

INDUCTION HEATERS

BETEX MF Quick-Heaters – medium-frequency technology

Mounting, dismantling and preheating of metal components

Induction generators with medium frequency technology are suitable not only for thermal assembly, but also for disassembly. By using medium frequency technology, energy is effectively transferred to the workpiece, heating it easily and quickly. The MF Quick-Heater consists of a generator with a fixed or flexible inductor. Its compact dimensions make it easy to move.

BETEX MF Quick-Heaters result in time savings as they can be deployed very rapidly (fewer actions) and heat faster than conventional methods. Energy use is much more efficient thanks to its lower power consumption. One of the major advantages of this type of induction heater is that they are not limited to components with a cylindrical shape: flexible inductors can be wound around any size or shape. This makes it possible to heat very large and heavy components.

Advantages of BETEX MF Quick-Heaters

- ✓ For mounting, dismantling and preheating
- ✓ Suitable for steel, cast iron, stainless steel and titanium
- ✓ Temperature and/or time controlled heating
- ✓ Double temperature measurement (ΔT monitoring)
- ✓ Low connection power (32/63 Amp)
- ✓ Generators are adjustable from 2.5 to 3.5/10/22/44 kW
- ✓ Easy to use and flexible
- ✓ Suitable for production and maintenance applications
- ✓ No residual magnetism
- ✓ No fire hazard due to open flames
- ✓ No noise, fumes or smoke nuisance
- ✓ Air-cooled: no water cooling needed
- ✓ Because the work is carried out damage-free, expensive components can be reused
- ✓ A flexible or fixed inductor is recommended depending on the application



To be used for

- Bearings
- Labyrinth seals
- Bearing rings
- Bearing housings
- Gear wheels
- Rollers
- Tubes
- Bushings
- Couplings
- Train wheels/train wheel tyres
- Extruders
- Stator housings

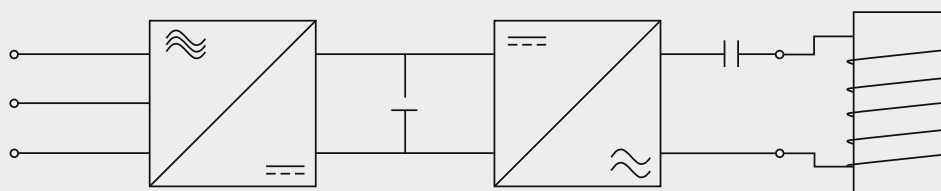
The BETEX MF Quick-Heater

This heater consists of a generator and one or more inductors. The generator is designed for the connection of inductors used for heating ferromagnetic workpieces. Suitable materials include iron, steel, stainless steel, titanium and certain bronze alloys. The maximum capacity workpieces can be subjected to is 3.5, 10, 22 kW or 44 kW, depending on the type of heater.

Operating principle

The three-phase voltage is rectified and smoothed. This rectified voltage is then converted by means of an inverter into an AC voltage with a frequency between 10 and 25 kHz. The power is then applied to the workpiece magnetically via a 'resonance capacitor' using an inductor (coil).

Since the frequency is relatively high, the penetration depth of the magnetic field is not too large, so that only the outer layer of the workpiece is heated. This principle makes heating using medium-frequency particularly suitable for dismantling purposes, such as removing bearing rings from shafts.



Flexible inductors

Flexible inductors can be placed in or around a workpiece. Therefore, they are ideal for a large variety of parts. From large inner rings to very large components such as gear wheels and housings.



Heating a bore for bearing or shaft mounting



Heating a coupling for dismounting

Fixed inductors

Fixed inductors are used for serial work. The short set-up time and high degree of process reliability are important here.



Heating bearing rings for dismounting



Heating labyrinth rings for dismounting

Testing

For special applications, we can carry out tests in advance with components that the client provides for this purpose. If necessary, we can supply a customised application.

For standard applications, we have a large database with examples. We also use simulation programmes.

By supplying optimum solutions, we achieve significant savings. In fact, measurable savings are guaranteed simply by working damage-free and hence, being able to reuse the parts.



INDUCTION HEATERS

Medium-frequency projects



BETEX 3.0, 22 kW

Mounting of wheels in an elevator plant using pin inductors. For this client, custom inductors were made, with the required lengths and diameters.



BETEX 3.0, 22 kW

Dismounting in a steel factory, using a flexible inductor wrapped around a bearing ring.

Temperature: 200°C
Time needed: 17 min.



BETEX 3.0, 44 kW

Dismounting of a coupling at a gearbox repair company.

Temperature: 100°C
Time needed: 7 min.



BETEX 3.0, 22 kW

Preheating in preparation for laser cladding.

INDUCTION HEATERS

BETEX MF Quick-Heater 3.0 - 3,5kW

New



3,5
power kW

4,3"
display inch

230
voltagess V

BETEX MF Quick-Heater 3.0 - 3,5kW

- Portable induction heater, weighs only 7,85 kg, ideal for working on site.
- Easy to connect to mains voltage (230V)
- Easy operation with 4,3" touchscreen
- Smart electronics ensure optimal operating frequency
- Dual temperature sensing (monitoring Delta T)
- Choice of flexible inductors: 5m, 7,5m, 10m
- Can heat according to preset temperature/time curve
- The heating process is displayed in a clear graph
- Create proof of work report
- Log function to save data or export it via a USB port



For more control and stress-free mounting

Thanks to the Delta-T ΔT monitoring, it is possible to measure the internal and external temperature of a workpiece with 2 temperature probes. Thus the maximum preset temperature difference between 2 points can never be exceeded. This achieves even and uniform heating and prevents material stress.



Type	MF Quick-Heater 3.0, 3,5kW
Power	3,5kW
Voltage/Amperage	230V/16A
Heat curve in display	Yes
Setpoint power	No
Setpoint temperature	Yes, via touchscreen
Setpoint temperature curve	Yes, via touchscreen
Setpoint timer	Yes, via touchscreen
Inductor recognition	No
USB connection	Yes
Network connection	No
Heating log	Yes
Weight generator	7,85 kg



Log function and export to USB stick

See page 50 for detailed technical specifications.

INDUCTION HEATERS

BETEX MF Quick-Heater 2.5 & 3.0 - 10kW



10
power kW

3.5"
display inch

**400/450/
500/600**
voltages V

BETEX MF Quick-Heater 2.5 - 10kW

- Compact design with 3.5" display
- User-friendly touchscreen operation
- Smart electronics ensure optimum operating frequency
- Adjustable power regulation
- Double temperature measurement (ΔT monitoring)
- Choice between fixed and flexible inductors

Type	MF Quick-Heater 2.5, 10kW	MF Quick-Heater 3.0, 10kW
Power	10kW	10kW
Voltage/Amperage	3~400V/16A 3~450V/14A 3~500V-12A 3~600V-10A	3~400V/16A 3~450V/14A 3~500V-12A 3~600V-10A
Heat curve in display	No	Yes
Setpoint power	Yes, via touchscreen	Yes, via touchscreen
Setpoint temperature	Yes, via touchscreen	Yes, via touchscreen
Setpoint temperature curve	No	Yes, via touchscreen
Setpoint timer	Yes, via touchscreen	Yes, via touchscreen
Inductor recognition	Yes	Yes
USB connection	No	Yes
Network connection	No	Yes
Heating log	No	Yes
Weight generator	46 kg	46 kg

See page 50 for detailed technical specifications.



10
power kW

7"
display inch

**400/450/
500/600**
voltages V

SMART inductor recognition
The desired temperature and desired power do not have to be set if an inductor with identification feature is connected. In this case the generator automatically adopts the settings defined in the program (1, 2 or 3) for the corresponding inductor.

BETEX MF Quick-Heater 3.0 - 10kW

- Compact design with 7" display
- User-friendly touchscreen operation
- Smart electronics ensure optimum operating frequency
- Adjustable power regulation
- Double temperature measurement (ΔT monitoring)
- Choice between fixed and flexible inductors
- Can heat according to preset temperature/time curve
- The heating process is displayed in a clear graph
- Create proof of work report
- Log function to save data or export it via a USB port



For more control and stress-free mounting

Thanks to the Delta-T ΔT monitoring, it is possible to measure the internal and external temperature of a workpiece with 2 temperature probes. Thus the maximum preset temperature difference between 2 points can never be exceeded. This achieves even and uniform heating and prevents material stress.



The MF 3.0 has a 7" touchscreen



Optional signal tower for MF 2.5 and 3.0

INDUCTION HEATERS

BETEX MF Quick-Heater 2.5 & 3.0 - 22kW



22
power kW

3.5"
display inch

**400/450/
500/600**
voltages V

BETEX MF Quick-Heater 2.5 - 22kW

- Compact design with 3.5" display
- User-friendly touchscreen operation
- Smart electronics ensure optimum operating frequency
- Adjustable power regulation
- Double temperature measurement (ΔT monitoring)
- Choice between fixed and flexible inductors

Type	MF Quick-Heater 2.5, 22kW	MF Quick-Heater 3.0, 22kW
Power	22kW	22kW
Voltage/Amperage	3 ~ 400V-32A 3 ~ 450V-30A 3 ~ 500V-28A 3 ~ 600V-23A	3 ~ 400V-32A 3 ~ 450V-30A 3 ~ 500V-28A 3 ~ 600V-23A
Heat curve in display	No	Yes
Setpoint power	Yes, via touchscreen	Yes, via touchscreen
Setpoint temperature	Yes, via touchscreen	Yes, via touchscreen
Setpoint temperature curve	No	Yes, via touchscreen
Setpoint timer	Yes, via touchscreen	Yes, via touchscreen
Inductor recognition	Yes	Yes
USB connection	No	Yes
Network connection	No	Yes
Heating log	No	Yes
Weight generator	46 kg	46 kg

See page 50 for detailed technical specifications.



22
power kW

7"
display inch

**400/450/
500/600**
voltages V

SMART inductor recognition
The desired temperature and desired power do not have to be set if an inductor with identification feature is connected. In this case the generator automatically adopts the settings defined in the program (1, 2 or 3) for the corresponding inductor.

BETEX MF Quick-Heater 3.0 - 22kW

- Compact design with 7" display
- User-friendly touchscreen operation
- Smart electronics ensure optimum operating frequency
- Adjustable power regulation
- Double temperature measurement (ΔT monitoring)
- Choice between fixed and flexible inductors
- Can heat according to preset temperature/time curve
- The heating process is displayed in a clear graph
- Create proof of work report
- Log function to save data or export it via a USB port



For more control and stress-free mounting

Thanks to the Delta-T ΔT monitoring, it is possible to measure the internal and external temperature of a workpiece with 2 temperature probes. Thus the maximum preset temperature difference between 2 points can never be exceeded. This achieves even and uniform heating and prevents material stress.



The MF 3.0 has a 7" touchscreen



Optional signal tower for MF 2.5 and 3.0

INDUCTION HEATERS

BETEX MF Quick-Heater 2.5 & 3.0 - 44kW



44
power kW

3.5"
display inch

**400/450/
500/600**
voltages V

BETEX MF Quick-Heater 2.5 - 44kW

- Compact design with 3.5" display
- User-friendly touchscreen operation
- Smart electronics ensure optimum operating frequency
- Adjustable power regulation
- Double temperature measurement (ΔT monitoring)
- Choice between fixed and flexible inductors

Type	MF Quick-Heater 2.5, 44kW	MF Quick-Heater 3.0, 44kW
Power	44kW	44kW
Voltage/Amperage	3 ~ 400V-63A 3 ~ 450V-59A 3 ~ 500V-55A 3 ~ 600V-45A	3 ~ 400V-63A 3 ~ 450V-59A 3 ~ 500V-55A 3 ~ 600V-45A
Heat curve in display	No	Yes
Setpoint power	Yes, via touchscreen	Yes, via touchscreen
Setpoint temperature	Yes, via touchscreen	Yes, via touchscreen
Setpoint temperature curve	No	Yes, via touchscreen
Setpoint timer	Yes, via touchscreen	Yes, via touchscreen
Inductor recognition	Yes	Yes
USB connection	No	Yes
Network connection	No	Yes
Heating log	No	Yes
Weight generator	78 kg	78 kg

See page 50 for detailed technical specifications.



44
power kW

7"
display inch

**400/450/
500/600**
voltages V

SMART inductor recognition
The desired temperature and desired power do not have to be set if an inductor with identification feature is connected. In this case the generator automatically adopts the settings defined in the program (1, 2 or 3) for the corresponding inductor.

BETEX MF Quick-Heater 3.0 - 44kW

- Compact design with 7" display
- User-friendly touchscreen operation
- Smart electronics ensure optimum operating frequency
- Adjustable power regulation
- Double temperature measurement (ΔT monitoring)
- Choice between fixed and flexible inductors
- Can heat according to preset temperature/time curve
- The heating process is displayed in a clear graph
- Create proof of work report
- Log function to save data or export it via a USB port



For more control and stress-free mounting

Thanks to the Delta-T ΔT monitoring, it is possible to measure the internal and external temperature of a workpiece with 2 temperature probes. Thus the maximum preset temperature difference between 2 points can never be exceeded. This achieves even and uniform heating and prevents material stress.



The MF 3.0 has a 7" touchscreen



Optional signal tower for MF 2.5 and 3.0

INDUCTION HEATERS

Flexible and fixed inductors

Fixed inductor

This type of inductor is made to order. For each application we design customized solutions for serial work.



Fixed inductor



Pin inductor



Fixed inductor

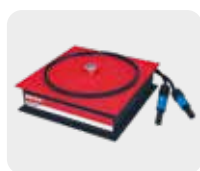
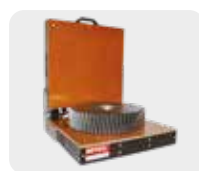


Table inductor



Sandwich table inductor

Flexible inductor

Flexible inductors are available in different cable lengths, temperature- and power levels. Thanks to their flexibility, a wide range of applications is possible.



Flexible inductor



Caged flexible inductor

Type	Length m	Max. temperature	Diameter cable Ø mm	Min. winding diameter mm
3.5 kW	5, 7.5, 10	180 °C / 356 °F	12	ca. 90
10 kW	15, 20, 25, 30	180 °C / 356 °F	12	ca. 75
10 kW	15, 20, 25, 30, 35	180 °C / 356 °F	15	ca. 100
10 kW	15, 20, 25, 30, 35	300 °C / 572 °F	20	ca. 120
22 kW	15, 20, 25, 30	180 °C / 356 °F	12	ca. 75
22 kW	15, 20, 25, 30	180 °C / 356 °F	15	ca. 100
22 kW	15, 20, 25, 30	300 °C / 572 °F	20	ca. 120
44 kW	15, 20, 25, 30	180 °C / 356 °F	19	ca. 140
44 kW	15, 20, 25, 30	300 °C / 572 °F	28	ca. 220

Magnetic holder

Optional: magnetic holders to secure the flexible inductors.



INDUCTION HEATERS

Medium-frequency heating methods

Fixed inductor around the workpiece

Energy input from outside to inside. For dismounting of, for example, bearing rings, labyrinth rings, pipes and rings.



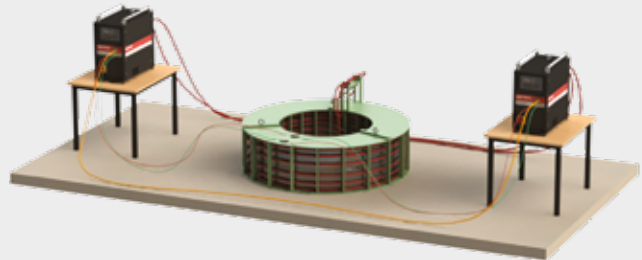
Fixed inductor in the workpiece

Heating a bore for bearing or shaft mounting.



Fixed inductor in and around the workpiece

For stress-free mounting of a bearing, two coupled generators are used. Inner and outer ring are heated simultaneously.



Pin inductor in the workpiece

Heating a bore for example for bearing or shaft mounting.



Table inductor

Local preheating for laser cladding.



TECHNICAL SPECIFICATIONS

Medium-frequency 2.5



Type	MF Quick-Heater 2.5 10kW	MF Quick-Heater 2.5 22kW	MF Quick-Heater 2.5 44kW
Forced air cooling	Yes	Yes	Yes
Power	10kW	22kW	44kW
Frequency	10-25 kHz	10-25 kHz	10-25 kHz
Voltage/Amperage	3 ~ 400V/16A 3 ~ 450V/14A 3 ~ 500V/12A 3 ~ 600V/10A	3 ~ 400V/32A 3 ~ 450V/30A 3 ~ 500V/28A 3 ~ 600V/23A	3 ~ 400V/63A 3 ~ 450V/59A 3 ~ 500V/55A 3 ~ 600V/45A
Frequency	50/60Hz	50/60Hz	50/60Hz
Temperature measurement	For type K thermocouple	For type K thermocouple	For type K thermocouple
Accuracy	± 3.5°C / ± 38.2 °F	± 3.5°C / ± 38.2 °F	± 3.5°C / ± 38.2 °F
Inductor recognition	Yes	Yes	Yes
Temperature sensor (2 pieces)	Yes, for max 300°C / 572 °F	Yes, for max 300°C / 572 °F	Yes, for max 300°C / 572 °F
Extra thermocouple input	Yes	Yes	Yes
Dimensions of generator LxWxH	600x300x600 mm / 23.6x11.8x23.6 inch	600x300x600 mm / 23.6x11.8x23.6 inch	600x650x580 mm / 23.6x25.6x22.8 inch
Weight of generator	46 kg	46 kg	78 kg
Operation			
Dimensions display	3.5"	3.5"	3.5"
Heat curve in display	No	No	No
Delta T (ΔT)	Yes	Yes	Yes
Setpoint power	Via touchscreen	Via touchscreen	Via touchscreen
Setpoint temperature	Via touchscreen	Via touchscreen	Via touchscreen
Setpoint temperature curve	No	No	No
Setpoint timer	Via touchscreen	Via touchscreen	Via touchscreen
Selection operating mode	Via touchscreen	Via touchscreen	Via touchscreen
Digital readings temperature	Setpoint and actual value on touchscreen	Setpoint and actual value on touchscreen	Setpoint and actual value on touchscreen
Digital readings time	Setpoint and actual value on touchscreen	Setpoint and actual value on touchscreen	Setpoint and actual value on touchscreen
Digital readings power	Actual value on touchscreen	Actual value on touchscreen	Actual value on touchscreen
Digital readings frequency	Actual value on touchscreen	Actual value on touchscreen	Actual value on touchscreen
USB connection	No	No	No
Network connection	No	No	No
Heating log	No	No	No
Signaling by			
Installation in operational state	Green flash light	Green flash light	Green flash light
Error message	Red continuous light / acoustic signal	Red continuous light / acoustic signal	Red continuous light / acoustic signal
End of heating cycle	Green continuous light / acoustic signal	Green continuous light / acoustic signal	Green continuous light / acoustic signal
Signal tower	Optional	Optional	Optional

TECHNICAL SPECIFICATIONS

Medium-frequency 3.0



Type	MF Quick-Heater 3.0 3.5kW	MF Quick-Heater 3.0 10kW	MF Quick-Heater 3.0 22kW	MF Quick-Heater 3.0 44kW
Forced air cooling	Yes	Yes	Yes	Yes
Power	3,5kW	10kW	22kW	44kW
Frequency	10-50kHz	10-25 kHz	10-25 kHz	10-25 kHz
Voltage/Amperage	230V/16A	3 ~ 400V/16A 3 ~ 450V/14A 3 ~ 500V/12A 3 ~ 600V/10A	3 ~ 400V/32A 3 ~ 450V/30A 3 ~ 500V/28A 3 ~ 600V/23A	3 ~ 400V/63A 3 ~ 450V/59A 3 ~ 500V/55A 3 ~ 600V/45A
Frequency	50/60Hz	50/60Hz	50/60Hz	50/60Hz
Temperature measurement	Voor type K thermo element	For type K thermocouple	For type K thermocouple	For type K thermocouple
Accuracy	± 3.5°C / ± 38.2 °F	± 3.5°C / ± 38.2 °F	± 3.5°C / ± 38.2 °F	± 3.5°C / ± 38.2 °F
Inductor recognition	No	Yes	Yes	Yes
Temperature sensor (2 pieces)	Yes, for max 300°C / 572 °F	Yes, for max 300°C / 572 °F	Yes, for max 300°C / 572 °F	Yes, for max 300°C / 572 °F
Extra thermocouple input	Yes	Yes	Yes	Yes
Dimensions of generator LxWxH	320 x 350 x 150 mm / 12.6x13.8x5.9 inch	600x300x600 mm / 23.6x11.8x23.6 inch	600x300x600 mm / 23.6x11.8x23.6 inch	600x650x580 mm / 23.6x25.6x22.8 inch
Weight of generator	7,85 kg	46 kg	46 kg	78 kg
Operation				
Dimensions display	4,3"	7"	7"	7"
Heat curve in display	Yes	Yes	Yes	Yes
Delta T (ΔT)	Yes	Yes	Yes	Yes
Setpoint power	No	Via touchscreen	Via touchscreen	Via touchscreen
Setpoint temperature	Via touchscreen	Via touchscreen	Via touchscreen	Via touchscreen
Setpoint temperature curve	Yes	Yes	Yes	Yes
Setpoint timer	Via touchscreen	Via touchscreen	Via touchscreen	Via touchscreen
Selection operating mode	Via touchscreen	Via touchscreen	Via touchscreen	Via touchscreen
Digital readings temperature	Setpoint and actual value on touchscreen	Setpoint and actual value on touchscreen	Setpoint and actual value on touchscreen	Setpoint and actual value on touchscreen
Digital readings time	Setpoint and actual value on touchscreen	Setpoint and actual value on touchscreen	Setpoint and actual value on touchscreen	Setpoint and actual value on touchscreen
Digital readings power	No	Actual value on touchscreen	Actual value on touchscreen	Actual value on touchscreen
Digital readings frequency	No	Actual value on touchscreen	Actual value on touchscreen	Actual value on touchscreen
USB connection	Yes	Yes	Yes	Yes
Network connection	No	Yes	Yes	Yes
Heating log	Yes	Yes	Yes	Yes
Signaling by				
Installation in operational state	LED on front	Via touchscreen	Via touchscreen	Via touchscreen
Error message	Acoustic signal	Acoustic signal	Acoustic signal	Acoustic signal
End of heating cycle	Acoustic signal	Acoustic signal	Acoustic signal	Acoustic signal
Signal tower	-	Optional	Optional	Optional