FSM – FLAT GRINDING MACHINE

FSM Type 2200 - 4200

For flat grinding up to 600 mm width
Product description

The principle: FSM – Flat grinding machine
The FSM compact moves the machine table in the X direction. (Table Machine). The basic machine includes a range of equipment, which allows the machine to use in high availability for accurate production.

Standard features include:
// Full encapsulation
// Direct measuring of the axes Y and W
// Emulsions mist filtration system

The basic machine
The machine bed of the FSM is a ribbed welded construction. The generously sized, high-precision linear guide ways are centrally lubricated.

Vorteile
Coolant system

User Interface

Highly rigid construction
The rigid construction guarantees a long lifespan combined with highest precision.

Highest dynamic
State-of-the-art linear drive technology ensures increased productivity.

Easy-to-use
With the sophisticated operating concept ergonomic handling and short training units are possible.

Production Non-Stop
Fully automatic single flank.
**DETAILS AND OPTIONAL EQUIPMENT**

**Grinding head with balancing system as standard**

Fully automatic balancing system which recognizes and removes unbalances at a very early stage. This guarantees a high quality of the workpiece surfaces and a long tool life of the spindle.

**Grinding disk change**

The cylindrical grinding spindle allows easy disc changing.

**Dressing during production time by a 2-axis dressing system with diamond wheel**

The grinding disk will be dressed during production with a 2-axis CNC controlled multigrain diamond dresser which enables a consistently high quality and less downtime.

**Control / User Interface**

Siemens 840D sl with Sinamics drives in an air-conditioned cabinet. Equipped for teleservice.
DETAILS AND OPTIONAL EQUIPMENT

Automatic adjustment of cooling agent supply (Option)
In case of wear the nozzle automatically adjusts the diameter of the grinding wheel.

Generously dimensioned sliding doors
Optional also with automatic door drive for comfortable and safe working.

Coolant system
Coolant system with integrated fine filter system, optional with 16 kW cooling unit.

Clamping devices (options)
Clamping device magnetic
TECHNICAL DRAWINGS

Side view (left) and Top view (top)
## TECHNICAL DATA

### Working Area

<table>
<thead>
<tr>
<th></th>
<th>FSM 2200</th>
<th>FSM 3200</th>
<th>FSM 4200</th>
</tr>
</thead>
<tbody>
<tr>
<td>X - Axis lengthwise</td>
<td>2.260 mm</td>
<td>3.260 mm</td>
<td>4.260 mm</td>
</tr>
<tr>
<td>Y - Axis crosswise</td>
<td>560 mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Z - Axis vertical</td>
<td>500 mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V - Axis</td>
<td>105 mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>W - Axis</td>
<td>120 mm</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Machine table

<table>
<thead>
<tr>
<th></th>
<th>FSM 2200</th>
<th>FSM 3200</th>
<th>FSM 4200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions correspond with clamping surface</td>
<td>472 x 2.220 mm</td>
<td>472 x 3.220 mm</td>
<td>472 x 4.220 mm</td>
</tr>
<tr>
<td>Max. load</td>
<td>3.000 kg</td>
<td>4.000 kg</td>
<td>5.000 kg</td>
</tr>
</tbody>
</table>

### X - Axis lengthwise

- **Speed**: 40 m/min

### Y - Axis crosswise

- **Speed**: 10 m/min

### Z - Axis vertical

- **Speed**: 6 m/min
- **Incremental length measuring system**: Direct positioning accuracy ±0.002 mm

### Grindning head

<table>
<thead>
<tr>
<th></th>
<th>FSM 2200</th>
<th>FSM 3200</th>
<th>FSM 4200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power consumption</td>
<td>30 kW (S6 at 40%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speed range</td>
<td>max. 4000 1/min.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grinding wheel adapter</td>
<td>100 mm H5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cutting speed, programmable</td>
<td>constant 10-80 m/s</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grinding wheel</td>
<td>keramified or resin-bonded grinding wheel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grinding wheel width</td>
<td>max. 101 mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grinding wheel Ø</td>
<td>min. 210 mm - max. 400 mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hole diameter of grinding wheel</td>
<td>152,4 mm (6 inch)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grinding area</td>
<td>up to 600 mm width</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Cooling unit

- **Cooling unit**: approx. 3,000 l with integrated deep-bed filter

### Machine

- **Extraction of emulsion mist**: 1,800 m³/h
- **NC-control**: Siemens 840D sl
- **Drives**: Siemens
- **Total connected load**: 80 kVA
- **Weight**: 15,000 kg (FSM 2200), 17,500 kg (FSM 3200), 20,000 kg (FSM 4200)

### Options

- **Clamping device magnetic**
- **Automatic sliding doors**
- **16 kW cooling unit for a constant lubrication temperature**
- **Fleece separator**
- **Automatic adjustment of cooling agent supply**
- **Hydraulic clamping nut**
- **Oil collection pans made of steel**
- **Chipping case 400 ltr.**
HABRAMA ZSM compact - SERIES
Rack Grinding Machine
ZSM compact Type 2200 - 3200
For grindings racks up to module 22

HABRAMA ZEM - SERIES
Rack Deburring Machine
ZEM Type 1000 - 2000
For deburring of rack teeth up to a cross-section 100 x 100 mm

HABRAMA PPFM - SERIES
High Precision Milling Machine
PPFM Type 2200 - 10200
For milling racks up to modul 36, broaches, saw blades and special profiles

HABRAMA ZLM - SERIES
Automatic Rack Measuring Machine
ZLM Type 1000 – 2000
For measuring racks up to a cross-section 100 x 100 mm

HABRAMA KPSM - SERIES
Contour Precision Grinding Machine
KPSM Type 2200 - 4200
For longitudinal profile grinding up to 70 x 70 mm

HABRAMA FSM - SERIES
Flat Grinding Machine
FSM Type 2200 - 4200
For flat grinding up to 600 mm width

HABRAMA ZFM compact - SERIES
Rack Milling Machine
ZFM compact Type 2200 - 3200
For milling racks up to modul 36

HABRAMA ZSM compact - SERIES
Rack Grinding Machine
ZSM compact Type 2200 - 3200
For grindings racks up to module 22

HABRAMA UVF - SERIES
Universal Gear Milling Center
UVF-Center II - III
For gear cutting of gear wheels, worms, worm wheels, spline shafts, trapezoidal thread spindles and timing belt pulleys

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