



CNC Rotary Tables – Edition 3



Main catalog

09.2017

Backlash-free, high-speed, with sensors –
thanks to **pl**-iBox ready for real industry 4.0

pl LEHMANN®

Swiss Rotary Table Technology

pL LEHMANN is a medium-sized business that has specialized in rotary tables for over 40 years:

- 1960 Founding – Contract manufacturing
- 1973 Conversion into a stock corporation
- 1974 Introduction of the first numerically controlled rotary tables (HUST)
- 1980 Construction of new factory building
- 1986 Development of the Series 400
- 1988 2nd generation joins the company's management
- 1997 Construction of new assembly building
- 2000 Development of Series 800 (direct drive up to 10,000 rpm)
- 2002 2nd generation assumes management responsibility
- 2003 Development of Series 700 (direct drive up to 800 rpm)
- 2008 Addition of office building
- 2010 Development of the Series 500
- 2011 Start of internationalization / lean production
- 2013 Development of high-speed version
- 2016 Expansion of factory building
- 2017 Introduction of Series 600

Today, pL LEHMANN is still an owner-managed family-owned company present in over 20 countries (see the back of this catalog).

The company is committed to typical Swiss values

- + Product quality
- + Superior technology
- + Innovation and flexibility
- + Long-term, sound business policies

For more, see www.lehmann-rotary-tables.com.

Further catalogs



Overview of branches



Service – Lifecycle

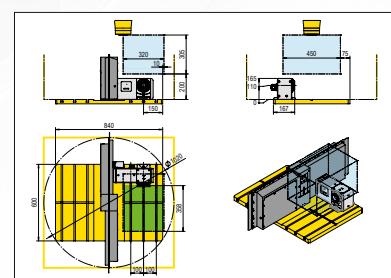


* Sales and service partners trained and equipped by pL (agents or VAR – value added resellers)

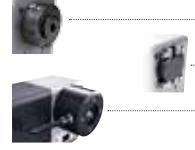
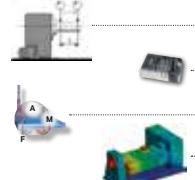
Applications Catalogs

pL LEHMANN offers detailed application catalogs for

- + ALMAC
- + BFW
- + BROTHER
- + DMG MORI
- + DOOSAN
- + FANUC Robodrill
- + HAAS
- + HURCO
- + HYUNDAI WIA
- + MAS Kovosvit
- + MAZAK
- + TONGTAI
- + YCM



Whoever wishes to invest in tomorrow's way of production must consider the needs and opportunities available today

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CNC rotary tables for economical manufacturing:
pL LEHMANN has suitable and rational solutions
for nearly every industry

Overview

Rotary tables

Applications & Facts

SPZ, DDF, WMS,
indexing accuracy

Aligning,
GLA, RST

MOT, KAB, CNC

Workpiece
clamping system

Technology & service



pL rotary tables in use: on over **40** different machine brands
and over **160** different machine models.

pL competence: Integration in **all known** CNC control systems
(Fanuc, Siemens, Heidenhain, Haas, Winmax, Mitsubishi, Brother ...),
for new machines as well as for retrofits

Highly productive solutions even on compact machines –
for almost every requirement: 4-axis or 5-axis



Base machine can be used in 3-axis mode at all times, e.g. for bulky workpieces



4th axis with swivel yoke, on base plate



4th axis with swivel yoke, directly on machine table



4th axis, 3-spindle, X-mounting (lengthwise)



4th axis, 3-spindle, Y-mounting



4th + 5th axis, 1-spindle, X-mounting (lengthwise)



4th + 5th axis, 2-spindle, Y-mounting (crosswise)



4th + 5th axis, 2-spindle, X-mounting (lengthwise)



4th axis for tilting the grinding spindle.
5th axis (vertical) for workpiece rotation

Overview

Rotary tables

Applications & Facts

SPZ, DDF, WMS,
indexing accuracy

Aligning,
GLA, RST

MOT, KAB, CNC

Workpiece
clamping system

Technology & service

Up to 210 rpm
up to 0.21 sec / 90°

NEW
up to +30 %

High speed

Extended travel in Z- and X-direction

More space

High spindle load,
heavy-duty bearing

Heavy duty

E-Series



Selection of suitable machines

Vertical machining centers

- + Almac
- + AMS
- + Awea
- + BFW
- + Brother Speedio
- + DMG MORI
- + Doosan
- + Fanuc Robodrill
- + GF Mikron
- + Haas CNC
- + Hurco
- + Huron
- + Hyundai/Wia
- + MAS
- + Mazak
- + Quaser
- + Tongtai
- + YCM
- + ...

Save energy



PGD

DD

Rotary tables suitable for simultaneous operation!

Energy label at the left

An intuitive rating as consumption greatly depends on usage, and without any liability assumed, following the directives on energy labelling

High torque

Feed torque up to 850 Nm

NEW
up to +30 %

Adaptability

Multifunctional spindle HSK

Precision

On the workpiece, as precise as 2 µm / 100 mm

Pneum. clamping
up to 7,000 Nm

NEW
up to +150 %

High clamp

Large parts
up to ø 500

Big size

PGD backlash-free
long-life gear unit

No backlash

Other

- + Finepart (waterjet cutting)
- + Hexagon (measuring)
- + LT Ultra (ultra precision)
- + OGP Quality vision (measuring)
- + ...

Grinding

- + Blohm Jung
- + Chevalier
- + Hauser
- + Kellenberger
- + Lapmaster Wolters
- + Mägerle
- + Moore
- + ...

Laser

- + DMG MORI Sauer
- + GF Mikron
- + Litz
- + Microlution
- + ...

T-Series



**All base plates
made of steel**

NEW

with integrated hole pattern for slot spacing of 100 and 125 mm, integrated alignment system **lineFIX** for lengthwise or cross-wise clamping.

M-Series



NEW

Connectivity

Wireless monitoring,
for operation & service

No adjust

Load change without
parameter adjustment

Less cost

No cooling system,
no hydraulics

Overview

Rotary tables

Applications & Facts

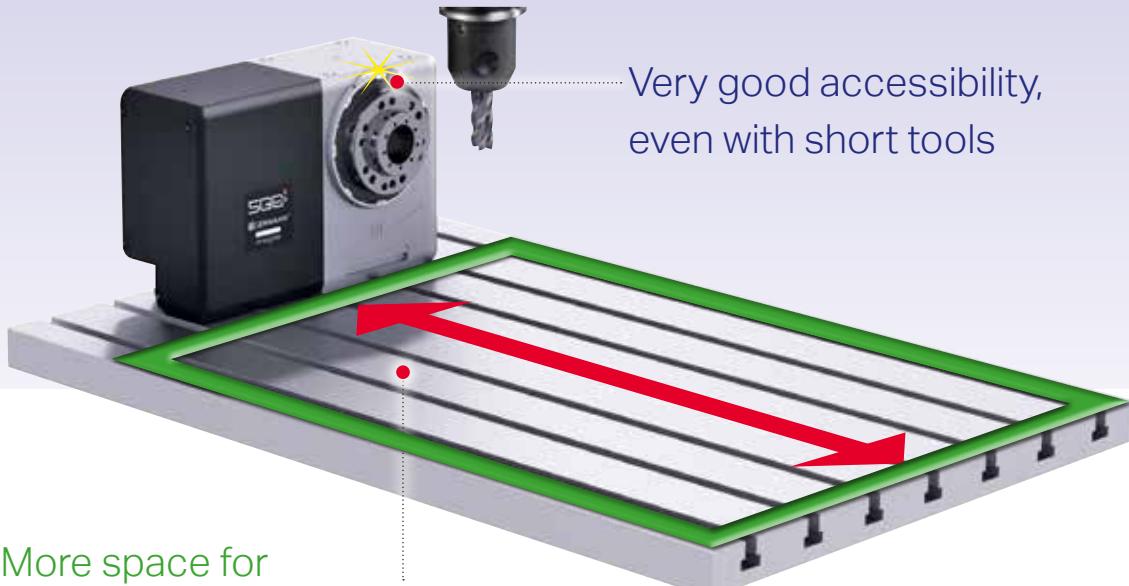
SPZ, DDF, WMS,
indexing accuracy

Aligning,
GLA, RST

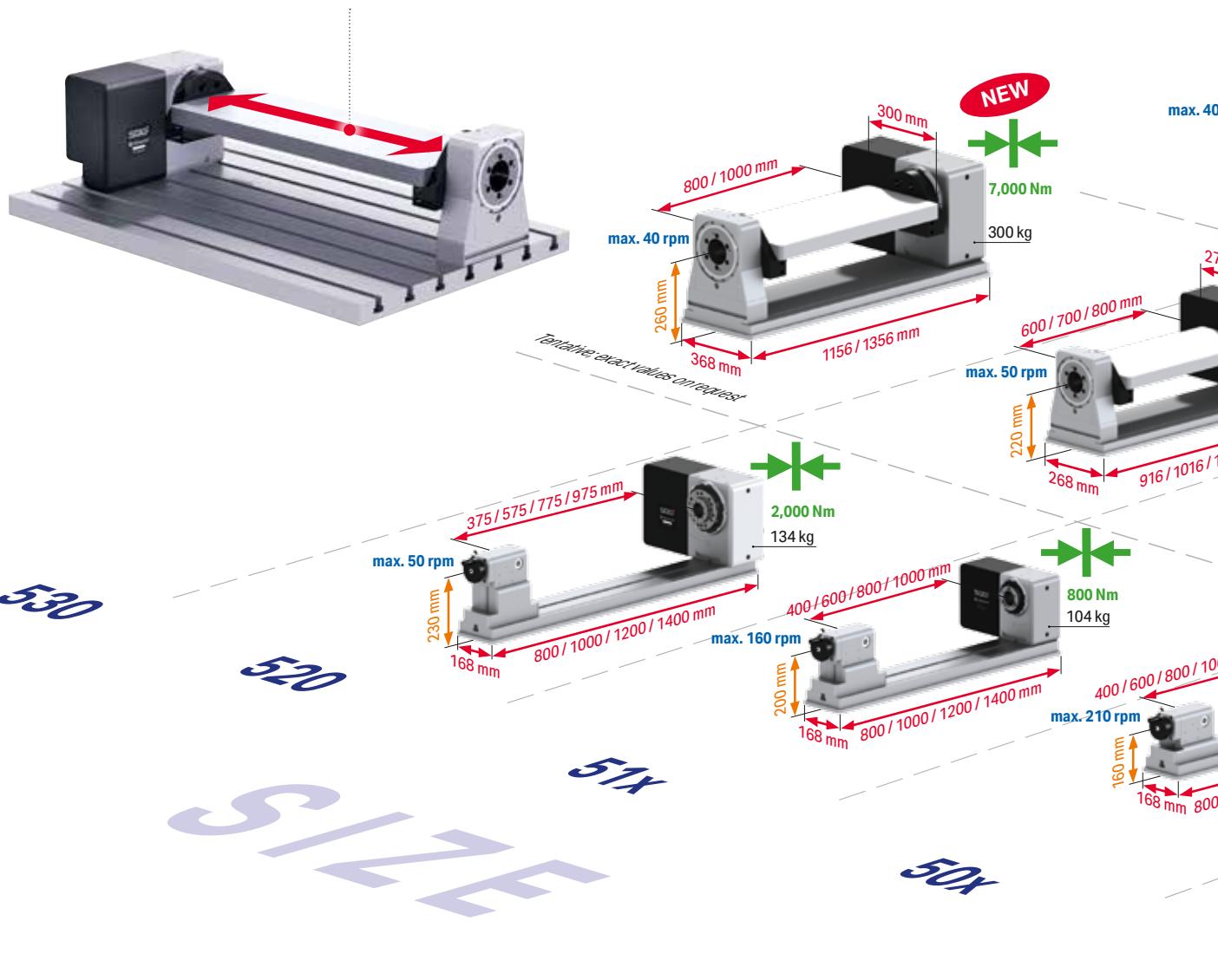
MOT, KAB, CNC

Workpiece
clamping system

Technology & service



More space for
workpieces and fixtures

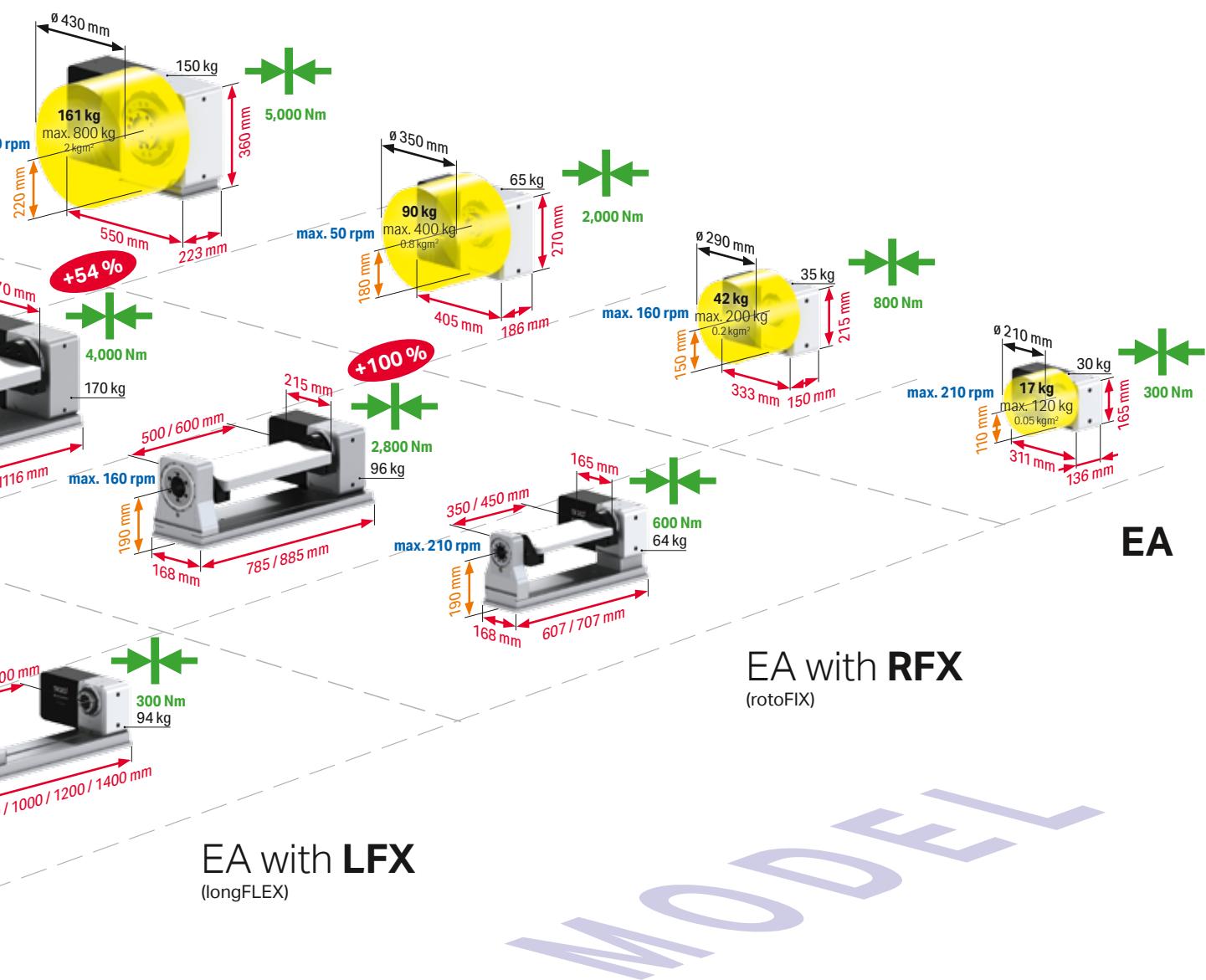


News in brief

1. High speed up to 210 rpm
2. Feed torque up to 850 Nm (tentative)
3. Steel base plates with hole pattern
4. Cycle time 90° as fast as 0.21 sec.



Weight data represent the standard load; higher weights possible, but require modification of rotational speed, acceleration and jerk limitation.



50x	507 (standard) or 508 (high speed)
51x	510 (standard) or 511 (high speed)
EA	single-axis, single-spindle CNC rotary table
rotoFIX	modular clamping yoke system
longFLEX	modular shaft clamping system



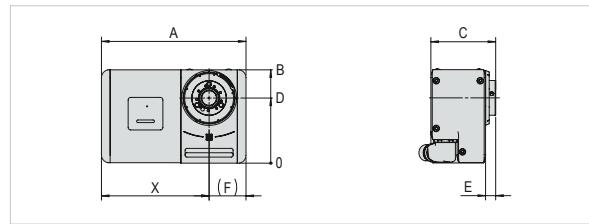
Overview									
Rotary tables	Applications & Facts								
SPZ, DDF, WMS, indexing accuracy	Aligning, GLA, RST								
Dimensions	Swivel ø		mm	160		240		350	430
	Center height		mm	110		150		180	220
	Total weight with motor	kg		25		35		65	150
	Center bore ²⁾	mm		31		34		46 / 64	90 / 102
Bearing / Clamping	Max. clamping torque		Nm	300	250	800	600	2,000	4,500
	Max. spindle load with tailstock		kg		240		400	800	1,600
	Max. spindle load without tailstock		kg		120		200	400	800
	Standard load ¹⁾		kg	17	12	42	22	90	161
Gear unit	Max. axial force		kN		44		46	100	210
	Max. pull-out torque		Nm		1,200		2,000	3,900	10,400
	Max. moment of inertia J max		kNm ²	0.05	0.025	0.2	0.07	0.8	2
	Max. feed torque ³⁾		Nm	120	70	250	150	440	650 optional 850
Precision	Indexing accuracy Pa ²⁾		± arc sec		20/12		17/10	12/8	10/6
	Repeat accuracy Ps average		± arc sec				2		
	Max speed		min ⁻¹	111	210	80	160	50	40
Precision	Radial run-out ²⁾	on spindle ø	µm				6 / 3		
	Axial run-out ²⁾	at spindle end face	µm				6 / 3		
	Parallelism ²⁾	Dividing axis to base	µm/100mm				10 / 5		

¹⁾ Mutually dependent; for individual drive motor data, see right side

²⁾ Standard / increased; for measuring method and validity of the values, please refer to p. 52; for optional angular position measuring system please refer to p. 53

³⁾ Limit value for gear unit, at 1 rpm

Dimensions



	A	B	C	D	E	F	X	
EA-507	311	165	136	110	23	75	236	
EA-508	311	165	136	110	23	75	236	
EA-510	333	215	150	150	23	85	248	
EA-511	333	215	150	150	23	85	248	
EA-520	405	270	186	180	44	110	295	
EA-530	550	360	223	220	43	160	390	

Vertical clamping



Add-on housing for vertical clamping. Shown with rotary union.

Item no.	DDF	SPZ	WMS 2	WMS 7	Height mm
EA-510 (511) GPL.510ver-180	•				180
EA-510 (511) GPL.510ver-240*	•	•	•		240
EA-520 GPL.520ver-215	•				215
EA-520 GPL.520ver-275	•	•	•		275
EA-530 GPL.530ver-255	•				255
EA-530 GPL.530ver-310	•	•	•	•	310

* only 1 accessory possible (e.g. DDF), cannot be combined (e.g. DDF+SPZ)

WMS = for angular position measuring systems (WMS 2 small, WMS 7 large); for more, please refer to p. 53

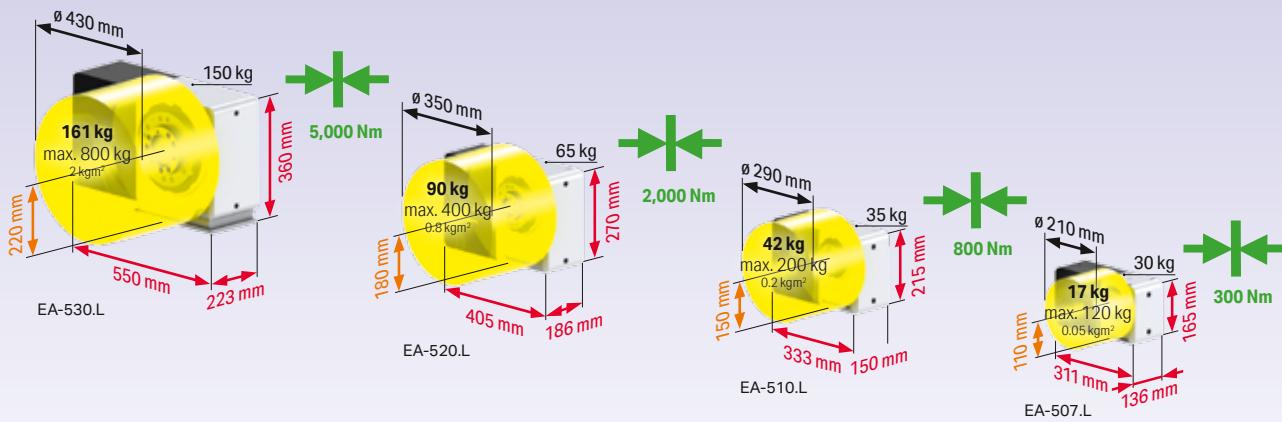
SPZ = for clamping cylinder; for more, please refer to pp. 48/49

DDF = for rotary union; for more, please refer to p. 50

Item no.

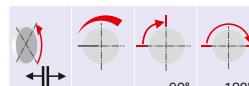
EA-510_L-F1





Drive data

(based on standard load cube shown on pp. 104/105)



	Motors	Feed* [Nm]	Speed [min⁻¹]	Cycle time*** [sec]
MAVILOR/ MOVINOR**	EA-507	BLS-072	120	111
	EA-508	BLS-072	70	210
	EA-510	BLS-072	250	80
	EA-511	BLS-072	150	160
	EA-520	BLS-073	440	50
	EA-520	LN-098	440	45
	EA-530	LN-098	650	40
FANUC	EA-507	β1 is	80	66.7
	EA-508	β1 is	55	130
	EA-510	α2 (HV)is	120	55
	EA-511	α2 (HV)is	85	100
	EA-520	α2 (HV)is	210	33
	EA-520	α4 (HV)is	355	33
	EA-530	α4 (HV)is	420	27
	EA-530	α8 (HV)is****	650	26.7
YASKAWA SGM/J	EA-507	SGM7J 06	120	66
	EA-508	SGM7J 06	70	133
	EA-510	SGM7J 08	195	66.6
	EA-511	SGM7J 08	135	133
	EA-520	SGM7J 08	335	40
	EA-520	SGM JV 04	115	66.7
YASKAWA SGMJV	EA-507	SGM JV 04	70	130
	EA-508	SGM JV 04	195	66.7
	EA-510	SGM JV 08	140	133
	EA-511	SGM JV 08	335	40
	EA-520	SGM JV 08	115	66.7
	EA-520	HG56	70	110
MITSUBISHI 200 V	EA-507	HG56	120	60
	EA-508	HG56	185	50
	EA-510	HG75	130	100
	EA-511	HG75	440	32
	EA-520	HG105	650	24
	EA-530	HG104	120	66.7
MITSUBISHI 400V	EA-510	HG-H75	130	100
	EA-511	HG-H75	345	30
	EA-520	HG-H75	440	32
	EA-520	HG-H105	650	24
	EA-530	HG-H104	120	66.7
	EA-530	R2Ax 06040	70	130
SANYO	EA-507	R2Ax 06040	210	66.7
	EA-508	R2Ax 06040	145	130
	EA-510	R2Ax 08075	270	45
	EA-511	R2Ax 08075	120	66.7
	EA-520	R2Ax 08075	70	130
OKUMA UMA	EA-520	BL-ME24J-50SN	210	66.7
	EA-530	BL-ME80J-40SN	145	130
	EA-520	1FK7042	270	45
	EA-530	1FK7062	120	66.7

* At 1 rpm; for more, please refer to p. 110

** for Siemens / Heidenhain

*** Without clamping; for times, please refer to p. 114

**** not with 35iB

For calculation of load, forces and torques, please see p. 106

Important information

- The limit values as set out in the corresponding parameter list take precedence over the data and information provided in the main catalog (due to motor, drive enhancement and the respective machine CNC)
- Motor-dependent data are optimum values at operating temperature
- Further details are available at www.lehmann-rotary-tables.com, under Download / Commissioning



Labyrinth seal
(cutaway view)

Recommended for:
+ grinding operations
+ high coolant pressures
+ extremely fine abrasive particles

Accessories

Motor, cable, angular position measuring system and pL CNC starting at p. 58. Accessories starting at p. 46

Options

Item no.	Description
GET.5xx-GEN	Increased gear precision ¹⁾
GEO.5xx-GEN	Incr. geometric precision, ½ standard tolerance
SPI.5xx-Lab ²⁾	Spindle seal with labyrinth, integrated sealing air pressure control
MOT.520-LNG	long motor housing EA-520

1) incl. increased radial and axial run-out 0.003 mm

2) for 507/510: HSK and ripas clamping not possible manually, GET.5xx-GEN and GEO.5xx-GEN only partly possible (increased radial and axial run-out cannot always be reached)

Center height increase



Item no.	Designation	Increase / center height D
EA-507 (508) GPL.507-150	Base plate for	40 mm / 150 mm
EA-510 (511) GPL.510-180	center height	30 mm / 180 mm
EA-520 GPL.520-220	increase	40 mm / 220 mm
EA-530 GPL.530-270		50 mm / 270 mm

Suitable alignment elements

Item no.	Designation	Slot width
AUR.St-12		12h6
AUR.St-14	Alignment block, 1 pair	14h6
AUR.St-16		16h6
AUR.St-18		18h6

Overview

Rotary tables

SPZ, DDF, WMS,
indexing accuracy

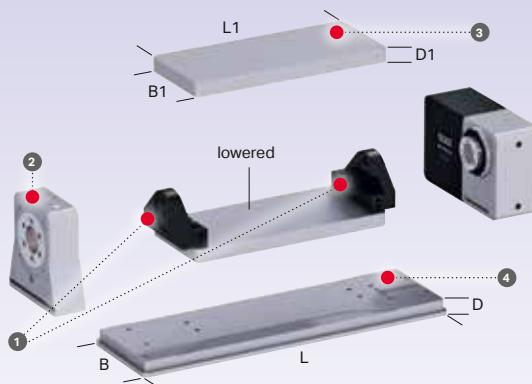
Aligning,
GLA, RST

MOT, KAB, CNC

Workpiece
clamping system

Technology & service

rotoFIX Clamping Yoke System



In order to meet more demanding accuracy requirements, we recommend using a direct angular position measuring system (pp.52–53)

Overview

Rotary tables

Applications & Facts

SPZ, DDF, WMS, indexing accuracy

Aligning, GLA, RST

MOT, KAB, CNC

Workpiece clamping system

Technology & service

		EA-507		EA-510		EA-520		EA-530	
① Bore sets	Sph	[mm]	190	190	220	260			
	Aluminum	Item no.	RFX.507-ASa	RFX.510-ASa	RFX.520-ASa	RFX.530-ASa			
	Vorb. DDF 4-fluted*	Item no.	DDF.507-RFX	DDF.510-RFX	DDx.520-RFX	DDx.530-RFX			
② Counter-bearing (GLA)	Vorb. DDF 6-fluted*	Item no.	–	DDF.510-RFX-06 (GLA only)	DDx.520-RFX-06	DDx.530-RFX-06			
	fix	Item no.	GLA.TOP1-110	GLA.TOP2-150	GLA.TOP2-180	GLA.TOP2-220			
	adjustable	Item no.			Option: GLA.HYD-vario				
③ Clamping yokes	Length L1	[mm]	350	450	500**	600**	600**	700**	800**
	Width B1	[mm]	165		215		270		350
	Thickness D1	[mm]	20		35		40		40
	Aluminum	Item no.	RFX.507-SB350a	RFX.507-SB450a	RFX.510-SB500a	RFX.510-SB600a	RFX.520-SB600a	RFX.520-SB700a	RFX.530-SB800a
	Steel	Item no.	RFX.507-SB350s	RFX.507-SB450s	RFX.510-SB500s	RFX.510-SB600s	RFX.520-SB600s	RFX.520-SB700s	RFX.530-SB800s
④ Base plates	Length L	[mm]	622	722	785	885	916	1016	1116
	Width B	[mm]	168		168		268		368
	Thickness D	[mm]	40		40		40		40
	Steel	Item no.	RFX.507-GP350s	RFX.507-GP450s	RFX.510-GP500s	RFX.510-GP600s	RFX.520-GP600s	RFX.520-GP700s	RFX.520-GP800s
Weights / moments of inertia (without rotary table, without counter bearing)	Weight (Al)	[kg]	10	12	23	28	40	45	52
	Weight (steel)	[kg]	29	34	66	80	117	130	152
	Mom. inert. (Al)	[kgm²]	0.02	0.02	0.06	0.07	0.16	0.17	0.21
	Mom. inert. (steel)	[kgm²]	0.04	0.05	0.17	0.21	0.46	0.50	0.60

fix = Clamping is permanently attached to rotary table; adjustable = Clamping with flexible conduit, assembled by customer

Moments of inertia only for centered placement; eccentric on request

* For suitable rotary union, please refer to p. 50

** When the clamping yoke is mounted eccentrically, the zentriX alignment system cannot be used (risk of collision)

Important information

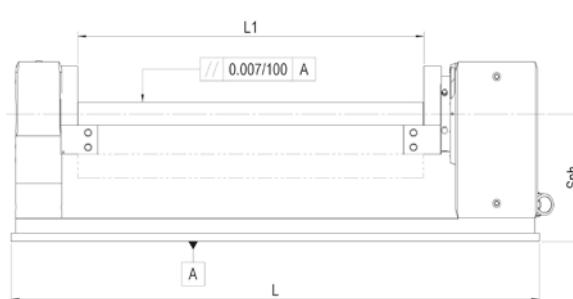
When retrofitting, it may be necessary to reduce the rotational speed, acceleration and gear backlash. The rotary table, rotoFIX and the counter bearing must be installed coaxially to one another <0.05 mm.

Standard load from steel

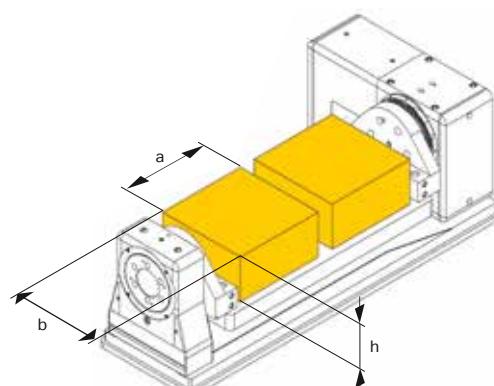
Type	Standard load a × b × h [mm]	Weight [kg]	Moment of inertia J with sls* clamping yoke (Al) below [kgm²]	Moment of inertia J with sls* clamping yoke (Al) centric [kgm²]
507	2×130×130×65	17	0.07	0.08
510	2×173×173×83	42	0.28	0.35
520	2×228×228×114	90	0.92	1.26
530	2×273×273×136	161	on request	

*sls = Standard load, cube pp. 104/105

Can be moved with standard drive data for EA rotary tables (see p. 11); larger loads required a reduction in rotational speed, acceleration and jolts.



For alignment and clamping, please refer to p. 54



Support of longer workpieces with adjustable tailstock or counter bearing



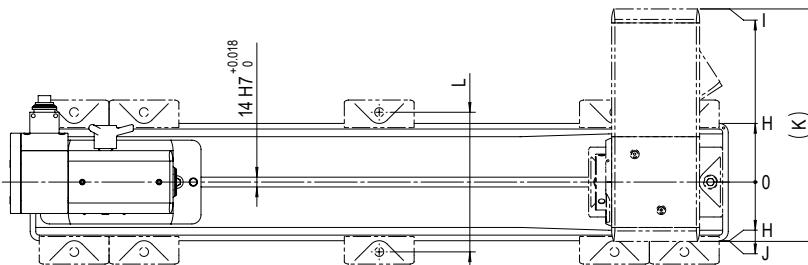
longFLEX base plate kit

Item no.	A	B	C	D	E	F	H	I	J	K	L	X	Y	Z	Weight*[kg]	
												[mm]				
507	LFX.5xx-400a	50	160	215	44	157	180	84	236	75	311	200	425	800	835	63
	LFX.5xx-600a												625	1,000	1,035	68
	LFX.5xx-800a												825	1'200	1'235	72
	LFX.5xx-1000a												1'025	1'400	1'435	77
510	LFX.5xx-400a	50	200	265	46	172	196	84	248	85	333	200	409	800	835	73
	LFX.5xx-600a												609	1,000	1,035	78
	LFX.5xx-800a												809	1'200	1'235	82
	LFX.5xx-1000a												1'009	1'400	1'435	87
520	LFX.520-400a	50	230	320	46	188	217	84	295	110	405	200	388	800	835	103
	LFX.520-600a												588	1,000	1,035	108
	LFX.520-800a												788	1'200	1'235	112
	LFX.520-1000a												988	1'400	1'435	117

* Complete, including rotary table and tailstock, base plate made from high-quality aluminum, steel version on request

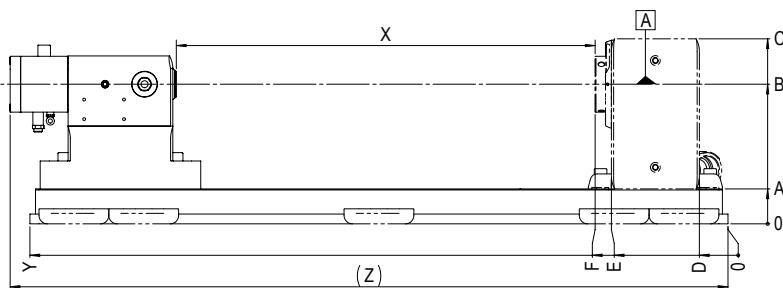
H: Base plate

J: Rotary table housing



Fastening material

Item no.	Designation
LFX.GLA-Bef	for counter bearing
LFX.RST-Bef	for tailstock



Overview

Rotary tables

Applications & Facts

SPZ, DDF, WMS, indexing accuracy

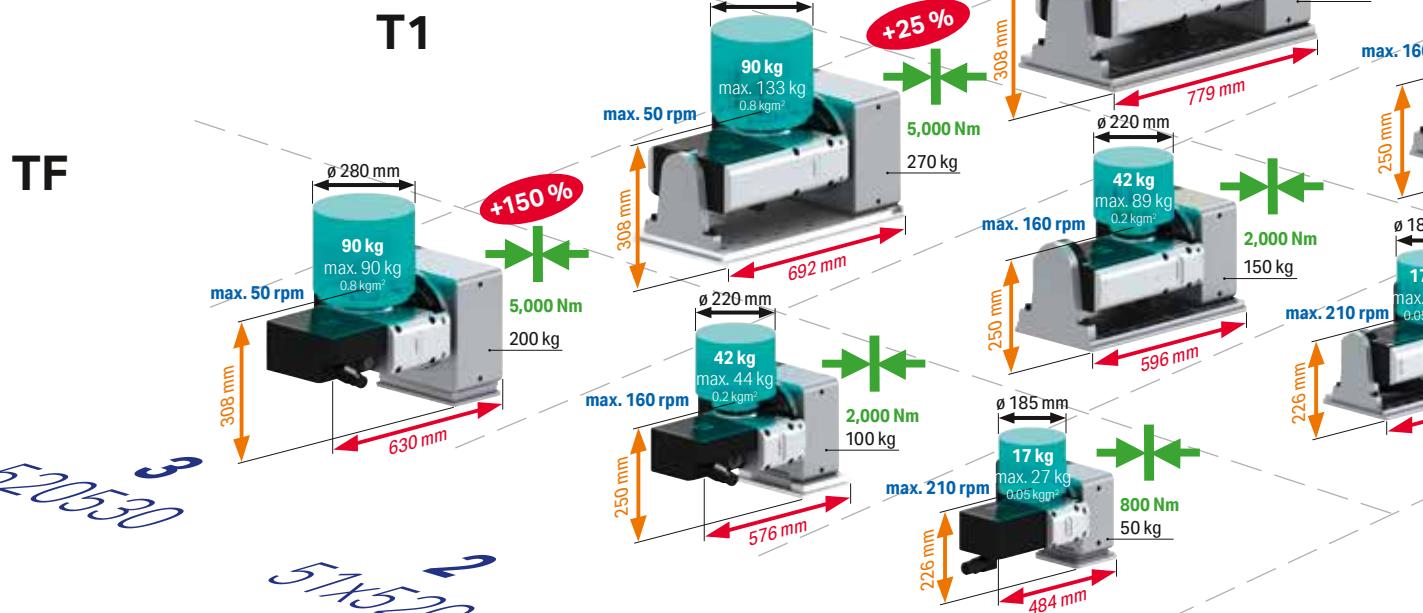
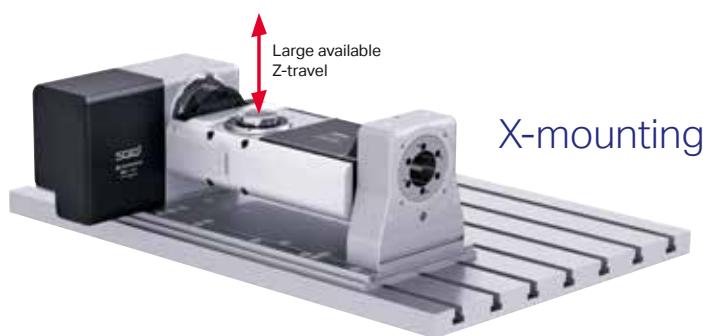
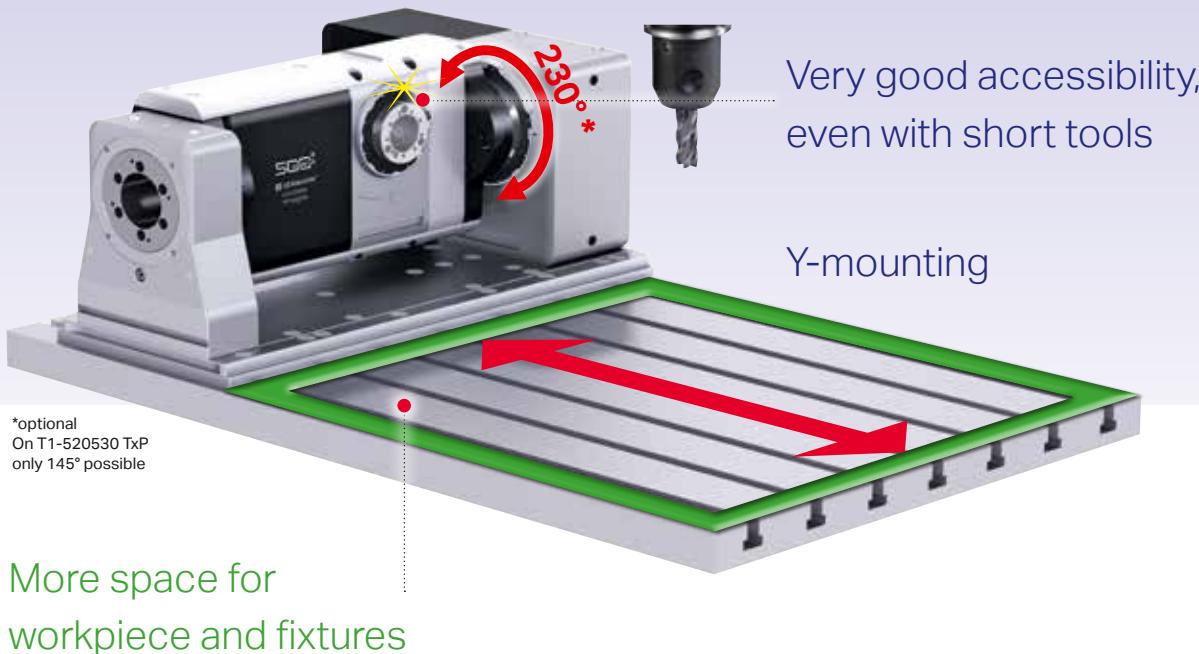
Aligning, GLA, RST

MOT, KAB, CNC

Workpiece clamping system

Technology & service

Overview of T-Series

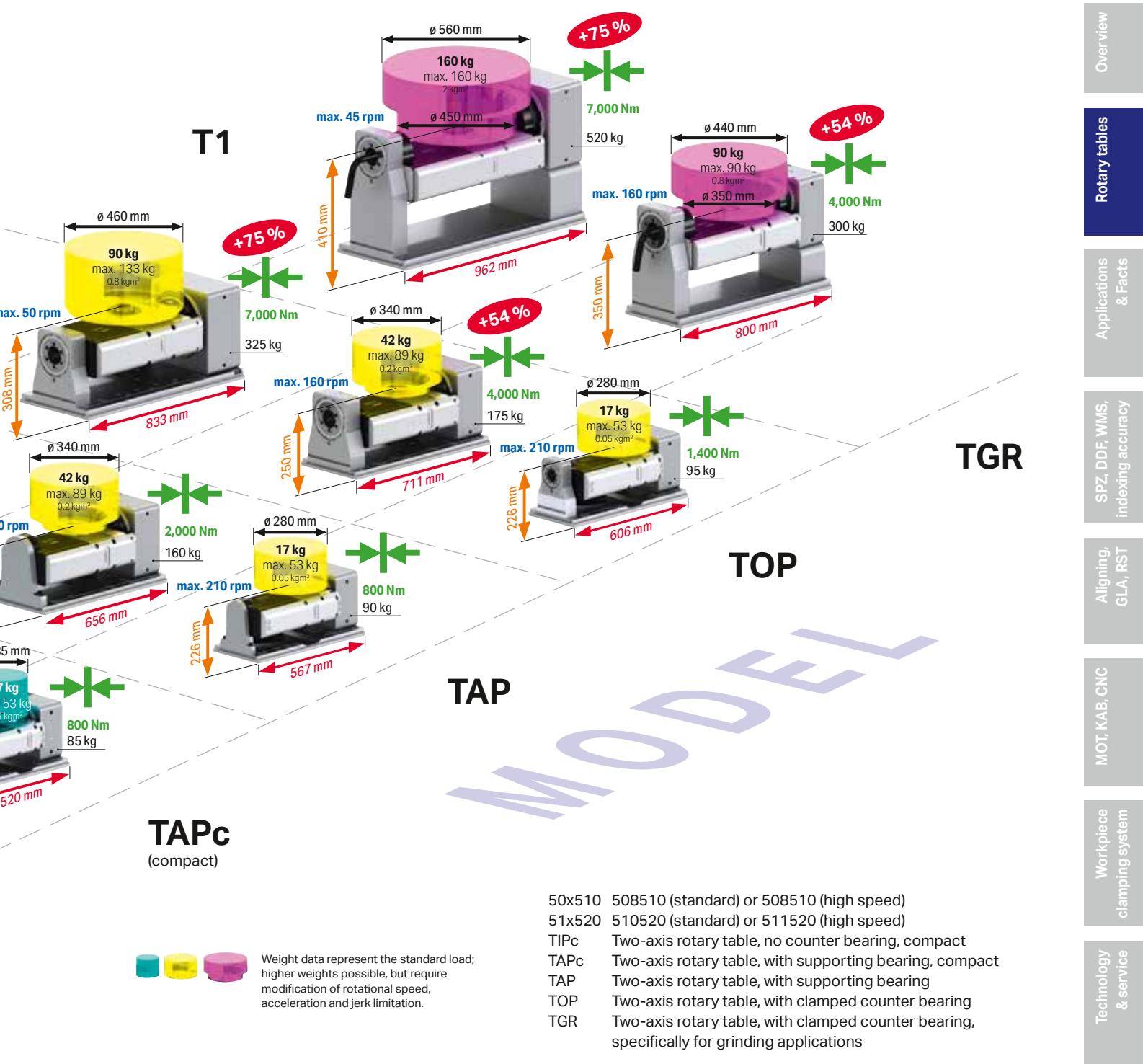


520530 51X520 50X510

S/NF

News in brief

1. Up to 150 % higher clamping torque in tilting axis
2. Fewer variant – more solution
3. Larger workpiece Ø possible
4. Spatially optimized arrangement of the dividing axis



50x510 508510 (standard) or 508510 (high speed)
 51x520 510520 (standard) or 511520 (high speed)
 TIPc Two-axis rotary table, no counter bearing, compact
 TAPc Two-axis rotary table, with supporting bearing, compact
 TAP Two-axis rotary table, with supporting bearing
 TOP Two-axis rotary table, with clamped counter bearing
 TGR Two-axis rotary table, with clamped counter bearing,
 specifically for grinding applications

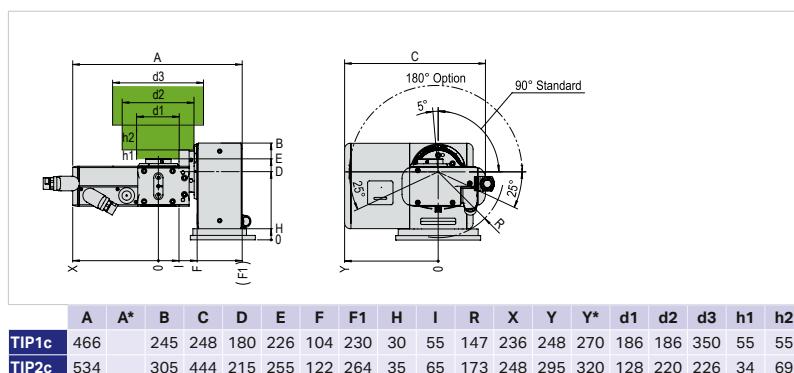


*optional

			TF-507510 TIP1c	TF-508510 TIP1cs	TF-510520 TIP2c	TF-511520 TIP2cs	TF-520530 TIP3c
Dimensions	Swivel ø	mm	180		220		280
	Swiveling range	degrees		90° +5°/-25° (optional 180° ±25°)			
	Center height	mm	180		210		220
	Total weight with motor	kg	50		100		200
	Center bore Standard / increased	mm	30		34		46 / 64
Max. clamping torque	4th axis	Nm	300	250	800	600	2,000
	5th axis	Nm		800		2,000	5,000
Max. spindle load	0°-30°	kg		40		66	135
	30°-90°	kg		27		44	90
	Standard load ¹⁾	kg	17	12	42	21	90
Bearing / Clamping	Max. axial force	4th axis	kN	6		10	40
	Max. pull-out torque	4th axis	Nm	1,200		2,000	3,900
		5th axis	Nm	2,000		3,900	10,400
Gear unit	Max. moment of inertia	Standard load ¹⁾		0.05	0.025	0.2	0.07
	J max			0.5	0.25	2	0.7
	Feed torque max ³⁾	4th axis	Nm	120	70	250	150
		5th axis	Nm	230		440	650 opt. 850
	Gear unit loading	without load	Nm	-12		-22	-5
	5th axis	with standard load	Nm	15	10	30	5
	M max		Nm	250		440	650
Precision	Indexing accuracy Pa	4th axis ²⁾	± arc sec	20/12		17/10	12/8
		5th axis (90°) ⁴⁾	± arc sec	35/20	35/22	21/22	21/13
	Repeat accuracy Ps average	4th axis	± arc sec			2	
		5th axis	± arc sec			2	
	Max speed at standard load	4th axis ¹⁾	rpm	111	210	80	160
		5th axis ¹⁾	rpm	70		40	25
	Radial run-out ²⁾	on spindle ø	µm			6 / 3	
	Axial run-out ²⁾	at spindle end face	µm			6 / 3	
	Parallelism ²⁾	Spindle to base	µm/100mm			10 / 5	

¹⁾ Mutually dependent; for individual drive motor data, see right side²⁾ Standard / increased; for measuring method and validity of the values, please refer to p. 52; for optional angular position measuring system please refer to p. 53³⁾ Limit value for gear unit, at 1 rpm⁴⁾ Without load / with standard load 0°-90°

Dimensions



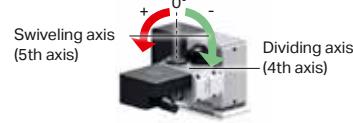
Dimensions with 508 or 511 identical to 507510 and 510520.

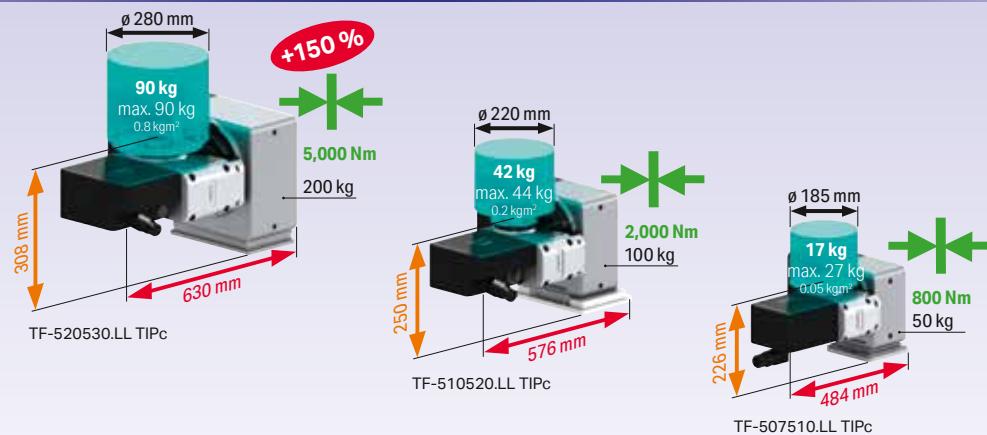
*With large motor (option)

Important information

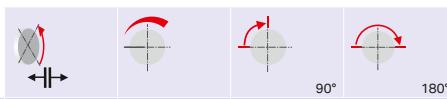
Center height increase (option)

Depending on the accessories involved (clamping cylinder, rotary union, angular position measuring system...), a center height increase (dimension D) is required. (See page for respective accessory)



**Drive data**

(based on standard load cube shown on pp. 104/105)



	Motors 4th/5th	Feed* [Nm]		Speed [rpm]		Cycle time*** [sec]		90°	180°	
		4.	5.	4.	5.	4.	5.			
MAVINOR / MOVINOR**	TF-507510 TIP1c	BLS-072/BLS-072	120	230	111	70	0.26	0.43	0.39	0.64
	TF-508510 TIP1c	BLS-072/BLS-072	70	230	210	70	0.23	0.43	0.29	0.64
	TF-510520 TIP2c	BLS-072/BLS-073	250	425	80	45	0.30	0.50	0.49	0.83
	TF-510520 TIP2c	BLS-072/LN-098	250	440	80	40	0.30	0.50	0.49	0.87
	TF-511520 TIP2c	BLS-072/BLS-073	150	425	160	45	0.23	0.50	0.31	0.83
	TF-511520 TIP2c	BLS-072/LN-098	150	440	160	40	0.23	0.50	0.31	0.87
FANUC	TF-520530 TIP3c	BLS-073/LN-098	440	650	50	25	0.41	0.89	0.71	1.49
	TF-507510 TIP1c	$\beta_1 \text{ is}/\alpha_2 (\text{HV})\text{is}$	80	110	66.7	45	0.30	0.49	0.53	0.83
	TF-508510 TIP1c	$\beta_1 \text{ is}/\alpha_2 (\text{HV})\text{is}$	55	110	130	45	0.25	0.49	0.36	0.83
	TF-510520 TIP2c	$\alpha_2 (\text{HV})\text{is}/\alpha_2 (\text{HV})\text{is}$	120	195	55	29	0.36	0.66	0.63	1.18
	TF-510520 TIP2c	$\alpha_2 (\text{HV})\text{is}/\alpha_4 (\text{HV})\text{is}$	120	335	55	30	0.36	0.64	0.63	1.14
	TF-511520 TIP2c	$\alpha_2 (\text{HV})\text{is}/\alpha_2 (\text{HV})\text{is}$	85	195	100	29	0.24	0.66	0.39	1.18
	TF-511520 TIP2c	$\alpha_2 (\text{HV})\text{is}/\alpha_4 (\text{HV})\text{is}$	85	335	100	30	0.24	0.64	0.39	1.14
	TF-520530 TIP3c	$\alpha_2 (\text{HV})\text{is}/\alpha_4 (\text{HV})\text{is}$	210	395	33	20	0.54	0.94	0.99	1.69
	TF-520530 TIP3c	$\alpha_4 (\text{HV})\text{is}/\alpha_8 (\text{HV})\text{is}^{***}$	355	650	33	25	0.56	0.89	1.01	1.49
YASKAWA SGM7J	TF-507510 TIP1c	SGM7J 06/08	120	180	66	60	0.30	0.44	0.53	0.69
	TF-508510 TIP1c	SGM7J 06/08	70	180	133	60	0.22	0.44	0.33	0.69
	TF-510520 TIP2c	SGM7J 08/08	195	315	66.6	38	0.32	0.54	0.55	0.94
	TF-511520 TIP2c	SGM7J 08/08	135	315	133	38	0.22	0.54	0.33	0.94
	TF-520530 TIP3c	SGM7J 08/15	335	650	40	25	0.46	0.89	0.84	1.49
	TF-507510 TIP1c	SGM JV 04/08	115	180	66.7	60	0.30	0.44	0.53	0.69
YASKAWA SGM JV	TF-508510 TIP1c	SGM JV 04/08	70	180	130	60	0.22	0.44	0.33	0.69
	TF-510520 TIP2c	SGM JV 08/08	195	315	66.7	38	0.32	0.54	0.55	0.94
	TF-511520 TIP2c	SGM JV 08/08	140	315	133	38	0.21	0.54	0.32	0.94
	TF-520530 TIP3c	SGM JV 08/08	335	650	40	25	0.46	0.89	0.84	1.49
	TF-507510 TIP1c	HG56/75	120	170	60	45	0.32	0.49	0.57	0.83
	TF-508510 TIP1c	HG56/75	70	170	110	45	0.22	0.49	0.36	0.83
MITSUBISHI 200V	TF-510520 TIP2c	HG75/105	185	430	50	30	0.37	0.59	0.67	1.09
	TF-511520 TIP2c	HG75/105	130	430	100	30	0.24	0.59	0.39	1.09
	TF-520530 TIP3c	HG105/104	440	650	32	20	0.54	0.94	1.01	1.69
	TF-510520 TIP2c	HG-H75/H105	185	430	50	30	0.37	0.59	0.67	1.09
	TF-511520 TIP2c	HG-H75/H105	130	430	100	30	0.24	0.59	0.39	1.09
	TF-520530 TIP3c	HG-H105/H104	440	650	32	20	0.54	0.94	1.01	1.69
MITSUB 400 V	TF-510520 TIP2c	HG-H75/H105	185	430	50	30	0.37	0.59	0.67	1.09
	TF-511520 TIP2c	HG-H75/H105	130	430	100	30	0.24	0.59	0.39	1.09
	TF-520530 TIP3c	HG-H105/H104	440	650	32	20	0.54	0.94	1.01	1.69
	TF-507510 TIP1c	R2Ax 06040/08075	120	185	66.7	60	0.30	0.44	0.52	0.69
SANYO	TF-508510 TIP1c	R2Ax 06040/08075	70	185	130	60	0.22	0.44	0.33	0.69
	TF-510520 TIP2c	R2Ax 08075/08075	210	245	66.7	40	0.32	0.54	0.55	0.92
	TF-511520 TIP2c	R2Ax 08075/08075	145	245	130	40	0.22	0.54	0.34	0.92
	TF-520530 TIP3c	BL-ME24J-50SN/ BL-ME80J-40SN	300	650	27.5	25	0.61	0.89	1.15	1.49
OKU- MA	TF-520530 TIP3c	1FK7042/ 1FK7062	435	650	50	25	0.44	0.89	0.74	1.49
	TF-520530 TIP3c	1FK7042/ 1FK7062	435	650	50	25	0.44	0.89	0.74	1.49

* At 1 rpm; for more, please refer to p. 110

** Without clamping; for times, please refer to p. 114

** for Siemens / Heidenhain

**** not with 35iB

For calculation of load, forces and torques, please see p. 106

Important information

- The limit values as set out in the corresponding parameter list take precedence over the data and information provided in the main catalog (due to motor, drive enhancement and the respective machine CNC)
- Motor-dependent data are optimum values at operating temperature
- Further details are available at www.lehmanna-rotary-tables.com, under Download / Commissioning

Accessories

Motor, cable, angular position measuring system and pL CNC starting at p. 58.
Accessories starting at p. 46

Options

Item no.	Description
GET.5xx-GEN	Increased gear precision ¹⁾
GEO.5xx-GEN	Incr. geometric precision, ½ standard tolerance
SPI.5xx-Lab ²⁾	Spindle seal with labyrinth, integrated sealing air pressure control
MOT.520-LNG	long motor housing
SWB.510-180	Tilting range max. 230°; set to 180°
SWB.520-180	Tilting range max. 230°; set to 180°
SWB.530-180	Tilting range max. 230°; set to 180°

- 1) incl. reduced radial and axial run-out 0.003 mm
2) for 507/510: HSK and ripas clamping not possible manually, GET.5xx-GEN and GEO.5xx-GEN only partly possible (increased radial and axial run-out cannot always be reached)

Suitable alignment elements

Item no.	Designation	Slot width
AUR.St-12		12g6
AUR.St-14	Alignment T-slot nuts,	14g6
AUR.St-16	1 pair	16g6
AUR.St-18		18g6

Overview

Rotary tables

Applications & Facts

Aligning, GLA, RST

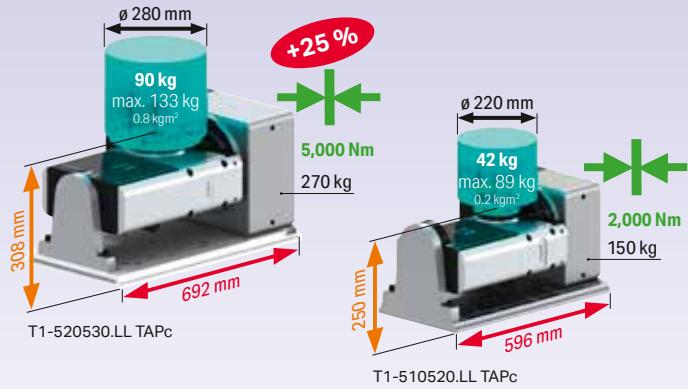
MOT, KAB, CNC

Workpiece clamping system

Technology & service



*optional



Overview

Rotary tables

Applications & Facts

SPZ, DDF, WMS, indexing accuracy

Aligning, GLA, RST

MOT, KAB, CNC

Workpiece clamping system

Technology & service

			T1-507510 TAP1(c)	T1-508510 TAP1(c)s	T1-510520 TAP2(c)	T1-5111520 TAP2(c)s	T1-520530 TAP3(c)
Dimensions	Swivel ϕ	mm	180	90° +5°/-25° (optional 180° ±25°)	220	210 (235 ³⁾	218 (258 ³⁾
	Swiveling range	degrees					
	Center height	mm	180		160 (150)	133	133
	Total weight with motor	kg	90 (85)		300 (270)	46 / 64	2,000
	Center bore Standard / increased	mm	30		34	2,000	5,000
Max. clamping torque	4th axis	Nm	300	250	800	600	2,000
	5th axis	Nm		800		1,33	200
Max. spindle load	0°-30°	kg	79			89	133
	30°-90°	kg	53				
	Standard load ¹⁾	kg	17	12	42	21	90
Max. axial force	4th axis	kN		6		10	40
Max. pull-out torque	4th axis	Nm		1,200		2,000	3,900
	5th axis	Nm		2,000		3,900	10,400
Max. moment of inertia	Standard load ¹⁾	kgm ²	0.05	0.025	0.2	0.07	0.8
	J max	kgm ²	0.5	0.25	2	0.7	8
Feed torque max ****	4th axis	Nm	120	70	250	150	440
	5th axis	Nm		250		440	650 opt. 850
Gear unit	without load	Nm	-12		-22		-5
	with standard load	Nm	15	10	30	5	190
	M max	Nm		250	440		650
Indexing accuracy Pa	4th axis ²⁾	± arc sec	20/12		17/10		12/8
	5th axis (90°) ⁵⁾	± arc sec	35/20	35/22	21/22	21/13	11/38
Repeat accuracy Ps average	4th axis	± arc sec			2		
	5th axis	± arc sec			2		
Max speed at standard load	4th axis ¹⁾	rpm	111	210	80	160	50
	5th axis ¹⁾	rpm		60	40		30
Precision	Radial run-out ²⁾ on spindle ϕ	µm			6 / 3		
	Axial run-out ²⁾ at spindle end face	µm			6 / 3		
	Parallelism ²⁾ Spindle to base	µm/100mm			10 / 5		

¹⁾ Mutually dependent; for individual drive motor data, see right side

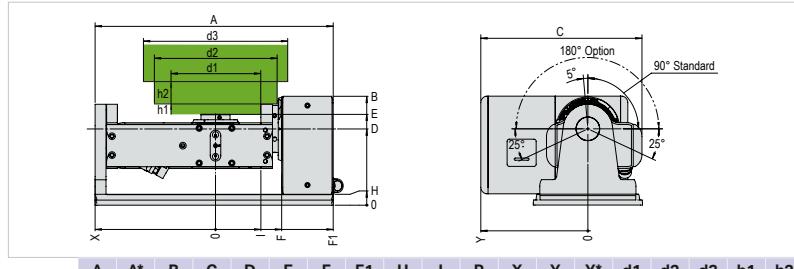
²⁾ Standard / increased; for measuring method and validity of the values, please refer to p. 52; for optional angular position measuring system please refer to p. 53

³⁾ In relation to dividing axis when in the horizontal position

⁴⁾ Limit value for gear unit, at 1 rpm

⁵⁾ Without load / with standard load 0°-90°

Dimensions



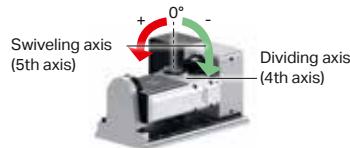
Dimensions with 508 or 511 identical to 507510 and 510520.

*With large motor (option)

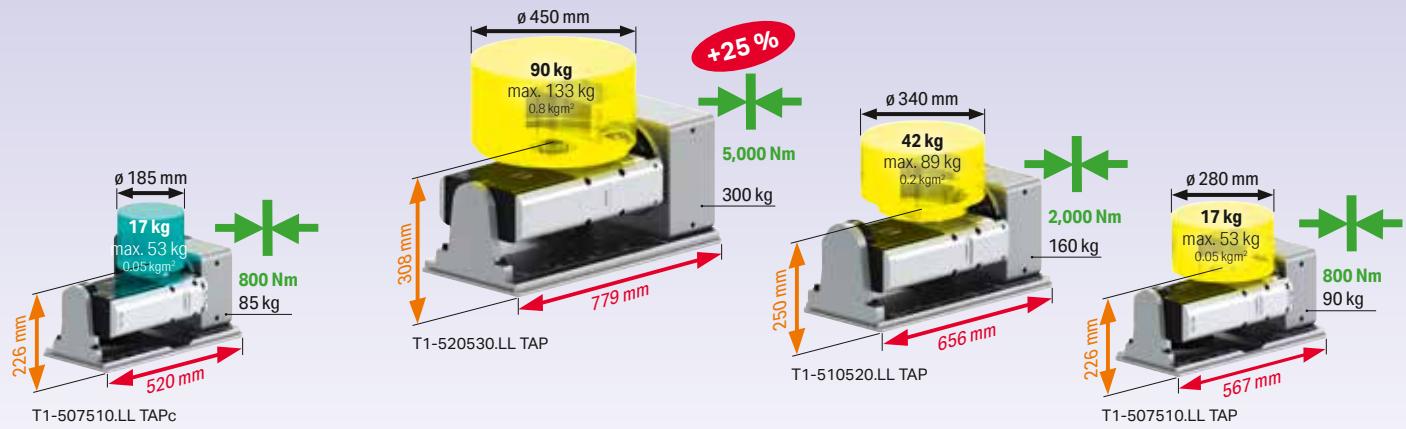
Important information

Center height increase (option)

Depending on the accessories involved (clamping cylinder, rotary union, angular position measuring system...), a center height increase (dimension D) is required. (See page for respective accessory)

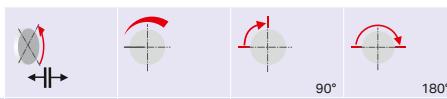


T1-Type Rotary Tables TAP (unclamped supporting bearing)



Drive data

(based on standard load cube shown on pp. 104/105)



	Motors 4th/5th	Feed* [Nm]		Speed [rpm]		Cycle time*** [sec]		90°	180°	
		4.	5.	4.	5.	4.	5.			
MAVILOR / MOVINOR **	T1-507510 TAP1	BLS-072/BLS-072	120	230	111	70	0.26	0.43	0.39	0.64
	T1-508510 TAP1	BLS-072/BLS-072	70	230	210	70	0.23	0.43	0.29	0.64
	T1-510520 TAP2	BLS-072/BLS-073	250	425	80	45	0.30	0.50	0.49	0.83
	T1-511520 TAP2	BLS-072/BLS-073	150	425	160	45	0.23	0.50	0.31	0.83
	T1-511520 TAP2	BLS-072/LN-098	150	440	160	40	0.23	0.50	0.31	0.87
	T1-520530 TAP3	BLS-073/LN-098	440	650	50	25	0.41	0.89	0.71	1.49
FANUC	T1-507510 TAP1	$\beta_1 \text{ is}/\alpha_2 (\text{HV})\text{is}$	80	110	66.7	45	0.30	0.49	0.53	0.83
	T1-508510 TAP1	$\beta_1 \text{ is}/\alpha_2 (\text{HV})\text{is}$	55	110	130	45	0.25	0.49	0.36	0.83
	T1-510520 TAP2	$\alpha_2 (\text{HV})\text{is}/\alpha_2 (\text{HV})\text{is}$	120	195	55	29	0.36	0.66	0.63	1.18
	T1-510520 TAP2	$\alpha_2 (\text{HV})\text{is}/\alpha_4 (\text{HV})\text{is}$	120	335	55	30	0.36	0.64	0.63	1.14
	T1-511520 TAP2	$\alpha_2 (\text{HV})\text{is}/\alpha_2 (\text{HV})\text{is}$	85	195	100	29	0.24	0.66	0.39	1.18
	T1-511520 TAP2	$\alpha_2 (\text{HV})\text{is}/\alpha_4 (\text{HV})\text{is}$	85	335	100	30	0.24	0.64	0.39	1.14
	T1-520530 TAP3	$\alpha_2 (\text{HV})\text{is}/\alpha_4 (\text{HV})\text{is}$	210	395	33	20	0.54	0.94	0.99	1.69
	T1-520530 TAP3	$\alpha_4 (\text{HV})\text{is}/\alpha_8 (\text{HV})\text{is}^{***}$	355	650	33	25	0.56	0.89	1.01	1.49
YASKAWA SGM7J	T1-507510 TAP1	SGM7J 06/08	120	180	66	60	0.30	0.44	0.53	0.69
	T1-508510 TAP1	SGM7J 06/08	70	180	133	60	0.22	0.44	0.33	0.69
	T1-510520 TAP2	SGM7J 08/08	195	315	66.6	38	0.32	0.54	0.55	0.94
	T1-511520 TAP2	SGM7J 08/08	135	315	133	38	0.22	0.54	0.33	0.94
	T1-520530 TAP3	SGM7J 08/15	335	650	40	25	0.46	0.89	0.84	1.49
YASKAWA SGM JV	T1-507510 TAP1	SGM JV 04/08	115	180	66.7	60	0.30	0.44	0.53	0.69
	T1-508510 TAP1	SGM JV 04/08	70	180	130	60	0.22	0.44	0.33	0.69
	T1-510520 TAP2	SGM JV 08/08	195	315	66.7	38	0.32	0.54	0.55	0.94
	T1-511520 TAP2	SGM JV 08/08	140	315	133	38	0.21	0.54	0.32	0.94
	T1-520530 TAP3	SGM JV 08/08	335	650	40	25	0.46	0.89	0.84	1.49
MITSUBISHI MITSUBISHI 200V	T1-507510 TAP1	HG56/75	120	170	60	45	0.32	0.49	0.57	0.83
	T1-508510 TAP1	HG56/75	70	170	110	45	0.22	0.49	0.36	0.83
	T1-510520 TAP2	HG75/105	185	430	50	30	0.37	0.59	0.67	1.09
	T1-511520 TAP2	HG75/105	130	430	100	30	0.24	0.59	0.39	1.09
	T1-520530 TAP3	HG105/104	440	650	32	20	0.54	0.94	1.01	1.69
MITSUBISHI 400 V	T1-510520 TAP2	HG-H75/H105	185	430	50	30	0.37	0.59	0.67	1.09
	T1-511520 TAP2	HG-H75/H105	130	430	100	30	0.24	0.59	0.39	1.09
	T1-520530 TAP3	HG-H105/H104	440	650	32	20	0.54	0.94	1.01	1.69
SANYO	T1-507510 TAP1	R2Ax 06040/08075	120	185	66.7	60	0.30	0.44	0.52	0.69
	T1-508510 TAP1	R2Ax 06040/08075	70	185	130	60	0.22	0.44	0.33	0.69
	T1-510520 TAP2	R2Ax 08075/08075	210	245	66.7	40	0.32	0.54	0.55	0.92
	T1-511520 TAP2	R2Ax 08075/08075	145	245	130	40	0.22	0.54	0.34	0.92
OKU- MA	T1-520530 TAP3	BL-ME24J-50SN/ BL-ME20J-40SN	300	650	27.5	25	0.61	0.89	1.15	1.49
SIE- MENS	T1-520530 TAP3	1FK7042/ 1FK7062	435	650	50	25	0.44	0.89	0.74	1.49

* At 1 rpm; for more, please refer to p. 110

** Without clamping; for times, please refer to p. 114

** for Siemens / Heidenhain

**** not with 35iB

For calculation of load, forces and torques, please see p. 106

Important information

- The limit values as set out in the corresponding parameter list take precedence over the data and information provided in the main catalog (due to motor, drive enhancement and the respective machine CNC)
- Motor-dependent data are optimum values at operating temperature
- Further details are available at www.lehmann-rotary-tables.com, under Download / Commissioning

Accessories

Motor, cable, angular position measuring system and pL CNC starting at p. 58.
Accessories starting at p. 46

Options

Item no.	Description
GET.5xx-GEN	Increased gear precision ¹⁾
GEO.5xx-GEN	Incr. geometric precision, ½ standard tolerance
SPI.5xx-Lab ²⁾	Spindle seal with labyrinth, integrated sealing air pressure control
MOT.520-LNG	long motor housing
SWB.510-180	Tilting range max. 230°; set to 180° (SWB.530 center height increase required)
SWB.520-180	
SWB.530-180	

1) incl. lower radial and axial run-out 0.003 mm

2) for 507/510: HSK and ripas clamping not possible manually, GET.5xx-GEN and GEO.5xx-GEN only partly possible (increased radial and axial run-out cannot always be reached)

Suitable alignment elements

Item no.	Designation	Slot width
AUR.iX-12		12g6
AUR.iX-14	Alignment pin lineFIX ,	14g6
AUR.iX-16	1 pair	16g6
AUR.iX-18		18g6

For **lineFIX**, refer to p. 54



Overview

Rotary tables

Applications & Facts

SPZ, DDF, WMS, indexing accuracy

Aligning, GLA, RST

MOT, KAB, CNC

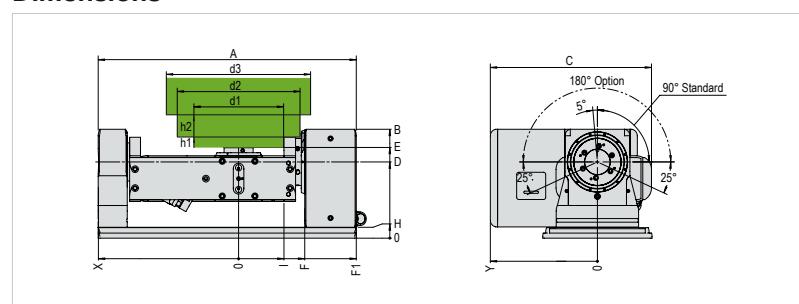
Workpiece clamping system

Technology & service

			T1-507510 TOP1	T1-508510 TOP1s	T1-510520 TOP2	T1-511520 TOP2s	T1-520530 TOP3
Dimensions	Swivel ø	mm	180	90° +5°/-25° (optional 180° ±25°)	220	210 (235 ³⁾)	218 (258 ³⁾
	Swiveling range	degrees					
	Center height	mm	180		160 (150)	300 (270)	
	Total weight with motor	kg	90 (85)				
	Center bore Standard / increased	mm	30				
Max. clamping torque	4th axis	Nm	300	250	800	600	2,000
	5th axis	Nm		1,400		4,000	7,000
Max. spindle load	0°-30°	kg		79		133	200
	30°-90°	kg		53		89	133
	Standard load ¹⁾	kg	17	12	42	21	90
Max. axial force	4th axis	kN		6		10	40
Max. pull-out torque	4th axis	Nm		1,200		2,000	3,900
	5th axis	Nm		2,000		3,900	10,400
Max. moment of inertia	Standard load ¹⁾	kgm ²	0.05	0.025	0.2	0.07	0.8
	J max	kgm ²	0.5	0.25	2	0.7	8
Feed torque max ⁴⁾	4th axis	Nm	120	70	250	150	440
	5th axis	Nm		250		440	650 opt. 850
Gear unit	without load	Nm	-12		-22		-5
	with standard load	Nm	15	10	30	5	190
	M max	Nm		250		440	650
Indexing accuracy Pa	4th axis ²⁾	± arc sec	20/12		17/10		12/8
	5th axis (90°) ⁵⁾	± arc sec	35/20	35/22	21/22	21/13	11/38
Repeat accuracy Ps average	4th axis	± arc sec			2		
	5th axis	± arc sec			2		
Max speed at standard load	4th axis ¹⁾	rpm	111	210	80	160	50
	5th axis ¹⁾	rpm		60		40	30
Precision	Radial run-out ²⁾	on spindle ø	µm		6 / 3		
	Axial run-out ²⁾	at spindle end face	µm		6 / 3		
	Parallelism ²⁾	Spindle to base	µm/100mm		10 / 5		

¹⁾ Mutually dependent; for individual drive motor data, see right side²⁾ Standard / increased; for measuring method and validity of the values, please refer to p. 52; for optional angular position measuring system please refer to p. 53³⁾ In relation to dividing axis when in the horizontal position⁴⁾ Limit value for gear unit, at 1 rpm⁵⁾ Without load / with standard load 0°-90°

Dimensions



	A	A*	B	C	D	E	F	F1	H	I	R	X	Y	Y*	d1	d2	d3	h1	h2
TOP1	606		245	382	180	226	151	277	30	102	149	328	248	270	280	280	350	55	55
TOP2	711		300	444	210	250	182	324	30	125	173	386	295	320	248	340	400	34	69
TOP3	833	858	358	554	218	308	242	422	38	177	168	411	390		354	460	500	6	80

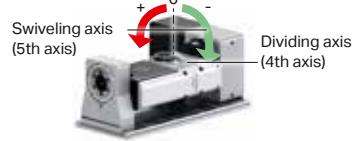
Dimensions with 508 or 511 identical to 507510 and 510520.

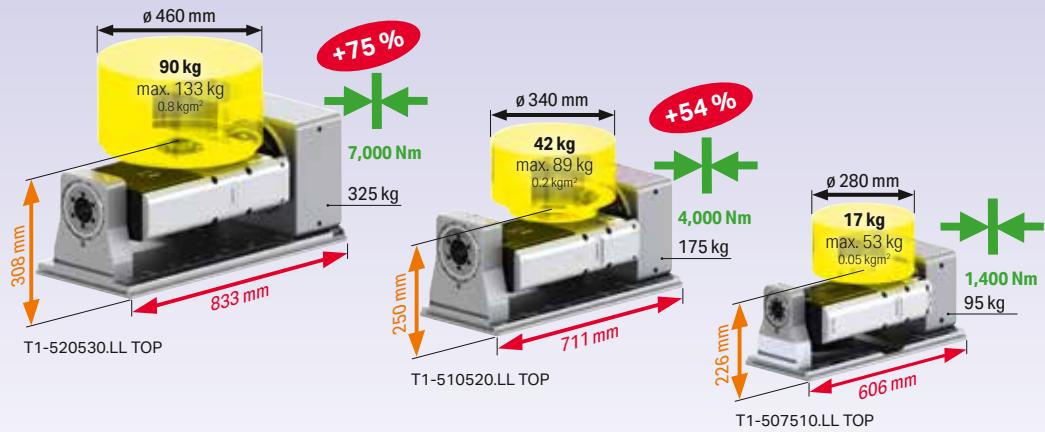
*With large motor (option)

Important information

Center height increase (option)

Depending on the accessories involved (clamping cylinder, rotary union, angular position measuring system...), a center height increase (dimension D) is required. (See page for respective accessory)



**Drive data**

(based on standard load cube shown on pp. 104/105)



	Motors 4th/5th	Feed* [Nm]		Speed [rpm]		Cycle time*** [sec]		90°	180°	
		4.	5.	4.	5.	4.	5.			
MAVILOR / MOVINOR**	T1-507510 TOP1	BLS-072/BLS-072	120	230	111	70	0.26	0.43	0.39	0.64
	T1-508510 TOP1	BLS-072/BLS-072	70	230	210	70	0.23	0.43	0.29	0.64
	T1-510520 TOP2	BLS-072/BLS-073	250	425	80	45	0.30	0.50	0.49	0.83
	T1-511520 TOP2	BLS-072/BLS-073	150	425	160	45	0.23	0.50	0.31	0.83
	T1-511520 TOP2	BLS-072/LN-098	150	440	160	40	0.23	0.50	0.31	0.87
	T1-520530 TOP3	BLS-073/LN-098	440	650	50	25	0.41	0.89	0.71	1.49
FANUC	T1-507510 TOP1	$\beta_1 \text{ is}/\alpha_2 (\text{HV})\text{is}$	80	110	66.7	45	0.30	0.49	0.53	0.83
	T1-508510 TOP1	$\beta_1 \text{ is}/\alpha_2 (\text{HV})\text{is}$	55	110	130	45	0.25	0.49	0.36	0.83
	T1-510520 TOP2	$\alpha_2 (\text{HV})\text{is}/\alpha_2 (\text{HV})\text{is}$	120	195	55	29	0.36	0.66	0.63	1.18
	T1-511520 TOP2	$\alpha_2 (\text{HV})\text{is}/\alpha_4 (\text{HV})\text{is}$	120	335	55	30	0.36	0.64	0.63	1.14
	T1-511520 TOP2	$\alpha_2 (\text{HV})\text{is}/\alpha_2 (\text{HV})\text{is}$	85	195	100	29	0.24	0.66	0.39	1.18
	T1-520530 TOP3	$\alpha_2 (\text{HV})\text{is}/\alpha_4 (\text{HV})\text{is}$	85	335	100	30	0.24	0.64	0.39	1.14
	T1-520530 TOP3	$\alpha_2 (\text{HV})\text{is}/\alpha_4 (\text{HV})\text{is}$	210	395	33	20	0.54	0.94	0.99	1.69
	T1-520530 TOP3	$\alpha_4 (\text{HV})\text{is}/\alpha_8 (\text{HV})\text{is}^{***}$	355	650	33	25	0.56	0.89	1.01	1.49
YASKAWA SGM7J	T1-507510 TOP1	SGM7J 06/08	120	180	66	60	0.30	0.44	0.53	0.69
	T1-508510 TOP1	SGM7J 06/08	70	180	133	60	0.22	0.44	0.33	0.69
	T1-510520 TOP2	SGM7J 08/08	195	315	66.6	38	0.32	0.54	0.55	0.94
	T1-511520 TOP2	SGM7J 08/08	135	315	133	38	0.22	0.54	0.33	0.94
	T1-520530 TOP3	SGM7J 08/15	335	650	40	25	0.46	0.89	0.84	1.49
	T1-507510 TOP1	SGM JV 04/08	115	180	66.7	60	0.30	0.44	0.53	0.69
	T1-508510 TOP1	SGM JV 04/08	70	180	130	60	0.22	0.44	0.33	0.69
	T1-510520 TOP2	SGM JV 08/08	195	315	66.7	38	0.32	0.54	0.55	0.94
	T1-511520 TOP2	SGM JV 08/08	140	315	133	38	0.21	0.54	0.32	0.94
	T1-520530 TOP3	SGM JV 08/08	335	650	40	25	0.46	0.89	0.84	1.49
MITSUBISHI MITSUBISHI 200V	T1-507510 TOP1	HG56/75	120	170	60	45	0.32	0.49	0.57	0.83
	T1-508510 TOP1	HG56/75	70	170	110	45	0.22	0.49	0.36	0.83
	T1-510520 TOP2	HG75/105	185	430	50	30	0.37	0.59	0.67	1.09
	T1-511520 TOP2	HG75/105	130	430	100	30	0.24	0.59	0.39	1.09
	T1-520530 TOP3	HG105/104	440	650	32	20	0.54	0.94	1.01	1.69
MITSUBISHI 400 V	T1-510520 TOP2	HG-H75/H105	185	430	50	30	0.37	0.59	0.67	1.09
	T1-511520 TOP2	HG-H75/H105	130	430	100	30	0.24	0.59	0.39	1.09
	T1-520530 TOP3	HG-H105/H104	440	650	32	20	0.54	0.94	1.01	1.69
SANYO	T1-507510 TOP1	R2Ax 06040/08075	120	185	66.7	60	0.30	0.44	0.52	0.69
	T1-508510 TOP1	R2Ax 06040/08075	70	185	130	60	0.22	0.44	0.33	0.69
	T1-510520 TOP2	R2Ax 08075/08075	210	245	66.7	40	0.32	0.54	0.55	0.92
	T1-511520 TOP2	R2Ax 08075/08075	145	245	130	40	0.22	0.54	0.34	0.92
OKU- MA	T1-520530 TOP3	BL-ME24J-50SN/ BL-ME80J-40SN	300	650	27.5	25	0.61	0.89	1.15	1.49
SIE- MENS	T1-520530 TOP3	1FK7042/ 1FK7062	435	650	50	25	0.44	0.89	0.74	1.49

* At 1 rpm; for more, please refer to p. 110

** Without clamping; for times, please refer to p. 114

** for Siemens / Heidenhain

**** not with 35iB

For calculation of load, forces and torques, please see p. 106

Important information

- The limit values as set out in the corresponding parameter list take precedence over the data and information provided in the main catalog (due to motor, drive enhancement and the respective machine CNC)
- Motor-dependent data are optimum values at operating temperature
- Further details are available at www.lehmann-rotary-tables.com, under Download / Commissioning

Accessories

- Motor, cable, angular position measuring system and pL CNC starting at p. 58.
Accessories starting at p. 46

Options

Item no.	Description
GET.5xx-GEN	Increased gear precision ¹⁾
GEO.5xx-GEN	Incr. geometric precision, $\frac{1}{2}$ standard tolerance
SPI.5xx-Lab ²⁾	Spindle seal with labyrinth, integrated sealing air pressure control
MOT.520-LNG	long motor housing
SWB.510-180	tilting range max. 230°; set to 180° (SWB.530 center height increase required)
SWB.520-180	
SWB.530-180	

1) incl. lower radial and axial run-out 0.003 mm

2) for 507/510: HSK and ripas clamping not possible manually, GET.5xx-GEN and GEO.5xx-GEN only partly possible (increased radial and axial run-out cannot always be reached)



Labyrinth seal
(cutaway view)
Recommended for:
+ grinding operations
+ high coolant pressures
+ extremely fine abrasive particles

Suitable alignment elements

Item no.	Designation	Slot width
AUR.iX-12		12g6
AUR.iX-14	Alignment pin lineFIX ,	14g6
AUR.iX-16	1 pair	16g6
AUR.iX-18		18g6

For **lineFIX**, refer to p. 54

Overview

Rotary tables
Applications & Facts
SPZ, DDF, WMS, indexing accuracyAligning GLA, RST
MOT, KAB, CNCTechnology & service
Workpiece clamping system



Overview

Rotary tables

Applications & Facts

SPZ, DDF, WMS, indexing accuracy

Aligning, GLA, RST

MOT, KAB, CNC

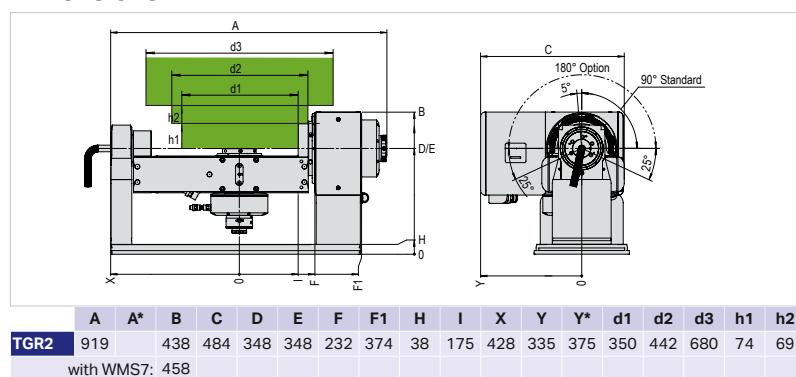
Workpiece clamping system

Technology & service

			T1-510520 TGR2	T1-511520 TGR2s (on request)	T1-520530 TGR3
Dimensions	Swivel ø	mm	220		280
	Swiveling range	degrees	90° +5°/-25° (optional 180° ±25°)		
Center height	Center height	mm	180		220
	Total weight with motor	kg	300		520
Center bore	Standard / increased	mm	34		46 / 64
Max. clamping torque	4th axis	Nm	800	600	2,000
	5th axis	Nm		4,000	7,000
Max. spindle load	0°-30°	kg		135	200
	30°-90°	kg		90	160
Standard load ¹⁾	Standard load ¹⁾	kg	90	22	160
Max. axial force	4th axis	kN		10	40
Max. pull-out torque	4th axis	Nm		2,000	3,900
	5th axis	Nm		3,900	10,400
Max. moment of inertia	Standard load ¹⁾	kgm ²	0.8	0.07	2.0
	J max	kgm ²	2	0.7	8
Feed torque max ³⁾	4th axis	Nm	250	150	440
	5th axis	Nm		440	650 opt. 850
Gear unit	without load	Nm		-105	-160
	with standard load	Nm		-10	60
Gear unit loading 5th axis	M max	Nm		440	650
Indexing accuracy Pa	4th axis ²⁾	± arc sec		17/10	12/8
	5th axis (90°) ⁴⁾	± arc sec	49/18	49/42	31/25
Repeat accuracy Ps average	4th axis	± arc sec		2	
	5th axis	± arc sec		2	
Max speed at standard load	4th axis ¹⁾	rpm	80	160	50
	5th axis ¹⁾	rpm	35		25
Precision	Radial run-out ²⁾	on spindle ø	µm		6 / 3
	Axial run-out ²⁾	at spindle end face	µm		6 / 3
	Parallelism ²⁾	Spindle to base	µm/100mm		10 / 5

¹⁾ Mutually dependent; for individual drive motor data, see right side²⁾ Standard / increased; for measuring method and validity of the values, please refer to p. 52; for optional angular position measuring system please refer to p. 53³⁾ Limit value for gear unit, at 1 rpm⁴⁾ without load / with standard load 0°-90°

Dimensions



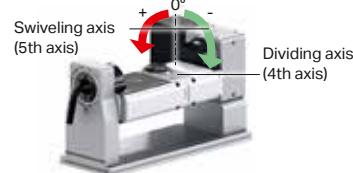
Dimensions with 511 identical to 510520.

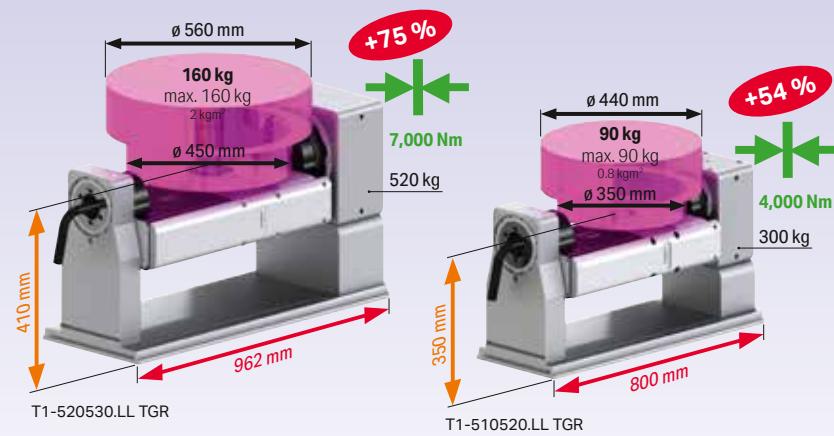
*With large motor (option)

Important information

Center height increase (option)

Depending on the accessories involved (clamping cylinder, rotary union, angular position measuring system...), a center height increase (dimension D) is required. (See page for respective accessory)



**Drive data**

(based on standard load cube shown on pp. 104/105)



	Motors 4th/5th	Feed* [Nm]		Speed [rpm]		Cycle time*** [sec]		90°	180°	
		4.	5.	4.	5.	4.	5.			
MAVILOR MOVINOR*	T1-510520 TGR2	BLS-072/BLS-073	250	425	65	30	0.45	0.75	0.68	1.25
	T1-510520 TGR2	BLS-072/LN-098	250	440	65	35	0.45	0.71	0.68	1.14
	T1-511520 TGR2	BLS-072/BLS-073	150	425	160	30	0.23	0.75	0.31	1.25
	T1-511520 TGR2	BLS-072/LN-098	150	440	160	35	0.23	0.71	0.31	1.14
	T1-520530 TGR3	BLS-073/LN-098	425	650	45	25	0.50	0.89	0.83	1.49
	T1-520530 TGR3	BLS-098/LN-098	440	650	40	25	0.53	0.89	0.91	1.49
FANUC	T1-510520 TGR2	α2 (HV)is/α2 (HV)is	120	195	45	15	0.51	1.22	0.84	2.22
	T1-510520 TGR2	α2 (HV)is/α4 (HV)is	120	335	45	27	0.51	0.86	0.84	1.41
	T1-511520 TGR2	α2 (HV)is/α2 (HV)is	85	195	100	15	0.24	1.22	0.39	2.22
	T1-511520 TGR2	α2 (HV)is/α4 (HV)is	85	335	100	27	0.24	0.86	0.39	1.41
	T1-520530 TGR3	α2 (HV)is/α4 (HV)is	210	395	28	22	0.66	0.97	1.19	1.65
	T1-520530 TGR3	α4 (HV)is/α8 (HV)is***	355	650	30	25	0.64	0.89	1.14	1.49
YASKAWA SGM7/J	T1-510520 TGR2	SGM7J 08/08	195	315	60	30	0.46	0.81	0.71	1.31
	T1-511520 TGR2	SGM7J 08/08	135	315	133	30	0.22	0.81	0.33	1.31
	T1-520530 TGR3	SGM7J 08/15	315	650	40	25	0.53	0.89	0.91	1.49
YASKAWA SGMV	T1-510520 TGR2	SGMVJ 08/08	195	315	60	30	0.46	0.81	0.71	1.31
	T1-511520 TGR2	SGMVJ 08/08	140	315	133	30	0.21	0.81	0.32	1.31
	T1-520530 TGR3	SGMVJ 08/08	315	650	40	25	0.53	0.89	0.91	1.49
MITSUBI 200 V	T1-510520 TGR2	HG-H75/H105	185	430	50	28	0.48	0.74	0.78	1.28
	T1-511520 TGR2	HG-H75/H105	130	430	100	28	0.24	0.74	0.39	1.28
	T1-520530 TGR3	HG-H105/H104	430	650	30	22	0.63	0.94	1.13	1.62
SA- NYO	T1-510520 TGR2	R2Ax 08075/08075	210	245	60	25	0.46	0.97	0.71	1.57
	T1-511520 TGR2	R2Ax 08075/08075	145	245	130	25	0.22	0.97	0.34	1.57
OKU- MA	T1-520530 TGR3	BL-ME24J-50SN/ BL-ME80J-40SN	280	650	27	25	0.67	0.89	1.23	1.49
	T1-520530 TGR3	1FK7042/ 1FK7062	410	650	45	25	0.50	0.89	0.83	1.49

* At 1 rpm; for more, please refer to p. 110

** Without clamping; for times, please refer to p. 114

** for Siemens / Heidenhain

**** not with 35iB

For calculation of load, forces and torques, please see p. 106

Important information

- The limit values as set out in the corresponding parameter list take precedence over the data and information provided in the main catalog (due to motor, drive enhancement and the respective machine CNC)
- Motor-dependent data are optimum values at operating temperature
- Further details are available at www.lehmann-rotary-tables.com, under Download / Commissioning

Labyrinth seal
(cutaway view)

Recommended for:
 + grinding operations
 + high coolant pressures
 + extremely fine abrasive particles

Accessories

Motor, cable, angular position measuring system and pL CNC starting at p. 58.

Accessories starting at p. 46

Options

Item no.	Description
GET.5xx-GEN	Increased gear precision ¹⁾
GEO.5xx-GEN	Incr. geometric precision, ½ standard tolerance
SPI.5xx-Lab ²⁾	Spindle seal with labyrinth, integrated sealing air pressure control
SWB.520-180	Tilting range max. 230°; set to 180°
SWB.530-180	

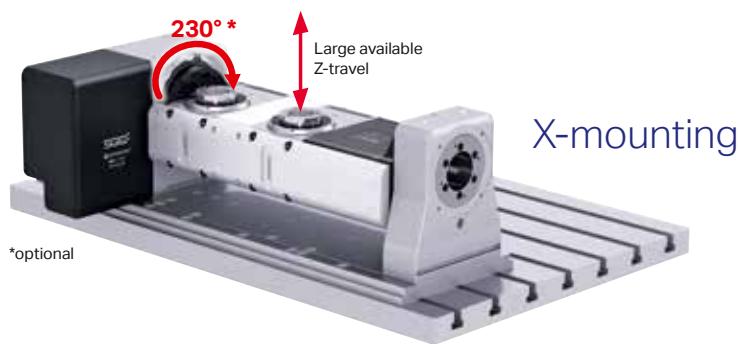
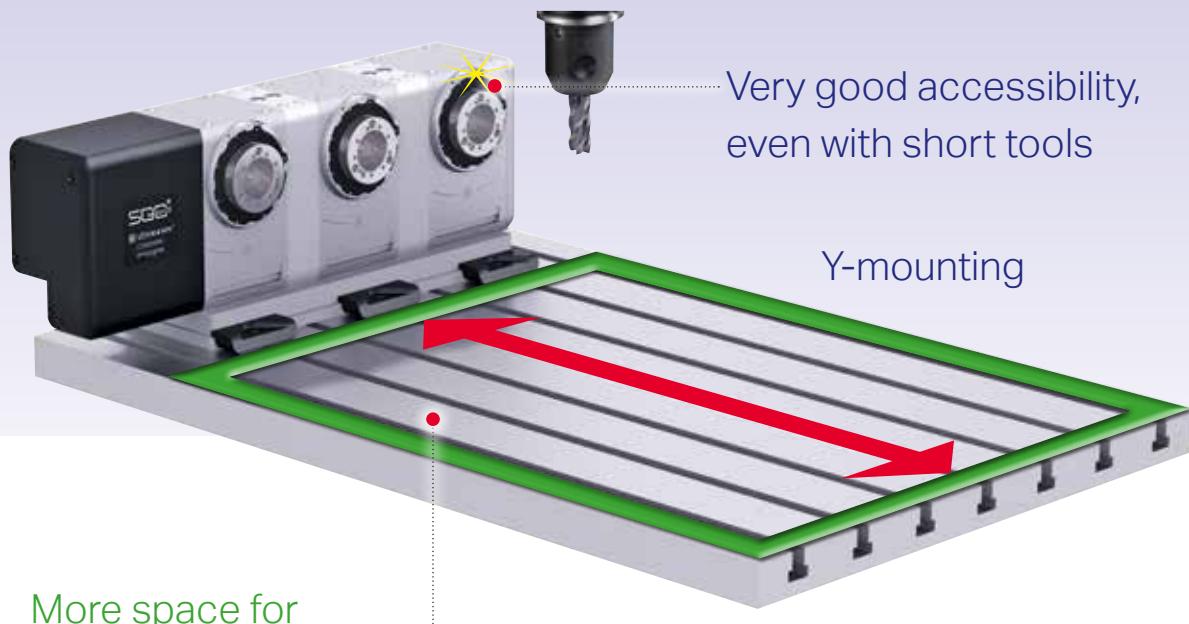
1) incl. lower radial and axial run-out 0.003 mm

2) for 507/510: HSK and ripas clamping not possible manually, GET.5xx-GEN and GEO.5xx-GEN only partly possible (increased radial and axial run-out cannot always be reached)

Item no.**T1-510520.LL TGR-F1****Suitable alignment elements**

Item no.	Designation	Slot width
AUR.iX-12		12g6
AUR.iX-14	Alignment pin lineFIX,	14g6
AUR.iX-16	1 pair	16g6
AUR.iX-18		18g6

For lineFIX, refer to p. 54

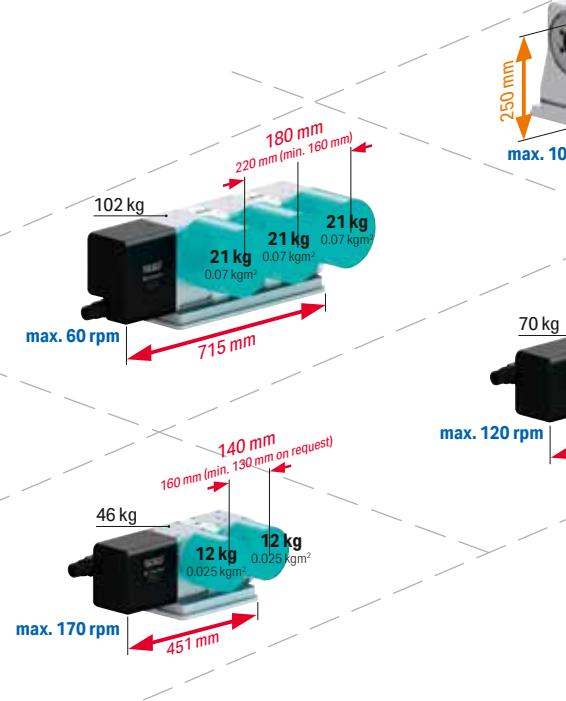


T2

M3

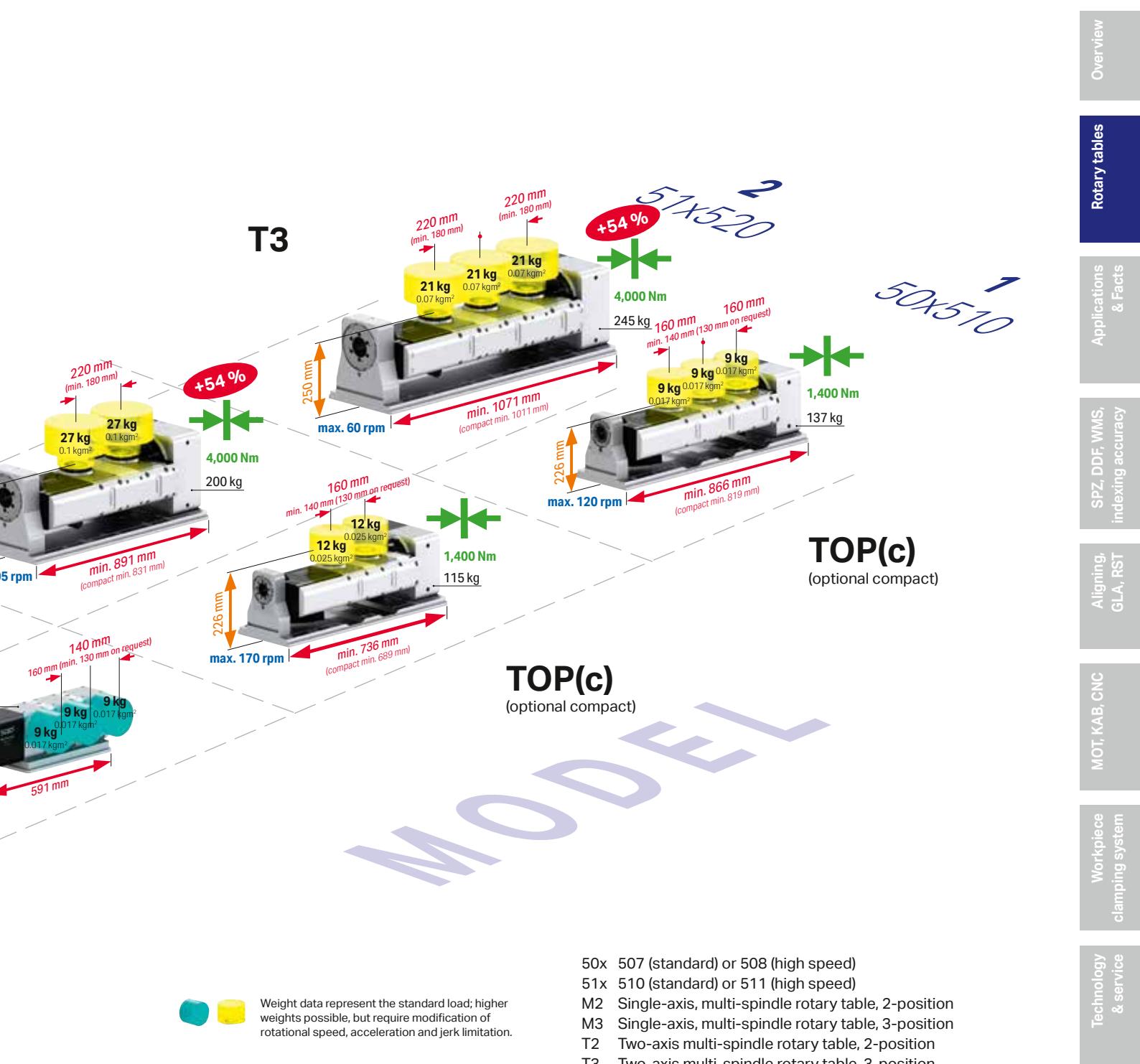
M2

51X
50X



News in brief

1. Up to 54 % higher clamping torque in tilting axis
2. Fewer variant – more solution
3. Spindle distance min. 130 mm
4. Spatially optimized arrangement of the dividing axis



50x 507 (standard) or 508 (high speed)
 51x 510 (standard) or 511 (high speed)
 M2 Single-axis, multi-spindle rotary table, 2-position
 M3 Single-axis, multi-spindle rotary table, 3-position
 T2 Two-axis multi-spindle rotary table, 2-position
 T3 Two-axis multi-spindle rotary table, 3-position

M-Type Rotary Tables



M2



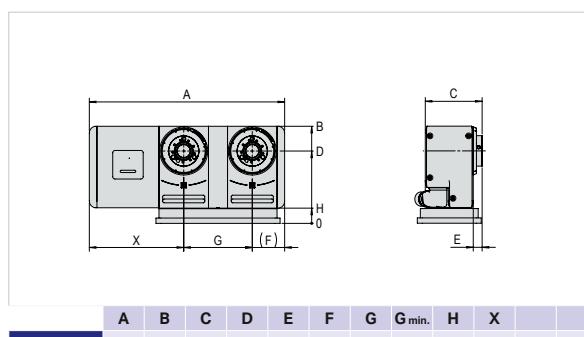
M3

				M2-507	M2-508	M2-510	M2-511	M3-507	M3-508	M3-510	M3-511
Dimensions	Swivel ø		mm	140		180		140		180	
	Spindle distance		mm	140		180		140		180	
	Center height		mm	150		190		150		190	
	Total weight with motor	kg	kg	46	67	70		70	102		
	Center bore	mm	mm	31	34	31		31	34		
Bearing / Clamping	Max. clamping torque		Nm	300	800	600		300	800	600	
	Max spindle load per spindle	with tailstock	kg	2x120	2x60	2x200	2x100	3x80	3x40	3x133	3x67
		without tailstock	kg	2x60	2x30	2x100	2x50	3x40	3x20	3x67	3x33
		Standard load*	kg	2x12	2x7.5	2x27	2x14	3x9	3x6	3x21	3x11
	Max. axial force	per spindle		kN	44	46		44	46		
Gear unit	Max. pull-out torque	per spindle		Nm	1,200	2,000		1,200	2,000		
	Max. moment of inertia	Standard load* J max		kgm²	0.05	0.025	0.2	0.07	0.05	0.025	0.21
				kgm²	0.5	0.25	2	0.7	0.5	0.25	2
	Max. feed torque			Nm	120	70	190	140	120	70	150
	Indexing accuracy Pa **			± arc sec	20/12	17/10		20/12	17/10		
Precision	Repeat accuracy Ps average			± arc sec				2			
	Max speed	with standard load*		min⁻¹	90	170	70	105	70	120	40
	Radial run-out **	on spindle ø, outside & inside		µm				6 / 3			
	Axial concentricity **	at spindle end face		µm				6 / 3			
	Parallelism **	Dividing axis to base		µm/100mm				10 / 5			

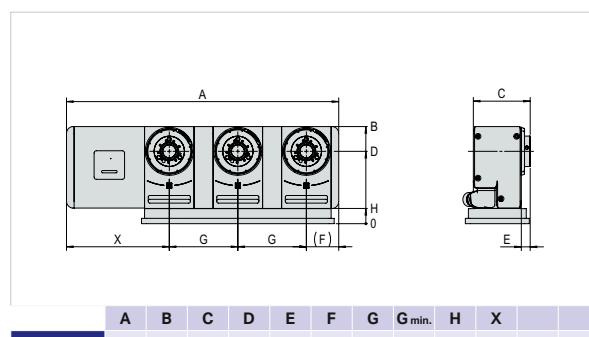
* Maximum values possible mechanically, mutually dependent; for individual drive motor data, see right side

** Standard / increased; for measuring method and validity of the values, please refer to p. 52; for optional angular position measuring system please refer to p. 53

Dimensions

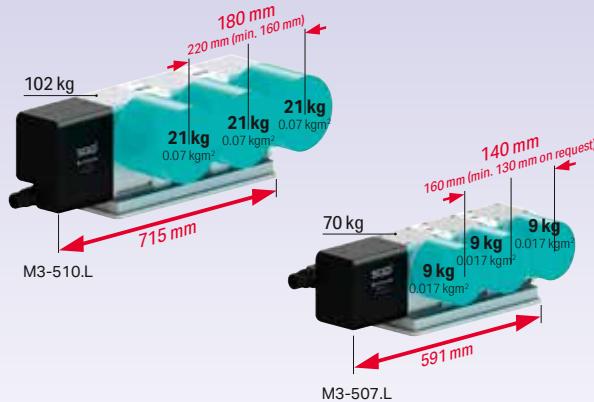
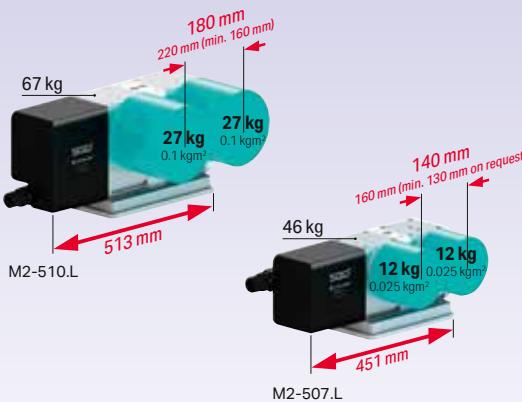


	A	B	C	D	E	F	G	G min.	H	X	
M2-207	451	205	136	150	23	75	140	130	40	236	
M2-510	513	255	150	190	23	85	180	160	40	248	



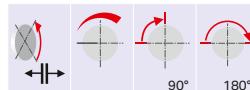
	A	B	C	D	E	F	G	G min.	H	X	
M3-507	591	205	136	150	23	75	140	130	40	236	
M3-510	693	255	150	190	23	85	180	160	40	248	

Dimensions with 508 or 511 identical to 507 and 510.



Drive data

(based on standard load cube shown on pp. 104/105)



	Motors	Feed* [Nm]	Speed [min ⁻¹]	Cycle time*** [sec]
MAVILOR / MOVINOR **	M2-507	BLS-072	120	90 0.32 0.48
	M2-508	BLS-072	70	170 0.27 0.35
	M2-510	BLS-072	190	70 0.32 0.54
	M2-511	BLS-072	140	105 0.25 0.40
	M3-507	BLS-072	120	70 0.34 0.55
	M3-508	BLS-072	70	120 0.27 0.39
	M3-510	BLS-072	150	40 0.48 0.85
FANUC	M3-511	BLS-072	120	50 0.36 0.66
	M2-507	β1 is	65	60 0.37 0.62
	M2-508	β1 is	40	90 0.34 0.50
	M2-510	α2 (HV)is	95	45 0.45 0.78
	M2-511	α2 (HV)is	80	70 0.33 0.55
	M3-507	β1 is	30	30 0.57 1.07
	M3-508	β1 is	30	40 0.48 0.86
YASKAWA SGM7J	M3-510	α2 (HV)is	65	30 0.66 1.16
	M3-511	α2 (HV)is	65	35 0.52 0.95
	M2-507	SGM7J 06	120	65 0.35 0.58
	M2-508	SGM7J 06	70	120 0.23 0.36
	M2-510	SGM7J 08	145	50 0.40 0.70
	M2-511	SGM7J 08	110	90 0.28 0.45
	M3-507	SGM7J 06	120	50 0.39 0.69
YASKAWA SGMJV	M3-508	SGM7J 06	70	95 0.28 0.43
	M3-510	SGM7J 08	105	35 0.54 0.97
	M3-511	SGM7J 08	85	60 0.38 0.63
	M2-507	SGMJV 04	85	50 0.41 0.71
	M2-508	SGMJV 04	65	85 0.31 0.49
	M2-510	SGMJV 08	145	50 0.40 0.70
	M2-511	SGMJV 08	110	90 0.28 0.45
MITSUBISHI 200 V	M3-508	SGMJV 04	50	55 0.39 0.66
	M3-510	SGMJV 08	105	35 0.54 0.97
	M3-511	SGMJV 08	85	60 0.38 0.63
	M2-507	HG56	100	40 0.43 0.81
	M2-508	HG56	70	80 0.29 0.48
	M2-510	HG75	135	45 0.40 0.73
	M2-511	HG75	100	80 0.30 0.49
MITSUBISHI 400 V	M3-507	HG56	75	35 0.48 0.91
	M3-508	HG56	65	65 0.37 0.60
	M3-510	HG75	95	25 0.64 1.24
	M3-511	HG75	80	35 0.48 0.91
	M2-510	HG-H75	135	45 0.40 0.73
	M2-511	HG-H75	100	80 0.30 0.49
	M3-510	HG-H75	95	25 0.64 1.24
SANYO	M3-511	HG-H75	80	35 0.48 0.91
	M2-507	R2Ax 06040	95	55 0.37 0.64
	M2-508	R2Ax 06040	70	100 0.30 0.45
	M2-510	R2Ax 08075	145	50 0.39 0.69
	M2-511	R2Ax 08075	135	90 0.28 0.45
	M3-507	R2Ax 06040	70	40 0.48 0.85
	M3-508	R2Ax 06040	60	65 0.35 0.58
	M3-510	R2Ax 08075	110	35 0.54 0.97
	M3-511	R2Ax 08075	120	60 0.35 0.60

* at 1 rpm; for more, please refer to p. 110

** for Siemens / Heidenhain

*** without clamping; for times, please refer to p. 114

For calculation of load, forces and torques, please see p. 106

Important information

- The limit values as set out in the corresponding parameter list take precedence over the data and information provided in the main catalog (due to motor, drive enhancement and the respective machine CNC)
- Motor-dependent data are optimum values at operating temperature
- Further details are available at www.lehmann-rotary-tables.com, under Download / Commissioning



Labyrinth seal
(cutaway view)

Recommended for:
+ grinding operations
+ high coolant pressures
+ extremely fine abrasive particles

Accessories

Motor, cable, angular position measuring system and pL CNC starting at p. 58. Accessories starting at p. 46

Options

Item no.	Description
GET.5xx-GEN	Increased gear precision ¹⁾
GEO.5xx-GEN	Incr. geometric precision, ½ standard tolerance
SPI.5xx-Lab-x2²⁾	Spindle seal with labyrinth, integrated sealing air pressure control
SPI.5xx-Lab-x3²⁾	Spindle seal with labyrinth, integrated sealing air pressure control

1) incl. increased radial and axial run-out 0.003 mm

2) for 507/510: HSK and ripas clamping not possible manually, GET.5xx-GEN and GEO.5xx-GEN only partly possible (increased radial and axial run-out cannot always be reached)

Item no.

M2-510.L-F1	Motor	F1=Fanuc is (200V), F2=Fanuc HVis (400V), M1=Movinor/Mavilor ERN, M2=Movinor/Mavilor EQN 1125, M3= Movinor/Mavilor EQN 1135, M13= Mitsubishi 200V, M14 Mitsubishi 400V, S2=Sanyo, Y2=Yaskawa SGMJV/SGMEV, Y4=Yaskawa SGM7J
	Dividing axis motor position	L=left, R=right
	Dividing axis size	507, 508, 510, 511
	Rotary table model	

Overview

Rotary tables

SPZ, DDF, WMS,
indexing accuracy

Aligning,
GLA, RST

MOT, KAB, CNC

Workpiece
clamping system

Technology & service

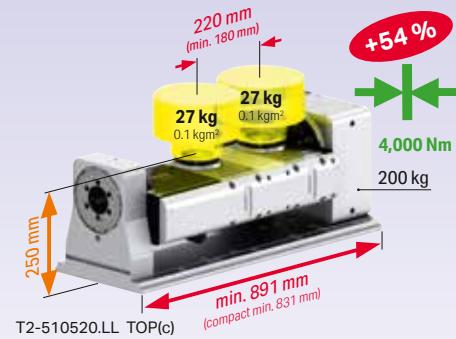
T2...T3-Type Rotary Tables **TOP**



T2



T3



4,000 Nm
200 kg

Overview

Rotary tables

Applications & Facts

SPZ, DDF, WMS, indexing accuracy

Aligning, GLA, RST

MOT, KAB, CNC

Workpiece clamping system

Technology & service

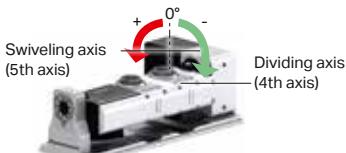
			T2-507510 (508510) TOP1.2(s)	T2-510520 (511520) TOP2.2(s)	T3-507510 (508510) TOP1.3(s)	T3-510520 (511520) TOP2.3(s)	
Dimensions	Swivel ø	mm	160	220	160	220	
	Spindle distance	mm	160	220	160	220	
	Center height	mm	190	220	190	220	
	Total weight with motor	kg	116	186	151	236	
	Center bore	mm	31	34	31	34	
Bearing / Clamping	Max. clamping torque	4th axis 5th axis	Nm Nm	300 1,100	800 (600) 2,600	300 1,100	800 (600) 2,600
	Max spindle load per spindle	0°-30° 30°-90°	kg kg	2x40 2x27	2x67 2x45	3x27 3x18	3x44 3x30
	Standard load ¹⁾	kg	2x12 (2x7.5)	2x27 (2x14)	3x9 (3x6)	3x21 (3x11)	
	Max. axial force	4. axis per spindle	kN	12	20	12	20
	Max. pull-out torque	4th axis 5th axis	Nm Nm	1,200 2,000	2,000 3,900	1,200 2,000	2,000 3,900
	Max. moment of inertia	Standard load ¹⁾ J max	kgm ² kgm ²	0.05 (0.025) 0.5 (0.25)	0.2 (0.07) 2 (0.7)	0.05 (0.025) 0.5 (0.25)	0.21 (0.07) 2 (0.7)
	Feed torque max ³⁾	4th axis 5th axis	Nm Nm	120 (70) 230	190 (140) 440	120 (70) 230	150 (120) 440
Gear unit	Gear unit loading 5th axis	without load with standard load	Nm Nm	-20 18 (16)	-33 30 (8)	-22 22 (20)	-45 25 (13)
	M max	Nm	250	440	250	440	
	Indexing accuracy Pa	4th axis ²⁾ 5th axis (90°) ⁴⁾	± arc sec ± arc sec	20/12 45/20 (45/29)	17/10 26/22 (26/15)	20/12 56/28 (56/30)	17/10 30/20 (30/18)
	Repeat accuracy Ps average	4th axis 5th axis	± arc sec ± arc sec		2 2		
	Max speed at standard load	4th axis ¹⁾ 5th axis ¹⁾	rpm rpm	90 (170) 60	70 (105) 40	70 (120) 60	40 (50) 40
Precision	Radial run-out ²⁾	on spindle ø	µm		6 / 3		
	Axial run-out ²⁾	at spindle end face	µm		6 / 3		
	Parallelism ²⁾	Spindle to base	µm/100mm		10 / 5		

¹⁾ Mutually dependent; for individual drive motor data, see right side

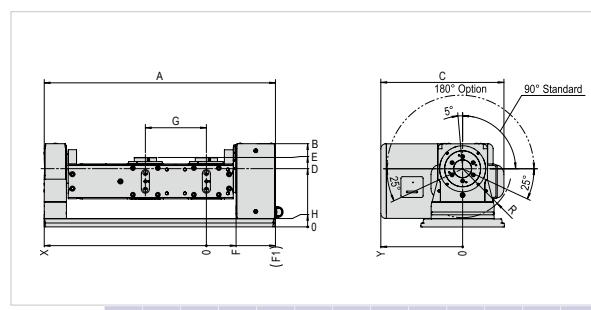
²⁾ Standard / increased; for measuring method and validity of the values, please refer to **p. 52**; for optional angular position measuring system please refer to **p. 53**

³⁾ Limit value for gear unit, at 1 rpm

⁴⁾ without load / with standard load 0°-90°



Dimensions

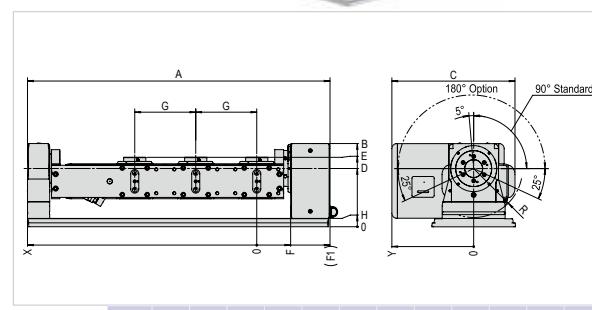


	A	B	C	D	E	F	F1	G	G2*	H	R	X	Y
T2-507510	766	245	382	180	226	151	230	160	130	30	136	489	248
T2-510520	931	300	469	210	250	182	264	220	180	30	177	571	295

Dimensions with 508 or 511 identical to 507510 and 510520.

* Minimum possible spindle distance (option)

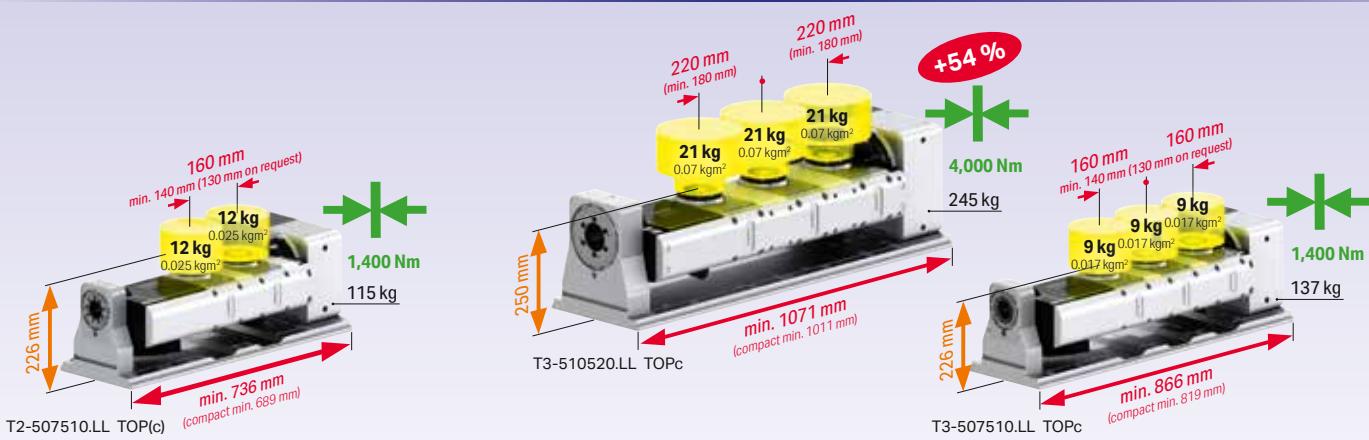
Compact versions: Dimension A, F and X
507510: 47 mm shorter, 510520: 60 mm shorter



	A	B	C	D	E	F	F1	G	G2*	H	R	X	Y
T3-507510	896	245	382	180	226	151	230	160	130	30	136	658	248
T3-510520	1111	300	469	210	250	182	264	220	180	30	177	791	295

Raised center height (option): Depending on the accessories involved (clamping cylinder, rotary union, angular position measuring system...), a center height increase (dimension D) is required. (See page for respective accessory)

Item no. as for TOP. Instead of «T1», however, «T2» or «T3».



Drive data

(based on standard load cube shown on pp. 104/105)



	Motors 4th/5th	Feed* [Nm]		Speed [rpm]		Cycle time*** [sec]		90°	180°
		4.	5.	4.	5.	4.	5.		
MAVILOR/MOVINOR **									
T2-507510	BLS-072/BLS-072	120	230	90	60	0.32	0.44	0.48	0.69
T2-508510	BLS-072/BLS-072	70	230	170	60	0.27	0.44	0.35	0.69
T2-510520	BLS-072/BLS-073	190	425	80	45	0.32	0.54	0.54	0.87
T2-510520	BLS-072/LN-098	190	440	80	40	0.32	0.52	0.54	0.89
T2-511520	BLS-072/BLS-073	140	425	105	45	0.25	0.54	0.40	0.87
T2-511520	BLS-072/LN-098	140	440	105	40	0.25	0.52	0.40	0.89
T3-507510	BLS-072/BLS-072	120	230	70	60	0.34	0.50	0.55	0.75
T3-508510	BLS-072/BLS-072	70	230	120	60	0.27	0.50	0.39	0.75
T3-510520	BLS-072/BLS-073	150	425	40	40	0.48	0.57	0.85	0.94
T3-510520	BLS-072/LN-098	150	440	40	40	0.48	0.54	0.85	0.92
T3-511520	BLS-072/BLS-073	120	425	50	40	0.36	0.57	0.66	0.94
T3-511520	BLS-072/LN-098	120	440	50	40	0.36	0.54	0.66	0.92
FANUC									
T2-507510	β_1 is/ α_2 (HV)is	65	110	60	40	0.37	0.61	0.62	0.98
T2-508510	β_1 is/ α_2 (HV)is	40	110	90	40	0.34	0.61	0.50	0.98
T2-510520	α_2 (HV)is/ α_2 (HV)is	95	195	45	28	0.45	0.69	0.78	1.23
T2-510520	α_2 (HV)is/ α_4 (HV)is	95	335	45	30	0.45	0.66	0.78	1.16
T2-511520	α_2 (HV)is/ α_2 (HV)is	80	195	70	28	0.33	0.69	0.55	1.23
T2-511520	α_2 (HV)is/ α_4 (HV)is	80	335	70	30	0.33	0.66	0.55	1.16
T3-507510	β_1 is/ α_2 (HV)is	30	110	30	40	0.57	0.69	1.07	1.06
T3-510520	α_2 (HV)is/ α_2 (HV)is	65	195	30	27	0.66	0.74	1.16	1.29
T3-510520	α_2 (HV)is/ α_4 (HV)is	65	335	30	29	0.66	0.68	1.16	1.19
YASKAWA SGM7J									
T2-507510	SGM7J 06/08	120	180	65	55	0.35	0.48	0.58	0.75
T2-508510	SGM7J 06/08	70	180	120	55	0.23	0.48	0.36	0.75
T2-510520	SGM7J 08/08	145	315	50	38	0.40	0.56	0.70	0.95
T2-511520	SGM7J 08/08	110	315	90	38	0.28	0.56	0.45	0.95
T3-507510	SGM7J 06/08	120	180	50	50	0.39	0.52	0.69	0.82
T3-508510	SGM7J 06/08	70	180	95	50	0.28	0.52	0.43	0.82
T3-510520	SGM7J 08/08	105	315	35	35	0.54	0.61	0.97	1.03
T3-511520	SGM7J 08/08	85	315	60	35	0.38	0.61	0.63	1.03
MITSUBI. 200V									
T2-507510	HG56/75	100	170	40	45	0.43	0.51	0.81	0.85
T2-508510	HG56/75	70	170	80	45	0.29	0.51	0.48	0.85
T2-510520	HG75/105	135	430	45	30	0.40	0.63	0.73	1.13
T2-511520	HG75/105	100	430	80	30	0.30	0.63	0.49	1.13
T3-507510	HG56/75	75	170	35	40	0.48	0.57	0.91	0.94
T3-508510	HG56/75	65	170	65	40	0.37	0.57	0.60	0.94
T3-510520	HG75/105	95	430	25	30	0.64	0.64	1.24	1.14
T3-511520	HG75/105	80	430	35	30	0.48	0.64	0.91	1.14
T2-507510	R2Ax 06040/08075	95	185	55	55	0.37	0.48	0.64	0.75
T2-508510	R2Ax 06040/08075	70	185	100	55	0.30	0.48	0.45	0.75
T2-510520	R2Ax 08075/08075	145	245	50	40	0.39	0.57	0.69	0.94
T2-511520	R2Ax 08075/08075	135	245	90	40	0.28	0.57	0.45	0.94
T3-507510	R2Ax 06040/08075	70	185	40	50	0.48	0.52	0.85	0.82
T3-508510	R2Ax 06040/08075	60	185	65	50	0.35	0.52	0.58	0.85
T3-510520	R2Ax 08075/08075	110	245	35	35	0.54	0.61	0.97	1.03
T3-511520	R2Ax 08075/08075	120	245	60	35	0.35	0.61	0.60	1.03

* At 1 rpm; for more, please refer to p. 110

** Without clamping; for times, please refer to p. 114

** for Siemens / Heidenhain

For calculation of load, forces and torques, please see p. 106

Important information

- The limit values as set out in the corresponding parameter list take precedence over the data and information provided in the main catalog (due to motor, drive enhancement and the respective machine CNC)
- Motor-dependent data are optimum values at operating temperature
- Further details are available at www.lehmann-rotary-tables.com, under Download / Commissioning



Labyrinth seal (cutaway view)

Recommended for:
+ grinding operations
+ high coolant pressures
+ extremely fine abrasive particles

Accessories

Motor, cable, angular position measuring system and pL CNC starting at p. 58.

Accessories starting at p. 46

Options

Item no.	Description
GEO.5xx-GEN	Incr. geometric precision, $\frac{1}{2}$ standard tolerance
SPI.5xx-Lab ¹⁾	Spindle seal with labyrinth, integrated sealing air pressure control
SPI.5xx-Lab-x2 ¹⁾	Spindle seal with labyrinth, integrated sealing air pressure control, for 2 spindles
SPI.5xx-Lab-x3 ¹⁾	Spindle seal with labyrinth, integrated sealing air pressure control, for 3 spindles
SWB.510-180	Tilting range max. 230°; set to 180°
SWB.520-180	Tilting range max. 230°; set to 180°

¹⁾ for 507/510: HSK and ripas clamping not possible manually, GET.5xx-GEN and GEO.5xx-GEN only partly possible (increased radial and axial run-out cannot always be reached)

Suitable alignment elements

Item no.	Designation	Slot width
AUR.iX-12		12g6
AUR.iX-14	Alignment pin lineFIX,	14g6
AUR.iX-16	1 pair	16g6
AUR.iX-18		18g6

For lineFIX, refer to p. 54

Overview

Rotary tables

Aligning, GLA, RST

Technology & service

MOT, KAB, CNC

Workpiece clamping system

Interesting applications for increasing productivity

Provided on GF+ Machining Solutions, Akira Seiki, Almac, Amada Machine, AMS, AWEA, BFW, Blohm Jung, Bridgeport (Hardinge), Brother Milling, Chevalier, Chiron, DMG MORI, Doosan, Emco Famup, Fanuc Robodrill, Finepart, Feeler, Haas Automation, Hartford, Hasegawa, Hedelius, Hurco, Huron, Hwacheon, Hyundai WIA, ICON, Kitamura, Kondia, Leadwell, Makino, MAS, Mazak, Microlution, Mikron, Moore Tool, MT Rent, Okuma, POSmill (Microcut), Quaser, Sauer (DMG MORI), Spinner, Stama, TongTai, Toyoda, Unitech, Willemin-Macodel, XYZ, YCM

Overview
Rotary tables
Applications & Facts
SPZ, DDF, WMS, indexing accuracy
Aligning, GLA, RST
MOT, KAB, CNC
Workpiece clamping system
Technology & service



TF-510520 – Milling/boring – Mechanics



T1-520520 – Milling/boring – Mechanics



T1-507510 – Milling/boring – Automotive



EA-510 rotoFIX – Milling/boring – Automotive



T2-507510 – Milling/boring – Automotive



T1-520520 – Milling/boring – Mechanics



EA-510 – Grinding – built-in – several industries



T1-520520 – Grinding – Aerospace/Turbines



EA-510 – Grinding – Mechanics



TF-507510 – Milling/boring – Medical technology



TF-507510 – Milling/boring – Watches/Micro Technology



TF-507510 – Milling/boring – Dental Technology

Additional interesting examples of applications can be found on our website www.lehmann-rotary-tables.com in the Download / Applications area



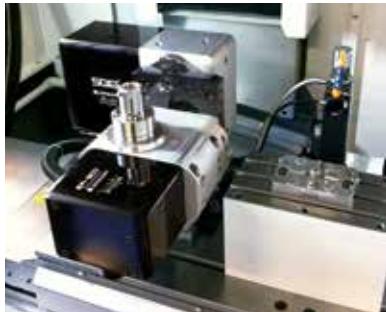
M2-510 – Milling/boring – Automotive



EA-510 – Milling/boring – Automotive



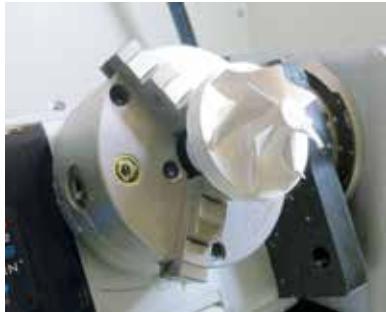
TF-507507 – Milling/boring – Dental Technology

TF-507510 – Milling/boring – Watches/
Micro Technology

EA-510 rotoFIX – Milling/boring – Mechanics



EA-510 rotoFIX – Milling/boring – Mechanics



T1-510520 – Milling/boring – Mechanics



T3-510520 – Milling/boring – Automotive



T1-507510 – Waterjet drilling – Aerospace/Turbines



EA-510 longFLEX – Milling/boring on horizontal center – Mechanics



EA-520 – Milling/boring – Mechanics



T1-510520 – Grinding – Aerospace/Turbines

Overview

Rotary tables

Applications & Facts

SPZ, DDF, WMS,
indexing accuracyAligning,
GLA, RST

MOT, KAB, CNC

Workpiece
clamping systemTechnology &
service

Benefits for the...

OEM ...OEMs themselves (manufacturer, importer)

USE ...users and OEM application technicians

best of

Benchmark features (average values) in relation to ...

5 ... 5 axis machines

GD ... other gear unit rotary tables up to ø400 mm

best of

DD ... Direct drives up to ø250 mm

best of

... ... not applicable

All % values and color notes are according to pL-Benchmark 2015 with a total of 16 machines



OEM USE | GD DD

5

5 Axis Processing

- + Simultaneous or positioning mode
- + For CNC control systems from Siemens, Fanuc, Heidenhain, Brother, Haas, Mitsubishi, Hurco, Mazak
- + Can be used worldwide in pure positioning mode without restrictions due to the export control



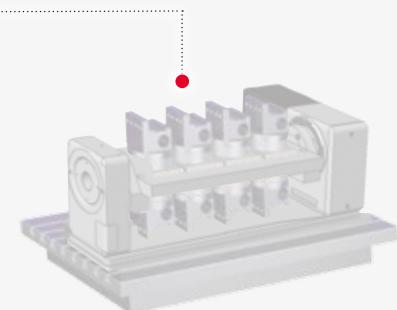
OEM USE | GD DD

5

Multi-part processing

not possible

- + Highly productive parts manufacturing with clamping bridge and counter bearing
- + Manual or automatic workpiece change
- + Can be used on 4th axis as well as 4th/5th. axes
- + Easy to retrofit



OEM USE | GD DD

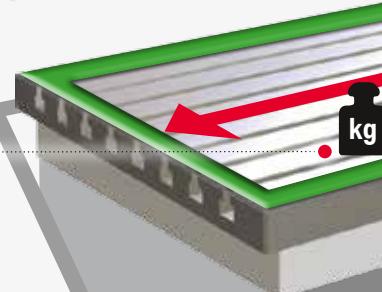
5

+257 %

best of

Table load

- + Significantly more reserves for heavy devices and additional clamping devices, without overloading the machine



OEM USE | GD DD

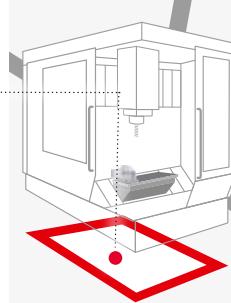
5

- 40 %

Machine floor space

- + 5 machines on a floor space for 3

- + 67% higher productivity per m²



Market studies show major productivity gain in various industries with 3 + 2 concepts – at significantly lower costs

Efficient manufacturing of workpieces ... to Ø350 mm / 150 kg (positioning) or Ø150 mm/34 kg (simultaneous) with workpiece precision of 0.01 ... 0.002 mm per 100 mm spatial diagonal. (For more information and our conditions see pp. 114/115)

Section	OEM	USE	GD	DD	Rating	Value
Low projecting edge					5	-52 %
C axis perm. load					5	-12 %
Work table surface					5	+94 %
Floor load					5	-30 %

Benefits for the...

OEM ...OEMs themselves (manufacturer, importer)

USE ...users and OEM application technicians

best of

Benchmark features (average values) in relation to ...

5 ... 5 axis machines

GD ... other gear unit rotary tables up to ø400 mm

best of

DD ... Direct drives up to ø250 mm

best of

... ... not applicable

All % values and color notes are according to pL-Benchmark 2015 with a total of 129 rotary tables from renowned manufacturers

OEM

USE

5

GD

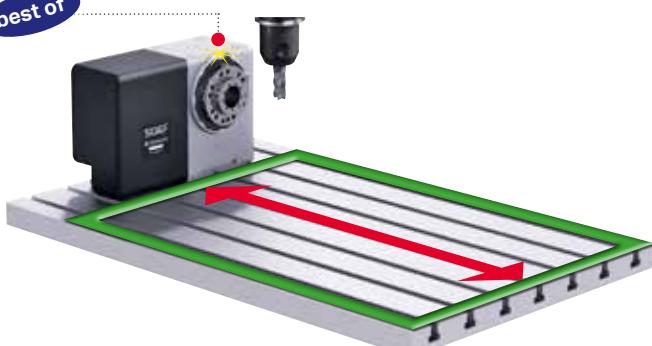
DD

Low projecting edge

- 40 % **- 41 %**

best of

- + Very good accessibility across the axis (from the top)
- + Cutting tools clamped very quickly: Maximum service life, milling performance and surface quality
- + Good use of and accessibility to cutting wheel (surface grinding machines)



OEM

USE

5

GD

DD

Space requirement

- 27 % **- 23 %**

best of

- + More machine table space available
- + Machining more than one part in one processing cycle extends the unattended machining time
- + Larger or more than one workpiece machined on one machine – lower overall investment on less floor space
- + Entire table surface can be used when rotary table is removed



OEM

USE

5

GD

DD

Weight

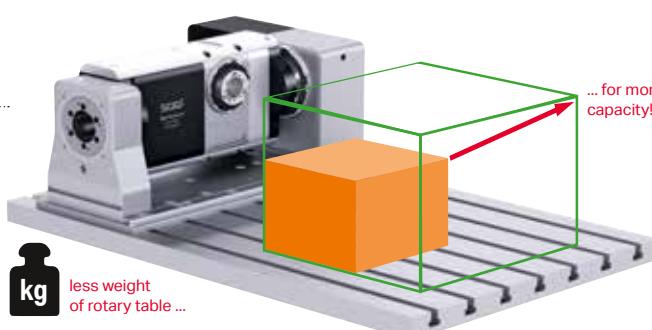
- 41 % **- 50 %**



less weight
of rotary table ...

... for more load
capacity!

- + Significantly more reserves for heavy devices and additional clamping devices, without overloading the machine
- + Or smaller machines for the same processing



Extremely compact with comparable or better performance. Standardized interface in front and rear: maximum universality

Spindle accessories in rear

- + Rotary unions **up to 250 bar**
- + Clamping cylinder **23 kN at 120 bar**
- + Angular position measuring systems **as precise as ± 1 arcsec**



Tailstock and counter bearing

- + manual, pneumatic and hydraulic tailstocks
- + hydraulically clamped counter bearing, very compact (no hydraulic unit required, supplied directly by rotary table)



Spindle accessories in front



Medium transfer dividing axis

- + No uncontrolled moving hydraulic hoses
- + Robust tubing
- + Available for T1...T4 and for rotoFIX



Overview

Rotary tables

Applications & Facts

SPZ, DDF, WMS, indexing accuracy

Aligning, GLA, RST

MOT, KAB, CNC

Workpiece clamping system

Technology & service

Rotary Table in Use

Benefits for the...

OEM ...OEMs themselves (manufacturer, importer)

USE ...users and OEM application technicians

best of

Benchmark features (average values) in relation to ...

5 ... 5 axis machines

GD ... other gear unit rotary tables up to ø400 mm

best of

DD ... Direct drives up to ø250 mm

best of

... ... not applicable

All % values and color notes are according to pL-Benchmark 2015 with a total of 129 rotary tables from renowned manufacturers.
All criteria is based on the max. achievable limits

Overview

Rotary tables

Applications & Facts
SPZ, DDF, WMS,
indexing accuracy

Aligning,
GLA, RST

MOT, KAB, CNC

Workpiece
clamping system

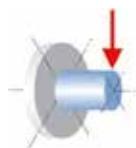
Technology & service

Pull-out torque

+ 147 % + 233 %

best of

- + Withstands high machining forces?
(e.g. during drilling)

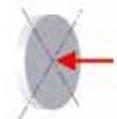


Axial force

+ 324 % not available

best of

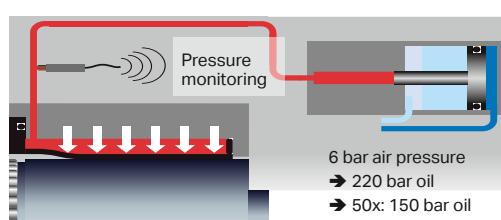
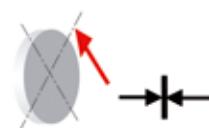
- + Withstands very high compressive and tensile forces



Clamping torque

+ 115 % + 236 %

- + Ultra-fast, monitored, strong, only 6 bar air pressure



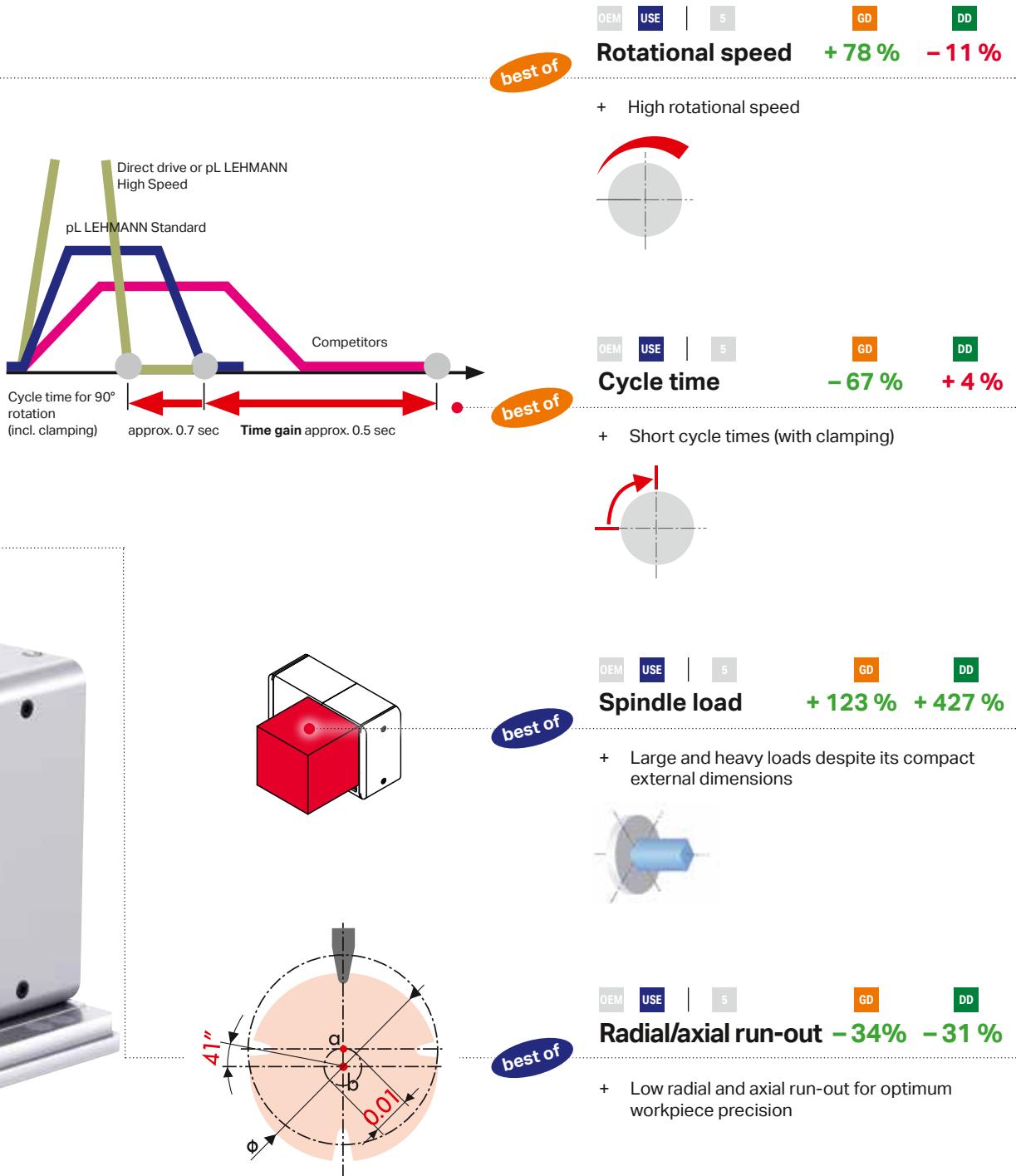
Fully integrated BRAKY pressure intensifier



PGD* Advantages as Compared to Direct Drives (DD) at a glance

1. One rotary table for everything: Standard or high speed, for CNCs from Siemens, Heidenhain, Fanuc...
2. No cooling unit needed
3. No safety brake
4. Smaller drive enhancements
5. Lower electrical power consumption
6. Easier commissioning and drive tuning

*For more information, please refer to p. 40



Overview

Rotary tables

Applications & Facts

SPZ, DDF, WMS, indexing accuracy

Aligning, GLA, RST

MOT, KAB, CNC

Workpiece clamping system

Technology & service

Functional design, good chip and coolant flow,
service-friendly

Transport and bleeding holes

- + Screw holes for transport
- + Easily accessible bleeding holes for oil bath and spindle clamping system

Drive motor

- + One single housing (2 lengths) for all motors: Fanuc, Mavilor (Siemens, Heidenhain), Yaskawa, Sanyo, Meldas/Mitsubishi
- + Motors are easy to replace

USB slot

- + Fast, simple data output for evaluation on a PC in case of malfunction
- + Licensing possibility with registration code via USB stick (OEM feature)
- + Fully sealed, placed in well protected location
- + PC connection for remote diagnostics

Wire guide

- + Wire guide up to 150° (in different directions) swiveling and can be fixed
- + Circlip for quick change in the event of a malfunction
- + All wires and hoses plugged into the motor housing

Connector interfaces

- + Standardized, fully wired, available for many different machines
- + Wide range of lengths and connectors



Productivity and availability increase,
downtime and maintenance costs decrease



NEW
Bluetooth®, Ethernet,
web server



Tightness IP 67 (IP 68)

- + Fully sealed motor compartment IP67 (optional IP 68)
- + Prevents damage to motor, wiring, connectors, etc.

PL-iBox – for real industry 4.0

unique

Helps to increase productivity and availability, lower downtime and maintenance costs and permits quick troubleshooting and preventive maintenance.

Sensors for ...

- + Speed
- + Internal pressure
- + Temperature
- + Humidity
- + Shock / impact
- + Limit value exceeded with real-time stamp

New features with version 4.3

Components

- + Faster microprocessor
- + 3D acceleration sensor (previously 2D) – shock sensor

Monitoring

- + Duty cycle limit – overload protection, prevents motor and gear unit damage

Interfaces

- + Bluetooth – set parameters and read out data via smartphone and app
- + Web server with Ethernet and RJ45 port – display state/error on CNC
- + Input for current sensor

Compatibility

- + 100% backwards-compatible – starting at Edition 2

Prepared for options

- + External WLAN- or GSM module
- + External, better vibration sensor with additional DSP
- + E-mail notification, e.g. of error messages

For details, please refer to p. 100/101

Overview

Rotary tables

Applications & Facts

SPZ, DDF, WMS,
indexing accuracy

Aligning,
GLA, RST

MOT, KAB, CNC

Workpiece
clamping system

Technology & service

PGD – The preloaded gear unit, permanently backlash-free, wear-resistant: requirements for simultaneous machining and maintenance-free use in production

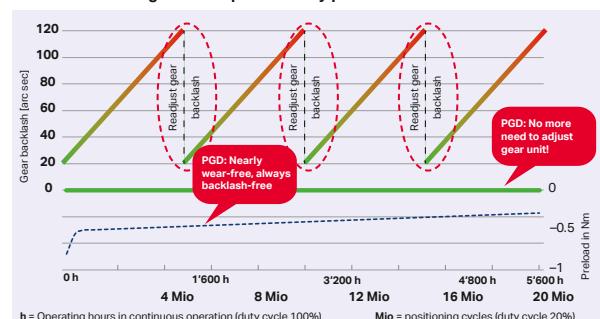
PGD (Preloaded Gear Drive)

- + Strong gear teeth
- + Wheel and worm gear made of steel, surface hardened and ground, runs in an oil bath
- + Worm gear with 4-way backlash-free mount
- + Permanently backlash-free preloaded
- + High long-term precision, virtually wear-free
- + High impact resistance
- + Up to 20,000 h or 20 million* 90° positionings
- + Easy to adjust, if ever necessary
- + For smaller machining tasks*** no clamping necessary (time savings)
- + 5,000 h highly dynamic simultaneous processing*

* Based on long-term tests of more than 20,000 h with over 23 million 90° cycles; valid under appropriate use; the limit reached first is valid

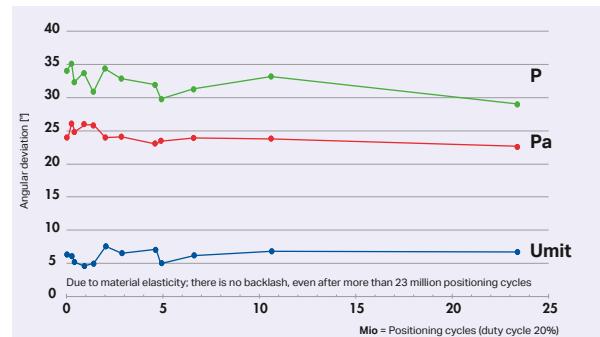
** Possible torque per characteristic curve for 100% duty cycle at 1 rpm; please refer to p. 110 – 113

Maintenance free gear unit – permanently preloaded



All values based on internal testing using standard load and catalog values (speed, cycle time). Duty cycle as defined on p. 124

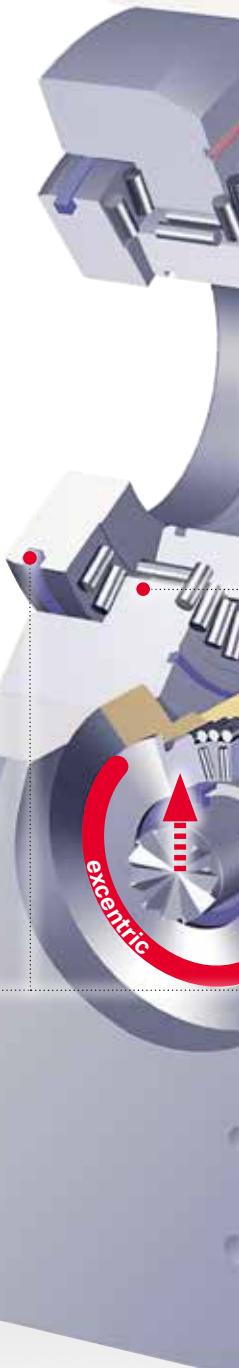
Consistent accuracy – even after more than 23 million positioning cycles



Realistic measurements according to VDI / DGQ 3441 or ISO 230-2: changes in the scope of the measuring uncertainty.

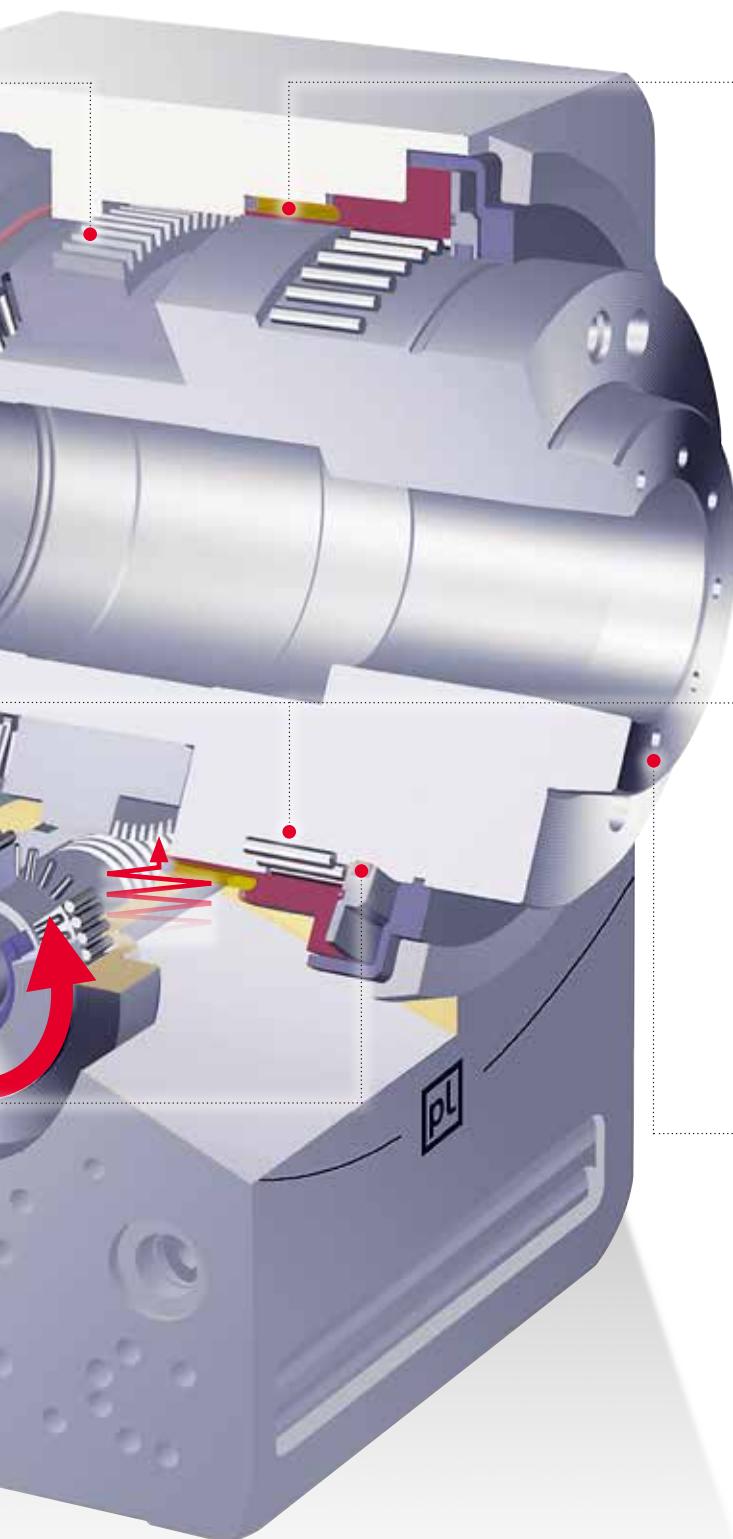
Tightness IP 67 (IP 68)

- + All models are fully sealed
- + Spindle housing with pressurized oil lubrication system
- + Additional spindle labyrinth seal (optional) for use with high-pressure coolant (e.g.. production grinding) and aggressive materials such as glass, graphite, ceramic, etc.



PGD* Advantages as Compared to Direct Drives (DD) at a glance

1. One rotary table for everything: Standard or high speed, for CNCs from Siemens, Heidenhain, Fanuc...
2. No cooling unit needed
3. No safety brake
4. Smaller drive enhancements
5. Lower electrical power consumption
6. Easier commissioning and drive tuning



Spindle clamping

- + Expansion chuck principle
- + 6 bar air pressure, integrated pressure intensifier
- + Clamping with largest spindle diameter and close to the workpiece
- + Very fast acting, 360° simultaneously
- + Integrated pressure sensors for optimum monitoring (microprocessor-controlled)
- + Long service life
- + Consistent clamping force throughout the entire service life

Spindle bearing

- + 4x play-free fitted, large precision roller bearings
- + Long distance between the radial bearings provides for high spindle rigidity
- + All bearing points run in oil baths
- + Good gear unit efficiency ratio (up to 60 %)

Spindle

- + Steel, hardened and ground
- + Radial and axial run-out 6 µm (optional to 2 µm)
- + Universal interface with HSK cone and / or short cone KK (both according to DIN)
- + Accessories for manual or automatic HSK/ISO clamping, various collet systems, faceplates and jaw chucks, palletising systems, rotary unions and clamping cylinders...

Overview

Rotary tables

Applications & Facts

SPZ, DDF, WMS, indexing accuracy

Aligning, GLA, RST

MOT, KAB, CNC

Workpiece clamping system

Technology & service

High value retention: can be modified at any time,
only 4 sizes ø100 – 500 mm – over 290 standard
configurations

	Overview
	Rotary tables
	Applications & Facts
	SPZ, DDF, WMS, indexing accuracy
	Aligning, GLA, RST
	MOT, KAB, CNC
	Workpiece clamping system
	Technology & service

EA → TF TIP



Diversity of products

unique

- + Wide range of applications for each size
- + Lower storage costs, also in the service (spare parts)
- + Increased sales and service productivity

EA → EA with rotoFIX



EA → EA with longFLEX



Standard machine in stock, available at short notice,
equipped with matching rotary table

Highest level of flexibility

unique

- + Rotary table is readily available and can be converted by the OEM
- + If the needs change, the investment is not lost
- + Pay in installments: First, the machine later the rotary table - can be retrofitted at any time

TF TIP → T1 TAP



TF TIP → T1 TOP



T1 TAP → T1 TOP



Overview

Rotary tables

Applications & Facts

SPZ, DDF, WMS,
indexing accuracy

Aligning,
GLA, RST

MOT, KAB, CNC

Workpiece
clamping system

Technology & service

1. Very space-saving, as integrated completely into the spindle
2. Set up workpieces during machine operation – change quickly

For ordering information, please refer to p. 70

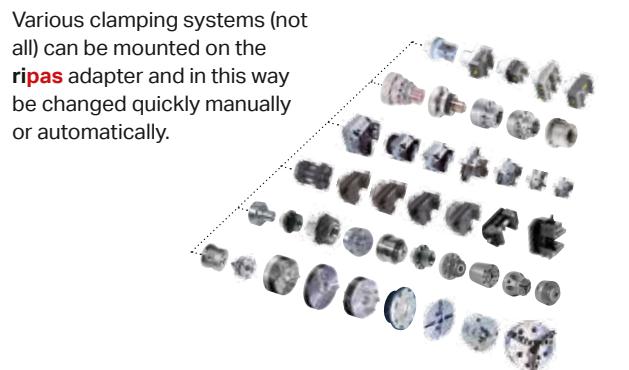
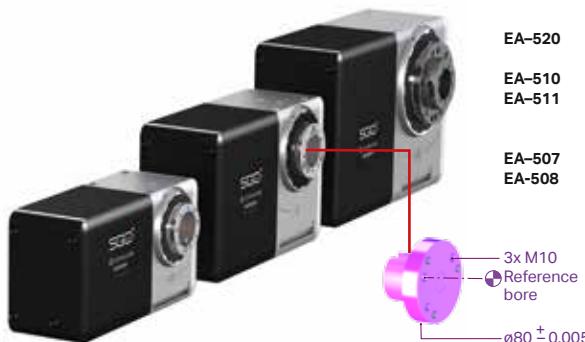


EA-507 with ripas auto and ripas adapter

① ripas can be retrofitted and adapted to many other systems

pL LEHMANN rotary tables have a universal, standard spindle mount. This permits retrofitting of many different tool holder systems.

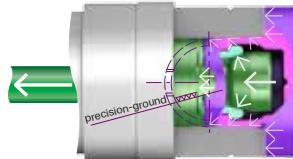
ripas can be retrofitted at any time.



Various clamping systems (not all) can be mounted on the ripas adapter and in this way be changed quickly manually or automatically.

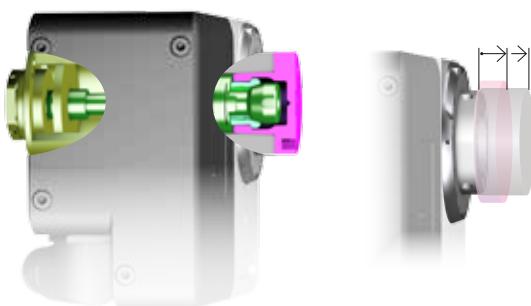
② The ripas zero point clamping system for automated manufacturing on standard interface HSK-A63

Fully integrated into the spindle!



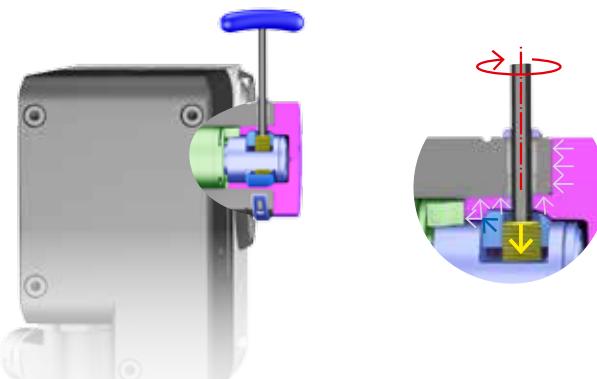
Unique features of the HSK-A63 mount

The pressure in the taper in conjunction with simultaneous face contact creates high static and dynamic rigidity. Also with ripas: on adapter with precision-ground grooves and spring-action, ground positioning cams in the mount for highly precise angular positioning. Guide pins for clear initial positioning.



ripas automatic clamping

With a hydraulically actuated clamping cylinder. This allows a pulling force of up to 30 kN (at 50 bar). Angular positioning accuracy: ± 4 sec.



Other zero point clamping systems

Other chucks usually add 40 to 60 mm. ripas is fully integrated.

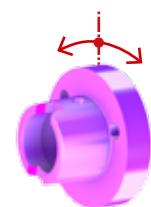
ripas manual clamping

With a few turns, the manual ripas adapter sits on the spindle very precisely and securely. You can also enjoy all HSK benefits of ripas adapters with the manual solution. Holding force of 30 kN at a tightening torque of 20 Nm. Angular positioning accuracy: ± 8 sec.

3. High repeat accuracy and rigidity
4. Can be retrofitted and automated



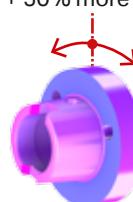
③ The ripas HSK standard interface in three versions



ripas HSK adapter - Standard

Bore for initial positioning and precision-ground positioning groove. Transmitted torque of up to approx. 300 Nm.

+ 50% more torque



ripas HSK adapter - Grip

additionally with face coating for major improvement in slip-free torque transmission. Transmitted torque of up to approx. 450 Nm.



Standard HSK adapter

for precision to Standard DIN 69893 Form A. Transmitted torque of up to approx. 300 Nm (no exact angular positioning).

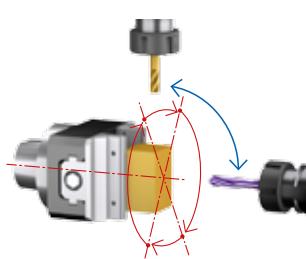


Each HSK spindle can be retrofitted: CAPTO interface, hand- or hydraulic-operated. Details on demand.

④ With ripas step by step to automation

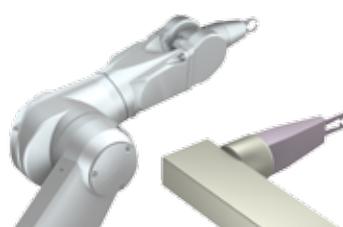
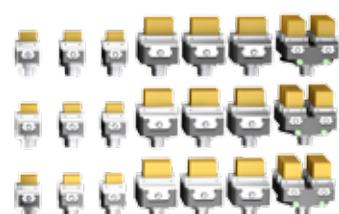


ripas table chuck for machining the 6th side, for example, or suitable for use as set-up station (manual).



Workpiece pool

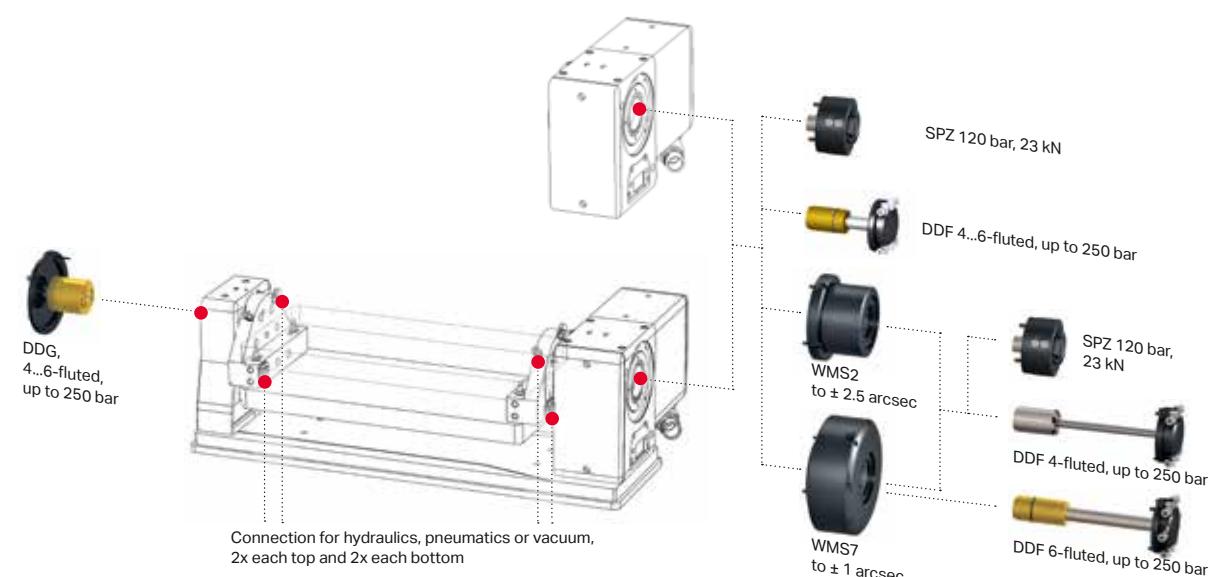
Different palletized workpieces, prepared for automatic manufacturing.



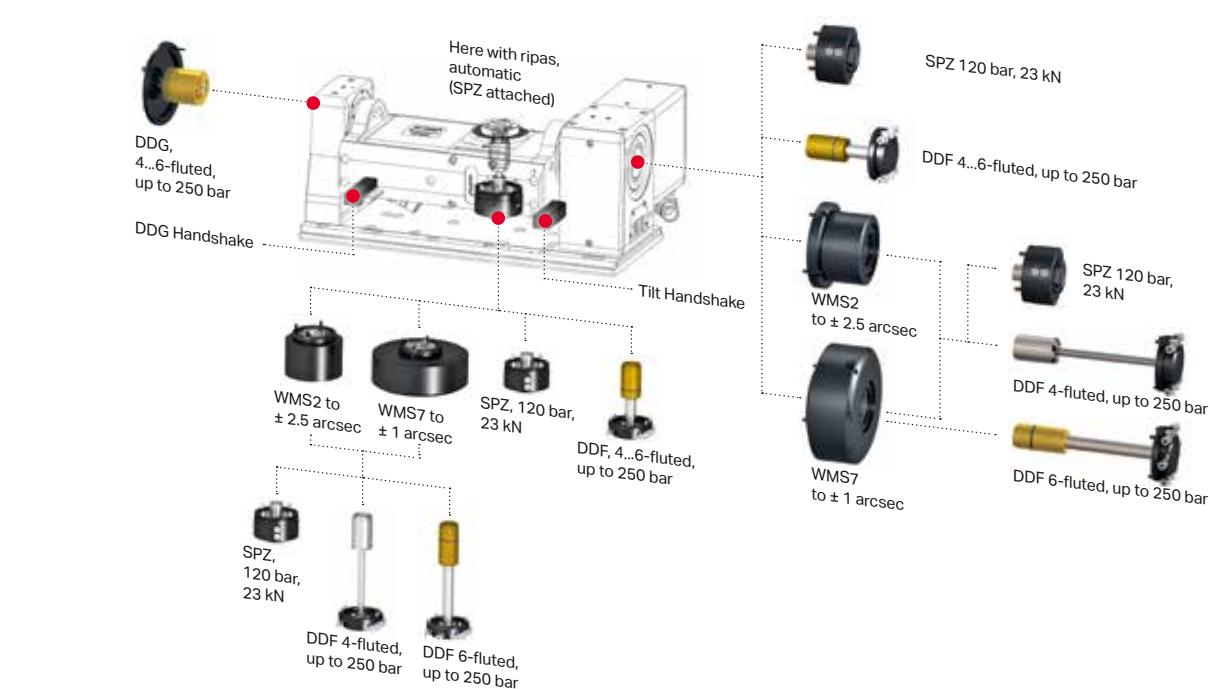
Complete multi-side machining with commercially available HSK adapters or ripas adapters. With automatic loading by robot or part handling systems.

1. Positioning accuracy to ± 1 arcsec
2. Up to 12 channels on dividing axis or clamping yoke
3. Medium: Oil, air or vacuum, up to 250 bar
4. Many standard combinations

E-Series



T-Series



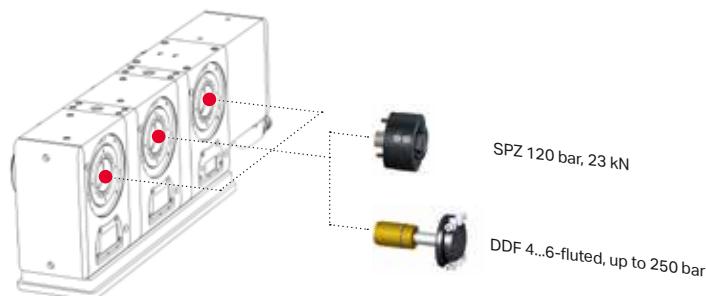
5. Rotary union in combination with angular position measuring systems (small and large)

6. Easy to retrofit

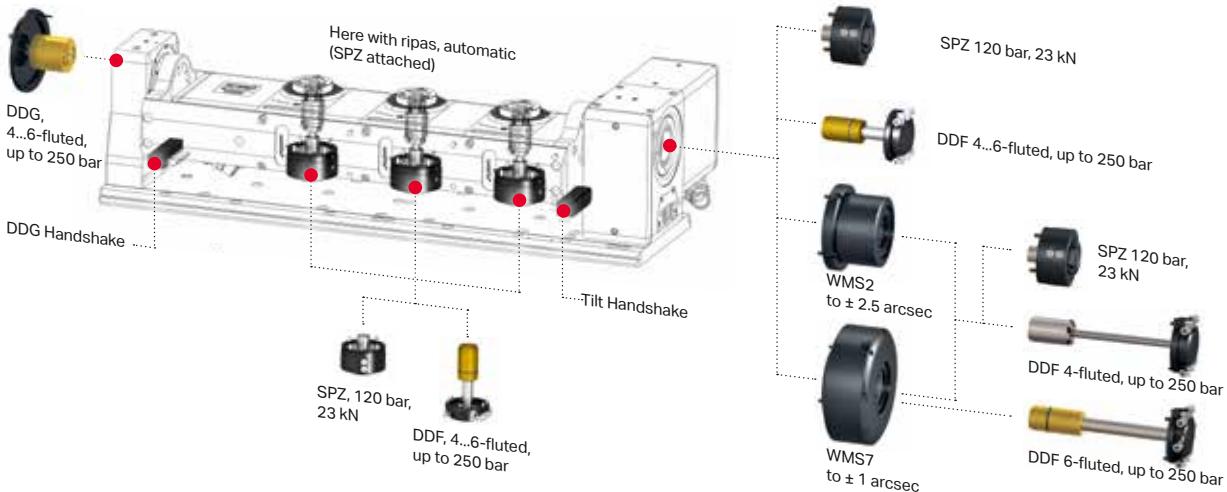
7. Clamping cylinder up to 23 kN

NEW
- DDF up to 2x6 channels
- SPZ on WMS2

M-Series



T2...T3-Series



Note

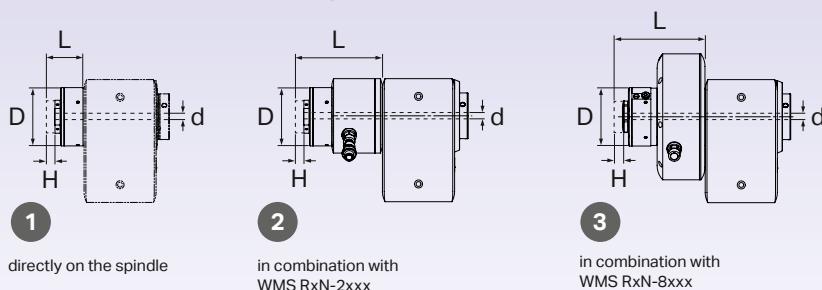
1. DDF 6-fluted not available with
+ 507 and 508
+ Small counter bearing (TOP1)
+ 510 with rotoFIX
2. WMS7 not possible with 507 and 508

- | | |
|-----|--|
| WMS | Angular position measuring system
2 = Size 2000, Heidenhain,
Magnescale
7 = Size 8000, Heidenhain |
| DDF | Rotary union on rotary table |

- | | |
|-----|--|
| DDG | Rotary union for counter bearing
4 = 4 channels
6 = 6 channels |
| SPZ | Clamping cylinders |
| MTS | Modular tooling system |

Depends on the requested tooling, the center height has to be increased. Please see page 49.

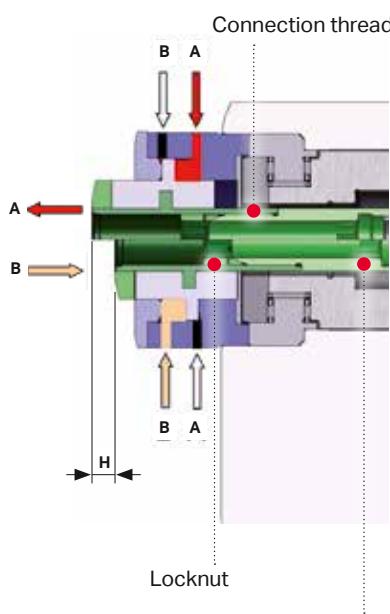
Hydraulic clamping cylinders standard



Pull force max. 23 kN by max. pressure of 120 bar

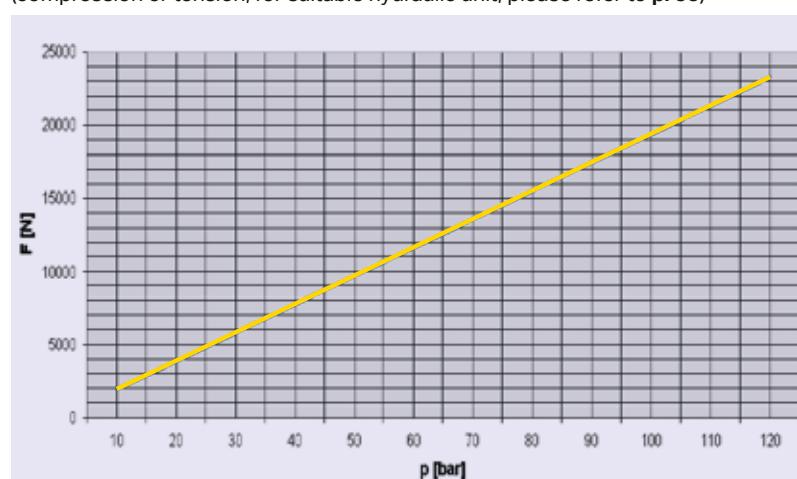
Item no.	Effective direction Designation	H [mm]	Oil [cm³]	D [mm]	d [mm]	Connection thread	L [mm]		
							①	②	③
SPZ.5xx-d2.5		2.5	5.2				60	149	
SPZ.5xx-9	hydraulic or pneumatic, double	9		102			72	161	
SPZ.5xx-15		15	18.8				•		
SPZ.50x-WMS2	Draw tube extension, for WMS.510-VOR2						52	141	136
SPZ.5xx-d2.5		2.5	5.2				64	153	148
SPZ.5xx-9	hydraulic or pneumatic, double	9		102			•		
SPZ.5xx-15		15	18.8				73	165	160
SPZ.510-WMS2	Draw tube extension, for WMS.510-VOR2						85	177	172
SPZ.510-WMS7	Draw tube extension, for WMS.510-VOR7						•		
SPZ.520-d2.5		2.5	5.2				65	144	133
SPZ.520-9	hydraulic or pneumatic, double	9		102			77	156	145
SPZ.520-15		15	18.8				•		
SPZ.520-WMS2	Draw tube extension, for WMS.520-VOR2						73	165	160
SPZ.520-WMS7	Draw tube extension, for WMS.520-VOR7						85	177	172
SPZ.530-d2.5		2.5	5.2				•		
SPZ.530-9	hydraulic or pneumatic, double	9		102			65	144	133
SPZ.530-15		15	18.8				77	156	145
SPZ.530-WMS2	Draw tube extension, for WMS.530-VOR2						•		
SPZ.530-WMS7	Draw tube extension, for WMS.530-VOR7						73	165	160
SPZ.Awk-Vor	Preparation for presence check (control box optional, SPZ.Awk)						85	177	172
SPZ.Awk	Control fox for presence check						•		

Principle of operation



Hydraulically actuated: Force diagram 10...120 bar

(compression or tension; for suitable hydraulic unit, please refer to p. 55)



Draw tube (not included in delivery)

Pneumatic clamping cylinders with adjustable stroke

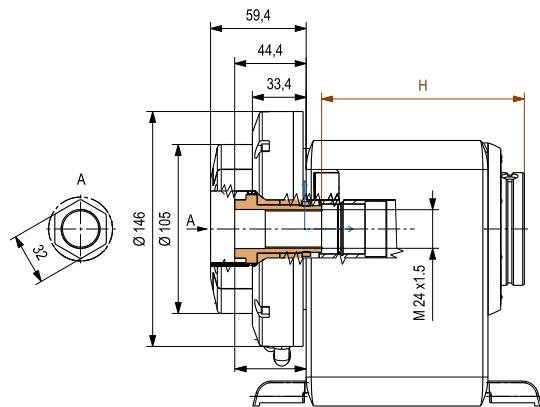


1 **2** **3**

More Information for clamping cylinder p. 48, rotary unions p. 50, angular position measuring system p. 53



Pull force 800...8'000 N at 1...10 bars



Explanation

Stroke 6.5 mm. The adjustable limits (option) allows a limitation of the stroke in both directions

PL LEHMANN Item no.	Designation	H min [mm]	H max [mm]	TGColin Item no.
510 507	TGC.507-SPZ-6.5 Pneumatic clamping cylinder	131	124.5	CP507-01
	TGC.507-SPZ-6.5A Pneumatic clamping cylinder with stroke limit	131	124.5	CPB507-01
	TGC.510-SPZ-6.5 Pneumatic clamping cylinder	131	124.5	CP510-01
	TGC.510-SPZ-6.5A Pneumatic clamping cylinder with stroke limit	131	124.5	CPB510-01



Pneumatic clamping cylinder



Pneumatic clamping cylinder with stroke limit

Raised center height on T-type rotary tables

For all combinations with the possible spindle accessories.

Item no.	Increase	① WMS2	③ WMS7	② DDF	① SPZ2.5	① SPZ9	① SPZ15	② WMS2+ DDF	③ WMS7+ DDF	② WMS2+ SPZ2.5	③ WMS7+ SPZ2.5	② WMS2+ SPZ9	③ WMS7+ SPZ9	② WMS2+ SPZ15	③ WMS7+ SPZ15
SPH.501-040-TIP1	without	•		•	•	•	•	•							
SPH.501-080-TIP1	40mm	•		•	•	•	•	•	•						
SPH.501-080-TIP1	80mm	•		•	•	•	•	•	•						
SPH.512-040-TIP2	without	•		•	•	•	•	•	•						
SPH.512-040-TIP2	40mm	•		•	•	•	•	•	•						
SPH.512-080-TIP2	80mm	•		•	•	•	•	•	•						
SPH.523-050-TIP3	without	•		•	•	•	•	•	•						
SPH.523-050-TIP3	50mm	•		•	•	•	•	•	•						
SPH.501-040-TOP1	without	•		•	•	•	•	•							
SPH.501-040-TOP1	40mm	•		•	•	•	•	•							
SPH.501-100-TOP1	100mm	•		•	•	•	•	•	•						
SPH.512-060-TOP2	without	•		•	•	•	•	•	•						
SPH.512-060-TOP2	60mm	•		•	•	•	•	•	•						
SPH.512-120-TOP2	120mm	•		•	•	•	•	•	•						
SPH.523-050-TOP3	without	•		•	•	•	•	•	•						
SPH.523-050-TOP3	50mm	•		•	•	•	•	•	•						
SPH.523-100-TOP3	100mm	•		•	•	•	•	•	•						
SPH.501-040-TAP1	without	•		•	•	•	•	•							
SPH.501-040-TAP1	40mm	•		•	•	•	•	•							
SPH.512-060-TAP2	without	•		•	•	•	•	•	•						
SPH.512-060-TAP2	60mm	•		•	•	•	•	•	•						
SPH.523-050-TAP3	without	•		•	•	•	•	•	•						
SPH.523-050-TAP3	50mm	•		•	•	•	•	•	•						

WMS = Angular position measuring system, SPZ = Clamping cylinder, DDF = Rotary unions

Overview

Rotary tables

Applications & Facts
SPZ, DDF, WMS,
indexing accuracy

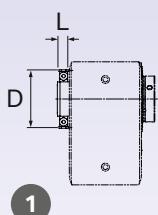
Aligning,
GLA, RST

MOT, KAB, CNC

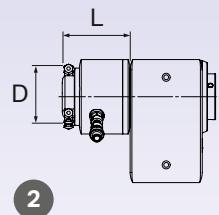
Workpiece
clamping system

Technology &
service

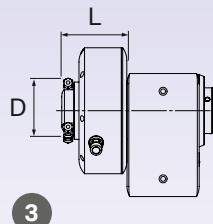
Ultra-compact, for air and oil



directly on the spindle



in combination with
WMS RxN-2xxx



in combination with
WMS RxN-8xxx



Rotary unions for rotary table

	Item no.	Flutes	Oil	Air	D [mm]	1	2	3
	507	510	520	530		30	119	
DDF.507-04	4		●	●		21		
DDF.507-04-2	4		●	●		101		
DDF.510-04	4		●	●				
DDF.510-06	6		●	●	100			
DDF.510-04-2	4		●	●				
DDF.510-04-7	4		●	●				
DDF.510-06-7	6		●	●				
DDF.520-04	4		●	●				
DDF.520-06	6		●	●				
DDF.520-04-2	4		●	●				
DDF.520-04-7	4		●	●				
DDF.520-06-7	6		●	●				
DDF.530-04	4		●	●				
DDF.530-06	6		●	●				
DDF.530-04-2	4		●	●				
DDF.530-04-7	4		●	●				
DDF.530-06-7	6		●	●				

All rotary unions can be used on all T-type rotary tables without increasing the center height so long as no angular position measuring system is used.



Take-off or medium transfer

Raised center height on T-type rotary tables

The center height changes only if the rotary union is used on an angular position measurement system and only for the following types:

Item no.	Increase without	1 DDF	2 WMS2+DDF	3 WMS7+DDF
SPH.501-040-TIP1	40mm	●		●
SPH.501-080-TIP1	80mm	●		●
SPH.512-040-TIP2	40mm	●		●
SPH.512-080-TIP2	80mm	●		●
SPH.523-050-TIP3	50mm	●	●	●
SPH.501-040-TOP1	40mm	●		
SPH.501-100-TOP1	100mm	●		●
SPH.512-060-TOP2	60mm	●		●
SPH.512-120-TOP2	120mm	●		●
SPH.523-050-TOP3	50mm	●	●	●
SPH.523-100-TOP3	100mm	●	●	●
SPH.501-040-TAP1	40mm	●		
SPH.512-060-TAP2	60mm	●		●
SPH.523-050-TAP3	50mm	●	●	●

Rotary unions (DDF) for counter bearing (GLA)

	Item no.	Flutes	Oil	Air	D [mm]	L [mm]
507/510	DDG.TOP1-04	4		●	100	30
520/530	DDG.TOP2-04	4	●	●	166	44
520/530	DDG.TOP2-06	6	●	●	166	44

DDF on GLA for T-type rot. table



4 connections, at rear

DDF on GLA for rotoFIX

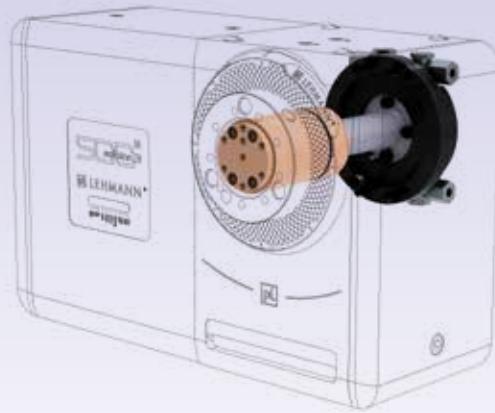


2 connections facing up



2 connections facing down

All rotary unions:
Channel size $\varnothing 3.5$ mm,
permissible pressure 250 bar



Handshake for T-type rotary tables

The following options (adapter plate and tubing) are required in order to feed the rotary unions on the dividing axis via the tilting axis:

	Item no.	Left	Right	A	B	Remarks
TxP	DDF.TxP1.Lx	•	•	•		
	DDF.TxP1.Rx	•	•			
	DDF.TxP2.Lx-2	•	•			
	DDF.TxP2.Lx-06-2	•	•			
	DDF.TxP2.Rx-2	•	•			
	DDF.TxP2.Rx-06-2	•	•			
	DDF.TxP3.Lx	•	•			
	DDF.TxP3.Lx-06	•	•			
	DDF.TxP3.Rx	•	•			
	DDF.TxP3.Rx-06	•	•			
TOP	DDG.TOP1	•	•	•		
	DDG.TOP2-2	•	•	•		
	DDG.TOP2-06-2	•	•	•		
	DDG.TOP3	•	•	•		
	DDG.TOP3-06	•	•	•		
	DDF.TGR2.Lx	•	•			
	DDF.TGR2.Lx-06	•	•			
	DDF.TGR2.Rx	•	•			
	DDF.TGR2.Rx-06	•	•			
	DDF.TGR3.Lx	•	•			
TGR	DDF.TGR3.Lx-06	•	•			
	DDF.TGR3.Rx	•	•			
	DDF.TGR3.Rx-06	•	•			
	DDG.TGR1	•	•	•		
	DDG.TGR2-2	•	•	•		
	DDG.TGR2-06-2	•	•	•		
	DDG.TGR3	•	•	•		
	DDG.TGR3-06	•	•	•		



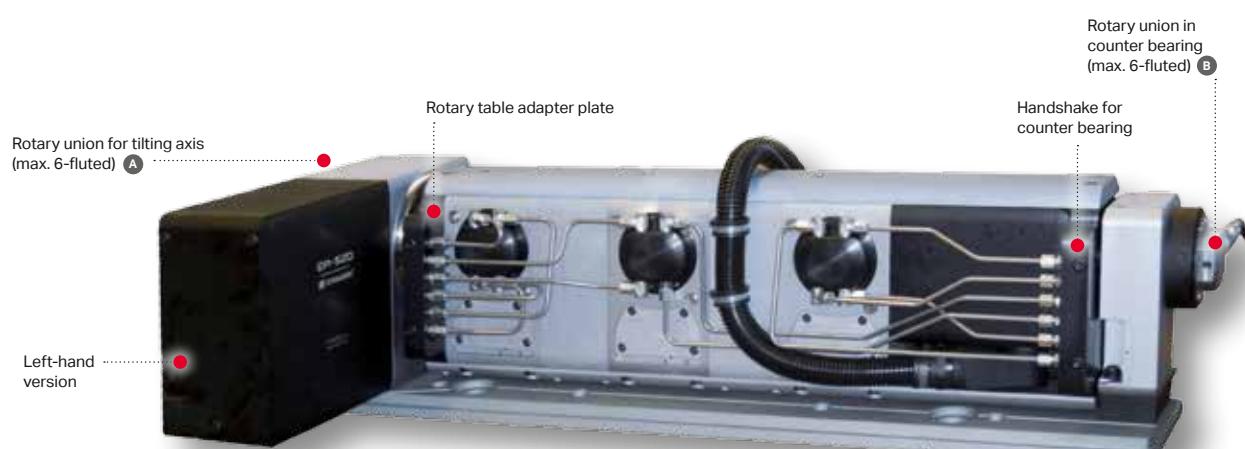
Handshake
Medium transfer from
tilting axis to dividing
axis (rear)



Handshake
Medium transfer from
tilting axis to dividing
axis (front)

Essential for handshake with WMS.5xx-Vor7

Item no.	Left	Right	Remarks
DDFWMS-7	•	•	Adjustment strip, rotary table adapter plate



Rotary union in
counter bearing
(max. 6-fluted) B

Handshake for
counter bearing

Measuring and recording the angular accuracy, important application information



Fully automated measuring system for indexing accuracy measurement

Measuring method used to determine the gear unit's accuracy to VDI/DGQ 3441 or ISO 230-2

- + measured at operating temperature of the unit after 5 warm-up cycles
- + 5 measuring cycles
- + 24 measuring points (15° steps)
- + Acceleration 500°/s²
- + All measured values apply in the unloaded condition at an ambient temperature of approx. 22°C

Please note: Due to the influence of environmental factors during the measurement (temperature, vibration...), the recorded measurement error may exceed the catalog limit value by up to 10%.

Elasticity of tilting axes (reference values for pitch error)

0°...90° [arc sec]	Unloaded		Standard load sls _{min} *	
	TxP	TGR	TxP	TGR
TF...T1-507510 (508510)	-35 (-35)	-	6 (-9)	-
TF...T1-510520 (511510)	-18 (-18)	-73 (on request)	20 (1)	12 (on request)
TF...T1-520530	-2	-42	56	29
T2-507510 (508510)	-56 (-56)	-	-5 (-23)	-
T2-510520 (511510)	-28 (-28)	-	20 (-5)	-
T3-507510 (508510)	-78 (-78)	-	-21 (-40)	-
T3-510520 (511510)	-37 (-37)	-	16 (-11)	-

* see p. 105

Explanation: The pitch error corrects the positioning error resulting from elasticity and caused by the eccentric load of the dividing / indexing axis on the tilting axis.

Recommendation: In order to achieve the best possible accuracies, we always recommend compensating for the gear backlash and the pitch error (5th axis) with the CNC control unit and/or by using a direct angular position measuring system (option, p. 53). A tilting range of 180° results in other compensation values; please contact the factory if necessary.

Attainable workpiece accuracies

Reference values for T-rotary tables

In order to achieve the best possible accuracies (volumetric accuracy), a few points must be observed. For more information, please refer to p. 115.

Size	Positioning	Simultaneous
	Cube 350 mm	Cube 150 mm
Weight	150 kg	34 kg
Accuracy¹	± 10 µm/100 mm	
Accuracy²	± 5 µm/100 mm	not possible
Accuracy WMS¹	± 3 µm / 100 mm	
Accuracy WMS²	± 2 µm/100 mm	not possible

WMS: Angular position measuring system ±2.5"

¹ only ONE workpiece zero point

² multiple workpiece zero points

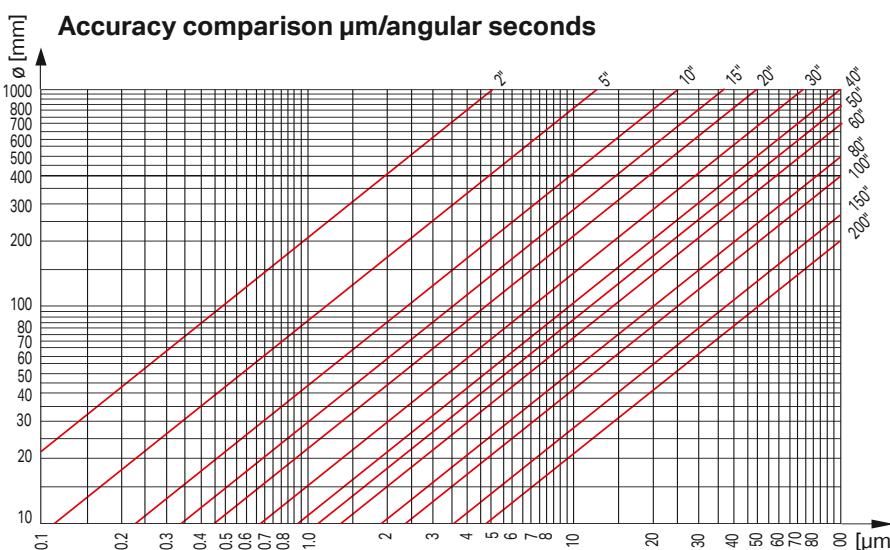
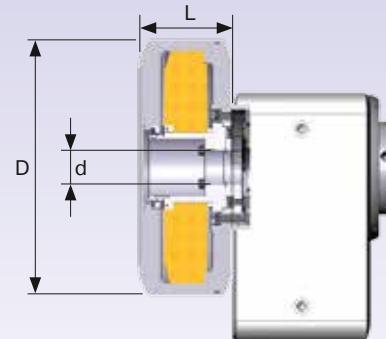


Diagram for determining the relationship between angular seconds and µm on the basis of diameter

For the highest indexing accuracy
Fully encapsulated, leak-proof, protected
against impact, adjusted in a highly
precise manner



Alternative to angular position measuring system

Optional increased mechanical gear accuracy

GET.5xx-GEN ½ standard tolerance (only possible for EA, TF and T1)

Add-on parts, assembly and measurement

Preparation	Item no.	d	D	L	507	510	520	530
	WMS.507-Vor2	15	130	89	① ③ ④			
	WMS.510-Vor2	15	130	89		① ③ ④		
	WMS.510-Vor7	30	220	84		②		
	WMS.520-Vor2	15	130	92		① ③ ④		
	WMS.520-Vor7	46	220	87		②		
	WMS.530-Vor2	15	130	79			① ③ ④	
	WMS.530-Vor7	50	220	68			②	



Heidenhain RxN 2xxx
Passage: Ø 20



Heidenhain RxN 8xxx
Passage: Ø 60



Magnescale RU 97



Magnescale RU 77

Angular position measuring system (encoders)

The angular position measuring system option always includes radial and axial run-out of the spindle of 0.003 mm

	Item no.	Designation	System accuracy [arc sec]	Remarks
Heidenhain	WMS.2580	RCN 2580, Endat/1Vss (replaces RCN 228)	± 2.5	①
Heidenhain	WMS.275	RON 275, 5VTTL	± 5	Haas/Hurco ①
Heidenhain	WMS.8390F	RCN 8390F, Fanuc (replaces RCN 727F)	± 2	Ø 60 mm ②
Heidenhain	WMS.8390M	RCN 8390M, Mitsubishi (replaces RCN 727M)	± 2	Ø 60 mm ②
Heidenhain	WMS.8380	RCN 8380, Endat/1Vss (replaces RCN 729)	± 2	Ø 60 mm ②
Heidenhain	WMS.8590F	RCN 8590F, Fanuc (replaces RCN 827F)	± 1	Ø 60 mm ②
Heidenhain	WMS.8590M	RCN 8590M, Mitsubishi (replaces RCN 827M)	± 1	Ø 60 mm ②
Heidenhain	WMS.8580	RCN 8580, Endat/1Vss (replaces RCN 829)	± 1	Ø 60 mm ②
Magnescale	WMS.RU97A	RU97A, Siemens driveClip (only for Solution Line)	± 2.5	③
Magnescale	WMS.RU77F	RU77, Fanuc	± 2.5	④
Magnescale	WMS.RU77M	RU77, Mitsubishi	± 2.5	④

Option: Additional cable for retrofitting WMS

KAB.WMS-14.0-o



Cable run in flexible tubing, 14 m long, without connector

Center height increase on T-type rotary tables

The center height of T-type rotary tables is increased in accordance with the angular position measuring system (additional charge)

	Item no.	Increase	1 ③ ④	2	2	3	2	3	2	3	2	3
TIP1	SPH.501-040-TIP1	40mm	•		•		•		•		•	
TIP2	SPH.501-080-TIP1	80mm	•		•		•		•		•	
TIP2	SPH.512-040-TIP2	40mm	•		•		•		•		•	
TIP2	SPH.512-080-TIP2	80mm	•		•		•		•		•	
TOP1	SPH.523-050-TIP3	50mm	•		•		•		•		•	
TOP1	SPH.501-040-TOP1	40mm	•									
TOP2	SPH.501-100-TOP1	100mm	•									
TOP2	SPH.512-060-TOP2	60mm	•		•		•		•		•	
TOP2	SPH.512-120-TOP2	120mm	•		•		•		•		•	
TOP3	SPH.523-050-TOP3	50mm	•		•		•		•		•	
TOP3	SPH.523-100-TOP3	100mm	•		•		•		•		•	
TAP1	SPH.501-040-TAP1	40mm	•									
TAP2	SPH.512-060-TAP2	60mm	•	•	•	•	•	•	•	•	•	•
TAP3	SPH.523-050-TAP3	50mm	•	•	•	•	•	•	•	•	•	•

Overview

Rotary tables

Applications & Facts

SPZ, DDF, WMS, indexing accuracy

Aligning, GLA, RST

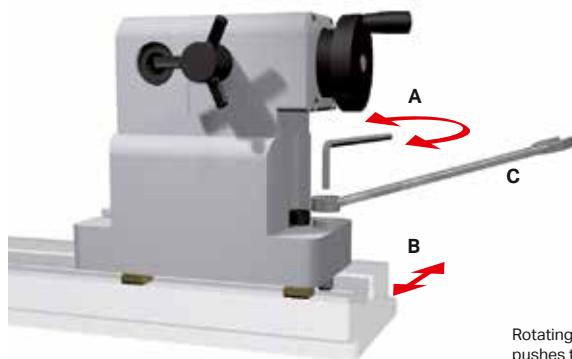
MOT, KAB, CNC

Workpiece clamping system

Technology & service

Align and secure correctly on the machine table:
lineFIX and **zentriX**

zentriX alignment system (example: tailstock on longFLEX)



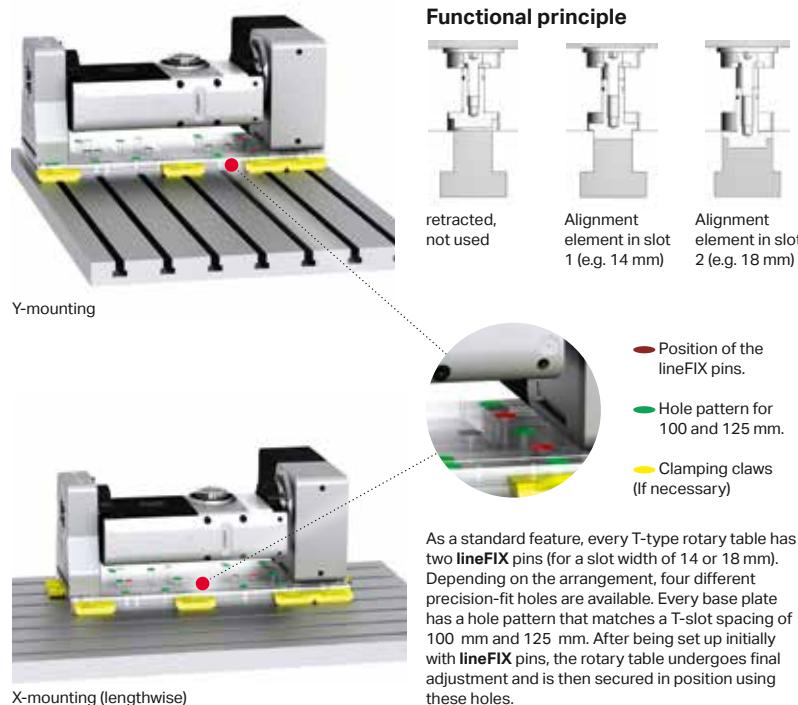
Item no.	Designation	Slot width
AUR.zX-12		12g6
AUR.zX-14	zentriX alignment pin, 1 pair	14g6
AUR.zX-16		16g6
AUR.zX-18		18g6
LOZ.GPL-125	Long clamping claws	

Rotating the Allen wrench (A) pushes the tailstock against the base plate (B) by means of an eccentric screw. Once the desired position is reached, the eccentric screw is secured with a hexagon nut (C). Finished. For additional information, please refer to the installation and commissioning instructions at: www.lehmann-roto-tables.com

available for ...



lineFIX alignment system for T-type rotary tables (not for TIP) NEW



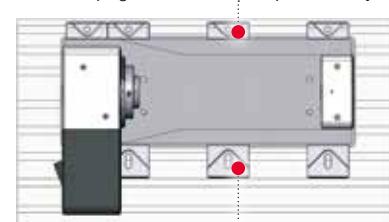
Item no.	Designation	Slot width
AUR.iX-12-16	Option (1 pair)	12/16
AUR.iX-14-18	Standard (1 pair)	14/18
LOZ.GPL-125	Long clamping claws*	

* When installed properly as described in the operating manual, the hold-down force per clamping claw (short or long) is 20 kN.

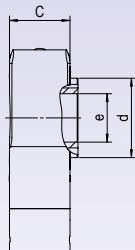
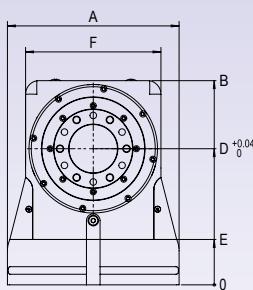
Version with clamping claws

If no hole pattern matches the slots, the rotary table can be secured by means of clamping claws.

Short clamping claws (standard scope of delivery)



Long clamping claws (Item no.: LOZ.GPL-125): for use when mounting at intermediate positions.



GLA.TOP2 with 2'000 Nm

GLA.TOP1 with 300 Nm

Counter bearing, incl. bearing pin

- + A compact and stable counter bearing with a large rolling bearing
- + Prepared for automatic clamping, oil connection at the bottom and as well at the side
- + Allowable hydraulic pressure max. 220 bar (GLA.TOP2) resp. max. 150 bar (GLA.TOP1)
- + Option: axial bearing available (GLA.TOP2)
- + Center height 0 +0.04 mm
- + Delivered with bearing pin

Item no.	Clamping torque* [Nm]	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	d [mm]	e [mm]	weight [kg]	
507 510, 520, 530	GLA.TOP1-110	300	155	170	55	110	30	110	46.55	70	7
	GLA.TOP1-150	300	155	210	55	150	70	110	46.55	70	9
	GLA.TOP2-150	2'000	227	240	80	150	30	179	64	105	21
	GLA.TOP2-180	2'000	227	270	80	180	60	179	64	105	24
	GLA.TOP2-312	2'000	227	402	80	312	192	176	64	105	40
all sizes	GLA.HYD-fix	Hydraulik-Kit fix									
	GLA.HYD-vario	Hydraulik-Kit vario**									

* at hydraulic pressure = 220 bar resp. 150 bar

** in combination with EA-520 or EA-530 and suitable counter bearing, the pull-out torque is reduced by approx. 10% (applies to rotary table and counter bearing)

CYMAX hydraulic unit

Item no.	Designation	Technical data
HAG.CY-AGG-1*	Cymax hydraulic unit	1 clamping circuit, 400 V (can be converted to 200 V)
HAG.CY-AGG-2*	Cymax hydraulic unit	2 clamping circuits, 400 V (can be converted to 200 V)
HAG.LEIT-05-2	Hydraulic line with threaded fitting (supplied loose)	1 pair (2 pieces), 5 m

* Preparing the machine for connection of the unit is the customer's responsibility

- + 3x400 V AC (380–480 V, 50–60 Hz) convertible to 3x200 V AC (200–280 V, 50–60 Hz)
- + Control voltage U = 24 V DC
- + Main pressure 10–125 bar

Suitable alignment elements

Item no.	Designation	Slot width
AUR.St-10		10h6
AUR.St-12		12h6
AUR.St-14	Alignment block,	14h6
AUR.St-16	1 pair	16h6
AUR.St-18		18h6
AUR.St-20		20h6



Control box

Item no.	Designation	Remarks	in conjunction with
SPZ.Awk	Control box for presence check	incl. 10 m tubing mat. and wall bushing	SPZ.Awk-Vor



Presence check control box



Overview

Rotary tables

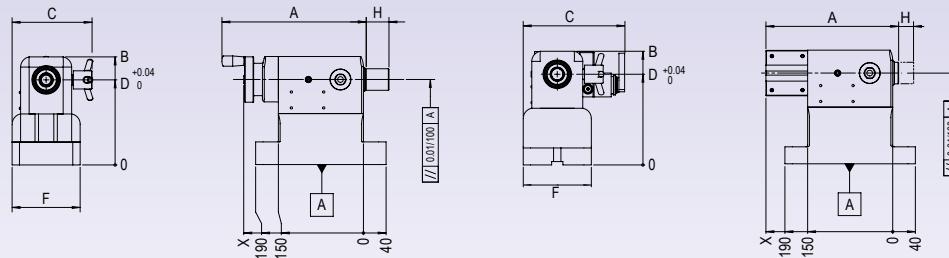
SPZ, DDF, WMS,
indexing accuracy

Aligning,
GLA, RST

MOT, KAB, CNC

Workpiece
clamping system

Technology & service



measured without load, quill extended halfway

Standard design for all types = right-handed version (as shown)

	Item no.	Designation	A [mm]	B [mm]	C [mm]	F [mm]	H [mm]	Manual	Pneumatic ²⁾	Hydraulic ³⁾	Weight [kg]		
110	RST.COM-110m ⁴⁾	COMPACT tailstock	222	128	130	100	30	●			11		●
	RST.LIG-110m	LIGHT tailstock	255		142		40	●			20		●
	RST.LIG-110p ¹⁾	LIGHT tailstock	225	150	184	120	40		●		20		●
	RST.LIG-110h ¹⁾	LIGHT tailstock	229		168		40			●	24		●
150	RST.COM-150m ⁴⁾	COMPACT tailstock	222	168	130	100	30	●			16		●
	RST.LIG-150m	LIGHT tailstock	255		142		40	●			25		●
	RST.LIG-150p ¹⁾	LIGHT tailstock	238	190	184	120	40		●		25		●
	RST.LIG-150h ¹⁾	LIGHT tailstock			168		40			●	29		●
180	RST.LIG-180m	LIGHT tailstock	255		142		40	●			30		●
	RST.LIG-180p ¹⁾	LIGHT tailstock	238	220	184	120	40		●		30		●
	RST.LIG-180h ¹⁾	LIGHT tailstock			168		40			●	34		●
	RST.LIG-220m	LIGHT tailstock	255		142		40	●			35		●
220	RST.LIG-220p ¹⁾	LIGHT tailstock	238	260	184	120	40		●		35		●
	RST.LIG-220h ¹⁾	LIGHT tailstock			168		40			●	40		●
	RST.LIG-270m	LIGHT tailstock	255		142		40	●			42		●
	RST.LIG-270p ¹⁾	LIGHT tailstock	238	310	184	120	40		●		42		●
270	RST.LIG-270h ¹⁾	LIGHT tailstock			168		40			●	47		●
	RST.L-m	Left-hand version, manual											●
	RSTL-p	Left-hand version, pneumatic											●
	RST.R-poh	Pneumatic, without manual lever valve											●
Tailstock Option / Accessories	RST.R-poh	Left-hand version, pneumatic, without manual lever											●
	RST.L-h	Left-hand version, hydraulic											●
	RST.R-hoh	Hydraulic without manual lever valve											●
	RST.L-hoh	Left-hand version, hydraulic, without manual lever valve											●
	RST.Hub-p	Stroke monitoring for tailstock (pneumatic), free cable ends 5 m of which 4.5 m in flexible tubing; stroke 5 mm shorter											●
	RST.Hub-h	Stroke monitoring for tailstock (hydraulic), free cable ends 5 m of which 4.5 m in flexible tubing; stroke 5 mm shorter											●
	RST.SPI-MK2s	Fixed center, hardened steel					MK2						●
	RST.SPI-MK3s	Fixed center, hardened steel					MK3						●
	RST.SPI-MK2hm	Fixed center, HM use					MK2						●
	RST.SPI-MK3hm	Fixed center, HM use					MK3						●

All LIGHT tailstocks: Parallelism of quill axis to alignment groove adjustable thanks to zentriX system (see operating manual)

Morse taper size (DIN 228)

- COMPACT = MK 2
- LIGHT = MK 3

¹⁾ Delivered as standard with manual lever valve. Connection plate for external hydraulic supply is a special model, please contact factory.

²⁾ Impact force approx. 660...2,000 N at 2...6 bar air

³⁾ Impact force approx. 3,800 N at max. 24 bar oil pressure

⁴⁾ Delivered with center height +/-0.01 mm

CANNOT be retrofitted

can be retrofitted

Suitable alignment elements

Item no.	Designation	Slot width
AUR.zX-12		12g6
AUR.zX-14		14g6
AUR.zX-16		16g6
AUR.zX-18		18g6
zentriX alignment pin, 1 pair		



Manual version (right-hand)

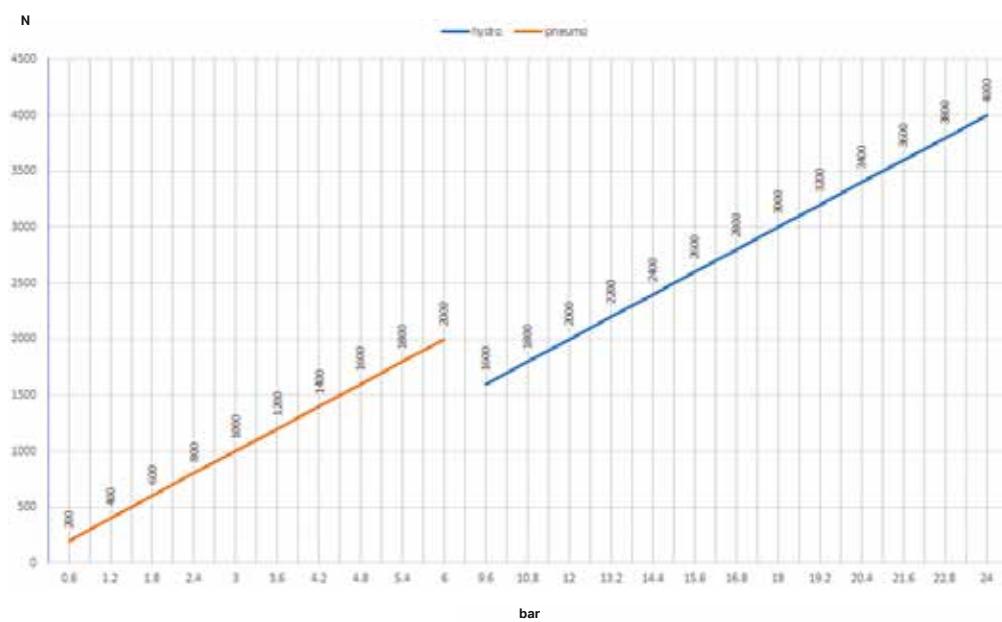


Pneumatic version (right-hand)



Hydraulic version (right-hand)

Pressure-force diagram



Left-hand model.



Tailstock modules

Overview

Rotary tables

Applications & Facts
SPZ, DDF, WMS,
indexing accuracyAligning,
GLA, RST

MOT, KAB, CNC

Workpiece
clamping system

Technology & service

Suitable motors for drive systems from
FANUC, SIEMENS, HEIDENHAIN, YASKAWA,
MITSUBISHI, SANYO...



Order items

The correct motor is defined in the order code for the respective rotary table by specifying the motor abbreviation from the applicable order number key.

Item no.	Designation
MOT.dCliq	Siemens sensor module for drive Click for installation in control cabinet

Integration on Siemens Solution Line

pL LEHMANN has developed appropriate solutions together with SIEMENS. Request our special documentation. Our specialists will assist you during commissioning.

Important information

Servo drive design: Rated current at least 75% of motor's peak current! (Otherwise, only reduced drive performance is possible)

Mass X = Dimension from spindle axis to end of motor housing (see p. 8-29).

Motor flange, max

507 = 70x70 mm, 510 = 80x80 mm

520 = 110x110 mm, 530 = 130x130 mm

Motor table

Supplier	Model	Motor manufacturer	Item no.	Voltage [V AC]	Dimension X						Overall transmission ratio i_{tot}			
					s = Standard o = Option			Motor pos. L/R			s = Standard o = Option			
MOVINOR / MAVILOR (Siemens, Heidenhain)	BLS 072 ERN 1185	MOT.MA-072ERN	BLS 072 ERN 1185	400	s	s		236	248		90:1	120:1		
	BLS 072 EQN 1125	MOT.MA-072EQN25	BLS 072 EQN 1125	400	o	o		236	248		90:1	120:1		
	BLS 072 EQN 1135	MOT.MA-072EQN35	BLS 072 EQN 1135	400	o	o		236	248		90:1	120:1		
	BLS 073 ERN 1185	MOT.MA-073ERN	BLS 073 ERN 1185	400			s			295				150:1
	BLS 073 EQN 1125	MOT.MA-073EQN25	BLS 073 EQN 1125	400			o			295				150:1
	BLS 073 EQN 1135	MOT.MA-073EQN35	BLS 073 EQN 1135	400			o			295				150:1
	LN098 ERN 1185	MOT.MO-098ERN	LN098 ERN 1185	400			s			390				150:1
	LN098 EQN 1125	MOT.MO-098EQN25	LN098 EQN 1125	400			o			390				150:1
	LN098 EQN 1135	MOT.MO-098EQN35	LN098 EQN 1135	400			o			390				150:1
FANUC	β 1/6000is	MOT.FA-1/6is	A06B-0116-B103	200	s	o		236	248		90:1	90:1		
	α 2/5000is	MOT.FA-2/5is	A06B-0212-B100	200	s	s		248	295		90:1	150:1		
	α 2/5000HVis	MOT.FA-2/5HVis	A06B-0213-B100	400	s	s		248	295		90:1	150:1		
	α 4/5000is	MOT.FA-4/5is	A06B-0215-B100	200			s			390				180:1
	α 4/5000HVis	MOT.FA-4/5HVis	A06B-0216-B100	400			s			390				180:1
	α 8/4000is			200										
	α 8/4000HVis			400										
YASKAWA	SGMJV-04	MOT.YA-SGMJV04	SGMJV-04ADA61	200	s	o		236	248		90:1	120:1		
	SGMJV-08	MOT.YA-SGMJV08	SGMJV-08ADA61	200	s	s		248	295		90:1	150:1		
	SGMEV-15	MOT.YA-SGMEV15	SGMEV-15ADA61	200			s			390				180:1
	SGM7J-06	MOT.YA-SGM7J06	SGM7J-06A7A61	200	s	o		236	248		90:1	120:1	150:1	
	SGM7J-08	MOT.YA-SGM7J08	SGM7J-08A7A61	200	s	s		248	295		90:1			
MITSUBISHI	HG56	MOT.MI-HG-56S	HG-56S-D47	200	s	o		236			90:1			
	HG75	MOT.MI-HG-75S	HG-75S-D48	200		s			270			90:1		
	HG-H75	MOT.MI-HG-H75S	HG-H75S-D48	400		s			270			90:1		
	HG104	MOT.MI-HG-104S	HG-104S-D48	200			s			390				150:1
	HG-H104	MOT.MI-HG-H104S	HG-H104S-D48	400			s			390				150:1
	HG105	MOT.MI-HG-105S	HG-105S-D48	200			s			335				150:1
	HG-H105	MOT.MI-HG-H105S	HG-H105S-D48	400			s			336				150:1
SA-NYO	R2Ax06040	MOT.SA-R2Ax060	R2Ax06040FXP00M	200	s	o		236	248		90:1	90:1		
	R2Ax08075	MOT.SA-R2Ax080	R2Ax08075FXP00M	200	s	s		248	295		90:1	120:1		
OKUMA	BL-ME24J-50SN						s			335				180:1
	BL-ME80J-40SN						s			390				
SIEMENS	1FK7042-2AK71	EQN					s			335				150:1
	1FK7062-2AH71	EQN					s			390				150:1
	1FK7042-2AK71	Drive cliq					s			335				150:1
	1FK7062-2AH71	Drive cliq					s			390				150:1

Suitable servo amplifiers for the respective motor



● = Ideal servo ● = Servo at power limit. You may have to reduce the drive data. ○ = Servo oversized. Operation guaranteed, however

		General		Output		Motor*							General		Output		Motor*														
		Number of axes		Input		Design current		Peak current		1 2 3 4					Number of axes		Input		Design current		Peak current		1 2 3 4								
				U		I _{out,n}		I _{out,p}									U		I _{out,n}		I _{out,p}		1 2 3 4								
Servo model		[V DC]		[A]		[A]									Servo model		[V DC]		[A]		[A]										
Siemens Powerline	6SN112x-1AA00-0BAx	1	510-625	9	18	●	●	●	●	●	●	●	●	●	Fanuc 200V	SVM1 αiSV 20	1	300 DC	6.5	20	●	●	●	●	MOT, KAB, CNC	SPZ, DDF, WMS, indexing accuracy					
	6SN112x-1AA00-0CAx	1		18	36	○	○	○	●	●	●	●	●	●		SVM1 αiSV 80	1	19	80												
	6SN112x-1AB00-0BAx	2		2x9	2x18	●	●	●	●	●	●	●	●	●		SVM1 βiSV 20	1	3x200-240 AC	6.8	20	●	●	●	●							
	6SN112x-1AB00-0CAx	2		2x18	2x36	○	○	○	●	●	●	●	●	●		SVM1 βiSV 40	1	13	40												
	6SL3120-1TE21-0ABx	1		9	18	●	●	●	●	●	●	●	●	●		SVM1 βiSV 80	1	18.5	80												
	6SL3120-1TE21-8ABx	1		18	36	○	○	○	●	●	●	●	●	●		SVM2 αiSV 4/20	1	300 DC	6.5	20	●	●	●	●							
	6SL3120-2TE21-0ABx	2		2x9	2x18	●	●	●	●	●	●	●	●	●		SVM2 αiSV 20/20	2		6.5	20	●	●	●	●							
	6SL3120-2TE21-8ABx	2		2x18	2x36	○	○	○	●	●	●	●	●	●		SVM2 αiSV 20/40	2	300 DC	6.5/19	20/80	●	●	●	●							
	6SL3420-1TE15-0AAx	1		5	15	●	●	●	●	●	●	●	●	●		SVM2 αiSV 80/80	2		19	80											
	6SL3420-1TE21-0AAx	1		9	27	●	●	●	●	●	●	●	●	●		SVM2 αiSV 80/160	2		19	80											
Heidenhain	6SL3420-2TE15-0AAx	1		18	54	○	○	○	●	●	●	●	●	●		SVM2 βiSV 20/20	2	3x200-240 AC	2x6.5	20	●	●	●	●							
	6SL3420-2TE15-0AAx	2		2x5	2x15	●	●	●	●	●	●	●	●	●		SVM3 αiSV 20/20/20	3	300 DC	3x6.5	20	●	●	●	●							
	UE 212B	5		7.5/15	15/30	●	●	●	●	●	●	●	●	●		SVM3 αiSV 20/20/40	3		20	●	●	●	●								
	UE 242B	5		1x23	3x15	●	●	●	●	●	●	●	●	●		SVM3 αiSV 20/20/40	3		20	●	●	●	●								
	UM 111 / UM 111D	1		1x7.5	1x15	●	●	●	●	●	●	●	●	●		SVM1 αiSV 10HV	1	600 DC	3.1	10	●	●	●	●							
	UM 111B	1		1x15	1x30	○	○	○	●	●	●	●	●	●		SVM1 αiSV 40HV	1		9.1	40											
	UM 111BD	1		1x15	1x30	○	○	○	●	●	●	●	●	●		SVM1 βiSV 10HV	1	3x400-480 AC	3.1	10	●	●	●	●							
	UM 121 / UM 121D	2		2x7.5	2x15	●	●	●	●	●	●	●	●	●		SVM1 βiSV 40HV	1		9.2	40											
	UM 121B / UM 121BD	2		2x15	2x30	○	○	○	●	●	●	●	●	●		SVM2 αiSV 10/10HV	2		3.1	10	●	●	●	●							
	MDS-E-V1-20	1		6.4		●	●	●	●	●	●	●	●	●		SVM2 αiSV 20/40HV	2	600 DC	9.1	40											
Mitsubishi 200V	MDS-E-V1-40	1		10.9												SVM2 αiSV 40/40HV	2		9.1	40											
	MDS-E-V2-20	2		6.4		●	●	●	●	●	●	●	●	●		SVM2 αiSV 40/80HV	2		9.1	40											
	MDS-E-V2-40	2		10.9												Sanyo 2W01A0KL10XXXXC00	1	300 DC		15	●										
	MDS-E-V2-80	2		16												Sanyo 2W03A0KL10XXXXC00	1		30	●	●	●	●								
	MDS-E-V3-20	3		6.4		●	●	●	●	●	●	●	●	●		Yaskawa SGDS-05A12AVY520	3x200-230V AC		3.8	11	●										
	MDS-E-V3-40	3		10.9												Yaskawa SGDS-08A12AVY520	3x200-230V AC		5.5	16.9	○	●	●	●							
	MDS-EJH-V1-15	1		2.8												Yaskawa SGDV-2R8A01A	3x200-230V AC		2.8	9.3	●										
	MDS-EJH-V1-20	1		5.4												Yaskawa SGDV-3R8A01A	3x200-230V AC		3.8	11	●	●	●	●							
	MDS-EH-V1-10	1		2.3												Yaskawa SGDV-5R5A01A	3x200-230V AC		5.5	16.9	○	●	●	●							
	MDS-EH-V1-20	1		4.9												Yaskawa SGDV-120A01A			11.6	28	○	●	●	●							
	MDS-EH-V2-10	2		2.3																											
	MDS-EH-V2-20	2		4.9																											
	MDS-EH-V2-40	2		7.7																											

*Motors for above table

	1	2	3	4
Siemens Powerline	BLS072-A-ERN/EQN	BLS073-A-ERN/EQN	LN098-2-C-ERN/EQN	
Siemens Solutionline	BLS072-A-ERN/EQN	BLS073-A-ERN/EQN	LN098-2-C-ERN/EQN	
Heidenhain	BLS072-A-ERN/EQN	BLS073-A-ERN/EQN	LN098-2-C-ERN/EQN	
Mitsubishi 200V	HG-56	HG-75	HG-105	HG-104
Mitsubishi 400V	β1/6000is	α2/5000is	α4/5000is	
Fanuc 200V	β1/6000is	α2/5000is	α4/5000is	
Fanuc 400V	α2/5000HVis	α4/5000HVis	α8/4000HVis	
Brother Sanyo	R2Ax06040FXP00M	R2Ax08075FXP00M		
Yaskawa	SGM7J-06	SGM7J-08		
Yaskawa	SGM JV-04	SGM JV-08		

A few implemented and known machine/rotary table/servo combinations (incomplete list)



Technology & service	MOT, KAB, CNC
Workpiece clamping system	Aligning, GLA, RST
SPZ, DDF, WMS, indexing accuracy	Applications & Facts
Rotary tables	Overview

	Machine Type	CNC System	CNC Type	Input Voltage	507 (508)	510 (511)	520	530		Machine Type	CNC System	CNC Type	Input Voltage	507 (508)	510 (511)	520	530		
Akira Seiki	Vx Series	Mitsubishi	M700	200 VAC	●	●	●	●	●	Mills400	Heidenhain	iTNC530	400 VAC	●	●	●	○		
Alzmetall	BAZ35	Heidenhain	TNC426	400 VAC	○	○	○	○	●	VCE			400 VAC	○	○	○	○		
AMS	MVC400	Fanuc	OiMD	200 VAC	●	●	●	○		VCP			400 VAC	○	○	○	○		
Awea	AF-1000	Fanuc	18iMB	200 VAC	●	●	●	●		Minimill, VF-x, DT-1	HAAS	> M18.7	200 VAC	●	●	●	○		
Axa	AF-1060	Heidenhain	iTNC530	400 VAC	●	●	●	○		OM-2A	HAAS	> M18.7	200 VAC	●	●	●	○		
BFW	AF-1250	Heidenhain	iTNC530	400 VAC	●	●	●	○		VF-x	HAAS NGC	100.16.000.1021	200 VAC	●	●	●	○		
Bridgeport	DBZ	Heidenhain	iTNC530	400 VAC	○	○	○	○		Hasegawa	PM250	31i-B5	200 VAC	●	●	●	○		
Brother	Dhruba 4070HE	Fanuc	OiMD	200 VAC	●	○	●	●		Hermle	C800U	Siemens	840Dpl	400 VAC	○	○	●	○	
Chiron	Dhruba	Siemens	828D	?	○	○	○	○		Hurco	VMX10(i)	HURCO	WinMax V9.x	200 VAC	●	●	●	●	
Doosan	Dhruba	Mitsubishi	MV70BV	?	○	○	○	○		VMX24(i), 30(i)	HURCO	WinMax V9.x	200 VAC	●	●	●	●		
Fanuc Robodrill	XV2290	Siemens	828D	400 VAC	●	●	●	●		VMX42(i)	HURCO	WinMax V8.x	200 VAC	●	●	●	●		
DMG MORI	R450X1	Sanyo	C00	200 VAC	●	○	●	●		Hyundai WIA	F400	Fanuc	OiMD	200 VAC	●	●	●	○	
Doosan	Sx00X1	Sanyo	C00	200 VAC	●	●	●	○		Jyoti	VMC640	Siemens	810D	400 VAC	○	○	○	○	
Fanuc Robodrill	TC-22Brn	Yaskawa	B00	200 VAC	●	○	●	●		KAAST	KAAST	Fanuc			○	○	○	○	
Doosan	TC-32Brn/FT/QT	Yaskawa	B00	200 VAC	●	○	●	●		Lapmaster	Micron Macro-S/SK	Siemens	840Dpl	400 VAC	●	●	○	○	
Fanuc Robodrill	TC-R2B	Sanyo	B00	200 VAC	●	○	●	●		Leadwell	LCV760	Fanuc	OiMF	200 VAC	●	●	●	○	
Doosan	TC-S2Dn	Sanyo	B00	200 VAC	●	○	●	●		Makino	Slim3N	Fanuc	OiMD	400 VAC	●	●	●	○	
Fanuc Robodrill	SMART III Series	Syntec	21MA	200 VAC	●	●	●	○		Mazak	PS95	Fanuc	?	?	○	○	○	○	
Doosan	FMG 1632CNC-HD	Siemens	840Dsl	400 VAC	●	●	●	○		VCS430	Mazak (Mitsubishi)	SMART or MATRIX NEXUS 2	200 VAC	○	●	●	○		
Fanuc Robodrill	FZ 12W	Fanuc	31iB5	400 VAC	●	●	●	●		VCS530CSL	Mazak (Mitsubishi)	SMART	200 VAC	○	●	●	○		
Doosan	Mill2000	Siemens	840Dsl	400 VAC	○	○	●	○		VTC800	Mazak (Mitsubishi)	Mazatrol	400 VAC	○	●	●	●		
Fanuc Robodrill	DMU 50, 70, 100			400 VAC	○	○	○	○		B800	FANUC	OiMD	200 VAC	●	●	●	●		
Doosan	Milltap 700	Siemens	840Dsl	400 VAC	●	●	●	●		POSmill	C1050	Heidenhain	iTNC530 HSCI	400 VAC	●	●	●	○	
Fanuc Robodrill	DMC xx35V			400 VAC	○	○	○	○		C1050	Heidenhain	TNC620	400 VAC	●	●	●	○		
Doosan	DMC xx50V	Siemens	840Dsl	400 VAC	○	○	○	○		C800	Heidenhain	iTNC530 HSCI	400 VAC	●	●	●	○		
Fanuc Robodrill	DMF			400 VAC	○	○	○	○		Quaser	MV154	Fanuc	?	200 VAC	○	○	○	○	
Doosan	CMX xx35V	Siemens	840Dsl	400 VAC	●	●	●	○		MV184	Fanuc	OiMF	200 VAC	●	●	●	●		
Fanuc Robodrill	CMX xx50V	Siemens	840Dsl	400 VAC	●	●	●	○		MV184	Heidenhain	TNC620	400 VAC	●	●	●	○		
Doosan	CMX xx50V	Fanuc	?	?	○	○	○	○		MV184	Siemens	828D	400 VAC	●	●	●	○		
Fanuc Robodrill	NVX5x Series	Mitsubishi	M730BM	200 VAC	●	●	●	●		MV234	Fanuc	31iB	200 VAC	●	●	●	●		
Doosan	DNN400-650	Siemens	828Dsl	400 VAC	●	●	●	●		MV235	Fanuc	31iB	200 VAC	●	●	●	●		
Fanuc Robodrill	DNN400-650	Fanuc	OiMD	200 VAC	●	●	●	●		Reckermann	Kombi 1300	Heidenhain	TNC320	400 VAC	●	●	●	○	
Doosan	DNN400-650	Fanuc	OiMD	200 VAC	●	●	●	●		Republic Lagun	VGC5028	Fanuc	31i-B5	200 VAC	○	○	○	○	
Fanuc Robodrill	DNM500 II, 650 II	Fanuc	OiMD	200 VAC	●	●	●	●		Sauer	Lasertech 45	Siemens	840Dsl	400 VAC	●	●	●	○	
Doosan	DNM400-650HS	Fanuc	30/31/32i-A	200 VAC	○	○	○	○		Spinner	MVC610	Siemens	840Dsl	400 VAC	●	●	●	●	
Fanuc Robodrill	DT360D	Fanuc	OiMD	200 VAC	○	○	○	○		Tongtai	VU5	Siemens	840dDsl	400 VAC	○	○	○	○	
Doosan	DT400	Fanuc	OiMD	200 VAC	○	○	○	○		Wagner	WMC1100B	Siemens	828D	400 VAC	○	○	○	○	

- all technical information available at pL, partially listed at machine builder
- known, realized integration, technical information partially available at pL, respectively the integration has to be done at machine builder; feasibility on request

Specific commissioning documentation available for over 40 different machines (incl. parameter lists)

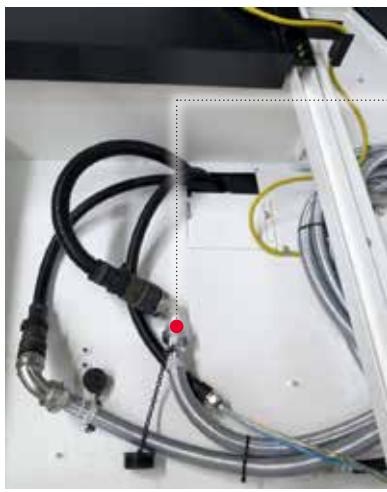


	Machine Type	CNC System	CNC Type	Input Voltage	50x510	51x510	51x520	520x520		Machine Type	CNC System	CNC Type	Input Voltage	50x510	51x510	51x520	520x520
Akira Seiki	Vx Series	Mitsubishi	M700	200 V AC	● ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	GF Mikron	Mills400	Heidenhain	iTNC530	400 V AC	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○
Alzmetall	BAZ35	Heidenhain	TNC426	400 V AC	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	VCE				400 V AC	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●
AMS	MVC400	Fanuc	OiMD	200 V AC	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	Haas	Minimill, VF-x, DT-1	HAAS	> M18.7	200 V AC	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●
Awea	AF-1000	Fanuc	18iMB	200 V AC	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	Hasegawa	PM250	Fanuc	31i-B5	200 V AC	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○
Axa	AF-1060	Heidenhain	iTNC530	400 V AC	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	Hermle	C800U	Siemens	840Dpl	400 V AC	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●
BFW	AF-1250	Heidenhain	iTNC530	400 V AC	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	Hurco	VMX10(i)	HURCO	WinMax V9.x	200 V AC	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●
Bridgeport	DBZ	Heidenhain	iTNC530	400 V AC	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	VMX24(i), 30(i)	HURCO	WinMax V9.x	200 V AC	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●
Brother	Dhruba 4070HE	Fanuc	OiMD	200 V AC	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	VMX42	HURCO	WinMax V8.x	200 V AC	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●
Chiron	Dhruba	Siemens	828D	?	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	VMX42(i)	HURCO	WinMax V9.x	200 V AC	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○
Chevalier	XV2290	Siemens	828D	400 V AC	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	Hyundai WIA	F400	Fanuc	0iMD	200 V AC	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○
DMG MORI	R450X1	Sanyo	C00	200 V AC	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	Jyoti	VMC640	Siemens	810D	400 V AC	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○
Doosan	Sx001X	Sanyo	C00	200 V AC	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	KAAST	KAAST	Fanuc			○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○
Fanuc Robodrill	TC-22Bn	Yaskawa	B00	200 V AC	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	Lapmaster	Micron Macro-S/SK	Siemens	840Dpl	400 V AC	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●
	TC-32Bn/FT/QT	Yaskawa	B00	200 V AC	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	Leadwell	LCV760	Fanuc	0iMF	200 V AC	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○
	TC-R2B	Sanyo	B00	200 V AC	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	Makino	Slim3N	Fanuc	0iMD	400 V AC	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○
	TC-S2Dn	Sanyo	B00	200 V AC	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	Mazak	PS95	Fanuc	?	?	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○
	SMART III Series	Syntec	21MA	200 V AC	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	VCS430	Mazak (Mitsubishi)	SMART or MATRIX NEXUS 2		200 V AC	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○
	FMG 1632CNC-HD	Siemens	840Dsl	400 V AC	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	VCS530CSL	Mazak (Mitsubishi)	SMART		200 V AC	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●
	FZ 12W	Fanuc	31iB5	400 V AC	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	VTC800	Mazak (Mitsubishi)	Mazatrol		400 V AC	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●
	Mill2000	Siemens	840Dsl	400 V AC	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	B800	FANUC	0iMD		200 V AC	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●
	DMU 50, 70, 100			400 V AC	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	C1050	Heidenhain	iTNC530 HSCI		400 V AC	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○
	Milltap 700	Siemens	840Dsl	400 V AC	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	C1050	Heidenhain	TNC620		400 V AC	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●
	DMC xx35V			400 V AC	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	C800	Heidenhain	iTNC530 HSCI		400 V AC	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●
	DMC xx50V	Siemens	840Dsl	400 V AC	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	MV154	Fanuc	?		200 V AC	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○
	DMF			400 V AC	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	MV184	Fanuc	0iMF		200 V AC	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○
	CMX xx35V	Siemens	840Dsl	400 V AC	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	MV184	Heidenhain	TNC620		400 V AC	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○
	CMX xx50V	Siemens	840Dsl	400 V AC	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	MV184	Siemens	828D		400 V AC	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○
	CMX xx50V	Fanuc	?	?	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	MV234	Fanuc	31iB		200 V AC	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○
	NVX5x Series	Mitsubishi	M730BM	200 V AC	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	MV235	Fanuc	31iB		200 V AC	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○
	DNM400-650	Siemens	828Dsl	400 V AC	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	Reckermann	Kombi 1300	Heidenhain	TNC320	400 V AC	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○
	DNM400-650	Fanuc	0iMD	200 V AC	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	Republic Lagun	VGC5028	Fanuc	31i-B5	200 V AC	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○
	DNM500 II, 650 II	Fanuc	0iMD	200 V AC	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	Sauer	Lasertech 45	Siemens	840Dsl	400 V AC	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○
	DNM400-650HS	Fanuc	30/31/32i-A	200 V AC	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	Spinner	MVC610	Siemens	840Dsl	400 V AC	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●
	DT360D	Fanuc	0iMD	200 V AC	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	Tongtai	VU5	Siemens	840dDsl	400 V AC	● ● ○ ○ ○	● ● ○ ○ ○	● ● ○ ○ ○	● ● ○ ○ ○
	DT400	Fanuc	0iMD	200 V AC	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	Wagner	WMC1100B	Siemens	828D	400 V AC	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○
	Mynx7500/50	Fanuc	0iMD	200 V AC	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	Technology & service								
	VC430 / VC510	Fanuc	0iMD	200 V AC	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	Workpiece clamping system								
	VM5400, 6400	Fanuc	30/31/32i-A	200 V AC	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	Aligning, GLA, RST								
	a-T14iFx	Fanuc	31i-A5/B5	200 V AC	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	SPZ, DDF, WMS, indexing accuracy								
	a-T21iFx	Fanuc	31i-A5/B5	200 V AC	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	MOT, KAB, CNC								
	a-D14xiA(5)	Fanuc	31i-B5	200 V AC	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	Technology & service								
	a-D21xiA(5)	Fanuc	31i-B5	200 V AC	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○	Workpiece clamping system								
	a-D21xiB(5)	Fanuc	31i-B5	200 V AC	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	Aligning, GLA, RST								

The right connector solution for every need:
for the motor, machine and servo

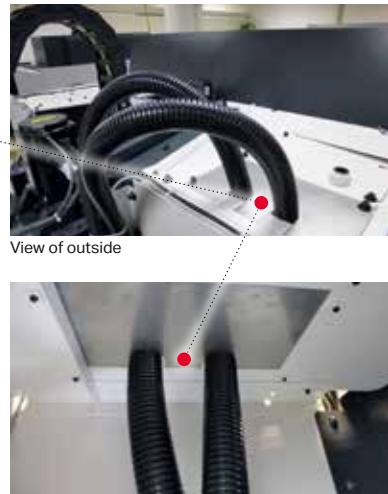
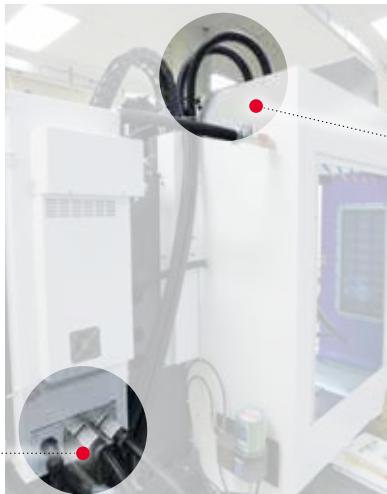
Customer-provided additional cover on cabin wall penetration WDFxx-K

Mazak: Plug-in connection of top of cabin

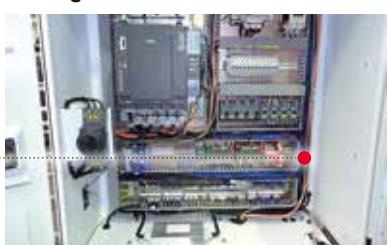


**Connectors suitable for
Standard preparation for
Kitagawa (Plug and Play):**
Pull original cable and connectors
onto top of cabin and connect to
pL LEHMANN connectors.

Connectorless installation, performed through hole in cabin



Control cabinet wall penetration, Harting, WDF.xx-S ...



Control cabinet wall penetration, Clipper, WDF.xx-S



Depending on the preparation of the machine, loose mating connectors or fully wired wall penetrations for cabin and control cabinet are available



Wall mounting of WDF.xx-MIL

Overview

Rotary tables

Applications & Facts

SPZ, DDF, WMS, indexing accuracy

Aligning, GLA, RST

MOT, KAB, CNC

Workpiece clamping system

Technology & service

Cabin wall penetration, round connector (MIL), WDF.xx-R1(z)-S...



WDF.Fx-R1



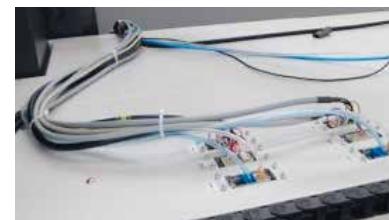
View of outside



Harting mating connector (without cable)



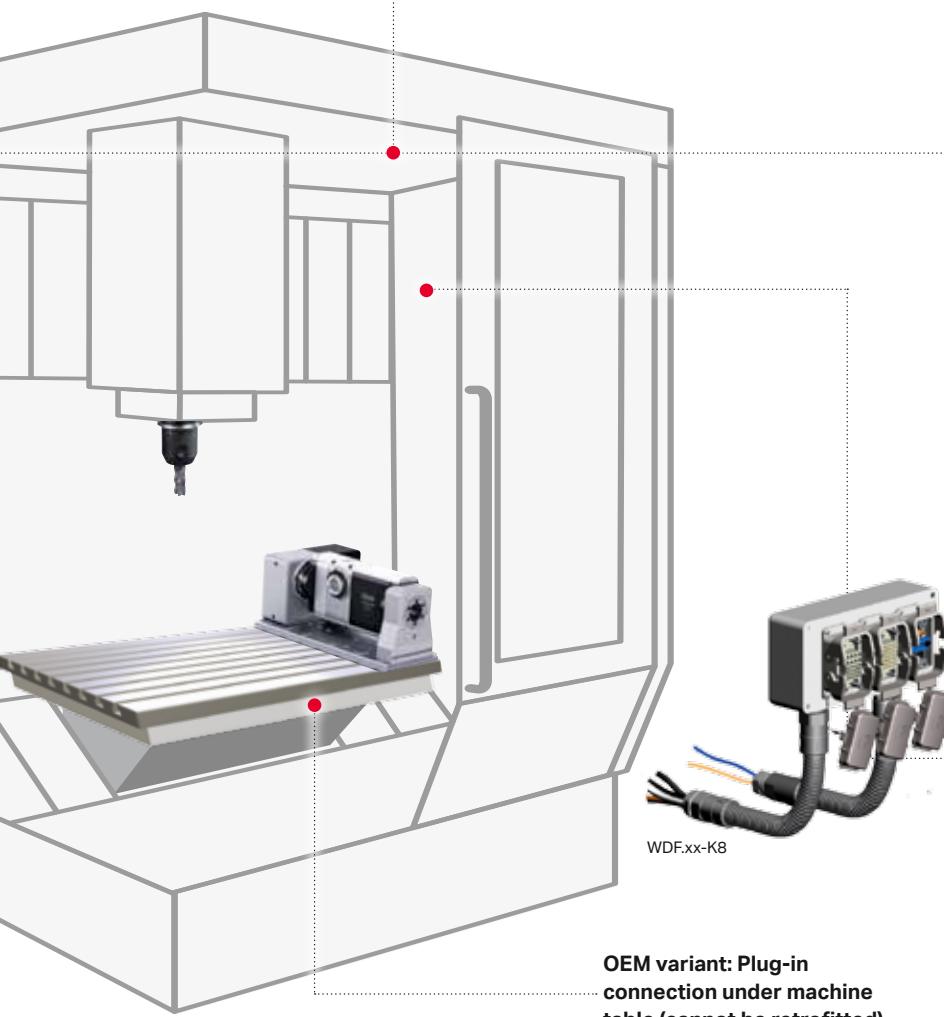
WDF.K8 inside



WDF.K8 outside



Cabin wall penetration, WDF.xx-K ...



OEM variant: Plug-in connection under machine table (cannot be retrofitted)

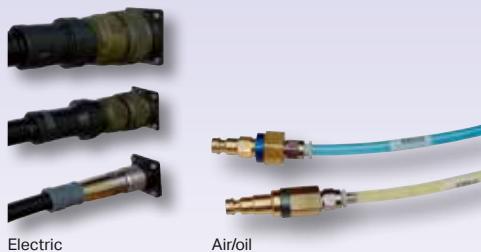
1 HARTING K8



(pL-Standard)

all in tight connector housings

2 MIL



Electric

Air/oil

A cable set is an essential accessory to guarantee imperviousness.

Overview

Rotary tables

Applications & Facts

SPZ, DDF, WMS, indexing accuracy

Aligning, GLA, RST

MOT, KAB, CNC

Workpiece clamping system

Technology & service

Standard cabling HARTING K8

- Proven over years
- High availability
- Connector is easy to disassemble when servicing is required
- Interface coding makes it impossible to mix up the connectors
- High degree of imperviousness (IP 65)
- Secure connection thanks to crimping
- Different connectors for motor and measuring system
- Air and oil integrated into the connection system
- Cables and hoses are relieved from strain
- Outflow on rotary table in just one flexible tube

Item no.

Please put together order number using the code key below.

KAB.F3-4.0w-K8w

Connector
o = without connector (free cable ends)
K8g = Harting Hank8/24, straight
K8w = Harting Hank8/24, angled
R1 = MIL round connector 28-11N/20-29W (4th axis)
R1z = MIL round connector 28-11Z/20-29Z (5th axis)
FNC = Fanuc CNC 35iB

needed only if rotary table is equipped with angular position measuring system

Motor
Cable lengths

F3 = Fanuc α Standard = 2 m, 4 m, 6 m

F4 = Fanuc β Special = 1 m, 3 m, 5 m (additional charge)

M1 = Movinor / Mavilor ERN

M2 = Movinor / Mavilor EQN

MI2 = Mitsubishi HG(-H)

SA = Sanyo

Y2 = Yaskawa SGMJV / SGMEV

OK = Okuma



Connector set



Item no.	For machine...	Required
STE.BRa-2	Brother	
STE.DMa	Deckel DMC xx3V, DMC xx4V, DMC xx35V (eco), DMC xx50V, Milltap 700 (only when 4th axis)	KAB.2H-2, when WMS in add. to STE.DMaw
STE.DMaw	WMS, Deckel DMC xx3V, DMC xx4V, DMC xx35V (eco), DMC xx50V, Milltap 700 (only when 4th axis)	
STE.DMb-2	Deckel DMU 50/70	When WMS in add. to STE.DMbaw
STE.DMbaw-2	WMS, Deckel DMU 50/70	
STE.FAa-2	Fanuc Robodrill (Europe)	
STE.FAb	Fanuc Robodrill (USA); 4th axis	KAB.1H-2
STE.FAbz	Fanuc Robodrill (USA); 5th axis	KAB.1H-2
STE.FNC	Fanuc-control system 35iB	KAB.2H-2
STE.HUB	Hurco VMX	KAB.1H-2
STE.K8g	Harting, straight	KAB.2H-2
STE.K8w	Harting, angled	KAB.2H-2
STE.Mlb	Mikron VCE	KAB.2H-2
STE.R1	MIL round connector 28-11N/20-29W	KAB.2H-2, when WMS in add. to KAB1Hw
STE.R1z	MIL round connector 28-11Z/20-29Z	KAB.2H-2, when WMS in add. to KAB1Hw

Flexible tubing with splitter

Required when a cable set with free cable ends and connector set STE.xxx is used.

Item no.	Designation
KAB.1H-2	1 Splitters
KAB.1Hw	1 Splitter with WMS
KAB.2H-2	2 Splitters



3 Clipper (FANUC Robodrill Europe)



Electric

Air/oil



Machine-specific cabling

Item no.	For machine... (ready to plug in)
KAB.F3-1.0-K8w-2	Kitamura Mycenter 2XiF
KAB.F3-1.6-FAbz-2	Fanuc Robodrill MIL round connector
KAB.F3-4.5-FAa-2	Fanuc Robodrill Clipper
KAB.F3-4.5w-FAa-2	Fanuc Robodrill Clipper
KAB.F3-3.0-FAa2-2	Fanuc Robodrill Clipper
KAB.F3-1.9-DMa-2	Deckel Maho DMC xx3V, xx4V, xx35V and xx35V eco
KAB.F4-3.0-DOa-2	Doosan 4th axis
KAB.F3-3.0-DOa-2	Doosan 4th axis
KAB.F3-3.0-DOa2-2	Doosan 5th axis
KAB.F4-4.5-FAa-2	Fanuc Robodrill Clipper
KAB.F4-3.0-FAa2-2	Fanuc Robodrill Clipper
KAB.F4-2.5-FAb-2	Fanuc Robodrill MIL round connector
KAB.M1-0.95-DMa-2	Deckel Maho DMC xx50V
KAB.M1-0.95w-DMa-2	Deckel Maho DMC xx50V
KAB.M1-1.9-DMa-2	Deckel Maho DMC xx3V, xx4V, xx35V, CMX and Milltap 700 (only when 4th axis)
KAB.M1-1.9-DMa2-2	Deckel Maho DMC xx3V, xx4V, xx35V CMX (5th axis)
KAB.M1-1.9w-DMa-2	Deckel Maho DMC xx3V, xx4V, xx35V, CMX and Milltap 700 (only when 4th axis)
KAB.M1-1.9w-DMa2-2	Deckel Maho DMC xx3V, xx4V, xx35V CMX (5. axis)
KAB.M1-1.7-DMb-2	Deckel Maho DMF and DMU, 4th axis
KAB.M1-1.7-DMb2-2	Deckel Maho DMF and DMU, 5th axis
KAB.M1-1.7w-DMb-2	Deckel Maho DMF and DMU, 4th axis
KAB.M1-1.7w-DMb2-2	Deckel Maho DMF and DMU, 5th axis
KAB.M1-3.0-DMc-2	Deckel Maho Milltap 700 (only when 4th/5th axis)
KAB.M1-3.0w-DMc-2	Deckel Maho Milltap 700 (only when 4th/5th axis)
KAB.M1-3.0-DOa-2	Doosan
KAB.M1-2.0-Mla-2	Mikron VCP 600/800 and VCP1000 Duro
KAB.M1-3.0-Mlb-2	Mikron VCE 600 Pro - VCE 1400 Pro
KAB.M1-5.0-Mlb-2	Mikron VCE 1600
KAB.M1-1.1-Mlc-2	Mikron HSM
KAB.M1-1.5-Mlc-2	Mikron HPM
KAB.M1-3.0-MZa-2	Mazak
KAB.M1-4.0-MZa-2	Mazak
KAB.Y1-0.33-BRa-2	Brother TC-32BN QT
KAB.Y1-1.3-BRa-2	Brother TC-32BN QT
KAB.Y1-2.0-BRa-2	Brother TC-32BN FT, TC-22B (tilting axis)
KAB.Y1-4.0-BRa-2	Brother TC-32BN FT, TC-22B (dividing axis)
KAB.SA-0.5-BRa-2	Brother TC-31B/Speedio R450X1
KAB.SA-1.3-BRa-2	Brother TC-31B/TC-R2B/Speedio R450X1
KAB.SA-3.0-BRa-2	Brother TC-S2D/Speedio SX1
KAB.SA-4.0-BRa-2	Brother TC-S2D/Speedio SX1
KAB.SA-5.0-BRa-2	Brother TC-S2D/Speedio SX1
KAB.Y2a-2.5-HUB-2	Hurco 4. Achse: Hurco VM1, VM2, VM3, VMX10, VMX24, VMX30, VMX40; 4th/5th axis: VM1, VM2, VM3, VMX10
KAB.Y2-2.5-HUB-2	Hurco 4th axis: Hurco VMX42; 4th/5th axis: VMX24, VMX30, VMX40, VMX42, VMX50, VMX64
KAB.Y2-2.5w-HUB-2	Hurco 4th axis: Hurco VMX50, VMX60, VMX64, VMX84; 4th/5th axis: VMX60, VMX84
KAB.Y2a-5.0-HAA-2	Haas
KAB.Y2-5.0-HAA-2	Haas
KAB.Y2-5.0w-HAA-2	Haas
KAB.Y3-5.0-HAA-2	Haas

Mating plugs / wall penetrations

Item no.	Designation	Wall bushing
WDF.K8	Harting	
WDF.R1	MIL round connector 28-11N/20-29W	
WDF.R1z	MIL round connector 28-11Z/20-29Z	
WDF.WMS	M23, 17-pole	
WDF.WMS-Fx-PCR	M23, 17-pole, Fanuc	
WDF.WMS-Mix-10P	M23, 17-pole, Mitsubishi	
WDF.Fx-S-2	Control cabinet, per axis for Fanuc	
WDF.Fx-Sw-2	WMS, control cabinet, per axis for Fanuc	
WDF.Fx-R1(z)-S-2	Control cabinet, per axis for Fanuc	
WDF.Mx-S-2	Control cabinet, per axis for Mavilor	
WDF.Mx-Sw-2	WMS, control cabinet, per axis for Mavilor	
WDF.M2-R1(z)-S-2	Control cabinet, per axis for Mavilor	
WDF.M1-DOa	Encoder plug for Doosan	
WDF.Fx-K-2	Cabinet wall, per axis for Fanuc	
WDF.Fx-Kw-2	WMS, cabinet wall, per axis for Fanuc	
WDF.Mx-K-2	Cabinet wall, per axis for Mavilor	
WDF.Mx-Kw-2	WMS, cabinet wall, per axis for Mavilor	
WDF.lo	Air/oil	

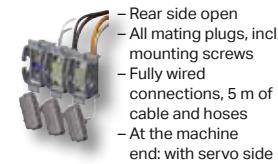
WMS = Angular position measuring system

④ Loose mating plugs K8



- Mating plug, including mounting screws
- Delivered loose
- incl. drilling template for quick installation

⑤ Control cabinet wall penetration



- Rear side open
- All mating plugs, incl. mounting screws
- Fully wired connections, 5 m of cable and hoses
- At the machine end: with servo side mating plug
- incl. drilling template

⑥ Cabinet wall penetration



- Rear side closed
- Fully wired connections, 10 m of cable and hoses, 5 m of flexible tubing
- At the machine end: with servo side mating plug
- incl. drilling template for quick installation

⑦ Loose mating plugs MIL



- Mating plug, including mounting screws
- Delivered loose
- incl. drilling template for quick installation

Option: Additional cable for retrofitting WMS

KAB.WMS-14.0-o



Cable run in flexible tubing, 14 m long, without connector

Overview

Rotary tables

SPZ, DDF, WMS, indexing accuracy

MOT, KAB, CNC

Workpiece clamping system

Technology & service

CNC control system FANUC 35iB: Manual control pendant

Multi-functional manual operating device which can be used for both this CNC control system as well as for machines equipped with FANUC CNC.



Please view the appropriate instructions on our website for functions and operation
www.lehmann-rotary-tables.com

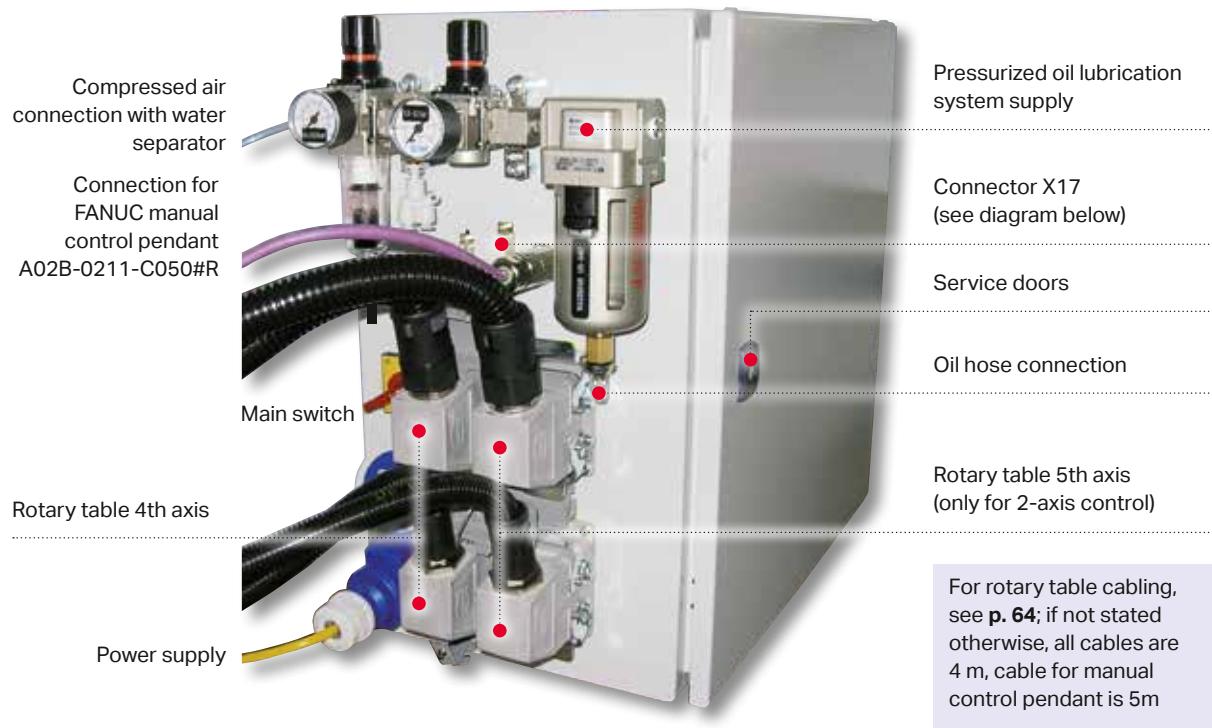
CNC control system for 1 or 2 axes

Original FANUC components – worldwide on-site service guaranteed!

Control cabinet

All connections and operating elements on the side wall on the left. Control cabinet doors for easy access to components. Control cabinet suitable for one- or two-axis models.

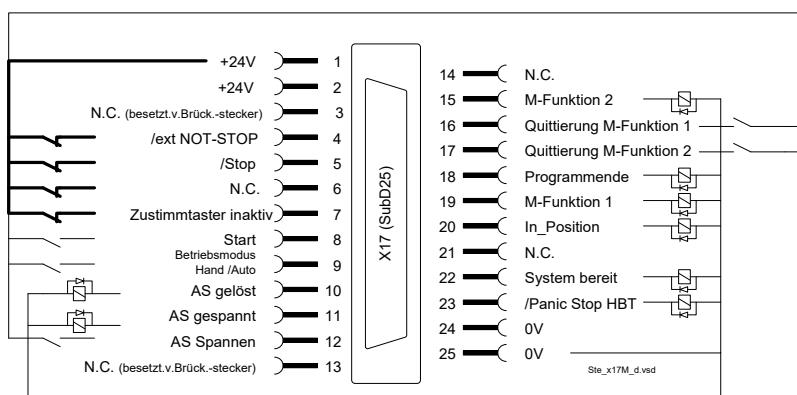
Control cabinet dimensions (without connectors):
230 V model: H = 500, B = 500, T = 300 mm



Connector X17 for connecting the 4th and 5th axis

The jumper connectors supplied with the product enable the control system to be operated without these axes connected.

Connections necessary for operation are shown in bold.



Wide range of functions



EA-530 with Fanuc 35iB: Drive data reduced by approx. 30%

Order items

Item no.	Designation	Dimensions / remarks
CNC.1AX-FA	CNC control system Fanuc 35iB, 1-axis	see p. 66/67
CNC.2AX-FA	CNC control system Fanuc 35iB, 2-axis	see p. 66/67
CNC.MFK	M-function cable	only in conjunction with CNC.1AX-FA or CNC.2AX-FA
CNC.HaKab-10m	Handy cable	10 m
CNC.WMS-1	Option for angular position measuring system	only in conjunction with CNC.1AX-FA
CNC.WMS-2	Option for angular position measuring system	only in conjunction with CNC.2AX-FA
CNC.BAT	Backup battery option	only in conjunction with CNC.1AX-FA or CNC.2AX-FA
CNC.Trafo	Transformer	for Fanuc-CNC (400 V to 200 V)
CNC.TRE	Option: Indexing calculator	

Technical data

Features	Specifications	Remarks
1. Programmable angle	0.001 ... 9999.999°	freely programmable
2. Sub-programs	Yes	can be nested in 4 ways
3/ Total storage capacity	4000 characters (bytes)	Optional 128 kBytes
4. Number of programs, incl. macros	63	Optional 400
5. Program storage buffering	via battery	
6. Programming options	Absolute, incremental	can be combined in any way you wish
7. Reference point approach	Yes, by means of reference cam and measuring system	optional absolute
8. Reference point shift	Yes	via parameters
9. Manual feed	creep, rapid traverse, gradual	
10. Feed programming	Yes	
11. Repeat function	programmable loop	
12. Software range limit switch	Yes	adjustable via parameters
13. Hardware range limit switch	Yes	
14. Spindle clamping	Automatic	can be switched on / off
15. Monitoring of spindle clamping	Yes	
16. «Rotary table in position» output	Yes	
17. External «Manual/Automatic» input	Yes	
18. «Ready for operation / fault detection» output	Yes	
19. External «Enable turning» input	yes	
20. Free M-function outputs	5x	e.g. to activate an automatic tailstock
21. «External cycle start» input	Yes	
22. «External cycle stop» input	Yes	
23. «External EMERGENCY STOP» input	Yes	1-channel
24. OK button	single stage	
25. Fault message system on manual control pendant	Clear text	
26. Motor output	AC servomotor	1 or 2 axes
27. Motor measuring system input	FANUC serial	
28. Position measuring system input	FANUC serial	Optional with SDU box
29. Power supply	200...240 VAC 50/60 Hz	1-phase
30. Interface	USB slot, PC card	Ethernet (option)
31. Minimum required signals from the machine	acknowledgeable M-function EMERGENCY STOP connection	if connection to machine CNC required
32. External single block position specification	via RS232 option	not provided
33. Program skips	by using GoTo command	must be done with block numbers (Nxxxx)
34. Continuous turning	Yes	e.g. for grinding work
35. Sub-programs	Yes	can be nested in 4 ways
36. External «EMERGENCY STOP» output	Yes, from manual control pendant	1-channel

Easy to program



Program functions

Angular positioning	G91 G00 A45	G91 = Incremental G00 = Rapid traverse A45 = 45° with A-axis	Incremental / absolute divisions	G91 G00 A45; M00 (cycle stop); A181.567; M00 (cycle stop); A90.987; M00 (cycle stop); G90 A0;	Subprogram call	Main programm
Circle milling	G91 G01 A45 F100	G01 = Feed F = °/min	Workpiece zero point offset	G53 = Delete zero point offset G54 = Set zero point offset	Sub-programm #1	01001 Program for drilling #1 M99
Unequal divisions	G91 G00 A45; M00 (cycle stop); A35.12; M00 (cycle stop); A61.876; M00 (cycle stop); A93; M00 (cycle stop); A67.34; M00 (cycle stop); A57.3;	20.47°	Continuous turning	M04 S0.5; G04 X30000; M05	Delay time	G04 X1000
Auto reference	G28 A00	Moves to reference position	M-function	30 seconds continuous turning in counterclockwise direction at 0.5 [1/min] (only 4th axis)	Delay time 1 second	
					Cycle stop	M00
					After each motion, an M00 must be programmed so that the program cycle can be stopped.	
					Program end	M30
						M30 = Jump to program start.

Programming

Programming uses the internationally known ISO code.

Programming example 1 – axis:	Programming example 2 – axis:	Example of M-functions
%; O0001 (Tes tprogram 1); N10 G90 G00 A0 (P1); N20 M00 (cycle stop); N30 G90 G00 A90 (P2); N40 M00 (cycle stop); N50 G90 G00 A150 (P3); N60 M00 (cycle stop); N70 G91 G01 A30 F40 (P4); N80 M00 (cycle stop); N90 G90 G00 A300 (P5); N100 M30 (PG end)	%; O0001 (Tes tprogram 2); N10 G90 G00 A90 B0 (P1); N20 M00 (cycle stop); N30 G90 G00 A270 B90 (P2); N40 M00 (cycle stop); N50 G91 G00 A-20 B0 (P3); N60 M00 (cycle stop); N70 G91 G00 A10B0 (P4); N80 M00 (cycle stop); N90 G90 G00 A0 B0 (P5); N100 M00 (cycle stop); N110 G91 G01 A45 B0 (P5); N120 M30 (PG end); 	CNC machine program N... N1030 G90 G00 X4 Y14 Z40; N1040 M?? → N1050 G90 G00 X8 Y4 Z30; ← N1060 M?? → N1070 G90 G00 X16 Y2 Z33; ← N1080 M?? → N1090 G90 G00 X16 Y2 Z33; ← N1100 M30 → Fanuc CNC 35iB program %; O1001(FanucNC PG); N10 G90 G00 A90; N20 M00 (cycle stop); N30 G90 G00 A45; N40 M00 (cycle stop); N50 G90 G00 A00; N60 M30 (PG end) M?? = M-function according to CNC machine

HSK clamping with precise angular positioning =
compact palletizing system manually and
automatically



newChuck: ideal table chuck for machining of the 5th or 6th side, for example, with integrated ripas

For application ideas and system explanation, see p. 44/45

The main advantages of ripas

- + Very space-saving, as integrated completely into the spindle
- + Easy to retrofit
- + Very torsionally rigid
- + High precision
- + Standard interface proven in thousands of applications
- + When required, standard adapter can also be used (no rough positioning possible)

The principle

The basis is the standardized HSK clamping with conventional clamping sets. However, the carrier cams are precisely ground and can deflect axially. The counterpart (HSK adapter) has a precise groove as well as a positioning bore for the guide pin.



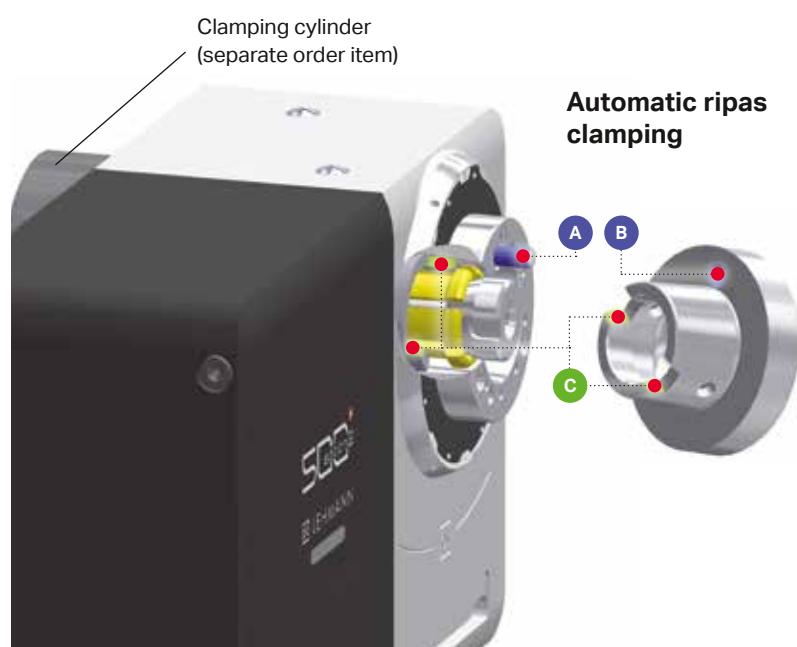
The function

ripas has 3 functions:

- A** Anti-twist protection
- B** Rough positioning
- C** Precision positioning

Process

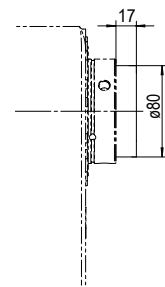
During changes (manually or automatic), the guide pin **A** ensures proper orientation while providing rough positioning at the same time **B**. Shortly before the face is reached, the inner precision cams perform the precision positioning **C**.



Flexible, precise, compact and can be automated –
the ripas / zero point clamping system from
pL LEHMANN

SPZ.5xx = Item number for combined clamping cylinder for types 507 and 510

	Item no.	Designation	Manual (MAPAL)	Hydraulic (Ortlieb)	Required clamping cylinder *
507	RIP.507-63m**	HSK-A63	•		SPZ.5xx-9
510	RIP.507-63h	HSK-A63		•	SPZ.5xx-9
520	RIP.510-63m**	HSK-A63	•		SPZ.5xx-9
all sizes	RIP.510-63h	HSK-A63		•	SPZ.520-9
	RIP.520-63m	HSK-A63			
	RIP.520-63h	HSK-A63			
	MKx.5xx-MK4-1	Adapter MK4			
	RIP.ada	ripas adapter - Standard			
	RIP.adaGrip	ripas adapter with face coating for major improvement of the slip-free torque transmitted (please refer to technical data)			
	RIP.63-KD-1	ripas/HSK alignment pin			
	RIP.FUTm	ripas table chuck	•		



Above dimensions apply with ripas adapter inserted. Without adapter, the collet chuck projects approx. 10.5 mm.

HSK = Hollow shank taper to DIN 69063-1 (spindle) or DIN 69893 (adapters)

* For T-type rotary tables it may be necessary to increase the center height, see p. 49

** Not possible in combination with the «Labyrinth» spindle seal (see p. 11)

Technical data for ripas / HSK

	Unit	HSK-A63 manual		HSK-A63 automatic	
		Standard	ripasGrip (option)	Standard	ripasGrip (option)
Perm. tension, max.	kN	–	–	10 at 50 bar ¹⁾	10 at 50 bar ¹⁾
Resulting insertion force on adapter, max.	kN	–	30 at 20 Nm ²⁾	–	30
Perm. pull-out torque (before losing face contact)	kN	–	approx. 600	–	approx. 600
Transport load	kg	–	approx. 60	–	approx. 60
Perm. torque ³⁾ (slip ⁴⁾ max. ± 0.003°) A	Nm	–	approx. +50%	approx. 150	approx. 300
Perm. torque ³⁾ (slip ⁴⁾ max. ± 0.01°) B	Nm	–	approx. +50%	approx. 250	approx. 450
Repeat accuracy, XYZ	mm	–	< 0.005	–	< 0.005
Repeat accuracy, angular	± arc sec	–	8	–	4

¹⁾ with SPZ.5xx-9

²⁾ Radial screw

³⁾ Values apply under static conditions, without any vibrations, with no load, dry, grease-free, clean

⁴⁾ returns to original position after unclamping/clamping

Options for all sizes

SPZ.Awk-Vor	Preparation for presence check only possible for automatic clamping (only with adapter from pL)
SPZ.Awk	Control box for presence check (see p. 55)

Overview

Rotary tables

Applications & Facts
SPZ, DDF, WMS,
indexing accuracy

Aligning,
GLA, RST

MOT, KAB, CNC

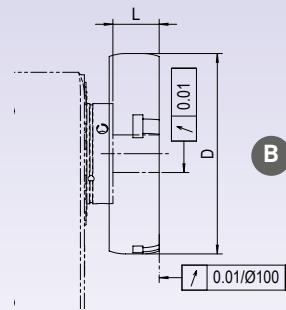
Workpiece
clamping system

Technology & service

Everything included



Clamped quickly and easily



Small parts

A

	Item no.	For machine	For product
507	LOZ.507-EA		EA-507
	LOZ.507-LFX		longFlex
	LOZ.5x0-EAo		EA-510/520.Ox
	LOZ.510-EA		EA-510
	LOZ.510-LFX		longFlex
510	LOZ.DMG-xxxV	Deckel DMC xxxV	
	LOZ.DMG-DMU	Deckel DMU	
	LOZ.MIK-VCP	Mikron VCP	
	LOZ.MIK-VCE	Mikron VCE	
	LOZ.MIK-HxM	Mikron HSM/HPM	
	LOZ.5x0-EAo		EA-510/520.Ox
	LOZ.520-EA		EA-520
520	LOZ.DMG-xxxV	Deckel DMC xxxV	
	LOZ.DMG-DMF	Deckel DMF	
	LOZ.MIK-VCP	Mikron VCP	
	LOZ.MIK-VCE	Mikron VCE	
	LOZ.MIK-HxM	Mikron HSM/HPM	
530	LOZ.530-EA		EA-530
	LOZ.DMG-DMF-530	Deckel DMF	
	LOZ.MIK-VCE-530	Mikron VCE	
	LOZ.5xx-M2		M2-5xx
	LOZ.5xx-M3+M4		M3/M4-5xx
all sizes	LOZ.5xx5xx-TAP		TF-5xx5xx
	LOZ.5xx5xx-TF		TF-5xx5xx
	LOZ.5xx5xx-T1+2		T1/T2-5xx5xx
	LOZ.5xx5xx-T3+4		T3/T4-5xx5xx
	LOZ.5xx-RFX		rotoFIX

	Item no.	For machine	For product
	LOZ.5xx-GLA		for counter bearing
	LOZ.lo		Air/oil
	LOZ.RST-14		for tailstock LIGHT
	LOZ.RST-18		for tailstock LIGHT
	LOZ.Bride-L	Long clamps, for 63/125 grid pattern	
	LOZ.AKI-Vx-Tx	Akira Seiki Vx	Tx
	LOZ.AKI-Vx-EA	Akira Seiki Vx	EA
	LOZ.DMG-CMX-Tx	DMG CMX xx00V	Tx
	LOZ.DMG-CMX-EA	DMG CMX xx00V	EA
	LOZ.DOO-EA	Doosan DNM/DVM/VM & Mynx	EA
	LOZ.DOO-Tx	Doosan DNM/DVM/VM & Mynx	Tx
	LOZ.DOO-DT-Tx	Doosan DT360D/DT400	Tx
	LOZ.DOO-DT-EA	Doosan DT360D/DT400	EA
	LOZ.DOO-VC-EA	Doosan VC430/VC510	EA
	LOZ.DOO-VC-Tx	Doosan VC430/VC510	Tx
	LOZ.FAN-EA	Fanuc	EA
	LOZ.FAN-Tx	Fanuc	Tx
	LOZ.HAA-OM-EA	Haas (only OM-2A)	EA
	LOZ.HAA-EA	Haas (without OM-2A)	EA
	LOZ.HAA-Tx	Haas (without OM-2A)	Tx
	LOZ.HYU-EA	Hyundai F-Series	EA
	LOZ.MAK-SLI-Tx	Makino Slim3	Tx
	LOZ.MAZ-VCP-2EA	Mazak VCP	2 x EA or 2 x M
	LOZ.MAZ-VCS-EA	Mazak VCS	EA
	LOZ.MAZ-VTC-EA	Mazak VTC	EA
	LOZ.MAZ-VTC-Tx	Mazak VTC	Tx

Faceplates (axial discs)

B

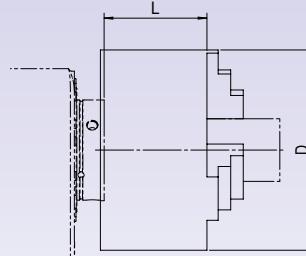
	Item no.	Designation	Diameter D [mm]	Thickness [mm]	Passage [mm]	LL from spindle [mm]	Weight [kg]	Moment of inertia J [kgm²]
507*	TPL.507-160	Faceplate, 4 T-slots 12 mm	160	30	30	27	6	0.02
510	TPL.510-160	Faceplate, 4 T-slots 12 mm	160	40	30	37	6	0.02
520	TPL.510-200	Faceplate, 4 T-slots 12 mm	200	40	30	37	10	0.05
530	TPL.510-240	Faceplate, 4 T-slots 12 mm	240	45	30	42	16	0.12
520	TPL.520-250	Faceplate, 8 T-slots 14 mm	250	45	45	45	17	0.14
530	TPL.520-300	Faceplate, 8 T-slots 14 mm	300	50	45	50	27	0.31
520	TPL.520-350	Faceplate, 8 T-slots 14 mm	350	50	45	50	37	0.58
530	TPL.530-300	Faceplate, 8 T-slots 18 mm	300	51	45	51	27	0.31
520	TPL.530-400	Faceplate, 8 T-slots 18 mm	400	51	45	51	49	0.99
530	TPL.530-500**	Faceplate, 8 T-slots 18 mm	500	56	45	56	84	2.65
all sizes	TPL.5xx-GEN	Increased accuracy = 1/2 tolerance values						
	TPL.mon	Faceplate assembled and measured						



* Not possible in combination with spindle seal with labyrinth SPI.507-Lab

** Increased center height required (see p. 11)

Quickly converted for small series
and express work



Exact alignment possible
thanks to adjustment play
(ca. 0.1mm), without
BFU.530-xxxps (short taper)

Scroll chucks (manual)

incl. suitable adapter flange, 1 set of one-piece stepped clamping jaws, hardened and ground, for external and internal clamping as well as clamping wrench

		Item no.	Designation	Diameter D [mm]	Passage [mm]	L from spindle [mm]	Weight [kg]	Moment of inertia J [kgm ²]		
530	520	510	507*	BFU.507-100ps	Scroll chuck	100	20	62.5	4	0.005
				BFU.507-125ps	Scroll chuck	125	35	74	7	0.01
				BFU.507-160ps	Scroll chuck	160	42	82.5	13	0.04
				BFU.510-125ps	Scroll chuck	125	35	73.5	7	0.01
				BFU.510-160ps	Scroll chuck	160	42	82	13	0.04
				BFU.510-200ps	Scroll chuck	200	44	92	22	0.07
				BFU.520-160ps	Scroll chuck	160	42	85	13	0.04
				BFU.520-200ps	Scroll chuck	200	55	95	23	0.12
				BFU.520-250ps	Scroll chuck	250	76	106	39	0.31
				BFU.530-250ps	Scroll chuck	250	76	89	32	0.25
				BFU.530-315ps	Scroll chuck	315	80	96.2	56	0.69
				BFU.530-400ps	Scroll chuck	400	136	108	97	1.88



For more information, please visit:
www.lehmann-systemtechnik.ch

Wedge bar chucks SCHUNK ROTA-S plus 2.0 (manual)

incl. suitable adapter flange, 1 set of reversible stepped jaws, hardened and ground, as well as clamping wrench

		Item no.	Designation	160	42	82.8	11	0.04		
530	520	510	507*	BFU.507-160ks	Wedge bar chuck	160	42	82.3	11	0.04
				BFU.510-160ks	Wedge bar chuck	160	42	100.3	21	0.11
				BFU.510-200ks	Wedge bar chuck	200	44	83.3	11	0.04
				BFU.520-160ks	Wedge bar chuck	160	42	83.3	11	0.04
				BFU.520-200ks	Wedge bar chuck	200	52	104.3	21	0.11
				BFU.520-250ks	Wedge bar chuck	250	62	115	38	0.30
				BFU.530-250ks	Wedge bar chuck	250	62	121	31	0.30
				BFU.530-315ks	Wedge bar chuck	315	92	143	58	0.89
				BFU.530-400ks	Wedge bar chuck	400	102	153	108	2.58



For more information, please visit:
www.schunk.com and
www.lehmann-systemtechnik.ch

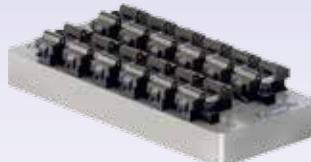
Increased accuracy (for all chucks above)

BFU.5xx-GEN Increased accuracy = ½ tolerance values

* Not possible in combination with spindle seal with labyrinth SPI.507-Lab



KSC2 40
1 sides, 1 rows



KSC2 40
1 sides, 2 rows



KSC2 40
2 sides, 1 rows

pL LEHMANN Item no.	pL LEHMANN Item no. Hole grid plate	L [mm]	Clamping system	Description	Number of clamping elements	SCHUNK Item no. Hole grid plate	SCHUNK Item no. Clamping elements
SCH.510-5-KSC40-11	Always needed: SCH.510-LRP500	500	KSC2 40	1 sides, 1 row	6	Always needed: 40105326	40105274
SCH.510-5-KSC40-12		500	KSC2 40	1 sides, 2 row	12		40105276
SCH.510-5-KSC40-21		500	KSC2 40	2 sides, 1 row	12		40105275
SCH.510-5-KSC40-22		500	KSC2 40	2 sides, 2 row	24		40105277
SCH.510-5-KSC65-1		500	KSC2 65	1 sides, 1 row	3		40105278
SCH.510-5-KSC65-2		500	KSC2 65	2 sides, 1 row	6		40105279
SCH.510-5-KSC125-1		500	KSC 125	1 sides, 1 row	3		40105280
SCH.510-5-KSC125-2		500	KSC 125	2 sides, 1 row	6		40105281
SCH.510-5-KSM400-11		500	KSM2 400	1 sides, 1 row	max. 5		40105282
SCH.510-5-KSM400-12		500	KSM2 400	1 sides, 2 row	max. 10		40105284
SCH.510-5-KSM400-21		500	KSM2 400	2 sides, 1 row	max. 10		40105283
SCH.510-5-KSM400-22		500	KSM2 400	2 sides, 2 row	max. 20		40105285
SCH.510-6-KSC40-11	Always needed: SCH.510-LRP600	600	KSC2 40	1 sides, 1 row	7	Always needed: 40105355	40105286
SCH.510-6-KSC40-12		600	KSC2 40	1 sides, 2 row	14		40105288
SCH.510-6-KSC40-21		600	KSC2 40	2 sides, 1 row	14		40105287
SCH.510-6-KSC40-22		600	KSC2 40	2 sides, 2 row	28		40105289
SCH.510-6-KSC65-1		600	KSC2 65	1 sides, 1 row	4		40105290
SCH.510-6-KSC65-2		600	KSC2 65	2 sides, 1 row	8		40105291
SCH.510-6-KSC125-1		600	KSC 125	1 sides, 1 row	3		40105292
SCH.510-6-KSC125-2		600	KSC 125	2 sides, 1 row	6		40105293
SCH.510-6-KSM500-11		600	KSM2 500	1 sides, 1 row	max. 6		40105294
SCH.510-6-KSM500-12		600	KSM2 500	1 sides, 2 row	max. 12		40105296
SCH.510-6-KSM500-21		600	KSM2 500	2 sides, 1 row	max. 12		40105295
SCH.510-6-KSM500-22		600	KSM2 500	2 sides, 2 row	max. 24		40105297

Ordering information

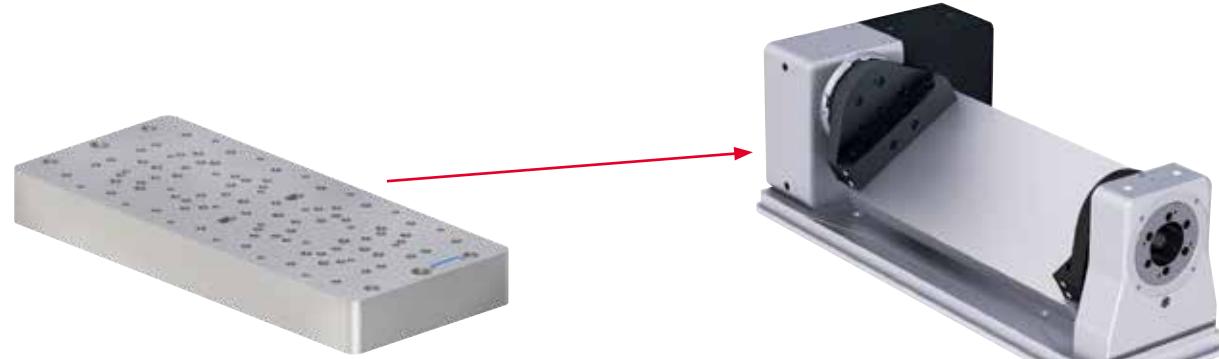
Always order together with pL

+ counter bearing GLA.510-150 (**p. 12**)

+ bore set RFX.510-ASa (**p. 12**)

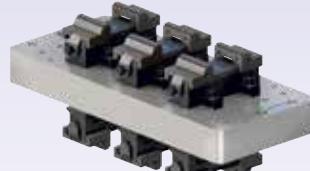
+ base plate RFX.510-GPxxxx (**p. 12**) or hydraulic kit GLA.Hyd-xxx (**p. 55**)

For further information, please visit: www.schunk.com



Hole grid plate SCHUNK 40105326, 40105355, 40105356,
40105357

Instead of the standard clamping yoke shown
on **p. 12** the SCHUNK hole grid plate is used here.

KSC2 40
2 sides, 2 rowsKSC2 65
1 sides, 1 rowsKSC2 65
2 sides, 1 rows

pL LEHMANN Item no.	pL LEHMANN Item no. Hole grid plate	L [mm]	Clamping system	Description	Number of clamping elements	SCHUNK Item no. Hole grid plate	SCHUNK Item no. Clamping elements
SCH.520-6-KSC40-11	Always needed: SCH.520-LRP600	600	KSC2 40	1 sides, 1 row	7	Always needed: 40105356	40105298
SCH.520-6-KSC40-12		600	KSC2 40	1 sides, 2 row	14		40105300
SCH.520-6-KSC40-21		600	KSC2 40	2 sides, 1 row	14		40105299
SCH.520-6-KSC40-22		600	KSC2 40	2 sides, 2 row	28		40105301
SCH.520-6-KSC65-1		600	KSC2 65	1 sides, 1 row	4		40105302
SCH.520-6-KSC65-2		600	KSC2 65	2 sides, 1 row	8		40105303
SCH.520-6-KSC125-1		600	KSC 125	1 sides, 1 row	3		40105304
SCH.520-6-KSC125-2		600	KSC 125	2 sides, 1 row	6		40105305
SCH.520-6-KSM500-11		600	KSM2 500	1 sides, 1 row	max. 6		40105306
SCH.520-6-KSM500-12		600	KSM2 500	1 sides, 2 row	max. 12		40105308
SCH.520-6-KSM500-21		600	KSM2 500	2 sides, 1 row	max. 12		40105307
SCH.520-6-KSM500-22		600	KSM2 500	2 sides, 2 row	max. 24		40105309
SCH.520-8-KSC40-11	Always needed: SCH.520-LRP800	800	KSC2 40	1 sides, 1 row	10	Always needed: 40105357	40105310
SCH.520-8-KSC40-12		800	KSC2 40	1 sides, 2 row	20		40105312
SCH.520-8-KSC40-21		800	KSC2 40	2 sides, 1 row	20		40105311
SCH.520-8-KSC40-22		800	KSC2 40	2 sides, 2 row	40		40105313
SCH.520-8-KSC65-1		800	KSC2 65	1 sides, 1 row	5		40105314
SCH.520-8-KSC65-2		800	KSC2 65	2 sides, 1 row	10		40105315
SCH.520-8-KSC125-1		800	KSC 125	1 sides, 1 row	5		40105316
SCH.520-8-KSC125-2		800	KSC 125	2 sides, 1 row	10		40105317
SCH.520-8-KSM500-11		800	KSM2 500	1 sides, 1 row	max. 6		40105318
SCH.520-8-KSM500-12		800	KSM2 500	1 sides, 2 row	max. 12		40105320
SCH.520-8-KSM500-21		800	KSM2 500	2 sides, 1 row	max. 12		40105319
SCH.520-8-KSM500-22		800	KSM2 500	2 sides, 2 row	max. 24		40105321

Ordering information

Always order together with pL

+ counter bearing GLA.520-180 (**p. 12**)

+ bore set RFX.520-ASa (**p. 12**)

+ base plate RFX.520-GPxxxx (**p. 12**) or hydraulic kit GLA.Hyd-xxx (**p. 55**)

For further information, please visit: www.schunk.com

KSC 125
1 sides, 1 rowsKSCM2 400
1 sides, 1 rowsKSCM2 400
1 sides, 2 rowsKSC 125
2 sides, 1 rowsKSM2 400
2 sides, 1 rowsKSM2 400
2 sides, 2 rows

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Workpiece
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SPZ, DDF, WMS, indexing accuracy	Applications & Facts
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		pL LEHMANN Item no.	Designation	Size [mm]	L from spindle (without jaws) [mm]	Pneumatic	Manual	Centered	Fixedjaw	Jaw stroke [mm]	Clamping force [kN] *	Max. pressure (bar)	Max. torque [Nm]	Max. range with standard jaws ** [mm]	Additionally required pLehmann rotary union ***	SCHUNK catalog reference	SCHUNK Item no. incl. adapter flange
507	SCH.507-KSP64	KSP-Z plus 64	64 x 64	65.7	●	●	●	●	2	4.5 9	40	DDF.507-04	0405102	40105123			
	SCH.507-KSP100	KSP-Z plus 100	100 x 100	80.2	●	●	●	●	2	18 9	70	DDF.507-04	0405202	40101540			
	SCH.507-KSP100LH	KSP-LH-Z plus 100	100 x 100	80.2	●	●	●	●	6	8 9	70	DDF.507-04	0405222	40101541			
	SCH.507-KSP100F	KSP-F-Z plus 100	100 x 100	80.2	●	●	●	●	4	18 9	70	DDF.507-04	0405212	40101542			
	SCH.507-KSA100	KSA-Z plus 100	100 x 100	85.2	● ●	● ●	● ●	● ●	2	18 9 8	70		0405291	40101543			
	SCH.507-KSA100LH	KSA-LH-Z plus 100	100 x 100	85.2	● ●	● ●	● ●	● ●	6	18 9 20	70		0405295	40101544			
510	SCH.507-KSA100F	KSA-F-Z plus 100	100 x 100	85.2	● ●	● ●	● ●	● ●	4	18 9 8	70		0405293	40101545			
	SCH.510-KSP64	KSP-Z plus 64	64 x 64	65.7	●	●	●	●	2	4.5 9	40	DDF.510-04	0405102	40105124			
	SCH.510-KSP100	KSP-Z plus 100	100 x 100	80.2	●	●	●	●	2	18 9	70	DDF.510-04	0405202	40106193			
	SCH.510-KSP100LH	KSP-LH-Z plus 100	100 x 100	80.2	●	●	●	●	6	8 9	70	DDF.510-04	0405222	40106253			
	SCH.510-KSP100F	KSP-F-Z plus 100	100 x 100	80.2	●	●	●	●	4	18 9	70	DDF.510-04	0405212	40106195			
	SCH.510-KSA100	KSA-Z plus 100	100 x 100	85.2	● ●	● ●	● ●	● ●	2	18 9 8	70		0405291	40106194			
520	SCH.510-KSA100LH	KSA-LH-Z plus 100	100 x 100	85.2	● ●	● ●	● ●	● ●	6	18 9 20	70		0405295	40106196			
	SCH.510-KSA100F	KSA-F-Z plus 100	100 x 100	85.2	● ●	● ●	● ●	● ●	4	18 9 8	70		0405293	40109197			
	SCH.510-KSP160	KSP-Z plus 160	160 x 160	102.7	●	●	●	●	3	45 9	120	DDF.510-04	0405302	40101546			
	SCH.510-KSP160LH	KSP-LH-Z plus 160	160 x 160	102.7	●	●	●	●	8	20 9	120	DDF.510-04	0405322	40101547			
	SCH.510-KSP160F	KSP-F-Z plus 160	160 x 160	102.7	●	●	●	●	6	45 9	120	DDF.510-04	0405312	40101548			
	SCH.510-KSA160	KSA-Z plus 160	160 x 160	107.7	● ●	● ●	● ●	● ●	3	45 9 10	120		0405391	40101549			
530	SCH.510-KSA160LH	KSA-LH-Z plus 160	160 x 160	107.7	● ●	● ●	● ●	● ●	8	45 9 25	120		0405395	40101550			
	SCH.510-KSA160F	KSA-F-Z plus 160	160 x 160	107.7	● ●	● ●	● ●	● ●	6	45 9 10	120		0405393	40101551			
	SCH.520-KSP250	KSP-Z plus 250	250 x 250	128.2	●	●	●	●	5	55 6	170	DDF.520-04	0405502	40101552			
	SCH.520-KSP250LH	KSP-LH-Z plus 250	250 x 250	128.2	●	●	●	●	15	20 6	170	DDF.520-04	0405522	40101553			
	SCH.520-KSP250F	KSP-F-Z plus 250	250 x 250	128.2	●	●	●	●	10	55 6	170	DDF.520-04	0405512	40101554			
	SCH.530-KSP250	KSP-Z plus 250	250 x 250	128.2	●	●	●	●	5	55 6	170	DDF.530-04	0405502	on request			
530	SCH.530-KSP250LH	KSP-LH-Z plus 250	250 x 250	128.2	●	●	●	●	15	20 6	170	DDF.530-04	0405522	on request			
	SCH.530-KSP250F	KSP-F-Z plus 250	250 x 250	128.2	●	●	●	●	10	55 6	170	DDF.530-04	0405512	on request			

* at max. pressure and / or max. torque

** with standard jaws KTR 64 / 100 / 160 / 250 (processing must be carried out by the customer)

*** see pp. 50/51

For more information, please visit: www.schunk.com



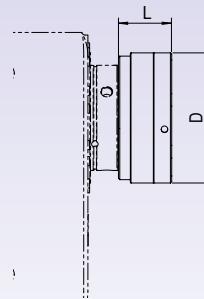
KSPZ plus 250 on EA-520



SCHUNK-clamping unit on SCHUNK VERO-S (p. 77)



Increased accuracy = $\frac{1}{2}$ tolerance values;
Item no. NPS.5xx-GEN



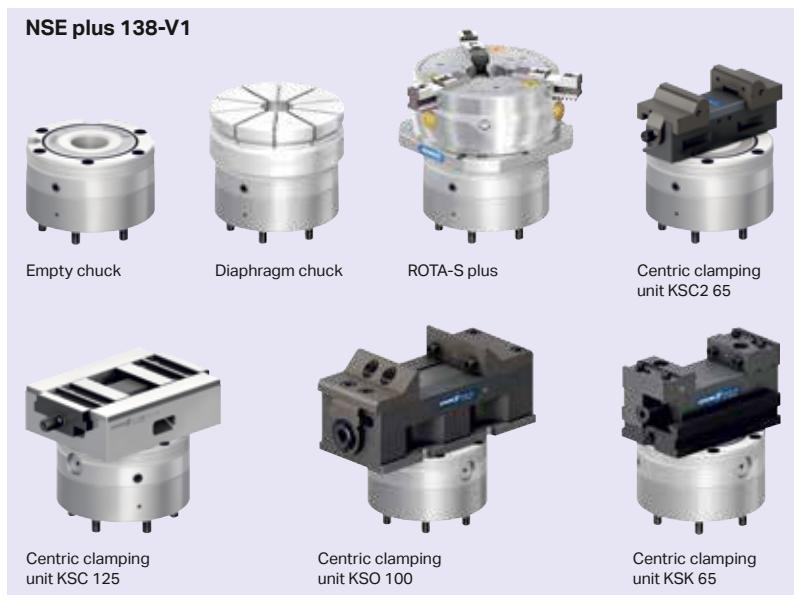
bL LEHMANN Item no.	Designation non-rusting	Pneumatic 6 bar Turbo function non-rusting	D [mm]	L from spindle [mm]	Draw-in force [kN]	Increased draw-in force with turbo function [kN]	Max. retention force [kN]	Open Anti-twist protection	Required rotary union*	SCHUNK catalog reference	SCHUNK Item no., incl. adapter flange
507	SCH.507-90ix	VERO-S NSE MINI 90-V1	● ● ● Ø90	35	0.5	15	25	● ●	DDF.507-04	0435105	40105125
510	SCH.507-138ix	VERO-S NSE plus 138-V1	● ● ● Ø138	69.5	7.5	25	75	● ●	DDF.507-04	0471095	40101342
510	SCH.510-90ix	VERO-S NSE MINI 90-V1	● ● ● Ø90	35	0.5	15	25	● ●	DDF.510-04	0435105	40105125
510	SCH.510-138ix	VERO-S NSE plus 138-V1	● ● ● Ø138	79	7.5	25	75	● ●	DDF.510-04	0471095	40101344
520	SCH.520-138ix	VERO-S NSE plus 138-V1	● ● ● Ø138	79	7.5	25	75	● ●	DDF.520-04	0471095	40105132
520	SCH.520-176ix	VERO-S NSE plus 176-V1	● ● ● Ø176	90	9	40	75	● ●	DDF.520-04	0471096	40101346
530	SCH.530-176ix	VERO-S NSE plus 176-V1	● ● ● Ø176	90	9	40	75	● ●	DDF.530-04	0471096	40105138

* see pp. 50/51

Important technical data

	Unit	NSE +138	NSE +176
Pneumatic system	[mm]	yes	yes
Repeat accuracy	[mm]	< 0.005	< 0.005
Actuating pressure	[bar]	6	6
Draw-in force	[kN]	25	40
Retention force	[kN]	75	75

For further information, please visit: www.schunk.com



Overview
Rotary tables

Applications & Facts
SPZ, DDF, WMS,
indexing accuracy

Aligning,
GLA, RST

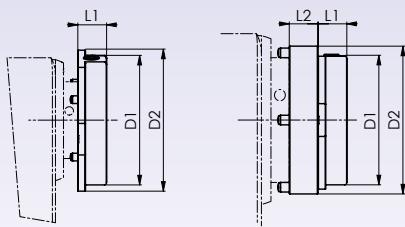
MOT, KAB, CNC

Workpiece
clamping system

Technology & service

GRESSEL

Spann technik



Overview

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Applications & Facts

SPZ, DDF, WMS, indexing accuracy

Aligning, GLA, RST

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Workpiece clamping system

Technology & service

pL LEHMANN Item no.	Designation	Manual	D1 [mm]	D2 [mm]	L1 [mm]	L2 [mm]	Weight [kg]	GRESSEL Item no., incl. adapter flange
507 GRE.507-GRU	gredoc round	•	ø135	148	30	–	3.0	NGS.010.015.01
510 GRE.510-GRU				148			3.0	NGS.010.016.01
520 GRE.520-GRU				154	30	6.4	NGS.010.007.01	

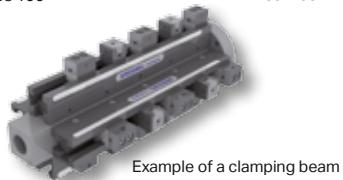
Technical data	Unit	Dimensions
Mechanical system		yes
Repeat accuracy	(mm)	< 0.01
Draw-in force	(kN)	20
Height tolerance	(mm)	± 0.005

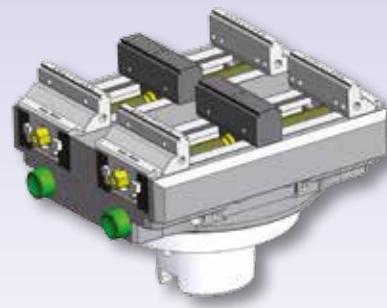
Clamping devices for above GRESSEL gredoc pallet system

pL LEHMANN Item no.	Designation	Manual	D [mm]	L from spindle [mm]	Pallet sizes [mm]	Workpiece weight (perm.) [kg]	GRESSEL catalog reference	GRESSEL Item no. incl. adapter flange
GRE.CEN-65	centrinos 65	•	170 x 88 x 87	137		6.0	CSM.065.001.01	CSM.065.035.01
GRE.CEN-655A	centrinos 65 5 A	•	170 x 88 x 97	147		6.0	CSM.065.101.01	CSM.065.135.01
GRE.CEN-100	centrinos 100	•	220 x 118 x 117	167		14.6	CHM.100.001.01	CHM.100.035.01
GRE.CEN-1005A	centrinos 100 5 A	•	220 x 118 x 117	167		13.6	CHM.100.101.01	CHM.100.135.01
GRE.SOL-65V4	solinos 65 4 V	•	193 x 164 x 164	243		18.5	KLM.065.020.01	KLM.065.023.01
GRE.LP	empty pallet	•	ø148 x 30	80	ø148	2.0	NGA.000.002.01	NGA.000.004.01
GRE.LRP	Pallet with hole grid	•	ø148 x 30	80	ø148	2.0	NGA.000.003.01	NGA.000.005.01

For further information, please visit: www.gressel.ch

Possible applications





	pL LEHMANN Item no.	Designation	Manual 1) 4)	Hydraulic 1) 4)	Clamping capacity [mm] 0 – 65	L from spindle (without jaws) [mm]	Centering clamping system size [mm]	LANG catalog reference	LANG Item no., incl. HSK adapter
507	LAN.MG46-S65	Makro-Grip 46, incl. flange	1) 4)	0 – 65	65	77x77x65	47065	LEH.47065-63	
	LAN.MG46-S105	Makro-Grip 46, incl. flange	1) 4)	0 – 105	65	77x117x65	47105	LEH.47105-63	
	LAN.MG77-S85	Makro-Grip 77, incl. flange	1) 4)	0 – 85	65	77x102x65	47085	LEH.47085-63	
	LAN.MG77-S120	Makro-Grip 77, incl. flange	1) 4)	0 – 120	65	77x130x65	47120	LEH.47120-63	
	LAN.MG77-S160	Makro-Grip 77, incl. flange	1) 4)	0 – 160	65	77x170x65	47160	LEH.47160-63	
	LAN.MG125-S155	Makro-Grip 125, incl. flange	1) 4)	0 – 155	89	125x160x89	47155	LEH.47155-63	
510	LAN.MG46-S65	Makro-Grip 46, incl. flange	2) 5)	0 – 65	65	77x77x65	47065	LEH.47065-63	
	LAN.MG46-S105	Makro-Grip 46, incl. flange	2) 5)	0 – 105	65	77x117x65	47105	LEH.47105-63	
	LAN.MG77-S85	Makro-Grip 77, incl. flange	2) 5)	0 – 85	65	77x102x65	47085	LEH.47085-63	
	LAN.MG77-S120	Makro-Grip 77, incl. flange	2) 5)	0 – 120	65	77x130x65	47120	LEH.47120-63	
	LAN.MG77-S160	Makro-Grip 77, incl. flange	2) 5)	0 – 160	65	77x170x65	47160	LEH.47160-63	
	LAN.MG125-S155	Makro-Grip 125, incl. flange	2) 5)	0 – 155	89	125x160x89	47155	LEH.47155-63	
520	LAN.MG46-S65	Makro-Grip 46, incl. flange	3) 6)	0 – 65	65	77x77x65	47065	LEH.47065-63	
	LAN.MG46-S105	Makro-Grip 46, incl. flange	3) 6)	0 – 105	65	77x117x65	47105	LEH.47105-63	
	LAN.MG77-S85	Makro-Grip 77, incl. flange	3) 6)	0 – 85	65	77x102x65	47085	LEH.47085-63	
	LAN.MG77-S120	Makro-Grip 77, incl. flange	3) 6)	0 – 120	65	77x130x65	47120	LEH.47120-63	
	LAN.MG77-S160	Makro-Grip 77, incl. flange	3) 6)	0 – 160	65	77x170x65	47160	LEH.47160-63	
	LAN.MG125-S155	Makro-Grip 125, incl. flange	3) 6)	0 – 155	89	125x160x89	47155	LEH.47155-63	

Additionally required clamping system (see p. 70):

1) = RIP.507-63m, 2) = RIP.510-63m, 3) = RIP.520-63m, 4) = RIP.507-63h, 5) = RIP.510-63h, 6) = RIP.520-63h

All LANG clamping devices can be attached to other zero clamping systems (LANG, EROWA, SCHUNK, 3R, etc.) after being adjusted slightly.

For more information, please visit: www.lang-technik.de



Overview

Rotary tables

SPZ, DDF, WMS,
indexing accuracy

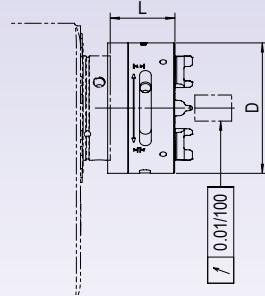
Aligning,
GLA, RST

MOT, KAB, CNC

Workpiece
clamping system

Technology
& service

EROWA®



Increased accuracy = $\frac{1}{2}$ tolerance values;
Item no. NPS.5xx-GEN

ERO.5xx = Item number for combined clamping chuck for types 507 and 510

		pL LEHMANN Item no.	Designation (incl. flange)	Manual	Pneumatic	D [mm]	L from spindle [mm]	Pallet sizes [mm]	Workpiece weight (perm.) [kg]	Open	Clean Z-support	Rotary union	EROWA catalog refer- ence	EROWA Item no., incl. adapter flange
507	ERO.5xx-FTSix	FTS, inox	•	•	ø74	46.5	ø72	4	35	•	•	1)	ER-057335	ER-073469
	ERO.5xx-Qcix	QuickChuck 100 P, inox	•	•	ø100	50	ø50/ø148	35	35	•	•	1)	ER-036345	ER-073351
	ERO.5xx-ITS100ix	ITS-CHUCK 100 P inox	•	•	ø100	50	ø50/ø148	35	35	•	•	1)	ER-043123	ER-073433
	ERO.5xx-PC	PowerChuck P	•	•	ø150	64.5	ø50/ø148	50	50	•	•	1)	ER-029391	ER-073046
	ERO.5xx-MTS	MTS S-P/A	•	•	ø130	60	ø148	50	50	•	•	1)	ER-036802	ER-073457
	ERO.5xx-FTSix	FTS, inox	•	•	ø74	46.5	ø72	4	4	•	•	2)	ER-057335	ER-073469
510	ERO.5xx-Qcix	QuickChuck 100 P, inox	•	•	ø100	50	ø50/ø148	35	35	•	•	1)	ER-036345	ER-073351
	ERO.5xx-ITS100ix	ITS-CHUCK 100 P inox	•	•	ø100	50	ø50/ø148	35	35	•	•	2)	ER-043123	ER-073433
	ERO.5xx-PC	PowerChuck P	•	•	ø150	64.5	ø50/ø148	50	50	•	•	2)	ER-029391	ER-073046
	ERO.5xx-MTS	MTS S-P/A	•	•	ø130	60	ø148	50	50	•	•	2)	ER-036802	ER-073457
	ERO.520-PC	PowerChuck P	•	•	ø150	75	ø50/ø148	50	50	•	•	3)	ER-029391	ER-073460
	ERO.520-P210	ProductionChuck 210	•	•	ø81/ø210	80	ø210	120	120	•	•	3)	ER-032964	ER-073461
520	ERO.520-P210c	ProductChuck 210 combi	•	•	ø210	80	ø50/ø210	120	120	•	•	3)	ER-032388	ER-073462
	ERO.530-PC	PowerChuck P	•	•	ø150	75	ø50/ø148	50	50	•	•	4)	ER-029391	on request
	ERO.530-P210	ProductionChuck 210	•	•	ø81/ø210	80	ø210	120	120	•	•	4)	ER-032964	on request
	ERO.530-P210c	ProductChuck 210 combi	•	•	ø210	80	ø50/ø210	120	120	•	•	4)	ER-032388	on request
	ERO.530-UPCP	UPC-P	•	•	320x320	95	ø320	250	250	•	•	4)	ER-016841	ER-077382
	ERO.530-UPCC	UPC Combi	•	•	320x320	90	ø50/ø320	200	200	•	•	4)	ER-070649	on request

for all automatic chucks

ERO.HSV	Manual control valve	supplied loose with all necessary cables and hoses, ready to connect
ERO.ASV	Automatic control valve	supplied loose, for installation in the control cabinet, with all necessary cables/hoses

Additionally required rotary union (see pp. 50/51):

1) = DDF.507-04, 2) = DDF.510-04, 3) = DDF.520-04, 4) = DDF.530-04

When standard pallets with open holes are used, water, metal chips etc. can get into the pallet chuck, air lines and control valve. To prevent this, seal kits are available from the respective chuck manufacturers.

For more information, please visit: www.erowa.com



Manual control valve
(option)



ER-036345



ER-029391



ER-032964

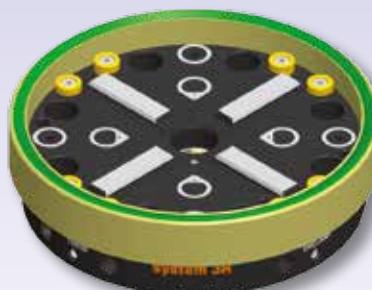
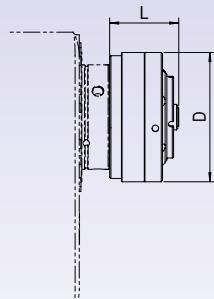


Production Chuck combi



ER-016092

system 3R



Increased accuracy = $\frac{1}{2}$ tolerance values;
Item no. NPS.5xx-GEN

S3R.5xx = Item number four combined chuck for types 507 and 510

	pL LEHMANN Item no.	Designation (incl. flange)	Pneumatic	D [mm]	L from spindle [mm]	Pallet sizes [mm]	Workpiece weight (perm.) [kg]	Rotary union	SYSTEM 3R catalog refer- ence	SYSTEM 3R Item no., incl. adapter flange
	507	S3R.5xx-G70	3R GPS 70	•	ø99	56	ø70	10	1) C198700	X663000
	510	S3R.5xx-G70	3R GPS 70	•	ø99	56	ø70	10	2) C198700	X663000
	520	S3R.510-G120	3R GPS 120	•	ø118	56	ø120	20	2) C188770	X663010
	530	S3R.510-MGC*	3R Magnum Chuck	•	ø162	46	ø156, with indexpin	100	2) 3R-SP26712	90940.02
	540	S3R.510-MCC	3R Macro Chuck	•	ø100	49	54x54, 70x70	10	2) 3R-600.14-30	90940.01
	550	S3R.520-G120	3R GPS 120	•	ø118	70	ø120	20	3) C188770	X663020
	560	S3R.520-G240	3R GPS 240	•	240x240	84	240x240	100	3) C219200	X663030
	570	S3R.520-G240ix	3R GPS 240, rust-resistant	•	240x240	84	240x240	100	3) X607620	X663040
	580	S3R.520-MGC*	3R Magnum Chuck	•	ø162	60	ø156, with indexpin	100	3) 3R-SP26712	90940.12
	590	S3R.520-MCC	3R Macro Chuck	•	ø100	63	54x54, 70x70	10	3) 3R-600.14-30	90940.11
	600	S3R.530-G240	3R GPS 240	•	240x240	84	240x240	100	4) C219200	a.A.
	610	S3R.530-G240ix	3R GPS 240, rust-resistant	•	240x240	84	240x240	100	4) X607620	a.A.
	620	S3R.RP-GPS240	Reference pallet GPS 240						C846600	
	630	S3R.RP-GPS70120	Reference pallet GPS 70						C846360	
	640	S3R.RP-Macro	Reference pallet Macro						36-606.1	
	650	S3R.RP-Magnum	Reference pallet Magnum						3R-686.1-HD	

Additionally required Rotary union (see pp. 50/51):

1) = DDF.507-04, 2) = DDF.510-04, 3) = DDF.520-04, 4) = DDF.530-04

* For Magnum pallets only.
Macro pallets may not be clamped

When standard pallets with open holes are used, water, metal chips etc. can get into the pallet chuck, air lines and control valve. To prevent this, seal kits are available from the respective chuck manufacturers.

For more information, please visit: www.system3r.com



GPS 70

GPS 120

Macro

Macro Magnum

GPS 240

Overview

Rotary tables

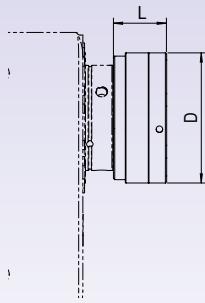
SPZ, DDF, WMS,
indexing accuracy

Aligning,
GLA, RST

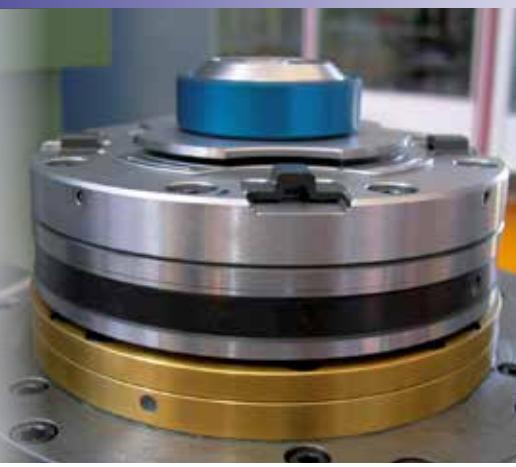
MOT, KAB, CNC

Workpiece
clamping system

Technology
& service



Increased accuracy = 1/2 tolerance values;
Item no. NPS.5xx-GEN



SPZ.5xx = Item number for combined clamping cylinder for types 507 and 510

	bL LEHMANN Item no.	PAROTEC catalog reference	Manual Pneumatic Hydraulic	D [mm]	L from spindle [mm]	Pallet sizes [mm]	Workpiece weight (perm.) [kg]	Open [bar]	Clean Z-support	With re-tightening	Required clamping cylinder	Required rotary union*	PAROTEC Item no., Incl. adapter flange
507	PAR.5xx-PGmp6	POWER GRIP 160	●	ø145	56	□158	50	6	●	●	DDF.507-04	PT 1160142710	
	PAR.5xx-PGp6	POWER GRIP 160	●	ø145	56	□158	100	6	●	●	SPZ.DDF-01	PT 1160112700	
	PAR.507-PGp40	POWER GRIP 160	●	ø145	35	□158	100	40	●	●	SPZ.5xx-9	PT 9911020710	
	PAR.5xx-PYmp130	POLY GRIP	●	ø130	55	ø70–148	30	6	○				
	PAR.5xx-PYp110	POLY GRIP	●	ø110	55	ø70–148	50	6	●	●	DDF.507-04	PT 9911320710	
	PAR.5xx-DGp142	DEFO GRIP 100	●	ø142	55	ø100–148	20	6	●	●	DDF.507-04	PT 6101032710	
510	PAR.5xx-PGmp6	POWER GRIP 160	●	ø145	56	□158	50	6					PT 1160102710
	PAR.5xx-PGp6	POWER GRIP 160	●	ø145	56	□158	100	6	●	●	DDF.510-04	PT 1160142710	
	PAR.510-PGp40	POWER GRIP 160	●	ø145	35	□158	100	40	●	●	SPZ.DDF-01	PT 1160112710	
	PAR.5xx-PYmp130	POLY GRIP	●	ø130	55	ø70–148	30	6	○				PT 9911020710
	PAR.5xx-PYp110	POLY GRIP	●	ø110	55	ø70–148	50	6	●	●	DDF.510-04	PT 9911320710	
	PAR.5xx-DGp142	DEFO GRIP 100	●	ø142	55	ø100–148	20	6	●	●	DDF.510-04	PT 6101032710	
520	PAR.5xx-PGmp6	POWER GRIP 160	●	ø145	56	□158	50	6					PT 1160102710
	PAR.5xx-PGp6	POWER GRIP 160	●	ø145	56	□158	50	6	●	●	DDF.520-04	PT 1160142710	
	PAR.520-PGp40	POWER GRIP 160	●	ø145	35	□158	50	40	●	●	SPZ.520-9	SPZ.DDF-01	PT 1160112720
	PAR.5xx-PYmp130	POLY GRIP	●	ø130	55	ø70–148	30	6	○				PT 9911020710
	PAR.5xx-PYp110	POLY GRIP	●	ø110	55	ø70–148	50	6	●	●	DDF.520-04	PT 9911320710	
	PAR.5xx-DGp142	DEFO GRIP 100	●	ø142	55	ø100–148	20	6	●	●	DDF.520-04	PT 6101032710	
530	PAR.530-PGmp6	POWER GRIP 160	●	ø145	56	□158/ø158	50	6					PT 1160102730
	PAR.530-PGp6	POWER GRIP 160	●	ø145	56	□158/ø158	100	6	●	●	DDF.530-04	PT 1160142730	
	PAR.530-PGp40	POWER GRIP 160	●	ø145	35	□158/ø158	100	40	●	●	SPZ.530-9	SPZ.DDF-01	PT 1160112730
	PAR.530-PYmp130	POLY GRIP	●	ø130	55	ø70–148	30	6	○				PT 9911020730
	PAR.530-PYp110	POLY GRIP	●	ø110	55	ø70–148	50	6	●	●	DDF.530-04	PT 9911320730	
	PAR.530-DGp142	DEFO GRIP 100	●	ø142	55	ø100–148	20	6	●	●	DDF.530-04	PT 6101032730	
PAR.530-PGp316	POWER GRIP 160-2			320x160	76	320x160	100	6	●	●	DDF.530-06	PT 1160232730	
	PAR.530-PGp320	POWER GRIP 160-4		320x320	76	320x320	300	6	●	●	DDF.530-06	PT 1160432730	

* see pp. 50/51

o = optional

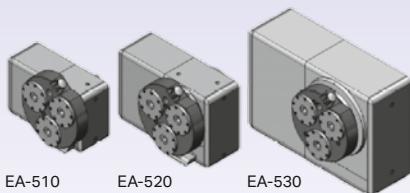
Technical data	Unit	POWER GRIP	POLY GRIP	DEFO GRIP
Repeat accuracy	(mm)	+/- 0.002	+/- 0.002	+/- 0.005
Retention force without re-tightening	(kN)	17*	7	0.75
Retention force with re-tightening	(kN)	30*	12	1.2

* For POWER GRIP 160-2 and 160-4 = Value x2 and x4, resp.

For further information, please visit: www.parotec.ch



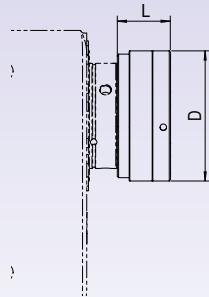
ROEMHELD
HILMA ■ STARK



EA-510

EA-520

EA-530



Increased accuracy = $\frac{1}{2}$ tolerance values; Item no. NPS.5xx-GEN

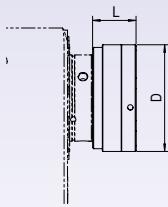
		pL LEHMANN Item no.	Designation	Hydraulic	D [mm]	L from spindle [mm]	Max. pull-out torque (Nm)	Open [bar]	Suspension mechanism	Manual loading	Can be automated	X-Y-Z-positioning/clean support	Z-contact check	Clamping check	Integrated media passage	Increased clamping force	Required rotary union*	STARK catalog reference	STARK Item no., incl. adapter flange
	507		on request																
	510	STA.510-01	SVP 510 SPEEDY classic 1	●	ø250	60	1740 40	● ●								-	804 331	SL1-63-0-0-2-01	
		STA.510-02		●	ø250	60	2620 80	● ●								● -	804 348	SL1-63-0-0-3-01	
		STA.510-03		●	ø250	60	1740 40	● ●								DDF510-04	804 331	SL1-63-0-1-2-01	
		STA.510-04		●	ø250	60	2620 80	● ●								DDF510-04	804 348	SL1-63-0-1-3-01	
		STA.510-05		●	ø250	60	1740 40	● ●								DDF510-04	804 331	SL1-63-1-1-2-01	
		STA.510-06		●	ø250	60	2620 80	● ●								DDF510-04	804 348	SL1-63-1-1-3-01	
		STA.510-21	SVP 510 SPEEDY classic 1 Twister	●	ø250	63	1740 40	● ● ● ● ●								DDF510-04	804 500	SL1-63-0-1-2-11	
		STA.510-22		●	ø250	63	2620 80	● ● ● ● ●								DDF510-04	804 501	SL1-63-0-1-3-11	
		STA.510-23		●	ø250	63	1740 40	● ● ● ● ●								DDF510-04	804 500	SL1-63-1-1-2-11	
		STA.510-24		●	ø250	63	2620 80	● ● ● ● ●								DDF510-04	804 501	SL1-63-1-1-3-11	
		STA.520-01	SVP 520 SPEEDY classic 1	●	ø250	60	1740 40	● ●								-	804 331	SL2-63-0-0-2-01	
		STA.520-02		●	ø250	60	2620 80	● ●								● -	804 348	SL2-63-0-0-3-01	
		STA.520-03		●	ø250	60	1740 40	● ●								DDF520-04	804 331	SL2-63-0-1-2-01	
		STA.520-04		●	ø250	60	2620 80	● ●								DDF520-04	804 348	SL2-63-0-1-3-01	
		STA.520-05		●	ø250	60	1740 40	● ●								DDF520-04	804 331	SL2-63-1-1-2-01	
		STA.520-06		●	ø250	60	2620 80	● ●								DDF520-04	804 348	SL2-63-1-1-3-01	
		STA.520-21	SVP 512 SPEEDY classic 1 Twister	●	ø250	63	1740 40	● ● ● ● ●								DDF520-04	804 500	SL2-63-0-1-2-11	
		STA.520-22		●	ø250	63	2620 80	● ● ● ● ●								DDF520-04	804 501	SL2-63-0-1-3-11	
		STA.520-23		●	ø250	63	1740 40	● ● ● ● ●								DDF520-04	804 500	SL2-63-1-1-2-11	
		STA.520-24		●	ø250	63	2620 80	● ● ● ● ●								DDF520-04	804 501	SL2-63-1-1-3-11	
		STA.530-01	SVP 530 SPEEDY classic 1	●	ø250	60	1740 40	● ●								-	804 331	SL3-63-0-0-2-01	
		STA.530-02		●	ø250	60	2620 80	● ●								● -	804 348	SL3-63-0-0-3-01	
		STA.530-03		●	ø250	60	1740 40	● ●								DDF530-04	804 331	SL3-63-0-1-2-01	
		STA.530-04		●	ø250	60	2620 80	● ●								DDF530-04	804 348	SL3-63-0-1-3-01	
		STA.530-05		●	ø250	60	1740 40	● ●								DDF530-04	804 331	SL3-63-1-1-2-01	
		STA.530-06		●	ø250	60	2620 80	● ●								DDF530-04	804 348	SL3-63-1-1-3-01	
		STA.530-21	SVP 513 SPEEDY classic 1 Twister	●	ø250	63	1740 40	● ● ● ● ●								DDF530-04	804 500	SL3-63-0-1-2-11	
		STA.530-22		●	ø250	63	2620 80	● ● ● ● ●								DDF530-04	804 501	SL3-63-0-1-3-11	
		STA.530-23		●	ø250	63	1740 40	● ● ● ● ●								DDF530-04	804 500	SL3-63-1-1-2-11	
		STA.530-24		●	ø250	63	2620 80	● ● ● ● ●								DDF530-04	804 501	SL3-63-1-1-3-11	

* see pp. 50/51

For further information, please visit: www.stark-inc.com

Note permissible pull-out torque (use counter bearing if necessary)

Version 20 kN			Version 30 kN		
Distance [mm]	Force [kN]	Weight [kg]	Distance [mm]	Force [kN]	Weight [kg]
200	8.8	897	200	13.1	1335
300	5.9	601	300	8.8	897
400	4.4	449	400	6.6	673
500	3.5	357	500	5.3	540
600	2.9	296	600	4.4	449



Overview

Rotary tables

Applications & Facts

SPZ, DDF, WMS, indexing accuracy

Aligning, GLA, RST

MOT, KAB, CNC

Workpiece clamping system

Technology & service

pL LEHMANN Item no.	Designation	Pneumatic, 5 bar Hydraulic, 50 bar	D [mm]	L from spindle [mm]	Draw-in and closing force up to	Retention force	Indexing Contact check	Required rotary union*	AMF catalog reference	AMF Item no., incl. adapter flange
507 510 520 530 510 507	AMF.507-6206-S1 6206ILA-10	●	ø112	47	10 kN	25 kN	● ●	DDF.507-04	428771	533190
	AMF.510-6206-S1 6206ILA-10	●	ø112	47	10 kN	25 kN	● ●	DDF.510-04	428771	533216
	AMF.520-6206-S1 6206ILA-20	●	ø138	90	17 kN	55 kN	● ●	DDF.520-04	428797	533232
	AMF.530-6370-S1 6370EAIHA40	●	ø148	98	40 kN	105 kN	● ●	DDF.530-04	429845	533257

* see pp. 50/51

For further information, please visit: www.amf.de



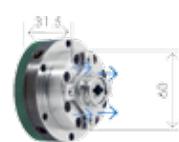
pL LEHMANN Item no.	Designation	Hydraulic	Pneumatic	D [mm]	L from spindle [mm]	Workpiece size, approx. [mm]	Required clamping cylinder	Required rotary union**	YERLY catalog reference	YERLY Item no., incl. adapter flange
507 510	YER.507-060P-* YERLY* NPS 60	●		60	85	0.1...60		DDF.507-04	MD-60-*	YER.507-60P-*JT
	YER.507-100P-* YERLY* NPS 100	●		100	108	0.1...100	SPZ.5xx-9		MD-100-*	YER.507-100P-*TI
	YER.507-100M-* YERLY* NPS 100	●		100	85	0.1...100	SPZ.5xx-9		MD-100-*	YER.507-100M-*TI
	YER.510-060P-* YERLY* NPS 60	●		60	85	0.1...60		DDF.510-04	MD-60-*	YER.510-60P-*TI
	YER.510-100P-* YERLY* NPS 100	●		100	108	0.1...100	SPZ.5xx-9		MD-100-*	YER.510-100P-*TI
	YER.510-100M-* YERLY* NPS 100	●		100	85	0.1...100	SPZ.5xx-9		MD-100-*	YER.510-100M-*TI

* 2 = 2-jaw chuck, 3 = 3-jaw chuck, 4 = 4-jaw chuck

** see pp. 50/51

For more information, please visit: <http://fr.yerlymecanique.ch/>

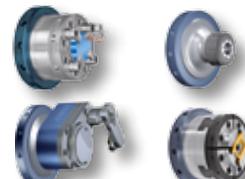
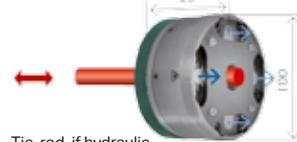
Yerly Basis 60P



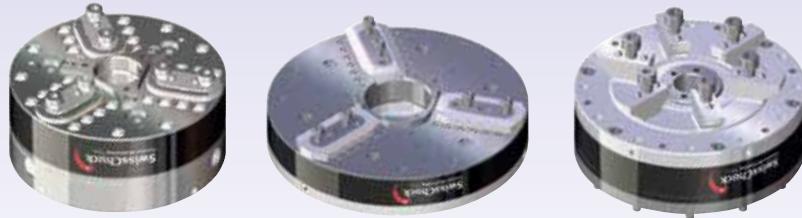
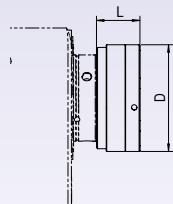
Yerly Basis 100P



Yerly Basis 100M



Examples of YERLY chuck attachments. Can be adapted to any chuck type



Precision power chucks (cylinder-actuated)

pL LEHMANN Item no.	Designation	D [mm]	Passage [mm]	L from spindle [mm]	Weight [kg]	Moment of inertia [kg²]	Required clamping cylinder	SwissChuck Item no., incl. adapter flange	
507 510 510 507	SWI.507-3-110	3KCHP 110-12	ø110	12	70	3.5	0.003	SPZ.5xx-15	SZ1020101
	SWI.507-3-160	3KCHP 160-30	ø160	14	85	5	0.015	SPZ.5xx-15	SZ1020102
	SWI.510-3-110	3KCHP 110-12	ø110	12	70	3.5	0.003	SPZ.5xx-15	SZ1020103
	SWI.510-3-160	3KCHP 160-30	ø160	14	85	5	0.015	SPZ.5xx-15	SZ1020104
	SWI.510-3-200	3KCHP 200-40	ø200	14	98	7.8	0.036	SPZ.5xx-15	SZ1020105
	SWI.520-3-160	3KCHP 160-30	ø160	14	72	5	0.015	SPZ.520-15	SZ1020106
	SWI.520-3-200	3KCHP 200-40	ø200	14	85	7.8	0.036	SPZ.520-15	SZ1020107
	SWI.520-3-250	3KCHP 250-52	ø250	14	91	12.8	0.101	SPZ.520-15	SZ1020108
	SWI.530-3-250	3KCHP 250-52	ø250	14	91	128	0.101	SPZ.530-15	SZ1020109
	SWI.530-3-315	3KFHP 315-48	ø315	0	93	36	0.457	SPZ.530-15	SZ1020110
	SWI.530-3-400	3KFHP 400-120	ø400	0	100	58	1,236	SPZ.530-15	SZ1020111

Attach complete with chuck, spindle flange, tie-rod and tie-rod adapter

Precision diaphragm chuck (pneumatically actuated)

pL LEHMANN Item no.	Designation	D [mm]	Passage [mm]	L from spindle [mm]	Weight [kg]	Moment of inertia [kg²]	SwissChuck Item no., incl. adapter flange	
507 510 510 507	SWI.507-6-85	6VMCHP 85 V1	ø85	0	53	1.5	0.001	SZ1020112
	SWI.507-6-128	6VMCHP 128 V1	ø128	0	77	4.6	0.01	SZ1020113
	SWI.507-6-160	6VMCHP 160 V1	ø160	0	92	10	0.032	SZ1020114
	SWI.510-6-128	6VMCHP 128 V1	ø128	0	81	4.6	0.01	SZ1020115
	SWI.510-6-160	6VMCHP 160 V1	ø160	0	96	10	0.032	SZ1020116
	SWI.510-6-200	6VMCHP 200 V1	ø200	0	120	16	0.084	SZ1020117
	SWI.520-6-128	6VMCHP 128 V1	ø128	0	67	4.6	0.01	SZ1020118
	SWI.520-6-160	6VMCHP 160 V1	ø160	0	96	10	0.032	SZ1020119
	SWI.520-6-200	6VMCHP 200 V1	ø200	0	106	16	0.084	SZ1020120
	SWI.530-6-128	6VMCHP 128 V1	ø128	0	71	4.6	0.01	SZ1020121
	SWI.530-6-160	6VMCHP 160 V1	ø160	0	82	10	0.032	SZ1020122
	SWI.530-6-200	6VMCHP 200 V1	ø200	0	102	16	0.084	SZ1020123

Attach complete with chuck, spindle flange, rotary feed and adapter

Interchangeable jaws and accessories on request

For more information, please visit: www.SwissChuck.com

Overview

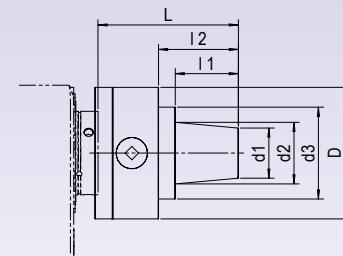
Rotary tables

SPZ, DDF, WMS,
indexing accuracy

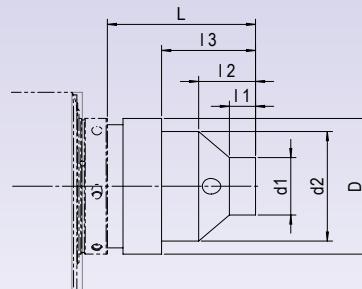
Aligning,
GLA, RST

MOT, KAB, CNC
Workpiece
clamping system

Technology
& service



Mounting chuck, manual



Mounting chuck, automatic Type B axfix

SPZ.5xx = Item number for combined clamping cylinder for types 507 and 510 (see pp. 48/49)

pL LEHMANN Item no.	Designation	System	Axix	Manual	Power-actuated	L [mm]	I 1 [mm]	I 2 [mm]	I 3 [mm]	D [mm]	d1 [mm]	d2 [mm]	d3 [mm]	Required clamping cylinder * (Option)	Niederhauser item no., incl. adapter flange
ZSP.507-B32Am	Mounting chuck	B32	•	•	•	133	59	75	—	126	53	62	88	507-B32	507
ZSP.507-B32Aka	Mounting chuck	B32	•	•	•	133	59	75	—	130	—	—	—	SPZ.5xx-d2.5d25	507-B32KA
ZSP.510-B32Am	Mounting chuck	B32	•	•	•	133	59	75	—	126	53	62	88	510-B32	510
ZSP.510-B32Aka	Mounting chuck	B32	•	•	•	—	—	—	—	130	—	—	—	SPZ.5xx-d2.5d25	510-B32KA
ZSP.520-B32Am	Mounting chuck	B32	•	•	•	149	59	75	—	130	53	62	88	520-B32	520
ZSP.520-B32Aka	Mounting chuck	B32	•	•	•	135	25	54.5	90	130	55	105	—	SPZ.5xx-d2.5d25	520-B32KA
ZSP.520-B45Am	Mounting chuck	B45	•	•	•	180	76	—	—	160	65	96	—	520-B45	520
ZSP.520-B45Aka	Mounting chuck	B45	•	•	•	142	25	55.5	—	130	68	105	—	SPZ.520-d2.5	520-B45KA

* For T-type rotary tables it may be necessary to increase the center height, see p. 49

Clamping capacity and passage

System	Clamping capacity [mm]	Collet passage [mm]
B32	0.3...32	28
B45	1...45	36

For further information, please visit: www.niederhauser.ch

Mounting chuck



B32, manual



B32, automatic



B45, manual

Collet holder B32

ki-mech gmbh



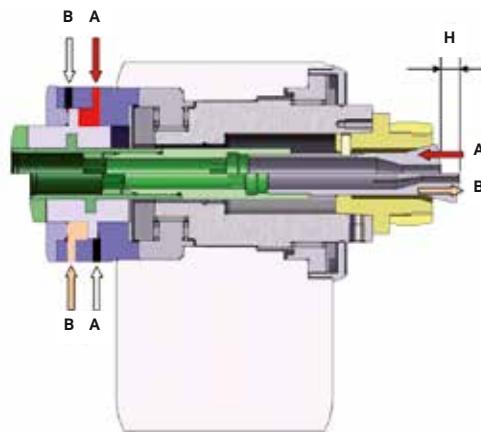
with pointed B32 collet



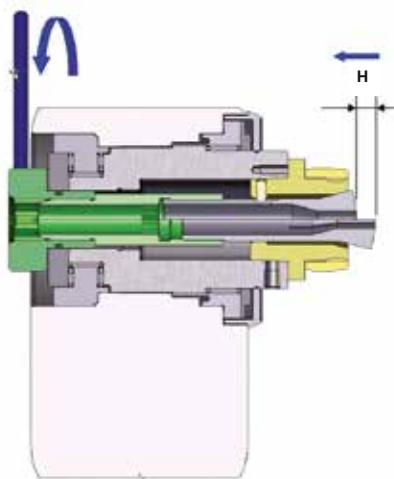
with standard B32 collet

For more, please see p. 83

Principle of collet clamping with HSK application



Automatic collet clamping

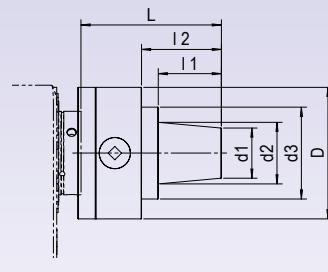


Manual collet clamping

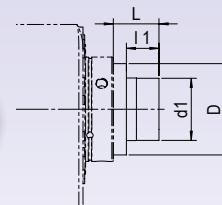
NIEDERHAUSER
SPANNTECHNIK UND SYSTEME

pl LEHMANN®

ki-mech gmbh



Mounting chuck, manual



Collect adapter

SPZ.5xx = Item number for combined clamping cylinder for types 507 and 510 (see pp. 48/49)

pL LEHMANN Item no.	Designation	System	Manual	Power-actuated	L [mm]	L1 [mm]	L2 [mm]	D [mm]	d1 [mm] * with/without threaded protective ring	d2 [mm]	d3 [mm]	Required clamping cylinder * (Option)	Niederhauser item no., incl. adapter flange
			•	•									
ZSP.507-W20m	with HSK application	W20	•	•	50	35	—	70	38/54	—	—		
ZSP.507-W20Am	Mounting chuck	W20	•	•	111	36	53	126	40	54	88		507-W20
ZSP.507-W20k	with HSK application	W20	•	•	50	35	—	70	38/54	—	—	SPZ.5xx-d2.5	
ZSP.507-W25m	with HSK application	W25	•	•	50	35	—	70	38/54 *	—	—		
ZSP.507-W25Am	Mounting chuck	W25	•	•	135	60	76	126	48	59	88		507-W25
ZSP.507-W25k	with HSK application	W25	•	•	50	35	—	70	38/54 *	—	—	SPZ.5xx-d2.5	
ZSP.507-W31m	with HSK application	W31.75	•	•	50	35	—	70	46	—	—		
ZSP.507-W31Am	Mounting chuck	W31.75	•	•	122	48	64	126	53	62	88		507-W31.75
ZSP.507-W31k	with HSK application	W31.75	•	•	50	35	—	70	46	—	—	SPZ.5xx-d2.5	
ZSP.507-W31kND	with HSK application, effective passage increased ø25 mm	W31.75	•	•	50	35	—	70	46	—	—	SPZ.5xx-d2.5d25	
ZSP.510-W20m	with HSK application	W20	•	•	50	35	—	70	38/54 *	—	—		
ZSP.510-W20Am	Mounting chuck	W20	•	•	111	36	53	126	40	54	88		510-W20
ZSP.510-W20k	with HSK application	W20	•	•	50	35	—	70	38/54 *	—	—	SPZ.5xx-d2.5	
ZSP.510-W25m	with HSK application	W25	•	•	50	35	—	70	38/54 *	—	—		
ZSP.510-W25Am	Mounting chuck	W25	•	•	135	60	76	126	48	59	88		510-W25
ZSP.510-W25k	with HSK application	W25	•	•	50	35	—	70	38/54 *	—	—	SPZ.5xx-d2.5	
ZSP.510-W31m	with HSK application	W31.75	•	•	50	35	—	70	46	—	—		
ZSP.510-W31Am	Mounting chuck	W31.75	•	•	122	48	64	126	53	62	88		510-W31.75
ZSP.510-W31k	with HSK application	W31.75	•	•	50	35	—	70	46	—	—	SPZ.5xx-d2.5	
ZSP.510-W31kND	with HSK application, effective passage increased ø25 mm	W31.75	•	•	50	35	—	70	46	—	—	SPZ.5xx-d2.5d25	
ZSP.520-W20Am	Mounting chuck	W20	•	•	127	36	53	130	40	54	88		520-W20
ZSP.520-W25Am	Mounting chuck	W25	•	•	151	60	76	130	48	59	88		520-W25
ZSP.520-W31Am	Mounting chuck	W31.75	•	•	138	48	64	130	53	62	88		520-W31.75

* For T-type rotary tables it may be necessary to increase the center height, see p. 49

Collet adapters (Type W) **pl LEHMANN**®



W20



W25



W31.75 (5C)

Collet holder W25

with standard W25
collet

ki-mech gmbh

For further information,
please visit:
www.ki-mech.ch

- + Rugged and slim design for better accessibility
- + Radial run-out < 0.005 mm

Clamping capacity and (effective) passage

System	Clamping capacity [mm]	Collet passage [mm]	Standard effective passage [mm]	Item no.	Increased effective passage [mm]
W20	0.3...23	14.5	14		
W25	0.3...29	21	17		
W31.75 (5C)	0.5...31	27	17	ZSP.???.W31kND	25

???. = Rotary table type (e.g. 510)

Overview

Rotary tables

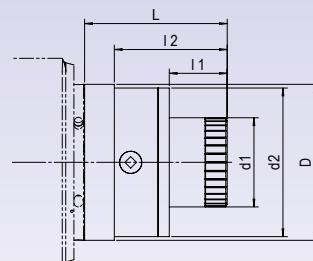
SPZ, DDF, WMS,
indexing accuracy

MOT, KAB, CNC

Workpiece
clamping system

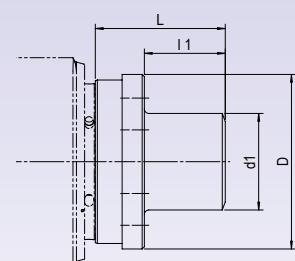
Technology
& service

for sizes 507 to 530



Mounting chuck, manual Type F

for sizes 507 to 530



Mounting chuck, hydraulic Type F

Collet clamping Type F

pL LEHMANN Item no.	Designation	Manual	Pneumatic	Hydraulic	System	Clamping capacity [mm]	L [mm]	I 1 [mm]	I 2 [mm]	D [mm]	d 1 [mm]	d 2 [mm]	Required clamping cylinder *	Niederhauser item no., incl. adapter flange
507 510 507	ZSP.507-F35Am	Mounting chuck	●		F35	1...30	129	40	160	90				507-F35
	ZSP.507-F35Ak	Mount. chuck, power-actuated		●	F35	1...30	1174	73.4	112	85	SPZ.5xx-9			507-F35K
530 520 510	ZSP.510-F35Am	Mounting chuck	●		F35	1...30	129	40	160	90				510-F35
	ZSP.510-F35Ak	Mount. chuck, power-actuated		●	F35	1...30	1144	73.4	112	85	SPZ.5xx-9			510-F35K
530 520	ZSP.520-F48Am	Mounting chuck	●		F48	1...42	145	40	160	90				520-F48
	ZSP.520-F48Ak	Mount. chuck, power-actuated		●	F48	1...42	1379	90.9	155	102	SPZ.520-9			520-F48K
530	ZSP.530-F66Am	Mounting chuck	●		F66	4...60	192	78	210	120				530-F66
	ZSP.530-F66Ak	Mount. chuck, power-actuated		●	F66	4...60	1749	1089	235	130	SPZ.530-9			530-F66K

SPZ.5xx = Item number for combined clamping cylinder for types 507 and 510 (see pp. 48/49)

* For T-type rotary tables it may be necessary to increase the center height, see p. 49



Manual



Automatic

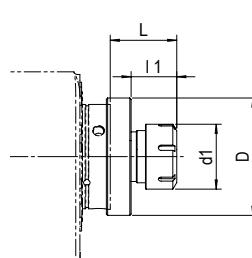
Collect clamping Type ER

pL LEHMANN Item no.	Designation	Manual	System	Clamping capacity [mm]	L [mm]	I 1 [mm]	I 2 [mm]	D [mm]	d 1 [mm]	d 2 [mm]	Niederhauser item no., incl. adapter flange
507 510 507	ZSP.507-E25Am	Mounting chuck	●	ER-25	0.5...17	62	30	—	90	42	— 507-ER25
	ZSP.507-E32Am	Mounting chuck	●	ER-32	1...22	70	38	—	90	50	— 507-ER32
	ZSP.507-E40Am	Mounting chuck	●	ER-40	2...30	72	40	—	90	63	— 507-ER40
520 510 510	ZSP.510-E25Am	Mounting chuck	●	ER-25	0.5...17	46	30	—	90	42	— 510-ER25
	ZSP.510-E32Am	Mounting chuck	●	ER-32	1...22	54	38	—	90	50	— 510-ER32
	ZSP.510-E40Am	Mounting chuck	●	ER-40	2...30	56	40	—	90	63	— 510-ER40
520	ZSP.520-E25Am	Mounting chuck	●	ER-25	0.5...17	80	30	50	130	42	90 520-ER25
	ZSP.520-E32Am	Mounting chuck	●	ER-32	1...22	88	38	50	130	50	90 520-ER32
	ZSP.520-E40Am	Mounting chuck	●	ER-40	2...30	90	40	50	130	63	90 520-ER40



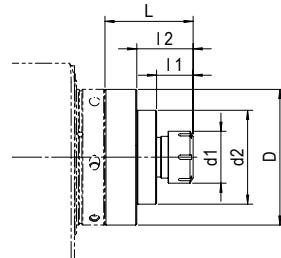
Manual

for sizes 507 and 510



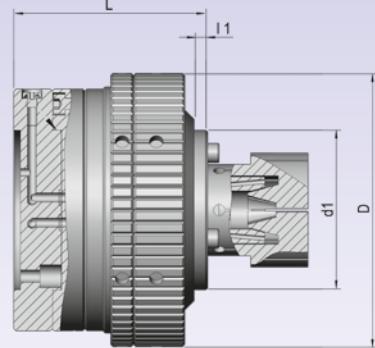
Mounting chuck, manual Type ER

for size 520



Mounting chuck, manual Type ER

For further information, please visit: www.niederhauser.ch



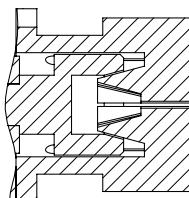
OTTET collet clamping

pL LEHMANN Item no.	Designation	D [mm]	d 1 [mm]	L [mm]	l 1 [mm]	Power- actuated	Required rotary union or clamping cylinder*	Niederhauser item no., incl. adapter flange
507	ZSP.507-OTp	130	—	85	—	●	DDF.507-04	507-FNO-1
	ZSP.507-OTph	120	70	82	—	●	DDF.507-04	507-FNO-PH
	ZSP.507-OTkh	120	70	96	20	●	SPZ.5xx-9	507-FNO-K
510	ZSP.510-OTp	130	—	85	—	●	DDF.510-04	510-FNO-1
	ZSP.510-OTph	120	70	85	—	●	DDF.510-04	510-FNO-PH
	ZSP.510-OTkh	120	70	99	20	●	SPZ.5xx-9	510-FNO-K
520	ZSP.520-OTp	130	—	101	—	●	DDF.520-04	520-FNO-1
	ZSP.520-OTph	130	70	98	—	●	DDF.520-04	520-FNO-PH
	ZSP.520-OTkh	130	70	102	20	●	SPZ.520-9	520-FNO-K

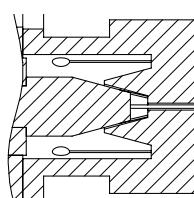
* see pp. 48–51

For further information, please visit: www.niederhauser.ch

The collet chuck with clamping piston inside is suitable for internal and external clamping, pneumatically actuated.



External clamping



Internal clamping



Overview

Rotary tables

Applications & Facts

SPZ, DDF, WMS,
indexing accuracy

Aligning,
GLA, RST

MOT, KAB, CNC

Workpiece
clamping system

Technology & service

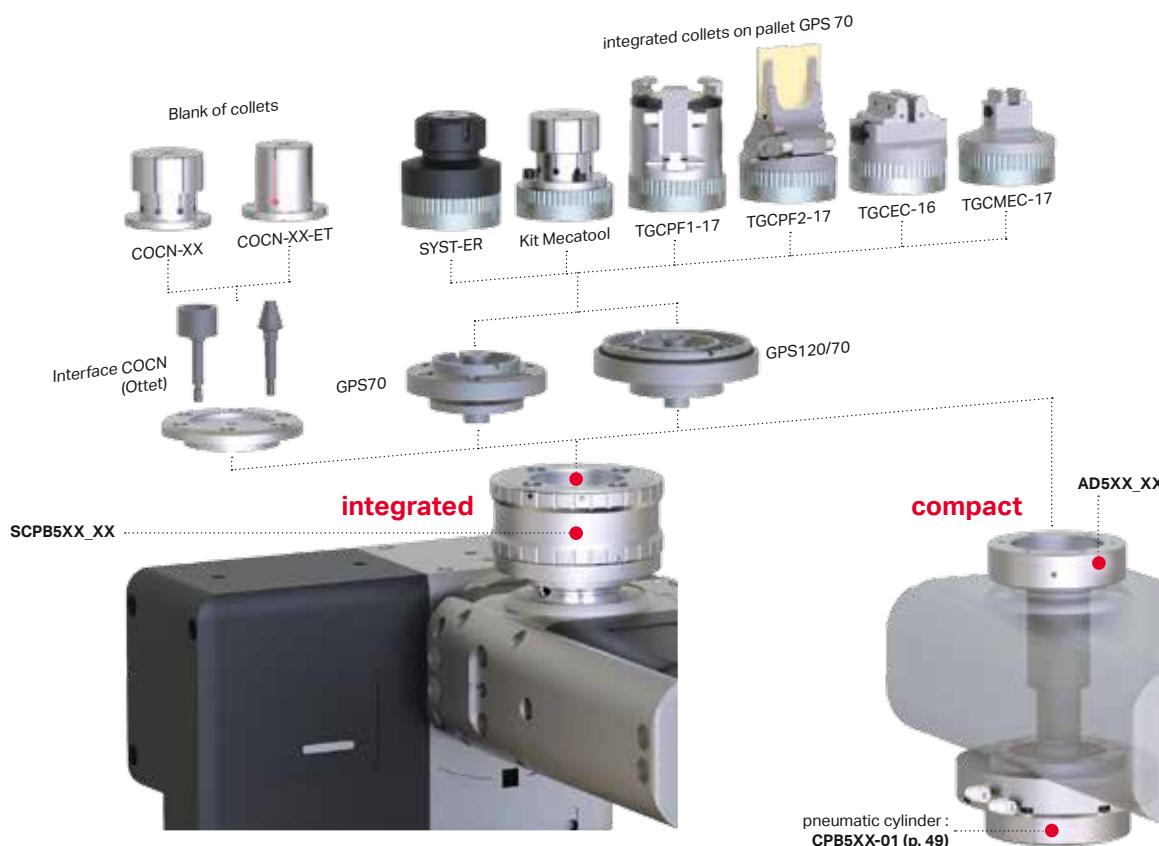
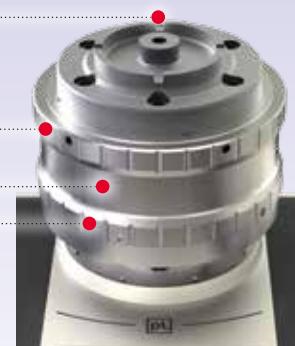


Interface COCN, clamping chuck 3R GPS 70
(image) or GPS 120/70

Clamping stroke adjustment, in front

Integrated pneumatic clamping cylinder 600...5800N
(1...10 bar), stroke 6 mm

Clamping stroke adjustment, at rear

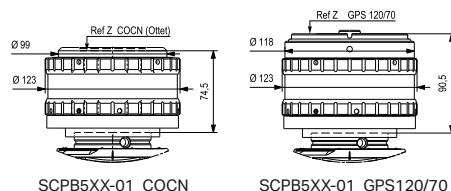


pL LEHMANN Item no.	Designation	Functions	integrated com- pact	Required rotary union or clamping cylinder*	TGColin Item no.	
507	TGC.507-COCN	clamping fixture COCN	clamp/unclamp	●	DDF.507-04	SCPB507-01_COCN
	TGC.507-G70	clamping fixture GPS70	pallet control / clamp/unclamp	●	DDF.507-04	SCPB507-01_GPS70
	TGC.507-G12070	clamping fixture GPS120/70	pallet control / clamp/unclamp	●	DDF.507-04	SCPB507-01_GPS120/70
	TGC.Ada-COCN	adapter COCN	clamp/unclamp	●	TGC.507-SPZ-6.5A	AD507-01_COCN
	TGC.Ada-GPS70	adapter GPS70	clamp/unclamp	●	TGC.507-SPZ-6.5A	AD507-01_GPS70
	TGC.Ada-GPS12070	adapter GPS120/70	clamp/unclamp	●	TGC.507-SPZ-6.5A	AD507-01_GPS120/70
510	TGC.510-COCN	clamping fixture COCN	clamping / unclamping	●	DDF.510-04	SCPB510-01_COCN
	TGC.510-G70	clamping fixture GPS70	pallet control / clamp/unclamp	●	DDF.510-04	SCPB510-01_GPS70
	TGC.510-G12070	clamping fixture GPS120/70	pallet control / clamp/unclamp	●	DDF.510-04	SCPB510-01_GPS120/70
	TGC.Ada-COCN	adapter COCN	clamp/unclamp	●	TGC.510-SPZ-6.5A	AD510-01_COCN
	TGC.Ada-GPS70	adapter GPS70	clamp/unclamp	●	TGC.510-SPZ-6.5A	AD510-01_GPS70
	TGC.Ada-GPS12070	adapter GPS120/70	clamp/unclamp	●	TGC.510-SPZ-6.5A	AD510-01_GPS120/70

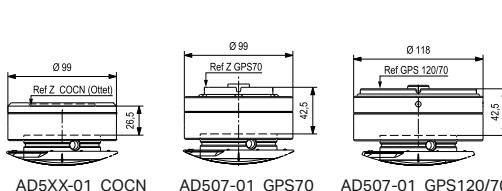
* see pp. 48-51

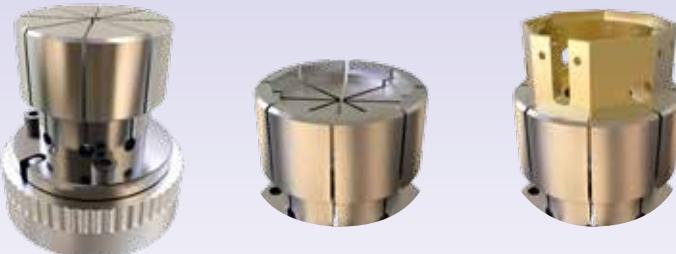
More information: www.tgcolin.ch

integrated versions



compact versions





More information: www.tgcolin.ch



TGCPF1-17

System for precise positionning and axial clamping from watch boards



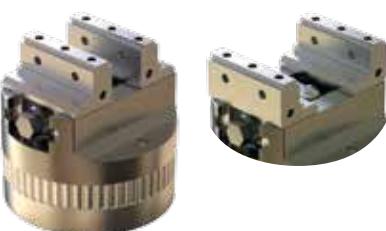
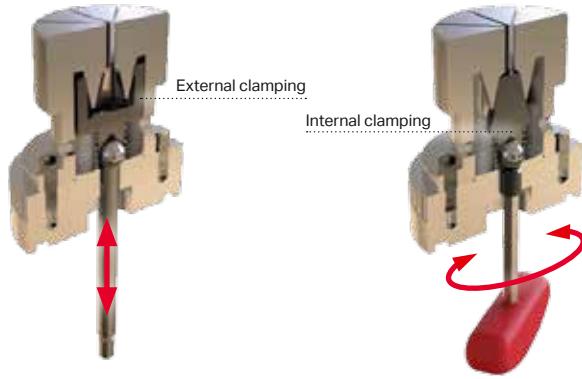
TGCPF2-17

System for clamping of blank watch boards and to machine them from both sides



KIT MECATOOL

Blank clamping collets, closing or opening; workpiece form can be adapted by individual machining



TGCEC-16

Clamping stroke 0–48 mm. Wide 40 mm. Height from pallet surface 45 mm.



TGCMEC-17

Clamping stroke 0–22 mm. Wide 20 mm. Height from pallet surface 43 mm.

Overview

Rotary tables

Applications & Facts

SPZ, DDF, WMS, indexing accuracy

Aligning, GLA, RST

MOT, KAB, CNC

Workpiece clamping system

Technology & service



The clamping means serves as the starting point on the Lehman CNC rotary table and can be set up easily for your workpieces through use of a wide variety of clamping elements and adapters. Regardless of whether the clamping requires a round or profiled contour, whether unmachined or finish-machined parts are involved, whether soft or hard machining, or external or internal clamping – the HAINBUCH system offers a multitude of clamping options – without major expense or effort for setup.

Rotating clamping means

TOPlus Chuck



TOPlus mini Chuck



SPANNTOP Chuck



SPANNTOP mini Chuck



TOROK hand chuck

Clamping element

Clamping head – External clamping

- + all-around clamping

- + 3 different versions: for tubular material, fine machining or boring out yourself

- + Multitude of profile clamping options

- + Coolant-resistant rubber-metal connection, keeps swarf out of the clamping means

- + Clamping capacity SE \varnothing 4 – 100 mm
Clamping capacity RD \varnothing 4 – 160 mm

Clamping adapters

MANDO Adapt mandrel – Internal clamping

- + Fast conversion from external to internal clamping without alignment thanks to CENTREX interface

- + Radial run-out < 0.005 mm between chuck taper and mandrel taper

- + Clamping capacity \varnothing 8 – 190 mm



Jaw module, size 145 or 215 – Jaw clamping

- + axfixe 3-jaw clamping
- + Can be used in rotating (moving) and stationary applications
- + Convert from clamping head or mandrel to jaw clamping in less than 2 minutes

Stationary clamping means

MANOK plus manual vise



Face driver adaptation

- + Spring-mounted center
- + Hardmetal face driver
- + Fast external conversion without disassembly of the chuck (1 min.)



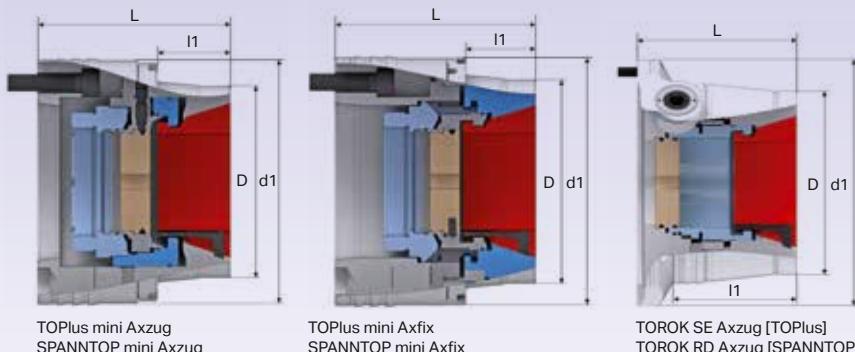
HYDROK hydraulic vise



Morse taper adaptation

- + Adaptation using Morse taper
- + Assembly without need to align (1 min.)

For further information, please visit:
www.hainbuch.com



HAINBUCH chucks TOPlus | TOROK

* For T-type rotary tables it may be necessary to increase the center height, see p. 49

pL LEHMANN Item no.	Designation	Manual	Hydraulic	Size	Clamping capacity [mm]	L [mm]	I 1 [mm]	D [mm]	d 1 [mm]	Required clamping cylinder *	Compatible with modular system	Hainbuch Item no., incl. adapter flange
507	HAI.507-tp-axz TOPlus mini Axzug	•	26	4...26	84.5	31	67 f7	129	SPZ.5xx-9			10908/0001
	HAI.507-tp-axf TOPlus mini Afix	•	26	4...26	86	33	74 f7	129	SPZ.5xx-9			10909/0001
510	HAI.510-tp-axz TOPlus mini Axzug	•	52	4...52	103.5	42	119 f7	150	SPZ.5xx-9	•		10908/0002
	HAI.510-tp-axf TOPlus mini Afix	•	52	4...52	104.5	44	119 f7	150	SPZ.5xx-9	•		10909/0002
520	HAI.510-tp-to TOROK SE Axzug	•	52	4...52	137	65.8	125 f7	174		•		10913/0001
	HAI.520-tp-axz TOPlus mini Axzug	•	52	4...52	107	42	119 f7	150	SPZ.520-9	•		10908/0003
530	HAI.520-tp-axf TOPlus mini Afix	•	52	4...52	109	44	119 f7	150	SPZ.520-9	•		10909/0003
	HAI.520-tp-to TOROK SE Axzug	•	52	4...52	140	65.8	125 f7	174		•		10913/0002
530	HAI.530-tp-axz TOPlus mini Axzug	•	65	4...65	112	49	129 f7	205	SPZ.530-9	•		10908/0004
	HAI.530-tp-axf TOPlus mini Afix	•	65	4...65	1055	50	137 f7	203	SPZ.530-9	•		10909/0004
	HAI.530-tp-to TOROK SE Axzug	•	65	4...65	1515	74.7	145 f7	210		•		10913/0003

For further information, please visit: www.hainbuch.com

TOPlus

- + 25 % higher retention force than SPANNTOP
- + Outstanding rigidity thanks to large contact surface of the clamping segments
- + Insensitive to dirt thanks to clamping head geometry
- + Lower centrifugal force losses compared to jaw chucks
- + Optimal lubrication thanks to lubrication grooves in the clamping element holder
- + Workpiece stabilized through axial pulling against workpiece stop
- + Radial run-out < 0.015 mm
- + Minimal interference contour and easy changing of the clamping heads



HAINBUCH chucks SPANNTOP | TOROK

* For T-type rotary tables it may be necessary to increase the center height, see p. 49

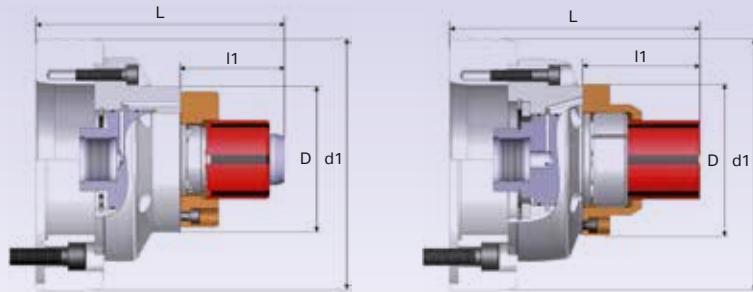
pL LEHMANN Item no.	Designation	Manual	Hydraulic	Size	Clamping capacity [mm]	L [mm]	I 1 [mm]	D [mm]	d 1 [mm]	Required clamping cylinder *	Compatible with modular system	Hainbuch Item no., incl. adapter flange
507	HAI.507-st-axz SPANNTOP mini Axzug	•	32	4...32	101	43	66 f7	133	SPZ.5xx-9			10910/0001
	HAI.507-st-axf SPANNTOP mini Afix	•	32	4...32	96	44	74 f7	129	SPZ.5xx-9			10911/0001
510	HAI.510-st-axz SPANNTOP mini Axzug	•	52	4...52	103.5	45	90 f7	150	SPZ.5xx-9	•		10910/0002
	HAI.510-st-axf SPANNTOP mini Afix	•	52	4...52	104.5	44	98 f7	150	SPZ.5xx-9	•		10911/0002
520	HAI.510-st-to TOROK RD Axzug	•	52	4...52	137	65.8	125 f7	174		•		10912/0001
	HAI.520-st-axz SPANNTOP mini Axzug	•	52	4...52	107	42	90 f7	150	SPZ.520-9	•		10910/0003
530	HAI.520-st-axf SPANNTOP mini Afix	•	52	4...52	109	44	98 f7	150	SPZ.520-9	•		10911/0003
	HAI.520-st-to TOROK RD Axzug	•	52	4...52	140	65.8	125 f7	174		•		10912/0002
530	HAI.530-st-axz SPANNTOP mini Axzug	•	65	4...65	112	47	111 f7	205	SPZ.530-9	•		10910/0004
	HAI.530-st-axf SPANNTOP mini Afix	•	65	4...65	1055	50	119 f7	203	SPZ.530-9	•		10911/0004
	HAI.530-st-to TOROK RD Axzug	•	65	4...65	1515	74.7	145 f7	210		•		10912/0003

For further information, please visit: www.hainbuch.com

SPANNTOP

- + Classical benefits of all HAINBUCH power chucks, e.g. high retention force, all-around clamping with high accuracy and exceptional ease of setup
- + Lower centrifugal force losses compared to jaw chucks
- + Workpiece stabilized through axial pulling against workpiece stop
- + Radial run-out < 0.01 mm
- + Minimal interference contour and easy changing of the clamping heads





MANDO T211 Axzug

MANDO T212 Axzug
MANDO T812 Axfix

HAINBUCH clamping mandrels MANDO

* For T-type rotary tables it may be necessary to increase the center height, see p. 49

pL LEHMANN Item no.	Designation	Hydraulic	Size	Clamping capacity [mm]	L [mm]	l1 [mm]	D [mm]	d 1 [mm]	Required clamping cylinder*	Hainbuch Item no., incl. adapter flange
507	HAI.507-ma-axz1 MANDO T212 Axzug	•	xxs	8...13	121.5	45.5	65	141	SPZ.5xx-9	10915/0001
	HAI.507-ma-axf1 MANDO T812 Axfix	•	xxs	8...13	116.75	44.0	65	141	SPZ.5xx-9	10916/0001
	HAI.507-ma-axz2 MANDO T212 Axzug	•	xs	13...19	116	45.5	65	141	SPZ.5xx-9	10915/0002
	HAI.507-ma-axf2 MANDO T812 Axfix	•	xs	13...19	120	47.5	65	141	SPZ.5xx-9	10916/0002
510	HAI.510-ma-axz1 MANDO T212 Axzug	•	s	16...21	112.5	47.5	70	141	SPZ.5xx-9	10915/0003
	HAI.510-ma-axf1 MANDO T812 Axfix	•	s	16...21	117.5	49.5	70	141	SPZ.5xx-9	10916/0003
	HAI.510-ma-axz2 MANDO T211 Axzug	•	0	20...28	115.5	40.0	65	141	SPZ.5xx-9	10914/0001
	HAI.510-ma-axz3 MANDO T212 Axzug	•	0	20...28	123.5	58.5	90	141	SPZ.5xx-9	10915/0004
520	HAI.510-ma-axf2 MANDO T812 Axfix	•	0	20...28	129.5	60.5	90	141	SPZ.5xx-9	10916/0004
	HAI.520-ma-axz1 MANDO T211 Axzug	•	1	26...38	130	51.0	75	141	SPZ.520-9	10914/0002
	HAI.520-ma-axz2 MANDO T212 Axzug	•	1	26...38	134	64.5	90	141	SPZ.520-9	10915/0005
	HAI.520-ma-axf1 MANDO T812 Axfix	•	1	26...38	137.5	66.5	90	141	SPZ.520-9	10916/0005
530	HAI.520-ma-axz3 MANDO T211 Axzug	•	2	36...54	150	71.0	100	141	SPZ.520-9	10914/0003
	HAI.520-ma-axz4 MANDO T212 Axzug	•	2	36...54	152	80.5	104	141	SPZ.520-9	10915/0006
	HAI.520-ma-axf2 MANDO T812 Axfix	•	2	36...54	1535	82.5	104	141	SPZ.520-9	10916/0006
	HAI.530-ma-axz1 MANDO T211 Axzug	•	3	50...80	172	78.0	100	211	SPZ.530-9	10914/0004
	HAI.530-ma-axz2 MANDO T212 Axzug	•	3	50...80	172	87.5	120	211	SPZ.530-9	10915/0007
	HAI.530-ma-axf1 MANDO T812 Axfix	•	3	50...80	1735	90.0	120	211	SPZ.530-9	10916/0007
	HAI.530-ma-axz3 MANDO T211 Axzug	•	4	69...100	187	95.0	100	211	SPZ.530-9	10914/0005
	HAI.530-ma-axz4 MANDO T212 Axzug	•	4	69...100	1805	97.5	138	211	SPZ.530-9	10915/0008
	HAI.530-ma-axf2 MANDO T812 Axfix	•	4	69...100	1835	100.0	138	211	SPZ.530-9	10916/0008

For further information, please visit: www.hainbuch.com

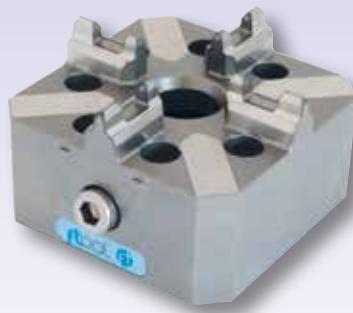
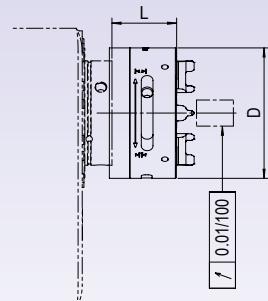


MANDO T211

MANDO T212
MANDO T812

MANDO

- + Typical HAINBUCH features such as ease of setup, parallel clamping, optimal force transmission, high rigidity and retention force as well as low wear
- + Workpiece stabilized through axial pulling against workpiece stop
- + Radial run-out < 0.01 mm, version T812 < 0.025 mm
- + Large adaptation range through use of vulcanized clamping elements
- + Prepared for air system check at workpiece stop



pL LEHMANN Item no.	Designation	Manual	D [mm]	L from spindle [mm]	Pallet sizes, max. [mm]	Workpiece weight (perm.) [kg]	F-Tool catalog reference	F-Tool Item no., incl. adapter flange
								FT 02404
FTO.5xx-1043	ER Chuck 80P	• Ø103	51	Ø148	35	FT 01043	FT 02404	
FTO.5xx-1044	F-Tool Chuck 80 IF3R	• Ø90	41	Ø156	35	FT 01044	FT 02405	
FTO.5xx-2110	F-Tool ER-Chuck 50	• Ø78	50	Ø72	15	FT 02110	FT 02406	
FTO.5xx-1716	F-Tool PIN centering chuck	• Ø80	48	Ø100	15	FT 01716	FT 02407	
FTO.5xx-1581	F-Tool collet chuck holder ETS32	• Ø50	55			FT 01581	FT 02408	
FTO.5xx-2188	SHS clamping base with side actuation for Ottet collet chucks (base only)	• Ø60	34	Ø80		FT 02188	FT 02409	



ER Chuck 80P



Chuck 80 IF3R



ER Chuck 50



PIN



ETS 32



OTTET

Overview

Rotary tables

Applications & Facts

SPZ, DDF, WMS, indexing accuracy

Aligning, GLA, RST

MOT, KAB, CNC

Workpiece clamping system

Technology & service



SAFE and AirLine zero point clamping systems

530	520	510	507	pL LEHMANN Item no.	Designation	Manual open, pneumatic 6 bar open, hydraulic 65 bar	D1 [mm]	D2 [mm]	L from spindle [mm]	Draw-in force [kN]	Retention force [kN]	vb Item no., incl. adapter flange
VBO.507-al	AirLine	•		120	130	52	>9	40	DDF.507-04	755 507-04		
VBO.507-SAhh	SAFE20	•	•	120	130	50	>9	40	DDF.507-04	752 507-04		
VBO.507-SAm	SAFE20	•		120	130	50	>9	40		752 507-04-M		
VBO.510-al	AirLine	•		120	130	52	>9	40	DDF.510-04	755 510-04		
VBO.510-SAhh	SAFE20	•	•	120	130	50	>9	40	DDF.510-04	752 510-04		
VBO.510-SAm	SAFE20	•		120	130	50	>9	40		752 510-04-M		
VBO.520-al	AirLine	•		120	140	52	>9	40	DDF.520-04	755 520-04		
VBO.520-SAhh	SAFE20	•	•	120	140	50	>9	40	DDF.520-04	752 520-04		
VBO.520-SAm	SAFE20	•		120	140	50	>9	40		752 520-04-M		
VBO.530-al	AirLine	•		120	220	57	>9	40	DDF.530-04	755 530-04		
VBO.530-SAhh	SAFE20	•	•	120	220	55	>9	40	DDF.530-04	752 530-04		
VBO.530-SAm	SAFE20	•		120	220	55	>9	40		752 530-04-M		

* see pp. 50/51

Clamping means for SAFE and AirLine zero point clamping systems

Empty pallets	Center clamp	pL LEHMANN Item no.	Designation	Interference circle ø [mm]	L from support [mm]	Clamping capacity [Nm]	Dimensions LxWxH [mm]	vb Item no.
VBO.al-76	AirLine vb centro76	175	75	5-74/44-120	Ø148x90x75	vb-centro76 AL		
VBO.al-76P	AirLine vb centro76 pendulum	175	75	22-74/62-120	Ø148x90x75	vb-centro76 P AL		
VBO.sa-76	SAFE20 vb centro76	175	75	5-74/44-120	Ø148x90x75	vb-centro76 S		
VBO.sa-76P	SAFE20 vb centro76 pendulum	175	75	22-74/62-120	Ø148x90x75	vb-centro76 P S		
VBO.al-PalQ	AirLine Index pallet	206	35		150x150x35	755601 PL		
VBO.al-PalR	AirLine Index pallet, round	160	35		Ø160x35	755602 PL		
VBO.sa-PalQ	SAFE20 Index pallet	206	35		150x150x35	752601 PL		
VBO.sa-PalR	SAFE20 Index pallet, round	160	35		Ø160x35	752602 PL		

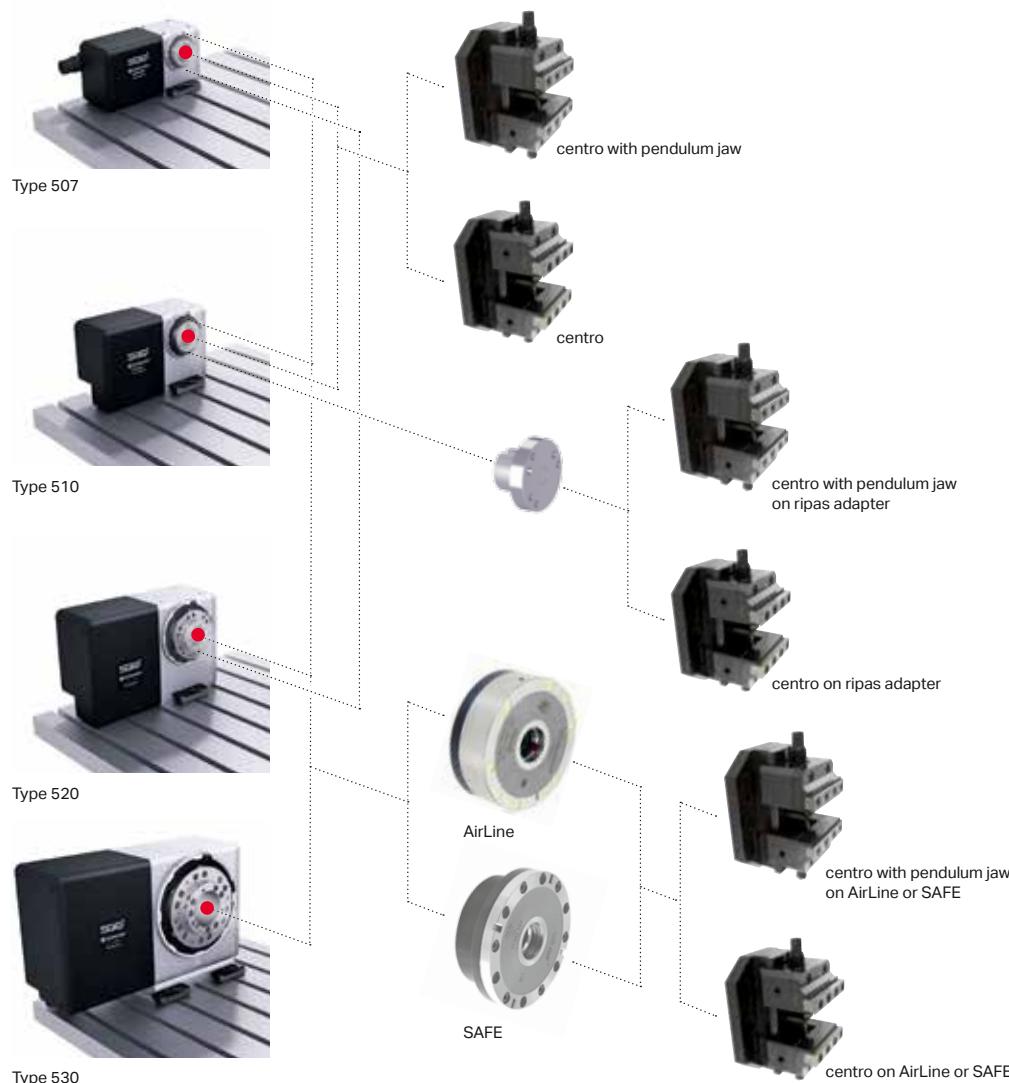
Center clamp on ripas or directly on spindle

510	507	ripas	pL LEHMANN Item no.	Designation	Interference circle ø [mm]	L from support [mm]	Clamping capacity [Nm]	Dimensions LxWxH [mm]	vb Item no.
VBO.RIP-76	vb centro76, ripas	175	83	5-74/44-120	Ø148x90x83	vb-centro76 Ri			
VBO.RIP-76P	vb centro76 pendulum, ripas	175	83	22-74/62-120	Ø148x90x83	vb-centro76 P Ri			
VBO.507-76	vb-centro76, direct	175	67	5-74/44-120	Ø148x90x75	vb-centro76 pl 507			
VBO.507-76P	vb-centro76 pendulum, direct	175	67	22-74/62-120	Ø148x90x75	vb-centro76 P pl 507			
VBO.510-76	vb-centro76, direct	175	67	5-74/44-120	Ø148x90x75	vb-centro76 pl 510			
VBO.510-76P	vb-centro76 pendulum, direct	175	67	22-74/62-120	Ø148x90x75	vb-centro76 P pl 510			



vb-centro76 jaw line

	vb Item no.	Designation	Dimension (LxWxH)
Soft jaws	748-086ST	Soft steel jaws	86x60x40
	748-086AL	Soft aluminum jaws	86x60x40
Grip jaws	748-76-04-ST	Grip jaw, standard	
	748-76-04-RG	Grooved / Grip jaw	
	748-76-04-AL	Grip jaw for aluminum	
	748-76-04-L	Positive-fit jaws	
Accessories	748-76-M8	Workpiece stop	
	748-NM	Torque wrench	
	748-SW12	Wrench socket, 12 mm	



Overview

Rotary tables

Applications & Facts

SPZ, DDF, WMS, indexing accuracy

Aligning, GLA, RST

MOT, KAB, CNC

Workpiece clamping system

Technology & service

High geometric accuracies as standard,
combined with a high level of rigidity and stability



(*) values = increased accuracy. Item no.. GEO.5xx-GEN

The tolerances given below apply under the following conditions:

1. The rotary table is mounted as specified in the commissioning instructions
2. The measurement is carried out on a calibrated granite plate (all machine errors are excluded)
3. The rotary table is not subjected to any outside thermal influences (sun, fans, heaters...).
4. Prior to the measurement, the rotary table and the measuring and test equipment have been in the same environment for at least 24 h
5. All measured values are determined for an unloaded rotary table

Geometry of EA rotary tables

	Perpendicularity Spindle surface to support surface 	Parallelism Spindle axis to support surface 	Center height
	0.01/100 mm (0.005/100 mm)	0.01/100 mm (0.005/100 mm)	0...0.04 mm

Geometry of EA rotary tables with rotoFIX

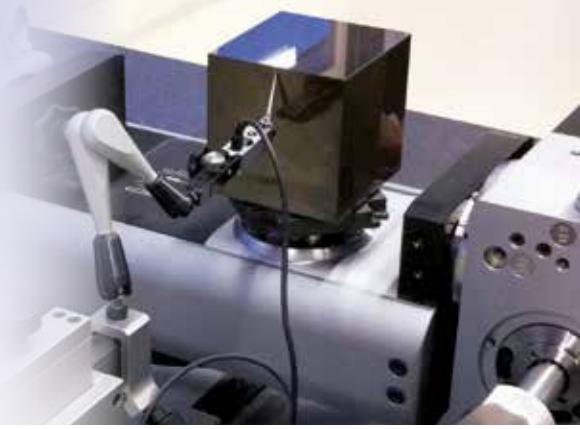
	Parallelism with support surface 	Parallelism with tilting axis 	For longFLEX, see p. 41
	0.007/100 mm (0.0035/100 mm)	0.01/300 mm (0.005 /300 mm)	

Geometry of M-type rotary tables

	Perpendicularity Spindle surface to support surface 	Parallelism Spindle axis to support surface 	Center height
	0.01/100 mm (0.005/100 mm)	0.01/100 mm (0.005/100 mm)	0...0.04 mm
on request	Axis parallelism Spindle 2, 3 and 4 to spindle 1 	Center distance X1, X2 and X3 	Depth difference of the spindles
	0.01/100 mm (0.005/100 mm)	± 0.02 mm (± 0.01 mm)	± 0.03

And for the most demanding requirements:
1/2 tolerance as an option

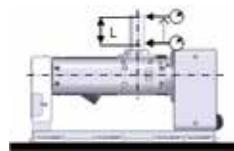
(*) values = increased accuracy. Item no.. GEO.5xx-GEN



Geometry of TF and T1 rotary tables

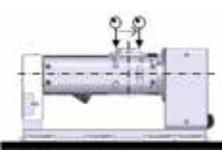


Perpendicularity
Dividing / indexing axis to tilt axis



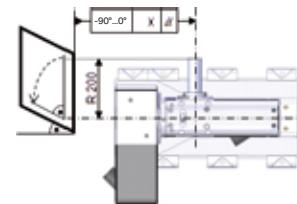
0.01/100 mm (0.005/100 mm)

Parallelism
Spindle surface to support surface



0.01/100 mm (0.005/100 mm)

Tilt drift
Change in the angle between the dividing / indexing axis and tilting axis during the tilting movement from -90° to 0°

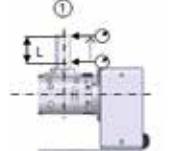


0.01/R150 mm (0.005/R150 mm);
applies only to T1

Geometry of T2...3 rotary tables

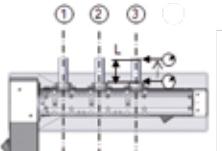


Perpendicularity
Dividing / indexing axis to tilt axis of spindle 1



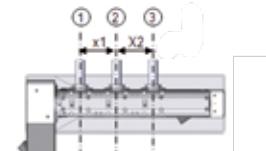
0.01/100 mm (0.005/100 mm)

Axis parallelism
Spindle 2 and 3 to spindle 1



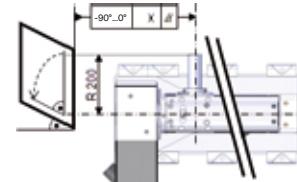
0.01/100 mm (0.005/100 mm)

Center distance
X1, X2 and X3



± 0.02 mm (± 0.01 mm)

Tilt drift
Change in the angle between the dividing / indexing axis and tilting axis during the tilting movement from -90° to 0°

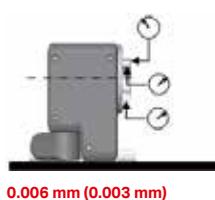


0.01/R150 mm (0.01/R150 mm)

For all rotary tables

Radial and Axial run-out for all rotary table versions

- measured at spindle nose
- Axial run-out on largest diameter
- Radial run-out of the inner bore as well as centering ø



0.006 mm (0.003 mm)

Overview

Rotary tables

Applications & Facts

SPZ, DDF, WMS,
indexing accuracy

Aligning,
GLA, RST

MOT, KAB, CNC

Workpiece
clamping system

Technology & service

Increase availability and decrease maintenance costs!

Every pL rotary table is equipped with a sealed (watertight) USB port. When a common USB flash drive is inserted, the data is automatically read out as a file. This file can be easily sent to pL or to the representative in your country by e-mail for an error analysis.

Technical information for «pL-iBox» – the rotary table electronics

The electronics unit controls and monitors the system. It is housed in a black box.

Voltage: 24 V DC

Current: 0.1 A max standard 0.3A max with servo valve

1 input: «clamp», optionally +24 VDC ca. 5 mA or 110 VAC ca. 25 mA without hardware measures. With AC actuation, the software parameter «Input Clamp» must be set to «AC». Otherwise the pneumatic valve chatters.

8 outputs: Ready, Error, Unclamped, Clamped, Reference, Limit1, Limit2, Service. Current: Each output individually, max. 50 mA NPN/PNP: can be combined, rewired.

Buffer: The real-time clock is battery-buffered.

Interface: USB interface, Bluetooth, Ethernet



Malfunction display by means of the pL-iBox, flashing «ERROR» LED

Meaning of the red LED, «ERROR» ■

- + In the event of an error, the red LED «ERROR» flashes continuously until the error is rectified.
- + When there are several errors, the flashing code for the next error follows after a pause of 3 s, etc.
- + The errors do not appear in order of importance, but in ascending order.
- + It is possible to continue working with some errors; with others, the «READY» signal goes to 0 V, disabling the rotary table. See the following table.

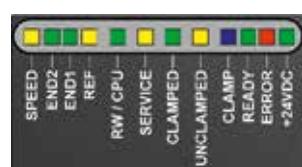
Measure: Call technician for maintenance.

Example of flashing code for «ERROR» LED (red): flashing code for «Rel.humidity» (2) AND «Negative pressure, housing» (4):



Displays and operating elements

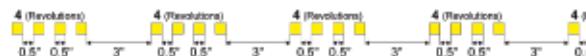
LEDs on the motor cover indicate the operating status.



Meaning of the yellow LED, «SERVICE» ■

- + Meaning of the yellow LED, «SERVICE»
- + When «SERVICE» is necessary, the corresponding code flashes continuously.
- + For additional instructions, see «Maintenance recommendation» and «Maintenance log», document DOK-0301 included in the packaging. It is also provided on the USB stick for the pL rotary table.
- + The continuously updated document must be saved in the course of machine maintenance.

Example of yellow «SERVICE» LED: flashing code for «revolutions of the worm»



Remote maintenance – a highlight in the event of an emergency



NEW
Bluetooth®, Ethernet,
web server



Meaning of the LEDs

LED	Color	Function	Comment
SPEED	yellow	Worm speed	Flashes 1x per worm revolution END2
END2	green	Limit switch 2 (-) UZ	Extinguishes when end position «» is reached. (Only for tilting axes with connected limit switches.) END1
END1	green	Limit switch 1 (+) GUZ	Extinguishes when end position «» is reached. (Only for tilting axes with connected limit switches.) REF
REF	yellow	Spindle reference	Illuminates/extinguishes on the edge of the cam / slot RW/CPU
RW/CPU	green	EPROM / USB stick	- Flashes in idle state at 2 second intervals if OK. - Flickers during read in/out on USB stick or EPROM. - Illuminates permanently/does not illuminate if system is not ready SERVICE
SERVICE	yellow	Service	Flashing sequence. For code key, see below. CLAMPED
CLAMPED	green	Spindle clamping «clamped»	Illuminates when spindle clamping is clamped UNCLAMPED
UNCLAMPED	yellow	Spindle clamping «unclamped»	Illuminates when spindle clamp is unclamped CLAMP
CLAMP	blue	«clamp» spindle clamping	Illuminates when «clamping» signal is present READY
READY	green	System OK.	Illuminates permanently when system is ready. NOTE: If error messages are displayed and the LED «READY» is nevertheless illuminated, only warnings are involved. ERROR
ERROR	red	Error	Flashing sequence. For code key, see below. +24VDC
+24VDC	green	Power System OK.	Illuminates permanently when power supply is OK.

Flashing code ERROR ■

No. of flashes	Meaning	Brief explanation	E/B*	Opt.	Schalt schw. (Bsp)	Signal «READY»**
1	Temperature level	Internal temperature exceeded	E		85 [C°]	0 ↴
2	Relative humidity	Relative humidity exceeded	E		50 [%]	0 ↴
3	Excess pressure housing	Housing overpressure exceeded	E		500 [mbar]	0 ↴
4	Negative pressure, housing	Below minimum pressure for motor add-on	B		100 [mbar]	0 ↴
5	Excess. current, prop. valve	Excessive current at proportional valve	E	x	0.100 [A]	1
6	Insuff. current, prop. valve	Insufficient current at proportional valve	B	x	0.001 [A]	1
7	Air pressure too high	Air pressure too high	E	x	7.0 [bar]	0 ↴
8	Air pressure too low	Air pressure too low	B	x	4.0 [bar]	0 ↴
9	Overscurrent at motor	Overscurrent at motor	E	x	(10 [A])	1
10	Max. impact X	Impact / acceleration X exceeded	E		10 [g] 30 [ms]	1
11	Max. impact Y	Impact / acceleration Y exceeded	E		10 [g] 30 [ms]	1
12	«Clamped» time exceeded	«Clamp» time exceeded	E		2 000 [ms]	1
13	«Unclamped» time exceeded	«Unclamp» time exceeded	E		2 000 [ms]	1
14	Excess. current at clamping valve	Excessive current at clamping valve (short circuit?)	E		10 [mA]	0 ↴
15	Insuff. current at clamping valve	Insufficient current at clamping valve (broken wire?)	B		1 [mA]	0 ↴
16	External pressure intensifier	Error at external pressure intensifier				1
17	License expired	License expired				0 ↴
18	License key incorrect	License key incorrect				1
19	System time wrong	System time wrong				0 ↴
20	Max. rpm exceeded	Max. rpm exceeded	E		(11 000 [rpm])	
21	Interruption request	Interruption request				
22	Max. duty cycle exceeded	Motor duty cycle exceeded	E			
25	No serial no. parameterized	No serial number parameterized				0 ↴
26	Initializ. clamping sensor incompl.	Initializ. of sensor for clamping - calibration not correct				0 ↴
27	Initializ. operating pressure sensor incompl.	Initializ. of sensor initialization for operating pressure calibration not correct (e.g. 6 bar)				0 ↴
28	Initializ. sealing air sensors not correct	Initializ. of sensor for sealing air calibration not correct				0 ↴
29	Initializ. acceleration sensors not correct	Initializ. of sensor for acceleration calibration not correct				0 ↴

* E = Exceed, B = Below

** «READY» = Signal high = OK, low = Fehler/Error

Flashing code SERVICE ■ When flashing, see instructions in «Maintenance recommendation» and «Maintenance log»

No. of flashes	Meaning	Brief explanation
1	Clamping cycles	1 clamping cycle is made of «unclamp+clamp» and the signal control.
2	Rotary table «ON»	Set number of «operating hours» exceeded. The counter starts when the pL-iBox is «on».
3	Worm rotating	Set number of «partial operation» hours exceeded. The counter starts running as soon as clamping is released.
4	Worm rev.	Set number of «worm revolutions» exceeded. Sensor at the belt pulley.

Overview

Rotary tables

Applications & Facts

SPZ, DDF, WMS,
indexing accuracy

Aligning,
GLA, RST

MOT, KAB, CNC

Workpiece
clamping system

Technology & service

Never search for documents again – everything at hand at all times
No Internet connection necessary!

The everyday life of a commissioning technician

The information needed is missing: electrical schematics, drive data, parameter lists, commissioning instructions ... Commissioning must be interrupted, the search for data begins: paper? Internet? Passwords? Time is passing. The deadline is approaching. The urgency of the situation means do the best possible with existing knowledge.

Result: It rotates, but functions only halfway, pL data cannot be achieved-(rotational speed, cycle time, accuracy...)

pL finding: Investigations have shown that 70% of optimization cases can be attributed to poor or incorrect commissioning.



smart doc on the USB stick

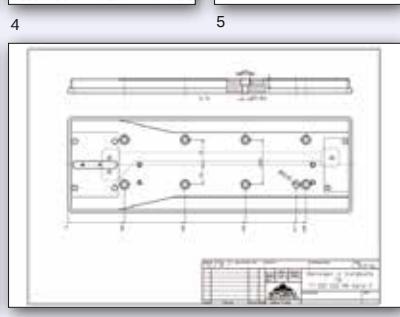
- + A mini USB stick is plugged into a USB slot (in the swiveling / tilting axis on T-type rotary tables)
- + The following files have been saved on this USB stick:
 - 1 ADAT drive setup data for each system
 - 2 Appropriate parameter list for the provided CNC control system
 - 3 General operating manual / user's manual in German and English
 - 4 General commissioning manual in German and English with all diagrams
- + If necessary, machine-specific commissioning manual in German and English (e.g. for Brother)
- 6 Indexing accuracy report(s) to VDI/DGQ 3441
- 7 Geometry report
- + If necessary, special drawings from the customer
- + The files are also available online in the pL-ERP (for Helpliner) as well as in the «full documentation» on the pL website (accessible to all pL representatives)
- + All files at the current revision level – version check not needed, risk of errors minimized

Product documentation saved securely:
The USB stick remains on the product



Your benefit

- + Download no longer necessary – extra work eliminated
- + Password no longer necessary – waiting for registration eliminated
- + Internet no longer necessary – problems with poor or no network connection eliminated
- + No lost documents, no missing USB stick – stick is always inserted, «loaded» and safety protected under the USB slot cover
- + Everything needed is immediately available (appropriate for each rotary table) – tedious searching eliminated
- + Emergency solution by technician no longer necessary – existing, often wrong (because out-of-date) data are no longer used



If the USB stick is lost,
everything is still
available on the website.

Overview

Rotary tables

Applications & Facts

SPZ, DDF, WMS,
indexing accuracy

Aligning,
GLA, RST

MOT, KAB, CNC

Workpiece
clamping system

Technology & service

Basics of the drive data

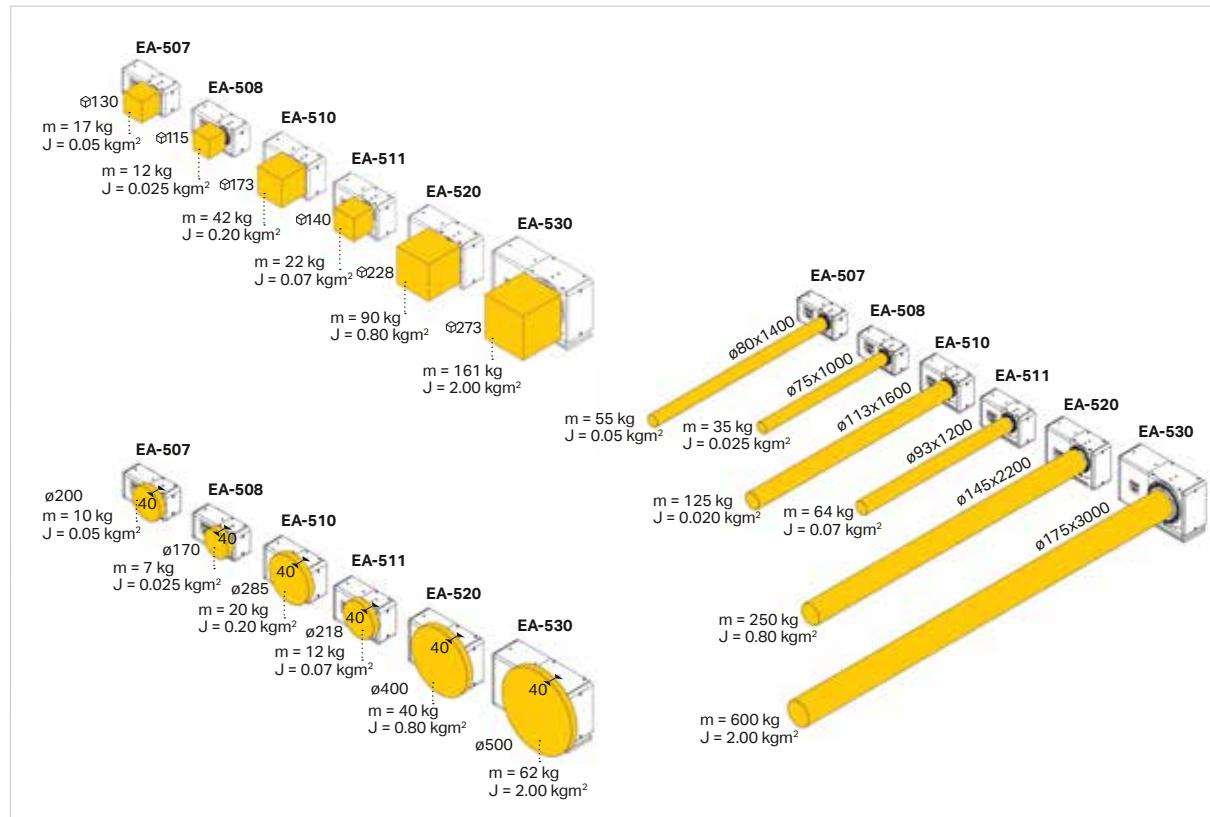
All drive data of pL LEHMANN rotary tables (**pp. 8-29**) have been designed for the following

standard spindle loads in accordance with DIN/VDE 0520 as follows:

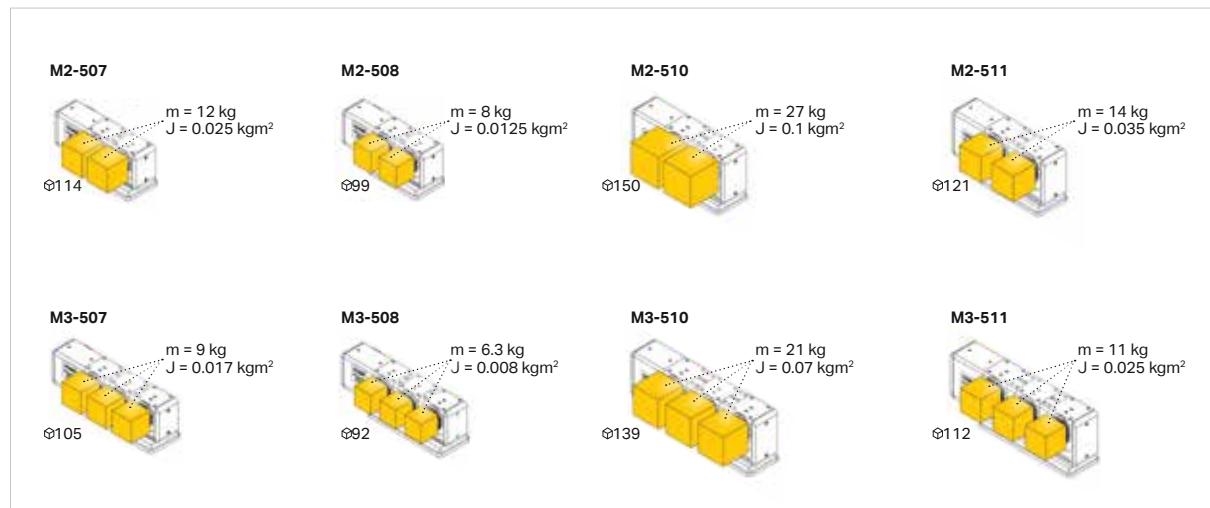
- + For intermittent service S3, duty cycle 20%
- + Cycle time of one minute

Any other conditions require the adjustment of the drive data (acceleration, jerk limitation, rotational speed).

E-type rotary tables



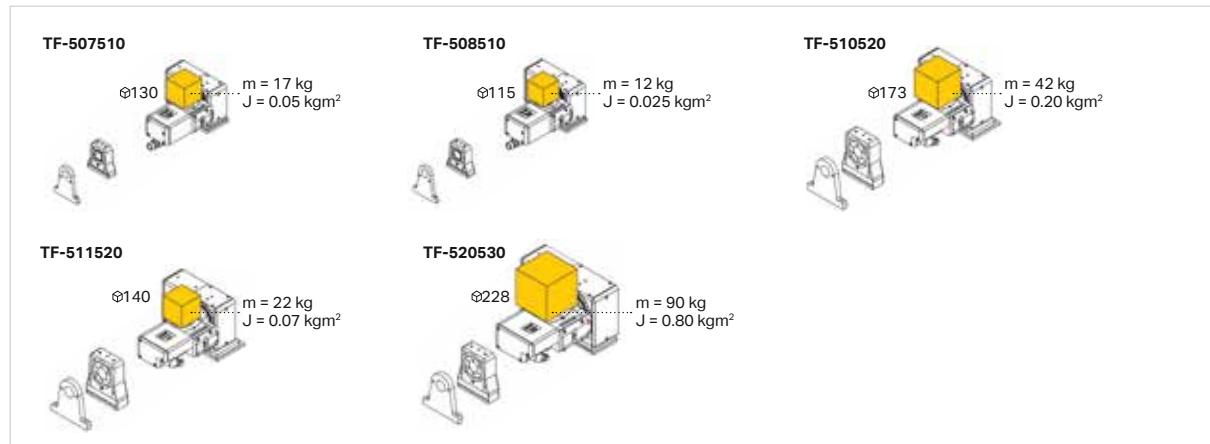
M-type rotary tables



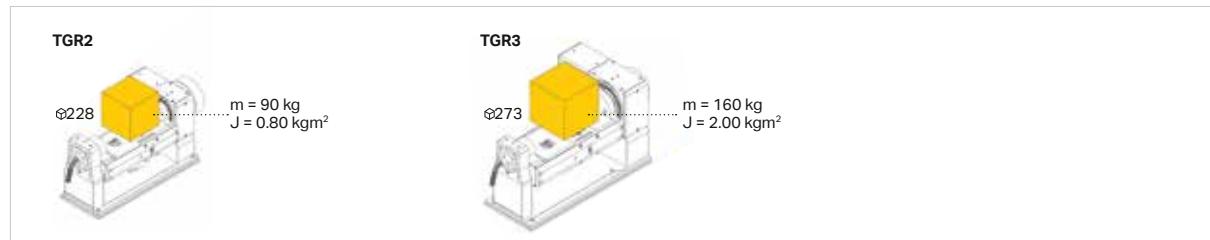
Reference values for duty cycle (ED)

- + For normal rotary table work such as milling / boring (mainly positioning): approx. 20 %.
- + For milling / boring in intensive mixed operation (positioning / feed machining): approx. ED 40 %
- + For profile and depth grinding: approx. ED 60 % / simultaneous machining, 5-axis
- + For engraving: approx. ED 80–100 %.

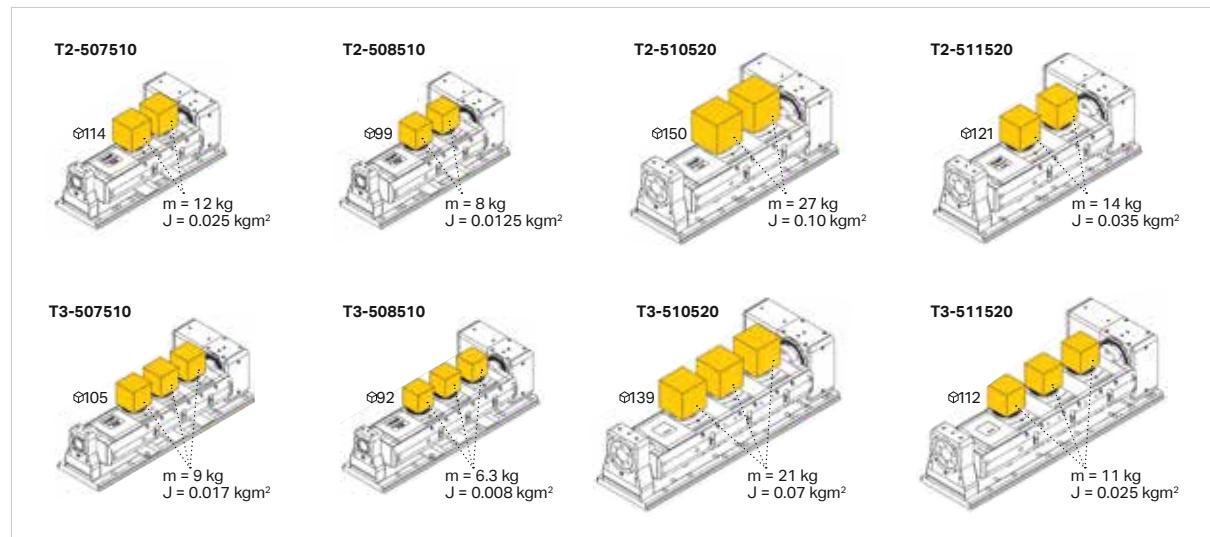
T-type rotary tables (TIP, TAP, TOP)



T1-type rotary tables (TGR)



T2...3-type rotary tables (TOP.x)



Overview

Rotary tables

Applications & Facts

SPZ, DDF, WMS, indexing accuracy

Aligning, GLA, RST

MOT, KAB, CNC

Workpiece clamping system

Technology & service

Calculating loads, forces and moments of inertia, avoiding risks and damage



It is not only the weight which counts; shape and position are also often decisive factors

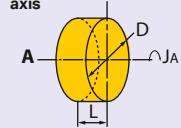
We are here to help

Request a proposal and we will gladly prepare you an offer for your individual calculation up to and with a specific list of parameters. Contact your closest pL LEHMANN representative. We are here to help.

Calculation of the load on the dividing axis

(using Steiner's theorem)

Center of gravity in rotary axis



D: Outside diameter of the round bar [m]

L: Length of the round bar [m]

p: Density [kg/m³]

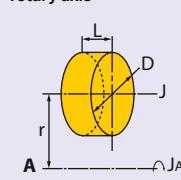
m: Mass of the round bar [kg]

J_A : Moment of inertia [kgm²]

$$m = \frac{D^2 \cdot \pi}{4} \cdot L \cdot p$$

$$J_A = \frac{m \cdot D^2}{8}$$

Center of gravity outside rotary axis



D: Outside diameter of the round bar [m]

L: Length of the round bar [m]

r: Turning radius [m]

p: Density [kg/m³]

m: Mass of the round bar [kg]

J_A : Moment of inertia of the round bar at center A [kgm²]

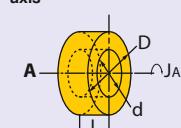
J: Moment of inertia [kgm²]

$$m = \frac{D^2 \cdot \pi}{4} \cdot L \cdot p$$

$$J = \frac{m \cdot D^2}{8}$$

$$J_A = J + m \cdot r^2$$

Center of gravity in rotary axis



D: Outside diameter of the cylinder [m]

d: Bore diameter of the cylinder [m]

L: Length of the round bar [m]

p: Density [kg/m³]

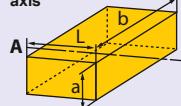
m: Mass of the cylinder [kg]

J_A : Moment of inertia [kgm²]

$$m = \left(\frac{D^2 \cdot \pi}{4} \cdot L \cdot p \right) - \left(\frac{d^2 \cdot \pi}{4} \cdot L \cdot p \right)$$

$$J_A = \frac{1}{8} m (D^2 + d^2)$$

Center of gravity in rotary axis



a: Side length [m]

b: Side length [m]

L: Side length [m]

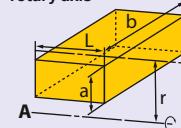
p: Density [kg/m³]

J_A : Moment of inertia [kgm²]

$$m = a \cdot b \cdot L \cdot p$$

$$J_A = \frac{1}{12} m (a^2 + b^2)$$

Center of gravity outside rotary axis



a: Side length [m]

b: Side length [m]

L: Side length [m]

p: Density [kg/m³]

r: Turning radius [m]

J_A : Moment of inertia [kgm²]

$$m = a \cdot b \cdot L \cdot p$$

$$J_A = \frac{1}{12} m (a^2 + b^2 + 12r^2)$$

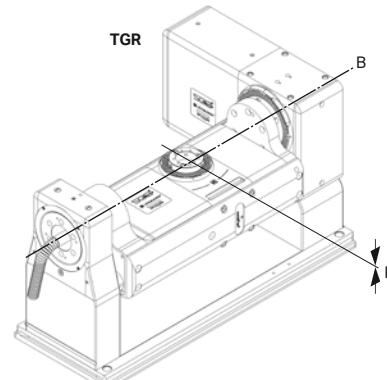
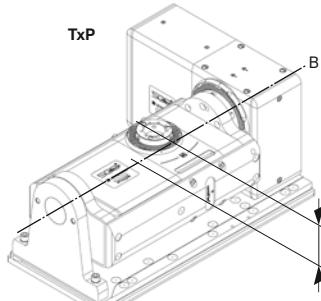
Key

- A = Dividing axis
- B = Tilting axis
- R = Radius between tilting axis and spindle nose of dividing axis [m]
- Rs = Center distance [m]
- m = Mass [kg]
- M = Torque calculated from $m \times g \times Rs$ [Nm]
- Me = Torque acting on the tilting axis caused by the dead weight of the tilting axis [Nm]
- g = Acceleration due to gravity 9.81 [m/s²]

Densities of different materials x dynamic speed (p)

Steel	7.85×10^3 kg/m³
Cast iron	7.85×10^3 kg/m³
Aluminum	2.7×10^3 kg/m³
Copper	8.94×10^3 kg/m³
Brass	8.5×10^3 kg/m³

Calculation of the load on the tilting axis



Distance R

Rotary table	TxP	TGR
TF..T1-507510	46 [mm]	-
TF..T1-510520	30 [mm]	0 [mm]
TF..T1-520520	90 [mm]	0 [mm]

Calculation of the torque in the tilting direction (without intrinsic torque of the dividing axis):

$$Rs = R + L/2$$

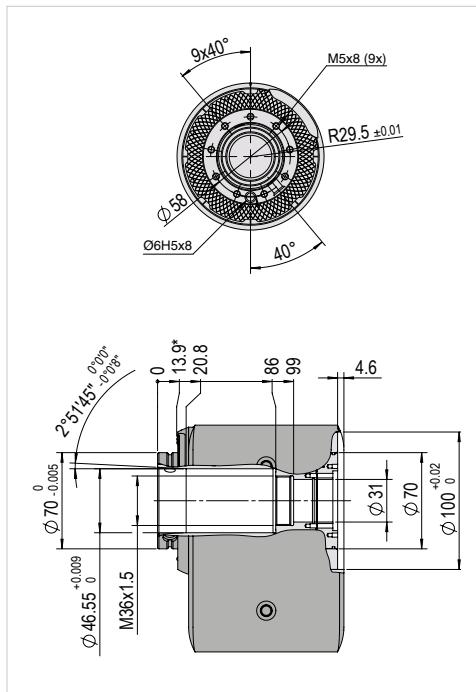
$$M = m \times Rs \times g$$

Calculation of the total torque in the tilting direction (with intrinsic torque of the dividing axis):

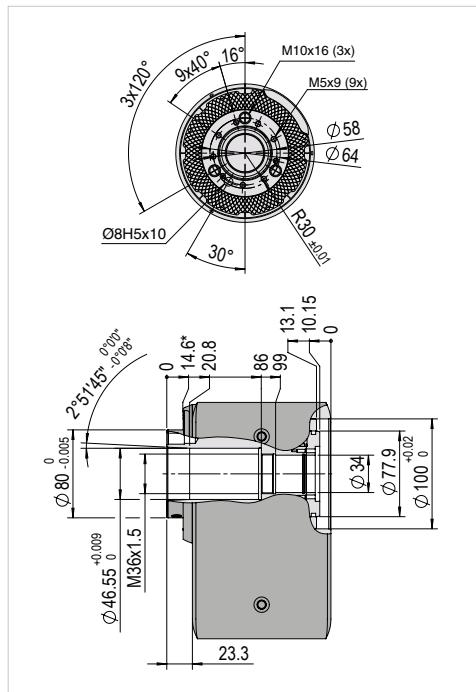
$$M_{tot} = M + Me \quad (Me \text{ is the gear unit loading without load; see appropriate T-type rotary table pp. 14-23})$$

All dimensions for the construction of your device:
Exact, compact, complete

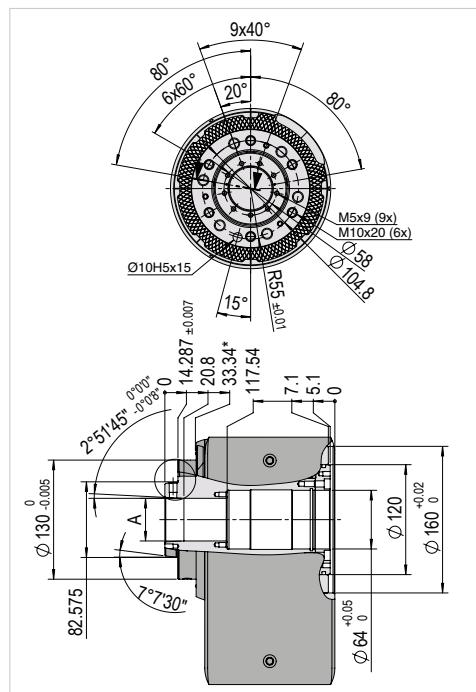
507 HSK-A63/ø70



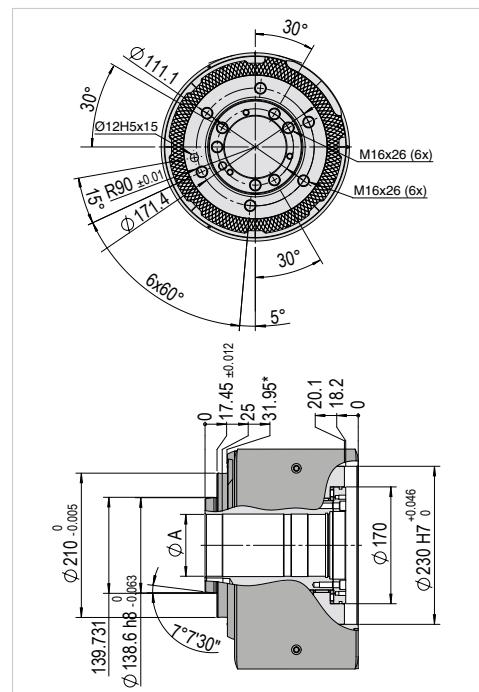
510 HSK-A63/ø80



520 HSK-A63/KK5



530 ø90/KK8



HSK = Hollow shank
taper in acc. with DIN
69063-1 (spindle) or
DIN 69893 (adapter),
KK... = Short taper size ...
in acc. with DIN 55026

* with SPI.5xx-Lab:
507 = 1.25
510 = 4.95
520 = 20.15
530 = 17.55
(see pp. 8-29)

Overview

Rotary tables

SPZ, DDF, WMS,
indexing accuracy

Aligning,
GLA, RST

MOT, KAB, CNC

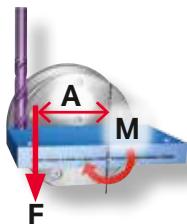
Workpiece
clamping system

Technology
& service

Reference values for configuring and selecting the correct rotary table

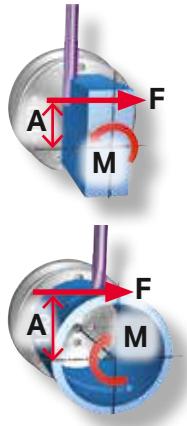
F = Feed force, **A** = Distance [m] from rotary table axis to feed force (F) during machining, **M** = Resulting torque (FxA)
Resulting torque M = $F \times A \rightarrow$ must not exceed the max. clamping torque [Nm] or max. feed torque [Nm] of the rotary table!

V = Rough machining, WP = indexable Inserts, VHM = Solid hard metal



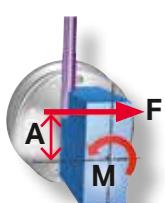
Drilling

Tool type	Wz ø [mm]	Cutting speed [m/min]	Feed F [mm]	Feed force F [N]		
				CK45	X5CrNi18-10	AlMg4.5Mn0.7
Twist drill VHM	5	220	0.12	920		
		120	0.10		1120	
		350	0.15			315
Twist drill VHM	10	220	0.27	1450		
		120	0.18		1900	
		350	0.2			650
Twist drill VHM	17	220	0.35	2850		
		120	0.25		3980	
		350	0.3			1250
WP drill	38	140	0.09	4350		
		100	0.08		6550	
		180	0.16			2800



End milling and slot milling

Tool type	Wz ø [mm]	Cutting speed [m/min]	Feed F [mm]	Depth of cut [mm]	Cutting width [mm]	Feed force F [N]		
						CK45	X5CrNi18-10	AlMg4.5Mn0.7
End milling cutter V	8	180	0.09 x 4	4	8	840		
		70	0.06 x 4	4	8		410	
		570	0.15 x 4	4	8			360
End milling cutter V	12	180	0.11 x 4	6	12	1100		
		70	0.07 x 4	6	12		700	
		570	0.17 x 4	6	12			550
End milling cutter V	20	180	0.095 x 4	10	20	1550		
		70	0.08 x 4	10	20		1400	
		570	0.17 x 4	10	20			950

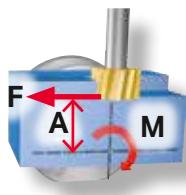


Hobbing

Tool type	Wz ø [mm]	Cutting speed [m/min]	Feed F [mm]	Depth of cut [mm]	Cutting width [mm]	Feed force F [N]		
						CK45	X5CrNi18-10	AlMg4.5Mn0.7
End milling cutter V	8	200	0.09 x 4	8	4	510		
		77	0.06 x 4	8	4		420	
		627	0.15 x 4	8	4			360
End milling cutter V	12	200	0.11 x 4	12	6	1050		
		77	0.07 x 4	12	6		700	
		627	0.17 x 4	12	6			550
End milling cutter V	20	200	0.15 x 4	20	10	2700		
		77	0.08 x 4	20	10		1350	
		627	0.17 x 4	20	10			950

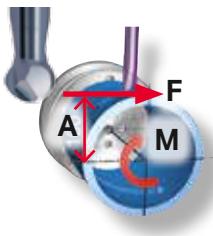
Factory information from well-known tool manufacturers (applies to new tool cutting edges)

Corner milling (slab milling or plane milling)



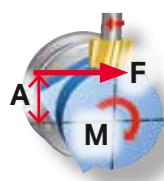
Tool type	Wz ø [mm]	Cutting speed [m/min]	Feed F [mm]	Depth of cut [mm]	Cutting width [mm]	Feed force F [N]		
						CK45	X5CrNi18-10	AlMg4.5Mn0.7
Angular milling cutter WP	40	160	0.12 x 6	2	40	1750		
		160	0.12 x 6	2.5	25	1250		
		85	0.12 x 6	2	40		1550	
		85	0.12 x 6	2.5	25		1150	
		500	0.15 x 6	3	40			1250
Angular milling cutter WP	80	210	0.15 x 10	3.5	80	4900		
		240	0.15 x 10	7	40	4900		
		160	0.08 x 10	3.5	80		3450	
		176	0.08 x 10	7	40		3450	
		450	0.2 x 10	3.5	80			3100
		495	0.2 x 10	7	40			3100

Ball end milling



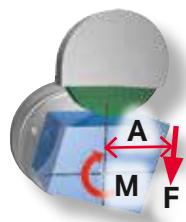
Tool type	Wz ø [mm]	Cutting speed [m/min]	Feed F [mm]	Depth of cut [mm]	Cutting width [mm]	Feed force F [N]		
						CK45	X5CrNi18-10	AlMg4.5Mn0.7
Ball end milling cutter	6	220	0.1 x 2	1.0	1.0	60		
		100	0.08 x 2	0.8	0.8		35	
		530	0.15 x 2	2.0	2.0			50
Ball end milling cutter	12	220	0.14 x 2	1.3	1.3	100		
		100	0.11 x 2	1.0	1.0		65	
		530	0.16 x 2	3.0	3.0			85

Mill turning



Tool type	Wz ø [mm]	Cutting speed [m/min]	Feed F [mm]	Depth of cut [mm]	Cutting width [mm]	Feed force F [N]		
						CK45	X5CrNi18-10	AlMg4.5Mn0.7
Angular milling cutter	40	130	0.12 x 6	5	1mm / 360°	435		
		85	0.12 x 6	5	1mm / 360°		390	
		500	0.12 x 6	5	1mm / 360°			193

Grinding



Tool type	Grinding capacity [kW]					Feed force F [N]		
						CK45	X5CrNi18-10	AlMg4.5Mn0.7
Ceramic grinding wheel	40					2200		
		75				4130		
CBN grinding wheel								

Overview

Rotary tables

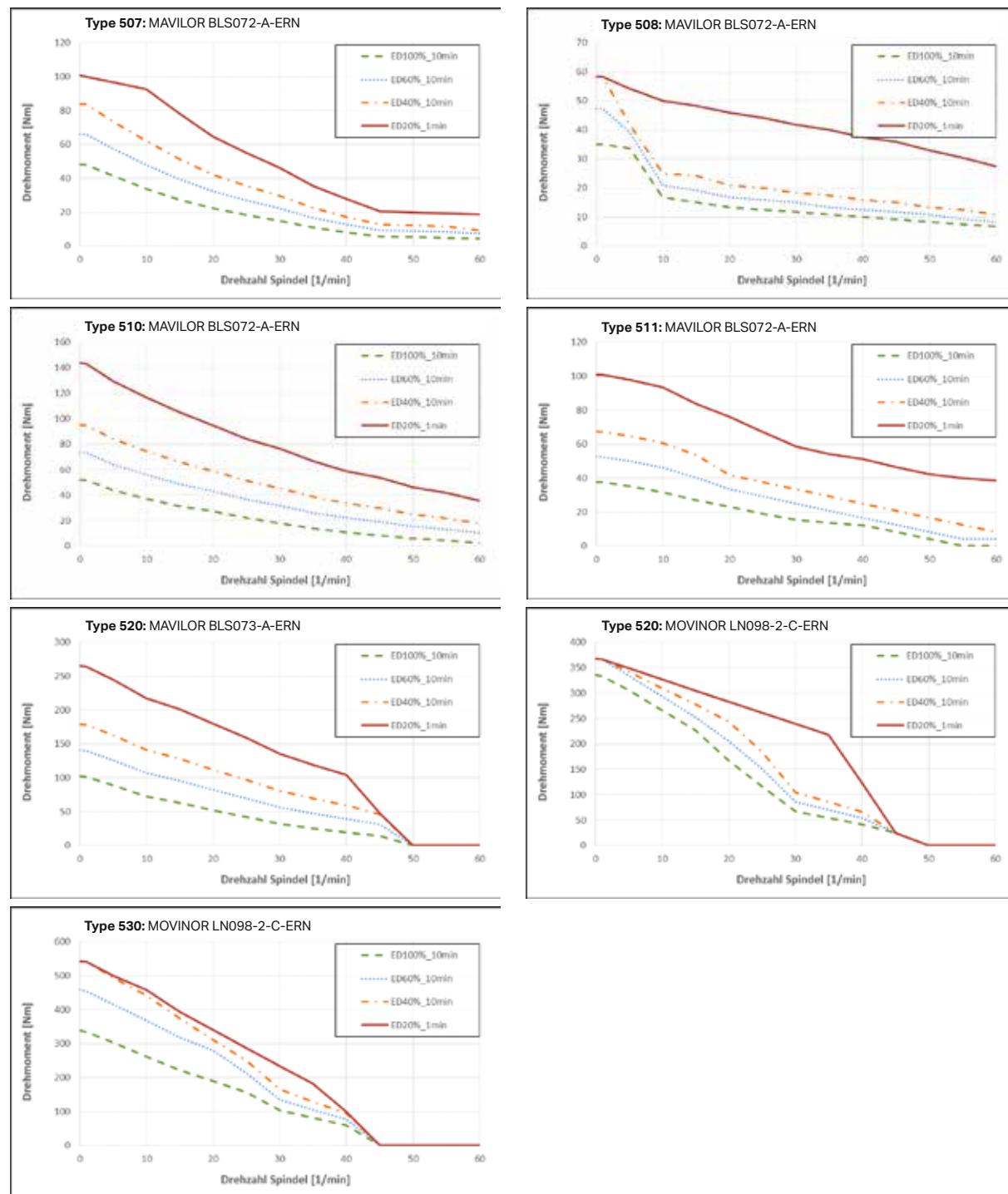
SPZ, DDF, WMS,
indexing accuracyAligning,
GLA, RSTMOT, KAB, CNC
Workpiece
clamping systemTechnology
& service

Permissible feed torque during machining under various conditions for **EA**-type rotary tables and dividing axes of **T**-type rotary tables



All diagram values with 20 % safety

For Siemens and Heidenhain CNCs



Overview

Rotary tables

Applications & Facts

SPZ, DDF, WMS, indexing accuracy

Aligning, GLA, RST

MOT, KAB, CNC

Workpiece clamping system

Technology & service

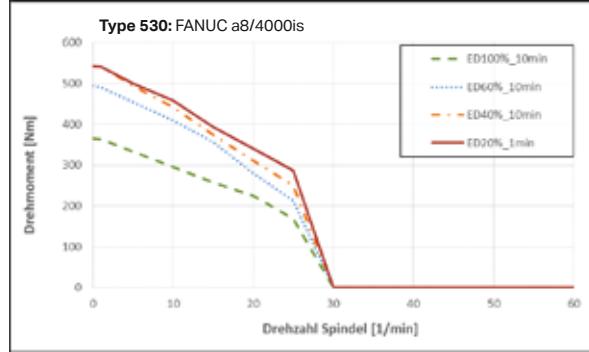
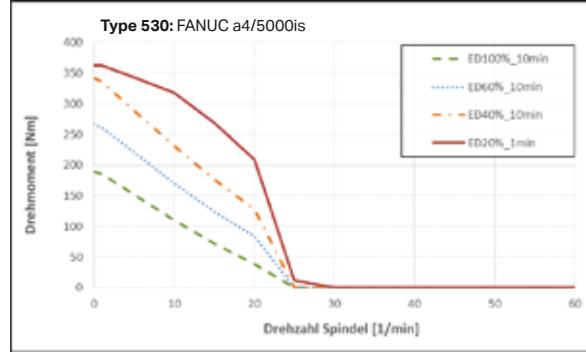
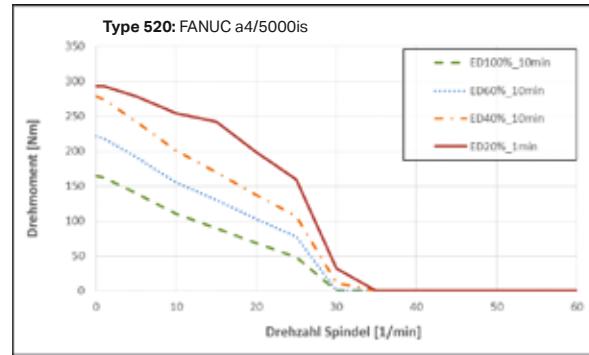
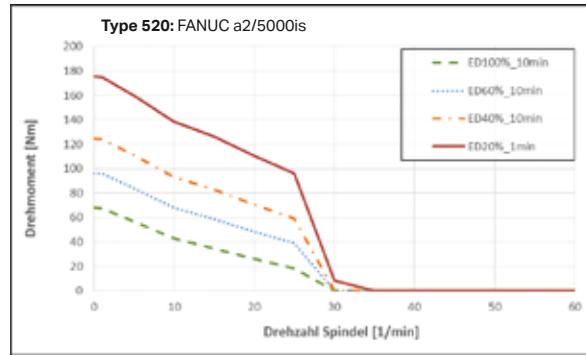
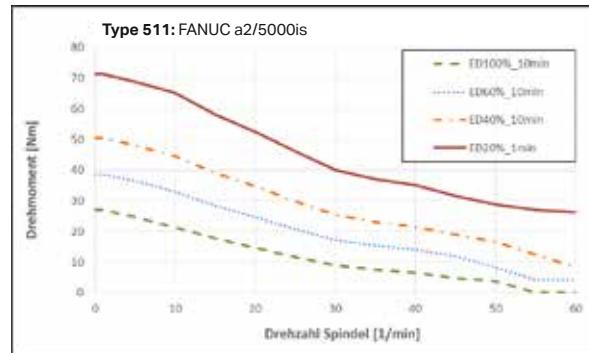
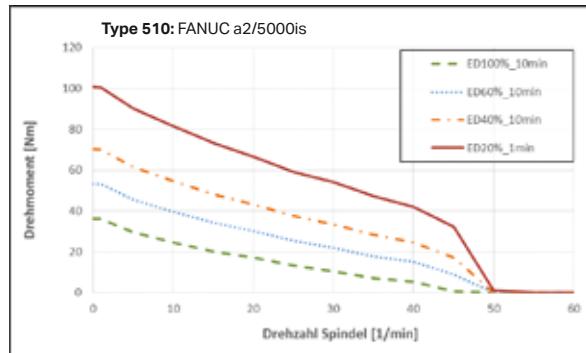
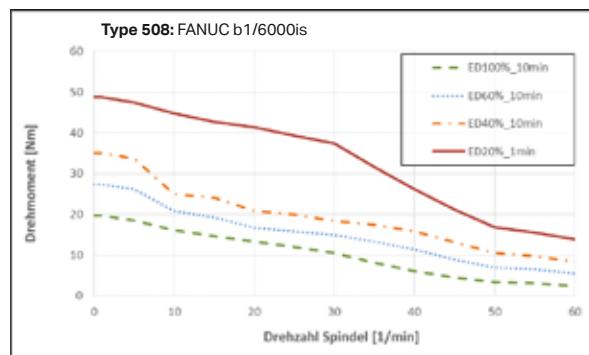
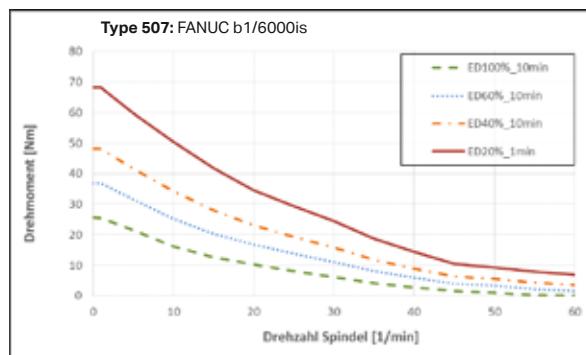
Reference values for duty cycle (ED)

- + Duty cycle 20 % → Normal rotary table work of milling / boring for positioning mode
- + Duty cycle 40 % → For milling / boring in intensive mixed operation (positioning / feed machining)
- + Duty cycle 60 % → Profile and depth grinding, temporary simultaneous machining, 5-axis
- + Duty cycle 80–100 % → Engraving, impeller machining, tool and die making

All diagram values with 20 % safety



For Fanuc CNC



Overview

Rotary tables

SPZ, DDF, WMS,
indexing accuracy

Aligning,
GLA, RST

MOT, KAB, CNC

Workpiece
clamping system

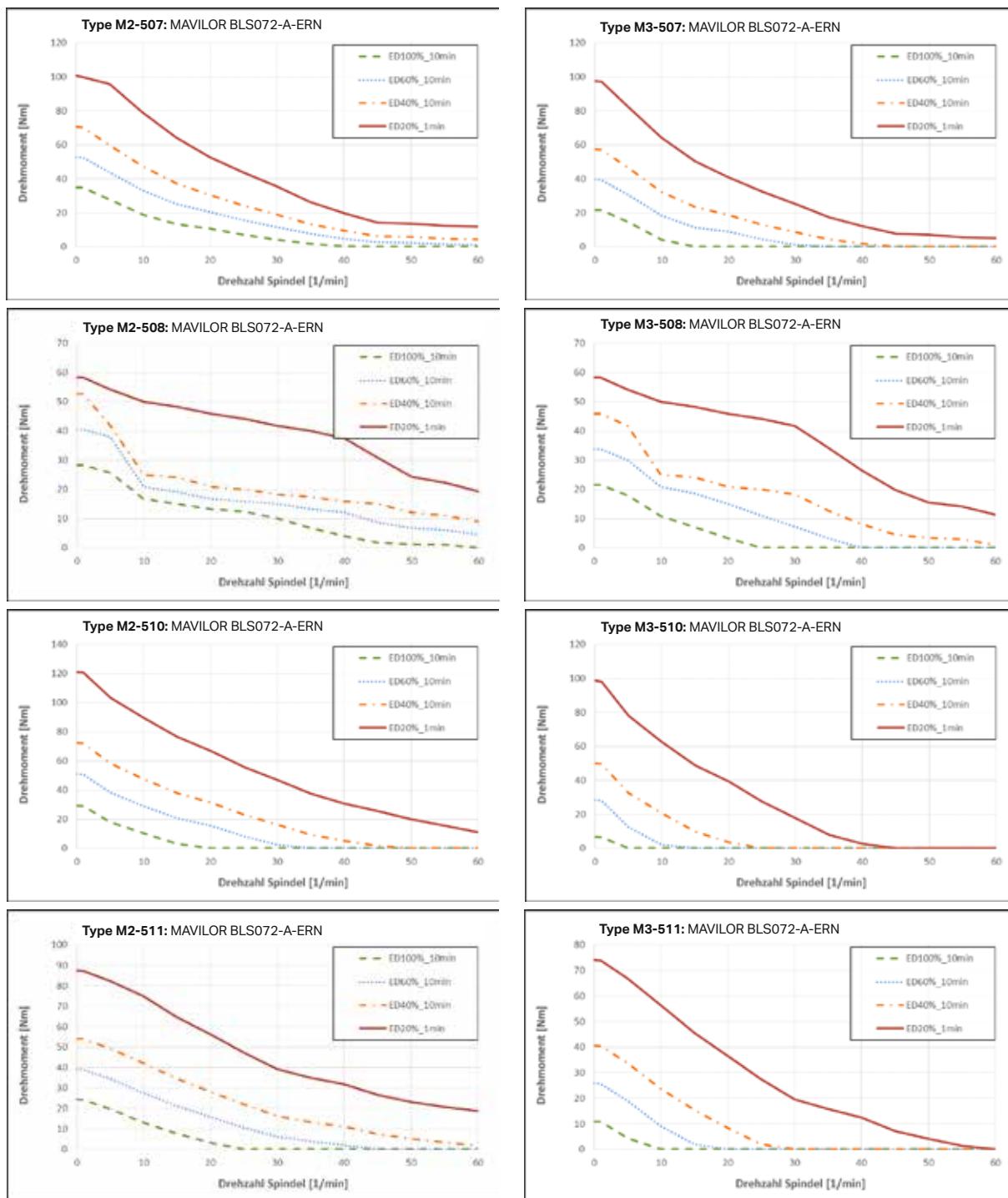
Technology
& service

Permissible feed torque during machining under various conditions for **M**-type rotary tables and dividing axes of **T2...3**-type rotary tables



All diagram values with 20 % safety

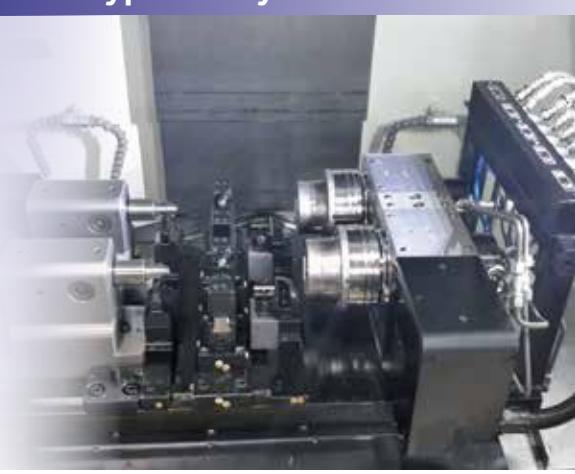
For Siemens and Heidenhain CNCs



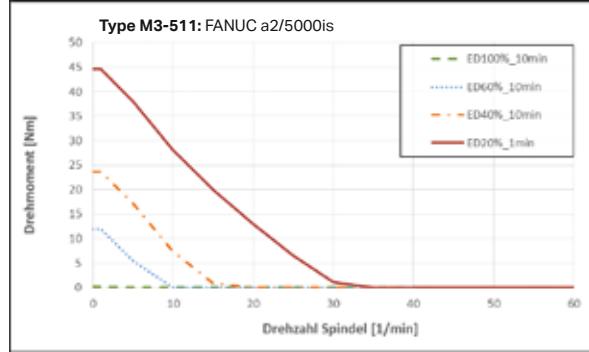
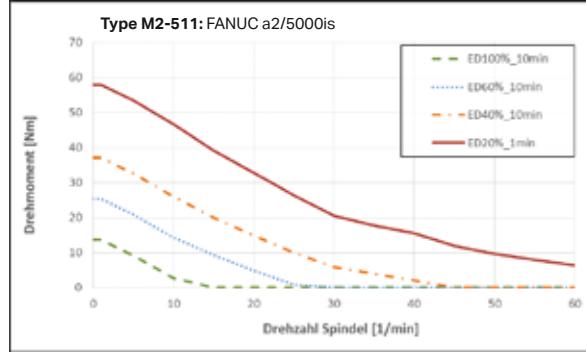
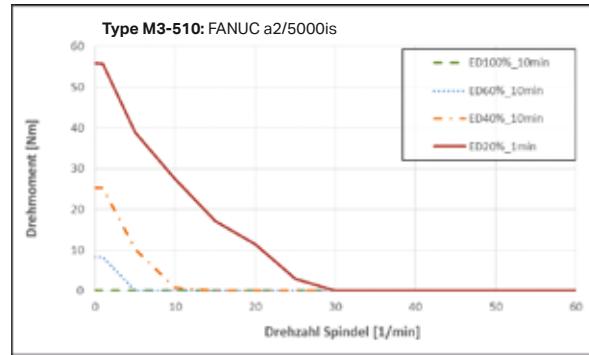
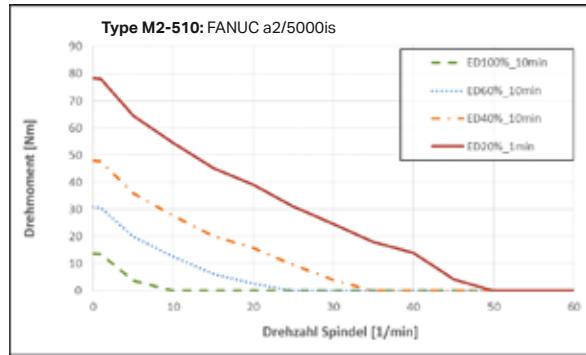
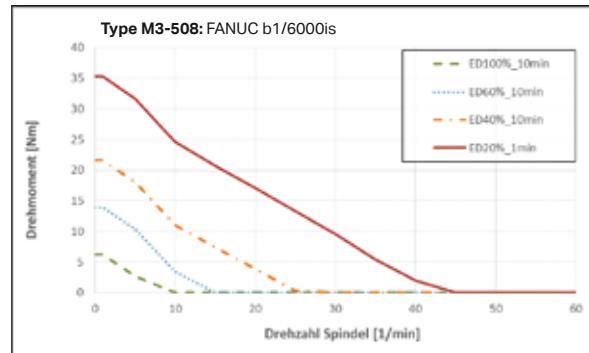
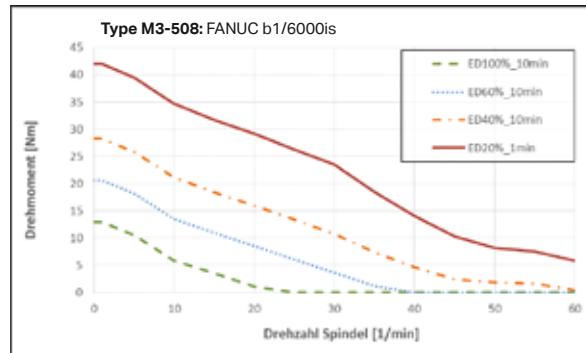
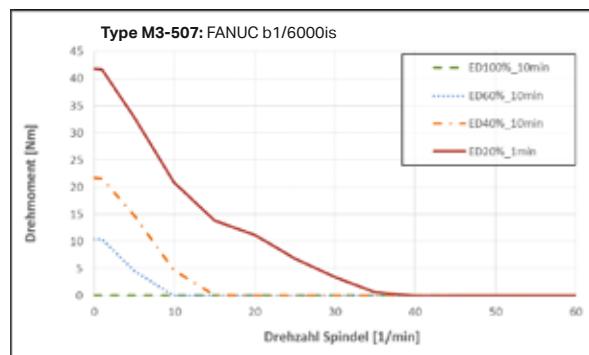
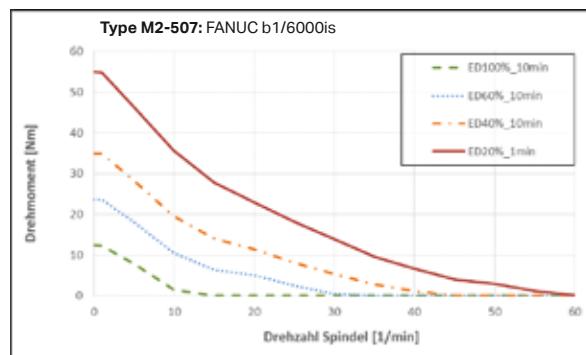
Reference values for duty cycle (ED)

- + Duty cycle 20 % → Normal rotary table work of milling / boring for positioning mode
- + Duty cycle 40 % → For milling / boring in intensive mixed operation (positioning / feed machining)
- + Duty cycle 60 % → Profile and depth grinding, temporary simultaneous machining, 5-axis
- + Duty cycle 80–100 % → Engraving, impeller machining, tool and die making

All diagram values with 20 % safety



For Fanuc CNC



Overview
Rotary tables

Applications & Facts
SPZ, DDF, WMS,
indexing accuracy

Aligning,
GLA, RST

MOT, KAB, CNC

Workpiece
clamping system

Technology & service

Information regarding questions about cycle time, PLC, commissioning and application (spec. simultaneous operation)

Cycle time calculation

pL has specific calculation tools at its disposal. Where necessary, we can provide assistance when calculating the piece part time. Based on your information, we will prepare a detailed cycle time calculation. See the table to the right for reference values for the clamping cycle.

	unclamp	clamp *
EA-507	60 ms	90 ms
EA-510	110 ms	140 ms
EA-520	120 ms	150 ms
EA-530	160 ms	260 ms

* can be eliminated with PLC optimization

PLC models

Spindle clamping is a pL LEHMANN exclusive and has great potential for savings. At www.lehmann-rotary-tables.com, you can find appropriate PLC templates.

Parameter lists*

A variety of parameter lists for various machines and three typical applications for each are available (Download).

Automatic parameter setting via CNC program.
For example, available for FANUC ROBODRILL.



Typ	Massenmoment Anklemmen	Kriterien (vert. Massenmoment nicht berücksichtigt)		
		L	W	D
Catalog (Max.Speed)		< 0.8kgm²	H	< 90kg < 230mm
Usual		< 1.2kgm²	H	< 120kg < 320mm
Max.Load		< 8kgm²	H	< 300kg < 450mm

* Tool for determining the permissible limit values for each rotary table; please contact us.

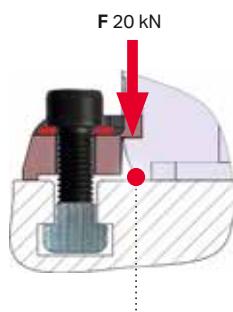
Pull-out torque

Permissible loads as a function of the individual rotary table mounting:

Reference values	Unit	507 / 508	510 / 511	520	530	Remarks
max. permissible depending on bearing	Nm	1,200	2,000	3,900	10,400	Pull-out load, spindle
EA and TF tilt with claw clamps	Nm	700	1,000	1,000	2,000	with max. tensile load on claw clamp, without noteworthy lifting of the housing ¹⁾
EA and TF tilt with base plate*	Nm	1,200	2,000	3,900	10,400	Securely bolted from below ²⁾ ; base plate is at least twice as wide as housing in the axis direction* and is bolted to machine table in optimal manner
*Base plate width	mm	226	254	284	360	Thickness: min. 40 mm (steel)

All data measured at face of spindle, across axis of rotation

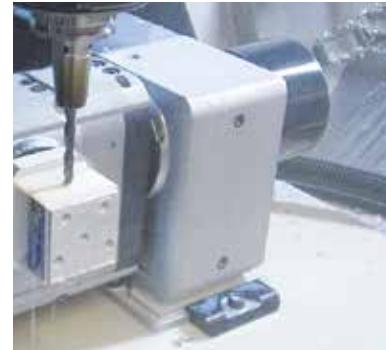
Bolt torque as specified in operating manual:



¹⁾ Lifting point on housing



²⁾ Individual base plate securely bolted to housing from below through all 4 holes



Properly tightened is a prerequisite for the best possible utilization of the permissible loading.

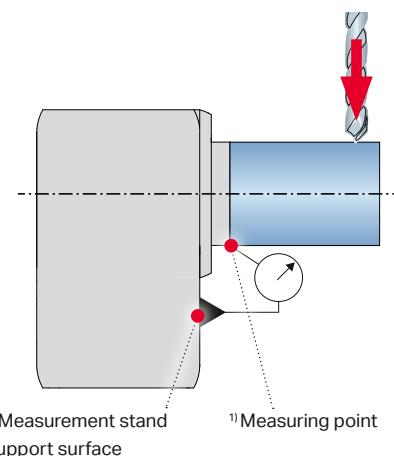
Specific reference values for individual applications and how to use them

Stiffness

Expected response (elasticity) to corresponding load:

Reference values	Unit	507 (508)	510 (511)	520	530	Remarks
Torsion, gear unit	Nm/ ^o	1,440 (1,000)	1,800 (1,800)	5,400	14,000	in conjunction with feed torque
Spindle, axial*	kN/mm	1,400	1,800	2,400	4,600	in conjunction with axial force
Spindle, deflection*	kNm/mm	21	26	52	135	in conjunction with pull-out torque

*All data measured at face of spindle¹⁾, relative to rotary table housing²⁾; spindle clamping active (inactive approx. -10%)



²⁾Measurement stand support surface

¹⁾Measuring point

Achievable workpiece accuracies in three dimensions

The reference values are based on detailed experiments where, among other things, such sample parts were produced on a DMU 65: with different T-type rotary tables (TF and T1), with and without WMS, with and without compensation. Depending on the machine's accuracy and the conditions listed below, the following workpiece accuracies are possible:

Reference values	Positioning	Simultaneous
Size	Cube 350 mm	Cube 150 mm
Weight	150 kg	34 kg
Accuracy ¹⁾	± 10 µm/100 mm	
Accuracy ²⁾	± 5 µm/100 mm	not possible
Accuracy WMS ¹⁾	± 3 µm/100 mm	
Accuracy WMS ²⁾	± 2 µm/100 mm	not possible

¹⁾ only ONE workpiece zero point

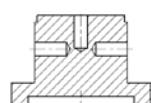
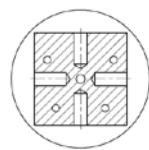
²⁾ several workpiece zero points

WMS = Angular position measuring system ± 2.5"; both axes



Conditions

1. Perfect alignment to machine axes
2. Highly accurate zero point
3. Best possible error compensation in all axes
4. Increased geometry accuracy of the rotary table (option: GEO.5xx-GEN)



Empirical values from intensive machining tests as an aid for proper selection of your T-type rotary table



Starting point

Machine:	DMC 1150V
Spindle output:	14.5 kW
Spindle torque:	110 Nm
Clamping:	8 clamping claws
Workpiece:	C45E, 130x130x130 mm



Test workpiece

Cutting data

No.	Tool	\varnothing mm	v _c Cutting speed m/min	n Speed min ⁻¹	f _z Feed mm/rev	z no. of teeth	v _f Feed speed mm/min
1	Angular milling cutter	40	260	2069	0.25	5	2578
2	End milling cutter	12	260	6898	0.18	4	4967
3	End milling cutter	12	180	4776	0.09	4	1719
4	Twist drill VHM	17	240	4495	0.35	1	1573



Optimal real-world cutting data or manufacturer's recommendation

General finding

Because of physical laws, the -90° tilt position (dividing axis horizontal) is always more stable than the 0° position (dividing axis vertical). For comparison with near-real-world conditions,

only the results for the **0° position** are listed in the following. Despite the absence of clamping in the counter bearing, the TAP-type rotary table achieved amazingly good results.

Comparison in detail

* The trials were conducted with the predecessor version fixX or varioX.

No.	radial depth of cut ap mm				axial depth of cut ae mm				Mat'l. removal rate Q cm ³ /min			
	T1-507510 TAP1	T1-507510 TOP1	T1-510520 TAP2	T1-510520 TOP2	T1-507510 TAP1	T1-507510 TOP1	T1-510520 TAP2	T1-510520 TOP2	T1-507510 TAP1	T1-507510 TOP1	T1-510520 TAP2	T1-510520 TOP2
1	2	2.5	2.5	3	32	32	32	32	166	207	207	248
2	20	20	20	20	3	3	3	3	298	298	298	298
3	5	5	5	5	10	10	10	10	86	86	86	86
									357	357	357	357

T1-507510 TAP1



T1-507510 TOP1 (fixX*)



T1-510520 TAP2



T1-510520 TOP2 (varioX*)



Conclusion

- + The limit is reached with tool no. 1, vibrations on the rotary table are quite audible. Reduction of cutting data required for long-term machining
- + Tool no. 3 is also at the limit for severe vibrations
- + The remaining machining is possible with major problems

Conclusion

- + Vibrations with tool no. 1 audible, but still in acceptable range
- + Tool no. 3 also generates some, but not critical, vibrations on the rotary table
- + Noticeably greater stability than TAP version, thanks to clamping of the counter bearing

Conclusion

- + Except for minor vibrations with tool no. 1, good machining performance was achieved
- + Except for tool no. 1, the machine and tools are the limiting factors. For this reason, the evaluation is identical to that for T1
- + Noticeable stability improvement compared to T1-507510 fixX and TAP1

Conclusion

- + With the available tools and this machine, the rotary table cannot be pushed to its performance limit. Only tool no. 1 is able to generate minor vibrations
- + Compared to TAP2, the stability improvement is not significant, but exists and is noticeable

Working productively and without problems from day 1: the correct commissioning is decisive



Investigations have shown that 70% of problem situations during the warranty period can be prevented through careful and professional commissioning. At the same time, it was

obvious that productivity could be increased significantly through use of application service. Make use of our services!

Basic commissioning

Goal

Connection of the rotary table and putting it into operation cleanly with the usual values

Activities:

- + Mechanical assembly of the rotary table on the machine table
- + Alignment of the rotary axes with respect to the main axes of the machine
- + Electrical connection of the rotary table on the machine
- + Basic parameterization using parameter lists from pL and usual values

Prerequisite

Machine must be prepared appropriately (servo, control cabinet cabling, connectors, PLC, CNC with readily available 4th and/or 5th axis/axes)

Commissioning of M-function

Goal

Linking of the FANUC 35i to the machine's CNC via M-function

Activities

- + Cabling from the FANUC 35i to the interface on the machine's CNC
- + Function test and brief training of the operator

Prerequisite

Machine and CNC must be prepared appropriately (readily available M-function)



Application support

Goal

Optimization of the rotary table settings for the customer's application through time optimization and/or accuracy improvement – Tuning

Activities

- + Calculation based on rotary table and workpiece (what is possible)
- + Check of the geometry, and correct as much as possible
- + Check whether the clamping control functions correctly and is not active before the intended position is actually reached
- + Check of dividing/indexing errors (0–90° relatively simple; possibly with portable measuring instrument)
- + Check of clamping/load placement (no overly eccentric loads, improper clamping), and of the machining sequence and the control response (smooth control)
- + Adjustment of gear backlash and pitch error
- + Optimization for specific workpiece, incl. clamping device and machining strategy (may require considerably more effort for simultaneous machining; invoiced separately)

Prerequisite

Programming system must be prepared appropriately (e.g. for simultaneous operation)

	Item no.	Data	Description
EA-type rotary tables	INB.1AX-APS	max. 10 h, 1-axis	Application support
	INB.1AX-CMS	basic, max. 8 h, 1-axis	Commissioning of integrated axes
	INB.1AX-SP	max. 7 h, 1 axis	Commissioning of servopack
T-type rota- ry tables	INB.2AX-APS	max. 20 h, 2-axes	Application support
	INB.2AX-CMS	basic, max. 13 h, 2-axes	Commissioning of integrated axes
	INB.2AX-SP	max. 14 h, 2 axes	Commissioning of servopack
with pL CNC	INB.MF	max. 8 h on-site	Commissioning of M-function

For more information please request our service brochure.

Overview

Rotary tables

Applications & Facts
SPZ, DDF, WMS,
indexing accuracy

Aligning,
GLA, RST

MOT, KAB, CNC

Workpiece
clamping system

Technology & service

Material elasticities and their effect on workpiece accuracy: Understand them correctly and know how to respond in real-world practice

Background

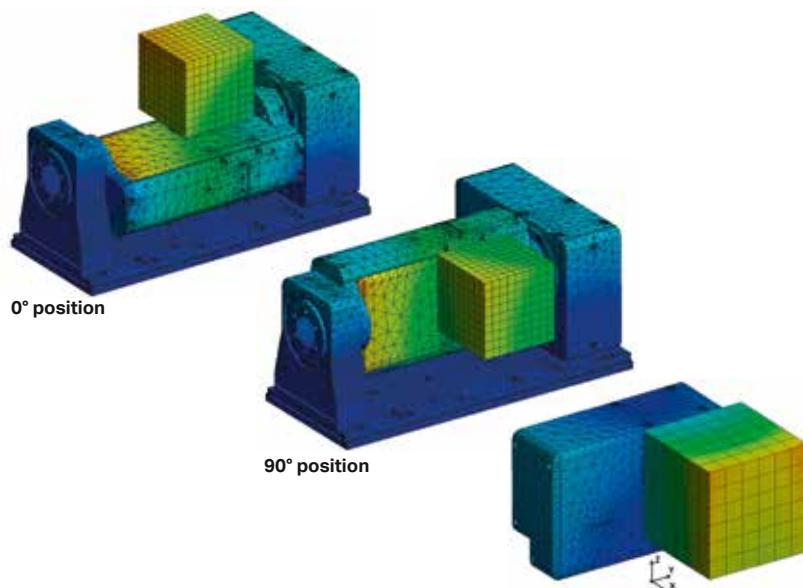
Every material has a certain elasticity. Depending on the orientation and load, these affect the accuracy of machining in different ways. The figures and data shown here provide information on the values to be expected.

Optimization options

If the static stiffness is insufficient, the following may help:

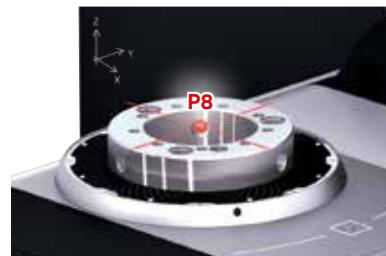
- + Error compensation in the axis direction affected
- + Use of lighter clamping means
- + Retrofitting a counter bearing in the case of a TF rotary table (TIP)
- + Changing the machining strategy

Results of static mechanical FEM analysis



Static mechanical analysis

Using FEM analyses, the compliance in P8 (see figure at right) was calculated in the respective configuration for all T-type rotary tables listed below. The deflections in the X- and Y-directions are usually negligible. The table below shows the deflection in the Z-direction. Depending on the workpiece weight, this information can be used to determine the approximate displacement.



T-type rotary tables in P8



EA- and M-type rotary tables in P8

Condition: Rotary table is mounted in the specified manner and both axes are clamped with 6 bar compressed air.

Compliance of EA- and M-type rotary tables in P8 in the Z-direction (approximate values)

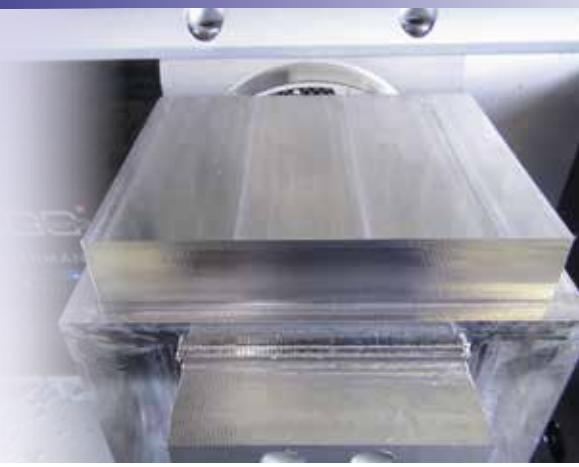
µm/kg	EA-507	EA-510	EA-520	EA-530
	-0.020	-0.015	-0.015	-0.006

Compliance of T-type rotary tables in P8 in the Z-direction (approximate values)

µm/kg	0°					90°				
	TIPc	TAPc	TAP	TOP	TGR	TIPc	TAPc	TAP	TOP	TGR
507510 / 508510	-0.110	-0.032	-0.031	-0.039		-0.142	-0.074	-0.104	-0.132	
510520 / 511520	-0.064	-0.024	-0.038	-0.041	-0.030	-0.076	-0.051	-0.082	-0.082	-0.069
520530	-0.046	-0.026	-0.046	-0.041	-0.041	-0.056	-0.055	-0.110	-0.097	-0.101

Vibrations, tool wear, surface quality and machining capacity optimizing

Every object has several natural frequencies (so-called eigenfrequencies) that depend on the object's shape, mass and material. If the machining frequency matches an eigenfrequency, e.g. that of a rotary table, the result is chattering or whistling noises. A vertical machining center has its first eigenfrequency in the range of about 100 Hz. It is important that the machining frequency does not match the eigenfrequency.



Dynamic analysis

The eigenfrequencies were determined using FEM modal analyses. The compliance frequency response curves at the right show the result of the harmonic analysis. The first 9 vibration modes and eigenfrequencies of all rotary tables listed below were determined. Experience has shown that mode 1 and mode 2 are the most important in actual practice. These values can be found in the table below.

Optimization options

If the frequency of the machining process starts to increase, change the following:

- + Tool speed
- + Number of teeth on tool
- + Machining strategy
- + Workpiece orientation

Important note: Form, weight and how the work pieces are clamped, as well as the used clamping parts can have a remarkable influence of the eigenfrequency.

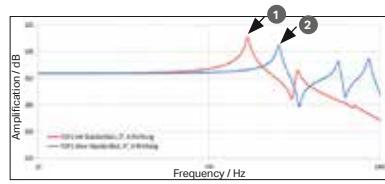
Condition: Rotary table is mounted in the specified manner and both axes are clamped with 6 bar compressed air.

Eigenfrequency of EA- and M-type rotary tables, mode 1 and 2 (approximate values)

Hz	Rotary table fastened by means of bolted connection from below, without consideration of the compliance of the intermediate plate								Rotary table fastened by means of clamping claws							
	without standard load				with standard load				without standard load				with standard load			
	507	510	520	530	507	510	520	530	507	510	520	530	507	510	520	530
Mode 1	859	760	669	602	352	229	160	201	780	716	627	564	339	222	155	194
Mode 2	913	797	681	634	371	249	163	211	857	731	638	596	364	245	160	203

With / without standard load

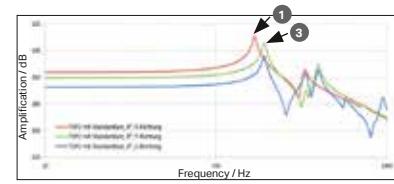
Example: T1-510520 TOP2,
excitation only in the X-direction



The above peak values 1-2 can be found in the table below. This example shows clearly how a change in the standard load can shift the eigenfrequencies. This shift also occurs during machining, of course, since the weight of the workpiece is changing.

Operating directions X, Y & Z

Example: T1-510520 TOP2



The lowest eigenfrequency is usually the most critical one. The above illustration shows clearly that this frequency is excited in the X-direction. For this reason, machining that could cause vibration should be performed in the Y- or Z-direction. The first two eigenfrequencies are given in the table below.

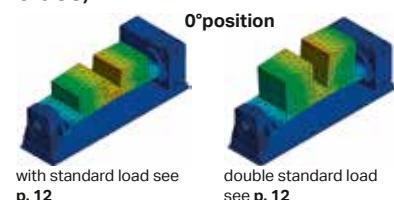
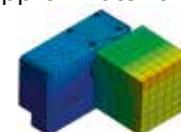
Example of machining frequency calculation

Angular milling cutter ø40 mm, number of teeth 4, speed 1900 rpm = $\frac{4 \times 1900}{60} = 127 Hz}$

The below illustrations shows Mode 1

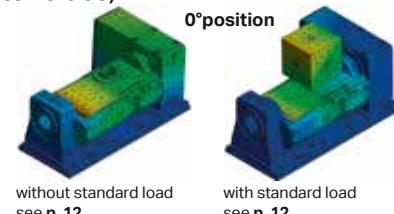
Eigenfrequency rotoFIX rotary tables mode 1 and 2 (approximate values)

Hz	without standard load								with standard load							
	TIPc				TAPc				TAP				TOP			
	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°
Mode 1	332	254	166	60	224	194	120	46	165	149	90	35				
Mode 2	575	364	306	179	325	249	176	108	193	157	104	62				



Eigenfrequency of T-type rotary tables, mode 1 and 2 (approximate values)

Hz	without standard load								with standard load							
	TIPc				TAPc				TAP				TOP			
	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°
Mode 1	180	185	270	283	230	231	241	245	129	134	187	201	181	190	183	195
Mode 2	206	215	261	296	233	249	294	321	232	247	132	143	162	187	158	175



Overview
Rotary tables

Applications & Facts
SPZ, DDF, WMS, indexing accuracy

Aligning, GLA, RST

MOT, KAB, CNC

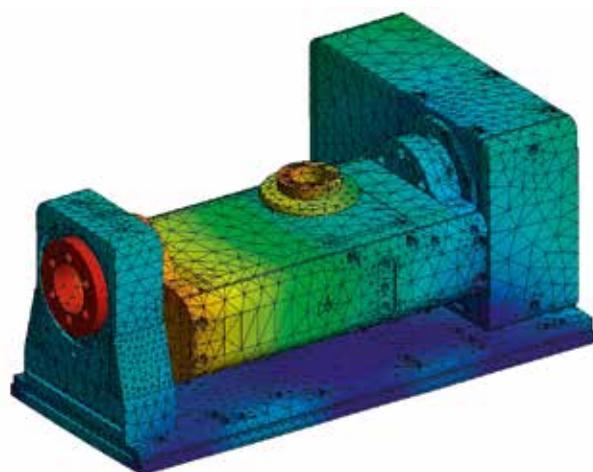
Workpiece clamping system

Technology & service

Thermal deformation from the process and operation

Basics

Heat is generated by friction and electrical losses. The more intense and the longer a motion lasts, the more the temperature rises. Depending on the particular heat sources (motor, gear unit, seals, etc.) the effects on dimensions differ greatly. At point P8 (see figure to the right), the relevant differences for the workpiece have been determined and are presented in the adjacent tables. The determination was made experimentally and with the aid of simulations.



Thermally induced deformations under steady-state conditions from the FEM simulation of the T1-510520 TOP2, duty cycle 20% in acc. with catalog, without coolant, deformation shown magnified 80x.

Influencing factors

The thermally induced deformations occur in response to external (coolant, ambient air, etc.) and internal (gear unit, bearings, motor, etc.) thermal factors. The following factors require particular attention:

- Operating mode of the table (duty cycle, performance, etc.)
- Idle time between the work cycles
- Optional cooling plate (on request) for removing internal heat from the gear unit, bearings, etc.
- Machine table (thickness, size, material) and how the rotary table is mounted on it

Approximate values for estimating the deformations

Approximate values for estimating the thermally induced deformations are listed in the tables on the following pages. All values apply to L-versions; on the R-version, it must be kept in mind that the signs for the directions of rotation are reversed.

Cooling plate

The cooling plate is an option for improving heat removal from the gear unit, bearings, etc. in demanding applications, e.g. simultaneous machining over an extended period of time (HSC, grinding, engraving). The values listed in the adjacent tables are based on the use of such cooling plates on EA-type rotary tables or tilting axes on T-type rotary tables.



Example of reading the tables

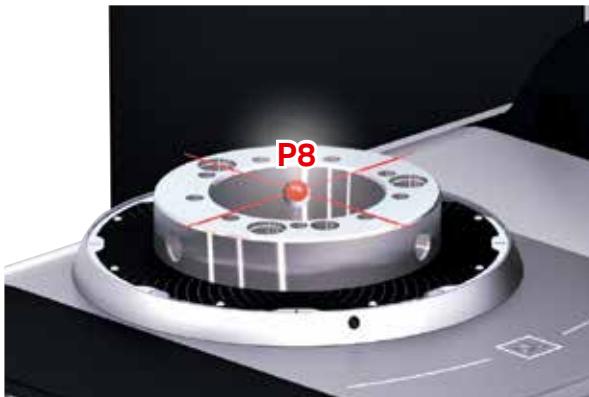
For dry machining with the T1-510520 TOP2, without a cooling plate, the table indicates a displacement at point P8 of 16 µm in the X-direction 60 s after a cold start. This displacement increases in the following minutes and then decreases later. Explanation for this behavior: When starting cold, there are very large temperature differences that cause corresponding displacements. The subsequent equalization of temperatures results in a reduction of the displacements. Tip: The Y-direction does not exhibit this behavior (see Table). It is thus better to perform precision machining shortly after a cold start in the Y-direction than in the X-direction.

The best cooling is not a substitute for the briefest possible workpiece clamping ...



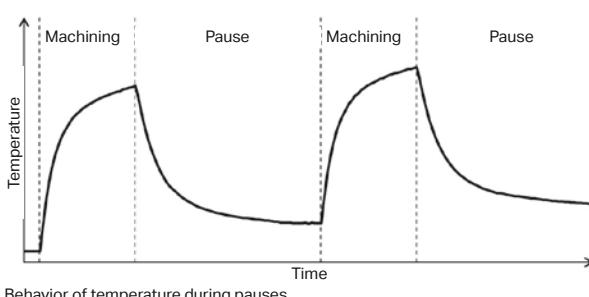
Measuring point P8

The displacements and rotations are evaluated at point P8, at the center of the spindle surface.



Important for precision machining

Maximum precision is achieved through use of coolant (KSS). Constant and uniform wetting of the rotary table is recommended. Interruptions in the use of coolant can result in accuracy fluctuations. The most effective heat removal is achieved with water-based coolants that are kept at a constant temperature and distributed uniformly. In addition, pauses and interruptions in machining between individual cycles should be avoided. Relevant cooling and thus deformations can occur even from pauses of one minute.



Overview

Rotary tables

Applications & Facts

SPZ, DDF, WMS, indexing

Aligning, GLA, RST

MOT, KAB, CNC

Workpiece clamping system

Technology & service



The following values in both tables apply with the rotary table mounted and resting over its entire surface on a solid machine table (steel/cast metal).

Dry machining

Time after start, duty cycle 20%	μm												arcsec																							
	X-displacement						Y-displacement						Z-displacement						U-rotation						V-rotation						W-rotation					
	60"	90"	180"	1 h	10 h	60"	90"	180"	1 h	10 h	60"	90"	180"	1 h	10 h	60"	90"	180"	1 h	10 h	60"	90"	180"	1 h	10 h	60"	90"	180"	1 h	10 h	60"	90"	180"	1 h	10 h	
EA-507, EA-508	2	2	3	21	35	0	0	0	-2	-4	2	2	4	20	37	-105	-121	-132	-53	-42	-3	-4	-6	-1	2	0	0	0	0	0	0					
EA-510, EA-511	2	2	3	23	38	0	0	0	-3	-5	2	3	6	27	50	-105	-121	-132	-53	-42	-4	-5	-8	-1	3	0	0	0	0	0	0					
EA-520	2	3	5	31	50	0	0	0	-4	-7	3	4	7	32	60	-88	-101	-111	-44	-35	-5	-6	-10	-2	4	0	0	0	0	0	0					
EA-530	3	4	5	35	57	0	0	0	-6	-10	3	5	8	40	74	-108	-125	-136	-55	-43	-6	-8	-12	-2	5	0	0	0	0	0	0					
TF-507510TIP1c	16	19	20	7	5	-1	-1	-3	-45	-70	9	13	20	54	83	-4	-5	-8	0	4	105	120	128	50	40	-135	-147	-141	-54	-47						
TF-510520TIP2c	16	19	20	7	5	-1	-2	-3	-52	-81	11	15	23	63	97	-5	-7	-11	-1	6	88	100	107	42	34	-135	-147	-141	-54	-47						
TF-520530TIP3c	57	66	68	26	18	-6	-8	-10	-71	-107	11	19	26	79	120	-6	-9	-13	-1	8	-108	-125	-136	-55	-43	-112	-123	-118	-45	-39						
T1-507510TAP1c	16	19	20	6	3	-3	-4	-7	-47	-70	8	10	15	47	75	-1	-2	-2	6	10	107	122	130	52	43	-149	-161	-156	-73	-67						
T1-510520TAP2c	16	19	20	6	3	-3	-5	-9	-54	-81	9	12	18	55	87	-1	-2	-3	8	13	89	102	109	44	36	-149	-161	-156	-73	-67						
T1-520530TAP3c	57	66	68	21	11	-6	-8	-10	-71	-107	9	15	21	69	107	-1	-3	-4	8	16	-108	-125	-136	-55	-43	-124	-135	-130	-61	-56						
T1-507510TAP1	16	19	20	6	3	-4	-6	-10	-65	-97	8	10	15	47	75	-1	-2	-2	6	10	107	122	130	52	43	-149	-161	-156	-73	-67						
T1-510520TAP2	16	19	20	6	3	-4	-7	-13	-77	-116	9	12	18	55	87	-1	-2	-3	8	13	89	102	109	44	36	-149	-161	-156	-73	-67						
T1-520530TAP3	57	66	68	21	11	-9	-12	-15	-105	-158	9	15	21	69	107	-1	-3	-4	8	16	-108	-125	-136	-55	-43	-124	-135	-130	-61	-56						
T1-510520TGR2	0	0	1	2	4	-4	-7	-13	-76	-114	14	18	27	83	132	-1	-2	-3	8	13	89	102	109	44	36	-149	-161	-156	-73	-67						
T1-520530TGR3	0	0	1	4	7	-8	-11	-14	-98	-148	14	23	31	104	163	-1	-3	-4	8	16	-108	-125	-136	-55	-43	-124	-135	-130	-61	-56						
EA-507, EA-508	2	2	3	16	20	0	-1	-1	-4	-5	2	2	4	14	17	-105	-122	-135	-64	-60	-3	-4	-6	-4	-4	0	0	-1	-1	-1						
EA-510, EA-511	2	2	3	17	21	0	-1	-2	-5	-5	2	3	6	19	23	-105	-122	-135	-64	-60	-4	-6	-8	-6	-5	0	-1	-1	-1	-2						
EA-520	2	3	4	23	28	-1	-1	-2	-7	-8	3	4	7	22	27	-88	-102	-112	-54	-50	-5	-7	-10	-7	-6	-1	-1	-1	-2	-2						
EA-530	3	3	5	27	33	-1	-2	-3	-11	-12	4	5	9	27	33	-108	-125	-139	-66	-62	-6	-8	-12	-8	-8	-1	-1	-1	-2	-3						
TF-507510TIP1c	16	18	19	7	6	-1	-1	-3	-36	-45	9	13	20	47	55	-4	-6	-9	-4	-4	105	120	130	61	57	-136	-148	-143	-57	-50						
TF-510520TIP2c	16	18	19	7	7	-1	-2	-3	-42	-52	11	15	23	55	64	-5	-8	-12	-6	-5	88	101	108	51	48	-136	-148	-143	-57	-50						
TF-520530TIP3c	56	64	66	23	23	-6	-6	-13	-61	-72	15	19	30	68	78	-6	-9	-14	-7	-7	-108	-125	-139	-66	-62	-113	-123	-119	-48	-42						
T1-507510TAP1c	16	18	19	7	6	-3	-4	-7	-38	-45	7	10	15	40	48	-1	-2	-2	2	2	104	119	127	54	50	-137	-149	-144	-61	-55						
T1-510520TAP2c	16	18	20	7	6	-3	-5	-8	-44	-52	8	11	17	47	55	-2	-2	-3	3	2	87	99	106	45	41	-137	-149	-144	-61	-55						
T1-520530TAP3c	56	64	68	23	22	-6	-6	-13	-61	-72	11	14	22	58	67	-2	-2	-4	3	3	-108	-125	-139	-66	-62	-114	-124	-120	-51	-46						
T1-507510TAP1	16	18	19	7	6	-4	-6	-10	-57	-67	7	10	15	40	48	-1	-2	-2	2	2	104	119	127	54	50	-137	-149	-144	-61	-55						
T1-510520TAP2	16	18	20	7	6	-5	-8	-12	-67	-79	8	11	17	47	55	-2	-2	-3	3	2	87	99	106	45	41	-137	-149	-144	-61	-55						
T1-520530TAP3	56	64	68	23	22	-9	-9	-19	-94	-111	11	14	22	58	67	-2	-2	-4	3	3	-108	-125	-139	-66	-62	-114	-124	-120	-51	-46						
T1-507510TOP1	16	18	19	7	6	-4	-6	-10	-57	-67	7	10	15	40	48	-1	-2	-2	2	2	104	119	127	54	50	-137	-149	-144	-61	-55						
T1-510520TOP2	16	18	20	7	6	-5	-8	-12	-67	-79	8	11	17	47	55	-2	-2	-3	3	2	87	99	106	45	41	-137	-149	-144	-61	-55						
T1-520530TOP3	56	64	68	23	22	-9	-9	-19	-94	-111	11	14	22	58	67	-2	-2	-4	3	3	-108	-125	-139	-66	-62	-114	-124	-120	-51	-46						
T1-507510TGR2	0	0	1	2	2	-5	-8	-12	-66	-78	8	11	17	47	55	-2	-2	-3	3	2	87	99	106	45	41	-137	-149	-144	-61	-55						
T1-520530TGR3	0	0	1	2	3	-9	-9	-18	-89	-105	11	14	22	58	67	-2	-2	-4	3	3	-108	-125	-139	-66	-62	-114	-124	-120	-51	-46						

* Coolant temperature equal to room temperature. Specific cooling capacity 420 W/K.



Wet machining (water-based coolant)

Values apply for coolant temperature equal to the ambient temperature

* Coolant temperature equal to room temperature. Specific cooling capacity 420 W/K.

Definition of the terms used in this catalog

1 Drive data

The term «drive data» always refers to rotational speed, acceleration as well as jerk limitation.

2 Gear unit

Gear unit loading ($M_{\text{gear max.}}$) [Nm]

...refers to the maximum permissible mechanical torque at a spindle rotational speed of 1min^{-1} .

She torque (M_{feed}) [Nm]

...refers to the available torque at a rotational speed of 1 min^{-1} , corresponding to the maximum permissible gear load. Depending on the motor used and/or duty cycle, however, it can be correspondingly lower.

Eccentric spindle load ($sl_{\text{eccentric}}$) [Nm]

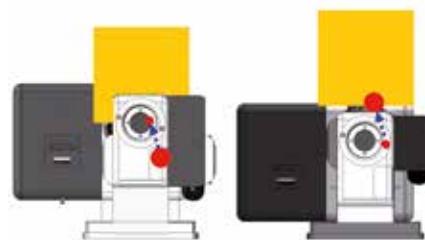
The excentric load catalog* corresponds

- to 0 Nm (standard load always centric) for EA and M rotary tables as well as dividing / indexing axes of T-type rotary tables
- For T-type rotary tables, to the maximum torque which affects the tilting axis in the form of the intrinsic load of the dividing / indexing axis as well as that of the cubic standard load. Please refer to the respective parameter list, catalog values.

For T-type rotary tables, the excentric load usual* is identical to the gear load with sls . For an EA rotary table, this torque is equal to the value resulting from the maximum excentric load when using a rotoFIX Alu with a standard load. Please refer to the respective parameter list for usual values.

The excentric load max load* corresponds to the maximum mechanical torque which can still be transmitted without any damage using the gear unit at a minimum rotational speed of approx. 10 min^{-1} . Please refer to the respective parameter list, max load values.

* For definitions, please refer to «Geometry / Integration» p. 125



Center of gravity shift without and with load.
The greater the red center of gravity, the greater is the gear unit loading in the tilting axis. The blue arrow shows the direction in which the center of gravity moves from «without load» to «with load».

pL standard spindle load ($sls = sl_{\text{standard}}$) pp. 106/107

[kg]

...refers to the pL spindle load defined as standard, derived from practice, covering approximately 90% of all applications. All drive data and parameter lists are designed for the cubic pL standard load. All masses moving within this volume (workpiece including device) and clamped coaxially to the rotary axis can be moved using the standard drive data. Eccentrically arranged standard pL spindle loads may require a reduction of the drive data.

Standard moment of inertia (J_{standard}) pp. 106/107

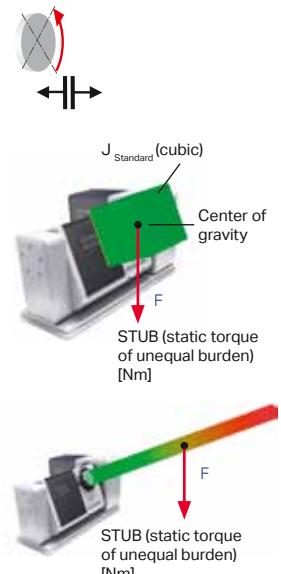
[kgm²]

...refers to the resulting moment of inertia due to the defined pL standard load and its shape, if the load is clamped coaxially to the rotary axis. The usual J ratio between load and motor is generally 1:1 or less (e.g. 0.5:1).

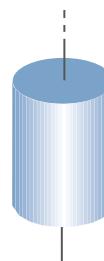
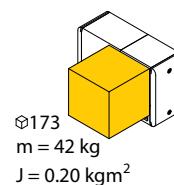
Max. perm. moment of inertia (J_{max})

[kgm²]

...corresponds to 10x the standard moment of inertia (J_{standard}). In most applications, this moment of inertia is not exceeded even with large workpieces. It should also be noted that the J ratio of 10:1 is NOT exceeded with any motorized model. Large J values can be moved, of course, but required appropriate adjustments (on request).



EA-510



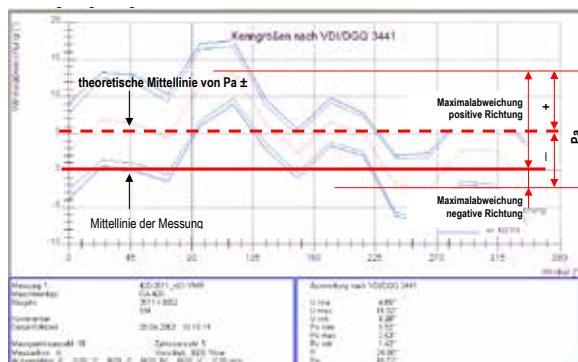
Function explanations, limit values and conditions minimize your risks

3 Gear accuracies

All accuracy data apply to an unloaded rotary table

Measuring process

- 5 warm-up cycles
- 5 measuring cycles
- 24 measuring points (15°)
- Acceleration 500°/s²
- Heidenhain ROD 800 measuring and test equipment with K15 coupling
- unloaded rotary table as individual module – room temperature approx. 22°C



Explanation of indexing accuracy $Pa \pm$:

Indexing accuracy ($Pa \pm$) [arc sec]

...refers to the sum of maximum positive and negative deviations between the ACTUAL position and the TARGET position of all angular positions over 360° measured in a direction of rotation, stated as \pm value.

This is equal to the position deviation Pa according to VDI/DGQ 3441, but accumulated (example: TG $\pm 15''$ corresponds to $Pa 30''$) and:

- without taking the reversal error into account
- without considering the radial and Axial run-out error of the spindle



Repeat accuracy (Ps with) [arc sec]

...refers to the maximum deviation within the results of the repeatedly measured angular positions, approached from the same side.

This corresponds to the position variation Ps max according to VDI/DGQ 3441, i.e.:

- without taking the reversal error into account

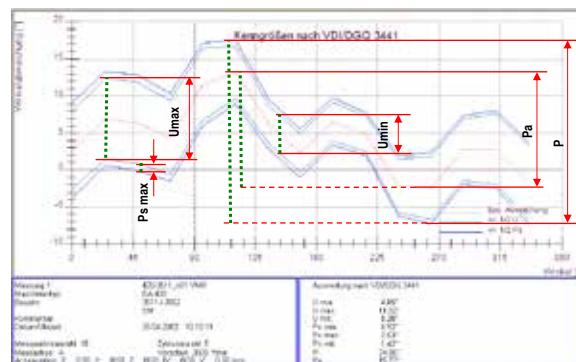


Positioning accuracy (P) [arc sec]

...refers to the maximum deviation between the TARGET position and the ACTUAL position when the direction of rotation changes.

This corresponds to the positioning uncertainty P according to VDI/DGQ, i.e.:

- without considering the radial and Axial run-out error of the spindle.



Explanation of various parameters according to VDI/DGQ 3441:

Reversal backlash (U gear) [arc sec]

...refers to the maximum mechanical backlash when the direction of rotation changes within a specific number of repeatedly measured angular positions.

- This does not correspond to a measurement parameter according to VDI/DGQ 3441
- The elasticity of all parts connected in the drive train is NOT taken into account

Reversal error (U average*) [arc sec]

...refers to the average reversal error, including elasticity, backlash and/or overshoot of all parts connected in the drive train when the direction of rotation changes within a specific number of repeatedly measured angular positions.

This corresponds to the reversal error U average according to VDI/DGQ 3441. The average value is calculated on the basis of all measured values.

* For compensation and definition of backlash, please refer to «Geometry / Integration, 6.4»

Overview

Rotary tables

Applications & Facts
SPZ, DDF, WMS,
indexing accuracy

Aligning,
GLA, RST

MOT, KAB, CNC

Workpiece
clamping system

Technology & service

Definition of the terms used in this catalog

4 Speed

Duty cycle (ED)

[%]

...refers to the duration of the movement per unit of time according to the DIN/VDE 0520 Standard. The pL rotary tables are designed for intermittent duty (positioning operation) S3 at ED 20%, but with a backlash time of 1 minute. If these conditions are exceeded by the respective application, the drive data must be reduced accordingly.

**DIN / VDE
0520
S3, ED 20%**

Rotational spindle speed (n_{sp})

[rpm]

...always refers to the maximum possible rotational speed of the spindle

- while complying with the duty cycle ED
- with the corresponding motor
- with the pL standard spindle load (cubic)

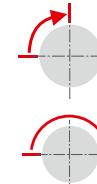


Cycle time 90° / 180° (t 90° / t 180°)

[sec]

...refers to the time required for the entire dividing / indexing operation for a 90°/180° movement

- Dividing/indexing operation STANDARD pL = unclamping and clamping monitored using a pressure sensor. During clamping, the clamped signal is sent as soon as a value of 100 bar has been reached. Thus, the machine can already move before the full clamping pressure is applied. If the full clamping pressure has not been reached after 2 sec, the clamped signal is canceled. Everything is controlled by the pL-iBox.
- Dividing/indexing operation OPTIMIZED = as standard, but the clamped signal is queried only prior to the feed movement. This operation requires adjustment of the respective machine PLC and is not included in the pL scope of delivery.

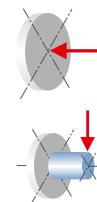


5 Spindle bearing

Axial force (F_{axial})

[N]

...refers to the maximum permissible axial load on the spindle. It includes the workpiece, devices, machining forces and other forces resulting from the rotational and tilting movement.



Pull-out torque (M_{tilt})

[Nm]

...refers to the maximum permissible tilting load on the spindle, measured from the spindle face. It includes the workpiece, devices, machining forces and torques resulting from the rotational and tilting movement.



Transport load (sl_{max})

[kg]

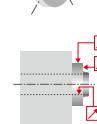
...refers to the total, maximum permissible load which is installed starting from the spindle nose and performs a rotational movement together with the spindle (device and workpiece). This load does not correspond to the pL standard spindle load.



Radial and axial run-out ($ro_{\text{con/ax}}$)

[mm]

...refers to the maximum deviation occurring in the axial (Axial run-out) or radial (Radial run-out) direction when measured over 360°. Measured in each case on the maximum possible diameter of the spindle nose.



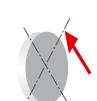
6 Clamping

Clamping torque (M_{clamp})

[Nm]

...refers to the maximum permissible torque load on the spindle nose during active clamping (6 bar air pressure). The pL clamping is extremely rigid. Depending on the load, there is also a setting behavior in addition to a usual elasticity. We distinguish between three phases when progressing from zero load to maximum load. The setting behavior results in an irreversible torsion after unloading as follows:

- Phase 1 «normal» (approx. 1/3 to 1/2 of the permissible clamping torque) up to approx. 0.0015 mm*
- Phase 2 «increased» (approx. 2/3 of the permissible clamping torque) up to approx. 0.005...0.01 mm*
- Phase 3 «maximum» (up to 100% of the permissible clamping torque) up to approx. 0.035 mm*



* For unilateral load, in relation to the spindle outside Ø of the respective rotary table. The indexing and repeat accuracy is not impaired by another positioning.

Function explanations, limit values and conditions minimize your risks

7 Leaktightness (acc. to EN 60529)

...refers to the leaktightness in terms of protection against accidental contact, protection against the ingress of foreign matter and protection against the ingress of water:

IP 65: Protection against accidental contact, no ingress of dust, protection against the ingress of water jets

IP 66: Same protection as IP 65, but protection against the ingress of powerful water jets

IP 67 (standard at pL): Same protection as IP 66, but protection against the ingress of water from temporary immersion

IP 68 (optional at pL): Same protection as IP 67, but protection against the ingress of water from permanent immersion



8 Geometry and integration

All accuracy data apply to an unloaded rotary table

Tilting drift (sd_{200})

...refers to the deviation of the perpendicularity between the dividing / indexing axis and the tilting axis over a specific tilting range. pL always measures three points: -90° (horizontal), -45° and 0° (vertical), always related to the position of the dividing/indexing axis and on a radius starting from the center of the tilting axis of 200 mm.

3D precision

offset 1: [mm]
0.013

pitch error: [°]
0.005

Offset values (offset)

...refer to the deviation from any theoretical NOMINAL values in order to ensure easier alignment of the rotary table on the machine and faster commissioning.

Pitch error (pe)

...refers to the effective NOMINAL-ACTUAL deviation over a specific rotation angle ("pitch error") for axis error compensation on the CNC machine. For rotary tables, this occurs typically with the movement of eccentrically arranged loads such as clamping yokes, tilting axes etc.

Backlash (bl)

...refers to the mechanical and electronic reversal error* (gear unit, angular position measuring system, positioning control...) for the loose backlash compensation on the CNC machine.

* For definition, see «Gear unit» p. 118

Parameter lists

To minimize commissioning time and make maximum use of the pL rotary table, you can find parameter lists for various controls at www.lehmann-rotary-tables.com. In the case of load-relevant parameters, we distinguish between...

FANUC	
a25000ls	
Fanuc	
a1000A	
LEHMANN	
RCN 12x12	
i 90:1	
Value	Value
Catalog: 19800	
Usual: 16200	
Max. load: 5400	

usual

...refers to the practice-oriented drive values for pL standard spindle loads, which should usually be set (pL recommendation) in order to still provide certain reserves to integrate deviations occurring in practice and to allow an easier control comparison. Normally, no warm-up is required here.

catalog

...refers to the maximum achievable catalog drive values for pL standard spindle loads, for which more demanding requirements are imposed both on the commissioning engineer and on the material in order to achieve these values. Depending on the respective application, they must be reduced (empirically). A warm-up cycle for the gear unit is frequently recommended here.

max load

...refers to the maximum achievable drive values for J max. and eccentric loading.

Overview

Rotary tables

Applications & Facts

SPZ, DDF, WMS, indexing accuracy

Aligning, GLA, RST

MOT, KAB, CNC

Workpiece clamping system

Technology & service

Present in over 20 countries: from sales consultation to the final service



Services from A to Z

Overview

Rotary tables

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Workpiece clamping system

Technology & service

Pre Sales

- + First class literature
- + Application drawings 2D
- + 3D models
- + Example of applications

Sales & Post Sales

- + Specified offers for each machine
- + Wide range of workpiece clamping systems
- + Standardized interfaces

Commissioning

- + Parameter lists
- + Machine-specific commissioning instructions
- + User manual
- + Partner kit
- + On-site support

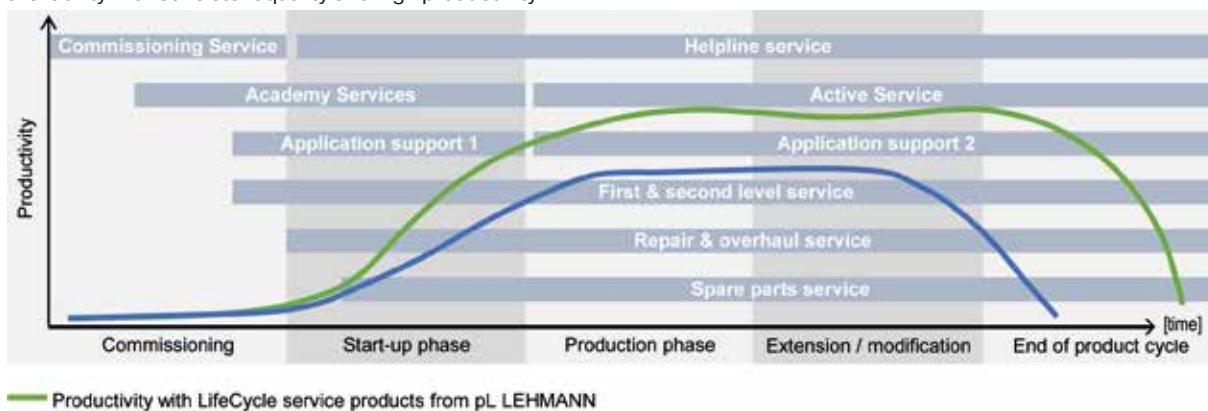
After Sales

- + Service points in 25 countries PTSE
- + Spare parts worldwide by eShop
- + In-field support by flying doctors



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A look in our production: High manufacturing depth provides for flexibility and quality

Production



Pallet pool for unmanned production



High precision circular and flat grinding



Material flow



Assembly area with Kanban System



Rational equipping of spare parts packages

Overview

Rotary tables

Applications & Facts

SPZ, DDF, WMS, indexing accuracy

Aligning, GLA, RST

MOT, KAB, CNC

Workpiece clamping system

Technology & service

Quality control



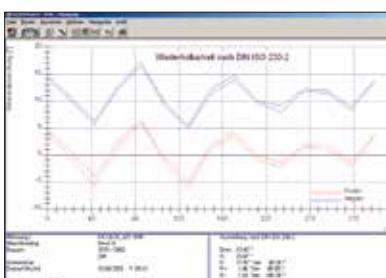
Measuring a housing on a 3D measuring unit



Measuring a T-type rotary table with a cube



Measuring the indexing accuracy - fully automatically



Recording the indexing accuracy according to ISO 230-2 and VDI/DGQ 3441

Interested? Contact us or visit our website at
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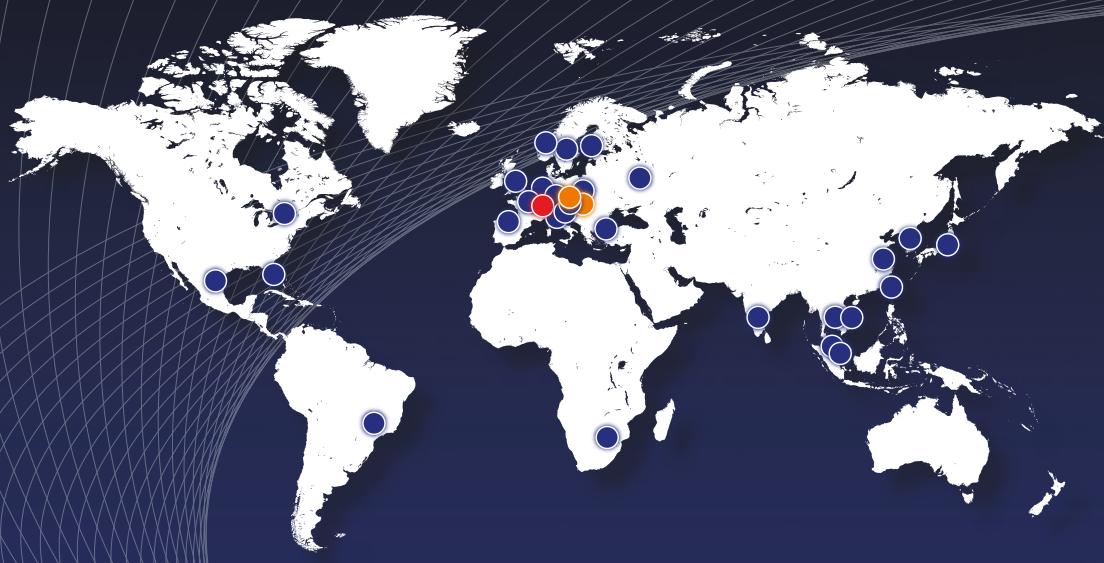
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○ vacant

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