INDUCTOHEAT EUROPE
An Inductotherm Group Company

INDUCTOSCAN

The evolution of flexible, modular induction hardening systems

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

<table>
<thead>
<tr>
<th>Features</th>
<th>INDUCTOSCAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>axes Y/Z - CNC</td>
<td>✔</td>
</tr>
<tr>
<td>1 NC X-CNC</td>
<td>✔</td>
</tr>
<tr>
<td>rotation U-center</td>
<td>✔</td>
</tr>
<tr>
<td>lower centers</td>
<td>✔</td>
</tr>
<tr>
<td>1 rotating center</td>
<td>✔</td>
</tr>
<tr>
<td>2 rotating centers</td>
<td>✔</td>
</tr>
<tr>
<td>upper centers</td>
<td>✔</td>
</tr>
<tr>
<td>1 rotating center</td>
<td>✔</td>
</tr>
<tr>
<td>2 rotating centers</td>
<td>✔</td>
</tr>
<tr>
<td>tower centers</td>
<td>✔</td>
</tr>
<tr>
<td>1 or 2 rotating centers</td>
<td>✔</td>
</tr>
<tr>
<td>control</td>
<td>OP277</td>
</tr>
<tr>
<td>electrically operated safety door</td>
<td>fully automatic</td>
</tr>
<tr>
<td>pneumatically operated door</td>
<td>semi-automatic</td>
</tr>
<tr>
<td>tempering module</td>
<td>✔</td>
</tr>
<tr>
<td>pre-heating module</td>
<td>✔</td>
</tr>
<tr>
<td>horizontal module</td>
<td>✔</td>
</tr>
<tr>
<td>indexing table with gearbox</td>
<td>✔</td>
</tr>
<tr>
<td>indexing table</td>
<td>✔</td>
</tr>
<tr>
<td>central water supply</td>
<td>✔</td>
</tr>
<tr>
<td>inverter cooling</td>
<td>water</td>
</tr>
<tr>
<td>inductor cooling</td>
<td>water</td>
</tr>
<tr>
<td>quench water cooling</td>
<td>quench</td>
</tr>
<tr>
<td>band filter for quench water</td>
<td>✔</td>
</tr>
<tr>
<td>&quot;automatic matching&quot; for inductor</td>
<td>✔</td>
</tr>
</tbody>
</table>

* Available

* Optional
Technical data

Inverter

- MF 75–200 kW
- 5–40 kHz
- HF 50–150 kW
- 50–200 kHz

Cooling system

- Energy circuit
  - 220 l/min
  - 4 bar
- Pressure increase
  - 160 l/min
  - 10 bar
- Quench water
  - 250 l/min

Control *

- CNC control for programming of complete hardening operation
- 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 OP 277
- 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
- 50/60 Hz
- Power consumption
  - Inverter x 1,7
- Cooling water approx.
  - 90 kVA
  - 110 l/min
- 220 kVA
  - 220 l/min
- At 25°C inlet
- Requirements depending on temperature and load

Safety devices

- Safety enclosure with door interlock
- Temperature switches on all critical cooling water paths
- Flow monitoring devices for inverter, inductors and quenches

Moving heat station *

- Vertical z-axis
  - 940 mm
  - 150 mm/sec
- Retraction axis y-axis
  - 150 mm
  - 80 mm/sec
- Feed axis transverse x-axis
  - 50 mm
  - 80 mm/sec

Lower center *

- Workpiece rotation
  - 40–400 rpm
- Number of workpieces
  - 1 oder 2
- Max. workpiece weight
  - 650 kg
- Max. workpiece length
  - 900 mm
- Max. workpiece diameter
  - With 1 workpiece
    - 350 mm
  - With 2 workpieces
    - 120 mm
- Special sizes available

Indexing table, two parts at a time *

<table>
<thead>
<tr>
<th>Indexing</th>
<th>Max. Workpiece Diameter</th>
<th>Max. Workpiece Weight</th>
<th>Indexing Time</th>
<th>Workpieces on Indexing Table</th>
</tr>
</thead>
<tbody>
<tr>
<td>180°</td>
<td>120 mm</td>
<td>1,0 kg</td>
<td>2,0 sec</td>
<td>4</td>
</tr>
<tr>
<td>90°</td>
<td>120 mm</td>
<td>0,75 kg</td>
<td>1,5 sec</td>
<td>8</td>
</tr>
</tbody>
</table>

Indexing table, one part at a time *

<table>
<thead>
<tr>
<th>Indexing</th>
<th>Max. Workpiece Diameter</th>
<th>Max. Workpiece Weight</th>
<th>Indexing Time</th>
<th>Workpieces on Indexing Table</th>
</tr>
</thead>
<tbody>
<tr>
<td>180°</td>
<td>200 mm</td>
<td>2,0 kg</td>
<td>2,0 sec</td>
<td>2</td>
</tr>
<tr>
<td>90°</td>
<td>200 mm</td>
<td>1,0 kg</td>
<td>1,5 sec</td>
<td>4</td>
</tr>
<tr>
<td>45°</td>
<td>120 mm</td>
<td>0,4 kg</td>
<td>1,0 sec</td>
<td>8</td>
</tr>
</tbody>
</table>

Servo round axis *

<table>
<thead>
<tr>
<th>Feature</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. Speed</td>
<td>200 rpm</td>
</tr>
<tr>
<td>Number of Workpieces</td>
<td>1</td>
</tr>
<tr>
<td>Max. Workpiece Weight</td>
<td>1000 kg</td>
</tr>
<tr>
<td>Max. Workpiece Length</td>
<td>900 mm</td>
</tr>
<tr>
<td>Max. Workpiece Diameter</td>
<td>600 mm</td>
</tr>
<tr>
<td>Tooth by Tooth Hardening ID/OD</td>
<td>Yes</td>
</tr>
<tr>
<td>Circumferential Hardening ID/OD</td>
<td>Yes</td>
</tr>
</tbody>
</table>

* See equipment options
## Module overview

### Pre-heating/tempering module
- **Vertical lift:** 200 mm
- **Cross-slide:** +,– 50 mm in X/Y-direction
- **Manually adjustable**

### Horizontal roller module with pusher or tractor drive
- **Tractor drive**
  - Feed speed min.: 18.1 mm/sec
  - Feed speed max.: 108.8 mm/sec.
- **Rotation drive**
  - Roller rotation: stepless
  - Roller diameter: 90 mm
- **Workpiece dimensions**
  - L min.: 50 mm
  - L max.: 600 mm
  - D min.: 10 mm
  - D max.: 50 mm
- **Monitoring**
  - Roller rotation via inductive proximity switch
  - Part in inductor
  - Option: pyrometer

### Indexing table module
- **Indexing table, two parts**
  - Max. part diameter: 120 mm
  - Max. part weight: 1.0 kg
  - Max. part diameter: 120 mm
  - Max. part weight: 0.75 kg
- **Indexing table, one part**
  - Max. part diameter: 200 mm
  - Max. part weight: 2.0 kg
  - Max. part diameter: 200 mm
  - Max. part weight: 1.0 kg
  - Max. part diameter: 120 mm
  - Max. part weight: 0.4 kg

### Universal table module
- Design without drive disk attachment
Main dimensions and layout plan

Control cubicle separated

Control cubicle compact

place of installation as required

recirculating units optional

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