

## The World of Dr. Fritsch: FAST/SPS & Powder Processing Technologies

FAST/SPS  
SINTERING PRESS

# DSP 535



### Benefits with Dr. Fritsch

#### Experience:

- Leading in FAST/SPS technology since 1953
- More than 1.000 FAST/SPS Sinter Presses installed worldwide
- Quality Made in Germany

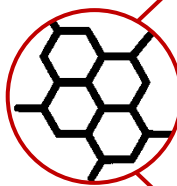
#### Application Center:

- Most machines available for testing and product development
- Powder processing equipment
- CAD Mold Design
- Consulting & Support

#### Customized Turnkey Solutions for:

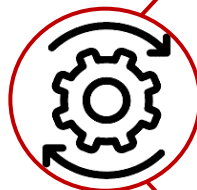
- FAST/SPS sintering
- Automation
- Powder Processing

### FAST/SPS Advantages



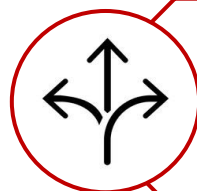
#### Improved Material Properties:

- Significant reduction of grain growth (esp. for nanoscale)
- Highest density achievable
- Homogeneous microstructure



#### Highest Productivity

- Very short sinter cycles
- Near net shape production reduces or even omits post-processing steps, which are necessary when using traditional sintering techniques



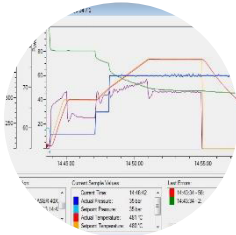
#### Highest Flexibility

- Development time for new materials can be substantially shortened
- Quick change over to other materials and dimensions



Click [here](#) or scan QR-code to watch a FAST/SPS sintering demonstration

## Product Features



### Precise control

All sintering parameters (pressure, temperature, travel distance and time) can be controlled and monitored exactly via visualization software and process management.



### Highest output

Machine is designed for highest productivity and for 24/7-operation. Automation and integration in an automated production environment possible.



### Easy operation & Low maintenance

Easy operation by a touch panel. Clear and intuitive menu navigation. Low maintenance due to high quality standards.

## Machine Data

	<u>Standard</u>	<u>Option</u>
<b>Electric Power:</b> - Total electric power: - Max. heating power: - Max. heating current: - Total electric load:	Approx. 420 kVA 410 kVA Up to 85.500 A, 4 tappings available 3 x 160 A	(other voltages and frequencies are possible on request)
<b>Vacuum:</b>	20 mbar	0,05 mbar
<b>Pressing force:</b> - normal / differential switching:  - effective pressing area of cyl.: - oil pressure:	39 – 461 and 51 – 603 kN  153,9 cm <sup>2</sup> and 201,1 cm <sup>2</sup> 25 – 300 bar 2,5 – 30 MPa	differential switching: 35 – 414 kN and 47 – 555 kN 61 – 725 kN and 76 – 904 kN 91 – 1092 kN and 119 – 1424 kN  2 – 100 % regulation: 49 – 482 kN and 173 – 2072 kN
<b>Graphite electrodes:</b> - dimensions (WxDxH):  - max./min. opening height:  - specific resistance:	350 x 350 x 40 - 130 mm  505 – 325 mm (dep. on electrodes, cooling options, etc.)  12 – 14 μΩm	Ø 350 x 40 - 130 mm  (reduction of opening height on request)
<b>Temperature control</b>	Thermocouple Ni-Cr-Ni: up to 1.100 °C three-fold control	Thermocouple Pt-Rh-Pt: up to 1300 °C  Pyrometer: 300 – 3.000 °C
<b>Electronic Position sensor:</b>	accuracy 0,1 mm resolution 0,005 mm	
<b>Dimensions:</b>  Weight:	according to floor plan  approx. 6.550 kg	

## Required Infrastructure

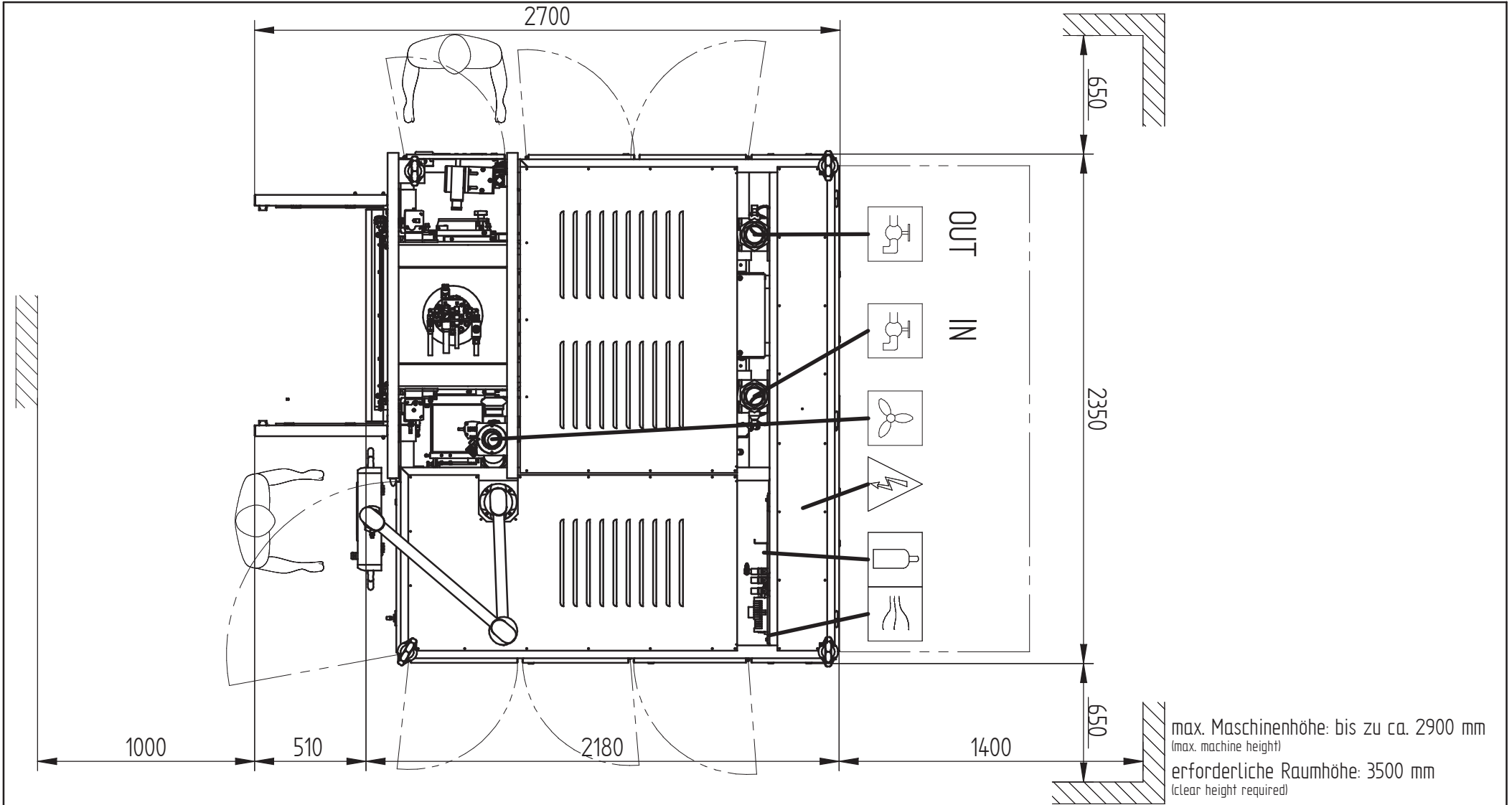
	<u>Standard</u>	<u>Option</u>
<b>Power:</b> Supply voltage: Fuses (provided by customer):	3 x 400 V, 50/60 Hz 3 x 630 A	(other voltages and frequencies are possible on request)
<b>Cooling water:</b> - consumption: - recommended water supply temperature: - pressure: - differential pressure (supply – discharge): - connection:	approx. 300 – 350 l/min (at 20 °C)  18 – 22 °C 2 – 4 bar  1 – 2 bar supply: for external thread 3" discharge: for external thread 3"	
<b>Compressed air:</b> - consumption: - pressure: - connection:	approx. 20 l/min (depending on process) 4 – 6 bar hose nozzle for hose with inner Ø 8 – 9 mm	
<b>Inert gas:</b> - consumption: - pressure: - connection: - types:	approx. 300 – 1000 l/h (depending on process) 1 – 5 bar plug-type adapter for hose with outer Ø 6 mm nitrogen, forming gas (max. 5 % H <sub>2</sub> ), noble gas	
<b>Suction system:</b> - connection: - recommended air flow rate:	provided by customer connection piece for hose or pipe with inner Ø 100 mm approx. 800 m <sup>3</sup> /h	

Subject to modifications of technical data and design

### The World of Dr. Fritsch: FAST/SPS & Powder Processing Technologies

Dosing – Mixing – Granulating – Cold Pressing – FAST/SPS Sintering – Automation





Symbol	Bedeutung (meaning)	Symbol	Bedeutung (meaning)	500	DSP518_APL.dft ASM034849.asm	<h3>Aufstellplan</h3> <p>floor plan</p> <p>Maschinen Typ : DSP5XX harmonisiert machine type :</p> <p>Zeichnungs Nr.: 30</p>												
	Elektrik (electrics)		Gas (gas)				<table border="1"> <tr> <td></td> <td>Datum</td> <td>Name</td> </tr> <tr> <td>Bearb.</td> <td>18.07.2013</td> <td>e_freitag</td> </tr> <tr> <td>Gepr.</td> <td></td> <td></td> </tr> <tr> <td>Norm</td> <td></td> <td></td> </tr> </table>		Datum	Name	Bearb.	18.07.2013	e_freitag	Gepr.			Norm	
	Datum	Name																
Bearb.	18.07.2013	e_freitag																
Gepr.																		
Norm																		
	Pneumatik (pneumatics)		Wand (wall)		DR. FRITSCH Sondermaschinen GmbH D-70722 Fellbach													
	Kuehlwasser (cooling water)		Arbeiter (operator)															
	Absaugung (suction)																	