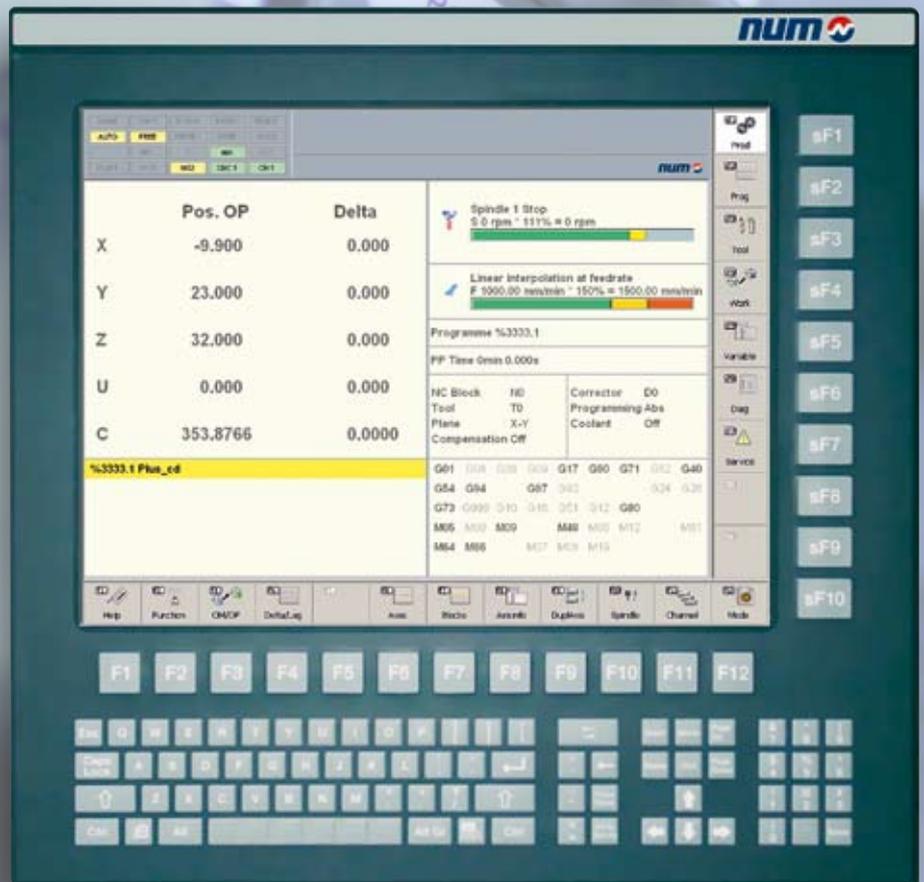


# Axiom Power CNC System



- From CNC System to Total Solution
- Flexibly, precisely and quickly
- User interface extensively configurable
- Complete systems with operating panels, drives and motors



## Axiom Power: We take on your toughest applications

Our goal is to optimize the overall production process using the latest control technology and to provide superior long-term support. We offer real-world solutions to real-world problems.

NUM has acquired a wealth of knowledge as an engineering partner for the automation of CNC controlled production machines.

### **Key element - Axiom Power CNC**

The Axiom Power CNC is highly expandable and flexible, purposely developed to satisfy a wide variety of applications. It is the answer for small demanding applications as well as large-scale complex ones. The most sophisticated configuration in a multi CNC arrangement can include more than 150 interpolated CNC axes. Due to the configurability of the NUMpass operator interface, the machine users can expect an intuitive layout that provides simple step-by-step operation.



# Axiom Power

## Axiom Power CNC: Flexibility, Precision and Productivity

Available in various configurations and equipped with application specific functions and function packages, Axiom Power can be customized to meet the specific requirements of most customers.

Adaptable to the application at hand, the combination of the Axiom Power CNC with NUM servo drives and motors makes a strong argument. Together, they form an ideal system to transfer the precision of the CNC to the work piece.

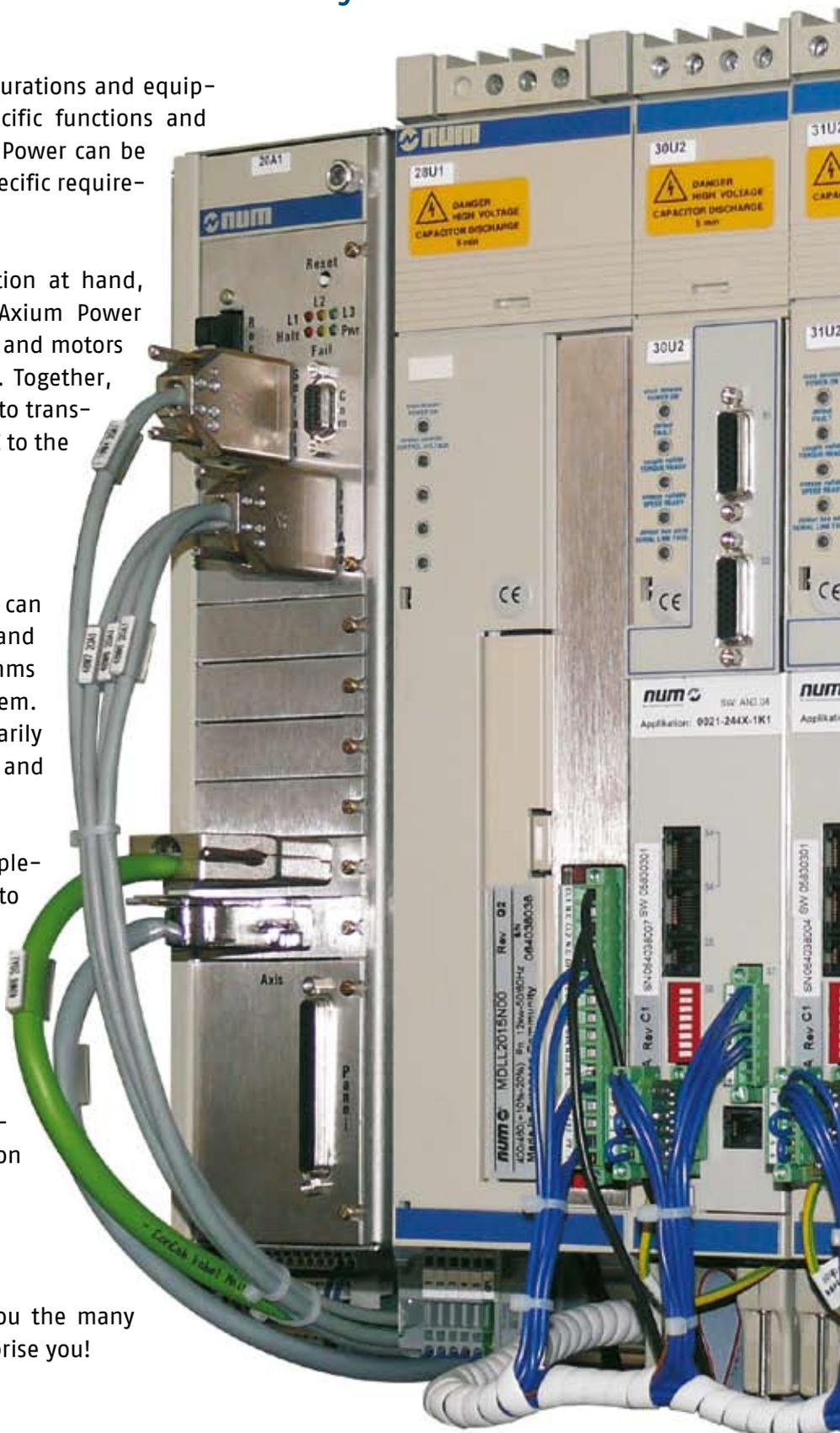
### First-class algorithms

One part of this precision can be found in the accurate and high-performance algorithms that are part of the system. They are intended primarily to enhance productivity and quality.

Perfectly matched and implemented, they allow you to achieve the highest contour precision using high-speed machining with 5 axes. Even very intricate machining processes produce perfect results while maintaining high productivity and reducing wear on the tool.

### NUM as a partner

We would like to show you the many possibilities. They will surprise you!





## NUMpass HMI: Fully configurable user interface and special functions

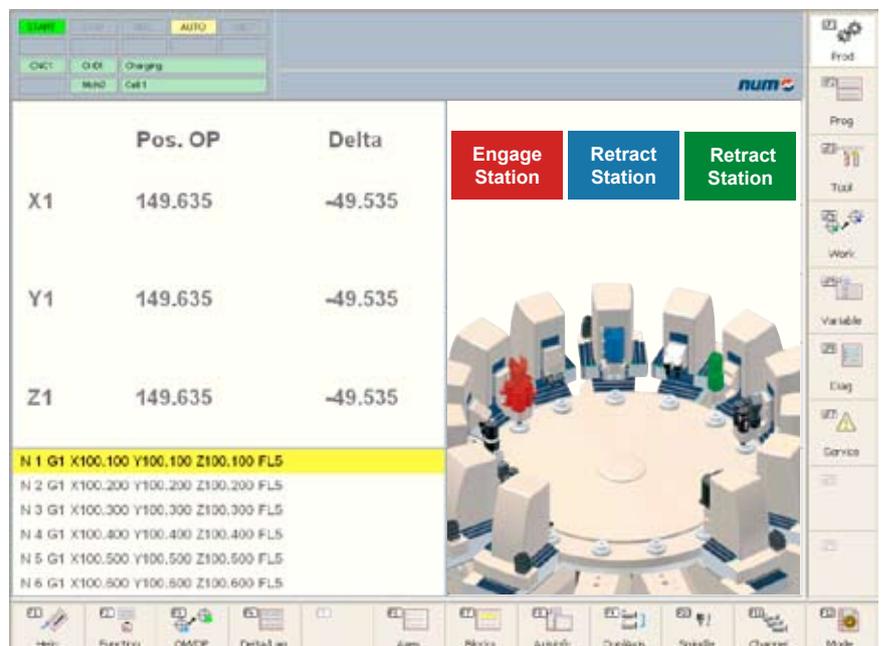
**The human-machine interface NUMpass HMI and its simple programming is the key to customer- or application-specific machine control.**

As a supplement to the standard configuration options, the user interface can be configured, with the NUMpass HMI, to fulfill the needs of specific application requirements. The modular structure of the software and its special tools make it possible to easily develop or modify special or customized functions in a real-time application. This allows you to fully take advantage of the machines strong points, logically model the applications and, consequently, increase the efficiency of the machining processes.

Classifying the operating mode according to contexts allows you to adapt the type of information displayed for each category of users, namely; programmers, set-up technicians, operators, maintenance personnel, etc. The easy-to-use, web-based remote maintenance facility, for the entire system, facilitates and reduces troubleshooting time.

# Operation

The user interface can be easily customized using standard development tools and editors such as HTML, Java, Visual Basic, Delphi, Visual C and C++.



# Operating panels for every application: active, passive and expandable

The wide range of NUM operating panels offers just the right concept for each application.

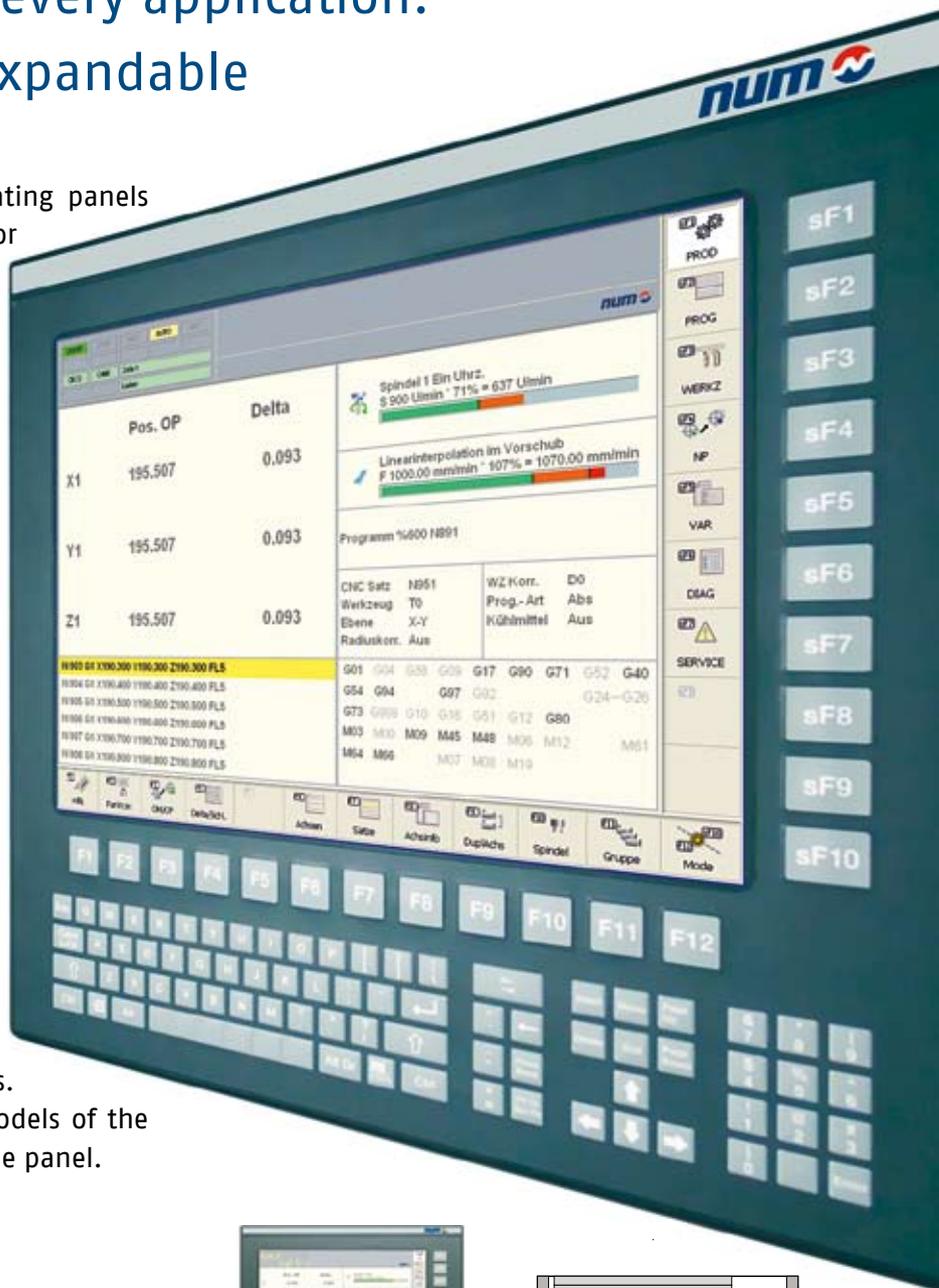
## Active operating panels

The operating panels of the FS151 family are delivered with an integrated PC or are intended for operation with an external PC. All types are equipped with 22 large function keys. The FS151i/FS151i-KBD with integrated PC is available in two power stages as well as with or without extended Qwerty keyboard. The models FS151/FS151-KBD are available with or without extended Qwerty keyboard.

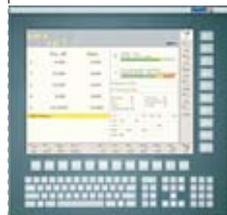
These operating panels make it possible to easily implement demanding, modern systems. The ideal supplement to all models of the FS151 family is the MP03 machine panel.

## Passive operating panels

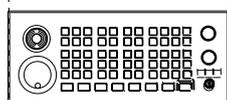
The CP20F is ideal when space is at a premium, whereas the CP30F with Qwerty keyboard offers a high level of user comfort. Both models can be expanded by adding the MP03 machine panel.



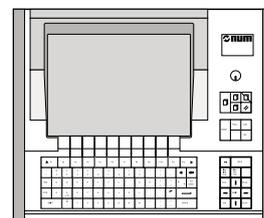
FS151, FS151i



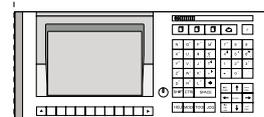
FS151-KBD, F151i-KBD



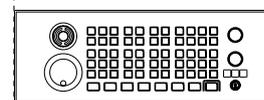
MP03 Panel



CP30F Panel



CP20F Panel



MP03 Panel



## Servodrives: Dynamic, precise and available in a wide selection

The comprehensive family of NUM servo drive comprises three series. All have in common the high level of precision, particularly if used in conjunction with the NUM motors.

### **NUM HP Drives: Modular**

The technical specifications, powerful functions and modern algorithms predestine the NUM HP drives for HSC as well as for taking on demanding applications.

MDLU3 modules can be optionally equipped with the Safety Monitor Module (SAM). This provides integrated safety functions in accordance with EN954-1 CAT-3.

### **MBLD**

The MBLD series combines the power supply and servo drives into a single housing.

In addition to version "R" with regenerative braking, two other versions are available: version "A" with internal or external brake resistance and version "H" with 700 VDC and regenerative braking.

### **NUMDrive C: Highest degree of integration**

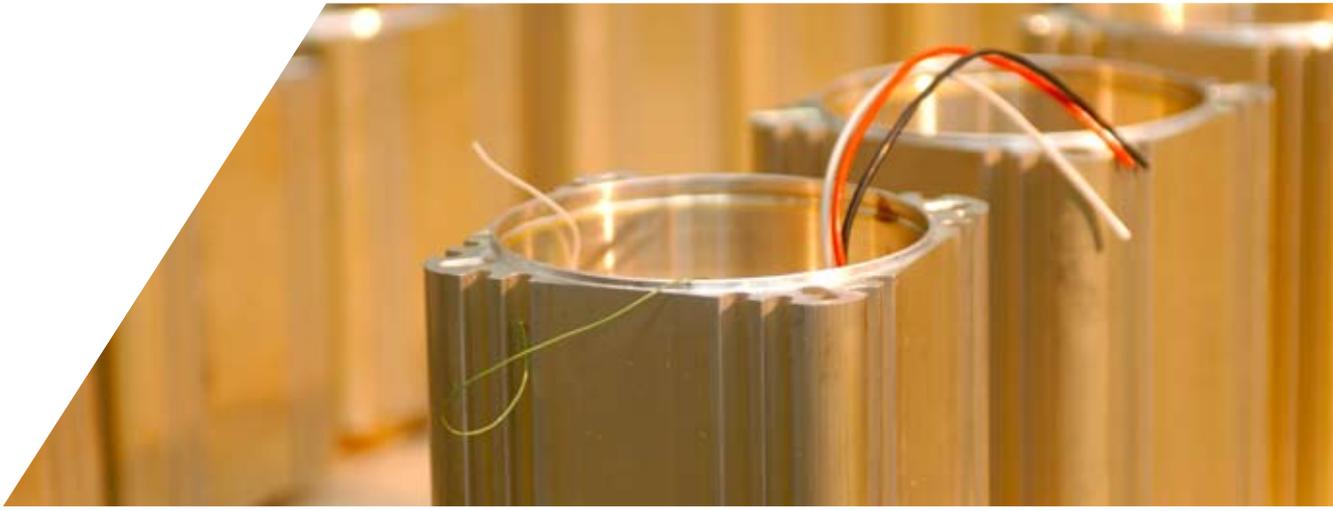
The latest generation of the NUM servodrives offers tremendous power in the smallest of spaces. Thus, they offer one of the best performance-to-space ratios available and save considerable installation space.

Users can choose not only between single and dual axis units with different current capacity, but can also choose between basic performance (BP) and high performance (HP) control to match their specific requirements. The small footprint and scalable width (a multiple of 50 mm) simplify the cabinet layout. The Safety Monitor Module (SAM) is also available as an option.

## NUM Drive – the product line

In addition to the following listed drives, other versions are available.

<b>NUM HP Drive</b>		MDLU3034N	MDLU3050N	MDLU3075N	MDLU3100N	MDLU3150N
Rated Current (S1)	Arms	14	20	35	45	60
Maximum Current	Arms	24	35	53	71	106
Overall Dimensions	mm	80 x 355 x 285		110 x 355 x 285	140 x 355 x 285	
<b>NUMDrive C Mono-Axis</b>		MDLU3014A...	MDLU3021A...	MDLU3034A...	MDLU3050A...	MDLU3075A...
Switching Frequency	kHz	5   10	5   10	5   10	5   10	5   10
Rated Current (S1)	Arms	8.9   6	13   8	13   8	28   17	35   21
Maximum Current	Arms	10	15	24	35	53
Overall Dimensions	mm	50 x 355 x 206			100 x 355 x 206	
<b>NUMDrive C Bi-Axes</b>		MDLU3014B...	MDLU3021B...		MDLU3050B...	
Switching Frequency	kHz	5   10	5   10		5   10	
Rated Current (S1)	Arms	6,3 + 6,3   4,2 + 4,2	6,3 + 6,3   4,2 + 4,2		20 + 20   12 + 12	
Maximum Current	Arms	10 + 10	15 + 15		35 + 35	
Overall Dimensions	mm	50 x 355 x 206	50 x 355 x 206		100 x 355 x 206	
<b>Power Supply</b>		MDLL3015...	MDLL3030..	<b>Power Supply</b>		MDLQ3
Rated Power (S1)	kW	15	30	Nennleistung	W	250
S3 power S3 (4s on, 6s off)	kW	40	45	(Power Supply for		
Overload Power	kW	50	50	Auxiliary)		
Input Voltage	Vrms	400VACrms -10% to 480VACrms+6% 50/60Hz ± 5% 3 phases				
Overall Dimensions	mm	100 x 355 x 206				50 x 355 x 206
<b>MBLD All-in-one, R</b>		MBLD2050N00R	MBLD2075N00R	MBLD2100N00R	MBLD2150N00R	MBLD2200N00R
PSU, Rated Power(S1)	kW	30		37	45	62
PSU, Overload Power	kW	39		50	64	80
Input Voltage	Vrms	400VACrms -10% to 480VACrms+6% 50/60Hz ± 5% 3 phases				
Drive, Rated Current (S1)	Arms	26	40	52	72	100
Drive, Max. Current (S3-S6)	Arms	35	53	71	106	141
Overall Dimensions	mm	250 x 480 x 285		400 x 600 x 285		400 x 776 x 285



Motors:

## Perfect Rotation under all Circumstances

The extensive number of motors offered by NUM features an excellent performance-to-weight ratio, to meet the needs of virtually any application. In combination with the NUM drives, these motors offer outstanding stability, even at lower speeds, and can be easily integrated into many different types of machines.

# NUM Motors

### Brushless Axis Motors

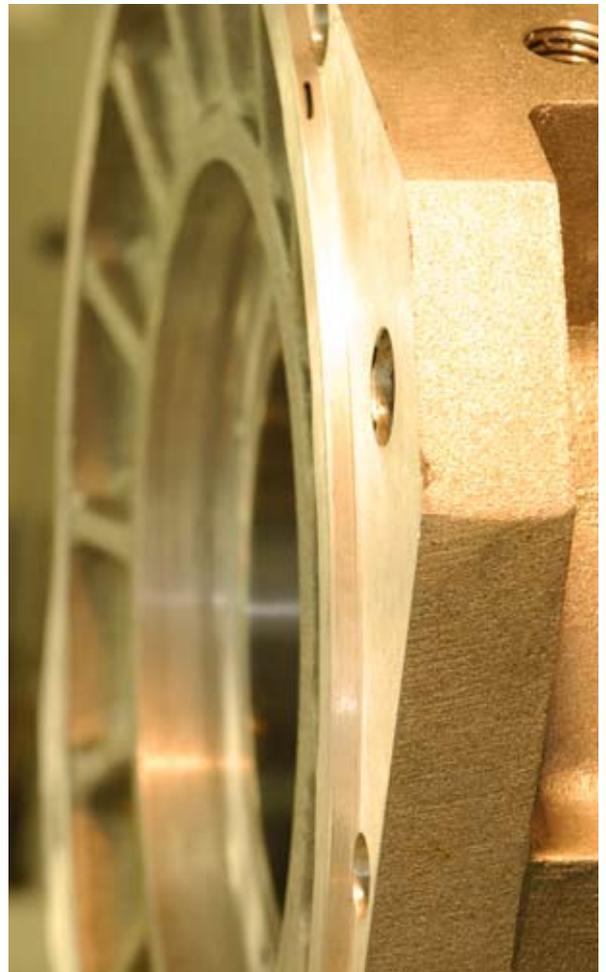
Compact, with a high power-to-weight ratio, a high speed range and smooth rotation, even at low speeds, they cover continuous torques ranging from 1.1 Nm to 160 Nm.

### Spindle Motors

The AMS asynchronous motors offer a very wide range of speeds at constant power. In addition, their high stability, even at low speeds, ensures excellent results for C axis and spindle indexing functions. They cover power ratings from 2.2 kW to 36 kW.

### Motorspindle®

The active parts of the motor are integrated directly in the spindle, thereby ensuring better machine stiffness and more silent operation. NUM also develops Motorspindle motors on request.



## NUM Motors – the product line

As well as the standard product described above NUM builds customized motors in order to fulfill the customer requirements. Please contact NUM for information about special and built-in motors.

### Brushless Axis Motors

**BPH Motors:** axes of machine tools, grinding machines, robotics and special machines.

**BPG Motors:** the same as the BPH motors but with increased inertia and rotor stiffness; for axes with high inertia at the motor shaft.

**BPL Motors:** the same as the BPH motors but for applications requiring very compact motors.

**BHL Motors:** the same as the BPH motors, but specifically designed for large machines. A version with forced convection is available for optimization of size and performance.

BPL Motors	Stall Cont. Torque Nm	Rated speed rpm
BPL0751...	1.1	6000
BPL0753...	2.8	3000
BPL0951...	2	6000
BPL0953...	5.4	3000
BHL Motors	Stall Cont. torque Nm	Rated speed rpm
BHL2601...	85, 120	3 000
BHL2602...	120, 160	2 000

BPH Motors	Stall Cont. torque Nm	Rated speed max. rpm
BPH0751...	1.3	6000
BPH0752...	2.3	6000
BPH0754...	4	3000
BPH0952...	4.3	6000
BPH0953...	6	6000
BPH0955...	9.2	3000
BPH1152...	7.4	6000
BPH1153...	10.5	6000
BPH1154...	13.3	6000
BPH1156...	18.7	3000
BPH1422...	12	4250
BPH1423...	17	4250
BPH1424...	22	4250
BPH1427...	35	3000
BPH1902...	25	4250
BPH1903...	36	3000
BPH1904...	46	3000
BPH1905...	56	2500
BPH1907...	75	3000
BPH190A...	100	2000
BPG Motors	Stall Cont. Torque Nm	Rated speed max. rpm
BPG0751...	1.3	3000
BPG0752...	2.3	3000
BPG0952...	4.3	3000
BPG0953...	6	3000
BPG1152...	7.4	3000
BPG1153...	10.5	6000
BPG1422...	12	3000
BPG1423...	17	3000
BPG1424...	22	4250
BPG1427...	35	3000
BPG1902...	25	3000
BPG1903...	36	3000
BPG1904...	46	3000
BPG1905...	56	2500





## CNC Total Solutions, based on Axium Power

### Partnership

The optimum cooperation with our partners in the machine and production industry is based in three development and project concepts, enabling maximum benefit and efficiency of CNC controllers, drives and NUM services.

### From Project Support to Project Cooperation all the way to Total Solution.

NUM offers the right partnership to suit your needs. **ProDesign**, is the classic form of **project support**, our specialists and expert consultants support customers and their development department or developers of sub-areas as needed.

**CoDesign** describes the **project cooperation** and contains the development of vertical-market or customer together with machine or software manufactures, who bring their specialised expertise into the collaboration.

**AllDesign** as the name implies, NUM provides **total solutions** that are developed by our application development teams for specific fields of applications. These are high-end groundbreaking products for demanding requirements. The most prominent example of an AllDesign solution is NUMROTO, the CNC total solution for tool grinding. This software is currently offered by 14

machine manufacturers on about 30 different machines – as convincing argument for tool manufacturers and regrinding specialists, who can then use the same software on different machines. It has been a trendsetter for several years, and its extensive range of functions has been continuously adapted to the changing demands of tool grinding. Together with the excellent support provided, this is the cornerstone of our success.

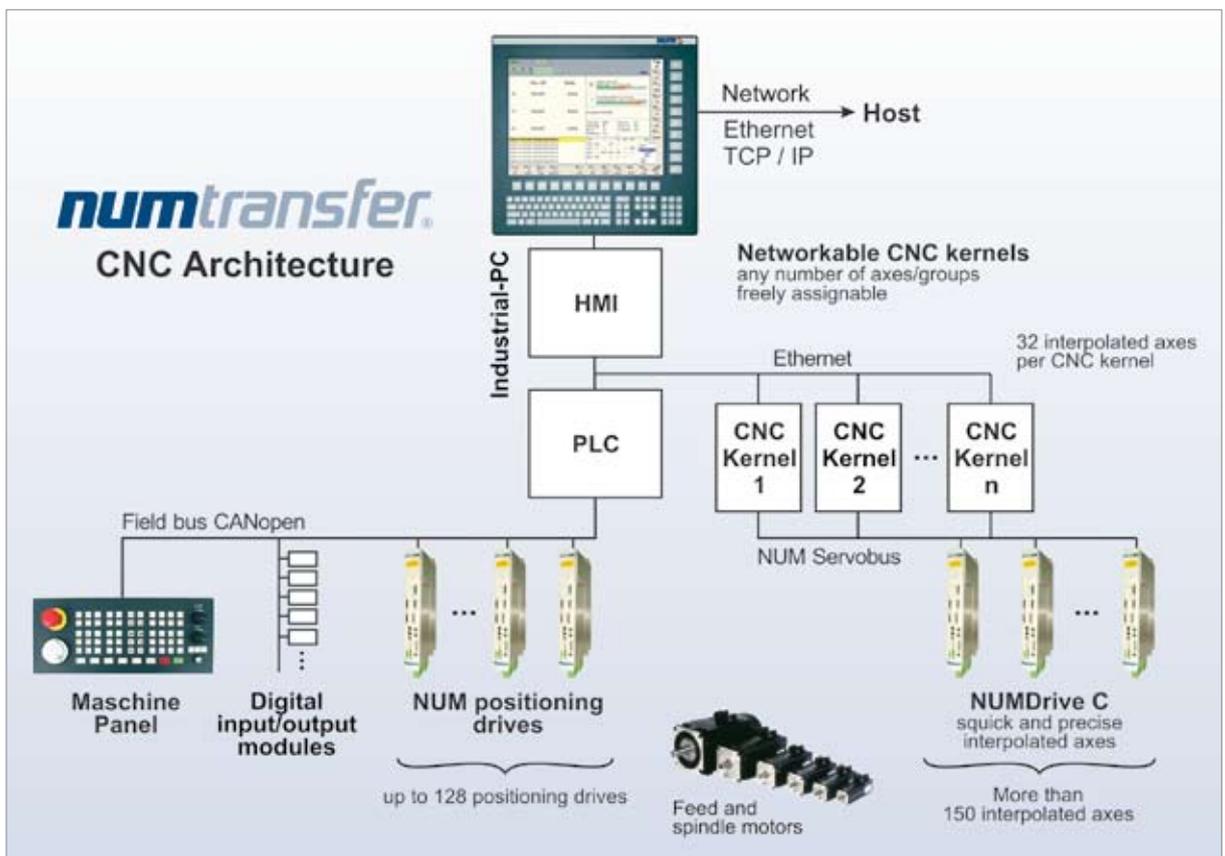
**numroto**®  
Total solution for tool grinding

Solutions

## Total Solution for Transfer, Rotary Transfer and Multi-Spindle Machines

In mass production, transfer, rotary transfer and multi-spindle machines must be optimised to the workpiece in order to work in a time-efficient manner. The profitable use of these machines, particularly for small batch sizes and for a large variety of products, requires flexibility and efficient operation that is intuitive and transparent to the user.

The practically-oriented total solution, NUM-transfer, is the result of many years of experience in this field. The Axiom Power CNC makes it possible to implement high-end systems with more than 150 interpolating CNC axes and up to 120 positioning axes. The fully configurable user interface NUMpass HMI makes the operation of such complex systems intuitive and simple.



## Creative and intelligent solutions

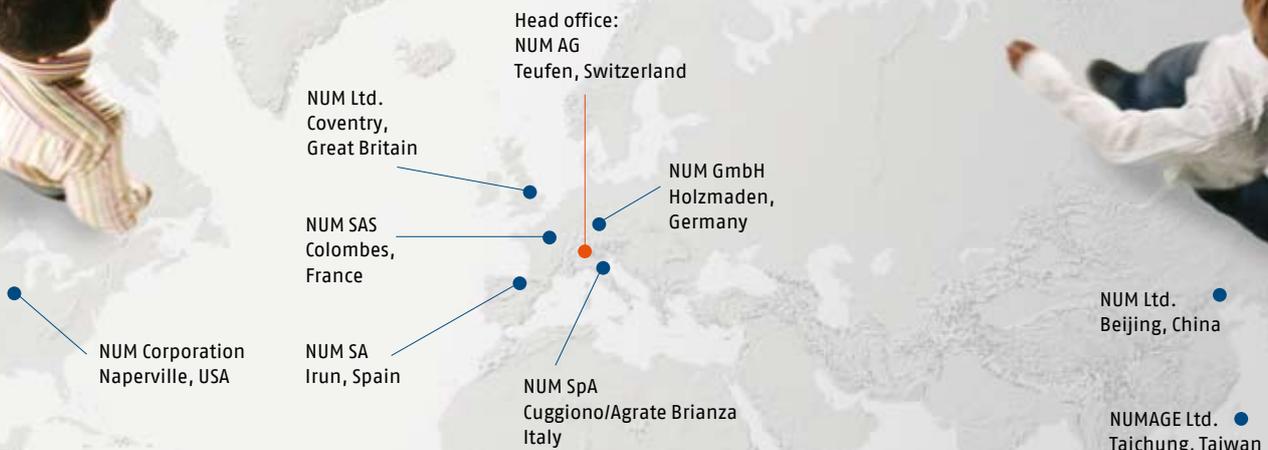
NUM has developed a number of customer and application-specific solutions in many industries. For car makers and their suppliers, these are, for example, CNC systems designed to control tank welding systems, the automation of large metal presses and much more. The entire spectrum ranges from aircraft construction to furniture manufacturing, from turbine

construction for power plant construction to complex transfer machines that extend over 100 stations in the clock manufacturing industry. Alternatively, our NUM Retrofits give older machines a new lease on life.

Real-life solutions to real-life problems – always on the right track with NUM.

# CNC Power Engineering Always on the move

## NUM competence centers for CNC high-end applications:



## NUM:

A European company active on a global scale.

### Your specialist for CNC total solutions

- Transfer, rotary-transfer and multispindle machines: NUMtransfer
- Tool grinding: NUMROTO
- Gear hobbing: NUMgear
- 5-axis machining for HSC and mould construction
- Woodworking
- Special machines for the car industry
- Wide range of solutions for machines retrofit