Smart FS medium frequency induction crucible furnace: Small capacity furnace solutions from ABB
Smart FS: The flexible furnace for small capacity applications

The Smart FS is best suited for the following foundry applications:
- Steel foundries
- Small, highly flexible gray iron foundries
- Non-ferrous metal foundries
- Special product foundries (job shops)
- Precision foundries (lost wax method)
- Laboratory test furnaces for large foundries

Fast, reliable global service – whenever and wherever you need it

The Smart FS’ modular design and standard ABB components make it easy to maintain. In addition, ABB’s numerous service locations are available to your foundry, providing you with extensive services whenever and wherever you need them.

ABB in foundries
- Decades of worldwide foundry experience.
- Global knowledge and development of advanced foundry technologies.
- Open and continuous exchange of experiences with foundry customers.
- International competence in coreless induction crucible furnaces.
- Complete solution provider for the entire range of sophisticated foundry technology.

After-sales support – retrofit existing furnace installations

Existing installations can be retrofitted with the Smart FS by exchanging either the furnace or power supply. Contact your ABB service representative for a solution customized to your foundry’s requirements.

ABB is committed to being your foundry partner

ABB induction furnaces and inductive heating solutions bring new capacity to foundry operations. With substantial market share worldwide in the foundry industries, ABB solutions can be found in almost every modern foundry – proof of confidence and a commitment to the future.

ABB offers more than advanced, reliable, high-quality solutions to foundry customers, ABB offers its commitment and enthusiasm for foundries and foundrymen. This common bond with foundrymen, is the foundation of the successful, long-term partnership between ABB and its many satisfied foundry customers.

Applying comprehensive process knowledge to support its customers, ABB creates value for foundries. At ABB, our goal is to meet our customers’ custom requirements – our main motivation is your success!

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**Medium frequency induction furnace Smart FS**

The Smart FS medium frequency induction furnace melts and holds gray iron, steel, and other ferrous and non-ferrous metals.

The Smart FS' melting rate is between 400 kg/h and 1200 kg/h (880 LB/h and 2640 LB/h.) - related to cast iron.

ABB offers the following standard Smart FS steel and iron melting installations for capacities between 300 and 800 kg (660 and 1760 LB) with 1000 Hz operating frequency:

<table>
<thead>
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<th>FS 3 (300 kg)</th>
<th>FS 5 (500 kg)</th>
<th>FS 8 (800 kg)</th>
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<tbody>
<tr>
<td>250 kW</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>500 kW</td>
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<td>750 kW</td>
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The above furnaces are adapted to meet the requirements of copper, brass and aluminum foundries. The Smart FS installation includes the following components:

- Coreless Induction crucible type furnace.
- Medium frequency power supply.
- Peripheral equipment such as water cooling, hydraulics and transformers.
- Furnace control, with either operator panel or simple pushbuttons.

**ABB’s extended line of FS furnace solutions**

**A high degree of reliability and availability**

- Open-cage furnace design allows for easy installation.
- Magnetic yokes of furnace conform to low magnetic radiation workplace requirements.
- Modular power supply components.

**Low energy consumption**

Optimal furnace design and the efficient IGBT converter reduce power consumption and energy losses.

**High operational safety**

Continuous automatic monitoring ensures safe melting.

**Reduced lifecycle costs**

Smart FS has the lowest lifecycle costs in its class.

**Ease of installation**

Major system components; i.e. furnace, power supply and hydraulics are pre-assembled and tested prior to shipment, reducing installation time significantly. The furnace can be installed free standing on the foundry floor.
Proven design for a high degree of reliability and availability

ABB draws on the successes of its large capacity FS induction crucible furnaces to ensure the best possible construction of the Smart FS. ABB’s proven design elements include the following:

- Rectangular copper profile and coil-in-segment technology, coupled with axial coil fixing, provides high mechanical stability and extends the lifecycle of the coil.
- Coil segment design promotes breathing of the coil and the evaporation of moisture from the refractory during sintering. This makes it possible to apply full power to the coil sooner.
- The upper and lower coil ends are equipped with cooling turns that end in a flat surface. This makes it easier and faster to exchange coils.
- Easy-to-replace furnace head. The pre-cast furnace head can be dried before installing it on the furnace, allowing the furnace to be started and energized immediately.
- Open-cage design permits accessibility and visibility of mechanical parts, designed for easy preventive maintenance.
- Exchange yoke insulation without replacing the coil.
- Higher lining life due to upper cooling coil turns

**Furnace cooling system**

The induction furnace, capacitor bank and converter are cooled using a common closed loop water system. De-ionized water is not required because there are no electrically energized converter parts in contact with the water system. The environmentally friendly Smart FS cools without anti-freeze aids, and the simple water-cooling system is easy to maintain.
**Smart FS - total control from the power supply to the operator station**

**Compact power supply**

Advanced semi-conductor technology and a compact design make the Smart FS power supply best in class. In addition, the Smart FS power supply relies on the same patented maintenance-free IGBT technology that are found in ABB’s large drives. This technology has proven itself in ABB’s large drives for many years. (ABB is the world’s largest drive supplier)

- Modular converter – each module consists of a rectifier and an inverter.
- Modules in a drawer make them fast to replace, giving the furnace higher availability.
- Small footprint. Compact furnace capacitors and converter modules can be placed in one cabinet.
- Furnace coil and capacitors are water cooled in one closed-loop circuit.

**Limit power consumption with advanced ABB solutions**

ABB Energy Management Systems can help you optimize your foundry operations. With ABB Energy Management Systems, foundries can automatically adjust and limit power consumption during peak energy times. ABB’s unique Energy Management Systems solution provides foundries with the ability to tie in directly to energy provider supply constraints and meet these constraints through controlled power limitation of their furnaces.

**IndustrialIT solutions for improved furnace operation**

Installations and converters are controlled with ABB’s ControlIT AC800 controller.

Centralized operator panels allow operators to control the furnace via a panel with user-friendly, intelligent screen build-up features.

Operator panels offer customers several unique features and allow operators to perform several critical activities such as:

- Recording of furnace parameters and calculation of the power consumption.
- Control of the power supply for melting or holding, start-up of the cold furnace, sintering.
- Recording and display of current operation data and status.
- Fault monitoring and alarm signaling.
- User-friendly with large function keys so Operators do not need to remove their gloves.
- Exchangeable protective foil...
Our scope of supply for foundries

Induction Furnaces
- Coreless induction furnaces for ferrous and non-ferrous metals
- Channel-type induction furnaces for cast iron, aluminum, copper and zinc
- Inductive-heated and unheated pouring systems

Additional Equipment
- TWIN-POWER®, and MULTI-POWER power supplies for multiple furnaces
- Cooling systems with water/water-heat exchanger, air/water or evaporation cooler
- Pneumatic and hydraulic stopper mechanism for automatic pouring systems
- Skimming devices
- Crucible push out devices
- Movable charging equipment for coreless induction furnaces

Process Control and Automation
- Melt processors
- Automatic pouring control system LaserPour®
- Process control systems
- Management information systems
- Manufacturing Execution Systems (MES)

Instrumentation and Analyzing Systems

Electrical Installations
- Power supply and distribution
- Transformators, converters

Robots

Services
- Project management
- Assembly, installation, commissioning
- Documentation, training
- Maintenance
- Plant optimization, Consultation