

# INDEX

TRAUB



## INDEX MS16-6/MS16-6Plus

Tool holder

Technical Information

better.parts.faster.

## **Note on applicability**

Illustrations in this publication may deviate from the product supplied. Errors and omissions due to technical progress expected.

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## Tool holder selection



For more information, please visit our iXshop at ixshop.index-traub.com

We will be happy to send you an individual offer.  
Just call us at +49 711 3191-9854 or  
send us an email to werkzeughalter@index-werke.de.

## Warranty



When using tool holders that are not adjusted, tested and marked as such by INDEX TRAUB, the warranty for the tool drive is void.

## Information on wear parts

Tool holders are wear parts requiring correct handling.  
In order to ensure a long service life, compressed air or coolant must not enter the gap seals of the holders.

## Inspection of live tool holders



Tool holders must be inspected at regular intervals (at least twice a year) for smooth running and play.



The drive pinion and drive clutch of the live tool holders must be subjected to a visual inspection for damage or wear.

If one of the above-mentioned defects is detected during the inspection of the tool holders, they must be returned immediately for preventive maintenance or repair to the following address:

INDEX-Werke GmbH & Co. KG  
Hauffstraße 4  
D-73262 Reichenbach  
Fon +49 711 3191-554  
werkzeughalter@index-werke.de

## Tool holders with cooling lubricant supply



Tool holders marked with this symbol must be operated with cooling lubricant (no dry running permitted).



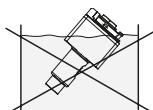
Tool holders marked with this symbol can be converted from external cooling lubricant supply to internal cooling lubricant supply.

Observe dry running capability of IC attachment!

## Cooling lubricant filtering

When using live tool holders with internal cooling lubricant supply, it is necessary to use a cooling lubricant filter system with a retained particle size  $\leq 50 \mu\text{m}$ .

## Cleaning live tool holders



Live tool holders must never be immersed in cleaning fluid since mixing the cleaning fluid with the bearing grease will reduce the service life of the tool holders.

## Speed ratio specifications on tool holders

The value to be programmed is specified in the documentation and on the live tool holders (= the input in the NC program).

$$n_{\text{prog}} = n_{\text{Tool}} \times i$$

$n_{\text{Tool}}$  = speed at the cutting tool edge

$n_{\text{PROG}}$  = speed to be programmed

$i$  = speed ratio in the tool holder

This means the speed increase or speed reduction is not specified as a fraction but as **a number**.

This gives speed **increase** ratios as numbers **less than 1**.

Example:  $i = 0.333$  (corresponds to  $i = 1:3$ )

$i = 0.676$  (corresponds to  $i = 1:1.48$ )

Speed reduction ratios are numbers greater than 1.

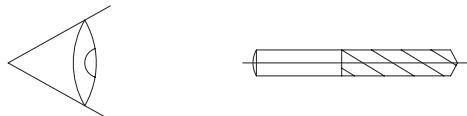
Example:  $i = 2$  (corresponds to  $i = 2:1$ )

$i = 1.333$  (corresponds to  $i = 4:3$ )

## Direction of rotation specification

Definition of the viewing direction.

Viewing direction for determining the direction of rotation is always from behind (that is, from the drive direction) toward the shaft.



On the machine side, the direction of rotation has been set by parameters such that M03 always denotes clockwise rotation and M04 counter-clockwise rotation at the interface of the drive pinion of the tool holder.

The direction of rotation given on the holder therefore refers to a "change in direction within the holder". M03 and M04 are machine functions to be programmed. The and arrows indicate the direction of rotation of the cutting edges.

This means:



### No reversal of direction of rotation

When the holder drive shaft has the **same** direction of rotation as the tool cutting edge, the clockwise direction of run must be specified by M03 (clockwise rotation). Accordingly, counter-clockwise rotation must be specified by M04.

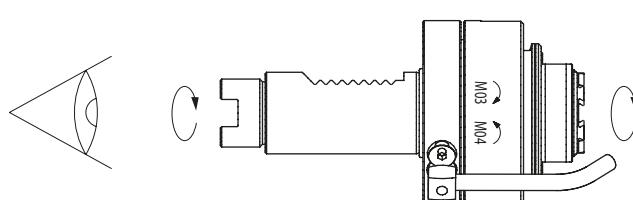


### Reversal of direction of rotation

When the holder drive shaft has the **opposite** direction of rotation as the tool cutting edge, the clockwise direction of rotation must be specified by M04. Accordingly, counter-clockwise rotation must be specified by M03.

Example

### No reversal of direction of rotation



## **Tightening torque**

The tightening torques of the clamping pieces to the tool holder mounting depends on the shank diameter of the tool holder.

Shank size	Tightening torque
Ø 20mm	8 Nm
Ø 25mm	20 Nm
Ø 30mm	25 Nm
Ø 40mm	40 Nm

## **Replacement seals for tool shank**

The gaskets on the tool shank and the cooling lubricant bushing must be regularly checked for damages.

O-ring	O-ring color	Material number	Installation location
ø23.52 x 1.78	Green	10823023	Shank ø25
ø9.75 x 1.78	Green	10046965	Cooling lubricant adapter

The color of the reordered O-ring must always be the same as the one already used on the tool shank.

## Tool holders with fixation



Except for very few cases, all tool holders have been pre-adjusted with high precision and sealed with the INDEX V bar / TRAUB adjusting bar / W-serration.

This setting must not be changed.

The INDEX V bar / TRAUB adjusting bar / W-serration ensures positional accuracy of the tool when re-inserted.

The tool holders are fixed around the shank axis by pins (DIN 69880).

DIN holders can be used.

Double serration of the tool holders allows several uses.

## Load limits of live tools

The drive power and torques are indicated in the performance charts. These values represent the upper limit of the calculated theoretical performance values (average values). In case of interrupted cuts, e.g., for milling, the load peaks occurring when the cutting edge enters the material may be much higher than the theoretical torque according to the performance chart.



The cutter should be selected so that a cutting edge is constantly being used for cutting during the machining process.

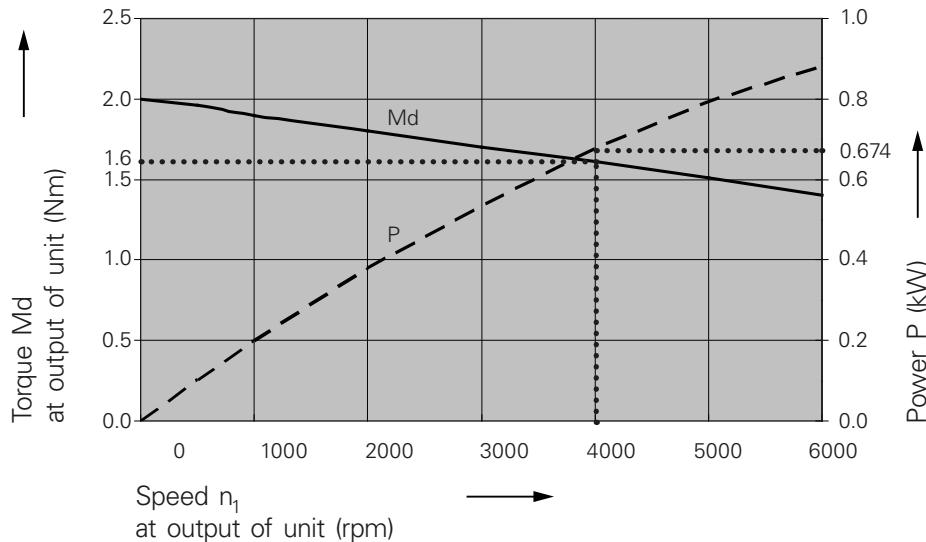
## Notes on how to use the chart when using tool holders

The diagram relates to the output speed  $n$  of the tool unit. The tool speed can be read directly from the diagram only if the internal speed ratio  $i$  in the tool holder is 1:1.

For tool holders with an internal speed ratio  $i \neq 1$ , the output speed  $n$  of the tool unit to be programmed must be calculated from the required tool speed and the speed ratio  $i$ . Afterwards, the actual powers or torques can be read off or determined.

Example (at 100% duty cycle):

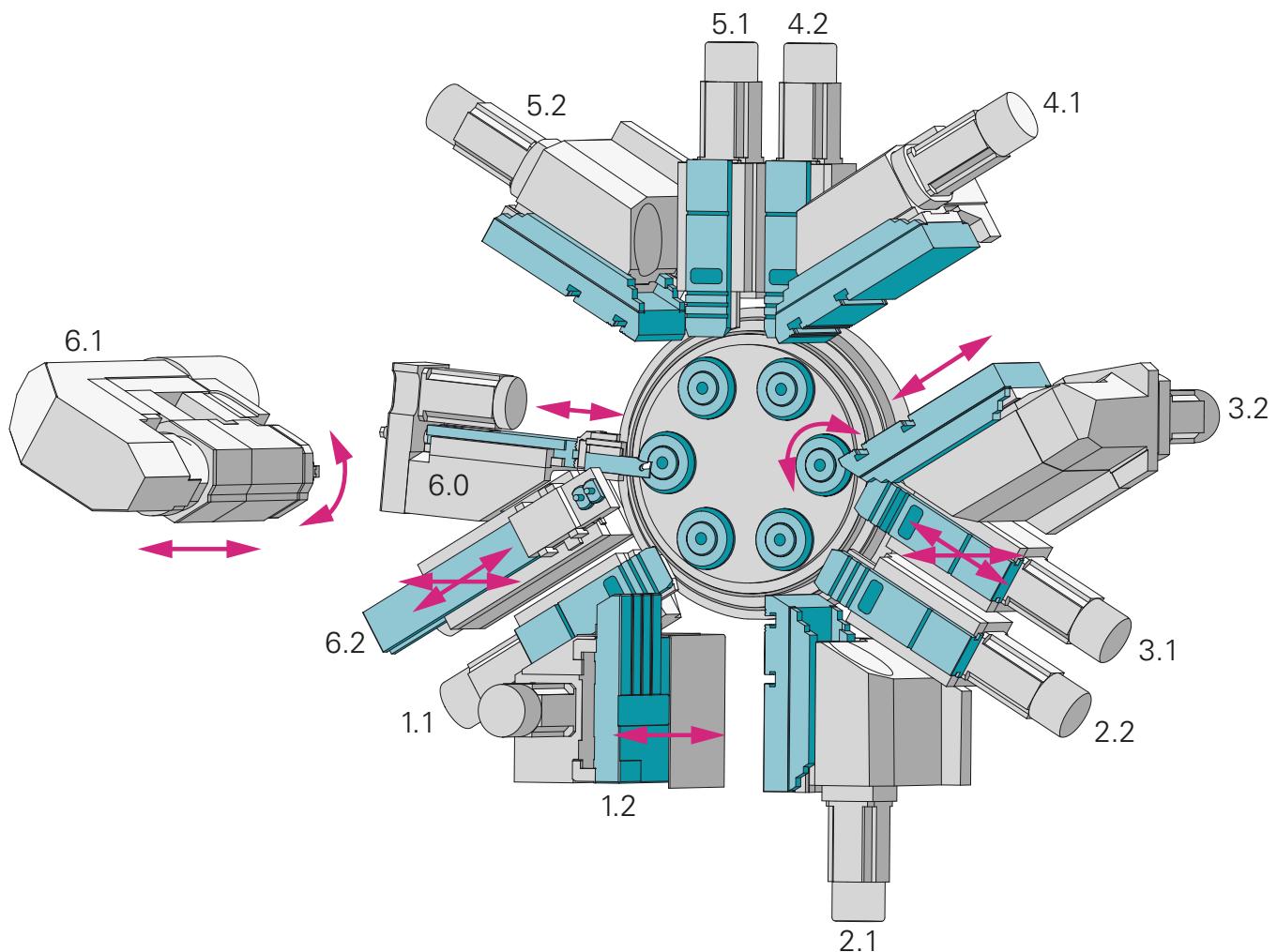
live tool unit, tool speed $n_{\text{tool}} = 1000 \text{ rpm}$	
Internal speed ratio $i$ of the tool holder	$i = 4$
Programmed speed $n_{\text{prog}}$ for the drive of the unit	$n_{\text{prog}} = n_{\text{tool}} \times i = 1000 \text{ rpm} \times 4 = 4000 \text{ rpm}$
Torque $M_{\text{tool}}$ at the output of the tool holder	Read-out $M_d$ at speed $n_{\text{prog}} = 4000 \text{ rpm} = 1.6 \text{ Nm}$ $M_d = M_{\text{tool}} : i$ Formula changed: $M_{\text{Tool}} = M_d \times i = 1.6 \text{ Nm} \times 4 = 6.4 \text{ Nm}$
Power $P$ at the output of the tool holder $\approx$ Power $P$ at the output of the setup	Read-out at 4000 rpm $\rightarrow P = 0.67 \text{ kW}$ calculated: $P = 2 \times \pi \times n_{\text{prog}} \times M_d$ $P = 2 \times \pi \times 4000 \times 1.6 \text{ Nm} = 0.67 \text{ kW}$ $60 \times 1000$



The speed ratio and the technical data of each tool holder are indicated on the next pages.

## Machine concept of INDEX MS16-6/MS16-6Plus

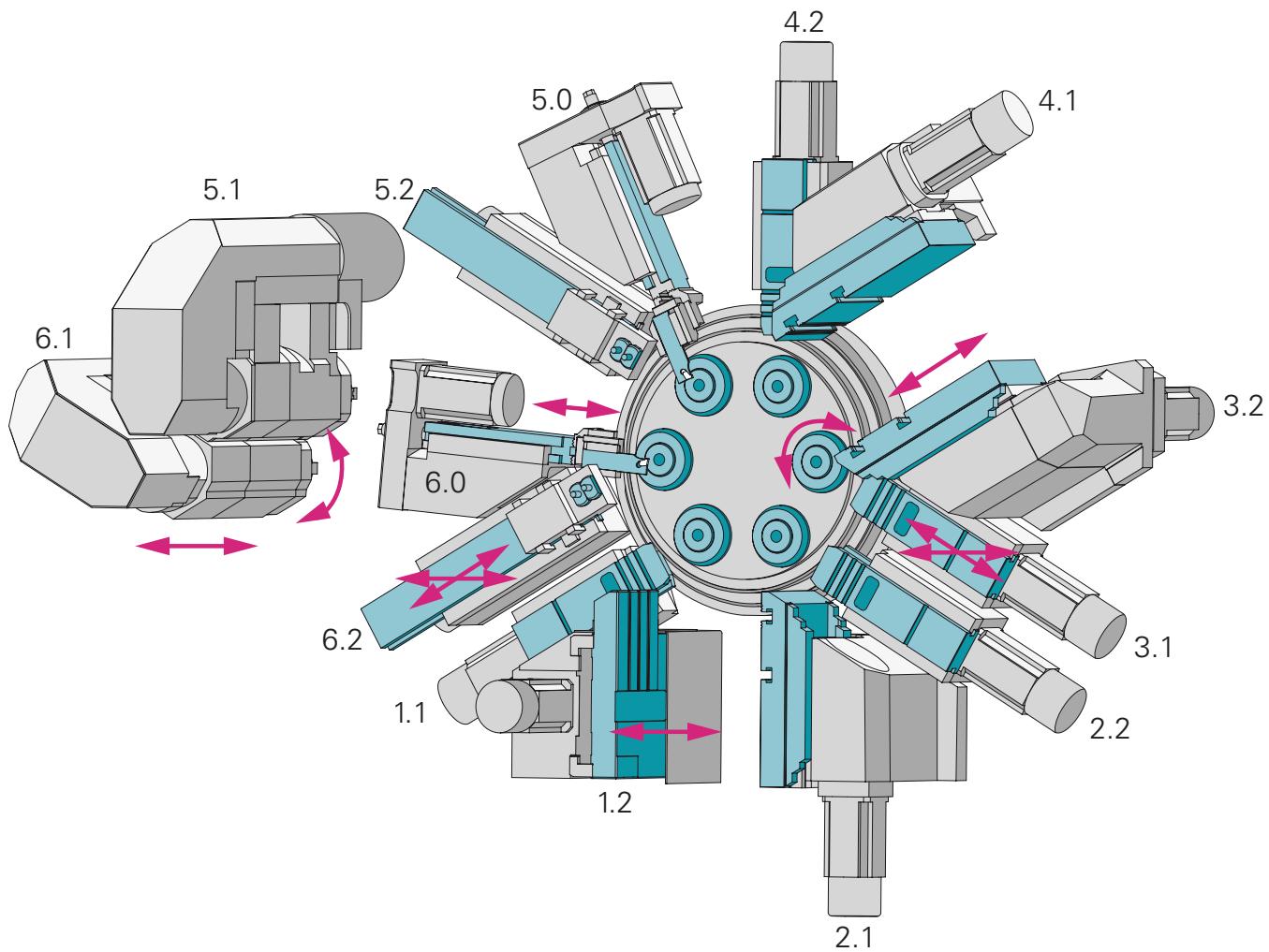
### Single synchronous machine



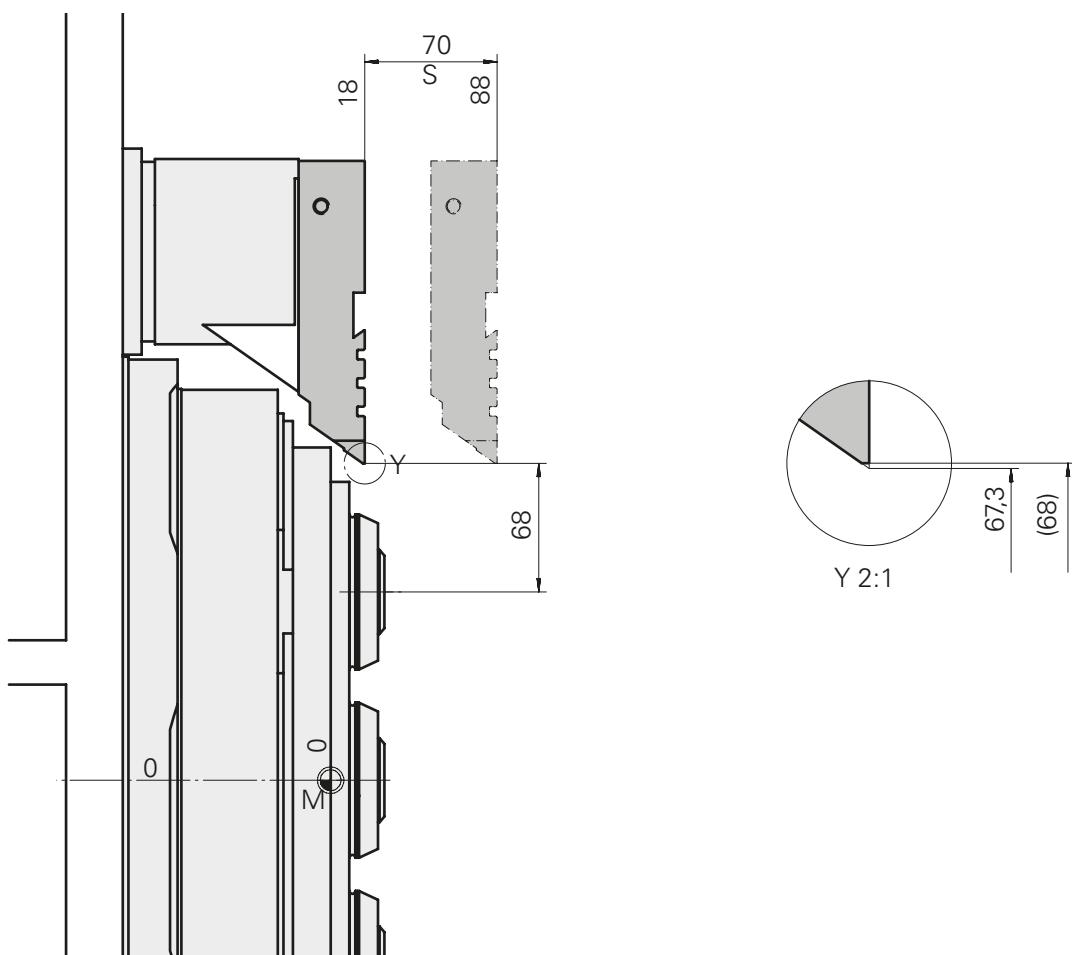
- Synchronous spindle in position 6.1
- Cutoff and back-boring slide in position 6.2
- Extension version with separate cutoff slide 6.0
- 1x cross slide (X/Z) per spindle position 1-5
- 1x grooving or drilling slide per spindle position 1-5
- Transverse machining with live tools
- Rear end machining with up to 3 tools (max. 2 tools are live)

## Machine concept of INDEX MS16-6/MS16-6Plus

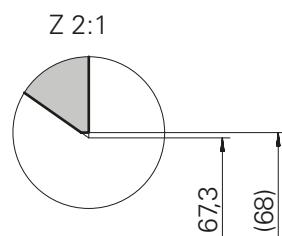
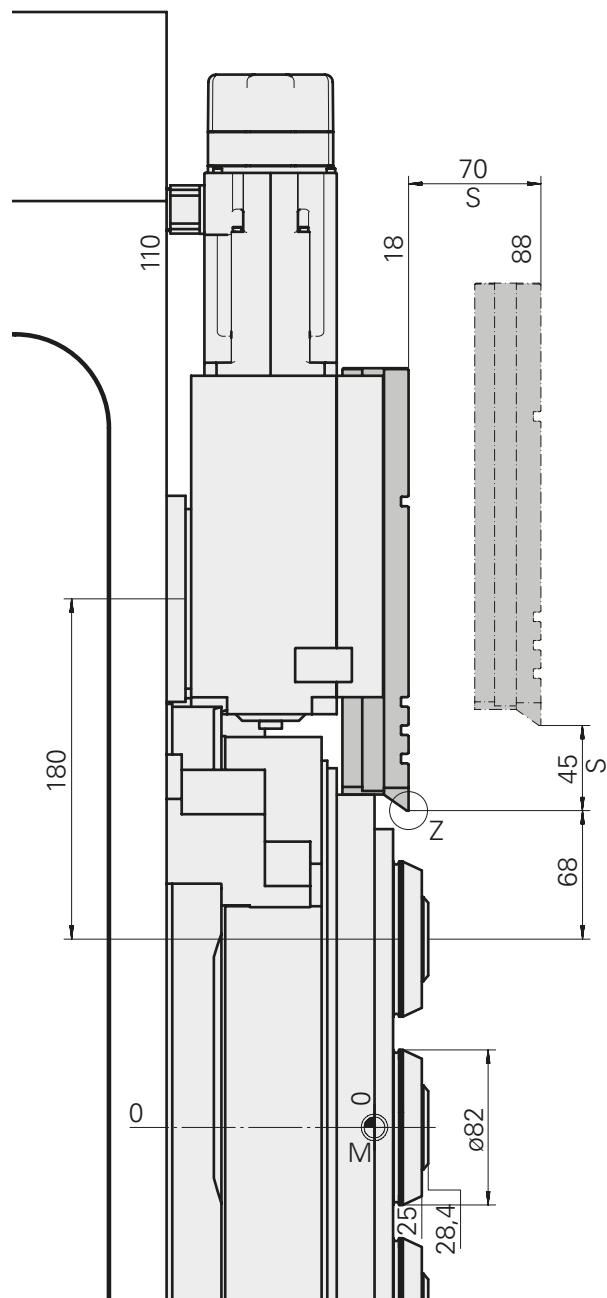
### Double synchronous machine



- Synchronous spindle in positions 5.1 and 6.1
- Cutoff and back-boring slide in positions 5.2 and 6.2
- Extension version with separate cutoff slide 5.0 and 6.0
- 1x cross slide (X/Z) per spindle position 1-4
- 1x grooving or drilling slide per spindle position 1-4
- Transverse machining with live tools
- Rear end machining with up to 3 tools (max. 2 tools are live)

**Travel of cross slide unit INDEX MS16-6/MS16-6Plus****Cross slide unit X-rigid 1.1, 2.2, 3.1, 4.2, 5.1**

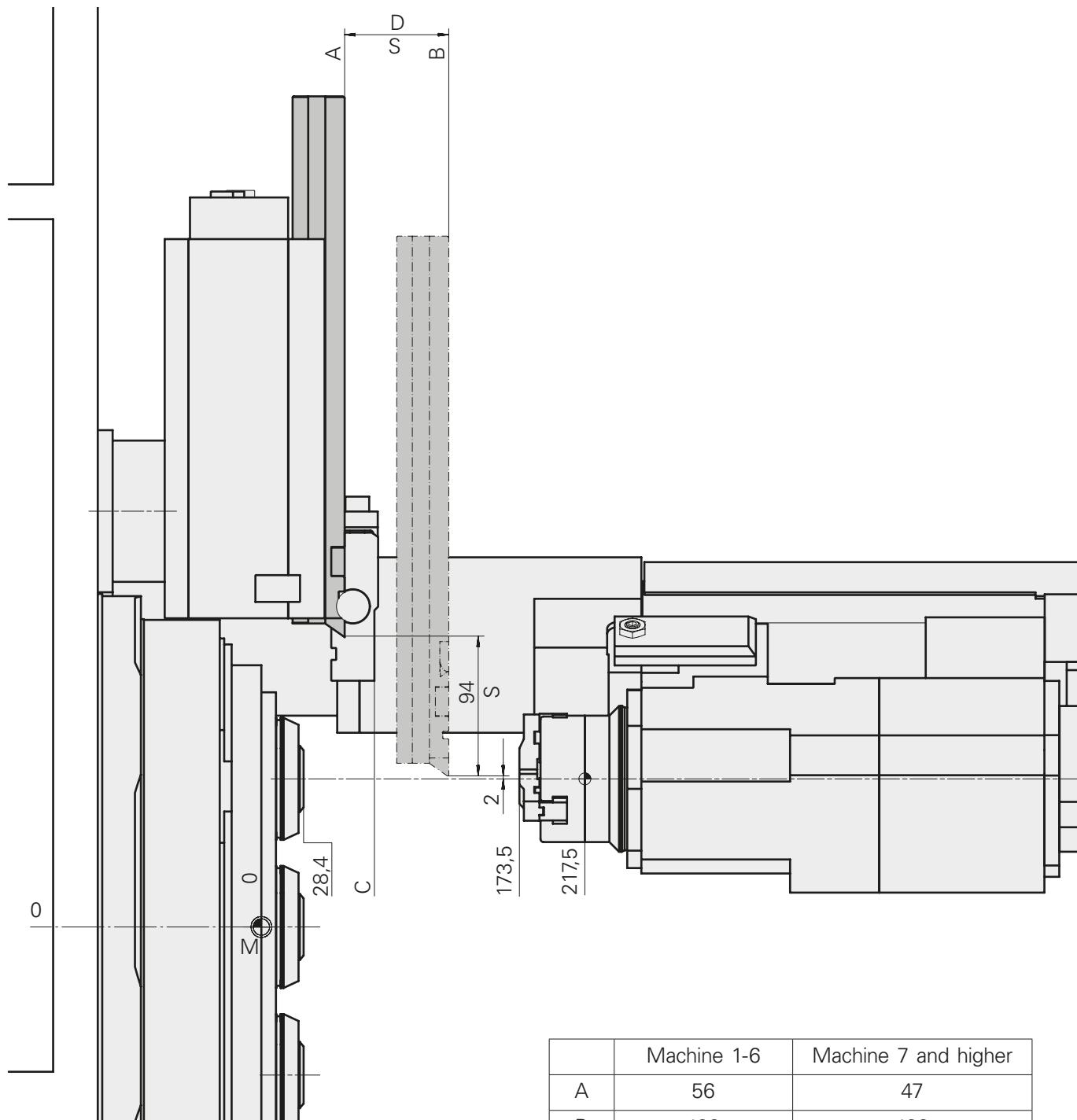
S = travel of cross slide unit

**Travel of cross slide unit INDEX MS16-6/MS16-6Plus****Cross slide unit X-NC / Z-NC 1.1, 2.2, 3.1, 4.2, 5.1**

S = travel of cross slide unit

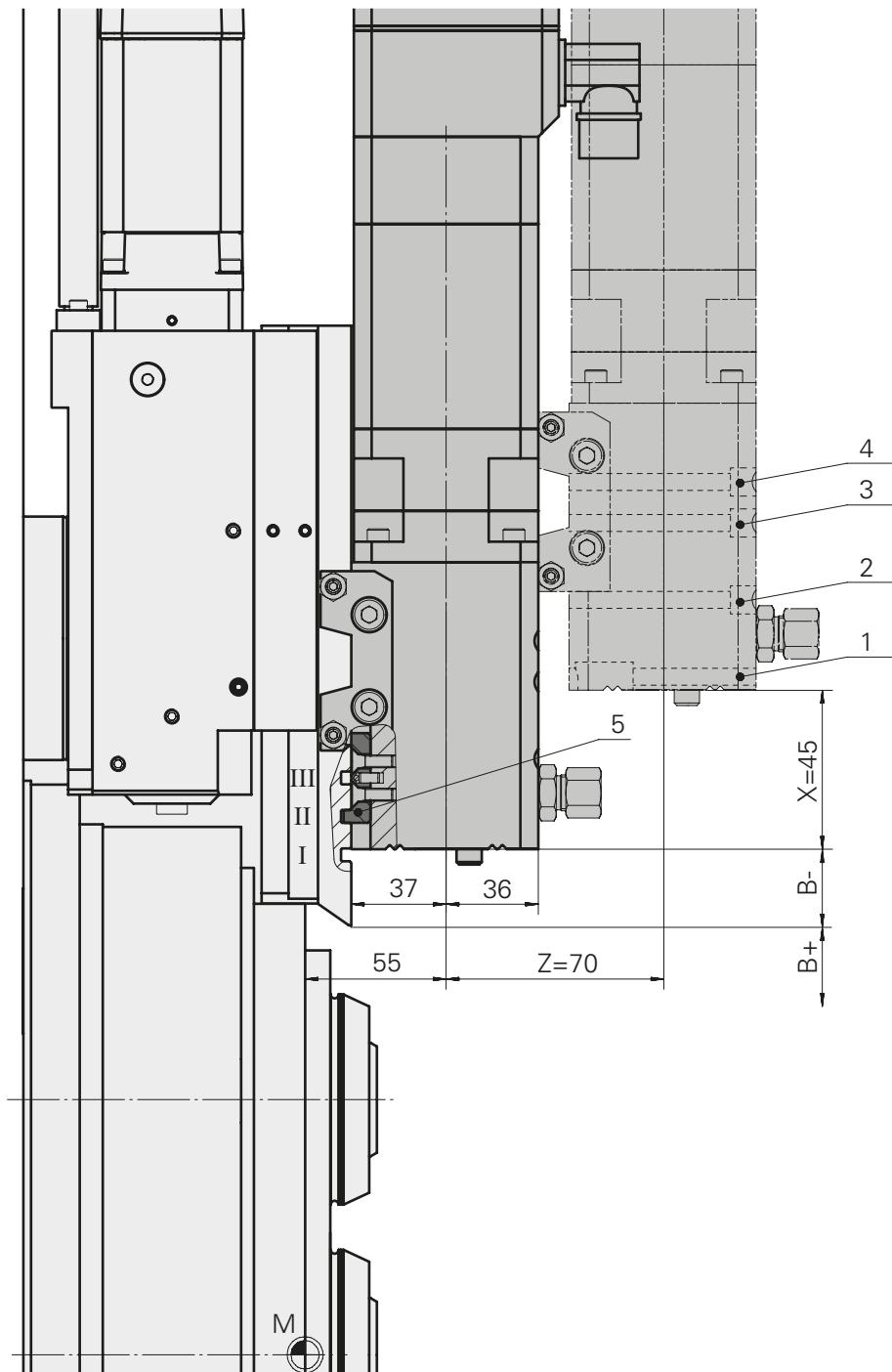
**Synchronous spindle INDEX MS16-6/MS16-6Plus****Synchronous spindle 6.1 with cross slide unit 6.2  
(synchronous spindle 5.1 with cross slide unit 5.2)**

Clamping device height  
Standard: 44 mm  
for  
Hainbuch-Axfix and Röhm  
chuck with top jaws



S = travel of cross slide unit

	Machine 1-6	Machine 7 and higher
A	56	47
B	126	126
C	76	67
D	70	79

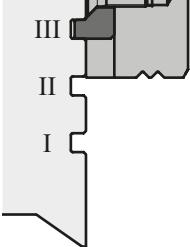
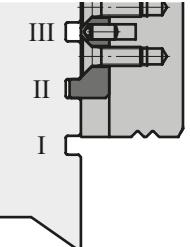
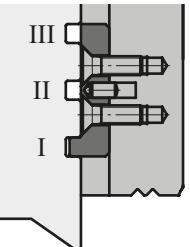
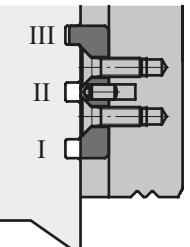
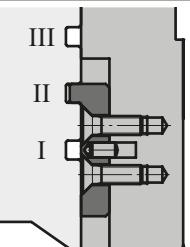
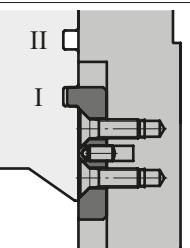
**Tool drive unit shank VDI20, INDEX MS16-6/MS16-6Plus****Cross slide unit X-NC / Z-NC 1.1, 2.2, 3.1, 4.2, 5.1****Installation size**

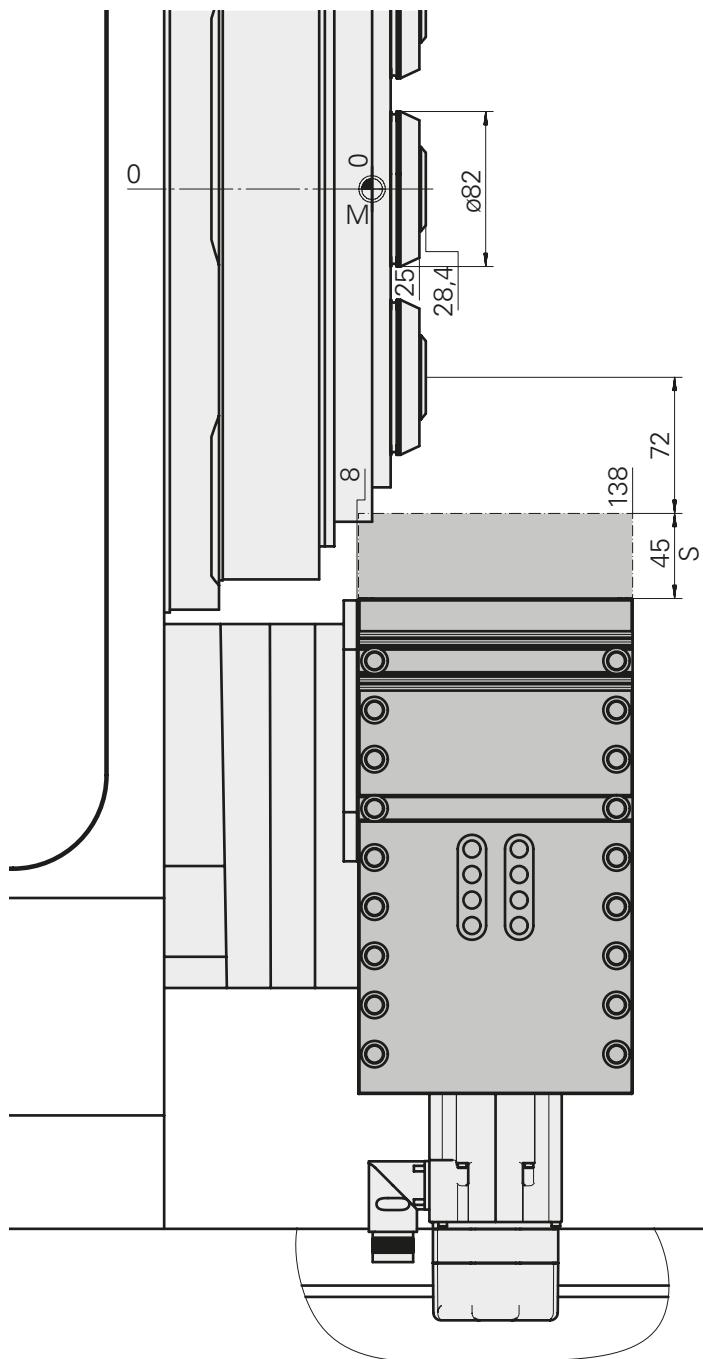
1-4 = pair of screws

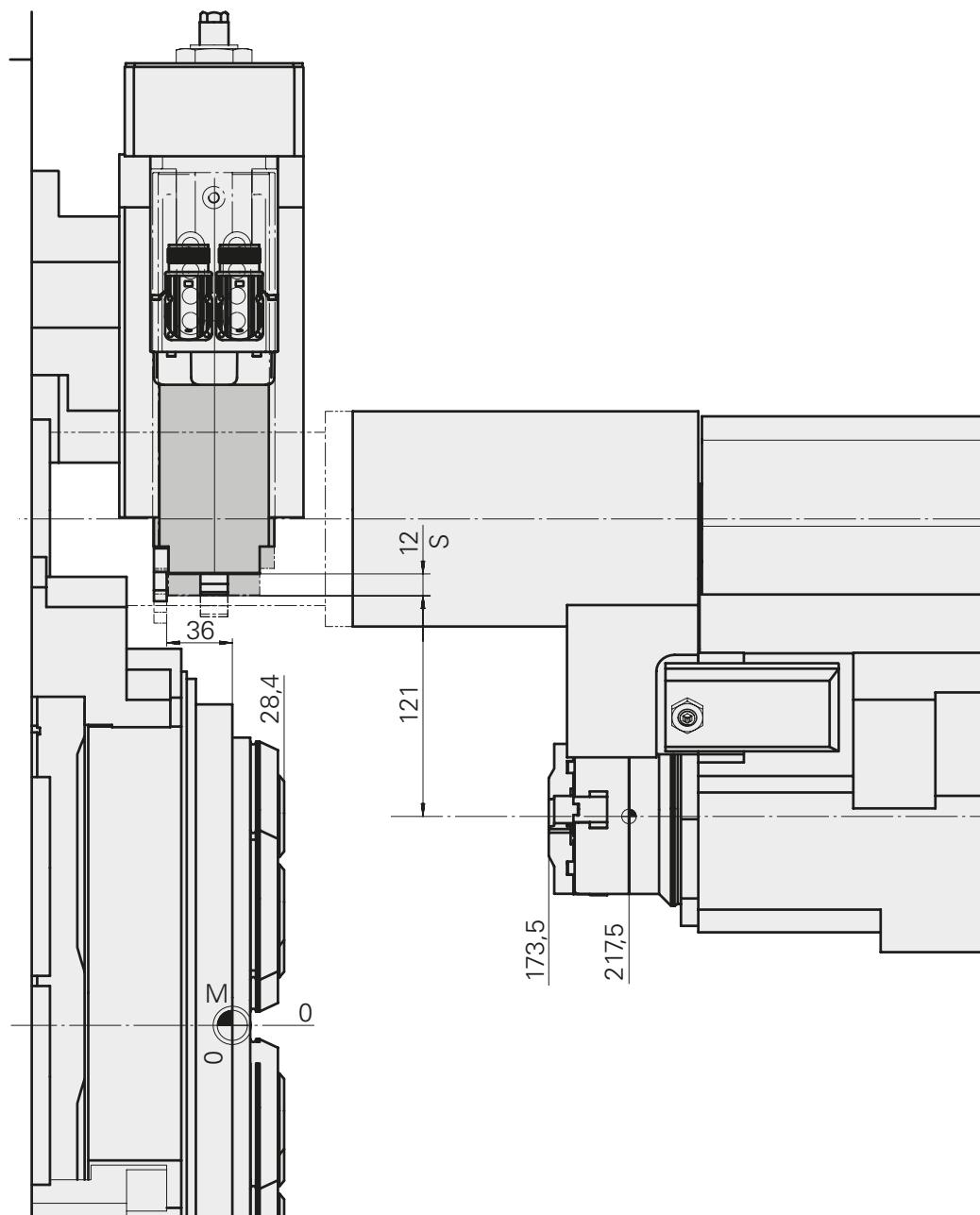
5 = slot nut

I, II, III = slide slot

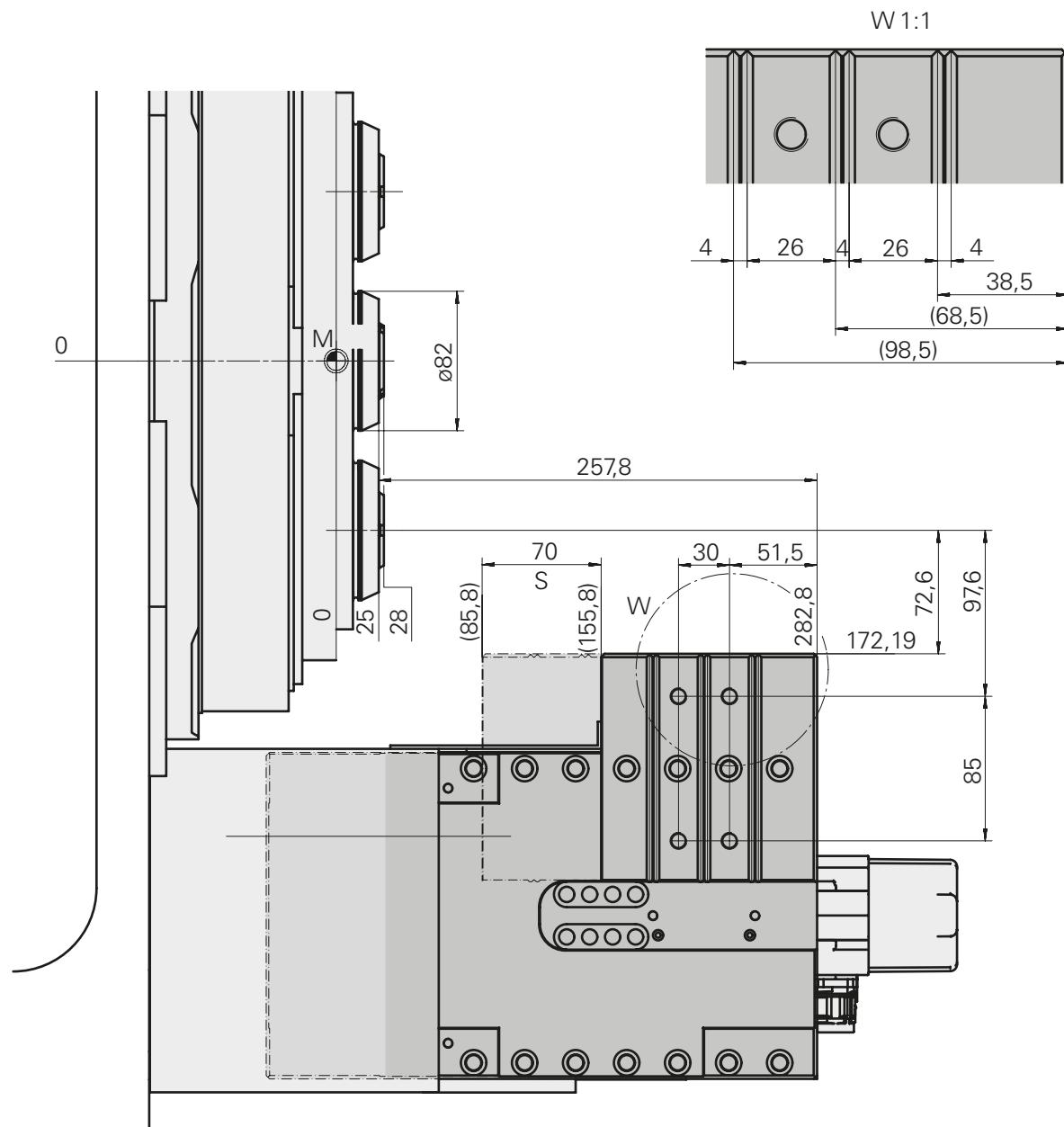
**Tool drive unit shank VDI20, INDEX MS16-6/MS16-6Plus****Cross slide unit X-NC / Z-NC 1.1, 2.2, 3.1, 4.2, 5.1****Installation size**

Basic dimension B	Slot nut 10223322 used in the cross slide unit slot	used pairs of screws
-45.4 mm		4 1
-30.4 mm		4 1
-15.4 mm		4 (2) 1
-15.4 mm		4 (2) 1
-0.4 mm		3 2
+14.6 mm		3 2

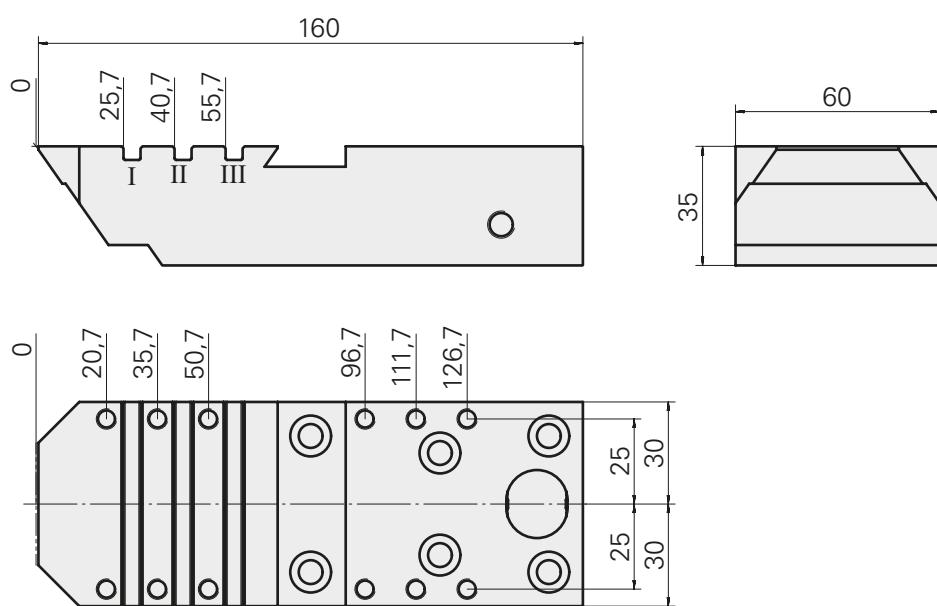
**Travel of grooving unit INDEX MS16-6/MS16-6Plus****Grooving unit X-NC 1.2, 2.1, 3.2, 4.1, (5.2)** $S$  = travel of grooving unit

**Synchronous spindle INDEX MS16-6/MS16-6Plus****Synchronous spindle 6.1 with grooving unit 6.0  
(synchronous spindle 5.1 with grooving unit 5.0)**

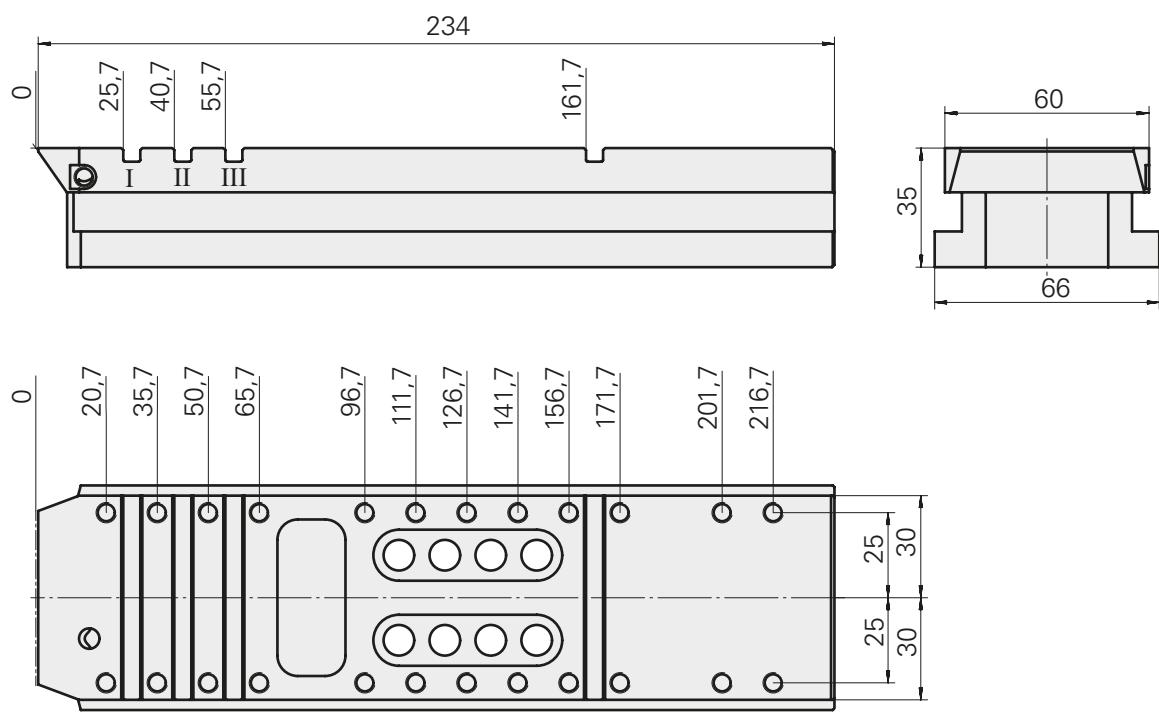
S = travel of grooving unit

**Travel of drilling unit INDEX MS16-6/MS16-6Plus****Drilling unit Z-NC 1.2, 2.1, 3.2, 4.1, (5.2)**

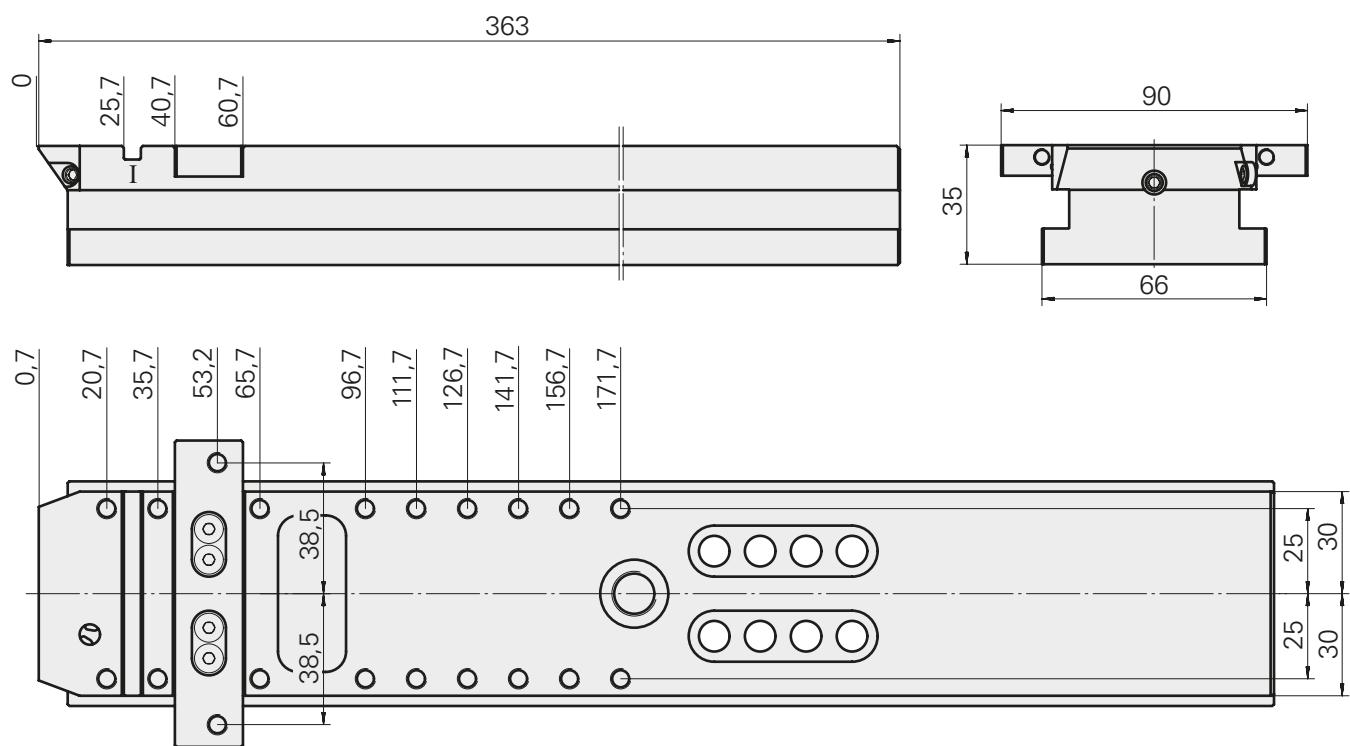
S = travel of drilling unit

**Cross slide unit INDEX MS16-6/MS16-6Plus****X-rigid 1.1, 2.2, 3.1, 4.2, 5.1**

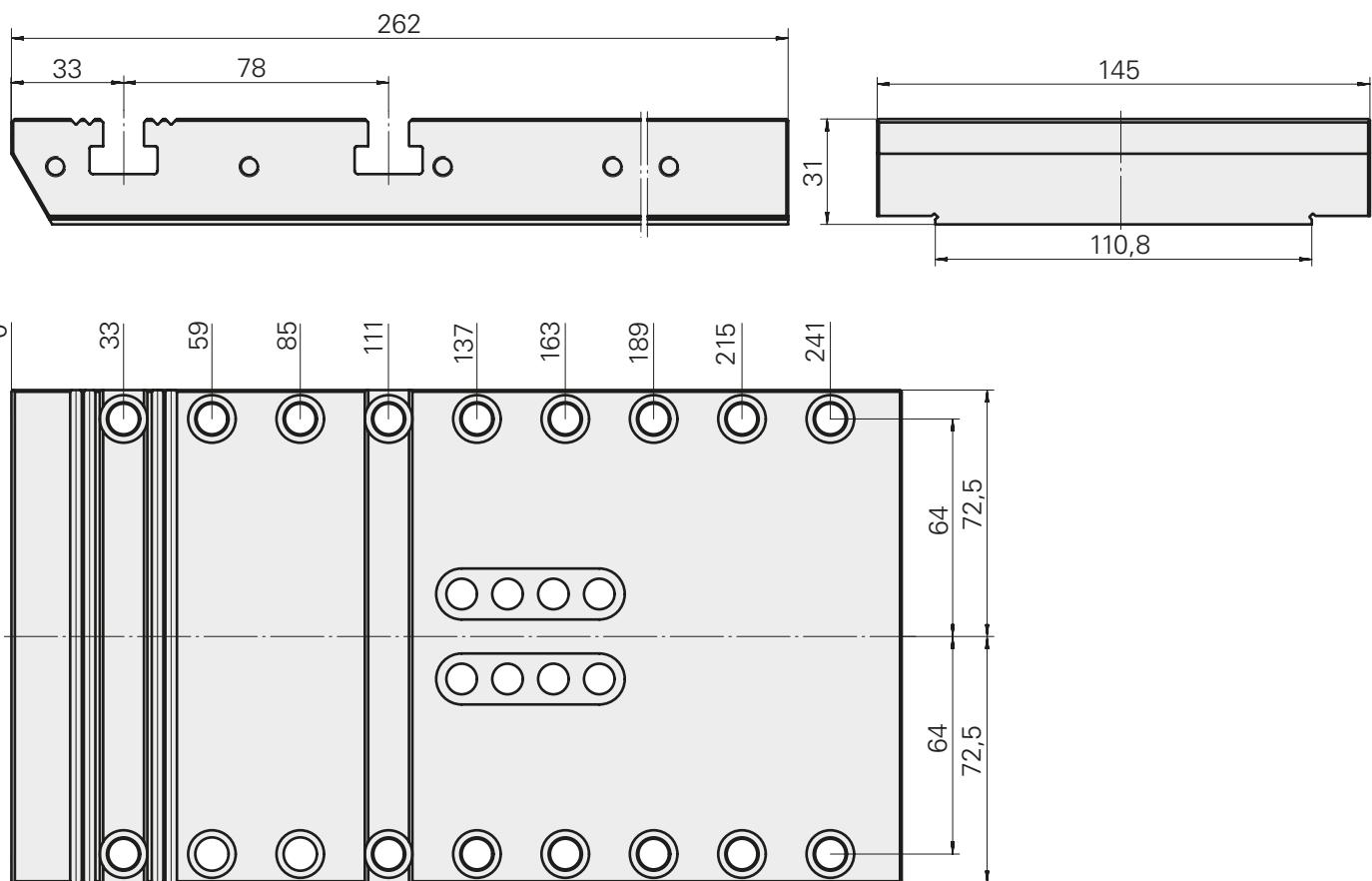
I, II, III = slide slot

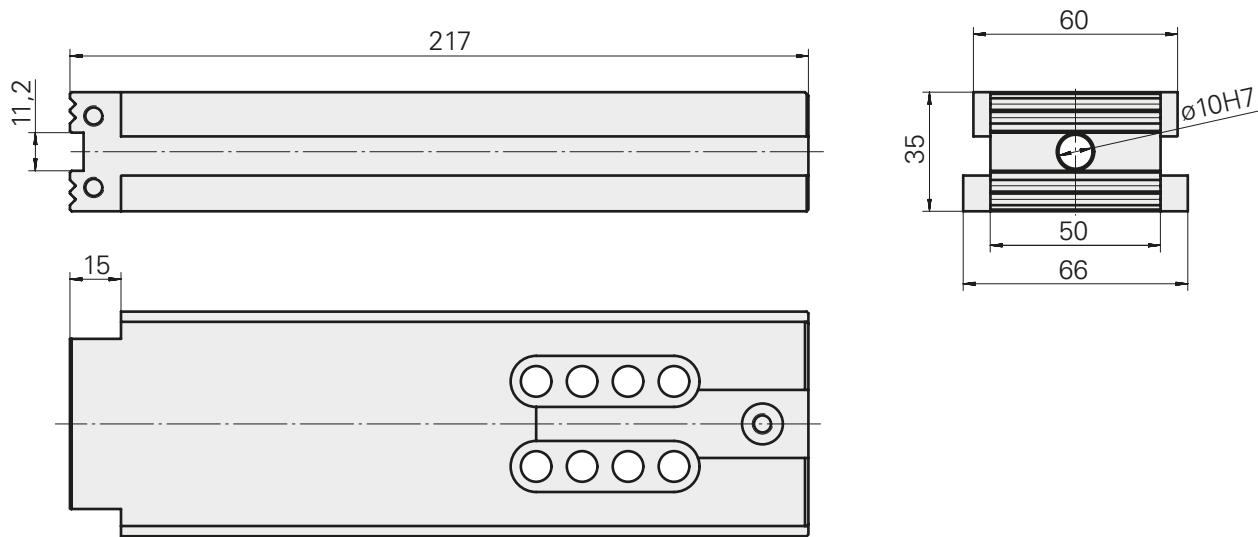
**Cross slide unit INDEX MS16-6/MS16-6Plus****X-NC, Z-NC 1.1, 2.2, 3.1, 4.2, 5.1**

I, II, III = slide slot

**Cross slide unit INDEX MS16-6/MS16-6Plus****X-NC, Z-NC 6.2, (5.2)**

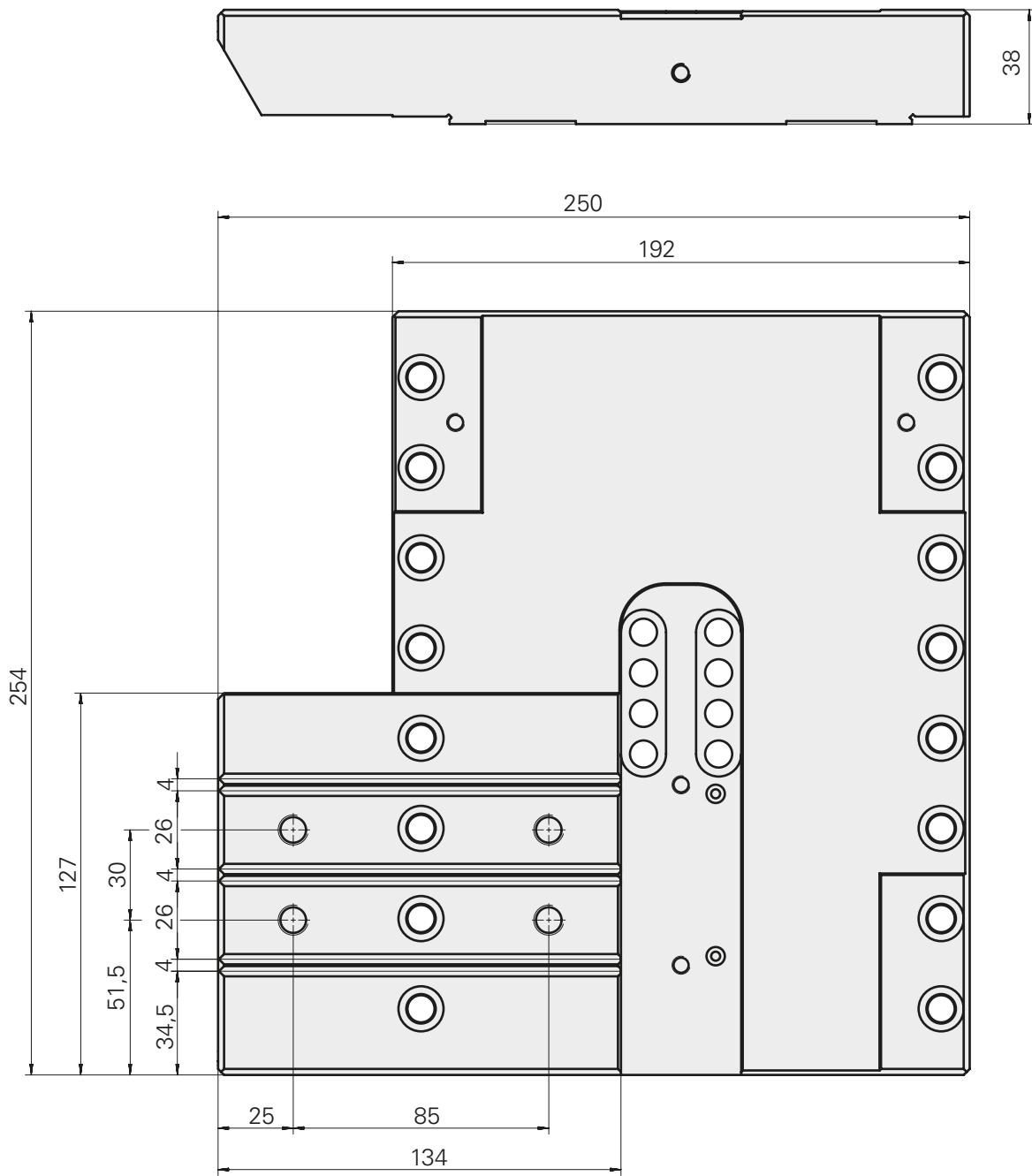
I = slide slot

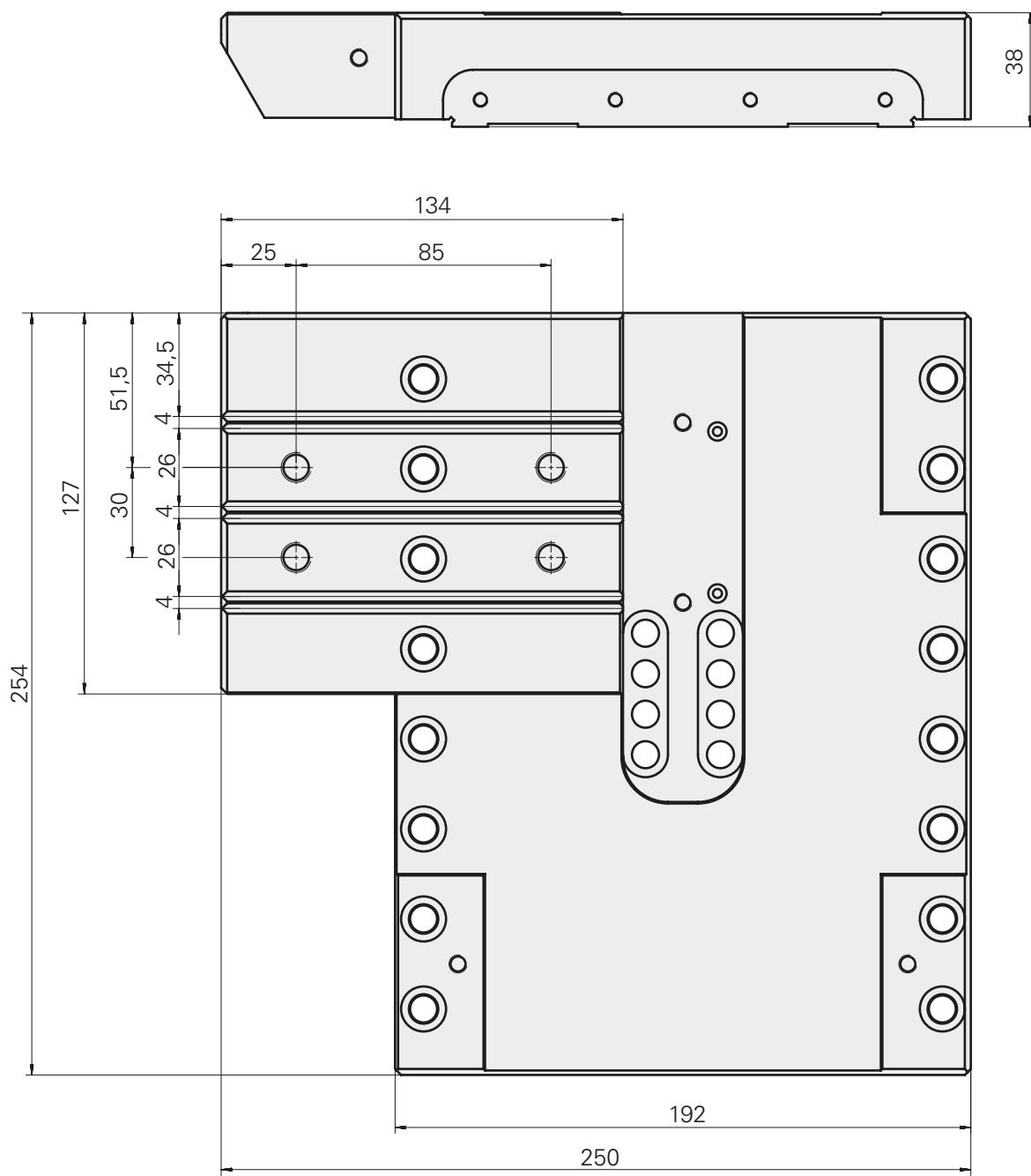
**Grooving unit INDEX MS16-6/MS16-6Plus****X-NC 1.2, 2.1, 3.2, 4.1, (5.2)**

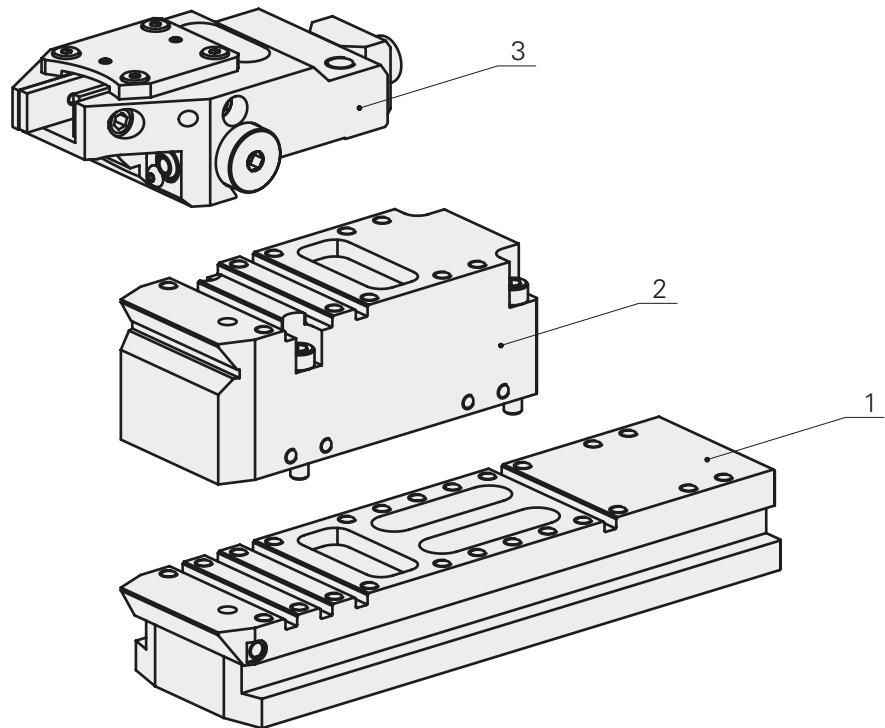
**Grooving unit INDEX MS16-6/MS16-6Plus****X-NC 5.0, 6.0**

## **Drilling unit INDEX MS16-6/MS16-6Plus**

Z-NC 1.2, 3.2, (5.2)



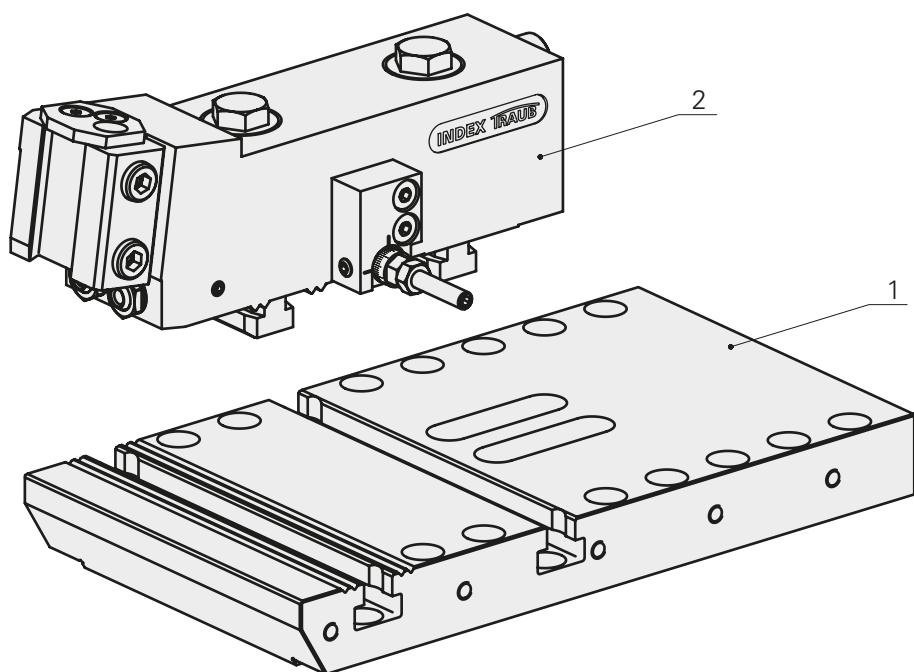
**Drilling unit INDEX MS16-6/MS16-6Plus****Z-NC 2.1, 4.1**

**Modular structure INDEX MS16-6/MS16-6Plus****Grooving tool holder****Cross slide unit 1.1, 2.2, 3.1, 4.2, 5.1, machining in X/Z direction**

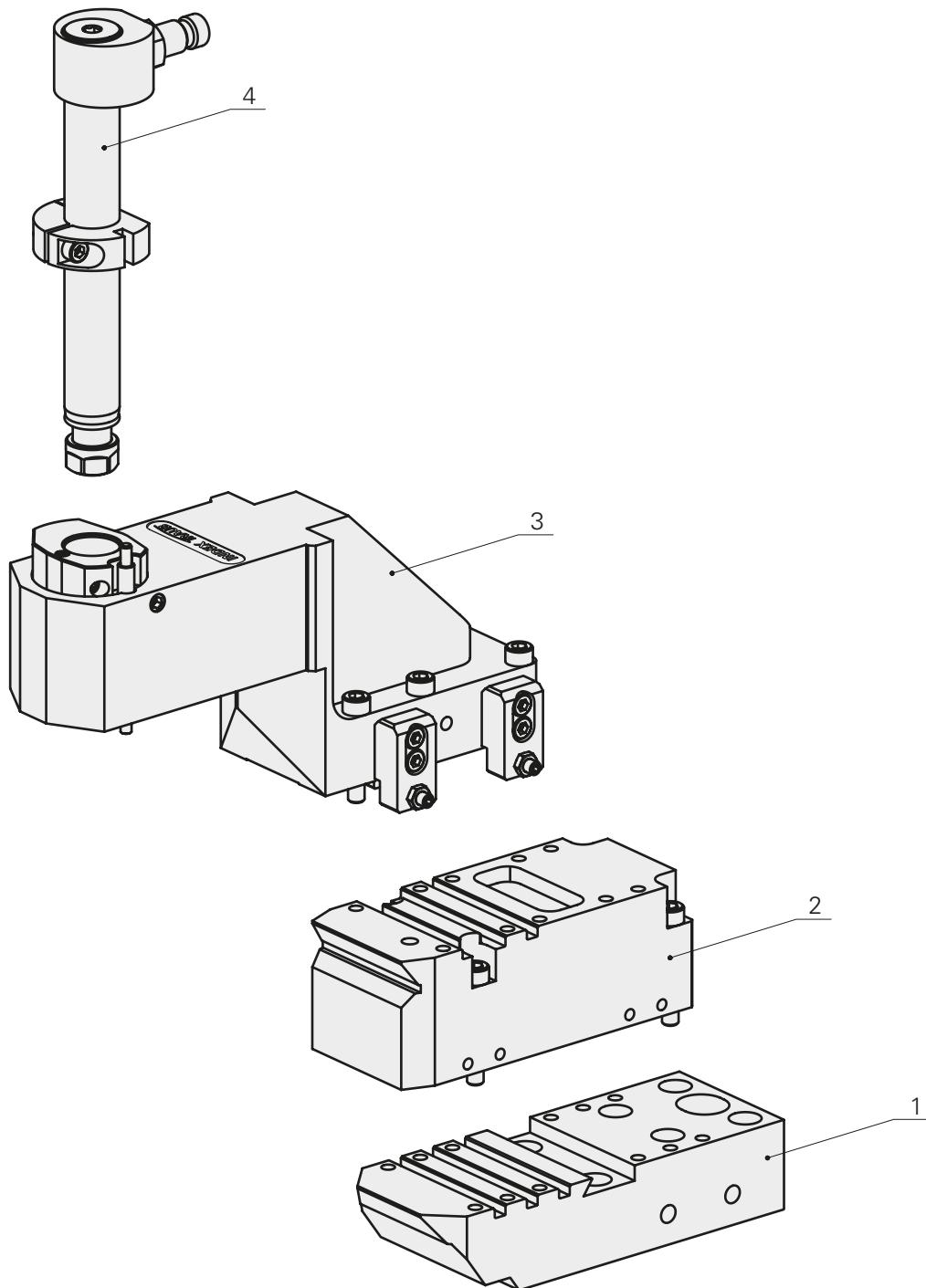
1 Cross slide 1.1, 2.2, 3.1, 4.2, 5.1

2 Intermediate plate as needed

3 Grooving tool holder

**Modular structure INDEX MS16-6/MS16-6Plus****Grooving tool holder****Grooving unit 1.2, 2.1, 3.2, 4.1, (5.2), machining in X direction**

- 1 Grooving unit 1.2, 2.1, 3.2, 4.1, (5.2)
- 2 Grooving tool holder

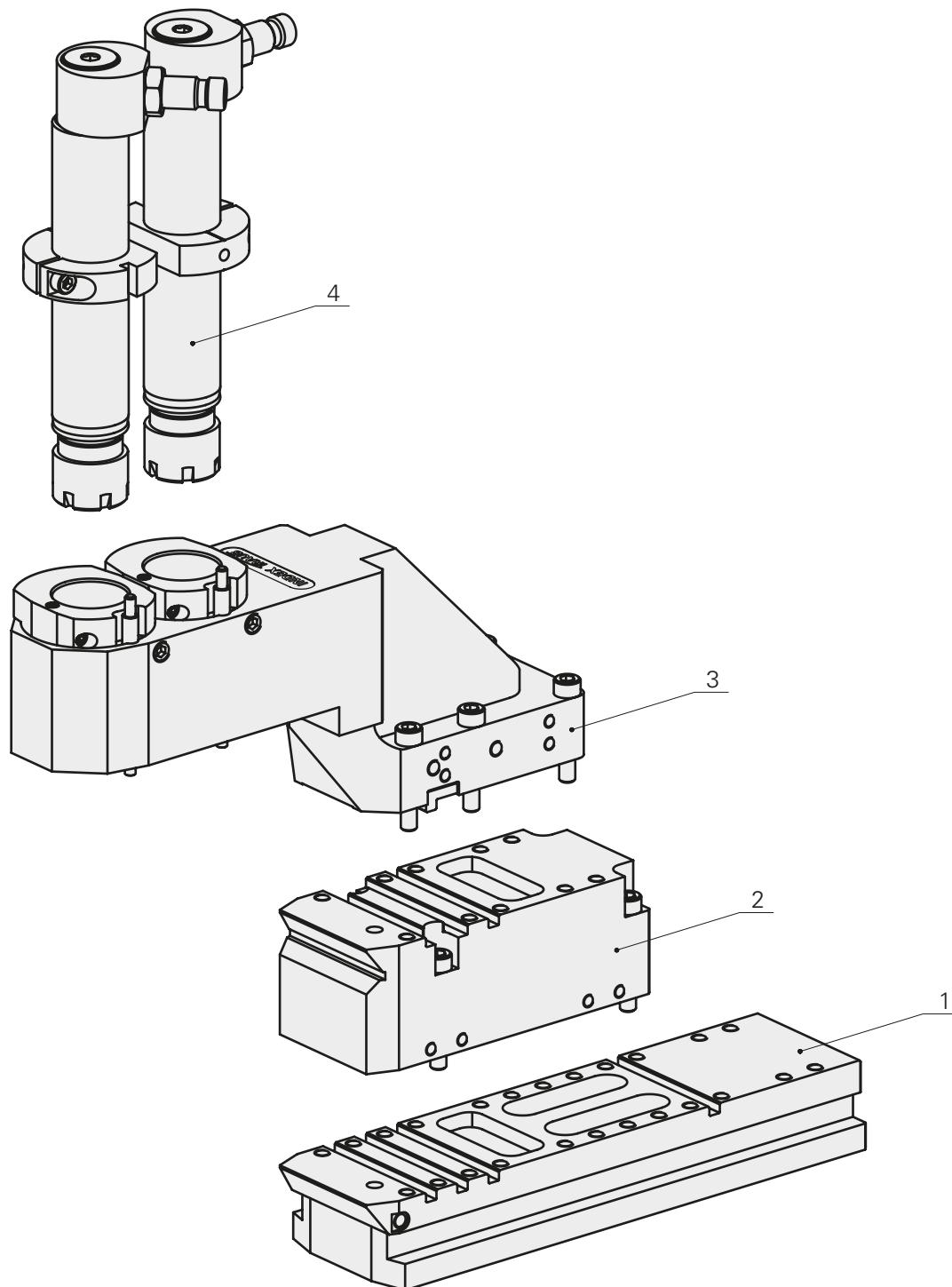
**Modular structure INDEX MS16-6/MS16-6Plus****Base holder with drill holder, D20mm/D28.5mm****Cross slide unit 1.1, 2.2, 3.1, 4.2, 5.1, machining in X direction**

1 Cross slide 1.1, 2.2, 3.1, 4.2, 5.1

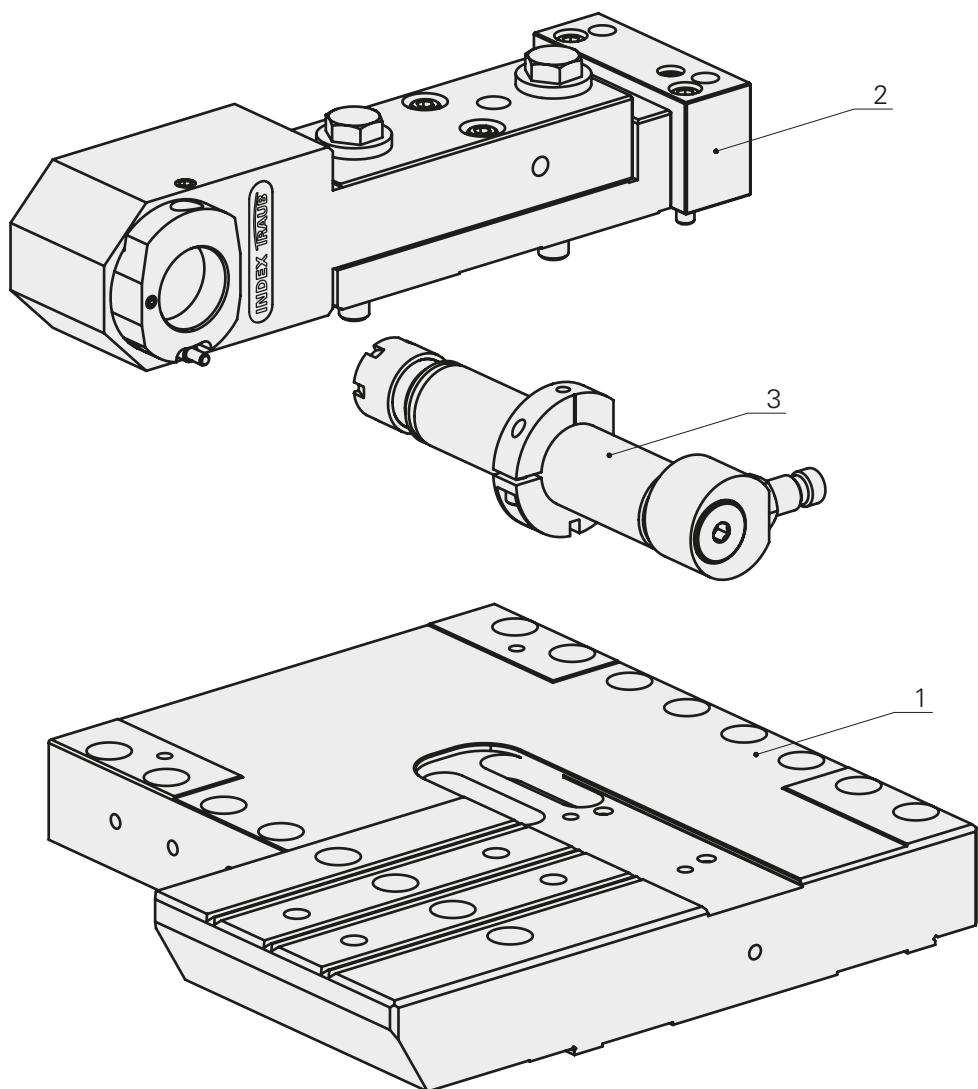
2 Intermediate plate as needed

3 Base holder

4 Drill holder, ø20mm/ø28.5mm

**Modular structure INDEX MS16-6/MS16-6Plus****Base holder with drill holder, D20mm/D28.5mm****Cross slide unit 1.1, 2.2, 3.1, 4.2, 5.1, machining in X/Z direction**

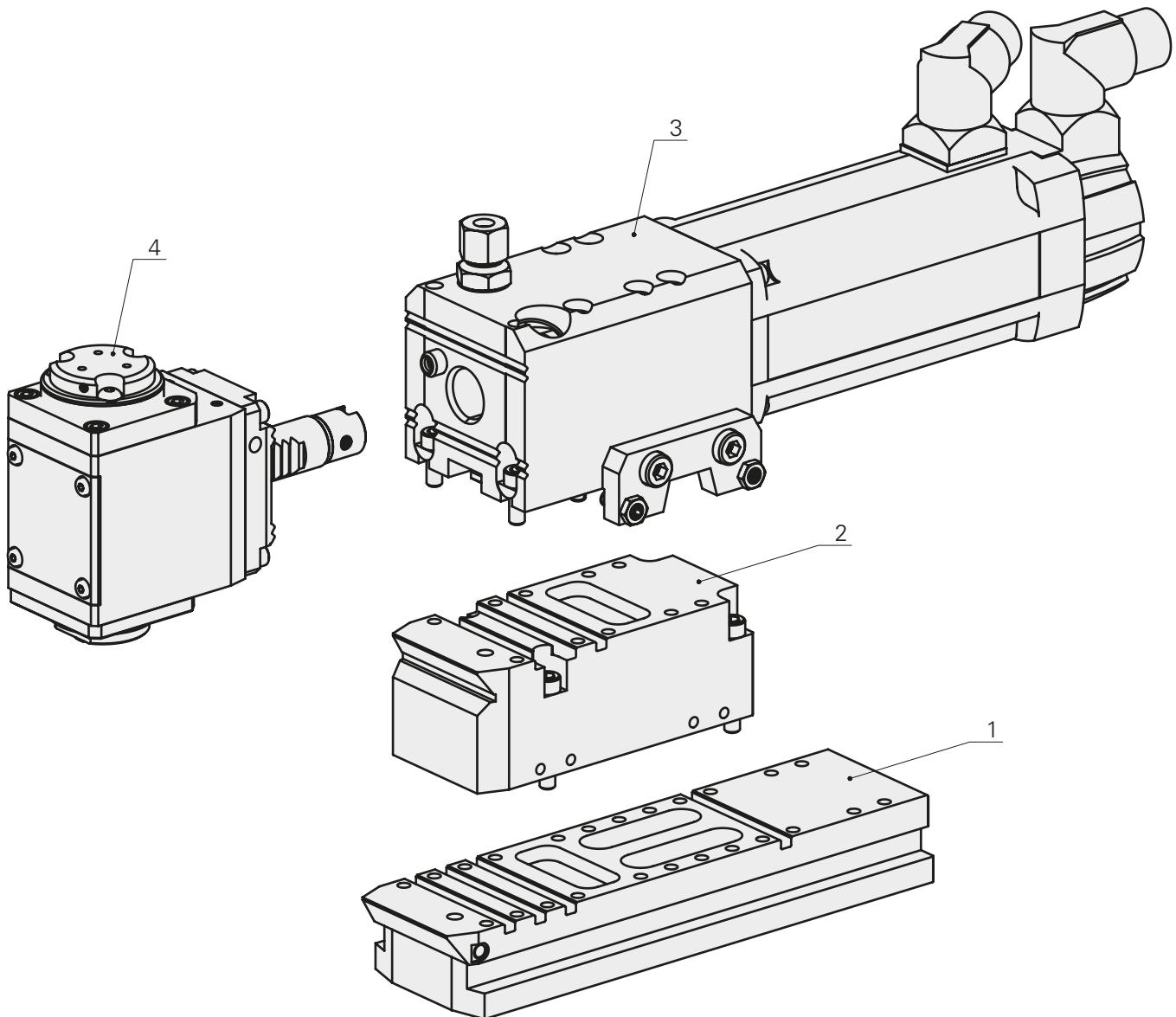
- 1 Cross slide unit 1.1, 2.2, 3.1, 4.2, 5.1
- 2 Intermediate plate as needed
- 3 Base holder
- 4 Drill holder, ø20mm/ø28.5mm

**Modular structure INDEX MS16-6/MS16-6Plus****Base holder with drill holder, D28.5mm****Drilling unit 1.2, 2.1, 3.2, 4.1, (5.2), machining in Z direction**

1 Drilling unit 1.2, 2.1, 3.2, 4.1, (5.2), shown x.2

2 Base holder

3 Drill holder, Ø28.5mm

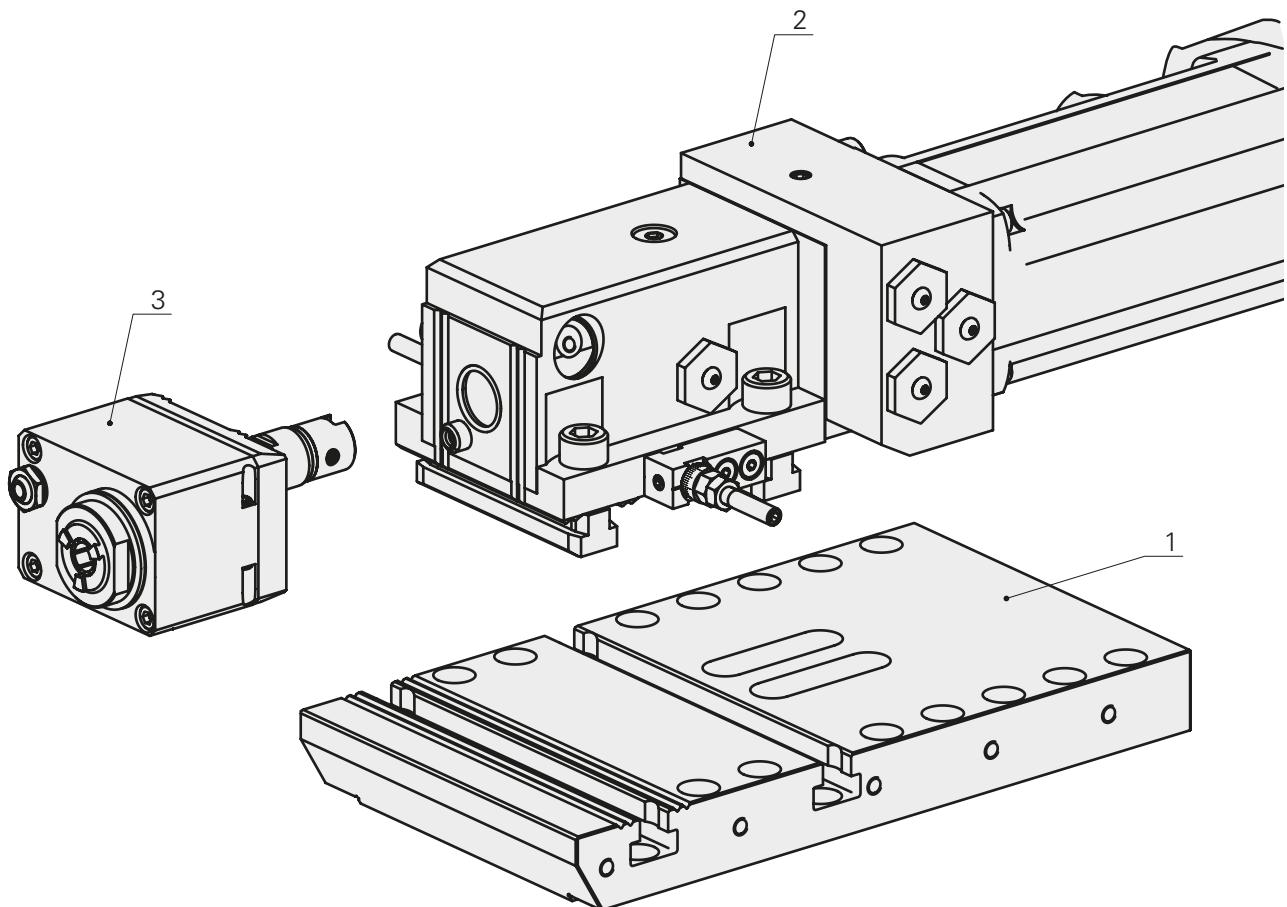
**Modular structure INDEX MS16-6/MS16-6Plus****Tool drive unit, shank VDI20****Cross slide unit 1.1, 2.2, 3.1, 4.2, 5.1, machining in X/Z direction**

1 Cross slide unit 1.1, 2.2, 3.1, 4.2, 5.1

2 Intermediate plate as needed

3 Base holder

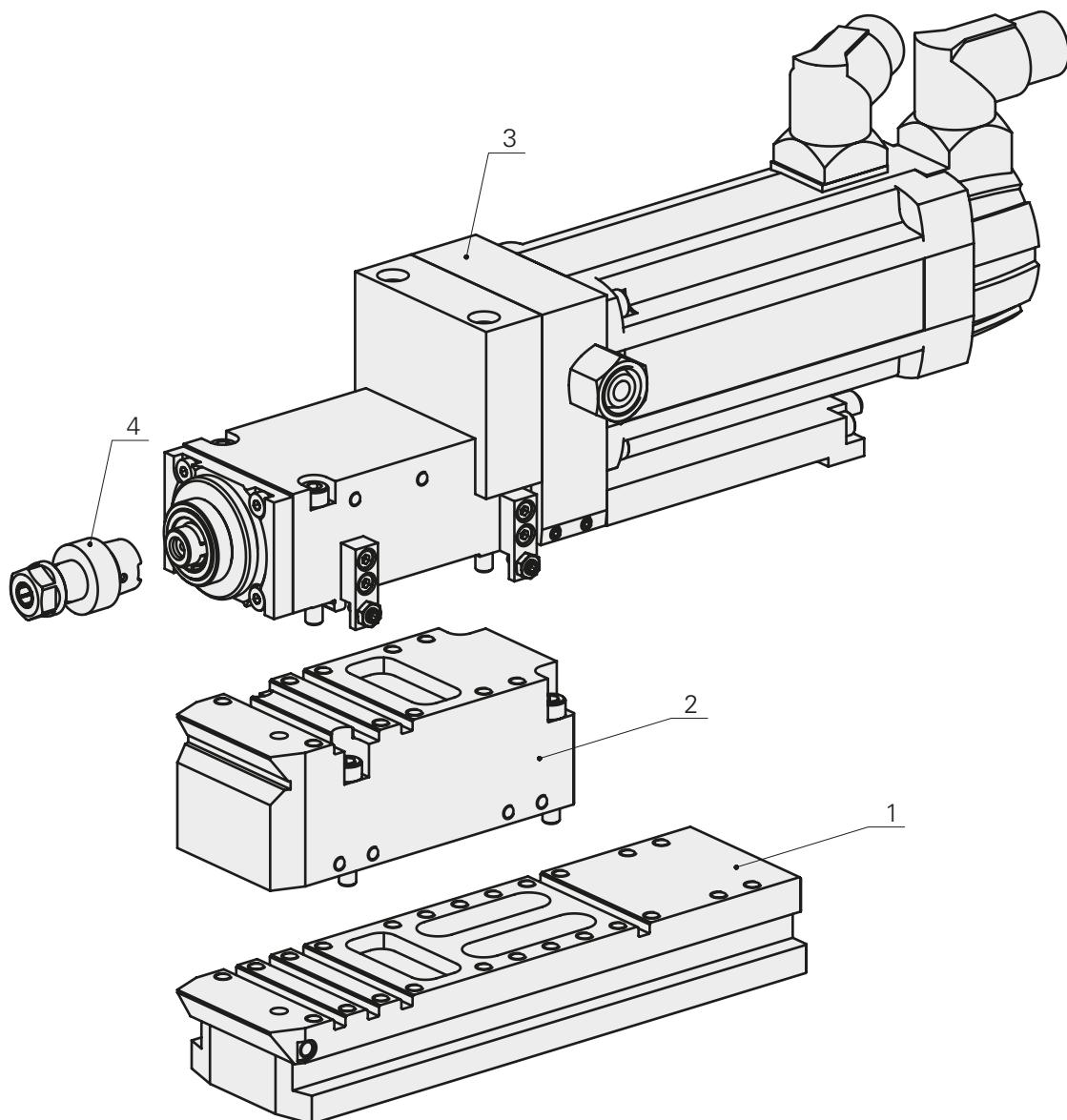
4 Tool holder VDI20

**Modular structure INDEX MS16-6/MS16-6Plus****Tool drive unit, shank VDI20****Grooving unit 1.2, 2.1, 3.2, 4.1, (5.2), machining in X direction**

1 Grooving unit 1.2, 2.1, 3.2, 4.1, (5.2)

2 Tool drive unit

3 Tool holder VDI20

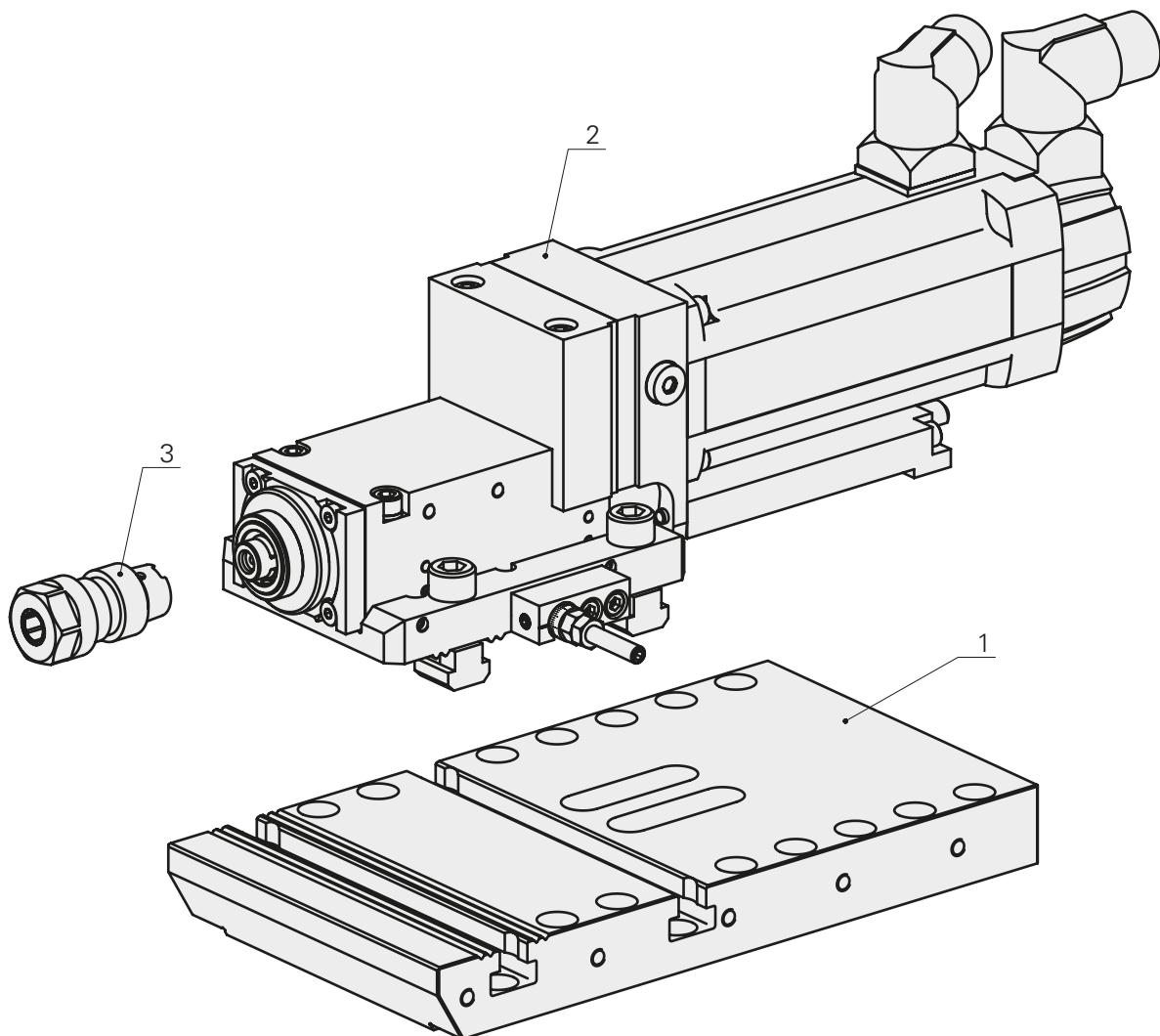
**Modular structure INDEX MS16-6/MS16-6Plus****Tool drive unit, shank HSK25C****Cross slide unit 1.1, 2.2, 3.1, 4.2, 5.1, machining in X/Z direction**

1 Cross slide unit 1.1, 2.2, 3.1, 4.2, 5.1

2 Intermediate plate as needed

3 Tool drive unit

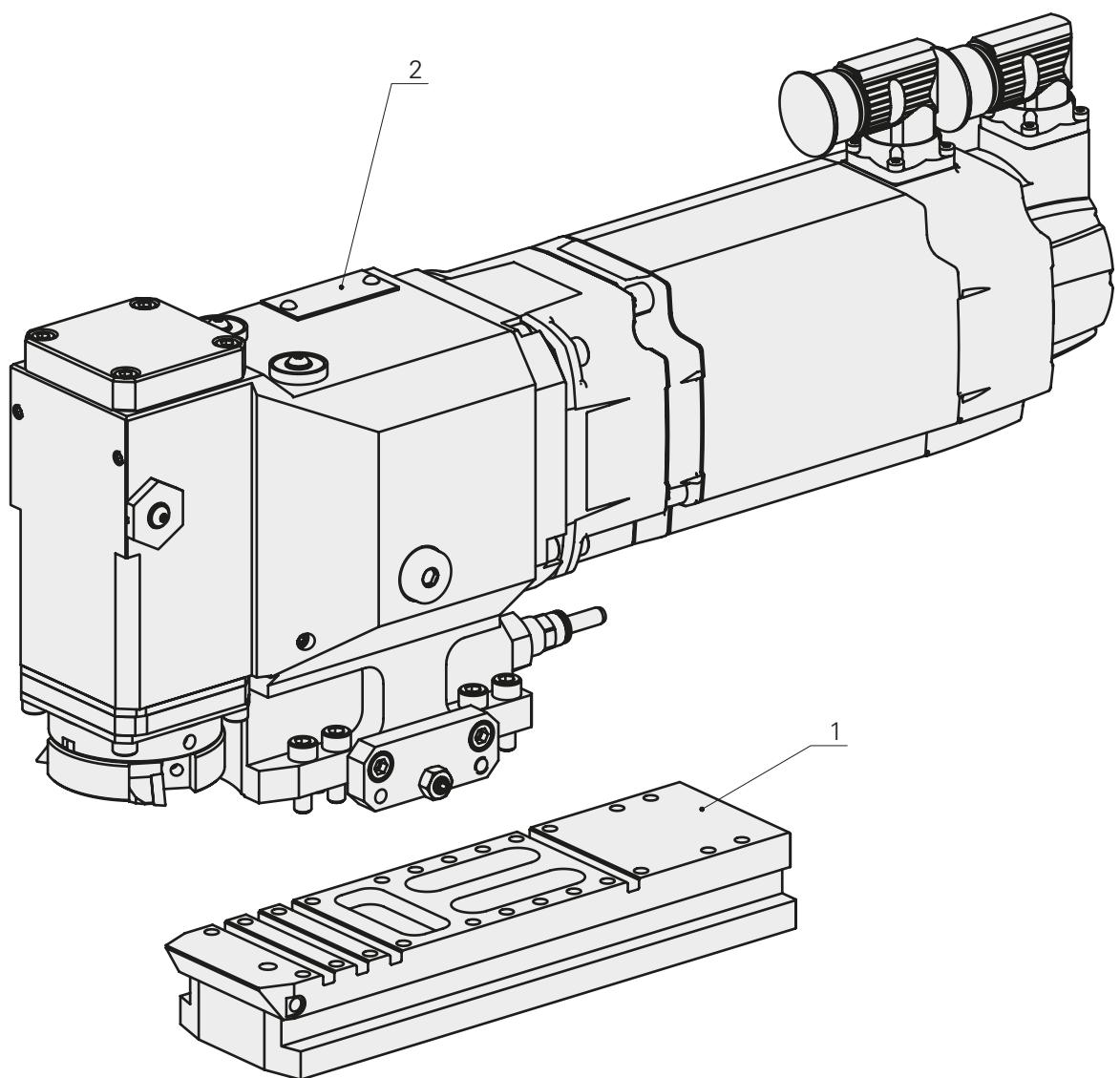
4 Tool holder HSK25C

**Modular structure INDEX MS16-6/MS16-6Plus****Tool drive unit, shank HSK25C****Grooving unit 1.2, 2.1, 3.2, 4.1, (5.2), machining in X direction**

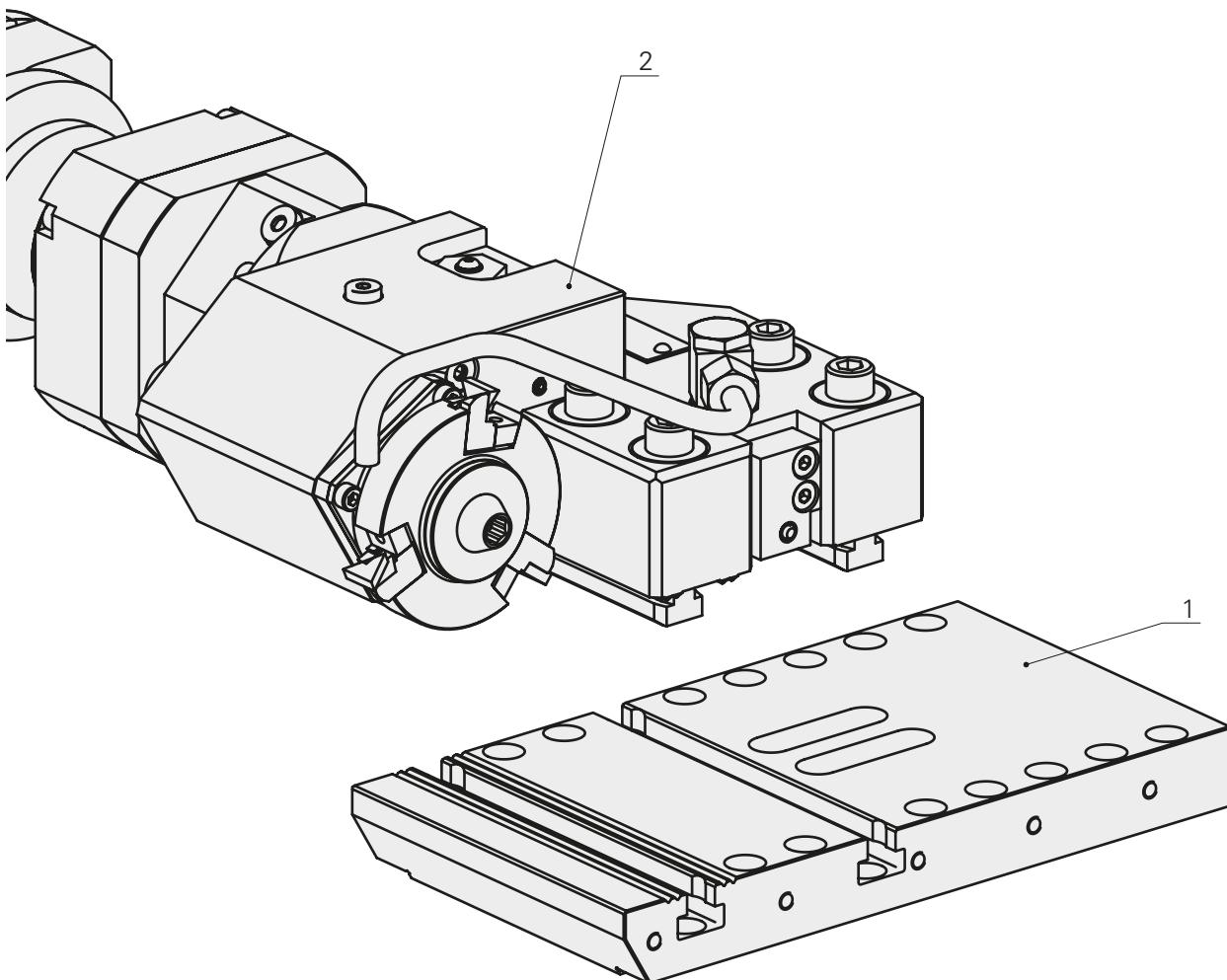
1 Grooving unit 1.2, 2.1, 3.2, 4.1, (5.2)

2 Tool drive unit

3 Tool holder HSK25C

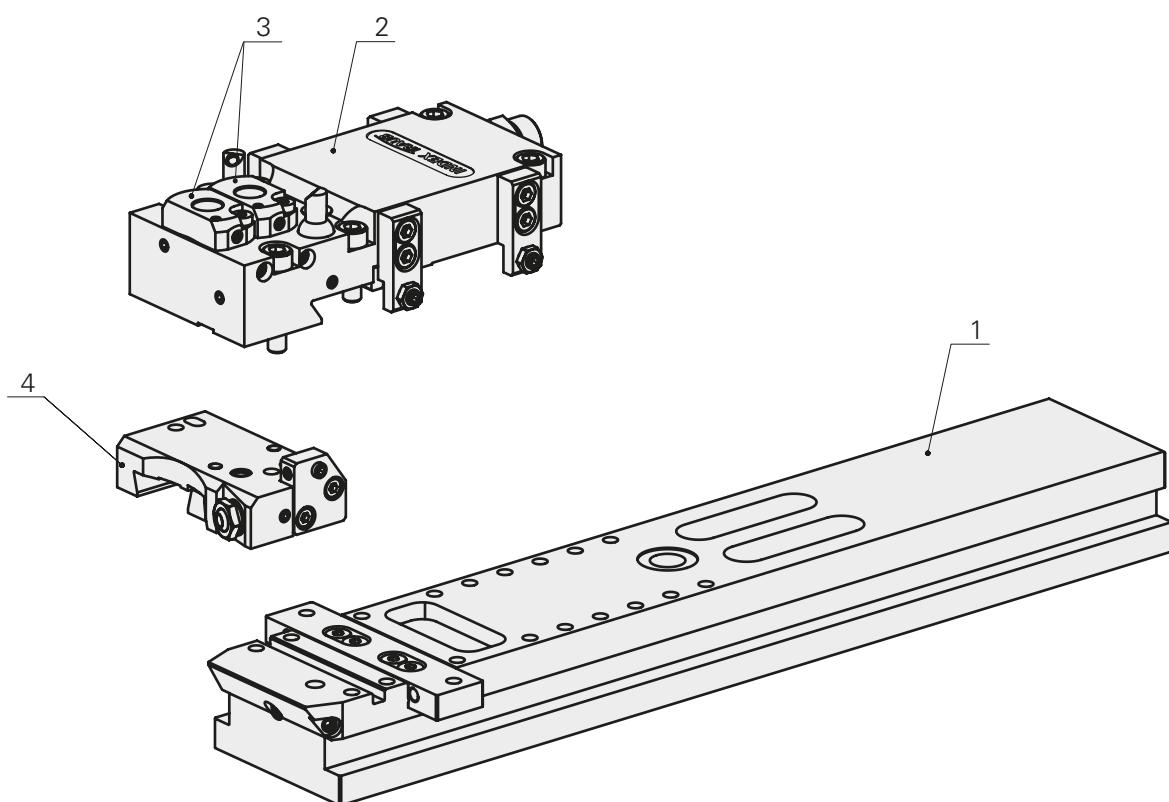
**Modular structure INDEX MS16-6/MS16-6Plus****Polygon turning unit****Cross slide unit 1.1, 2.2, 3.1, 4.2, 5.1, machining in X/Z direction**

- 1 Cross slide unit 1.1 - 6.2
- 2 Polygon turning unit

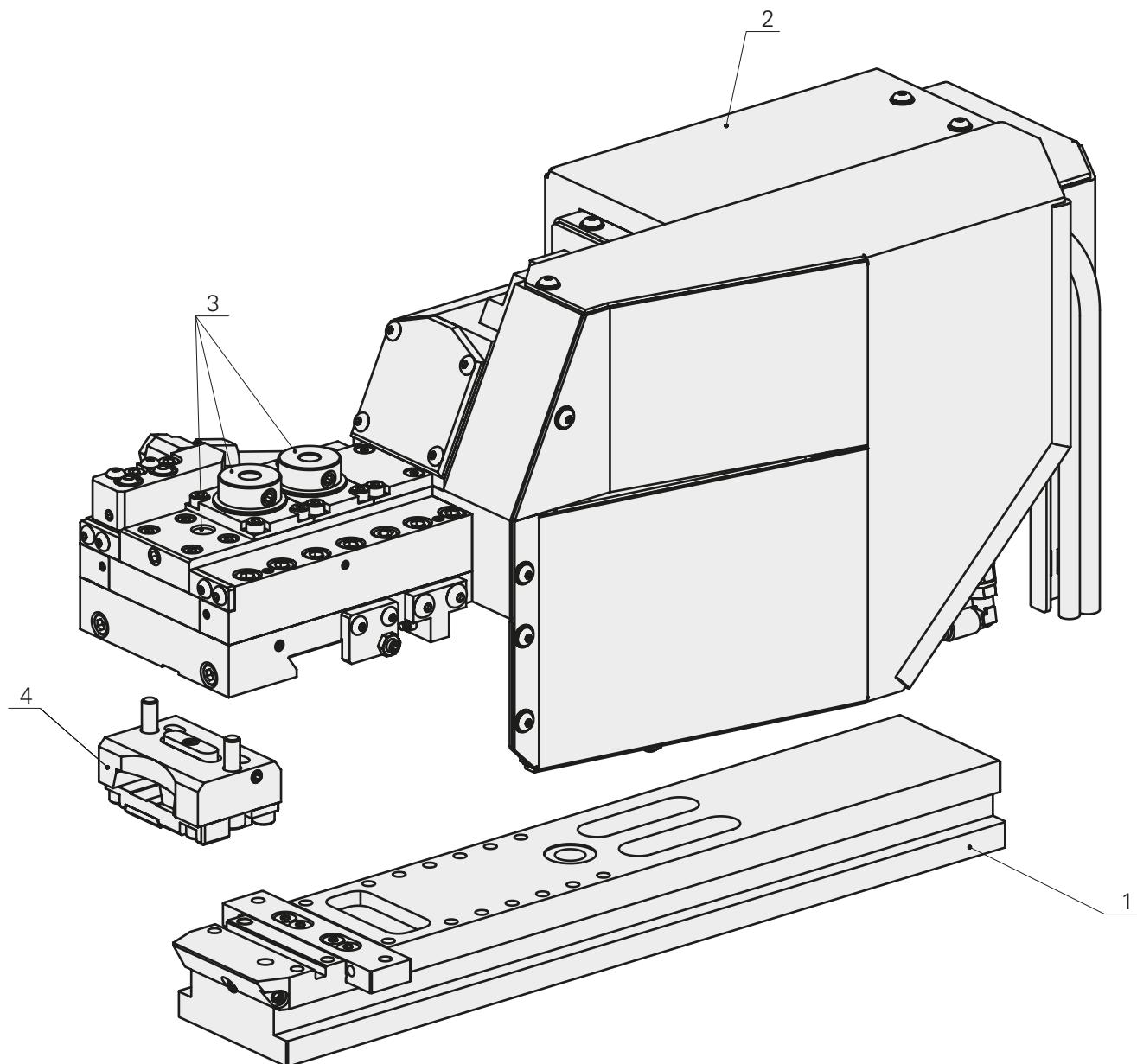
**Modular structure INDEX MS16-6/MS16-6Plus****Polygon turning unit****Grooving unit 1.2, 2.1, 3.2, 4.1, (5.2), machining in X direction**

1 Grooving unit 1.2, 2.1, 3.2, 4.1, (5.2)

2 Polygon turning unit

**Modular structure INDEX MS16-6/MS16-6Plus****Rear end machining unit, rigid****Cross slide unit 6.2, (5.2), machining in X/Z direction**

- 1 Cross slide unit 6.2, (5.2)
- 2 Grooving and back-boring tool holder
- 3 Mounting, fixed
- 4 Grooving tool holder block

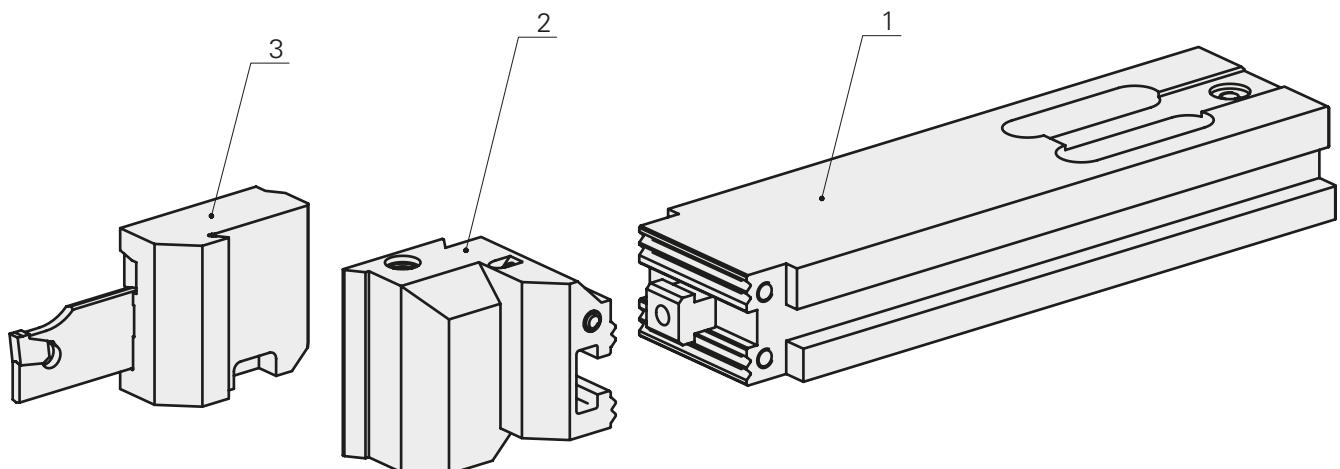
**Modular structure INDEX MS16-6/MS16-6Plus****Rear end machining unit****Cross slide unit 6.2, (5.2), machining in X/Z direction**

1 Cross slide unit 6.2, (5.2)

2 Rear end machining unit

3 Mounting fixed / live

4 Grooving tool holder block

**Modular structure INDEX MS16-6/MS16-6Plus****Base holder with grooving tool holder block****Grooving unit 5.0, 6.0, machining in X direction**

- 1 Grooving unit 5.0, 6.0
- 2 Base holder
- 3 Grooving tool holder block

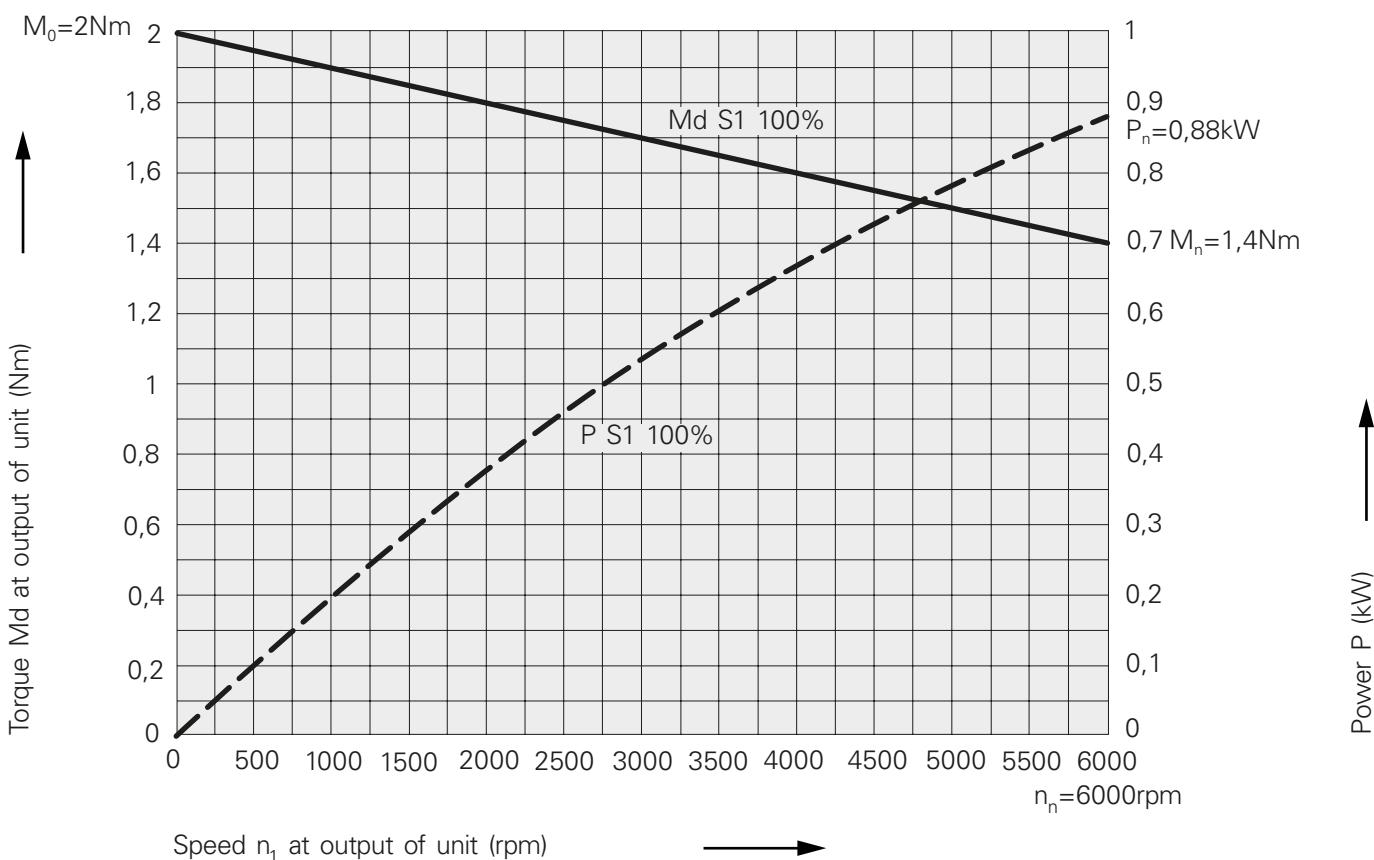
## Performance diagram

### Tool drive unit VDI20, i=1, cross slide unit

Speed range 0-6000 rpm



For information on how to use the diagram, see  
Chapter "Technical Information".



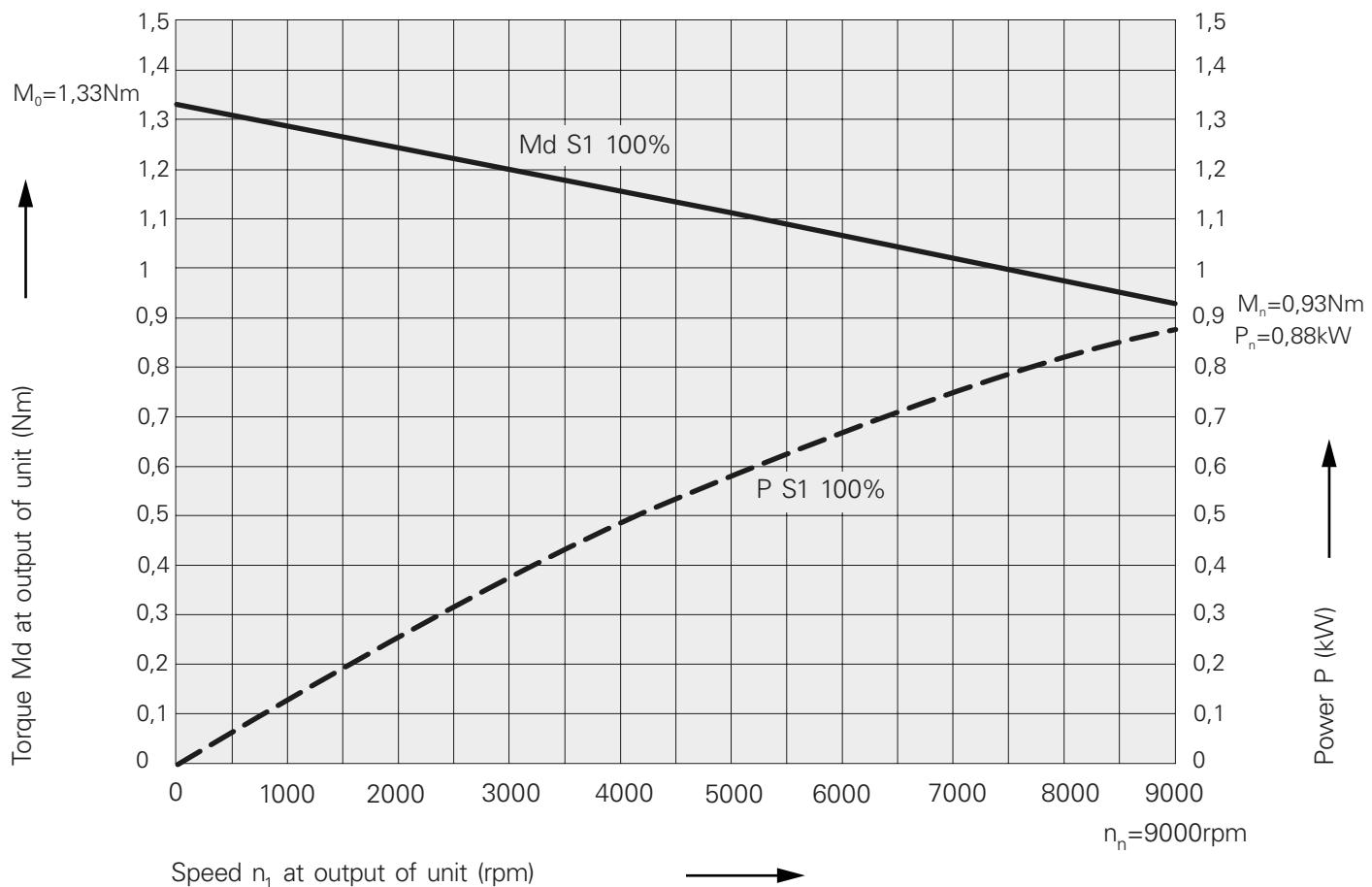
## Performance diagram

**Tool drive unit VDI20,  $i=0.66666$ , grooving unit**

Speed range 0-9000 rpm



For information on how to use the diagram, see  
Chapter "Technical Information".



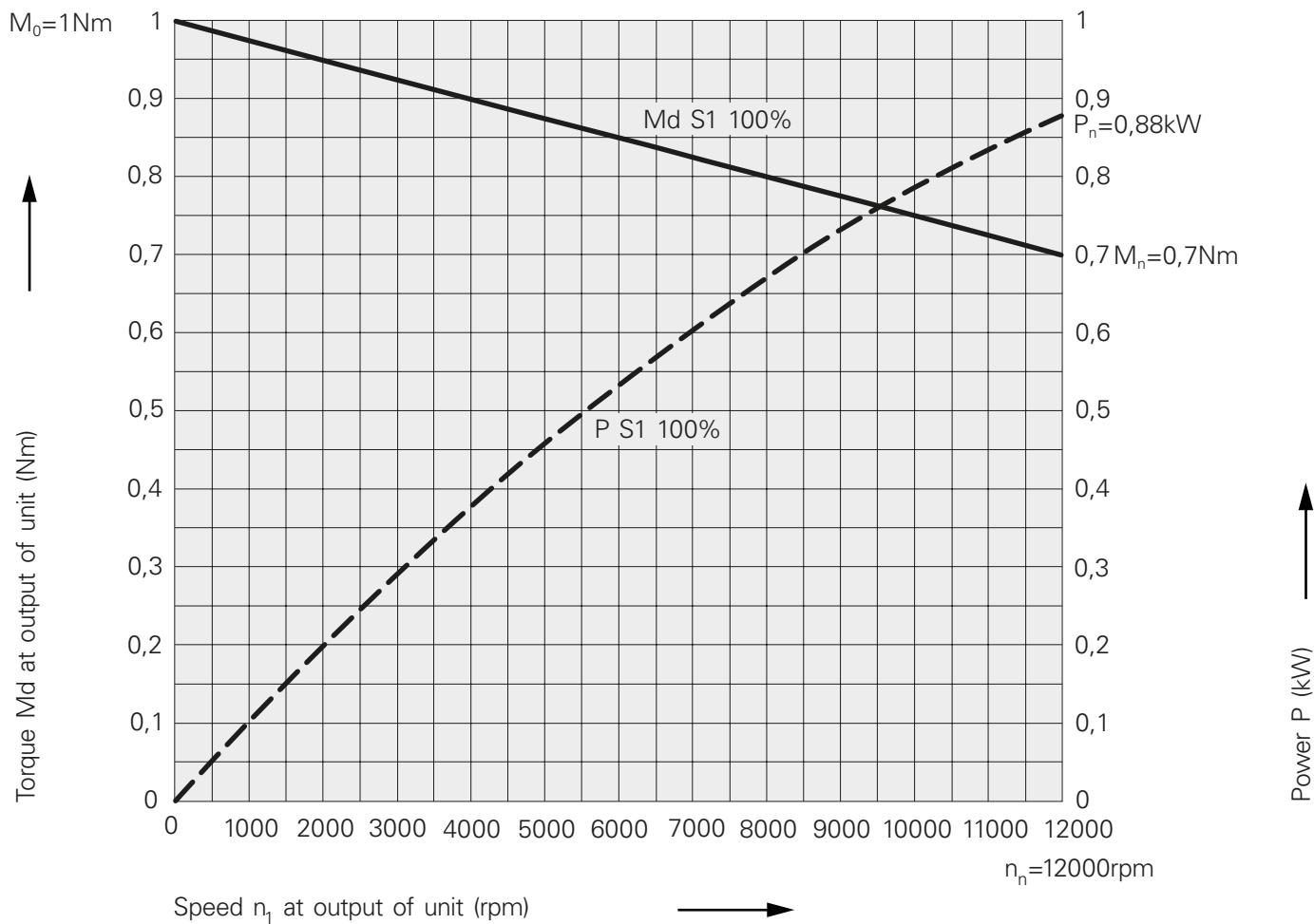
## Performance diagram

**Milling spindle transverse, HSK25C, i=0.5, cross slide unit and grooving unit**

Speed range 0-12000 rpm



For information on how to use the diagram, see Chapter "Technical Information".



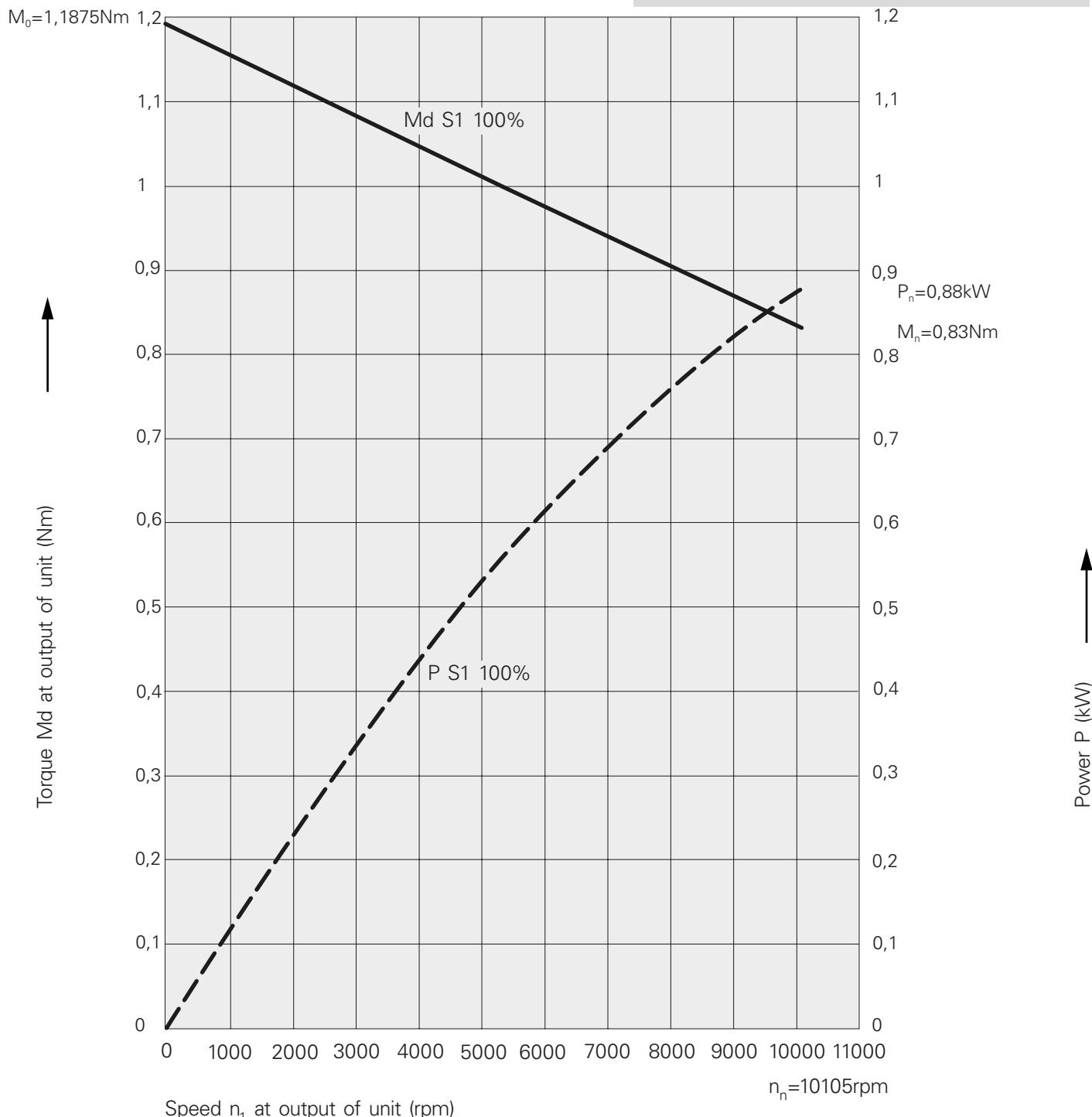
## Performance diagram

Milling spindle paraxial, HSK25C,  $i=0.59375$ , cross slide unit

Speed range 0-10000 rpm



For information on how to use the diagram, see Chapter "Technical Information".



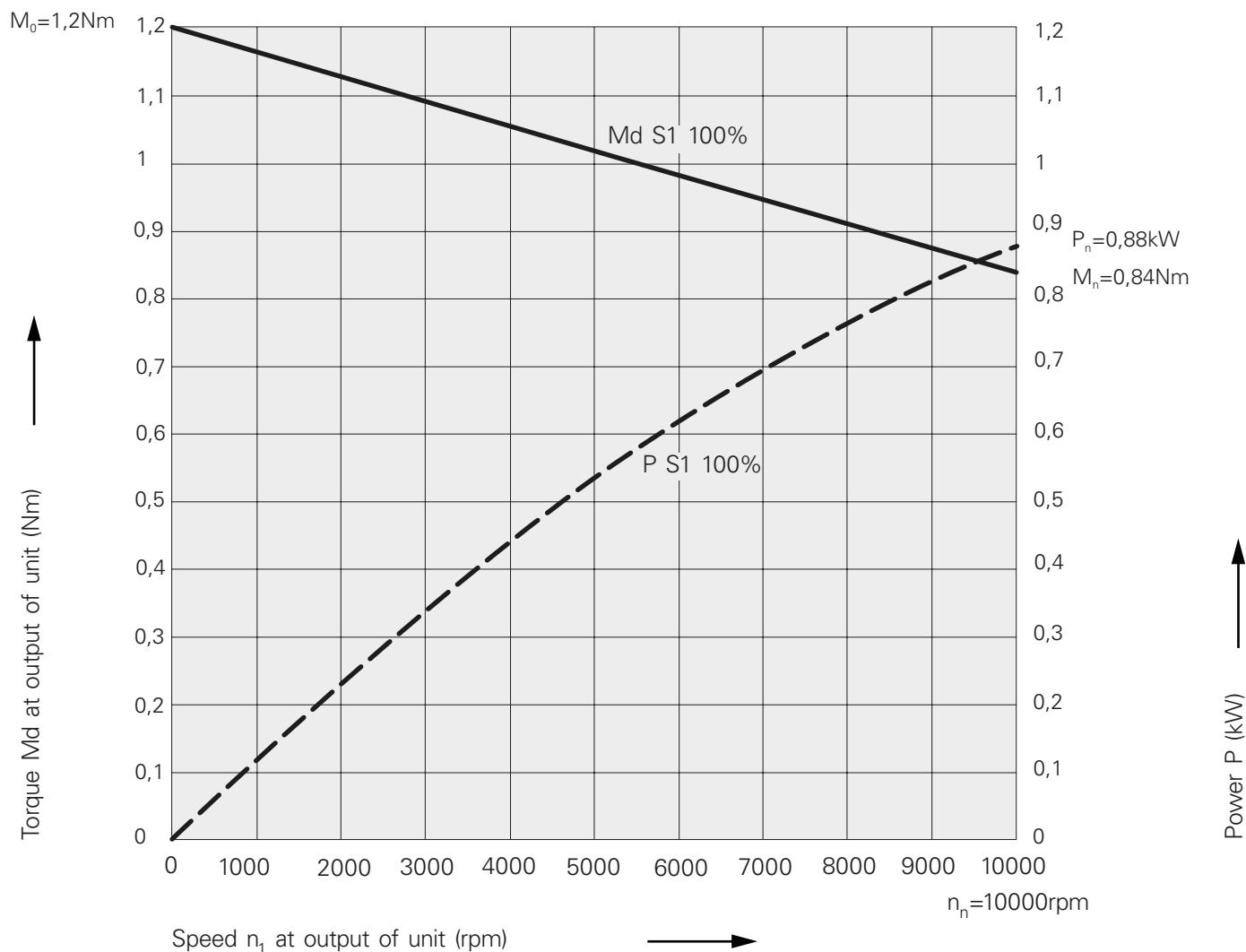
## Performance diagram

**Milling spindle transverse, HSK25C, i=0.6, cross slide unit**

Speed range 0-10000 rpm



For information on how to use the diagram, see Chapter "Technical Information".



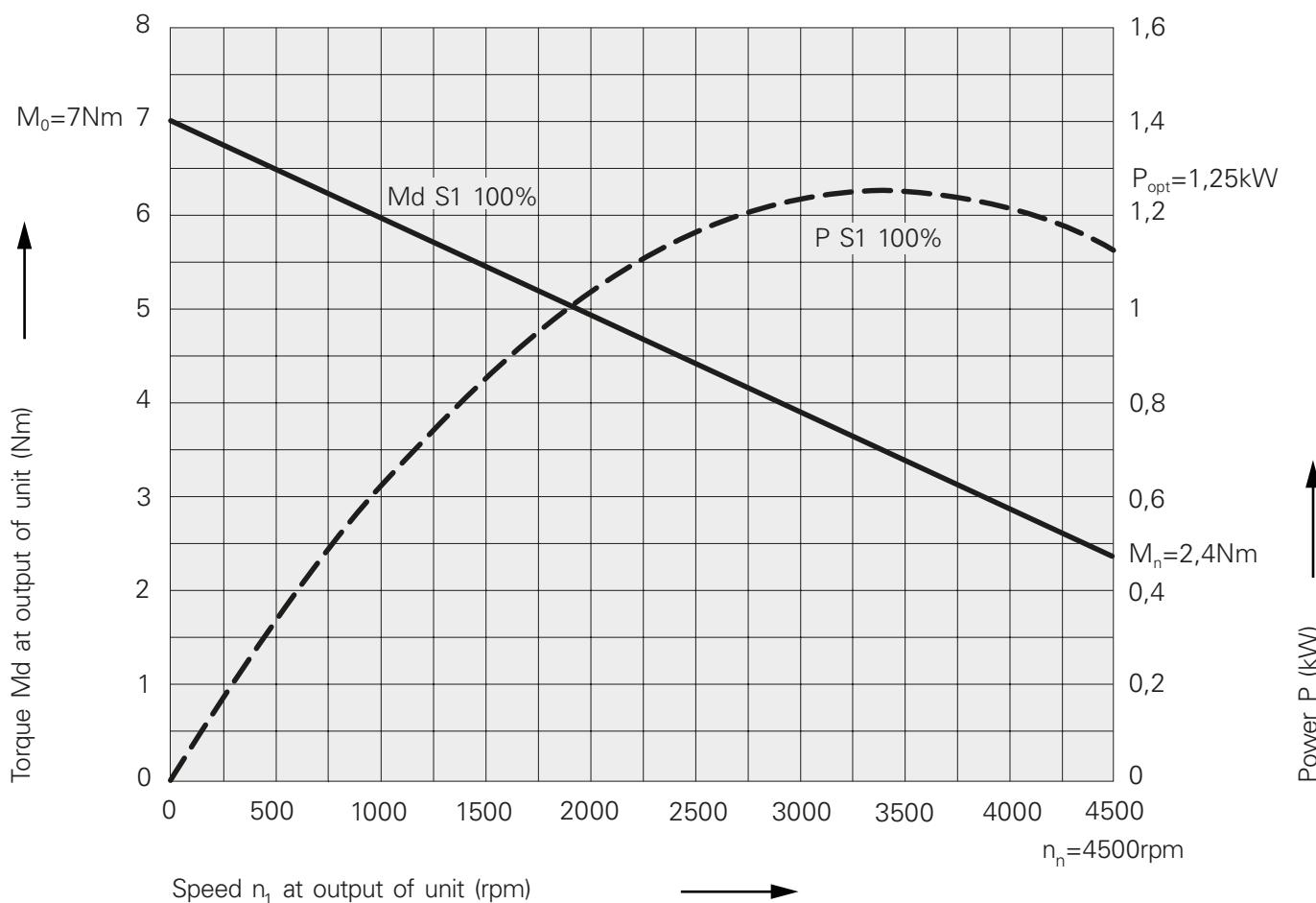
## Performance diagram

**Polygon turning unit  $i=1$ , cross slide unit and grooving unit**

Speed range 0-4500 rpm



For information on how to use the diagram, see  
Chapter "Technical Information".



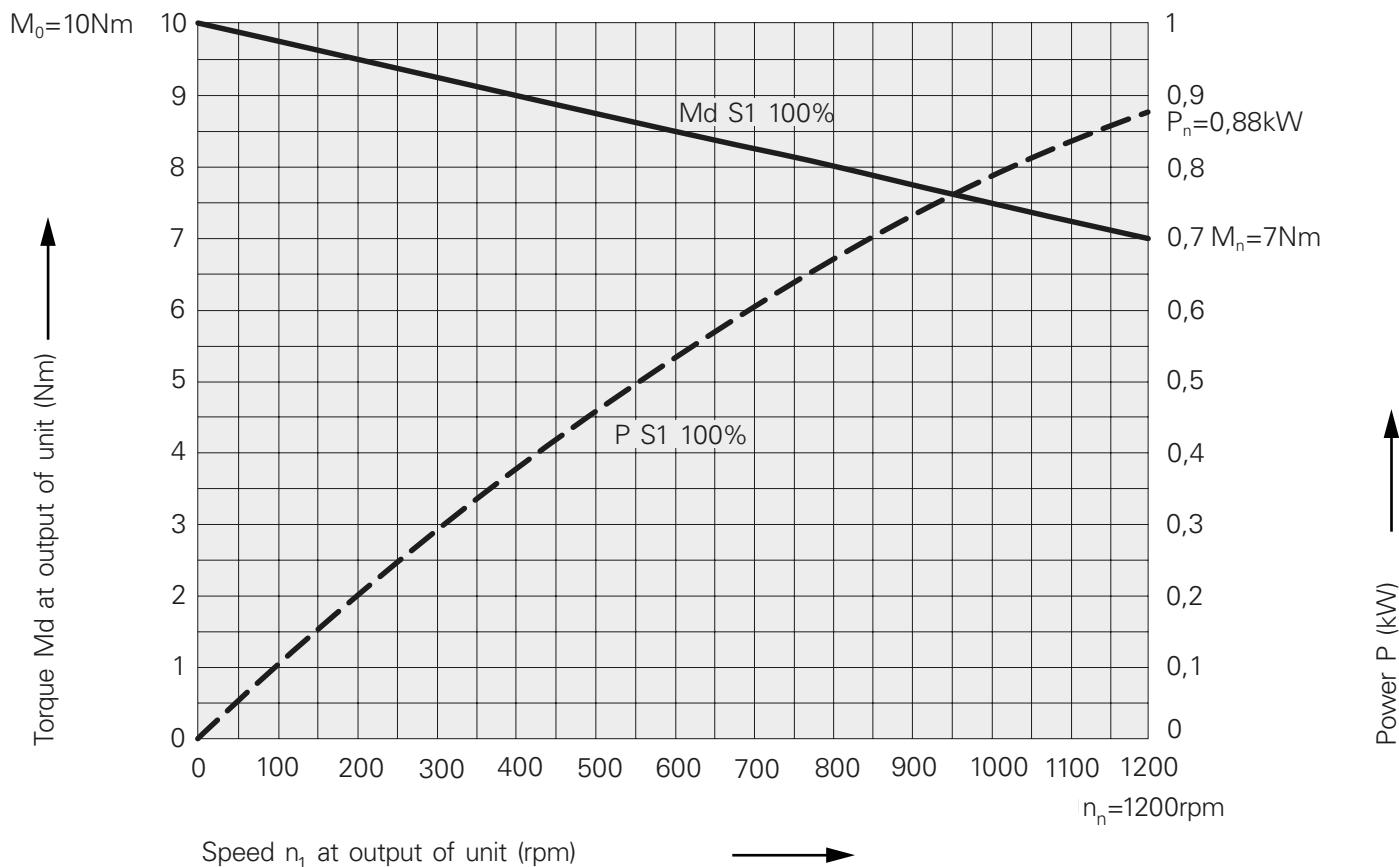
## Performance diagram

### Polygon turning unit i=5, cross slide unit

Speed range 0-1200 rpm



For information on how to use the diagram, see  
Chapter "Technical Information".



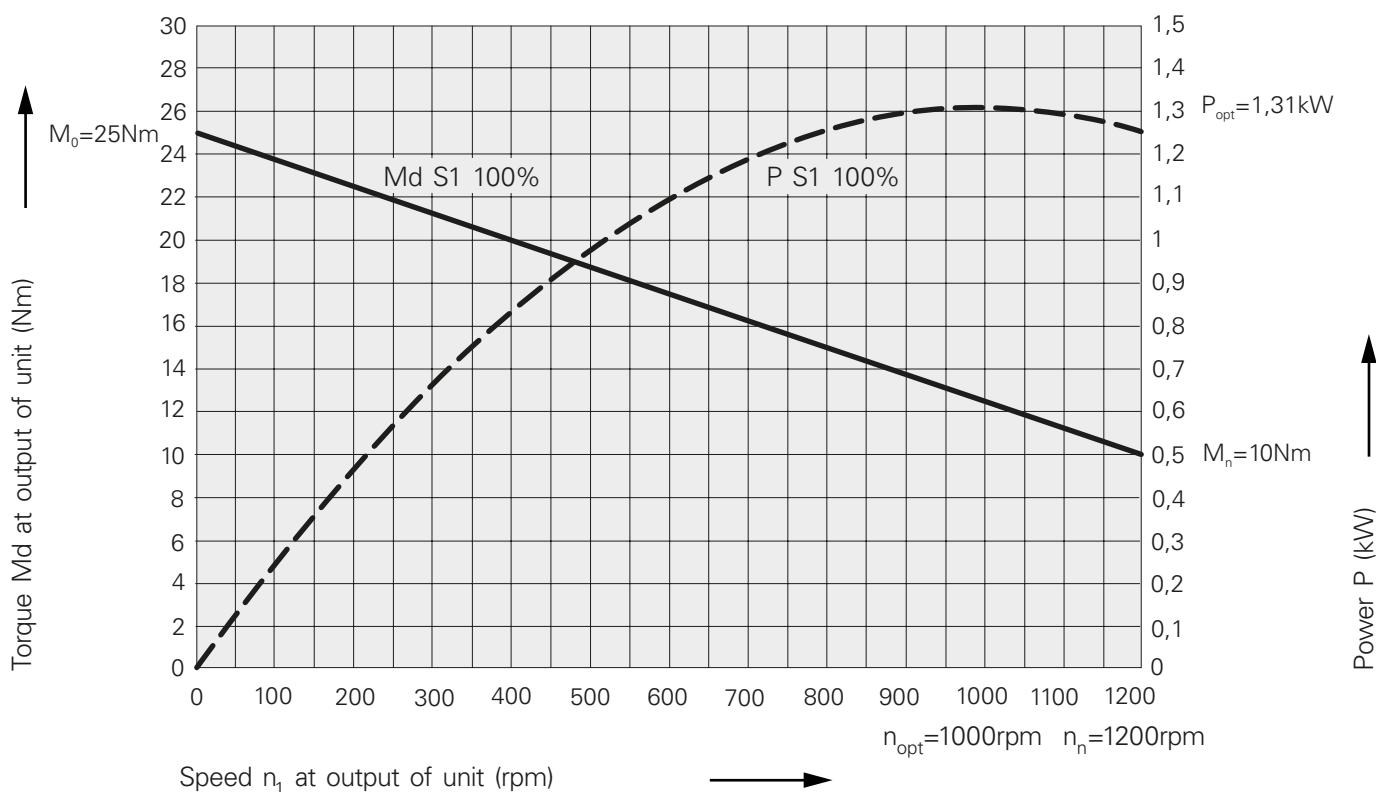
## Performance diagram

Polygon turning unit  $i=5$ , grooving unit

Speed range 0-1200 rpm



For information on how to use the diagram, see  
Chapter "Technical Information".



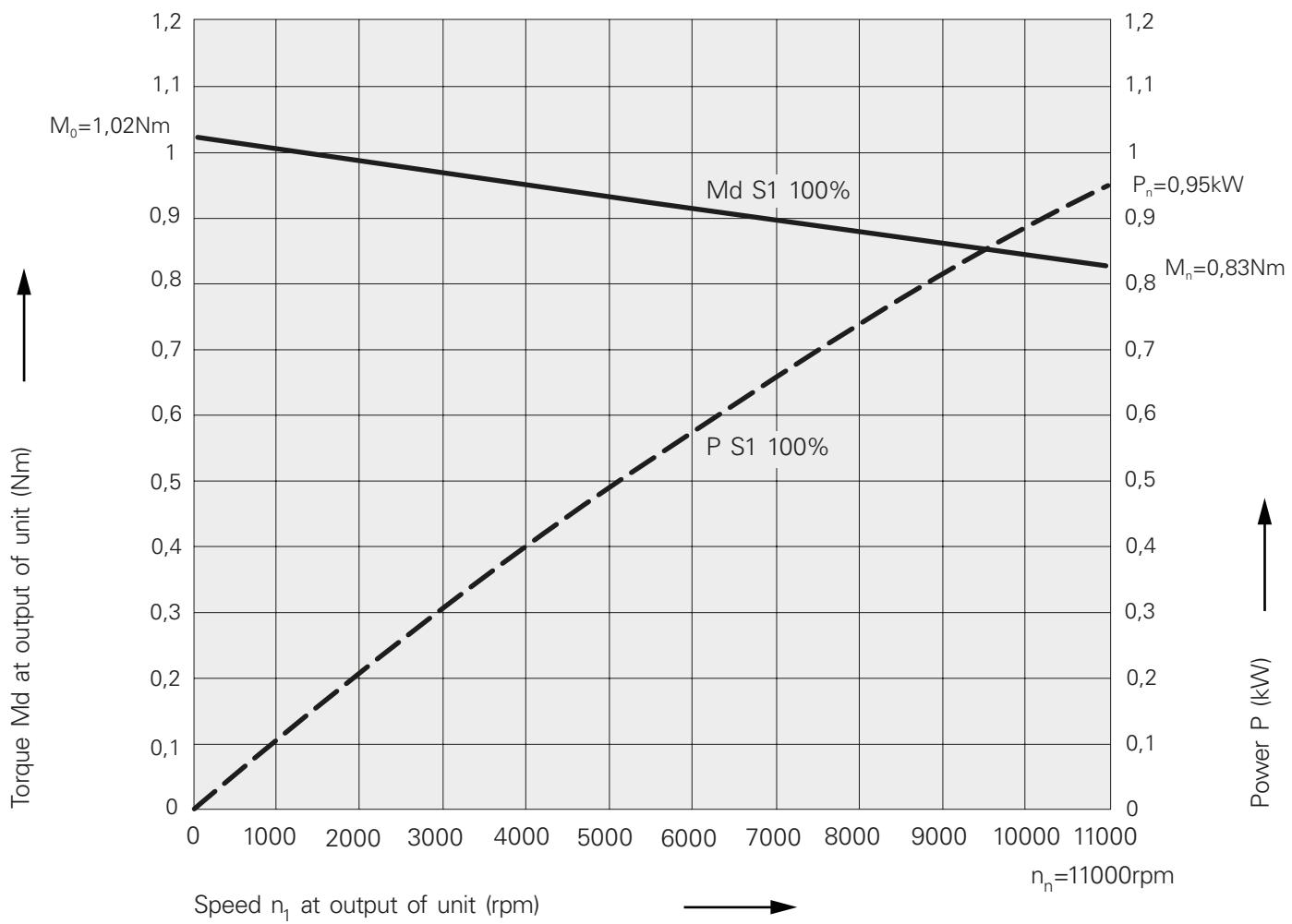
## Performance diagram

**Rear end machining unit  $i=0.5$ , cross slide unit 6.2, (5.2)**

Speed range 0-11000 rpm



For information on how to use the diagram, see Chapter "Technical Information".





# INDEX

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