

ANNEXURE-D**HIGH SPEED MOTOR SPINDLE****MACHINE MODEL: HX – 253****MAKE: M/S STARRAGHECKERT , SWITZERLAND**

Sl. No.	Description	Data / Specification
1.	Maximum Spindle rated RPM	15,000 rpm.
2.	Runs at max.	15,000 rpm.
3.	Spindle Motor power	27 KW.
4.	Frequency	Variable with variable drive.
5.	No. of poles	Not Known
6.	Tool Clamp	Draw bar mechanism with disc/helical coiled springs.
7.	Coolant Through Spindle.	Yes
8.	Spindle is cooled by refrigerating coolant system.	Yes
9.	Spindle Taper	HSK A 63
10.	Clamping force	20-22 KN
11.	Spindle Torque	90 Nm
12.	Bearing used –	Ceramic Hybrid Bearings. 1. Angular contact hybrid Bearing No. XCS7018E.T.P4S.UL – FAG (1 pair) 2. 65BNR10V-F NSK (1 pair)
13.	Seal reference	Not Available.
14.	Lubrication	One time grease lubrication

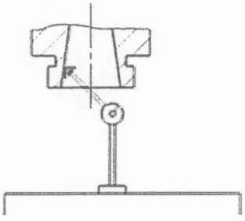
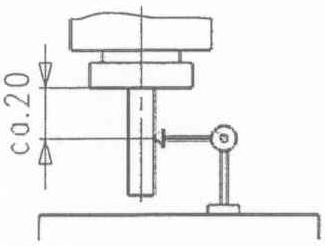
NOTE : 1) No Assembly drawing of the motor spindle is available.
2) No part drawing or part list can be provided.
3) No dismantling or assembly procedure is available.

ANNEXUR – E

TEST CHART

HX MOTOR SPINDLE –STARRAG

SPINDLE NO. - HX.....

Sl No.		Description of test	Admissible deviation in microns	Measured value in microns
1		Runout of spindle taper Control movement by spindle rotation	6	
2		Runout of control arbor (300 mm) in spindle Measurement at 20mm from gauge line	8	

Temperature measurements

Sl. No.	Running time (Hrs)	Rotational Speed (rpm)	Temperature Pos. 1 (°C)	Temperature Pos.2(°C)	Temperature Pos. 3 (°C)	Room Temperature (20°C)
1	1.0	5000				
2	1.0	10000				
3	1.0	12000				
4	1.0	14000				
5	5.0	15000				

Maximum acceptable temperature: 40°C

Pos.1 – At front bearings

Pos. 2- At middle of front and rear bearings

Pos. 3- At rear bearings

TOOL CLAMPING FORCE MEASUREMENTS

Sl. No.	DESIRED VALUE OF CLAMPING FORCE	ACTUAL VALUE OF CLAMPING FORCE	REMARKS
1	20-22 KN		

ELECTRICAL/ ELECTRONICS TEST CHART

SPINDLE NO. – HX.....

1. TOOL CLAMPING SYSTEM

Maximum and minimum values re to be taken during spindle rotation/ different positions of tool clamping system.

Sl. No.	Description	Desired Voltage	Tolerance	Achieved Voltage from sensor			Remarks
				Min.	Max.	Average	
1	Tool Unclamp	8.45 V	+0.4 V				
2	Clamped with tool	3.0 V	+/- 0.5 V				
3	Clamped without tool	1.04 V	+/- 0.1 V				

2. Temperature Sensors:

Sl No.	Description	Desired Resistance	Actual Resistance	Remarks
1	KTY (in encoder connector between pin no. 8 & 9)	540-610 ohm		

3. Encoder Signals

Sl. No.	Description	Desired value	Tolerance	Actual	Remarks
1	No. of pulses between two reference marks (both directions: Clockwise & Anticlockwise rotation of spindle)	256	NIL		
2	Peak to peak voltage	U/Ass=~1.1 V	0.95-1.2 V		
		U/Bss=~1.1 V	0.95-1.2 V		