



■ Made
■ in
■ Germany



Speedsynchro® Mini

EMUGE

Speedsynchro® Mini

Operating instruction

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Warnings, symbols

In this operating instruction the following symbols are used:



Attention

Marks special instructions, rules and prohibitions, which are important in order to avoid any damage.

- ▶ Please observe these instructions!



Note

Marks application instructions and other useful information.

Sectional view:



Speedsynchro® Mini



Attention

Battery:

- ▶ Not rechargeable
- ▶ Do not incinerate
- ▶ Dispose of as prescribed. Please refer to chapter 6, page 22.

1 Application range, safety instructions and technical data

1.1 Application range, determined use

The collet holders type Speedsynchro® Mini are used on CNC-machining centers with synchronous control. They are intended for clamping of taps/cold-forming taps for thread production.

Normally the Speedsynchro® Mini are equipped with the following shank:

- BT 30 (DIN) ISO 7388-2 JD

Applicable for cutting range M1 – M6, please refer to Table 1, page 7.

The tap/cold-forming tap is locked via the collets according to DIN ISO 15488.

The collets must be chosen depending on the used type and used tap/cold-forming tap, for more information please refer to chapter 2.6, page 15.

The collet holders type Speedsynchro® Mini are designed for coolant-lubricant pressure up to 70 bar.

For correct use, the Speedsynchro® Mini must be secured against twisting in the machine spindle. This requires a stop fixture adapted to the machine-side locking block. For further details, please refer to chapter 2.2 page 8.

The non-determined use exempts the manufacturer from any liability.

1.2 Specifications

Further characteristics of the Speedsynchro® Mini:

- The Speedsynchro® Mini uses an integrated gear ratio of 1:4,412. (This enables the machine spindle to be operated in a lower speed range, thus saving energy.)
- The integrated minimal length compensation on tension and compression compensates arising minimal pitch differences between synchronous spindle and tap/cold forming tap possibly leading to high thread flank friction forces. A possible increase of axial force during the thread producing cycle is reduced to a minimum. The resulting advantages are:
 - no mis-cutting of the threads
 - optimized tool life of tap/cold-forming tap
- The Speedsynchro® Mini has an NFC-Modul (NFC = Near Field Communication) with integrated electronics. This takes and stores the operating data. An NFC-enabled smartphone is required to read out the data (not included in the delivery). For further details please refer to chapter 3, page 18.
- Simple programming as synchronous cycle with feed programme adapted to the transmission ratio.
- The reversal of the tap/cold-forming tap is done by the machine spindle:
 - no switching components in the Speedsynchro® Mini
 - low wear and longer maintenance intervals
- High changing speeds are possible due to the low weight (< 2 kg) and the compact design.

1.3 Safety instructions and hints

For all works, i.e. putting into operation, production or maintenance, please observe the details given in the operating instruction.

All relevant safety regulations as well as local instructions are to be observed when working.

Below please find some basic rules:



Attention



- ▶ Please wear gloves during tool change to avoid injury.
- ▶ Basically change the tool yourself to avoid the sudden start of the spindle caused by mis-operating.



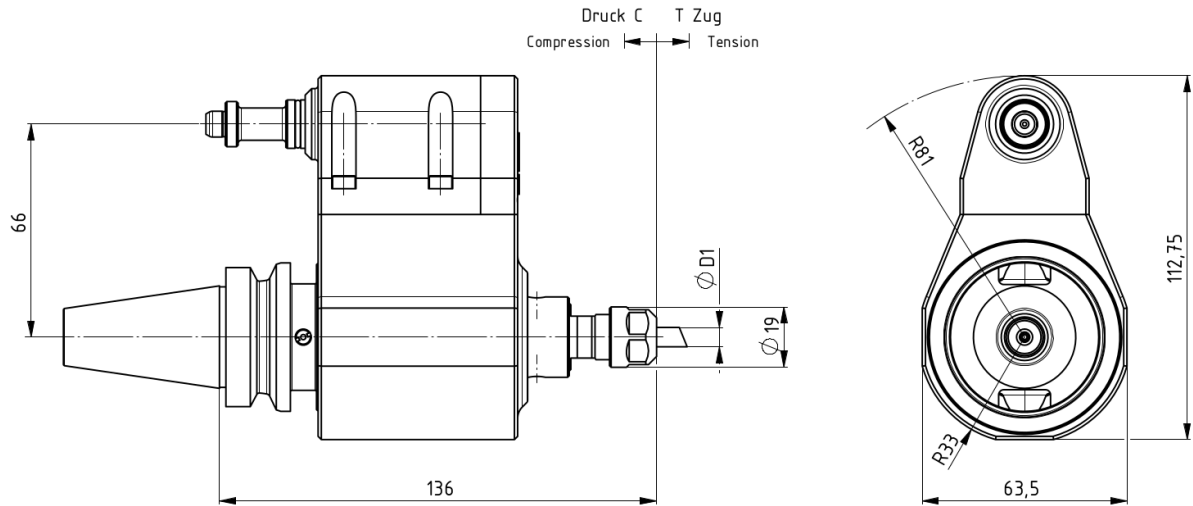
- ▶ Hold the tool when loosening the tool clamping to avoid it falling down and damaging the tool and the work piece.
- ▶ Keep the tool adaptation clean.
- ▶ There are maximum values for cutting speeds and feeds for every kind of machining. Please observe such data.
- ▶ Please observe the maximum tool dimensions.
- ▶ Furthermore, the instructions of the tool manufacturers are valid!

1.4 Proprietary rights

The entire contents of these operating instructions are subject to German proprietary rights legislation.

Any form of multiplication, processing, broadcasting, passing on to third parties - also in the form of extracts - and any kind of use outside the boundaries of proprietary rights requires the written consent of EMUGE GmbH&Co.KG.

1.5 Dimensions and technical data



Picture 1: Dimensions of Speedsynchro® Mini

Table 1: Technical data of Speedsynchro® Mini

Type	Article number	Cutting range	Clamping range $\varnothing D_1$ [mm]	Collet size	max. spindle speed [min ⁻¹ /rpm]	Transmission ratio	Shank connection	C	T	P max. [bar]
Speedsynchro® Mini	F3720I90	M1 – M6	2,5 – 6	ER 11 (GB)	2700	1:4,412	BT30 ISO 73882 JD	0,5	0,5	70

2 Putting the Speedsynchro® Mini into operation



Attention

The housing of the Speedsynchro® Mini must be secured against twisting via stop fixture. For the use of the Speedsynchro® Mini the machine-side locking block must be mounted.

2.1 Unpacking

- Take the Speedsynchro® Mini from the packing
- Clean the Speedsynchro® Mini with a duster to remove any conservation oil



Note

- ▶ Do not use any aggressive solvents.
- ▶ Do not use fibrous materials i.e. steel wool

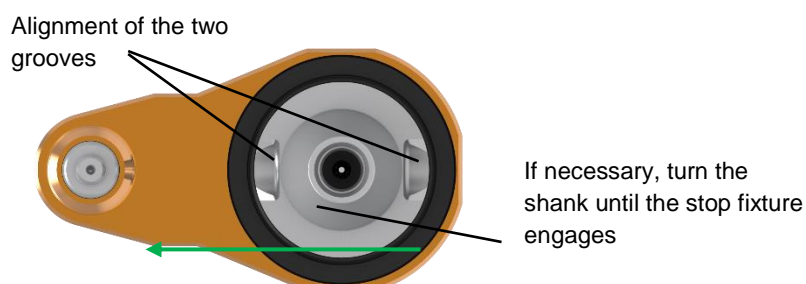
2.2 First putting into operation / preparation



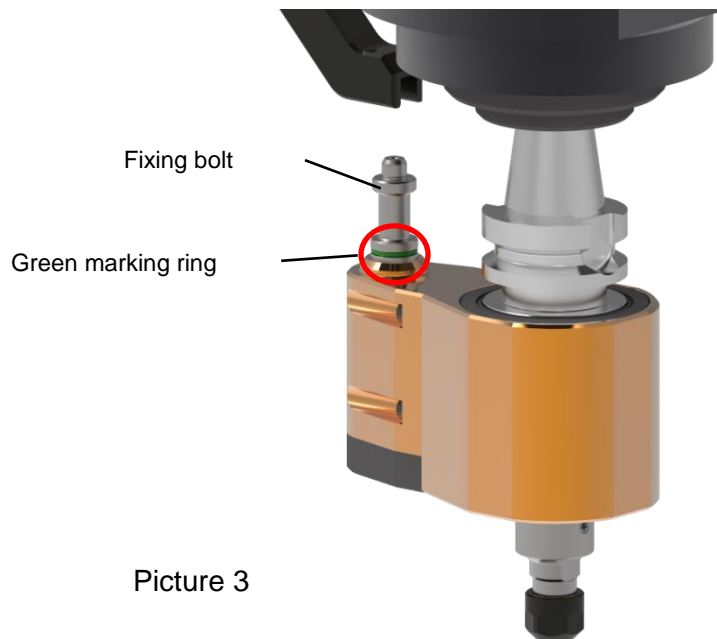
Note

The angel position of the Speedsynchro® Mini stop fixture is **not** adjustable. The position of the machine-side locking block at the spindle is adjusted to the stop fixture of the Speedsynchro® Mini during initial assembly.

- Hook the Speedsynchro® Mini manually into the designated magazine tool slot. Make sure that the stop fixture is engaged in the angular position, please see Picture 2. Green marking ring is visible, please see Picture 3, page 9.



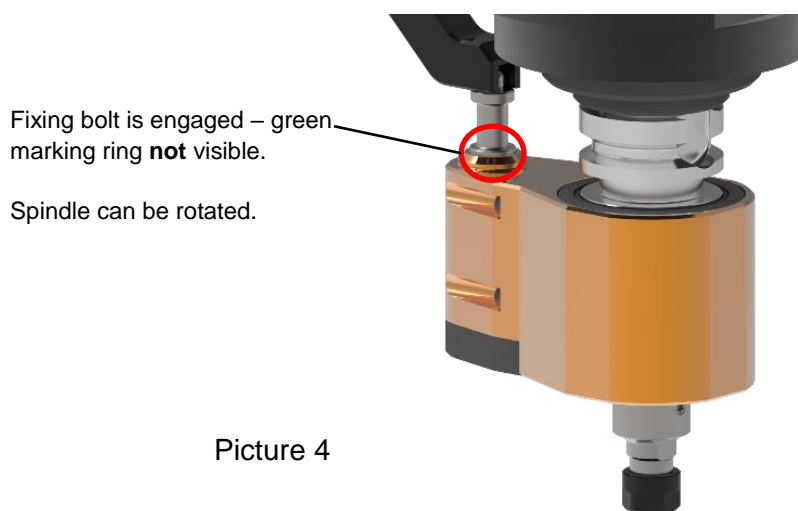
Picture 2



Picture 3

2.2.1 Locking block already mounted on the machine

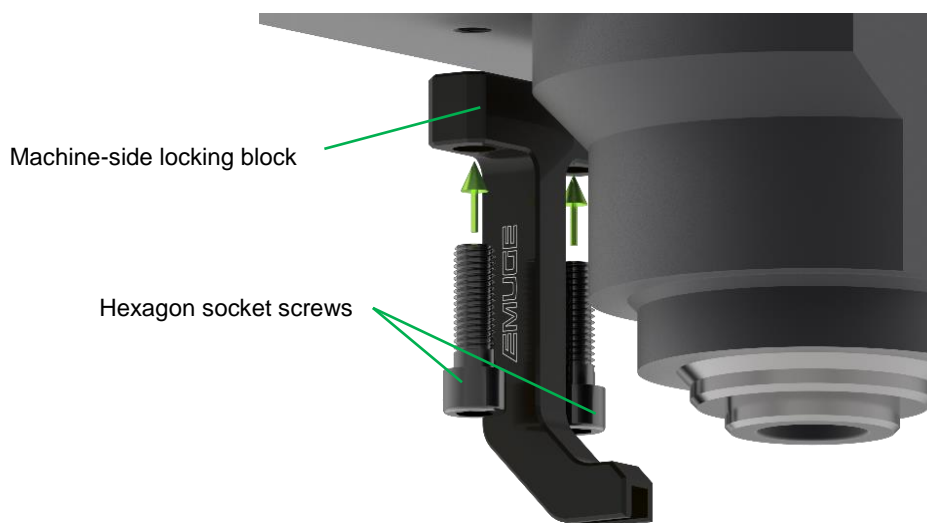
- Insert the Speedsynchro® Mini into the spindle at the slowest speed of the tool changer.
- Check the correct position of the machine-side locking block.
- Fixing bolt is engaged → green marking ring is **not** visible, please see Picture 4.



Picture 4

2.2.2 Mounting of the machine-side locking block on the spindle block

- Mount the machine-side locking block hand-tight with two hexagon socket screws.
The mounting threads on the spindle head are located on the side facing away from the machine door, M6, M8, M10, or M12, depending on the machine. Reducing sleeves are available as accessories for M6 and M8, please order these separately.



Picture 5

- Insert the Speedsynchro® Mini into the spindle at the lowest speed of the tool changer.
- Check the correct position of the fixing bolt → green marking ring is **not** visible, please see Picture 4, page 9.
- Tighten the mounting screws on the machine-side locking block.

Table 2: Tightening torques of the mounting screws

Dimension	Recommended tightening torque
M 6	10,5 Nm
M 8	25 Nm
M10	47 Nm
M12	78 Nm

- Replace the Speedsynchro® Mini via tool changer.
- Insert the Speedsynchro® Mini again via the tool changer at **slowest** speed and check the correct position of the stop fixture.



Note

For series use, please observe the programming instructions, chapter 2.3, page 12.

2.3 Programming notes

The transmission ratio of the Speedsynchro® Mini is 1:4,412.

This results in the following programming guidelines.

- **Feed f**

$$f = P \times 4,412$$

f = Feed [mm/rev.]

P = Pitch of threading tool [mm]

- **Rotational speed n of the machine spindle** for the desired tool speed

$$n_{MSP} = n_{TOOL} / 4,412$$

n_{MSP} = Rotational speed of machine spindle [rpm]

n_{TOOL} = Rotational speed of threading tool [rpm]



Attention

The maximum speed at the machine spindle is:

$$n_{MSP} = 2.700 \text{ rpm}$$

The maximum speed at the tool is:

$$n_{TOOL} = 11.912 \text{ rpm}$$

Example: thread M2 / pitch P = 0,4 mm:

Desired rotational speed of threading tool:

$$n_{TOOL} = 11.000 \text{ rpm}$$

Required rotational speed of machine spindle:

$$n_{MSP} = 11.000 \text{ rpm} / 4,412 = 2.490 \text{ rpm}$$

Required feed f, per revolution of the machine spindle:

$$f = 0,4 \times 4,412 \text{ mm/rev.} = 1,765 \text{ mm/rev.}$$



Attention

When working with internal coolant supply:

The maximum coolant-lubricant pressure is **70 bar**.

The internal coolant is supplied centrally through the spindle.



Der Speedsynchro® Mini is ready for use.

2.4 Re-putting into operation

If the Speedsynchro® Mini is put back into operation as described in chapter 5, page 22, please go through the following steps:

- Clean the Speedsynchro® Mini with a duster to remove any conservation oil



Note

- ▶ Do not use any aggressive solvents.
- ▶ Do not use fibrous materials i.e. steel wool.

- Test the stop fixture:

Press the fixing bolt down

➔ The fixation must be released, green marking ring is **not** visible, please refer to Picture 4, page 9.

Release the fixing bolt

➔ The stop fixture is engaged in the angular position, green marking ring is visible, please refer to Picture 3; page 9.

2.5 Sealing disk / cooling disk

2.5.1 Application

The sealing disks or cooling disks are inserted into the clamping nuts for producing threads with internal coolant supply. The sealing disks respectively the cooling disks additionally avoid the penetration of dirt and chips into the collet slots. We do recommend the use of sealing disks or cooling disks.

In contrast to the sealing disks, the cooling disks guide the coolant directly along the tool.



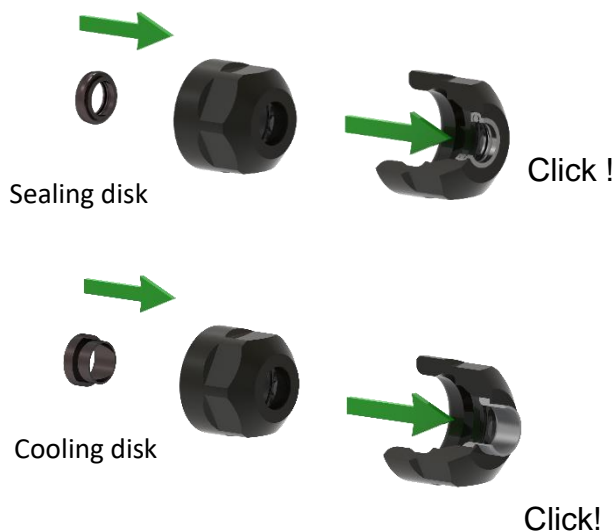
Note

Normally a clamping nut for sealing disks/cooling disks is part of the delivery.
The sealing disk or cooling disk has to be ordered separately, suitable for clamping nut and clamping diameter!

2.5.2 Assembly of the sealing disk or cooling disk



1. Screw off the clamping nut



2. Insert sealing disk/cooling disk into clamping nut as shown on picture.
Push sealing disk/cooling disk forward into clamping nut until you clearly hear the engagement.
The sealing disk must be flush at the front with the clamping nut.

2.6 Collets

2.6.1 Application

The adaptation of the tap/cold-forming tap is done via collets type ER and/or ER/GB. With collets type ER the tap/cold forming tap is centered and clamped via the shank diameter. With collets type ER/GB the torque - arising during the thread producing operation - is additionally transferred via the square integrated in the collet.



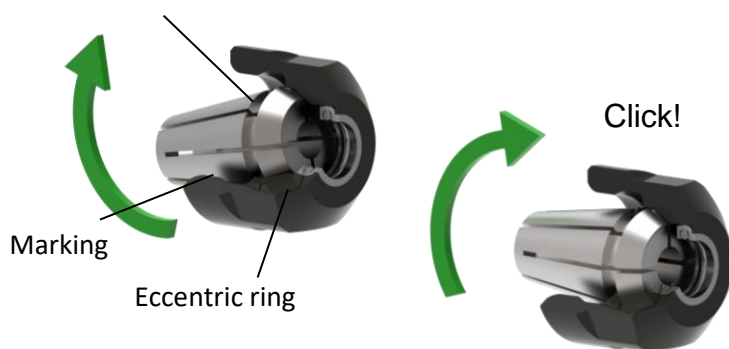
Note

Due to the better torque transmission we recommend the use of collets type ER/GB.

The collet sizes for the according Speedsynchro® Mini may be taken from Table 1, page 7. The clamping diameter is specified by the tap/cold-forming tap used.

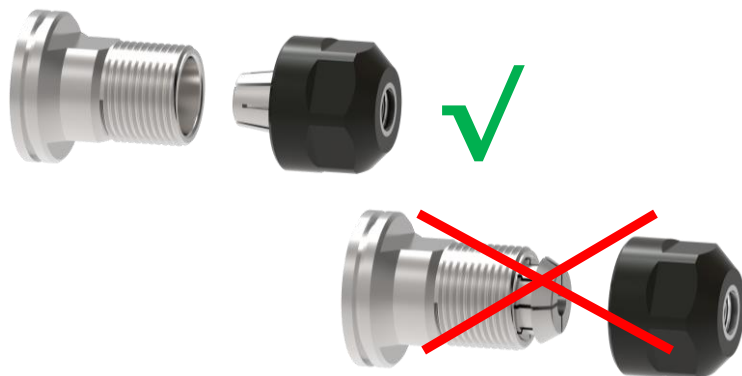
2.6.2 Assembly of the collet

Groove of the collet



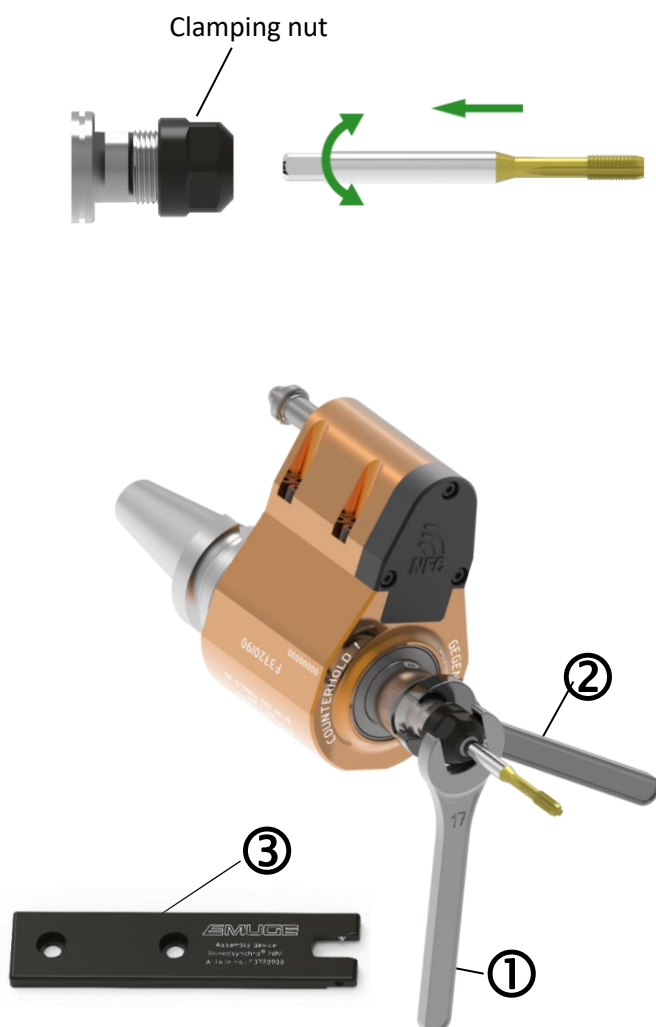
1. Insert collet into clamping nut, tilt collet.
The groove of the collet must engage in the eccentric ring of the clamping nut at the marked position. Tilt collet in opposite direction until it clearly engages.

→ Collet is flush with clamping nut and/or sealing disk.



1. Screw clamping nut with engaged collet onto the thread of the collet holder.

2.7 Assembly of the tap/cold-forming tap



1. Insert tap/cold-forming tap

If collet and tool are provided with a square, the tool must be turned into position in order to be inserted into the square of the collet!

2. Tighten clamping nut with appropriate wrench.



Attention

In order to avoid damaging of Speedsynchro® Mini parts, it is necessary during the tightening of the clamping nut via wrench ① to support with open-ended spanner ②.

As an alternative to the open-ended spanner ② the assembly device ③ F3720900 can be used.



Note

Wrenches are part of the delivery.

To adjust the correct torque (please see table 3), we recommend to use a torque wrench.

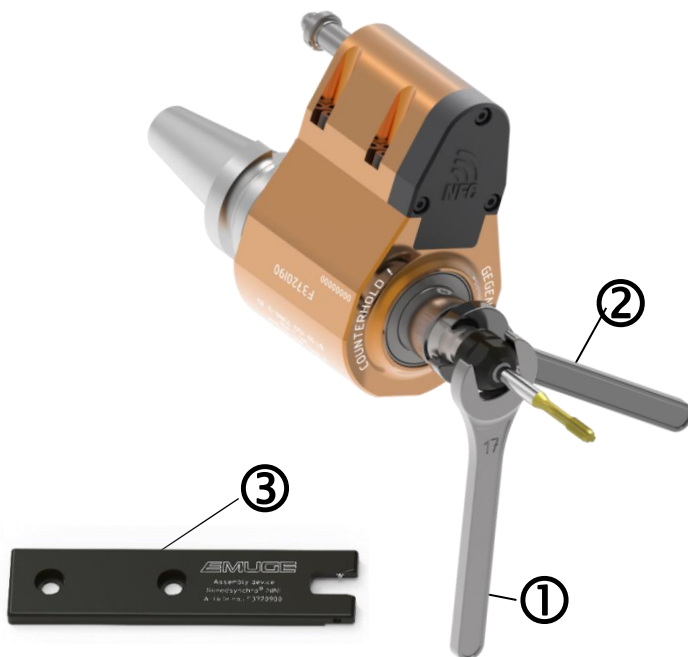
Table 3: Tightening torques for clamping nuts

Type	Recommended tightening torque [Nm]
Hi-Q/ERC 11	14

Data valid for the use of ER-GB collets.

The maximum tightening torque must not be more than 25% above the recommended values. Higher torque may result in the damage of the collet holder.

2.8 Remove the tap/cold-forming tap, the clamping nut and the sealing disk



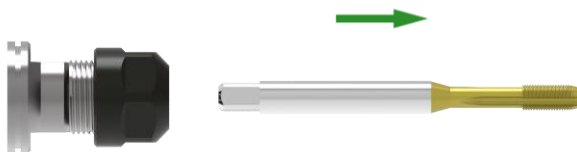
1. Loosen the clamping nut with wrench



Attention

In order to avoid damaging of Speedsynchro® Mini parts, it is necessary during the loosening of the clamping nut via wrench ① to support with open-ended spanner ②.

As an alternative to the open-ended spanner ② the assembly device ③ F3720900 can be used.



2. Pull out tap/cold-forming tap



3. Screw off the clamping nut



4. Tilt collet up to the marking until it is removed from the eccentric ring
Remove collet



5. Press the sealing disk or cooling disk out of the clamping nut from the front and remove it

3 Readout operating data via NFC interface

The operating data is recorded and stored by the electronics integrated in the Speedsynchro® Mini. The readout of data is done via an NFC-enabled smartphone.

The required app can be downloaded free of charge for iOS from Apple store or for Android operating systems from Google Play Store.

3.1 Speedsynchro® - Electronics

The electronics of the Speedsynchro® system are embedded and protected under the cover, the NFC readout antenna is integrated inside. Depending on the operating condition the electronics are in active or in energy saving mode.

Power is supplied by a battery integrated in the Speedsynchro® Mini, the battery charge state can be read via NFC. The battery has a service life of several years and is replaceable. The operating data is not lost when the battery is changed.

3.2 Readout operating data

The operating data is read out via wireless coupling of smartphone and Speedsynchro® Mini antenna. The antenna is located under the cover. The position of the antenna in the smartphone depends on manufacturer and model.

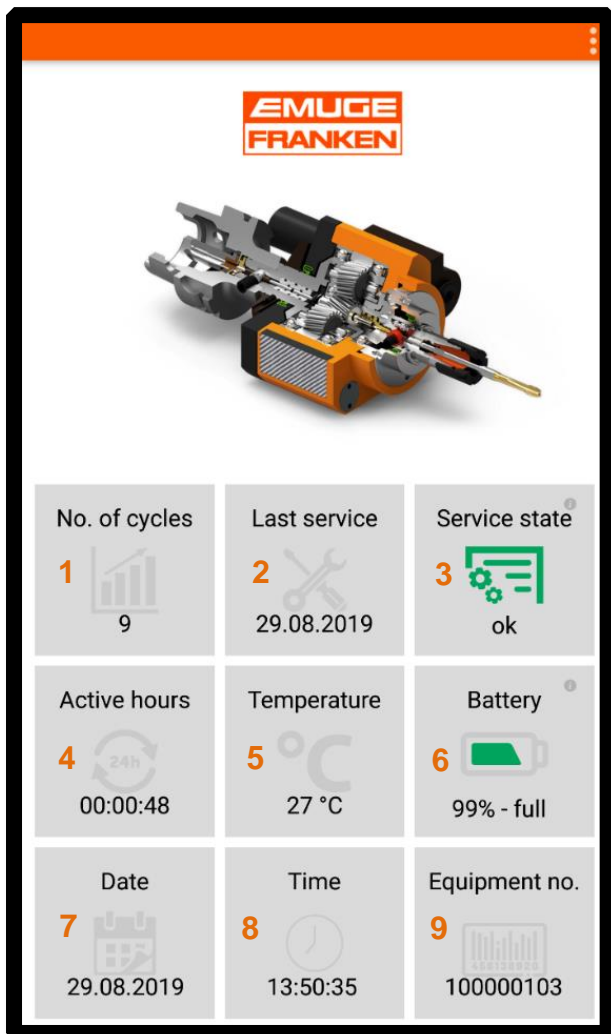
For coupling and reading the operating data, it is sufficient to move the back of the smartphone in direct contact or within a few millimeters over the cover.

Depending on the smartphone model, the EMUGE app opens automatically and the operating data can be read. If the app does not open automatically, it must be opened manually before coupling the devices.



Picture 6

3.3 Display in the app






Picture 7

6 Battery status

The traffic light colours indicate the status of the battery.

Specific meaning of the colours:

-  Fully charged
-  OK
-  Critical: Please return for maintenance

1 Number of threads

Shows the number of threads produced since the last maintenance or for new devices from date of delivery. The display/number is reset to „0“ during maintenance at EMUGE.

2 Last service

Shows the date of last maintenance or for new devices the date of delivery.

3 Service status

Maintenance is recommended after production of 2 million threads or 1000 hours of operation.

If maintenance is due, the traffic indicator jumps from green to red, which means in detail:



Number of threads < 2 Mio.
Operation hours < 1000



Number of threads > 2 Mio.
Operation hours > 1000

4 Duration of use

Shows the operating hours since the last maintenance or for new devices from date of delivery. Is reset to „0“ during maintenance at EMUGE.

5 Temperature

Shows the maximum temperature the Speedsynchro® Mini reached since last maintenance/ / new delivery.


7 + 8 Date / Time

Shows the current date and time of time zone Europe / Berlin.

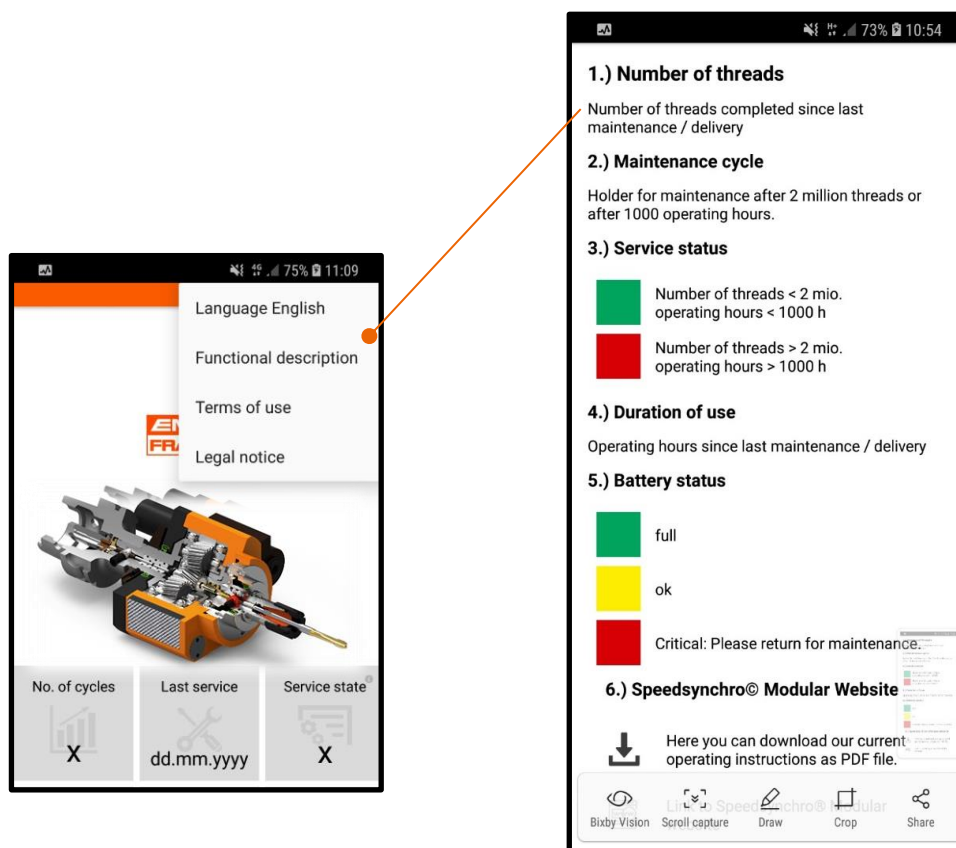
9 Device number

Shows the unique device number in addition to the article number, is assigned by EMUGE upon delivery.

A short summary of the display functions is shown in the menu selection at the top right under the item “Function description”

Tapping the button  in fields 3 + 6 (picture 7, page 19) also takes you to this page.

There are also the terms of use and the imprint.



Picture 8

4 Maintenance / Servicing

4.1 Maintenance schedule

What?	When?	Who?
External cleaning	Periodically, depending on the degree of dirt	Operator
Maintenance	After producing 2 million threads or reaching 1.000 operating hours	EMUGE

4.2 External cleaning

Clean the Speedsynchro® Mini at periodic intervals with a duster, depending on how dirty the holder is.



Attention

- ▶ Do not use any aggressive solvents.
- ▶ Do not use fibrous materials i.e. steel wool.
- ▶ Do not clean and dry the Speedsynchro® Mini in a temperature range > 60°C, as this may damage the built-in damping elements and the seals.

4.3 Maintenance

Maintenance is recommended after production of 2 million threads or 1.000 hours of operation.

During maintenance of the Speedsynchro® Mini, wear parts are replaced, the gearbox is greased, and the Speedsynchro® Mini is checked on function and leak tightness.

5 Storage when not in use

If the Speedsynchro® Mini is taken out of service, please go through the following steps:

- Clean the Speedsynchro® Mini with a duster, please refer to chapter 4.2, page 21.
- Spray or rub in the Speedsynchro® Mini with a conservation oil, to avoid rust formation



Attention

Before storage all coolant lubricant residues and machining residues must be removed!



6 Disposal instructions

This instrument contains a non- rechargeable Lithium battery! If the battery is empty, it must not be disposed of in household waste!

Spent batteries may contain toxic waste which can cause harm to environment and damage to health. To replace or remove the battery, please contact your EMUGE partner.

For safety reasons, do not attempt to remove the battery. Failure to properly remove the battery may result in damage to the device.

All batteries can be recycled. Raw materials such as iron, zinc or nickel can be recovered from recycled batteries. Thus battery recycling helps protecting the environment.

Used electrical devices put on the market by EMUGE can be returned to us. We will ensure an environmentally safe disposal. The current EU directives "RoHS" and "WEEE" and the "ElektroG" are observed.

7 EU-Declaration of Conformity



CE Marking for Speedsynchro® Mini

EMUGE-Werk Richard Glimpel GmbH & Co. KG declares that the designated products in their design and construction as well as in the versions placed on the market comply with the basic safety and health requirements of the

EU-Directive EN 61000-6-2:25005

Electromagnetic compatibility (EMC) - Immunity for industrial environments

and the

EU Directive EN 6100-6-4:2007+A1:2011

Electromagnetic compatibility (EMC) - Emission requirements for industrial environments.

In case of a modification of the product not agreed with EMUGE-Werk, Lauf this declaration loses its validity.

The declaration of conformity can be requested at the following address:

EMUGE-Werk Richard Glimpel GmbH & Co. KG
Fabrik für Präzisionswerkzeuge
Nürnberger Straße 96-100
91207 Lauf
Germany
info@emuge-franken.com

8 UK Conformity Assessed



UKCA marking for Speedsynchro® Mini

EMUGE-Werk Richard Glimpel GmbH & Co. KG declares that the designated products in their design and constructions as well as in the version placed on the market comply with the basic safety and health requirements of the

EN 61000-6-2:2005-08 Electromagnetic compatibility (EMC) – Part 6-2:

Generic standards - Immunity for industrial environments (IEC 61000-6-2:2005) and the

EN 61000-6-4:2007+A1:2011 Electromagnetic compatibility (EMC) – Part 6-4:

Generic standards - Emission standard for industrial environments (IEC 61000-6-4:2006 + A1:2010).

In case of a modification of the product not agreed with EMUGE-Werk Lauf this declaration loses its validity.

The declaration of conformity can be requested at the following address:

EMUGE-FRANKEN UK Ltd.

Contact: Mr. Mark Ridgway

Unit G, The Point, Bradmarsh Way

S60 1BP Rotherham

9 FCC-Rules



Valid for America/Canada:

This device with part 15 of FCC Rules.

Operation is subject of the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Notes:

Notes:

EMUGE Speedsynchro® Mini
Operating instruction

Article number: **ZB10061.GB** **10723033**

Original in German, Edition: 2, last change: 13.09.2022, change stage: 1

Please keep the operating instruction for future use!

EMUGE-Werk Richard Glimpel GmbH & Co. KG

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