed the maximum ambient temperature designated on the nameplate.	
Does the mounting position correspond to the specifications on the gear unit nameplate? Do not change the mounting position without prior consultation with SEW-EURODRIVE. ATEX EC declaration of conformity will become void without prior consultation.	
Are all oil drain plugs as well as breather plugs and valves freely accessible?	
Do all input and output elements to be installed have ATEX EC declaration of conformity?	
Is the cover mounted properly at the gear unit with hollow shaft and shrink disk?	

21242593/EN – 07/2015

Check prior to startup in potentially explosive atmospheres	Checked
Is the effectiveness of the speed monitoring traceably checked?	

5.3 Before startup

The variable-speed gear unit or variable-speed gearmotor may only be taken in operation after the following conditions are met:

- Remove present transport protection.
- Adhere to the important technical data indicated on the nameplate. Additional data relevant for operation is available in drawings and the order confirmation.
- Check for proper direction of rotation in decoupled state. Listen out for unusual grinding noises as the shaft rotates.
- Check the degree of protection.
- Secure the key for test mode without output elements.
- After having installed the gear unit, check to see that all retaining screws are tight.
- Make sure that the alignment has not changed after tightening the mounting elements.
- Prior to startup, ensure that rotating shafts as well as couplings are equipped with suitable protective covers.
- It is essential that there is no open fire or risk of sparks when working on the gear unit.
- Protect the gear unit from falling objects.
- Check that there is sufficient clearance around the motor to provide for adequate cooling air supply, and that the motor does not suck in warm air from other devices.

INFORMATION

During startup of a variable-speed gear unit in a potentially explosive area, the surface temperature must be measured after 3 hours according to directive 94/9/EC or 2014/34/EU. Do not exceed a temperature difference of 70 K compared to the ambient temperature.

At a value > 70 K immediately set the motor to standstill. Contact SEW-EURODRIVE.

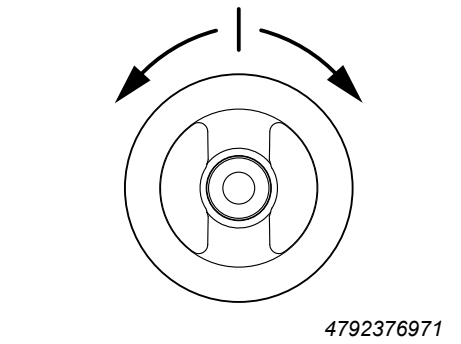
21242593/EN – 07/2015

5.4 Changing the speed via the handwheel

Turning the handwheel changes the speed range as follows:

- CCW rotation decreases the output speed.
- CW rotation increases the output speed.

The following figure illustrates the directions of rotation:



4792376971

INFORMATION

The setting range limit is ensured mechanically.

5.5 Speed monitoring

INFORMATION

VARIMOT® as category 2G unit may only be used with a functioning speed monitoring. The speed monitor must be correctly installed and set.

5.5.1 Standard version

The standard version of the VARIMOT® explosion-proof variable-speed gear unit in flange-mounted design features the following thread for mounting a voltage encoder in the housing of the variable-speed gear unit:

- M14x1 for VARIMOT® DF16/26, design with terminal strips in the terminal box
- M18x1 for VARIMOT® DF36/46, design with plug connector

Speed monitor and voltage encoder must be supplied and installed by the system operator.

5.5.2 Manufacturer's data

The following tables include the manufacturer's data.

WEXA/WEX speed monitor

Manufacturer:	PEPPERL+FUCHS
Type:	KFU8-UFC-Ex1.D
Auxiliary voltage:	DC 20 − 90 V AC 48 − 253 V
ATEX certification number:	TÜV 99 ATEX 1471

WEXA/WEX/IGEX voltage encoder for VARIMOT® D16/26

Manufacturer:	PEPPERL+FUCHS
Type:	NJ2-11-N-G according to DIN 19234 (NAMUR), 100 mm connection cable
Housing:	M14x1
ATEX certification number:	TÜV 99 ATEX 1471

WEXA/WEX/IGEX voltage encoder for VARIMOT® D36/46

Manufacturer:	PEPPERL+FUCHS
Type:	NJ5-18GM-N-V1 according to DIN 19234 (NAMUR), M12x1 plug-in connection
Housing:	M18x1
ATEX certification number:	TÜV 99 ATEX 1471

WEXA digital remote speed indication

Manufacturer:	Dr. E. Horn
Type:	HDA 4110-50
Display unit:	Digital
Line connection:	115 or 230 V, 50 − 60 Hz
Power consumption:	About 4.2 VA
Encoder connection:	With two-core cable, shielded

21242593/EN – 07/2015

5.6 WEXA/WEX speed monitor

INFORMATION

The speed monitor must be located outside the potentially explosive atmosphere.

INFORMATION

The following installation and setting notes refer to the speed monitor in WEXA/WEX design, specified in the manufacturer's data (see "Manufacturer's data (→ 🗎 32)").

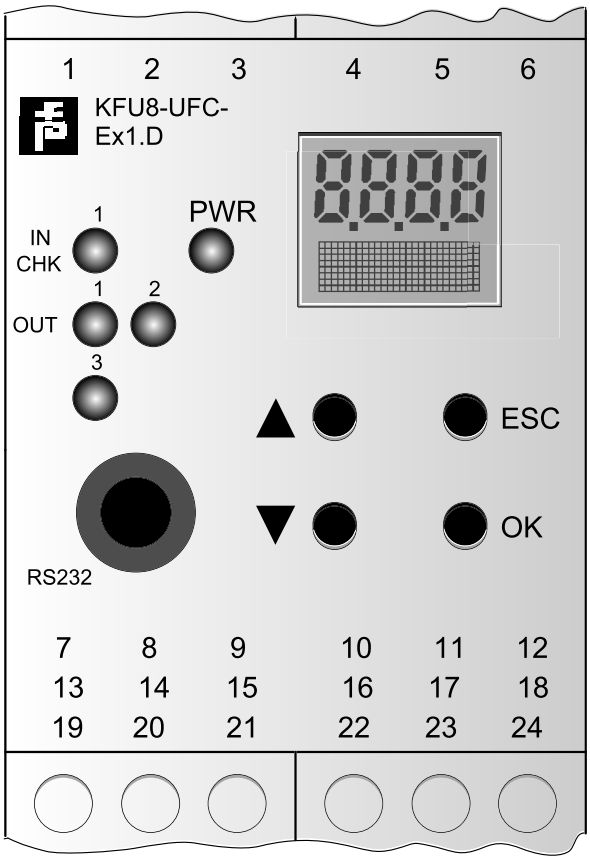
INFORMATION

In case the speed monitor included in the delivery deviates from the specified speed monitor for WEXA/WEX design, install it and start it up according to the manufacturer's documentation. In this case, refer to section "Installing and setting of deviating speed monitors (→ 🗎 44)" for information on determining the switching speed or switching frequency.

21242593/EN – 07/2015

5.6.1 Front side of the speed monitor

The following figure shows the front side of the speed monitor:



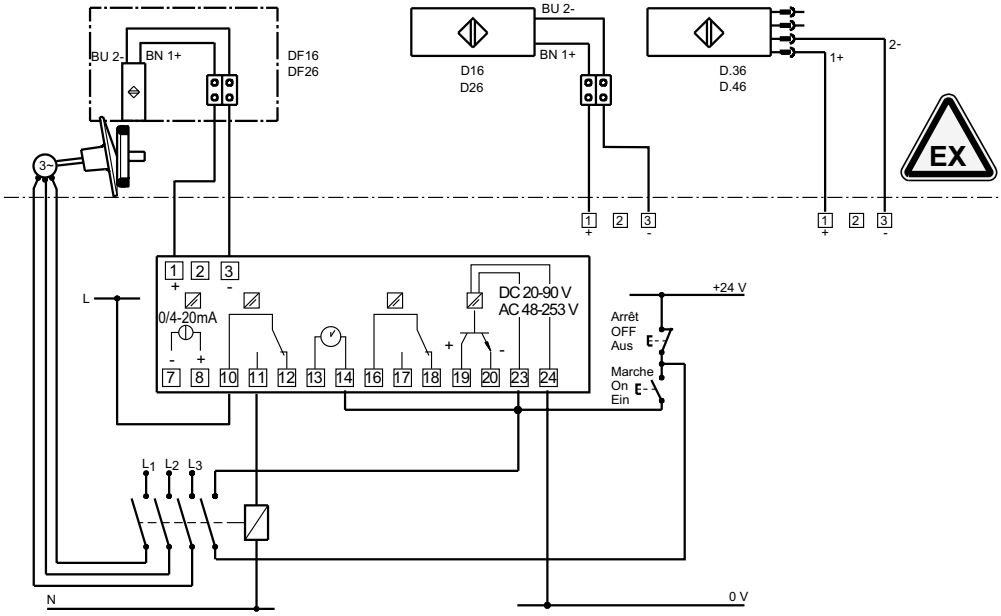
18702219

LED in CHK 1 (yellow/ red)	Input pulses (flashing yellow in sync) input malfunction (flashing red) device malfunction (continuously red)
LED PWR (green)	Voltage
LED OUT 1 (yellow)	Relay 1 active
LED OUT 2 (yellow)	Relay 2 active
LED OUT 3 (yellow)	Transistor active
RS232	The RS232 interface for connecting a PC for setting parameters and diagnosing the UFC with PACTware.
Display	For indicating measured values and faults in parameter assignment mode

21242593/EN – 07/2015

5.6.2 Installing and setting the speed monitor

The wiring diagram below shows possible wiring of the speed monitor:



12881391755

[1] Sensor +
[3] Sensor -
[10] Relay 1 (common wiring)
[11] Relay 1 (normally open contact)
[12] Relay 1 (normally closed contact)
[14] Startup bypass
[23] DC 24 V voltage supply, +
[24] DC 24 V voltage supply, -
[19] Auxiliary output for customer application, +
[20] Auxiliary output for customer application, -

INFORMATION

Relay 2 can be used for creating a warning signal or for machine control (terminal assignment 16 – 18).

Proceed as follows:

1. Read the operating instructions of the speed monitor manufacturer before you begin with the installation.
2. Connect the speed monitor.
3. Perform the basic setting of the speed monitor in accordance with the operating instructions of the speed monitor manufacturer.
   - ⇨ When the switching frequency or switching speed of the variable-speed gear unit falls below a limit value, the drive must switch off independently. For the limit values, refer to the table in chapter "VARIMOT® switching frequencies (→ 🗎 37)".
   - ⇨ The sensor built in the variable-speed gear unit generates two pulses per revolution of the variable-speed gear shaft.

NOTICE

Damages to the speed monitor when start bypass duration is longer than 3 seconds.

Damage to speed monitor.

- Perform the settings carefully.
- Check the settings via measurement.

NOTICE

Damages to the driving motor if the level falls below the switching speed of the variable-speed gear unit.

Damage to the driving motor.

- Immediately disconnect the driving motor from the supply voltage.
- Eliminate the failure.
- Before starting the variable-speed gear unit again, put it to standstill for at least 15 minutes. If incorrect operation by the operating personnel cannot be ruled out, install an automatic restart lock.
- In case of vibration or operating noises at the variable-speed gear unit after the restart, the friction ring has been damaged during the blockage. In this case, replace the friction ring (see "Replacing the friction ring (→ 🗎 49)").

21242593/EN – 07/2015

5.6.3 VARIMOT® switching frequencies

The following table shows the switching frequencies of the VARIMOT® variable-speed gear unit:

Variable speed gear unit type	Motor pole number	Motor frequency Hz	Switching speed 1/min	Switching frequency Hz	Pulses per revolution
D.16.	4	50	300	30.0	6
	6		194	19.4	
	8		150	15.0	
	4	60	375	37.5	6
	6		240	24.0	
	8		187	18.7	
D.26.	4	50	329	32.9	6
	6		211	21.1	
	8		159	15.9	
	4	60	403	40.3	6
	6		258	25.8	
	8		202	20.2	
D.36.	4	50	296	29.6	6
	6		194	19.4	
	8		142	14.2	
	4	60	356	35.6	6
	6		237	23.7	
	8		178	17.8	
D.46.	4	50	363	36.3	6
	6		243	24.3	
	8		183	18.3	
	4	60	441	44.1	6
	6		294	29.4	
	8		221	22.1	

5.7 Voltage encoder IGEX

Connect the voltage encoder to the WEX speed monitor as follows for:

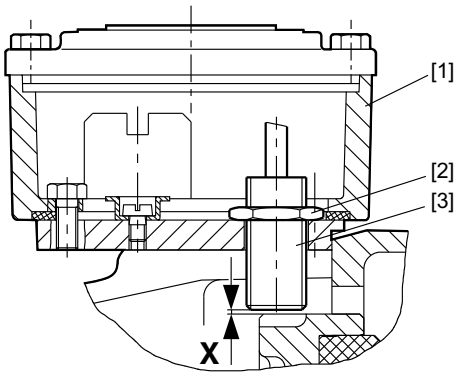
- VARIMOT® D.16/26 via terminal strips in the terminal box
- VARIMOT® D.36/46 via plug connector

5.7.1 Mount voltage encoder

The following figures illustrate the installation of the voltage encoder and the setting of the sensing distance x.

21242593/EN – 07/2015

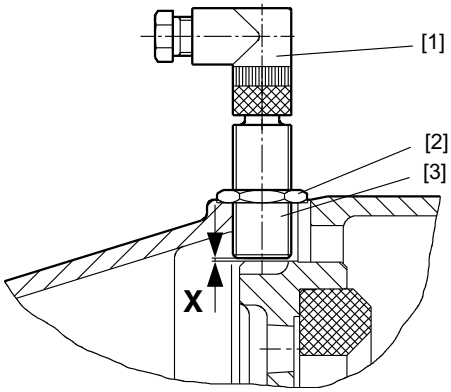
VARIMOT® D.16/26



12889666955

[1] terminal box
[2] Lock nut
[3] Voltage encoder

VARIMOT® D.36/46



12889670283

[1] Plug connector
[2] Lock nut
[3] Voltage encoder

Proceed as follows:

1. Rotate the output shaft of the variable speed gear unit until the machined casting surface of the friction ring carrier can be seen through the tapped hole in the gear unit housing.
2. Carefully screw the voltage encoder [3] into the thread of the gear unit housing, until it touches the friction ring carrier.
3. Turn back the voltage encoder [3] by 1 revolution. Tighten the voltage encoder using the lock nut [2]. The sensing distance X is now set as follows:

⇨ For VARIMOT® D16/26 to 1 mm

⇨ For VARIMOT® D36/46 to 2 mm

During operation, the voltage encoder supplies 6 pulses per revolution at this sensing distance.

21242593/EN – 07/2015

5.7.2 Changing sensing distance x

If no circuit state change occurs at the voltage encoder at the rotating variable-speed gear unit shaft, operating with the set switching interval, change the sensing distance:

NOTICE

Destruction of the voltage encoder by collision with turning recesses of the friction ring carrier.

Damage to the voltage encoder.

- Do not screw in the voltage encoder into the mounting bore further than:
  - 1/2 revolution for VARIMOT® D.16/26
  - 1 1/2 revolutions for VARIMOT® D.36/46

The circuit state change is indicated by the yellow LED on the front side of the speed monitor (see "Front side of the speed monitor (→ 🗎 34)").

- If the yellow LED on the speed monitor is constantly lit, turn the voltage encoder a half turn counterclockwise at a time and check to see if it is functioning.
- If the yellow LED on the speed monitor is not lit, turn the voltage encoder for 90° clockwise at a time:
  - For VARIMOT® D.16/26 max. 2 times
  - For VARIMOT® D.36/46 max. 6 times

INFORMATION

If no circuit state change occurs despite a changed sensing distance, check the voltage supply of the voltage encoder for WEXA/WEX design using the evaluation electronics.

21242593/EN – 07/2015

5.8 DA digital remote speed indication

INFORMATION

The contactless, digital remote speed indication must be located outside the potentially explosive area.

INFORMATION

The following installation and setting notes refer to the speed monitor in WEXA/WEX design and the remote speed indication in WEXA design, specified in the manufacturer's data (see "Manufacturer's data (→ 🗎 32)").

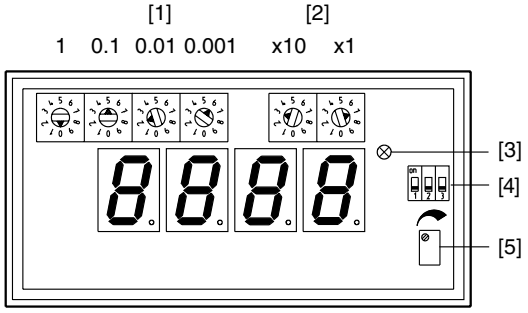
The digital remote speed indication with 4-digit display is connected to the speed monitor or the voltage encoder.

The digital remote speed indication is a time-based counter. The device is suitable for depicting all measured variables that derive from the frequency as measuring signal. The frequency can be present in form of pulses or AC voltage.

The input frequency (speed of the input shaft of the variable speed gear unit) can be assigned to the desired display at universally adjustable calibration values.

5.8.1 Front end of the digital remote speed indication

The following figure shows the front end of the digital remote speed indication:



4544974987

[1] Time base in s
[2] Pulse multiplier
[3] Pulse monitoring
[4] Decimal point setting
[5] Potentiometer "input sensitivity"

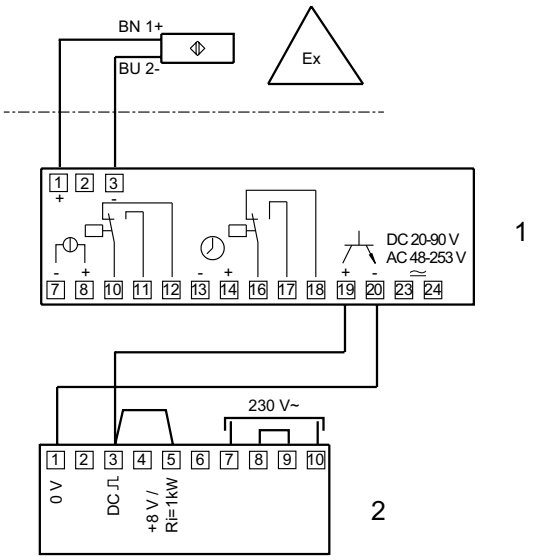
The calibration values can be set at the remote speed indication as follows:

Measuring interval (time base quartz)	Can be set in 0.001 s increments in the range of 0.010 s – 9.999 s after removing the front panel. Recommended measuring interval: 0.5 s – 2 s
Pulse multiplier	Can be set in increments in the range of 1 – 99 after removing the front panel.
Decimal point setting	Can be set via DIP switch after removing the front panel.
Indicating accuracy	±1 of last digit

21242593/EN – 07/2015

5.8.2 Installing and setting the digital remote speed indication

The following wiring diagram shows the digital remote speed indication at the pulse output of the speed monitor:



12672882699

[1] Speed monitor type KFU8-UFC-Ex1.D (PEPPERL+FUCHS)
[2] Digital remote speed indication type HDA 4110-50 (Dr. E. Horn)

Proceed as follows:

1. Connect the remote speed indication to the speed monitor according to the wiring diagram.
2. Provide a connection between terminals 3 and 5.
3. With an auxiliary voltage of AC 230 V, provide a connection between terminals 8 and 9.

NOTICE

Damages to the remote speed indication due to wrong connection of terminal 7 – 10 at an auxiliary voltage of AC 115 V.

Damage to the remote speed indication.

- With an auxiliary voltage of AC 115 V, the wiring of terminals 7 – 10 must be changed according to the manufacturer's documentation.

4. Set the measuring time. To calculate a suitable measuring time, apply the formula in chapter Calculating the measuring time (→ 🗎 42).
5. To set the input sensitivity, turn the potentiometer "input sensitivity" [5] to the right until the pulse monitoring light just lights up.

21242593/EN – 07/2015

5.8.3 Calculating the measuring time

To calculate the measuring time that is to be set at the remote speed indication, use the following formula:

$$M = \frac{60 \times A}{n \times k \times z \times f}$$

In the formula the following sizes are used:

M Measuring time, to be set at the remote speed indication

A Desired display of measured quantity at maximum speed. The display has 4 digits and no decimal point indication.

n Speed of the variable-speed gear units (see "VARIMOT® reference data (→ 🗎 42)")

k Pulse multiplier ≥ 1

z Pulse/revolution of the variable-speed gear units (see "VARIMOT® reference data (→ 🗎 42)")

f Calculation factor. The calculation factor is:

- With 50 Hz = 1
- With 60 Hz = 1.2

5.8.4 VARIMOT® reference data

The following table shows the reference speed of the VARIMOT® variable-speed gear unit:

Gear unit type and size	Pulses per revolution	VARIMOT® reference speed in 1/min		
		4-pole	6-pole	8-pole
D.16	6	1690	1065	833
D.26	6	1825	1200	885
D.36	6	1675	1080	825
D.46	6	1610	1073	850

21242593/EN – 07/2015

5.8.5 Calculation examples for measuring time

	Example 1		Example 2	
Drive	**R107R77D26/DA EDRE90L4**		**R107R77D26/DA EDRE90L4**	
Data (see "VARIMOT® reference data (→ 🗎 42)")	Output speed	n_a = 1.45 – 7.3 1/min	Output speed	n_a = 1.45 – 7.3 1/min
	Number of pulses	z = 6	Number of pulses	z = 6
	Maximum variable-speed gear unit speed	n = 1825 1/min	Maximum variable-speed gear unit speed	n = 1825 1/min
Required display	Output speed	A = 1.45 – 7.30 1/min	Belt velocity	A = 0.5 − 2.5 m/min
$M = \frac{60 \times A}{n \times k \times z \times f}$	$M = \frac{60 \times 7300}{1825 \times 1 \times 6 \times 1} = 40.00\,s$		$M = \frac{60 \times 2500}{1825 \times 1 \times 6 \times 1} = 13.69\,s$	
Recommended measuring time	0.5 - 2 s (max. 9,999 s)			
Calculation with new pulse multiplier	k = 50 $M = \frac{60 \times 7300}{1825 \times 50 \times 6 \times 1} = 0.800\,s$		k = 10 $M = \frac{60 \times 2500}{1825 \times 10 \times 6 \times 1} = 1.369\,s$	
Unit setting	M = measuring time	[0] [8] [0] [0]	M = measuring time	[1] [3] [6] [9]
	Pulse multiplier	[5] [0]	Pulse multiplier	[1] [0]
	Decimal point setting	1	Decimal point setting	1

21242593/EN – 07/2015

5.9 Installing and setting of deviating speed monitors

INFORMATION

Deviating speed monitors must feature an intrinsically safe sensor input (identification color: blue) for evaluation of sensors according to DIN 19234 (NAMUR) and be approved for use of this sensor in potentially explosive atmospheres.

INFORMATION

The voltage encoder (sensor) generally features a blue connection lead and must conform to DIN 19234 (NAMUR). The corresponding inspection number may be attached to the voltage encoder or the connection lead.

NOTICE

Damages to the driving motor if the level falls below the switching speed of the variable-speed gear unit.

Damage to the driving motor.

- Immediately disconnect the driving motor from the supply voltage.
- Eliminate the failure.
- Before starting the variable-speed gear unit again, put it to standstill for at least 15 minutes. If incorrect operation by the operating personnel cannot be ruled out, install an automatic restart lock.
- In case of vibration or operating noises at the variable-speed gear unit after the restart, the friction ring has been damaged during the blockage. In this case, replace the friction ring (see "Replacing the friction ring (→ 🗎 49)").

21242593/EN – 07/2015

6 Inspection/maintenance

6.1 General information

⚠ WARNING

Risk of crushing if the drive starts up unintentionally.

Severe or fatal injuries.

- Disconnect the gearmotor from the power supply before you start working on the unit.
- Prevent the gearmotor from starting up unintentionally (for example, by locking the key switch or removing the fuses from the current supply).
- Attach an information sign near the ON switch to warn that the gear unit is being worked on.

⚠ WARNING

Risk of burns due to hot gear unit.

Severe injuries.

- Let the gear unit cool off before beginning to work.

NOTICE

Damage to variable-speed gear unit due to improper inspection and maintenance work.

Damage to the variable-speed gear unit.

- Use only genuine spare parts in accordance with the valid spare parts list.
- Maintenance and repair work may only be performed by qualified personnel.
- It is important that you observe the notes in this chapter.

6.2 Inspection/maintenance work requirements

Observe if the following requirements are met before you start with inspection and maintenance work on the variable-speed gear unit:

- Before releasing shaft connections, be sure that there are no active shaft torsional moments present. This might lead to tension within the system.
- Prevent foreign particles from entering into the variable-speed gear unit during maintenance and inspection work.

21242593/EN – 07/2015

6.3 Required tools/resources

- Set of wrenches
- Hammer
- Drift and/or piercer
- Retaining ring pliers
- Lubricant

6.4 Inspection/maintenance intervals

INFORMATION

Strict adherence to the inspection and maintenance intervals is absolutely necessary to ensure operational safety and explosion protection.

The following table lists the inspection and maintenance intervals:

Time interval	What to do?
If required	Clean dust accumulations > 5 mm.
Weekly	Pass through the speed range.
Every 3000 hours of operation, at least every 6 months	• Check the rotational clearance (see "Checking the rotational clearance (→ 🖹 47)"). • Check the bearing, clean and grease the bearing if necessary. • Check the oil seals and replace them by original SEW-EURODRIVE spare parts in case of heavy wear (porous, brittle). Do not mount the new oil seal in the same track as the old one. • Check the running noise and the temperature of the rolling bearing (see "Measure temperature of rolling bearing (→ 🖹 50)"). • Check the interior of the variable speed gear unit and if remove existing dust accumulation.
Every 6000 operating hours	• Replace the friction ring (see "Replacing the friction ring (→ 🖹 49)").

21242593/EN – 07/2015

6.5 Cleaning the variable-speed gear unit

INFORMATION

When cleaning the gear unit, do not use materials or procedures (e.g. compressed air) that result in processes causing electrical charge on the coating.

NOTICE

Ingression of water at the sealing lip of the oil seal due to cleaning the variable-speed gear unit with a high-pressure cleaning device.

Damage to oil seals.

- Do not clean the variable-speed gear unit with a high-pressure cleaning device.

6.6 Painting the variable-speed gear unit

Repair any damage to the paint work (e.g. on the breather valve or the lifting eyes).

NOTICE

Ingress of paint at breather valve and sealing lips of the oil seal during painting or re-painting of the variable-speed gear unit.

Damage to oil seals.

- Thoroughly cover the breather valve and sealing lip of the oil seals with strips prior to painting.
- Remove the strips after painting.

6.7 Checking the rotational clearance

The rotational clearance of the input shaft is increased through wear of the friction ring.

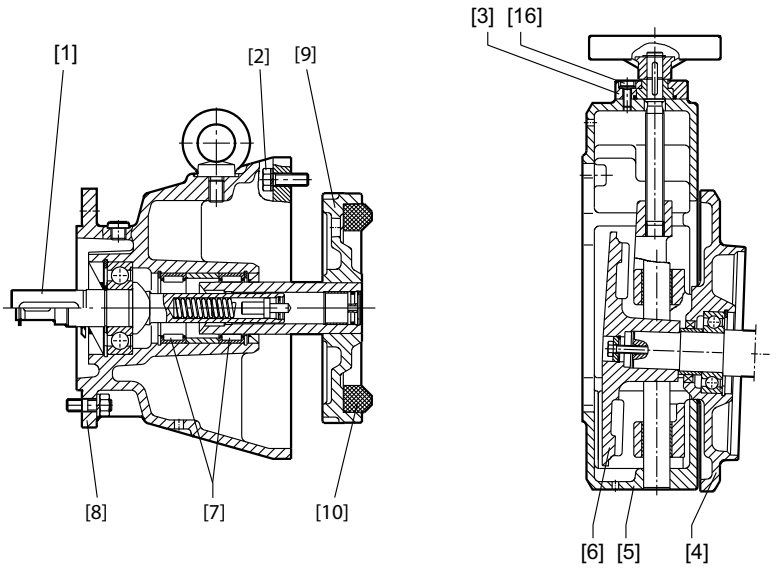
Proceed as follows:

1. Remove the fan guard of the driving motor.
2. Set the drive to a speed ratio of 1:1. This approximately equals the value 80 on the display scale of the position display.
3. Check the rotational clearance at the motor fan blade and at the fixed input shaft.
4. In case the rotational clearance is > 45°, check the friction ring (see "Checking the friction ring (→ 🗎 48).

21242593/EN – 07/2015

6.8 Checking the friction ring

The following figures shows the position of the friction ring in the VARIMOT®.

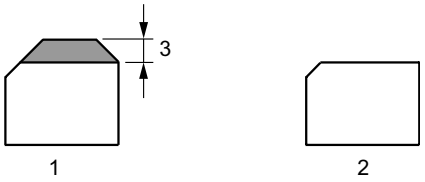


12894247819

[1]	Shaft	[5]	Housing cover	[9]	Hollow shaft
[2]	Retaining screws	[6]	Drive pulley	[10]	Friction ring
[3]	Flange	[7]	Needle roller bearing	[16]	Retaining screw
[4]	Adjusting plate	[8]	Housings		

Proceed as follows:

1. Loosen all retaining screws [2].
2. Separate the drive between the housing cover [5] and the housing [8].
3. Check the wear height of the friction ring [10]:



12894302347

[1]	New friction ring	[3]	Wear height (chamfer)
[2]	Worn friction ring		

⇨ If the chamfer is visible, the friction ring is intact.

⇨ If the chamfer is ground off or the friction ring is damaged, change the friction ring (see "Replacing the friction ring (→ 🗎 49)").

21242593/EN – 07/2015

6.9 Replacing the friction ring

INFORMATION

Use only genuine spare parts in accordance with the valid spare parts list.

Proceed as follows:

1. Disassemble the voltage encoder.
2. Remove the complete hollow shaft [9] from the housing.
3. Remove the friction ring [10] from hollow shaft using a hammer and drift/piercer.
4. Place the new friction ring on a clean, flat base.
5. Place the complete hollow shaft on the friction ring. Center the hollow shaft via the friction ring shoulder.
6. Press hollow shaft and friction ring together using slight pressure to the stop. If possible, use a hand lever press.
7. Regrease the needle roller bearing [7] with bearing grease.
8. Clean the following contact surfaces:
   - ⇨ On the friction ring, using dry paper or cloth
   - ⇨ On the drive pulley, using a degreasing cleaning agent
9. Push the complete hollow shaft with friction ring into the housing. Twist the parts until the cam curves mesh. Then do not turn the hollow shaft further.
10. Carefully put the housing and housing cover together. Tighten the screws.
11. Check the rotational clearance on the input shaft.
    - ⇨ When you notice a slight rotational clearance, the assembly was performed correctly.
12. Mount the voltage encoder.
13. Switch on the variable-speed gearmotor.
14. Slowly move through the speed range.

⇨ When the drive runs without noise and vibration, the assembly was performed correctly.

⇨ If the drive does not run smoothly and evenly, check the correct installation of the drive.

21242593/EN – 07/2015

6.10 Measure temperature of rolling bearing

⚠ WARNING

Risk of crushing if the drive starts up unintentionally.

Severe or fatal injuries.

- Disconnect the gearmotor from the power supply before you start working on the unit.
- Prevent the gearmotor from starting up unintentionally (for example, by locking the key switch or removing the fuses from the current supply).
- Attach an information sign near the ON switch to warn that the gear unit is being worked on.

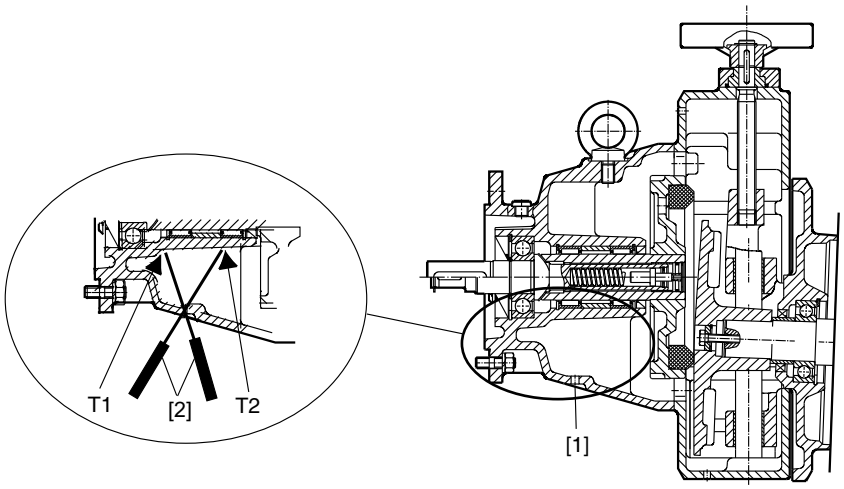
INFORMATION

To ensure safe working conditions and explosion protection, it is necessary that the temperature of the rolling bearing does not exceed 100 °C at test points.

- If the permitted temperature of the rolling bearing is exceeded, replace the affected rolling bearing.

INFORMATION

The temperature of the rolling bearing can be measured with a commercially available temperature probe. To insert the temperature probe into the condensation drain hole, a probe with a maximum diameter of 4 mm can be used.



12894558475

[1] Condensation drain hole
[2] Temperature probe
T1/T2 Measuring points

Depending on the type of variable speed gear unit, the condensation drain hole has the following diameter:

Variable speed gear unit type	Condensation drain hole Ø in mm
D.16	6.6
D.26	9
D.36	6

21242593/EN – 07/2015

Variable speed gear unit type	Condensation drain hole Ø in mm
D.46	6

Proceed as follows:

✓ The variable-speed gear unit is at standstill.

1. Insert the temperature measuring probe [2] through the condensation drain hole [1] directly after the variable speed gear unit has stopped.
2. Measure the bearing temperature at test points T1 and T2.

⇨ If the bearing temperature is > 100 °C at one of the measuring points, replace the affected rolling bearing.

6.11 Completing inspection and maintenance

Proceed as follows:

1. Check to see if the variable-speed gear unit is correctly assembled.
2. Check to see if all openings are carefully sealed.
3. Perform a safety and functional check.

21242593/EN – 07/2015

7 Operation and service

7.1 General information

⚠ WARNING

Risk of crushing if the drive starts up unintentionally.

Severe or fatal injuries.

- Disconnect the gearmotor from the power supply before you start working on the unit.
- Prevent the gearmotor from starting up unintentionally (for example, by locking the key switch or removing the fuses from the current supply).
- Attach an information sign near the ON switch to warn that the gear unit is being worked on.

NOTICE

Damage to variable-speed gear unit due to improper operation and service work.

Damage to the variable-speed gear unit.

- Use only genuine spare parts in accordance with the valid spare parts list.
- It is important that you observe the notes in this chapter.

7.2 Customer service

Have the following information available when you require assistance from the SEW-EURODRIVE service:

- Complete nameplate data.
- Type and extent of the failure.
- Time the failure occurred and any accompanying circumstances.
- Presumed cause.

If possible, take a digital picture of the failure.

21242593/EN – 07/2015

7.3 Interferences of VARIMOT® variable-speed gear units

Fault	Possible cause	Measure
Drive slips or speed monitoring is triggered.	• Friction ring is worn. • Friction ring or drive pulley contact surface is contaminated. • Load is too high.	• Replacing the friction ring. Cleaning the contaminated part: • Clean the friction ring with dry cloth or paper. • Clean the drive pulley with solvent or similar product. • Check drawn power and reduce to catalog values.
Drive heats up excessively.	• Load is too high.	• Check drawn power and reduce to catalog values.
Drive is too loud.	• Friction ring is damaged. Damage can occur after brief blocking or impulsive load of the drive, for example.	• Eliminate the cause. • Replacing the friction ring.
Meshing/grinding noise.	• Bearing damage.	• Change bearing (call service).
Nominal motor power is not transferred.	• Speed range too low.	• Increase speed range.

7.4 Interference at the WEXA/WEX speed monitor

Fault	Possible cause	Measure
No function of the voltage encoder.	• Voltage encoder is not properly connected.	Check voltage supply of voltage encoder using the evaluation electronics. With correct voltage supply: • Note the manufacturer's documentation. • Voltage encoder is not suitable for connection to the evaluation electronics (IGEX design). • Replace voltage encoder.
LED on voltage encoder is not lit or is lit constantly.	• Sensing distance is too large or too small.	• Set sensing distance.
No display.	• Device is not connected properly. • Voltage supply is missing or interrupted.	• Connect device correctly according to wiring diagram. • Check voltage supply according to wiring diagram.
Incorrect display.	• Display not adjusted properly.	• Check settings.

21242593/EN – 07/2015

7.5 Waste disposal

Dispose gear units in accordance with the material structure and the regulations in force.

- Dispose of housing parts, gear wheels, shafts and rolling bearings as steel scrap.
- Parts of the worm gears are made of non-ferrous metals. Dispose of the worm gears appropriately.
- Dispose of used oil according to the regulations in force.

21242593/EN – 07/2015

8 Declarations of conformity [EX]

8.1 Declaration of conformity for variable-speed gear unit of category 2G

EC Declaration of Conformity

Translation of the original text **900620210**

SEW-EURODRIVE GmbH & Co KG
Ernst-Blickle-Straße 42, D-76646 Bruchsal

declares under sole responsibility that the

Gear units of the series	**VARIMOT® D or DF**	
variant	**/II2G**	
Category	**2G**	
Designation	**II 2G c T3 or** **II 2G c T3 X** **II 2G c T4 or** **II 2G c T4 X**	
are in conformity with		
ATEX Directive	**94/9/EC**	**2)**
Applied harmonized standards:	**EN 13463-1:2009** **EN 13463-5:2011**	

2) SEW-EURODRIVE lodges the documents required by 94/9/EC, appendix VIII, with the notified body: FSA GmbH, EU ID No.: 0588

Bruchsal	**04.12.2014**	Johann Soder	
Place	Date	Managing Director Technology	a) b)

a) Authorized representative for issuing this declaration on behalf of the manufacturer
b) Authorized representative for compiling the technical documents with same address as manufacturer

21242593/EN – 07/2015

8.2 Declaration of conformity for variable-speed gear units of categories 3G and 3D

EC Declaration of Conformity

Translation of the original text **900600110**

SEW-EURODRIVE GmbH & Co KG
Ernst-Blickle-Straße 42, D-76646 Bruchsal

declares under sole responsibility that the

Gear units of the series	**VARIMOT® D or DF**
variant	**/II3G or /II3D**
Category	**3G or 3D**
Designation	**II 3G c T3 or II 3G c T3 X II 3D c T200°C or II 3D c T200°C X**
are in conformity with	
ATEX Directive	**94/9/EC**
Applied harmonized standards:	**EN 13463-1:2009 EN 13463-5:2011**

Bruchsal	**31.07.2014**	Johann Soder	
Place	Date	Managing Director Technology	a) b)

a) Authorized representative for issuing this declaration on behalf of the manufacturer
b) Authorized representative for compiling the technical documents with same address as manufacturer

21242593/EN – 07/2015

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21242593/EN – 07/2015

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21242593/EN – 07/2015

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21242593/EN – 07/2015

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Drive Center	Berlin	SEW-EURODRIVE GmbH & Co KG Alexander-Meißner-Straße 44 D-12526 Berlin	Tel. +49 306331131-30 Fax +49 306331131-36 dc-berlin@sew-eurodrive.de
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21242593/EN – 07/2015

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	Drive Service Hotline / 24 Hour Service		Tel. 01924 896911
Greece			
Sales	Athens	Christ. Boznos & Son S.A. 12, K. Mavromichali Street P.O. Box 80136 GR-18545 Piraeus	Tel. +30 2 1042 251-34 Fax +30 2 1042 251-59 http://www.boznos.gr info@boznos.gr
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Indonesia			
Sales	Jakarta	PT. Cahaya Sukses Abadi Komplek Rukan Puri Mutiara Blok A no 99, Sunter Jakarta 14350	Tel. +62 21 65310599 Fax +62 21 65310600 csajkt@cbn.net.id
	Jakarta	PT. Agrindo Putra Lestari JL.Pantai Indah Selatan, Komplek Sentra Industri Terpadu, Pantai indah Kapuk Tahap III, Blok E No. 27 Jakarta 14470	Tel. +62 21 2921-8899 Fax +62 21 2921-8988 aplindo@indosat.net.id http://www.aplindo.com
	Medan	PT. Serumpun Indah Lestari Jl.Pulau Solor no. 8, Kawasan Industri Medan II Medan 20252	Tel. +62 61 687 1221 Fax +62 61 6871429 / +62 61 6871458 / +62 61 30008041 sil@serumpunindah.com serumpunindah@yahoo.com http://www.serumpunindah.com
	Surabaya	PT. TRIAGRI JAYA ABADI Jl. Sukosemolo No. 63, Galaxi Bumi Permai G6 No. 11 Surabaya 60111	Tel. +62 31 5990128 Fax +62 31 5962666 sales@triagri.co.id http://www.triagri.co.id
	Surabaya	CV. Multi Mas Jl. Raden Saleh 43A Kav. 18 Surabaya 60174	Tel. +62 31 5458589 Fax +62 31 5317220 sianhwa@sby.centrin.net.id http://www.cvmultimas.com

21242593/EN – 07/2015

Ireland			
Sales Service	Dublin	Alperton Engineering Ltd. 48 Moyle Road Dublin Industrial Estate Glasnevin, Dublin 11	Tel. +353 1 830-6277 Fax +353 1 830-6458 http://www.alperton.ie info@alperton.ie
Israel			
Sales	Tel Aviv	Liraz Handasa Ltd. Ahofer Str 34B / 228 58858 Holon	Tel. +972 3 5599511 Fax +972 3 5599512 http://www.liraz-handasa.co.il office@liraz-handasa.co.il
Italy			
Assembly Sales Service	Solaro	SEW-EURODRIVE di R. Blickle & Co.s.a.s. Via Bernini,14 I-20020 Solaro (Milano)	Tel. +39 02 96 9801 Fax +39 02 96 79 97 81 http://www.sew-eurodrive.it sewit@sew-eurodrive.it
Ivory Coast			
Sales	Abidjan	SEW-EURODRIVE SARL Ivory Coast Rue des Pècheurs, Zone 3 26 BP 916 Abidjan 26	Tel. +225 21 21 81 05 Fax +225 21 25 30 47 info@sew-eurodrive.ci http://www.sew-eurodrive.ci
Japan			
Assembly Sales Service	Iwata	SEW-EURODRIVE JAPAN CO., LTD 250-1, Shimoman-no, Iwata Shizuoka 438-0818	Tel. +81 538 373811 Fax +81 538 373814 http://www.sew-eurodrive.co.jp sewjapan@sew-eurodrive.co.jp hamamatsu@sew-eurodrive.co.jp
Kazakhstan			
Sales	Almaty	SEW-EURODRIVE LLP 291-291A, Tole bi street 050031, Almaty	Tel. +7 (727) 350 5156 Fax +7 (727) 350 5156 http://www.sew-eurodrive.kz sew@sew-eurodrive.kz
	Tashkent	SEW-EURODRIVE LLP Representative office in Uzbekistan 96A, Sharaf Rashidov street, Tashkent, 100084	Tel. +998 71 2359411 Fax +998 71 2359412 http://www.sew-eurodrive.uz sew@sew-eurodrive.uz
	Ulaanbaatar	SEW-EURODRIVE LLP Representative office in Mongolia Suite 407, Tushig Centre Seoul street 23, Sukhbaatar district, Ulaanbaatar 14250	Tel. +976-77109997 Fax +976-77109997 http://www.sew-eurodrive.mn sew@sew-eurodrive.mn
Kenya			
is supported by Tanzania.			
Latvia			
Sales	Riga	SIA Alas-Kuul Katlakalna 11C LV-1073 Riga	Tel. +371 6 7139253 Fax +371 6 7139386 http://www.alas-kuul.lv info@alas-kuul.com
Lebanon			
Sales Lebanon	Beirut	Gabriel Acar & Fils sarl B. P. 80484 Bourj Hammoud, Beirut	Tel. +961 1 510 532 Fax +961 1 494 971 ssacar@inco.com.lb
Sales / Jordan / Kuwait / Saudi Arabia / Syria	Beirut	Middle East Drives S.A.L. (offshore) Sin El Fil. B. P. 55-378 Beirut	Tel. +961 1 494 786 Fax +961 1 494 971 http://www.medrives.com info@medrives.com

21242593/EN – 07/2015

Lithuania			
Sales	Alytus	UAB Irseva Statybininku 106C LT-63431 Alytus	Tel. +370 315 79204 Fax +370 315 56175 http://www.sew-eurodrive.lt irmantas@irseva.lt
Luxembourg			
Assembly Sales Service	Brussels	SEW-EURODRIVE n.v./s.a. Researchpark Haasrode 1060 Evenementenlaan 7 BE-3001 Leuven	Tel. +32 16 386-311 Fax +32 16 386-336 http://www.sew-eurodrive.lu info@sew-eurodrive.be
Macedonia			
Sales	Skopje	Boznos DOOEL Dime Anicin 2A/7A 1000 Skopje	Tel. +389 23256553 Fax +389 23256554 http://www.boznos.mk
Madagascar			
Sales	Antananarivo	Ocean Trade BP21bis. Andraharo Antananarivo 101 Madagascar	Tel. +261 20 2330303 Fax +261 20 2330330 oceantrabp@moov.mg
Malaysia			
Assembly Sales Service	Johor	SEW-EURODRIVE SDN BHD No. 95, Jalan Seroja 39, Taman Johor Jaya 81000 Johor Bahru, Johor West Malaysia	Tel. +60 7 3549409 Fax +60 7 3541404 sales@sew-eurodrive.com.my
Mexiko			
Assembly Sales Service	Quéretaro	SEW-EURODRIVE MEXICO SA DE CV SEM-981118-M93 Tequisquiapan No. 102 Parque Industrial Quéretaro C.P. 76220 Quéretaro, México	Tel. +52 442 1030-300 Fax +52 442 1030-301 http://www.sew-eurodrive.com.mx scmexico@seweurodrive.com.mx
Mongolia			
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Morocco			
Sales Service	Mohammedia	SEW-EURODRIVE SARL 2 bis, Rue Al Jahid 28810 Mohammedia	Tel. +212 523 32 27 80/81 Fax +212 523 32 27 89 http://www.sew-eurodrive.ma sew@sew-eurodrive.ma
Namibia			
Sales	Swakopmund	DB Mining & Industrial Services Einstein Street Strauss Industrial Park Unit1 Swakopmund	Tel. +264 64 462 738 Fax +264 64 462 734 anton@dbminingnam.com
Netherlands			
Assembly Sales Service	Rotterdam	SEW-EURODRIVE B.V. Industrieweg 175 NL-3044 AS Rotterdam Postbus 10085 NL-3004 AB Rotterdam	Tel. +31 10 4463-700 Fax +31 10 4155-552 Service: 0800-SEWHELP http://www.sew-eurodrive.nl info@sew-eurodrive.nl
New Zealand			
Assembly Sales Service	Auckland	SEW-EURODRIVE NEW ZEALAND LTD. P.O. Box 58-428 82 Greenmount drive East Tamaki Auckland	Tel. +64 9 2745627 Fax +64 9 2740165 http://www.sew-eurodrive.co.nz sales@sew-eurodrive.co.nz

21242593/EN – 07/2015

New Zealand			
	Christchurch	SEW-EURODRIVE NEW ZEALAND LTD. 30 Lodestar Avenue, Wigram Christchurch	Tel. +64 3 384-6251 Fax +64 3 384-6455 sales@sew-eurodrive.co.nz
Nigeria			
Sales	Lagos	EISNL Engineering Solutions and Drives Ltd Plot 9, Block A, Ikeja Industrial Estate (Ogba Scheme) Adeniyi Jones St. End Off ACME Road, Ogba, Ikeja, Lagos	Tel. +234 1 217 4332 http://www.eisnl.com team.sew@eisnl.com
Norway			
Assembly Sales Service	Moss	SEW-EURODRIVE A/S Solgaard skog 71 N-1599 Moss	Tel. +47 69 24 10 20 Fax +47 69 24 10 40 http://www.sew-eurodrive.no sew@sew-eurodrive.no
Pakistan			
Sales	Karachi	Industrial Power Drives Al-Fatah Chamber A/3, 1st Floor Central Commercial Area, Sultan Ahmed Shah Road, Block 7/8, Karachi	Tel. +92 21 452 9369 Fax +92-21-454 7365 seweurodrive@cyber.net.pk
Paraguay			
Sales	Fernando de la Mora	SEW-EURODRIVE PARAGUAY S.R.L De la Victoria 112, Esquina nueva Asunción Departamento Central Fernando de la Mora, Barrio Bernardino	Tel. +595 991 519695 Fax +595 21 3285539 sewpy@sew-eurodrive.com.py
Peru			
Assembly Sales Service	Lima	SEW EURODRIVE DEL PERU S.A.C. Los Calderos, 120-124 Urbanizacion Industrial Vulcano, ATE, Lima	Tel. +51 1 3495280 Fax +51 1 3493002 http://www.sew-eurodrive.com.pe sewperu@sew-eurodrive.com.pe
Philippines			
Sales	Makati	P.T. Cerna Corporation 4137 Ponte St., Brgy. Sta. Cruz Makati City 1205	Tel. +63 2 519 6214 Fax +63 2 890 2802 mech_drive_sys@ptcerna.com http://www.ptcerna.com
Poland			
Assembly Sales Service	Łódź	SEW-EURODRIVE Polska Sp.z.o.o. ul. Techniczna 5 PL-92-518 Łódź	Tel. +48 42 293 00 00 Fax +48 42 293 00 49 http://www.sew-eurodrive.pl sew@sew-eurodrive.pl
	Service	Tel. +48 42 293 0030 Fax +48 42 293 0043	24 Hour Service Tel. +48 602 739 739 (+48 602 SEW SEW) serwis@sew-eurodrive.pl
Portugal			
Assembly Sales Service	Coimbra	SEW-EURODRIVE, LDA. Av. da Fonte Nova, n.º 86 P-3050-379 Mealhada	Tel. +351 231 20 9670 Fax +351 231 20 3685 http://www.sew-eurodrive.pt infosew@sew-eurodrive.pt
Romania			
Sales Service	Bucharest	Sialco Trading SRL str. Brazilia nr. 36 011783 Bucuresti	Tel. +40 21 230-1328 Fax +40 21 230-7170 sialco@sialco.ro
Russia			
Assembly Sales Service	St. Petersburg	ZAO SEW-EURODRIVE P.O. Box 36 RUS-195220 St. Petersburg	Tel. +7 812 3332522 / +7 812 5357142 Fax +7 812 3332523 http://www.sew-eurodrive.ru sew@sew-eurodrive.ru

21242593/EN – 07/2015

Sambia

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Senegal

Sales	Dakar	SENEMECA Mécanique Générale Km 8, Route de Rufisque B.P. 3251, Dakar	Tel. +221 338 494 770 Fax +221 338 494 771 http://www.senemeca.com senemeca@senemeca.sn

Serbia

Sales	Belgrade	DIPAR d.o.o. Ustanicka 128a PC Košum, IV floor SRB-11000 Beograd	Tel. +381 11 347 3244 / +381 11 288 0393 Fax +381 11 347 1337 office@dipar.rs

Singapore

Assembly Sales Service	Singapore	SEW-EURODRIVE PTE. LTD. No 9, Tuas Drive 2 Jurong Industrial Estate Singapore 638644	Tel. +65 68621701 Fax +65 68612827 http://www.sew-eurodrive.com.sg sewsingapore@sew-eurodrive.com

Slovakia

Sales	Bratislava	SEW-Eurodrive SK s.r.o. Rybničná 40 SK-831 06 Bratislava	Tel.+421 2 33595 202, 217, 201 Fax +421 2 33595 200 http://www.sew-eurodrive.sk sew@sew-eurodrive.sk
	Košice	SEW-Eurodrive SK s.r.o. Slovenská ulica 26 SK-040 01 Košice	Tel. +421 55 671 2245 Fax +421 55 671 2254 Mobile +421 907 671 976 sew@sew-eurodrive.sk

Slovenia

Sales Service	Celje	Pakman - Pogonska Tehnika d.o.o. UI. XIV. divizije 14 SLO - 3000 Celje	Tel. +386 3 490 83-20 Fax +386 3 490 83-21 pakman@siol.net

South Africa

Assembly Sales Service	Johannesburg	SEW-EURODRIVE (PROPRIETARY) LIMITED Eurodrive House Cnr. Adcock Ingram and Aerodrome Roads Aeroton Ext. 2 Johannesburg 2013 P.O.Box 90004 Bertsham 2013	Tel. +27 11 248-7000 Fax +27 11 248-7289 http://www.sew.co.za info@sew.co.za
	Cape Town	SEW-EURODRIVE (PROPRIETARY) LIMITED Rainbow Park Cnr. Racecourse & Omuramba Road Montague Gardens Cape Town P.O.Box 36556 Chempet 7442	Tel. +27 21 552-9820 Fax +27 21 552-9830 Telex 576 062 bgriffiths@sew.co.za
	Durban	SEW-EURODRIVE (PROPRIETARY) LIMITED 48 Prospecton Road Isipingo Durban P.O. Box 10433, Ashwood 3605	Tel. +27 31 902 3815 Fax +27 31 902 3826 cdejager@sew.co.za
	Nelspruit	SEW-EURODRIVE (PROPRIETARY) LIMITED 7 Christie Crescent Vintonia P.O.Box 1942 Nelspruit 1200	Tel. +27 13 752-8007 Fax +27 13 752-8008 robermeyer@sew.co.za

South Korea

Assembly Sales Service	Ansan	SEW-EURODRIVE KOREA CO., LTD. 7, Dangjaengi-ro, Danwon-gu, Ansan-si, Gyeonggi-do, Zip 425-839	Tel. +82 31 492-8051 Fax +82 31 492-8056 http://www.sew-eurodrive.kr master.korea@sew-eurodrive.com

21242593/EN – 07/2015

South Korea			
	Busan	SEW-EURODRIVE KOREA CO., LTD. 28, Noksansandan 262-ro 50beon-gil, Gangseo-gu, Busan, Zip 618-820	Tel. +82 51 832-0204 Fax +82 51 832-0230
Spain			
Assembly Sales Service	Bilbao	SEW-EURODRIVE ESPAÑA, S.L. Parque Tecnológico, Edificio, 302 E-48170 Zamudio (Vizcaya)	Tel. +34 94 43184-70 Fax +34 94 43184-71 http://www.sew-eurodrive.es sew.spain@sew-eurodrive.es
Sri Lanka			
Sales	Colombo	SM International (Pte) Ltd 254, Galle Raod Colombo 4, Sri Lanka	Tel. +94 1 2584887 Fax +94 1 2582981
Swaziland			
Sales	Manzini	C G Trading Co. (Pty) Ltd PO Box 2960 Manzini M200	Tel. +268 2 518 6343 Fax +268 2 518 5033 engineering@cgtrading.co.sz
Sweden			
Assembly Sales Service	Jönköping	SEW-EURODRIVE AB Gnejsvägen 6-8 S-55 303 Jönköping Box 3100 S-55 003 Jönköping	Tel. +46 36 34 42 00 Fax +46 36 34 42 80 http://www.sew-eurodrive.se jonkoping@sew.se
Switzerland			
Assembly Sales Service	Basel	Alfred Imhof A.G. Jurastrasse 10 CH-4142 Münchenstein bei Basel	Tel. +41 61 417 1717 Fax +41 61 417 1700 http://www.imhof-sew.ch info@imhof-sew.ch
Taiwan			
Sales	Taipei	Ting Shou Trading Co., Ltd. 6F-3, No. 267, Sec. 2 Tung Huw S. Road Taipei	Tel. +886 2 27383535 Fax +886 2 27368268 Telex 27 245 sewtwn@ms63.hinet.net http://www.tingshou.com.tw
	Nan Tou	Ting Shou Trading Co., Ltd. No. 55 Kung Yeh N. Road Industrial District Nan Tou 540	Tel. +886 49 255353 Fax +886 49 257878 sewtwn@ms63.hinet.net http://www.tingshou.com.tw
Tanzania			
Sales	Daressalam	SEW-EURODRIVE PTY LIMITED TANZANIA Plot 52, Regent Estate PO Box 106274 Dar Es Salaam	Tel. +255 0 22 277 5780 Fax +255 0 22 277 5788 http://www.sew-eurodrive.co.tz central.mailbox@sew.co.tz
Thailand			
Assembly Sales Service	Chonburi	SEW-EURODRIVE (Thailand) Ltd. 700/456, Moo.7, Donhuaroh Muang Chonburi 20000	Tel. +66 38 454281 Fax +66 38 454288 sewthailand@sew-eurodrive.com
Tunisia			
Sales	Tunis	T. M.S. Technic Marketing Service Zone Industrielle Mghira 2 Lot No. 39 2082 Fouchana	Tel. +216 79 40 88 77 Fax +216 79 40 88 66 http://www.tms.com.tn tms@tms.com.tn
Turkey			
Assembly Sales Service	Kocaeli-Gebze	SEW-EURODRİVE Hareket Sistemleri San. Ve TIC. Ltd. Sti Gebze Organize Sanayi Böl. 400 Sok No. 401 41480 Gebze Kocaeli	Tel. +90 262 9991000 04 Fax +90 262 9991009 http://www.sew-eurodrive.com.tr sew@sew-eurodrive.com.tr

21242593/EN – 07/2015

Ukraine			
Assembly Sales Service	Dnipropetrovsk	ООО «СЕВ-Евродрайв» ул.Рабочая, 23-В, офис 409 49008 Днепропетровск	Tel. +380 56 370 3211 Fax +380 56 372 2078 http://www.sew-eurodrive.ua sew@sew-eurodrive.ua
United Arab Emirates			
Sales Service	Sharjah	Copam Middle East (FZC) Sharjah Airport International Free Zone P.O. Box 120709 Sharjah	Tel. +971 6 5578-488 Fax +971 6 5578-499 copam_me@eim.ae
Uruguay			
Assembly Sales	Montevideo	SEW-EURODRIVE Uruguay, S. A. Jose Serrato 3569 Esqina Corumbe CP 12000 Montevideo	Tel. +598 2 21181-89 Fax +598 2 21181-90 sewuy@sew-eurodrive.com.uy
USA			
Production Assembly Sales Service	Southeast Region	SEW-EURODRIVE INC. 1295 Old Spartanburg Highway P.O. Box 518 Lyman, S.C. 29365	Tel. +1 864 439-7537 Fax Sales +1 864 439-7830 Fax Production +1 864 439-9948 Fax Assembly +1 864 439-0566 Fax Confidential/HR +1 864 949-5557 http://www.seweurodrive.com cslyman@seweurodrive.com
Assembly Sales Service	Northeast Region	SEW-EURODRIVE INC. Pureland Ind. Complex 2107 High Hill Road, P.O. Box 481 Bridgeport, New Jersey 08014	Tel. +1 856 467-2277 Fax +1 856 845-3179 csbridgeport@seweurodrive.com
	Midwest Region	SEW-EURODRIVE INC. 2001 West Main Street Troy, Ohio 45373	Tel. +1 937 335-0036 Fax +1 937 332-0038 cstroy@seweurodrive.com
	Southwest Region	SEW-EURODRIVE INC. 3950 Platinum Way Dallas, Texas 75237	Tel. +1 214 330-4824 Fax +1 214 330-4724 csdallas@seweurodrive.com
	Western Region	SEW-EURODRIVE INC. 30599 San Antonio St. Hayward, CA 94544	Tel. +1 510 487-3560 Fax +1 510 487-6433 cshayward@seweurodrive.com
	Additional addresses for service in USA provided on request!		
Uzbekistan			
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Venezuela			
Assembly Sales Service	Valencia	SEW-EURODRIVE Venezuela S.A. Av. Norte Sur No. 3, Galpon 84-319 Zona Industrial Municipal Norte Valencia, Estado Carabobo	Tel. +58 241 832-9804 Fax +58 241 838-6275 http://www.sew-eurodrive.com.ve ventas@sew-eurodrive.com.ve sewfinanzas@cantv.net
Vietnam			
Sales	Ho Chi Minh City	Nam Trung Co., Ltd Huế - South Vietnam / Construction Materials 250 Binh Duong Avenue, Thu Dau Mot Town, Binh Duong Province HCM office: 91 Tran Minh Quyen Street District 10, Ho Chi Minh City	Tel. +84 8 8301026 Fax +84 8 8392223 khanh-nguyen@namtrung.com.vn http://www.namtrung.com.vn
	Hanoi	MICO LTD Quảng Trị - North Vietnam / All sectors except Construction Materials 8th Floor, Ocean Park Building, 01 Dao Duy Anh St, Ha Noi, Viet Nam	Tel. +84 4 39386666 Fax +84 4 3938 6888 nam_ph@micogroup.com.vn http://www.micogroup.com.vn

21242593/EN – 07/2015

Index

C

D

E

F

I

M

N

O

P

R

21242593/EN – 07/15

S

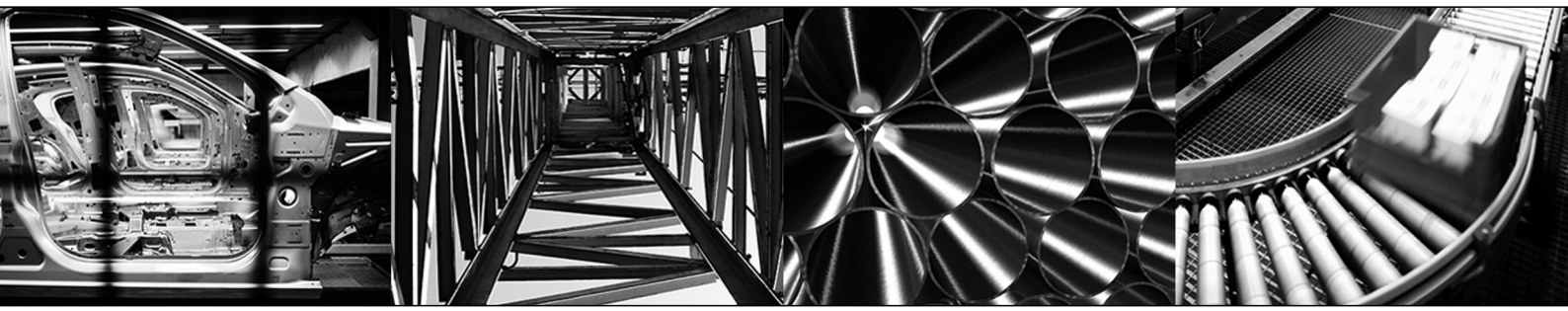
T

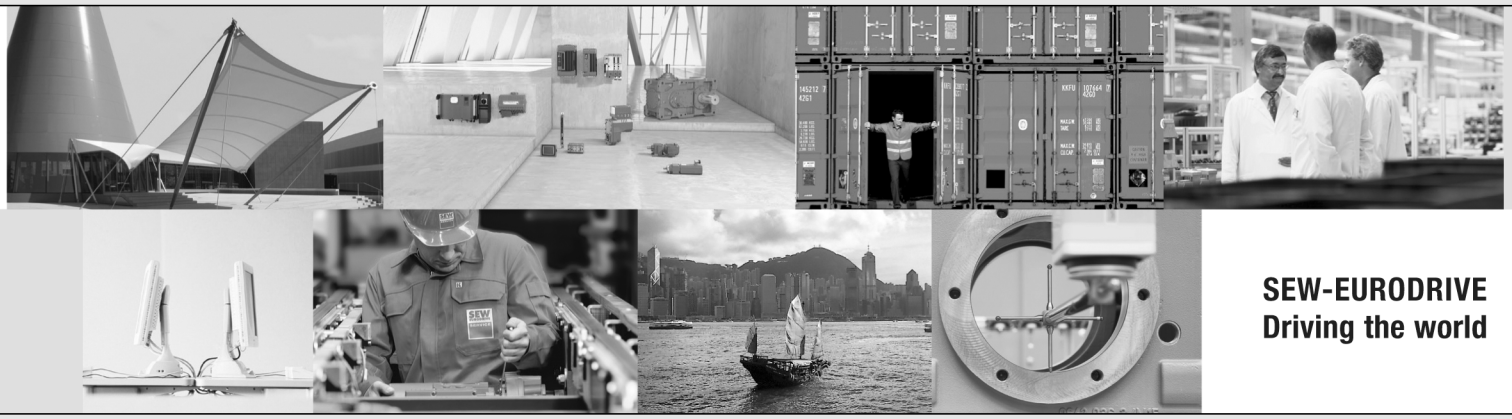
U

V

W

21242593/EN – 07/15





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