INDEX


# INDEX MS24-6

Tool holder Technical Information

## Note on applicability

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

## A word on copyright

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## Tool holder selection

For more information, please visit our iXshop
at ixshop.ixworld.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.

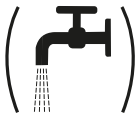
The drive pinion and drive clutch of the live tool holders must be subjected to a visual inspection for damage or wear.

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
Plochinger Straße 92
D-73730 Esslingen
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).

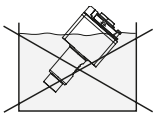


Tool holders marked with this symbol can be converted from external cooling lubricant supply to internal cooling lubricant supply.
Observe dry running capability of IC attachment!

## 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 ≤ 50 µm.

## 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).

$n_{prog} = n_{tool} \times i$

$n_{tool}$ = speed at the cutting tool edge

$n_{PROG}$ = speed to be programmed

i = speed ratio in the tool holder

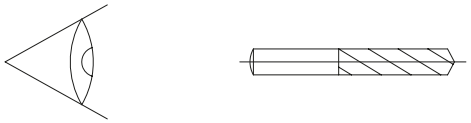
This means the speed increase or speed reduction is not specified as a fraction but as **a number**.

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:

↷ M03 ↶ M04

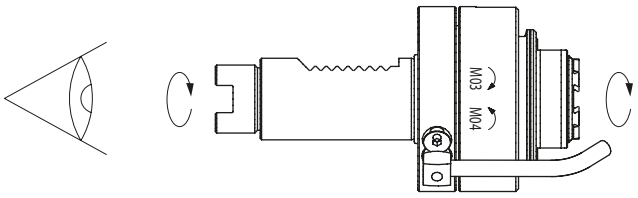
**No reversal of direction of rotation**
When the holder drive shaft has the **same** direction of rotation as the tool cutting edge, the clockwise direction of run must be specified by M03 (clockwise rotation). Accordingly, counter-clockwise rotation must be specified by M04.

↶ M04 ↷ M03

**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 | Material number | Installation location |
|---|---|---|
| ø 18,77 x 1,78 | 10763730 | Shank ø 20mm |
| ø 23,52 x 1,78 | 10823023 | Shank ø 25mm |
| ø 9,75 x 1,78 | 10046965 | Cooling lubricant adapter |

## 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.

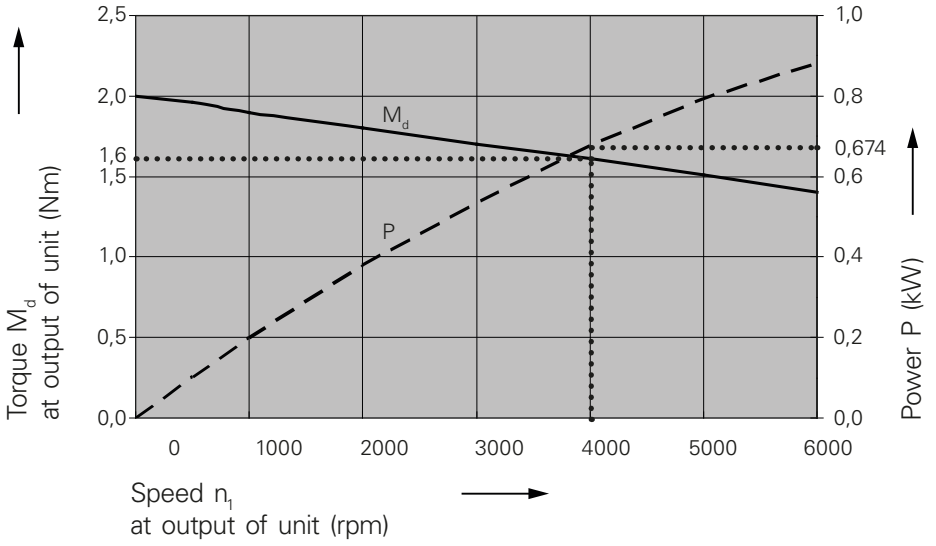
## Notes on how to use the diagram when using tool holders

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 ≠ 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 $n_{Tool}$ = 1000 rpm** | |
|---|---|
| Internal speed ratio i<br>of the tool holder | i = 4 |
| Programmed speed $n_{prog}$<br>for the drive of the unit | $n_{prog} = n_{Tool} * i = 1000 \text{ rpm} * 4 = 4000 \text{ rpm}$ |
| Torque $M_{Tool}$<br>at the output of the tool holder | Read-out $M_d$ at speed $n_{prog}$ = 4000 rpm = 1.6 Nm<br>$M_d = M_{Tool}: i$<br>Formula changed: $M_{Tool} = M_d * i = 1.6 \text{ Nm} * 4 = 6.4 \text{ Nm}$ |
| Power P<br>at the output of the tool holder<br>≈ Power P<br>at the output of the setup | Read-out at 4000 rpm –> P = 0.67 kW<br>calculated: $P = 2 * \pi * n_{prog} * M_d$<br>$P = \frac{2 * \pi \times 4000 * 1.6 \text{ Nm}}{60 * 1000} = 0.67 \text{ kW}$ |

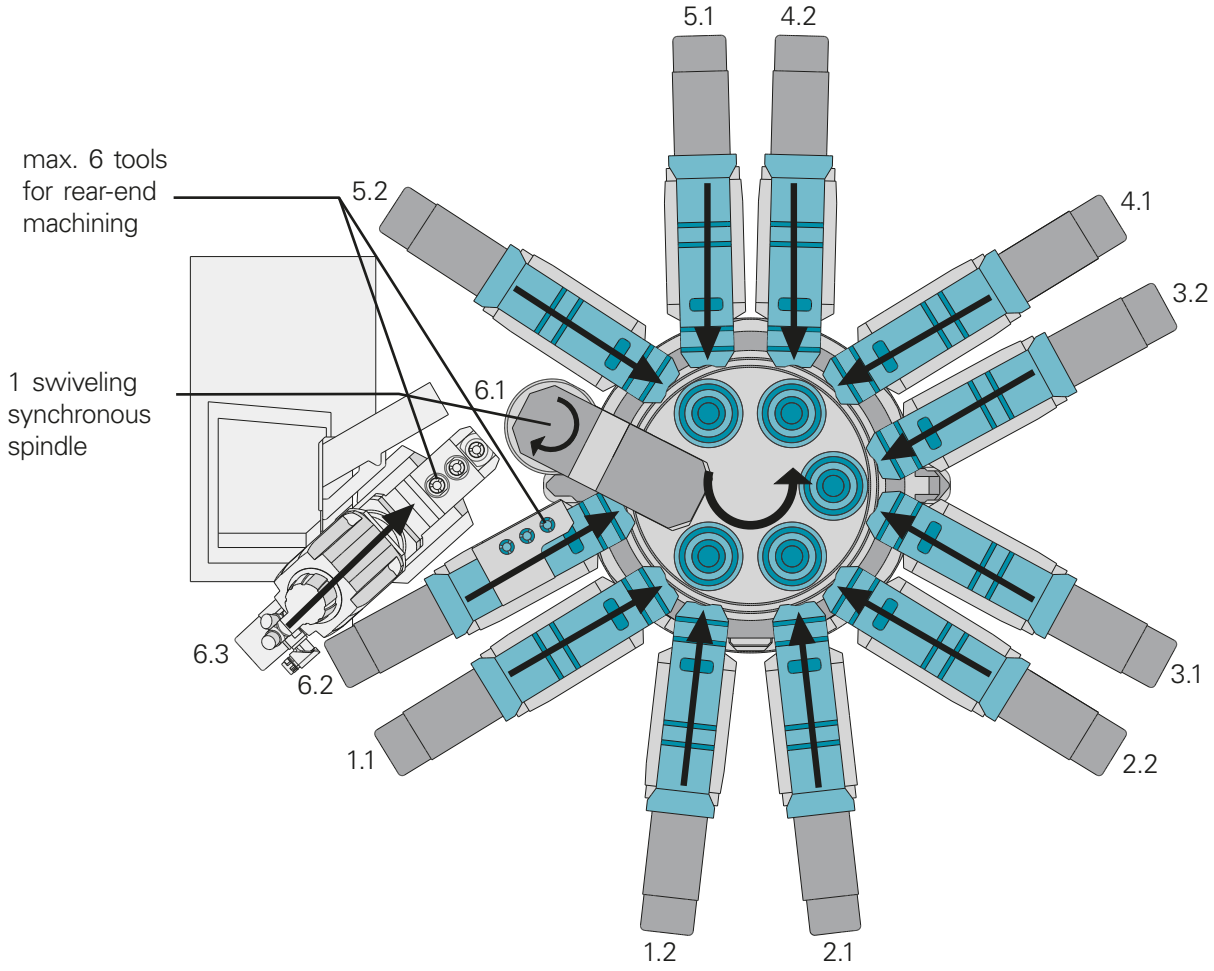



The transmission ratio and the technical data of each tool holder are available in our iXshop at ixshop.ixworld.com

# Machine concept of the INDEX MS24-6

## Fully equipped with one synchronous spindle

## Machining with six spindles




**Fully equipped**

- A maximum of 12 tool carriers with 1 or 2 travel axes
- Y axes (optional)
- 1 or 2 synchronous spindles
- Variable use of tool carriers for internal and external machining
- Use of several tools per tool carrier possible
- Transverse machining with live tools
- C axis and polygon turning for extended use options

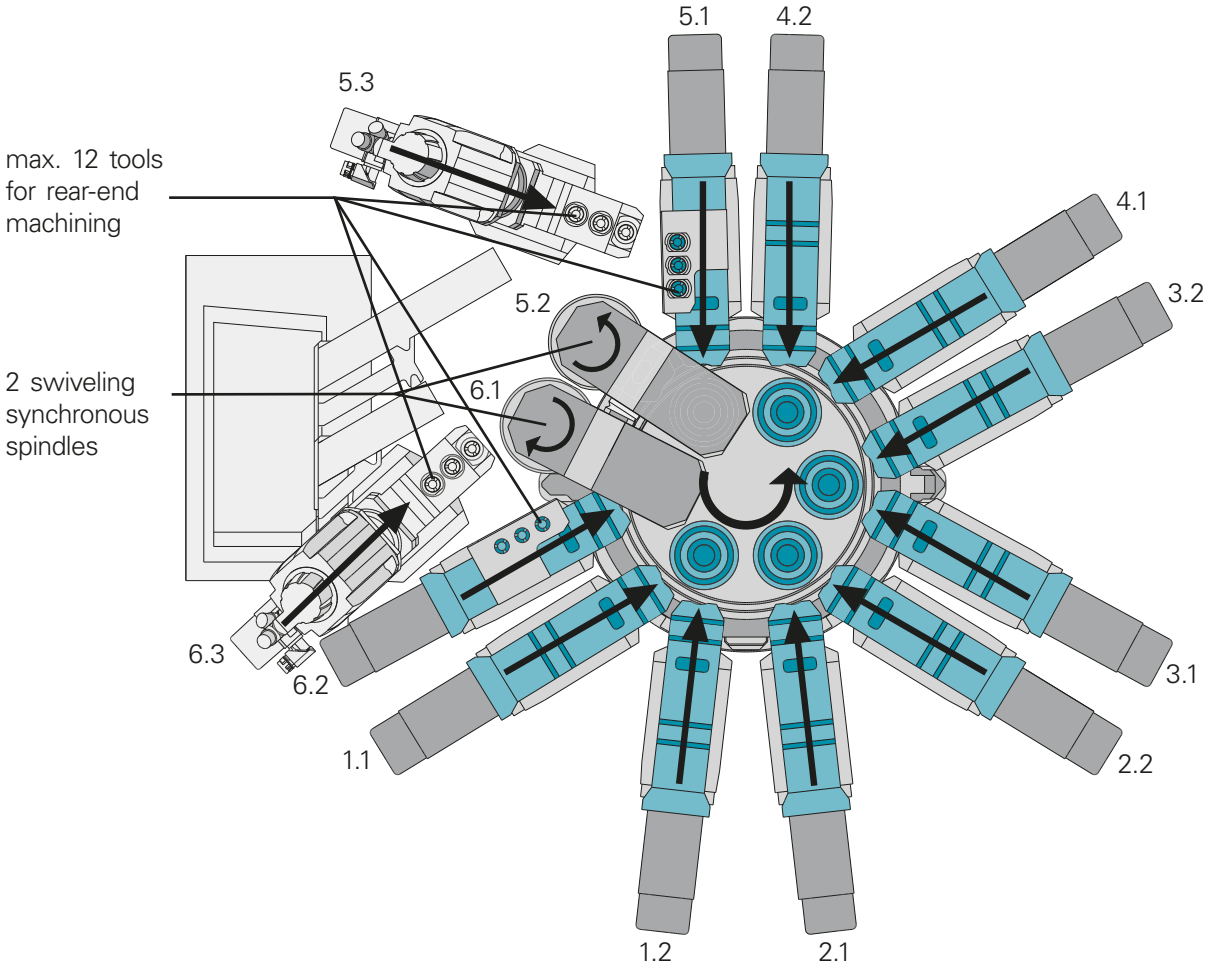
**Rear-end machining with swiveling synchronous spindle**

- Up to 6 tools, 3 of which are live
- Fast swivel motion and hydraulic locking of the swiveling synchronous spindle using a Hirth coupling
- Favorable chip flow due to machining outside the main working area
- Numerous machining options using live tools in conjunction with C and Y axes, and also with an electronic shaft

# Machine concept of the INDEX MS24-6

## Fully equipped with two synchronous spindles

## Double three-spindle machining or six-spindle machining with simultaneous rear-end machining in two spindle positions




**The double three-spindle machine – for maximum work output**

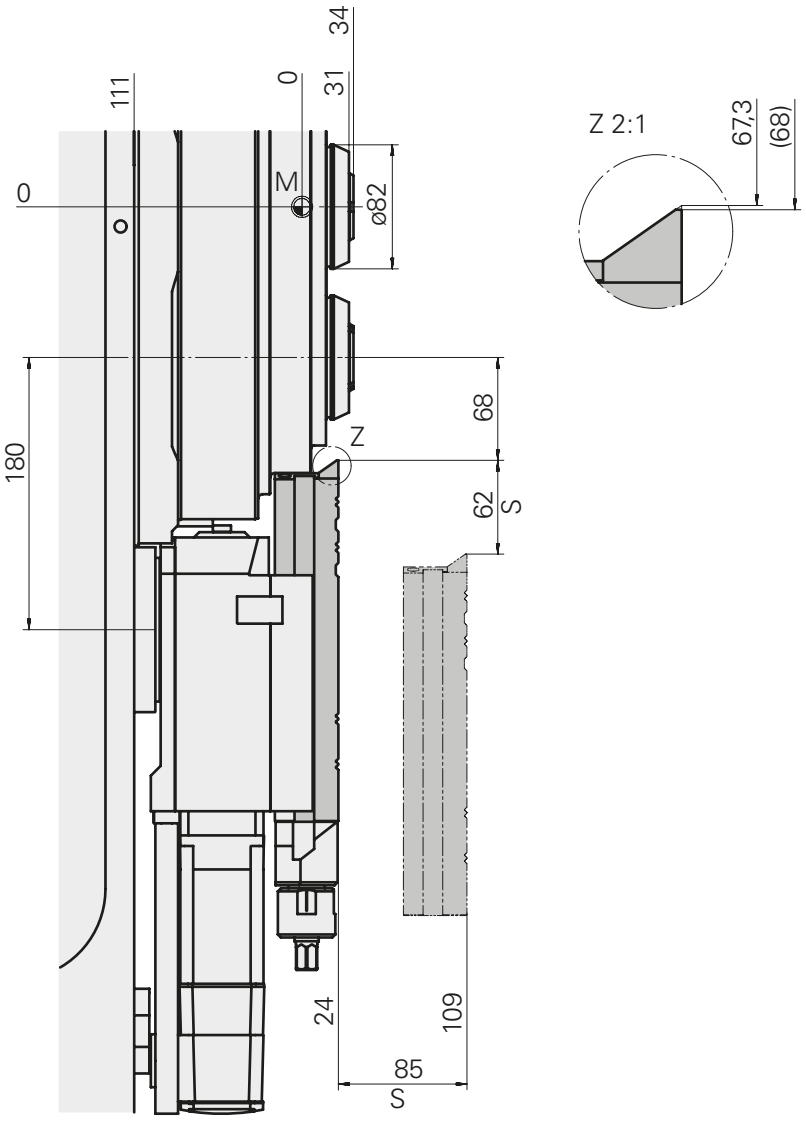
- Additional part production time, reduced as a result of the simultaneous manufacturing of 2 workpieces
- 10 tool carriers with 1 or 2 axes (optionally also Y axis)
- 2 swiveling synchronous spindles
- 2 back-boring slides (option) with 3 tools each, of which up to 2 are live tools

**With the same equipment level as a 6-spindle machine and simultaneous rear-end machining in two spindle positions**

- Front-end machining on 4 main spindles
- Simultaneous cutoff-side machining on 2 swiveling synchronous spindles

# Travel of cross slide unit INDEX MS24-6

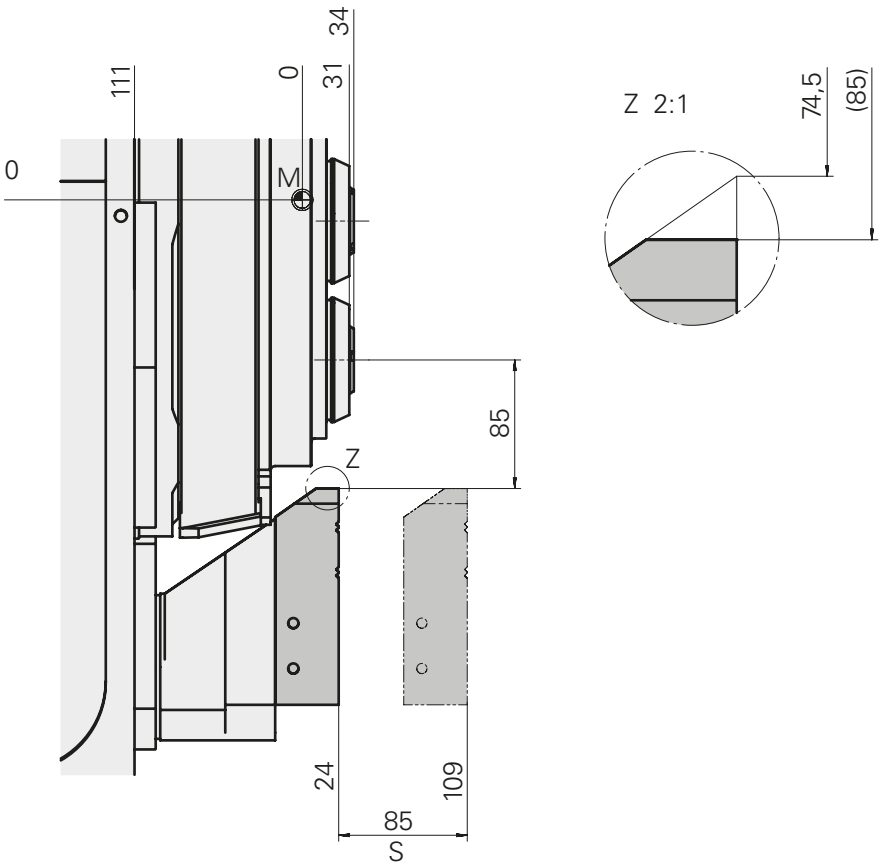
## Cross slide unit X-NC 1.1 - 6.2




S = travel of cross slide unit

# Travel of cross slide unit INDEX MS24-6

## Cross slide unit X-rigid 1.1, 1.2, 2.1, 3.2, 4.2, 5.2

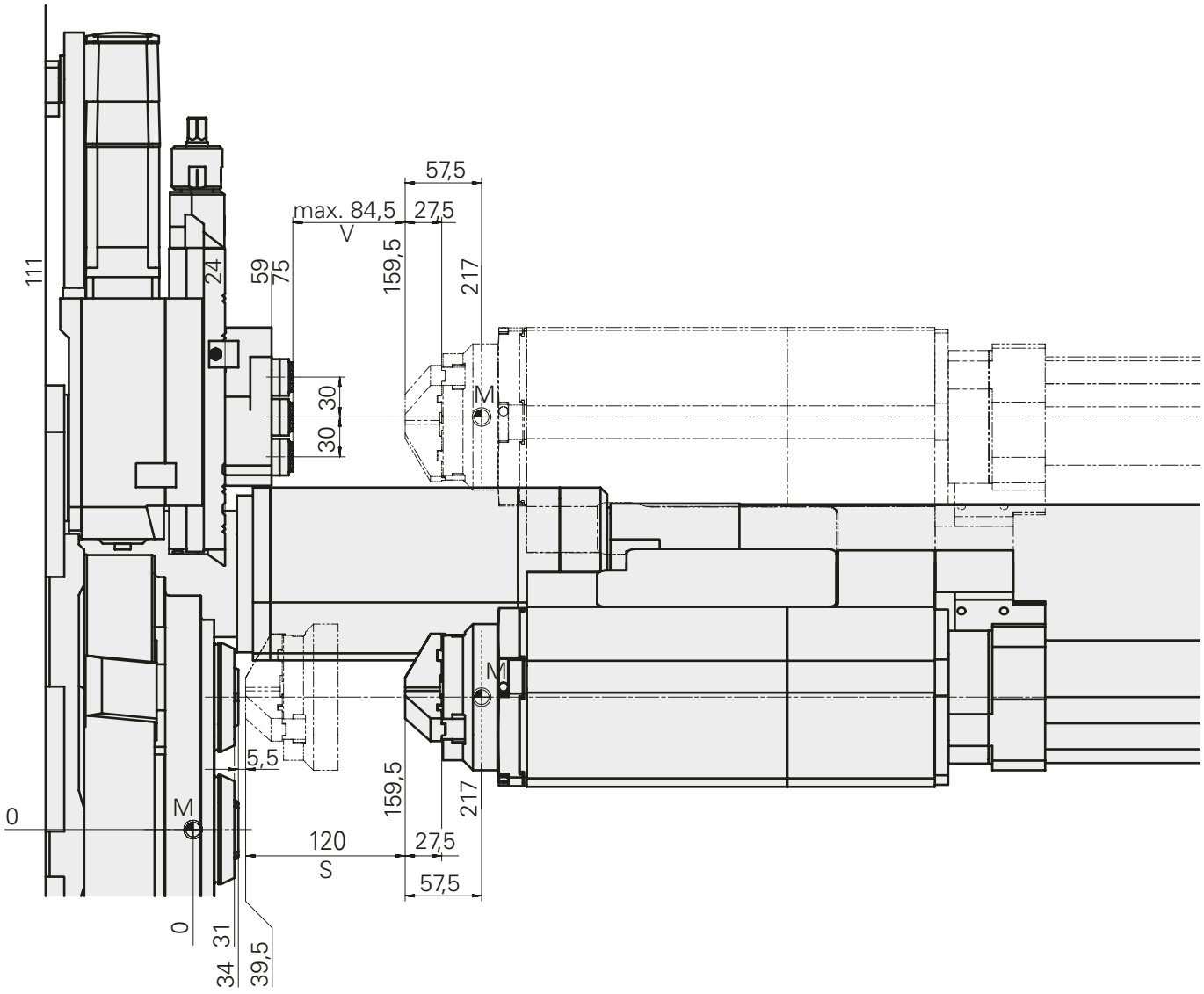



S = travel of cross slide unit

# Synchronous spindle INDEX MS24-6

## Rear-end machining on swivel axis 5.2, 6.1,
## Rear end machining unit with 3 stationary tools on cross slide unit 5.1, 6.2

Clamping device height
Standard: 57.5 mm
for Hainbuch deadlength and
Röhm chuck with top jaws

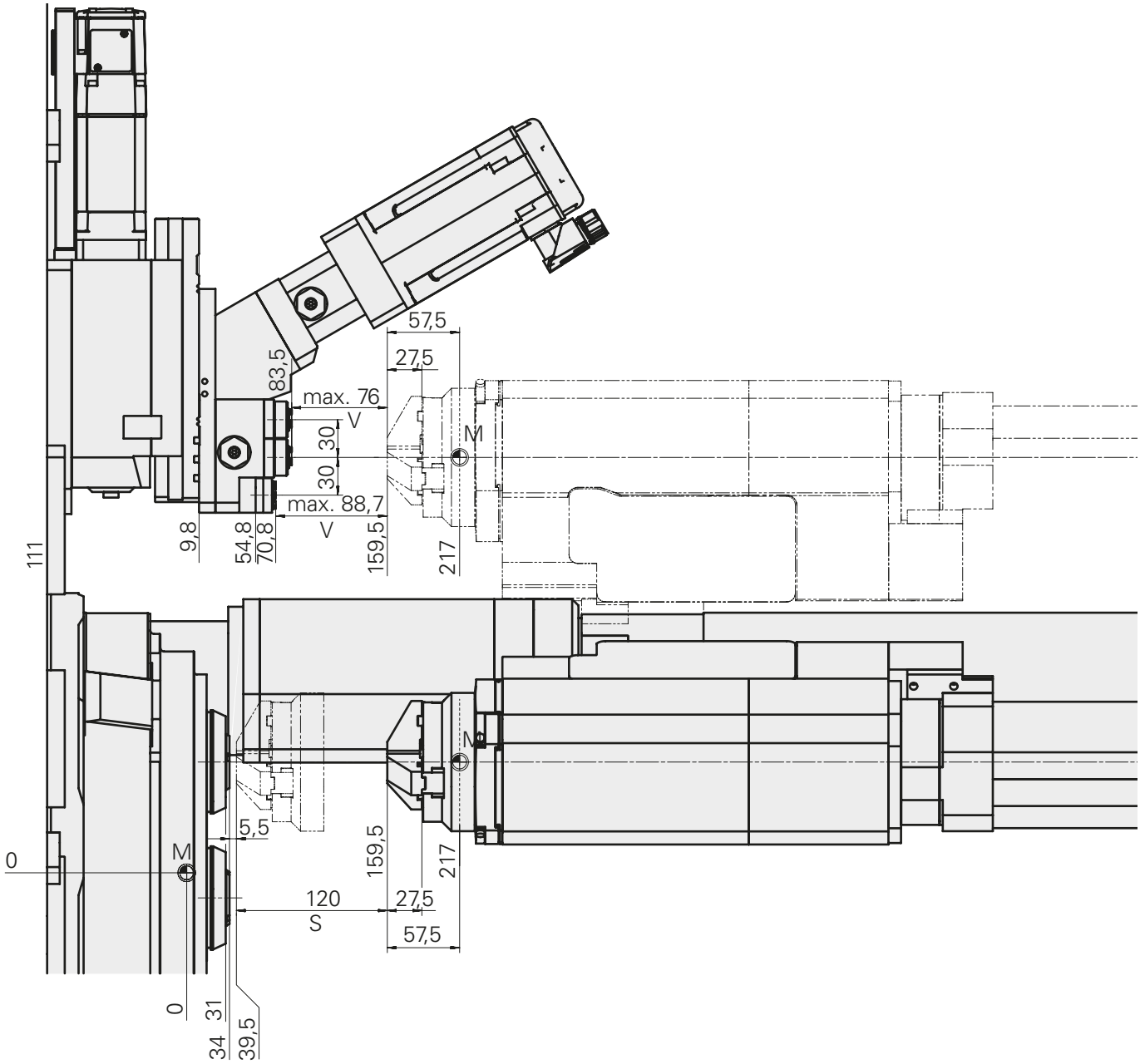



S = travel of cross slide unit
V = adjustment option

## Synchronous spindle INDEX MS24-6

### Rear-end machining on swivel axis 5.2, 6.1,
### Rear end machining unit with 1 stationary and 2 live tool tools on cross slide unit 5.3, 6.3

Clamping device height
Standard: 57.5 mm
for Hainbuch deadlength and
Röhm chuck with top jaws

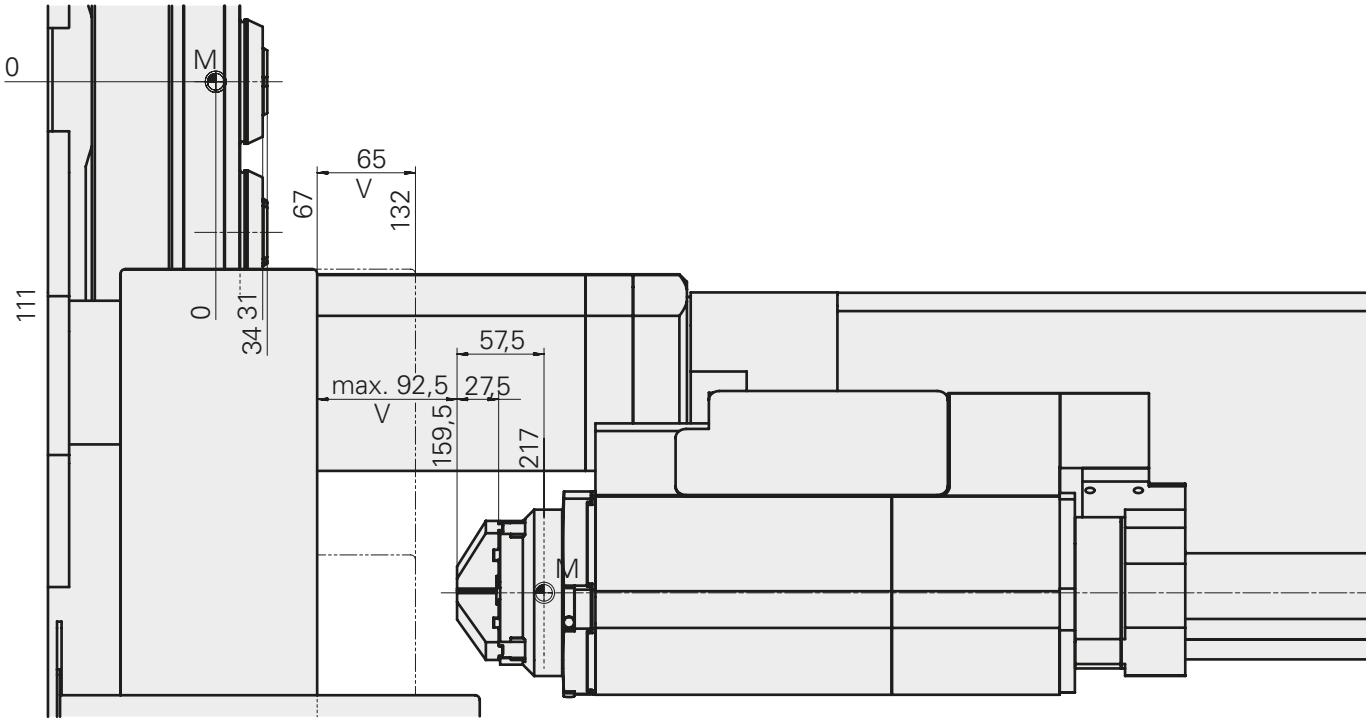



S = travel of cross slide unit
V = adjustment option

# Synchronous spindle INDEX MS24-6

## Rear-end machining on swivel axis 5.2, 6.1, with part discharge

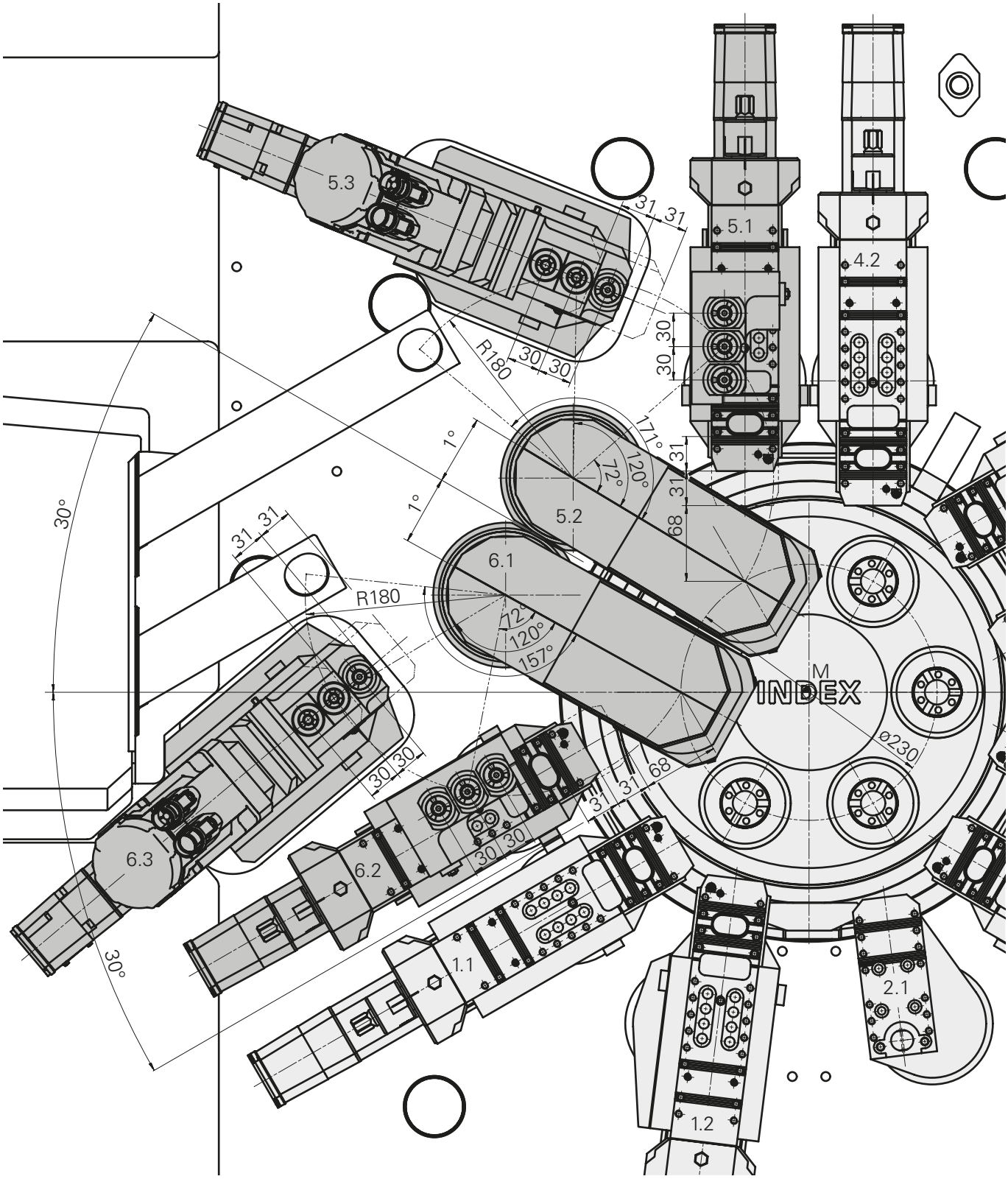
Clamping device height
Standard: 57.5 mm
for Hainbuch deadlength and
Röhm chuck with top jaws




V = adjustment option

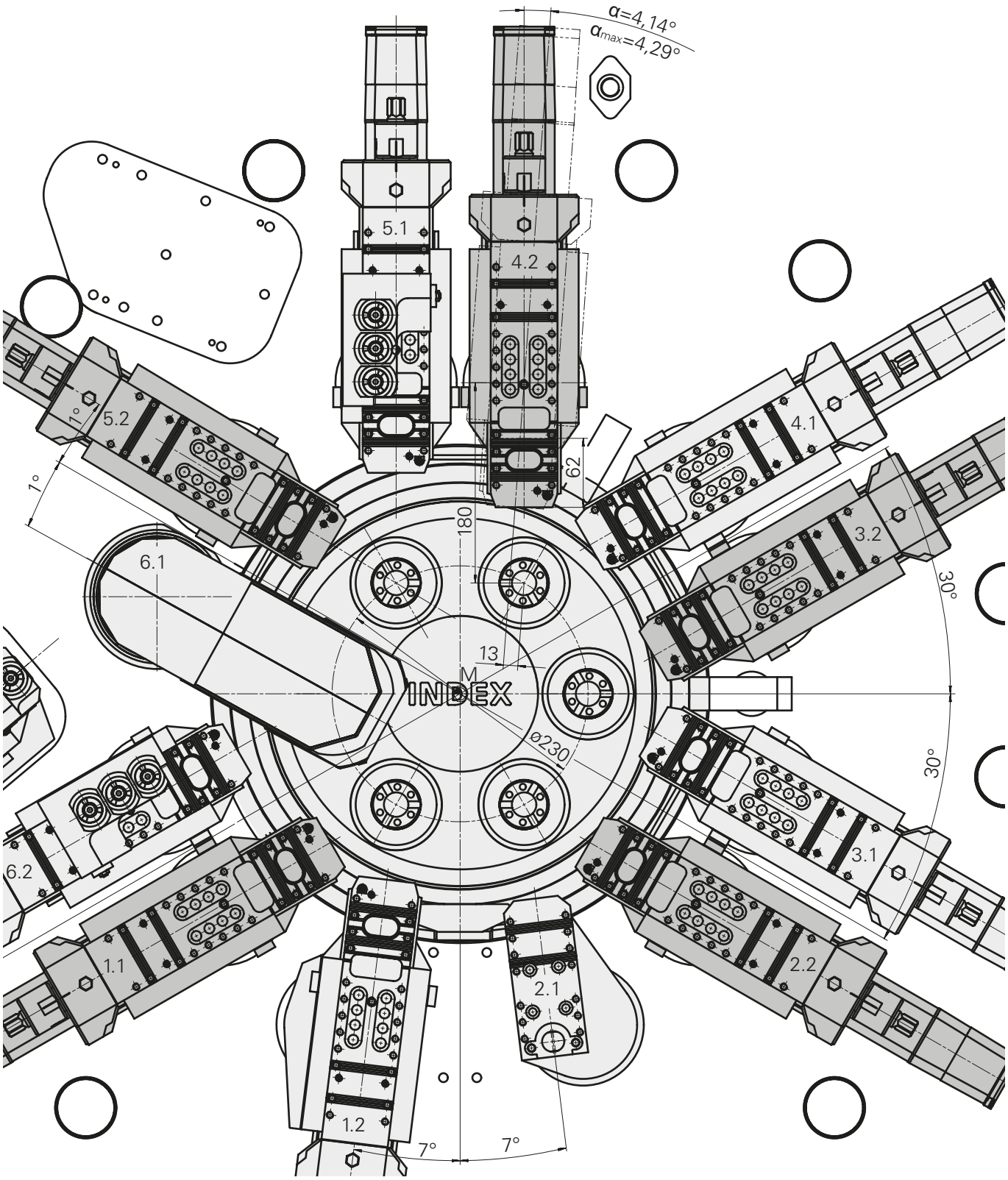
# Synchronous spindle INDEX MS24-6

## Rear-end machining on swivel axis 6.1, 5.2
## Rear-end machining tool on cross slide unit 6.2, 6.3, 5.1, 5.3



# Y axis INDEX MS24-6

## Attachable to cross slide unit 1.1, 2.2, 3.2, 4.2, 5.2



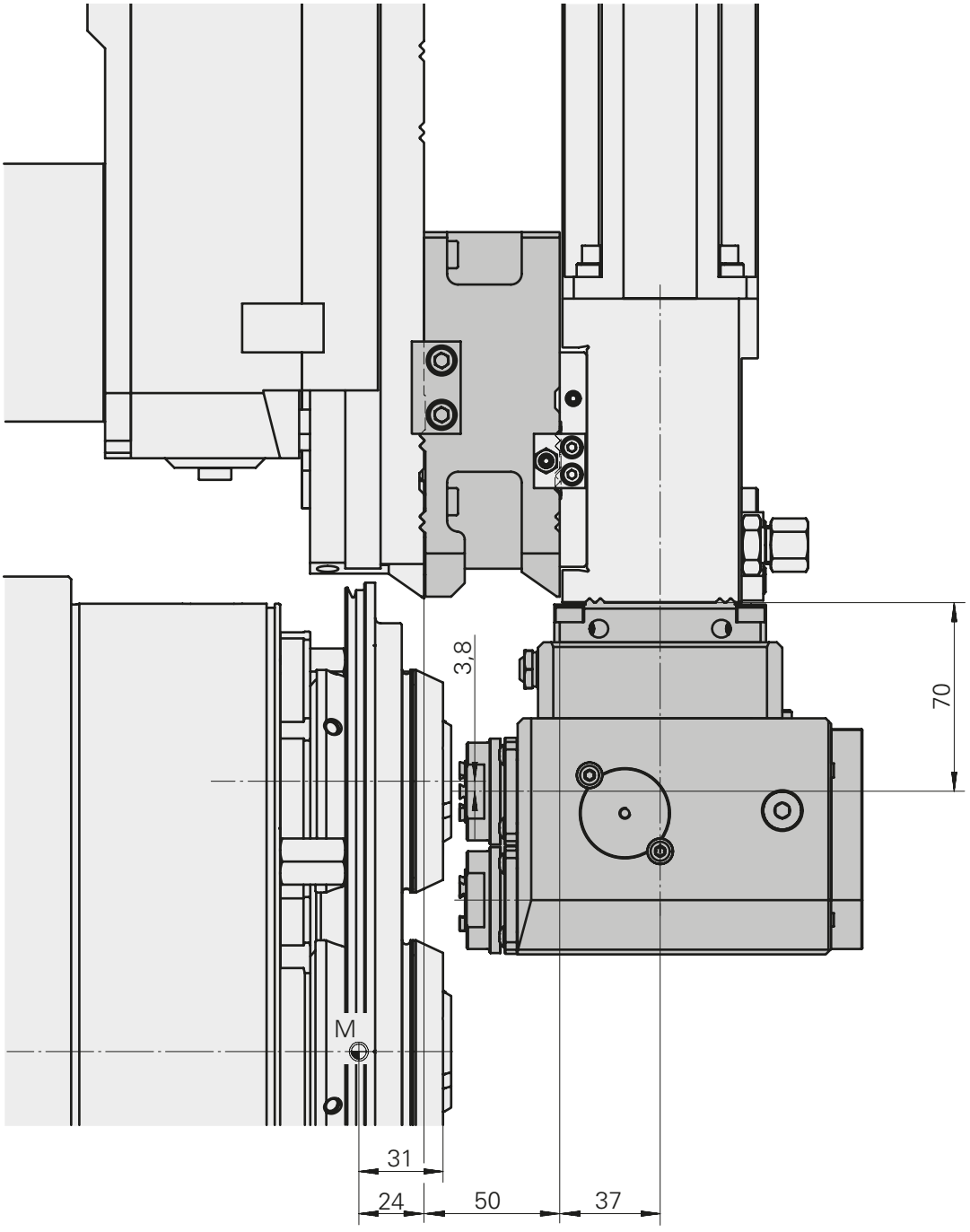

α=0.93333° per motor revolution

# Tool drive unit INDEX MS24-6

## Setup option on cross slide units 1.1 - 6.2

**Installation example**

**VDI shank angled, tool drive unit offset in Z direction**

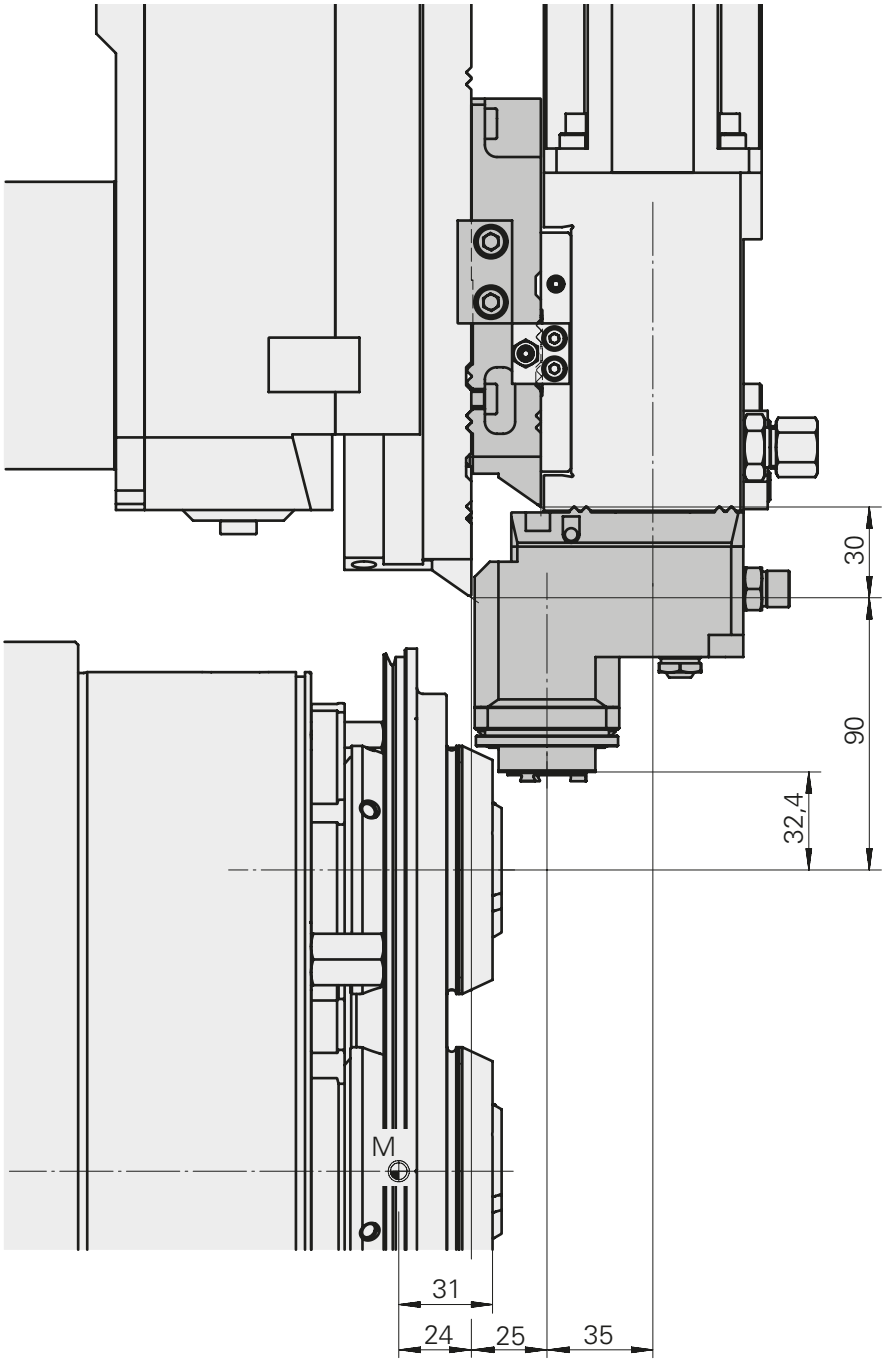


# Tool drive unit INDEX MS24-6

## Setup option on cross slide units 1.1 - 6.2

### Installation example

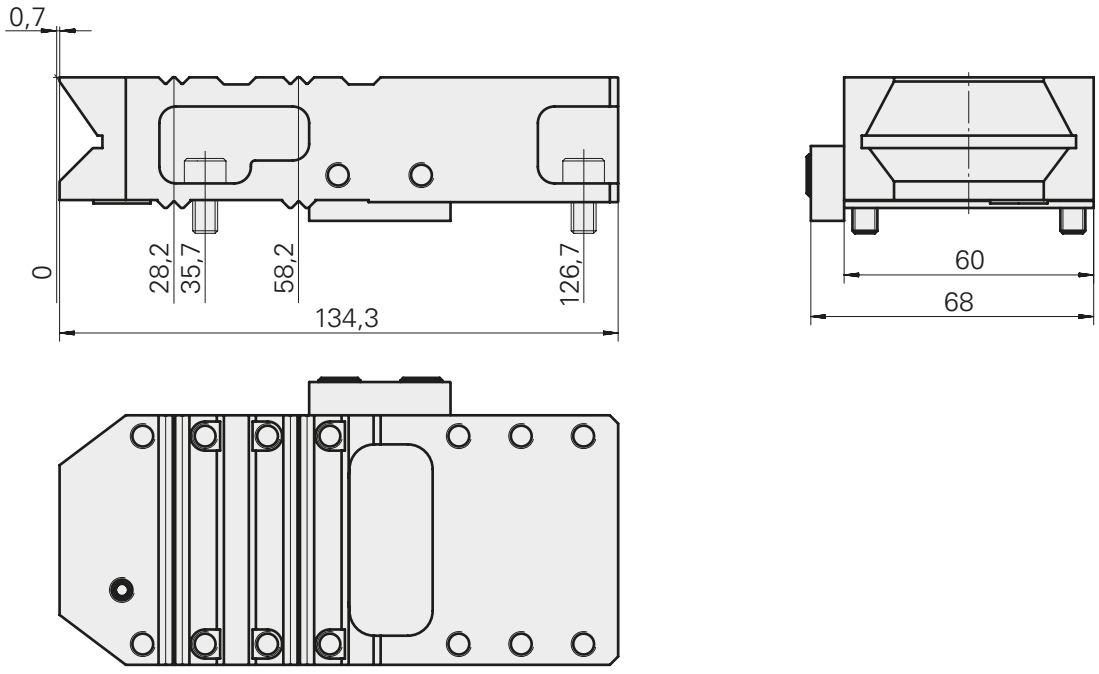
**VDI shank straight, axis-offset, tool drive unit offset back in X direction**



# Distance plate INDEX MS24-6

## Z direction, for use of tool holders with W-serration fixation

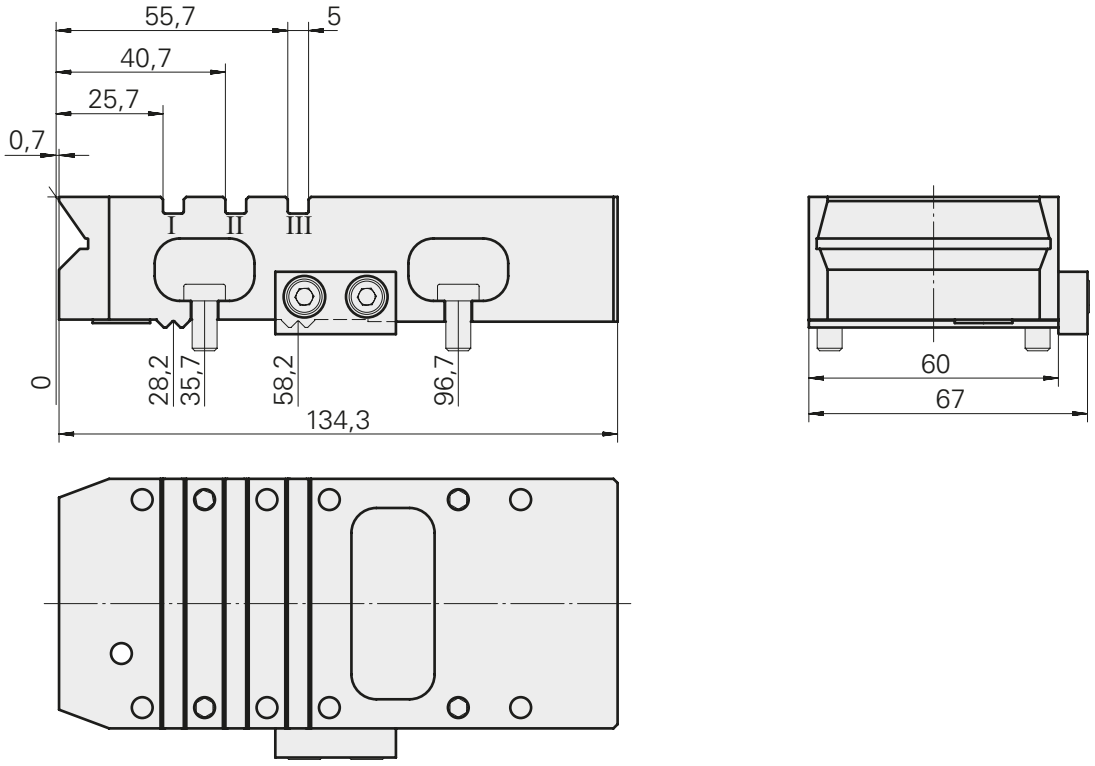
For selection of the appropriate distance plates, see ixshop.ixworld.com



# Distance plate INDEX MS24-6

## Z direction, for use of tool holders with slide system MS16/MS22

For selection of the appropriate distance plates, see ixshop.ixworld.com

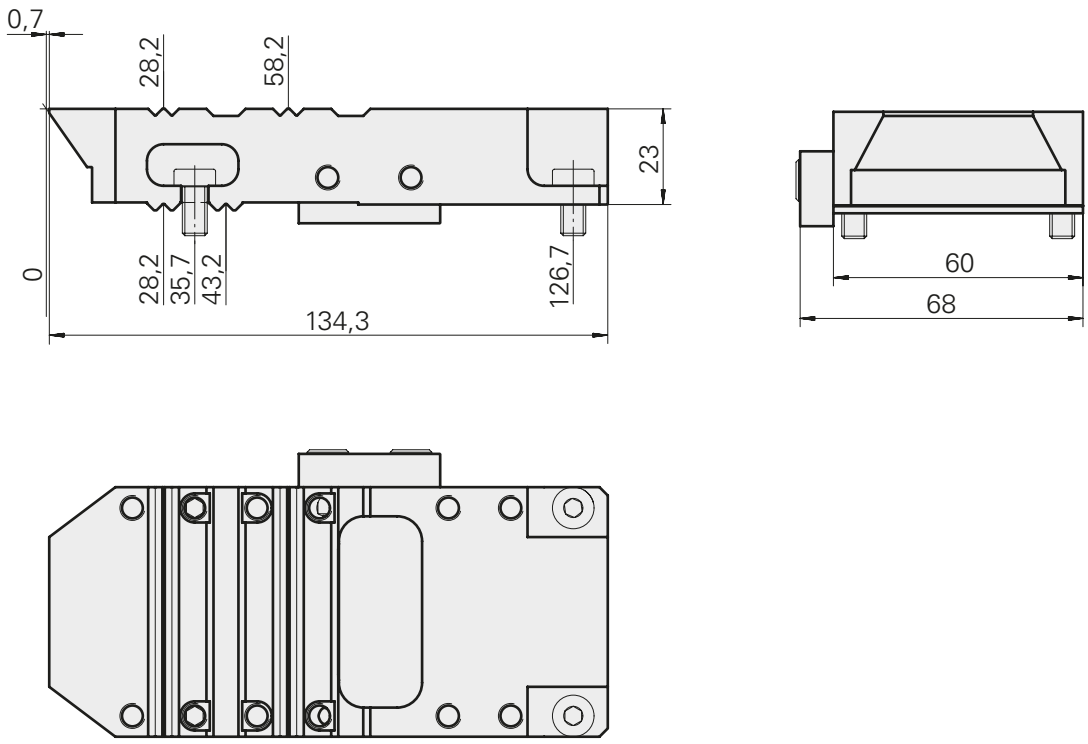



I, II, III = slide slot

# Distance plate INDEX MS24-6

## X direction, for use of tool drive unit VDI shank

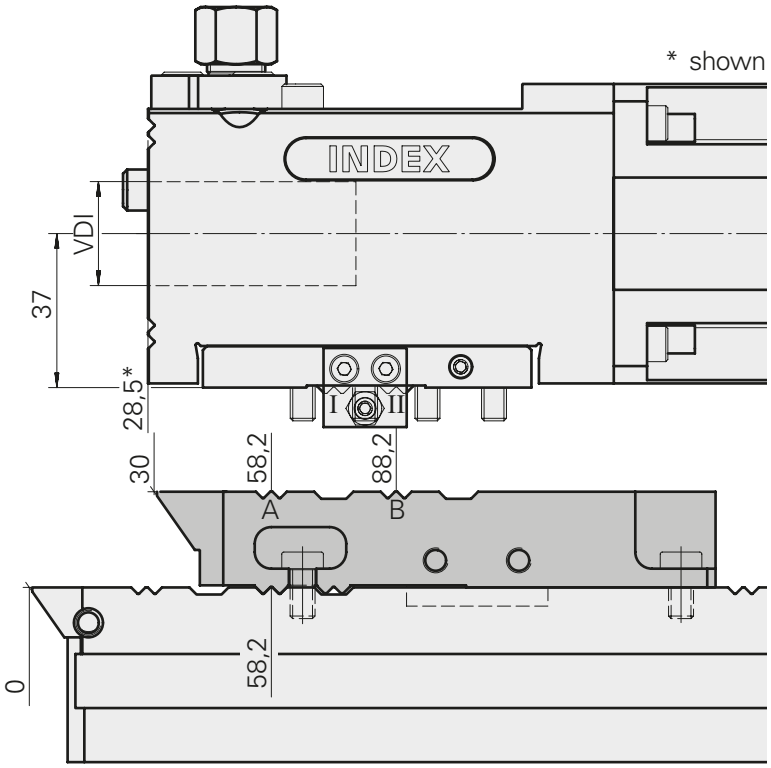
Distance plates used 12140726



# Distance plate INDEX MS24-6

## X direction, for use of tool drive unit VDI shank

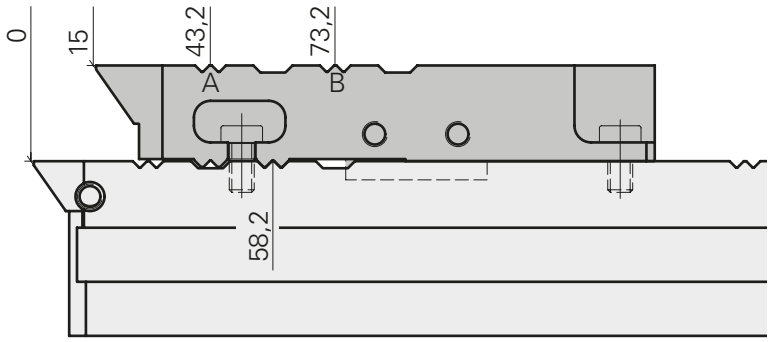
### Offset dimensions




Theoretical peak of distance plate = 30

W-serration used for

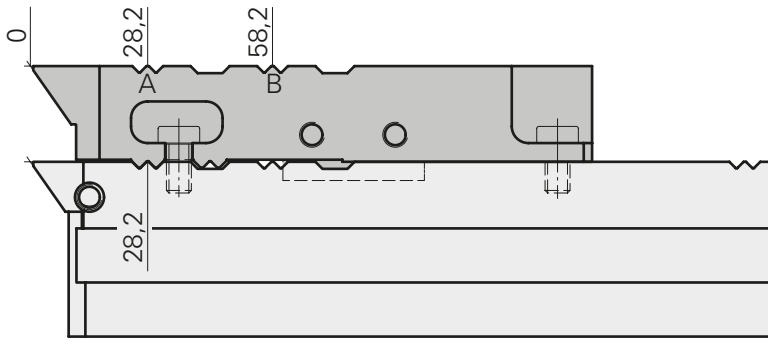
| | distance plate | Tool drive unit | |
|---|---|---|---|
| | A (58.2) | VDI20 I | 15.4 |
| | B (88.2) | VDI20 II | 30.4 |
| | B (88.2) | VDI20 I | 45.4 |
| | A (58.2) | VDI25 I | 13.5 |
| * | B (88.2) | VDI25 II | 28.5 |
| | B (88.2) | VDI25 I | 43.5 |




Theoretical peak of distance plate = 15

W-serration used for

| distance plate | Tool drive unit | |
|---|---|---|
| A (43.2) | VDI20 I | 0.4 |
| B (73.2) | VDI20 II | 15.4 |
| B (73.2) | VDI20 I | 30.4 |
| A (43.2) | VDI25 I | - 1.5 |
| B (73.2) | VDI25 II | 13.5 |
| B (73.2) | VDI25 I | 28.5 |



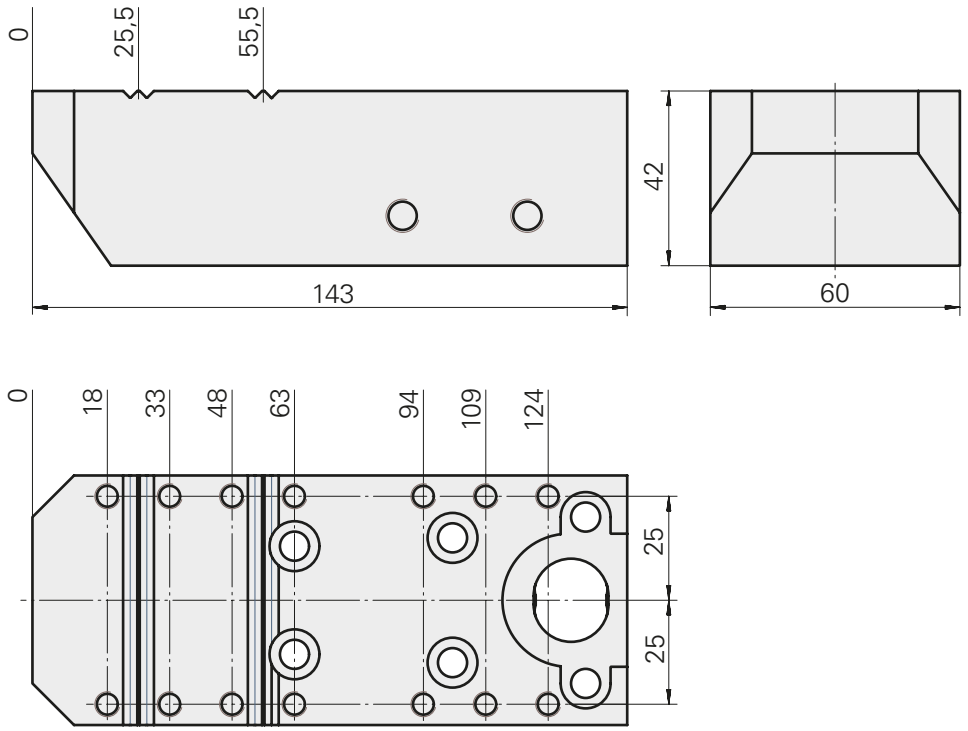

theoretical peak of distance plate = 0

W-serration used for

| distance plate | Tool drive unit | |
|---|---|---|
| A (28.2) | VDI20 I | - 14.6 |
| B (58.2) | VDI20 II | 0.4 |
| B (58.2) | VDI20 I | 15.4 |
| A (28.2) | VDI25 I | - 16.5 |
| B (58.2) | VDI25 II | - 1.5 |
| B (58.2) | VDI25 I | 13.5 |

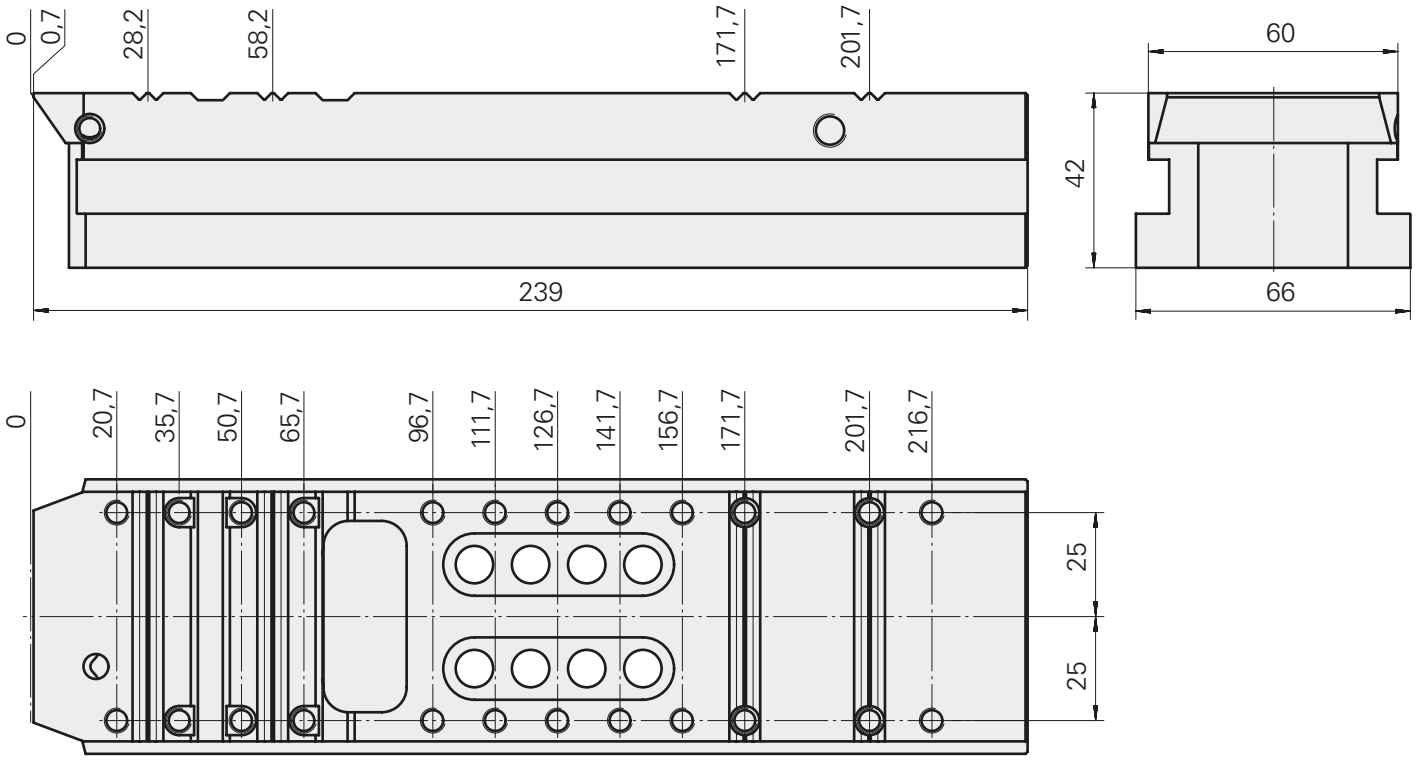
# Cross slide unit INDEX MS24-6

## X-rigid 1.2, 2.1, 3.2, 4.1, 5.2



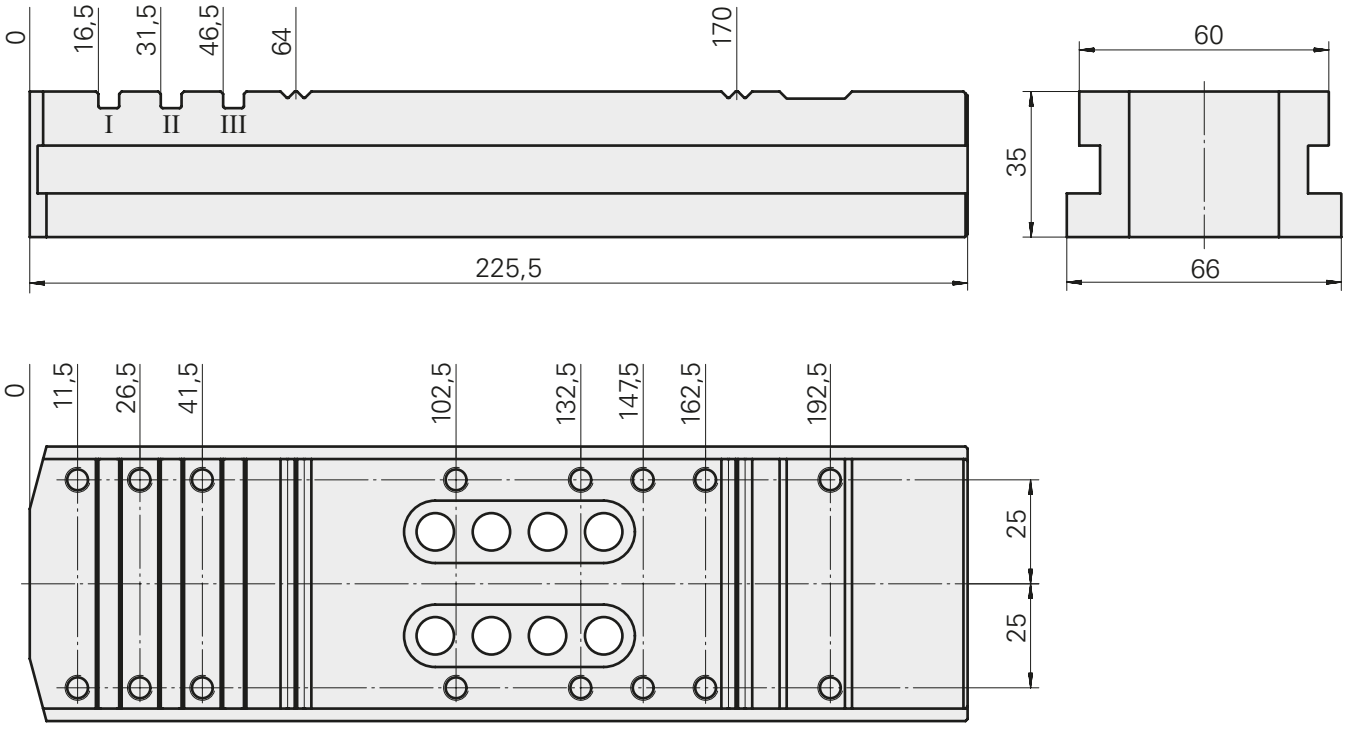
# Cross slide unit INDEX MS24-6

## X-NC, Z-NC 1.1 - 6.2
## X-NC, Z-NC, Y-NC 1.1, 2.2, 3.2, 4.2, 5.2



# Cross slide unit INDEX MS24-6

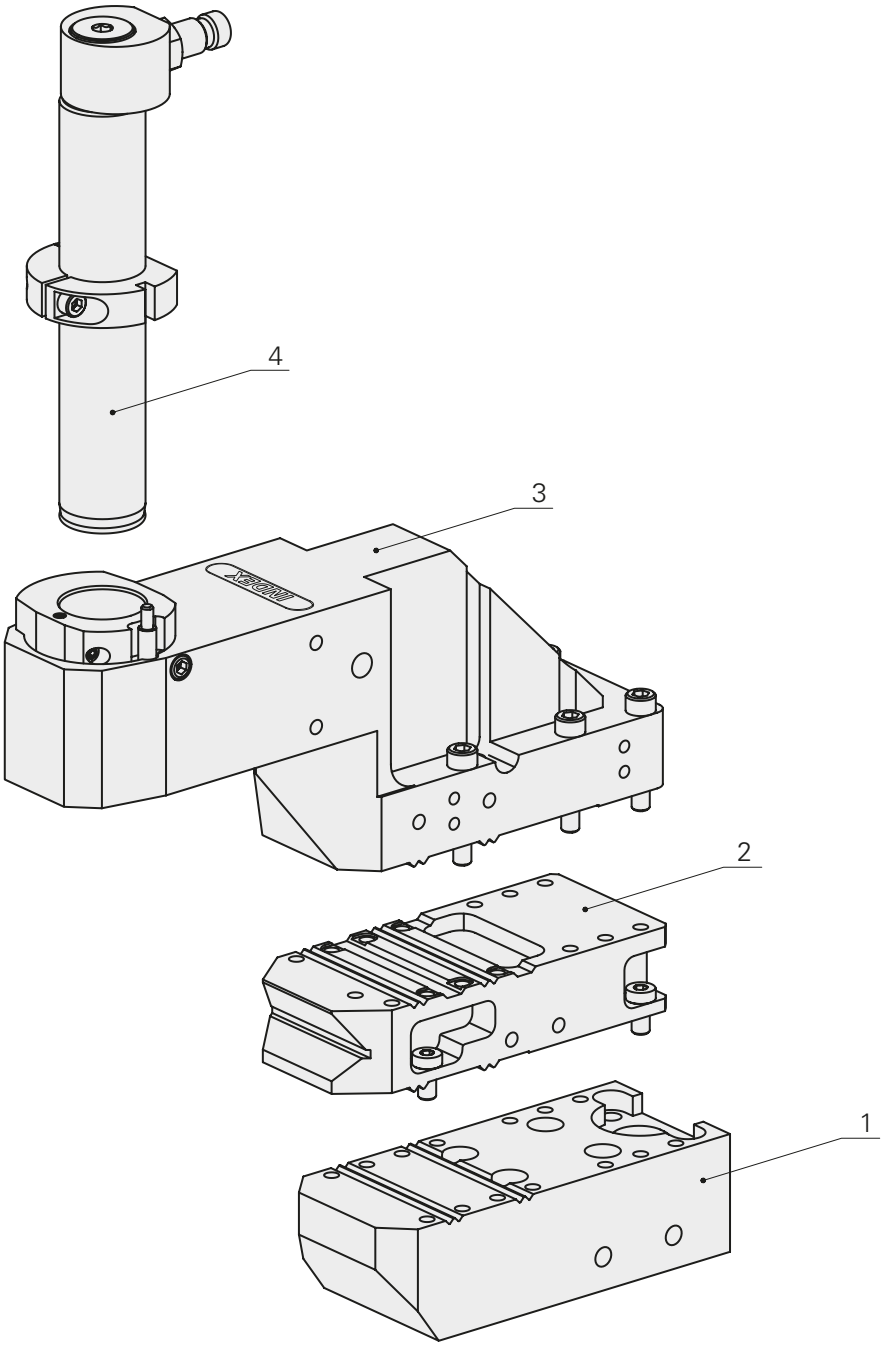
## X-NC, Z-NC 5.3, 6.3



# Modular design of INDEX MS24-6

## Base holder with drill holder D20mm/D28.5mm

### Cross slide unit 1.2, 2.1, 3.2, 4.1, 5.2, machining in X direction

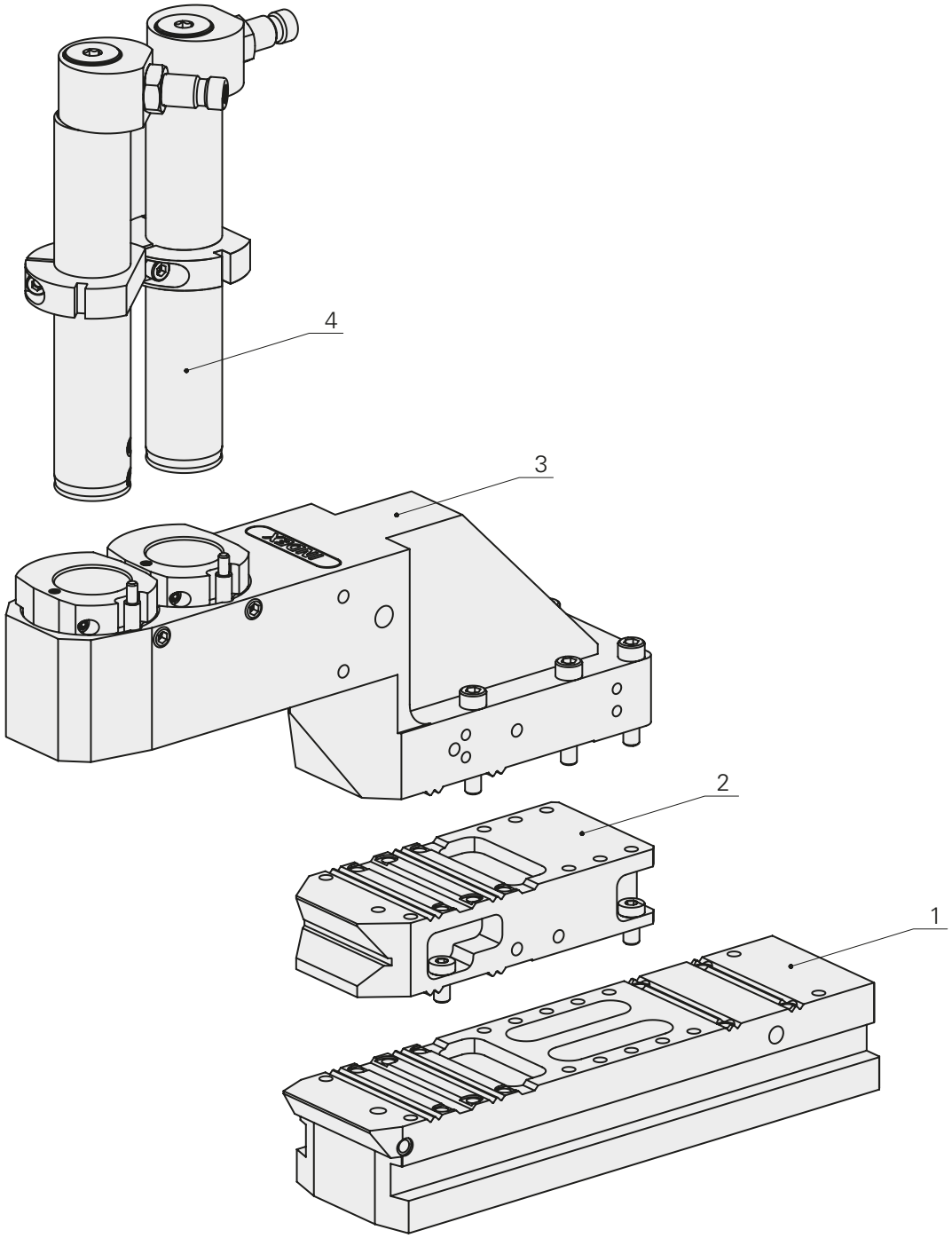



1 Cross slide unit 1.2, 2.1, 3.2, 4.1, 5.2
2 Distance plate as needed
3 Base holder
4 Drill holder

# Modular design of INDEX MS24-6

## Base holder with drill holder D20mm/D28.5mm

### Cross slide unit 1.1 - 6.2, machining in X/Z direction

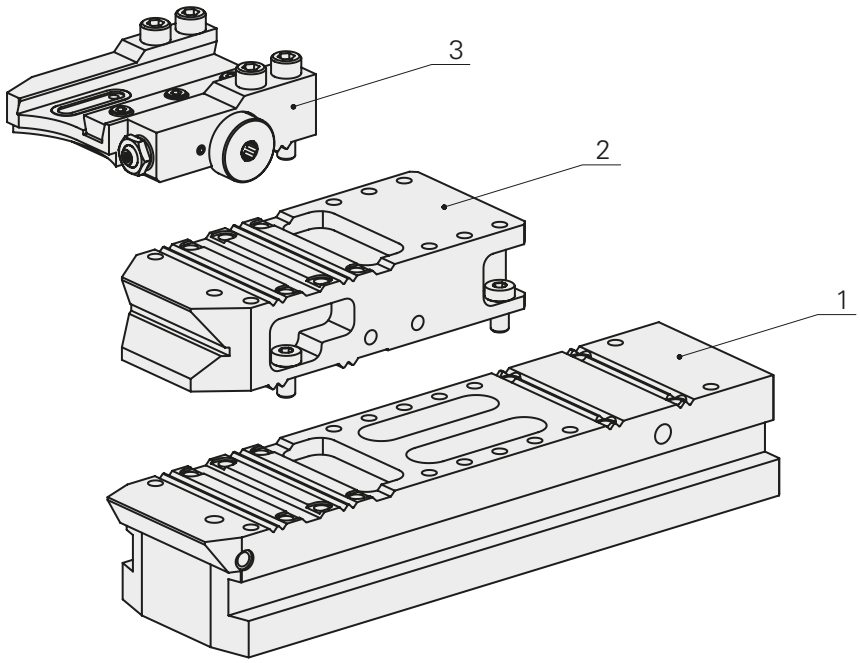



1 Cross slide unit 1.1 - 6.2
2 Distance plate as needed
3 Base holder
4 Drill holder ø28.5 mm

# Modular design of INDEX MS24-6

## Grooving tool holder

### Cross slide unit 1.1 - 6.2, machining in X/Z direction

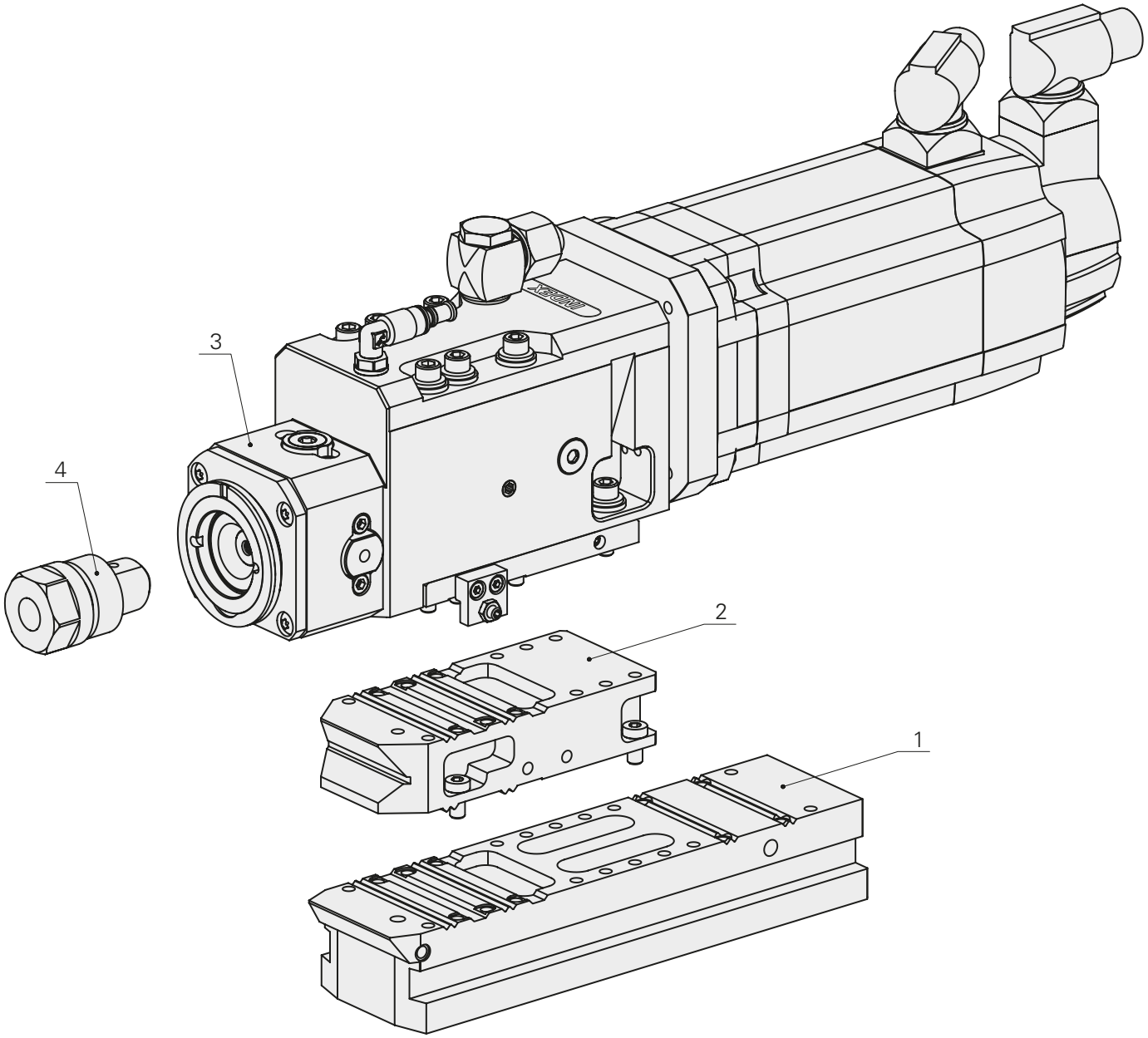



1 Cross slide unit 1.1 - 6.2
2 Distance plate as needed
3 Grooving tool holder

# Modular design of INDEX MS24-6

## Milling unit

**Cross slide unit 1.1 - 6.2, machining in X/Z direction**

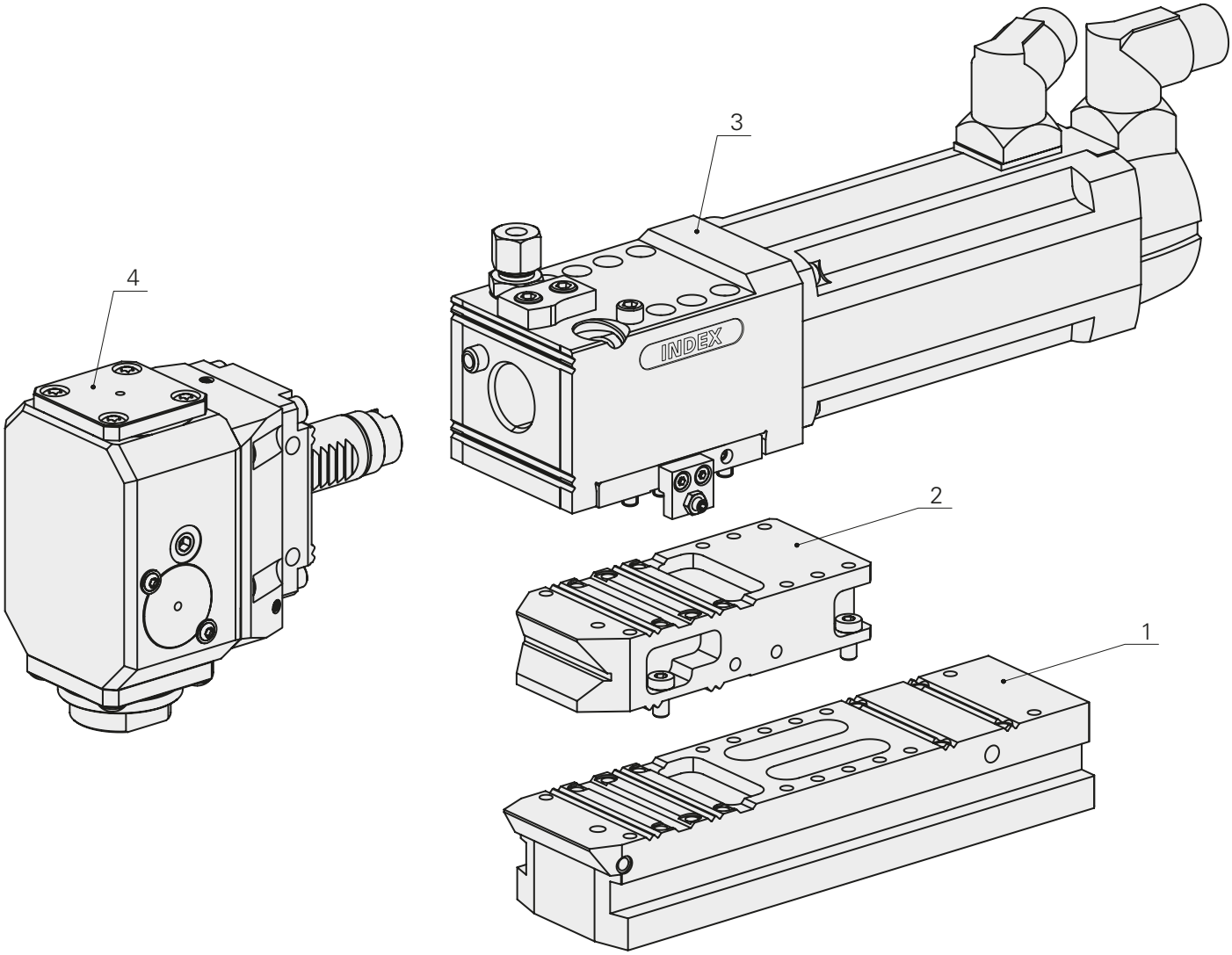



1 Cross slide unit 1.1 - 6.2
2 Distance plate as needed
3 Milling unit
4 Quick-change insert INDEX CAPTO

# Modular design of INDEX MS24-6

## Tool drive unit, VDI20/VDI25 shank

### Cross slide unit 1.1 - 6.2, machining in X/Z direction

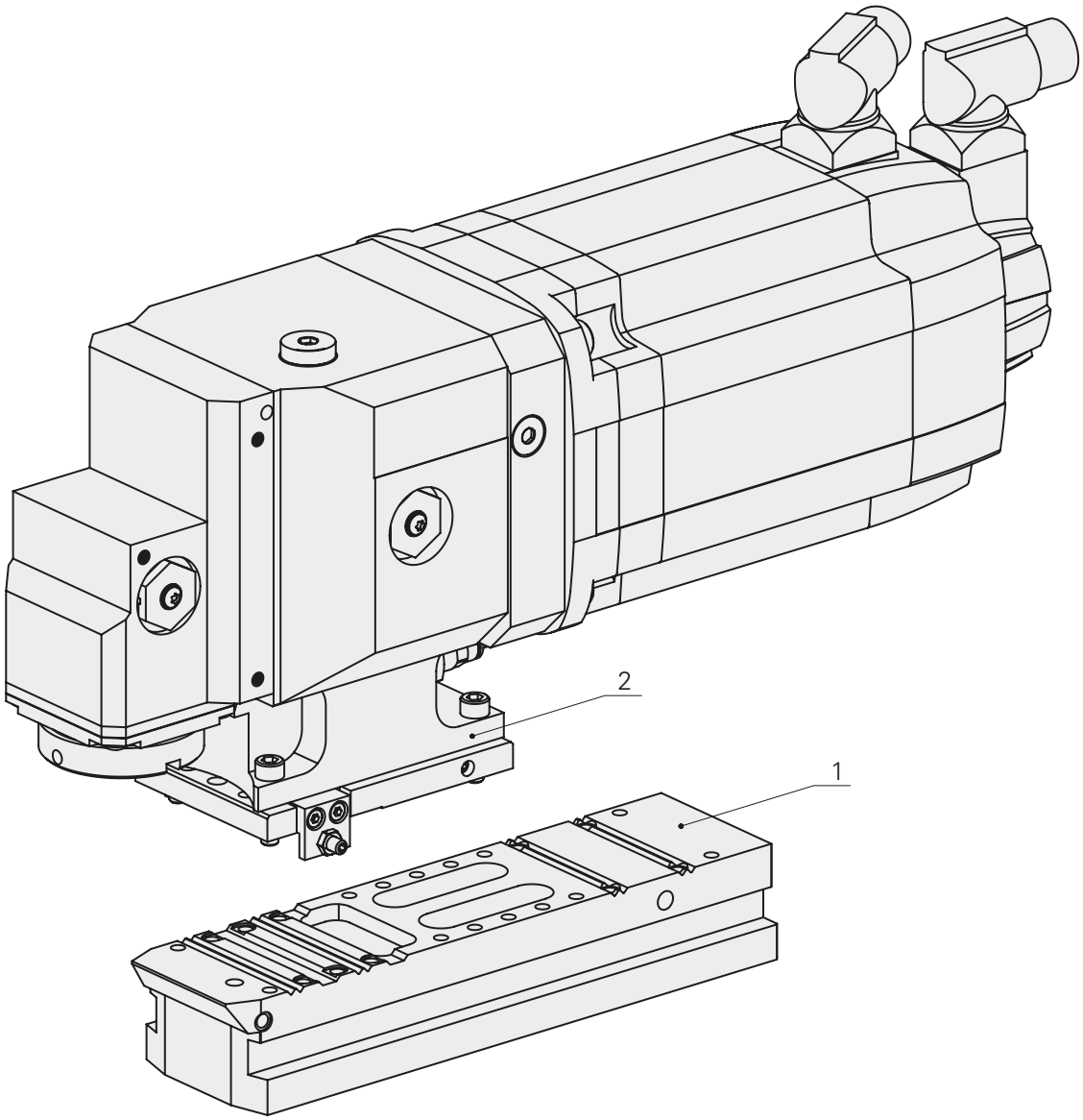



1 Cross slide unit 1.1 - 6.2
2 Distance plate as needed
3 Tool drive unit
4 VDI20/VDI25 tool holder

# Modular design of INDEX MS24-6

## Polygon turning unit

**Cross slide unit 1.1 - 6.2, machining in X/Z direction**

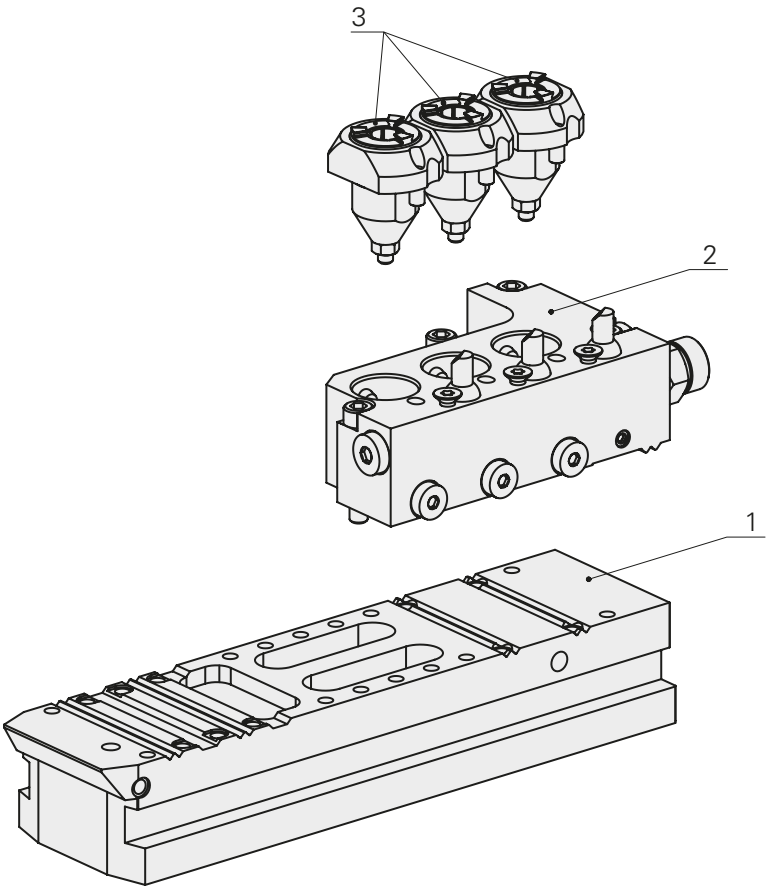



1 Cross slide unit 1.1 - 6.2
2 Polygon turning unit

# Modular design of INDEX MS24-6

## Rear end machining unit, rigid

### Cross slide unit 6.2/5.1, machining in X/Z direction

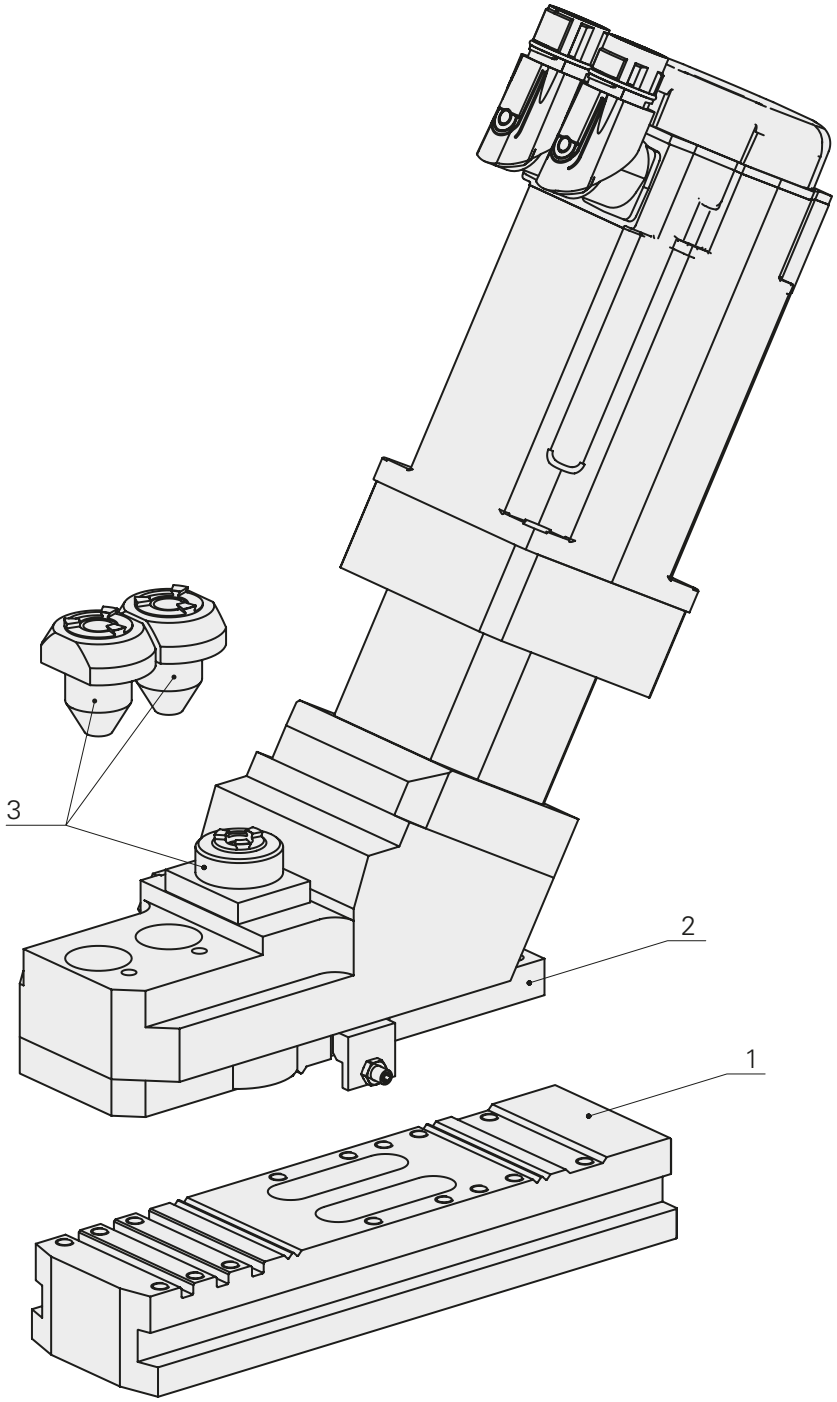



1 Cross slide unit 6.2/5.1, shown 6.2
2 Rear end machining unit, rigid
3 Mounting, fixed

# Modular design of INDEX MS24-6

## Rear end machining unit

### Cross slide unit 5.3/6.3, machining in X/Z direction



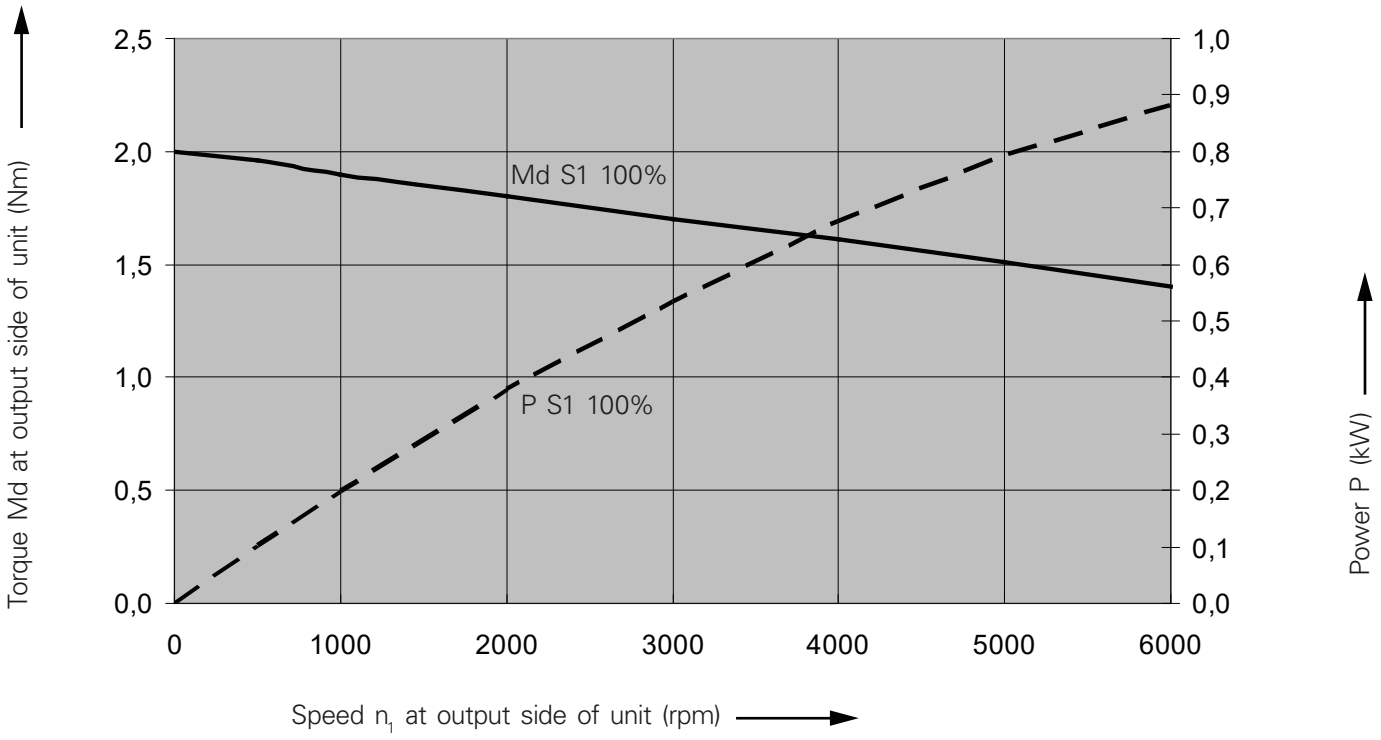

1 Cross slide unit 5.3/6.3
2 Rear end machining unit
3 Mounting stationary / live

# Performance chart

## Tool drive unit VDI20/VDI25, i=1

Speed range 0-6000 rpm

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

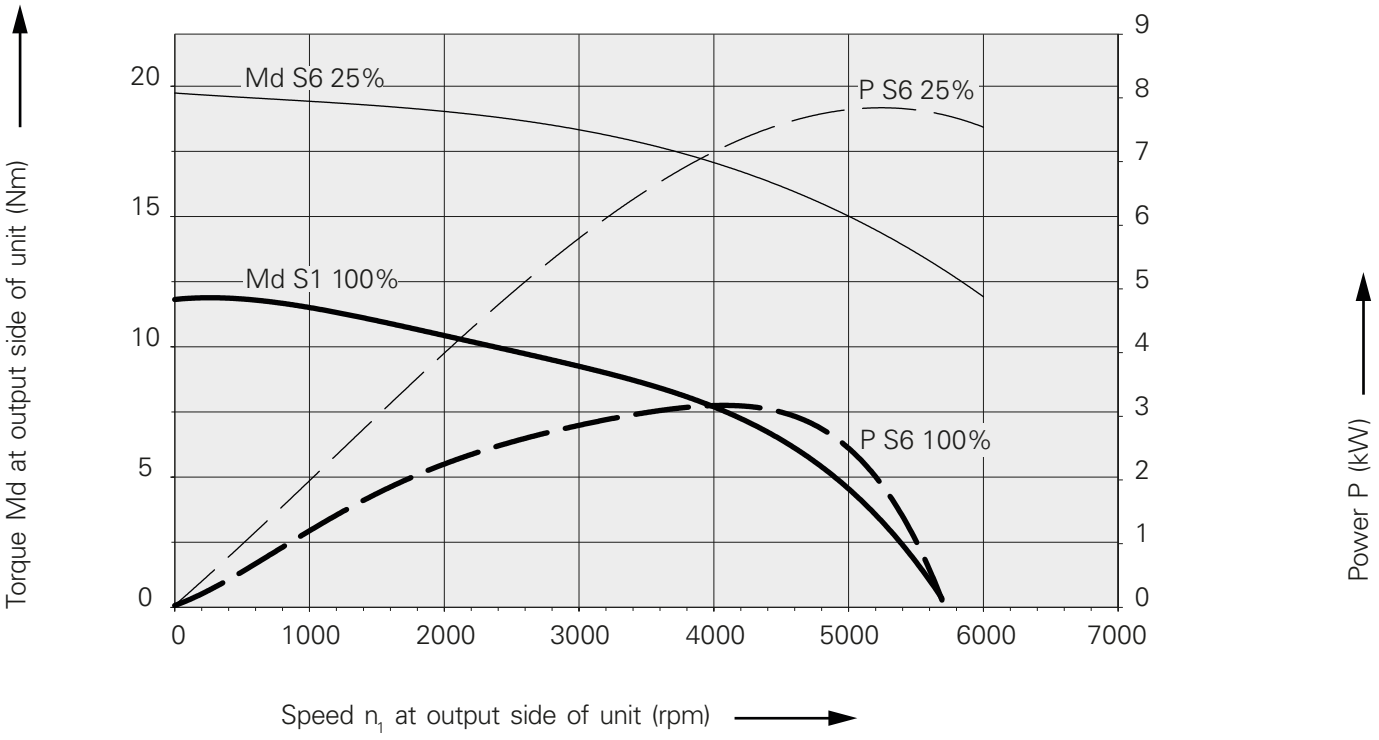


# Performance chart

## Polygon turning unit i=1

Speed range 0-6000 rpm

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

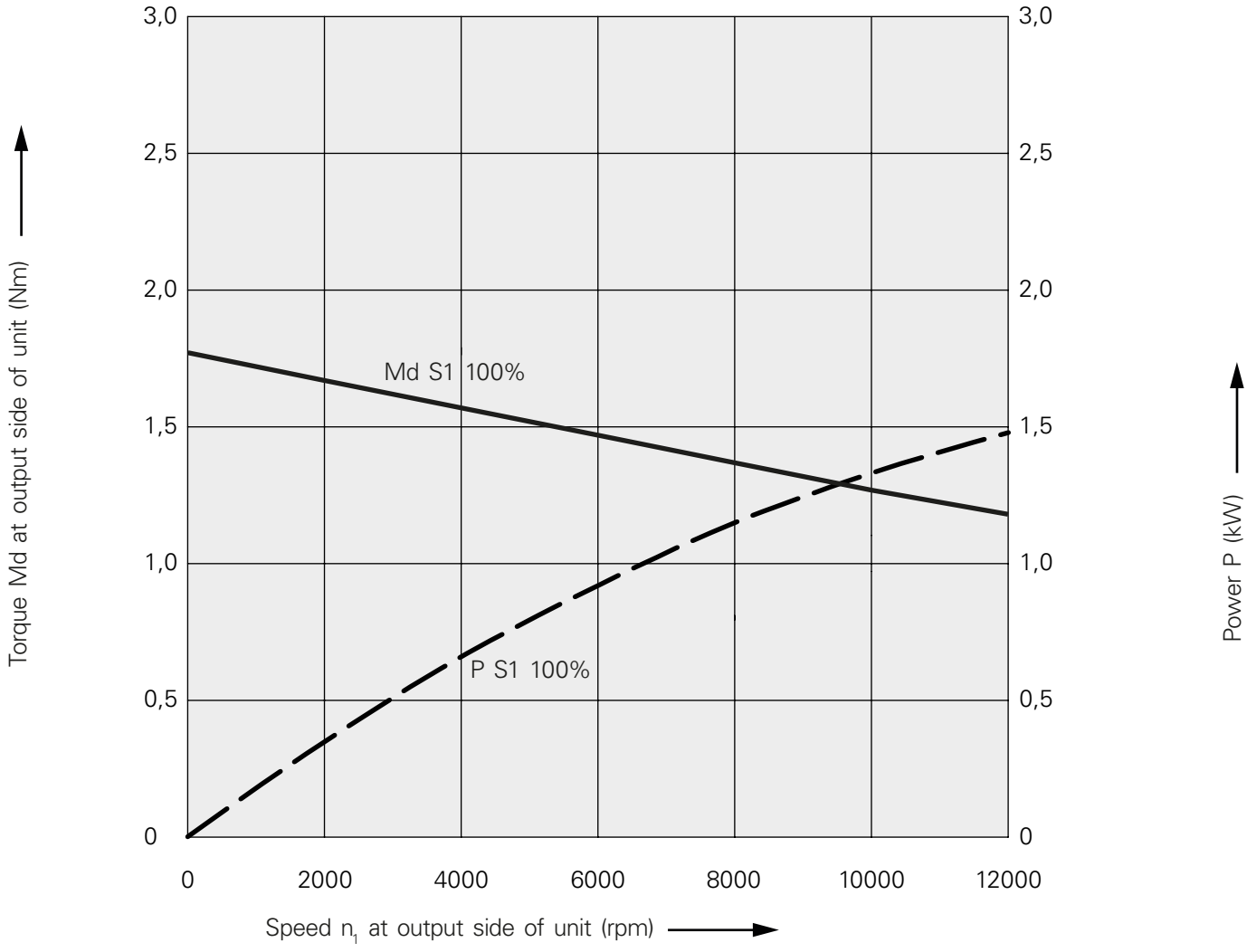


# Performance chart

## Rear end machining unit, i=0.5

Speed range 0-12000 rpma

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

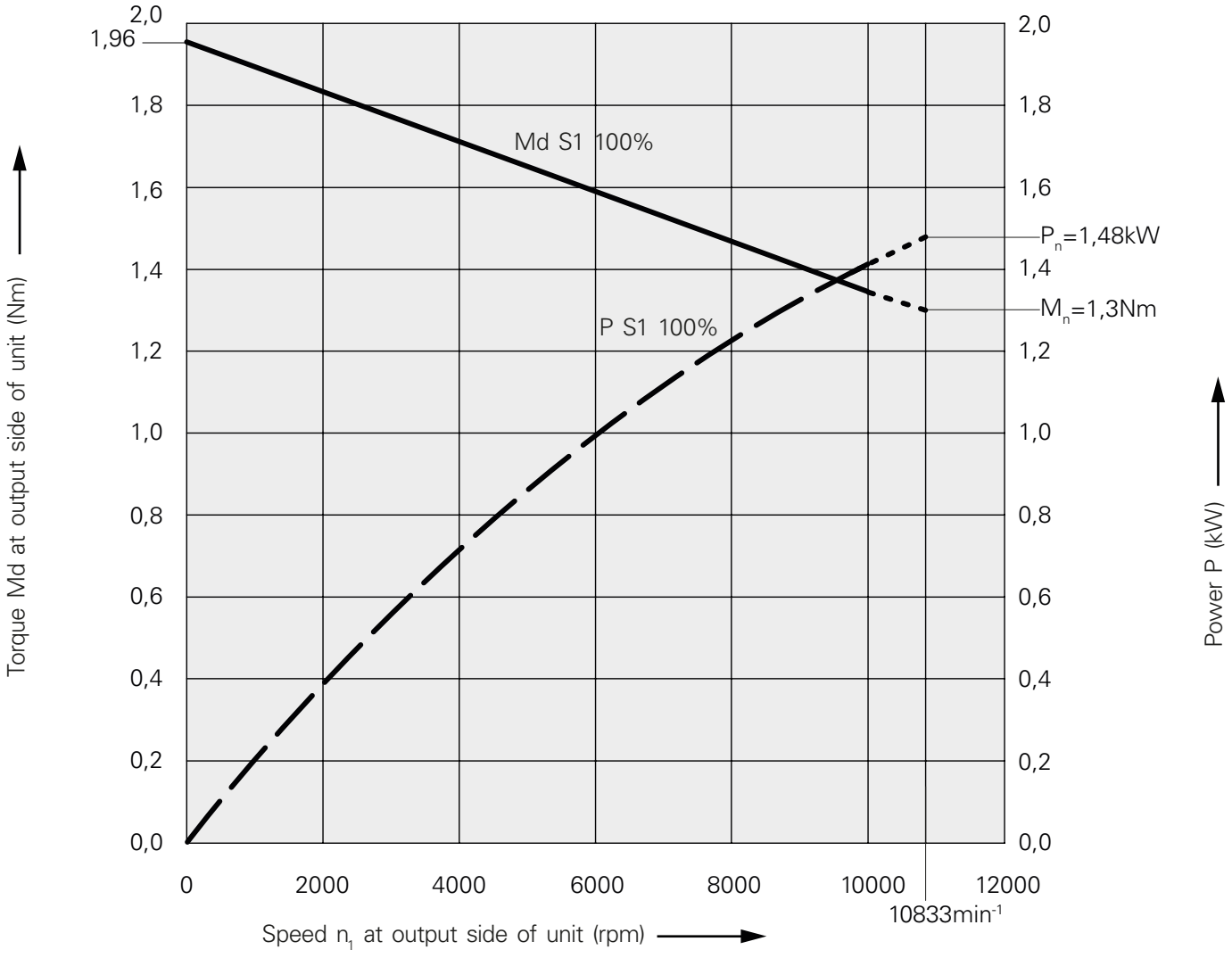


## Performance chart

### Rear end machining unit, i=0.5538847

Speed range 0-10000 rpm

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



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