SEW
EURODRIVE

Manual

Diagnostic Unit Vibration

DUV40A

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1 General information

1.1 About this documentation

The documentation at hand is the original.

This documentation is an integral part of the product. The documentation is intended for all employees who perform work on the product.

Make sure this documentation is accessible and legible. Ensure that persons responsible for the systems and their operation as well as persons who work on the product independently have read through the documentation carefully and understood it. If you are unclear about any of the information in this documentation or if you 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 product or its environment
INFORMATION	Useful information or tip: Simplifies handling of the product.	

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.

Meaning of the hazard symbols

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

Hazard symbol	Meaning
⚠	General hazard

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 Decimal separator in numerical values

In this document, a period is used to indicate the decimal separator.

Example: 30.5 kg

1.4 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 product.

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

2 Safety notes

2.1 Preliminary information

The following general safety notes serve the purpose of preventing injury to persons and damage to property. They primarily apply to the use of products described in this documentation. If you use additional components, also observe the relevant warning and safety notes.

2.2 Duties of the user

As the user, you must ensure that the basic safety notes are observed and complied with. Make sure 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.

As the user, you must ensure that all of the work listed in the following may be carried out only by qualified specialists:

- Setup and installation
- Installation and connection
- Startup
- Maintenance and repairs
- Shutdown
- Disassembly

Ensure that the persons who work on the product pay attention to the following regulations, conditions, documentation, and information:

- National and regional safety and accident prevention regulations
- Warning and safety signs on the product
- All other relevant project planning documents, installation and startup instructions, and wiring diagrams
- Do not assemble, install or operate damaged products
- All system-specific specifications and conditions

Ensure that systems in which the product is installed are equipped with additional monitoring and protection devices. Observe the applicable safety regulations and legislation governing technical work equipment and accident prevention regulations.

2.3 Target group

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

- Qualifications in the field of mechanics in accordance with the national regulations
- Familiarity with this documentation

Specialist for electrotechnical work	Any electrotechnical work may be performed only by electrically skilled persons with a suitable education. Electrically skilled persons in the context of this documentation are persons who are familiar with electrical installation, startup, troubleshooting, and maintenance of the product who possess the following qualifications:

- Qualifications in the field of electrical engineering in accordance with the national regulations
- Familiarity with this documentation

Additional qualifications	In addition to that, these persons must be familiar with the valid safety regulations and laws, as well as with the requirements of the standards, directives, and laws specified in this documentation.

The persons must have the express authorization of the company to operate, program, parameterize, label, and ground devices, systems, and circuits in accordance with the standards of safety technology.

Instructed persons	All work in the areas of transportation, storage, operation and waste disposal must be carried out by persons who are trained appropriately. The purpose of the training is to give persons the ability to perform the required tasks and work steps in a safe and correct manner.

2.4 Transport

Inspect the shipment for damage as soon as you receive the delivery. Inform the shipping company immediately about any damage. If the product is damaged, it must not be assembled, installed or started up.

Observe the following notes when transporting the device:

- Always use all attachment points if available. The attachment points are designed to carry only the mass of the product. Severe or fatal injuries. Do not apply any additional loads.
- Ensure that the product is not subject to mechanical impact.

If necessary, use suitable, sufficiently dimensioned handling equipment.

2.5 Maintenance and repair

The DUV40A is an enclosed and encapsulated system and therefore maintenance-free in principle. If you determine a defect at the DUV40A, contact SEW-EURODRIVE..

You can clean the outside of the DUV40A if necessary.

✓ Do not use chemical solvents, such as acetone, nitro-cellulose combi thinner or similar products. Such solvents can damage the housing.

1. Disconnect the DUV40A from the power supply.

2. Clean the DUV40A using a soft, lint-free cloth.

3 Product description

3.1 About DUV40A

The DUV40A is a vibration monitoring system for continuous frequency-selective monitoring. With 2 integrated signals and up to 3 connected signals, further measured values can be detected, recorded, and analyzed. After the analysis and depending on user-defined alarm limits, the system can switch outputs and display the state using LEDs.

To allow integration into a higher-level system, inputs are available via which additional signals are recorded. These signals can be used as reference values for signal analysis e.g. to trigger time or event-based measuring tasks.

The DUV40A allows you to cover a large number of applications. Configure the DUV40A according to your application using the integrated web application and SmartWeb software. Several DUV40A devices can be combined in one network. Regardless of the number of devices, administration takes place centrally on a PC equipped with the SmartUtility software.

With the DUV40A SEW-EURODRIVE offers condition monitoring optimized for your requirements.

The device is ready for measuring as soon as DUV40A is connected to the supply voltage. To ensure an optimal vibration monitoring start the DUV40A only after the following steps are complete:

- All the components are connected correctly.
- The monitored machine is in a normal operating state.

3.2 Designated use

DUV40A is designated for the following purposes.

- For the collection and analysis of vibration measurement signals.
- For the detection of temperature signals.
- For the evaluation of incoming signals.

DUV40A may be operated only within the application limits specified in the technical data.

Analysis of measured values as well as changes to the settings may be performed only using the software SmartUtility light included in the delivery, the optionally purchased software SmartUtility, the integrated software SmartWeb or directly at the device, if possible.

Any other way of using the product exceeds the designated use and the user bears the risk caused by such use. The user is responsible for observing the designated use, this includes observing the manual.

INFORMATION

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DUV40A must not be used for safety-relevant tasks or critical switching operations. This especially applies if these tasks or switching operations are safety relevant to prevent death or injury.

DUV40A is included in plants as system for permanent machine monitoring.

For installation in the plant, connection to plant components, and plant operation you must not exceed the specified values stated in this manual. Observe chapter "Technical data" (→ 🖹 29).

The plant operator bears the sole responsibility for correct installation and safe operation of the overall plant.

In addition to collecting measured values, DUV40A can also provide characteristic values or alarms to the higher-level control system using its outputs. Observe the DUV40A specifications as well as the application limit values of the connected plant components. This is the sole responsibility of the system operator.

3.3 Modification by the user

The user may not modify the DUV40A device. Only settings made at the device or using the software SmartWeb or SmartUtility Light/SmartUtility are permitted.

The user bears all responsibility for modifications that exceed such settings. If you determine a defect at your DUV40A, contact SEW-EURODRIVE.

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4 DUV40A

4.1 Features

DUV40A is an innovative online system that can be used with various units.

Benefits of the DUV40A:

- Condition monitoring and condition diagnostics of rolling bearings and machines using a single device

- Small size

- Robustness

- Cost-effective solution

- Intuitive operation

- Expansion options

- A preconfigured system

- Comprehensive information regarding the machine state based on process parameters such as power rating, speed, and temperature

- Overview of the machine status provided at a glance in your web browser

- Possible prediction of long-term changes in the machine status enabled by the integrated data storage

- Connecting interface to the control station or controller

- Safe alarm system based on automatized alarm threshold adjustment

- Direct system access via Ethernet and web browser

- Data protected by a multi-stage access concept

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4.1.1 Operation and communication

DUV40A can be used easily and intuitively using 2 capacitive buttons.

The SmartWeb software installed on the device can be accessed via the web interface using any standard browser.

Via analog and digital interfaces, the device can be connected e.g. to the controller or the control station.
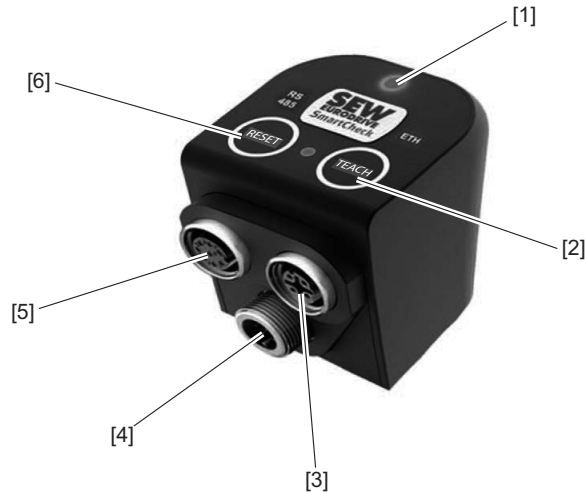
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[1]   Status LED, red, yellow, green
[2]   TEACH button, membrane keypad, activates teach mode
[3]   Ethernet interface, PoE voltage supply
[4]   Voltage supply interface
[5]   Input and output interfaces, analog and digital
[6]   RESET button, membrane keypad, reset alarm

Deactivating the keypad lock

✓   You must unlock the keypad before you can use the buttons on the DUV40.

1.   Push the RESET button [6] and then the TEACH button [2] within 2 seconds.

⇨   The LED between the 2 buttons flashes to acknowledge the command.

The keypad lock will automatically reactivate after 2 minutes and the LED between the 2 buttons is not lit.

RESET button

The function accessed by the RESET button [6] depends on how long you push the button.

•   To reset the current alarms push the RESET button [6] for at least 2 seconds.

•   To restart the DUV40A push the RESET button [6] for at least 10 seconds.

TEACH button

✓   Use the TEACH button [2] to restart the teach mode for all measurement tasks that use teach mode.

1.   To do so, push the TEACH button [2] for at least 5 seconds.

Factory settings

✓ DUV40A can be reset to factory settings using the TEACH button [2] and the RESET button [6].

1. Startup of DUV40A must be complete and the device must be ready for measuring (indicated by the status LED after startup).

2. Simultaneously push the TEACH button [2] and the RESET button [6] for at least 10 seconds.

⇨ The device is reset to delivery state. Saved data, such as measured values and configurations will be lost.

4.1.2 Function

DUV40A is ready for operation upon delivery.

The set of integrated characteristic values enables general and reliable monitoring.

To achieve a more precise monitoring part templates are available on the device, e.g. for rolling bearings or gear units. The part data is entered into the part template.

In case of rolling bearings a rolling bearing database containing data for standard gear units is integrated on the device. You can add other rolling bearings to this database at any time.

Certain parameters can be adjusted depending on the selected part template, for example:

• Bearing type

• Number of fan blades

• Gearings

• Belt length

Software assistant functions support you when adjusting part templates. The generated set of characteristic values facilitates monitoring the unit precisely.

4.1.3 Configuration

Using a DUV40A you can monitor several components of your unit at the same time.

For example, all bearings in a gearmotor can be monitored by a single monitoring device. To do so, several part templates are combined into an overall configuration for the monitored unit. This configuration can be copied to infinite other DUV40A devices.

4.1.4 Monitoring

Vibration and process parameters, such as speed and temperature, are determined and correlated.

4.1.5 Alarm

The alarm threshold adjustment ensures a reliable alarm. An LED at the device immediately indicates an alarm. The alarm can be transmitted to the control station via interfaces.

4.1.6 Use

The device detects damages to the various units early.

4.1.7 Standard templates

The standard template of DUV40A detects the following damages:

- Roller bearing damage
- Imbalance
- Incorrect alignment
- Stop positions

4.1.8 Extended monitoring functionalities

You can choose the standard template for monitoring purposes. In addition, you can select unit-specific templates. DUV40A analyzes the signals, compares them to data from the template and recognizes specific damage patterns and their causes. A typical example is a bearing damage.

But not all detected damages can be automatically assigned by DUV40A. Some damage patterns are very complex and must be analyzed by an expert.

4.1.9 Component-specific templates

The following table shows examples of complex damage patterns:

Component	An expert can recognize
Electric motors and gearmotors	Damage to windings and loose rotor bars
Vacuum pumps and hydraulic pumps	Wear and cavitation
Fans	Rotational frequencies of blades and vanes
Compressors	Operation outside of the specified range
Gear unit	Damage to the gearing
Separators and decanters	Cavitation, imbalance between worm and drum
Vibrating screen	Touching of the screen, loose springs, broken springs

4.1.10 Concept

Monitoring with the DUV40A is available in 3 stages.

1. In the first stage individual components are monitored decentralized.

2. If you select the second stage, the device is intelligently integrated into the machine control.

3. In the third stage remote access via the Internet connection is possible.
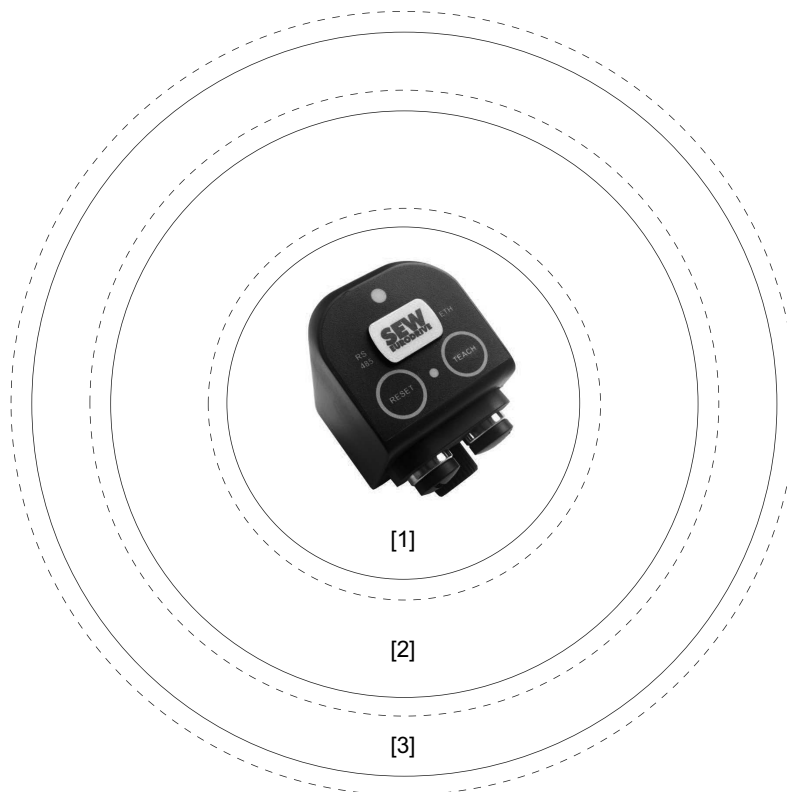
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[1]   Decentralized machine and process monitoring
[2]   Intelligent process integration
[3]   Service from a single source

Decentralized machine and process monitoring

DUV40A can be installed and wired easily. The device is ready for operation immediately. The data can be accessed directly via the device.

Intelligent process integration

The intelligent process integration is a communication option using interfaces to exchange data and information for example with a controller or a database agent.

Service from a single source

The web interface of DUV40A enables the remote access of measurement data via the Internet connection so that monitoring tasks can be performed by an external service provider.

4.1.11   Software

DUV40A can be configured via SmartWeb, SmartUtility light or SmartUtility.

Range of functions

Function	SmartWeb	SmartUtility light	SmartUtility
Display status of characteristic values	×	×	×
Display system information	×	×	×
Display measurement data	×	×	×
Display trend	×	×	×
Select component template	×	×	×
Configure inputs and outputs	×	×	×
Configure and activate validation	×	×	×
Configure and activate trigger	×	×	×
Configure user management	×	×	×
Display input signals in real time	×	×	×
TCP/IP settings	×	×	×
Update firmware	×	×	×
Download and save data	×	×	×
Manage all DUV40A of the supply system	–	×	×

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Function	SmartWeb	SmartUtility light	SmartUtility
Analyze data	–	–	×
Load and check configurations	–	–	×
Create measure-ment report	–	–	×

SmartWeb

The software SmartWeb software is integrated into each DUV40A. Using a web browser, you can enter the IP address of a device and directly access this device.

It is typically used when using a single DUV40A.

SmartUtility light

The free PC software SmartUtility light is included in the delivery. This software has the same features as SmartWeb, in addition a list with the IP addresses of all connected DUV40A devices is displayed and devices can be selected quick and easy. Manually entering the IP address is not required.

It is typically used when using multiple DUV40A devices. Using this software requires an Windows PC, see chapter "Technical data" (→ 🖹 29).

SmartUtility

The paid SmartUtility software allows unlimited access to all functions of DUV40A. Multiple devices can be configured simultaneously. Saved configurations can be loaded and for example sent to other locations. In addition, data can be analyzed and all DUV40A devices in the network can be managed.

It is typically used when managing the production machines at all your locations centrally or when analyzing data, where a large amount of expert knowledge is required. Using this software requires an Windows PC, see chapter "Technical data" (→ 🖹 29).

4.1.12   Accessing the sensor (SmartWeb)

Initial view of the signals in a browser

When the DUV40A unit has been started and is in measurement mode, you can view the measurement data on your computer using the SmartWeb software. Doing so, you can check if a valid vibration or temperature signal is detected, if the inputs are correctly connected and configured, and if DUV40A is functioning correctly.

The following points are required for connecting the device to a computer.

- DUV40A must be connected to the network or directly connected to the computer via Ethernet cable.

- If DUV40A not been assigned an address via DHCP, it has the IP address 192.168.1.100 by default. In this case the IP address of the computer must be 192.168.1.x.

Proceed as follows:

- Open your Internet browser and enter the IP address of the DUV40A device into the address field.

- The SmartWeb web application opens.
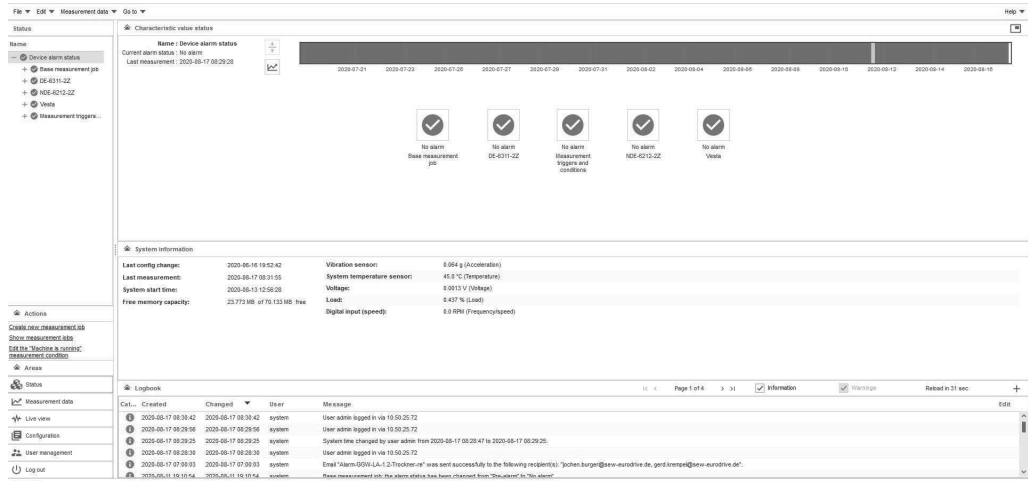
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To change the language, perform the following steps:

- Click "Edit program settings" in the "Edit" menu.

- Click "Language".

- Select the required language from the list and confirm your selection with "OK".

- Refresh the browser page for the changes to take effect.

- Click the "Real-time display" button in the left part of the window.

Here, you can view the individual signals from each input and from each scaling factor created.

- For example, select "Vibration sensor input" from the menu on the left.

- If DUV40A is connected correctly the "Real-time display" area will display the data from the vibration sensor or the selected signal input.
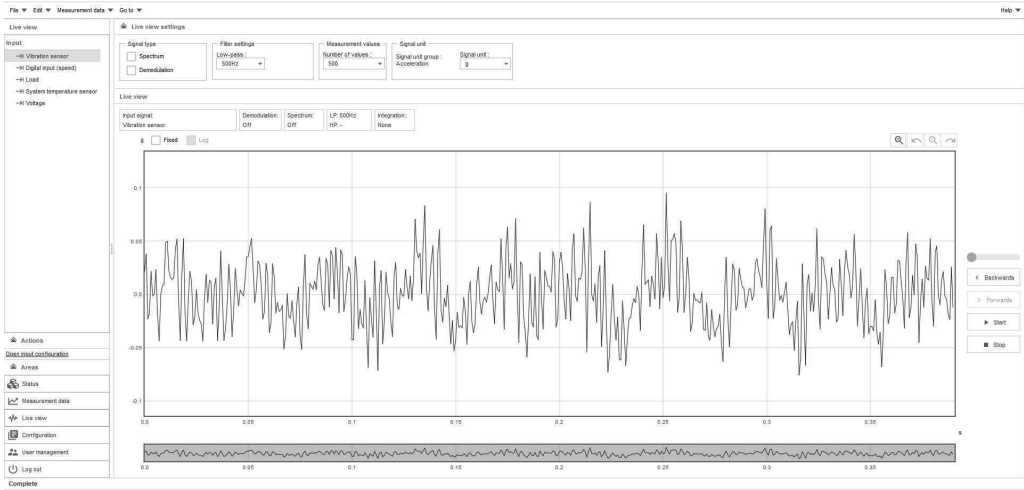
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4.1.13   Data analysis

DUV40A offers multiple possibilities to analyze measurement data and evaluate the status of the monitored unit.

The following general characteristic values are determined base on acceleration and acceleration envelope signal.

•   ISO 10816

•   RMS broadband

•   Peak-to-peak value

But DUV40A not only calculates general characteristic values. The part templates on the device also offer frequency-selective monitoring possibilities tailored to several components.

Characteristic patterns of components such as shafts, belt pulleys, or fan wheels indicate incipient damage at an early stage. The device provides time signals that are displayed in the viewer. This analysis tool is part of the SmartUtility software and enables experts to analyze the time signals. In combination with process parameters such as temperature, load, or speed, damage progressions can be precisely traced back and the cause of a failure can be determined.
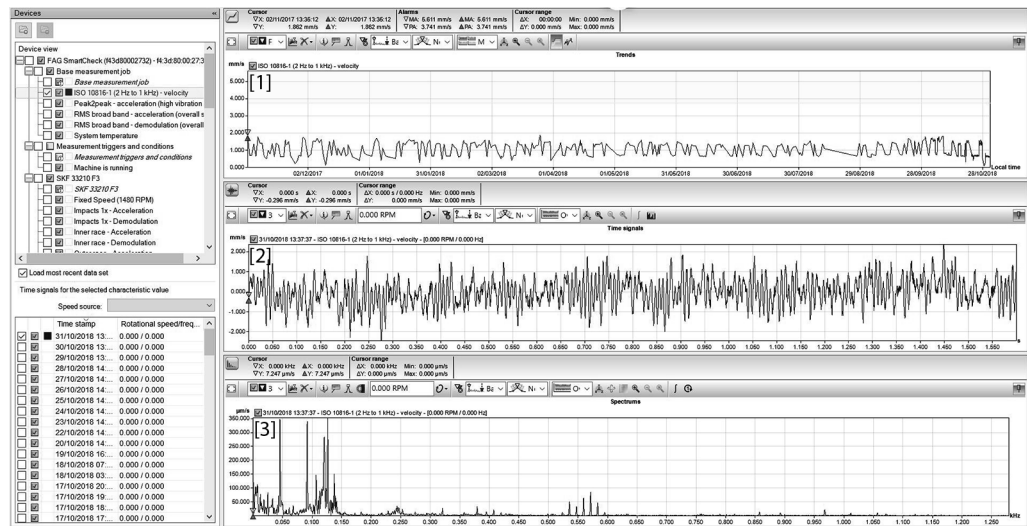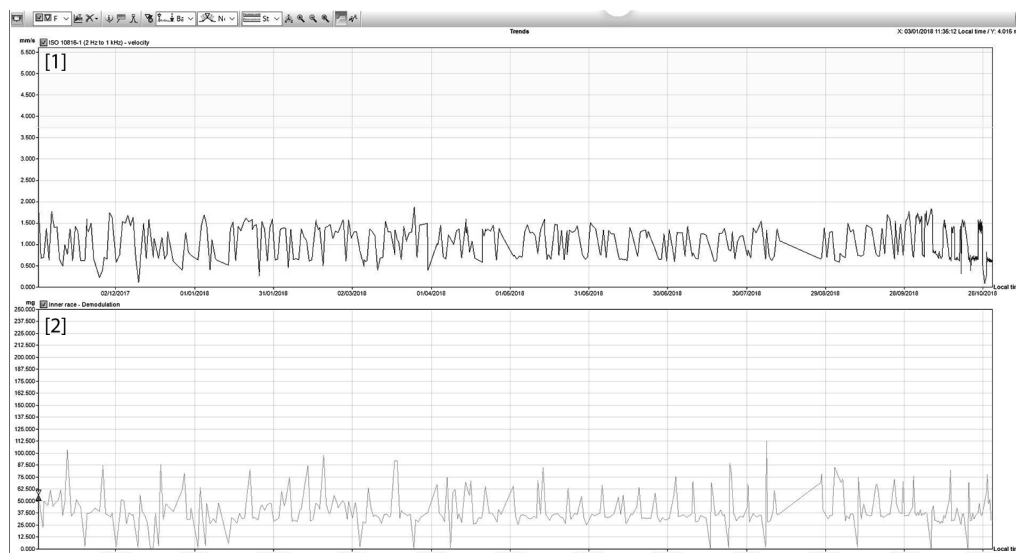

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[1]   Trend
[2]   Time signals
[3]   Frequency spectrum

4.1.14 Trend charts

The trend chart is an easy method to clearly depict characteristic values. Changes to the vibration behavior are visible at a glance. Even slight changes are visible in the trend chart. The depiction of several trends at once allows for very accurate analyses.

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[1]   Trend according to ISO 10816
[2]   Trend in bearing monitoring

4.1.15 Detailed analysis

This analysis requires the viewer of the SmartUtility software. The viewer offers many tools to assist experienced users in analyzing the data.

4.1.16 Adjusting the alarm threshold

DUV40A uses preset alarm thresholds in delivery state. The vibration of a unit is significantly affected by the operating state. DUV40A has an automatic teach mode to adjust the alarm thresholds to the conditions of the unit. The teach mode can be started directly during startup. Then the relevant vibration value is measured and assigned for each operating state of the unit.

DUV40A automatically determines the correct alarm threshold based on the vibration measurement data and process values. This also takes into consideration how vibrations depend several process values.

If teach mode is not initiated during startup it can be started at any time by pushing the buttons at the DUV40A device or activated via SmartWeb.

You can repeat teach mode an unlimited number of times. As soon as sufficient measurement data is available DUV40A automatically replaces the preset alarm threshold with the newly determined alarm threshold.

If the machine is operated in more than one operating state, defining an alarm threshold for each operating state may be useful. A signal is defined at the digital or analog input for this purpose. This signal shows the operating state of the machine parameters. Teach mode stops automatically as soon as sufficient data has been collected.

If one or more operating states (e.g. speed ranges) occur only infrequently, teach mode may run longer accordingly.

You can also define 2 signals in case you wish to include 2 machine parameters into the alarm thresholds.

4.1.17 Measuring report

You can create measurement reports using the SmartUtility software. Measurement reports are based on the determined measurement data and can contain the following information.

- Device information
- Alarm status
- Trend data
- Log

The standard templates contain all these informations.

4.1.18 Selecting a device

A report can include the data of one or several DUV40A devices.

Select the menu item "Create report" to view a list of devices from which data has been downloaded. Then select the device or devices of which you wish to create a report including the measured values. Selected devices are indicated with a check mark.
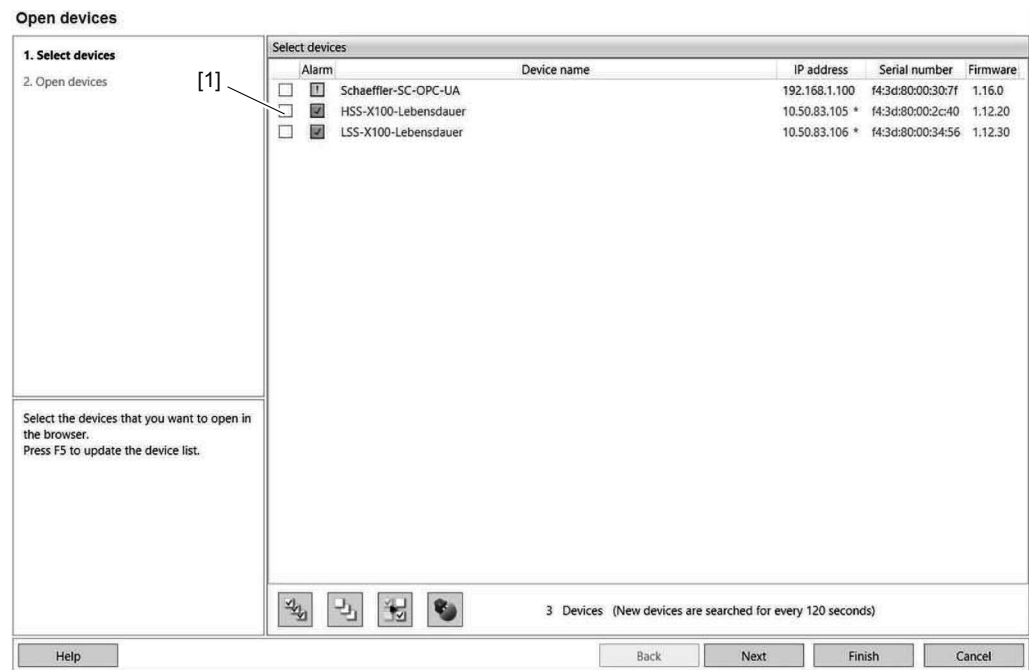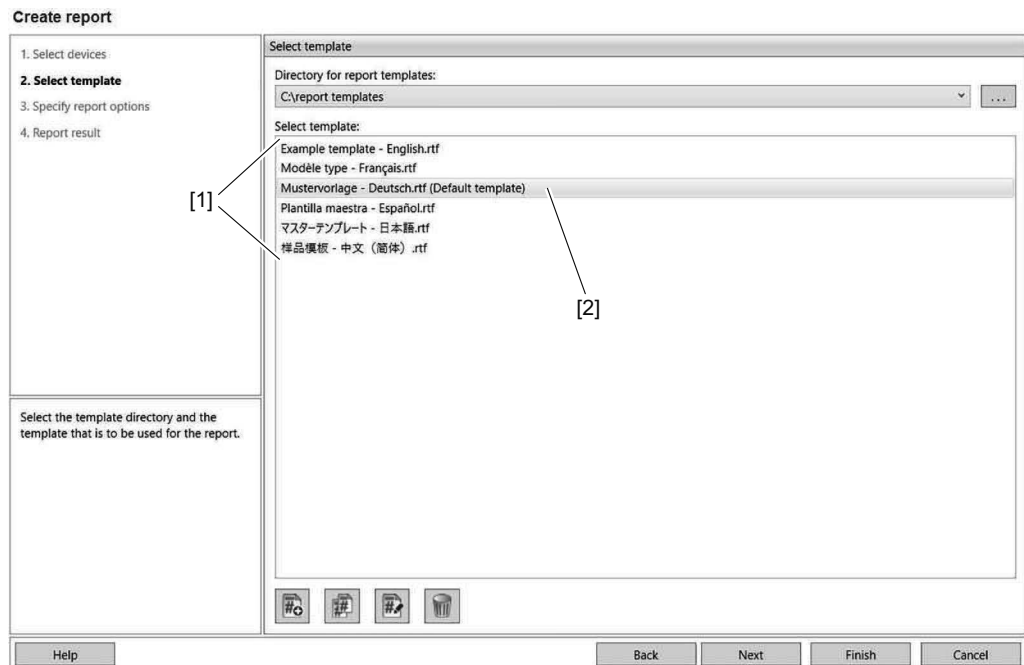

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[1]   Select units

4.1.19 Selecting templates

A template prescribes the content and form of the report.

Report templates are available in the same languages as the software. Templates can be used immediately. Existing templates can also be modified and saved as new templates.


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[1] List of templates
[2] Selected template

Measurement reports are provided in the common text exchange format RTF. You can edit the templates with any software capable of reading and writing RTF.

4.1.20 Determining the report options

Reports are created for the data that has been measured and generated by the device during the selected time. If the menu item "Create a separate report for each device" is selected, a separate report is created for each of the selected devices.
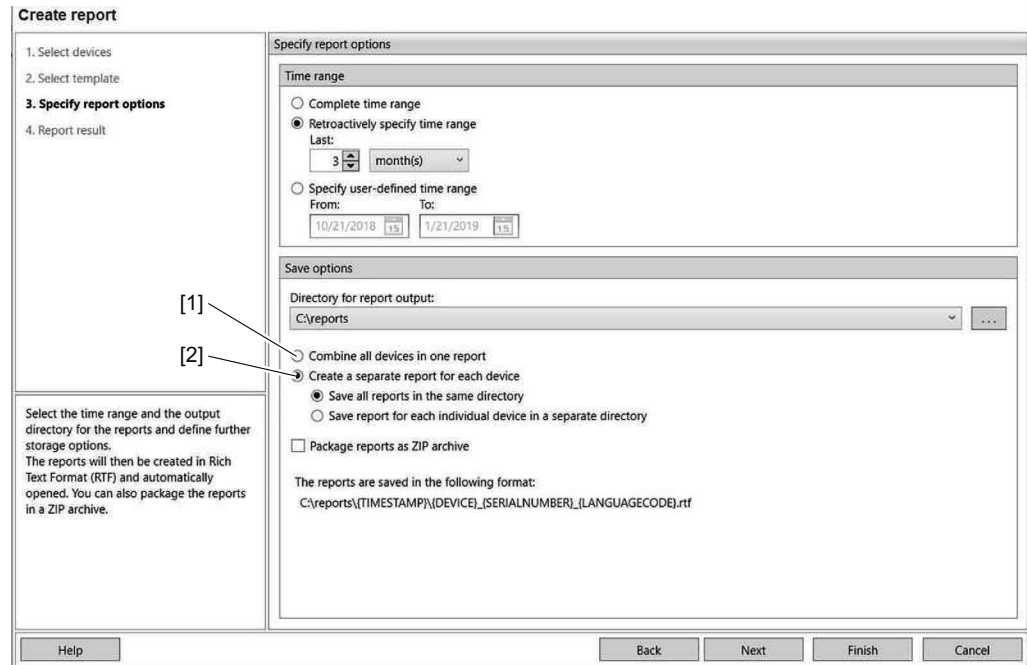
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[1]   One report for all selected DUV40A devices
[2]   One report for each DUV40A

4.1.21 Service

SEW-EURODRIVE offers a comprehensive range of services, from strategy development, to startup and remote monitoring.

4.1.22 Startup

A suitable monitoring strategy is developed together with the customer, the devices are mounted and reference measurements are performed.

4.1.23 Training courses

Employees are trained depending on their level of experience and on the requirements. The training includes handling the DUV40A, using the software and integrating the device into networks.

4.1.24 Operation

You can always benefit from our experience. Experts can assist you for example with the evaluation of measurement results.

If the measurement results indicate damages, the experts can provide you with tips for further action.

4.1.25   Remote monitoring

In case you have no employees with the required expert knowledge or adequate training on site, you can benefit from remote monitoring.

When SEW-EURODRIVE is commissioned with remote monitoring the customer will regularly be provided with reports regarding the devices, and with recommendations for action to increase system availability.

If the DUV40A detects sings of imminent damage the customer will be notified immediately. Repair works can then be schedules and spare parts can be procured on time. For more information, go to: www.sew-eurodrive.de.

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4.2 Mounting the diagnostic unit

4.2.1 Mounting with threaded hole

1. Prepare the mounting surface for mounting the DUV40A diagnostic unit (≥ Ø 25 mm, Ra = 3.2 µm).

2. In the middle of the mounting surface, bore a vertical threaded hole M6 with a minimum depth of 9 mm.

3. Clean the mounting surface and apply a thin film of lubricating oil.

INFORMATION

To avoid damage, select a retaining screw that matches the material properties of the mounting surface.

4. Insert the M6 × 45 hexagon socket head screw into the mounting hole of DUV40A.

5. If necessary, use an O-ring to secure the screw against falling out. Make sure that the O-ring does not slip between the mounting surface and the sensor plate.

INFORMATION

For safe and permanent mounting of the DUV40A unit, we recommend a medium-strength thread locking compound (such as Loctite® 243).

6. Align the DUV40A unit on the mounting surface and hand-tighten the hexagon socket head screw. Fasten the screw with a tightening torque of 5 to 10 Nm. Make sure that the sensor surface of the unit is flush with the mounting surface.

7. Close the mounting hole with the supplied plug.
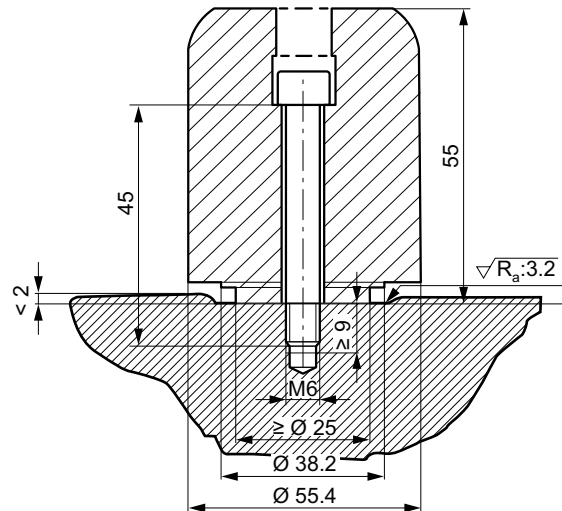
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4.2.2 Mounting with mounting disk

If it is not possible to mount the DUV40A unit directly onto a machine or component, you can glue a sensor mounting disk M6 onto the mounting surface and screw the unit onto this disk.

The following requirements must be met for mounting with sensor mounting disk.

• The mounting surface must not be curved or uneven.

• DUV40A must be mounted perpendicular to the mounting surface.

• The surface should have an average roughness of Ra = 3.2 µm.

Proceed as follows:

1. Prepare a round, smooth, and level mounting surface with a diameter of at least 25 mm.

2. Clean the mounting surface.

3. Apply an adhesive, which is suitable for vibration measurement, to the surface.

INFORMATION

Select an adhesive suitable for the mounting location and ambient conditions.

4. Place the sensor mounting disk on the adhesive and press it on firmly. Wait until the adhesive is completely dry.

5. Clean the surface of the sensor mounting disk.

6. Apply a thin film of lubricant on the cleaned surface. Adding lubricant improves the transmission of vibrations.

7. Insert the supplied Allen screw M6 × 45 into the mounting hole of the DUV40A diagnostic unit.

   ⇨ To prevent the screw from falling out during mounting, you can secure it with the O-ring included in the delivery. Make sure that the O-ring does not slip between the mounting surface and the sensor surface during mounting. If the O-ring falls out, it would dampen the vibration transmission and falsify the measurement result.

   ⇨ For permanent installation, you can optionally use a thread locking compound (such as Loctite®).

8. Align the sensor surface of the DUV40A unit on the mounting surface and hand-tighten the retaining screw with an angle wrench. Make sure that the DUV40A unit sits flat on the surface to ensure that vibrations can be transmitted effectively.

9. Use a torque wrench to tighten and secure the connection with a tightening torque of 5 to 10 Nm.

10. Check that the DUV40A unit is fitted securely.

11. Close the mounting opening of DUV40A by inserting the plug with the logo until it snaps into place.
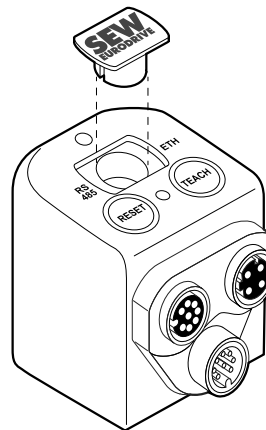
You can now set up and connect the DUV40A diagnostic unit.
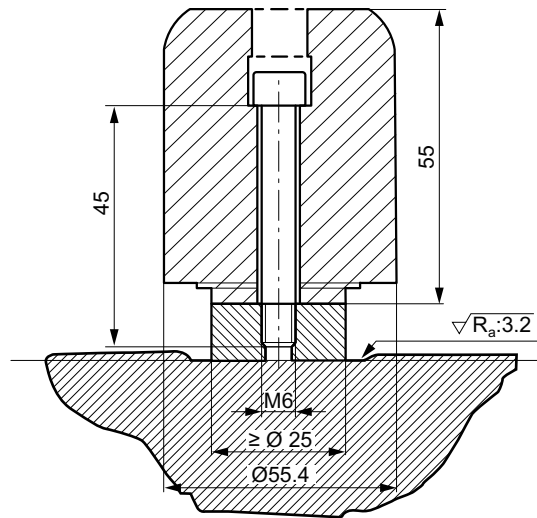
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4.2.3 Closing the mounting opening

Close the mounting opening of DUV40A by inserting the plug with the logo until it snaps into place.

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4.3 Technical data

4.3.1 DUV40A

Characteristic	Description
Dimensions (W × H × D)	44 × 57 × 55 mm
Weight	210 g
Material for housing	Glass fiber reinforced plastic
Material for mounting foot	Stainless steel 1.4301
Mounting	M6 bolt Contact surface on the machine: Ø 25 mm
Protection class	IP 67
MTBF[1]	78.9 years (EN/IEC 61709)
Voltage supply	• DC 16 V to DC 32 V • Power over Ethernet (in reference to IEEE 802.3af, Mode A not supported)
Maximum current consumption	200 mA at 24 V
Ambient temperature	- 0 ºC bis + 70 ºC
Internal operating temperature	- 20 ºC bis + 85 ºC
Operating system	Embedded Linux
Software (Languages: German, English, Chinese, Spanish, French)	SmartWeb Recommendation: • Windows XP: Internet Explorer 7, Firefox 16 • Windows 7: Internet Explorer 8, Firefox 16
	SmartUtility light

1) Mean operating hours in between failures for electronic components of the DUV40A.

4.3.2 Interfaces

Characteristic	Description
Control elements	2 pushbuttons for • Teach mode • Reset alarm • Restart • Factory settings
Display elements	• 1 LED to display status and alarm • 1 LED to acknowledge the pushbuttons • 1 LED to display communication

Characteristic	Description
Communication	Ethernet 100 MB/s • Optional: OPC/UA (server with additional license)
Electrical connections	• 3 polarity reversal protected M12 plug connectors for voltage supply • Analog and digital inputs/outputs • Ethernet

4.3.3 Memory

Characteristic	Description
Program and data memory (compression algorithm)	• 64 MB RAM • 128 MB Flash

4.3.4 Piezoelectric acceleration sensor

Characteristic	Description
Frequency range	0.8 Hz to 10 kHz
Measuring range	50 g

4.3.5 Measurements

Characteristic	Description
Measurement functions	• Acceleration, speed and distance by integration • System temperature and process parameters such as speed, load, pressure are measured using external signals or sensors
Diagnostic methods	• Time signal, envelope • Speed and frequency checking • Spectrum and trend analysis
Characteristic values in time and frequency range	Defined characteristic values: • DIN ISO 10816 Calculated characteristic values: • RMS • Frequency-selective RMS • Direct component • Peak • Peak-to-peak • Crest factor • Condition monitoring

Characteristic	Description
Special features	Other user-specific characteristic values are possible

4.3.6 Signal processor

Characteristic	Description
Frequency resolution	• 1600 lines • 3200 lines • 6400 lines • 12800 lines
Measuring accuracy	24 Bit, A/D converter
Frequency range	0.8 Hz to 10 kHz
Low-pass filter	50 Hz to 10 kHz • Steps: 50 Hz, 100 Hz, 200 Hz, 500 Hz, 1 kHz, 2 kHz, 5 kHz, 10 kHz
High-pass filter, envelope only	• 750 Hz • 1 kHz • 2 kHz
Special features	Additional filters available on request

4.3.7 Inputs and outputs

Characteristic	Description
Inputs	2 analog inputs, 12 Bit, Frequency range 0 Hz to 500 Hz: Voltage: • 0 V to 10 V • 0 V to 24 V Input resistance: 10 kΩ Current: • 0 mA – 20 mA • 4 mA – 20 mA Input resistance 500 Ω
	1 pulse input: • 0 V to 30 V • 0.1 Hz to 50 Hz

Characteristic	Description
Outputs	1 analog output, 12 Bit:
	Voltage: 0 V to 10 V
	Minimum load resistance: 1000 Ω
	Current:
	• 0 mA – 20 mA
	• 4 mA – 20 mA
	Maximum load resistance: 250 Ω
	1 switching output:
	Open collector, max. 1 A, 30 V
Special features	Galvanic isolation between inputs and outputs, and galvanic isolation of the voltage supply at inputs and outputs

4.3.8 Accessories

Order designation	Description	SEW part number
Voltage supply cable, 8-pin M12(B) open end	Voltage supply cable, 8-pin, M12 connector to free cable end Available cable lengths: • 5 m • 10 m • 20 m	• 5 m: 19179596 • 10 m: 19190247 • 20 m: 19190255
Ethernet cable M12 RJ45	Ethernet cable, M12 connector to RJ45 Available cable lengths: • 5 m • 10 m • 20 m	• 5 m: 19179618 • 10 m: 19190271 • 20 m:19190298
I/O cable 8-pin M12 open end	Input/output cable: 10 m, 8-pin, M12 connector to free cable end Available cable lengths: • 5 m • 10 m • 20 m	• 5 m: 19179626 • 10 m: 19190301 • 20 m: 19190328

Order designation	Description	SEW part number
Base for mounting on standard gear units	Mounting base with sealing ring Available sealing rings: • M10 × 1 • M12 × 1.5 • M22 × 1.5 • M33 × 2 • M42 × 2	• M10 × 1: 20593422 • M12 × 1.5: 20593430 • M22 × 1.5: 20593449 • M33 × 2: 20593457 • M42 × 2: 20593465
Base for mounting on industrial gear units	Mounting base with sealing ring Available sealing rings: • G3/4 • G1 • G1 1/4 • G1 1/2	• G3/4: 20593384 • G1: 20593392 • G1 1/4: 20593406 • G1 1/2: 20593414
Base for mounting on standard motors	Fastening element Available sizes: • M8 • M12 • M16 • M20	• M8: 20593503 • M12: 20593473 • M16: 20593481 • M20: 20593511
SPM base for mounting on industrial gear units	SPM base Available sizes: • M6 × 78 • M6 × 24 • M6 × 113	• M6 × 78: 22017119 • M6 × 24: 22015604 • M6 × 113: 22016317
General base	Stick-on adapter	24469017
Special features	Other accessories available on request	–

4.3.9 Communication package

Order designation	Description
DUV40A communication package	• OPC/UA function (server) • E-mail function • Condition monitoring

4.3.10 Software

Order designation	Description
SMART.UTILITY	Paid computer software for managing and analyzing systems

4.3.11 System requirements for SmartUtility and SmartUtility light

Characteristic	Description
System architecture	Windows 7
Processor speed	1 GHz or faster
RAM (minimum)	2 GB (recommended 4 GB)
Screen resolution	At least 1024 × 768 Font size
Free memory on the hard disk	40 MB
Browser	Internet Explorer version 10 or higher Mozilla Firefox ESR 38 or higher

5 Service

5.1 Waste disposal

Dispose of the product and all parts separately in accordance with their material structure and the national regulations. Put the product through a recycling process or contact a specialist waste disposal company. If possible, divide the product into the following categories:

- Iron, steel or cast iron
- Stainless steel
- Magnets
- Aluminum
- Copper
- Electronic parts
- Plastics

The following materials are hazardous to health and the environment. These materials must be collected and disposed of separately.

- Oil and grease

  Collect used oil and grease separately according to type. Ensure that the used oil is not mixed with solvent. Dispose of used oil and grease correctly.

- Screens
- Capacitors

**Waste disposal according to WEEE Directive 2012/19/EU**

This product and its accessories may fall within the scope of the country-specific application of the WEEE Directive. Dispose of the product and its accessories according to the national regulations of your country.

For further information, contact the responsible SEW-EURODRIVE branch or an authorized partner of SEW-EURODRIVE.
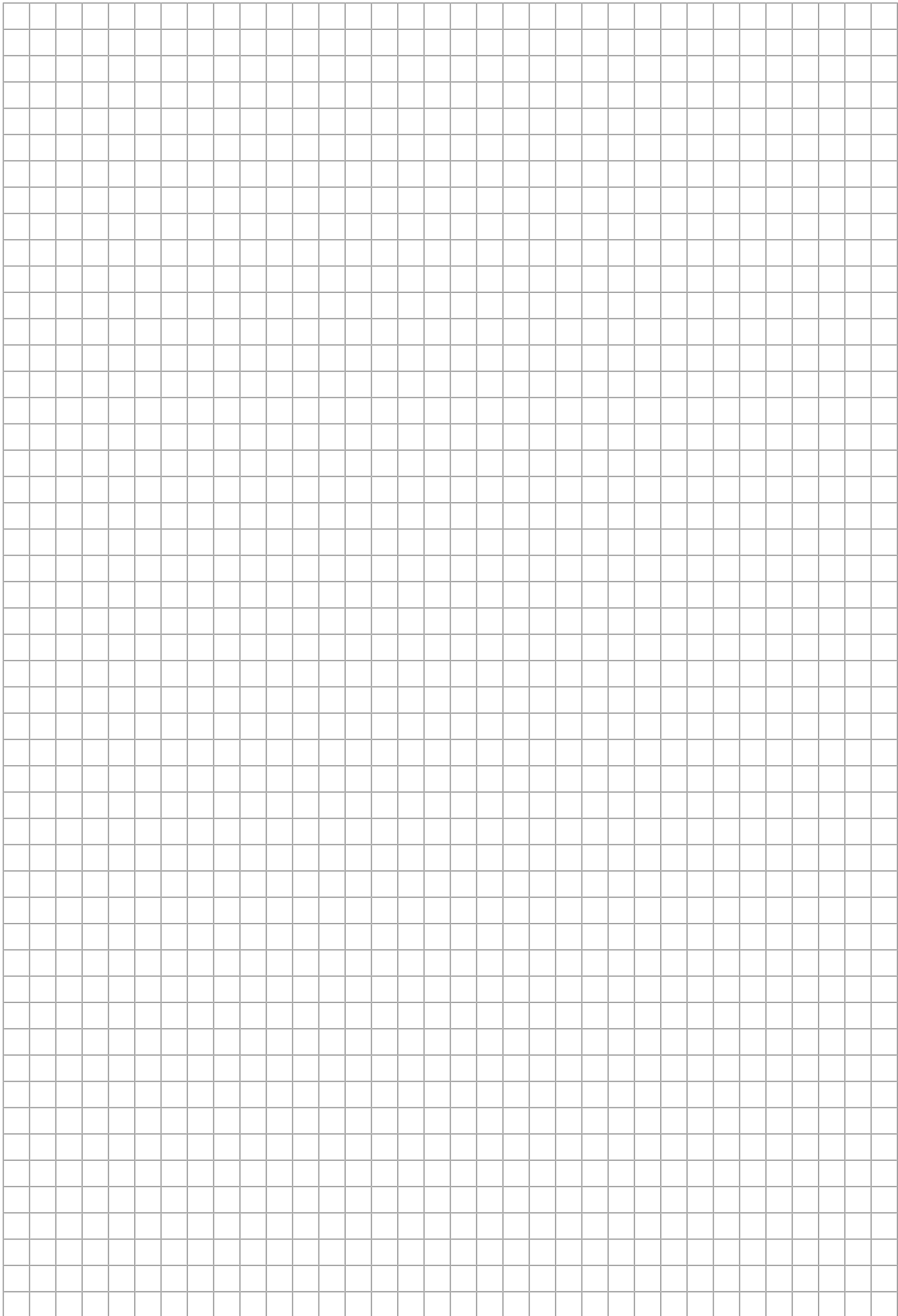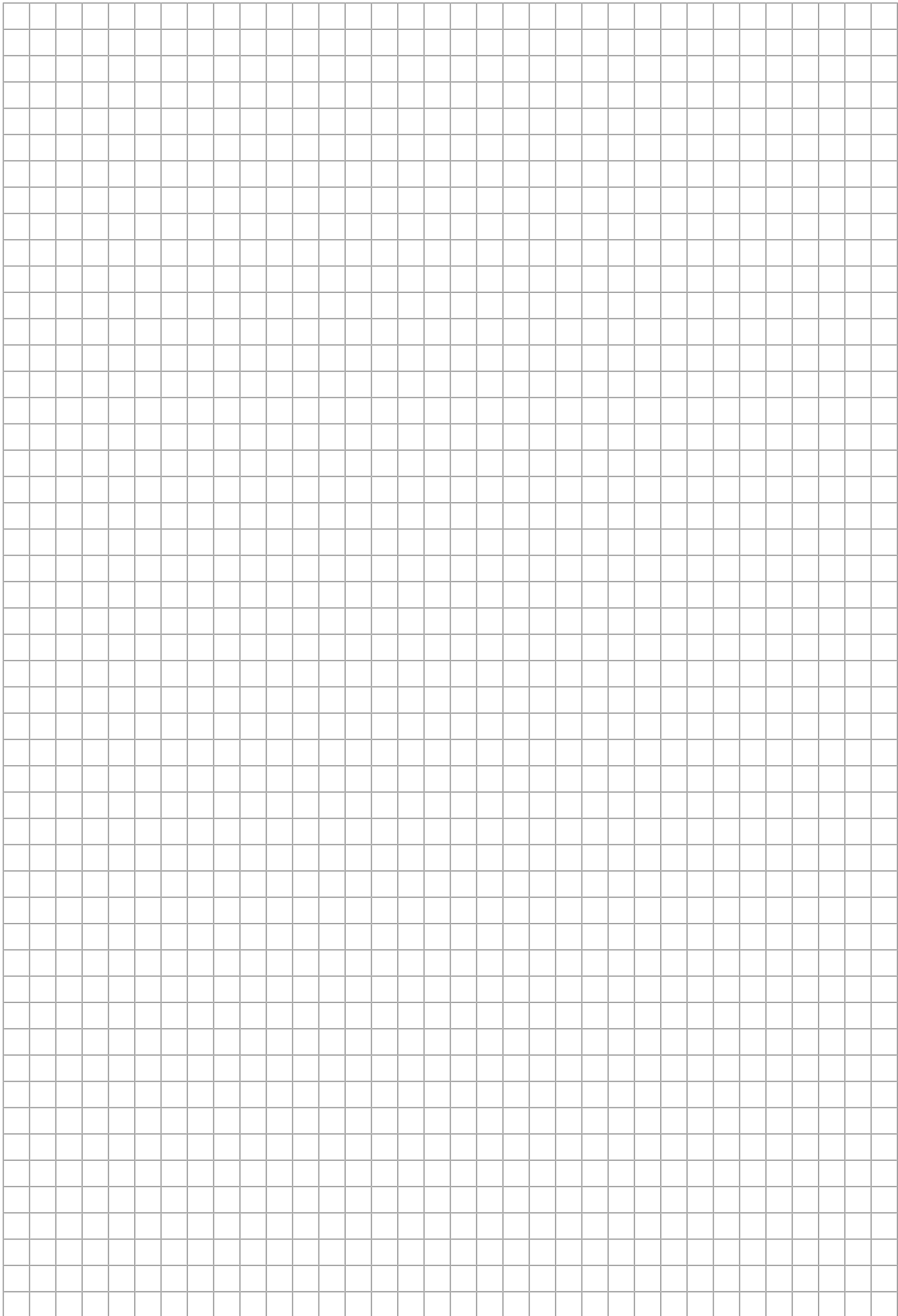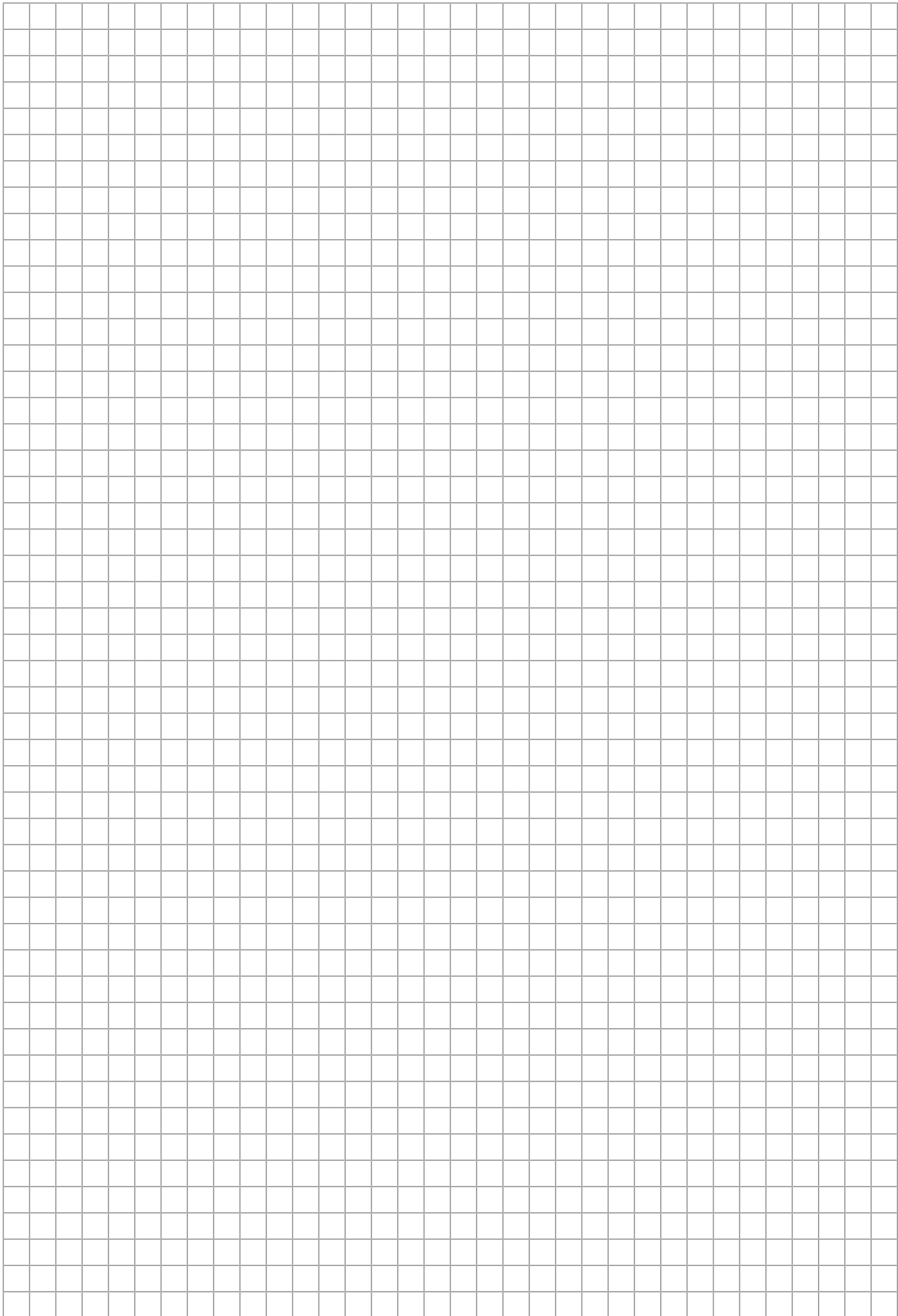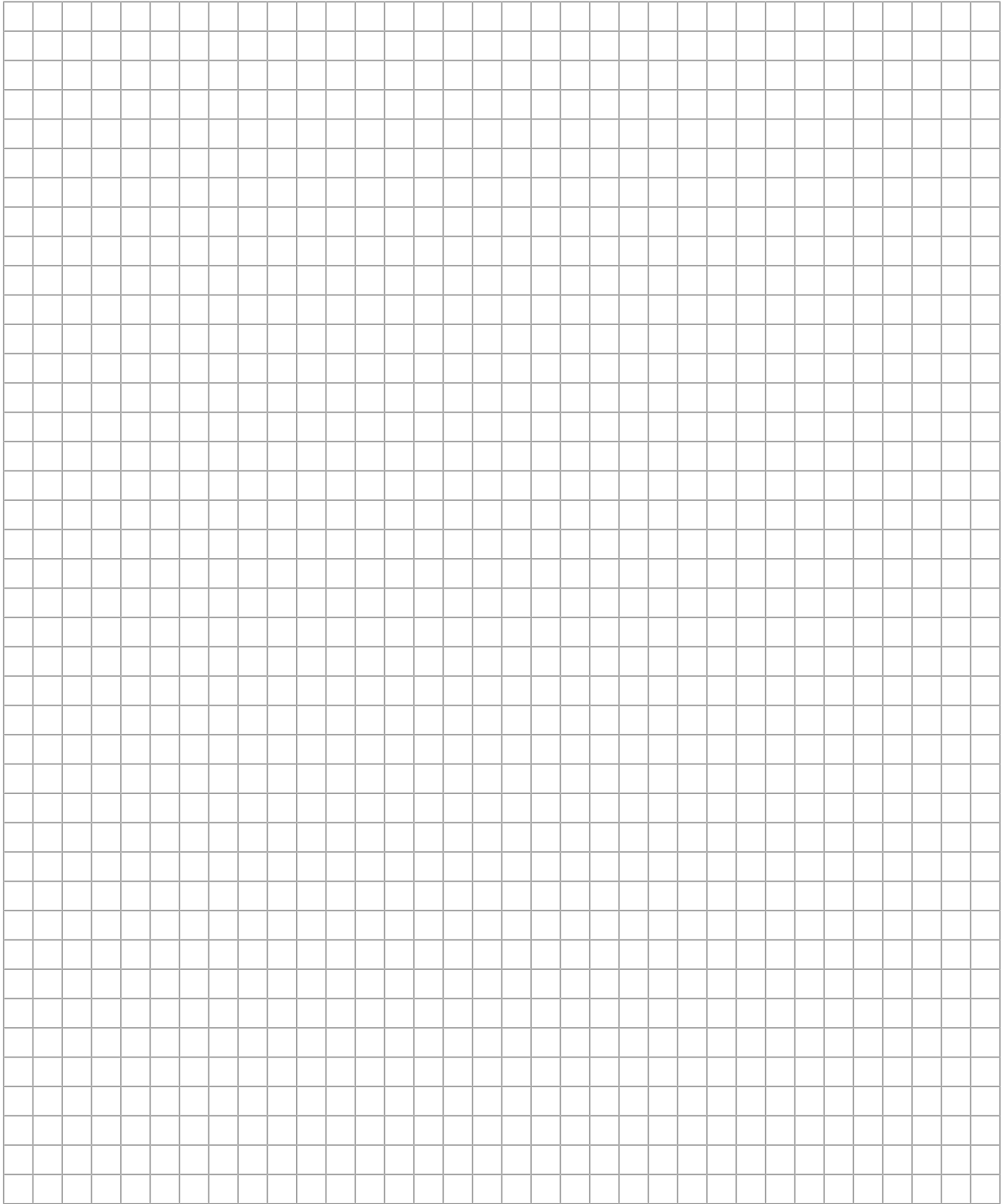
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