SCHAEFFLER

Induction systems with medium frequency technology

Rely on us and our innovative solution for thermal mounting and dismounting of metal components.

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Schaeffler is your

all-in-one solution provider

for production and maintenance applications

The challenge

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The challenge in detail

Energy efficiency

Of all equipment and all processes in maintenance

Safety

for both man and machine

Limited time & budgets

In maintenance

Unplanned downtimes

15 to 20 % of all bearing damage is caused by incorrect mounting

The solution

The environmentally friendly and innovative solution

Induction heaters with medium frequency technology are an innovative solution

Because: they can be used quickly and easily and heat more energy-efficiently than conventional methods.

Induction heaters with medium frequency technology

One device, multiple application possibilities

- Thermal mounting and dismounting is possible
- Preheating of components
- Also suitable for large and heavy work pieces
- Mobile, easy to move on site

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The sustainable solution

Energy efficiency
thanks to high efficiency

Safety
for the workpiece thanks to controlled heating

Short heating times

Reusability
of parts that would otherwise be scrapped

Improved machine availability and productivity

Longer lifecycle

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Induction heaters with medium frequency technology – our customer sectors

Rail

Wind

Paper

Drive Technology

Aerospace

Raw Material Extraction and Processing

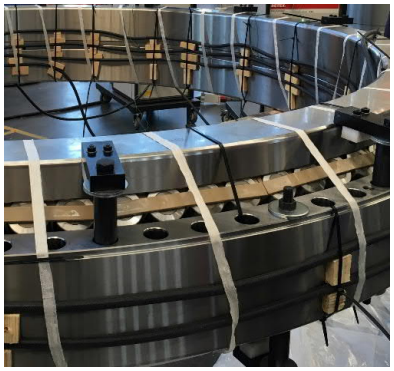
Cement

Steel

Induction heaters with medium frequency technology – applications

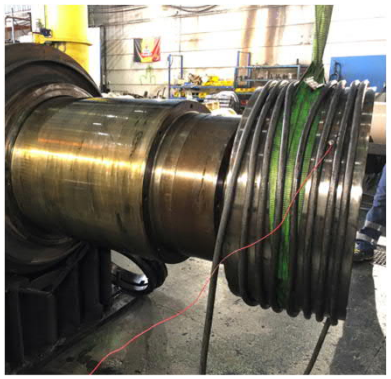
Application examples

Gear wheels



Bearings

Bearings in housings



Bearing inner rings

Couplings

...and many other ferromagnetic components, e.g. steel, cast iron, other materials upon request.

Medium frequency induction heaters consist of:

Generator

Flexible Inductor

Fixed inductor

MFT induction heaters consist of a generator combined with a flexible or fixed inductor.

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Flexible inductors offer excellent adaptability to components of different sizes and geometries.

Special features

- can be placed either in the bore or on the outside of the workpiece
- depending on the application, up to 40 m long, max. 180 C° and 300 C°
- unique flexibility to adapt to different workpiece shapes and dimensions
- also suitable for particularly large components such as bearings, gear wheels, housings etc.

Fixed inductors

Fixed inductors are more suitable for serial production, where short set-up times and high process reliability are important.

Special features

- Application-specific manufacture
- can be placed on the work piece easily and quickly
- particularly suitable for serial production, mounting and dismounting

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Schaeffler has been the leading supplier of
induction heaters for professional industrial use for years.

**Our induction heaters with
medium frequency technology are the solution
for both mounting and dismounting.**

Two models

MF-GENERATOR 2.5

compact design with 3.5” display

10 kW

22 kW

44 kW

MF-GENERATOR 3.0-3.5

advanced functions and 4.3’’ resp. 7.0” display

3,5 kW

10 kW

22 kW

44 kW

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MF-GENERATOR 2.5

When the most important functions are sufficient

The fast, environmentally friendly and reliable induction heater for mounting and dismounting.

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MF-GENERATOR2.5

What makes it different:

- compact design
- 3,5'' touch screen
- user-friendly operation with touch screen
- smart electronics for optimum operating frequency
- adjustable output control
- dual temperature measurement with ΔT monitoring
- choice between fixed and flexible inductors

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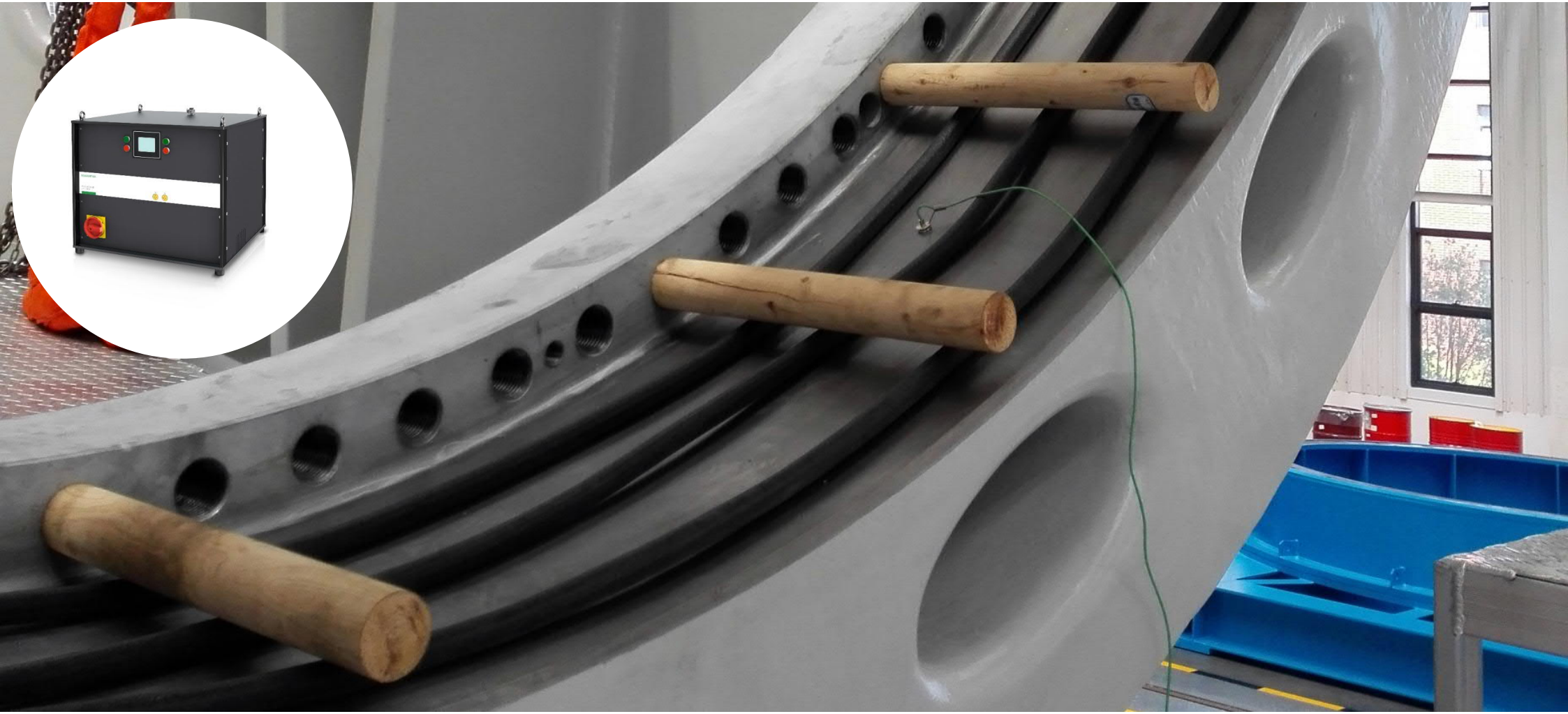
MF-**GENERATOR2.5 in action**



MF-GENERATOR3.0 – 10 to 44 kW

MF-GENERATOR 3.0

When more control is needed.

The fast, environmentally friendly and reliable induction heater for mounting and dismounting.

MF-GENERATOR3.0 – 10 to 44 kW

Additional benefits compared to the 2.5 model

- larger 7“ touch screen
- heating possible according to pre-set temperature/time curve
- heating process is displayed with clear graphic
- creation of a work protocol as proof
- log function for data storage and export via USB port
- up to 8 generators can work together (leader – follower) to heat larger parts

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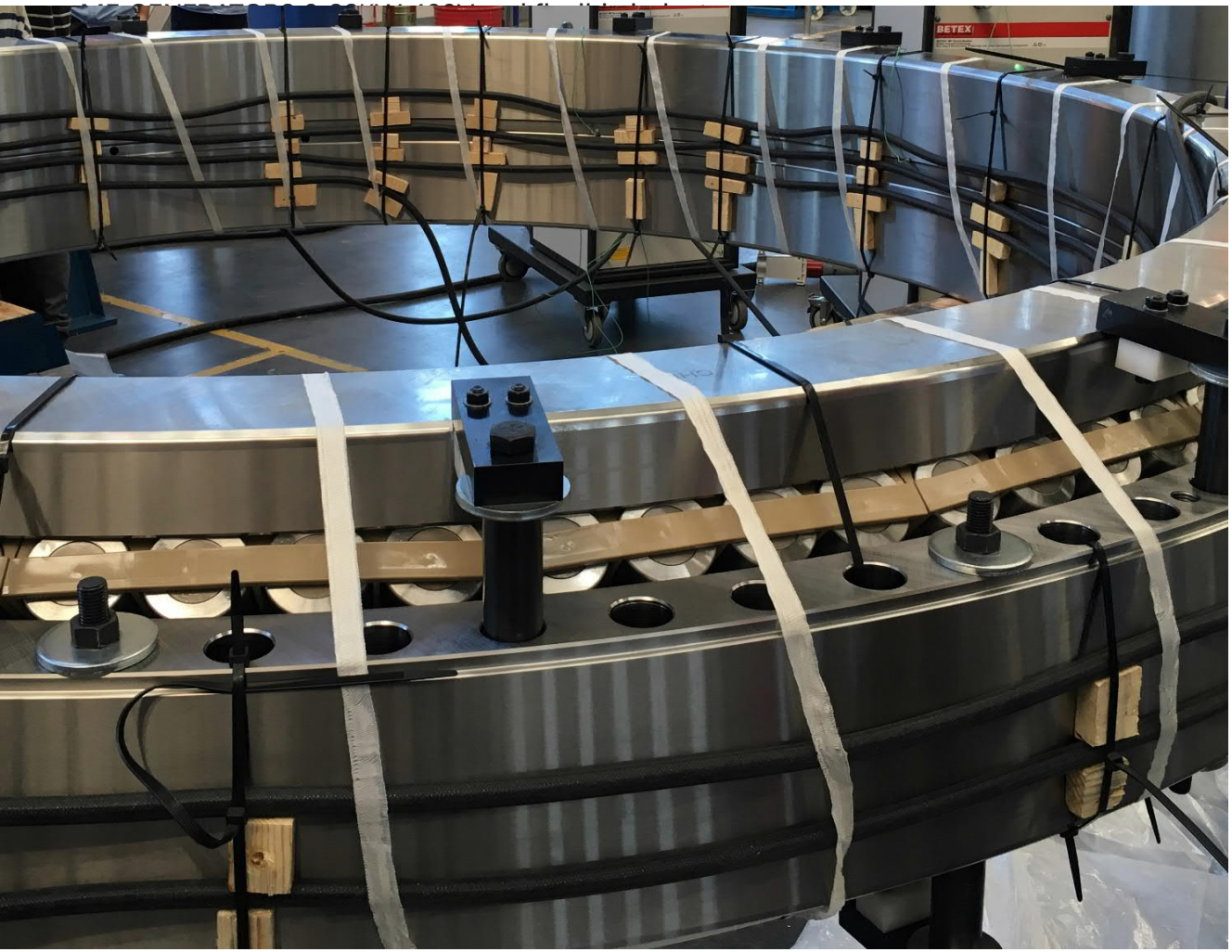
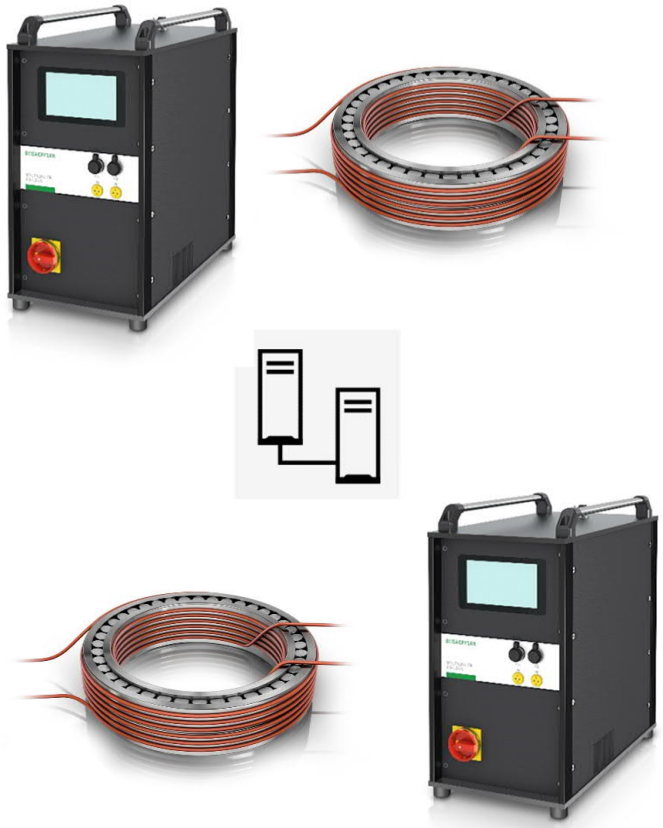
MF-**GENERATOR 3.0 in action**

Simultaneous heating of bearing inner ring and outer ring with 2 generators





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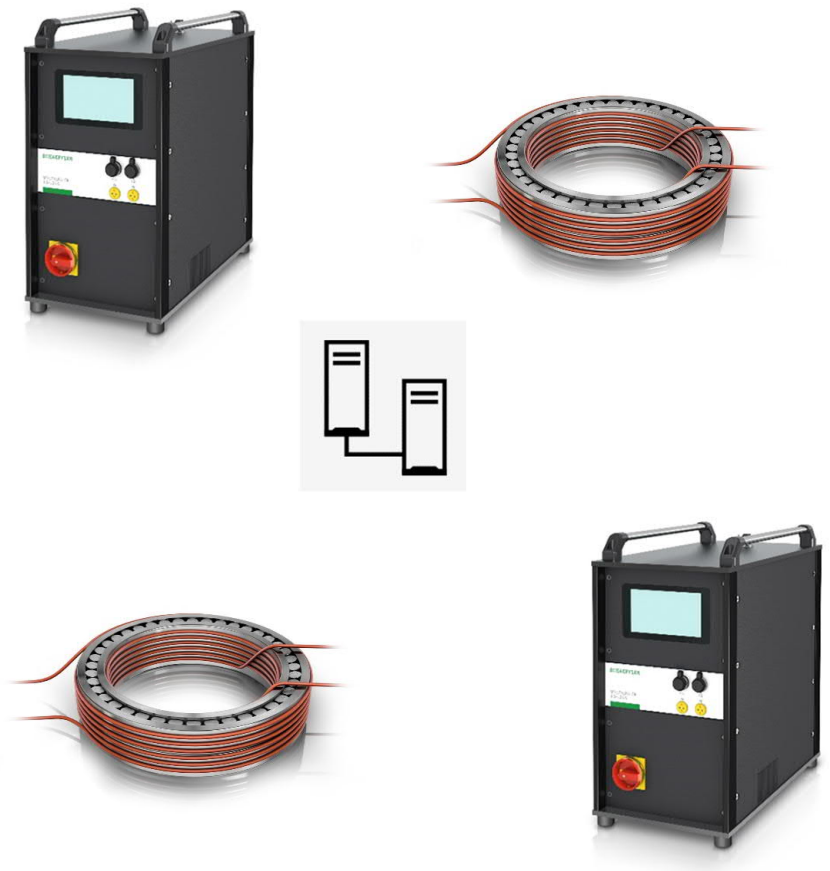
Safety through controlled heating

The two generators communicate with each other.

A max. permissible temperature difference (Delta-T) between the inner ring and outer ring is set for the heating process.

Depending on the allowed temperature difference, the generators regulate the output during the heating process.

The clearance in the bearing is maintained by the controlled heating process. Consequently, damage to the bearing due to the heating process can be ruled out.

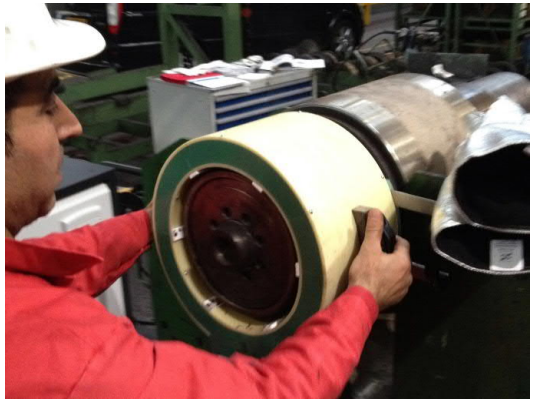


A consistently positive user experience

The configuration of an induction unit depends on the specific application. If required, we also design and manufacture fixed inductors custom-made to the application.

In short:

We have the solution for customized demands.



MF-GENERATOR3.0–3.5 kW

MF-GENERATOR 3.5KW

Small, mobile and powerful

- Compact dimensions, low weight
- Low cost
- Simple power supply (230V/16A)
- 4.3‘‘ touch screen
- Mobile and flexible use
- Usable in hard-to-reach mounting locations or where space is limited
- Ideal for small and medium-sized work pieces
- Economical solution also for smaller workshops
- Usage with flexible inductors only (5m, 7.5m 10m) (ordered separately)

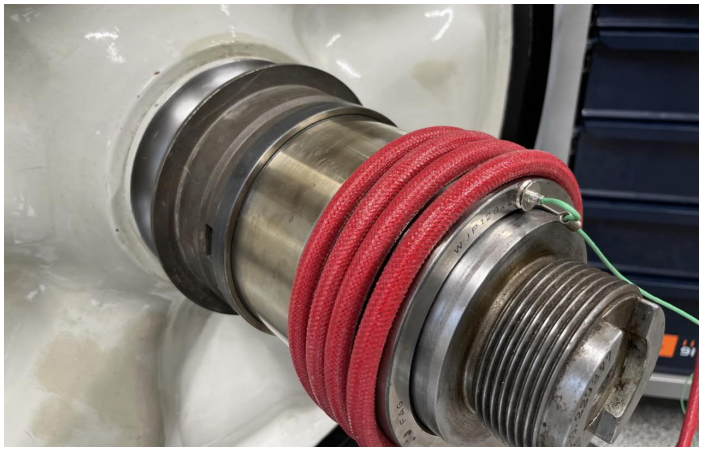
MF-GENERATOR3.0-3.5KW in action

Economic inductive solution also for smaller repair shops:

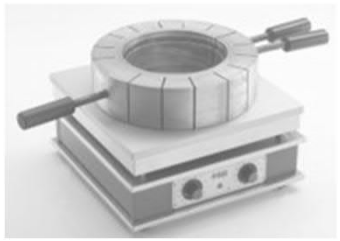
The inner rings of cylindrical roller bearings, here mounted in pairs, are heated and dismantled one by one.
Time needed : < 2 min
Temperature: 120°C

Compared to conservative thermal tools, such as aluminum heating rings with heater plate:

- Controlled and safe heating
- Easy handling
- No mechanical wear of the tool
- Suitable for different sized work pieces and not only one
- Energy-efficient and cost-effective heating



Inner ring dimension:
d = 120 mm
D = 150 mm
B = 80/65mm



Former method

MF-IDUCTOR

Handy and easy to use

- Lightweight handheld without temperature control
- Usage with flexible or fixed inductors
- Various performance variants available
- Can be operated with one hand
- Ideal for small work pieces
- Low-cost tool for workshops

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MF-IDUCTOR with flexible inductor for various workpieces:

- For mounting and dismounting of bearings, housings, bushings, sleeves and many other components
- Flexible inductor is simply wrapped around the component or placed in the bore
- Usable for different sizes of workpieces
- For complex shaped components
- Energy-efficient and cost-effective heating

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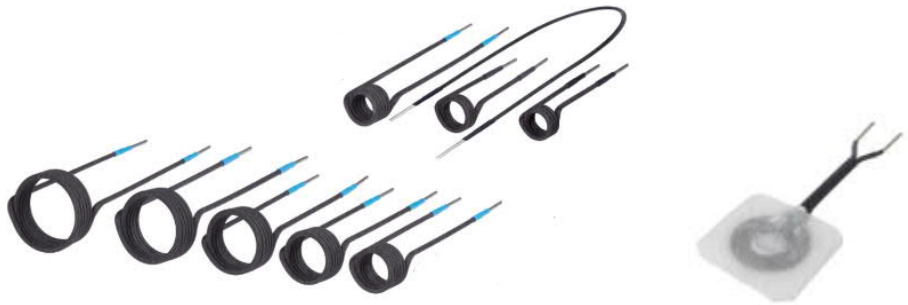
MF-IDUCTOR with fixed inductors for small workpieces:

- 9 fixed inductors available as a set (option)
- Loosens stuck components such as nuts, rings, bushings
- Ideal for rusted screw connections, e. g. axles, exhaust systems and many other components of construction machinery and vehicles
- Inductive pad (option) for localised heating of surfaces, removal of decals, adhesives and coatings



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Advantages of the new induction heaters with medium frequency technology

More opportunities

Mounting and dismounting also of large work pieces

More flexibility

By using flexible or fixed inductors

More sustainability

Through energy efficiency and longer lifetime

More mobility

The MF-GENERATOR can be taken to the workpiece, not the other way round

More individuality

The best solution for every application

More efficiency

Through lower costs and higher productivity

More safety

For both man and machine

Application examples

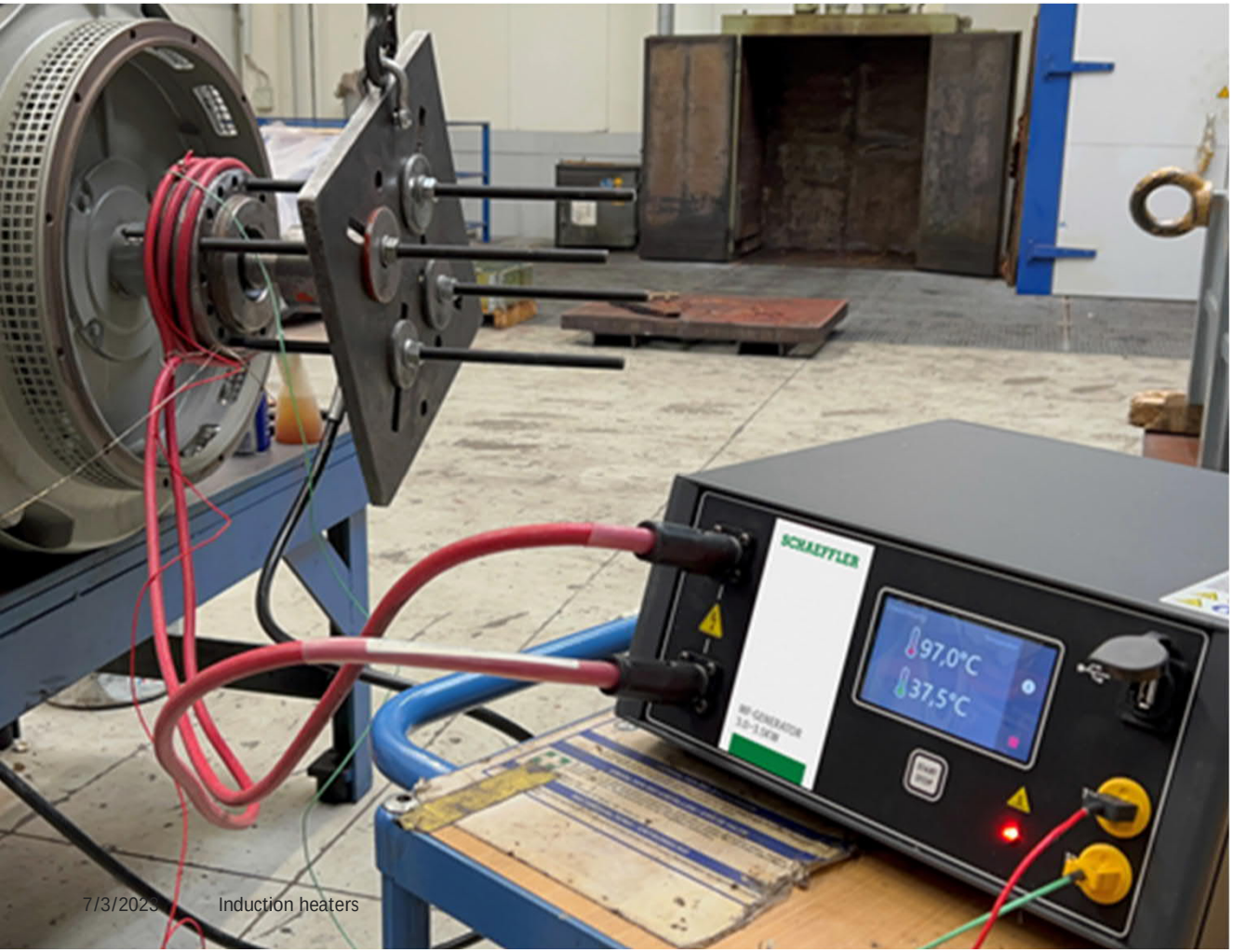
Construction machinery

Dismounting bushing from a pump

Time needed : 3.5 minutes

Temperature: 120°C

Application examples

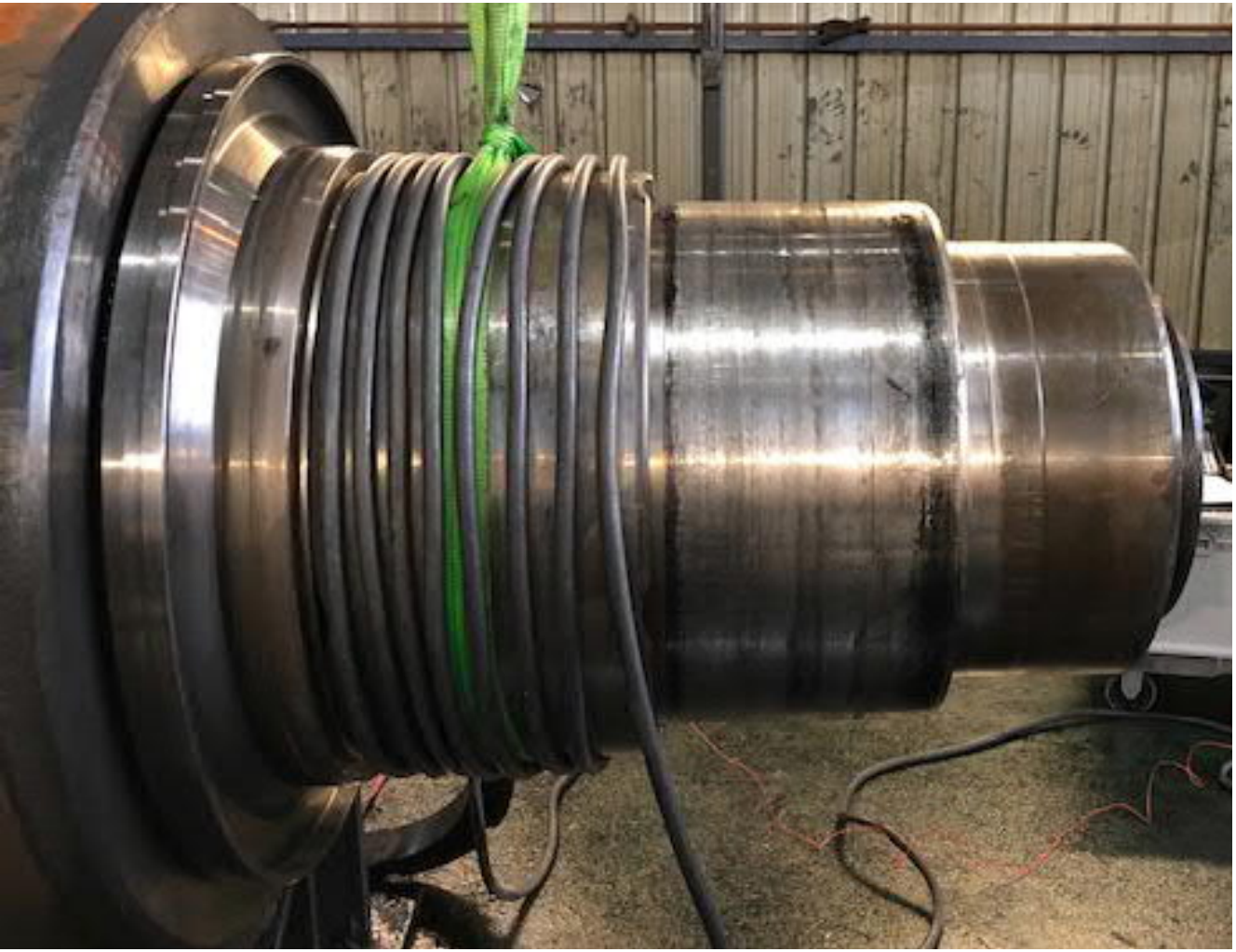


Marine

Dismounting coupling from an electric motor (with mechanical support):

Time needed: 2.2 minutes
Temperature: 100°C

Application examples

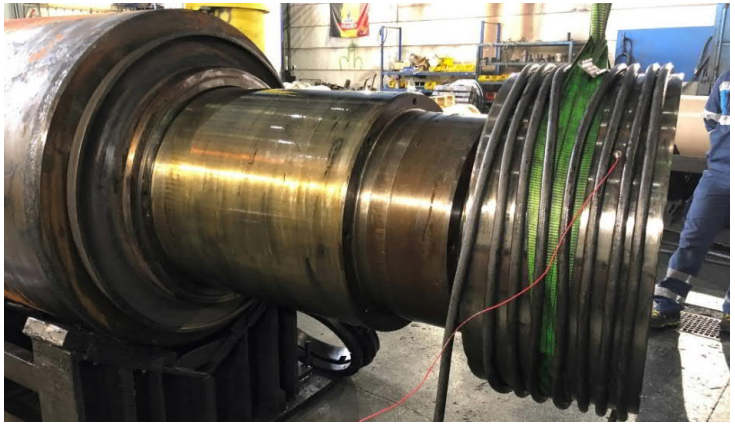


Steel

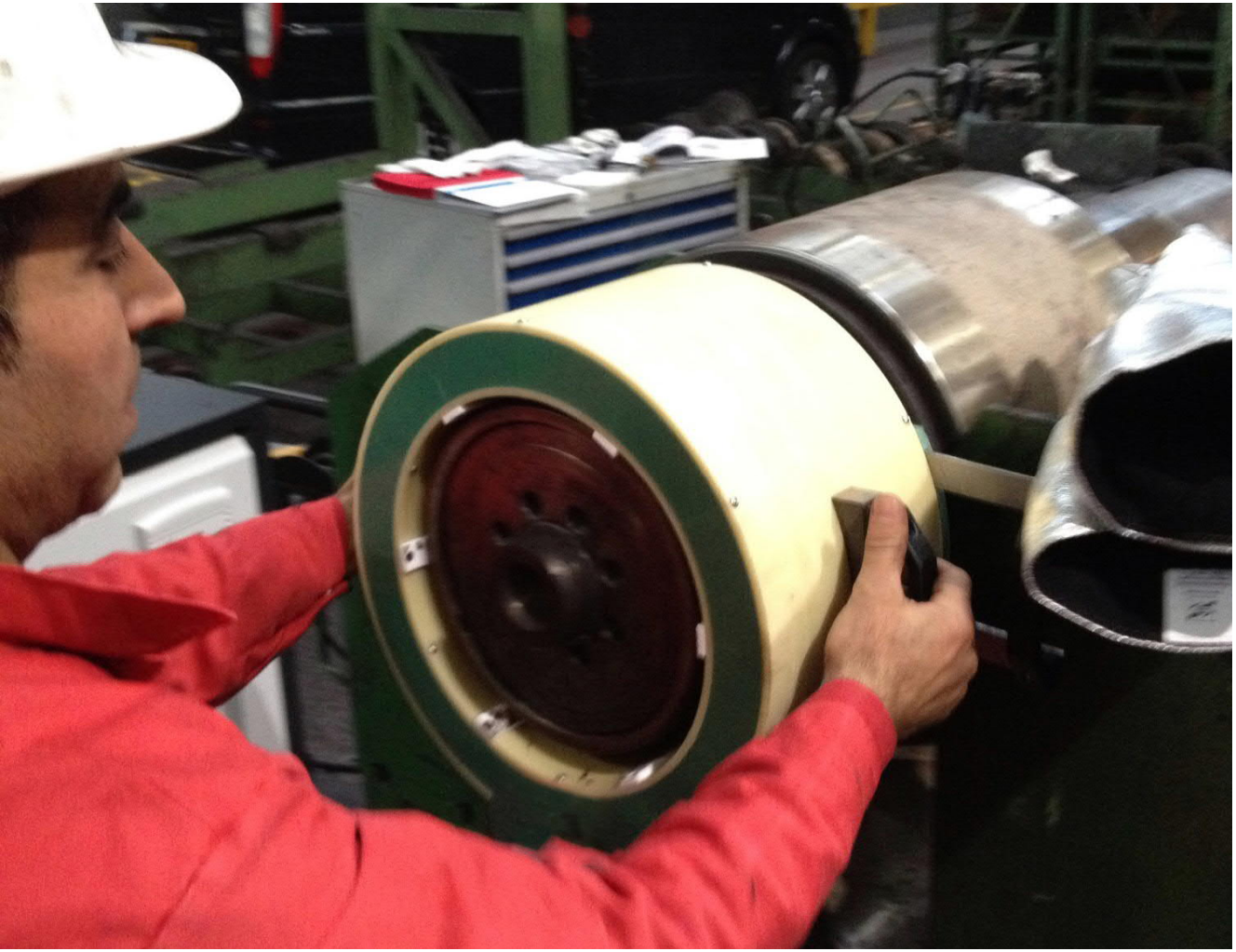
Dismounting bearing inner rings with a 22 kW generator and a flexible inductor:

Time needed: 8 minutes

Temperature: 120°C



Application examples



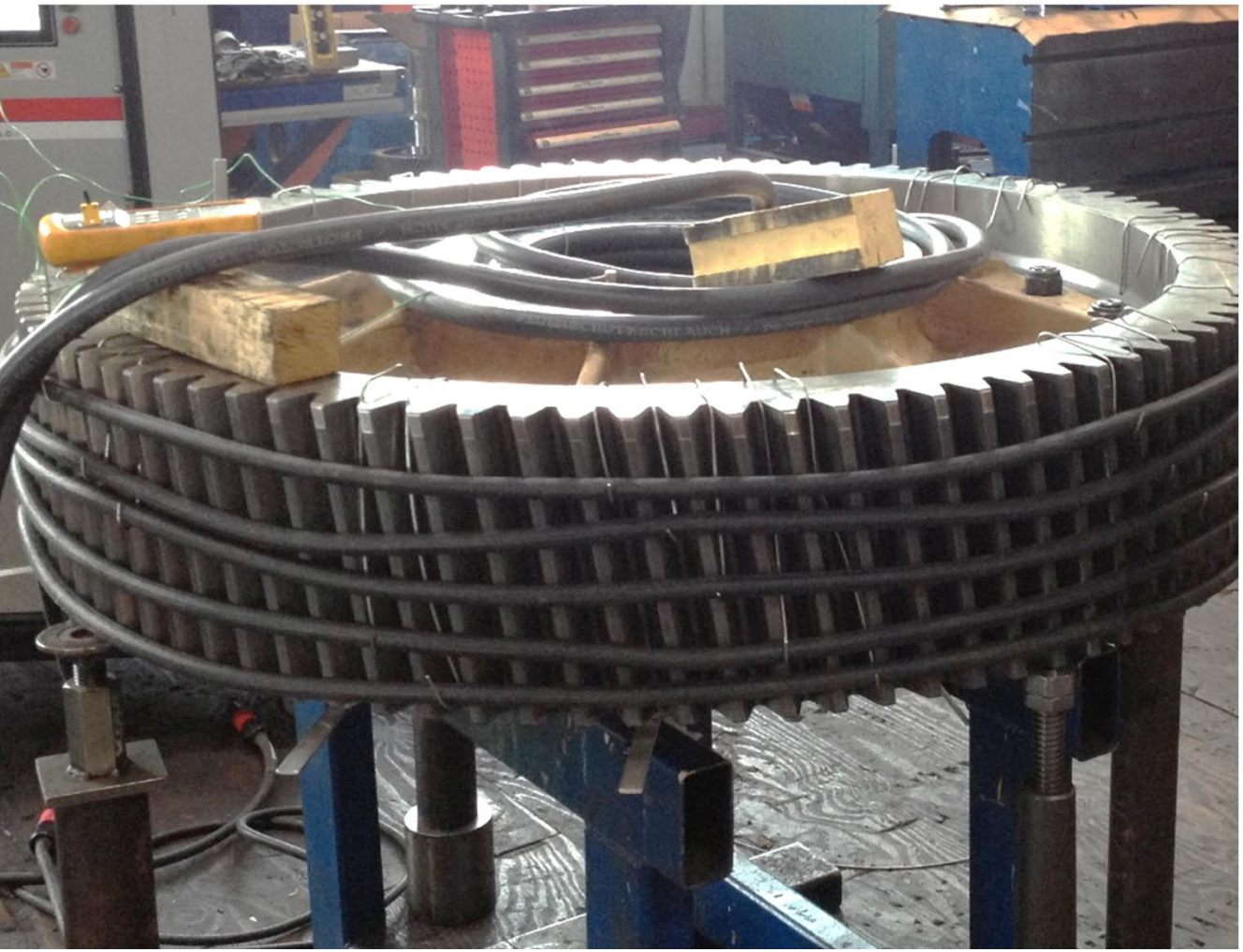
Steel

Serial dismounting of bearing inner rings with a 22 kw GENERATOR and fixed inductor:

Time needed : 3 minutes

Temperature: 120°C

Application examples



DRIVE TECHNOLOGY

Mounting of a gear wheel with MF-GENERATOR2.5–44 kW and flexible inductor.

Winding distribution over the circumference and face of the gear (± 2500 kg).

Time needed: 30 minutes
Temperature: 180°C

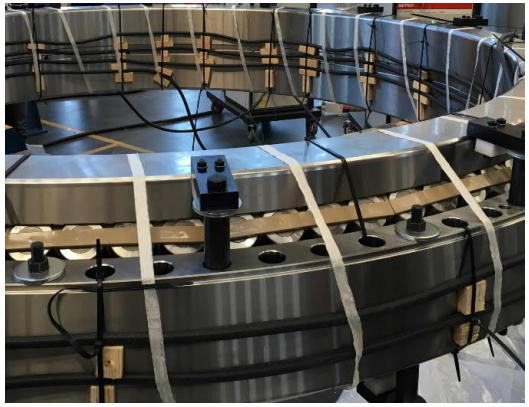
Application examples

Drive Technoloy

Bearing seat heating for mounting the bearing in a cable wheel with a MF GENERATOR 22 kW and flexible inductor:

Time needed: 4 minutes
Temperature: 120°C

Application examples



Wind

Mounting a main bearing:

Step 1: heating the bearing (6800 kg) with 2 GENERATOR3.0-44KW generators simultaneously using flexible inductors:

- 1 generator heats the inner ring
- 1 generator heats the outer ring

Time needed: 120 minutes
Temperature: 110°C

Step 2: heating the bearing seat (11.000 kg) to mount the bearing in the housing:

Time needed: 60 minutes
Temperature: 80°C

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Laser Cladding

Preheating of components for laser coating with a MF GENERATOR 22 kW and a flexible inductor

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When to use the innovative solutions for mounting and dismounting?