



**M40 | M40X | M50**

**M40-G | M40X-G | M50-G**

**M40 | M40X | M50 | M40-G | M40X-G | M50-G**  
[DE] [EN] [FR] [IT] [ES] [BR] [RU] [CN] [JP]

**CLAMP ONCE - MACHINE COMPLETE**



## Maximum productivity

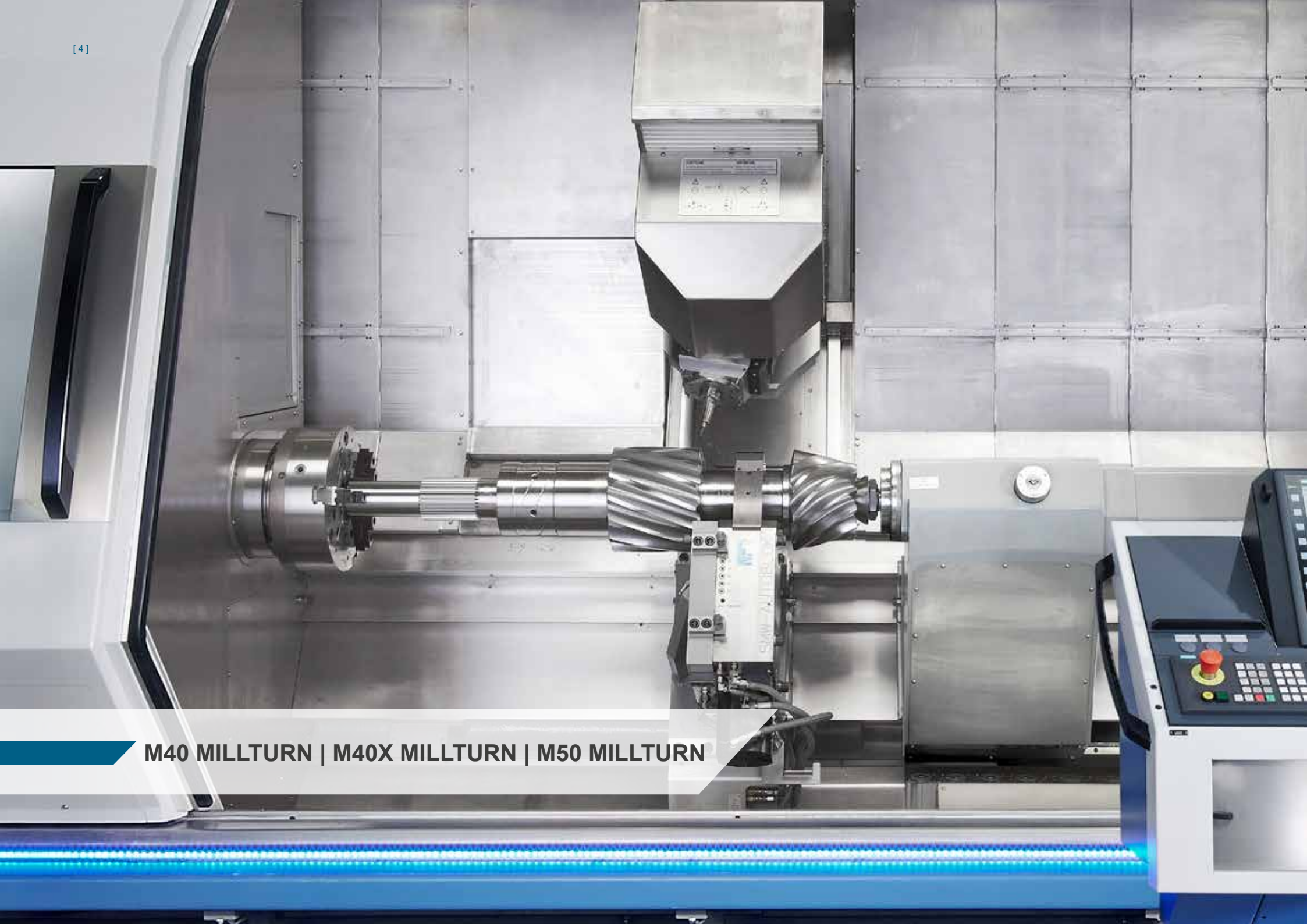
With the M40, M40-G, M40X, M40X-G, M50 and M50-G MILLTURN series, WFL Millturn Technologies is presenting a new generation of multifunctional turning-boring-milling centres for one-hit machining of complex chuck and shaft parts up to 670 mm swing over bed. Beside superior output and torque values of the spindle drives, the imposing feed forces in all axes make for superb dynamics and maximum productivity.

## Supreme flexibility

Turning, milling, drilling, hobbing, shaping, gun drilling as well as ID machining can be performed under any angle of the tool. The interpolation of up to 5 axes makes machining of any geometrical profile possible. For six-side machining the M40-G, M40X-G and M50-G is equipped with two powerful turning spindles, and optionally with a 2x12 station disc turret, which can be equipped with driven tools and a hydraulic steady rest. The turning-boring-milling unit is offered in two speed-torque versions. The sturdy slant bed and the characteristic amply dimensioned linear guideways with their extra wide guide distance ensure perfect stability and optimum anti-vibration behaviour. The incomparable amount of hardware and software options and the meticulously designed machine structure are the consequence of long years at the cutting edge technological advance.







M40 MILLTURN | M40X MILLTURN | M50 MILLTURN



## Features

Wide distances between guideways for the stable  
accommodation of big steady rests



Pick-up magazine for long tools  
with standard tool interface



B-axis turning







**M40-G MILLTURN | M40X-G MILLTURN | M50-G MILLTURN**



## Features

4-axis turning



Workpiece transfer



High-precision measuring with integrated  
measuring probe



## The standard tool interface

In order to respond to the demands of the broad technological spectrum, MILLTURN turning-boring-milling centres use only modular tool interfaces with the highest levels of long-term precision and the maximum rigidity (HSK, Capto). The high pull-in forces of

the standard tool interface provide for particularly reliable machining. WFL offers a broad range of add-ons to ensure highly-productive deep hole drilling processes and to enable a variety of special technologies to be used.

### High coolant pressure

- High coolant pressure for optimised chip breakage
- Coolant pressure below 150 bar – High Pressure Coolant (HPC)
- Coolant pressure between 150 and 350 bar – Ultra-High Pressure Coolant (UHPC)
- Significant increases in cutting parameters, tool life and process safety
- Reduced machining costs
- No additional interfaces required for up to 200 bar (coolant supplied directly through the milling spindle)

### Coolant solutions for deep hole drilling

- High coolant supply rates to ensure the best possible removal of chips from the hole – this makes the MILLTURN a fully-fledged deep hole drilling machine
- Coolant supply rates of up to 200 l/min
- External interfaces with manual docking
- Individual configuration of the coolant pumps and filters

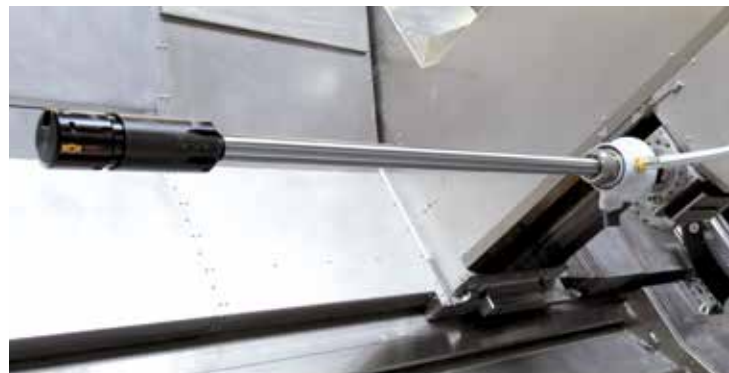
### Special tool heads

- Special tool heads for special manufacturing requirements (difficult to access workpiece geometries, special processes and special coolant solutions)
- The special tool heads are handled by means of the automatic tool changer
- Optional torque support prevents undesirable turning of the special tool head and ensures a rigid connection to the swivel housing

Ultra-High Pressure Coolant (UHPC)



Ejector drilling



Angular head with torque support





## The tool magazine

### Fast tool change

The numerous types of machining require a large number of different tools. With up to 200 tool stations within the exceedingly safe operating disc type tool magazine the M40 and M50 MILLTURN possesses sufficient reserve. But, it's not just quantity that counts, it's also dimensions. Even tools with 500 mm length and 160 mm diameter are no problem for the super swift tool changer with double gripper.

In order to minimize shuttling distances and hence undesirable non-productive times during tool change, the change position can be programmed at will over the entire path of the Z-axis. And tool change is possible even while the Z-axis is in rapid traverse. In the case of tools having short cycle times, the optional look-ahead buffer brings about a sensible reduction of the chip-to-chip time. For optimum user-friendliness, tools are exchanged from/into the magazine at the machine front also while machining is in course. For even greater ease and rapidity, an optional chip-based writing and reading system is provided.

Fast tool change



### Tool management

Convenient software functions support the anticipating, multi-order tooling of the magazine and guarantee tool employment until their edge life is up. The operator is guided by simple and logical menu instructions. The tool offsets are independent of the machining angle and are automatically converted by the control for all edge directions and B-axis positions.

Look-ahead buffer



## The prismatic tool system







Pick-up magazine for prismatic tools

## The interface for large tools

The prismatic tool interface enables the use of tools that exceed the maximum dimensions of standard tools. Thanks to the use of robust prismatic tool holders, boring bars, solid drills and angular heads can be attached to the milling unit in a highly stable manner.



WFL system boring bar

## Pick-up magazine

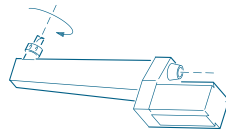
Prismatic tools can be stored in this additional magazine, which is positioned above the headstock. Tool transfer from the triple pick-up magazine and hydraulic clamping are automatic.



Internal milling with angular head

## Prismatic tools

Internal machining tool  
Driven



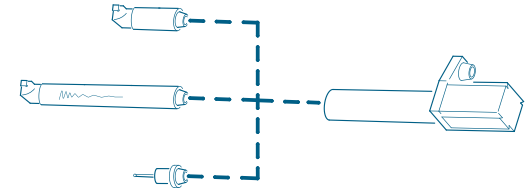
Boring bar  
Single-piece, vibration damped



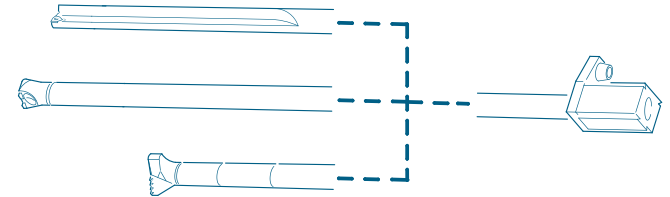
CNC special contour boring bar  
Static with radial feed out  
(bottle boring)



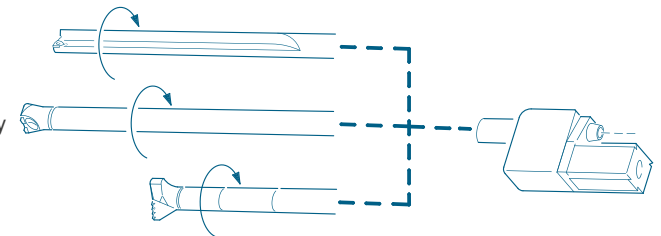
WFL system boring bar  
Manual tool head change



Deep hole drilling tool  
For central holes



Deep hole drilling tool  
Rotating, with coolant supply





## Ergonomic industrial design



### Optimal view of the workpiece

- Large safety windows provide the best possible overview of the working area
- Optional spin windows
- Innovative and energy-saving lighting concept with LED lamps

### Machine operation made easy

- Tilttable 19-inch display
- Ability of the operator panel to travel along the full length of the working range as far as the tool magazine

### Easy maintenance

- Clear and logical structure of the control cabinet allows easy maintenance
- Excellent access to components requiring regular maintenance
- Hydraulic unit on extendable drawer

## Software solutions by WFL

### The latest in control technology

Not only does the Sinumerik 840D sl, which is perfectly-suited to machining tasks, have the highest processing power, alongside its especially user-friendly programming it is also perfectly compatible with all current CAD/CAM systems. NC programs, technological data, measuring protocols, tool data and machine and process parameters can be transferred to a host computer, for example, using an Ethernet connection. This means that the MILLTURN is fully prepared for connection to networked production and to meet future requirements.

### Safety is a central concern

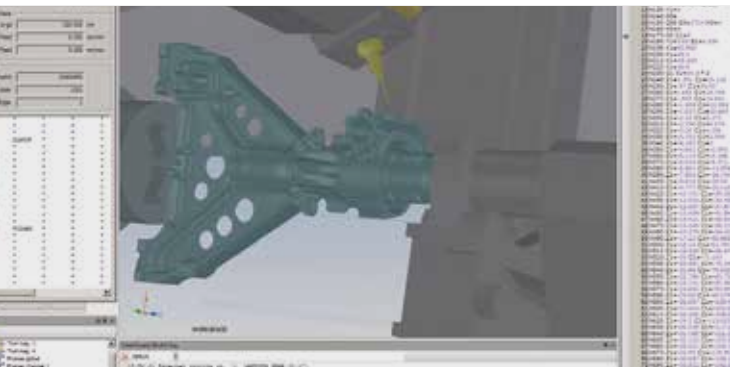
The sophisticated MILLTURN safety concept works on an exclusively electronic basis. The advantages of this are that the system reacts extremely quickly in comparison to conventional concepts, the cabinet configuration is more simple and it provides the option of precise fault diagnosis on site and via a network connection.

### Good parts from the very first workpiece

High-precision measuring probes, linear direct measuring systems and clearance-free anti-friction guideways transform the MILLTURN into a 3D measuring machine. WFL provides the user with comprehensive modular measuring software and proven expertise for intelligent measuring strategies, which serve to exclude as many error-causing variables as possible, right from the very start.

- Creation of complex user-specific measuring processes
- Determination of workpiece features or any forging allowances prior to machining
- Automatic recording and compensation for tool wear
- Software-controlled temperature compensation in order to eliminate machining errors caused by the thermal expansion of the workpiece
- Saving or printing of measuring protocols

Simulation



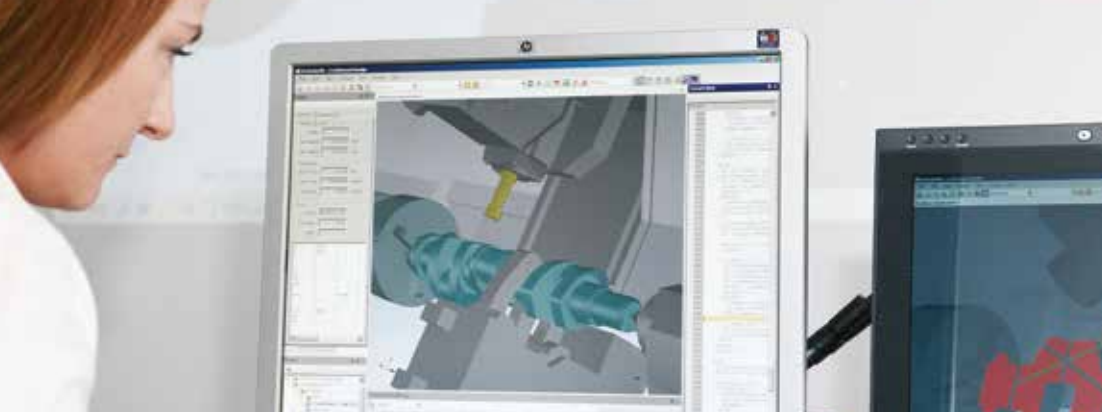
Reality



Technology cycles







CrashGuard Studio



CrashGuard

## Professional CAM solutions from WFL

... for the programmer:

**CrashGuard Studio:** Offline 3D-simulation with material removal to enable verification of NC programs

**Millturn PRO:** Programming editor in CrashGuard Studio with interactive graphics.



... for the machine operator:

**CrashGuard:** Real time collision prevention software within the CNC machine control system



## Safe machining with up to 12 monitoring channels...

During machining, the sophisticated process monitoring visualises and monitors the flow of forces on all of the axes and spindles. This renders the cutting process fully transparent and makes it easy to identify potential for optimisation.

- Tool breakage and collision monitoring
- Teach-In procedure to enable cutting forces to be saved and used for calibration in the event that the same task is repeated
- Machining aborts in the event that the process parameters exceed the freely-definable tolerance limits

Process monitoring



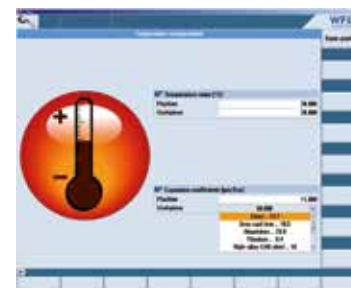
Tool management



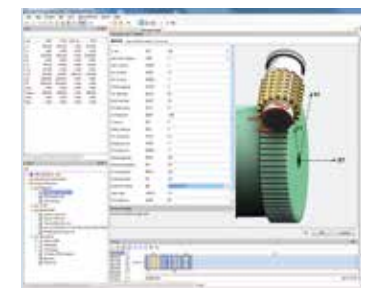
Tool correction



Temperature compensation

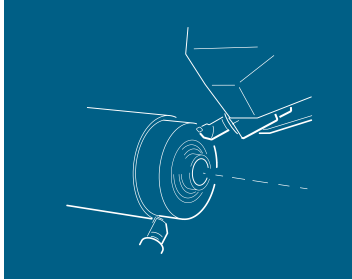


Millturn PRO programming editor

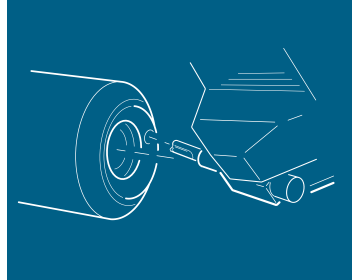


# Technologies by WFL

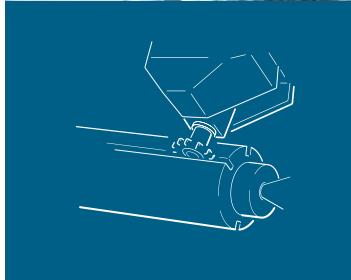
Turning



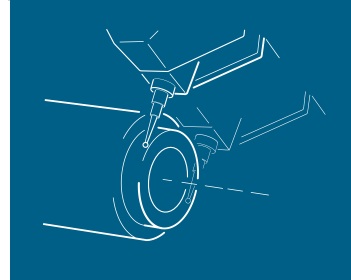
Drilling



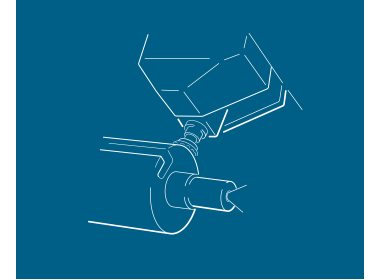
Milling



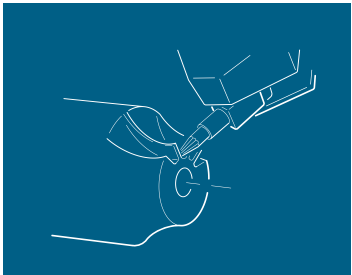
In-process measuring



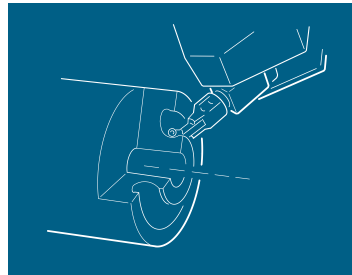
Turn-milling



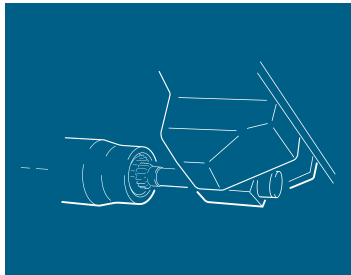
5-axis milling



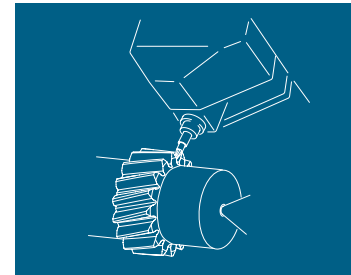
B-axis turning



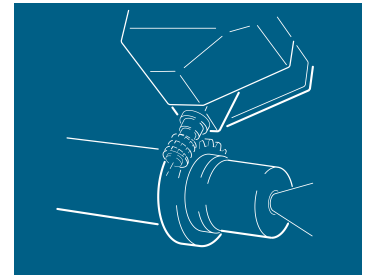
Shaping of gear teeth (Flanx-Spline)



Milling of gear teeth (Flanx-LM)

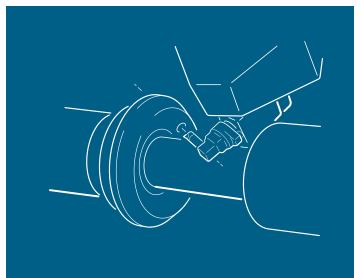


Hobbing of gear teeth (Flanx-Hob)

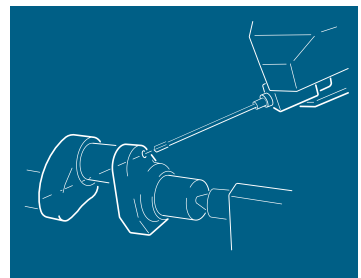




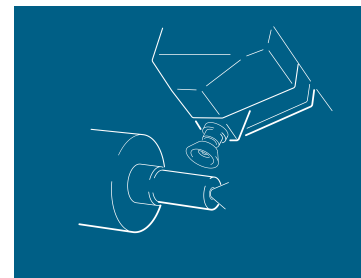
Special tool heads



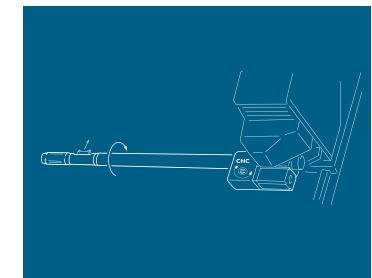
Deep hole drilling



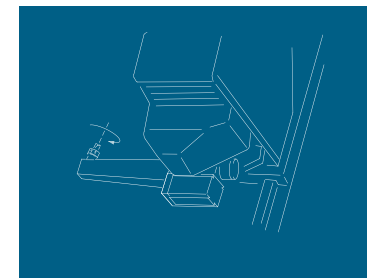
Grinding and fine machining



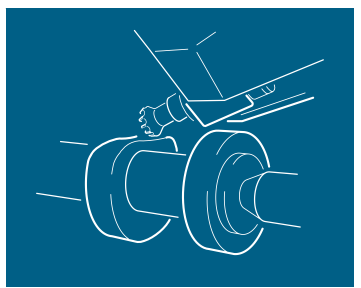
CNC special contour boring bar



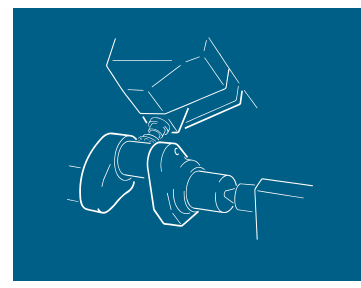
Internal machining tool



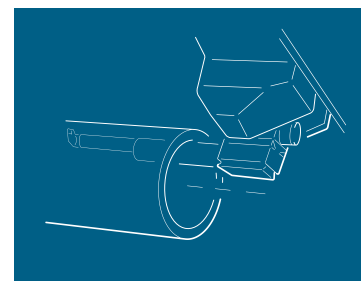
Cam milling



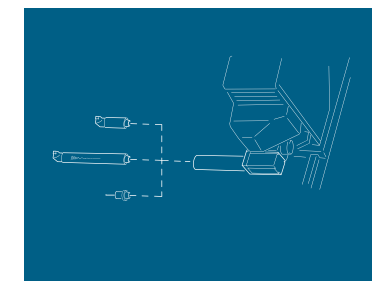
Milling of crankshaft pins



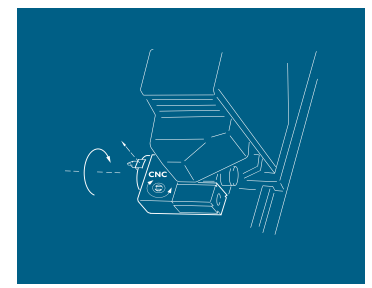
Drilling and internal turning



WFL system boring bar



CNC facing head



## Automation



Buckling arm robot  
with deburring-station

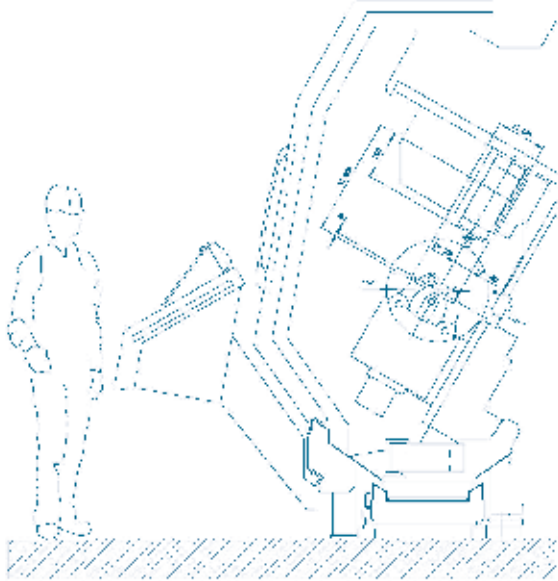


Gantry loader with loading hatch

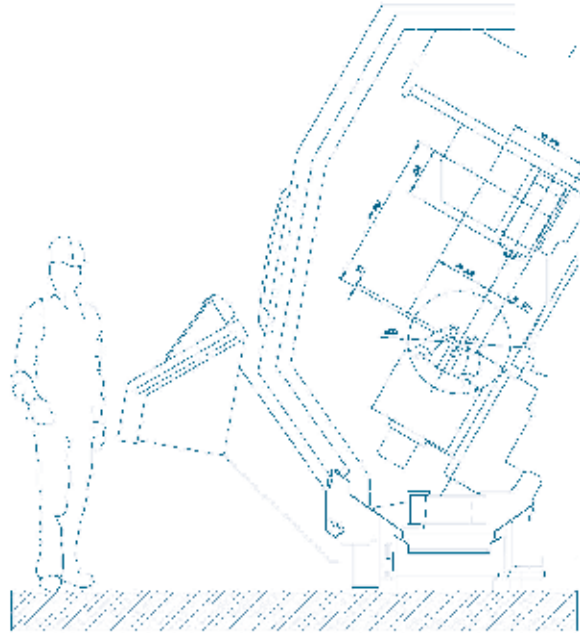


Gantry loader with rotary index magazine

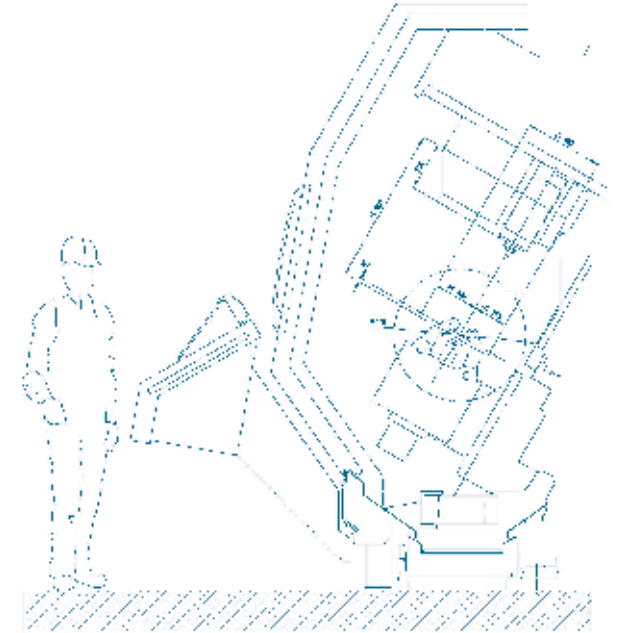
## Machine cross section



■ M40 MILLTURN | M40-G MILLTURN



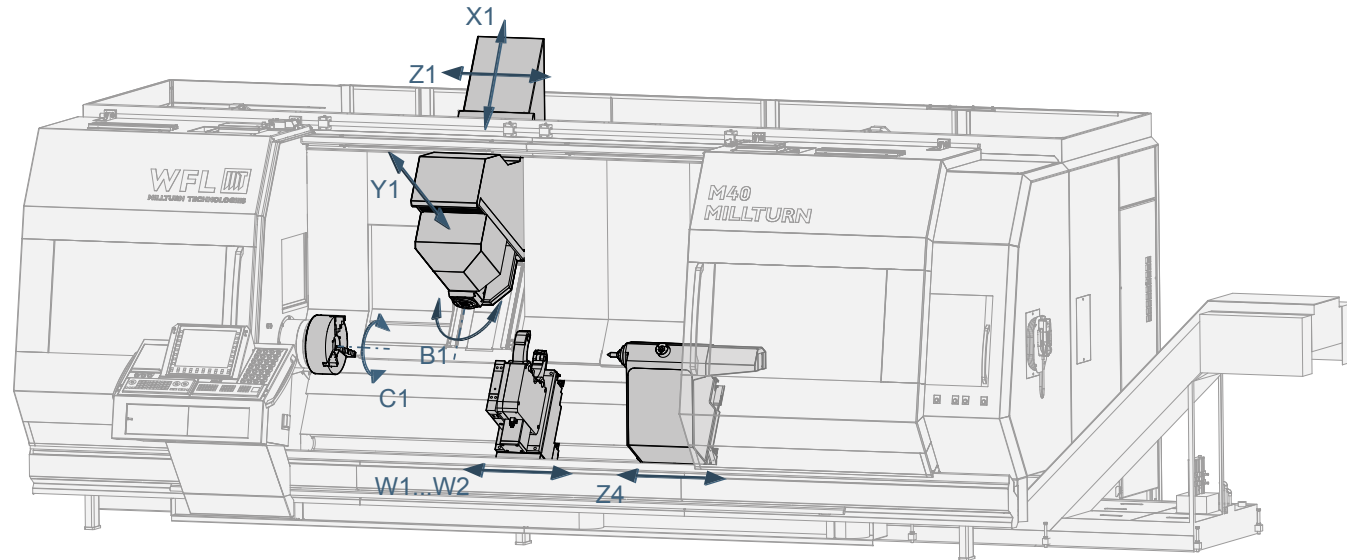
■ M40X MILLTURN | M40X-G MILLTURN



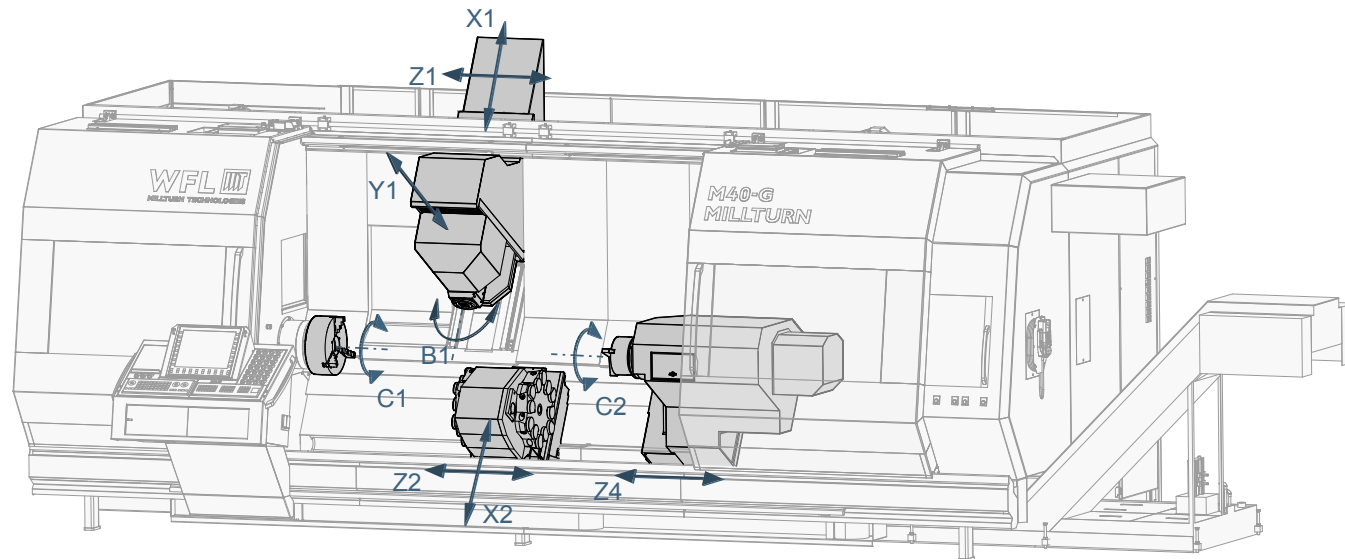
■ M50 MILLTURN | M50-G MILLTURN



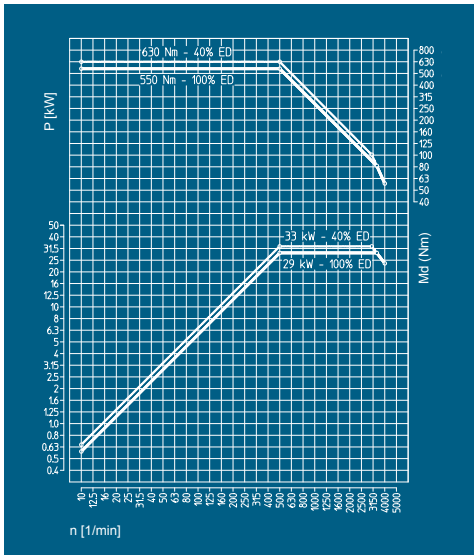
Axis scheme



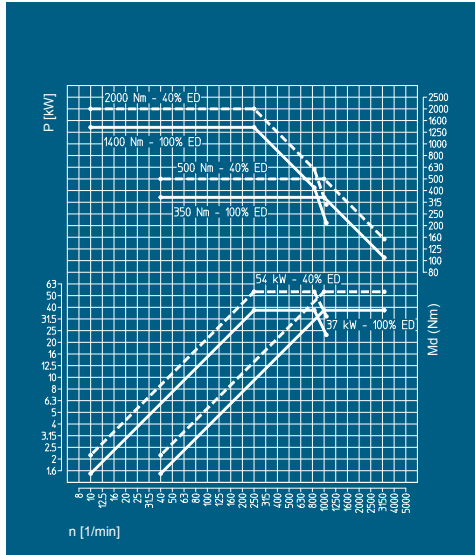
M40 MILLTURN | M40X MILLTURN | M50 MILLTURN



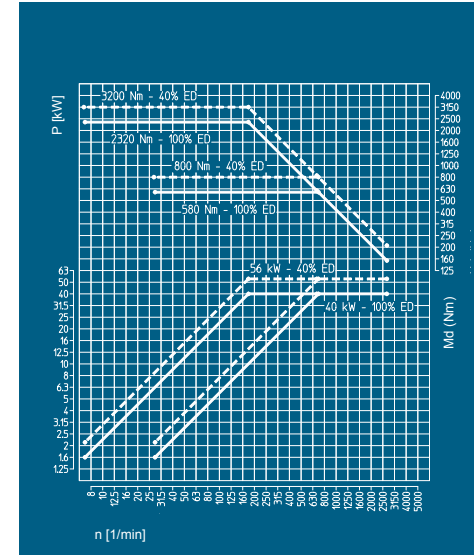
M40-G MILLTURN | M40X-G MILLTURN | M50-G MILLTURN



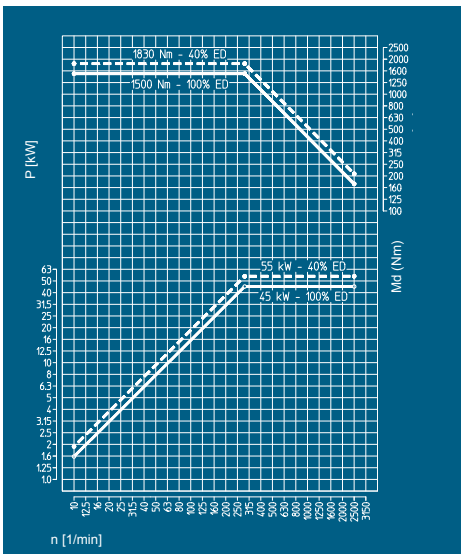
Main spindle 33(29) kW / A8 - 4000 min<sup>-1</sup>



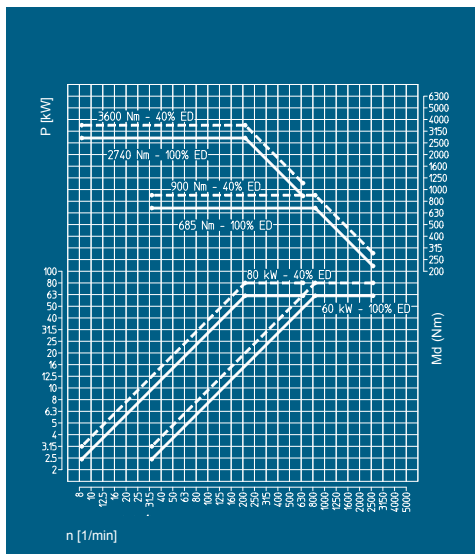
Main spindle 54(37) kW / A11 - 3300 min<sup>-1</sup>



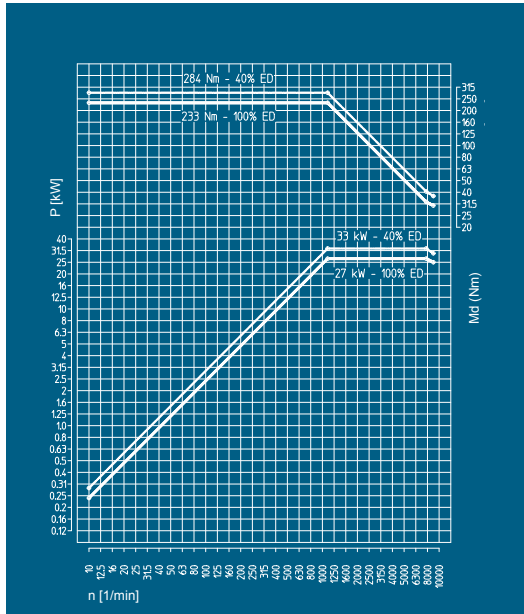
Main spindle 56(40) kW / A15 - 2600 min<sup>-1</sup>



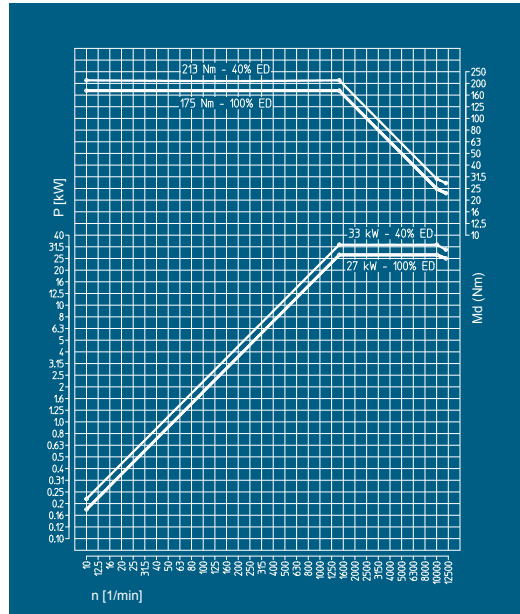
Main spindle 55(45) kW / A11 - 2500 min<sup>-1</sup>



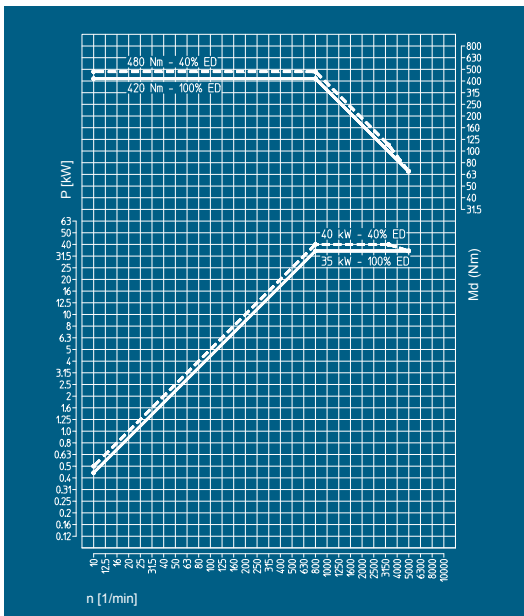
Main spindle 80(60) kW / A15 - 2600 min<sup>-1</sup>



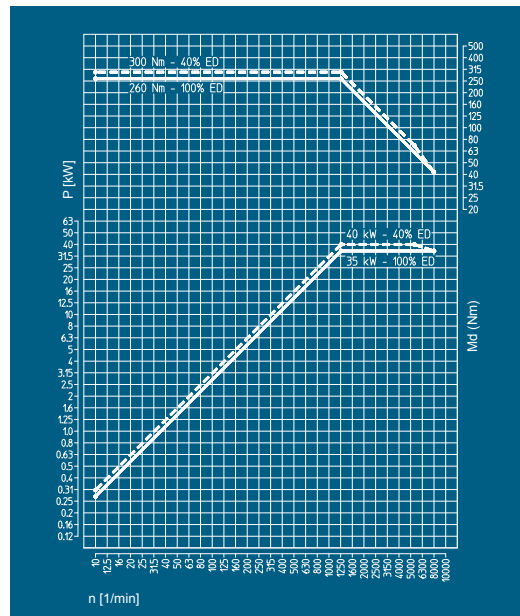
Milling spindle 33(27) kW - 9000 min<sup>-1</sup>



Milling spindle 33(27) kW - 12000 min<sup>-1</sup>



Milling spindle 40(35) kW - 5000 min<sup>-1</sup>



Milling spindle 40(35) kW - 8000 min<sup>-1</sup>

M40 MILLTURN

M40-G MILLTURN

WORKING RANGE

Centre distance	mm	1000 / 2000 / 3000 / 4500	1000 / 2000 / 3000 / 4500
Turning length max. (dependent on clamping device and spindle)**	mm	1100 / 2100 / 3100 / 4700	900 / 1900 / 2900 / 4700
Swing diameter over top slide	mm	520	520
Turning diameter max.	mm	520	520

TURNING SPINDLE – LEFT // RIGHT

	L	L // R
Spindle head DIN 55026	Size A8 / A11	A8 / A11 // A8
Spindle bore	mm 77 / 115	77 / 115 // 77
Spindle diameter in front bearing	mm 160 / 160	160 / 160 // 160
Standard chuck diameter	mm 260 / 325 / 400	260 / 325 / 400

MAIN DRIVE – LEFT // RIGHT

	L	L // R
Power max., 40% (100%) ED	kW 33 (29) / 54 (37)	33 (29) / 54 (37) // 33 (29)
Speed max.	min <sup>-1</sup> 4000 / 3300	4000 / 3300 // 4000
Torque max. 40% (100%) duty cycle	Nm 630 (550) / 2000 (1400)	630 (550) / 2000 (1400) // 630 (550)

C-AXIS – LEFT // RIGHT

	L	L // R
Speed max.	min <sup>-1</sup> 100 / 32	100 / 32 // 100
Torque max. 40% (100%) duty cycle	Nm 630 (550) / (1500)	630 (550) / (1500) // 630 (550)
Holding torque max. of the disc brake	Nm 2000 / 3000	2000 / 3000 // 2000
Smallest programmable increment	Degrees 0,0001	0,0001 // 0,0001

TURNING-BORING-MILLING UNIT – UPPER TOOL CARRIER\*

Power max. 40% (100%) duty cycle	kW	33 (27)
Speed max.	min <sup>-1</sup>	9000 / 12000 / *
Torque at the spindle max. 40% (100%) duty cycle	Nm	284 (233) / 213 (175)
Milling spindle diameter in front bearing	mm	80
Z-axis travel	mm	1150 / 2150 / 3150 / 4750
X-axis travel	mm	600 (-20...+580)
Y-axis travel	mm	250 (-100...+150)
Z-axis feed force 100% duty cycle	kN	14
X-axis feed force 100% duty cycle	kN	14
Y-axis feed force 100% duty cycle	kN	12
Rapid feed speed Z / X / Y	m/min	40 / 30 / 15
B-axis swivelling range	Degrees	-110...+110
B-axis additional indexing	Degrees	2,5
B-axis swivelling torque max.	Nm	1250
B-axis holding torque max. indexed	Nm	10000
B-axis holding torque max. clamped	Nm	5000
Smallest programmable increment B-axis	Degrees	0,0001
Tool system	Type	HSK-A63 / Capto C6



M40X MILLTURN	M40X-G MILLTURN
1000 / 2000 / 3000 / 4500	1000 / 2000 / 3000 / 4500
1020 / 2020 / 3020 / 4620	900 / 1900 / 2900 / 4620
520	520
520	520
<b>L</b>	<b>L // R</b>
A8 / A11	A8 / A11 // A8
77 / 115	77 / 115 // 77
160 / 160	160 / 160 // 160
260 / 325 / 400	260 / 325 / 400
<b>L</b>	<b>L // R</b>
33 (29) / 54 (37)	33 (29) / 54 (37) // 33 (29)
4000 / 3300	4000 / 3300 // 4000
630 (550) / 2000 (1400)	630 (550) / 2000 (1400) // 630 (550)
<b>L</b>	<b>L // R</b>
100 / 32	100 / 32 // 100
630 (550) / (1500)	630 (550) / (1500) // 630 (550)
2000 / 3000	2000 / 3000 // 2000
0,0001	0,0001 // 0,0001
33 (27) // 40 (35)	
9000 / 12000 / * // 5000 / 8000	
284 (233) / 213 (175) // 480 (420) / 300 (263)	
80 // 100	
1070 / 2070 / 3070 / 4670	
800 (-20...+780)	
400 (-100...+300)	
14	
14	
12 // 17	
40 / 30 / 15 // 40 / 30 / 18	
-110...+110	
2,5	
1250 // 1600	
10000 // 15000	
5000 // 6000	
0,0001	
HSK-A63 / Capto C6 // HSK-A100 / Capto C8	

	M40 MILLTURN	M40-G MILLTURN	M40X MILLTURN	M40X-G MILLTURN
<b>TAILSTOCK (MECHATRONIC, ADJUSTMENT VIA NC SERVO DRIVE)</b>				
Feed force (adjustable)	kN	2,4 - 12	-	2,4 - 12 -
Live centre	MK	5	-	5 -
Weight of workpiece max.	kg	1.000	-	1.000 -
<b>STEADY REST</b>				
Clamping diameter max.	mm	350 / *	-	350 / * -
Swing over steady rest slide	mm	520	-	520 -
<b>DISC MAGAZINE</b>				
Number of tool stations (place-encoded)	Number	50 / 100 / 150 / 200		50 / 100 / 150 / 200 // 36 / 72 / 108 / 144
Tool diameter, adjacent, max.	mm	90		90 // 125
Tool diameter, non-adjacent, max.	mm	160		160
Max. tool length	mm	500		500
Max. tool weight	kg	15		15
<b>DISC TURRET – BOTTOM TOOL CARRIER</b>				
Number of tool stations, (VDI 50, HSK-A63, Capto C6)	Number	12	2x12	12 2x12
Z-axis travel	mm	- / 1777 / 2777 / -	- / 1777 / 2777 / -	- / 1777 / 2777 / - - / 1777 / 2777 / -
X-axis travel	mm	230	230	230 230
Rapid feed speed Z / X	m/min	30 / 10	30 / 10	30 / 10 30 / 10
Turning diameter max.	mm	350	350	350 350
Swing over turret	mm	360 / *	360 / *	360 / * 360 / *
<b>CHIP CONVEYOR AND COOLANT UNIT</b>				
Discharge height	mm	1250		1250
Standard coolant pump pressure	bar	10		10
<b>PRINCIPAL DIMENSIONS OF THE BASE MACHINE</b>				
Length x width x height (Magazine max. 72x / 100x)	m	7,3 / 8,3 / 9,3 / 11,7 x 4,6 x 3,3		7,3 / 8,3 / 9,3 / 11,7 x 4,7 x 3,6
Working height of turning spindle	mm	1255		1255
Weight total, approximately	kg	17.000 - 27.000	18.000 - 28.000	19.000 - 29.000 20.000 - 30.000
<b>CONTROL</b>				
			Sinumerik 840D sl	
Display on the operator panel	Type		LCD colour display / 19"	
<b>PAINTING</b>				
		RAL 5023 distant blue, texture / 7035 light grey, texture / 7037 dusty grey, texture		

\* other values available upon request

\*\* indicated values refer to headstock A8 left without neck and chuck diameter 260mm

**M50 MILLTURN**
**M50-G MILLTURN**
**M50 MILLTURN**
**M50-G MILLTURN**
**WORKING RANGE**

Centre distance	mm	1000 / 2000 / 3000 / 4500 / *	1000 / 2000 / 3000 / 4500 / *
Turning length max. (dependent on clamping device and spindle)**	mm	900 / 1900 / 2900 / 4500	750 / 1750 / 2750 / 4500
Swing diameter over top slide	mm	670	670
Turning diameter max.	mm	670	670

**TURNING SPINDLE – LEFT /// RIGHT**
**L**
**L /// R**

Spindle head DIN 55026	Size	A11 / A11 /// A15	A11 / A11 /// A15 /// A11
Spindle bore	mm	115 / 130 /// 165-145	115 / 130 /// 165-145 /// 130
Spindle diameter in front bearing	mm	160 / 190 /// 240	160 / 190 /// 240 /// 190
Standard chuck diameter	mm	325 / 400 / 500	325 / 400 / 500

**MAIN DRIVE – LEFT /// RIGHT**
**L**
**L /// R**

Power max. 40% (100%) ED	kW	54 (37) / 55 (45) // 56 (40) / 80 (60)	54 (37) / 55 (45) // 56 (40) / 80 (60) // 55 (45)
Speed max.	min <sup>-1</sup>	3300 / 2500 // 2600 / 2600	3300 / 2500 // 2600 / 2600 /// 2500
Torque max. 40% (100%) duty cycle	Nm	2000 (1400) / 1830 (1500) // 3200 (2320) / 3600 (2740)	2000 (1400) / 1830 (1500) // 3200 (2320) / 3600 (2740) // 1830 (1500)

**C-AXIS – LEFT /// RIGHT**
**L**
**L /// R**

Speed max.	min <sup>-1</sup>	32 / 100 // 20	32 / 100 // 20 /// 100
Torque max. 40% (100%) duty cycle	Nm	1500 / 1500 // 3000	1500 / 1500 // 3000 /// 1500
Holding torque max. of the disc brake	Nm	3000 / 3000 // 4000	3000 / 3000 // 4000 /// 3000
Smallest programmable increment	Degrees	0,0001 / 0,0001 // 0,0001	0,0001 / 0,0001 // 0,0001 /// 0,0001

**TURNING-BORING-MILLING UNIT – UPPER TOOL CARRIER\***

Power max. 40% (100%) duty cycle	kW	33 (27) // 40 (35)
Speed max.	min <sup>-1</sup>	9000 / 12000 / * // 5000 / 8000
Torque at the spindle max. 40% (100%) duty cycle	Nm	284 (233) / 213 (175) // 480 (420) / 300 (263)
Milling spindle diameter in front bearing	mm	80 // 100
Z-axis travel	mm	1070 / 2070 / 3070 / 4670
X-axis travel	mm	800 (-20...+780)
Y-axis travel	mm	400 (-175...+225)
Z-axis feed force 100% duty cycle	kN	14
X-axis feed force 100% duty cycle	kN	14
Y-axis feed force 100% duty cycle	kN	12 // 17
Rapid feed speed Z / X / Y	m/min	40 / 30 / 15 // 40 / 30 / 18
B-axis swivelling range	Degrees	-110...+110
B-axis additional indexing	Degrees	2,5
B-axis swivelling torque max.	Nm	1250 // 1600
B-axis holding torque max., indexed	Nm	10000 // 15000
B-axis holding torque max., clamped	Nm	5000 // 6000
Smallest programmable increment B-axis	Degrees	0,0001
Tool system	Type	HSK-A63 / Capto C6 // HSK-A100 / Capto C8

**TAILSTOCK (MECHATRONIC, ADJUSTMENT VIA NC SERVO DRIVE)**

Feed force (adjustable)	kN	4 - 20	-
Live centre	MK	6	-
Weight of workpiece max.	kg	1.500	-

**STEADY REST**

Clamping diameter max.	mm	350 / *	350 / *
Swing over steady rest slide	mm	670	670

**DISC MAGAZINE**

Number of tool stations (place-encoded)	Number	50 / 100 / 150 / 200 // 36 / 72 / 108 / 144
Tool diameter, adjacent, max.	mm	90 // 125
Tool diameter, non-adjacent, max.	mm	160
Max. tool length	mm	500
Max. tool weight	kg	15

**CHIP CONVEYOR AND COOLANT UNIT**

Discharge height	mm	1250
Standard coolant pump pressure	bar	10

**PRINCIPAL DIMENSIONS OF THE BASE MACHINE**

Length x width x height (Magazine max. 72x / 100x)	m	7,3 / 8,3 / 9,3 / 11,7 x 4,7 x 3,6
Working height of turning spindle	mm	1295
Weight total, approximately	kg	19.000 - 29.000      20.000 - 30.000

**CONTROL**

Sinumerik 840D sl

Display on the operator panel	Type	LCD colour display / 19"
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**PAINTING**

RAL 5023 distant blue, texture / 7035 light grey, texture / 7037 dusty grey, texture

\* other values available upon request

\*\* indicated values refer to headstock A11 left and chuck diameter 325mm