About this manual

Who is this manual for?

While it is sturdy and efficient, the Gildemeister CT lathe is also a technically sophisticated machine requiring careful handling. Hence it can only be programmed by trained personnel.
One method of acquiring the required knowledge is to attend the special training sessions conducted by Gildemeister.

The programmer should be acquainted with the technical fundamentals of machining (such as cutting materials, workpiece materials, cutting rates, cooling, etc.).
He or she should be familiar with the structure and mode of operation of CNC programming, including features as per DIN 66025 related to:

- logic of programming
- planning of operating procedures
- program preparation
- information parts of a program
- G-functions
- technological addresses
- M-functions
- programming
- program storage

We assume that the machine will be programmed only by trained personnel.

What does this manual contain?

This manual describes the programming of the Gildemeister CT lathe.

Introduction to programming
If you are not yet totally confident in programming, Chapter 3.1 will be particularly important for you. It describes the operation of the Gildemeister EPL control system.
It also contains a brief description of the fundamentals of CNC programming.

Special programming techniques
If you already possess advanced knowledge of programming, the special programming techniques described in Chapter 8 will enable you to employ even more efficient and sophisticated procedures.

What does this manual <u>not</u> contain?

The manual does not describe the operation and maintenance of the machine.
For all work not involving programming, please pay particular attention to the operating manual which describes the day-to-day operation of the machine (loading, calling programs, servicing, etc.).

This manual contains some functions and/or control extensions regarding its parameter list, menu structure, program functions or error list which are not yet available.

Consult your authorized Gildemeister representative for the current status of standard available options and/or control extensions.

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Operating elements of the control system

Handwheel

Emergency stop

Spindle direction clockwise (to DIN)
The symbol on the key indicates the turning direction from the operator's viewpoint.

Spindle stop

Spindle direction counter-clockwise (to DIN)
The symbol on the key indicates the turning direction from the operator's viewpoint.

Spindle jog control
The spindle turns at minimum speed as long as this key is pressed.

Manual direction key (transversal)
Slide moves in direction X+.

Manual direction key (transversal)
Slide moves in direciton X-.

Manual direction key (longitudinal)
Slide moves in direction Z+.

Manual direciton key (longitudinal)
Slide moves in direction Z-.

Rapid traverse
This key can be actuated simultaneously with either one or two manual direction keys. While the given key combination is being pressed, the slides move at the maximum speed determined by the stored parameters.
Both slides will run (45°) when one transversal and one longitudinal manual direction key are both pressed simultaneously.

Cycle start

Cycle stop

Feed stop

Operating mode key
This key is used to return directly to the operating modes menu from any other menu level.

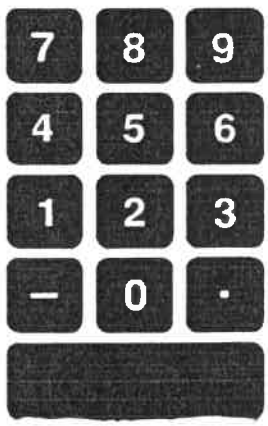
Not used at present
Slide switchover (for 4-axes machines only)
All inputs automatically refer to slide I
when the control system is switched on.

Graphics simulation (optional)

Cancel key
To cancel inputs and error messages in the error line.

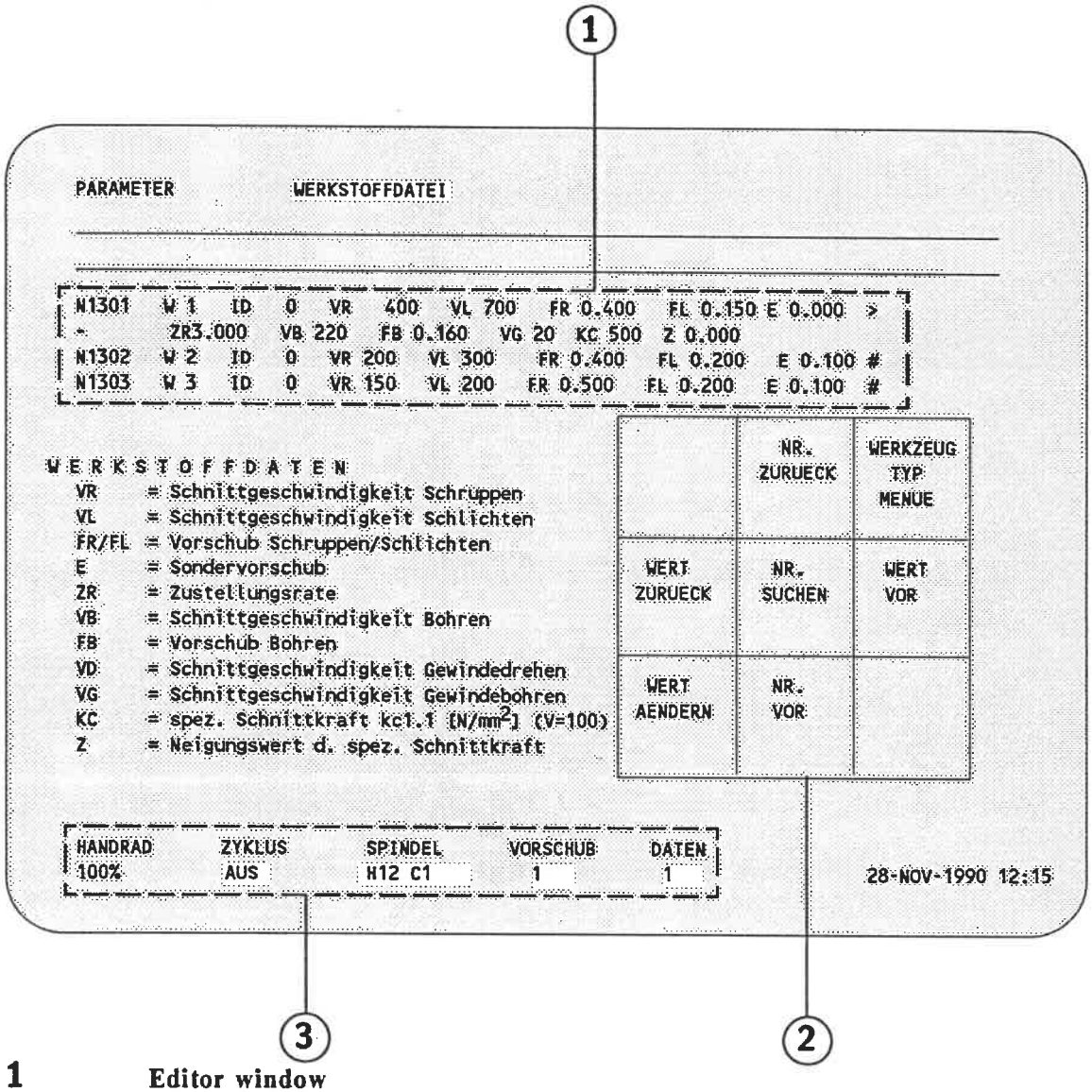
Return to next higher menu level
If you are in the main menu level, this key will have no effect. The basic menu cannot be accessed using this key. For basic menu: operating mode key.

Switch to subsequent menu on same level
The existance of a subsequent menu is indicated by > on the screen, the end of the menu range by <.



10-number keypad
For entering digits and softkey functions depending on display (see also section 1).

Confirmation key
This key must be pressed after every input.

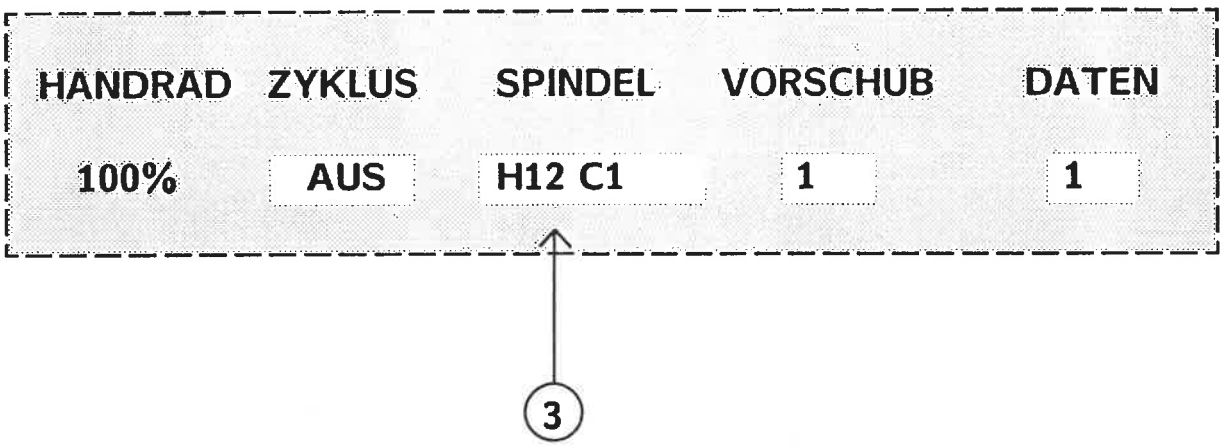


1 **Editor window**
The current program block is displayed entirely - even when comprising several lines (> means: program block continues in next line). The beginning of the following program block is displayed on one line only (# means: program block not displayed entirely).

Editing is possible in the program block following the > cursor.

2 **Softkey functions.**

3 **Status display** (see following page)



3 Status display

HANDWHEEL
Set in percentage divisions

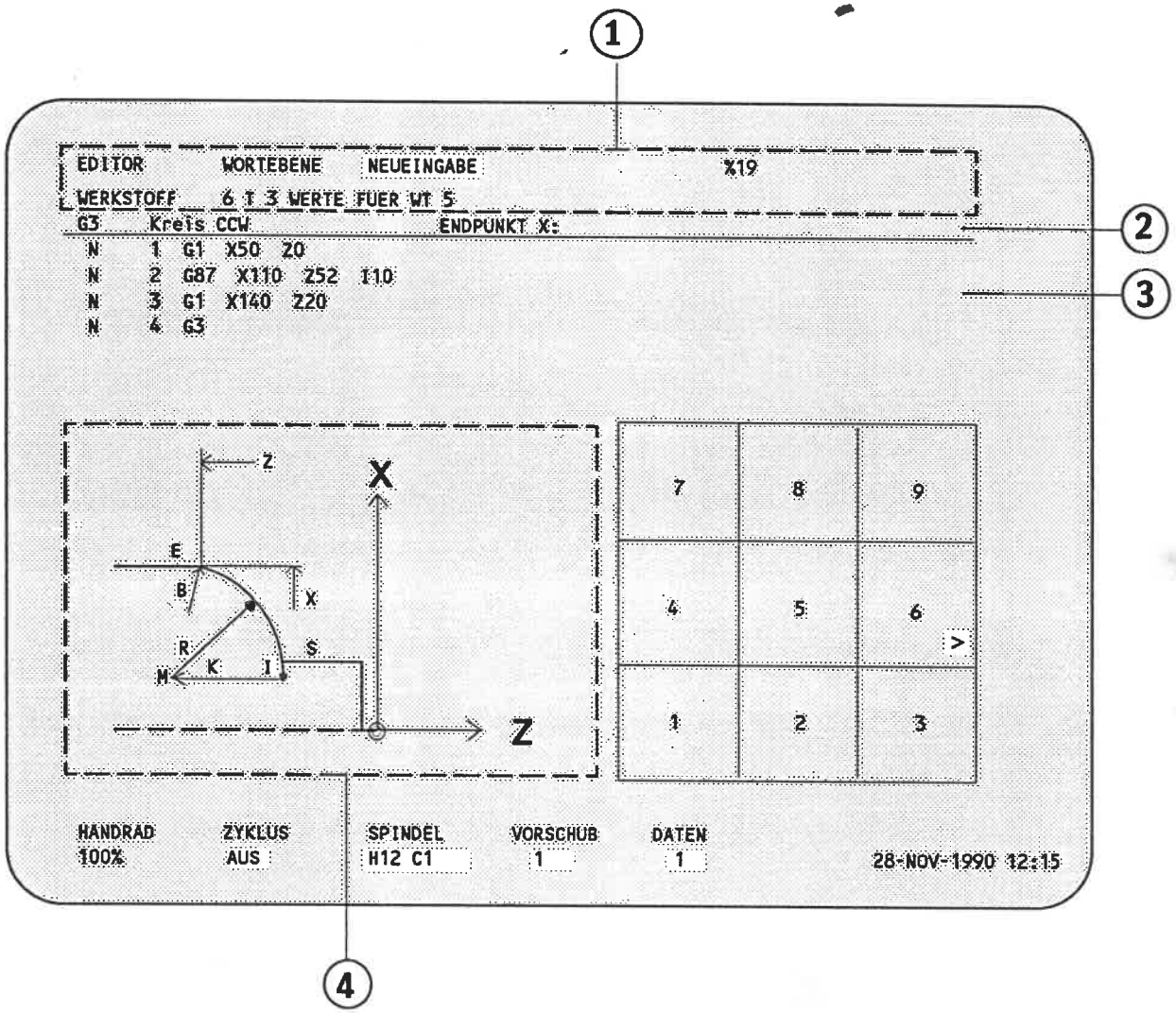
CYCLE
Cycle stop key, feed stop key, or cycle start key is pressed.

RELEASES (a release is displayed in inverse letters)

SPINDLE
H, 1 and 2 for the main spindle H and auxiliary spindle 1 or 2
C-axis 1 is displayed with C1

FEED
Feed release for slide 1

DATA
Data release for slide 1

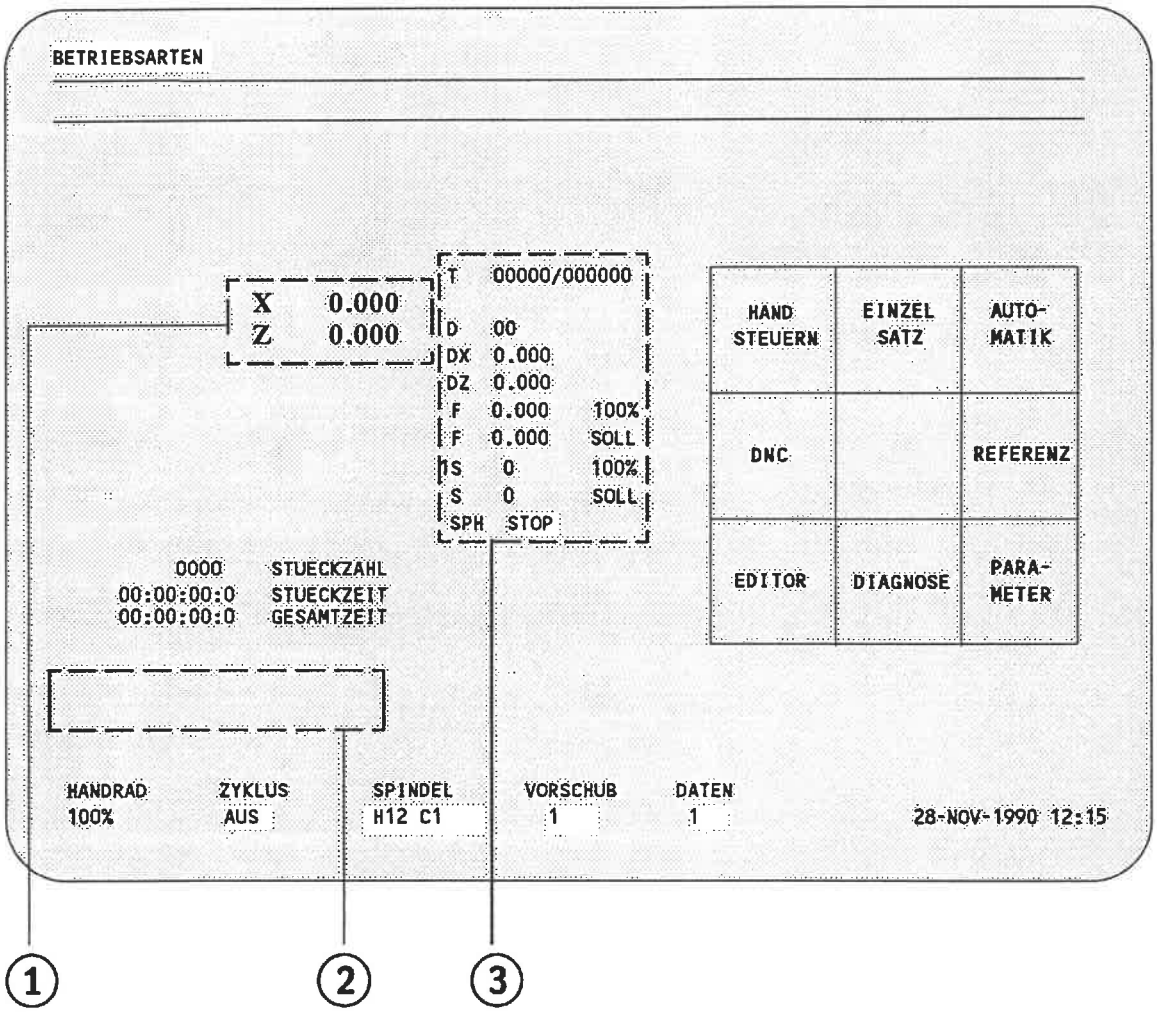


1 **Display operating mode and menu level**
The bright field contains the current menu level. % Number of the current program. Material number for tool type WT.

2 **Edit line**
Contains written input instructions

3 **Program lines**
The NC-block following the > cursor can be edited.

4 **Graphic operator support**

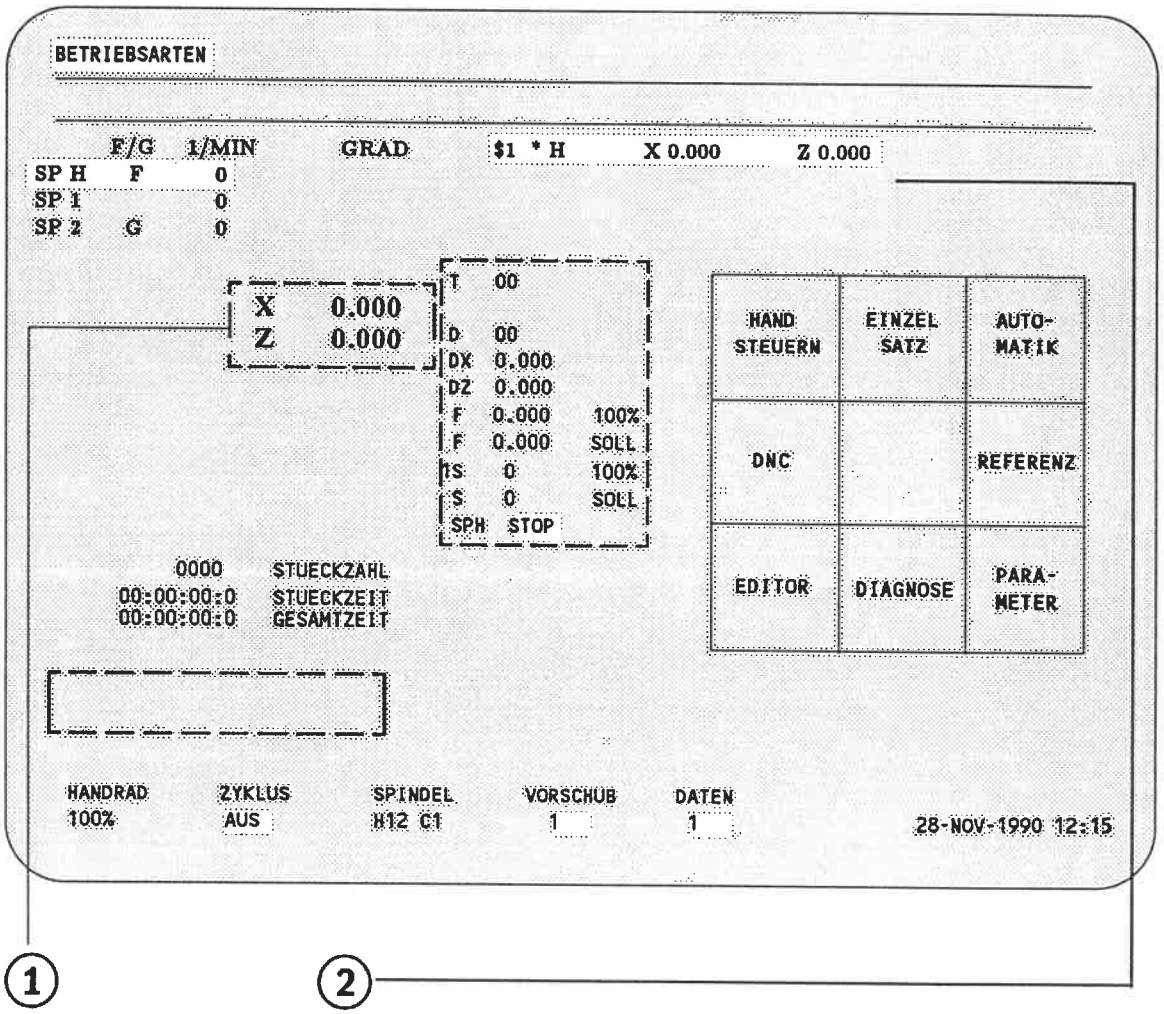


1 **Actual position display (with the display selection only the display for the slide was chosen)**

2 **Error display**
Displays last 10 errors

3 **Technology data display**
Current feed, feed override,
command feed value, chosen spindle and its state (CW, CCW, STOP)
Current speed, speed override, gear stage,
command speed value, active tool offset and offset values,
tool number (version shown here symbolizes tool resident number programming)
current tool service life

Further displays
Display Configuration (extended actual position display)



1 **Actual position display** (actual position display for the actual slide)

2 **Extended actual position display** (actual position display of spindle speed, spindle position and slide position. This function may be selected in mode of operation AUTOMATC or MANUAL by actuating the softkey **DISPLAY SELECT**. The actual position values of the selected spindle and the slide are displayed in inverse letters.

Spindles:	SPH ... SP2
F/G:	F - leading spindle; G - led spindle
1/MIN:	Actual speed value in rev./min
GRAD:	Actual position value in degrees
$1	Slide identification; the "*" indicates if the slide is active
H,1,2	Spindle being related to the slide
X, Z	Additional actual position values for all existing axes

Technical data CTX400

Working space		
Swing over bed track guard	mm	500
Swing over transverse feed guard	mm	300
Transverse path	mm	212
Longitudinal path	mm	640
Main spindle		
Spindle nose (flat flange)	mm	140 h5
Spindle nose diameter in front bearing	mm	100
Spindle bore	mm	72
Chuck cross-section	mm	200
Main drive AC		
Driving power 100% ED (60%) capacity range 1:5	kW	22 (27.5)
Max. torque	Nm	210 (263)
Driving power 100% ED (60%) capacity range 1:10	kW	22
Max. torque	Nm	420
Speed range	min^{-1}	25-5000
Feed drive AC		
X-feed power 100% ED	N	4000
Z-feed power 100% ED	N	8000
X-rapid traverse	m/min	10
Z-rapid traverse	m/min	15
System of units of incremental speed transmitters		
Tool carrier		
Universal disk turret automatically indexing with directional logic		
Number of tool stations		12
Tool carrier cylinder shaft (DIN 69 880)	mm	30
Turret indexing time per station (180°)	sec	0.8 (2.3)
Alternative		
Universal disk turret with driven tools (option)		
Number of tool stations		12
of which, max. driven tools		6
Max. clamping cross-section of driven tools	mm	13
Driving power 100% ED (40%)	kW	2.1 (3.8)
Tailstock		
Quill diameter	mm	80
Quill stroke	mm	100
Quill holder	MK	4
Max. quill pressure	daN	800
Steady (option)		
Self-centering hydraulic steady	mm	8 - 70
Self-centering hydraulic steady	mm	20 - 120
Machine dimensions		
Dimensions (LxWxH) with chip conveyor	mm	4527 x 1940 x 1730
Weight with chip conveyor	kg	5140

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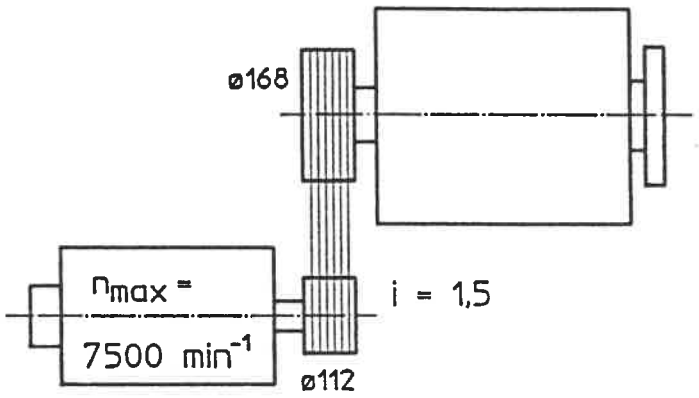
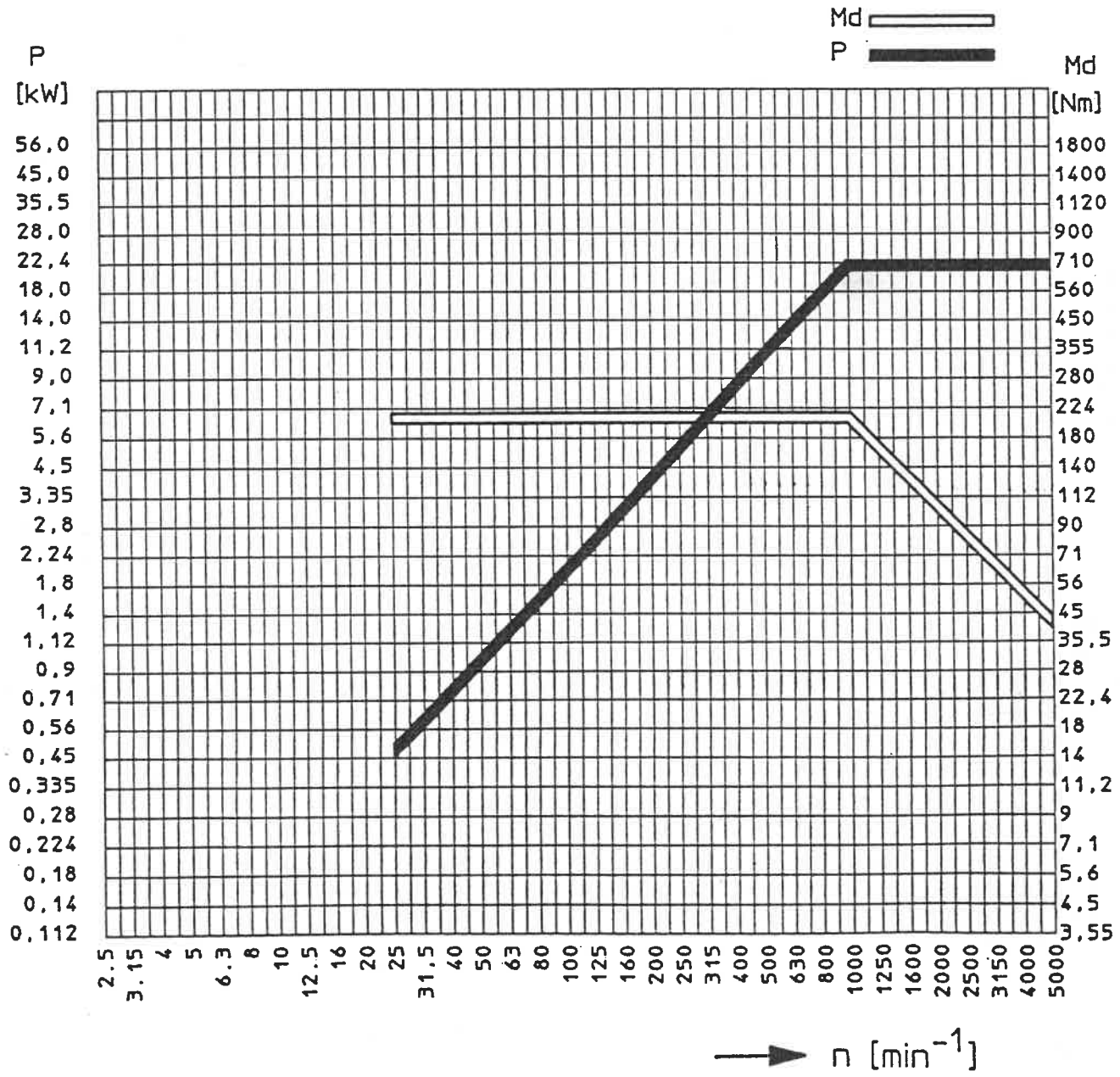
Performance chart of CTX400 main drive
Md_{max} = 210 Nm



Spindle data:

n_N = 25 - 5000 min^{-1}

Md_{max} = 210 Nm



Md_{max} = 420 Nm

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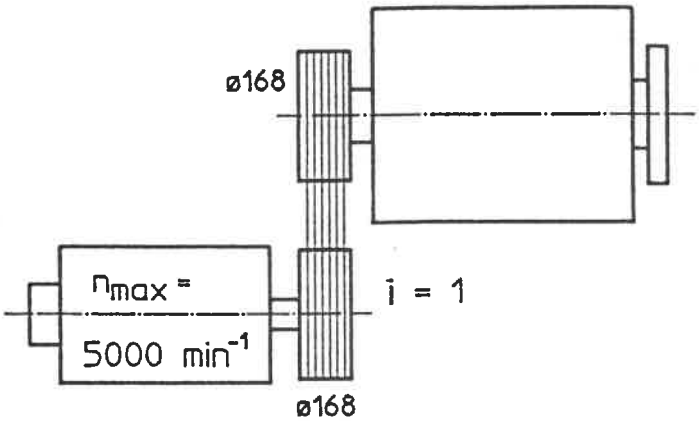
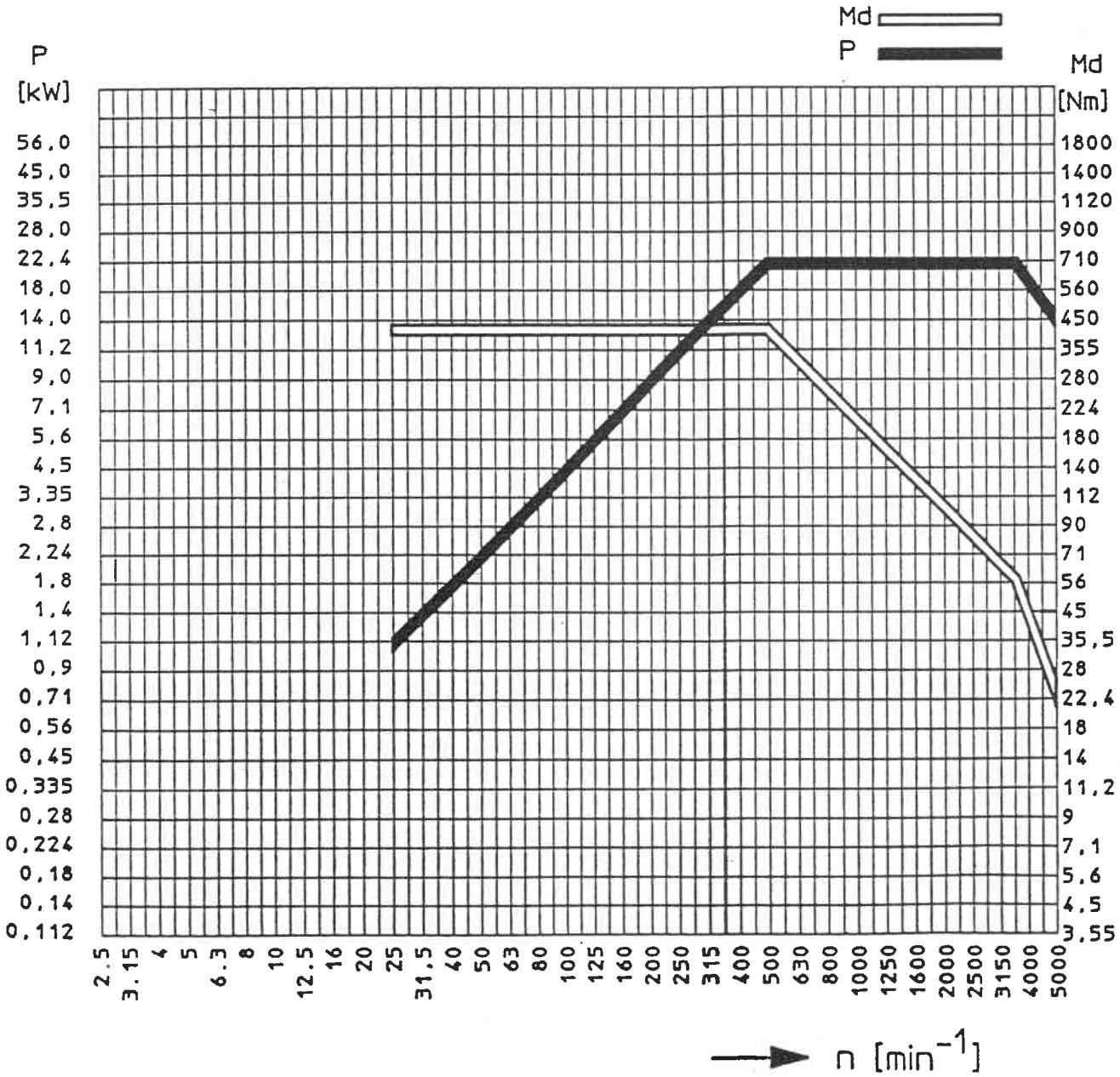
Spindle data:

n_N = 25 - 5000 min^{-1}

Md_{max} = 420 Nm





Performance chart of CTX400
Drive tools

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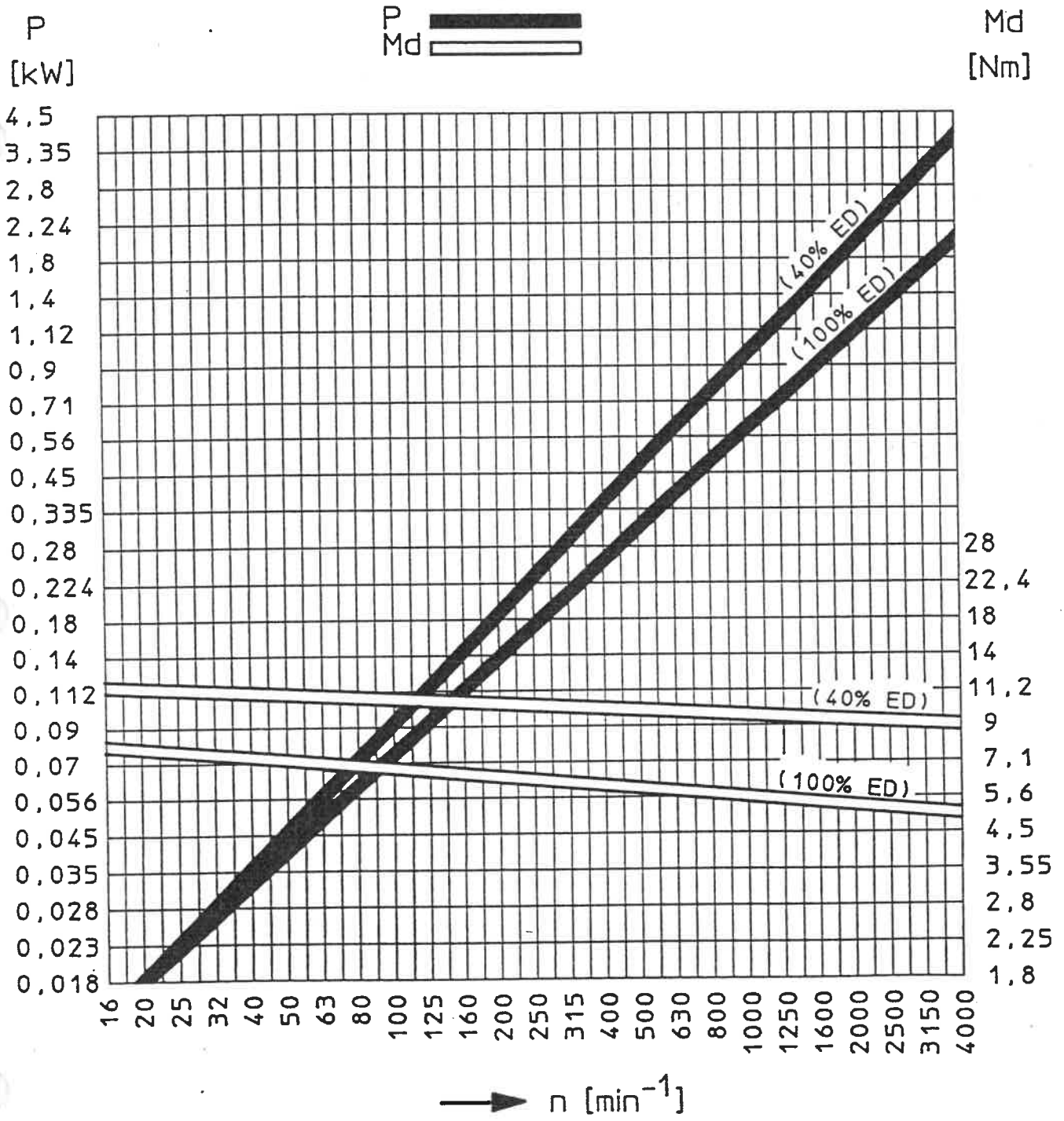
Spindle nosa data:

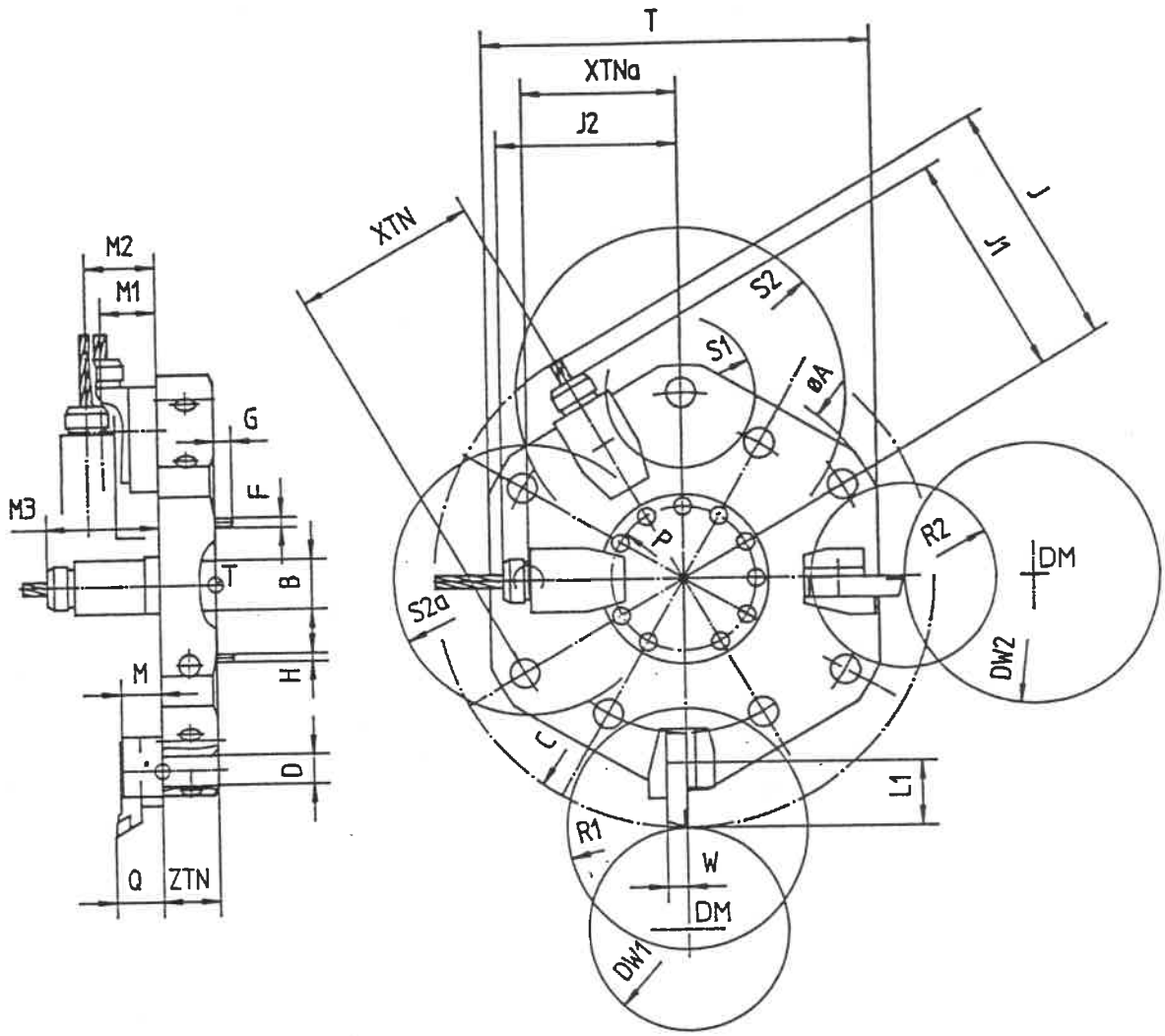
n_{max} = 4000 min^{-1}

Md_{max} = 9 Nm (bei n = 4000 min^{-1}; 40% ED)



Tool carrier, 12 fold

0952319.1



A	B	C	D	DW1	DW2	F	G	J	J1	J2	L1	M
425	50H6	500	30	200	260	11xM10	14	249	227	181	65	40

M1	M2	M3	P	R1	R2	S1	S2	S2a	T	W	XTN	XTNa	ZTN
55	70	113	145	240	185	150	330	270	388	20	185	155	58

Working space of CTX400
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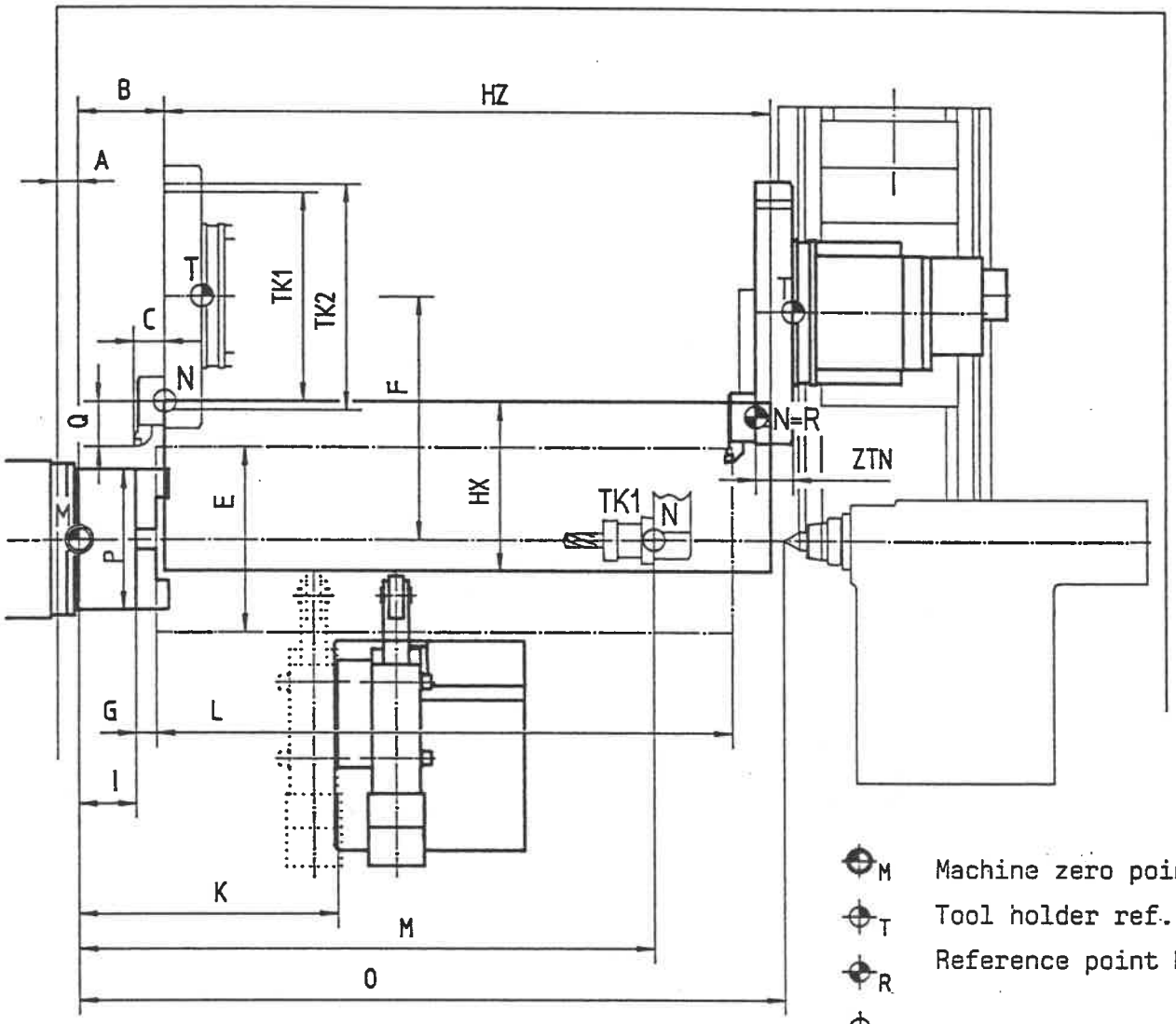

M Machine zero point
T Tool holder ref. point
R Reference point R=N
N Tool rference point

A	B	C	E	F	G **	HX	HZ	I **	K min	L	M	O	P **	Q	TK1	TK2	ZTN
32	116.5	47	260	350	24	212	640	86	312	600	682 / * 596	748	200	65	310	370	58

* Machines with driven tools

** The dimensions refer to a standard machine chuck. In case chucks other than those specified are used, please adapt dimensions accordingly.

Working space of CTX400
Page 2

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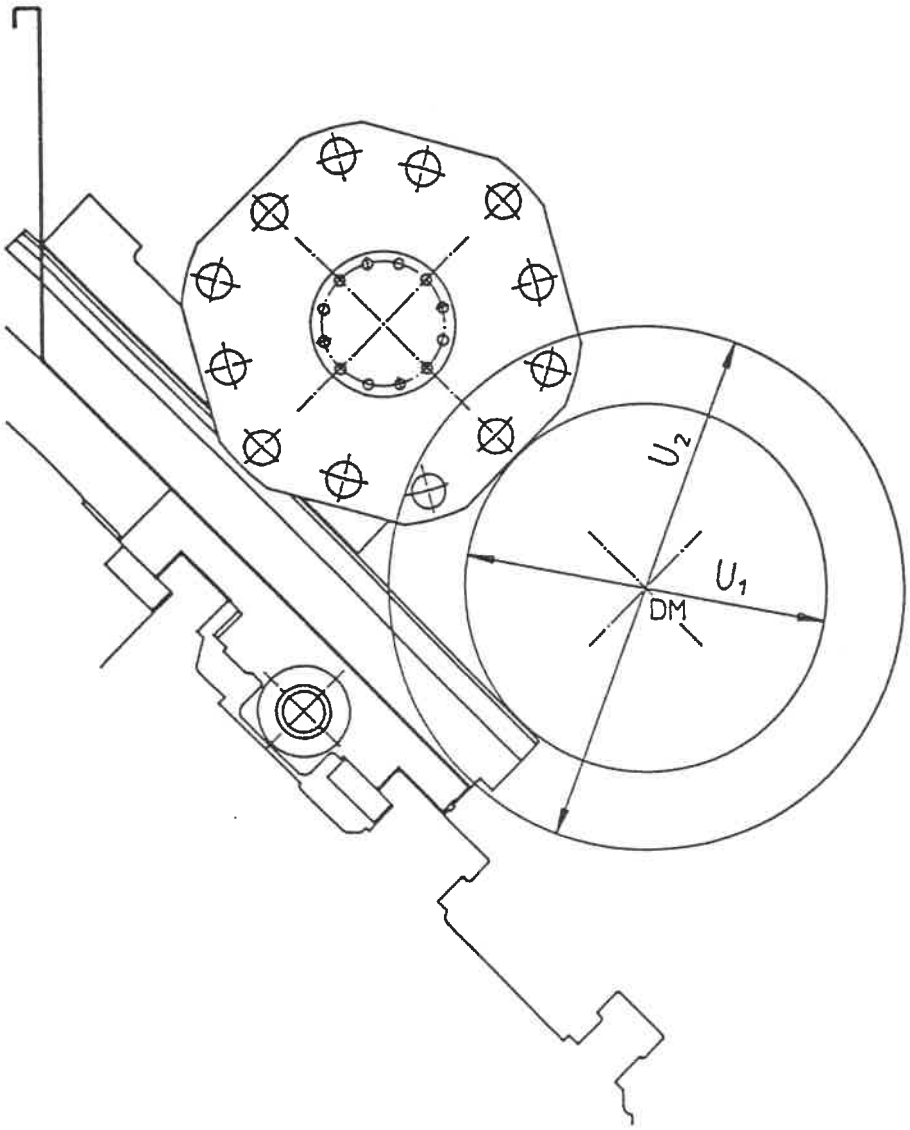

Maschine machine	U_1	U_2
CTX 400	290	500

Technical data CTX500

Working space		
Swing over bed track guard	mm	600
Swing over transverse feed guard	mm	420
Transverse path	mm	275
Longitudinal path	mm	1065
Main spindle		
Spindle nose (flat flange)	mm	220 h5
Spindle nose diameter in front bearing	mm	120
Spindle bore	mm	85
Chuck cross-section	mm	250
Main drive AC		
Driving power 100% ED (60%) capacity range 1:10	kW	27
Max. torque	Nm	800
Speed range	min^{-1}	16-3200
Feed drive AC		
X-feed power 100% ED	N	500
Z-feed power 100% ED	N	1000
X-rapid traverse	m/min	10
Z-rapid traverse	m/min	15
System of units of incremental speed transmitters		
Tool carrier		
Universal disk turret automatically indexing with directional logic		
Number of tool stations		12
Tool carrier cylinder shaft (DIN 69 880)	mm	40
Turret indexing time per station (180°)	sec	0,8 (2,3)
Alternative		
Universal disk turret with driven tools (option)		
Number of tool stations		12
of which, max. driven tools		6
Max. clamping cross-section of driven tools	mm	16
Driving power 100% ED (40%)	kW	9,2 (12,6)
Tailstock		
Quill diameter	mm	100
Quill stroke	mm	120
Quill holder	MK	5
Max. quill pressure	daN	950
Steady (option)		
Self-centering hydraulic steady	mm	22 - 150
Machine dimensions		
Dimensions (LxWxH) with chip conveyor*	mm	5014x2190x1873
Weight with chip conveyor	kg	7540

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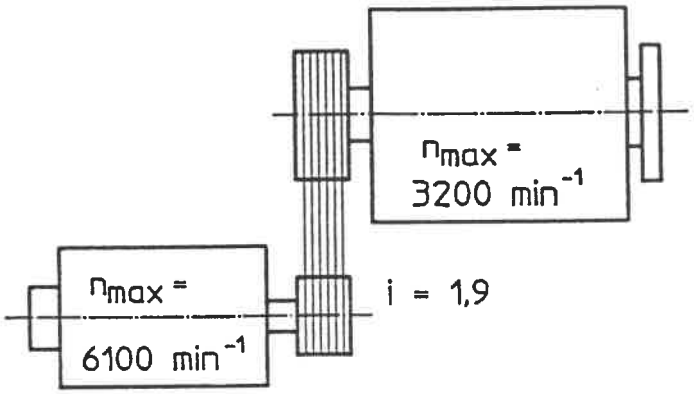
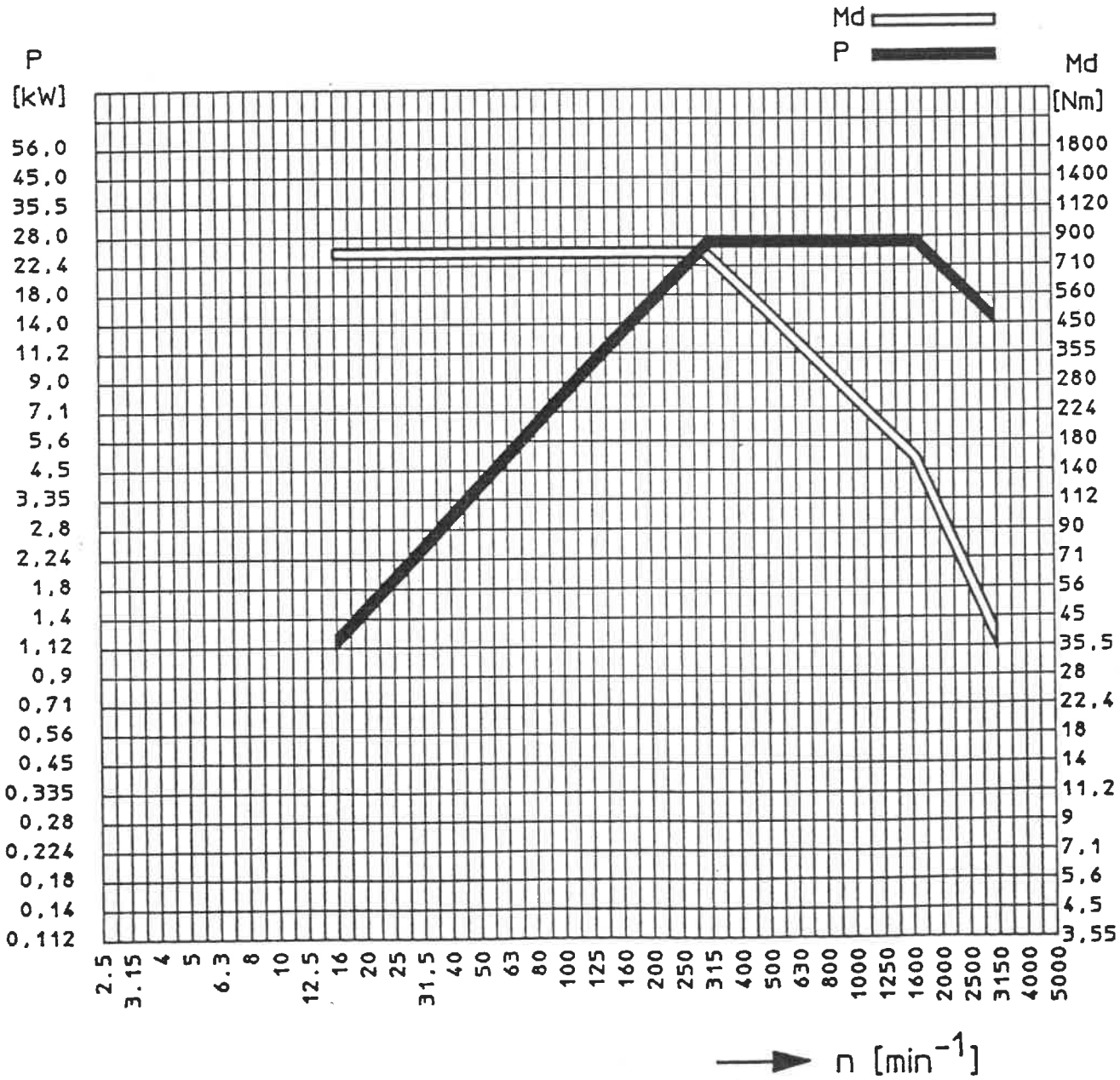
Performance chart of CTX500 main drive
Md_{max} = 800 Nm



Spindle data:
n_N = 16 - 3200 min^{-1}
Md_{max} = 800 Nm



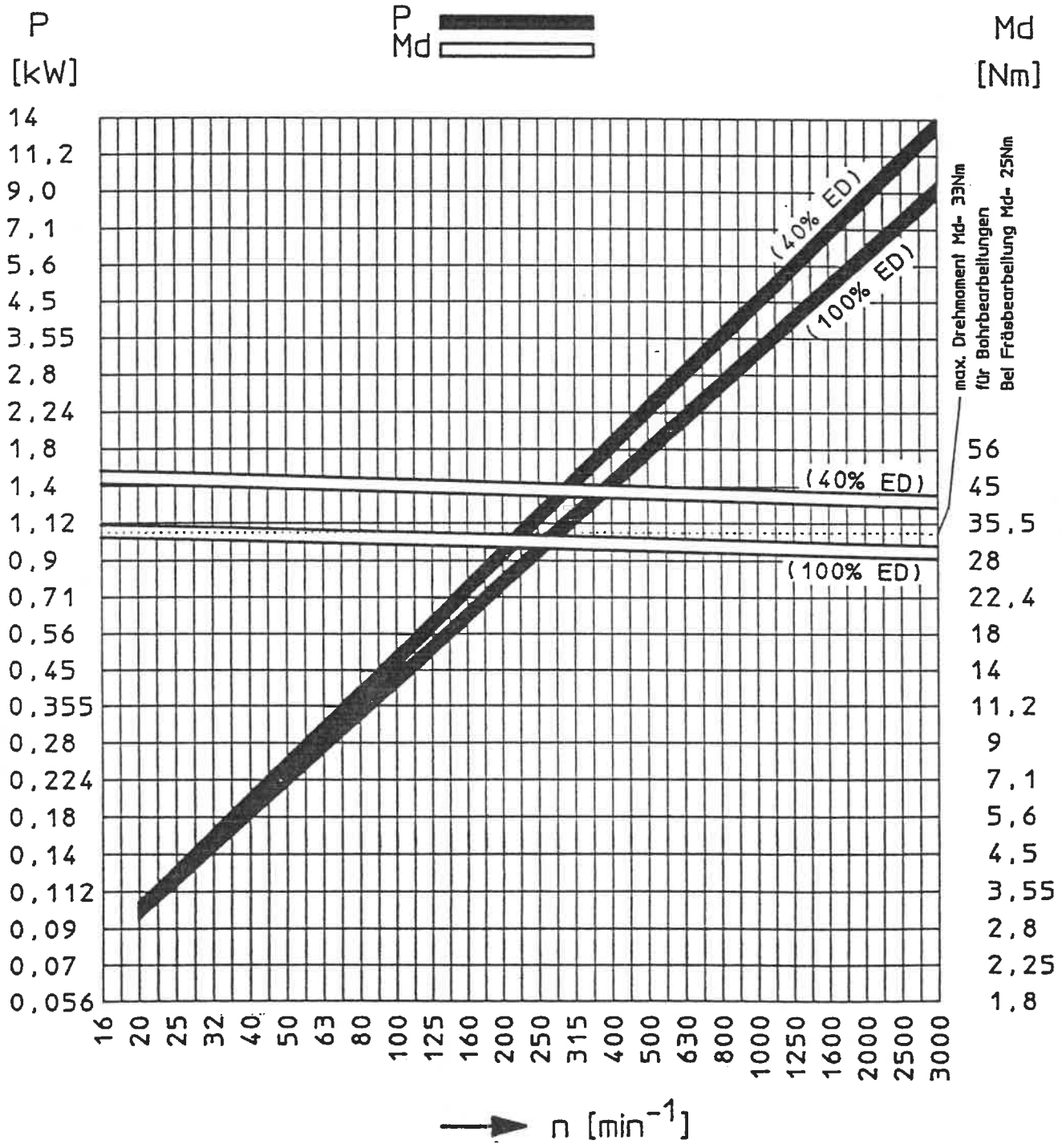
Performance chart of CTX500
Drive tools

0941114

Spindle nose data:

n_{max} = 3000 min^{-1}

Md_{max} = 30Nm (bei n = 3000 min^{-1} 100% ED)



Tool carrier, 12 fold

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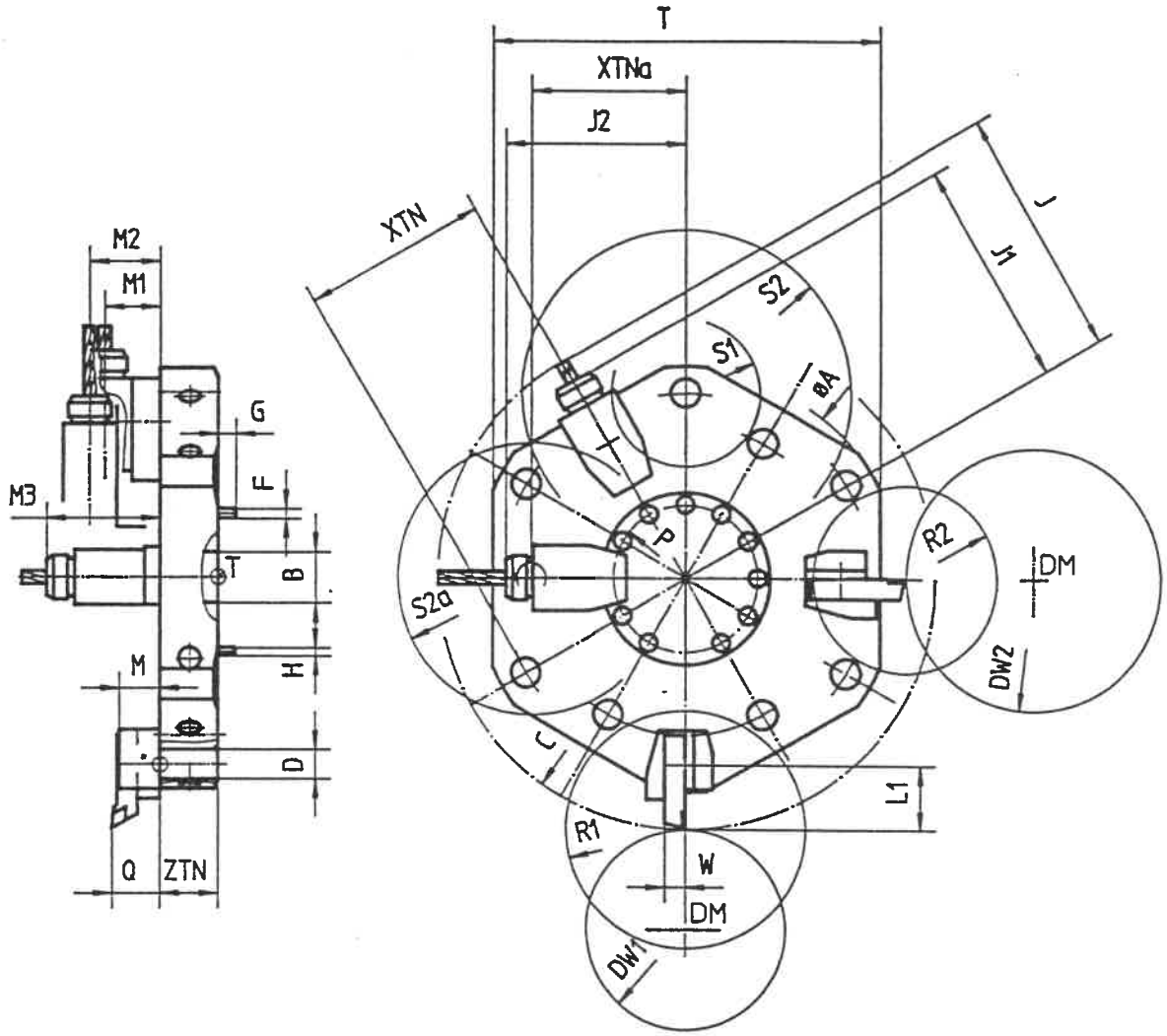

A	B	C	D	DW1	DW2	F	G	J	J1	J2	L1	M
465	50H6	590	40	300	330	11xM10	16	294	272	219	80	44

M1	M2	M3	P	R1	R2	S1	S2	S2a	T	W	XTN	XTNa	ZTN
65	86	138	145	260	230	160	360	330	435	25	200	185	66

Working space of CTX500
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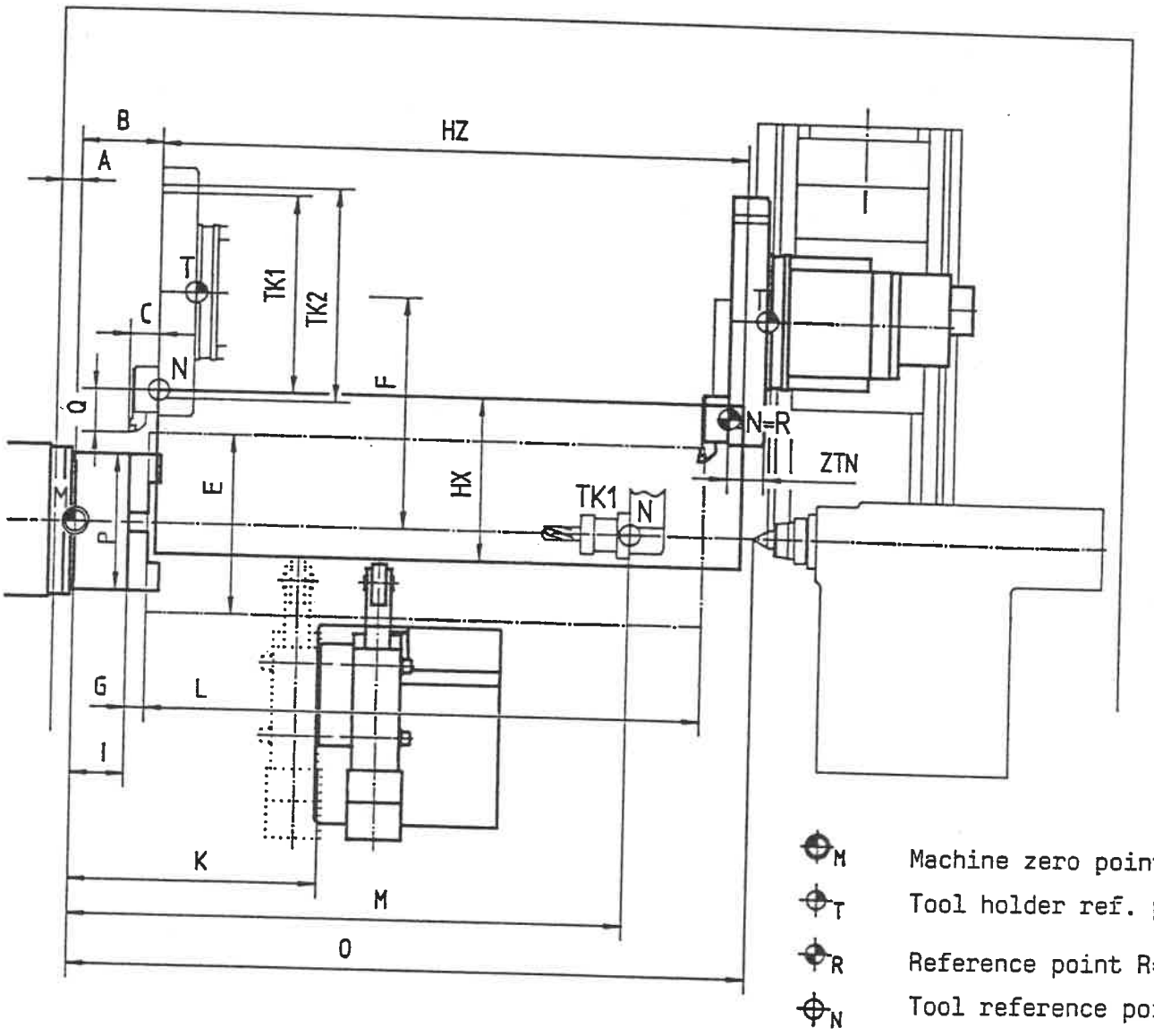

M Machine zero point

T Tool holder ref. point

R Reference point R=N

N Tool reference point

A	B	C	E	F	G **	HX	HZ	I **	K min	L	M	O	P **	Q	TK1	TK2	ZTN
38	153	54	330	430	36	275	1065	102	410	1026	1156 / *1070	1228	250	80	370	400	66

* Machine with driveb tools

** The dimensions refer to a standard machine chuck. In case chucks other than those specified are used, please adapt dimensions accordingly.

Working space of CTX500
Page 2

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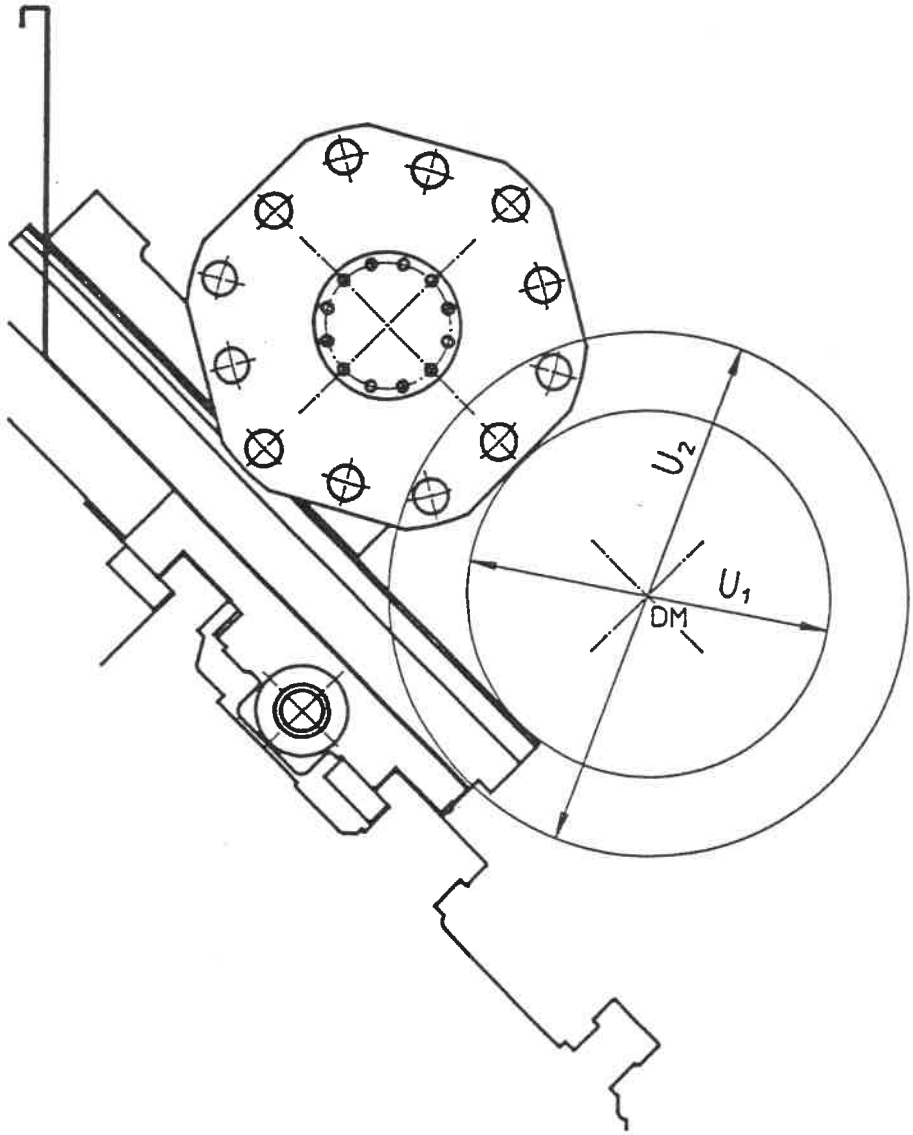

Maschine machine	U_1	U_2
CTX 500	420	600

Technical data CTX600

		DL 1000	DL 2000
Operating range			
Circulating diameter above bed slideway cover	mm	650	650
Circulation diameter above face guide	mm	480	480
Transverse path	mm	320	320
Longitudinal path	mm	1097	2097
Headstock spindle			
Spindle head (flat flange)	mm	220 h5	220 h5
Spindle head diameter in front bearing	mm	140	140
Spindle hole	mm	107	107
Clamping chuck diameter	mm	315	315
Main drive AC			
Speed range	rpm	4-3050	4-3050
Drive performance 100% duty cycle perform. range 1:20	kW	27	27
Max. torque gear level 1	Nm	1680	1680
Max. torque gear level 2	Nm	420	420
Speed range	min^{-1}	4-3050	4-3050
Feed drive AC			
X feed force 100% duty cycle	daN	800	800
Z feed force 100% duty cycle	daN	1500	1500
X rapid speed	m/mn	10	10
Z rapid speed	m/mn	15	15
Measuring system incremental shaft encoder			
Tool holder			
Universal disk turret, autom. switching with directional logics			
Number of tool stations		12	12
Tool mounting cylinder shaft (DIN 69 880)	mm	50	50
Turret switching time per station (180°)	sec.	1.0 (3.0)	1.0 (3.0)
Alternative			
Universal disk turret with driven tools (option)			
Number of tool stations		12	12
Of which max. driven tools		6	6
max. clamping diameter of driven tools	mm	25	25
Drive performance 100% duty cycle (40%)	kW	10.4 (14.1)	10.4 (14.1)
Tailstock			
Centre sleeve diameter	mm	120	120
Centre sleeve stroke	mm	120	120
Centre sleeve mounting	MK	5 (6)	5
max. centre sleeve pressure	daN	1400	1400
Steady rest			
Automatically centering hydr. steady rest	mm	22 - 150	22 - 150
Automatically centering hydr. steady rest	mm	100 - 200	100 - 200
Machine dimensions			
Dimensions (LxWxH) incl. chip conveyor	mm	5080x3437x1969	6388x3437x1969
Weight incl. chip conveyor	kg	7250	9150

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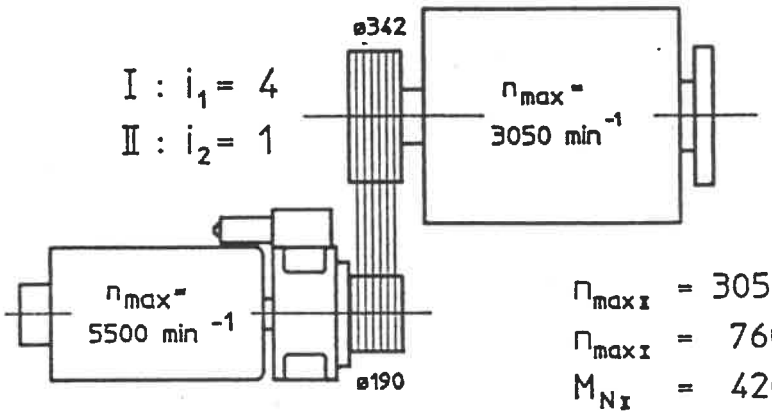
Performance chart of CTX600 main drive
Md_{max} = 1680 Nm



Spindle data:

n_N = 4 - 3050 min^{-1}

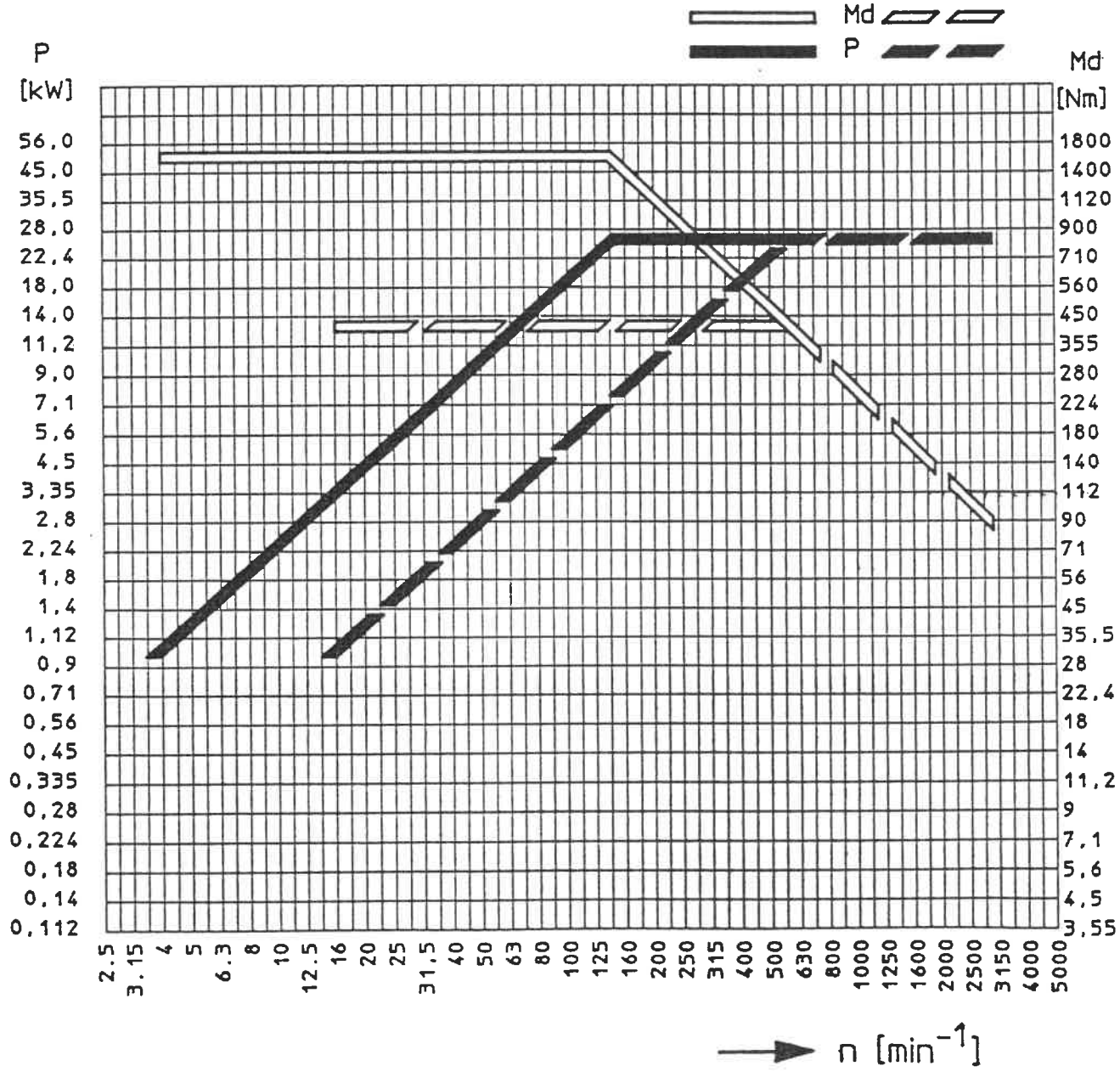
Md_{max} = 1680 Nm

$n_{max\,I}$ = 3050 min^{-1}

$n_{max\,I}$ = 760 min^{-1}

$M_{N\,I}$ = 420 min^{-1}

$M_{N\,I}$ = 1680 min^{-1}



Performance chart of CTX600
Drive tools

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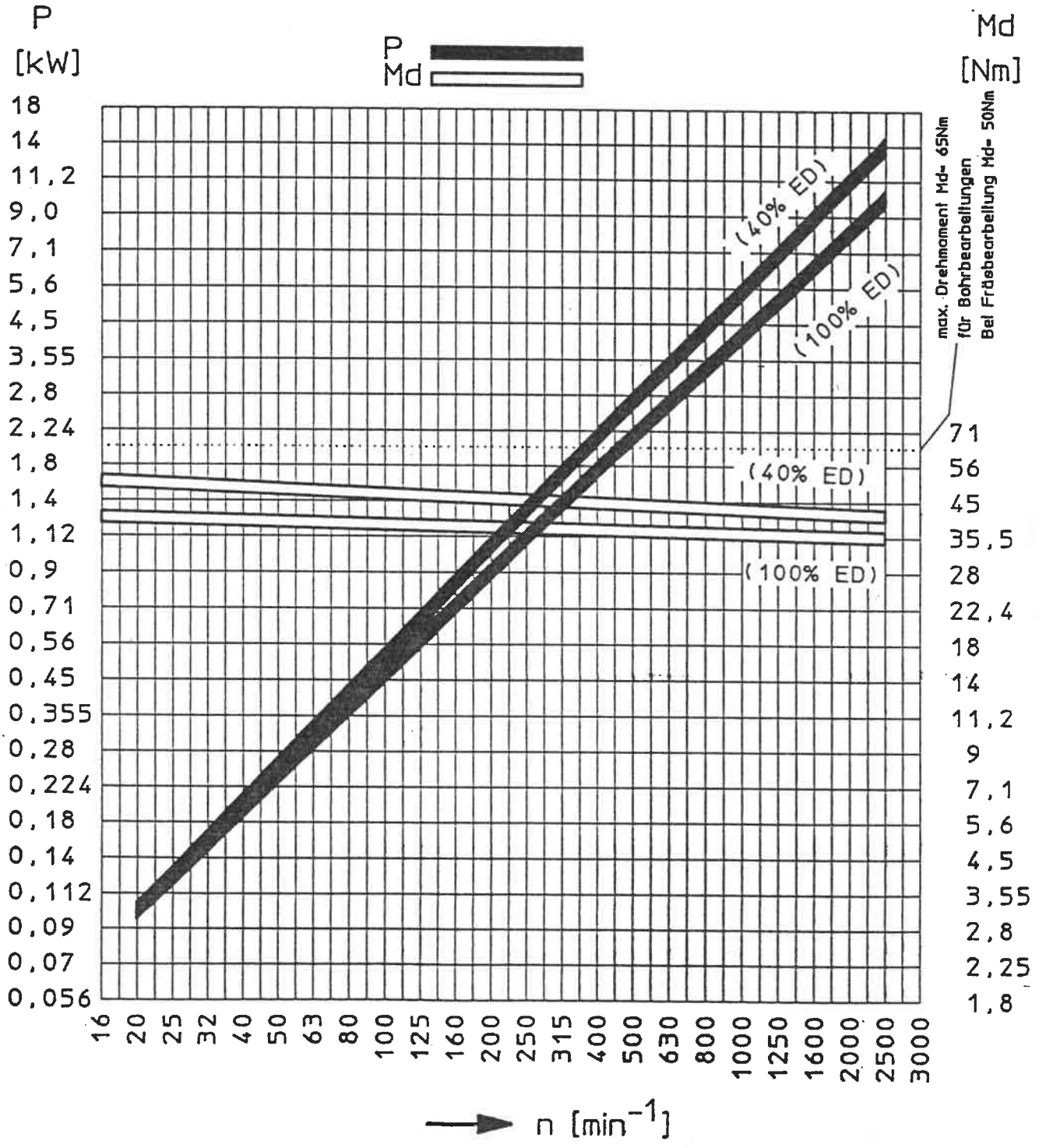
Spindle nose data:

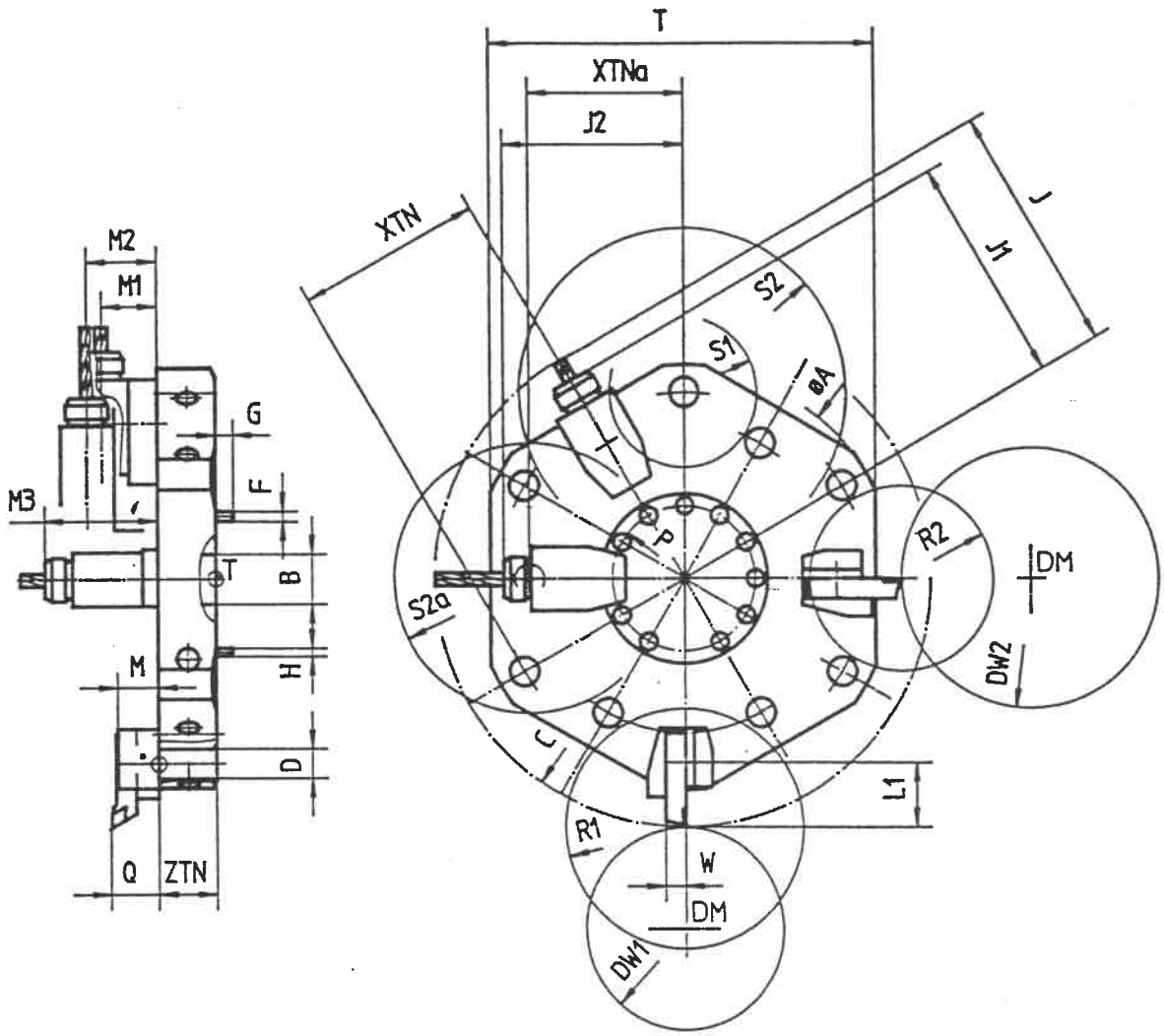
n_{max} = 2500 min^{-1}

Md_{max} = 40Nm (bei n = 2500 min^{-1} 100% ED)



Tool carrier, 12 fold

0952420.1



A	B	C	D	DW1	DW2	F	G	J	J1	J2	L1	M
545	63H5	650	50	355	425	11xM12	19	316	301	241	85	55

M1	M2	M3	P	R1	R2	S1	S2	S2a	T	W	XTN	XTNa	ZTN
72	98	152	182	300	230	180	415	345	504	32	235	200	82

Working space of CTX600
Page 1

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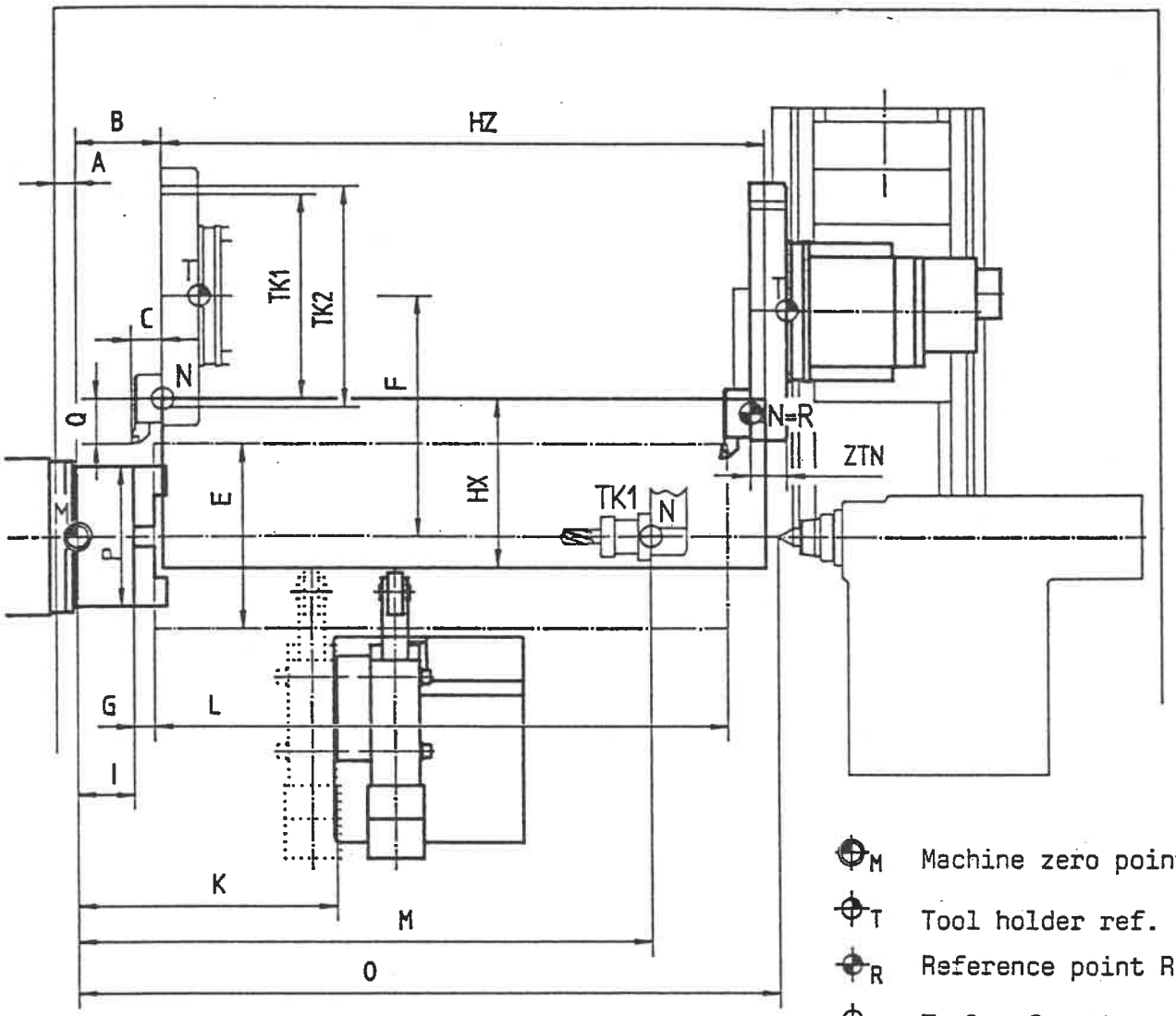


M Machine zero point

T Tool holder ref. point

R Reference point R=N

N Tool reference point

Maschine machine	A	B	C	E	F	G **	HX	HZ	I **	K min	L	M	O	P **	Q	TK1	TK2	ZTN
CTX 600 DL 1000	38	133	70	425	497.5	36	320	1097	102	407	1022	1087 / * 957	1174	315	85	400	470	82
*** CTX 600 DL 1000	38	133	70	425	497.5	36	320	1097	102	407	1022	1150 / * 1020	1238	315	85	400	470	82
*** CTX 600 DL 2000	38	133	70	425	497.5	36	320	2097	102	407	2022	2150 / * 2020	2238	315	85	400	470	82

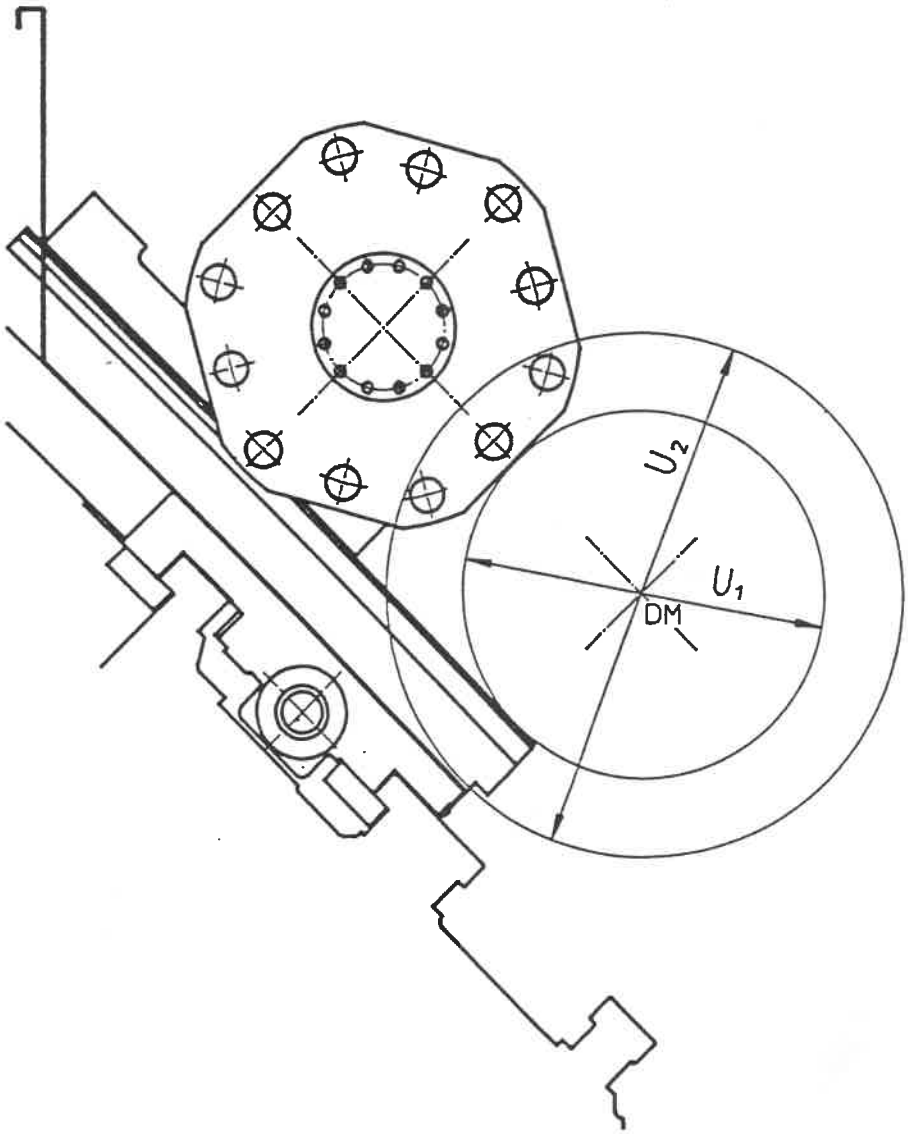
* Machines with driven tools

** The dimensions refer those a standard machine chuck. In case chucks other than those specified are used, please adapt dimensions accordingly.

*** Tailstock with integrated bearing

Working space of CTX600
Page 2

0952420.3



Maschine machine	U_1	U_2
CTX 600	480	650