HLQ

INDUCTION HEATING EQUIPMENT

Induction Shrink Fitting of Bearings

Mount and dismount rolling bearings without a press, flame or oil bath. Even, controlled heating to ≈ 110 °C with automatic demagnetising, from small bearings to multi-tonne rings.



≈ 110 °C	30–60 s	Ø20 mm – 3 m	Auto demag
mounting temperature	small bearings, HF coil	yoke, HF and cable heaters	clean, safe mounting

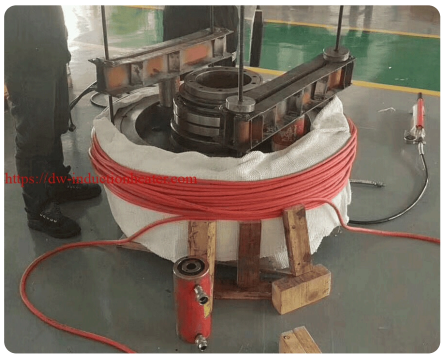
01 Why heat bearings by induction

Bearing inner rings are fitted to the shaft with an interference fit. Heating the bearing about 90 K above the shaft temperature expands the bore so it slides on without force; as it cools it grips the shaft. Induction heats only the bearing, evenly and to a set temperature, then demagnetises it. Hot plates, ovens, oil baths and torches are slower, dirtier or risk overheating.

Method	Speed	Temperature control	Risk
Induction heater	Fast (seconds – minutes)	Probe on inner ring, auto stop	Must demagnetise (automatic)
Oil bath	Slow	Limited	Contamination, fire, oil disposal
Oven / hot plate	Slow	Moderate	Uneven heating, long cycle
Open flame	Fast	Poor	Overheating, damage — never use
Cold press	Fast	—	Brinelling of raceways, shaft scoring



Yoke-type induction bearing heater.



Large bearing heated with a cable coil.



Bearing and coupling heating fixture.

02 How it works

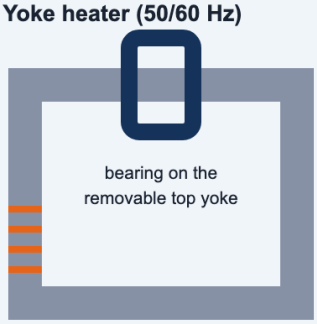
All three heater types induce current in the bearing rings. A yoke heater works like a transformer, with the bearing as a one-turn secondary. An HF helical coil heats small bearings placed across the coil axis. A flexible cable coil heats large bearings and rings with medium-frequency power.

How Induction Bearing Heating Works

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Current induced in the bearing rings heats them evenly; the inner ring grows and slides onto the shaft.

A Yoke heater (50/60 Hz)



primary coil — bearing = secondary

Transformer principle: the bearing is a one-turn short circuit.

B HF helical coil



bearing inside the coil, axis across the coil axis

One coil heats a range of sizes; small bearings in 30–60 s.

C Flexible cable coil



cable wound on the outer ring

MF power, for large bearings, rings and site work.

Temperature rules for bearings

≈ 110 °C usual mounting temperature	≤ 120 °C open bearings, typical maker maximum	≤ 80 °C sealed / pre-greased bearings	**Demagnetise** after heating, then mount at once

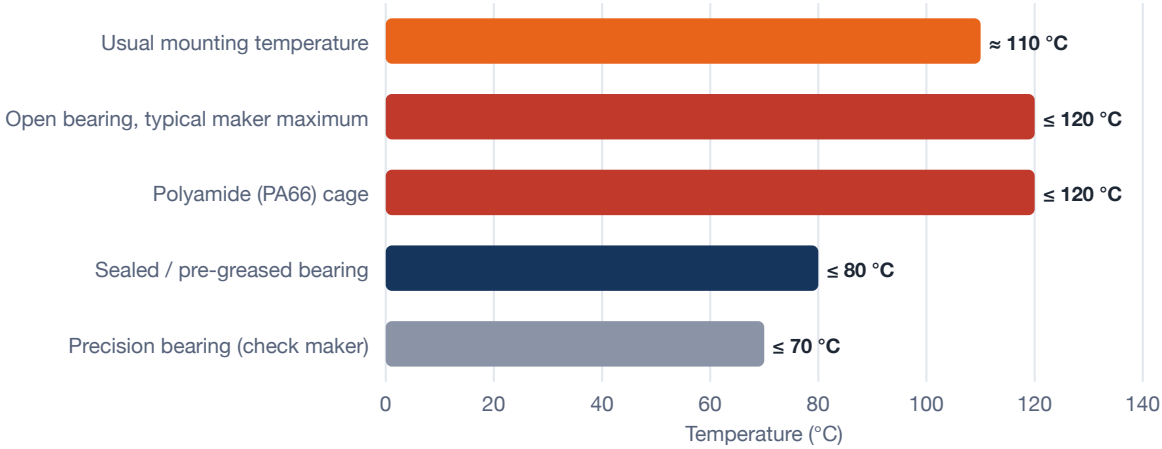
Bore growth at ΔT = 90 K (20 → 110 °C), bearing steel α ≈ 12 × 10^{-6} /K

Bearing bore d	Bore growth at ΔT 90 K	Max interference, m6 shaft*	ΔT needed for that interference
50 mm	0.054 mm	0.037 mm	≈ 62 K
100 mm	0.108 mm	0.055 mm	≈ 46 K
200 mm	0.216 mm	0.076 mm	≈ 32 K
300 mm	0.324 mm	0.087 mm	≈ 24 K

* ISO 286 m6 shaft with normal-tolerance bearing bore. Heating 90 K above the shaft leaves a margin for an easy slide-on. Small bearings with tight fits need a relatively higher ΔT — check against the maker limit.

03 Temperature: the one rule that matters

Chart B — Maximum heating temperature by bearing type



Typical values from bearing makers' mounting guidance. Always follow the specific bearing maker's limit.

Practical rules

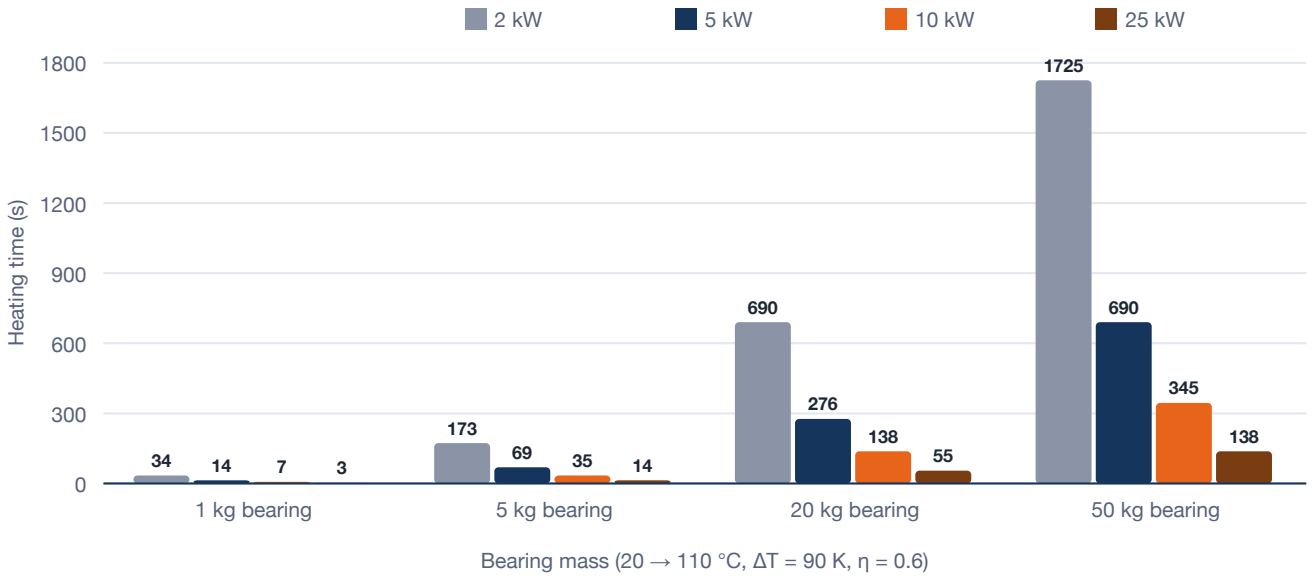
Rule	Why
Heat to ≈ 110 °C, never above the maker limit (typically 120 °C)	Higher temperatures can change ring dimensions and hardness
Sealed or pre-greased bearings ≤ 80 °C	Grease and seals degrade
Place the probe on the inner ring	The inner ring must expand; it is what mounts on the shaft
Use temperature mode, not time only	Bearings of different mass heat at different rates
Demagnetise after heating	Residual magnetism attracts wear particles
Mount immediately, hold against the shoulder	The ring cools fast and can stop short

04 Equipment and model selection

Heater type	Frequency	Bearing size	Notes
Yoke-type induction bearing heater	50/60 Hz	≈ Ø20–600 mm bore (by model)	Temperature mode, auto demag, swing-out yoke
HLQ UHF heater + helical coil (e.g. DW-UHF-6 kW)	≈ 100–400 kHz (180 kHz in the case below)	Ø25–89 mm in one coil	Single-phase supply, cart-mounted, 30–60 s
HLQ HF heater + custom coil (DW-HF)	30–80 kHz	Rings and bearings in production lines	Automation, fixed coil
MF flexible-cable heater	2–36 kHz	Large bearings, rings, Ø300 mm – 3 m	Cable wound on the ring; site work

Chart A — Heating time by bearing mass and heater power

t = m · c · ΔT / (P · η) · bearing steel c ≈ 0.46 kJ/kg·K · η ≈ 0.6



Recommended selection

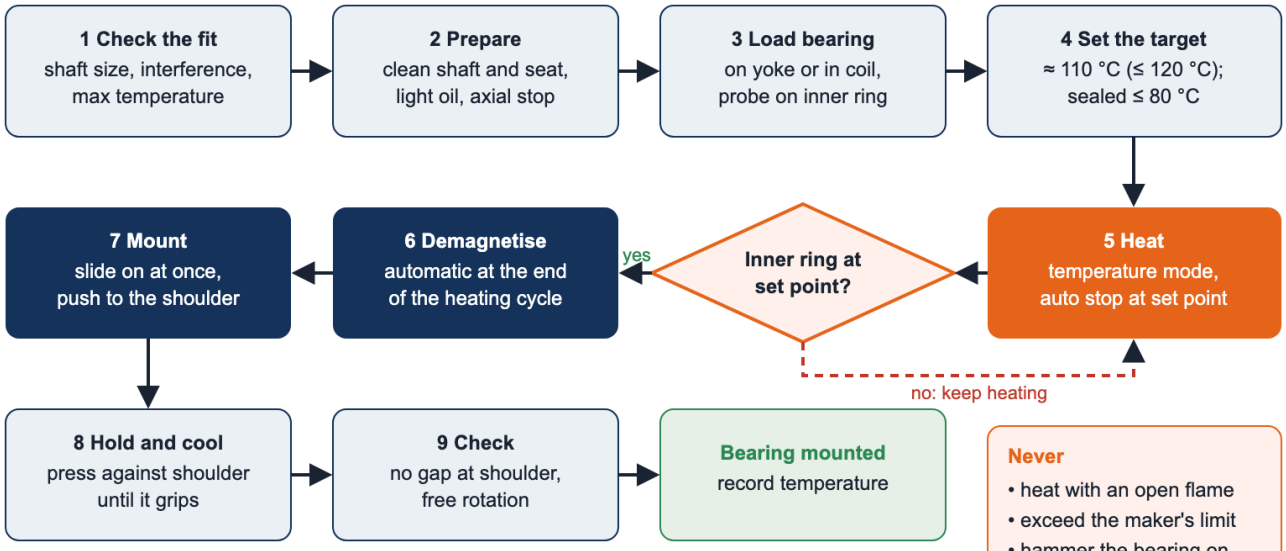
Bearing	Recommended
Small bearings in production (Ø25–90 mm)	UHF 6 kW + helical coil
Maintenance, bearings up to ≈ 300 kg	Yoke-type bearing heater
Large bearings and rings, on site	MF flexible-cable heater
Dismounting inner rings	Cable or custom coil, fast high-power heating

05 Mounting workflow and station layout

Induction Bearing Mounting Process Flow

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From fit check to a seated, cooled and demagnetised bearing.



Never

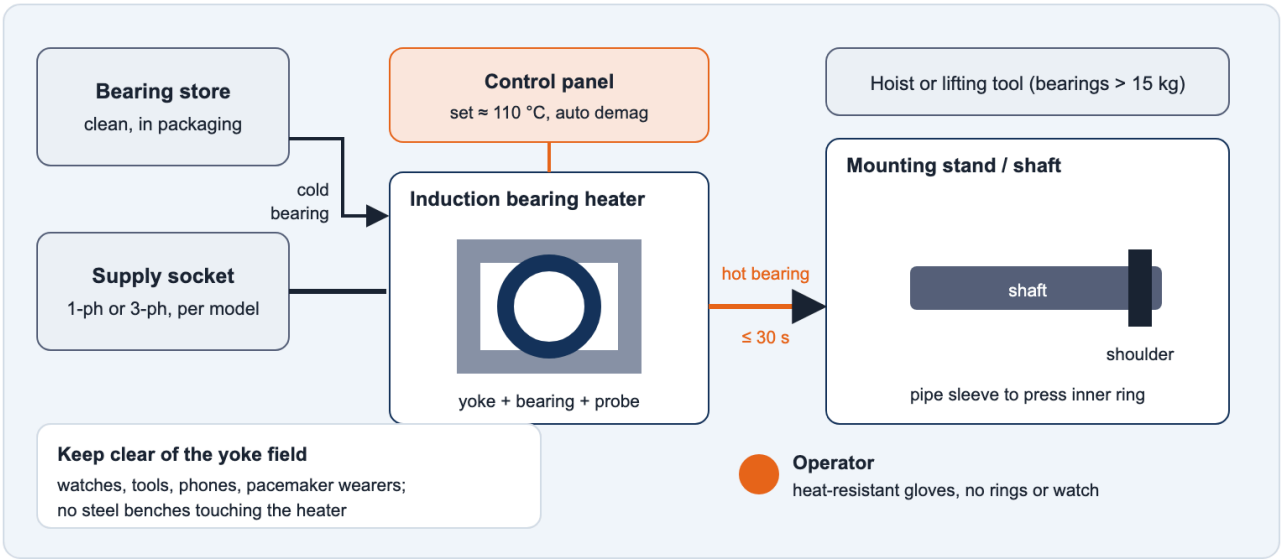
- heat with an open flame
- exceed the maker's limit
- hammer the bearing on
- heat sealed bearings above ≈ 80 °C
- skip demagnetising

Dismounting reverses the flow: heat the inner ring quickly with a puller in place, so it expands before the shaft warms, then pull the bearing off.

Bearing Mounting Station Layout

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Top view: heater, shaft and lifting kept within a few steps so the bearing is mounted while hot.



For large bearings the yoke heater is replaced by a flexible cable coil and MF power supply on the shaft or on a stand; the layout of supply, heating, shaft and lifting stays the same.

06 Application example and use cases

Roller bearings Ø25–89 mm (1–3.5 in) on steel shafts

Item	Value
Power supply	DW-UHF-6 kW, single-phase, remote heat station 2 × 0.1 μF
Frequency	180 kHz
Coil	Multi-turn helical; bearing axis across the coil axis (transverse)
Result in test	150–175 °C in 30–60 s; bearings slid onto shafts without force
Recommended production setting	≈ 110 °C (≤ 120 °C maker limit) — shorter cycle
Benefit	One coil covers the full size range; cart-mounted, single-phase



Large ring dismounting

Cable coil and insulation on a large bearing ring.



Slewing / large bearings

Cable coil heating for assembly or removal.

Typical use cases

Industry	Bearings
Electric motors and pumps	Deep-groove and cylindrical roller bearings
Gearboxes	Tapered and spherical roller bearings
Steel, paper, mining, cement	Large spherical roller bearings on rolls and shafts
Rail, wind, marine	Axle-box, main-shaft and stern-tube bearings

07 Frequently asked questions

What temperature should a bearing be heated to?

About 110 °C — roughly 90 K above the shaft. Do not exceed the maker limit, typically 120 °C; sealed bearings ≤ 80 °C.

Why demagnetise after heating?

Induction leaves residual magnetism that attracts wear particles. Bearing heaters demagnetise automatically at the end of the cycle.

How long does it take?

Small bearings 30–60 s with an HF coil; a 20 kg bearing about 2–5 min on a 5–10 kW heater (see Chart A).

Can induction remove bearings?

Yes. Heat the inner ring quickly with a puller in place so it expands before the shaft warms.

Can sealed bearings be heated?

Yes, but only to about 80 °C because of the grease and seals.

Is an oil bath acceptable?

It works but is slow and dirty; induction is cleaner, faster and temperature-controlled.

Why choose HLQ

Every bearing size
Yoke heaters, HF coils and MF cable heaters.

Temperature control
Probe on the inner ring, auto stop and hold.

Auto demagnetising
Clean bearings ready to mount.

Custom coils
Helical, split and cable coils for your parts.

Mounting and removal
One heater for both jobs.

Application testing
Cycle proven on your bearings.

Request an application test

Send your bearing type and shaft data. We will recommend the heater, coil and cycle for mounting or dismounting.

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Website
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Factory address
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Please include in your inquiry

- Bearing designation, bore, OD, width and weight
- Open or sealed; maximum allowed temperature
- Mounting, dismounting or both
- Bearings per day; workshop or on site
- Power supply available

