

TDM SA

motor spindle technology

GRINDING MOTOR SPINDLES



extreme rigidity

high quality motors

max. accuracy

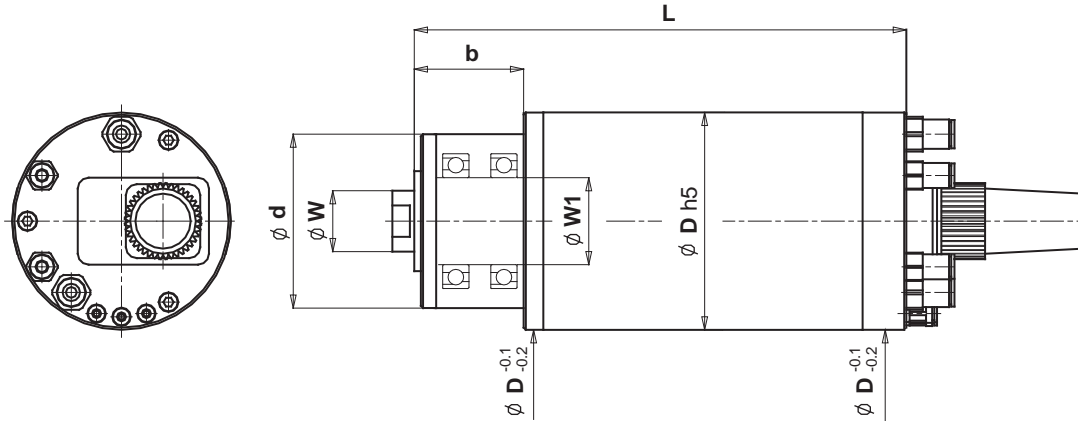
high speed



Made in Switzerland

A world leader in the design, development and manufacturing of high speed precision motor spindles

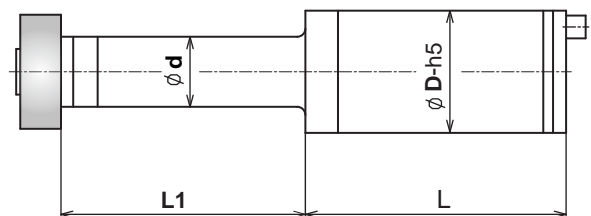
High frequency grinding spindles



body diameter D	designation	tool interface		max speed rpm	bearing bore (mm)			torque s1 Nm	continuous power S1 kW	max frequency Hz	nom. frequency	voltage V	current S1 A	poles	D	L	d	b	W
		d/W	HSK		W1	axial static stiffness N/μm	radial												
80	TG80-180-0.4	D04/08		180'000	9	9	16	0.05	0.8	3000	3000	220	3.3	2	80	140			8
	TG80-150-0.5	D04/08		150'000	9	10	16	0.05	0.8	2500	2500	220	3.3	2	80	150			8
	TG80-120-1.1	D06/12		120'000	15	12	22	0.12	1.5	2000	2000	220	6.2	2	80	150			12
	TG80-90-3	D08/14		90'000	15	18	30	0.32	3	1500	1500	220	12.3	2	80	160			14
100	TG100-105-3-HP	D09/16		105'000	17	34	37	0.18	2	1750	1750	220	8.2	2	100	180			16
	TG100-90-4-HP	D10/18		90'000	20	38	42	0.4	4	1500	1500	380	9.5	2	100	210	80	40	18
	TG100-75-2	D10/18		75'000	20	53	56	0.8	2	2500	833	380	4.7	4	100	150			18
	TG100-75-7-HP	D14/23		75'000	25	54	57	1.34	7	2500	1667	380	16.6	4	100	225	80	40	23
	TG100-75-5.5-SP	D14/23		75'000	25	54	57	0.7	5.5	1250	1250	380	3.0	2	100	225	80	50	23
	TG100-60-13-HP	D16/28	HSK-C25	60'000	30	63	75	4.1	13	2000	1000	380	30.9	4	100	235			28
	TG100-60-7-SP	D16/28	HSK-C25	60'000	30	63	75	1.5	7	2000	1500	380	16.6	4	100	235			28
	TG100-45-13	D22/38	HSK-C32	45'000	40	77	87	4.1	13	1500	1000	380	30.9	4	100	285			38
120	TG100-30-11-HP	D28/43	HSK-C40	30'000	45	81	85	6.2	11	1000	567	380	26.1	4	100	285			43
	TG120-75-7-HP	D14/23		75'000	25	55	69	1.34	7	1250	833	380	3	2	120	245	90	50	23
	TG120-75-5.5-SP	D14/23		75'000	25	55	69	0.7	5.5	1250	1250	380	3	2	120	245	90	50	23
	TG120-60-13-HP	D16/28	HSK-C25	60'000	30	70	98	4.1	13	2000	1000	380	30.9	4	120	265	100	50	28
	TG120-60-7-SP	D16/28	HSK-C25	60'000	30	70	98	1.5	7	2000	1500	380	16.6	4	120	265	100	50	28
	TG120-60-5	D16/28		60'000	30	72	99	2.5	5	2000	667	380	11.9	4	120	150			28
	TG120-45-20-HP	D28/43	HSK-C40	45'000	45	93	128	7	20	2250	1350	380	47.5	6	120	320			43
	TG120-45-13-SP	D28/43	HSK-C40	45'000	45	93	128	4.1	13	1500	1000	380	30.9	4	120	310			43
150	TG120-30-20-HP	D32/53	HSK-C50	30'000	55	101	148	10.6	20	1500	900	380	47.5	6	120	330			53
	TG120-30-13-SP	D32/53	HSK-C50	30'000	55	101	148	7	13	1500	900	380	30.9	6	120	330			53
	TG150-45-12	D28/43		45'000	45	94	154	7.5	12	3000	1000	380	28.5	8	150	170			43
170	TG150-45-38	D28/43	HSK-C40	45'000	45	92	152	12	38	2250	1500	380	90.2	6	150	380	120	60	43
	TG150-30-37	D36/63	HSK-C63	30'000	65	123	199	18	37	1500	1000	380	87.8	6	150	400			63
170	TG170-30-35	D32/53	HSK-C50	30'000	55	112	205	33.4	35	1500	500	380	83.1	6	170	460	120	65	53

Motor spindles for seat grinding in deep positions

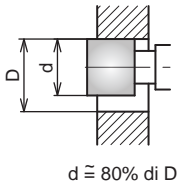
designation	max speed rpm	continuous power S1 kW	in collaboration with customer		
			D	L	d x L1
TG120-24-13-RP	24'000	13	120	303	
TG140-24-20-RP	24'000	20	140	350	
TG150-18-18-RP	18'000	18	150	350	
TG170-12-35-RP	12'000	35	170	350	



Optimal conditions

Admissible cutting speed

Corindon 35-60 m/sec
CBN 45-120 m/sec



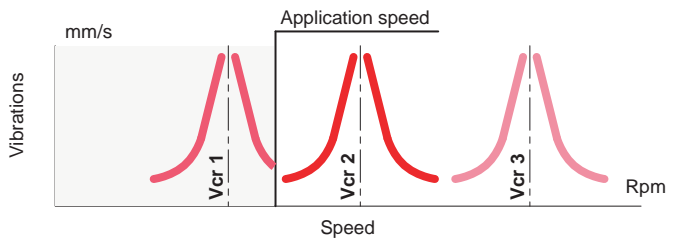
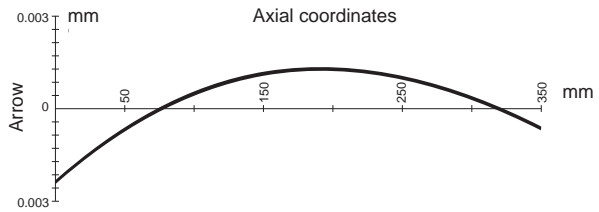
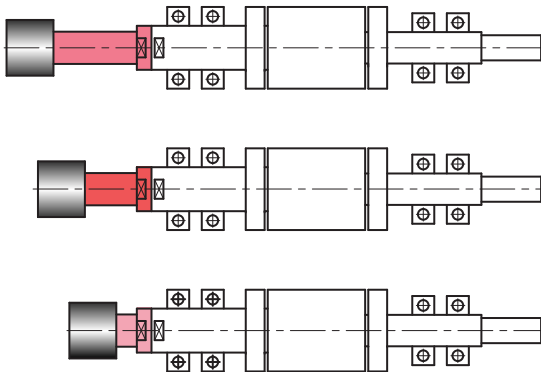
$$V_t = \frac{d \cdot \pi \cdot n}{60 \cdot 1000} = \text{m/sec}$$

Speed Rpm	Grinding wheel diameter (d)																						
	7	10	12	13	14	17	18	20	22	25	30	32	35	38	40	45	50	55	60	70	80	mm	
150'000	55	78.6	94.3																				
120'000	44	62.9	75.5	81.7	88																		
90'000	33	47	56.6	61	66	80	85																
75'000	27.5	39	47	51	55	66.8	70.7	78.6	86.5														
60'000	22	31.5	37.7	41	44	53.5	56.5	63	69	78.6	94.3												
51'000		27	32	34.7	37.4	45.4	48	53.5	58.8	66.8	80	85.5											
45'000		23.6	28	30.6	33	40	42.4	47	52	59	70.7	75.5	82.5	89.6									
42'000				28.6	30.8	37.4	39.6	44	48.4	55	66	70.4	77	83.6	88								
36'000					26.4	32	34	37.7	41.5	47	56.6	60.4	66	71.7	75.5	85	94.3						
30'000						26.7	28.3	31.5	34.6	39	47	50.3	55	59.7	63	70.7	78.6	86.5	94.3				
24'000									25	27.7	31.4	37.7	40	44	47.8	50.3	56.6	63	69	75.5	80	100	
18'000											23.6	28.3	30	33	35.8	37.7	42.4	47	52	56.6	66	75.5	
15'000												23.6	25	27.5	30	31.4	35.4	39.3	43	47	55	63	
12'000															24	25	28.3	31.4	34.6	37.7	44	50.3	
7'500																	19.6	21.6	23.6	27.5	31.4		
6'000																							25

Cutting speed (Vt)

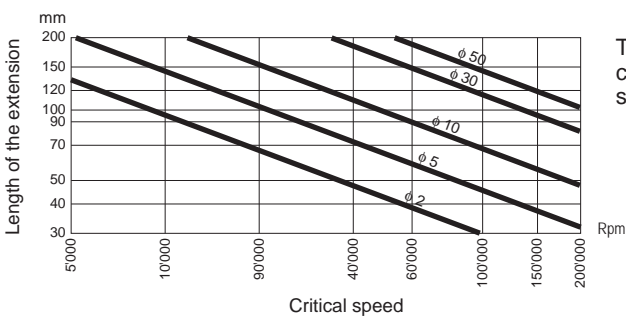
Calculation for critical speed and rigidity

motor spindle with grinding wheel extension



Critical speed

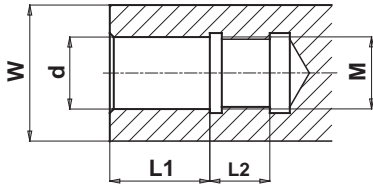
Example of critical speed of the extensions on the base of length and diameter



The dimensions of the rotating parts of the motor spindles **TDM** are calculated to obtain a lower ratio at 0.5 between shaft rotation speed (Vr) and the critical speed (Vcr).

$$\text{Example} = \frac{V_r}{V_{cr}} = \frac{60'000 \text{ Rpm}}{140'000 \text{ Rpm}} = 0.43$$

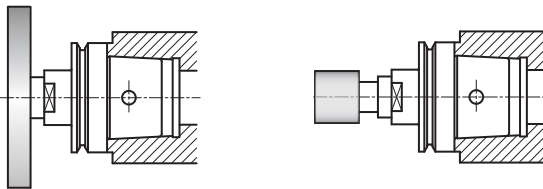
TDM Spindle nose



designation	d mm	tolerance	W mm	M	L1 mm	L2 mm
D04/08	4	+0.005/+0.002	8	M4 (x0.7)	6	8
D06/12	6	+0.005/+0.002	12	M6 (x1)	9	11
D08/14	8	+0.005/+0.002	14	M8 (x1.25)	12	14
D09/16	9	+0.005/+0.002	16	M9 (x1.25)	13	14
D10/18	10	+0.005/+0.002	18	M10 (x1.5)	15	19
D14/23	14	+0.007/+0.002	23	M14x1.5	20	19
D16/28	16	+0.007/+0.002	28	M16x1.5	24	19
D22/38	22	+0.007/+0.002	38	M22x2	34	25
D22/43	22	+0.007/+0.002	43	M22x2	34	25
D28/43	28	+0.008/+0.003	43	M28x2	42	25
D32/53	32	+0.008/+0.003	53	M32x2	46	25
D36/63	36	+0.008/+0.003	63	M36x2	50	30
D36/68	36	+0.008/+0.003	68	M36x2	50	30

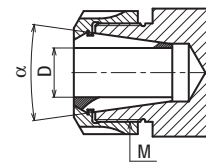
Options

Automatic tool change solutions
Application for medium and low speed

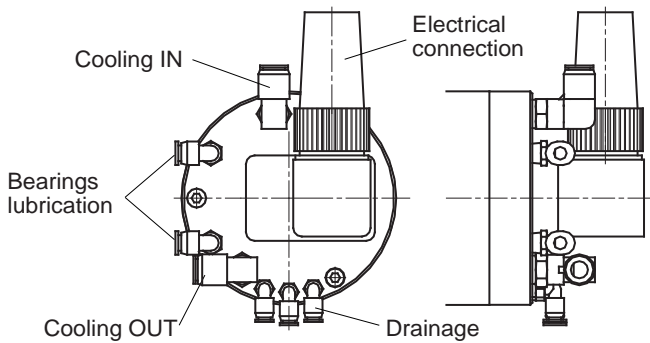


Holder HSK 25,32,40, 50, ...

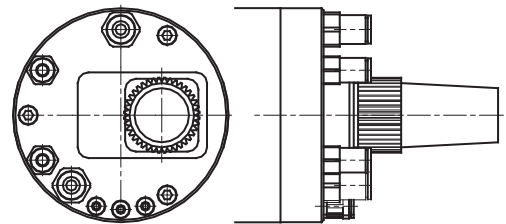
Collet taper (α)
Clamping nut thread (M)
Tool diameter (D)



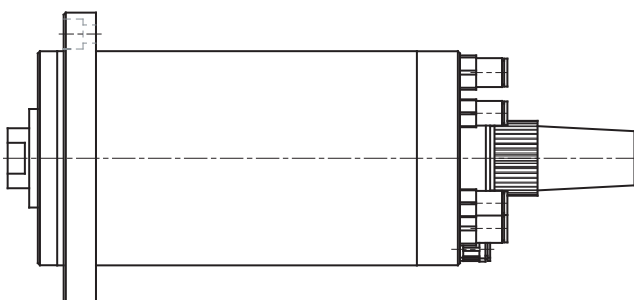
Holder with collet



Option with angle connections

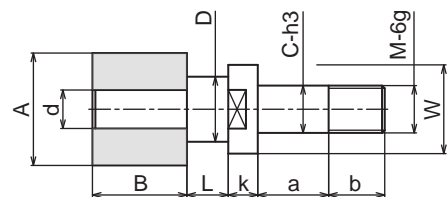


Standard straight connections



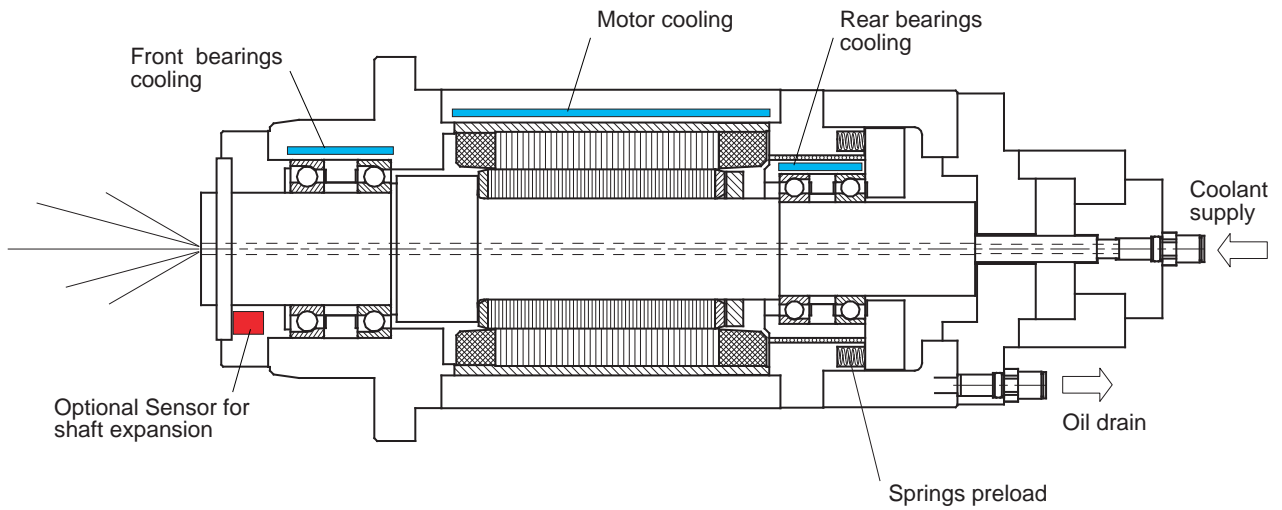
Option with flange housing

Sizes available on request A, B, d, L, k, a, b, D, C, M, W



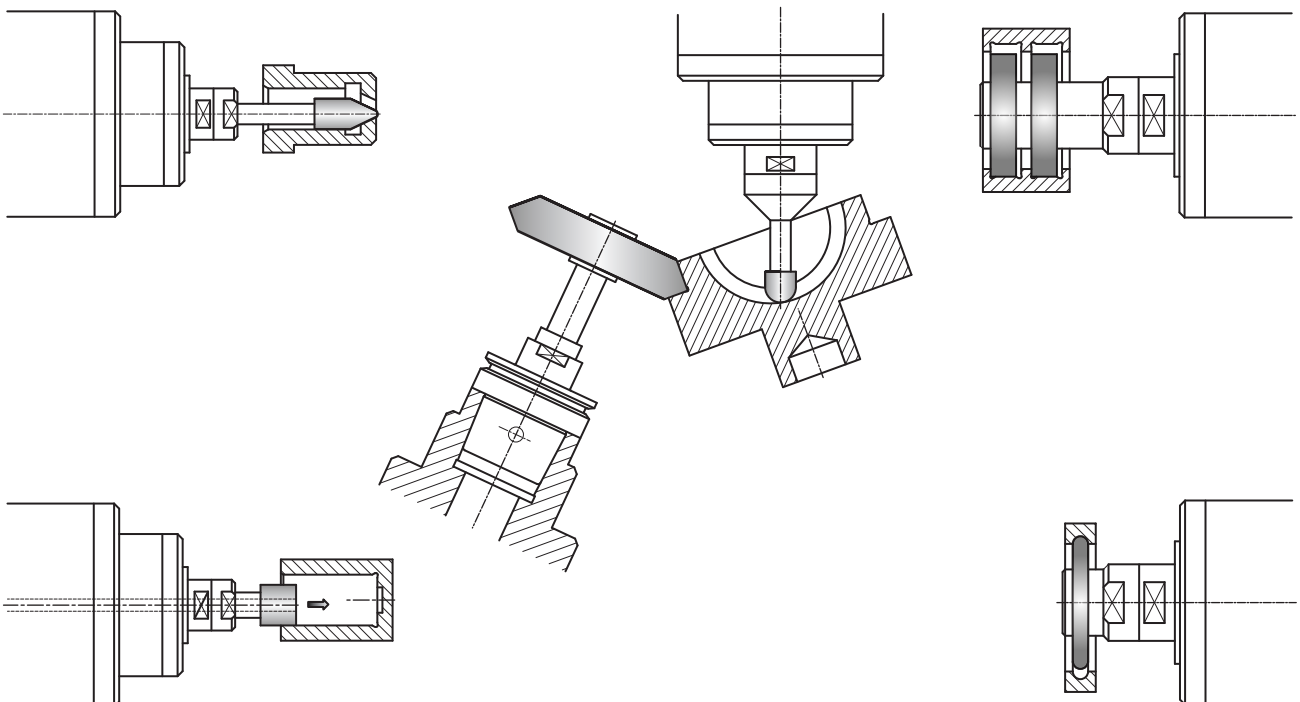
Grinding quills

Special Features

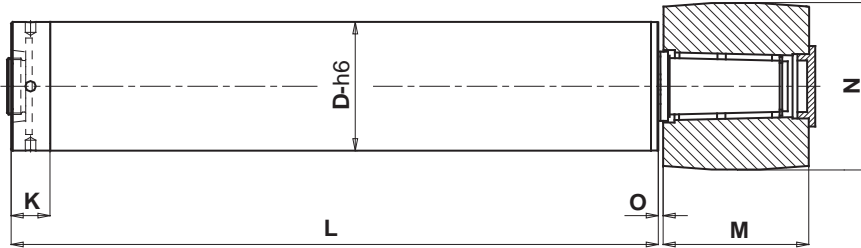


Wide range of variations and flexibility to ensure customised variants

Typical applications

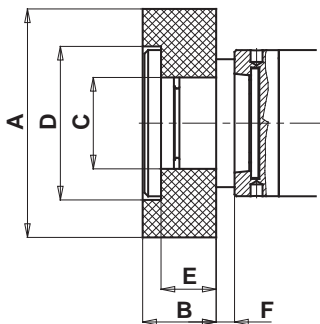


Belt driven spindles



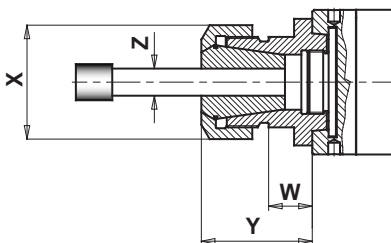
body diam.	spindles type	max speed rpm	D	L	K	O	M	N	spindles designation
50	TJ50-250-	23'000	50	250	15	1.5	50	∅ 32	TJ50-250-32
								∅ 38	TJ50-250-38
								∅ 48	TJ50-250-48
								∅ 60	TJ50-250-60
								∅ 75	TJ50-250-75
60	TJ60-300-	18'000	60	300	18	2.0	60	∅ 40	TJ60-300-40
								∅ 46	TJ60-300-46
								∅ 60	TJ60-300-60
								∅ 75	TJ60-300-75
								∅ 90	TJ60-300-90
70	TJ70-300-	14'000	70	300	22	2.5	70	∅ 50	TJ70-300-50
								∅ 58	TJ70-300-58
								∅ 75	TJ70-300-75
								∅ 90	TJ70-300-90
								∅ 105	TJ70-300-105
80	TJ80-300-	12'000	80	300	25	3.0	80	∅ 60	TJ80-300-60
								∅ 70	TJ80-300-70
								∅ 85	TJ80-300-85
								∅ 105	TJ80-300-105
								∅ 125	TJ80-300-125
80	TJ80-400-	12'000	80	400	25	3.0	80	∅ 60	TJ80-400-60
								∅ 70	TJ80-400-70
								∅ 85	TJ80-400-85
								∅ 105	TJ80-400-105
								∅ 125	TJ80-400-125

Grinding wheel flanges



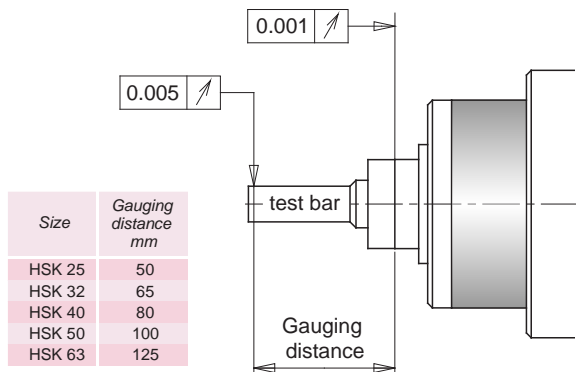
spindles type	flanges type	A	B	C	D	E	F	pulley diameter	max speed rpm
TJ50-	TJ50-30	75	25	30	52	15	6	∅ 60/75	7'600
TJ60-	TJ60-035	90	30	35	62	20	8	∅ 75/90	6'300
TJ70-	TJ70-040	110	35	40	72	25	9	∅ 90/105	5'400
TJ80-	TJ80-050	125	40	50	84	30	10	∅ 105/125	4'500

Collets system



spindles type	flanges type	X	W	Y	Z	collets type	pulley diameter	max speed rpm
TJ50-	TJ50-EX20	35	18	44	0.5-13	EX 20	∅ 32/38	23'000
TJ60-	TJ60-EX25	42	18	47	1-16	EX 25	∅ 40/46	18'000
TJ70-	TJ70-EX32	50	20	52	2-20	EX 32	∅ 50/58	14'000
TJ80-	TJ80-EX40	63	22	61	4-26	EX 40	∅ 60/70	12'000

High frequency spindles for manual and automatic tool change

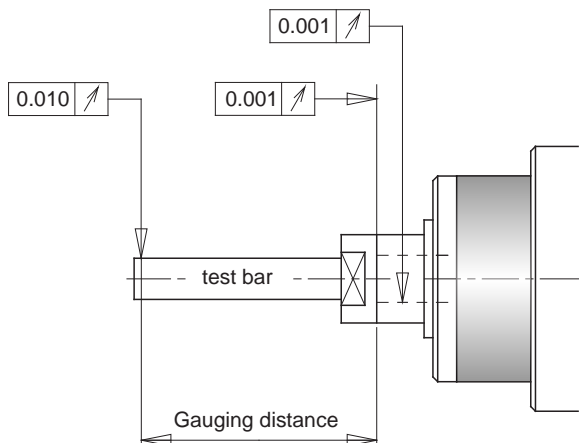


Test Spindle

Before delivery, every **TDM** spindles are completely tested and certificated.

Test certificate

This document supplied with every **TDM** spindles contains the measured values of: geometry tolerances, different electric measurement, vibration values, average temperatures. Other measurement conditions and limiting values differing from the **TDM** test standard can be accommodated.



Gauging distance:
5 x face hole diameter, max 100 mm

Operating instructions

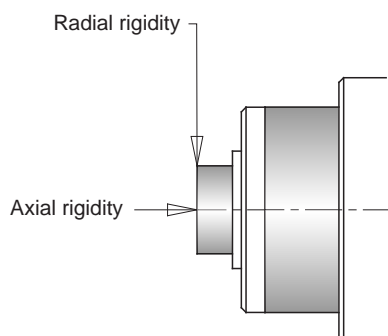
Operating instructions are available in English. They are also obtainable in other languages on request.

Training

Courses with theoretical and practical content for using **TDM** spindles an fitting and carrying out repair work are offered.

Initial operation

Spindles and spindle systems can be commissioned by **TDM** technical personnel on request; outside Switzerland, this may be carried out by our authorised service companies. It is prerequisite that the spindle is correctly installed using correct materials, fluids and initial start-up preparation.



Measured at not rotating shaft

Operating instructions

We recommend that the spindles are repaired by us or our authorized repair shops.

The **TDM** spindle repair service offers cost-effective, rapid and professional work.

Device for Grinding spindles



Type of Frequency converter



Air / oil lubrication

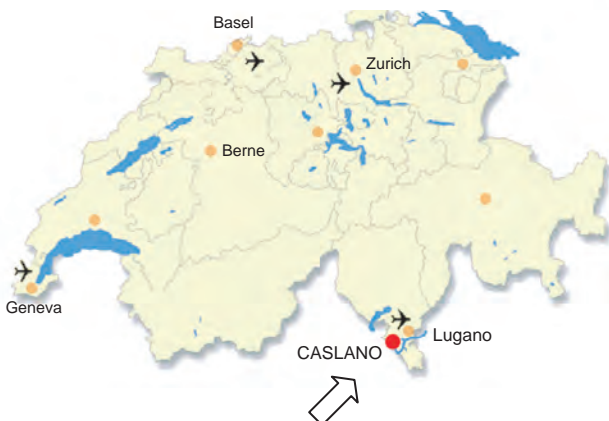


Cooling system



Complete support units

- Cooling system
- Frequency converter
- Lubrication unit air + oil



TDM SA 
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