



Haas Multigrind LLC  
137 Enterprise Drive  
Warsaw 46580  
United States of America

Customer number: 10512  
Date: 06-12-2018  
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**Delivery address:**

Alpha Form Technologies  
4101 40th Street Uni 4 SE  
Kentwood, MI 49512  
United States of America

## Confirmation 2181370

Multigrind CU grinding center for inserts

Pos	Description	Qty.	Unit	Price	Disc.	Total
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*Your order Alpha Form PO 3022159 dated 6/11/2018*

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Base Machine  
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1	XMA-3-00 Grinding center Multigrind CU	1.00	pc.			
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2	FBG-9-01-000035-01 Machine base CU With tool changer  incl: - 4 leveling elements - Pressure relief dampers - 2 LED light bars					
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3	FBG-9-02-000028-00 Linear axis CU XYZ-axis 630+465+630  - Axis stroke X,Y,Z: 630 mm, 465 mm, 630 mm - Direct distance measurement 0.0001 mm resolution - 30 m/min rapid feed					
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**sub total**



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|---|--|--|--|--|--|--|
| 4 | <b>FBG-9-03-000011-01</b><br>Rotation axis C CU<br>D270 n[l/min]50 M[Nm]540<br>- Pivot range +70 to -230°<br>- Positioning accuracy +/- 2.5 s<br>- Torque 540 Nm   |  |  |  |  |  |
| 5 | <b>FBG-9-02-000027-00</b><br>Machine table CU<br>L800 W300 H90 incl. X3 axis pneum.<br>- Supported on the rotation axis C of the CU machine<br>- 5 T-slots 12H7<br>- T-slot spacing 50 mm<br>- X3 stroke 150 mm<br>- End position monitoring with inductive switches |  |  |  |  |  |
| 6 | <b>FBG-7-03-000005-01</b><br>Rotary axis 108<br>A axis SK50, n=1,000 rpm<br>- 175 mm axis height<br>- 64 Nm torque<br>- 70H5 cylindrical centering collar  |  |  |  |  |  |
| 7 | <b>FBG-9-04-000014-00</b><br>Grinding spindle CU<br>HSK50E n[l/min]8000 P[kW]12<br>- Spindle power 11/12 kW at 100/40% on-time<br>- Speed 1 to 8000 l/min<br>- Torque 21 Nm<br>SENDE SHORT   |  |  |  |  |  |
| 8 | <b>KBG-9-14-000004-00</b><br>Extension for imbalance sensors CU<br>for cable linear axis<br>- Extension for unbalance sensor CU  |  |  |  |  |  |

sub total



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|----|--|--|--|--|--|--|
| 9  | <b>FBG-9-09-000113-00</b><br><b>Tool changer CU</b><br><b>Single wheel D800</b><br><br>- Single changeover wheel with T-slot<br>- Grinding wheel diameter max 200mm<br>- Tool length to 160mm from spindle nose  |  |  |  |  |  |
| 10 | <b>KBG-9-13-999999-00</b><br><b>Control cabinet CU</b><br><b>L620 W980 H1600</b><br><br>- Standard components CU in the control cabinet<br>- Standard components CU in the operator pendant<br>- Siemens contouring control 840 Dsl Solutionline<br>- Sinamics drives<br>- remote diagnostics<br>- The assembly number is replaced with a project-based number until delivery. |  |  |  |  |  |
| 11 | <b>FBG-9-32-000006-01</b><br><b>Supply cabinet CU</b><br><b>Pneumatic p[bar]6 Festo</b><br><br>- Standard pneumatic equipment for connecting the machine to the customer's compressed air supply.<br>- Valve clusters Profibus<br>- Minimum operating pressure: 6 bar  |  |  |  |  |  |
| 12 | <b>MBG-9-30-999999-00</b><br><b>List of valves</b><br><b>Multigrind CU</b><br><br>The assembly number is replaced with a project-based number until delivery   |  |  |  |  |  |

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| 13 | <b>MBG-9-11-000009-00</b><br><b>Coolant lubricant system CU</b><br><b>KSA 580</b> <ul style="list-style-type: none"><li>- Integrated in the machine base</li><li>- Brinkmann circulation pump TC160/430</li><li>- Brinkmann quick-suctioning immersion pump STL141/470 for cleaning station external/internal</li><li>- Flow sensor SI 5010 for assuring coolant supply</li><li>- Ultrasonic sensor in the contaminant tank for fill level monitoring</li></ul> |  |  |  |  |  |
| 14 | <b>FBG-9-18-000001-02</b><br><b>Central cooling system CU</b><br><b>Cooling unit</b> <ul style="list-style-type: none"><li>- Combination for holding constant temperature of</li><li>- Control cabinet</li><li>- Cooling lubricant tank / machine base</li><li>- Torque motors of the rotation axes A and C</li><li>- Motor spindles as grinding and dressing spindles</li><li>- Heat dissipation in the vicinity of the machine</li></ul>                      |  |  |  |  |  |
| 15 | <b>FBG-9-10-000054-01</b><br><b>Housing CU</b><br><b>for workpiece changer</b><br><br>incl: <ul style="list-style-type: none"><li>- Pressure relief damper</li><li>- Double sliding door</li><li>- Pneumatic pallet cover</li></ul>   |  |  |  |  |  |
| 16 | <b>EKP-0-16-000001-00</b><br><b>Coating, painting</b><br><b>Standard</b> <ul style="list-style-type: none"><li>- Powder-coated structure surface in standard colors</li><li>- Basic color: RAL 7035 light-gray</li><li>- Door areas: RAL 7016 anthracite gray</li></ul>   |  |  |  |  |  |

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17	<b>FBG-9-00-000001-00</b> <b>Standard accessories</b> <b>CU</b>					
	- Includes the documentation and the required special tools					

18	<b>EDO-9-29-000004-00</b> <b>User manual and labels</b> <b>international English</b>					
	- Labels with international symbols, texts are bilingual German / English					
	- User manual consisting of operating manual, user Manual Siemens 840 Dsl, plans and protocols in German / English					
	- Operating instructions for the components of suppliers in the available language					
	- Declaration of Conformity in English					
	- One copy in print version					

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Software  
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19	<b>AOP-0-15-001000-02</b> <b>Multigrind Horizon</b> <b>Basic Version</b>	1.00	pc.			
	Installation on the grinding machine.					

20	<b>AOP-0-15-001103-02</b> <b>Multigrind Horizon</b> <b>Modul 2,5D Contour</b>	1.00	pc.			
	Machining based on parametrized profile data [2D CAD]					

21	<b>AOP-0-15-000314-00</b> <b>2nd Software License Horizon</b> <b>SP 001.001.002</b>	2.00	pc.			
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22	<b>AOP-0-15-001200-01</b> <b>Multigrind Horizon</b> <b>Maintenance Contract</b>	1	pc.			
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Quarterly provision of further developments and corrections for an installation.

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Workholding

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Initial workholding system is for triangle inserts with holes. Using the pin holder and pin handling system for automatic loading.

Clamping systems for other styles of inserts can be added later.

23	<b>FBG-9-05-000005-00</b> <b>Standard clamping cylinder</b> <b>For rotary axis 108</b>	1.00	pc.			
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- Piston diameter, 160 mm
- 25 mm stress path
- Analog cylinder setting query

24	<b>FBG-0-05-000693-00</b> <b>Clamping device SK50</b> <b>Arbor clamping system D30/2,4</b>	1.00	pc.			
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SK 50 Holder with expandable clamping system for different sizes of inline arbors to keep parts with a bore.

excl.:

- arbors for four bore diameter which should be decided by the customer

sub total



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25	<b>FBG-0-05-002417-00</b> <b>Arbor-Holder d30 set</b> <b>centering; D2,7-5,7mm</b>	1.00	pc.			
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- interface d30 mm
- set contains holder for insert bore  
D2,7-2,8mm; D3,4-3,7mm; D4,4-4,7mm; D5,4-5,7mm
- centering of workpiece by spring loaded  
centering sleeve in the holder
- clamping direction: counter bore to holder
- inline arbor head outside / not hidden

26	<b>FBG-0-05-001398-00</b> <b>Clamping device SK50</b> <b>PV-Holder; plate vertical; auto</b>	1.00	pc.			
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- clamping direction parallel to the rotation  
axis
- clamping force by disc springs in package
- automatic actuation by push bar and clamping  
cylinder A-axis
- clamping jaw with pull-down effect
- repeatability clamping  $\leq 0,01\text{mm}$
- clamping stroke 6mm
- pull down stroke 4mm
- for clamping of rectangular inserts,  
triangular inserts with only one cutting edge
- IC = 6,5-19,5mm
- t = max. 2mm
- alignment of the workpiece by  
workpiece-specific jaws
- workpiece specific parts / clamping jaws are  
not included

27	<b>FBG-0-06-000473-00</b> <b>Clamping Jaws</b> <b>Rectangular Insert</b>	1.00	pc.			
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Wheel Dressing  
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sub total



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28	<b>FBG-9-08-000005-01</b> <b>Dressing spindle CU</b> <b>Cone 31.75 n[l/min]13000 P[kW]4</b>  - Carried on the C-axis - Speed range 1-13000 1/min - Design - motor spindle	1.00	pc.			
29	<b>FBG-0-20-000268-00</b> <b>Wheel Flange ø31,75</b> <b>for contact detection Xing-dressing</b>  - Aufnahme 31,75mm - D= 20mm - W= 5 - 25mm	1.00	pc.			
30	<b>FBG-0-14-000076-00</b> <b>Sensor Ring Dittel</b> <b>CU + CA + CB</b>	1.00	pc.			
31	<b>FBG-0-14-000077-02</b> <b>Receiver Dittel</b> <b>CU</b>	1.00	pc.			
32	<b>KBG-0-14-000004-00</b> <b>Noise sensing system and balancing comb</b> <b>Dittel serie 6000</b>  - Dittel noise sensing basic system serie DM6000 and balancing mounted on the grinding spindle - Balancing complete but - without sensor units for noise sensing - without licenses for channel contr.	1.00	pc.			

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Wheel Changer Configuration  
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33	<b>FBG-9-09-000004-02</b> Tool tray CU Carrier set3 HSK50E	1.00	pc.			
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Set HSK50E- tool trays suitable for tool changer CU, single wheel D800  
7 spring-loaded trays for tools to diameter 200mm  
- 2 trays for coolant pipe bracket 200mm

34	<b>FBG-9-11-000003-02</b> Cooling lubricant pipe bracket type A 2 channels 4 pipes man. change	1.00	pc.			
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For the manual quick change device  
- Grinding wheel: up to D200mm / L92mm  
- Grinding wheel: up to D150mm / L112mm  
- tools: up to D60mm / L155mm  
[Length L from spindle nose]

35	<b>FBG-9-11-000004-04</b> Coolant pipe seating 2 channels	1.00	pc.			
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- Fixture for fastening cooling pipe brackets  
- pneumatically activated locking mechanism  
[changeover automatic / manual]  
- Fastening possibility for an optional flush nozzle

36	<b>FBG-0-20-000016-00</b> Grinding Wheel Flange HSK-E50	4.00	pc.			
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-HSK-50 for grinding wheels up to Ø 200 mm  
-incl. weight balance device  
-grinding wheel bore Ø 51 h6 incl. clamping groove  
-suitable for 1 wheel, L= 8-22 mm, Nr:  
17.1113.0004.01

**-GRINDING WHEEL BORE Ø 1.25 INCH**

sub total



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Automation  
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37	<b>MBG-9-06-000001-00</b> <b>Workpiece Changer CU</b> <b>spindle handling Z-axis excentric</b>	1.00	pc.			
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- Workpiece changer: carried in 3 linear axis
- Gripper hand: 1 gripper 90° pivoting
- Pallet magazine: 2 or 4 pallets 90° pivoting

38	<b>FBG-0-06-000075-00</b> <b>Gripper finger set</b> <b>Carbide for flat parts</b>	1.00	pc.			
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- 2 parallel gripper fingers
- Adjustable carbide inserts

39	<b>FBG-9-06-000007-00</b> <b>Pallet CU</b> <b>L259 B200</b>	4.00	pc.			
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- Basic pallet to be finished by the customer
- usable size of 259x200 mm
- Workpiece height when using 4 pallets, maximum 60 mm
- Workpiece height when using 2 pallets, maximum 130 mm

40	<b>KBG-0-00-000018-00</b> <b>Warning signal column CU</b> <b>Standard</b>	1.00	pc.			
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- Three colors for the different operating conditions

41	<b>MBG-9-06-000002-00</b> <b>Arbor pin handling CU</b> <b>Standard</b>	1.00	pc.			
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- For the automatic removal of the arbor pin from the inline arbor clamping device
- Carried on X3-axis

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42	<b>FBG-0-05-002467-00</b> <b>Arbor-Set</b> <b>sunk head; D2,6-5,7mm; robot-auto.</b> <ul style="list-style-type: none"> <li>· countersunk head sunk in plate</li> <li>· plate holes Ø2,7-2,8; Ø3,4-3,7; Ø4,4-4,7; Ø5,4-5,7 mm</li> <li>· collet pull diameter Ø2,4 mm</li> <li>· suitable for arbor clamping system with pull-in stroke 18 mm</li> <li>· suitable for robot automation</li> <li>· included one each arbor FDR-0-05-002786-00, FDR-0-05-002832-00, FDR-0-05-002833-00 und FDR-0-05-002781-00</li> </ul>	1.00	pc.			
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Coolant Filtration, Delivery

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- Customer to supply 3nine mist collector unit
- See Haas standard external coolant filtration electrical interface.

43	<b>MBG-9-11-000002-01</b> <b>Coolant lubricant system Turboseparator Centrifuge T10</b> <ul style="list-style-type: none"> <li>- Centrifuge T10 for up to 60 l/min dirty oil</li> <li>- For supplier pump with max. 40 l/min</li> </ul>	1.00	pc.			
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44	<b>MBG-9-11-000003-00</b> <b>Coolant lubricant supply pump CU</b> <b>Q[l/min]40 p[bar]16 P[kW]2,6</b> <ul style="list-style-type: none"> <li>- Rotodynamic pump as supply pump</li> <li>- Brinkmann TH416 B390-W9FZ</li> </ul>	1.00	pc.			
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45	<b>MBG-9-11-000010-00</b> <b>External coolant connection</b> <b>CU</b>  - Sufficient space for connection to an external cooling lubricant system for filling the internal tank, including shut-off valve and fill-level sensor	1.00	pc.			
46	<b>FBG-9-11-000014-01</b> <b>Coolant pipe seating</b> <b>2 channels G1/4"</b>  - Fixture for fastening cooling pipes - Pipes manually mounted [internal threading G1/4"]	1.00	pc.			
47	<b>FBG-9-11-000017-00</b> <b>Cooling lubricant distributor A-axis</b> <b>Connections 4 centered</b>  - Manifold block and valve on the face side of the A-axis	1.00	pc.			
48	<b>FBG-9-12-000002-00</b> <b>Oil mist extraction CU</b> <b>External with shut-off damper</b>  Preparation for connecting the machine to an external extraction system - The extraction system must have devices for the recovery of the oil fraction from the extracted air - The CL air mixture may be explosive	1.00	pc.			
49	<b>FBG-9-34-000002-00</b> <b>Fire extinguishing equipment</b> <b>CU Kraft and Bauer</b>  - CO2 extinguishing equipment with an infrared sensor for preventing fires in the workspace of the machine. When the equipment is triggered, all air-supply systems are switched off. USA model. With level monitoring	1.00	pc.			

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50	<b>FBG-0-14-000078-00</b> Probe Renishaw Fixed mounted LP2  - LP2 Renishaw probe mounted on-board the grinding spindle.	1.00	pc.			
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51	<b>MBG-9-14-000001-01</b> Probe Renishaw LP2 toolprobe  LP2 probe from Renishaw in the machine table	1.00	pc.			
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**All sales subject to Adelbert Haas LLC Terms & Conditions.**

**Delivery conditions:** DDP Kentwood, MI, in accordance with ICC-Incoterms® 2020

**Delivery:** on or before 31st of December 2018

**Type of shipment** Truck

**Payment:** Special payment term:

10% with order, 80% due PRIOR TO SHIPMENT from Haas Germany

10% at final acceptance or within 30 days after delivery

-net in each case-

**Acceptance** To be determined between Customer and Haas.

**Guarantee** 1 year without shift limitation  
[see Haas maintenance instructions]

**Delivery** A 12,0 t lift truck shall be available to unload the machine  
at the customer facility.

**Setup and Installation** See Quotation.



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	<b>Sales and delivery conditions:</b>					
						Besides the terms in this order confirmation the general ORGALIME S2012 delivery conditions in their current version including our Appendix [United Nations Convention on Contracts for the international Sale of Goods excluded] will apply. Other conditions of the purchaser are non-binding for us.
	<b>Additional requirements:</b>					Our products satisfy the requirements of the European Directives and the standards assigned to them. The corresponding rules and standard for all other requirements must be provided free of charge, in a legible form and in full, with the technical specification. If only references to sources are provided, the customer must pay the costs associated with obtaining and if necessary translating them. These rules and standards include for example: <ul style="list-style-type: none"><li>- Statutory requirements for the site of operation, relating to emissions, particular requirements relating to the characteristics of safety technology and health and safety protection for workers</li><li>- Factory standards and operating equipment requirements</li><li>- Connection conditions of the energy and information network operators</li><li>- Requirements from the statutes of the company's accident insurance providers, and property insurers</li><li>- Installation requirements and special qualifications for installation and set-up staff, such as Safety Certificate for Contractors [SCC]</li><li>- Transport regulations</li><li>- Disposal specifications</li></ul>

We thank you again for your interest and remain

Yours truly

Haas Schleifmaschinen GmbH

Dirk Wember