The modular design of the ModMEMS allows easy mounting inside the mold housing of billet continuous casters. The modular stirrer design greatly simplifies:

- Building in
- Commissioning
- Operation
- Maintenance

Modular Design offers Maximum Flexibility
The ModMEMS stirrer consists of 4 or 6 standardized pole modules and an iron yoke specific for each installation. Each module consists of an iron core with electrical windings, enclosed in a sealed stainless steel casing. The windings are cooled by the mold cooling water surrounding the modules. ModMEMS is suitable for strand sizes up to about 160 mm sq. and rounds up to about 400 mm diameter.

Metallurgical and Operational Benefits
ModMEMS creates efficient stirring of the strand and provides the same metallurgical and operational improvements as a conventional MEMS regarding:

- Surface slags
- Pinholes
- Blowholes
- Subsurface slags
- Internal cracks
- Columnar structure
- Center line segregation
- Center porosities
- Breakout ratio
- Increased casting speed

ModMEMS, modular mold electromagnetic stirrer for billet casters

A Unique Stirrer with Substantial Advantages:
- Low energy consumption
- No separate cooling water system required
- Mold modifications can often be minimized
- Short delivery time
- Short installation and commissioning time
- Easy maintenance and low repair cost

ModMEMS – A unique modular concept

The modular design of the ModMEMS allows easy mounting inside the mold housing of billet continuous casters. The modular stirrer design greatly simplifies:

- Building in
- Commissioning
- Operation
- Maintenance

The design of ModMEMS makes it possible to apply stirring in many applications.

ModMEMS has been developed and optimised using advanced 3D computer simulation programs.
Low Energy Consumption
ModMEMS generates the same stirring force as a conventional MEMS, but with a substantially lower energy consumption. This is because the modules are placed very close to the strand and due to the special winding design. The power required for stirring a billet strand is a few kW. About 10kW is lost in the copper mold and water jacket. Remaining power is lost in the stirrer itself.

No Separate Cooling Water System Required
The electrical windings of ModMEMS are enclosed in waterproof stainless steel casings. The windings are completely dry and cooled by the mold cooling water surrounding the modules. Since no separate cooling water system is required, there is no need for any cooling water control and monitoring function, resulting in very simple control function for the complete ModMEMS installation.

Short Delivery Time
Thanks to the standardized design of modules only the iron yoke is customer-specific enabling a very short delivery time.

Savings of Cost and Time
Required time and costs for installation of the ModMEMS equipment are considerably lower than for a conventional MEMS, since:
• Piping for a separate cooling water system is not required
• Compact electrical equipment is used due to lower power need
• Existing molds can often be used with only minor modification
The few interface signals required also reduce the total commissioning time for a ModMEMS installation.
Advantages of **ModMEMS**

**Easy Maintenance and Lower Repair Costs**
Since the windings of ModMEMS are enclosed in sealed stainless steel boxes, they are not in direct contact with the cooling water. Therefore the winding insulation is not exposed to accelerated ageing. Due to the modular design, any failing module can easily be replaced on site with a minimum of down time. Spare modules can be kept in stock.

Each module is easy to install and replace.

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**Mold Level Control Equipment**

When radioactive mold level control equipment is used, the modules can be displaced vertically or horizontally to some extent to provide sufficient space for the gamma ray. Internal or external mould level control system can be used.

Example of an installation where the radioactive mold level control equipment is placed externally, i.e. outside the mold housing.

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**Power Supply Equipment**

A standard ABB frequency converter is used both for 3-phase operation with 6 poles and modified for 2 phase operation with 4 poles. The ABB power supply equipment is well known and handled by the local ABB service organizations around the world. Service and spare parts are available through ABB's local offices.
## Technical Data for 4 Pole Stirrer

<table>
<thead>
<tr>
<th>Module</th>
<th>Module height, H mm</th>
<th>Module depth, D mm</th>
<th>Module width, W mm</th>
<th>Approx. weight of the complete stirrer, kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>ModMEMS-160</td>
<td>456</td>
<td>380</td>
<td>116</td>
<td>186</td>
</tr>
<tr>
<td>ModMEMS-200</td>
<td>456</td>
<td>450</td>
<td>136</td>
<td>194</td>
</tr>
</tbody>
</table>

Design, dimension and weight data are subject to revision without notice. Weights for the 6 pole stirrer is approx. 50% higher.