### TECHNOLOGY & DATA

<table>
<thead>
<tr>
<th></th>
<th>FZ08 MT</th>
<th>FZ12 MT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Travel paths [X/Y/Z]</td>
<td>450 / 270 / 310 mm</td>
<td>550 / 320 / 420 mm</td>
</tr>
<tr>
<td>Acceleration [X/Y/Z]</td>
<td>10 / 15 / 20 m / s²</td>
<td>10 / 12 / 15 m / s²</td>
</tr>
<tr>
<td>Rapid feed speed</td>
<td>75 m/min</td>
<td>75 m/min</td>
</tr>
<tr>
<td>Spindle speed</td>
<td>up to 40,000 rpm</td>
<td>up to 24,000 rpm</td>
</tr>
<tr>
<td>Tool taper</td>
<td>HSK-E40 / A40</td>
<td>HSK-A63 / A46</td>
</tr>
<tr>
<td>Milling capacity St 60</td>
<td>30 cm³ / min</td>
<td>80 cm³ / min</td>
</tr>
<tr>
<td>Drilling capacity St 60</td>
<td>ø12 mm</td>
<td>ø18 mm</td>
</tr>
<tr>
<td>Thread cutting St 60</td>
<td>M8</td>
<td>M16</td>
</tr>
<tr>
<td>Tool places</td>
<td>24 (optionally up to 226)</td>
<td>24 (optionally up to 177)</td>
</tr>
<tr>
<td>Tool change time</td>
<td>ca. 0.8 sec.</td>
<td>ca. 0.9 sec.</td>
</tr>
<tr>
<td>Chip-to-chip times</td>
<td>ca. 1.9 sec.</td>
<td>ca. 2.4 sec.</td>
</tr>
</tbody>
</table>

### Turning spindle
- **Bar passage**: up to ø 65 mm, up to ø 65 mm
- **Speed**: up to 8,000 rpm, up to 8,000 rpm
- **Max. torque**: 90 Nm, 90 Nm
- **Clamping pressure**: adjustable, adjustable

### Tool revolver
- **Tool taper**: Capto C4, Capto C4
- **Number of tools**: 12, 12
- **Speed of driven tools**: up to 5,000 rpm, up to 5,000 rpm
- **Centric clamp with tool turning axis**: adjustable clamping pressure, adjustable clamping pressure

### Opposed spindle
- **Diameter**: up to ø 65 mm, up to ø 65 mm
- **Speed**: up to 6,500 rpm, up to 6,500 rpm
- **Max. torque**: 14.3 Nm, 14.3 Nm
- **Clamping pressure**: adjustable, adjustable

---

**Machining centres for six-sided complete machining (WB 4/2012)**

**Double productivity by simultaneous milling and turning**

---

**CHIRON-WERKE GmbH & Co. KG**
Kreuzstraße 75
78532 Tuttlingen, Germany
Tel. +49 7461 940-0
Fax +49 7461 940-8000
info@chiron.de
Machining centres for six-sided complete machining

Double productivity by simultaneous milling and turning

With two new machining centres, CHIRON is now also offering simultaneous milling and full-fledged turning at the highest speed. The simultaneous use of two tools means double the productivity and significantly reduced throughput times.

BY F. STEPHAN AUCH

At the EMO 2011, CHIRON from Tuttlingen presented the FZ08 MT, whereby the “MT” stands for “Mill Turn” and for simultaneous milling and turning. The integration of a turning revolver makes it possible to use two tools simultaneously.

“MT stands for double the productivity in machining of bars with a diameter of up to 65 mm. The machining centres score points with the classic CHIRON advantages: the highest degree of precision, especially short chip-to-chip times and fast set up,” says Dr. Claus Eppler, head of Research & Development at the long-established machine builder, describing the advantages of the new product.

A second, larger model with the designation FZ12 MT (illustration 1) will be presented for the first time at the Open House, from April 25 to 27 in Tuttlingen.

The full-fledged turning function is based on the use of a tool revolver with Capto C4 holding fixture for twelve tools, which can be driven at speeds of up to 5,000 rpm (illustration 2). “Compared to a standing tool in the milling spindle, the turning machining with the tool revolver is much more precise and delivers significantly improved cutting performance,” explains Daniel Gems from the CHIRON’s development department. The direct path measurement systems in all axes and highly dynamic linear drives in the ZB and V axes also help provide high precision in positioning and simultaneous operation. Besides this, the revolver disk can be equipped with a centric clamp for gripping and turning workpieces. This also allows six-sided complete machining if the customer does without an opposed spindle. “The workpiece is securely clamped and the repeat accuracy for this is in the μ range,” Roger Schöpf, head of technical applications, adds.

Complex five-axis operation and six-sided machining

The modular assembly of the FZ08 MT and FZ12 MT with swivelled head, turning spindle, tool revolver and optional opposed spindle (illustration 3) enables customer-specific configuration of the machining centres and their use in many fields. At the same time, the engineers optimised the machine for manufacture in continuous assembly so that the delivery times can be kept short.

The opposing unit facing the main turning spindle is available as a plain turning-swellved by 225° (as BIC kinematics), whereby the C-axis can be optionally provided as an integrated turning spindle. Thanks to a speed of 6,500 rpm and a maximum torque of 14.3 Nm, it is ready for powerful machining. “With this, complex and precise five-axis operation and workpiece machining from six sides can be done,” according to head of development Dr. Eppler. The user also has the possibility to do without an opposing unit. In this case a finished part chute with a collection container takes the place of the unneeded component.

Numerous innovations

„The workpiece removal via the opposed spindle is one of the many new features we have implemented in the MTs and which reduce the space requirements for bar machining,” Roger Schöpf reports. The opposed spindle can unload the finished parts overhead on the right machine side. „We placed a particular emphasis during the design of the machines on optimised dimensions and rigidities and excellent thermal stability,” Dr. Eppler continues. „A part of this is the free chip fall in the open base, which leads to heat being quickly conducted out of the machine. The newly developed mineral casting frame is thermal- ly very stable since all the axes are assembled at the work area rear wall. These are all factors which aid the accuracy of the machines.” Further improvements include the new machine design with lighter colours, the use of an LED signal tower and a newly designed operating control panel in 19-inch format.

Speed and dynamics are in the foreground

Besides precision – true to the company slogan „Seconds Ahead” – speed and dynamics are in the foreground at CHIRON. Both MT models offer high axis accelerations and rapid feeds of up to 75 m/min. The chip-to-chip time for the smaller version is 1.9 seconds; for the FZ12 MT it is 2.4 seconds. The tool change is done within 0.8 seconds and 0.9 seconds, respectively. The swivellable main spindle of both models has a speed of up to 30,000 rpm as well as up to 226 available tool places.

Individual configuration thanks to numerous equipment options

The many equipment options which are available for both models also contribute to versatility. Among these are, for example, an automated supply of bars, spindle probes for testing of workpieces, a laser supported drill check and a coolant supply of up to 150 bar through the spindle. With the Power Safe package from CHIRON, a comprehensive energy efficiency solution is available. For the control, the customer has the choice between a Siemens 840D Solution Line and a Fanuc i31-b5.

Variety of application options

The new CHIRON machining centres for bar machining are mostly used in medical engineering, the watch and jewellery industry, machine and vehicle manufacture and the aerospace industry. Both MT models provide efficient performance for milling, drilling and thread cutting. “That is why the machining centres can be used in nearly any industry to machine small and medium-sized workpieces with complex contours from bars.”

Im Bild unten der Werkzeugspeicher mit zwölf Werkzeugen und vollwertiger Drehfunktion