

DW-HF-45 Induction Brazing and Soldering Machine

45 kVA of high frequency power for large joints, several joints per heat, carbide tools and heavy soldering work, with a separate extension unit at the station.



45 kVA

IGBT, 3 × 380 V

30–80 kHz

high frequency

≈Ø60 mm

copper joint in about 15
s (est.)

8–9

Ø16 mm joints per 8 s
heat (est.)

One generator for brazing and soldering

Brazing joins metals with fillers that melt above 450 °C and gives strong, pressure-tight joints; soldering uses tin-based fillers below 450 °C for electrical and sealing joints. The DW-HF-45 does both. Its 45 kVA output brazes large joints, shares power across several joints in one coil, heats heavy carbide tool bodies and solders large copper parts such as cable lugs and busbars.



Extension unit with a multi-turn coil and a foot switch

Main parts

Part	Function	Size
Main cabinet	Rectifier, IGBT inverter, controls, displays, protections	550 × 240 × 535 mm
Extension unit	Output transformer, coil terminals and water connections	470 × 265 × 440 mm
Interconnecting cable	Links main cabinet and extension unit	2 m
Brazing or soldering coil	Water-cooled copper coil shaped for the joint	Made for each part
Foot switch and timer	Hands-free start; preset heating and holding stages	Timer on the timer version

Brazing vs soldering

Criterion	Brazing	Soldering
Filler melts	Above 450 °C	Below 450 °C
Typical fillers	B _{Ag} , B _{CuP} , Al-Si	Sn-Pb, Sn-Ag-Cu, Sn-Cu, Sn-Sb
Joint strength	High, often stronger than the tube	Lower; for electrical and sealing joints
Energy for copper, est.	About 800 kJ/kg	About 250 kJ/kg
Copper heated in 10 s by the DW-HF-45, est.	About 0.30 kg	About 0.96 kg
Typical use	Pressure tubes, tools, structural joints	Electrical connections, sealing, low-stress joints
Main risk	Overheating the base metal, spent flux	Cold joints, charred flux, damaged insulation

Technical specifications

Parameter	Specification	Notes
Model	DW-HF-45KW	IGBT high frequency induction heater
Input supply	3 × 380 V, 50/60 Hz	Published
Maximum oscillation power	45 kVA	Published
Maximum input power	50 kVA	Published
Oscillation frequency	30–80 kHz	Set by the coil and the part
Oscillating current	15–90 A	Depends on the load and the coil
Duty cycle	100% at 30 °C	Continuous work at full power
Cooling water	At least 6 L/min, maximum 0.3 MPa	Clean water in a closed loop
Main cabinet	550 × 240 × 535 mm	Generator and controls
Extension unit	470 × 265 × 440 mm	Output transformer and coil terminals
Cable length	2 m	Main cabinet to extension unit
Weight	75 kg	Published
Control modes	Constant current or constant power	Selectable
Displays	Heating power, heating current, oscillating frequency	Shows coil matching
Protections	Over-current, over-voltage, water failure, phase failure, unfit load	With fault display

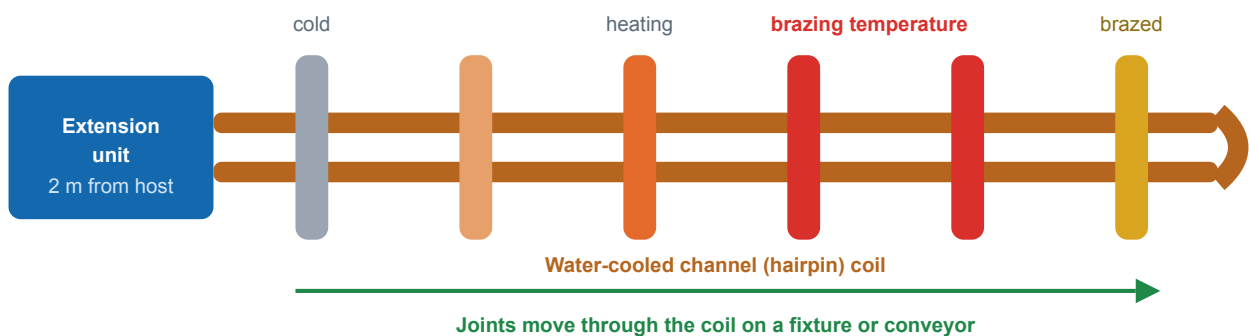
Site requirements

Item	Requirement	Note
Electrical supply	3 × 380 V circuit for 50 kVA	About 76 A per phase (est., from the published input)
Cooling water	At least 6 L/min, up to 0.3 MPa	About 6–9 kW of heat at full power (est.); more flow keeps the temperature rise lower
Water temperature	Inlet below about 35 °C	Closed-loop chiller or tank with pump
Fume extraction	Local extraction at the coil	Flux and solder fumes
Nitrogen	Low-flow purge for tube joints	Keeps tube bores free of oxide
Layout	Extension unit within 2 m of the main cabinet	Main cabinet away from flux and dust

How the DW-HF-45 works

The main cabinet converts the $3 \times 380 \text{ V}$ supply into 30–80 kHz current; the extension unit transforms it into the high coil current. Eddy currents heat the parts from the surface inwards, the filler melts at its working temperature and capillary action pulls it into the gap. With 45 kVA available, the coil can heat one large joint or share the power across several joints.

Channel coil for several joints in sequence



Several joints are in the coil at once, so the 45 kVA output is shared and one brazed joint leaves every few seconds

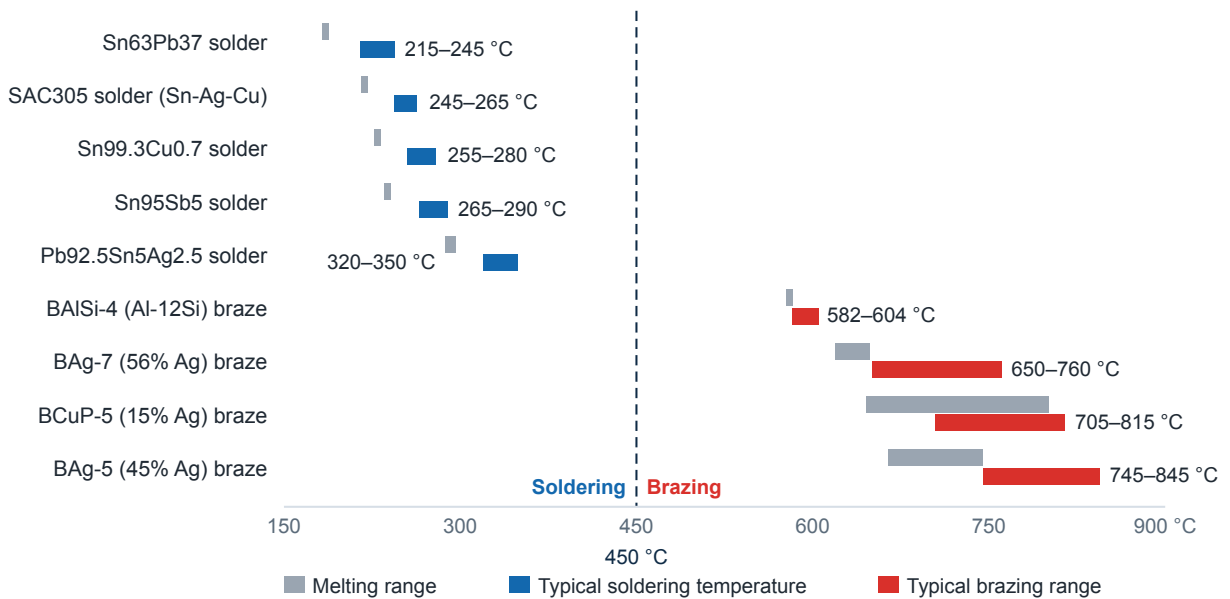
Coil set-ups for brazing and soldering

Coil set-up	How it works	Best for
Single ring coil	One joint inside a multi-turn coil	Large single joints, cable lugs
Multi-place coil	Several ring coils in series on one extension unit	Headers, manifolds, several stubs at once
Channel coil	Joints travel through a long hairpin coil	Conveyor brazing of U-bends and small fittings
Clamshell coil	Hinged coil closes around the joint	Closed assemblies that cannot be threaded
Profile coil	Follows the shape of the tool or part	Carbide tools, odd-shaped parts
Pancake coil	Flat spiral under the part	Busbars, flat terminals, plates

Base metals, fillers and fluxes

Base metal	Brazing filler	Soldering filler	Flux	Note
Copper	BCuP-2, BCuP-5 or BAg	Sn-Pb, Sn-Ag-Cu, Sn-Cu	None for BCuP on copper; rosin or water-soluble flux for solder	Needs a close coil and enough power
Brass	BAg or BCuP-5	Tin alloys	Required	Limit heat to reduce zinc loss
Carbon steel	BAg	Tin alloys	Required; active flux for solder	Never braze steel with BCuP
Stainless steel	BAg with nickel, such as BAg-24	Sn-Ag alloys	High-temperature flux; acid flux for solder	Heats faster than copper
Carbide on steel	BAg-24 or tri-metal shim	—	High-temperature flux	Slow cooling limits cracking
Aluminum	BAISi-4 (Al-12Si)	Zn-Al solders	Special flux	Very narrow window; trials needed
Nickel and plated parts	BAg	Tin alloys	Mild flux	Thin plating heats very quickly

Typical solder and brazing alloy temperatures



Typical values; always check the filler data sheet.

Key applications

Application	Typical parts	Process	Usual filler	Why 45 kVA
Heat exchangers and headers	Copper headers with many stubs, joints of Ø42–60 mm	Brazing	BCuP	Large or multiple joints in one heat
Multi-joint HVAC brazing	U-bends on coils, distributor assemblies	Brazing	BCuP-2 rings	Power shared across several joints in a channel coil
Copper to steel and stainless steel	Tube transitions, filter driers, sensor housings	Brazing	BAG with flux	Mixed materials with different heating rates
Carbide tools	Road-milling picks, mining bits, large drill heads, saw tips in batches	Brazing	BAG-24 or tri-metal shim	Heavy steel bodies need more power
Motor rotors	Copper bars to end rings	Brazing	BCuP or BAG	Heavy copper rings
Electrical soldering	Cable lugs of 95–400 mm ² , busbar tinning, transformer leads	Soldering	Tin alloys with flux	Large copper masses heated quickly
Steel and brass parts	Housings, caps, sensor bodies	Soldering	Tin alloys with active flux	Even heating of the whole joint
Steel tubes and fittings	Hydraulic and fuel lines, filters	Brazing	BAG	Thick fittings
Small-batch melting	Gold, silver, copper, brass in a crucible	Melting	—	Crucible coil on the extension unit

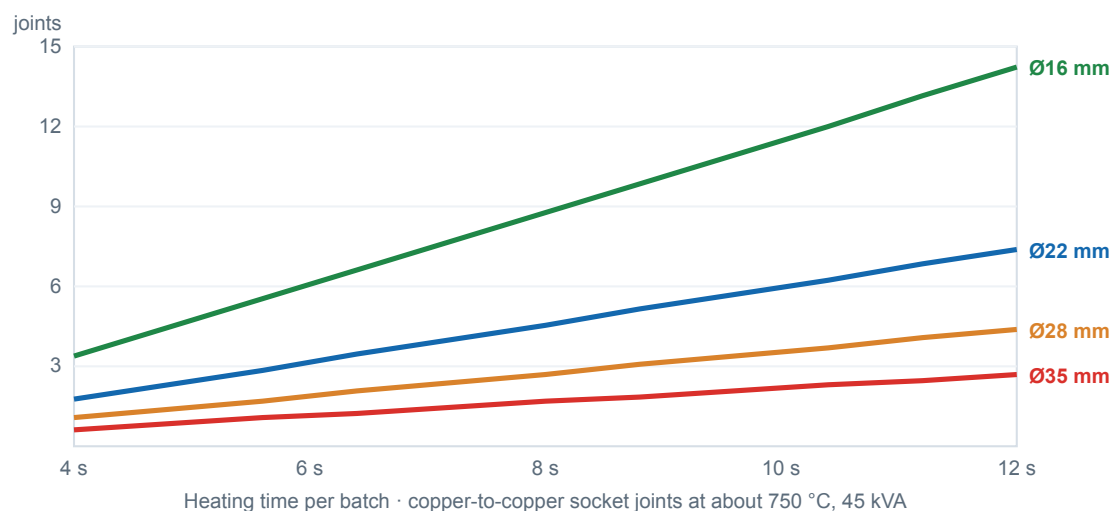


Main cabinet and extension unit

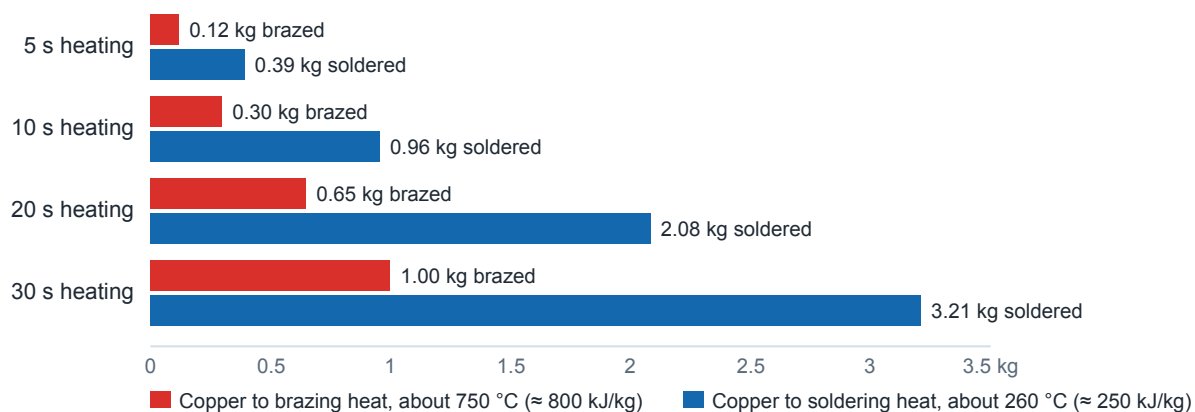
Choosing the right model

Model	Supply	Power	Largest copper joint in about 15 s, est.	Ø16 mm joints per 8 s heat, est.	Copper soldered in 10 s, est.	Line current, est.
DW-HF-15	1-phase 220 V	15 kW	About Ø35 mm	About 2–3	About 0.32 kg	About 76 A
DW-HF-25	3-phase 380 V	25 kVA	About Ø44 mm	About 4–5	About 0.53 kg	About 42 A
DW-HF-35	3-phase 380 V	35 kVA	About Ø52 mm	About 6–7	About 0.74 kg	About 53 A
DW-HF-45	3-phase 380 V	45 kVA	About Ø60 mm	About 8–9	About 0.96 kg	About 76 A
DW-HF-60	3-phase 380 V	60 kVA	About Ø70 mm	About 11–12	About 1.28 kg	About 101 A

Copper joints brought to brazing temperature at once (power-limited estimate)



Copper mass heated per cycle at 45 kVA



Worked examples

Step	A: Header with 8 × Ø16 mm stubs	B: Soldering a 240 mm ² cable lug	C: Carbide road-milling pick
Heated mass	8 joints × about 0.026 kg	Lug barrel and cable end, about 0.22 kg of copper	Steel body zone and tip, about 0.35 kg
Energy	8 × 21 kJ ≈ 166 kJ	0.22 kg × 250 kJ/kg ≈ 55 kJ	0.35 kg × 850 kJ/kg ≈ 300 kJ
Heating time at 45 kVA	About 7.4 s (DW-HF-35: about 9.1 s)	About 3.5 s at full power	About 12 s at full power
Practical setting	One heat per header, about 7–8 s	About 6–10 s at part power to protect the insulation	About 15–25 s with a holding stage
Filler and coil	BCuP-2 rings, multi-place coil	Tin solder with flux, ring coil, heat sink on the cable	BAG-24 or tri-metal shim, profile coil
Result	DW-HF-45	DW-HF-45 , or DW-HF-35 for smaller lugs	DW-HF-45

Heating time = $1.6 \times \text{energy} \div \text{power} + \text{about } 1.5 \text{ s for filler flow.}$

When to choose the DW-HF-45

Your job	Recommended
Single copper joints up to about Ø52 mm	DW-HF-35
Copper joints of Ø52–60 mm, or 6–9 small joints per heat	DW-HF-45
Carbide tools with heavy steel bodies	DW-HF-45
Soldering lugs, busbars and heavy copper parts up to about 1 kg per cycle	DW-HF-45
More than about 9 joints per heat, or joints above Ø60 mm	DW-HF-60 or larger
Only small parts on a single-phase supply	DW-HF-15

Typical brazing and soldering set-ups

Engineering examples; exact settings are confirmed by trials on your parts.

Header brazing

Workpiece	Copper header with 8 × Ø16 mm stubs, BCuP-2 rings
Set-up	Multi-place coil, timer version
Time, est.	About 7–8 s per header
Note	All stubs brazed in one heat

U-bend conveyor brazing

Workpiece	Ø9.52 mm U-bends on fin coils, BCuP-2 rings
Set-up	Channel coil over a conveyor
Time, est.	Line speed set by coil length
Note	Power for several small joints per second (est.)

Carbide road-milling pick

Workpiece	Steel body zone and carbide tip, about 0.35 kg
Set-up	Profile coil, BAg-24 or tri-metal shim
Time, est.	About 15–25 s with holding stage
Note	Slow cooling limits cracking

Cable lug soldering

Workpiece	240 mm ² copper lug and cable end, about 0.22 kg
Set-up	Ring coil, tin solder with flux, heat sink on cable
Time, est.	About 6–10 s at part power
Note	Insulation stays cool

Copper to stainless transition

Workpiece	Ø22 mm copper tube into a stainless fitting
Set-up	Ring coil, BAg-24 with high-temperature flux
Time, est.	About 5–8 s
Note	Coil biased towards the copper

Busbar tinning and soldering

Workpiece	60 × 10 mm copper busbar end, 80 mm long, about 0.43 kg
Set-up	Pancake coil, tin solder
Time, est.	About 8–12 s
Note	Even heating of a heavy flat part

Advantages and limitations

Advantages	Limitations
Brazes and solders with the same generator	Brazing and soldering need different coils and settings
Large joints and several joints per heat	Multi-place coils must be balanced for even heating
Enough power for carbide tools with heavy bodies	Needs 3 × 380 V and about 76 A per phase
Flame-free, timer-controlled, repeatable	Needs at least 6 L/min of cooling water
Separated extension unit at the station	Extension unit must stay within the 2 m cable reach
100% duty cycle at 30 °C	Oversized for small single joints, where a smaller model is cheaper

Brazing and soldering workflow

Step	Brazing	Soldering
1. Clean	Degrease and remove oxide	Degrease; pre-tin difficult surfaces
2. Fit	Clearance about 0.05–0.15 mm	Clearance about 0.05–0.2 mm
3. Filler and flux	Ring, paste or shim; flux as required	Solder ring, wire or paste; rosin, water-soluble or active flux
4. Position	Coil centred on the joint, slightly towards the heavier part	Coil on the heavier part; protect insulation and plastics
5. Heat	Fast to just below the filler range	Gentle heating to about 30–50 °C above the solder liquidus
6. Hold	Until a full fillet forms	Until the solder wets and flows around the joint
7. Cool	Keep still; no quenching while the filler solidifies	Keep still to avoid cold joints
8. Clean	Wash off flux residue	Wash off flux, or use no-clean flux
9. Inspect	Fillet check, leak or pressure test	Wetting check, resistance or pull test

Common problems and solutions

Problem	Likely cause	Solution
One joint in a multi-place coil overheats while another stays cold	Unequal coil gaps or different joint masses	Equalize gaps; adjust turns at each place; group parts of similar size
Filler does not enter the joint	Heavier part too cold, wrong clearance, dirty surfaces	Move the coil towards the heavier part; correct clearance; clean
Carbide cracks after brazing	Fast heating or fast cooling, thermal mismatch	Lower power, holding stage, tri-metal shim, slow cooling
Cold, grainy solder joint	Joint below working temperature or moved while solidifying	Longer holding stage; keep the part still while cooling
Flux turns black and solder will not wet	Overheating or too long at temperature	Lower power or shorter time; use a higher-temperature flux
Cable insulation damaged during lug soldering	Heat travels along the conductor	Clamp a heat sink on the cable; shorten heating
Water-failure or water-temperature alarm	Flow below 6 L/min, warm water	Raise the flow; keep the inlet below about 35 °C
Low power or unfit-load alarm	Coil not matched to the load	Change coil turns or gap; ask HLQ to match the coil

Frequently asked questions

1. What is the difference between induction brazing and induction soldering?

Brazing uses fillers that melt above 450 °C, such as silver and phos-copper alloys, and makes strong, pressure-tight joints. Soldering uses tin-based fillers that melt below 450 °C, mainly for electrical and sealing joints. The DW-HF-45 does both with different coils and settings.

2. What can the DW-HF-45 braze and solder?

Copper, brass, steel and stainless steel joints, heat exchanger headers, U-bends, motor rotor rings, carbide tools, cable lugs, busbars, housings and fittings.

3. How many joints can it braze at once?

About 8–9 Ø16 mm copper joints in an 8 s heat, or about 4–5 Ø22 mm joints, as a power-limited estimate. The practical number depends on the coil layout.

4. What is the largest copper joint it can braze?

About Ø60 mm in roughly 15 s of heating for a copper-to-copper socket joint (estimate).

5. Can it braze carbide tools?

Yes. Its power suits tools with heavy steel bodies, such as road-milling picks and mining bits. Use a nickel-bearing silver alloy or a tri-metal shim, a holding stage and slow cooling to avoid cracks.

6. Which solders and brazing alloys can be used?

Tin solders such as Sn-Pb, Sn-Ag-Cu, Sn-Cu and Sn-Sb for soldering; BAg, BCuP and aluminum-silicon alloys for brazing. Phos-copper must not be used on steel.

7. What power supply does it need?

3 × 380 V, 50/60 Hz, with a published maximum input of 50 kVA, which is about 76 A per phase.

8. What cooling water does it need?

At least 6 L/min at up to 0.3 MPa in a clean closed loop, with the inlet below about 35 °C. About 6–9 kW of heat is removed at full power (estimate).

9. How is the heating started and controlled?

From the panel or a foot switch. The operator chooses constant current or constant power, and the timer version presets the power and time of a heating stage and a holding stage.

10. Should I choose the DW-HF-35 or DW-HF-60 instead?

The DW-HF-35 is enough for single copper joints up to about Ø52 mm. The DW-HF-60 suits more than about 9 joints per heat or joints above Ø60 mm.

Request a quotation

Send us the information below and our engineers will recommend the model, coil and settings, and can run trials on sample parts.

Please include

- Drawings or photos of the joints and parts
- Process: brazing, soldering or both
- Base metals and the filler and flux used today
- Joints per heat and required output per hour
- Manual station, multi-place fixture or conveyor
- Supply voltage and frequency (380 V, 400 V, 415 V, 440 V, 480 V; 50 or 60 Hz)
- Cooling water, nitrogen and fume extraction available

HLQ INDUCTION EQUIPMENT

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Induction brazing and soldering generators, coils, fixtures and cooling from one supplier.

Model, supply, power, frequency, oscillating current, duty cycle, cooling water, weight, dimensions, cable length, functions and protections are HLQ's published data. Heating times, joints per heat, heated mass, line current and heat load are engineering estimates. Filler temperatures are typical values. Edition October 2026.