

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.

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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 not 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.

Survey of Contents

0. General (About This Manual, Contents, Operating Elements of the Control System, Display Configuration, Technical Specifications)
1. Control System Operation
2. Setting up / Manual Operation
REFERENCE and MANUAL CONTROL operating modes
3. Programming
4. Program Input/Output, Program Corrections
EDITOR operating mode
5. Program Execution
SINGLE BLOCK and AUTOMATIC CONTROL operating modes
6. **PARAMETERS** operating mode
7. Troubleshooting
DIAGNOSIS operating mode
8. Options and Expansions
9. Code List

Table of Contents**0. General**

About this manual	0-1
Summary of contents	0-2
Operating elements of the control system	0-9
Display configuration	0-11
Technical specifications	0-16

1. Control system operation

Menu technique and softkeys	1-1
Graphic support for the operator (editing aid and simulation)	1-5

**2. Setting up/manual operation
(MANUAL CONTROL operating mode)**

Geometrical principles	2-1
- System of coordinates, NC zero point machine zero point, reference point	
- Absolute dimension (G90), incremental dimension (G91)	
- Principle of dimensioning	
Approach reference point (REFERENCE operating mode)	2-6
Select MANUAL CONTROL operating mode	2-8
Movement of slide via direction keys and via handwheel	2-9
Selection of the spindle	2-10
Feed	2-11
Speed	2-12
Machine functions	2-13
Indexing the spindle dividing device	2-14
	0-3

Table of Contents

Setting up and travelling to machine dimensions	2-15
Extended actual-value display	2-17
Turning in longitudinal and transversal direction with constant feed	2-18
Wear correction (D) via handwheel	2-19
Protective zones	2-20
Tool change	2-21
Setting of NC zero point by means of scratching (basic tool)	2-23
Follow-up tool	2-27
Tool change point	2-29
Shifting the NC zero point	2-31
Tool measuring in MANUAL CONTROL mode (optics (optional), probe (optional), scratching on basis of a dimension entered by the operator)	2-33
Service life/batch size	2-42
Setting-up the chucking equipment (spindle and C-axis)	2-44
Diagnosis in side-line operation	2-47
G-functions evaluated by the SPS	2-48
Auxiliary programs for extensive sequences of movements	2-49

3. Programming

3.1 Basics

What is programming?	3.1-1
NC words / NC blocks	3.1-1
Program number / block number	3.1-2
What are G- and M-functions?	3.1-3
Survey of G- and M-functions	3.1-4

Table of Contents

3.2 Geometrical functions (Programming of rapid traverse, straight line and circle)

Description of all G-functions 3.2-1

3.3 Simplified Geometry Programming (SGP)

Introduction 3.3-1

Call-up of SGP 3.3-6

Transition straight line - chamfer 3.3-7

Transition straight line - roundance 3.3-9

Transition chamfer - roundance 3.3-10

Circular arc as roundance or in separate block 3.3-11

3.4 Tool data, tool change

Tool selection (T) 3.4-1

Wear compensation (D) 3.4-8

3.5 Subprogram technique

General 3.5-1

Repeats of subprograms 3.5-2

Nesting subprograms 3.5-2

Deletion level and deletion step 3.5-5

4. Program input/output

EDITOR operating mode

Program level 4-1

Program selection 4-2

Listing the programs 4-3

Erase programs 4-3

Copy programs 4-4

External data communication 4-4

Material selection (optional) 4-5

Table of Contents

Block level	
Search for and alter NC block	4-6
Search for NC word	4-7
Insert block	4-8
Word level	
Alter and erase NC word	4-9
Program test through graphic simulation	4-10
Utilization graphics	4-11
5. Program execution	
SINGLE BLOCK /AUTOMATIC operating mode	
AUTOMATIC operating mode	
Program selection	5-1
Start block selection	5-2
Deletion level selection	5-6
NC word selection	5-6
Setting for number of pieces	5-7
Start a program in the automatic operating mode	5-8
Feed override	5-8
Speed override	5-9
Switch-over: automatic/single block	5-9
Optional stop	5-10
Parallel operation in another operating mode	5-10
SINGLE BLOCK operating mode	5-12
Tool inspection	5-15
Restart after interruption	5-19

Table of Contents

6. PARAMETERS operating mode

Parameter input	6-1
List of parameters	6-10
Parameter description	6-18

7. Troubleshooting

7.1 DIAGNOSIS operating mode

Time input	7-2
Error output	7-2
Software version	7-2
Set password	7-3
SPS memory output	7-3
Display of input bytes	7-4
Variables output	7-5
Display of output bytes	7-5
Text and picture test	7-6
Setting variables undefined	7-6
Switch-over of the display language	7-7
7.2 DIAGNOSOS operating mode in side-line operation	7-9
7.3 DIAGNOSOS operating mode / TOOL DIAGNOSIS	7-10
7.4 Error diagnosis	7-17
7.5 PLC-errors	7.5-1

8. Further options and expansions

8.1 Programming variables	8-1
8.2 In-process measuring	8-15
8.3 Post-process measuring	8-22
8.4 Electronic measuring system	8-24
8.5 DNC operating mode	8-29
	0-7

Table of Contents

9. Code list

9.1 G-functions

9-1

9.2 M-functions

9-9

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 direction X-.



Manual direction key (longitudinal)

Slide moves in direction Z+.



Manual direction 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.



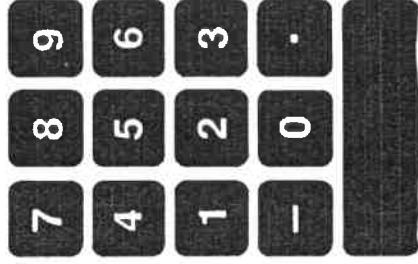
Switch to subsequent menu on same level

The existence 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.

Display Configuration

1

PARAMETER	WERKSTOFFDATEI													
N1301	W 1	ID	0	VR	400	VL	700	FR	0.400	FL	0.150	E	0.000	>
	Z	83.000	VB	220	FB	0.160	VG	20	KC	500	Z	0.000		
N1302	W 2	ID	0	VR	200	VL	300	FR	0.400	FL	0.200	E	0.100	#
N1303	W 3	ID	0	VR	150	VL	200	FR	0.500	FL	0.200	E	0.100	#

WERKSTOFFDATEI

- VR = Schnittgeschwindigkeit Schruppen
- VL = Schnittgeschwindigkeit Schliften
- FR/FL = Vorschub Schruppen/Schliften
- E = Sondervorschub
- ZR = Zustellungsrate
- VB = Schnittgeschwindigkeit Bohren
- FB = Vorschub Bohren
- VD = Schnittgeschwindigkeit Gewindedrehen
- VG = Schnittgeschwindigkeit Gewindebohren
- KC = spez. Schnittkraft kct.f (N/mm²) (V=100)
- Z = Neigungswert d. spez. Schnittkraft

WERKZEUG		WERKZEUG	
NR.	ZURUECK	NR.	TYP:
ZURUECK	WERT	SUCHEN	MENUE
	ZURUECK	WERT	ZURUECK
	WERT	AEANDERN	WERT
	AEANDERN	VOR	VOR

28-Nov-1990 12:15

3

HANDBRAD	ZYKLUS	SPINDEL	VORSCHUB	DATEN
100%	AUS	H12 C1	1	1

2

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)

Display Configuration

HANDRAD	ZYKLUS	SPINDEL	VORSCHUB	DATEN
100%	AUS	H12 C1	1	1

3

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

Display Configuration

EDITOR **NEUEINGABE** X19

WERKSTOFF 6 I 3 **WERTE FUER WT 5**

G5 Kreis CGV **ENDPUNKT X:**

N 1 G1 X50 Z0

N 2 G87 X110 Z52 I10

N 3 G1 X140 Z20

N 4 G3

HANDRAD 100%

ZYKLUS AUS

SPINDEL H12 C1

VORSCHUB 1

DATEN 1

28-NOV-1990 12:15

1

2

3

4

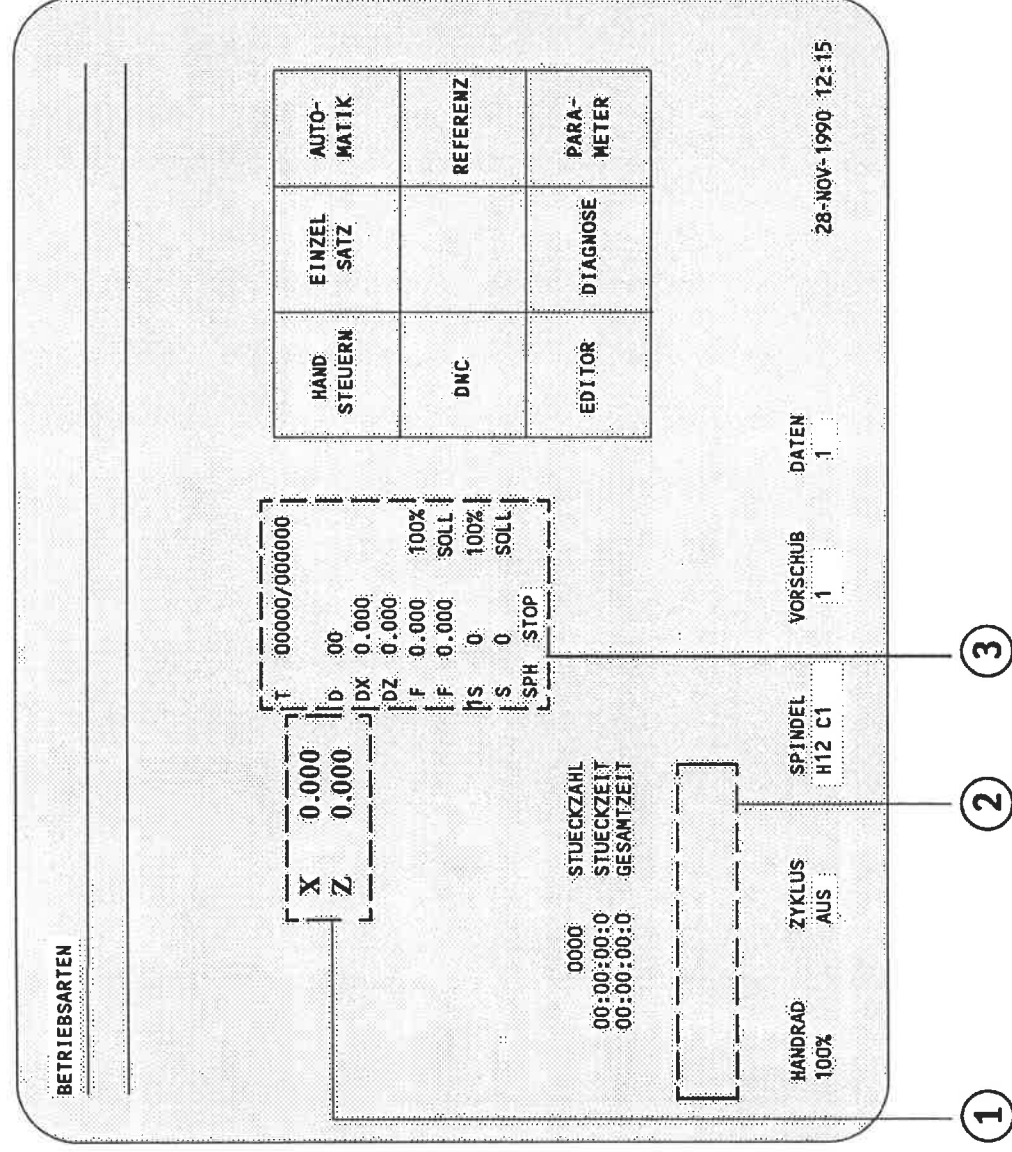
- 1** **Display operating mode and menu level**
The bright field contains the current menu level, % Number of the current program, Material number for tool type WT.

- 2** **Edit line**
Contains written input instructions

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

- 4** **Graphic operator support**

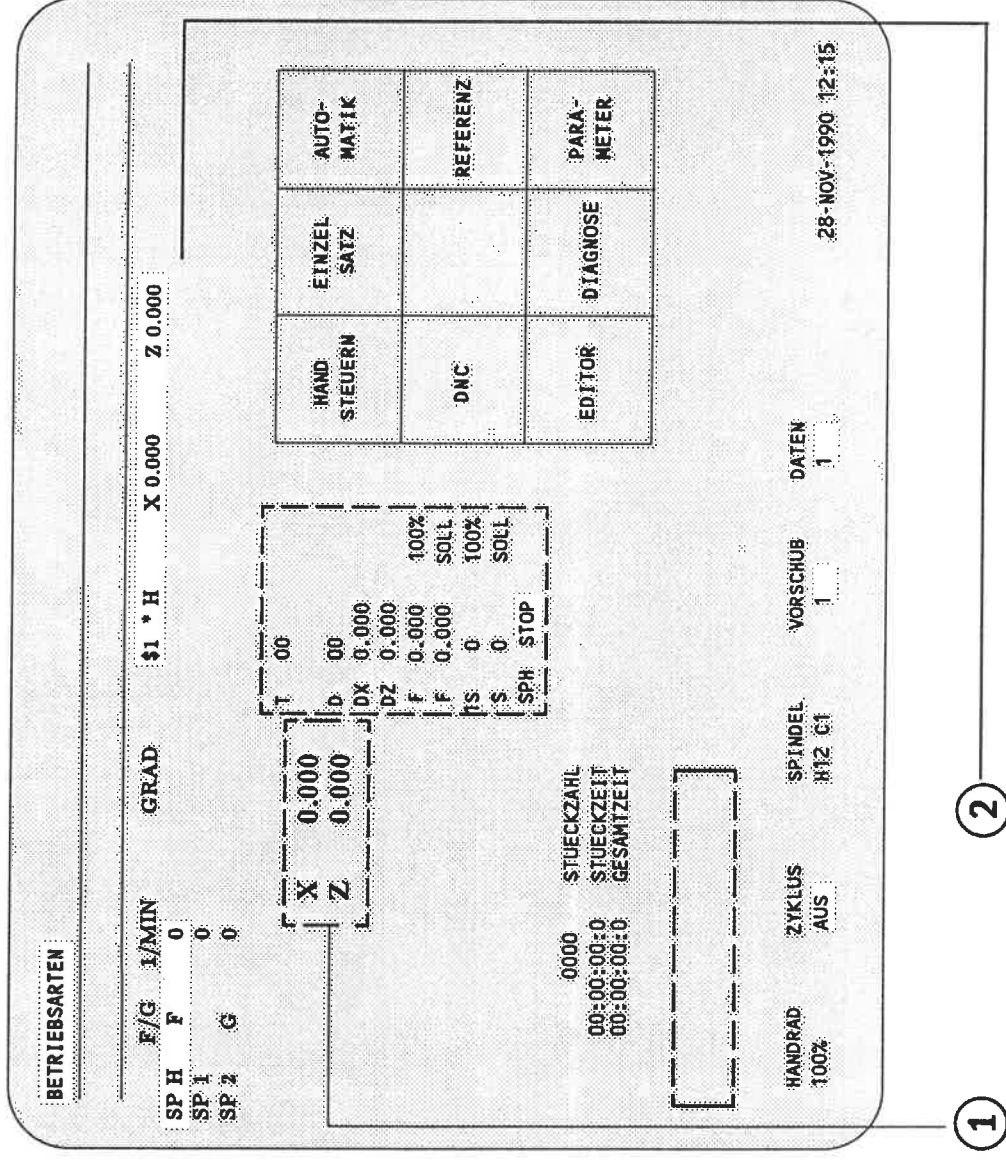
Display Configuration



- 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)

Display Configuration



- 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 AUTOMATIC 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

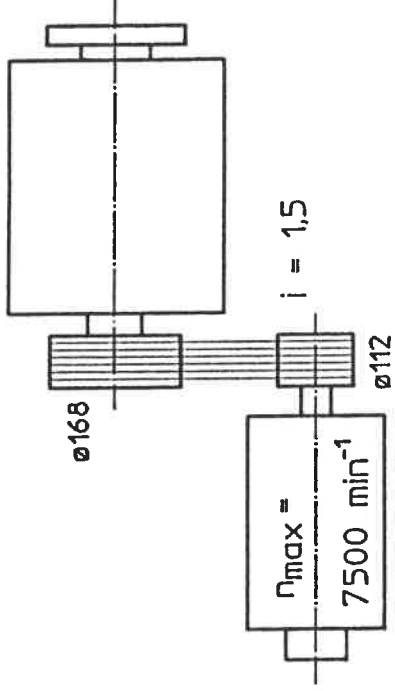
Technical data CTX400

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

0952421

Performance chart of CTX400 main drive

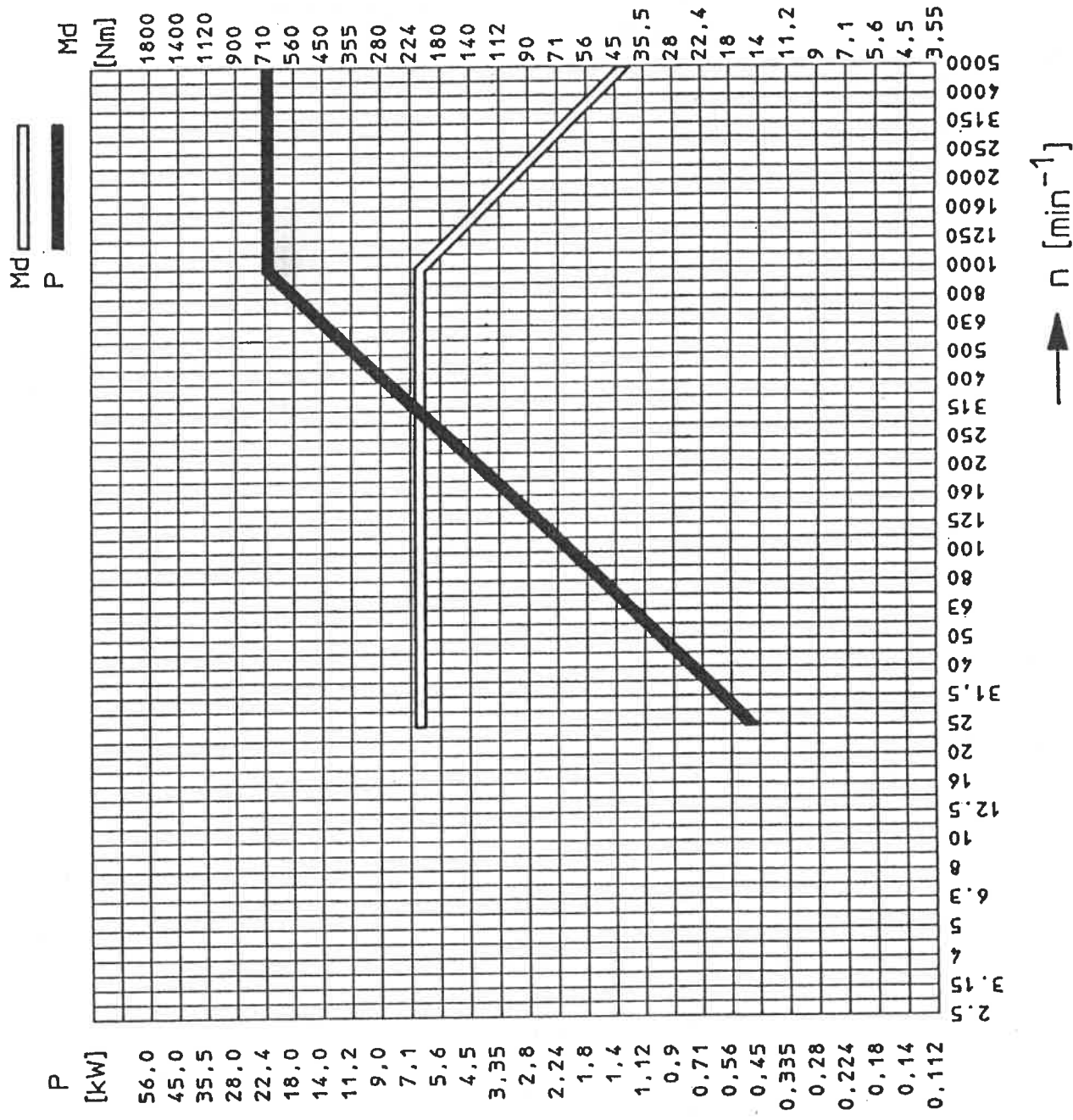
$M_{d_{max}} = 210 \text{ Nm}$



Spindle data:

$n_N = 25 - 5000 \text{ min}^{-1}$

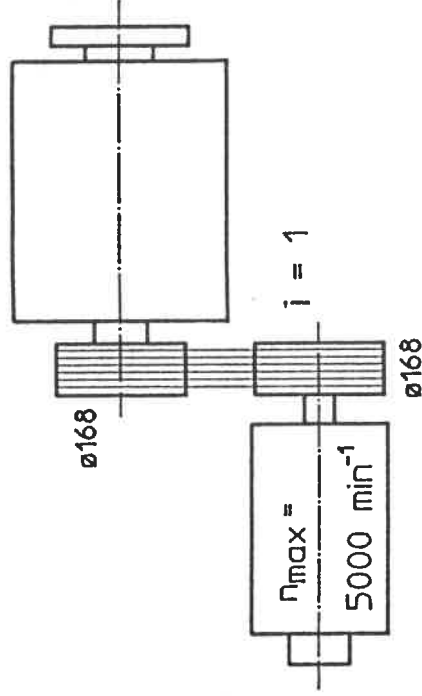
$M_{d_{max}} = 210 \text{ Nm}$



Technical data

$M_{dmax} = 420 \text{ Nm}$

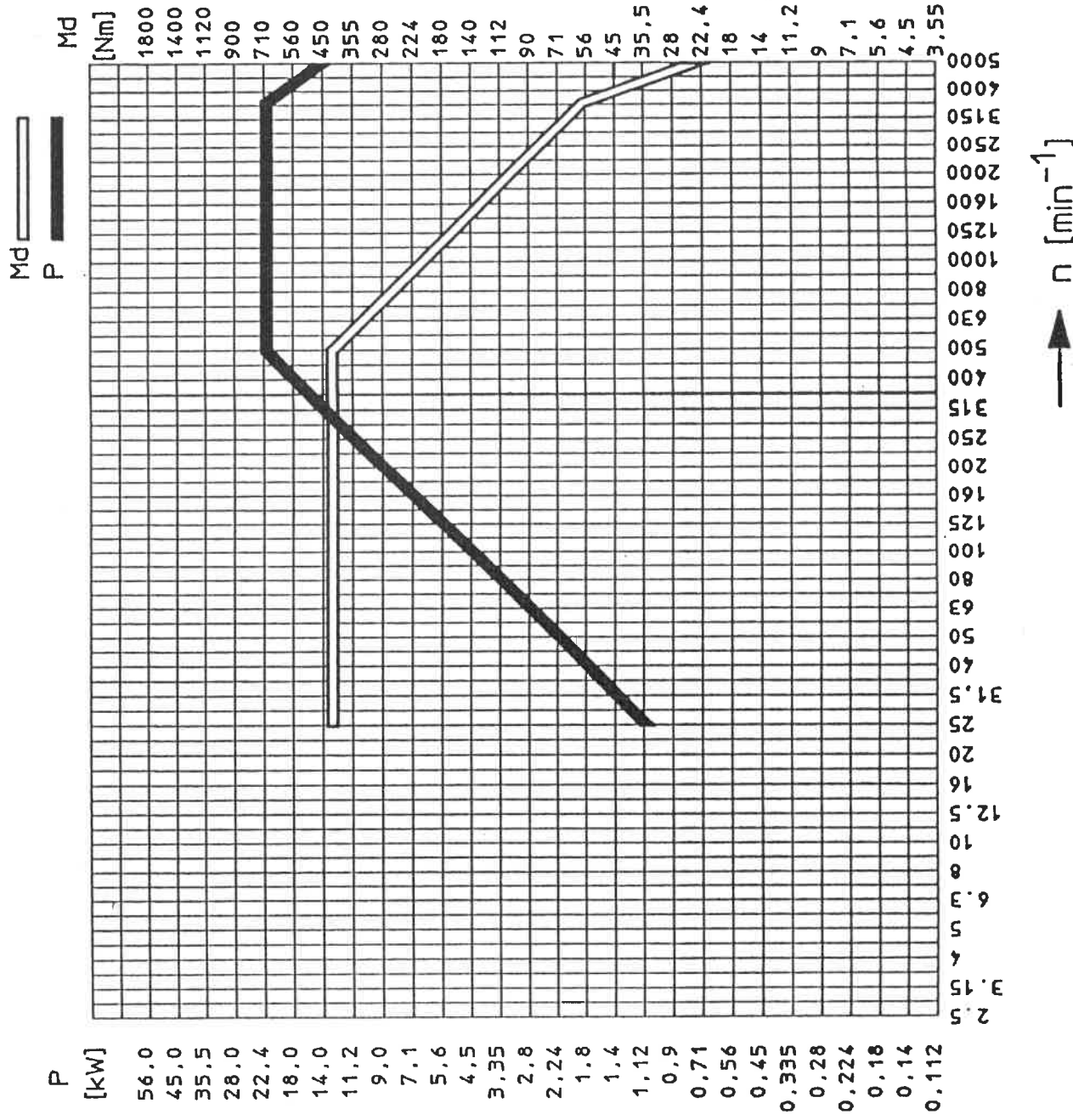
0952421



Spindle data:

$n_N = 25 - 5000 \text{ min}^{-1}$

$M_{dmax} = 420 \text{ Nm}$



Performance chart of CTX400

Drive tools

09336679

Spindle nosa data:

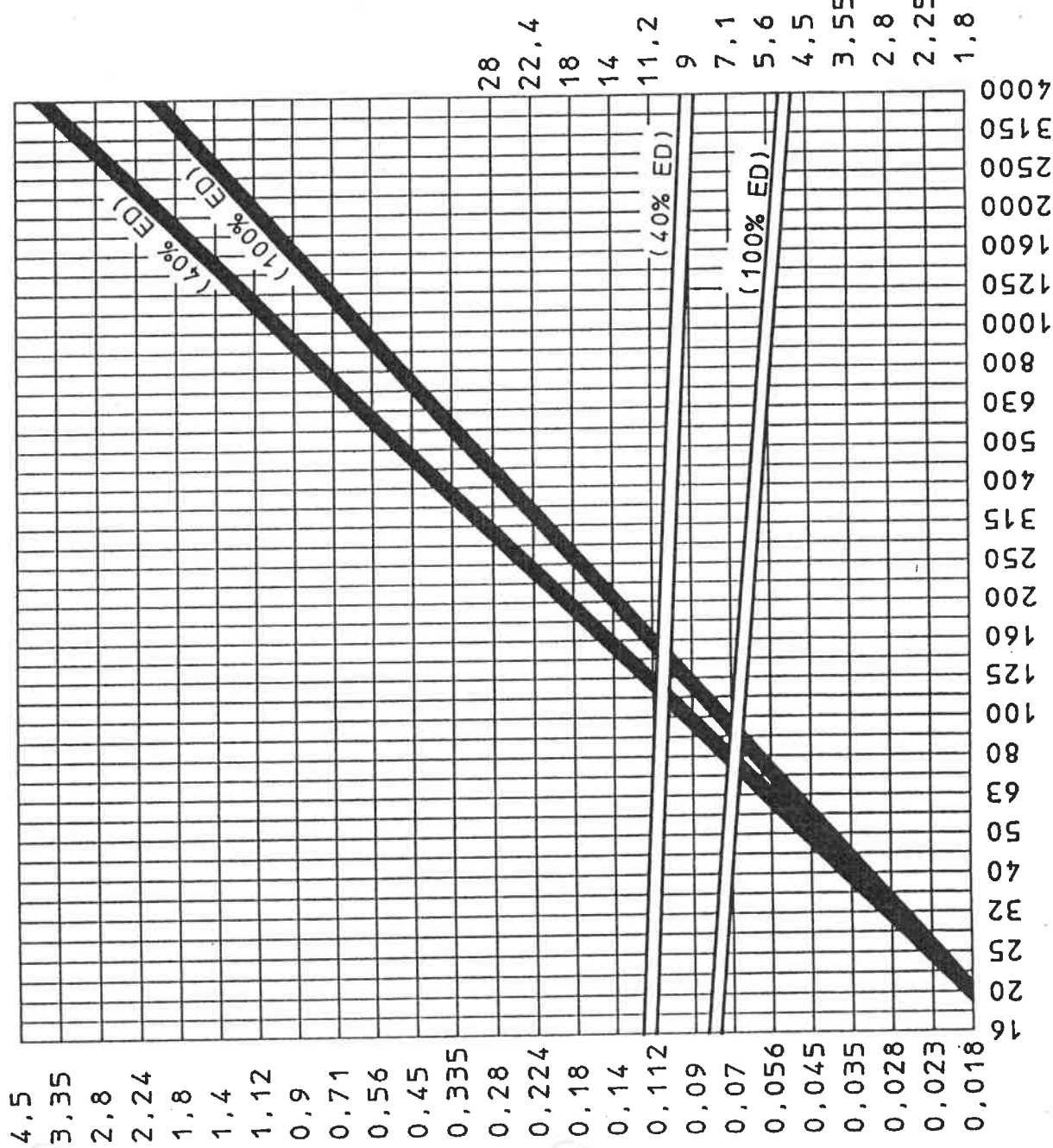
$n_{max} = 4000 \text{ min}^{-1}$

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



Md
[Nm]

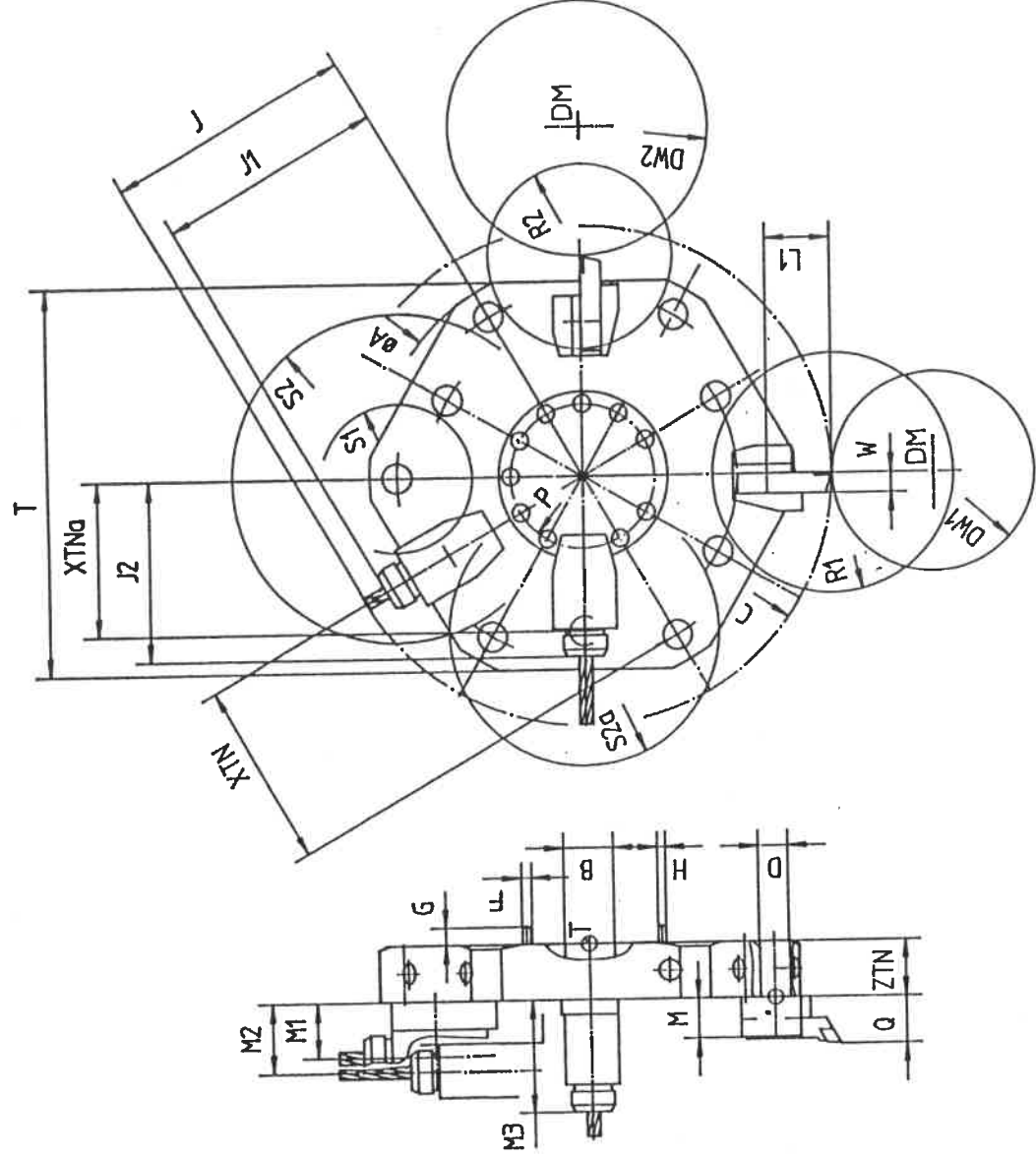
P
[kW]



$\rightarrow n$ [min^{-1}]

Tool carrier, 12 fold

0952319.1



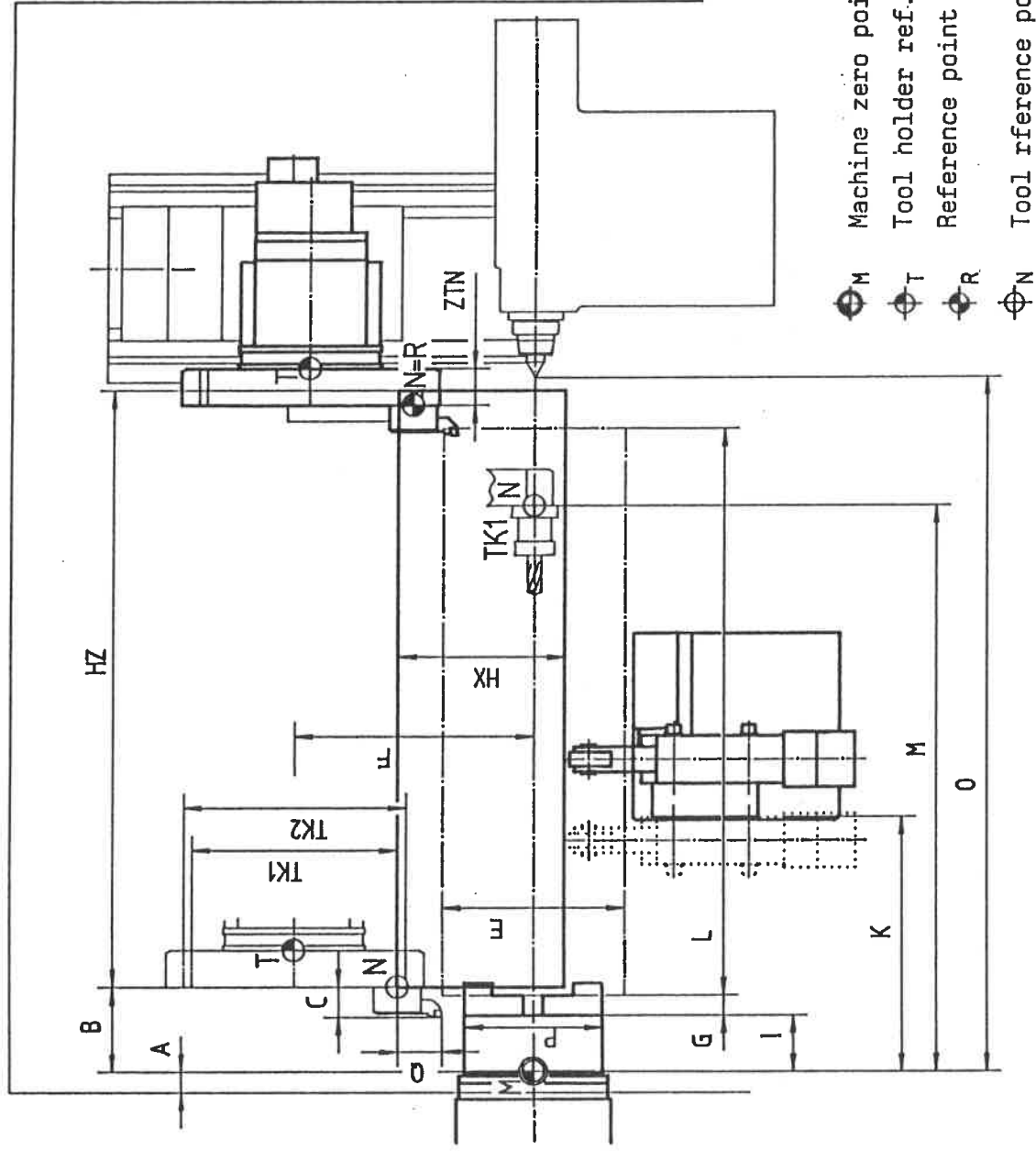
A	B	C	D	DW1	DW2	F	G	J	J1	J2	L1	M
425	50H6	500	30	200	260	11xM10	14	249	227	181	65	40

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

Page 1

0952319.2



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

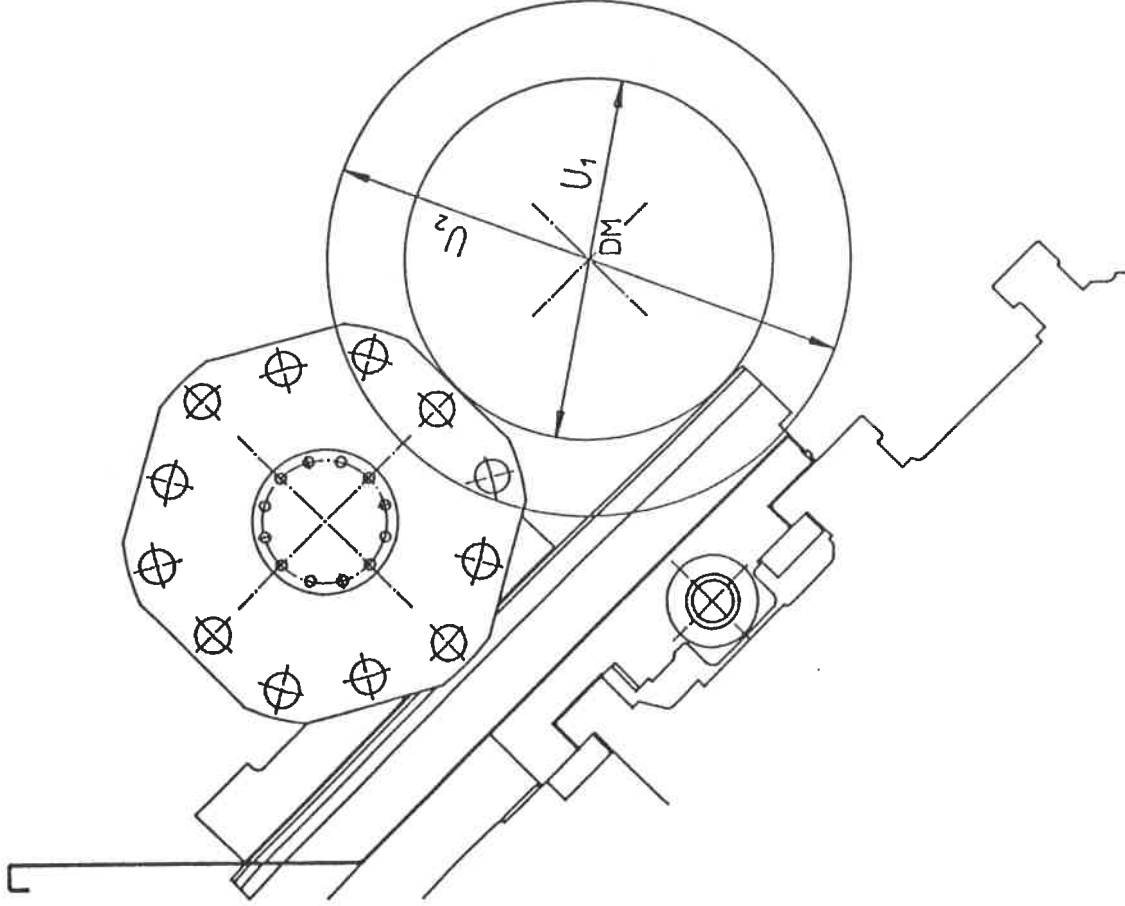
A	B	C	E	F	G	HX	HZ	I	K	L	M	O	P	Q	TK1	TK2	ZTN
32	116.5	47	260	350	24	212	640	86	312	600	682	748	200	65	310	370	58
					**			**	min		*						
											596						

* 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

0952319.3



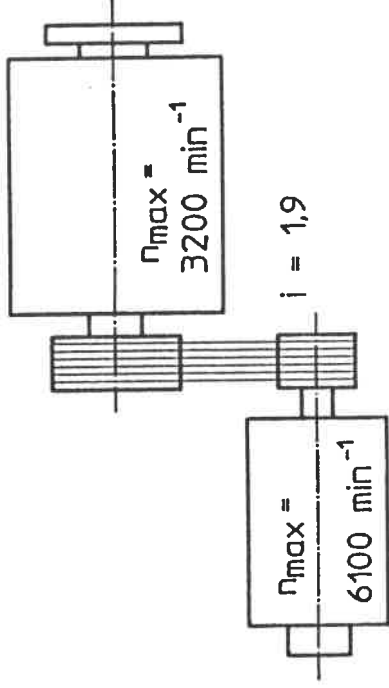
Machine machine	U_1	U_2
CTX 400	290	500

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	mm	12
Tool carrier cylinder shaft (DIN 69 880)	sec	40
Turret indexing time per station (180°)		0.8 (2,3)
Alternative		
Universal disk turret with driven tools (option)		
Number of tool stations	mm	12
of which, max. driven tools	kW	6
Max. clamping cross-section of driven tools		16
Driving power 100% ED (40%)		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

Performance chart of CTX500 main drive

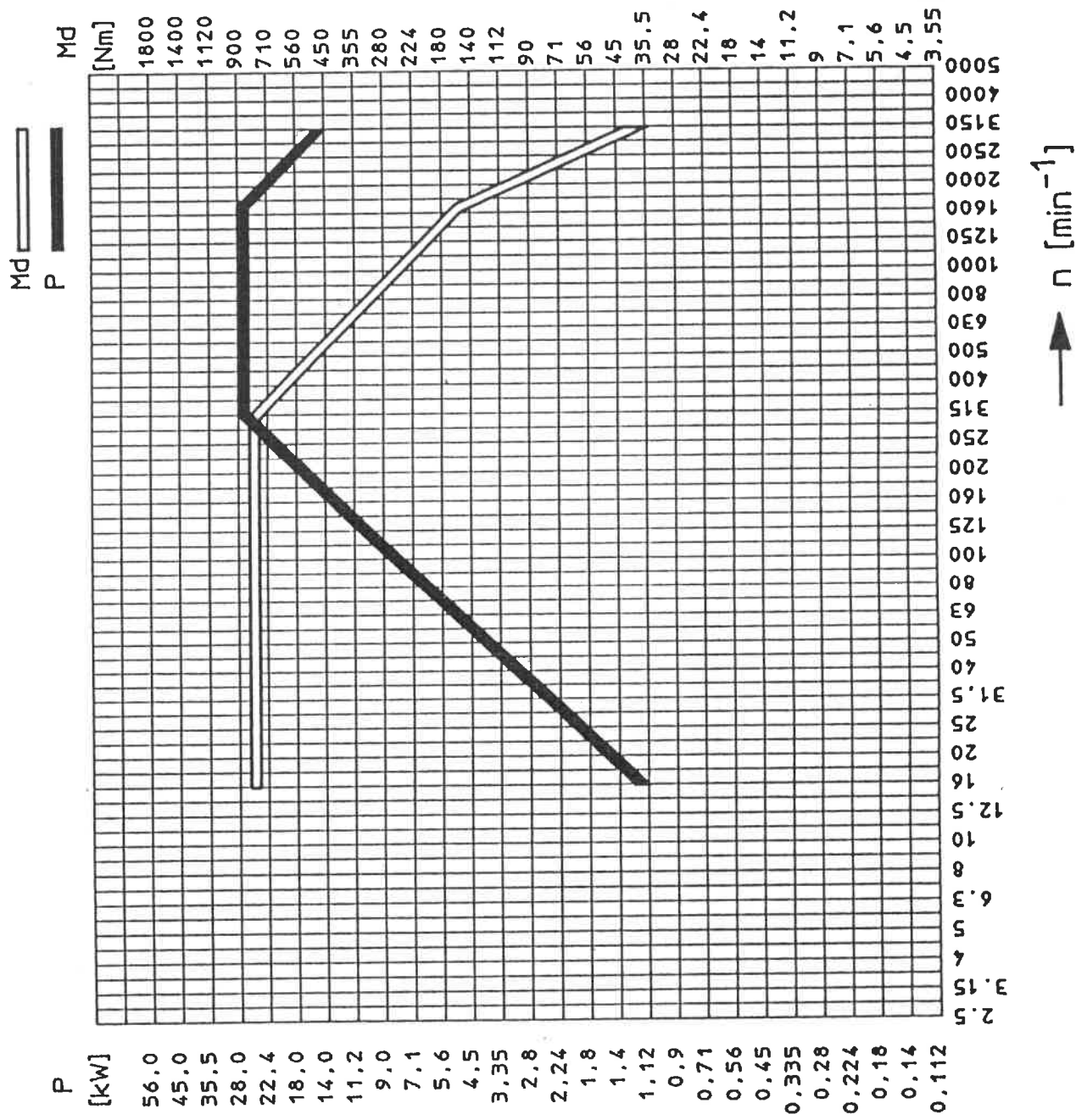
$M_{d\max} = 800 \text{ Nm}$



Spindle data:

$n_N = 16 - 3200 \text{ min}^{-1}$

$M_{d\max} = 800 \text{ Nm}$



Performance chart of CTX500

0941114

Drive tools

Spindle nose data:

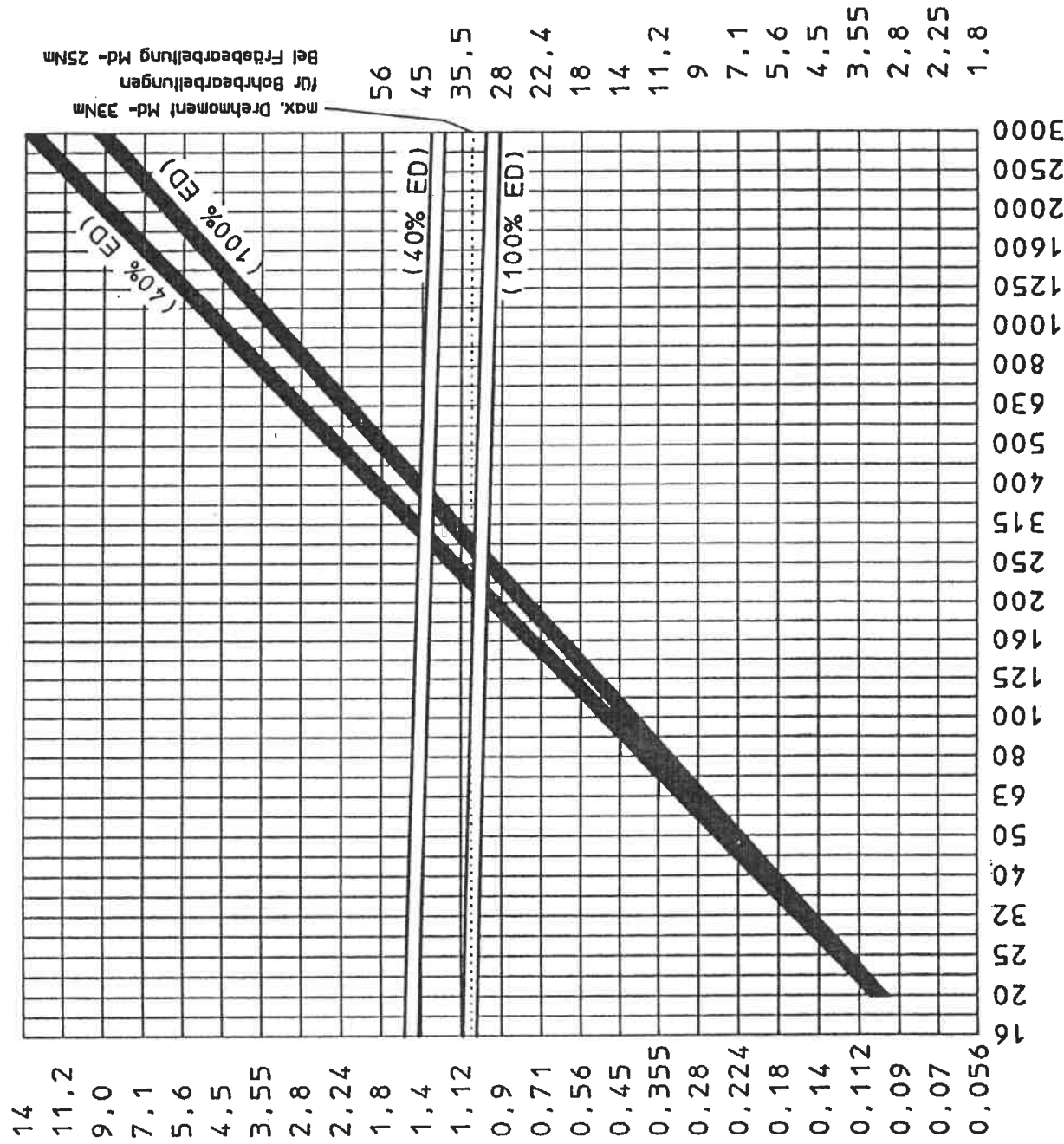
$n_{max} = 3000 \text{ min}^{-1}$

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



Md
[Nm]

P
[kW]

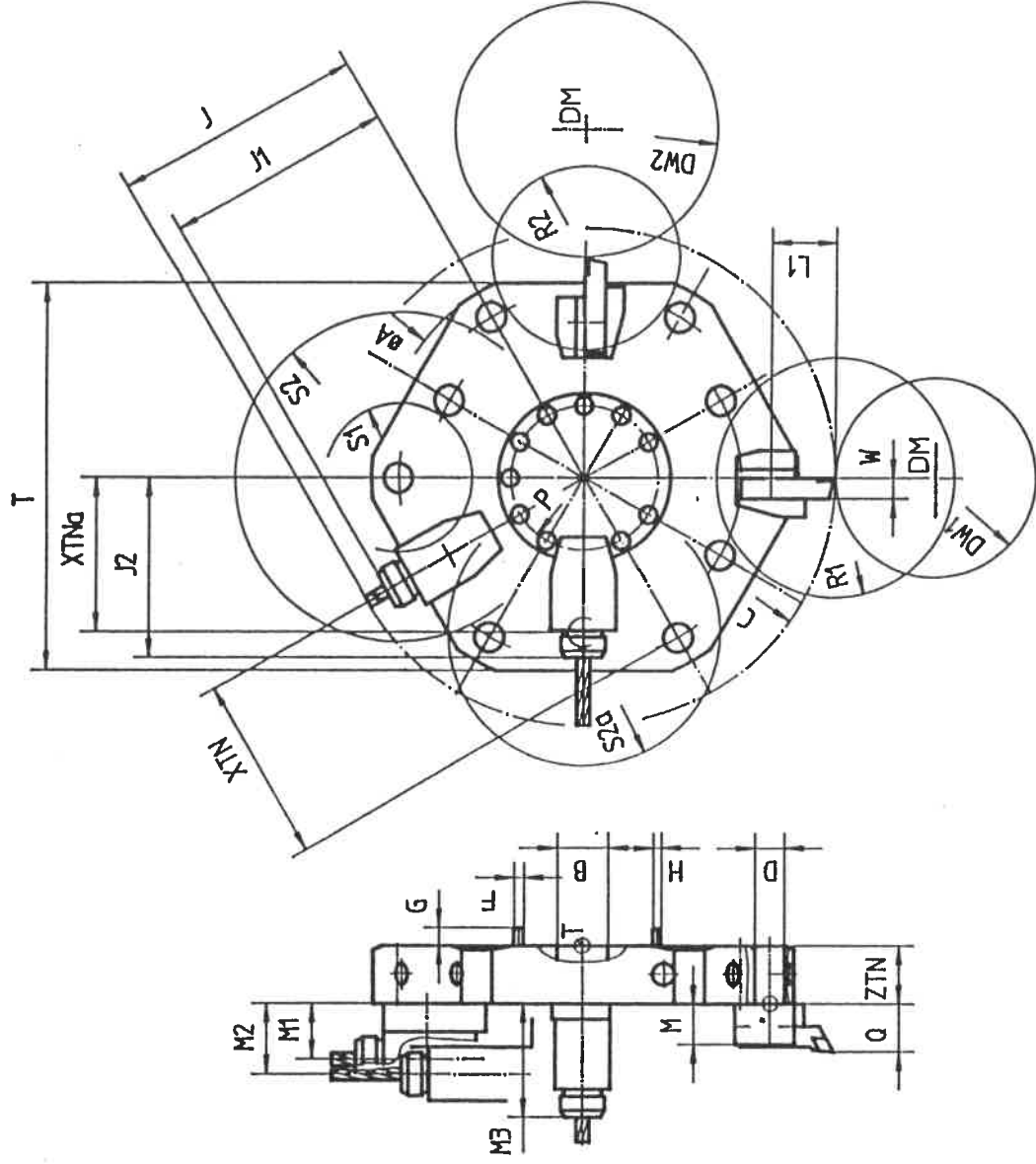


$\rightarrow n$ [min^{-1}]

Technical data

Tool carrier, 12 fold

0952419.1

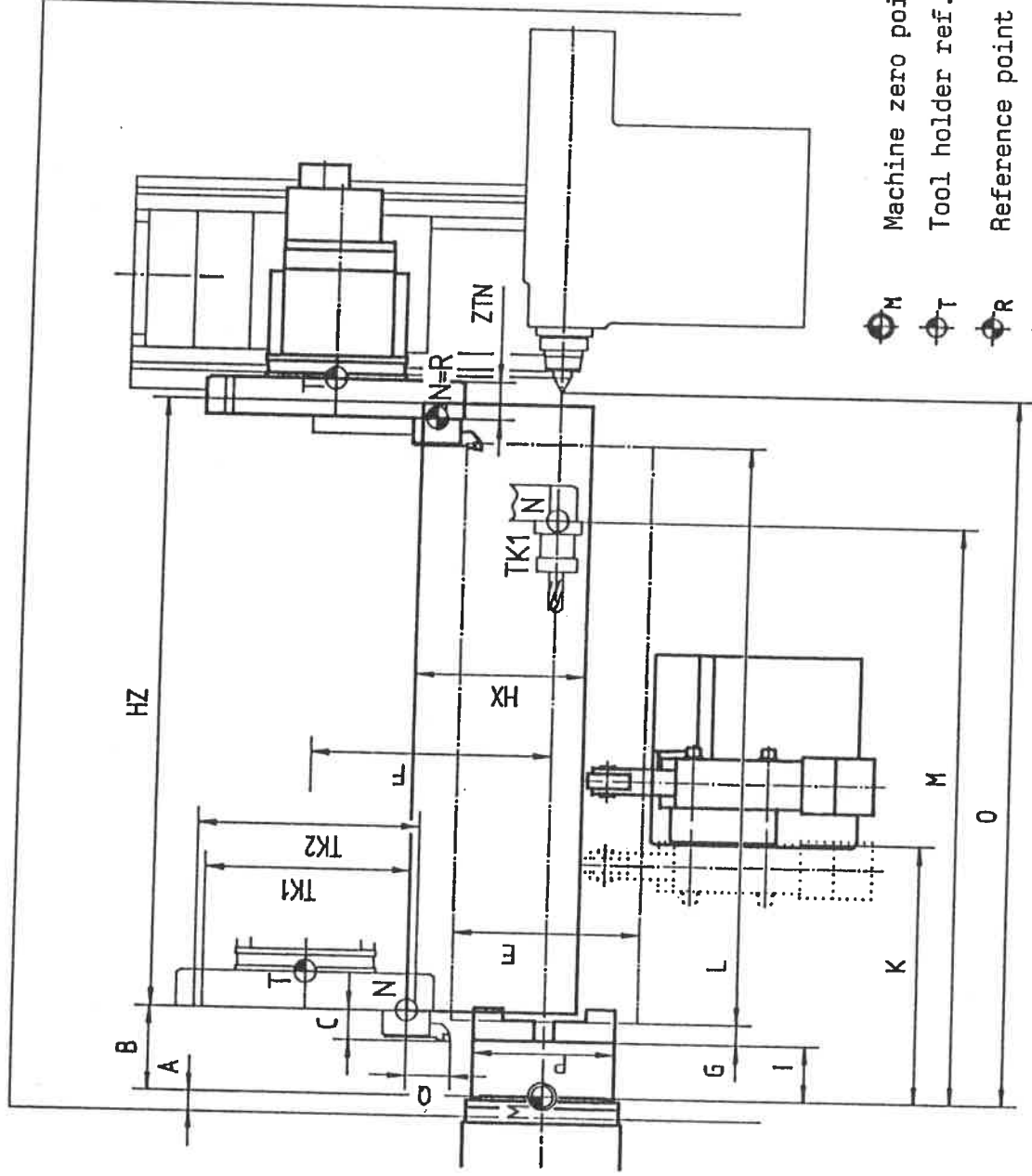


A	B	C	D	DW1	DW2	F	G	J	J1	J2	L1	M
465	50H6	590	40	300	330	11xM10	16	294	272	219	80	44

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
Page 1

0952419.2



- \odot M Machine zero point
- \odot T Tool holder ref. point
- \odot R Reference point R=N
- \odot N Tool reference point

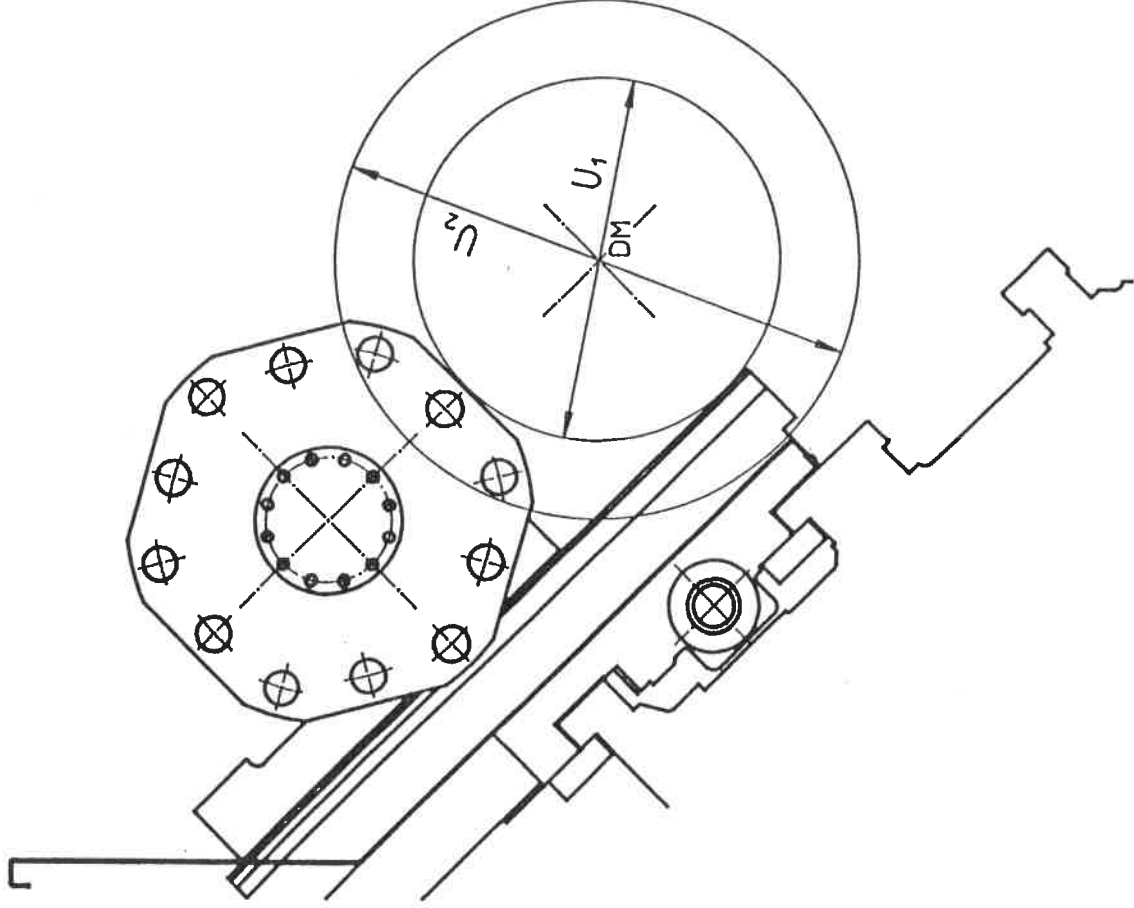
A	B	C	E	F	G	HX	HZ	I	K	L	M	O	P	Q	TK1	TK2	ZTN
38	153	54	330	430	36	275	1065	102	410	1026	$\frac{1156}{* 1070}$	1228	250	80	370	400	66

* Machine 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 CTX500
Page 2

0952419.3



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
Circulation diameter above face guide
Transverse path
Longitudinal path

mm 650 650
mm 480 480
mm 320 320
mm 1097 2097

Headstock spindle

Spindle head (flat flange)
Spindle head diameter in front bearing
Spindle hole
Clamping chuck diameter

mm 220 h5 220 h5
mm 140 140
mm 107 107
mm 315 315

Main drive AC

Speed range
Drive performance 100% duty cycle perform. range 1:20
Max. torque gear level 1
Max. torque gear level 2
Speed range
Feed drive AC
X feed force 100% duty cycle
Z feed force 100% duty cycle
X rapid speed
Z rapid speed
Measuring system incremental shaft encoder

rpm 4-3050 4-3050
kW 27 27
Nm 1680 1680
Nm 420 420
min⁻¹ 4-3050 4-3050
daN 800 800
daN 1500 1500
m/mn 10 10
m/mn 15 15

Tool holder

Universal disk turret, autom. switching with
directional logics
Number of tool stations
Tool mounting cylinder shaft (DIN 69 880)
Turret switching time per station (180°)

mm 12 12
mm 50 50
sec. 1.0 (3.0) 1.0 (3.0)

Alternative

Universal disk turret with driven tools (option)
Number of tool stations
Of which max. driven tools
max. clamping diameter of driven tools
Drive performance 100% duty cycle (40%)

mm 12 12
mm 6 6
mm 25 25
kW 10.4 (14.1) 10.4 (14.1)

Tallstock

Centre sleeve diameter
Centre sleeve stroke
Centre sleeve mounting
max. centre sleeve pressure

mm 120 120
mm 120 120
MK 5 (6) 5
daN 1400 1400

Steady rest

Automatically centering hydr. steady rest
Automatically centering hydr. steady rest

mm 22 - 150 22 - 150
mm 100 - 200 100 - 200

Machine dimensions

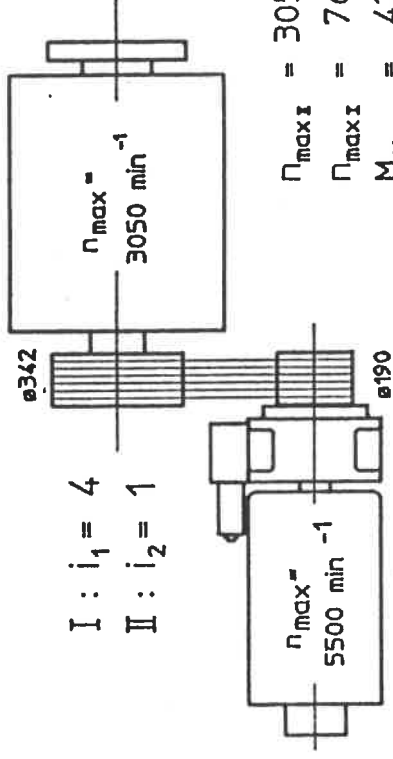
Dimensions (LxWxH) incl. chip conveyor
Weight incl. chip conveyor

mm 5080x3437x1969 6388x3437x1969
kg 7250 9150

Performance chart of CTX600 main drive

0952421

$M_{d\max} = 1680 \text{ Nm}$

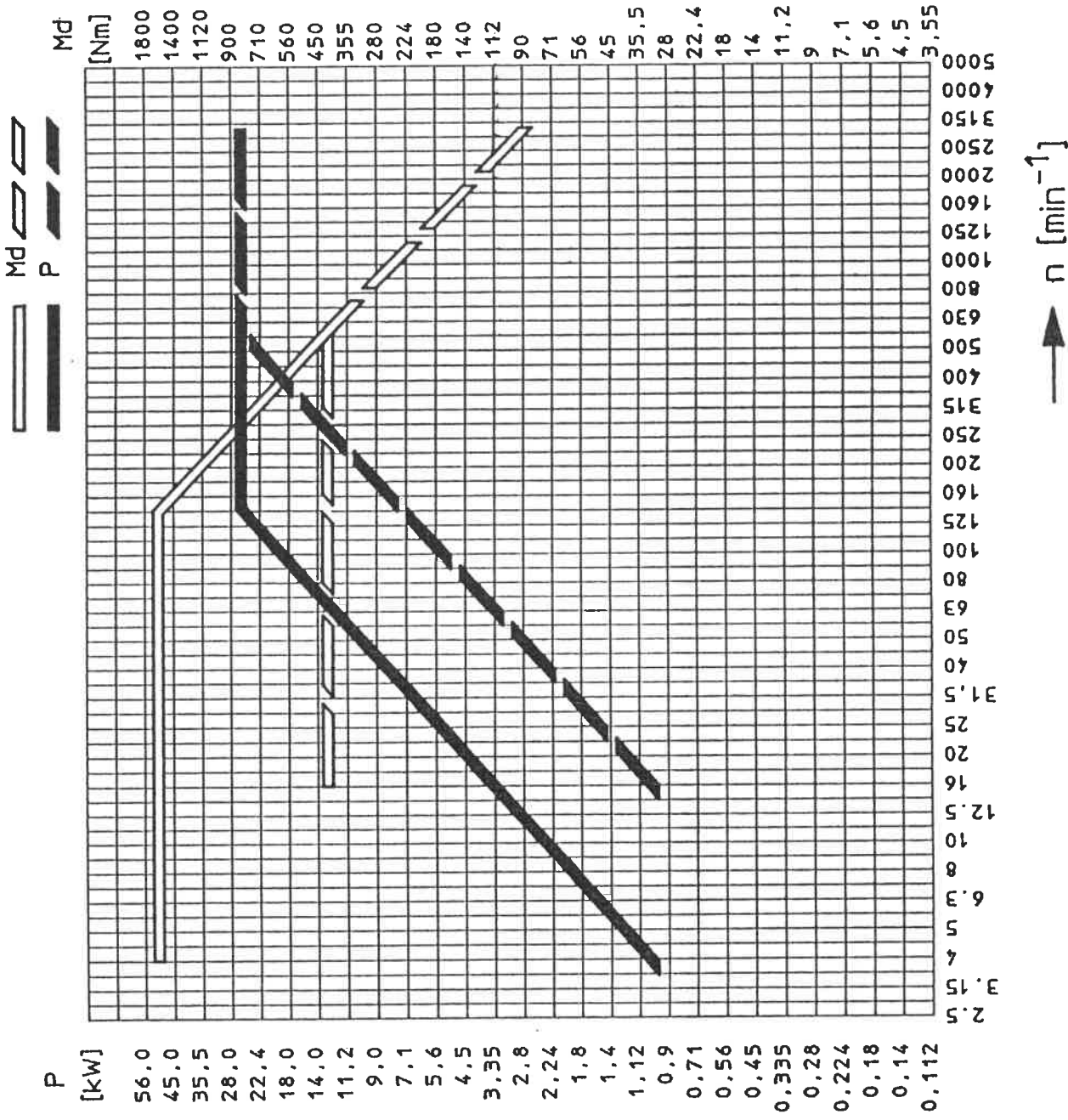


Spindle data:

$n_N = 4 - 3050 \text{ min}^{-1}$

$M_{d\max} = 1680 \text{ Nm}$

$n_{\max I} = 3050 \text{ min}^{-1}$
 $n_{\max II} = 760 \text{ min}^{-1}$
 $M_{NI} = 420 \text{ min}^{-1}$
 $M_{NII} = 1680 \text{ min}^{-1}$



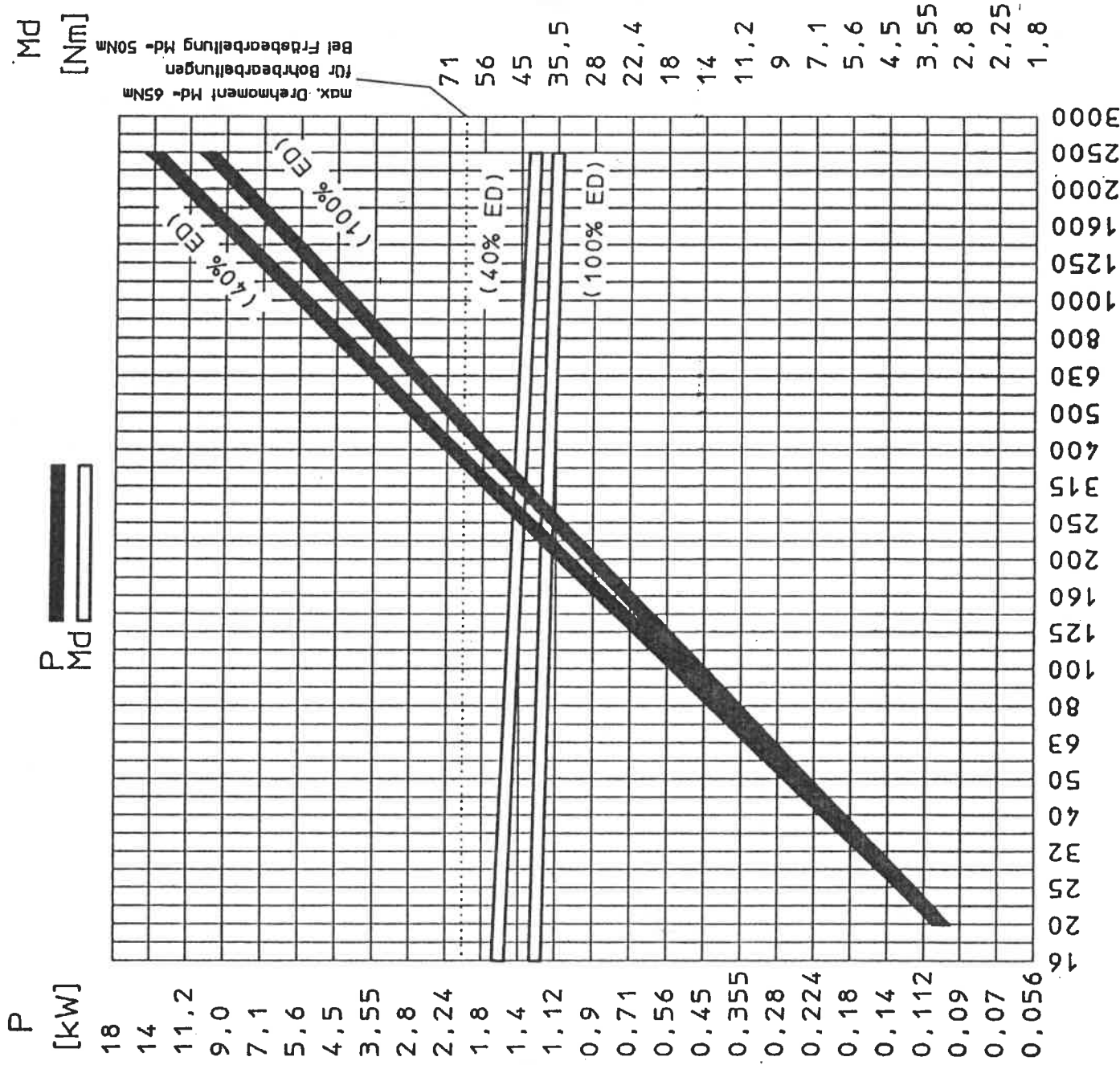
Performance chart of CTX600 Drive tools

0952077

Spindle nose data:

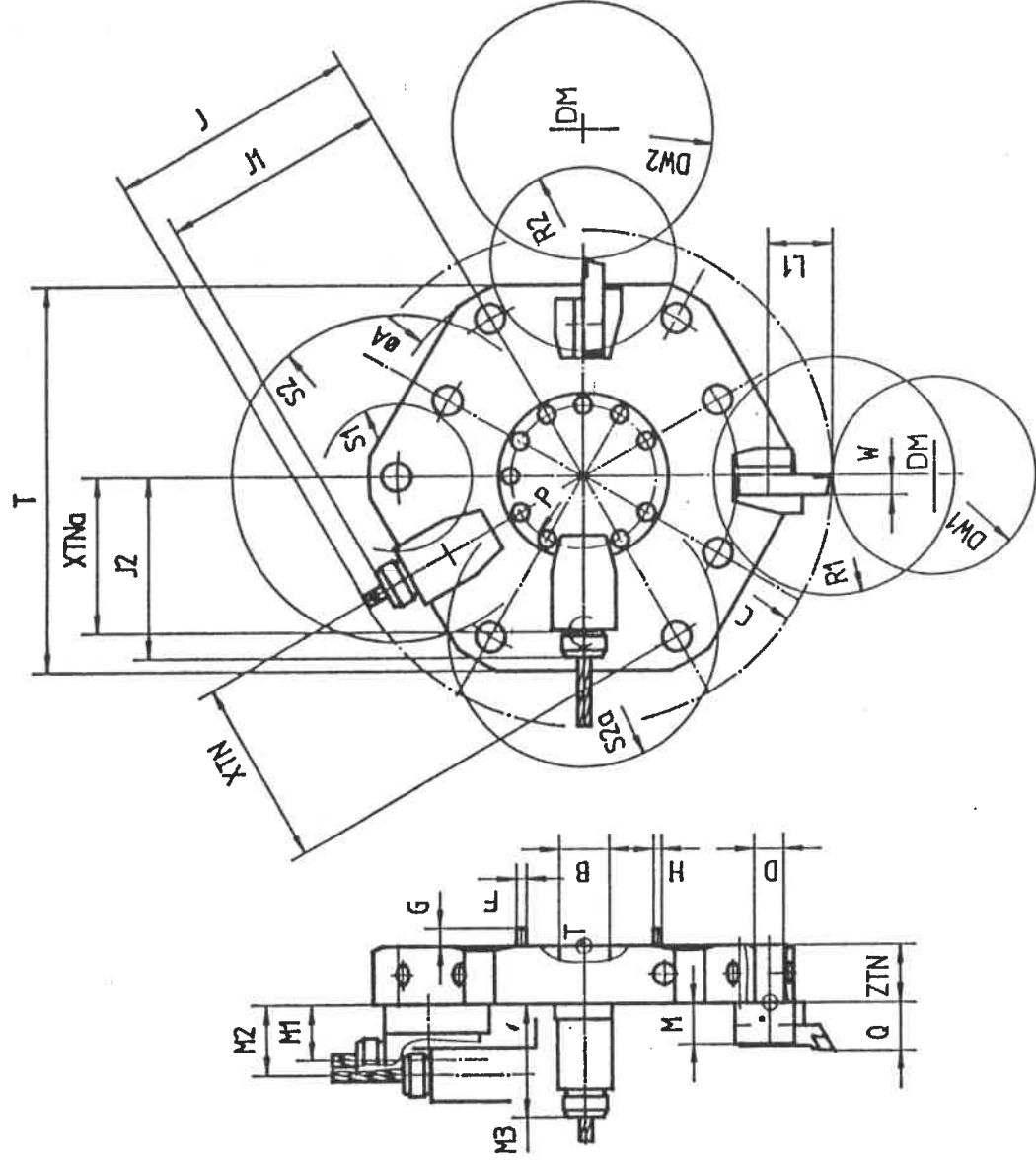
$n_{max} = 2500 \text{ min}^{-1}$

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



Tool carrier, 12 fold

0952420.1



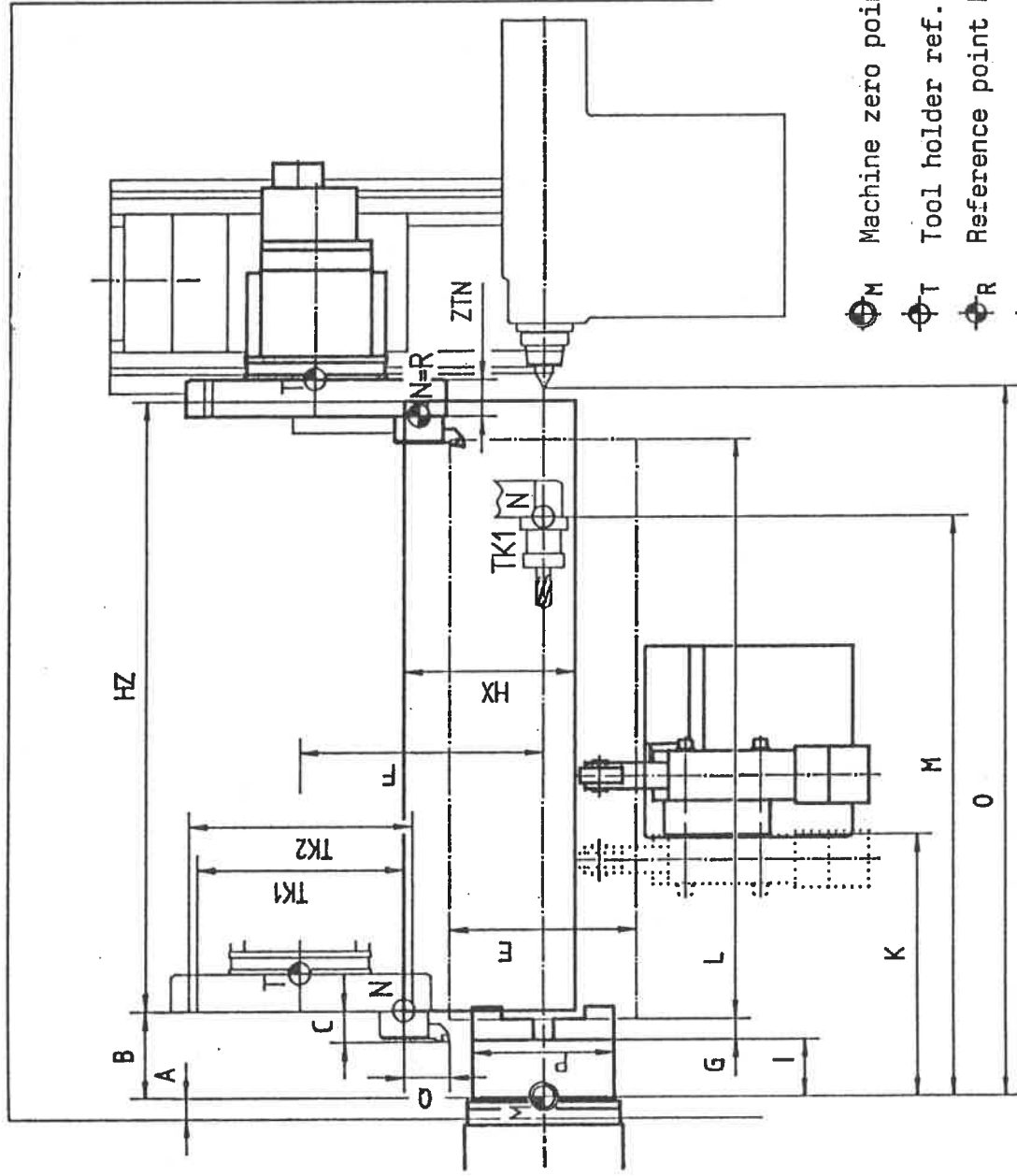
A	B	C	D	DW1	DW2	F	G	J	J1	J2	L1	M
545	63H5	650	50	355	425	11xM12	19	316	301	241	85	55

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

0952420.2



- ⊕ M Machine zero point
- ⊕ T Tool holder ref. point
- ⊕ R Reference point R=N
- ⊕ N Tool reference point

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	150 * 1020	1238	315	85	400	470	82
*** CTX 600 DL 2000	38	133	70	425	497.5	36	320	2097	102	407	2022	250 * 2020	2238	315	85	400	470	82

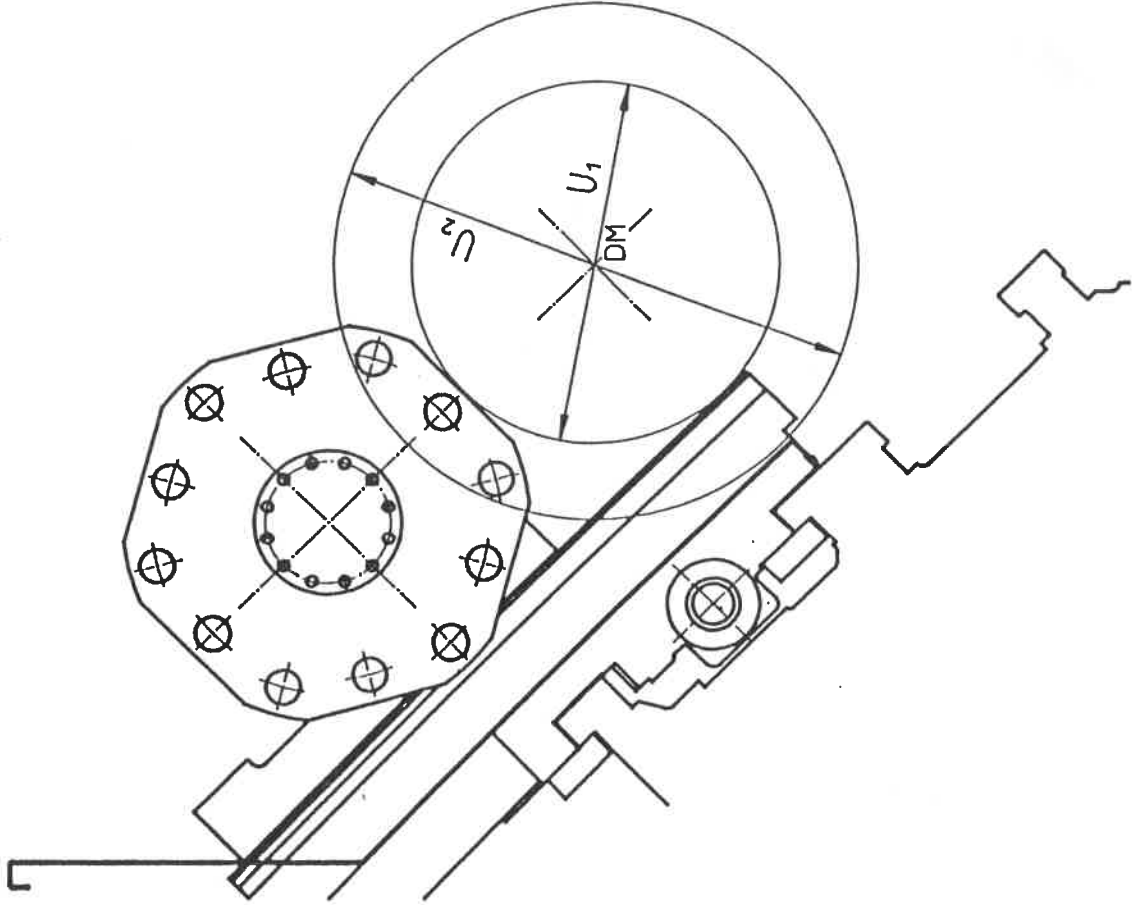
* Machines with driven tools

** 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