

**INDUCTOHEAT
EUROPE**

An Inductotherm Group Company

INDUCTOSCAN

**The evolution of flexible, modular
induction hardening systems**



product
design
award

2006



Saves time and money

by individual adaptation to your requirements, very simple operation and extremely short re-tooling times

**INDUCTOTHERM[®]
GROUP**

Leading Manufacturers of Melting, Thermal Processing & Production Systems for the Metals & Materials Industry Worldwide



Modular hardening equipment

The concept

Our universal hardening machine features a flexible, modular design and can be used for hardening of the most different types of workpieces. It comprises a basic machine to which various processing modules can be fitted quickly, simply and precisely, depending on the application.

Features (depending on design variant)

- MF 75–200 kW 5–40 kHz
- HF 50–150 kW 50–200 kHz
- Clamping length up to 900 mm
- Hardening length up to 800 mm
- 3 programmable inductor axes
1 programmable servo round axis at lower center
- Upper/lower center
- Modularly adaptable processing modules with plug-and-play technology
- Menu-guided CNC control SIEMENS 840D or OP277
- Precise energy control
- Inverter status control and automatic matching for simple, quick change of inductors

The modules (depending on design variant)

The following processing modules are available:

- Module to process parts between centers (1-track and 2-track)
- Indexing table module with rotating part locators
- Indexing table module with fixed part locators
- Horizontal continuous tractor feed module (1-track and 2-track)
- Horizontal pusher type module (1-track and 2-track)
- Universal table module
- Further modules for special applications
- Tempering module with separate servo drive

The individual processing modules match one another both technically and as regards their places of installation. Each module is provided with its own decentralized electrical periphery. The advantage is that each individual module only has to be plugged on and is ready for operation without additional efforts being necessary, even in the event of a later subsequent order.

Automatic inverter matching (depending on design variant)

The operator can call up the "Inverter status" menu via the controls. In this menu, any deviations from the optimum operating parameters are displayed and

the inverter can automatically be adjusted to the inductor currently used. Via a pneumatically switchable capacitor bus and transformer tap switch, inverter matching and frequency can be adjusted over a wide range. The matching programme measures the electrical parameters of the system and recommends the optimum matching, suggested in terms of transformer tap and numbers of capacitors to be then confirmed by the operator. The operator is additionally provided with further information on the modification of the coupling distance and inductivity. This saves time, makes retooling child's play and reduces the "expert know-how" required.

Service

In our process development, we determine – if requested – your optimum process parameters and the hardening accessories required such as inductors and quenches. Our test lab will provide you with a detailed description of the results obtained. Our inductor manufacturing department produces inductors and other hardening accessories according to HWG quality standards.

Our service network solves your problems quickly and competently, worldwide. In our own heat treat shop we can perform hardening tasks for you in the case of overcapacities, breakdowns or for series production start-up.

We guarantee this service for the whole life cycle of your hardening equipment.



Design options

Features		INDUCTOSCAN
axes	Y/Z-CNC	●
	1 NC X-CNC	○
	rotation U-center	
lower centers	1 rotating center	●
	2 rotating centers	○
upper centers	1 rotating center	○
	2 rotating centers	○
tower centers	1 or 2 rotating centers	○
control	840 D	○
	OP277	●
electrically operated safety door	fully automatic	○
pneumatically operated door	semi-automatic	●
tempering module		○
pre-heating module		○
horizontal module	1 pusher	○
indexing table CNC controlled		○
indexing table with gearbox		○
indexing table		○
central water supply		●
inverter cooling	water	○
inductor cooling	water	○
	quench	○
quench water cooling		○
band filter for quench water		○
"automatic matching" for inductor		○

● available
○ optional

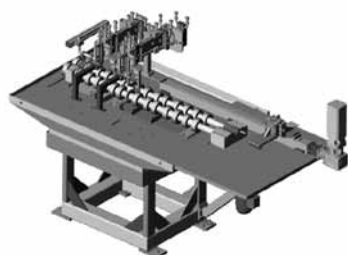
Inverter	MF 75–200 kW HF 50–150 kW	5–40 kHz 50–200 kHz		
Cooling system	energy circuit pressure increase Quench water	220 l/min 160 l/min 250 l/min	4 bar 10 bar	
Control *	<p>CNC control for programming of complete hardening operation</p> <ul style="list-style-type: none"> • automatic inverter matching assistance • automatic module indexing • positions • scan rate max. 250 mm/s • heat on/off • power in percent • quench on/off • times • M-functions, additional functions as required • process data documentation • inductor earth fault monitoring • main components: Siemens CNC 840 D oder mit OP277 • swivelling operator panel 			
Load/unload	manual, linking to handling or robot possible			
Dimensions	refer to layout			
Machine weight	approx. 5 200 kg			
Connected load	400/480 V power consumption cooling water approx.	50/60 Hz inverter x 1,7 90 kVA 220 kVA	110 l/min 220 l/min	
	at 25°C inlet requirements depending on temperature and load			
Safety devices	<p>safety enclosure with door interlock temperature switches on all critical cooling water paths flow monitoring devices for inverter, inductors and quenches</p>			
Moving heat station *	vertical z-axis retraction axis y-axis feed axis transverse x-axis	940 mm 150 mm 50 mm	150 mm/sec 80 mm/sec 80 mm/sec	
Lower center *	workpiece rotation number of workpieces max. workpiece weight max. workpiece length max. workpiece diameter	40–400 rpm 1 oder 2 650 kg 900 mm with 1 workpiece with 2 workpieces	350 mm 120 mm	special sizes available special sizes available
Indexing table, two parts at a time *	max. workpiece diameter	max. workpiece weight	indexing time	workpieces on indexing table
180° indexing	120 mm	1,0 kg	2,0 sec	4
90° indexing	120 mm	0,75 kg	1,5 sec	8
Indexing table, one part at a time *	max. workpiece diameter	max. workpiece weight	indexing time	workpieces on indexing table
180° indexing	200 mm	2,0 kg	2,0 sec	2
90° indexing	200 mm	1,0 kg	1,5 sec	4
45° indexing	120 mm	0,4 kg	1,0 sec	8
Servo round axis *	max. speed number of workpieces max. workpiece weight max. workpiece length max. workpiece diameter tooth by tooth hardening ID/OD circumferential hardening ID/OD	200 rpm 1 1000 kg 900 mm 600 mm yes yes	special sizes available speed selectable	

* see equipment options



Module overview

Pre-heating/tempering module	vertical lift cross-slide manually adjustable	200 mm +,- 50 mm	150 mm/sec in X/Y-direction
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Horizontal roller module with pusher or tractor drive	tractor drive feed speed min. feed speed max.	18,1 mm/sec 108,8 mm/sec.
	rotation drive roller rotation roller diameter	stepless 90 mm
	workpiece dimensions l min. l max. d min. d max.	50 mm 600 mm 10 mm 50 mm
	monitoring roller rotation via inductive proximity switch part in inductor option: pyrometer	



Indexing table module		
Indexing table, two parts 180° indexing 90° indexing	max. part diameter 120 mm 120 mm	max. part weight 1,0 kg 0,75 kg
Indexing table, one part 180° indexing 90° indexing 45° indexing	max. part diameter 200 mm 200 mm 120 mm	max. part weight 2,0 kg 1,0 kg 0,4 kg

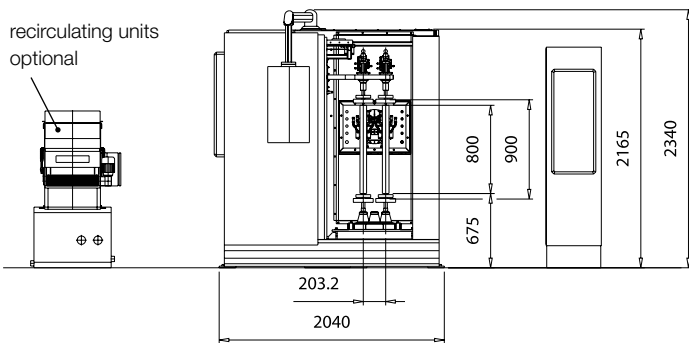


Universal table module	design without drive disk attachment
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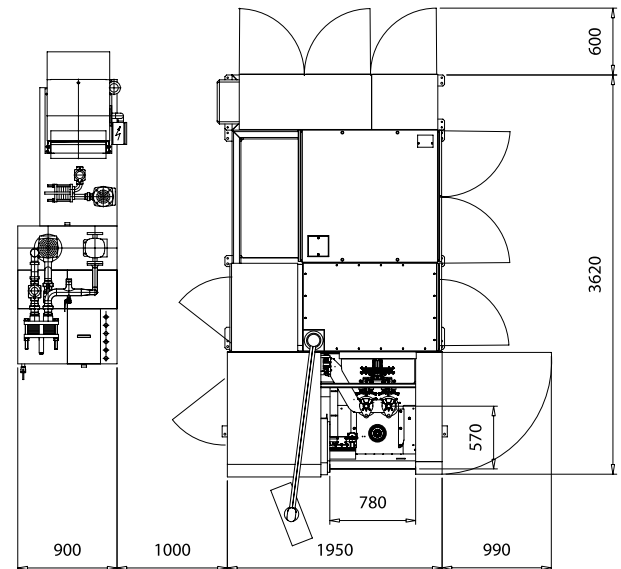
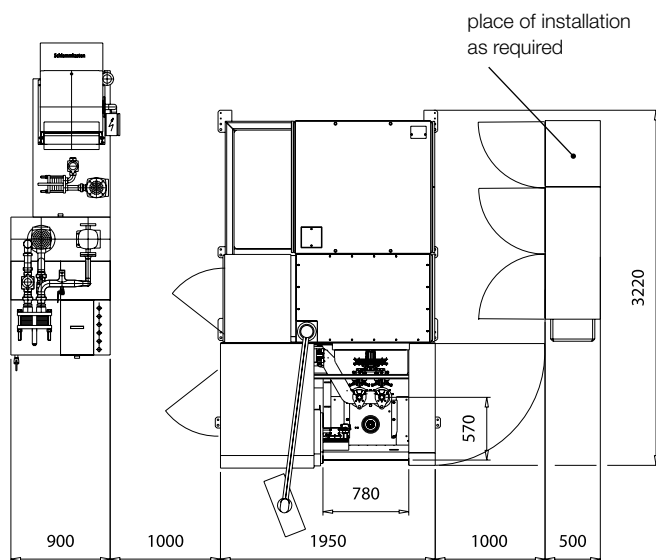
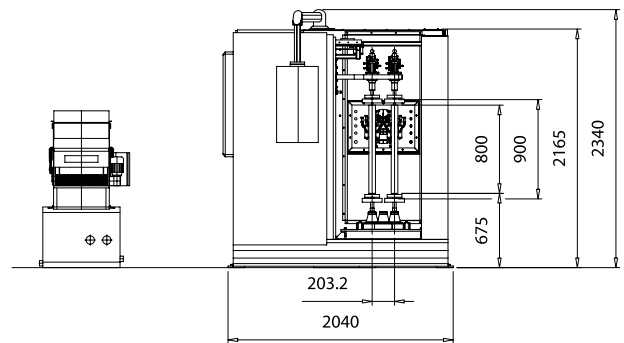
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Main dimensions and layout plan

Control cubicle separated



Control cubicle compact



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