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MACHINE SPECIFICATION

INTRODUCTION

MACHINE SPECIFICATION

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General Description and Machine Functions

The Tornado T8/T8M/T8MS/T8MSY and their large bore versions (see note below) is a high performance, 60° slant, CNC lathes with a suitably low floor to spindle height, excellent operator access, a comfortable workpiece loading position and optimum sight of the cutting process. The operator controls are ergonomically positioned for easy and efficient operation. The unique overall machine configuration minimises on floor space.

Soft Limits

Slideway movement extremes are monitored by software "soft limits" to limit any attempted move towards a point outside the machine working stroke, this applies to M.P.G. (manual pulse generator) input, M.D.I. (manual data input) and part program moves.

Sliding Door Interlock

The main door sliding guard is provided with a "shot-bolt" interlock switch to prevent access during a machining cycle. When the door is open only limited machine functions are permitted (for set-up purposes) and independent self checking spindle drive monitoring circuitry protects against spindle movement.

Headstock Access Door Interlock

If this door is opened during a machining cycle, emergency stop conditions will be applied.

Workholding Stroke Limit Detection

Sensors are fitted to detect "end of stroke reached" (bottoming condition) on the chucking actuator system. Access to these sensors is by the headstock access door. These sensors should be adjusted in accordance with the instructions provided in the application notes section of this manual each time a new workholding unit (chuck or collet chuck) is fitted.

Lubrication

The lathe features all 'sealed for life' bearing units and long term grease lubrication on the axis linear ways and ballscrew nuts. Only quarterly replenishment of the grease is required (from the centralised grease nipple arrangement on the saddle and cross-slide).

Large Bore [B] Machines

Some machines in the T8 range can be fitted with an alternate spindle with a larger bore which also allows for a larger chuck to be fitted. These machines are identified by the addition of the letter B to the machines name; i.e. 'T8MSB'.

These machines are otherwise identical to the standard version; i.e. To operate the 'T8MSB' you follow the instructions in this manual for 'T8MS' machines. Where there are differences between the two that need to be observed these will be clearly marked as being for 'Large bore [B] machines'

Machine Specification

Capacity	T8	T8M	T8MS	T8MSY
Swing over bed	510mm	510mm	510mm	510mm
Maximum turned diameter	260mm	290mm	290mm	260mm
'X' Axis travel	240mm	240mm	240mm	170mm
'Z' Axis travel [Turned length]	540mm	540mm	540mm	540mm
'A' Axis travel	-	-	625mm	625mm
'Y' Axis travel	-	-	-	80mm
Carriage inclination [Slant bed]	60°	60°	60°	60°
Main Spindle	T8	T8M	T8MS	T8MSY
Spindle centre height [from floor]	260	260	260	277
	STANDARD BORE M/C'S		LARGE BORE [B] M/C'S	
Spindle nose	A2-6		A2-8	
Chuck size	210/254mm		265/305mm	
Spindle bore	77.5mm		90.5mm	
Drawtube [bar] capacity	65mm		82.5mm	
Spindle bearing [internal diameter]	110mm		130mm	
Spindle speed [max] rpm	3500 or 5000*		3000 or 4000	
Spindle motor power	22kW		22kW	
'C' Axis resolution **	0.001°		0.001°	

* 5000rpm only available on T8MSY

** Only available on machines fitted with 'driven tooling'.

Axes	T8	T8M	T8MS	T8MSY
'X' Axis ballscrew [diameter and pitch]	32 x 5mm	32 x 5mm	32 x 5mm	32 x 8mm
'X' Axis rapid traverse	25m/min	25m/min	25m/min	25m/min
'X' Axis thrust	3.75kN	3.75kN	3.75kN	5.73kN
'Z' Axis ballscrew [diameter and pitch]	40 x 10mm	40 x 10mm	40 x 10mm	40 x 10mm
'Z' Axis rapid traverse	30m/min	30m/min	30m/min	30m/min
'Z' Axis thrust	7.15kN	7.15kN	7.15kN	7.15kN
'A' Axis ballscrew [diameter and pitch]	-	-	32 x 10mm	32 x 10mm
'A' Axis rapid traverse	-	-	30m/min	30m/min
'A' Axis thrust	-	-	4.77kN	4.77kN
'Y' Axis ballscrew [diameter and pitch]	-	-	-	32 x 5mm
'Y' Axis rapid traverse	-	-	-	10m/min
'Y' Axis thrust	-	-	-	5.00kN
Turret	T8	T8M	T8MS	T8MSY
Operation [hydraulic clamp/servo index]	Bi-directional	Bi-directional	Bi-directional	Bi-directional
Disk diameter [* = Across Flats]	410	410	320	270
Tooling Type	VDI 40	VDI 40	VDI 40	VDI30
Number of tool stations	12	12	12	12
Turning tool shank size	25 x 25mm	25 x 25mm	25 x 25mm	20 x 20mm
Maximum boring bar	40mm	40mm	40mm	32mm
Travel past centre line	-	27mm	27mm	22mm
Number of driven tool stations	-	6	12	12
Maximum collet size	-	20mm	20mm	16mm
Maximum speed	-	4000rpm	4000rpm	5000rpm
Maximum power	-	3.75kW	3.75kW	3.7kW
Rotating tool coupling	-	DIN 5482 (17 x 14)	DIN 5480 (20 x 0.8)	DIN 5480 (16 x 0.8)

Machine Specification

Sub Spindle	T8	T8M	T8MS	T8MSY
Width across cross guide ways	-	-	240mm	240mm
Min / Max travel [jaw to jaw]	-	-	0/600mm	0/600mm
Spindle nose	-	-	DIN 6353 [110Ø]	
Chuck size	-	-	170Ø/43mm Bore	
Spindle bore	-	-	55mm	55mm
Draw tube diameter [x length]	-	-	40 x 370mm	40 x 370mm
Spindle speed [max]	-	-	5000rpm	6000rpm
Spindle power	-	-	7.5kW	7.5kW
Spindle torque	-	-	47.7Nm	47.7Nm
'B' Axis resolution	-	-	0.001°	0.001°
Tailstock [If fitted - Optional extra]	T8	T8M	T8MS	T8MSY
Hydraulic quill	Yes	Yes	-	-
Quill taper	No.5 MT	No.5 MT	-	-
Quill diameter	95mm	95mm	-	-
Quill travel	125mm	125mm	-	-
Maximum quill thrust	7.85kN	7.85kN	-	-
Tailstock body travel	600mm	600mm	-	-
Size and Weight	T8	T8M	T8MS	T8MSY
Maximum power consumption	37kVA	50kVA	50kVA	50kVA
Machine footprint	4.05m ²	4.05m ²	4.05m ²	4.05m ²
Machine weight [approx]	4450kg	4450kg	5000kg	5000kg

Standard and Optional Accessories

Fitted as Standard	T8	T8M	T8MS	T8MSY
Full guarding				
Coolant tank capacity	150Ltr	100Ltr	100Ltr	125ltr
Coolant pump - delivery [2.5 bar]	25Ltr/min	25Ltr/min	25Ltr/min	25Ltr/min
Machine lighting - Fluorescent lamps				
Available as optional extras				
'X' Axis linear scale				
Collet chucking				
Parts catcher				
Swarf conveyor				
Tool set probe				
Inspection probe				
Bar feed unit [MBF1000]				
'Lights out' package				

Fanuc Control Specification

T8 Only

Controlled Axes 2 Axes (X and Z)
 Simultaneously Controllable Axes 2 Axes (1 Axis with M.P.G.)

T8M Only

Controlled Axes 3 Axes (C, X and Z)
 Simultaneously Controllable Axes 3 Axes (1 Axis with M.P.G.)

T8MS Only

Controlled Axes 5 Axes (A, B, C, X and Z)
 Simultaneously Controllable Axes 3 Axes (1 Axis with M.P.G.)

T8MS Only

Controlled Axes 6 Axes (A, B, C, X, Y and Z)
 Simultaneously Controllable Axes 3 Axes (1 Axis with M.P.G.)

All Machines

Least Input Increment 0.001mm (0.0001 in)
 Least Command Increment X 0.0005mm (0.00005in)
 (in the case of X Axis Diameter designation : 0.001mm)
 Z 0.001 mm (0.0001 in)
 C]and B] 0.001°
 [A 0.001 mm (0.0001 in)]

Data Input Via Keyboard (MDI)

Programme Format Metric: 04, N4, G2, X4.3, Z4.3 R4.3,
 (The numbers beside the letter addresses
 represents the number of digits and decimal
 point format) Inch: 04, N4, G2, X3.4, Z3.4, R3.4,
 F 16, S2 / S4, T4, P4.3, M2.

Max. Programmable Dimension +/- 9999.999 mm
 .. +/- 999.9999 inch

Rapid Traverse Speed X Axis 0-10m/min
 Z Axis 0-15/20m/min

Rapid Traverse Override 0 / 25 / 50 / 100%

Feed Rates 0.0001 - 40.0000mm /rev
 0.000001 - 4.000000inch /rev
 1 - 5000mm /min
 .0.01 - 200.00inch /min

Feed Rate Override 0 - 150%

Automatic Acceleration / Deceleration Linear for Rapid Traverse
 Exponential for Feed (By Servo Lag)

Combined use of Absolute / Incremental

Programming in the same Block of Tape.

Programming of Absolute Zero Point.

Positioning, Linear Interpolation,

Multi Quadrant Circular Interpolation

Thread Cutting Lead 0.0001 - 500.0000mm
 0.000001 - 9.9999inch

Fanuc Control Specification - continued

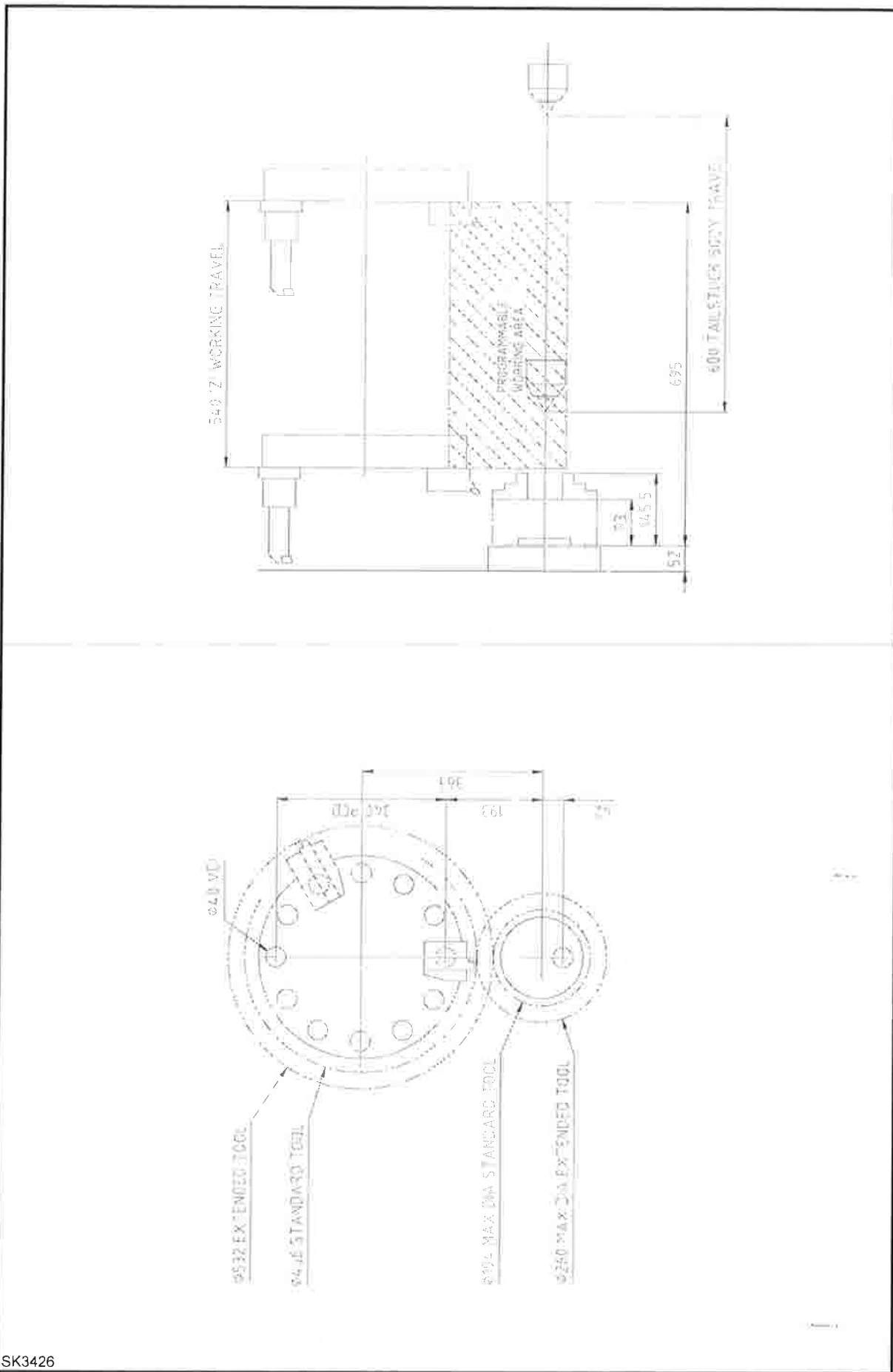
Buffer Register	
Dwell	
Auxiliary Function	.....M Codes
Tool Offset :	..... 16 pairs
Incremental Offset Possible	
Dry RunPart Programme Storage and Editing	.....64k standard
Sub Programme Control	.....4 Loops
Self Diagnosis	
Backlash Compensation	.....0 - 0.255mm
Single Block Operation	
Optional Block Skip	
Machine Lock	
Manual Slide Movement Button (Jog Feed)	
Feed Hold	
Cycle Hold	
Programme Protect	
Sequence Number Display	.....4 Digits
Sequence Number Search	
Programme Number Search	
Reference Point Return	.....Manual, Automatic (G27,G28)
Automatic Co-ordinate System Setting	
Work Co-ordinate System Shift	
Direct measured value input for tool offset	
Constant Tangential Feed Rate Control,	
Emergency Stop.	
Programme Input / Output	.....RS232C Interface
Tape Code	.....EIA. RS - 244-A or ISO 840 (Automatic Recognition of EIA or ISO)
Keyboard Type	.....Manual Data Input (MDI) and CRT Character Display

The following Fanuc options are included in the standard package

Programme Input / Output	.....RS232C Interface
Canned Cycles	.....G77, G78, G79
Multiple Repetitive Cycle	.....G70 - G76
Tool Nose Radius Compensation	
Inch Metric Conversion	.....Switchable by G Codes
Manual Pulse Generator	
Graphic Display	
Direct Measured Value Offset.	
Constant Surface Speed Programming	
Absolute Position Encoding	

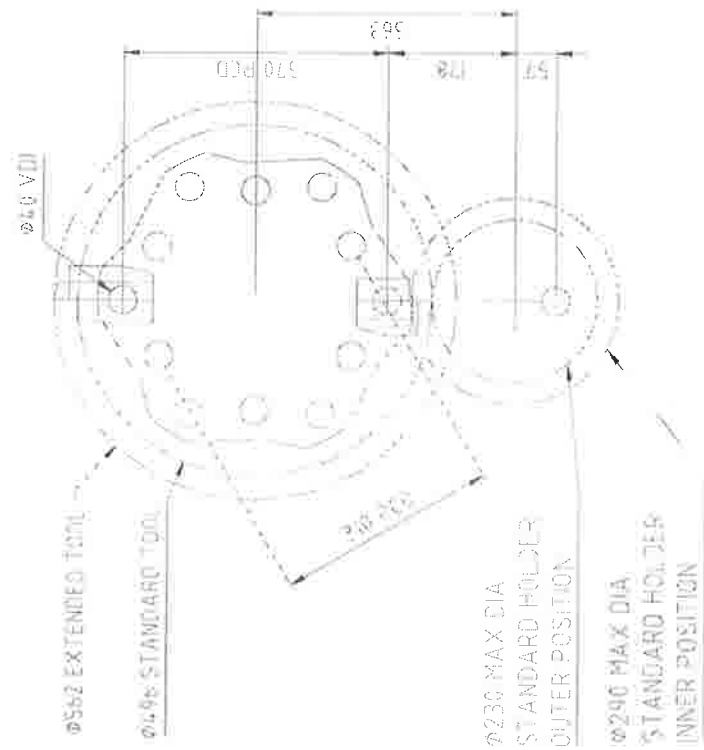
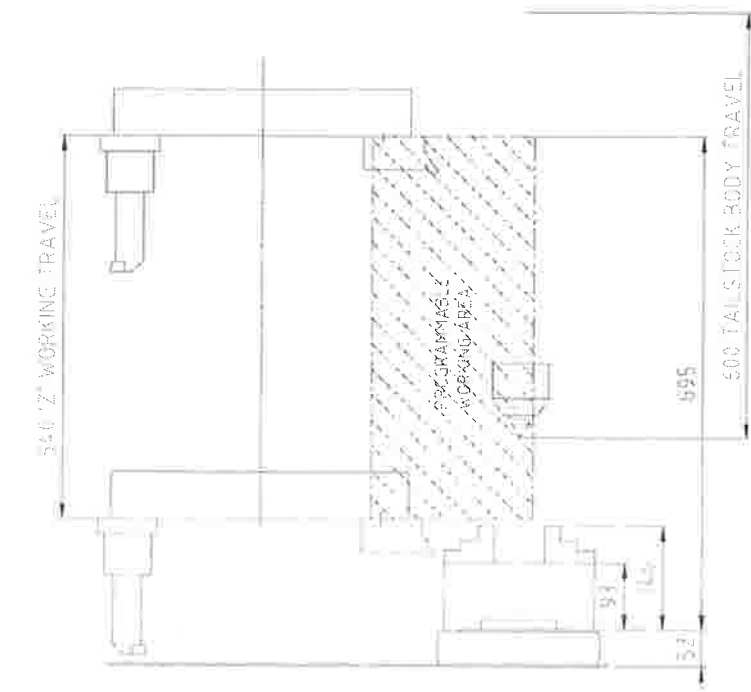
MACHINE SPECIFICATION

Capacity Diagram - T8 (Standard Machine)



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Capacity Diagram - T8M (Driven Tooling Machine)



SK3426

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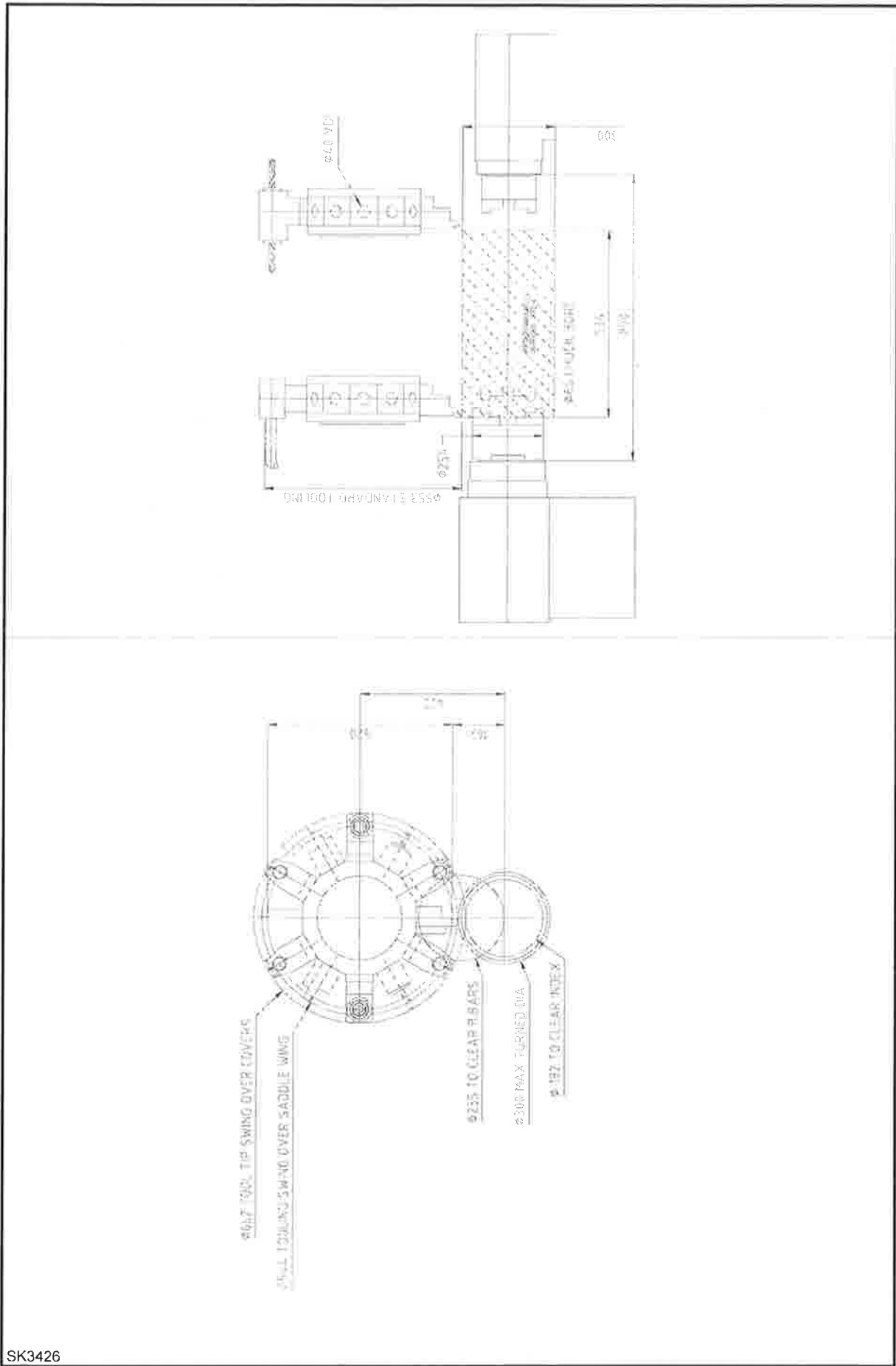
T8-E01
JUL/2004

MACHINE SPECIFICATION

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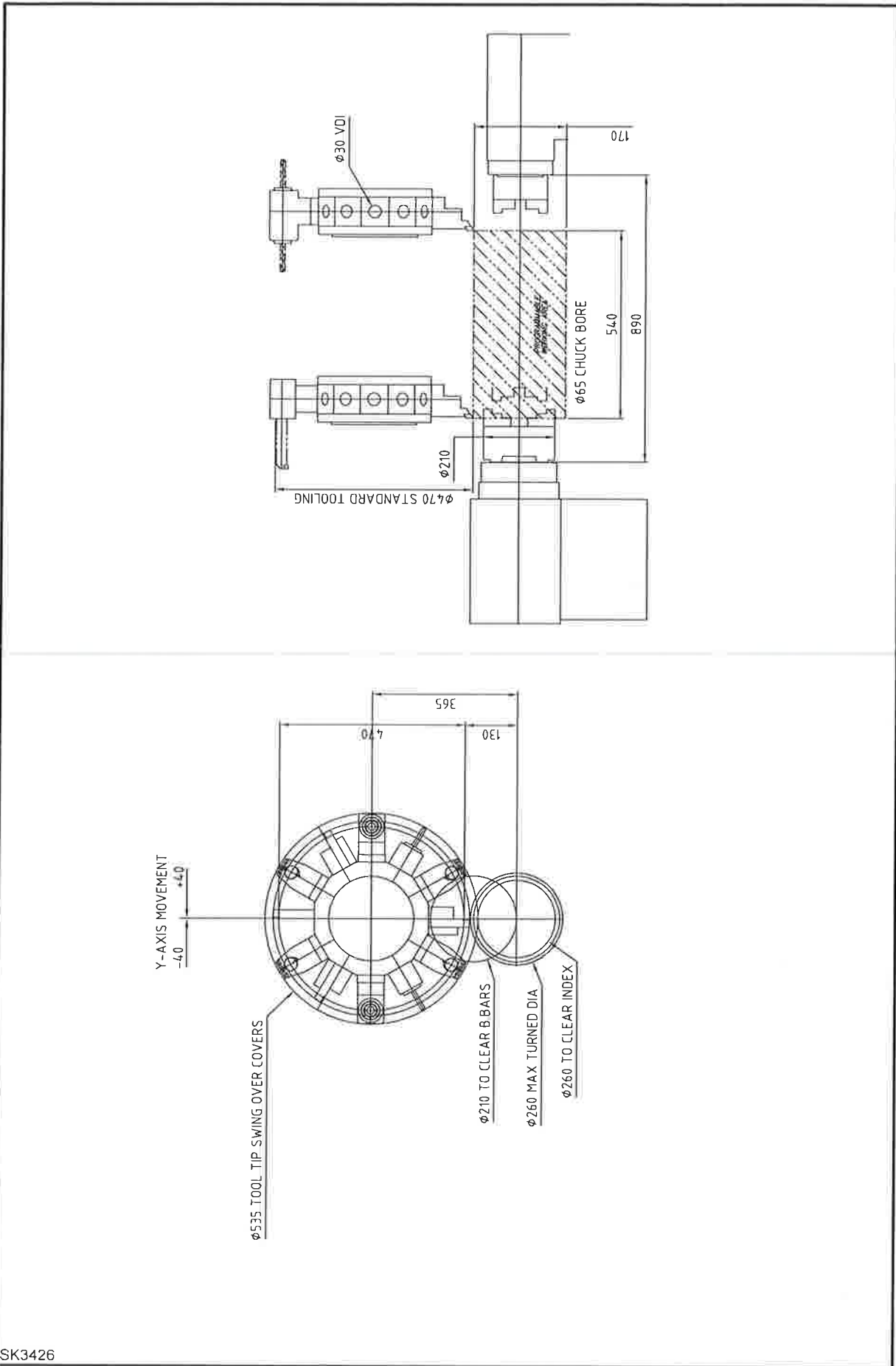
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Capacity Diagram - T8MS (Sub Spindle Machine)



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Capacity Diagram - T8MSY (Sub Spindle Machine with Y Axis)



SK3426

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T8-E01
JUL/2004

Noise Level

The maximum noise level at the operator's position is within 83 dB and the maximum mean noise level is within 83 dB.

The airborne noise emission has been determined in accordance with the methods given in Annex A of EN 12415 or EN 12840 dependant on the class of machine.

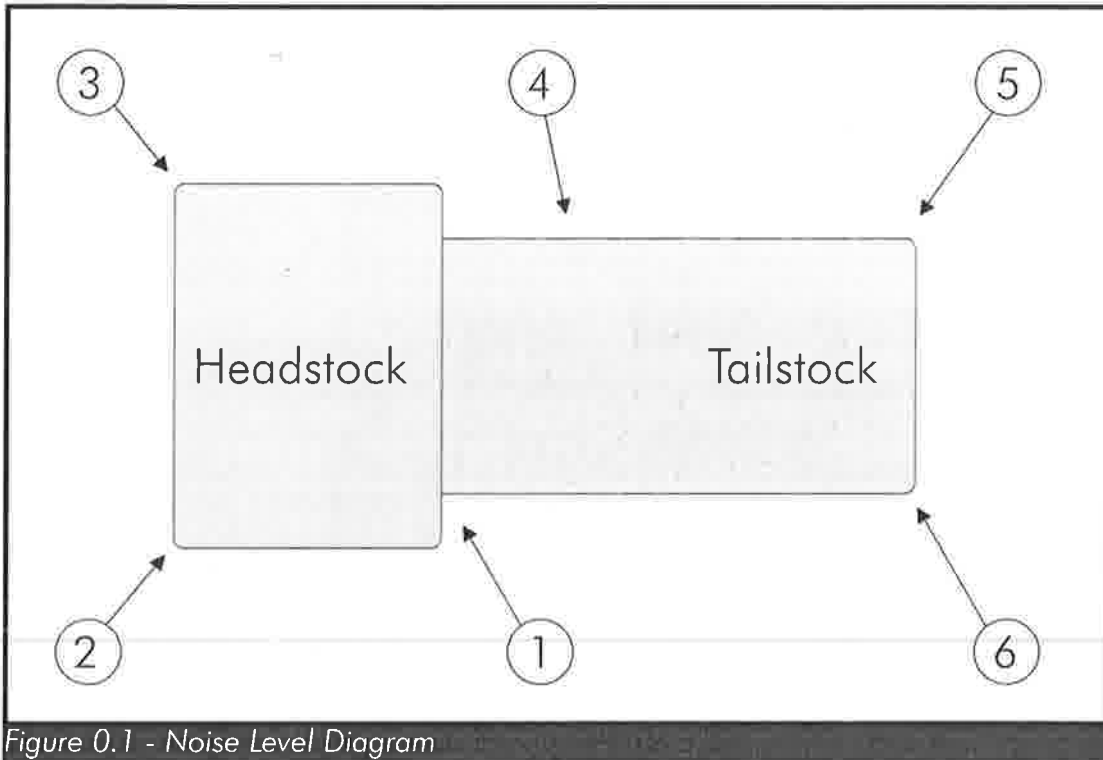


Figure 0.1 - Noise Level Diagram

The measuring method used and the operating conditions applied during the test and values for constant K as follows:-

4 dB when using EN ISO 3746: 1995

2 dB when using EN ISO 3744: 1995

Constant K = 4 dB measured in accordance with EN ISO 3746:1995.

The figures quoted are emission levels and are not necessarily safe working levels. Whilst there is a correlation between the emission and exposure levels, this cannot be used reliably to determine whether or not further precautions are required. Factors that influence the actual level of exposure of the work force include the characteristics of the work room, the other sources of noise, etc. i.e. the number of machines and other adjacent processes. Also the permissible exposure level can vary from country to country. This information, however, will enable the user of the machine to make a better evaluation of the hazard and risk.