INDEX DALIAN TNA300/TNA400 MILL-TURNING CENTER TECHNICAL SPECIFICATIONS

a) Features:

TNA400 is a high-capacity universal mill-turning center which can be used extremely flexibly. At the same time, it is outstanding thanks to a high degree of economy and productivity and can also be adapted to individual production requirements. So it is a machine which is equally convincing with small to medium-sized batches as it is with large series and complex processing. All told, these are properties which are in particular demand in both tool and mould making as well as in production.

- Robust structure

Slant bed at an angle of 40°, thermo-symetrically designed tailstock, linear motion guideways for compound slide, separate guideways for tailstock and steady ready, demonstrates the robustness of the machine.

- Stable and precision spindle unit and drive

The high-precision, life-time lubricated, play-free, pre-loaded angular contact bearings are used in the work spindle unit.
Highly dynamic AC-drive ensures maximum torque and thus maximum acceleration without jolting movements or visible distortion of contours.
AC-motor is robust, maintenance-free and has no thermal effects on the headstock.

- Rapid indexing turret

The shorter the chip-to-chip times are, the more productive production is. With the rapid-index disk-type turret, you get a great deal closer to this objective. The turret has 12 tool reception bores for the precise, quick-change tool holders to DIN 69880-40.
For milling work and driven drilling and

tapping tools, the turret can be equipped with a tool drive for all stations. A special coupling is used to drive only the tool in working position. In this way, there is always the maximum output available for metal cutting. In combination with the C axis and the available control options, the TNA400 thus becomes a mill-turning center for very complex workpieces.

- Tailstock

The tailstock has its own guideway. It is dragged by the turret slide and hydraulically clamped in the working position. The quill is also operated hydraulically. The play-free bearings in the tailstock quill correspond to the work spindle as regards precision, speed properties and load absorption. Radial and, in particular, the high axial forces are absorbed by play-free precision bearings.

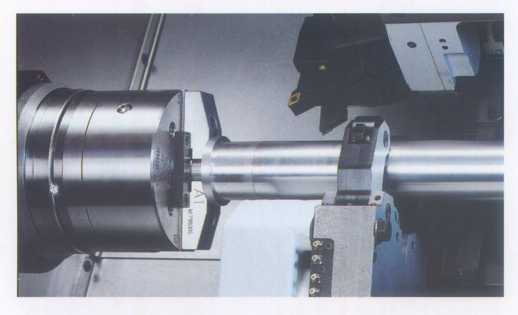
- Cooling

The inner coolant supply through the tool at a pressure of 5 bar ensures sufficient cooling and lubrication at all times.

- Absolute position feedback systems, which do away with the necessity of referencing the machine, and the electronic collision cut-out by monitoring of the motor current

- Steady

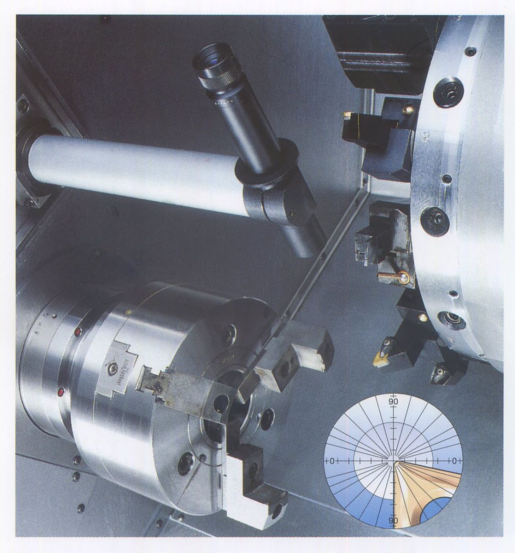
Workpieces with a high degree of slimness or corrugated parts must be supported with a steady. The steady is fixed and covers a clamping range of 12 to 145 mm. The guide rollers are moved to the workpiece hydraulically and are self-centering.



- Clamping devices

The ISO A6 short-taper receptor on the spindle nose makes the use of all standard power and collet chucks possible.
The clamping devices are operated by a hydraulic clamping cylinder.

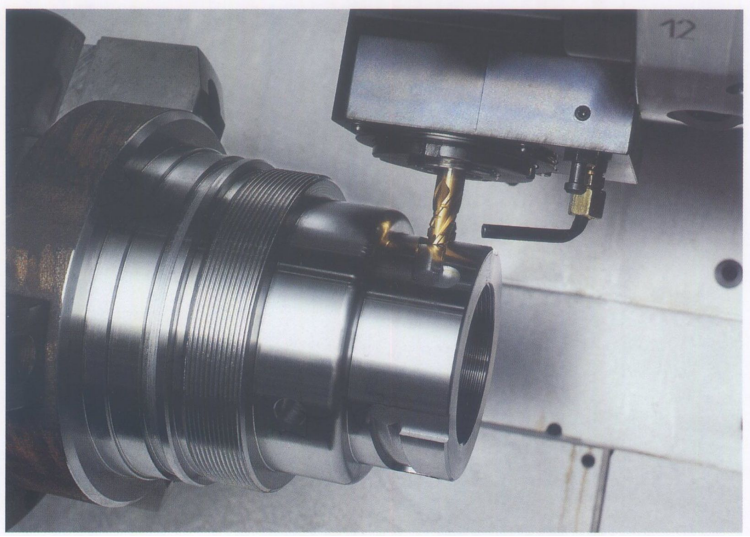
- Tool measurement with ATC



Long gone are the days when tools had to be measured manually and the dimensions entered into the machines in order to determine the exact position of the cutting. With the optical measurement device developed specifically for this purpose, the tool is only measured once it has been clamped in the turret. The operator positions the tool in the reticule of the optic The position is read in by the controls at the push of a button. This means drastically reduced set-up times.
The benefit: the use of the TNA400 remains economical even for small batches.

- Control system

1) System T65n1
The controls are designed as open controls and fitted with a 64 bit Risc processor. In this way, non-productive and change-over times can be greatly reduced.



All programmes and parameters are input and output in the comfortable DOS format.

The SYSTEM T65n1 control provides you with all the functions you need for effective use of the TNA400 in your production:

- Programming of constant cutting speed
- Thread cutting without compensatory chucks
- Tool measurement with ATC
- Movement by handwheel in jog operation
- MDI operation
- RS232 interface for data input and output
- Safety monitoring for all machine functions

The technology is supported by high-capacity cycles, thus considerably facilitating programming:

- Tapping, single point threading
- Deep-hole drilling with chip removal
- Inserting chamfers and radii
- Roughing and finishing (facing, longitudinal or parallel to the contour)
- Graphical display of the tool path

2) SYSTEM T65n2

In order to extend the potential of the TNA400 universal mill-turning center to cover the processing of complex workpieces as well, we have connected the X and the C axis with the SYSTEM T65n2 control and integrated a complete geometry support, thus extending the range of processing by milling of spot faces, lateral faces or chord faces with cutter radius compensation and also by radial processing and axial drilling. A special encoder in the C axis ensures maximum precision in this. Thanks to the coordinate calculation by the control programming is very user-friendly, even for difficult milling contours. Programming is done in the customary XYZ Cartesian coordinate system. A control, which can be considered exemplary with regard to comfort, user-friendliness and output.

- Control of the tool drive

- C axis with special encoder for maximum precision
- Simple programming in XYZ with automatic coordinate calculation for X and C axis
- Cutter radius compensation

b) Specifications

Machine Model		**TNA300**	**TNA400**
Working range			
Spindle bore (partial hollow)	mm	42	65
Spindle nose to ISO	size	A5	A6
Chuck diameter	mm		200-260
Turning diameter	mm	220	340
Turning length	mm	450	750
Swing diameter over cross slide	mm	395	530
Swing diameter over bed	mm	520	665
Main drive			
Spindle speed	rpm	50-5600	50-4000
Power rating at 63% duty cycle	kW	11	18.5
Torque at 63% cycle	Nm	200	382
Workpiece carrier			
Number of stations (DIN 69880 X 40)		12	12
Indexing time, 1st station	sec	0.2	0.2
Indexing time, each additional station	sec	0.15	0.15
Rapid rate X/Z	m/min	15/18	15/24
Drive for turret tools			
Speed	Rpm	4000	4000
Power rating at 25% duty cycle	kW	4	5.5
Torque at 25% duty cycle	Nm	34	47

Tailstock			
Quill stroke	mm	60	140
Quill force	N	8600	10000
Receptor, DIN 218		MT4	MK 5
Steady (fixed)			
Clamping range	mm		12-145
Coolant system			
Supply pressure	bar	5	5
Tank capacity	l		275
Dimensions, weight and connected loads with maximum equipment			
Dimensions LxWxH	approx. mm	2700x1620x1800	4593x1821x2005
Weight	approx. kg	4500	6200
Connected loads		22kW	28kW, 38kVA, 80A, 400V, 50Hz