SCHAEFFLER

Induction Heating Devices

MF-IDUCTOR

User Manual

Contents

1 About the manual

This manual is part of the product and contains important information. Read the manual thoroughly prior to use and follow the instructions precisely.

The original language of the manual is German. All other languages are translations from the original language.

1.1 Signs

The warning, prohibition and mandatory signs are defined in accordance with DIN EN ISO 7010 or DIN 4844-2.

1 Warning, prohibition and mandatory signs

Signs and descriptions	
	Wear safety gloves
	Wear safety shoes

1.2 Availability

A current version of this manual can be found at:
https://www.schaeffler.de/std/1FB3

Ensure that this manual is always complete and legible and is available to all persons engaged in transporting, fitting, dismantling, commissioning, operating or maintaining the product.

Keep the manual in a safe place for immediate reference.

1.3 Legal guidelines

The information in this manual reflects the status at the time of publication.

Unauthorised modifications to or improper use of the product are not permitted. Schaeffler accepts no liability in these cases.

1.4 Images

The images in this manual may be schematic representations and may differ from the delivered device.

1.5 Further information

Address any questions on fitting to your local contact at Schaeffler.

2 General safety regulations

2.1 Intended use

Heating of rolling bearings and other ferromagnetic workpieces.

2.2 Improper use

Do not operate the heating device in a potentially explosive environment.

2.3 Qualified personnel

Operator duties:

- Ensure that the activities described in this manual are carried out by qualified and authorised personnel only.
- Ensure that personal protective equipment is used.

Qualified personnel must:

- be in possession of the necessary product knowledge, obtained, for example, through training on how to handle the product
- be fully familiar with the contents of this manual, particularly all safety instructions
- be aware of any relevant country-specific regulations

2.4 Safety devices

In order to protect the user and the heating device, the following safety equipment is present:

- An overheat protection system terminates the heating process if a predetermined temperature in the heating device is exceeded.
- An overvoltage protection system terminates the heating process if the mains voltage is too high or the inductors suffer a short circuit.

2.5 Protective equipment

For certain work on the product, suitable protective equipment must be worn. Personal protective equipment consists of:

2 Required personal protective equipment

Personal protective equipment	Mandatory signs in accordance with DIN EN ISO 7010
Protective gloves	
Safety shoes	

2.6 Safety specifications

The device may only be operated under the ambient conditions described under the technical data.

Maintenance work and repairs may only be carried out by qualified personnel.

The power supply must correspond to the technical data for the respective device version.

2.7 Hazards

In the operation of induction units, the principle used means that hazards can occur as a result of electromagnetic fields, electrical voltage and hot components.

2.7.1 Danger of death

Danger of death due to electromagnetic field.

Persons fitted with a pacemaker are at risk of cardiac arrest

- Avoid remaining in the hazard area during operation.

2.7.2 Risk of injury

Risk of injury due to electromagnetic field

Risk of cardiac arrhythmias and tissue damage

- Minimise time spent in the electromagnetic field.

Wearers of ferromagnetic objects are at risk of burns

- Wearers of ferromagnetic objects must not remain in the immediate vicinity of the device.

Risk of injury from directly or indirectly heated workpieces

Risk of burns

- Wear heat-resistant protective gloves effective up to +250 °C during operation.

3 Scope of delivery

1 Scope of delivery of MF-IDUCTOR

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The device is supplied as a complete set containing the following:

- case
- MF-IDUCTOR
- flexible inductor MF-INDUCTOR-2.3KW-2M-D3.5
- mains cable with IEC Lock, length 2,5 m
- protective gloves, heat-resistant up to +250 °C (+482 °F)
- manual

Standard accessories are included in the scope of delivery, special accessories can be ordered separately.

3.1 Damage during transit

- ► Check the product immediately upon delivery for any damage during transit.
- ► Report any damage during transit promptly as a complaint to the carrier.

3.2 Defects

- ► Check the product immediately upon delivery for visible defects.
- ► Report any defects promptly as a complaint to the distributor of the product.

4 Product description

The MF-IDUCTOR enables precise heating of components for non-destructive fitting and dismantling. The components must be ferromagnetic and self-contained. Examples include screws, nuts or bearing inner rings.

Various inductors are available for component heating:

- Flexible inductors
- Rigid inductors
- Induction pad

4.1 Functional principle

An induction heating device generates an electromagnetic field via the inductor in a ferromagnetic component. The electromagnetic field generates a high induction current in the component at a low voltage. The induction current heats the component. Non-ferromagnetic components remain cold.

4.2 Controls

The heating device is operated using the rotary switch and operating button.

2 Controls

1	Rotary switch	2	Operating button

4.2.1 Rotary switch

The rotary switch controls the power and heating time.

The heating time can be set at six levels. Detailed information on the heating time can be found on the product label.

- Levels 1 to 5: Heating takes place over the set heating time.
- Level 6: Heating continues until the operating button is released.

The device may produce a ticking noise when operated at a reduced output power.

4.2.2 Operating button

The operating button starts the component heating process.

4.3 LED light

An LED light is built into the front of the device.

The LED lights up continuously during the heating process.

The LED flashes in the event of a malfunction ➤14|8.

4.4 Fan

The device has an integrated fan for cooling the heating device.

The fan only operates when the power supply is connected.

The fan commences cooling when the operating button is pressed and remains in operation for the entire heating time.

Once the component has been heated, the fan remains in operation until the temperature falls below a specified internal value. Leave the device connected to the power supply until the fan stops operating automatically.

4.5 Power supply

The device comes with a connection cable and mains connection plug.

The device is not fitted with an internal voltage fuse. Always connect the device to a circuit with a minimum of a 5 A and a maximum of a 16 A fuse.

The use of an external power supply is permissible under the following conditions:

- The output of the external power supply is sufficient.
- The output voltage of the external power supply is a clean sine wave within the frequency range of 50 Hz to 60 Hz.

5 Storage

Some heating devices are delivered in transport packaging. Wherever possible, the heating devices should be stored in the transport packaging in which they were delivered.

The heating device must be stored under dry conditions.

6 Commissioning

6.1 Connecting the inductors

- ✓ Only inductors that meet manufacturer specifications may be used.
- ✓ The inductor must not exhibit any form of damage.
- ✓ Observe the regulations and instructions set down in the corresponding inductor operating manual.
- ► Press the lateral buttons on the heating device.
- ► Insert the open ends of the inductor into the openings on the front of the device.
- ► Release the lateral buttons.
- ► Check that the connection between the inductor and heating device is secure.
- » The inductor is now ready for operation.

3 Connecting the inductors

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6.2 Connecting the mains connection cable

The device is not fitted with a main switch and is live as soon as the power supply is connected.

- ✓ The connection cable must not exhibit any form of damage.
- ✓ The mains connection plug must not exhibit any form of damage.
- ✓ The power supply must correspond to the technical data.
- ► Plug the connection cable into the opening provided on the back of the device.
- ► Insert the mains connection plug into a suitable socket.
- ► Lay the mains connection cable in such a way as to prevent a trip hazard.
- » The device is now ready to use.

4 Connecting the mains connection cable

7 Operation

Once the commissioning process is complete, the device can be used to heat ferromagnetic components.

7.1 Heating the component

5 Attachment example for a flexible inductor

- ✓ Wearers of ferromagnetic objects must not remain in the immediate vicinity of the device.
- ✓ Wear heat-resistant protective gloves effective up to +250 °C to avoid burns.
- ✓ Clean any contaminated workpieces to avoid smoke formation.
- ✓ When using a rigid inductor: Use an inductor that surrounds the object to be heated with the smallest possible distance.
- ✓ When using a flexible inductor: Surround the object to be heated with as few windings as possible.
- ✓ The inductor must not exhibit any form of damage.
- ▸ Turn the rotary switch to the required level to set the heating time.
- ▸ Position the inductor on the component to be heated.
- ▸ The inductor must not come into contact with component without its insulation.
- ▸ Pres the operating button.
- › Heating of the component begins.
- › Heating at levels 1 to 5 is terminated automatically after the specified heating time.
- › Heating at level 6 continues until the operating button is released or the over-heat protection system cuts in.
- ▸ Remove the inductor from the heated component.
- » The component has been successfully heated.

The device may produce a ticking noise when operated at a reduced output power.

7.2 Cooling the heating device and inductor

The MF-IDUCTOR and the inductor become hot during operation.

In order to protect the MF-IDUCTOR and the inductor from damage, they must be allowed to cool down following operation.

The MF-IDUCTOR and the inductor used may only be stored once they have cooled.

Once the component has been heated, the fan remains in operation until the temperature falls below a specified internal value. Leave the device connected to the power supply until the fan stops operating automatically.

8 Troubleshooting

A malfunction is indicated by a flashing LED when the operating button is pressed.

3 Troubleshooting

Fault	Possible cause	Remedy
Overheat protection system	Fan failure	Allow the device to cool down. Leave the device connected to the power supply until the fan stops operating.
	Air inlets blocked or covered.	Clear the air inlets. Allow the device to cool down. Leave the device connected to the power supply until the fan stops operating.
	Use of unauthorised inductors.	Allow the device to cool down. Leave the device connected to the power supply until the fan stops operating. Use original accessories and original replacement parts only.
Overvoltage protection	Mains voltage too high.	Check whether the applied voltage supply matches the specifications in the product description.
	Inductors have suffered a short circuit or a short circuit to earth.	Check the inductor for damage. Replace the inductor if the insulating protective casing is damaged.
	Too many windings around the part to be heated when using a flexible inductor.	Reduce the number of windings around the component to be heated.

9 Repair

Repairs may only be carried out by the manufacturer or by the manufacturer's authorised specialist dealer.

Contact your distributor if you feel that the device is not working properly.

10 Maintenance

Maintenance work and repairs may only be carried out by qualified personnel.

The device is maintenance-free.

Clean the device with a dry cloth.

Do not use solvents. These can damage the device or impair its function.

11 Decommissioning

If the heating device is no longer used regularly, remove it from service.

- ► Disconnect the heating device from the power supply.
- ► Disconnect the inductor from the heating device.

12 Disposal

Disposal must be carried out in accordance with locally applicable regulations.

13 Technical data

4 Technical data

Feature	MF-IDUCTOR-1.2KW	MF-IDUCTOR-2.0KW	MF-IDUCTOR-2.3KW
Power supply	230 V	120 V	230 V
Current rating	6 A	15 A	10 A
Output power	1,2 kW	2,0 kW	2,3 kW
Frequency	50 Hz to 60 Hz	50 Hz to 60 Hz	50 Hz to 60 Hz
Frequency range	30 kHz to 65 kHz	30 kHz to 65 kHz	30 kHz to 65 kHz
Protection class	IP20	IP20	IP20
Thermally protected	yes	yes	yes
Error message	yes	yes	yes
Fan	yes	yes	yes
LED light	yes	yes	yes
Length	150 mm	150 mm	150 mm
Width	490 mm	490 mm	490 mm
Height	390 mm	390 mm	390 mm
Mass	1,4 kg	1,4 kg	1,4 kg
Ambient temperature	–5 °C to +40 °C	–5 °C to +40 °C	–5 °C to +40 °C
	23 °F to 104 °F	23 °F to 104 °F	23 °F to 104 °F
Humidity	0% to 90 %	0% to 90 %	0% to 90 %

13.1 Available models

5 Model

Designation	Power supply	Current rating	Output power	Certificate
	V	A	kW	
MF-IDUCTOR-1.2KW-230V	230	6	1,2	CE
MF-IDUCTOR-1.2KW-230V-UK	230	6	1,2	UKCA
MF-IDUCTOR-2.0KW-120V	120	15	2,0	CE
MF-IDUCTOR-2.0KW-120V-UK	120	15	2,0	UKCA
MF-IDUCTOR-2.0KW-120V-US	120	15	2,0	UL/CSA
MF-IDUCTOR-2.3KW-230V	230	10	2,3	CE
MF-IDUCTOR-2.3KW-230V-UK	230	10	2,3	UKCA

13.2 Declaration of Conformity

See also

Declaration of Conformity [▶ 17]

13.2.1 Declaration of Conformity

CE DECLARATION OF CONFORMITY

We hereby declare that the product described below is in conformity with the applicable health and safety requirements of the EC Directive in terms of its design and type and in the execution we have brought into circulation. This declaration shall cease to be valid if any modification is made to the product without our agreement.

Product description:	Inductive heater
Product name/type:	■ MF-IDUCTOR-1.2KW-230V ■ MF-IDUCTOR-2.3KW-230V ■ MF-IDUCTOR-2.0KW-120V
Comply with the requirements of:	■ EMC Directive 2014/30/EU ■ Low Voltage Directive 2014/35/EU ■ RoHS Directive 2011/65/EU, annex II amended by directive 2015/863/EU
Applicable harmonized standards:	■ EN 55011 (2009) + A1 (2010): Conducted and radiated emission ■ EN 61000-6-1 (2007): Immunity ■ EN 61000-3-2 (2014): Emission ■ EN 61000-3-3 (2013): Emission ■ EN 60335-1 (2020): Safety of household and similar electrical appliances
Name and address of the authorized person for the technical documentation:	Schaeffler Technologies AG & Co. KG Georg-Schäfer-Straße 30 D-97421 Schweinfurt

H. van Essen
Managing Director
Bega International BV

Place, Date:
Vaassen, 01-03-2024

CE

UK DECLARATION OF CONFORMITY

We hereby declare that the product described below is in conformity with the applicable UK regulations terms of its design and type and in the execution we have brought into circulation. This declaration shall cease to be valid if any modification is made to the product without our agreement.

Product description:	Inductive heater
Product name/type:	■ MF-IDUCTOR-1.2KW-230V-UK ■ MF-IDUCTOR-2.3KW-230V-UK
Comply with the requirements of:	■ Electrical Equipment (Safety) Regulations 2016 S.I. 2016:1101 ■ Electromagnetic Compatibility Regulations 2016 S.I. 2016:1091 ■ RoHS Regulations 2012 S.I. 2012:3032
Applicable harmonized standards:	Electric Safety ■ EN 60335-1 EMC Emission ■ EN 55011 ■ EN 61000-3-2 ■ EN 61000-3-3 EMC Immunity ■ EN 61000-6-1
Name and address of the authorized person for the technical documentation:	Schaeffler Technologies AG & Co. KG Georg-Schäfer-Straße 30 D-97421 Schweinfurt

H. van Essen
Managing Director
Bega International BV

Place, Date:
Vaassen, 01-11-2022

UK CA

14 Accessories

14.1 Flexible inductors

6 Flexible inductor

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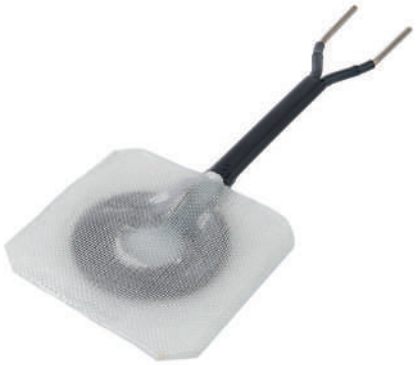
Flexible inductors with a length of 2,5 m to 3,5 m should only be used with the high-powered variants MF-IDUCTOR-2.0KW or MF-IDUCTOR-2.3KW, as these inductors are predominantly used for larger and heavier parts, which require a correspondingly higher power.

7 MF-INDUCTOR-2.3KW-PAD-D3.5



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6 Technical data MF-INDUCTOR

Designation	P	t_{max}	L	D	d_{min}	T_{max}		m	Order number
	kW	min	m	mm	mm	°C	°F	kg	
MF-INDUCTOR-2.3KW-1.1M-D3.5	1,2…2,3	∞	1,1	3,5	25	650	1202	0,2	300277180-0000-01
MF-INDUCTOR-2.3KW-2M-D3.5	1,2…2,3	∞	2,0	3,5	25	650	1202	0,3	300281161-0000-01
MF-INDUCTOR-2.3KW-2.5M-D3.5	2,0…2,3	∞	2,5	3,5	25	650	1202	0,3	300277164-0000-01
MF-INDUCTOR-2.3KW-3M-D3.5	2,0…2,3	∞	3,0	3,5	25	650	1202	0,4	300276508-0000-01
MF-INDUCTOR-2.3KW-3.5M-D3.5	2,0…2,3	∞	3,5	3,5	25	650	1202	0,5	300276494-0000-01
MF-INDUCTOR-2.3KW-PAD-D3.5	1,2…2,3	∞	–	3,5	–	150	302	0,2	300276486-0000-01

d_{min}	mm	Minimum workpiece diameter
D	mm	Outside diameter
L	m	Length
m	kg	Mass
P	kW	Generator power
t_{max}	min	Maximum operating time
T_{max}	°C or °F	Maximum temperature

14.2 MF-IDUCTOR-1.2KW-D3.5-Set

The set MF-IDUCTOR-1.2KW-D3.5-Set consists of nine rigid inductors and is intended for use with the MF-IDUCTOR-1.2KW.

8 MF-IDUCTOR-1.2KW-D3.5-Set

7 Technical data for inductor set

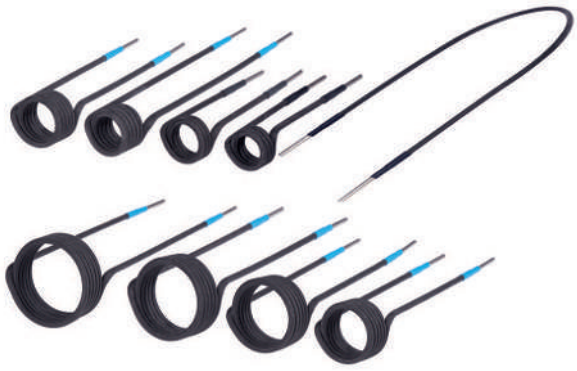
Designation	Quantity	P	t_{max}	L	D	d_{min}	d	n	T_{max}		Ordering number
		kW	min	mm	mm	mm	–	–	°C	°F	
18M08-150	1	1,2	∞	150	3,5	18	M8	3,5	325	617	300277199-0000-01
23M10-150	1	1,2	∞	150	3,5	23	M10	3,5	325	617	
23M10-250	1	1,2	∞	250	3,5	23	M10	3,5	325	617	
26M12-200	1	1,2	∞	200	3,5	26	M12	3,5	325	617	
32M16-200	1	1,2	∞	200	3,5	32	M16	3,5	325	617	
40M20-200	1	1,2	∞	200	3,5	40	M20	3,5	325	617	
47M24-240	1	1,2	∞	240	3,5	47	M24	2,5	325	617	
52M30-240	1	1,2	∞	240	3,5	52	M30	2,5	325	617	
U-INDUCTOR160-600	1	1,2	∞	600	3,5	–	–	0,5	325	617	

P	kW	Generator power
t_{max}	min	Maximum operating time
L	mm	Length
D	mm	Outside diameter
d_{min}	mm	Minimum workpiece diameter
d	–	Nominal size of metric nut
n	–	Number of windings
T_{max}	°C or °F	Maximum temperature

14.3 MF-IDUCTOR-2.3KW-D3.5-Set

The set MF-IDUCTOR-2.3KW-D3.5-Set consists of nine rigid inductors and is intended for use with all available power variants of the MF-IDUCTOR.

9 MF-IDUCTOR-2.3KW-D3.5-Set



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8 Technical data for inductor set

Designation	Quantity	P	t_{max}	L	D	d_{min}	d	n	T_{max}		Ordering number
		kW	min	mm	mm	mm	–	–	°C	°F	
18M08-150P+	1	2,0…2,3	∞	150	3,5	18	M8	3,5	325	617	300277172-0000-01
23M10-150P+	1	2,0…2,3	∞	150	3,5	23	M10	3,5	325	617	
23M10-250P+	1	2,0…2,3	∞	250	3,5	23	M10	5,5	325	617	
26M12-200P+	1	2,0…2,3	∞	200	3,5	26	M12	5,5	325	617	
32M16-200P+	1	2,0…2,3	∞	200	3,5	32	M16	5,5	325	617	
40M20-200P+	1	2,0…2,3	∞	200	3,5	40	M20	5,5	325	617	
47M24-240P+	1	2,0…2,3	∞	240	3,5	47	M24	5,5	325	617	
52M30-240P+	1	2,0…2,3	∞	240	3,5	52	M30	5,5	325	617	
U-INDUCTOR160-600	1	2,0…2,3	∞	600	3,5	–	–	0,5	325	617	

P	kW	Generator power
t_{max}	min	Maximum operating time
L	mm	Length
D	mm	Outside diameter
d_{min}	mm	Minimum workpiece diameter
d	–	Nominal size of metric nut
n	–	Number of windings
T_{max}	°C or °F	Maximum temperature

14.4 Protective gloves

Heat-resistant protective gloves effective up to +250 °C (+482 °F) are included in the scope of delivery. Heat-resistant protective gloves effective up to +300 °C (+572 °F) can be ordered as an accessory.

10 Protective gloves, heat-resistant

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9 Protective gloves, heat-resistant

Designation	Description	T_{max}		Ordering number
		°C	°F	
GLOVES-250C	protective gloves, heat-resistant	250	482	300966903-0000-10
GLOVES-300C	protective gloves, heat-resistant	300	572	300966911-0000-10

T_{max}	°C or °F	Maximum temperature

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