CNC Rotary Tables – Edition 4

NEW

Bluetooth®

Main catalog

1/2020 | EN

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

LEHMANN®

Swiss Rotary Table Technology

Since 1974

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 of the Series 500
2016 Expansion of factory building
2017 Introduction of Series 600
2019 Introduction of AM-LOCK and of the 900 DD Series up to 5,450 rpm

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.

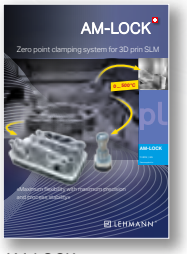
* Sales and service partners trained and equipped by pL (VAR – value added resellers or VAP – value added partners)

Selection Guides

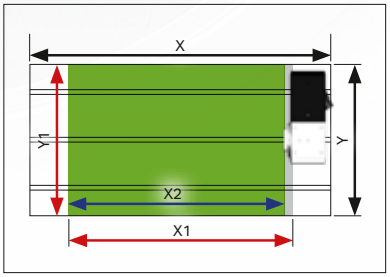
pL LEHMANN offers detailed Selection Guides for over 30 machine brands (see **page 6+7**)

Additional pL products

DD Series



AM-LOCK



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

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

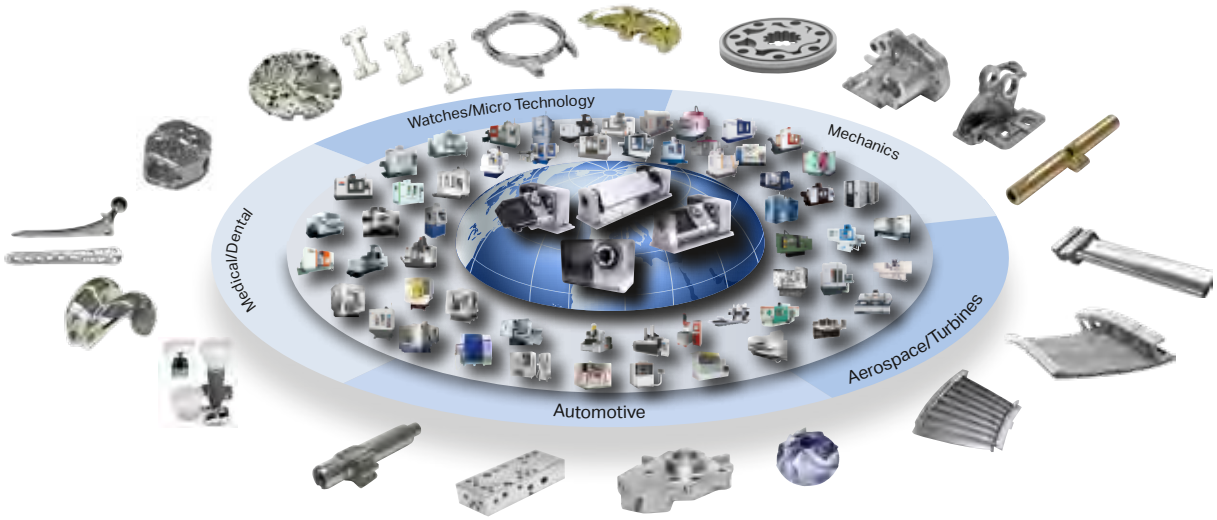

Automotive


Medical/Dental


Watches/
Micro Technology


Aerospace/Turbines


Mechanics



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, Mazatrol ...), for new machines as well as for retrofits

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

1

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

2

4th axis with swivel yoke, on base plate

3

4th axis with swivel yoke, directly on machine table

4

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

5

4th axis, 3-spindle, Y-mounting (crosswise)

6

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

7

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

8

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

9

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

Up to 210 rpm
up to 0.21 sec / 90°

High speed GD

Extended travel in
Z- and X-direction

More space

High spindle load,
heavy-duty bearing

Heavy duty

E-Series

EA-50x light only 12 kg

Selection of suitable machines

Vertical machining centers
(Selection Guides available)

+ Almac
+ AMS
+ BFW
+ Brother Speedio
+ Cincinnati
+ DMG MORI
+ Doosan
+ EMCO
+ Fanuc Robodrill
+ Fehlmann
+ GF Mikron
+ Haas CNC
+ Hardinge Bridgeport
+ Hasegawa
+ Hurco
+ Hwacheon
+ Hyundai/Wia
+ Kaast
+ Komatech
+ Map
+ MAPLE
+ MAS
+ Mazak
+ MTRent
+ Okuma
+ PreMill
+ Priminer
+ Quaser
+ Schaublin
+ Takumi
+ Tongtai
+ Toyoda
+ Wele
+ YCM

DD Series NEW

Request our special catalog

High speed DD

up to 5'450 rpm

Adaptability

Multifunctional
spindle HSK

Precision

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

Pneum. clamping
up to 7,000 Nm

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

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

M-Series

Connectivity

Wireless monitoring,
for operation & service

No adjust

Load change without
parameter adjustment

Less cost

No cooling system,
no hydraulics

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

EA ➔ TF TIP

EA ➔ EA with rotoFIX

EA ➔ EA with longFLEX

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

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 at any time
+ 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

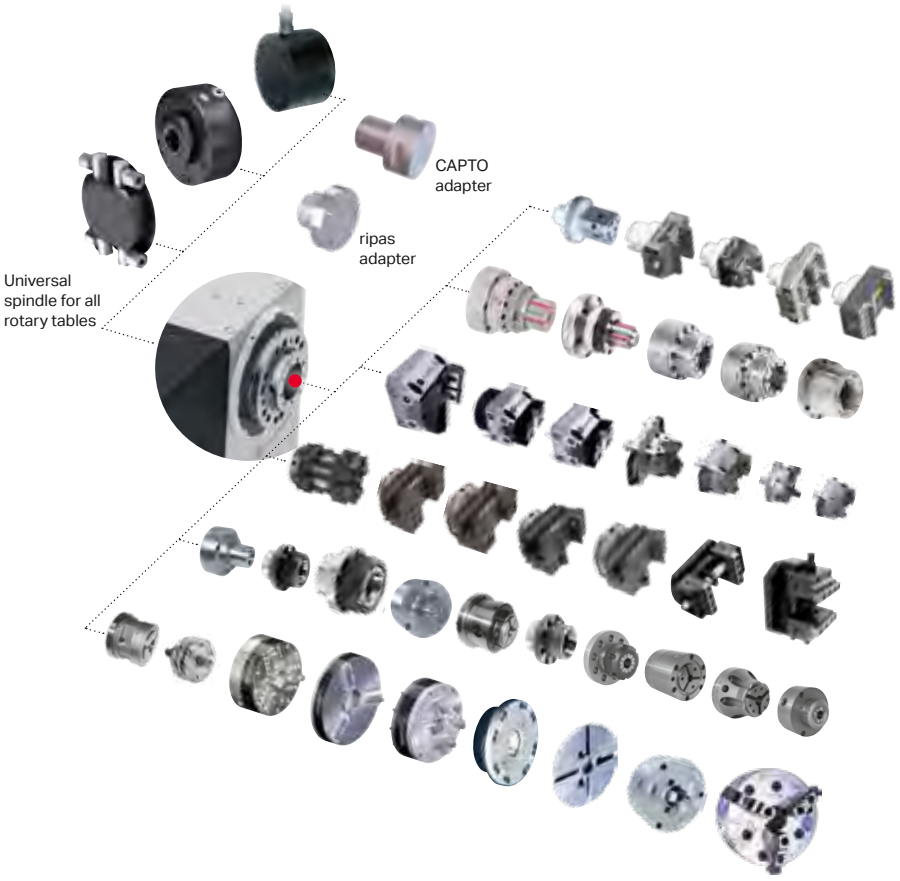
T1 TAP ➔ T1 TOP

Extremely wide assortment for workpiece clamping. Standardized interface in front and rear: maximum universality

For all variants and options, see from **p. 111**

Spindle accessories in rear (see from **p. 50**)

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



Spindle accessories in front (see from **p. 111**)

unique

amf
EROWA
EVARD PRECISION S.A.
ftool by erowa
GRESSEL Spanntechnik
HAINBUCH
LANG TECHNIK einfach. zukunft. greifen.
NIEDERHAUSER SPANNTECHNIK UND SYSTEME
PAROTEC
PANHACLAMP
reinmechanic feinmechanische Lösungen
ripas
ROEMHELD HILMA ▪ STARK
ROHM driven by technology
SCHUNK
SwissChuck Precision Workholding
system 3R
TG COLIN
Vischer & Bolli
YERLY

Tailstock and counter bearing (**pp. 69–71**)

ripas zero point clamping system (**pp. 112/113**)

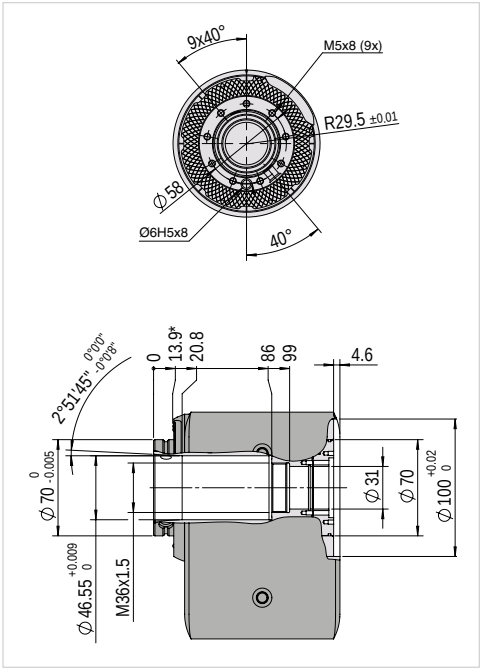
EA-507 with ripas auto and ripas adapter

CAPTO clamping NEW

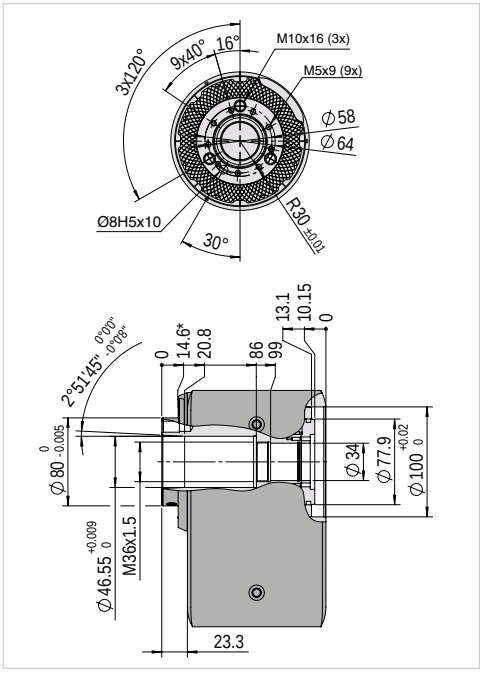
EA-507 with CAPTO retrofit kit (see **p. 113**)

All spindle connection dimensions front and back for building your fixture. Applies to all versions, whether EA-, M- or T-type rotary table

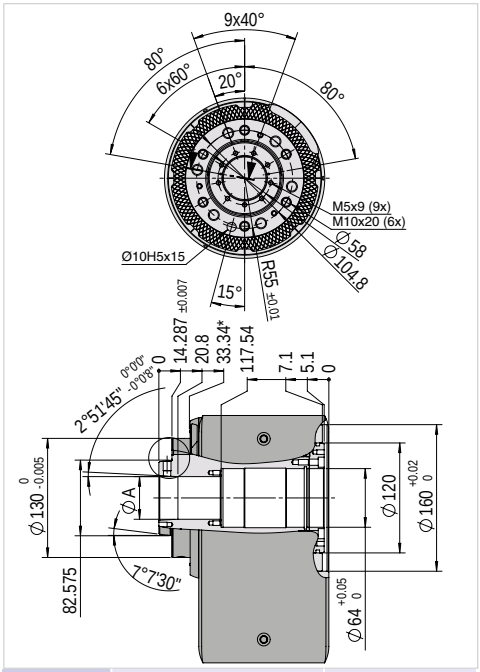
Module size
507 HSK-A63/ø70



Module size
510 HSK-A63/ø80

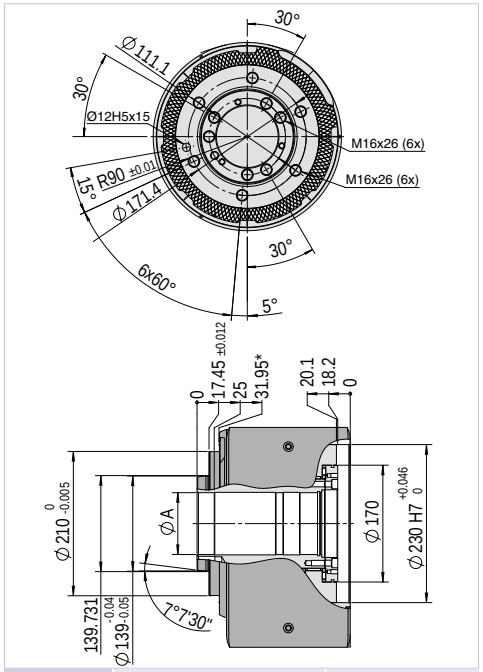


Module size
520 HSK-A63/KK5



Dimension A **Standard:** Ø46.55 +0.009/0 **SPI.520-d64:** Ø64

Module size
530 ø90/KK8



Dimension A **Standard:** Ø90 +0.015/0 **SPI.530-d102:** Ø102

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 = 21.75
(see **pp. 26–47**)

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

TF-510520 – Milling/boring – Mechanics

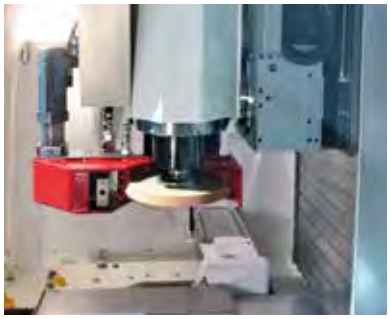
T1-520520 – Milling/boring – Mechanics

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

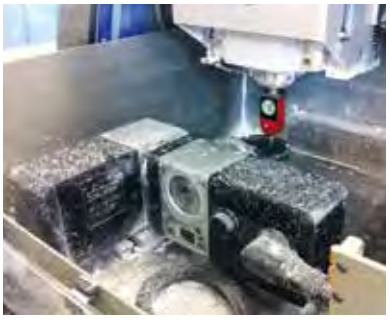
TF-507510 – Milling/boring – Watches/ Micro Technology

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

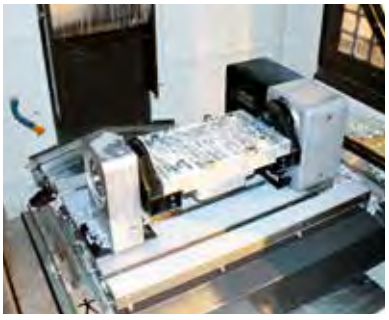
M2-510 – Milling/boring – Automotive

EA-510 – Milling/boring – Automotive



TF-507507 – Milling/boring – Dental Technology

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

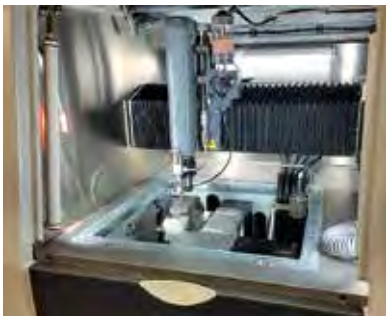


EA-510 rotoFIX – Milling/boring – Mechanics

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

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

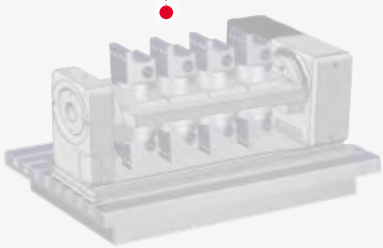
+ Simultaneous or positioning mode
+ For CNC control systems from Siemens, Fanuc, Heidenhain, Brother, Haas, Mitsubishi, Hurco, Mazak
+ Can be used worldwide in pure positioning mode without restrictions due to the export control

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



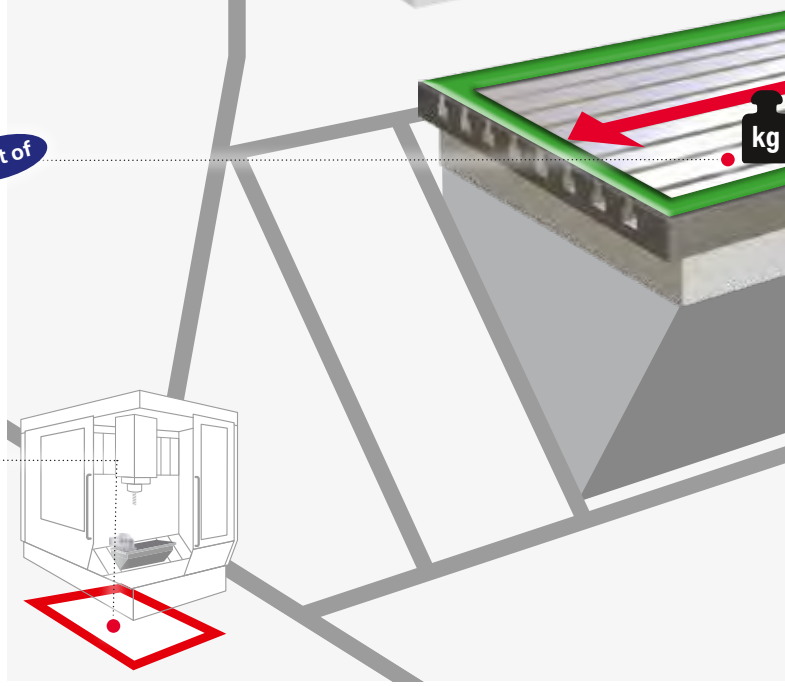
OEM USE | GD DD 5

Table load

+257 %

best of

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



OEM USE | GD DD 5

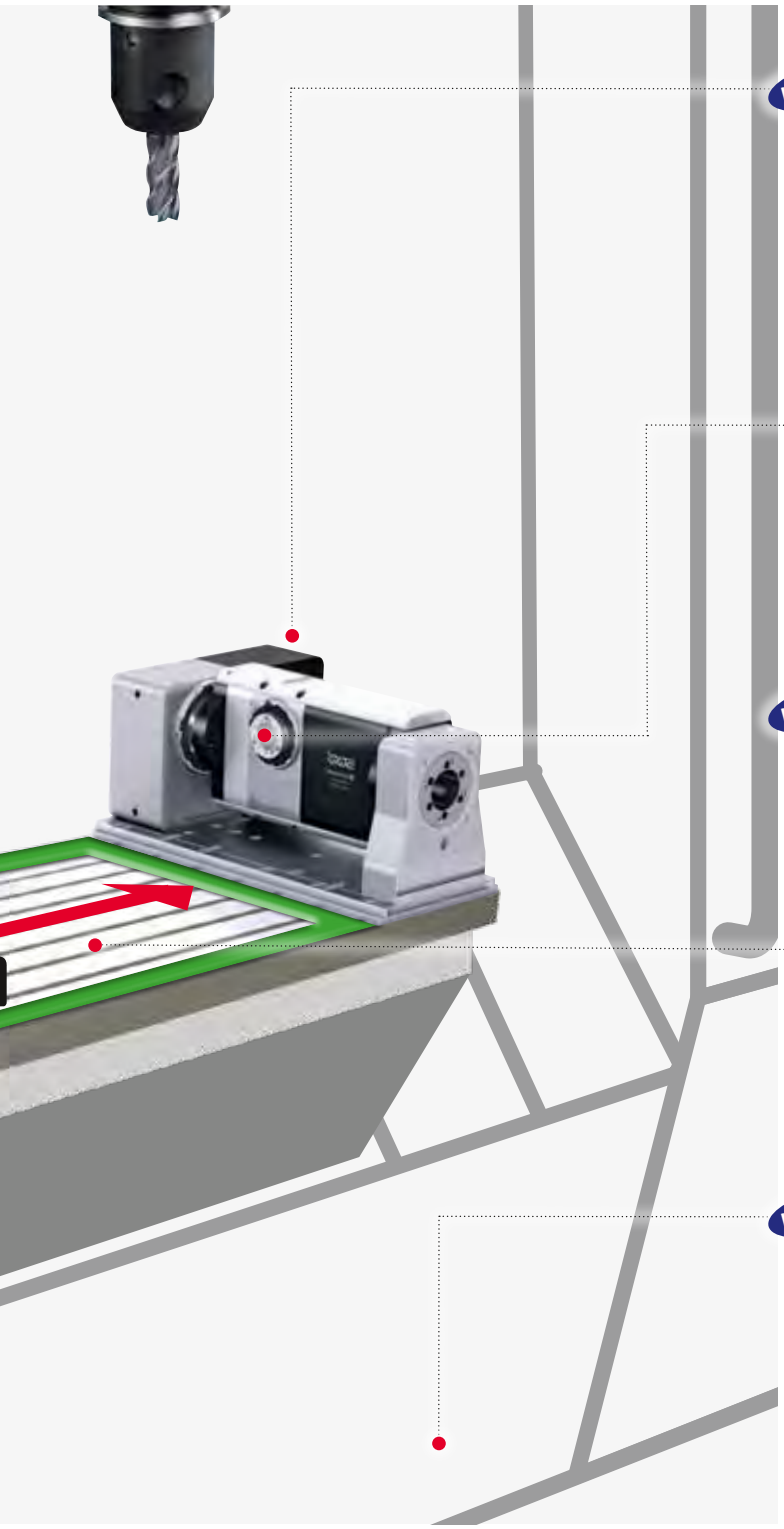
Machine floor space

– 40 %

+ 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. 104/105**



best of

OEM USE | GD DD 5

Low projecting edge – 52 %

+ Very good accessibility across the C axis (from the top)
+ Cutting tools preloaded very quickly: Maximum service life, best milling performance and surface quality

OEM USE | GD DD 5

C axis perm. load – 12%

+ Particularly suited for medium to small parts – the corresponding 5-axis machine is available for large parts

best of

OEM USE | GD DD 5

Work table surface +94 %

+ 2 machines in one: as 3-axis machine for large workpieces, for instance, and parallel to this a genuine 5-axis for the machining of impellers, for example
+ Particularly interesting for the flexible contract manufacturer
+ Work space for vise or chuck work (pre or post-processing of the 6th side)

best of

OEM USE | GD DD 5

Floor load – 30 %

+ Can also be installed in more lightweight production halls without additional foundations
+ Lower risk when used in multi-story buildings
+ Lower transport costs

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

OEM USE | 5 GD DD

Pull-out torque

+ 147 % + 233 %

best of

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

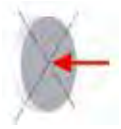
OEM USE | 5 GD DD

Axial force

+ 324 % not available

best of

+ Withstands very high compressive and tensile forces

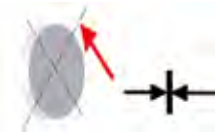


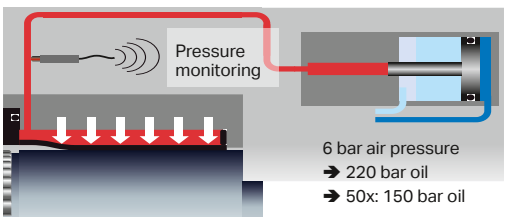
OEM USE | 5 GD DD

Clamping torque

+ 115 % + 236 %

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



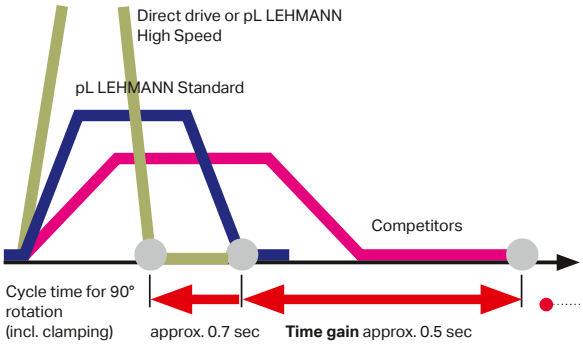


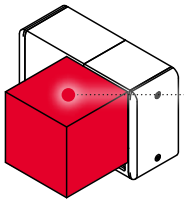
Fully integrated BRAKY pressure intensifier

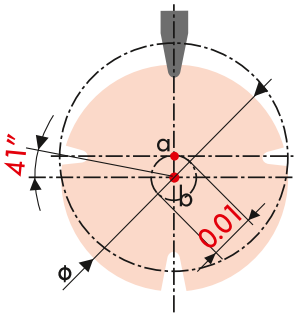
PGD* Advantages as Compared to Direct Drives (DD) at a glance

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. 18**







OEM USE | 5 GD DD

Rotational speed + 78 % – 11 %

best of

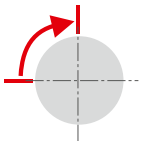
\+ High rotational speed

OEM USE | 5 GD DD

Cycle time – 67 % + 4 %

best of

\+ Short cycle times (with clamping)

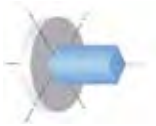


OEM USE | 5 GD DD

Spindle load + 123 % + 427 %

best of

\+ Large and heavy loads despite its compact external dimensions



OEM USE | 5 GD DD

Radial/axial run-out – 34% – 31 %

best of

\+ Low radial and axial run-out for optimum workpiece precision

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

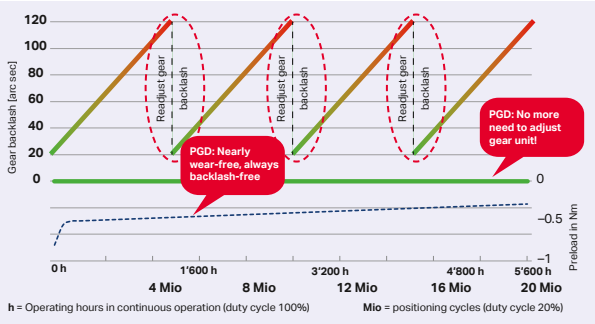
PGD (Preloaded Gear Drive)

+ 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

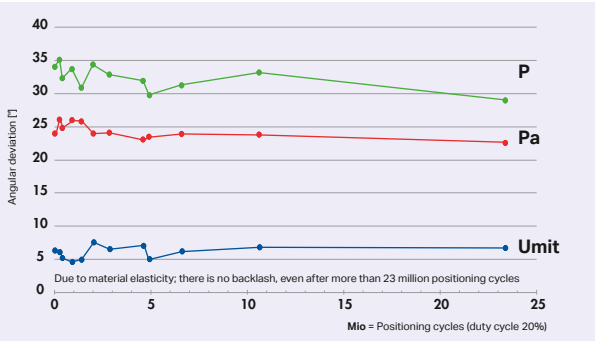
** Possible torque per characteristic curve for 100% duty cycle at 1 rpm; please refer to **p. 92 – 95**

Maintenance free gear unit – permanently preloaded

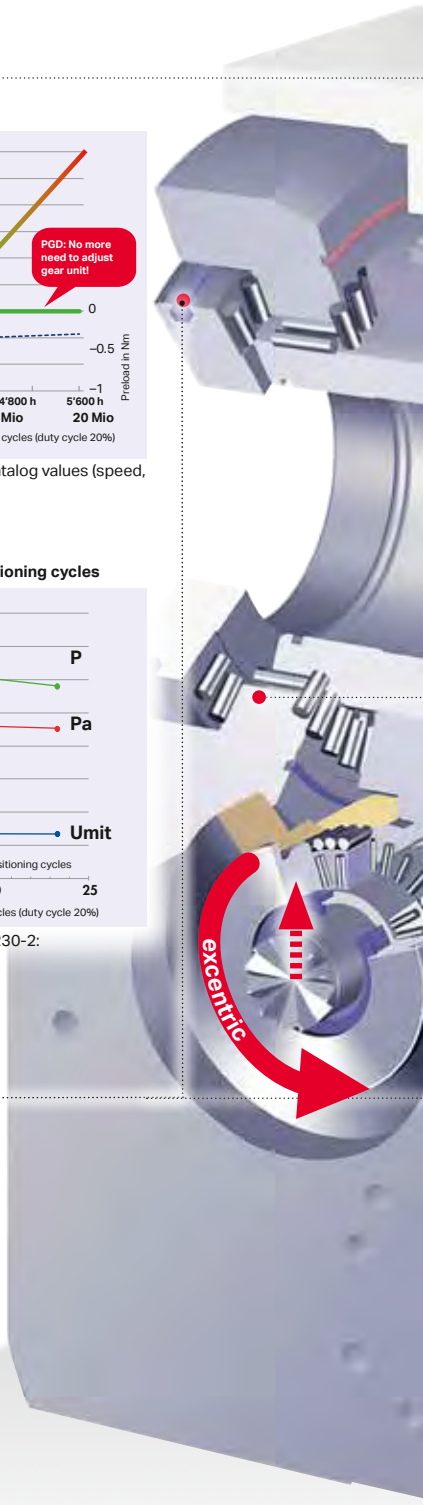


All values based on internal testing using standard load and catalog values (speed, cycle time). Duty cycle as defined on **p. 108**

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

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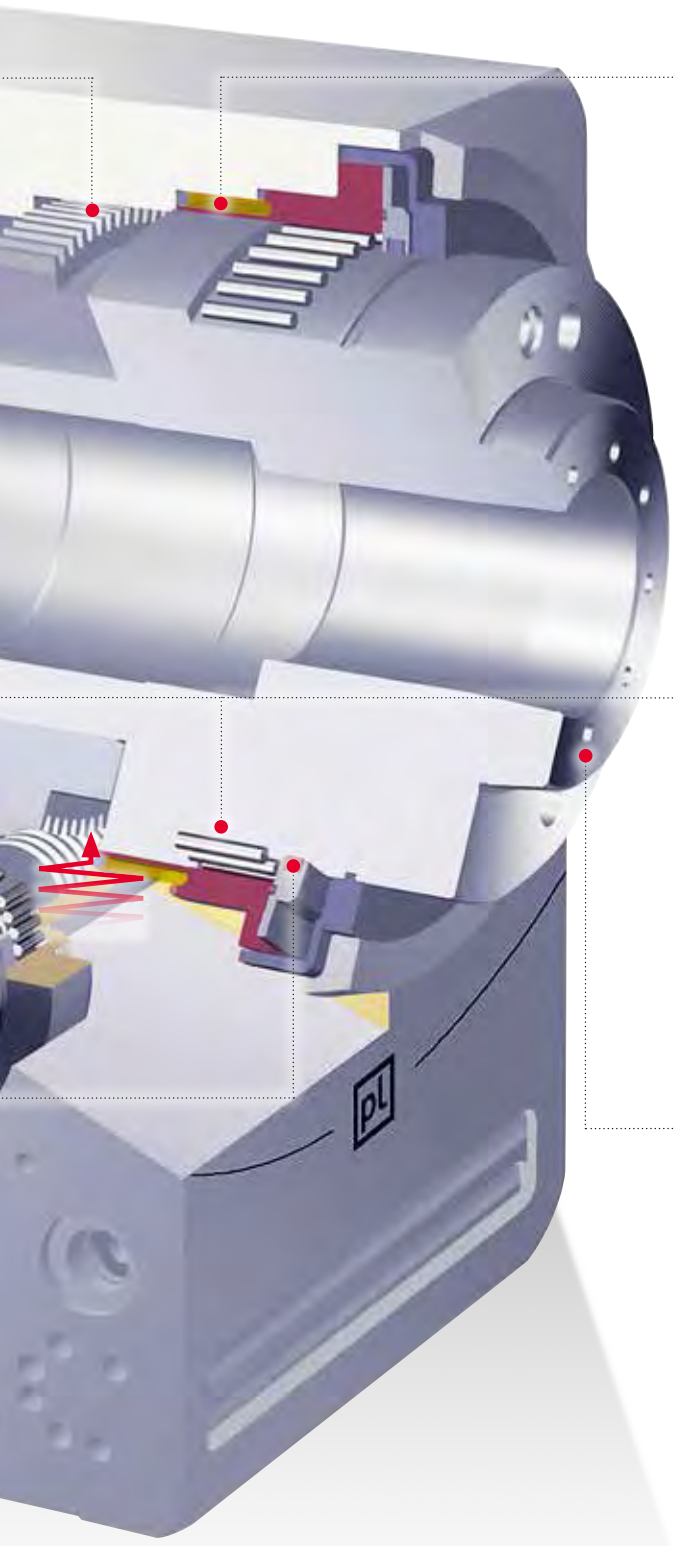


Spindle clamping

+ 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...

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

unique

+ 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

Bluetooth®, Ethernet, web server

unique

Tightness IP 67 (IP 68)

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

-iBox – for real industry 4.0

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. 22/23**

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):

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»

Displays and operating elements

LEDs on the motor cover indicate the operating status.

Remote maintenance – a highlight in the event of an emergency

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	Overcurrent at motor	Overcurrent 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.

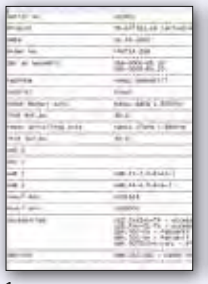
Never search for documents again – everything at hand at all times
No Internet connection necessary!

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.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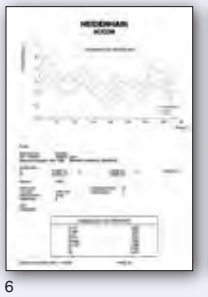
2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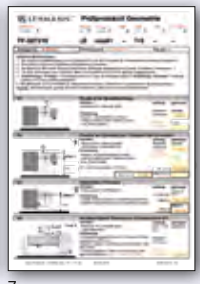
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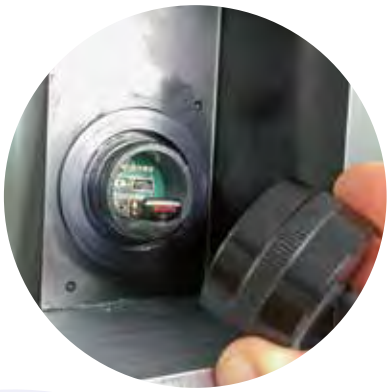
smart doc on the USB stick

+ 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
  5 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
  8 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



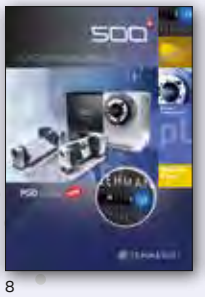
Your benefit

+ Download no longer necessary – extra work eliminated
+ Password no longer necessary – waiting for registration eliminated
+ Internet no longer necessary – problems with poor of 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

3

4

5



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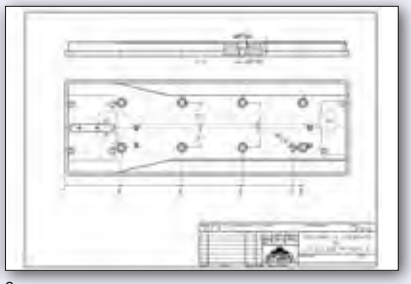

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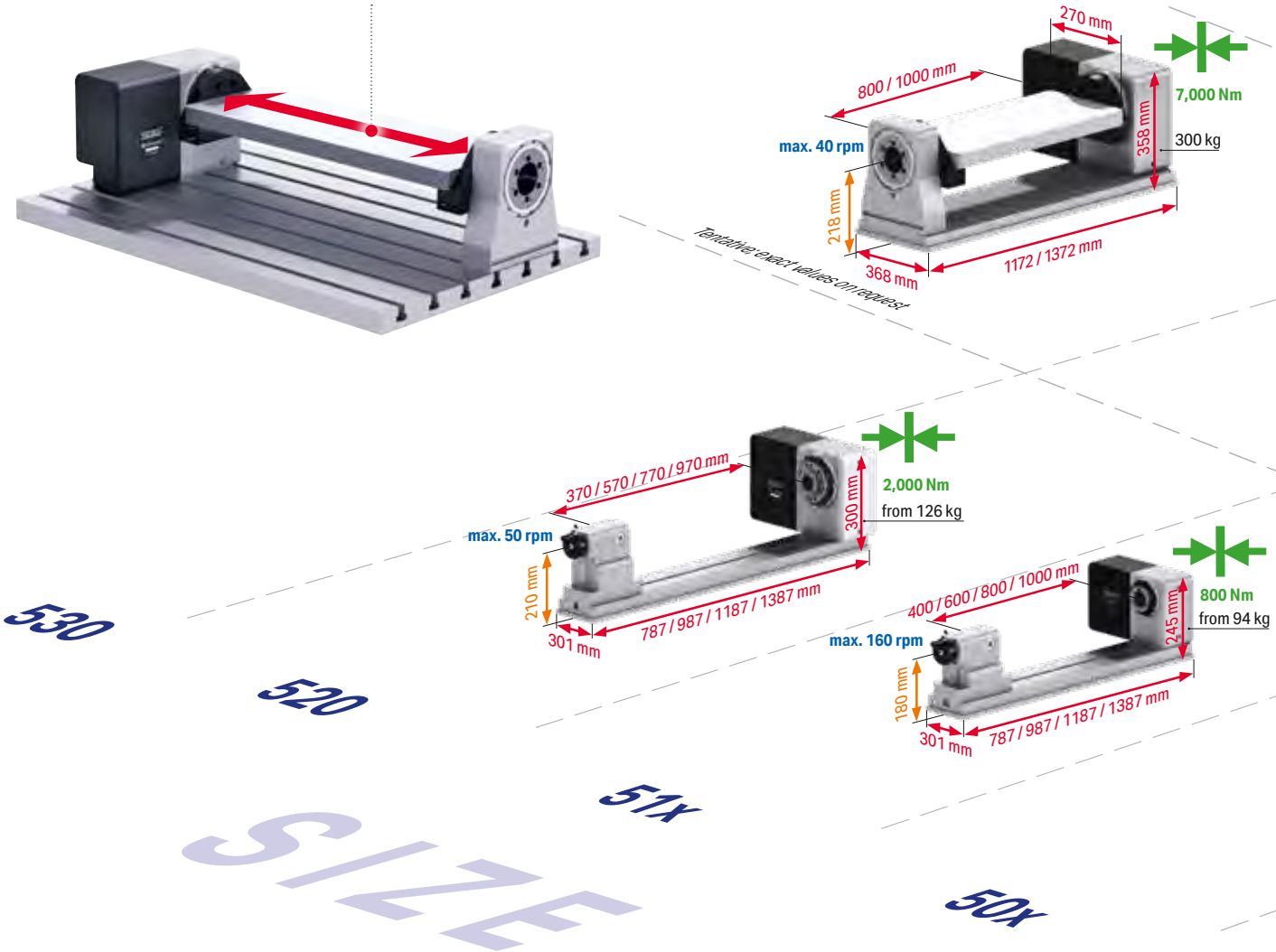
If the USB stick is lost, everything is still available on the website.

Very good accessibility,
even with short tools

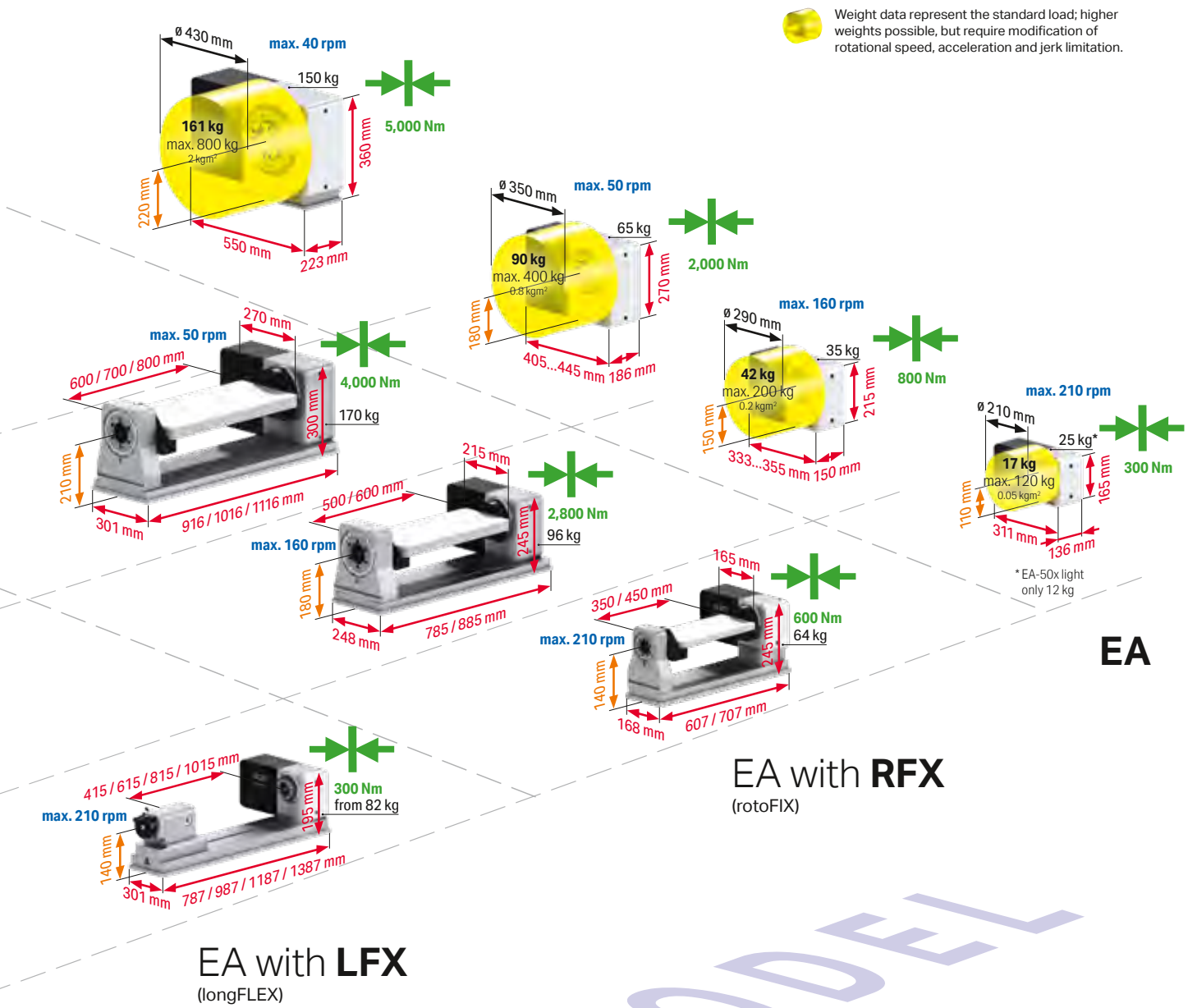
More space for
workpieces and fixtures



Facts

1. High speed up to 210 rpm
2. Feed torque up to 850 Nm (tentative)
3. Steel base plates with hole pattern (suitable for slot spacing of 100 and 125 mm)
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.



EA

EA with **RFX**
(rotoFIX)

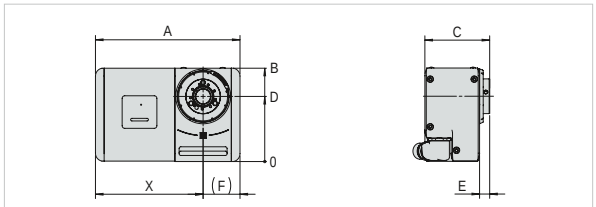
EA with **LFX**
(longFLEX)

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

					EA-507 (light)	EA-508 (light)	EA-510	EA-511	EA-520	EA-530
Dimensions	Swivel ø			mm	160		240		350	430
	Center height			mm	110		150		180	220
	Total weight	with motor		kg	25 (12)		35		65	150
	Center bore [2]			mm	31		34		46 / 64	90 / 102
Bearing / Clamping	Max. clamping torque			Nm	300 (0)	250 (0)	800	600	2,000	5,000
	Max. spindle load	with tailstock		kg	240		400		800	1,600
		without tailstock		kg	120		200		400	800
		Standard load [1]		kg	17	12	42	22	90	161
	Max. axial force			kN	44		46		100	210
	Max. pull-out torque			Nm	1,200		2,000		3,900	10,400
Gear unit	Max. moment of inertia	Standard load [1]		kgm^2	0.05	0.025	0.2	0.07	0.8	2
		J max		kgm^2	0.5	0.25	2	0.7	8	20
	Max. feed torque [3]			Nm	120	70	250	150	440	650 optional 850
	Limited torques due to eccentric loads [4]			Nm	28		40		100	280
	Indexing accuracy Pa [2]			± arc sec	20/12		17/10		12/8	10/6
	Repeat accuracy Ps average			± arc sec	2					
	Max speed	with standard load [1]		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. 54**; for optional angular position measuring system please refer to **p. 55**
[3] Limit value for gear unit, at 1 rpm
[4] Torque calculation, see **p. 88**

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

Item no.

EA–510.L–F1

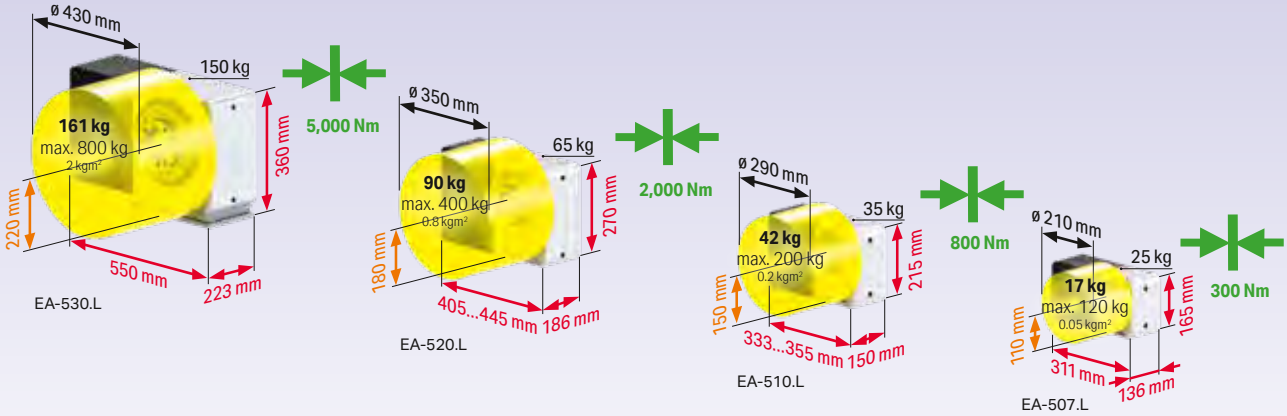
- **Motor** — F1=Fanuc is (200V), F2=Fanuc HVis (400V), M1=Movinor/Mavilor ERN, M2=Movinor/Mavilor EQN 1125, M3= Movinor/Mavilor EQN 1135, MI3= Mitsubishi 200V, MI4 Mitsubishi 400V, S2=Sanyo, Y2=Yaskawa SGMJV/SGMEV, Y4=Yaskawa SGM7J
- **Dividing axis motor position** — L=left, R=right
- **Dividing axis size** — 507, 508, 510, 511, 520, 530
- **Rotary table model**

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. 55**
SPZ = for clamping cylinder; for more, please refer to **pp. 50/51**
DDF = for rotary union; for more, please refer to **p. 52**



Drive data

(based on standard load cube shown on **pp. 86/87**)

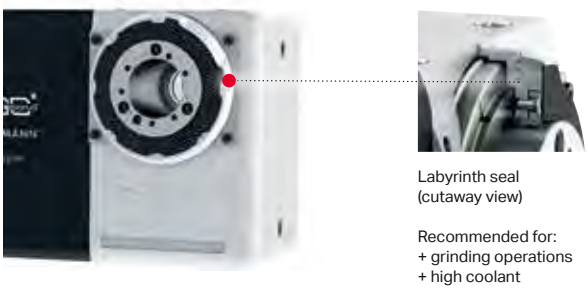
		Motors	Feed* [Nm]	Speed [min⁻¹]	Cycle time*** 90° [sec]	Cycle time*** 180° [sec]
MAVILOR / MOVINOR**	EA-507	BLS-072	120	111	0.26	0.39
	EA-508	BLS-072	70	210	0.23	0.29
	EA-510	BLS-072	250	80	0.30	0.49
	EA-511	BLS-072	150	160	0.23	0.31
	EA-520	BLS-073	440	50	0.41	0.71
	EA-520	LN-098	440	45	0.43	0.77
	EA-530	LN-098	650	40	0.52	0.89
FANUC	EA-507	β1 is	80	66.7	0.30	0.53
	EA-508	β1 is	55	130	0.25	0.36
	EA-510	α2 (HV)is	120	55	0.36	0.63
	EA-511	α2 (HV)is	85	100	0.24	0.39
	EA-520	α2 (HV)is	210	33	0.54	0.99
	EA-520	α4 (HV)is	355	33	0.56	1.01
	EA-530	α4 (HV)is	420	27	0.69	1.25
	EA-530	α8 (HV)is****	650	26.7	0.64	1.20
YASKAWA SGM7J	EA-507	SGM7J 06	120	66	0.30	0.53
	EA-508	SGM7J 06	70	133	0.22	0.33
	EA-510	SGM7J 08	195	66.6	0.32	0.55
	EA-511	SGM7J 08	135	133	0.22	0.33
	EA-520	SGM7J 08	335	40	0.46	0.84
	EA-530	on request				
YASKAWA SGMJV	EA-507	SGMJV 04	115	66.7	0.30	0.53
	EA-508	SGMJV 04	70	130	0.22	0.33
	EA-510	SGMJV 08	195	66.7	0.32	0.55
	EA-511	SGMJV 08	140	133	0.21	0.32
	EA-520	SGMJV 08	335	40	0.46	0.84
	EA-530	SGMEV 15	650	27	0.65	1.21
MITSUBISHI 200 V	EA-507	HG56	120	60	0.32	0.57
	EA-508	HG56	70	110	0.22	0.36
	EA-510	HG75	185	50	0.37	0.67
	EA-511	HG75	130	100	0.24	0.39
	EA-520	HG105	440	32	0.54	1.01
	EA-530	HG104	650	24	0.70	1.32
MITSUBISHI 400V	EA-510	HG-H75	185	50	0.37	0.67
	EA-511	HG-H75	130	100	0.24	0.39
	EA-520	HG-H105	440	32	0.54	1.01
	EA-530	HG-H104	650	24	0.70	1.32
SANYO	EA-507	R2Ax 06040	120	66.7	0.30	0.52
	EA-508	R2Ax 06040	70	130	0.22	0.33
	EA-510	R2Ax 08075	210	66.7	0.32	0.55
	EA-511	R2Ax 08075	145	130	0.22	0.34
	EA-520	R2Ax 08075	270	45	0.43	0.77
OK-UMA	EA-520	BL-ME24J-50SN	300	27.5	0.61	1.15
	EA-530	BL-ME80J-40SN	650	25	0.69	1.29
SIE-MENS	EA-520	1FK7042	435	50	0.44	0.74
	EA-530	1FK7062	650	40	0.52	0.89

* At 1 rpm; for more, please refer to **p. 92**
** for Siemens / Heidenhain
*** Without clamping; for times, please refer to **p. 104**
**** not with 35iB

For calculation of load, forces and torques, please see **p. 88**

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. 56**. Accessories starting at **p. 48**

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

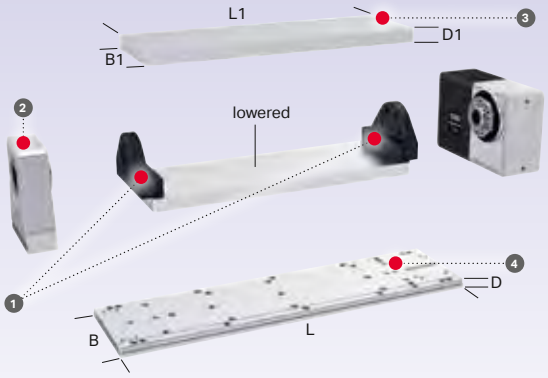
1) incl. increased radial and axial run-out 0.003 mm
2) for 507/510: HSK and ripas clamping not possible manually, GET.5xx-GEN and GEO.5xx-GEN only partly possible (increased radial and axial run-out cannot always be reached)

Center height increase

	Item no.	Designation	Increase / center height D
EA-507 (508)	GPL.507-150	Base plate for center height increase	40 mm / 150 mm
EA-510 (511)	GPL.510-180		30 mm / 180 mm
EA-520	GPL.520-220		40 mm / 220 mm
EA-530	GPL.530-280		60 mm / 280 mm

Suitable alignment elements

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



In order to meet more demanding accuracy requirements, we recommend using a direct angular position measuring system **(pp. 54–55)**

				EA-507		EA-510		EA-520			EA-530	
	Sph		[mm]	140		180		210			218	
1 **Bore sets**	Aluminium		Item no.	**RFX.507-ASa**		**RFX.510-ASa-TOP**		**RFX.520-ASa-TOP**			**RFX.530-ASa-TOP**	
	Vorb. DDF 4-fluted*	RT	Item no.	**DDF.507-RFX-04**		**DDF.510-RFX-04**		**DDF.520-RFX-04**			**DDF.530-RFX-04**	
	Vorb. DDF 6-fluted*	RT	Item no.	–		–		**DDF.520-RFX-06**			**DDF.530-RFX-06**	
	Vorb. DDF 4-fluted*	CB	Item no.	**DDF.507-RFX-04**		**DDG.510-RFX-04-TOP**		**DDG.520-RFX-04-TOP**			**DDG.520-RFX-04-TOP**	
	Vorb. DDF 6-fluted*	CB	Item no.	–		**DDG.510-RFX-06-TOP**		**DDG.520-RFX-06-TOP**			**DDG.520-RFX-06-TOP**	
2 **Counter-bearing (GLA)**	fix		Item no.	**GLA.TOP1-110**		**GLA.TOP2-150**		**GLA.TOP2-180**			**GLA.TOP2-180**	
	adjustable		Item no.	Option: **GLA.HYD-vario**								
3 **Clamping yokes**	Length L1		[mm]	350	450	500**	600**	600**	700**	800**	800	1000
	Width B1		[mm]	165		215		270			270	
	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.520-SB800a**	**RFX.520-SB800a**	**RFX.520-SB1000a**
	Steel		Item no.	**RFX.507-SB350s**	**RFX.507-SB450s**	**RFX.510-SB500s**	**RFX.510-SB600s**	**RFX.520-SB600s**	**RFX.520-SB700s**	**RFX.520-SB800s**	**RFX.520-SB800s**	**RFX.520-SB1000s**
4 **Base plates**	Length L		[mm]	622	722	785	885	916	1016	1116	1172	1372
	Width B		[mm]	168		248		301			368	
	Thickness D		[mm]	30		30		30			38	
	Steel		Item no.	**RFX.507-GP350s-TOP**	**RFX.507-GP450s-TOP**	**RFX.510-GP500s-TOP**	**RFX.510-GP600s-TOP**	**RFX.520-GP600s-TOP**	**RFX.520-GP700s-TOP**	**RFX.520-GP800s-TOP**	**RFX.530-GP800s-TOP**	**RFX.530-GP1000s-TOP**
Weights / moments of inertia (without rotary table, without counter bearing)	Weight (Al)		[kg]	10	12	23	28	40	45	52	on request	
	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. 52**
** When the clamping yoke is mounted eccentrically, the zentriX alignment system cannot be used (risk of collision)

Important information

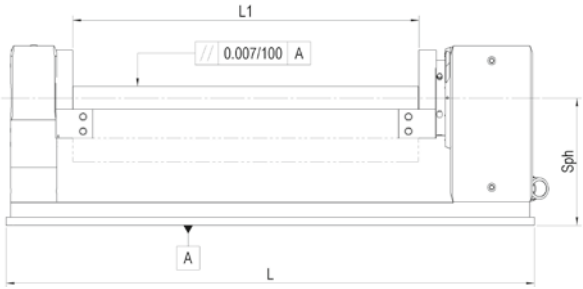
When retrofitting, it may be necessary to reduce the rotational speed, acceleration and gear backlash. The rotary table, rotoFIX and the counter bearing must be installed coaxially to one another <0.05 mm.

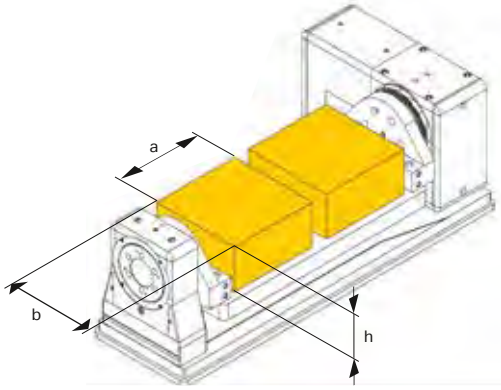
Standard load from steel

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. 86/87**

Can be moved with standard drive data for EA rotary tables (see **p. 29**); larger loads required a reduction in rotational speed, acceleration and jolts.





For alignment and clamping, please refer to **p. 68**

LEHMANN®

Support of longer workpieces with adjustable tailstock or counter bearing

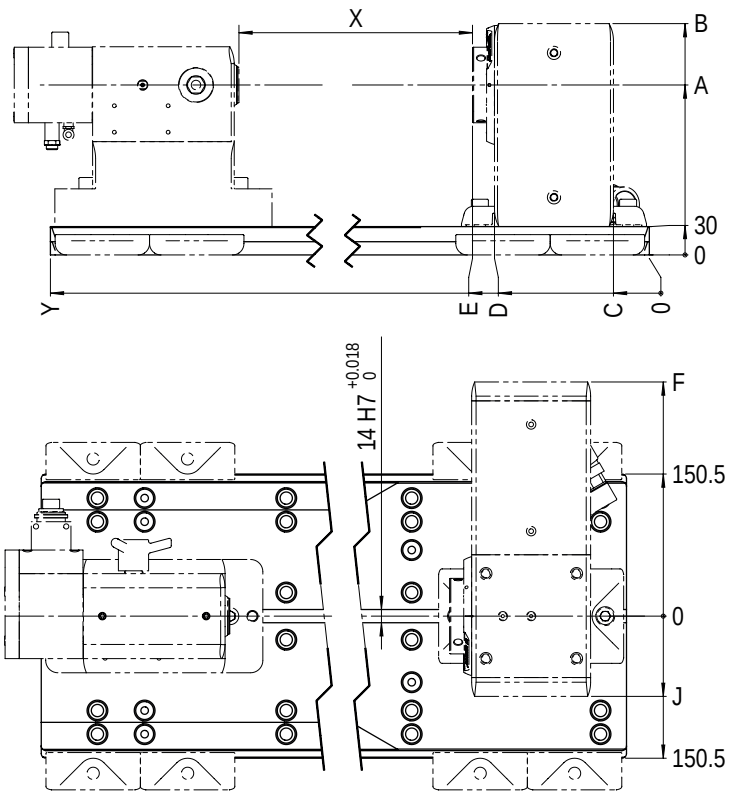
Option with counter bearing **(p. 69)**

longFLEX Standard

longFLEX base plate kit

	Item no.	A	B	C	D	E	F	X	Y	Weight*
		[mm]								[kg]
507	LFX.5xx-400s-2	140	195	38	151	174	236	415	787	82
507	LFX.5xx-600s-2							615	987	93
507	LFX.5xx-800s-2							815	1'187	102
507	LFX.5xx-1000s-2							1'015	1'387	113
510	LFX.5xx-400s-2	180	245	38	164	187	248 (270)	400	787	94
510	LFX.5xx-600s-2							600	987	105
510	LFX.5xx-800s-2							800	1'187	114
510	LFX.5xx-1000s-2							1'000	1'387	125
520	LFX.5xx-400s-2	210	300	38	180	209	295 (320)	370	787	126
520	LFX.5xx-600s-2							570	987	137
520	LFX.5xx-800s-2							770	1'187	146
520	LFX.5xx-1000s-2							970	1'387	157

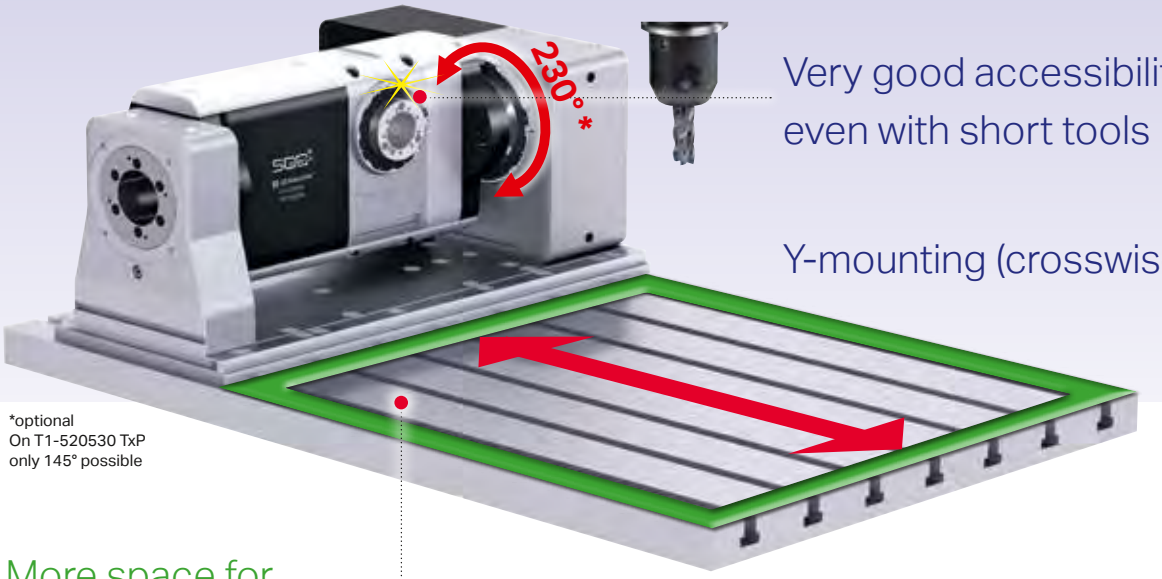
* Complete, including rotary table and tailstock, base plate in steel



Fastening material

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

For alignment and clamping, please refer to **p. 68**



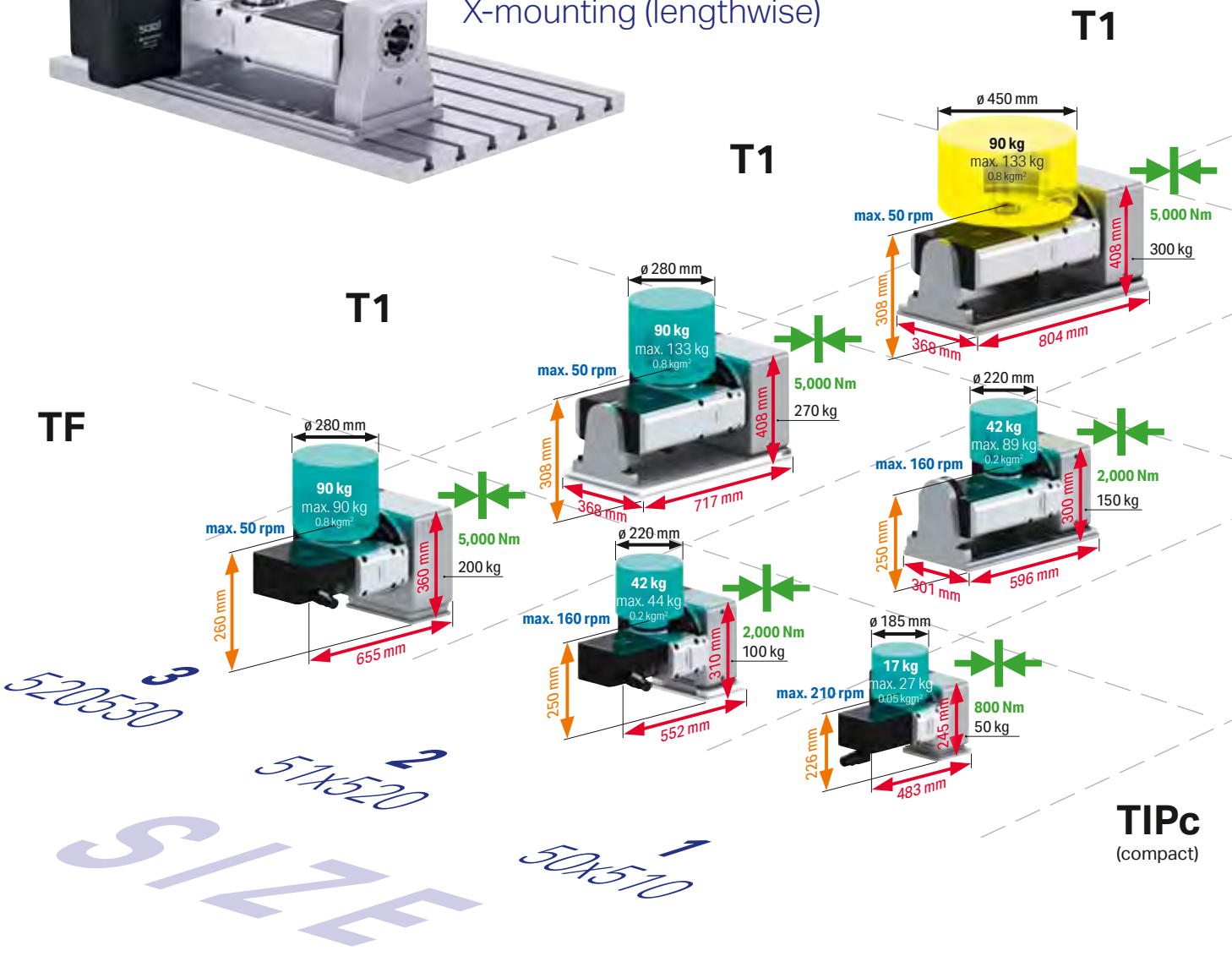
Very good accessibility, even with short tools

Y-mounting (crosswise)

*optional
On T1-520530 TxP
only 145° possible

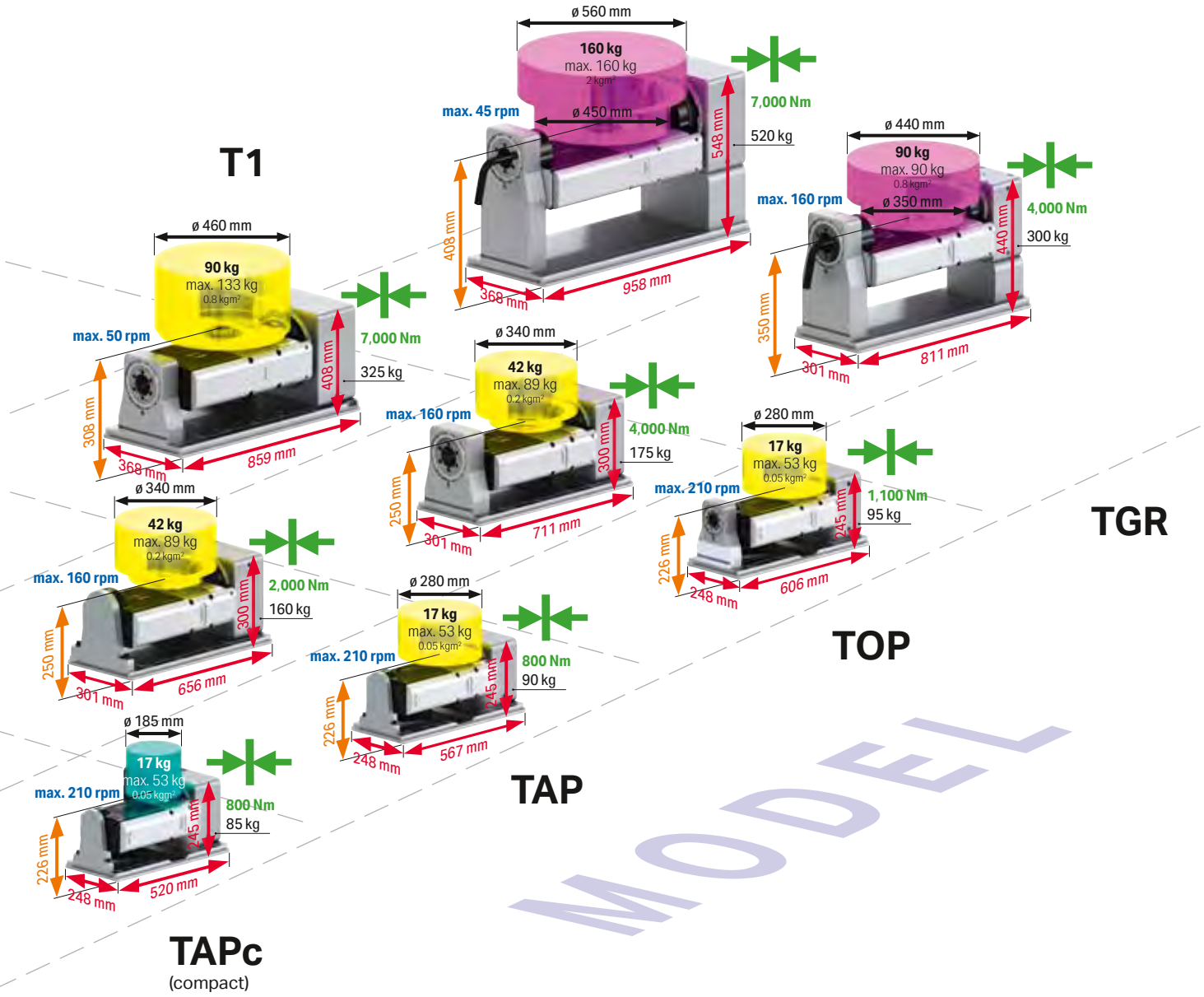
More space for workpiece and fixtures

X-mounting (lengthwise)



Facts

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



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

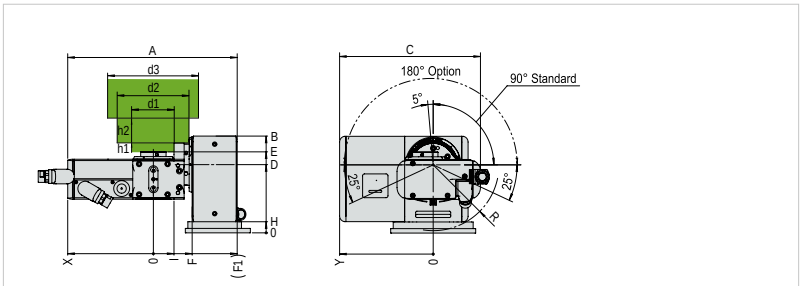
50x510	508510 (standard) or 508510 (high speed)
51x520	510520 (standard) or 511520 (high speed)
TIPc	Two-axis rotary table, no counter bearing, compact
TAPc	Two-axis rotary table, with supporting bearing, compact
TAP	Two-axis rotary table, with supporting bearing
TOP	Two-axis rotary table, with clamped 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		195
	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
Bearing / Clamping	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
	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]	kgm²	0.05	0.025	0.2	0.07	0.8
		J max	kgm²	0.5	0.25	2	0.7	8
	Feed torque max [3]	4th axis	Nm	120	70	250	150	440
		5th axis	Nm	230		440		650 opt. 850
	Gear unit loading 5th axis	without load	Nm	-12		-22		-5
		with standard load	Nm	15	10	30	5	130
		M max	Nm	250		440		650
	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	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	70		40		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 side
[2] Standard / increased; for measuring method and validity of the values, please refer to **p. 54**; for optional angular position measuring system please refer to **p. 55**
[3] Limit value for gear unit, at 1 rpm
[4] Without load / with standard load 0°–90°

Dimensions

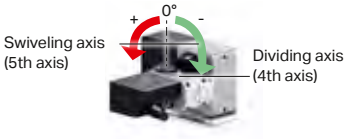


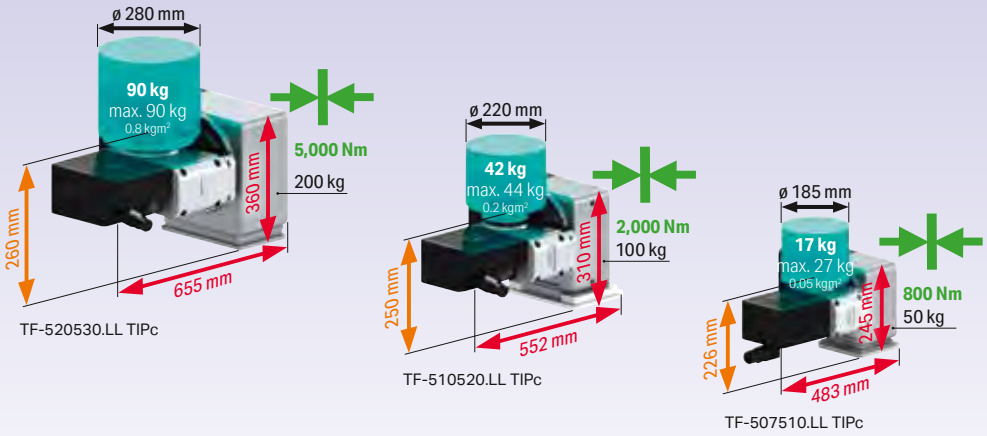
	A	A*	B	C	C*	D	E	F	F1	H	I	R	X	Y	Y*	d1	d2	d3	h1	h2
TIP1c	466		245	382	404	180	226	104	230	30	55	147	236	248	270		186	350		55
TIP2c	512	534	310	444	469	220	260	122	264	40	65	173	248	295	320	128	220	226	30	95
TIP3c	630	655	360	554		220	260	155	335	40	90	195	295	390		178	282	326	66	166

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. 86/87**)

		Motors 4th/5th	Feed* [Nm] 4.	5.	Speed [rpm] 4.	5.	Cycle time*** [sec] 90° 4.	5.	180° 4.	5.
MAVILOR / 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
	TF-520530 TIP3c	BLS-073/LN-098	440	650	50	25	0.41	0.89	0.71	1.49
FANUC	**TF-507510 TIP1c**	β1 is/α2 (HV)is	80	110	66.7	45	0.30	0.49	0.53	0.83
	TF-508510 TIP1c	β1 is/α2 (HV)is	55	110	130	45	0.25	0.49	0.36	0.83
	TF-510520 TIP2c	α2 (HV)is/α2 (HV)is	120	195	55	29	0.36	0.66	0.63	1.18
	TF-510520 TIP2c	α2 (HV)is/α4 (HV)is	120	335	55	30	0.36	0.64	0.63	1.14
	TF-511520 TIP2c	α2 (HV)is/α2 (HV)is	85	195	100	29	0.24	0.66	0.39	1.18
	TF-511520 TIP2c	α2 (HV)is/α4 (HV)is	85	335	100	30	0.24	0.64	0.39	1.14
	TF-520530 TIP3c	α2 (HV)is/α4 (HV)is	210	395	33	20	0.54	0.94	0.99	1.69
	TF-520530 TIP3c	α4 (HV)is/α8 (HV)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	on request								
YASKAWA SGMJV	**TF-507510 TIP1c**	SGMJV 04/08	115	180	66.7	60	0.30	0.44	0.53	0.69
	TF-508510 TIP1c	SGMJV 04/08	70	180	130	60	0.22	0.44	0.33	0.69
	TF-510520 TIP2c	SGMJV 08/08	195	315	66.7	38	0.32	0.54	0.55	0.94
	TF-511520 TIP2c	SGMJV 08/08	140	315	133	38	0.21	0.54	0.32	0.94
	TF-520530 TIP3c	SGMJV/EV 08/15	335	650	40	25	0.46	0.89	0.84	1.49
MITSUBISHI 200V	**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
	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
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
SANYO	**TF-507510 TIP1c**	R2Ax 06040/08075	120	185	66.7	60	0.30	0.44	0.52	0.69
	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
OKU-MA	**TF-520530 TIP3c**	BL-ME24J-50SN/ BL-ME80J-40SN	300	650	27.5	25	0.61	0.89	1.15	1.49
SIE-MENS	**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. 92**
** for Siemens / Heidenhain
*** Without clamping; for times, please refer to **p. 104**
**** not with 35iB

Item no.

TF–510520.LL TIP–F1

- **Motor** F1=Fanuc is (200V), F2=Fanuc HVis (400V), M1=Movinor/Mavilor ERN, M2=Movinor/Mavilor EQN 1125, M3= Movinor/Mavilor EQN 1135, MI3= Mitsubishi 200V, MI4 Mitsubishi 400V, S2=Sanyo, Y2=Yaskawa SGMJV/SGMEV, Y4=Yaskawa SGM7J
- **Divider add-on version**
- **Swiveling axis motor position** L=left, R=right
- **Dividing axis motor position** L=left, R=right
- **Swiveling axis size** 510, 520
- **Dividing axis size** 507, 510, 520
- **Rotary table model**

For calculation of load, forces and torques, please see **p. 88**

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. 56**. Accessories starting at **p. 48**

Options

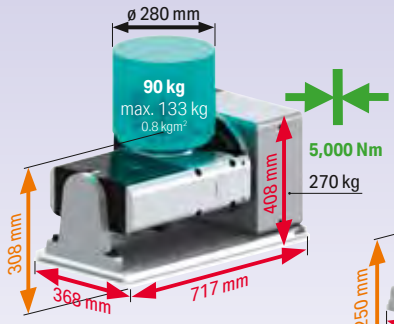
Item no.	Description
GET.5xx-GEN	Increased gear precision [1]
GEO.5xx-GEN	Incr. geometric precision, ½ standard tolerance
SPI.5xx-Lab [2]	Spindle seal with labyrinth, integrated sealing air pressure control
SWB.510-180	Tilting range max. 230°; set to 180°
SWB.520-180	
SWB.530-180	

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)

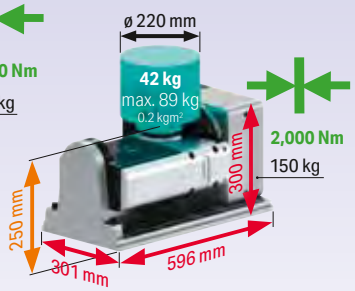
Suitable alignment elements

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

*optional



T1-520530.LL TAPc

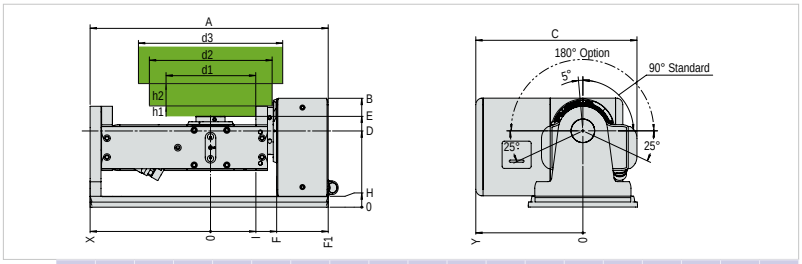


T1-510520.LL TAPc

					T1-507510 TAP1(c)	T1-508510 TAP1(c)s	T1-510520 TAP2(c)	T1-511520 TAP2(c)s	T1-520530 TAP3(c)
Dimensions	Swivel ø			mm	180		220		195
	Swiveling range			degrees	90° +5°/-25° (optional 180° ±25°)				
	Center height			mm	180		210 (235 [3])		268 / 308
	Total weight	with motor		kg	90 (85)		160 (150)		300 (270)
	Center bore	Standard / increased		mm	30		34		46 / 64
Bearing / Clamping	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	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
Gear unit	Max. moment of inertia	Standard load [1]		kgm²	0.05	0.025	0.2	0.07	0.8
		J max		kgm²	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 loading 5th axis	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 side
[2] Standard / increased; for measuring method and validity of the values, please refer to **p. 54**; for optional angular position measuring system please refer to **p. 55**
[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

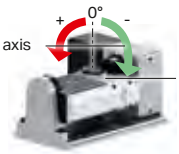


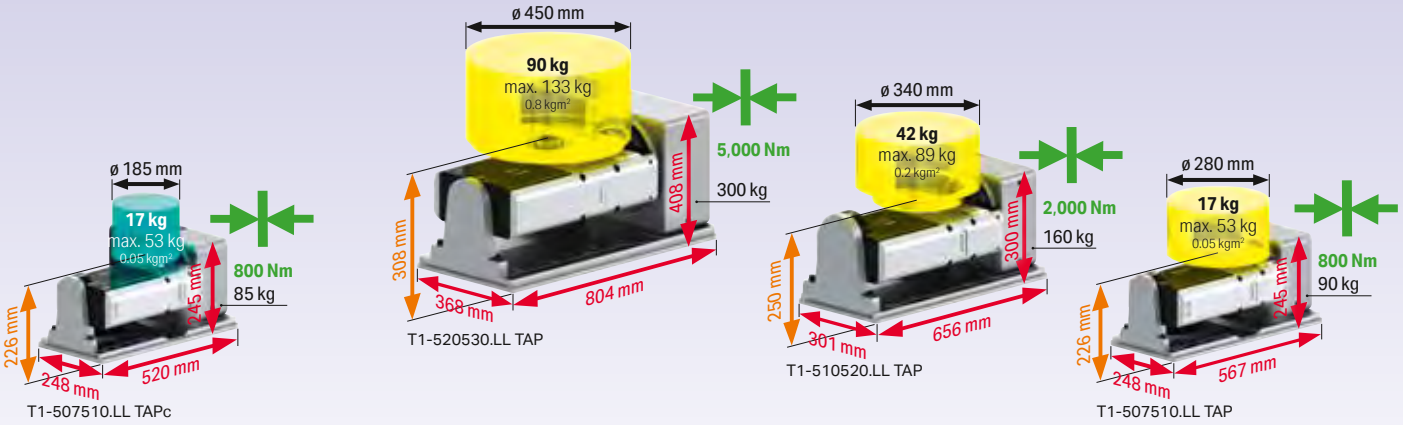
	A	B	C	C*	D	E	F	F1	H	I	R	X	Y	Y*	d1	d2	d3	h1	h2
TAP1	567	245	382	404	180	226	151	277	30	102	149	290	248	270		280	350		55
TAP1c	520	245	382	404	180	226	104	230	30	55	149	290	248	270		186	350		55
TAP2	656	300	444	469	210	250	182	324	30	125	173	332	295	320	248	340	400	30	95
TAP2c	596	300	444	469	210	250	122	264	30	65	173	332	295	320	128	220	400	30	95
TAP3	804	408	554		268	308	242	422	38	177	195	382	390		352	456	500	66	166
TAP3c	717	408	554		268	308	155	335	38	90	195	382	390		178	182	500	66	166

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. 86/87**)

		Motors 4th/5th	Feed* [Nm] 4.	5.	Speed [rpm] 4.	5.	Cycle time*** [sec] 90° 4.	5.	180° 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
	T1-510520 TAP2	BLS-072/LN-098	250	440	80	40	0.30	0.50	0.49	0.87
	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	β1 is/α2 (HV)is	80	110	66.7	45	0.30	0.49	0.53	0.83
	T1-508510 TAP1	β1 is/α2 (HV)is	55	110	130	45	0.25	0.49	0.36	0.83
	T1-510520 TAP2	α2 (HV)is/α2 (HV)is	120	195	55	29	0.36	0.66	0.63	1.18
	T1-510520 TAP2	α2 (HV)is/α4 (HV)is	120	335	55	30	0.36	0.64	0.63	1.14
	T1-511520 TAP2	α2 (HV)is/α2 (HV)is	85	195	100	29	0.24	0.66	0.39	1.18
	T1-511520 TAP2	α2 (HV)is/α4 (HV)is	85	335	100	30	0.24	0.64	0.39	1.14
	T1-520530 TAP3	α2 (HV)is/α4 (HV)is	210	395	33	20	0.54	0.94	0.99	1.69
	T1-520530 TAP3	α4 (HV)is/α8 (HV)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	on request								
YASKAWA SGMJV	T1-507510 TAP1	SGMJV 04/08	115	180	66.7	60	0.30	0.44	0.53	0.69
	T1-508510 TAP1	SGMJV 04/08	70	180	130	60	0.22	0.44	0.33	0.69
	T1-510520 TAP2	SGMJV 08/08	195	315	66.7	38	0.32	0.54	0.55	0.94
	T1-511520 TAP2	SGMJV 08/08	140	315	133	38	0.21	0.54	0.32	0.94
	T1-520530 TAP3	SGMJV/EV 08/15	335	650	40	25	0.46	0.89	0.84	1.49
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
MITSUB. 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-ME80J-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. 92**
** for Siemens / Heidenhain
*** Without clamping; for times, please refer to **p. 104**
**** not with 35iB

Item no.

T1–510520.LL TAP–F1

- **Motor** F1=Fanuc is (200V), F2=Fanuc HVis (400V), M1=Movinor/Mavilor ERN, M2=Movinor/Mavilor EQN 1125, M3= Movinor/Mavilor EQN 1135, MI3= Mitsubishi 200V, MI4 Mitsubishi 400V, S2=Sanyo, Y2=Yaskawa SGMJV/SGMEV, Y4=Yaskawa SGM7J
- **Divider add-on version**
- **Swiveling axis motor position** L=left, R=right
- **Dividing axis motor position** L=left, R=right
- **Swiveling axis size** 510, 520
- **Dividing axis size** 507, 510, 520
- **Rotary table model**

For calculation of load, forces and torques, please see **p. 88**

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. 56**. Accessories starting at **p. 48**

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.510-180	Tilting range max. 230°; set to 180°
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	Alignment pin **lineFIX**, 1 pair	12g6
AUR.iX-14		14g6
AUR.iX-16		16g6
AUR.iX-18		18g6

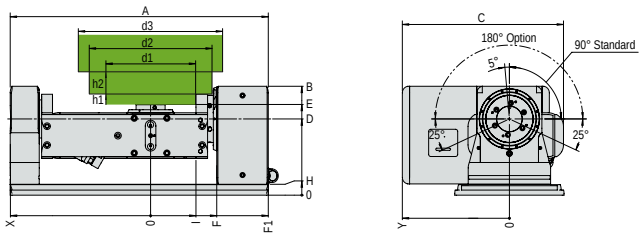
For **lineFIX**, refer to **p. 68**

*optional

				T1-507510 TOP1	T1-508510 TOP1s	T1-510520 TOP2	T1-511520 TOP2s	T1-520530 TOP3
Dimensions	Swivel ø		mm	180		220		195
	Swiveling range		degrees	90° +5°/-25° (optional 180° ±25°)				
	Center height		mm	180		210 (235 [3])		268 / 308
	Total weight	with motor	kg	95		175		325
	Center bore	Standard / increased	mm	30		34		46 / 64
Bearing / Clamping	Max. clamping torque	4th axis	Nm	300	250	800	600	2,000
		5th axis	Nm	1,100		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
Gear unit	Max. moment of inertia	Standard load [1]	kgm²	0.05	0.025	0.2	0.07	0.8
		J max	kgm²	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 loading 5th axis	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 side
[2] Standard / increased; for measuring method and validity of the values, please refer to **p. 54**; for optional angular position measuring system please refer to **p. 55**
[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

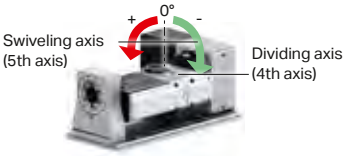


	A	B	C	C*	D	E	F	F1	H	I	R	X	Y	Y*	d1	d2	d3	h1	h2
TOP1	606	245	382	404	180	226	151	277	30	102	149	328	248	270		280	350		55
TOP2	711	300	444	469	210	250	182	324	30	125	173	387	295	320	248	340	400	30	95
TOP3	859	408	554		268	308	242	422	38	177	195	437	390		352	456	500	66	166

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)



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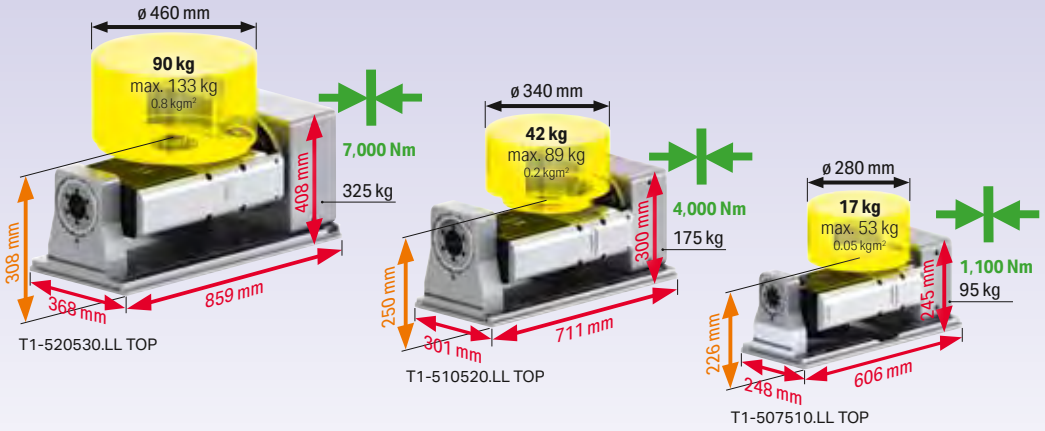


Drive data

(based on standard load cube shown on **pp. 86/87**)

		Motors 4th/5th	Feed* [Nm] 4.	Feed* [Nm] 5.	Speed [rpm] 4.	Speed [rpm] 5.	Cycle time*** [sec] 90° 4.	Cycle time*** [sec] 90° 5.	Cycle time*** [sec] 180° 4.	Cycle time*** [sec] 180° 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
	T1-510520 TOP2	BLS-072/LN-098	250	440	80	40	0.30	0.50	0.49	0.87
	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	β1 is/α2 (HV)is	80	110	66.7	45	0.30	0.49	0.53	0.83
	T1-508510 TOP1	β1 is/α2 (HV)is	55	110	130	45	0.25	0.49	0.36	0.83
	T1-510520 TOP2	α2 (HV)is/α2 (HV)is	120	195	55	29	0.36	0.66	0.63	1.18
	T1-510520 TOP2	α2 (HV)is/α4 (HV)is	120	335	55	30	0.36	0.64	0.63	1.14
	T1-511520 TOP2	α2 (HV)is/α2 (HV)is	85	195	100	29	0.24	0.66	0.39	1.18
	T1-511520 TOP2	α2 (HV)is/α4 (HV)is	85	335	100	30	0.24	0.64	0.39	1.14
	T1-520530 TOP3	α2 (HV)is/α4 (HV)is	210	395	33	20	0.54	0.94	0.99	1.69
	T1-520530 TOP3	α4 (HV)is/α8 (HV)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	on request								
YASKAWA SGMJV	T1-507510 TOP1	SGMJV 04/08	115	180	66.7	60	0.30	0.44	0.53	0.69
	T1-508510 TOP1	SGMJV 04/08	70	180	130	60	0.22	0.44	0.33	0.69
	T1-510520 TOP2	SGMJV 08/08	195	315	66.7	38	0.32	0.54	0.55	0.94
	T1-511520 TOP2	SGMJV 08/08	140	315	133	38	0.21	0.54	0.32	0.94
	T1-520530 TOP3	SGMJV/EV 08/15	335	650	40	25	0.46	0.89	0.84	1.49
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
MITSUB. 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. 92**
** for Siemens / Heidenhain
*** Without clamping; for times, please refer to **p. 104**
**** not with 35iB

Item no.

T1–510520.LL TOP–F1

- **Motor** F1=Fanuc is (200V), F2=Fanuc HVis (400V), M1=Movinor/Mavilor ERN, M2=Movinor/Mavilor EQN 1125, M3= Movinor/Mavilor EQN 1135, MI3= Mitsubishi 200V, MI4 Mitsubishi 400V, S2=Sanyo, Y2=Yaskawa SGMJV/SGMEV, Y4=Yaskawa SGM7J
- **Divider add-on version**
- **Swiveling axis motor position** L=left, R=right
- **Dividing axis motor position** L=left, R=right
- **Swiveling axis size** 510, 520
- **Dividing axis size** 507, 510, 520
- **Rotary table model**

For calculation of load, forces and torques, please see **p. 88**

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. 56**. Accessories starting at **p. 48**

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.510-180	Tilting range max. 230°; set to 180°
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	Alignment pin **lineFIX**, 1 pair	12g6
AUR.iX-14		14g6
AUR.iX-16		16g6
AUR.iX-18		18g6

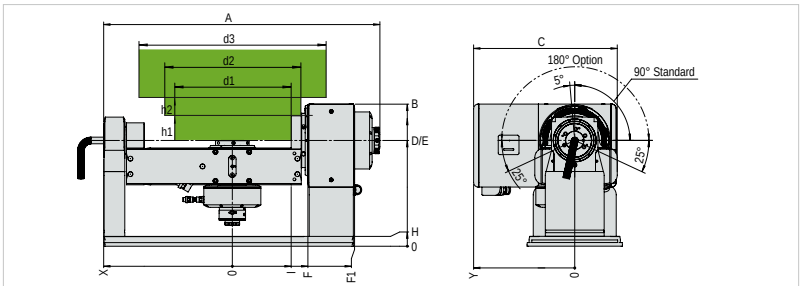
For **lineFIX**, refer to **p. 68**

*optional

				T1-510520 TGR2	T1-511520 TGR2s (on request)	T1-520530 TGR3
Dimensions	Swivel ø		mm	308		335
	Swiveling range		degrees	90° +5°/-25° (optional 180° ±25°)		
	Center height		mm	348		408
	Total weight	with motor	kg	300		520
	Center bore	Standard / increased	mm	34		46 / 64
Bearing / Clamping	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]	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
Gear unit	Max. moment of inertia	Standard load [1]	kgm²	0.8	0.07	2.0
		J max	kgm²	2	0.7	8
	Feed torque max [3]	4th axis	Nm	250	150	440
		5th axis	Nm	440		650 opt. 850
	Gear unit loading 5th axis	without load	Nm	-105		-160
		with standard load	Nm	-10		60
		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 side
[2] Standard / increased; for measuring method and validity of the values, please refer to **p. 54**; for optional angular position measuring system please refer to **p. 55**
[3] Limit value for gear unit, at 1 rpm
[4] without load / with standard load 0°–90°

Dimensions

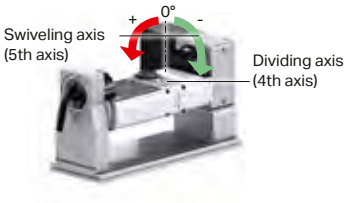


	A	B	C	D	E	F	F1	H	I	R	X	Y	d1	d2	d3	h1	h2
TGR2	928	440	469	350	350	232	374	38	175	196	437	320	352	456	680	56	206
with WMS7:	458																
TGR3	1056	548	554	408	408	292	472	38	227	226	487	390	452	556	800	96	206

Dimensions with 511 identical to 510520.

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)



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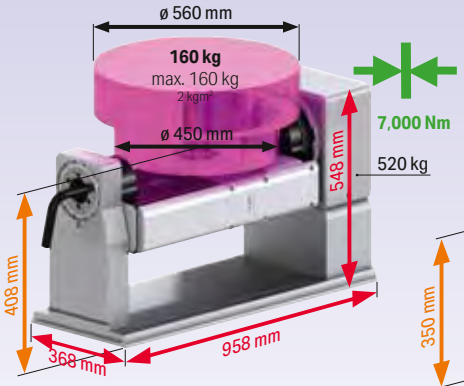
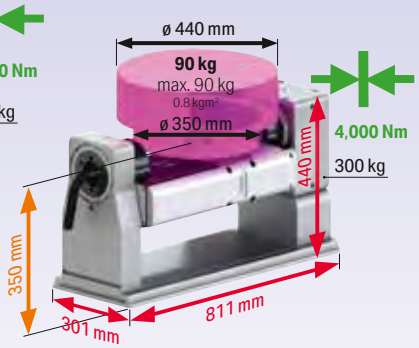


T1-520530.LL TGR



T1-510520.LL TGR

Drive data

(based on standard load cube shown on **pp. 86/87**)

		Motors 4th/5th	Feed* [Nm] 4.	5.	Speed [rpm] 4.	5.	Cycle time*** [sec] 90° 4.	5.	180° 4.	5.
MAVILOR MOVINOR**	**T1-510520 TGR2**	BLS-072/LN-098	250	440	65	35	0.45	0.71	0.68	1.14
	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/α4 (HV)is	120	335	45	27	0.51	0.86	0.84	1.41
	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 SGM7J	**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	on request								
YASKAWA SGMJV	**T1-510520 TGR2**	SGMJV 08/08	195	315	60	30	0.46	0.81	0.71	1.31
	T1-511520 TGR2	SGMJV 08/08	140	315	133	30	0.21	0.81	0.32	1.31
	T1-520530 TGR3	SGMJV/EV 08/15	315	650	40	25	0.53	0.89	0.91	1.49
MITSUB. 200 V	**T1-510520 TGR2**	HG75/105	185	430	50	28	0.48	0.74	0.78	1.28
	T1-511520 TGR2	HG75/105	130	430	100	28	0.24	0.74	0.39	1.28
	T1-520530 TGR3	HG105/104	430	650	30	22	0.63	0.94	1.13	1.62
MITSUB. 400 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
SIE-MENS	**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. 92**
** for Siemens / Heidenhain
*** Without clamping; for times, please refer to **p. 104**
**** not with 35iB

For calculation of load, forces and torques, please see **p. 88**

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. 56**. Accessories starting at **p. 48**

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.

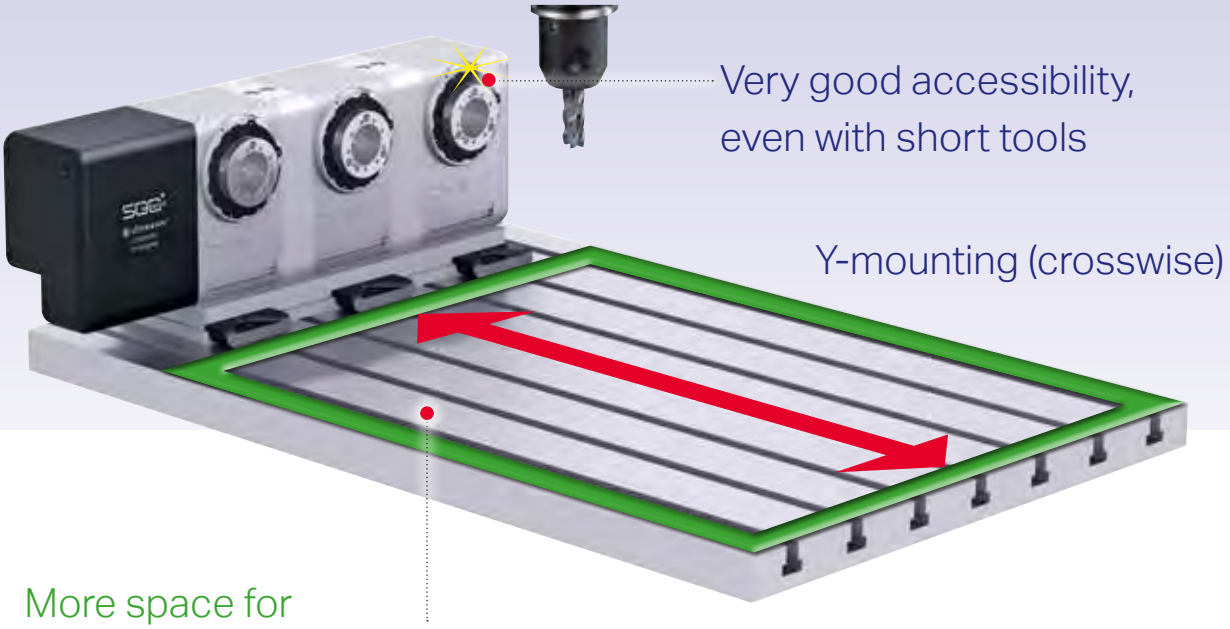
T1–510520.LL TGR–F1

- **Motor** F1=Fanuc is (200V), F2=Fanuc HVis (400V), M1=Movinor/Mavilor ERN, M2=Movinor/Mavilor EQN 1125, M3= Movinor/Mavilor EQN 1135, MI3= Mitsubishi 200V, MI4 Mitsubishi 400V, S2=Sanyo, Y2=Yaskawa SGMJV/SGMEV, Y4=Yaskawa SGM7J
- **Divider add-on version**
- **Swiveling axis motor position** L=left, R=right
- **Dividing axis motor position** L=left, R=right
- **Swiveling axis size** 510, 520
- **Dividing axis size** 507, 510, 520
- **Rotary table model**

Suitable alignment elements

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

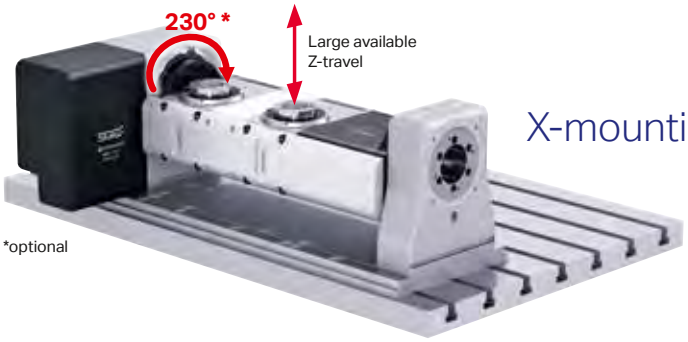
For **lineFIX**, refer to **p. 68**



Very good accessibility, even with short tools

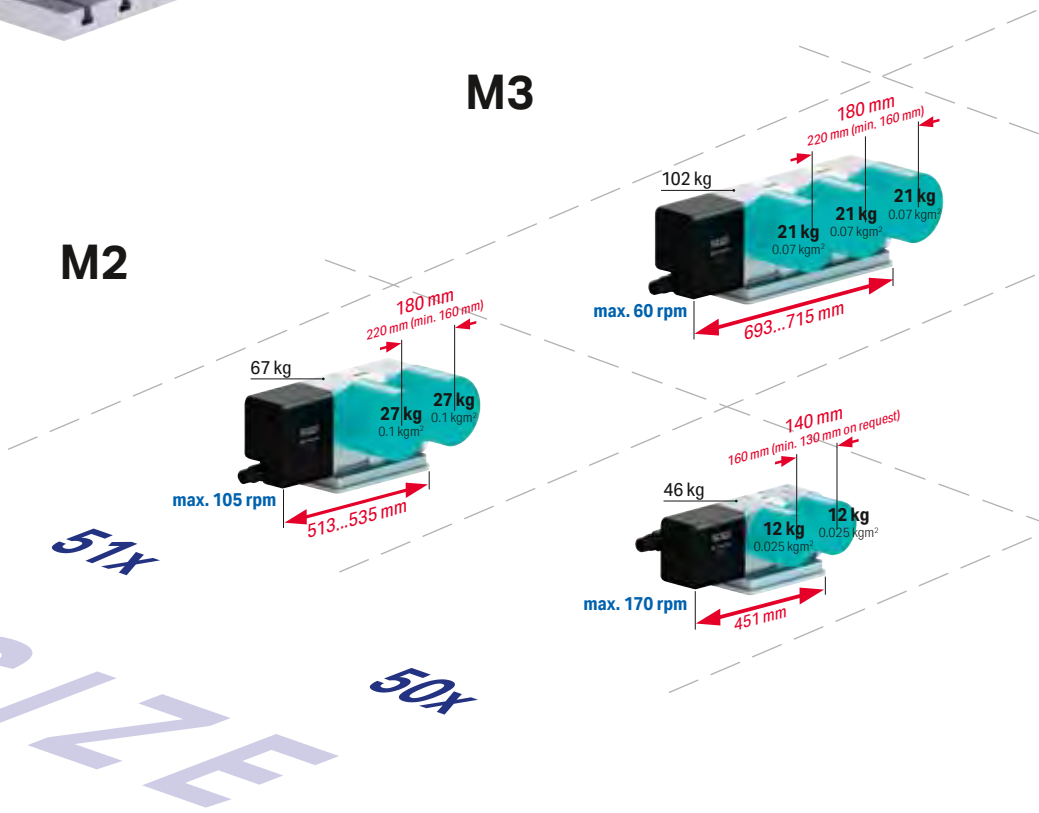
Y-mounting (crosswise)

More space for workpiece and fixtures



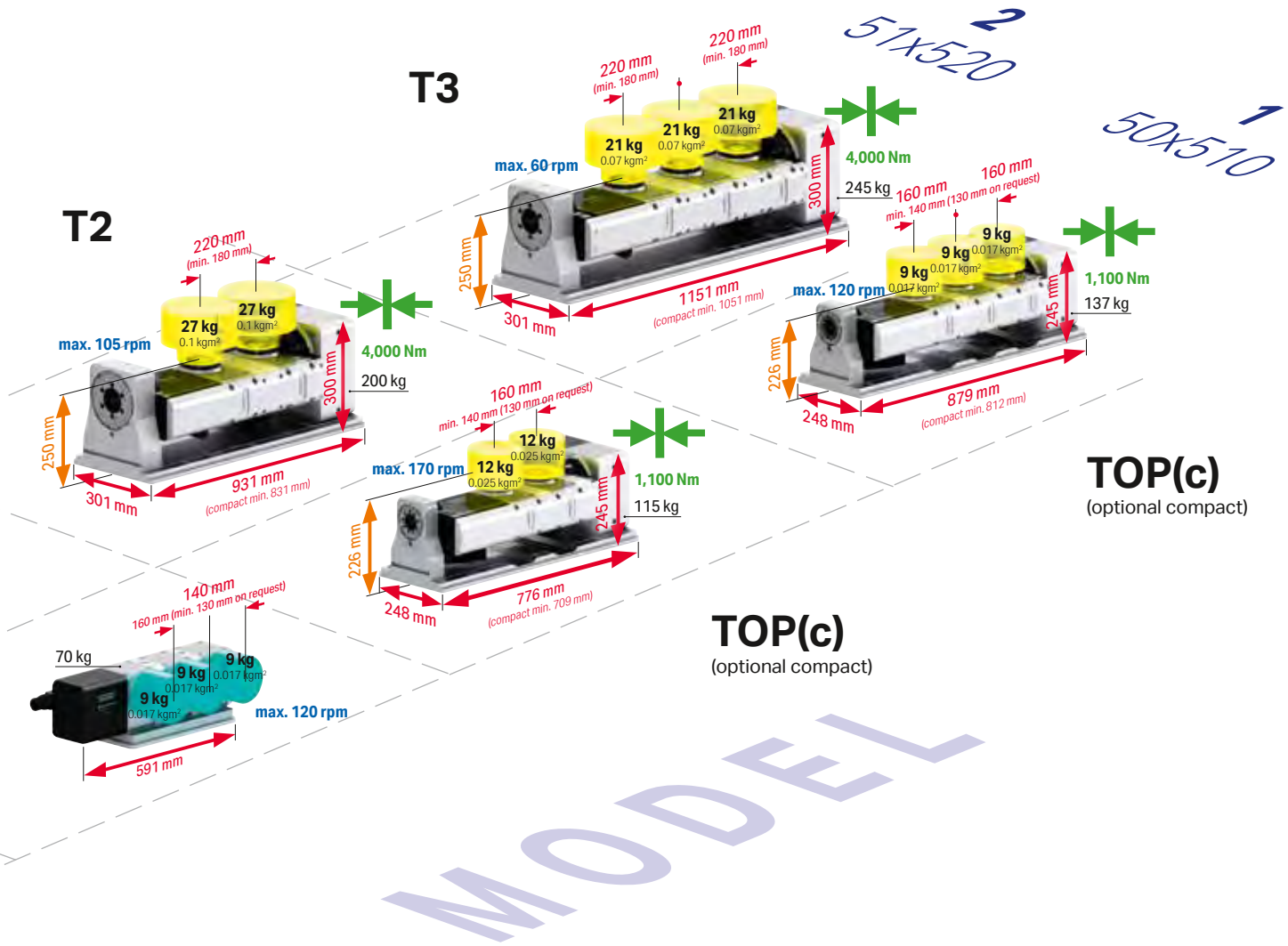
*optional

X-mounting (lengthwise)



Facts

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



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)
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

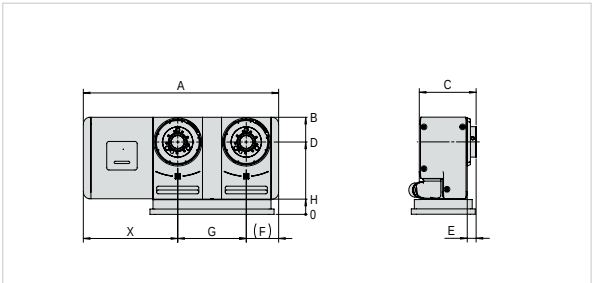
M2

M3

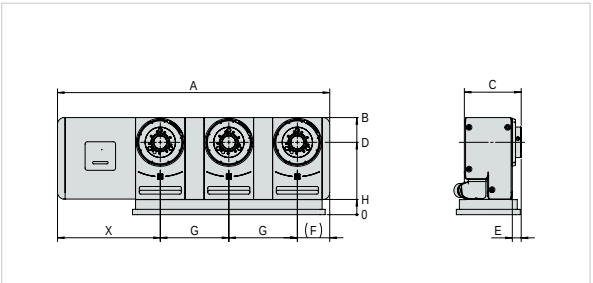
				M2-507	M2-508	M2-510	M2-511	M3-507	M3-508	M3-510	M3-511
Dimensions	Swivel ø		mm	140		180		140		180	
	Spindle distance		mm	140		180		140		180	
	Center height		mm	150		190		150		190	
	Total weight	with motor	kg	46		67		70		102	
	Center bore		mm	31		34		31		34	
Bearing / Clamping	Max. clamping torque		Nm	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	
	Max. pull-out torque	per spindle	Nm	1,200		2,000		1,200		2,000	
Gear unit	Max. moment of inertia	Standard load*	kgm^2	0.05	0.025	0.2	0.07	0.05	0.025	0.21	0.07
		J max	kgm^2	0.5	0.25	2	0.7	0.5	0.25	2	0.7
	Max. feed torque		Nm	120	70	190	140	120	70	150	120
	Indexing accuracy Pa **		± arc sec	20/12		17/10		20/12		17/10	
	Repeat accuracy Ps average		± arc sec	2							
	Max speed	with standard load*	min^{-1}	90	170	70	105	70	120	40	50
Precision	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. 54**; for optional angular position measuring system please refer to **p. 55**

Dimensions

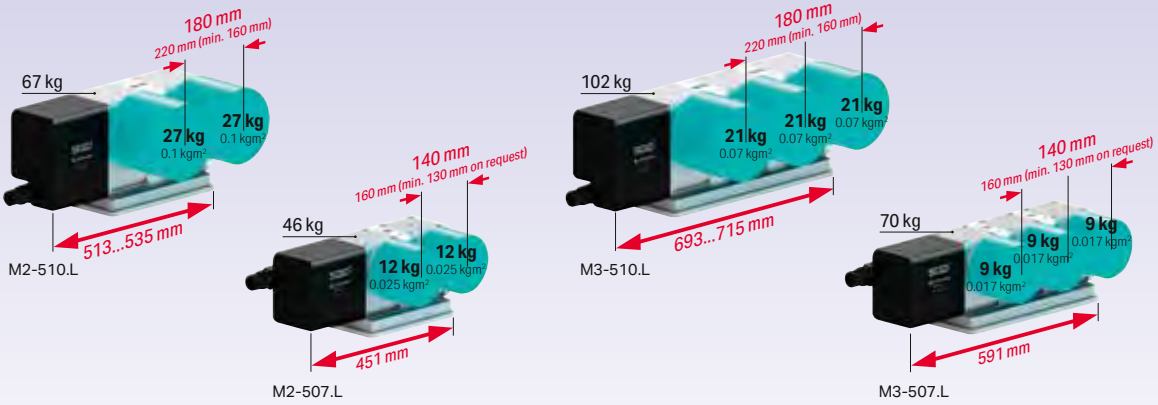


	A	B	C	D	E	F	G	G min.	H	X
M2-207	451	205	136	150	23	75	140	130	40	236
M2-510	513	255	150	190	23	85	180	160	40	248



	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. 86/87**)

		Motors	Feed* [Nm]	Speed [min⁻¹]	Cycle time*** 90° [sec]	Cycle time*** 180° [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
	M3-511	BLS-072	120	50	0.36	0.66
FANUC	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
	M3-510	α2 (HV)is	65	30	0.66	1.16
	M3-511	α2 (HV)is	65	35	0.52	0.95
YASKAWA SGM7J	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
	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
YASKAWA SGMJV	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
	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
MITSUBISHI 200 V	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
	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
MITSUBISHI 400V	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
	M3-511	HG-H75	80	35	0.48	0.91
SANYO	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. 92** ** for Siemens / Heidenhain
*** without clamping; for times, please refer to **p. 104**

For calculation of load, forces and torques, please see **p. 88**

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. 56**. Accessories starting at **p. 48**

Options

Item no.	Description
GEO.5xx-GEN	Incr. geometric precision, ½ standard tolerance
SPI.5xx-Lab-x2 1)	Spindle seal with labyrinth, integrated sealing air pressure control
SPI.5xx-Lab-x3 1)	Spindle seal with labyrinth, integrated sealing air pressure control

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)

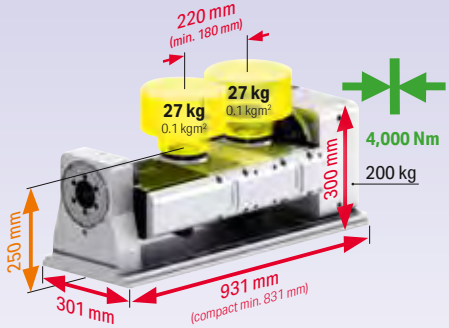
Item no.

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, MI3= Mitsubishi 200V, MI4 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**

T2

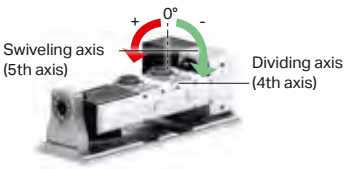
T3



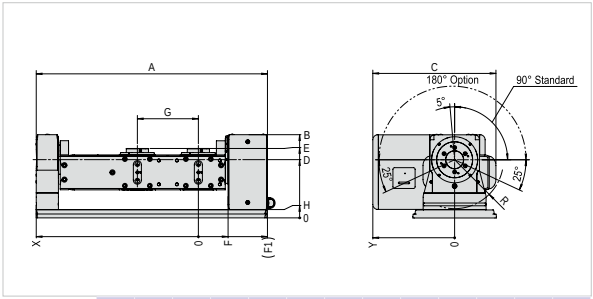
T2-510520.LL TOP(c)

					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	115	200	137	245
	Center bore			mm	31	34	31	34
Bearing / Clamping	Max. clamping torque	4th axis		Nm	300	800 (600)	300	800 (600)
		5th axis		Nm	1,100	4,000	1,100	4,000
	Max spindle load per spindle	0°–30°		kg	2x40	2x67	3x27	3x44
		30°–90°		kg	2x27	2x45	3x18	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		Nm	1,200	2,000	1,200	2,000
		5th axis		Nm	2,000	3,900	2,000	3,900
Gear unit	Max. moment of inertia	Standard load [1]		kgm²	0.05 (0.025)	0.2 (0.07)	0.05 (0.025)	0.21 (0.07)
		J max		kgm²	0.5 (0.25)	2 (0.7)	0.5 (0.25)	2 (0.7)
	Feed torque max [3]	4th axis		Nm	120 (70)	190 (140)	120 (70)	150 (120)
		5th axis		Nm	230	440	230	440
	Gear unit loading 5th axis	without load		Nm	-20	-33	-22	-45
		with standard load		Nm	18 (16)	30 (8)	22 (20)	25 (13)
		M max		Nm	250	440	250	440
	Indexing accuracy Pa	4th axis [2]		± arc sec	20/12	17/10	20/12	17/10
		5th axis (90°) [4]		± arc sec	45/20 (45/29)	26/22 (26/15)	56/28 (56/30)	30/20 (30/18)
	Repeat accuracy Ps average	4th axis		± arc sec	2			
		5th axis		± arc sec	2			
	Max speed at standard load	4th axis [1]		rpm	90 (170)	70 (105)	70 (120)	40 (50)
		5th axis [1]		rpm	60	40	60	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. 54**; for optional angular position measuring system please refer to **p. 55**
[3] Limit value for gear unit, at 1 rpm
[4] without load / with standard load 0°–90°



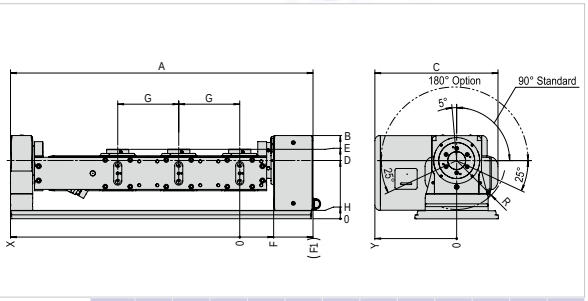
Dimensions



	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)

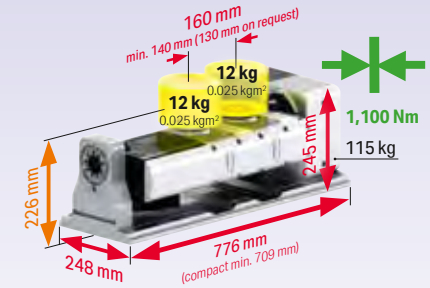
Compact versions: Dimension A, F and X
507510: 47 mm shorter, 510520: 60 mm shorter



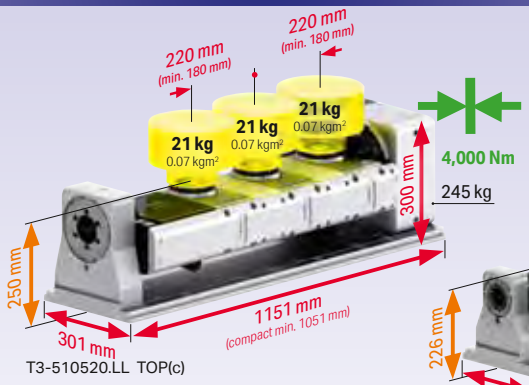
	A	B	C	D	E	F	F1	G	G2*	H	R	X	Y
T3-507510	896	245	382	180	226	151	230	160	130	30	136	658	248
T3-510520	1111	300	469	210	250	182	264	220	180	30	177	791	295

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)

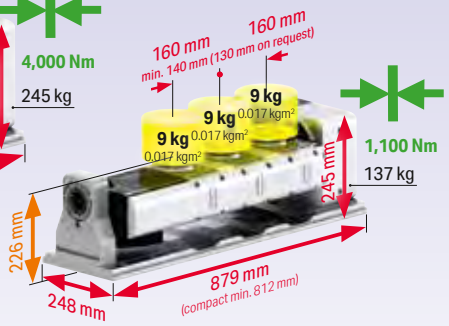
Item no. as for TOP. Instead of «T1», however, «T2» or «T3».



T2-507510.LL TOP(c)



T3-510520.LL TOP(c)



T3-507510.LL TOP(c)

Drive data

(based on standard load cube shown on **pp. 86/87**)

		Motors 4th/5th	Feed* [Nm] 4.	5.	Speed [rpm] 4.	5.	Cycle time*** [sec] 90° 4.	5.	180° 4.	5.
MAVILOR / MOVINOR **	**T2-507510 TOP1.2**	BLS-072/BLS-072	120	230	90	60	0.32	0.44	0.48	0.69
	T2-508510 TOP1.2(s)	BLS-072/BLS-072	70	230	170	60	0.27	0.44	0.35	0.69
	T2-510520 TOP2.2	BLS-072/BLS-073	190	425	80	45	0.32	0.54	0.54	0.87
	T2-510520 TOP2.2	BLS-072/LN-098	190	440	80	40	0.32	0.52	0.54	0.89
	T2-511520 TOP2.2(s)	BLS-072/BLS-073	140	425	105	45	0.25	0.54	0.40	0.87
	T2-511520 TOP2.2(s)	BLS-072/LN-098	140	440	105	40	0.25	0.52	0.40	0.89
	T3-507510 TOP1.3	BLS-072/BLS-072	120	230	70	60	0.34	0.50	0.55	0.75
	T3-508510 TOP1.3(s)	BLS-072/BLS-072	70	230	120	60	0.27	0.50	0.39	0.75
	T3-510520 TOP2.3	BLS-072/BLS-073	150	425	40	40	0.48	0.57	0.85	0.94
	T3-510520 TOP2.3	BLS-072/LN-098	150	440	40	40	0.48	0.54	0.85	0.92
	T3-511520 TOP2.3(s)	BLS-072/BLS-073	120	425	50	40	0.36	0.57	0.66	0.94
	T3-511520 TOP2.3(s)	BLS-072/LN-098	120	440	50	40	0.36	0.54	0.66	0.92
FANUC	**T2-507510 TOP1.2**	β1 is/α2 (HV)is	65	110	60	40	0.37	0.61	0.62	0.98
	T2-508510 TOP1.2(s)	β1 is/α2 (HV)is	40	110	90	40	0.34	0.61	0.50	0.98
	T2-510520 TOP2.2	α2 (HV)is/α2 (HV)is	95	195	45	28	0.45	0.69	0.78	1.23
	T2-510520 TOP2.2	α2 (HV)is/α4 (HV)is	95	335	45	30	0.45	0.66	0.78	1.16
	T2-511520 TOP2.2(s)	α2 (HV)is/α2 (HV)is	80	195	70	28	0.33	0.69	0.55	1.23
	T2-511520 TOP2.2(s)	α2 (HV)is/α4 (HV)is	80	335	70	30	0.33	0.66	0.55	1.16
	T3-507510 TOP1.3	β1 is/α2 (HV)is	30	110	30	40	0.57	0.69	1.07	1.06
	T3-510520 TOP2.3	α2 (HV)is/α2 (HV)is	65	195	30	27	0.66	0.74	1.16	1.29
	T3-510520 TOP2.3	α2 (HV)is/α4 (HV)is	65	335	30	29	0.66	0.68	1.16	1.19
YASKAWA SGM7J	**T2-507510 TOP1.2**	SGM7J 06/08	120	180	65	55	0.35	0.48	0.58	0.75
	T2-508510 TOP1.2(s)	SGM7J 06/08	70	180	120	55	0.23	0.48	0.36	0.75
	T2-510520 TOP2.2	SGM7J 08/08	145	315	50	38	0.40	0.56	0.70	0.95
	T2-511520 TOP2.2(s)	SGM7J 08/08	110	315	90	38	0.28	0.56	0.45	0.95
	T3-507510 TOP1.3	SGM7J 06/08	120	180	50	50	0.39	0.52	0.69	0.82
	T3-508510 TOP1.3(s)	SGM7J 06/08	70	180	95	50	0.28	0.52	0.43	0.82
	T3-510520 TOP2.3	SGM7J 08/08	105	315	35	35	0.54	0.61	0.97	1.03
	T3-511520 TOP2.3(s)	SGM7J 08/08	85	315	60	35	0.38	0.61	0.63	1.03
YASKAWA SGMJV	**T2-507510 TOP1.2**	SGMJV 04/08	85	180	50	55	0.41	0.48	0.71	0.75
	T2-508510 TOP1.2(s)	SGMJV 04/08	65	180	85	55	0.31	0.48	0.49	0.75
	T2-510520 TOP2.2	SGMJV 08/08	145	315	50	38	0.40	0.56	0.70	0.95
	T2-511520 TOP2.2(s)	SGMJV 08/08	110	315	90	38	0.28	0.56	0.45	0.95
	T3-508510 TOP1.3(s)	SGMJV 04/08	50	180	55	50	0.39	0.52	0.66	0.82
	T3-510520 TOP2.3	SGMJV 08/08	105	315	35	35	0.54	0.61	0.97	1.03
	T3-511520 TOP2.3(s)	SGMJV 08/08	85	315	60	35	0.38	0.61	0.63	1.03
MITSUBISHI 200V	**T2-507510 TOP1.2**	HG56/75	100	170	40	45	0.43	0.51	0.81	0.85
	T2-508510 TOP1.2(s)	HG56/75	70	170	80	45	0.29	0.51	0.48	0.85
	T2-510520 TOP2.2	HG75/105	135	430	45	30	0.40	0.63	0.73	1.13
	T2-511520 TOP2.2(s)	HG75/105	100	430	80	30	0.30	0.63	0.49	1.13
	T3-507510 TOP1.3	HG56/75	75	170	35	40	0.48	0.57	0.91	0.94
	T3-508510 TOP1.3(s)	HG56/75	65	170	65	40	0.37	0.57	0.60	0.94
	T3-510520 TOP2.3	HG75/105	95	430	25	30	0.64	0.64	1.24	1.14
	T3-511520 TOP2.3(s)	HG75/105	80	430	35	30	0.48	0.64	0.91	1.14
MITSUB. 400 V	**T2-510520 TOP2.2**	HG-H75/H105	135	430	45	30	0.40	0.63	0.73	1.13
	T2-511520 TOP2.2(s)	HG-H75/H105	100	430	80	30	0.30	0.63	0.49	1.13
	T3-510520 TOP2.3	HG-H75/H105	95	430	25	30	0.64	0.64	1.24	1.14
	T3-511520 TOP2.3(s)	HG-H75/H105	80	430	35	30	0.48	0.64	0.91	1.14
SANYO	**T2-507510 TOP1.2**	R2Ax 06040/08075	95	185	55	55	0.37	0.48	0.64	0.75
	T2-508510 TOP1.2(s)	R2Ax 06040/08075	70	185	100	55	0.30	0.48	0.45	0.75
	T2-510520 TOP2.2	R2Ax 08075/08075	145	245	50	40	0.39	0.57	0.69	0.94
	T2-511520 TOP2.2(s)	R2Ax 08075/08075	135	245	90	40	0.28	0.57	0.45	0.94
	T3-507510 TOP1.3	R2Ax 06040/08075	70	185	40	50	0.48	0.52	0.85	0.82
	T3-508510 TOP1.3(s)	R2Ax 06040/08075	60	185	65	50	0.35	0.52	0.58	0.85
	T3-510520 TOP2.3	R2Ax 08075/08075	110	245	35	35	0.54	0.61	0.97	1.03
	T3-511520 TOP2.3(s)	R2Ax 08075/08075	120	245	60	35	0.35	0.61	0.60	1.03

* At 1 rpm; for more, please refer to **p. 92**

** for Siemens / Heidenhain

*** Without clamping; for times, please refer to **p. 104**

For calculation of load, forces and torques, please see **p. 88**

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. 56**. Accessories starting at **p. 48**

Options

Item no.	Description
GEO.5xx-GEN	Incr. geometric precision, ½ standard tolerance
SPI.5xx-Lab [1] (for 5th axis)	Spindle seal with labyrinth, integrated sealing air pressure control
SPI.5xx-Lab-x2 [1] (for 4th axis)	Spindle seal with labyrinth, integrated sealing air pressure control, for 2 spindles
SPI.5xx-Lab-x3 [1] (for 4th axis)	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	

[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)

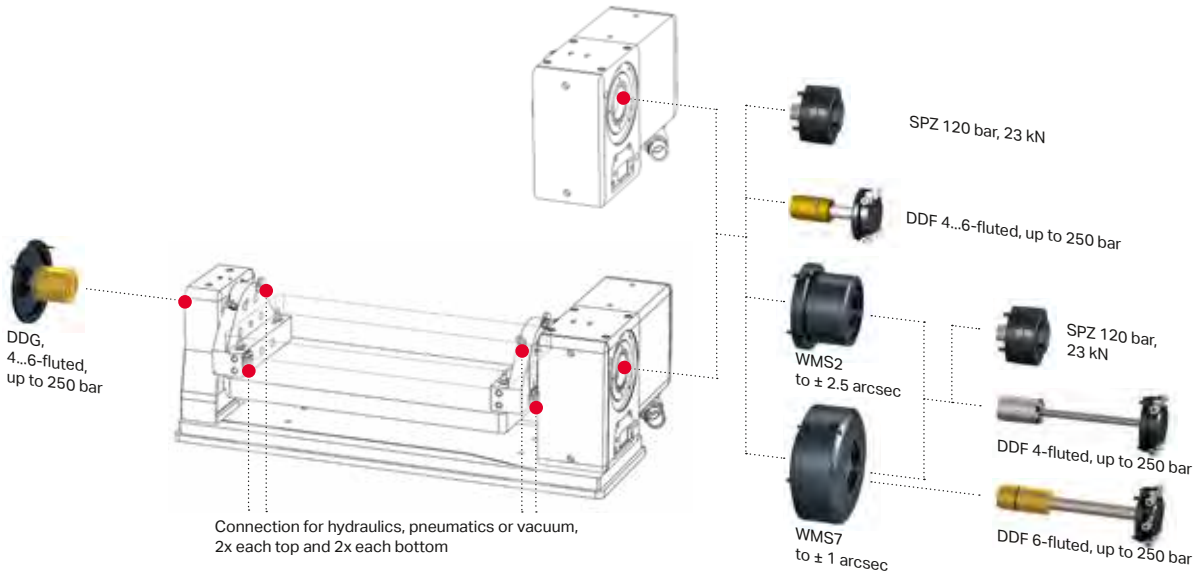
Suitable alignment elements

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

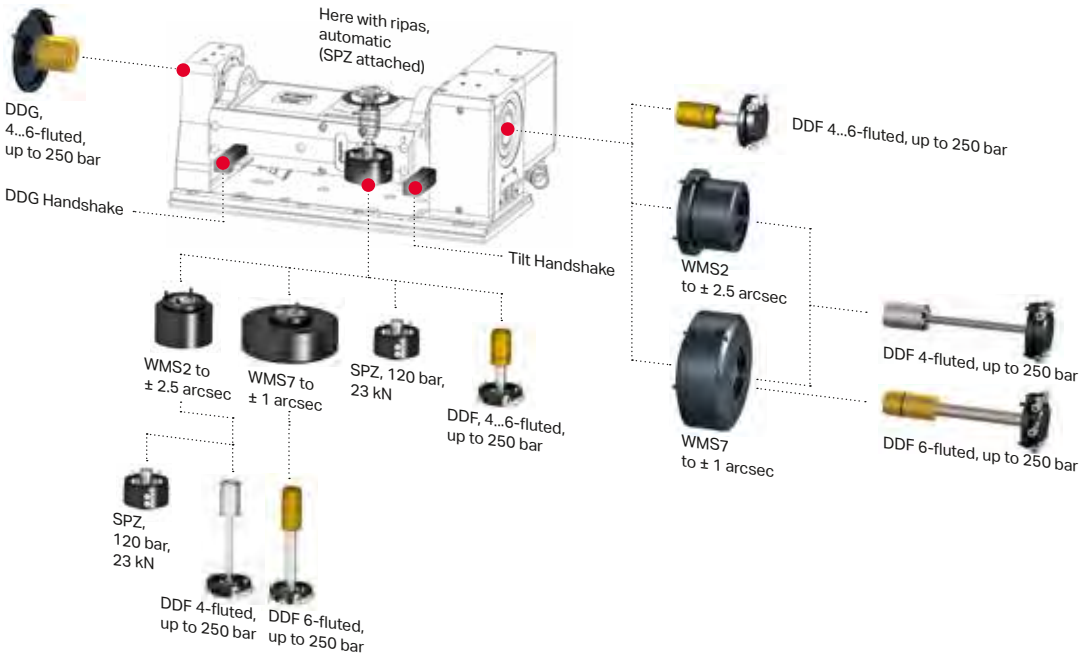
For **lineFIX**, refer to **p. 68**

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



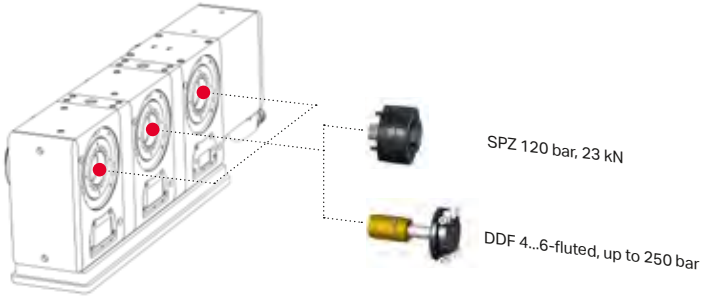
T-Series



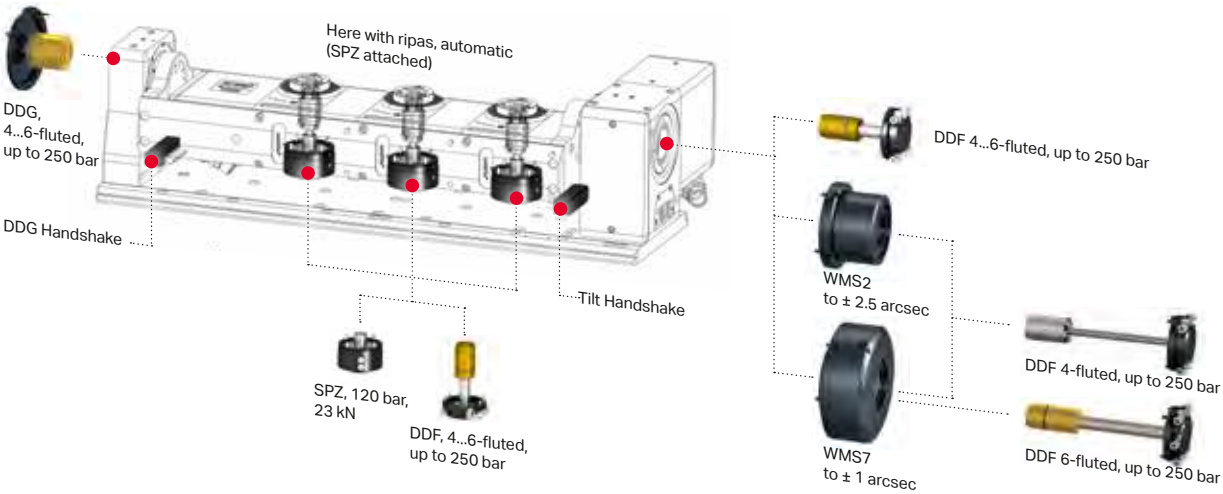
5. Rotary union in combination with angular position measuring systems (small and large)
6. Easy to retrofit
7. Clamping cylinder up to 23 kN

– DDF up to 2x6 channels
– SPZ on WMS2

M-Series



T2...T3-Series



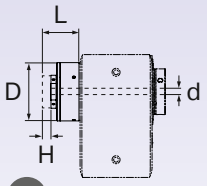
Note

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
3. SPZ (Stroke = 15 mm) not possible in combination with WMS2

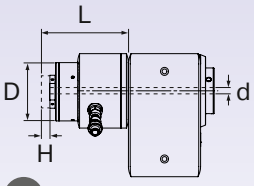
WMS Angular position measuring system
2 = Size 2000, Heidenhain, Magnescale
7 = Size 8000, Heidenhain
DDF Rotary union on rotary table
DDG Rotary union for counter bearing
4 = 4 channels
6 = 6 channels
SPZ Clamping cylinders
MTS Modular tooling system

Depends on the requested tooling, the center height has to be increased. Please see **page 51**.

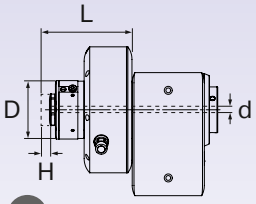
Hydraulic clamping cylindres standard



1 directly on the spindle



2 in combination with WMS RxN-2xxx *



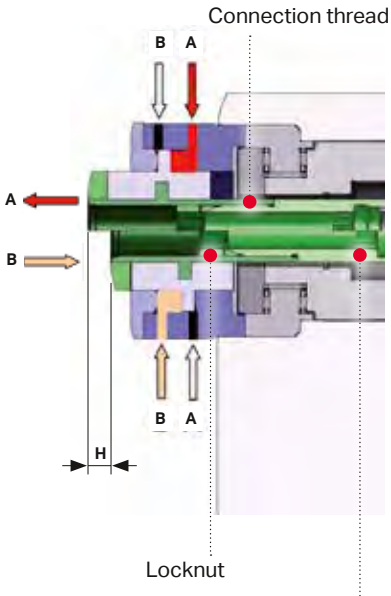
3 in combination with WMS RxN-8xxx

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	L [mm] 2 *	L [mm] 3
507	**SPZ.5xx-d2.5**	hydraulic or pneumatic, double	2.5	5.2	102	22	M24x1.5	60	149	
	SPZ.5xx-9		9	18.8						
	SPZ.5xx-15		15					72	161	
	SPZ.507-WMS2	Draw tube extension, for WMS.510-VOR2							●	
510	**SPZ.5xx-d2.5**	hydraulic or pneumatic, double	2.5	5.2	102			52	141	136
	SPZ.5xx-9		9	18.8						
	SPZ.5xx-15		15					64	153	148
	SPZ.510-WMS2	Draw tube extension, for WMS.510-VOR2							●	
	SPZ.510-WMS7	Draw tube extension, for WMS.510-VOR7								●
520	**SPZ.520-d2.5**	hydraulic or pneumatic, double	2.5	5.2	102			73	165	160
	SPZ.520-9		9	18.8						
	SPZ.520-15		15					85	177	172
	SPZ.520-WMS2	Draw tube extension, for WMS.520-VOR2							●	
	SPZ.520-WMS7	Draw tube extension, for WMS.520-VOR7								●
530	**SPZ.530-d2.5**	hydraulic or pneumatic, double	2.5	5.2	102			65	144	133
	SPZ.530-9		9	18.8						
	SPZ.530-15		15					77	156	145
	SPZ.530-WMS2	Draw tube extension, for WMS.530-VOR2							●	
	SPZ.530-WMS7	Draw tube extension, for WMS.530-VOR7								●
alle Typen	**SPZ.Awk-Vor**	Preparation for presence check (control box optional, SPZ.Awk)								
	SPZ.Awk	Control box for presence check, incl. 10 m of hose material and wall penetration (in conjunction with SPZ.Awk-Vor)								

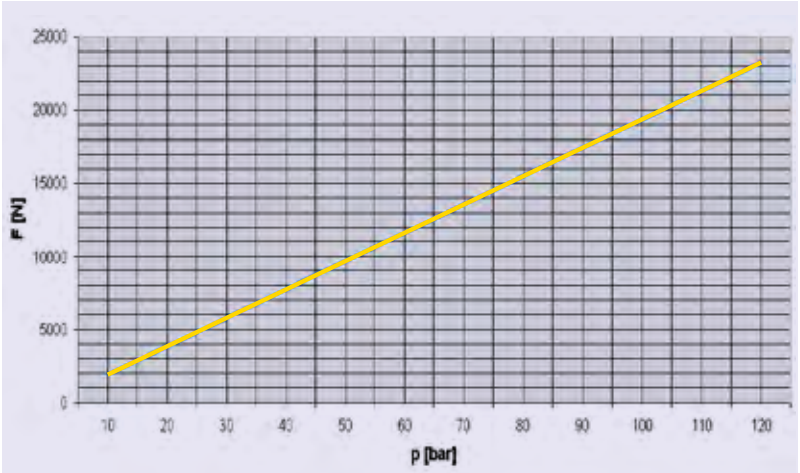
* If in combination with pL accessories, only on request (only possible for stroke 2.5 mm and 9 mm)

Principle of operation



Presence check control box (SPZ.Awk)

Hydraulically actuated: Force diagram 10...120 bar
(compression or tension; for suitable hydraulic unit, please refer to **p. 69**)

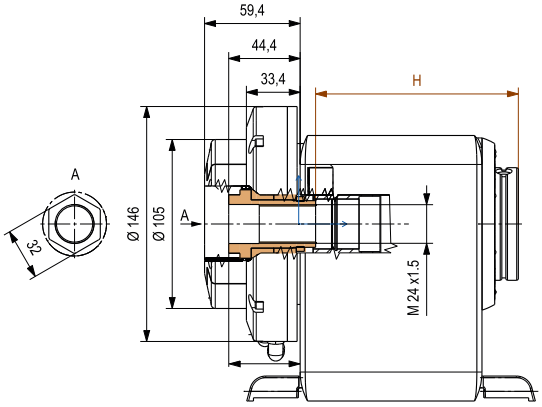


Pneumatic clamping cylindres with adjustable stroke

1 2 3

More Information for clamping cylinder **p. 50**, rotary unions **p. 52**, angular position measuring system **p. 55**

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



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

Pneumatic clamping cylinder

Pneumatic clamping cylinder with stroke limit

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

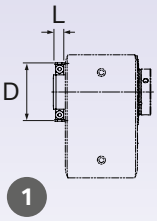
Raised center height on T-type rotary tables

For all combinations with the possible spindle accessories.

	Item no.	Increase	1 3 4 WMS2	2 WMS7	1 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	3 WMS7+ SPZ15
TIP1		without			•	•	•	•							
TIP1	**SPH.TIP1-40**	40mm	•		•	•	•	•	•						
TIP1	**SPH.TIP1-80**	80mm	•		•	•	•	•	•		•		•		
TIP2		without	•		•	•	•	•							
TIP2	**SPH.TIP2-40**	40mm	•	•	•	•	•	•	•	•					
TIP2	**SPH.TIP2-80**	80mm	•	•	•	•	•	•	•	•	•	•	•	•	•
TIP3		without			•	•									
TIP3	**SPH.TIP3-50**	50mm	•	•	•	•	•	•	•	•					
TIP3	**SPH.TIP3-100**	100mm	•	•	•	•	•	•	•	•	•	•	•	•	•
TAP1		without			•	•	•								
TAP1	**SPH.TAP1-40**	40mm	•		•	•	•	•							
TAP2		without			•	•	•								
TAP2	**SPH.TAP2-60**	60mm	•	•	•	•	•	•	•	•					
TAP3		without			•	•	•								
TAP3	**SPH.TAP3-50**	50mm	•	•	•	•	•	•	•	•					
TOP1		without			•	•	•								
TOP1	**SPH.TOP1-40**	40mm	•		•	•	•	•							
TOP1	**SPH.TOP1-100**	100mm	•		•	•	•	•	•		•		•		
TOP2		without			•	•	•								
TOP2	**SPH.TOP2-60**	60mm	•	•	•	•	•	•	•	•					
TOP2	**SPH.TOP2-120**	120mm	•	•	•	•	•	•	•	•	•	•	•	•	•
TOP3		without			•	•	•								
TOP3	**SPH.TOP3-50**	50mm	•	•	•	•	•	•	•	•					
TOP3	**SPH.TOP3-100**	100mm	•	•	•	•	•	•	•	•	•	•	•	•	•

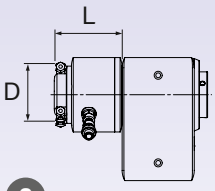
WMS = Angular position measuring system, SPZ = Clamping cylinder, DDF = Rotary unions

Ultra-compact, for air and oil



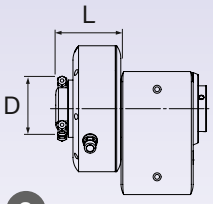
1

directly on the spindle



2

in combination with WMS RxN-2xxx



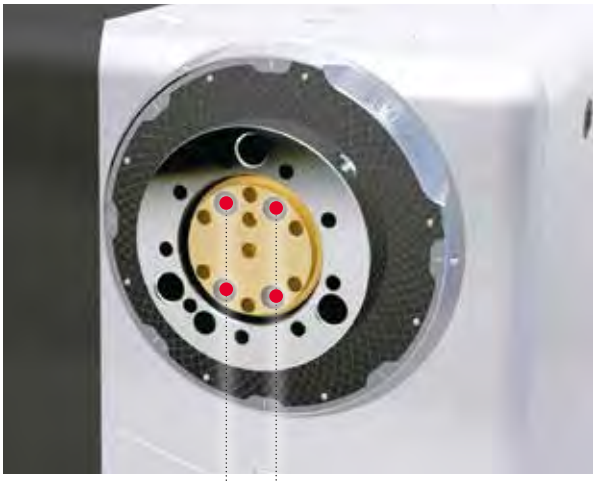
3

in combination with WMS RxN-8xxx

Rotary unions for rotary table

	Item no.	Flutes	Oil	Air	D[mm]	L [mm] 1	L [mm] 2	L [mm] 3
507	**DDF.507-04**	4	•	•	100	30		
	DDF.507-04-2	4	•	•			119	
510	**DDF.510-04**	4	•	•		21		
	DDF.510-06	6	•	•				
	DDF.510-04-2	4	•	•			101	
	DDF.510-04-7	4	•	•				96
	DDF.510-06-7	6	•	•				
520	**DDF.520-04**	4	•	•		42		
	DDF.520-06	6	•	•				
	DDF.520-04-2	4	•	•			134	
	DDF.520-04-7	4	•	•				129
	DDF.520-06-7	6	•	•				
530	**DDF.530-04**	4	•	•		34		
	DDF.530-06	6	•	•				
	DDF.530-04-2	4	•	•			113	
	DDF.530-04-7	4	•	•				102
	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	1 DDF	2 WMS2+DDF	3 WMS7+DDF
TIP1		without	•		
	SPH.TIP1-40	40mm	•	•	
	SPH.TIP1-80	80mm	•	•	
TIP2		without	•		
	SPH.TIP2-40	40mm	•	•	•
	SPH.TIP2-80	80mm	•	•	•
TIP3		without	•		
	SPH.TIP3-50	50mm	•	•	•
	SPH.TIP3-100	100mm	•	•	•
TAP1		without	•		
	SPH.TAP1-40	40mm	•		
TAP2		without	•		
	SPH.TAP2-60	60mm	•	•	•
TAP3		without	•		
	SPH.TAP3-50	50mm	•	•	•
TOP1		without	•		
	SPH.TOP1-40	40mm	•		
	SPH.TOP1-100	100mm	•	•	
TOP2		without	•		
	SPH.TOP2-60	60mm	•	•	•
	SPH.TOP2-120	120mm	•	•	•
TOP3		without	•		
	SPH.TOP3-50	50mm	•	•	•
	SPH.TOP3-100	100mm	•	•	•

Rotary unions (DDF) for counter bearing (GLA)

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

DDF on GLA for T-type rot. table

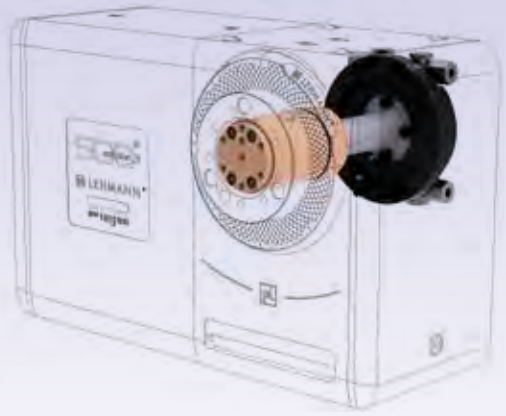
4 connections, at rear

DDF on GLA for rotoFIX

2 connections facing up

2 connections facing down

All rotary unions:
Channel size ø3.5 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:

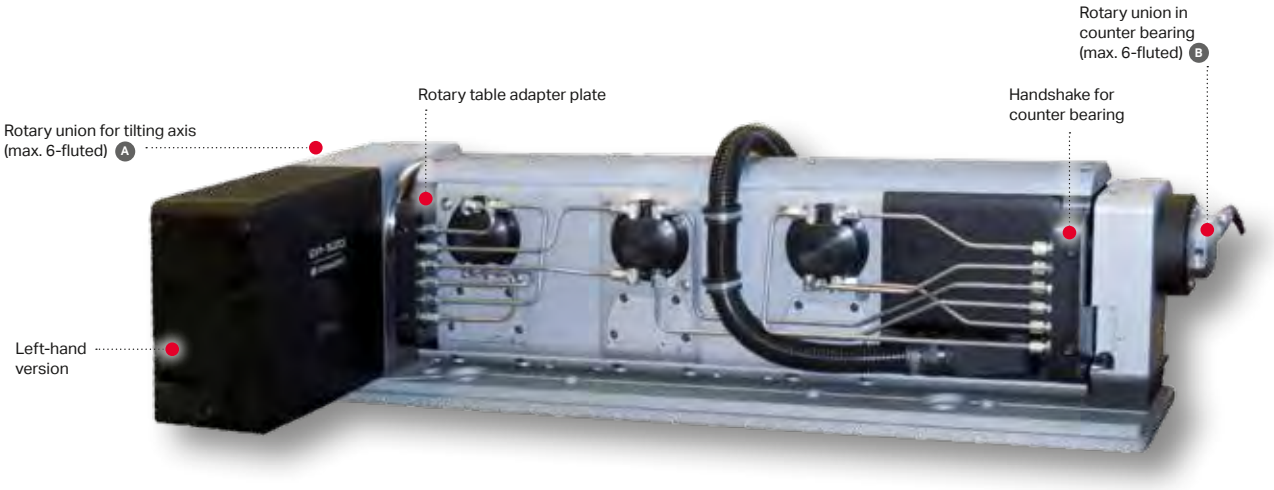
	Item no.	Left	Right	A	B	Remarks
TxP	**DDF.TxP1.Lx-04**	●		●		not possible for version TxP1c
	DDF.TxP1.Rx-04		●	●		not possible for version TxP1c
	DDF.TxP2.Lx-04-2	●		●		not possible for versions TxP2c and Oxx
	DDF.TxP2.Lx-06-2	●		●		not possible for versions TxP2c and Oxx
	DDF.TxP2.Rx-04-2		●	●		not possible for versions TxP2c and Oxx
	DDF.TxP2.Rx-06-2		●	●		not possible for versions TxP2c and Oxx
	DDF.TxP3.Lx-04-2	●		●		
	DDF.TxP3.Lx-06-2	●		●		
	DDF.TxP3.Rx-04-2		●	●		
	DDF.TxP3.Rx-06-2		●	●		
TOP	**DDG.TOP1-04**	●	●		●	
	DDG.TOP2-04-2	●	●		●	
	DDG.TOP2-06-2	●	●		●	
	DDG.TOP3-04-2	●	●		●	
	DDG.TOP3-06-2	●	●		●	
TGR	**DDF.TGR2.Lx-04**	●		●		
	DDF.TGR2.Lx-06	●		●		
	DDF.TGR2.Rx-04		●	●		
	DDF.TGR2.Rx-06		●	●		
	DDF.TGR3.Lx-04	●		●		
	DDF.TGR3.Lx-06	●		●		
	DDF.TGR3.Rx-04		●	●		
	DDF.TGR3.Rx-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
DDF.WMS-7-TxP	●	●	Adjustment strip, rotary table adapter plate



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)

	Unloaded		Standard load sls cube *	
0°...90° [arc sec]	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. 87**

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. 55**). 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. 105**.

	Positioning	Simultaneous
Size	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

Accuracy comparison µm/angular seconds

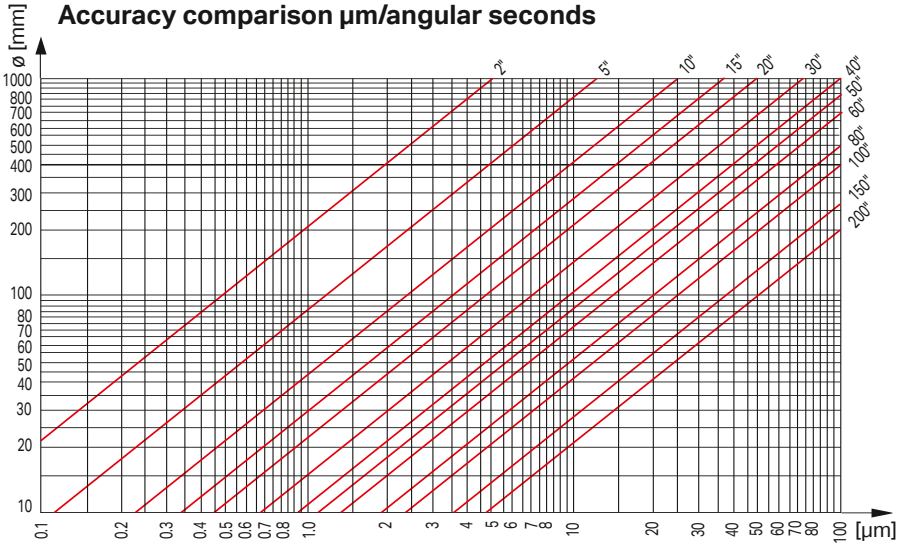
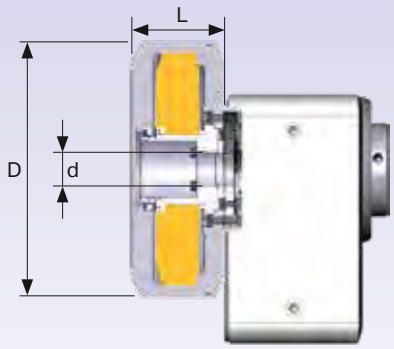


Diagram for determining the relationship between angular seconds and µm on the basis of diameter

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	only possible on EA-, TF- and T1-type rotary tables (for data, see respective rotary table on **p. 26–41**)

Add-on parts, assembly and measurement

	Item no.	d	D	L	507	510	520	530
Preparation	**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
	WMS.TOP2-Vor2	15	130	102	for counter bearing TOP2 1 3 4			

1

Heidenhain RxN 2xxx
Passage: ø 20

2

Heidenhain RxN 8xxx
Passage: ø 60

3

Magnescale RU 97

4

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
	WMS.275	RON 275, 5VTTL	± 5	Haas/Hurco	1
	WMS.8390F	RCN 8390F, Fanuc (replaces RCN 727F)	± 2	ø 60 mm	2
	WMS.8390M	RCN 8390M, Mitsubishi (replaces RCN 727M)	± 2	ø 60 mm	2
	WMS.8380	RCN 8380, Endat/1Vss (replaces RCN 729)	± 2	ø 60 mm	2
	WMS.8590F	RCN 8590F, Fanuc (replaces RCN 827F)	± 1	ø 60 mm	2
	WMS.8590M	RCN 8590M, Mitsubishi (replaces RCN 827M)	± 1	ø 60 mm	2
	WMS.8580	RCN 8580, Endat/1Vss (replaces RCN 829)	± 1	ø 60 mm	2
Magnescale	**WMS.RU97A**	RU97A, Siemens driveCliq (only for Solution Line)	± 2.5		3
	WMS.RU77F	RU77, Fanuc	± 2.5		4
	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

Important information

On T1-507510 with a WMS, the tilting range option for 180° is not possible

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 WMS2	2 WMS7	2 WMS2+DDF	3 WMS7+DDF	2 WMS2+SPZ2.5	3 WMS7+SPZ2.5	2 WMS2+SPZ9	3 WMS7+SPZ9	3 WMS7+SPZ15
TIP1		without									
	SPH.TIP1-40	40mm	•		•						
	SPH.TIP1-80	80mm	•		•		•		•		
TIP2		without	•								
	SPH.TIP2-40	40mm	•	•	•	•					
	SPH.TIP2-80	80mm	•	•	•	•	•	•	•	•	•
TIP3		without									
	SPH.TIP3-50	50mm	•	•	•	•					
	SPH.TIP3-100	100mm	•	•	•	•	•	•	•	•	•
TAP1		without									
	SPH.TAP1-40	40mm	•								
TAP2		without									
	SPH.TAP2-60	60mm	•	•	•	•					
TAP3		without									
	SPH.TAP3-50	50mm	•	•	•	•					
TOP1		without									
	SPH.TOP1-40	40mm	•								
	SPH.TOP1-100	100mm	•		•		•		•		
TOP2		without									
	SPH.TOP2-60	60mm	•	•	•	•					
	SPH.TOP2-120	120mm	•	•	•	•	•	•	•	•	•
TOP3		without									
	SPH.TOP3-50	50mm	•	•	•	•					
	SPH.TOP3-100	100mm	•	•	•	•	•	•	•	•	•

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. 26–47**).

Motor flange, max
507 = 70x70 mm, 510 = 80x80 mm
520 = 110x110 mm, 530 = 130x130 mm

Motor table

		pL LEHMANN Item no.	Motor manufacturer Item no.	Voltage [V AC]	s = Standard o = Option				Dimension X Motor pos. L/R				Overall transmission ratio i_{tot}			
					507 / 508	510 / 511	520	530	507 / 508	510 / 511	520	530	507 / 508	510 / 511	520	530
MOVINOR / MAVILOR (Siemens, Heidenh.)	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	
OK-UMA	BL-ME24J-50SN						s				335				180:1	
	BL-ME80J-40SN							s				390				120:1
SIE-MENS	1FK7042-2AK71	**Drive cliq**	1FK7042-2AK71-1RG0				s				335				150:1	
	1FK7062-2AH71	**Drive cliq**	1FK7062-2AH71-1RG0					s				390				150:1

* on T1-510520 TGR2, the standard motor used in the tilt axis is Movinor LN-098 or Fanuc alpha 4/5000(HV)is

Suitable servo amplifiers for the respective motor

+ incl. required connection material
+ Wall penetrations (WDF) **p. 60/61**, loose accessories (LOZ) **p. 72/73** and commissioning (INB.1AX-SP or INB.2AX-SP) recommended

Connection material

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

*** Where item no. missing, on request**

	Item no.*	Servo model	Number of axes	Input [V DC]	Design current [A]	Peak current [A]	Motor				
Brother							R2Ax 06040 FXP00M	R2Ax 08075 FXP00M			
		Sanyo RS2W01A0KL10XXXXC00		300 DC		15	🔴				
		Sanyo RS2W03A0KL10XXXXC00				30	🟢	🟢			
Fanuc 200V							β1/6000is	α2/5000is	α4/5000is		
	SER.F1-aiSV20-B-EA	SVM1 αiSV 20	1	300 DC	6.5	20	🟢	🟢	🟢		
		SVM1 αiSV 80	1		19	80					
	SER.F1-biSV20-B-EA	SVM1 βiSV 20	1	3x200-240 AC	6.8	20	🟢	🟢	🟢		
	SER.F1-biSV40-B-EA	SVM1 βiSV 40	1		13	40					
		SVM1 βiSV 80	1		18.5	80					
		SVM2 αiSV 4/20	1	300 DC	6.5	20	🟢	🟢	🟢		
	SER.F1-aiSV20/20-B-Tx	SVM2 αiSV 20/20	2	300 DC	6.5	20	🟢	🟢	🟢		
		SVM2 αiSV 20/40	2		6.5	20	🟢	🟢	🟢		
		SVM2 αiSV 40/80	2		6.5/19	20/80	🟢	🟢	🟢		
		SVM2 αiSV 80/80	2		19	80					
		SVM2 αiSV 80/160	2		19	80					
	SER.F1-biSV20/20-B-Tx	SVM2 βiSV 20/20	2	3x200-240 AC	2x6.5	20	🟢	🟢	🟢		
		SVM3 αiSV 20/20/20	3	300 DC	3x6.5	20	🟢	🟢	🟢		
		SVM3 αiSV 20/20/40	3			20	🟢	🟢	🟢		
Fanuc 400V							α2/5000HVis	α4/5000HVis	α8/4000 HVis		
		SVM1 αiSV 10HV	1	600 DC	3.1	10	🟢	🟢			
		SVM1 αiSV 40HV	1		9.1	40			🟢		
		SVM1 βiSV 10HV	1	3x400-480 AC	3.1	10	🟢	🟢			
		SVM1 βiSV 40HV	1		9.2	40			🟢		
		SVM2 αiSV 10/10HV	2	600 DC	3.1	10	🟢	🟢			
		SVM2 αiSV 20/40HV	2		9.1	40			🟢		
		SVM2 αiSV 40/40HV	2		9.1	40			🟢		
		SVM2 αiSV 40/80HV	2		9.1	40			🟢		
Heidenhain							BLS072-A-ERN/EQN	BLS073-A-ERN/EQN	LN098-2-C-ERN/EQN		
		UE 212B	5	565	7.5/15	15/30	🟢	🟢	🔴		
		UE 242B	5		1x23	3x15	🟢	🟢	🔴		
		UM 111 / UM 111D	1	565/650	1x7.5	1x15	🟢	🟢	🔴		
		UM 111B / UM 111BD	1		1x15	1x30	🟠	🟠	🟢		
		UM 121 / UM 121D	2		2x7.5	2x15	🟢	🟢	🔴		
		UM 121B / UM 121BD	2		2x15	2x30	🟠	🟠	🟢		
Mitsubishi 200V							HG-56	HG-75	HG-105	HG-104	
		MDS-E-V1-20	1	270-324DC	6.4		🟢	🟢	🟢		
		MDS-E-V1-40	1		10.9					🟢	
		MDS-E-V2-20	2		6.4		🟢	🟢	🟢		
		MDS-E-V2-40	2		10.9			🟢	🟢	🟢	
		MDS-E-V2-80	2		16					🟢	
		MDS-E-V3-20	3		6.4		🟢	🟢	🟢		
		MDS-E-V3-40	3		10.9			🟢	🟢	🟢	
Mitsubishi 400V								HG-H75	HG-H105	HG-H104	
	SER.MI4-EJH-15A-EA	MDS-EJH-V1-15	1	513-648	2.8			🟢			
	SER.MI4-EJH-20A-EA	MDS-EJH-V1-20	1		5.4				🟢	🟢	
	SER.MI4-EH-10A-EA	MDS-EH-V1-10	1		2.3			🟢	🟢		
	SER.MI4-EH-20A-EA	MDS-EH-V1-20	1		4.9					🟢	
	SER.MI4-EH-10A-Tx	MDS-EH-V2-10	2		2.3			🟢	🟢		
	SER.MI4-EH-20A-Tx	MDS-EH-V2-20	2		4.9			🟢	🟢	🟢	
		MDS-EH-V2-40	2		7.7					🟢	
Siemens Sinamics S120 (Solutionline)							BLS072-A-ERN/EQN	BLS073-A-ERN/EQN	LN098-2-C-ERN/EQN	1FK7042-2AK71-1RG0	1FK7062-2AH71-1RG0
		6SL3120-1TE13-0ADx 6SL3420-1TE13-0AAx	1	510-720DC	3	9	🔴	🔴		🔴	
	SER.Mx-6SL3120-EA	6SL3120-1TE15-0ADx 6SL3420-1TE15-0AAx	1		5	15	🟢	🟢		🟢	
		6SL3120-1TE21-0ADx 6SL3420-1TE21-0AAx	1		9	27	🟠	🟠	🔴	🟠	🟢
		6SL3120-1TE21-8ADx 6SL3420-1TE21-8AAx	1		18	54	🟠	🟠	🟢	🟠	🟠
		6SL3120-1TE23-0AAx	1		30	56					
		6SL3420-2TE11-0AAx	2		2x1.7	2x5.1	🟠	🟠	🟠	🟠	🟠
		6SL3120-2TE13-0ADx 6SL3420-2TE13-0AAx	2		2x3	2x9	🔴	🔴		🔴	
	SER.Mx-6SL3120-Tx	6SL3120-2TE15-0ADx 6SL3420-2TE15-0ADx	2		2x5	2x15	🟢	🟢		🟢	
		6SL3120-2TE21-0ADx	2		2x9	2x27	🟠	🟠	🔴	🟠	🟢
		6SL3120-2TE21-8AAx	2		2x18	2x36	🟠	🟠	🟢	🟠	🟠
Yaskawa Sigma 5							SGMJV-04	SGMJV-08	SGMEV-15		
		Yaskawa SGDV-2R8A01A		3x200-230V AC	2.8	9.3	🟢				
		Yaskawa SGDV-3R8A01A			3.8	11	🟢	🔴			
		Yaskawa SGDV-5R5A01A			5.5	16.9	🟠	🟢			
		Yaskawa SGDV-120A01A			11.6	28	🟠	🟠	🟢		
Yaskawa Sigma 7							SGM7J-06	SGM7J -08	SGM7A -25		
		Yaskawa SGD7S-5R5A00A (±10V)		3x200-230V AC	5.5	16.9	🟢	🟢			
		Yaskawa SGD7S-200A00A (±10V)			19.6	56			🟢		
		Yaskawa SGD7S-5R5AA0A (EtherCAT)			5.5	16.9	🟢	🟢			

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






	Machine Type	CNC System	CNC Type	Input Voltage	507 (508)	510 (511)	520	530
Akira Seiki	Vx Series	Mitsubishi	M700	200 V AC	●	●	●	●
Alzmetall	BAZ35	Heidenhain	TNC426	400 V AC	○	○	○	●
AMS	MVC400	Fanuc	0iMD	200 V AC	●	●	●	○
Awea	AF-1000	Fanuc	18iMB	200 V AC	●	●	●	●
	AF-1060	Heidenhain	iTNC530	400 V AC	●	●	●	○
	AF-1250	Heidenhain	iTNC530	400 V AC	●	●	●	○
Axa	DBZ	Heidenhain	iTNC530	400 V AC	○	○	○	○
BFW	Dhruva 4070HE	Fanuc	0iMD	200 V AC	●	○	●	●
	Dhruva	Siemens	828D	?	○	○	○	○
	Dhruva	Mitsubishi	MV70BV	?	○	○	○	○
Bridgeport	XV2290	Siemens	828D	400 V AC	●	●	●	●
Brother	R450X1	Sanyo	C00	200 V AC	●	○	●	●
	Sx00X1	Sanyo	C00	200 V AC	●	●	●	○
	TC-22Bn	Yaskawa	B00	200 V AC	●	○	●	●
	TC-32Bn/FT/QT	Yaskawa	B00	200 V AC	●	○	●	●
	TC-R2B	Sanyo	B00	200 V AC	●	○	●	●
	TC-S2Dn	Sanyo	B00	200 V AC	●	○	●	●
Chevalier	SMART III Series	Syntec	21MA	200 V AC	●	●	●	○
	FMG 1632CNC-HD	Siemens	840Dsl	400 V AC	●	●	●	○
Chiron	FZ 12W	Fanuc	31iB5	400 V AC	●	●	●	●
	Mill2000	Siemens	840Dsl	400 V AC	○	●	●	○
DMG MORI	DMU 50, 70, 100			400 V AC	○	○	○	○
	Milltap 700	Siemens	840Dsl	400 V AC	●	●	●	●
	DMC xx35V			400 V AC	○	○	○	○
	DMC xx50V	Siemens	840Dsl	400 V AC	○	○	○	○
	DMF			400 V AC	○	○	○	○
	CMX xx35V	Siemens	840Dsl	400 V AC	●	●	●	○
	CMX xx50V	Siemens	840Dsl	400 V AC	●	●	●	○
	CMX xx50V	Fanuc	?	?	○	○	○	○
	NVX5x Series	Mitsubishi	M730BM	200 V AC	●	●	●	●
Doosan	DNM400–650	Siemens	828Dsl	400 V AC	●	●	●	●
	DNM400–650	Fanuc	0iMD	200 V AC	●	●	●	●
	DNM500 II, 650 II	Fanuc	0iMD	200 V AC	●	●	●	●
	DNM400–650HS	Fanuc	30/31/32i-A	200 V AC	○	○	○	○
	DT360D	Fanuc	0iMD	200 V AC	○	○	○	○
	DT400	Fanuc	0iMD	200 V AC	○	○	○	○
	Mynx7500/50	Fanuc	0iMD	200 V AC	●	●	●	●
	VC430 / VC510	Fanuc	0iMD	200 V AC	●	●	●	○
	VM5400, 6400	Fanuc	30/31/32i-A	200 V AC	○	○	○	○
Fanuc Robodrill	a-T14iFx	Fanuc	31i-A5/B5	200 V AC	○	○	○	○
	a-T21iFx	Fanuc	31i-A5/B5	200 V AC	○	○	○	○
	a-D14xiA(5)	Fanuc	31i-B5	200 V AC	●	●	●	○
	a-D21xiA(5)	Fanuc	31i-B5	200 V AC	●	●	●	○
	a-D21xiB(5)	Fanuc	31i-B5	200 V AC	○	○	○	○

	Machine Type	CNC System	CNC Type	Input Voltage	507 (508)	510 (511)	520	530
GF Mikron	MillS400	Heidenhain	iTNC530	400 V AC	●	●	●	○
	VCE			400 V AC	○	○	○	○
	VCP			400 V AC	○	○	○	○
Haas	Minimill, VF-x, DT-1	HAAS	> M18.7	200 V AC	●	●	●	○
	OM-2A	HAAS	> M18.7	200 V AC	●	●	●	○
	VF-x	HAAS NGC	100.16. 000.1021	200 V AC	●	●	●	○
Hasegawa	PM250	Fanuc	31i-B5	200 V AC	●	●	●	○
Hermle	C800U	Siemens	840Dpl	400 V AC	○	○	●	○
Hurco	VMX10(i)	HURCO	WinMax V9.x	200 V AC	●	●	●	●
	VMX24(i), 30(i)	HURCO	WinMax V9.x	200 V AC	●	●	●	●
	VMX24, 30	HURCO	WinMax V8.x	200 V AC	●	●	●	●
	VMX42	HURCO	WinMax V8.x	200 V AC	●	●	●	●
	VMX42(i)	HURCO	WinMax V9.x	200 V AC	●	●	●	●
Hyundai WIA	F400	Fanuc	0iMD	200 V AC	●	●	●	○
Jyoti	VMC640	Siemens	810D	400 V AC	○	○	○	○
KAAST	KAAST	Fanuc			○	○	○	○
Lapmaster	Micron Macro-S/SK	Siemens	840Dpl	400 V AC	●	●	○	○
Leadwell	LCV760	Fanuc	0iMF	200 V AC	●	●	●	○
Makino	Slim3N	Fanuc	0iMD	400 V AC	●	●	●	○
	PS95	Fanuc	?	?	○	○	○	○
Mazak	VCS430	Mazak (Mitsubishi)	SMART or MATRIX NEXUS 2	200 V AC	○	●	●	○
	VCS530CSL	Mazak (Mitsubishi)	SMART	200 V AC	○	●	●	○
	VTC800	Mazak (Mitsubishi)	Mazatrol	400 V AC	○	●	●	●
POSmill	B800	FANUC	0iMD	200 V AC	●	●	●	●
	C1050	Heidenhain	iTNC530 HSCI	400 V AC	●	●	●	○
	C1050	Heidenhain	TNC620	400 V AC	●	●	●	○
	C800	Heidenhain	iTNC530 HSCI	400 V AC	●	●	●	○
Quaser	MV154	Fanuc	?	200 V AC	○	○	○	○
	MV184	Fanuc	0iMFi	200 V AC	●	●	●	●
	MV184	Heidenhain	TNC620	400 V AC	●	●	●	○
	MV184	Siemens	828D	400 V AC	●	●	●	○
	MV234	Fanuc	31iB	200 V AC	●	●	●	●
	MV235	Fanuc	31iB	200 V AC	●	●	●	●
Reckermann	Kombi 1300	Heidenhain	TNC320	400 V AC	●	●	●	○
Republic Lagun	VGC5028	Fanuc	31i-B5	200 V AC	○	○	○	○
Sauer	Lasertech 45	Siemens	840Dsl	400 V AC	●	●	●	○
Spinner	MVC610	Siemens	840Dsl	400 V AC	●	●	●	●
Tongtai	VU5	Siemens	840dDsl	400 V AC	○	○	○	○
Wagner	WMC1100B	Siemens	828D	400 V AC	○	○	○	○

● 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	520520
Akira Seiki	Vx Series	Mitsubishi	M700	200 V AC	●	●	●	●
					○	○	○	○
Alzmetall	BAZ35	Heidenhain	TNC426	400 V AC	○	○	○	○
AMS	MVC400	Fanuc	0iMD	200 V AC	○	○	○	○
					○	○	○	○
Awea	AF-1000	Fanuc	18iMB	200 V AC	●	●	●	●
	AF-1060	Heidenhain	iTNC530	400 V AC	●	●	●	●
	AF-1250	Heidenhain	iTNC530	400 V AC	●	●	●	●
Axa	DBZ	Heidenhain	iTNC530	400 V AC	○	○	○	○
BFW	Dhruva 4070HE	Fanuc	0iMD	200 V AC	○	○	○	○
	Dhruva	Siemens	828D	?	○	○	○	○
	Dhruva	Mitsubishi	MV70BV	?	○	○	○	○
Bridgeport	XV2290	Siemens	828D	400 V AC	○	○	○	○
Brother	R450X1	Sanyo	C00	200 V AC	●	●	●	●
	Sx00X1	Sanyo	C00	200 V AC	●	●	●	●
	TC-22Bn	Yaskawa	B00	200 V AC	●	●	●	●
	TC-32Bn/FT/QT	Yaskawa	B00	200 V AC	●	●	●	●
	TC-R2B	Sanyo	B00	200 V AC	●	●	●	●
	TC-S2Dn	Sanyo	B00	200 V AC	●	●	●	●
Chevalier	SMART III Series	Syntec	21MA	200 V AC	●	●	●	●
	FMG 1632CNC-HD	Siemens	840Dsl	400 V AC	●	●	●	●
Chiron	FZ 12W	Fanuc	31iB5	400 V AC	○	○	○	○
	Mill2000	Siemens	840Dsl	400 V AC	●	●	●	●
DMG MORI	DMU 50, 70, 100			400 V AC	○	○	○	○
	Milltap 700	Siemens	840Dsl	400 V AC	●	●	●	●
	DMC xx35V			400 V AC	○	○	○	○
	DMC xx50V	Siemens	840Dsl	400 V AC	○	○	○	○
	DMF			400 V AC	○	○	○	○
	CMX xx35V	Siemens	840Dsl	400 V AC	●	●	●	●
	CMX xx50V	Siemens	840Dsl	400 V AC	●	●	●	●
	CMX xx50V	Fanuc	?	?	○	○	○	○
	NVX5x Series	Mitsubishi	M730BM	200 V AC	●	●	●	●
Doosan	DNM400–650	Siemens	828Dsl	400 V AC	●	●	●	●
	DNM400–650	Fanuc	0iMD	200 V AC	○	○	○	○
	DNM500 II, 650 II	Fanuc	0iMD	200 V AC	○	○	○	○
	DNM400–650HS	Fanuc	30/31/32i-A	200 V AC	○	○	○	○
	DT360D	Fanuc	0iMD	200 V AC	○	○	○	○
	DT400	Fanuc	0iMD	200 V AC	●	●	●	●
	Mynx7500/50	Fanuc	0iMD	200 V AC	○	○	○	●
	VC430 / VC510	Fanuc	0iMD	200 V AC	○	○	○	○
	VM5400, 6400	Fanuc	30/31/32i-A	200 V AC	○	○	○	○
Fanuc Robodrill	a-T14iFx	Fanuc	31i-A5/B5	200 V AC	○	○	○	○
	a-T21iFx	Fanuc	31i-A5/B5	200 V AC	●	●	●	●
	a-D14xiA(5)	Fanuc	31i-B5	200 V AC	●	●	●	●
	a-D21xiA(5)	Fanuc	31i-B5	200 V AC	○	○	○	○
	a-D21xiB(5)	Fanuc	31i-B5	200 V AC	●	●	●	●

	Machine Type	CNC System	CNC Type	Input Voltage	50x510	51x510	51x520	520520
GF Mikron	MillS400	Heidenhain	iTNC530	400 V AC	○	○	○	○
	VCE			400 V AC	○	○	○	○
	VCP			400 V AC	●	●	●	●
Haas	Minimill, VF-x, DT-1	HAAS	> M18.7	200 V AC	●	●	●	●
	OM-2A	HAAS	> M18.7	200 V AC	●	●	●	●
	VF-x	HAAS NGC	100.16. 000.1021	200 V AC	●	●	●	○
Hasegawa	PM250	Fanuc	31i-B5	200 V AC	○	○	○	○
Hermle	C800U	Siemens	840Dpl	400 V AC	●	●	●	●
Hurco	VMX10(i)	HURCO	WinMax V9.x	200 V AC	●	●	●	●
	VMX24(i), 30(i)	HURCO	WinMax V9.x	200 V AC	●	●	●	●
	VMX24, 30	HURCO	WinMax V8.x	200 V AC	●	●	●	●
	VMX42	HURCO	WinMax V8.x	200 V AC	●	●	●	●
	VMX42(i)	HURCO	WinMax V9.x	200 V AC	○	○	○	○
Hyundai WIA	F400	Fanuc	0iMD	200 V AC	○	○	○	○
Jyoti	VMC640	Siemens	810D	400 V AC	○	●	○	○
KAAST	KAAST	Fanuc			○	○	○	○
Lapmaster	Micron Macro-S/SK	Siemens	840Dpl	400 V AC	●	●	●	●
Leadwell	LCV760	Fanuc	0iMF	200 V AC	○	○	○	○
Makino	Slim3N	Fanuc	0iMD	400 V AC	○	○	○	○
	PS95	Fanuc	?	?	○	○	○	○
Mazak	VCS430	Mazak (Mitsubishi)	SMART or MATRIX NEXUS 2	200 V AC	○	○	○	○
	VCS530CSL	Mazak (Mitsubishi)	SMART	200 V AC	●	●	●	●
	VTC800	Mazak (Mitsubishi)	Mazatrol	400 V AC	●	●	●	●
POSmill	B800	FANUC	0iMD	200 V AC	●	●	●	●
	C1050	Heidenhain	iTNC530 HSCI	400 V AC	○	○	○	○
	C1050	Heidenhain	TNC620	400 V AC	●	●	●	●
	C800	Heidenhain	iTNC530 HSCI	400 V AC	●	●	●	●
Quaser	MV154	Fanuc	?	200 V AC	○	○	○	○
	MV184	Fanuc	0iMFi	200 V AC	○	○	○	○
	MV184	Heidenhain	TNC620	400 V AC	○	○	○	○
	MV184	Siemens	828D	400 V AC	○	○	○	○
	MV234	Fanuc	31iB	200 V AC	○	○	○	○
	MV235	Fanuc	31iB	200 V AC	○	○	○	○
Reckermann	Kombi 1300	Heidenhain	TNC320	400 V AC	○	○	○	○
Republic Lagun	VGC5028	Fanuc	31i-B5	200 V AC	○	○	○	○
Sauer	Lasertech 45	Siemens	840Dsl	400 V AC	○	○	○	○
Spinner	MVC610	Siemens	840Dsl	400 V AC	●	●	●	●
Tongtai	VU5	Siemens	840dDsl	400 V AC	●	●	○	○
Wagner	WMC1100B	Siemens	828D	400 V AC	○	○	○	○

● 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

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

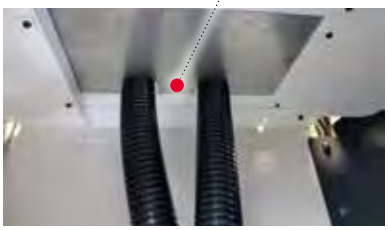
Customer-provided additional cover on cabin wall feedthrough WDF.xx-K

Mazak: Plug-in connection of top of cabin

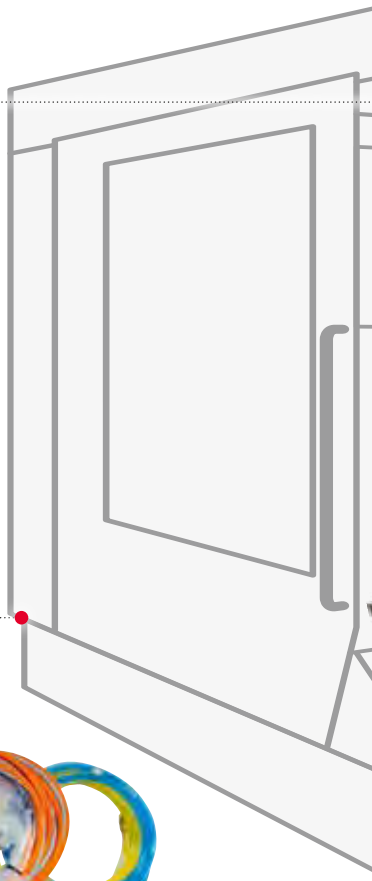
Connectors suitable for Standard preparation for Kitagawa (Plug and Play):
Pull original cable and connectors onto top of cabin and connect to pL LEHMANN connectors.

Connectorless installation, performed through hole in cabin

View of outside



View of inside

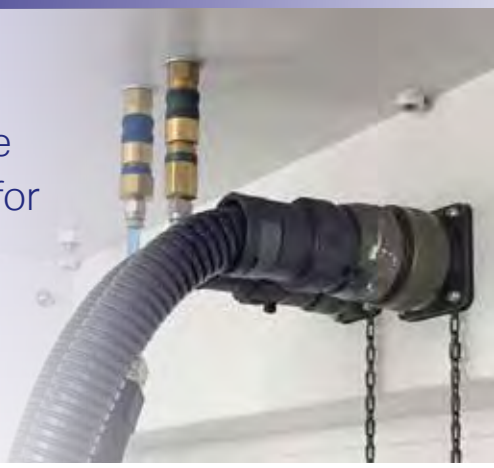


Control cabinet wall feedthrough, Harting, WDF.xx-S ...

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

WDF.M2-S-2

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



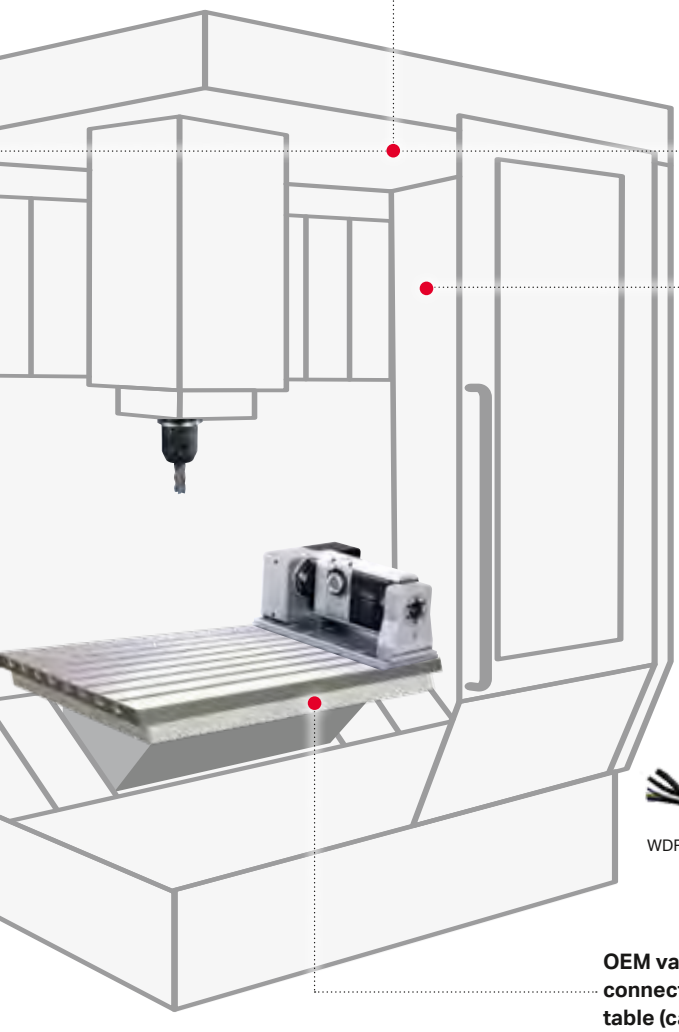
Wall mounting of WDF.xx-MIL

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

WDF.Fx-R1

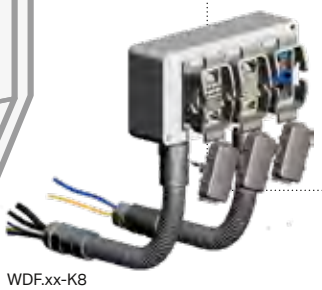
View of outside

Harting mating connector (without cable)



WDF.K8 inside

WDF.K8 outside



WDF.xx-K8

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

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

HARTING K8

(pL-Standard)

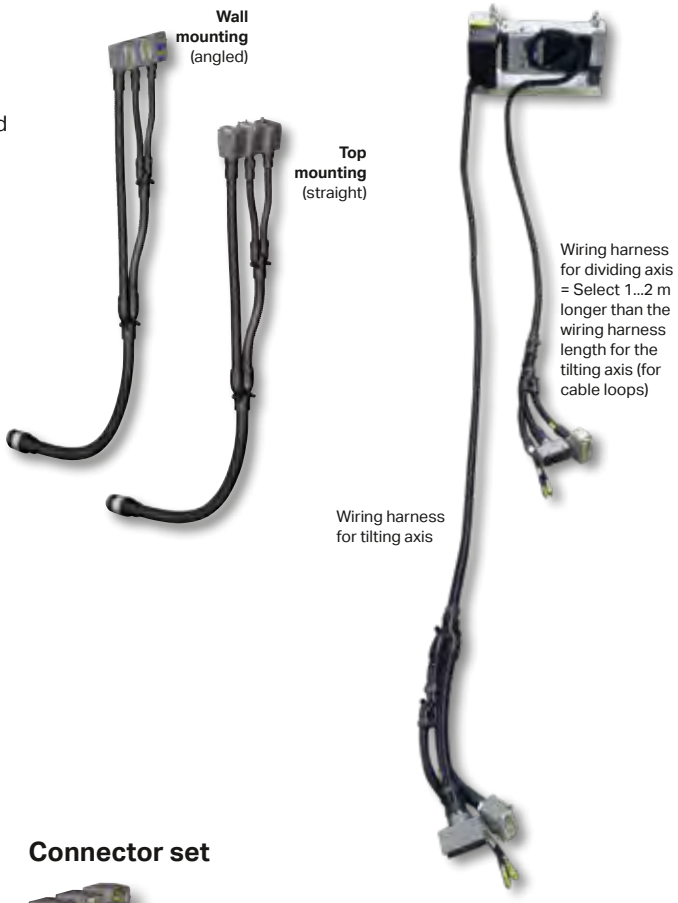
all in tight connector housings

A cable set is an essential accessory to guarantee imperviousness.

HARTING M4

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
M4g = Harting M4 straight
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
F3 = Fanuc α
F4 = Fanuc β
M1 = Movinor / Mavilor ERN
M2 = Movinor / Mavilor EQN
MI2 = Mitsubishi HF/HG(-H)
SA = Sanyo
Y2 = Yaskawa SGMJV / SGMEV, SGM7J
OK = Okuma

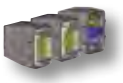
Cable lengths
Standard = 2 m, 4 m, 6 m
Special = 1 m, 3 m, 5 m (additional charge)

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

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.DMbw
STE.DMbw-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.MIb	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

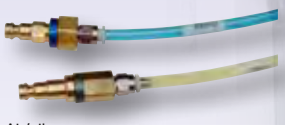
MIL

Electric

Air/oil

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.F3-3.0-HYa-2	Hyundai 4th axis
KAB.F3-2.0-HYaz-2	Hyundai 5th axis
KAB.F3-3.0-MKaT-2	Makino Slim3
KAB.F3-2.0-MKaSE-2	Makino Slim3
KAB.F3-3.0-MKbT-2	Makino PS95/105
KAB.F3-2.0-MKbSE-2	Makino PS95/105
KAB.F3-3.0-MKcT-2	Makino F
KAB.F3-2.0-MKcSE-2	Makino F
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, 4th axis
KAB.M1-0.95-DMa2-2	Deckel Maho DMC xx50V, 5th axis
KAB.M1-0.95w-DMa-2	Deckel Maho DMC xx50V, 4th axis
KAB.M1-0.95w-DMa2-2	Deckel Maho DMC xx50V, 5th axis
KAB.M1-1.7-DMa-2	DMG Mori CMX xx00V
KAB.M1-1.9-DMa-2	DMC xx35V(eco) and Milltap 700, 4th axis
KAB.M1-1.9-DMa2-2	DMC xx35V(eco), 5th axis
KAB.M1-1.9w-DMa-2	DMC xx35V(eco) and Milltap 700, 4th axis
KAB.M1-1.9w-DMa2-2	DMC xx35V(eco), 5th 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-MIa-2	Mikron VCP 600/800 and VCP1000 Duro
KAB.M1-3.0-MIb-2	Mikron VCE 600 Pro - VCE 1400 Pro
KAB.M1-5.0-MIb-2	Mikron VCE 1600
KAB.M1-1.1-MIc-2	Mikron HSM
KAB.M1-1.5-MIc-2	Mikron HPM
KAB.MI1-3.0-MZa-2	Mazak, 4th axis
KAB.MI2-4.0-MZa-2	Mazak, 4th axis
KAB.MI2-3.0-MZaz-2	Mazak, 5th axis
KAB.OK-3.0-OKa-2	Okuma Genos
KAB.OK-3.0-OKb-2	Okuma MB, 4th axis
KAB.OK-3.0-OKbz-2	Okuma MB, 5th axis
KAB.SA-1.3-BRa-2	Brother Speedio RX1/RX2
KAB.SA-5.0-BRa-2	Brother Speedio SX1/SX2
KAB.SA-6.0-BRa-2	Brother Speedio SX1/SX2
KAB.Y2a-2.5-HUb-2	Hurco 4th axis: Hurco VM1, VM2, VM3, VMX10, VMX24, VMX30, VMX40; 4th/5th axis: VM1, VM2, VM3, VMX10
KAB.Y2-2.5-HUb-2	
KAB.Y2-2.5w-HUb-2	
KAB.Y2-3.5-HUb-2	Hurco 4th axis: Hurco VMX42; 4th/5th axis: VMX24, VMX30, VMX40, VMX42, VMX50, VMX64
KAB.Y2-3.5w-HUb-2	
KAB.Y2-5.0-HUb-2	Hurco 4th axis: Hurco VMX50, VMX60, VMX64, VMX84; 4th/5th axis: VMX60, VMX84
KAB.Y2-5.0w-HUb-2	
KAB.Y2a-5.0-HAa-2	Haas
KAB.Y2-5.0-HAa-2	Haas
KAB.Y2-5.0w-HAa-2	Haas

Mating plugs / wall feedthroughs

Item no.		Designation	
LOZ.Io		Air/oil	
WDF.K8	Mating plug	Harting HanK8/24	1
WDF.R1	Mating plug	MIL round connector 28-11N/20-29W	4
WDF.R1z	Mating plug	MIL round connector 28-11Z/20-29Z	4
WDF.WMS	Mating plug	M23, 17-pole	
WDF.WMS-Fx-PCR	Mating plug	M23, 17-pole, Fanuc	
WDF.WMS-MIx-10P	Mating plug	M23, 17-pole, Mitsubishi	
WDF.Fx-S-2	Wall bushing	Control cabinet, per axis for Fanuc	2
WDF.Fx-Sw-2	Wall bushing	WMS, control cabinet, per axis for Fanuc	2
WDF.Fx-R1(z)-S-2	Wall bushing	Control cabinet, per axis for Fanuc	
WDF.Mx-S-2	Wall bushing	Control cabinet, per axis for Mavilor	2
WDF.Mx-Sw-2	Wall bushing	WMS, control cabinet, per axis for Mavilor	2
WDF.M2-R1(z)-S-2	Wall bushing	Control cabinet, per axis for Mavilor	
WDF.M1-DOa	Wall bushing	Encoder plug for Doosan	
WDF.Fx-K-2	Wall bushing	Cabinet wall, per axis for Fanuc	3
WDF.Fx-Kw-2	Wall bushing	WMS, cabinet wall, per axis for Fanuc	3
WDF.Mx-K-2	Wall bushing	Cabinet wall, per axis for Mavilor	3
WDF.Mx-Kw-2	Wall bushing	WMS, cabinet wall, per axis for Mavilor	3
WDF.Mx-M4-2	Wall bushing	Cabinet wall, per axis for Mavilor	
WDF.Io	Wall bushing	Air/oil	

WMS = Angular position measuring system

1 Loose mating plugs K8

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

2 Control cabinet wall feedthrough

- 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

3 Cabinet wall feedthrough

- 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

4 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

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

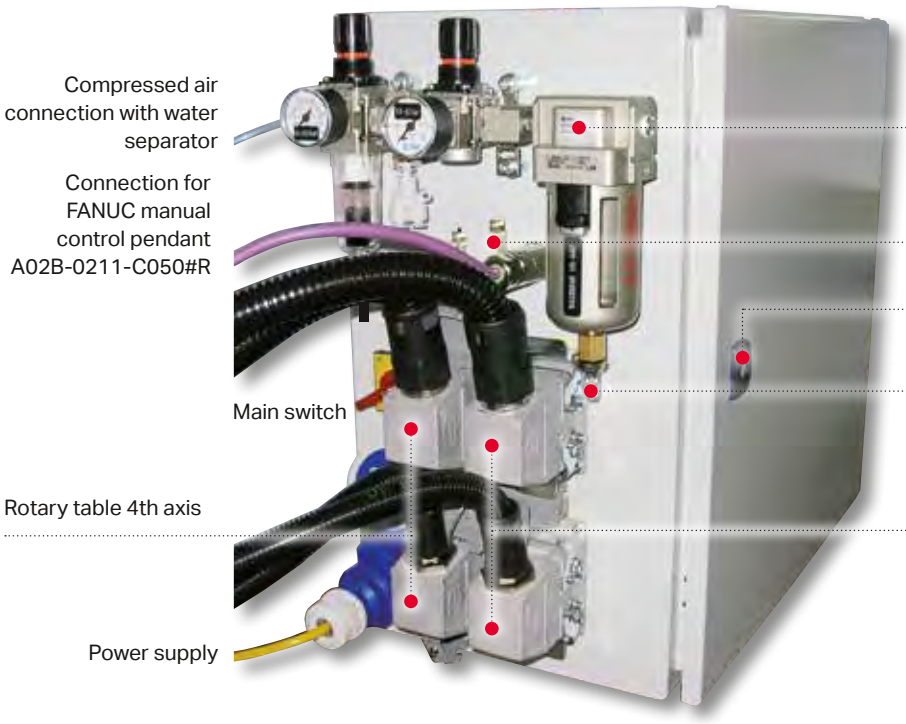
CNC control system for 1 or 2 axes

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

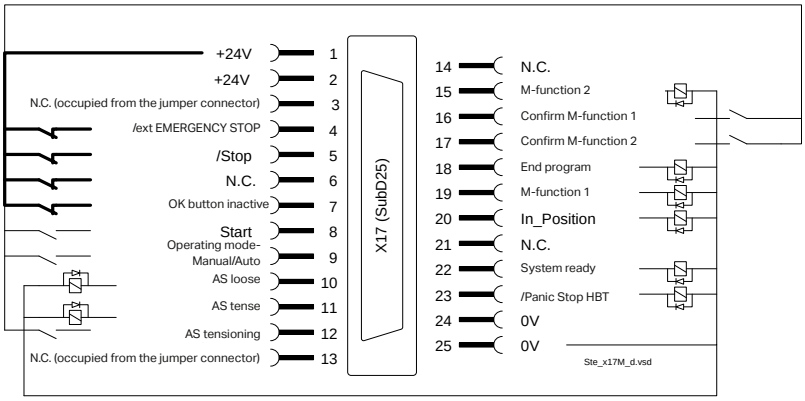


For rotary table cabling, see **p. 62**; if not stated otherwise, all cables are 4 m, cable for manual control pendant is 5m

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. 64/65**
CNC.2AX-FA	CNC control system Fanuc 35iB, 2-axis	see **p. 64/65**
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

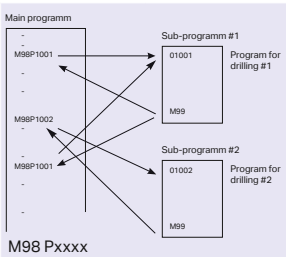
Features	Specifications	Remarks
1. Programmable angle	0.001 ... 9999.999°	freely programmable
2. Sub-programs	Yes	can be nested in 4 ways
3/ Total storage capacity	4000 characters (bytes)	Optional 128 kBytes
4. Number of programs, incl. macros	63	Optional 400
5. Program storage buffering	via battery	
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. «Exteral 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
Circle milling 	G91 G01 A45 F100	G01 = Feed F = °/min
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;	
Auto reference 	G28 A00	Moves to reference position

Incremental / absolute divisions 	G91 G00 A45; M00 (cycle stop); A181.567; M00 (cycle stop); A90.987; M00 (cycle stop); G90 A0;	
Workpiece zero point offset 	G53 = Delete zero point offset G54 = Set zero point offset	
Continuous turning 	M04 S0.5; G04 X30000; M05	30 seconds continuous turning in counterclockwise direction at 0.5 [1/min] (only 4th axis)
M-function	M110 M111 M112 M113 M114	Acknowledgeable M-functions, parameterizable

Subprogram call 	M98 Pxxxx	
Delay time 	G04 X1000	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.

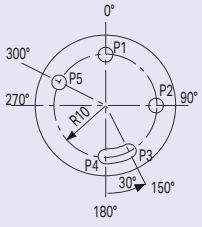
Programming

Programming uses the internationally known ISO code.

Programming example 1 – axis:

%;
O0001 (Tes tprogram 1);

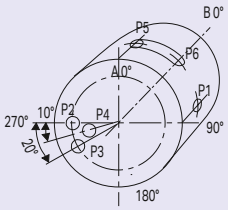
N10 G90 G00 A0 (P1);
N20 M00 (cycle stop);
N30 G90 G00 A90 (P2);
N40 M00 (cycle stop);
N50 G90 G00 A150 (P3);
N60 M00 (cycle stop);
N70 G91 G01 A30 F40 (P4);
N80 M00 (cycle stop);
N90 G90 G00 A300 (P5);
N100 M30 (PG end)



Programming example 2 – axis:

%;
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);



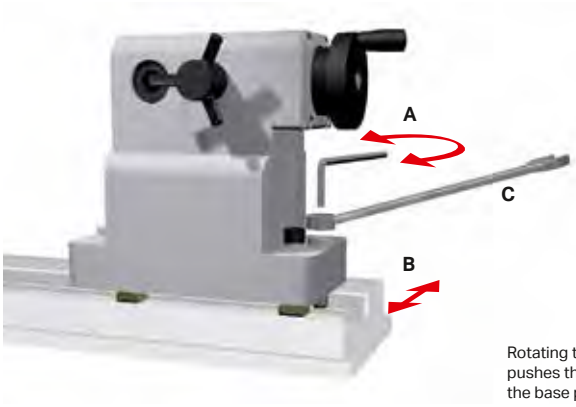
Example of M-functions

CNC machine program	Fanuc CNC 35iB program
N... N1030 G90 G00 X4 Y14 Z40; N1040 M?? →	%; O1001(FanucNC PG); N10 G90 G00 A90; N20 M00 (cycle stop);
N1050 G90 G00 X8 Y4 Z30; N1060 M?? →	N30 G90 G00 A45; N40 M00 (cycle stop);
N1070 G90 G00 X16 Y2 Z33; N1080 M?? →	N50 G90 G00 A00; N60 M30 (PG end)
N1090 G90 G00 X16 Y2 Z33; N1100 M30	

M?? = M-function according to CNC machine

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

zentriX alignment system (example: tailstock on longFLEX)



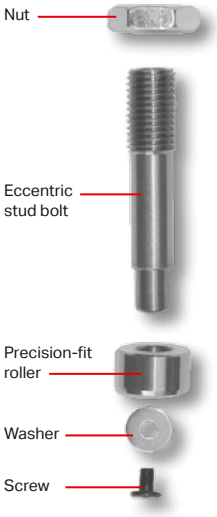
Item no.	Designation	Slot width
AUR.zX-12	**zentriX** alignment pin, 1 pair	12g6
AUR.zX-14		14g6
AUR.zX-16		16g6
AUR.zX-18		18g6

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-rotary-tables.com

available for ...

All longFLEX versions

All tailstocks



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

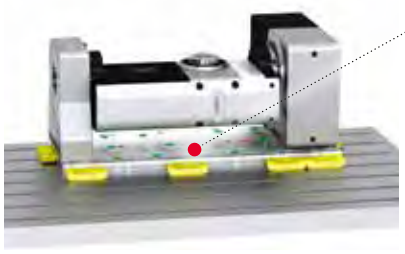
Y-mounting (crosswise)

Functional principle

retracted, not used

Alignment element in slot 1 (e.g. 14 mm)

Alignment element in slot 2 (e.g. 18 mm)



X-mounting (lengthwise)

- Position of the lineFIX pins.
- Hole pattern for 100 and 125 mm.
- Clamping claws (If necessary)

As a standard feature, every T-type rotary table has two **lineFIX** pins (for a slot width of 14 or 18 mm). Depending on the arrangement, four different precision-fit holes are available. Every base plate has a hole pattern that matches a T-slot spacing of 100 mm and 125 mm. After being set up initially with **lineFIX** pins, the rotary table undergoes final adjustment and is then secured in position using these holes.

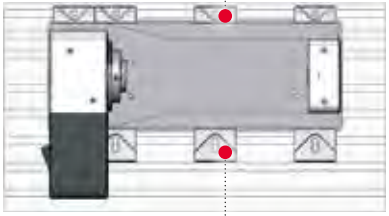
Item no.	Designation	Slot width
AUR.iX-12-16	Option (1 pair)	12/16
AUR.iX-14-18	Standard (1 pair)	14/18
LOZ.Bride-L	Long clamps, for 63/125 grid pattern*	

* 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.Bride-L**): for use when mounting at intermediate positions.

GLA.520hd


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)
+ Center height 0 +0.04 mm
+ Delivered with bearing pin

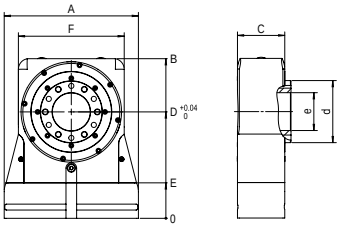
	Item no.	Clamping torque* [Nm]	Max. pull-out torque [Nm]	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	d [mm]	e [mm]	weight [kg]
507	**GLA.TOP1-110**	300	not availaable	155	170	55	110	30	110	70	46.55	7
507	**GLA.TOP1-150**	300	not availaable	155	210	55	150	70	110	70	46.55	9
510, 520, 530	**GLA.TOP2-150**	2'000	On request	227	240	80	150	30	179	105	64	21
510, 520, 530	**GLA.TOP2-180**	2'000	On request	227	270	80	180	60	179	105	64	24
510, 520, 530	**GLA.TOP2-220**	2'000	On request	227	310	80	220	100	179	105	64	29
510, 520, 530	**GLA.TOP2-280**	2'000	On request	227	370	80	280	160	179	105	64	36
all sizes	**GLA.HYD-fix**	Hydraulik-Kit fix										
all sizes	**GLA.HYD-vario-2**	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. 30% (applies to rotary table and counter bearing)

Suitable alignment elements

(for GLA.TOP only)

Item no.	Designation	Slot width
AUR.iX-12-16	Option (1 pair)	12/16
AUR.iX-14-18	Standard (1 pair)	14/18



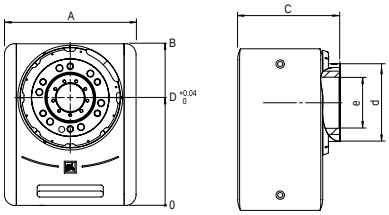
GLA.510hd-150, GLA.520hd-180

NEW

+ 2x radial and axial bearings (as on rotary tables)
+ Prepared for automatic clamping, oil connection from below and from side
+ Max. allowed hydraulic pressure 220 bar
+ Center height 0 +0.04 mm

Item no.	Clamping torque* [Nm]	Max. pull-out torque [Nm]	A [mm]	B [mm]	C [mm]	D [mm]	d [mm]	e [mm]	weight [kg]
GLA.510hd	800	2'000	170	215	150	150	80	34	32
GLA.520hd	2'000	3'900	220	270	171	180	130	46	62

* at hydraulic pressure = 220 bar



CYMAX hydraulic unit

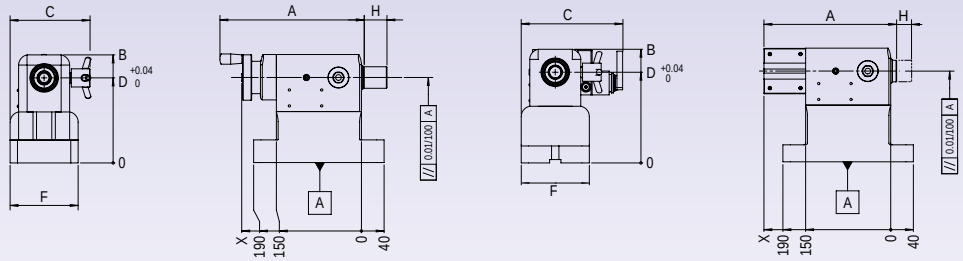
Item no.	Designation	Technical data
HAG.CY-AGG-1*	Cymax hydraulic unit	1 clamping circuit, 400 V (can be converted to 200 V)
HAG.CY-AGG-2*	Cymax hydraulic unit	2 clamping circuits, 400 V (can be converted to 200 V)
HAG.LEIT-05-2	Hydraulic line with threaded fitting (supplied loose)	1 pair (2 pieces),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

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

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

gripPACK suitable only for clamping cylinder with 2.5 mm stroke (must be ordered separately)

Item no.	Designation	Technical data
HAG.510-ph	Pressure intensifier package, integrated into cover, installed opposite motor (see image)	Clamping / unclamping: Manually via hand switch. No separate compressed air infeed necessary
HAG.520-ph		



measured without load, quill extended halfway

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

Center height D [mm]	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		●
220	**RST.LIG-220m**	LIGHT tailstock	255		142		40	●			35		●
	RST.LIG-220p [1]	LIGHT tailstock	238	260	184	120	40		●		35		●
	RST.LIG-220h [1]	LIGHT tailstock			168		40			●	40		●
280	**RST.LIG-280m**	LIGHT tailstock	255		142		40	●			42		●
	RST.LIG-280p [1]	LIGHT tailstock	238	310	184	120	40		●		42		●
	RST.LIG-280h [1]	LIGHT tailstock			168		40			●	47		●
Tailstock Option / Accessories	**RST.L-m**	Left-hand version, manual											●
	RSTL-p	Left-hand version, pneumatic										●	
	RST.R-poh	Pneumatic, without manual lever valve										●	
	RST.L-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)

[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

Morse taper size (DIN 228)
– COMPACT = MK 2
– LIGHT = MK 3

✗ CANNOT be retrofitted
✓ can be retrofitted

Suitable alignment elements

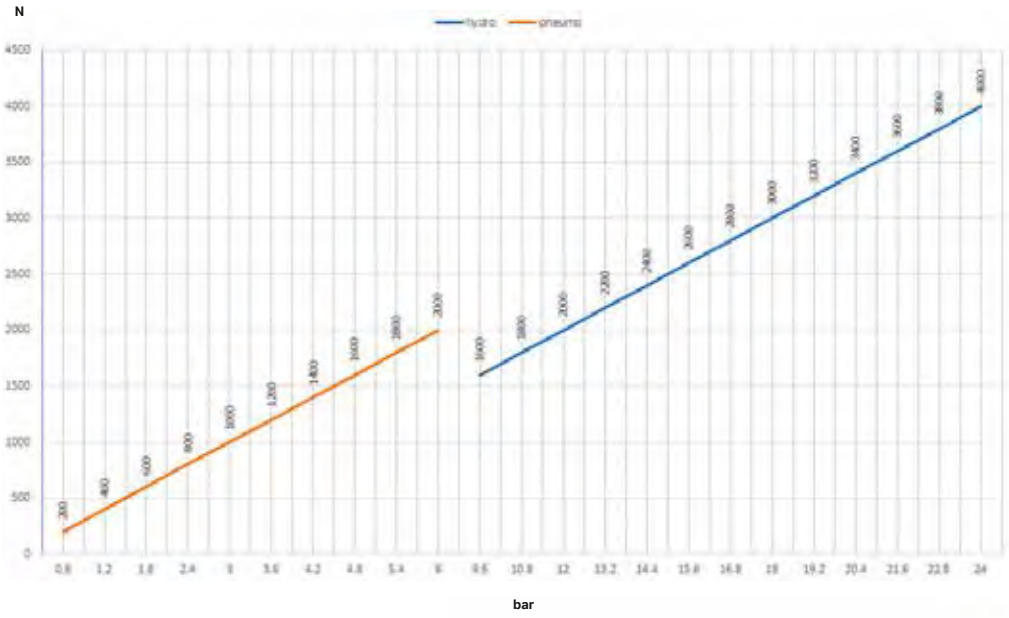
Item no.	Designation	Slot width
AUR.zX-12	**zentriX** alignment pin, 1 pair	12g6
AUR.zX-14		14g6
AUR.zX-16		16g6
AUR.zX-18		18g6

Manual version (right-hand)

Pneumatic version (right-hand)

Hydraulic version (right-hand)

Pressure-force diagram



Left-hand model.

Tailstock modules

Everything included

LOZ.FAN-EA

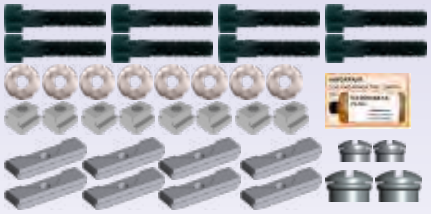
LOZ.5xx-EA

Small parts

	Item no.	For machine	For product	Maintenance unit	Gear oil, clamps, steel plugs	Fastening material on machine table (screws, T-slot nuts)	Alignment slot nut (1 pair)	Mating plug	Mating plug, air / oil
507	**LOZ.507-EA**		EA-507	x	x				
	LOZ.507-LFX		longFlex	x	x				
510	**LOZ.5x0-EAo**		EA-510/520.Ox	x	x				
	LOZ.510-EA		EA-510	x	x				
	LOZ.510-LFX		longFlex	x	x				
520	**LOZ.5x0-EAo**		EA-510/520.Ox	x	x				
	LOZ.520-EA		EA-520	x	x				
530	**LOZ.530-EA**		EA-530	x	x				
all sizes	**LOZ.5xx-M2**		M2-5xx	x	x				
	LOZ.5xx-M3+M4		M3/M4-5xx	x	x				
	LOZ.5xx5xx-TIP		TF-5xx5xx TIP	x	x				
	LOZ.5xx5xx-T1+2		T1/T2-5xx5xx	x	x				
	LOZ.5xx5xx-T3+4		T3/T4-5xx5xx	x	x				
	LOZ.5xx-RFX		rotoFIX	x	x				
	LOZ.GLA-TOP		for counter bearing		x*				
	LOZ.Nute12-EA		EA, 12mm			x			
	LOZ.Nute12-Tx		Mx-/Tx, 12mm			x			
	LOZ.Nute14-EA		EA, 14mm			x			
	LOZ.Nute14-Tx		Mx-/Tx, 14mm			x			
	LOZ.Nute16-EA		EA, 16mm			x			
	LOZ.Nute16-Tx		Mx-/Tx, 16mm			x			
	LOZ.Nute18-EA		EA, 18mm			x			
	LOZ.Nute18-Tx		Mx-/Tx, 18mm			x			
	LOZ.RST-14		for tailstock LIGHT			x	x**		
	LOZ.RST-18		for tailstock LIGHT			x	x**		
Machine-specific installation kits	**LOZ.AKI-Vx-EA**	Akira Seiki Vx	EA			x			x
	LOZ.AKI-Vx-Tx	Akira Seiki Vx	Tx			x			x
	LOZ.BFW-EA	BFW Dhruva HSTC	EA			x		x	
	LOZ.BFW-Tx	BFW Dhruva HSTC	Tx			x		x	
	LOZ.CHE-EA	Chevalier SMART III	EA			x	x		x
	LOZ.DMG-xxxV	Deckel DMC xxxV	EA		x	x	x		
	LOZ.DMG-CMX-EA	DMG CMX xx00V	EA		x	x	x		
	LOZ.DMG-CMX-Tx	DMG CMX xx00V	Tx		x	x			
	LOZ.DMG-DMF (530)	Deckel DMF	EA		x	x	x		
	LOZ.DMG-DMU	Deckel DMU	EA		x	x	x		
	LOZ.DMG-JP-EA	DMG Mori CMX xx00V + NVX (JP made)	EA			x	x		
	LOZ.DMG-JP-Tx	DMG Mori CMX xx00V + NVX (JP made)	EA			x			
	LOZ.DOO-EA	Doosan DNM/DVM/VM & Mynx	EA			x	x		x
	LOZ.DOO-Tx	Doosan DNM/DVM/VM & Mynx	Tx			x			x

* without gear oil
** with zentriX alignment system (instead of alignment slot nut) and with a fixed center MK3

Everything included



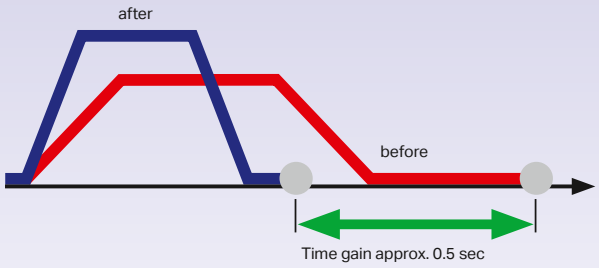
LOZ.DMG-CMX-Tx

LOZ.DOO-EA

	Item no.	For machine	For product	Maintenance unit	Gear oil, clamps, steel plugs	Fastening material on machine table (screws, T-slot nuts)	Alignment slot nut (1 pair)	Mating plug	Mating plug, air / oil
Machine-specific installation kits	**LOZ.DOO-DT-EA**	Doosan DT360D/DT400	EA			x			x
	LOZ.DOO-DT-Tx	Doosan DT360D/DT400	Tx			x			x
	LOZ.DOO-VC-EA	Doosan VC430/VC510	EA			x			x
	LOZ.DOO-VC-Tx	Doosan VC430/VC510	Tx			x			x
	LOZ.FAN-EA	Fanuc	EA			x			
	LOZ.FAN-Tx	Fanuc	Tx			x			
	LOZ.HAA-OM-EA	Haas (only OM-2A)	EA			x			
	LOZ.HAA-EA	Haas (without OM-2A)	EA			x			
	LOZ.HAA-Tx	Haas (without OM-2A)	Tx			x			
	LOZ.HAR-EA	Hardinge V480/710	EA			x	x		x
	LOZ.HAR-Tx	Hardinge V480/710	Tx			x			x
	LOZ.HAR-V1000-EA	Hardinge V1000	EA			x	x		x
	LOZ.HAR-V1000-Tx	Hardinge V1000	Tx			x			x
	LOZ.HWA-HIT-EA	Hwacheon HIT 400	EA			x	x		x
	LOZ.HWA-HIT-Tx	Hwacheon HIT 400	Tx			x			x
	LOZ.HYU-EA	Hyundai F-Series	EA			x			x
	LOZ.HYU-Tx	Hyundai F	Tx			x			x
	LOZ.LIT-EA	Litz TV	EA			x	x		x
	LOZ.LIT-Tx	Litz TV	Tx			x			x
	LOZ.MAK-PS-EA	Makino PS95/105	EA			x	x		x
	LOZ.MAK-SLI-EA	Makino Slim3	EA			x			
	LOZ.MAK-SLI-Tx	Makino Slim3	Tx			x			
	LOZ.MAZ-VCP-EA	Mazak VCP	EA			x	x		x
	LOZ.MAZ-VCP-2EA	Mazak VCP	2 x EA or 2 x M			x			x
	LOZ.MAZ-VCx-EA	Mazak VCS/VCN	EA			x	x		x
	LOZ.MAZ-VTC-EA	Mazak VTC	EA			x	x		x
	LOZ.MAZ-VTC-Tx	Mazak VTC	Tx			x			x
	LOZ.MIK-HxM	Mikron HSM/HPM	EA		x	x	x		
	LOZ.MIK-VCP	Mikron VCP	EA	x	x	x	x		
	LOZ.MIK-VCE (530)	Mikron VCE	EA	x	x	x	x		
	LOZ.MOR-NVX-EA	Mori Seiki NVX 5xxx	EA			x			x
	LOZ.MOR-NVX-Tx	Mori Seiki NVX 5xxx	Tx			x			x
	LOZ.OKU-EA	Okuma MB and Genos	EA			x	x		x
	LOZ.OKU-Tx	Okuma MB and Genos	Tx			x			x
	LOZ.PRI-EA	Priminer (Kaast) VxL-Series	EA			x	x		x
	LOZ.PRI-Tx	Priminer (Kaast) VxL-Series	Tx			x			x
	LOZ.PRI-V6-EA	Priminer (Kaast) V6L	EA			x	x		x
	LOZ.QUA-EA	Quaser MV	EA			x			
	LOZ.QUA-Tx	Quaser MV	Tx			x			
	LOZ.TON-EA	Tongtai VU-5	EA			x			
	LOZ.TON-Tx	Tongtai VU-5	Tx			x*			
	LOZ.WEL-EA	Wele AQ	EA			x	x		x
	LOZ.WEL-Tx	Wele AQ	Tx			x			x

* incl. LOZ.Bride-L

We support you from A to Z, whether you have problems or when its a matter of optimization



Optimization of the cycle time (CMS **position**)

commissioningService

Commissioning of new machines with controls from Siemens, Heidenhain, Fanuc, Brother, Hurco, Mitsubishi, Haas, Mazak, Okuma. In addition to **basic commissioning** (see **p. 77**), we optimize for positioning and simultaneous operation through our application support on request.

Goal
Improved application, optimal adjustment of rotary table and machine, higher productivity

For item no., see **p. 78**

3-D measurement

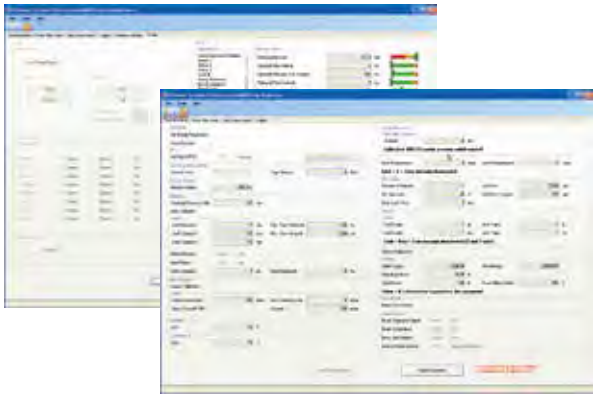
Mech. + electr. installation

helplineService

Telephone service from 7:30 a.m. – 12:00 noon and 2:00 p.m. – 5:00 p.m. as well as 24-h/5-day telephone service for all pL service centers

+ Technical assistance
+ Diagnostic support
+ Organizing factory and field service
+ Taking spare part orders

Goal
To help quickly, competently and unbureaucratically



Maximum productivity requires that your application be taken in account – we can help you

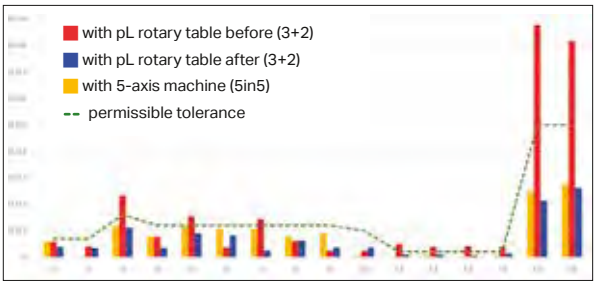
Optimally clamped? We can also provide on-site assistance in this regard.

applicationSupport

Experience has shown: A considerable improvement in time needed per piece and workpiece accuracy are almost always possible.
+ Clamping the workpiece correctly, Optimizing machining processes
+ Improving workpiece accuracy (alignment, 0-point...)
+ Fine tuning of drives and CNC parameterization

Goal
To extract the maximum, improve efficiency, lower workpiece costs, increase workpiece accuracy

For item no., see **p. 78**



Errors at the measuring points before and after APS **precision** for 3-D machining.

Examples from actual practice:

A. Maximization of productivity

1. Clamping deactivated when necessary
   + Reason: Production of small parts
   + Result: Productivity increased significantly

2. Speed increased from 12 to 58 rpm
   + Reason: Non-optimal commissioning by OEM
   + Result: Cycle time shortened noticeably

3. 'Catalog'-values (maximum values) set; at the same time, acceleration reduced by 30% (high moment of inertia)
   + Reason: Non-optimal commissioning by OEM
   + Result: Cycle time shortened noticeably, speed increased

4. Parameters adjusted on the basis of pL calculations, idle times reduced from 100 ms to 10 ms, clamping deactivated sometimes
   + Reason: Maximum possible optimization of time needed per piece
   + Result: Time needed per piece before 60 s, after 40 s; productivity increased 33%

5. Parameters for interpolation optimized, clamping idle times reduced from 500 ms to 10 ms / 1000 ms to 300 ms
   + Reason: Making machining an impeller possible with a 3+2 machine concept
   + Result: ED 100% and impeller production possible, cycle time shortened noticeably

B. Prevention of future damage/hazards

1. 'Releasing clamps' reduced from 300 ms to 100 ms
   + Reason: Unnoticed product flaw (pL)
   + Result: Cycle time shortened noticeably

2. Assignment of B/C-axis clamping/unclamp macros corrected
   + Reason: Incorrect commissioning by OEM
   + Result: Future production downtime prevented

3. Control OFF set after spindle 'clamped'
   + Reason: Incorrect commissioning by OEM
   + Result: Future production downtime prevented

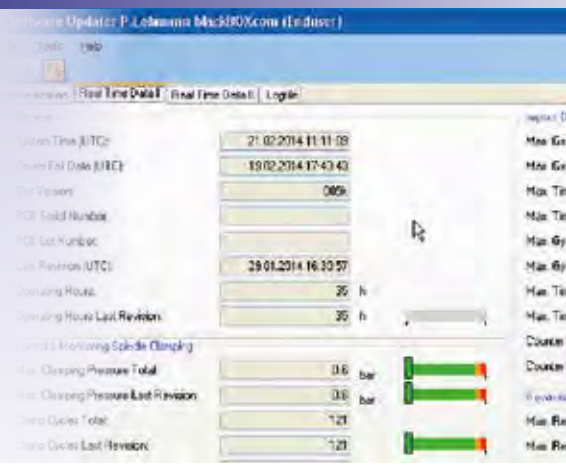
C. Optimization of workpiece accuracy

1. Positioning accuracy optimized from 100 to 10 increments
   + Reason: Incorrect commissioning by OEM
   + Result: Noticeably more accurate workpieces

2. Lag after servo OFF eliminated, position drift stopped
   + Reason: Incorrect commissioning by OEM
   + Result: Faulty workpieces during volume production prevented

3. Alignment and 0-point correction of the rotary table
   + Reason: Careless assembly by OEM
   + Result: Volumetric accuracy improved considerably

We also support you after the purchase to ensure high availability of your equipment



activeService[1)]

[1)] an excerpt from our Active Services; please contact us for additional options

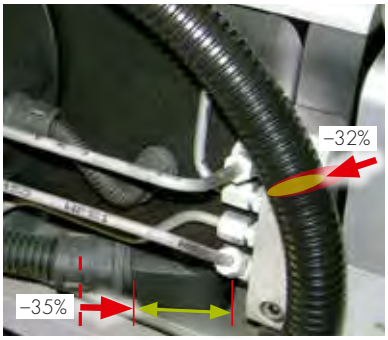
easyCheck
+ Visual inspection
+ Hose check
+ Oil check/maintenance unit
+ Bleed if necessary
+ Read and evaluate blackBOX data
+ Status report with recommendation

Facts
+ Without maintenance contract
+ We schedule the region on our own
+ Then notify the intended customers of the pending visit
+ Customers can decide yes or no

Benefits
+ Prevention helps to minimize expensive downtime
+ Travel costs are prorated
+ The customer does not need to think about it
+ No contract, you are free to decide annually
+ Based on the worldwide practical experience of pL

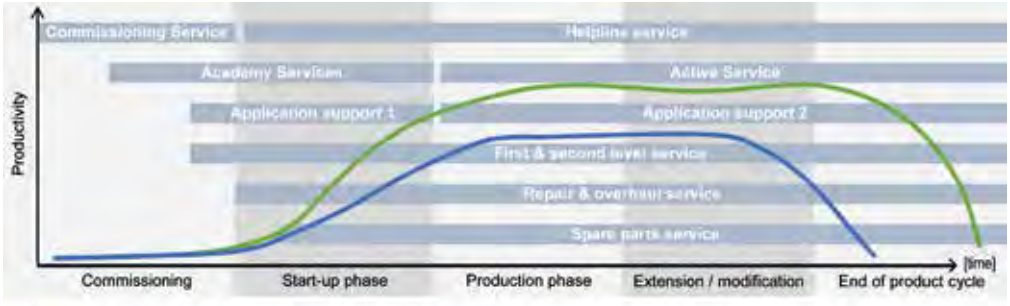
Goal
Prevent downtime, eliminate stress and costs, extend the service life → Prevention instead of reaction

Status report with recommendation

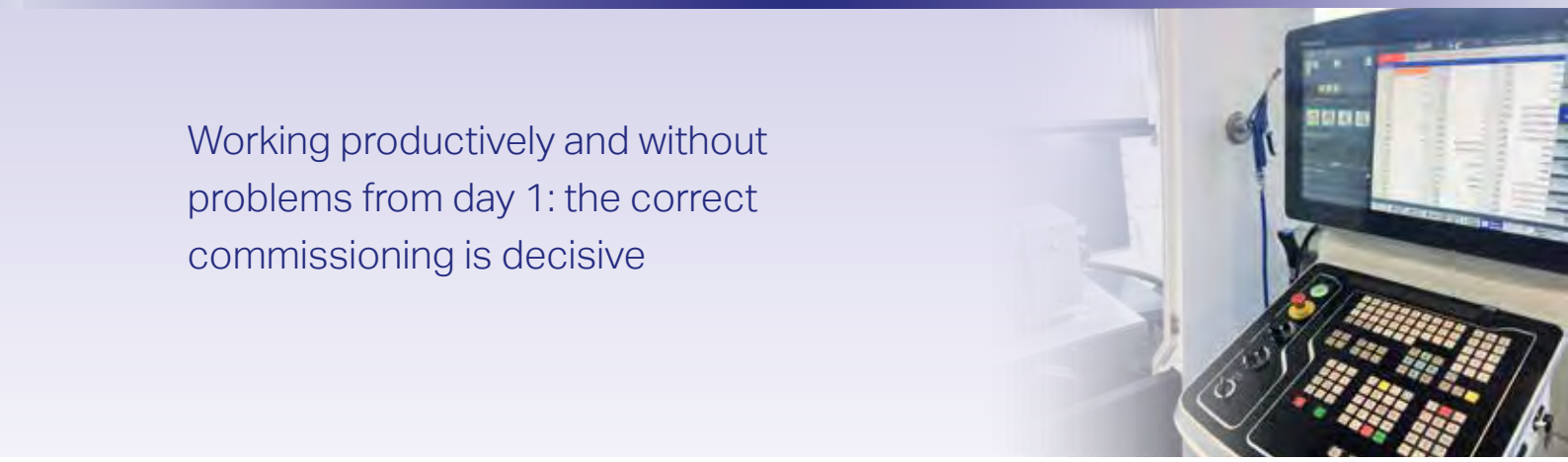


Retrofitting of further developments on request (shorter outgoing cable, smaller diameter).

LifeCycle Services: Increased productivity over the life of your machine ...



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
Rotary cable connected and parameterized, ready for production

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
+ Kinematics setting/check
+ Electrical connection of the rotary table on the machine
+ Basic parameterization using pL parameter lists, at least with usual values, but possibly to customer requirements
+ Brief customer training

Prerequisite
+ Machine must be prepared appropriately (servo, control cabinet cabling, connectors, PLC, CNC with readily available 4th and/or 5th axis/axes; or can be ordered from pL LEHMANN (depending on machine; PLC not possible)
+ During commissioning, a qualified technician from the machine supplier may be need to be present (parameter adjustments, possibly adjustment of the PLC etc.); organized and paid by customer, contact us with the request.

Commissioning of servopack

Goal
Connection of the rotary table and adjustment to customer requirements if possible, incl. integration of the Servopack retrofit kit

Activities
+ ServoPack installation with cabling in control cabinet up to enclosure wall
+ Mechanical assembly of the rotary table on the machine table
+ Alignment of the rotary axes with respect to the main axes of the machine
+ Kinematics setting/check
+ Electrical connection of the rotary table on the machine
+ Basic parameterization using pL parameter lists, at least with usual values, but possibly to customer requirements
+ Brief customer training

Prerequisite
+ Machine must be prepared appropriately (CNC has readily available 4th and/or 5th axis, PLC is prepared)
+ During commissioning, a qualified technician from the machine supplier may be need to be present (parameter adjustments, possibly adjustment of the PLC etc.); organized and paid by customer, contact us with the request.

Commissioning of M-function

Goal
FANUC 35i linked with machine 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
+ EMERGENCY-STOP link thus possible

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

Note
Remember that we offer training in our academy for operation of the Fanuc 35iB control.

Application support

Goal
Rotary table settings optimized for customer application (time optimization and/or accuracy improvement)

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)
+ Kinematics setting/check
+ Expenses such as travel time, travel costs, hotel and meals are calculated on the basis of actual cost

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

	Item no.	Data	Description
EA-type rotary tables	**INB.1AX-APS**	max. 15 h, 1-axis	Application support
	INB.1AX-CMS	basic, max. 10 h, 1-axis	Commissioning of integrated axes
	INB.1AX-SP	max. 15 h, 1 axis	Commissioning of servopack
T-type rotary tables	**INB.2AX-APS**	max. 20 h, 2-axes	Application support
	INB.2AX-CMS	basic, max. 15 h, 2-axes	Commissioning of integrated axes
	INB.2AX-SP	max. 20 h, 2 axes	Commissioning of servopack
with pL CNC	**INB.MF**	max. 15 h on-site	Commissioning of M-function

Only well-trained technical personnel can assure optimal performance. This applies to us as well as our customers. Don't hesitate to make use of our service offerings.


LEHMANN
CERTIFICATE
We confirm that
Alain Neveu
AND Precision
successfully completed the training as
pL certified service engineer
PCSE level 3
Valid from March 2013. The training included issues as follows:
- complete assembling of rotary tables
- advance maintenance at rotary tables
- exchange of gear
- assembly of more axis tables and its geometrically measurements
- reparation and use of different Lehmann-Controls

Example of a course confirmation

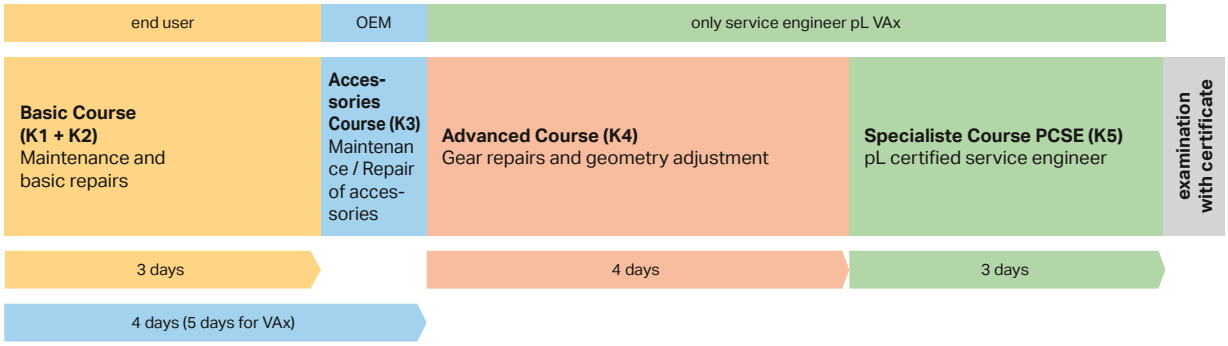
customerAcademy

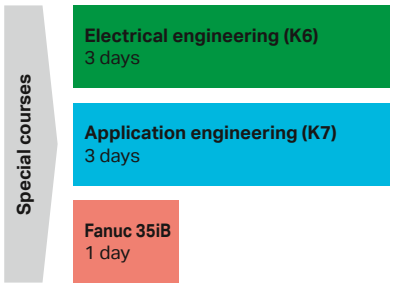
Professional training sessions at the pL factory (at the customer on request) with extensive documentation for reference as well as a corresponding training certificate.

Goal
To make pL service centers and customers more independent, increase the availability of pL products

Your benefit
+ Independence from third parties –maximum productivity
+ Shortest possible interruptions
+ Economical and competent
+ Prevention of expensive operator errors
+ Prevention of time-consuming fault diagnosis
+ Correct spare parts ordering
+ 1 year of Helpline support free of charge worldwide

Courses at a glance

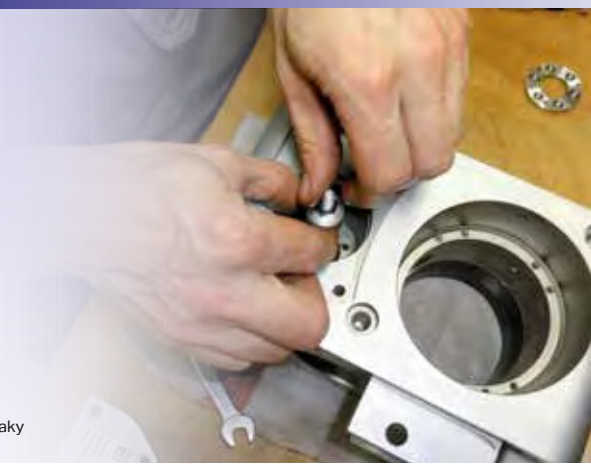




Additional information
+ Detailed documentation as references
+ 1 year of Helpline service free of charge worldwide
+ At least 2 participants, max. 4 participants per group
+ Course contents matched to the individual when necessary
+ Practical exercises, supplemented with theory

Registration prerequisites
+ Completion of technical training in mechanics, machining and assembly
+ CNC knowledge
+ Experience in maintenance or service (preferably with/on machine tools)
+ Basic knowledge of electrical engineering, pneumatics and hydraulics

We hold refresher courses to ensure that the knowledge of our technicians is updated continuously. These are also available for you.



Seal change on Braky

The courses in Detail (coarse language in German or English only)

For end customers and machine dealers

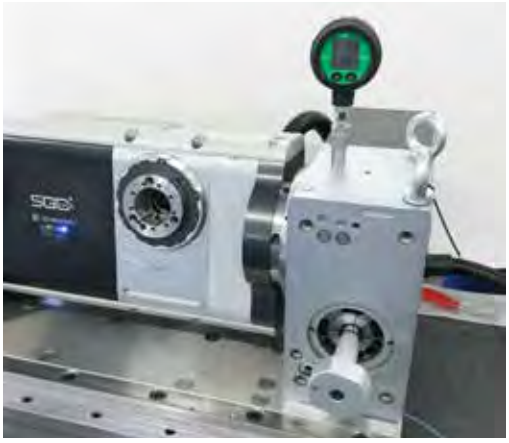
Basic Course – for Helpline and maintenance technicians (K1 + K2)

Prerequisite: Practical experience in maintenance of machine tools

Course goals:

+ Basic knowledge of pL LEHMANN rotary tables
+ Diagnosing faults (e.g. via blackBOX)
+ Knowledge of spare parts packages
+ Learning about specific tools
+ blackBOX software and analysis
+ Small repairs such as Braky replacement, for instance
+ Motor and wiring harness replacement on dividing and tilt axis
+ Checking and adjusting the gear unit
+ Adjusting and cleaning the scale dial

The better your knowledge of pL rotary table, the shorter are your downtimes and the higher is your productivity!



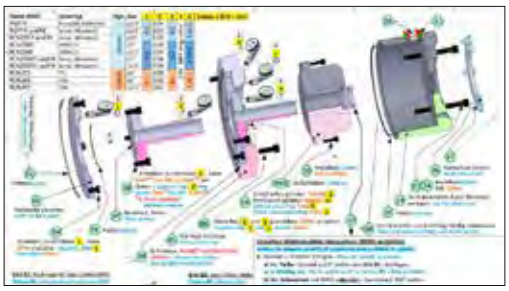
Checking the clamping pressure correctly

Accessories Course – for OEM service / commissioning technicians (K3)

Prerequisite: Basic Level Course

Course goals:

+ Correct setting and operation of accessories such as rotary union, clamping cylinder, tailstock, counter bearing...
+ Understanding and handling the angular position measuring system
+ Handling the ripas system correctly
+ Working correctly with CYMAX hydraulic units



Installation instructions for WMS

Courses for our service partners and large and customers who wish to be completely self-sufficient

Advanced Course – for the knowledgeable service technician as a freelancer (K4)

Prerequisite: Accessories Level Course (contractual cooperation with pL service location)

Course goals:

+ Repair of gear unit, spindle seals and spindle clamping
+ Measuring and adjusting the geometry correctly
+ Machine-specific wiring

Remeasuring and aligning

severe oil loss

Specialist Course PCSE – for the knowledgeable pL service technician – for pL service location only (K5)
Prerequisite: Advanced Level Course (contractual cooperation with pL service location)
Course goals:
+ In-depth knowledge of current and older products, incl. accessories
+ Good knowledge of the service structure and organization of pL
+ Performance of damage analyses
+ Parameterization of the blackBOX

Massive crash – a casoe for the pL professional

Special courses

Electrical engineering – for knowledgeable service technicians (K6)
Prerequisite: Practical experience in maintenance of machine tools
Course goals:
+ Analytical approach tor electrical problems
+ Measurement technology
+ Interpretation and understanding of electrical diagrams
+ Shutdown measures in case of electrical problems

Measuring correctly

Application engineering – for application technicians and product managers/sellers of pL LEHMANN rotary tables (K7)
Prerequisite: Knowledge of CNC machining and basic knowledge of rotary tables
Course goals:
+ Knowledge of the behavior of pL rotary tables in various applications
+ Optimization options for applications
+ Detailed troubleshooting for demanding customer requirements
+ Selection of the correct rotary table based on customer requirements

Application of a 4th axis on a 3-axis machining center

Fanuc 35iB
Prerequisite: Practical experience in operating and programming machine tools
Course goal:
+ Operation of our Fanuc 35iB control

Fanuc 35iB manual control pendant

Product line 900
Coming soon after market introduction

Knowledge is a prerequisite.
Professional implementation, however,
requires replacement parts and ...

Gear unit (for trained technicians only)

Seal sets

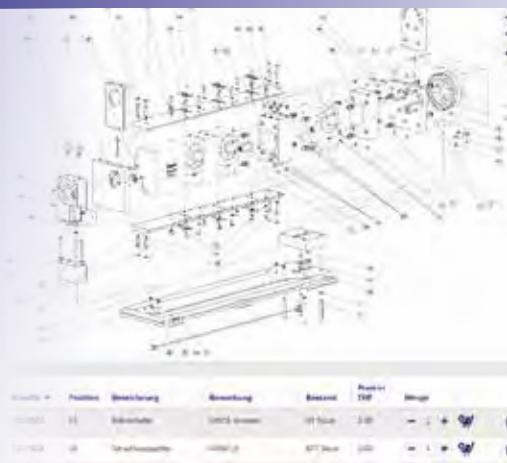
Bearing set

Spare parts packages BOOSTY

Cable sets

Suitcase spare parts packages

... tools. Our service partners have both. That is why they maintain a web shop with availability data that is updated daily.



Webshop example

WZP.BASIS.BR5xx

WZP.CARD

WZP.HARA.x07

WZP.RIP

WZP.BRAKY.DMO

3x 135-0042b

WZP.HARA.xx0

WZP.RIP.SKP

WZP.BRAKY.KTR507
WZP.BRAKY.KTR5x0

WZP.DDF

WZP.MANO.30

WZP.WMS

WZP.ZRSP

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:

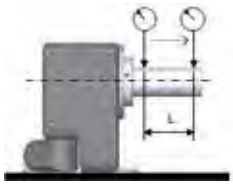
1. The rotary table is mounted as specified in the commissioning instructions
2. The measurement is carried out on a calibrated granite plate (all machine errors are excluded)
3. The rotary table is not subjected to any outside thermal influences (sun, fans, heaters...).
4. Prior to the measurement, 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

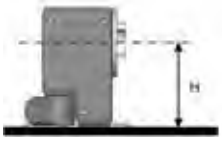
0.01/100 mm (0.005/100 mm)

Parallelism
Spindle axis to support surface



0.01/100 mm (0.005/100 mm)

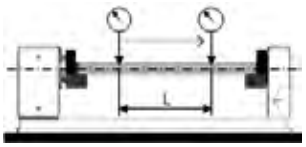
Center height



0...0.04 mm

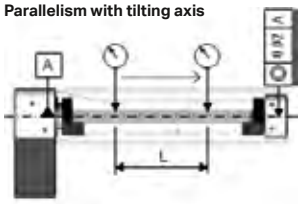
Geometry of EA rotary tables with rotoFIX

Parallelism with support surface



0.007/100 mm (0.0035/100 mm)

Parallelism with tilting axis



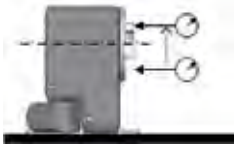
0.007/100 mm (0.0035/100 mm)

For longFLEX, see p. 31

Geometry of M-type rotary tables

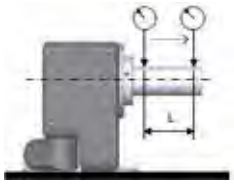
on request

Perpendicularity
Spindle surface to support surface



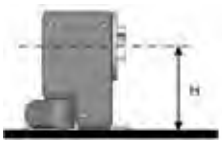
0.01/100 mm (0.005/100 mm)

Parallelism
Spindle axis to support surface



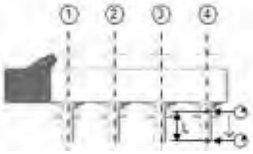
0.01/100 mm (0.005/100 mm)

Center height



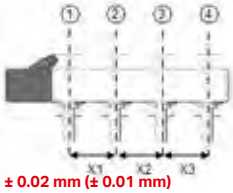
0...0.04 mm

Axis parallelism
Spindle 2, 3 and 4 to spindle 1



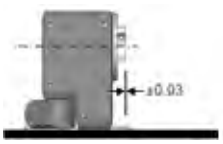
0.01/100 mm (0.005/100 mm)

Center distance
X1, X2 and X3

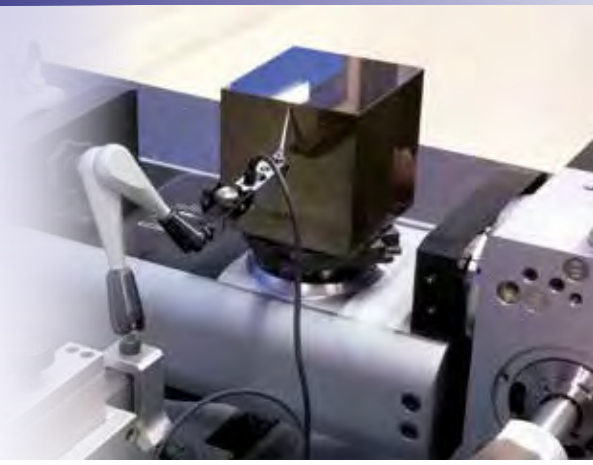


± 0.02 mm (± 0.01 mm)

Depth difference of the spindles



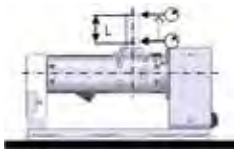
And for the most demanding requirements: 1/2 tolerance as an option



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

Geometry of TF and T1 rotary tables

Perpendicularity
Dividing / indexing axis to tilt axis

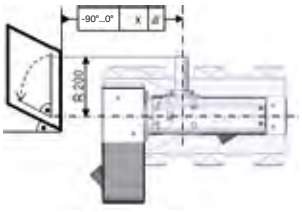


0.01/100 mm (0.005/100 mm)

Parallelism
Spindle surface to support surface

0.01/100 mm (0.005/100 mm)

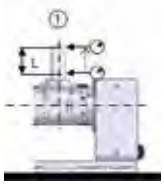
Tilt drift
Change in the angle between the dividing / indexing axis and tilting axis during the tilting movement from -90° to 0°



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

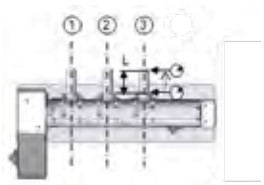
Geometry of T2...3 rotary tables

Perpendicularity
Dividing / indexing axis to tilt axis of spindle 1



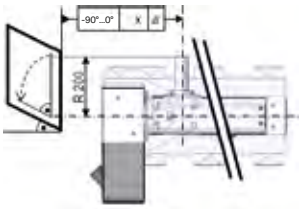
0.01/100 mm (0.005/100 mm)

Axis parallelism
Spindle 2 and 3 to spindle 1



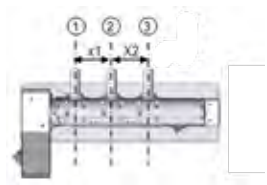
0.01/100 mm (0.005/100 mm)

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)

Center distance
X1, X2 and X3



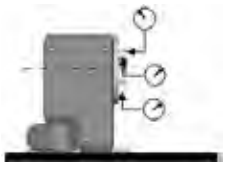
± 0.02 mm (± 0.01 mm)

Parallelism
Spindle surface to support surface

0.01/100 mm (0.005/100 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)

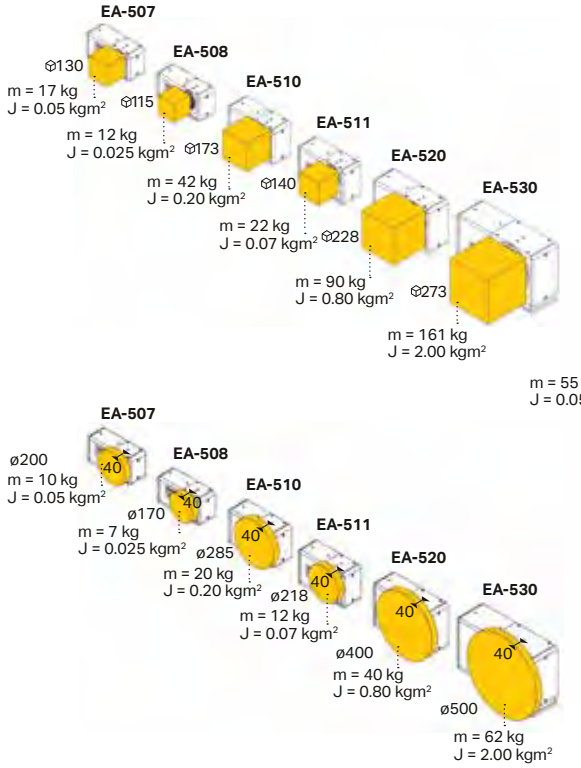
Basics of the drive data

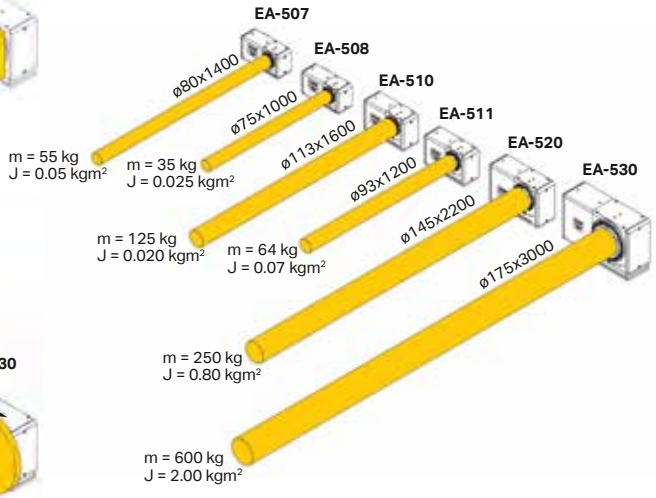
All drive data of pL LEHMANN rotary tables **(pp. 26–47)** have been designed for the following standard spindle loads in accordance with DIN/VDE 0530 as follows:

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

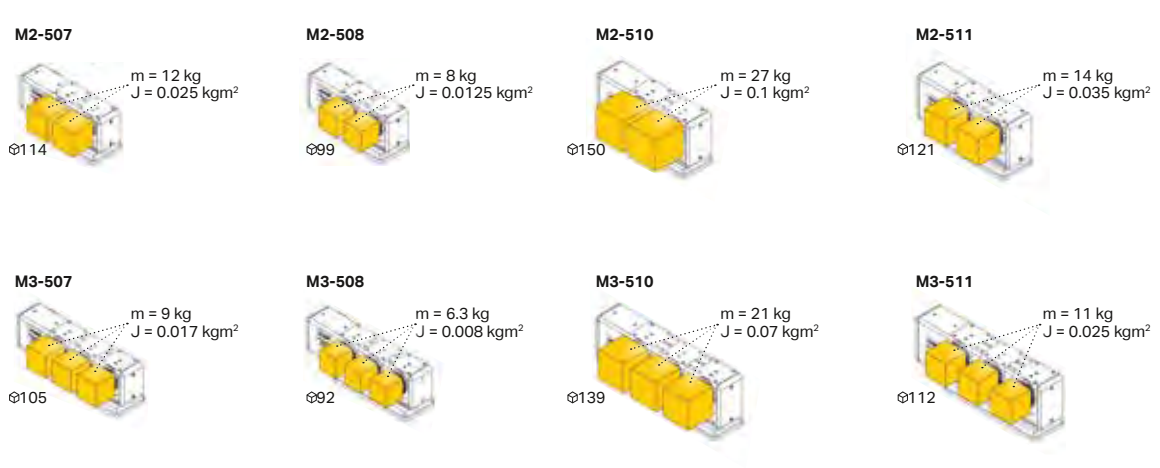
Any other conditions require the adjustment of the drive data (acceleration, jerk limitation, rotational speed).

EA-type rotary tables





Mx-type rotary tables

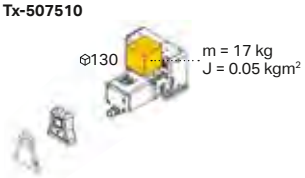


Reference values for duty cycle (ED)

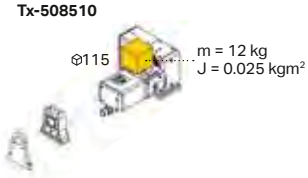
+ For normal rotary table work such as milling / boring (mainly positioning): approx. 20 %.
+ For milling / boring in intensive mixed operation (positioning / feed machining): approx. ED 40 %
+ For profile and depth grinding: approx. ED 60 % / simultaneous machining, 5-axis
+ For engraving: approx. ED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

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

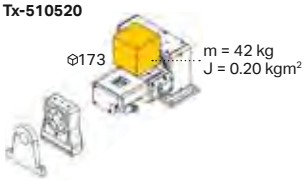
Tx-507510



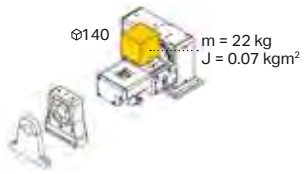
Tx-508510



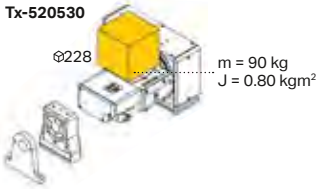
Tx-510520



Tx-511520

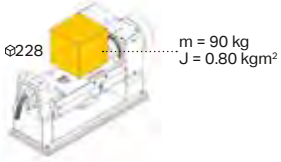


Tx-520530

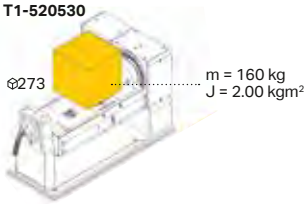


T1-type rotary tables (TGR)

T1-510520

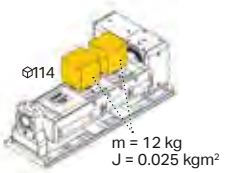


T1-520530

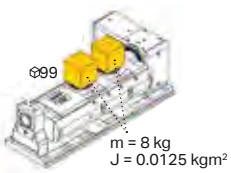


T2...3-type rotary tables (TOP.x)

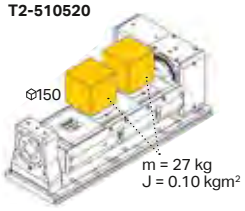
T2-507510



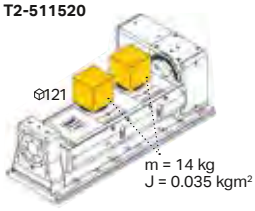
T2-508510



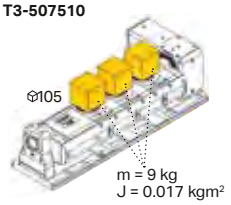
T2-510520



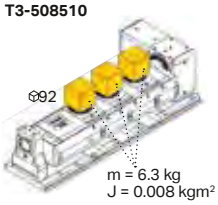
T2-511520



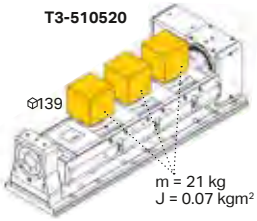
T3-507510



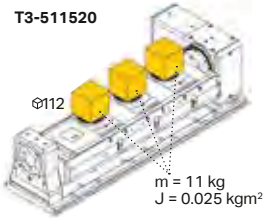
T3-508510



T3-510520



T3-511520



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

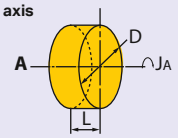
We are here to help

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

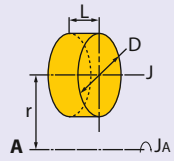


D: Outside diameter of the round bar [m]
L: Length of the round bar [m]
p: Density [kg/m³]
m: Mass of the round bar [kg]
J_A: Moment of inertia [kgm²]

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

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

Center of gravity outside rotary axis



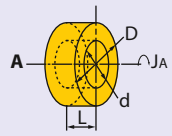
D: Outside diameter of the round bar [m]
L: Length of the round bar [m]
r: Turning radius [m]
p: Density [kg/m³]
m: Mass of the round bar [kg]
J_A: Moment of inertia of the round bar at center A [kgm²]
J: Moment of inertia [kgm²]

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

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

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

Center of gravity in rotary axis

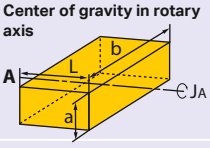


D: Outside diameter of the cylinder [m]
d: Bore diameter of the cylinder [m]
L: Length of the round bar [m]
p: Density [kg/m³]
m: Mass of the cylinder [kg]
J_A: Moment of inertia [kgm²]

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

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

Center of gravity in rotary axis

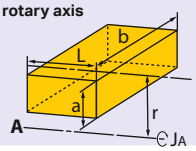


a: Side length [m]
b: Side length [m]
L: Side length [m]
p: Density [kg/m³]
J_A: Moment of inertia [kgm²]

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

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

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

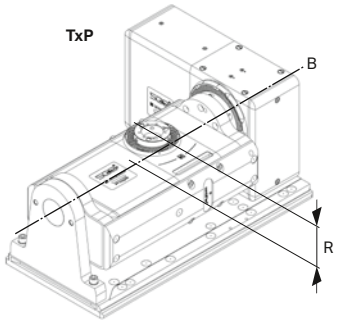
A = Dividing axis
B = Tilting axis
R = Radius between tilting axis and spindle nose of dividing axis [m]
Rs = Center distance [m]
m = Mass [kg]
M = Torque calculated from m x g x Rs [Nm]
Me = Torque acting on the tilting axis caused by the dead weight of the tilting axis [Nm]
g = Acceleration due to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

Densities of different materials x dynamic speed (p)

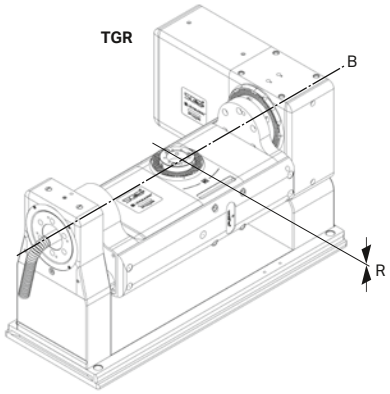
Steel	7.85 x 10^3 kg/m³
Cast iron	7.85 x 10^3 kg/m³
Aluminum	2.7 x 10^3 kg/m³
Copper	8.94 x 10^3 kg/m³
Brass	8.5 x 10^3 kg/m³

Calculation of the load on the tilting axis

TxP



TGR



Distance R

Rotary table	TxP [mm]	TGR [mm]	Limited torques [Nm]*
TF...T1-507510	46	–	40
TF...T1-510520	30	0	100
TF...T1-520520	90	0	100

* Limited torques due to eccentric loads, see **p. 28**

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

Rs = R + L/2
M = m x Rs x g

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

M tot = M + Me (Me is the gear unit loading without load; see appropriate T-type rotary table **pp. 32–47**)

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	ø mm	vc Cutting speed m/min	n Speed min⁻¹	fz Feed mm/rev	z no. of teeth	vf 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 cm³/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
4									357	357	357	357

T1-507510 TAP1

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

T1-507510 TOP1 (fixX*)

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

T1-510520 TAP2

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

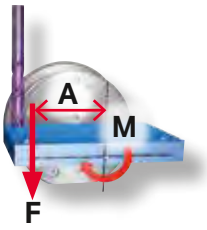
T1-510520 TOP2 (varioX*)

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

Reference values for configuring and selecting the correct rotary table

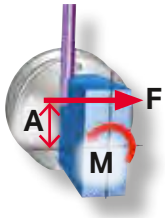
F = Feed force, **A** = Distance [m] from rotary table axis to feed force (F) during machining, **M** = Resulting torque (FxA)
Resulting torque M = F x A → must not exceed the max. clamping torque [Nm] or max. feed torque [Nm] of the rotary table!

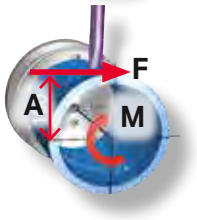
V = Rough machining, WP = indexable Inserts, VHM = Solid hard metal



Drilling

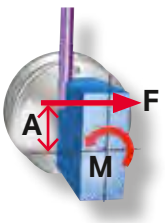
Tool type	Wz ø [mm]	Cutting speed [m/min]	Feed F [mm]	Feed force **F** [N] CK45	X5CrNi18-10	AlMg4.5Mn0.7
Twist drill VHM	5	220	0.12	920		
		120	0.10		1120	
		350	0.15			315
Twist drill VHM	10	220	0.27	1450		
		120	0.18		1900	
		350	0.2			650
Twist drill VHM	17	220	0.35	2850		
		120	0.25		3980	
		350	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

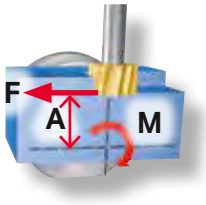


Hobbing

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

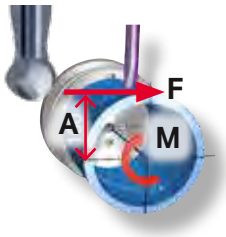
Factory information from well-known tool manufacturers (applies to new tool cutting edges)

Corner milling (slab milling or plane milling)



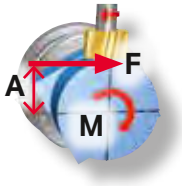
Tool type	Wz ø [mm]	Cutting speed [m/min]	Feed F [mm]	Depth of cut [mm]	Cutting width [mm]	Feed force **F** [N]		
						CK45	X5CrNi18-10	AlMg4.5Mn0.7
Angular milling cutter WP	40	160	0.12 x 6	2	40	1750		
		160	0.12 x 6	2.5	25	1250		
		85	0.12 x 6	2	40		1550	
		85	0.12 x 6	2.5	25		1150	
		500	0.15 x 6	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



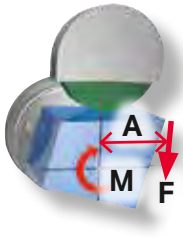
Tool type	Wz ø [mm]	Cutting speed [m/min]	Feed F [mm]	Depth of cut [mm]	Cutting width [mm]	Feed force **F** [N]		
						CK45	X5CrNi18-10	AlMg4.5Mn0.7
Ball end milling cutter	6	220	0.1 x 2	1.0	1.0	60		
		100	0.08 x 2	0.8	0.8		35	
		530	0.15 x 2	2.0	2.0			50
Ball end milling cutter	12	220	0.14 x 2	1.3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

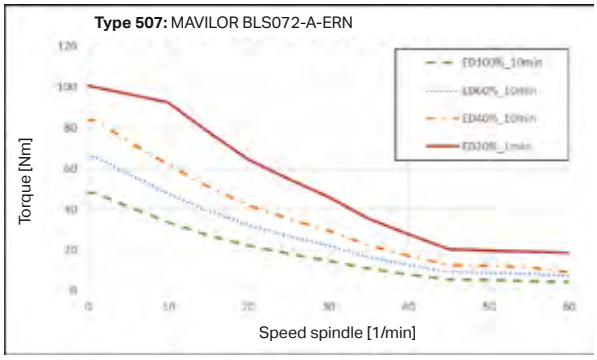


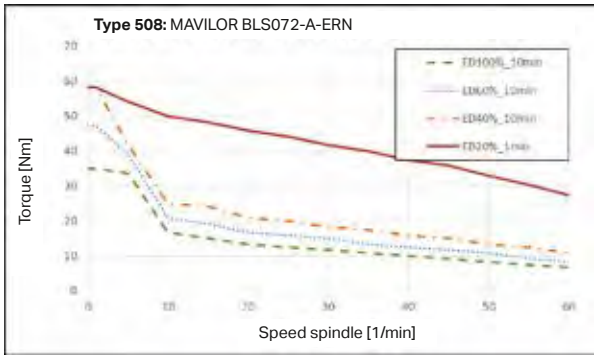
Tool type	Grinding capacity [kW]	Feed force **F** [N]		
		CK45	X5CrNi18-10	AlMg4.5Mn0.7
Ceramic grinding wheel	40	2200		
	75	4130		
CBN grinding wheel				

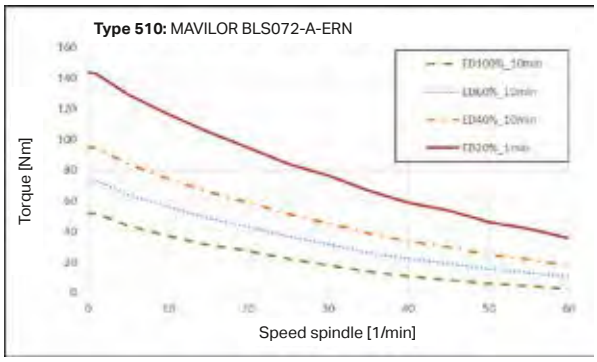
Permissible feed torque during machining under various conditions for **EA**-type rotary tables and dividing axes of **T**-type rotary tables

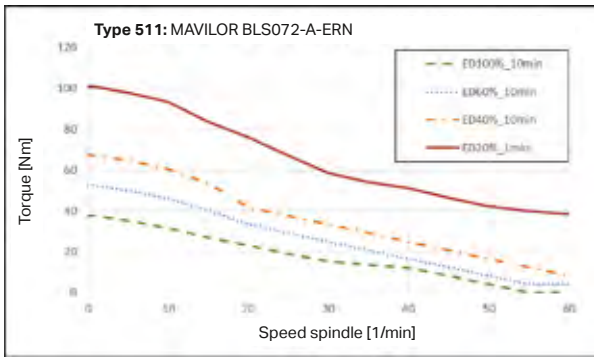
All diagram values with 20 % safety

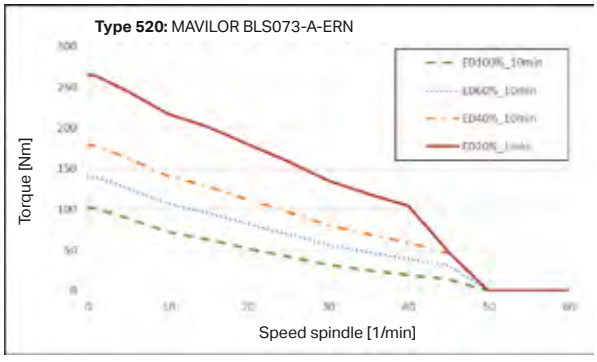
For Siemens and Heidenhain CNCs

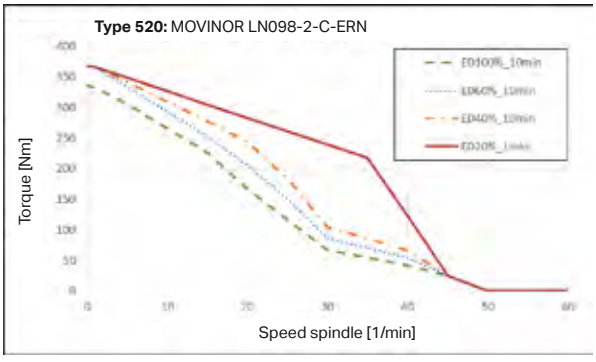


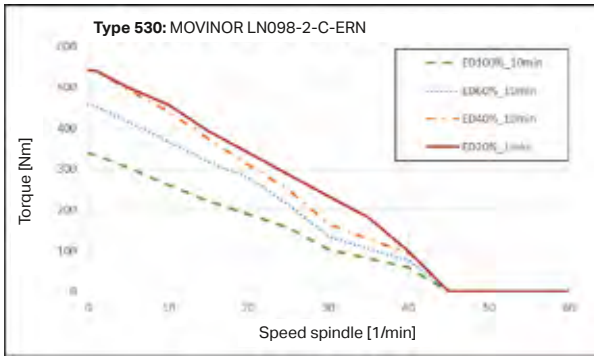










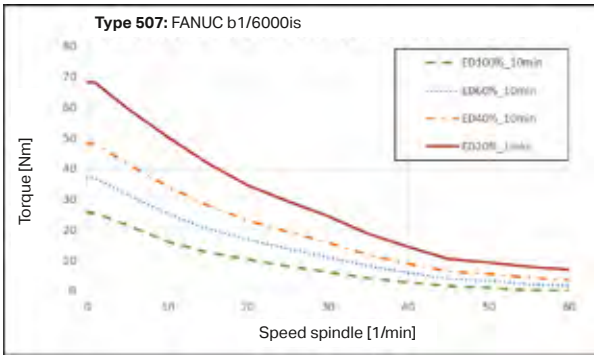


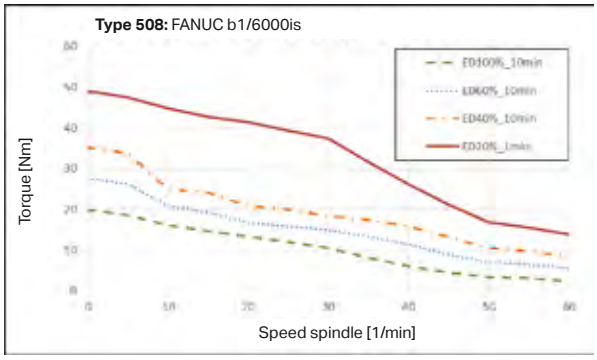
Reference values for duty cycle (ED)

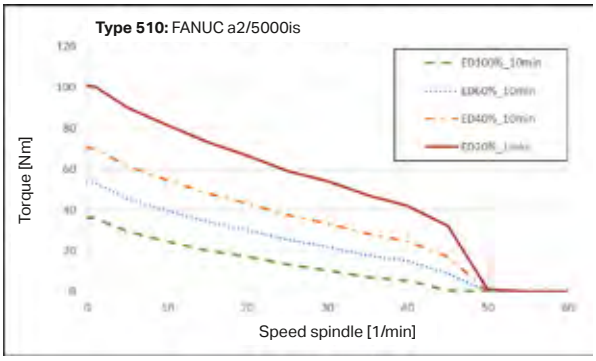
+ Duty cycle 20 % ➞ Normal rotary table work of milling / boring for positioning mode
+ Duty cycle 40 % ➞ For milling / boring in intensive mixed operation (positioning / feed machining)
+ Duty cycle 60 % ➞ Profile and depth grinding, temporary simultaneous machining, 5-axis
+ Duty cycle 80–100 % ➞ Engraving,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

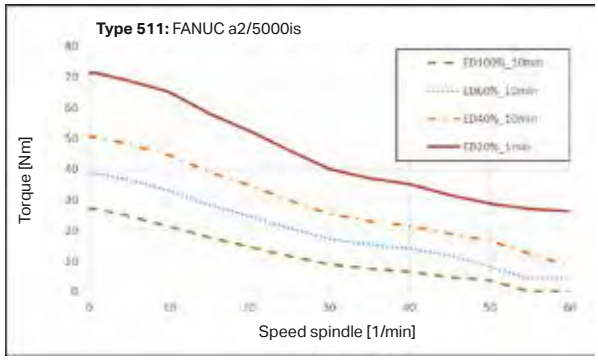
All diagram values with 20 % safety

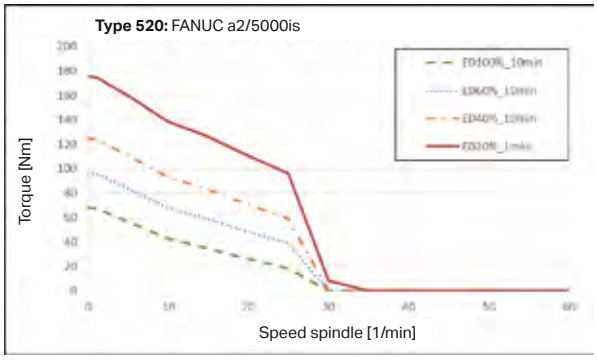
For Fanuc CNC

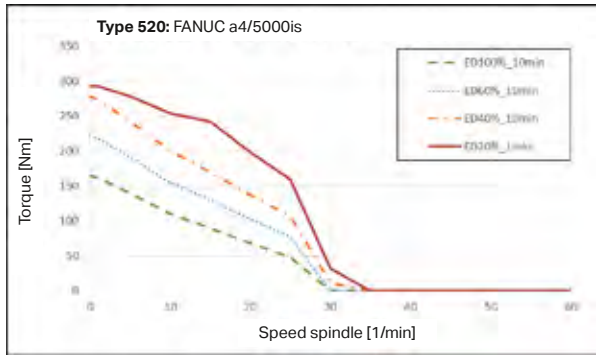


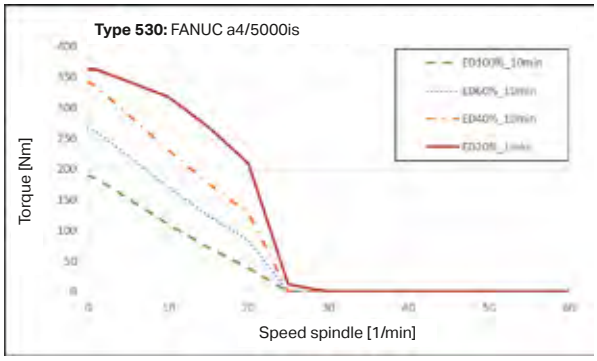


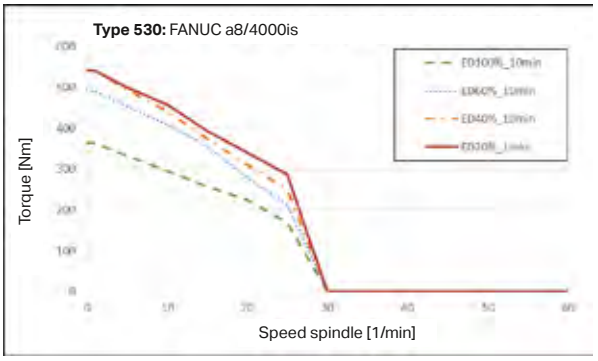








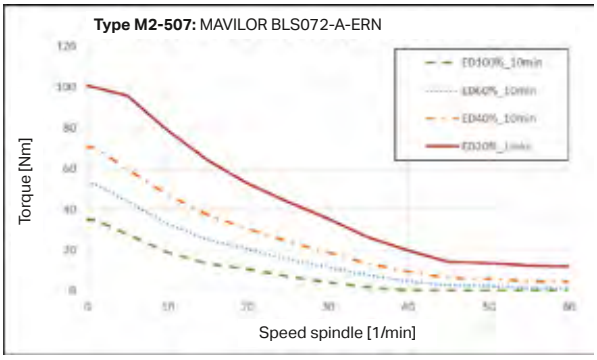


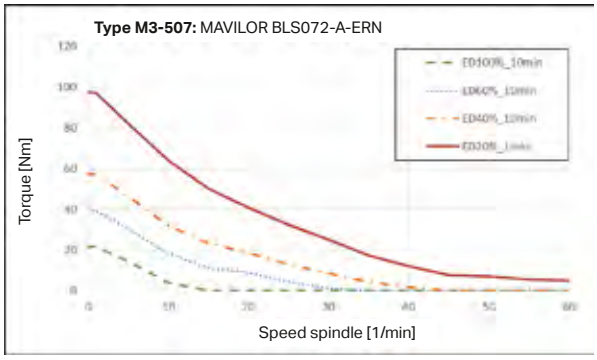


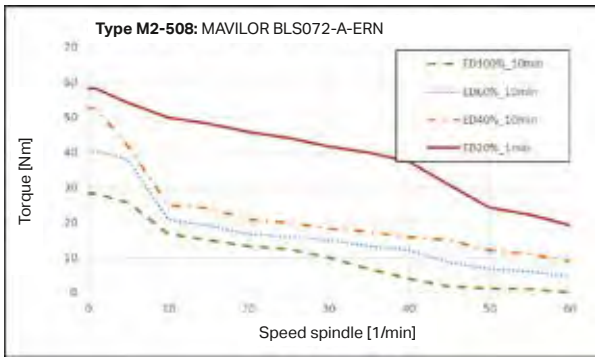
Permissible feed torque during machining under various conditions for **M**-type rotary tables and dividing axes of **T2...3**-type rotary tables

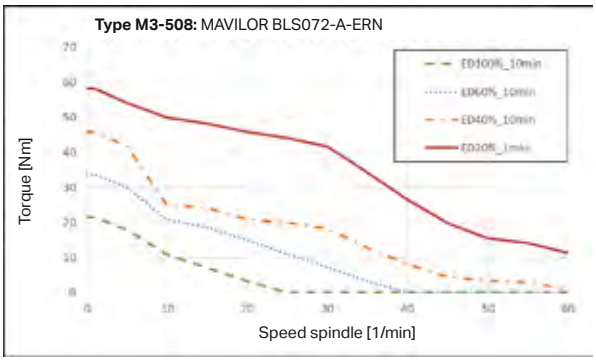
All diagram values with 20 % safety

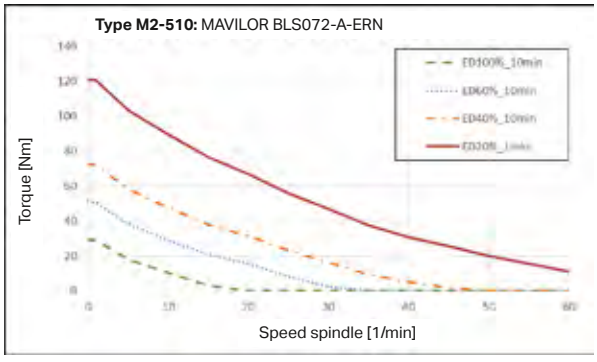
For Siemens and Heidenhain CNCs

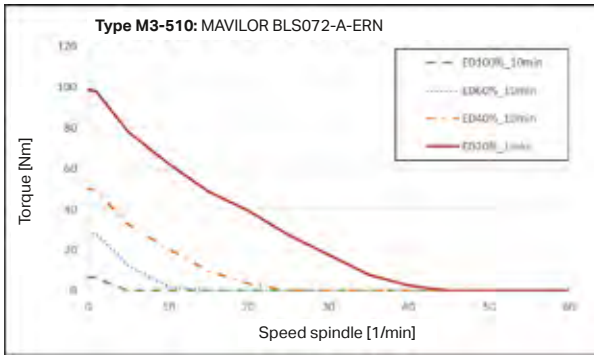


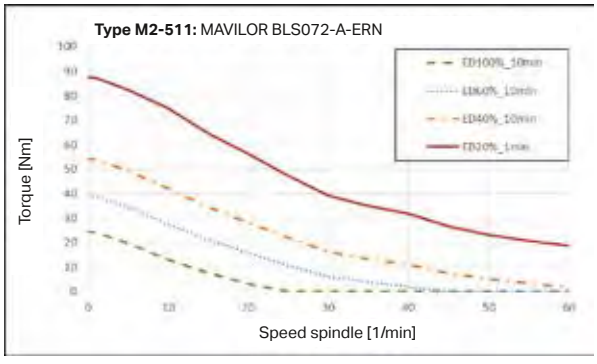


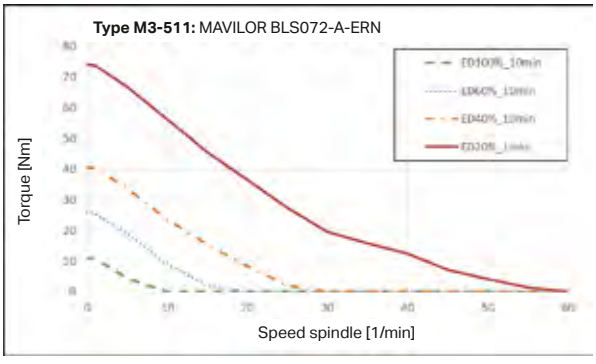










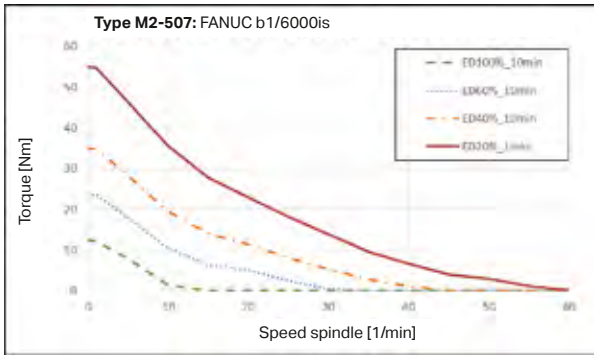


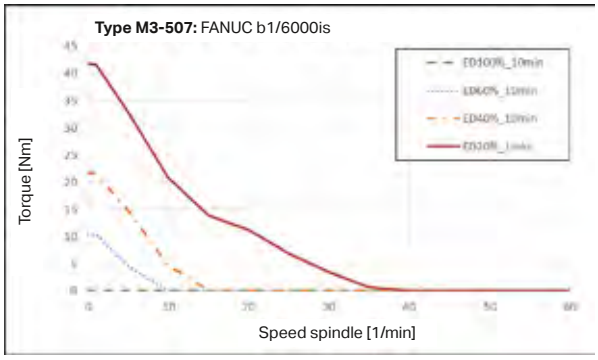
Reference values for duty cycle (ED)

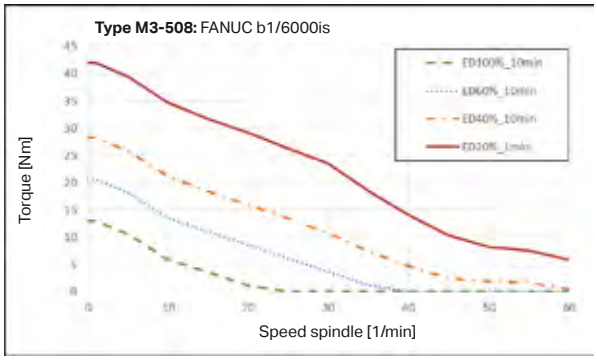
+ Duty cycle 20 % ➞ Normal rotary table work of milling / boring for positioning mode
+ Duty cycle 40 % ➞ For milling / boring in intensive mixed operation (positioning / feed machining)
+ Duty cycle 60 % ➞ Profile and depth grinding, temporary simultaneous machining, 5-axis
+ Duty cycle 80–100 % ➞ Engraving,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

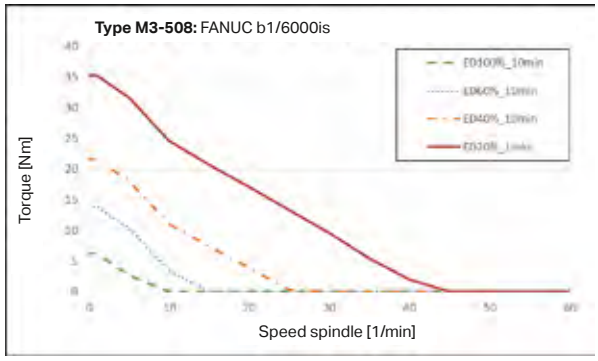
All diagram values with 20 % safety

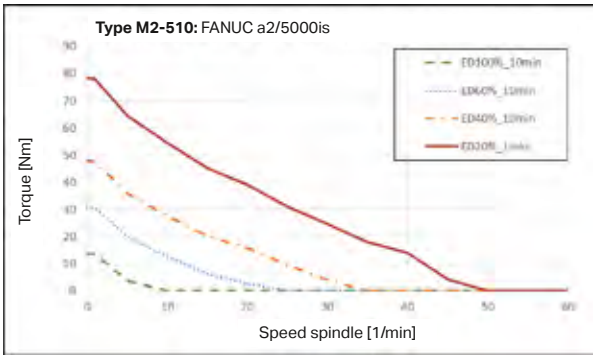
For Fanuc CNC

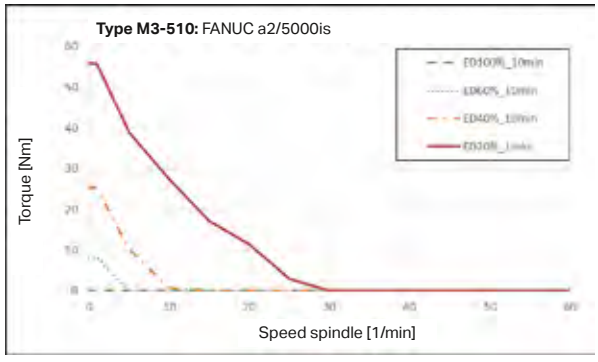


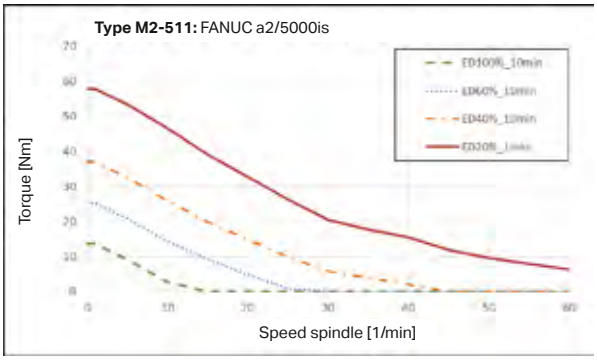


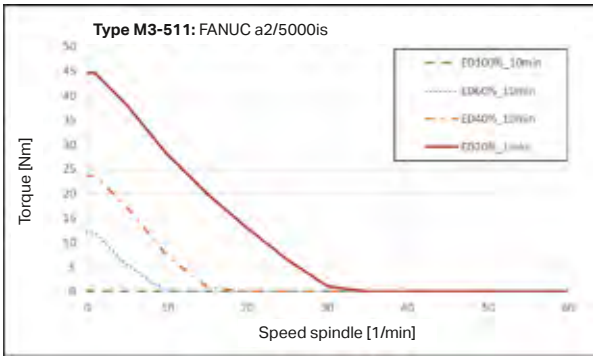












Material elasticities and their effect on workpiece accuracy: Understand them correctly and know how to respond in real-world practice

EA- and M-type rotary tables in P8

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

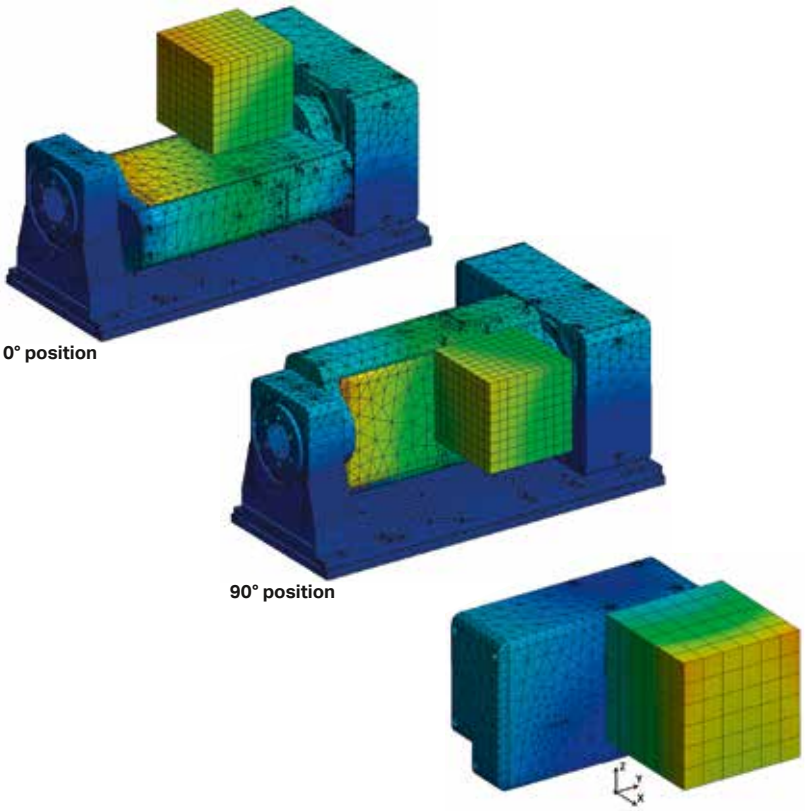
If the static stiffness is insufficient, the following may help:

+ 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

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.

Results of static mechanical FEM analysis



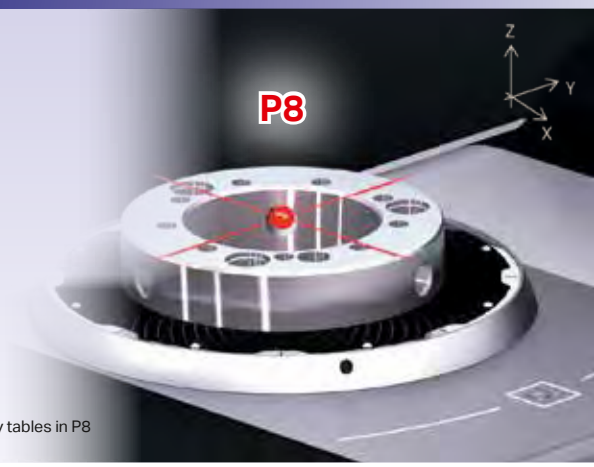
0° position

90° position

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	-0.020
EA-510	-0.015
EA-520	-0.015
EA-530	-0.006



T-type rotary tables in P8

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

µm/kg	0°	90°
	TIPc	TIPc
TF-507510	–0.110	–0.142
TF-508510	–0.110	–0.142
TF-510520	–0.064	–0.076
TF-511520	–0.064	–0.076
TF-520530	–0.046	–0.056

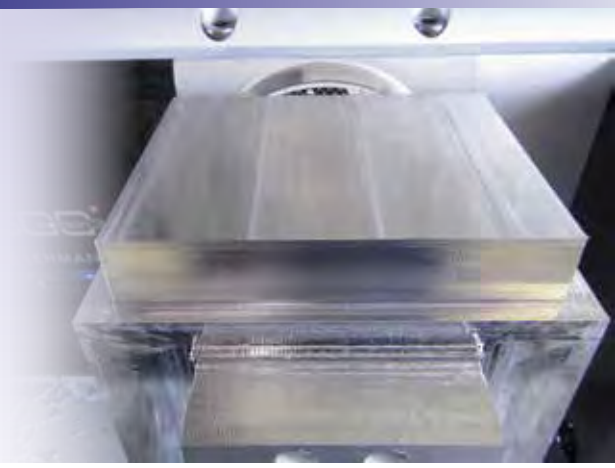
Compliance of T1-type rotary tables in P8 in the Z-direction (approximate values)

µm/kg	0°				90°			
	TAPc	TAP	TOP	TGR	TAPc	TAP	TOP	TGR
T1-507510	–0.032	–0.031	–0.039		–0.074	–0.104	–0.132	
T1-508510	–0.032	–0.031	–0.039		–0.074	–0.104	–0.132	
T1-510520	–0.024	–0.038	–0.041	–0.030	–0.051	–0.082	–0.082	–0.069
T1-511520	–0.024	–0.038	–0.041	–0.030	–0.051	–0.082	–0.082	–0.069
T1-520530	–0.026	–0.046	–0.041	–0.041	–0.055	–0.110	–0.097	–0.101

Compliance of T2-type rotary tables in P8 in the Z-direction (approximate values)

µm/kg	Spindle distance	0°		90°	
		Spindle 1	Spindle 2	Spindle 1	Spindle 2
T2-507510 TOP1.2	160 mm	-0.042	-0.099	-0.078	-0.219
T2-510520 TOP2.2	220 mm	-0.038	-0.098	-0.069	-0.234
T2-510520 TOP2.2	300 mm	-0.038	-0.117	-0.065	-0.292

Vibrations, tool wear, surface quality and machining capacity optimizing



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 the 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:

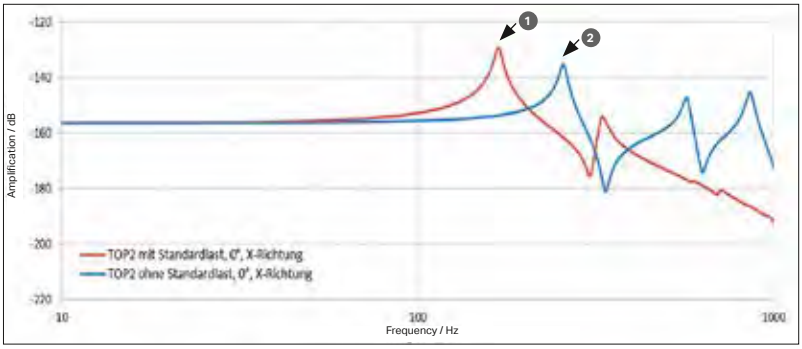
+ Tool speed
+ Number of teeth on tool
+ Machining strategy
+ Workpiece orientation

Important note: Form, weight and and how the work pieces are clamped, as well as the used clamping parts can has 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.

With / without standard load

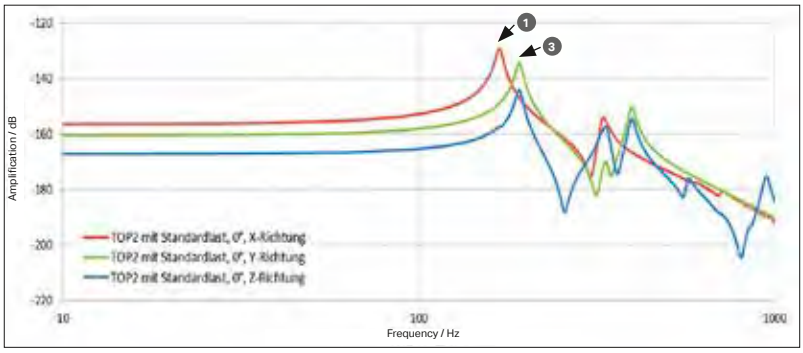
Example: T1-510520 TOP2, excitation only in the X-direction



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

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.

The below illustrations shows Mode 1

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

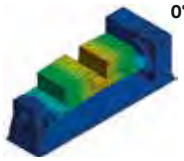
Hz	Rotary table fastened by means of bolted connection from below, without consideration of the compliance of the intermediate plate								Rotary table fastened by means of clamping claws							
	without standard load				with standard load				without standard load				with standard load			
	507	510	520	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

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

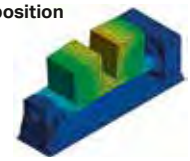
Hz	without standard load				with standard load				with double standard load			
	507	510	520	530	507	510	520	530	507	510	520	530
Mode 1	332	254	166	60	224	194	120	46	165	149	90	35
Mode 2	575	364	306	179	325	249	176	108	193	157	104	62

+ For 90° position, the eigenfrequency from mode 1 will be lower and from mode 2 will be higher (+/- 10–20%).
+ If rotoFIX is mounted on excentric position, the eigenfrequency mode 1 will be a bit lower and mode 2 20–30% higher.
+ rotoFIX executed in aluminium and with bigger load brings a lightly lower eigenfrequency mode 1, but in opposite, smaller load a little higher.

0°position



with standard load see **p. 30**

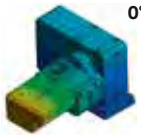


double standard load see **p. 30**

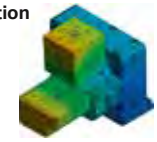
Eigenfrequency of TF-type rotary tables, mode 1 and 2 (approximate values)

Hz		without standard load		with standard load	
		TIPc		TIPc	
		0°	90°	0°	90°
Mode 1	**50x510**	180	185	129	134
	51x520	187	194	110	126
	520530	221	222	107	123
Mode 2	**50x510**	192	201	141	157
	51x520	206	215	132	143
	520530	226	243	133	137

0°position



without standard load see **p. 34**

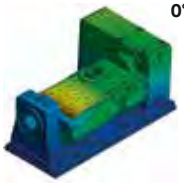


with standard load see **p. 34**

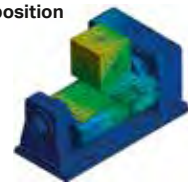
Eigenfrequency of T1-type rotary tables, mode 1 and 2 (approximate values)

Hz		without standard load								with standard load							
		TAPc		TAP		TOP		TGR		TAPc		TAP		TOP		TGR	
		0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°
Mode 1	**50x510**	270	283	230	231	241	245			187	201	181	190	183	195		
	51x520	249	233	215	194	(2) 257	214	212	196	152	156	143	142	(1) 169	154	155	154
	520530	243	211	184	172	195	181	144	122	133	131	107	105	113	112	107	94
Mode 2	**50x510**	318	315	283	265	312	295			229	238	218	218	244	238		
	51x520	261	296	233	249	294	321	232	247	162	187	158	175	(3) 192	210	181	196
	520530	260	314	238	259	259	264	157	196	139	156	134	142	143	145	122	143

0°position



without standard load see **p. 36, 38, 40**

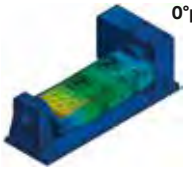


with standard load see **p. 36, 38, 40**

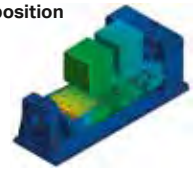
Eigenfrequency of T2-type rotary tables, mode 1 and 2 (approximate values)

Hz		Spindle distance	without standard load		with standard load	
			0°	90°	0°	90°
Mode 1	**T2-507510 TOP1.2**	160 mm	185	188	150	155
	T2-510520 TOP2.2	220 mm	154	142	101	96
	T2-510520 TOP2.2	300 mm	138	129	93	89
Mode 2	**T2-507510 TOP1.2**	160 mm	272	259	218	211
	T2-510520 TOP2.2	220 mm	221	220	142	146
	T2-510520 TOP2.2	300 mm	206	204	137	139

0°position



without standard load see **p. 46**

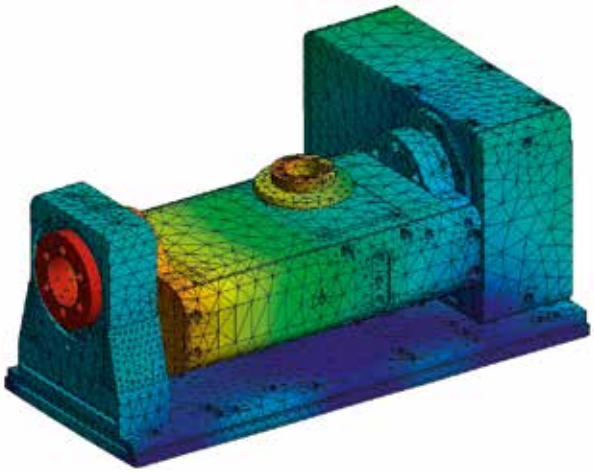


with standard load see **p. 46**

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.

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.

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

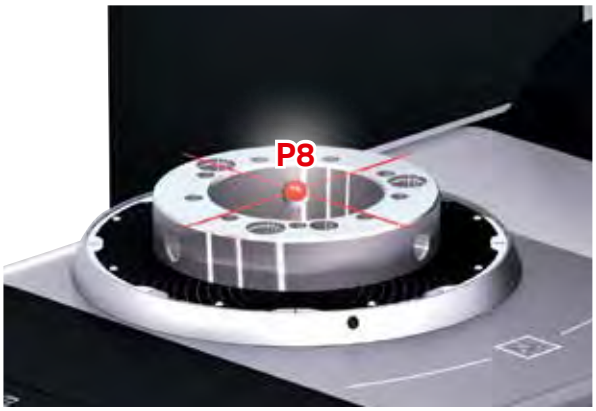
Example of reading the tables

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 ...

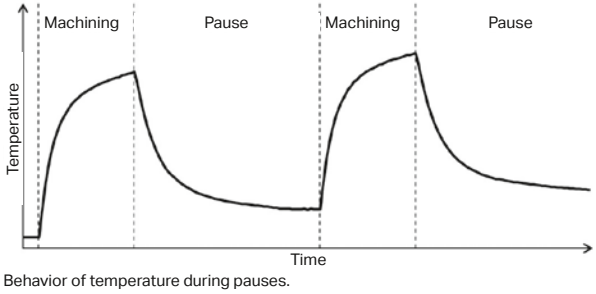
Measuring point P8

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.



Behavior of temperature during pauses.

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

		µm															arcsec													
		X-displacement					Y-displacement					Z-displacement					U-rotation					V-rotation					W-rotation				
	Time after start, duty cycle 20%	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
without cooling plate	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
	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
	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
	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
	TF-507510 TIP1c	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-510520 TIP2c	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-520530 TIP3c	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
	T1-507510 TAP1c	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
	T1-510520 TAP2c	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
	T1-520530 TAP3c	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
	T1-507510 TAP1	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
	T1-510520 TAP2	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
	T1-520530 TAP3	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
	T1-507510 TOP1	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
	T1-510520 TOP2	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
	T1-520530 TOP3	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
	T1-510520 TGR2	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
	T1-520530 TGR3	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
	T2-507510, 160, 2	16	19	20	6	3	-6	-10	-16	-105	-156	5	7	10	31	50	-1	-2	-2	6	10	107	122	130	52	43	-149	-161	-156	-73	-67
	T2-507510, 160, 1	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
	T2-510520, 220, 2	16	19	20	6	3	-7	-12	-23	-135	-204	6	7	11	34	54	-1	-2	-3	8	13	89	102	109	44	36	-149	-161	-156	-73	-67
	T2-510520, 220, 1	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
	T2-510520, 300, 2	16	19	20	6	3	-9	-15	-28	-166	-250	5	7	10	30	48	-1	-2	-3	8	13	89	102	109	44	36	-149	-161	-156	-73	-67
	T2-510520, 300, 1	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
with cooling plate* (optional)	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	-2	-3	-4
	TF-507510 TIP1c	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-510520 TIP2c	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-520530 TIP3c	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
	T1-507510 TAP1c	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
	T1-510520 TAP2c	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
	T1-520530 TAP3c	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
	T1-507510 TAP1	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
	T1-510520 TAP2	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
	T1-520530 TAP3	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
	T1-507510 TOP1	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
	T1-510520 TOP2	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
	T1-520530 TOP3	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
	T1-510520 TGR2	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
	T1-520530 TGR3	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
	T2-507510, 160, 2	16	18	19	7	6	-7	-10	-17	-97	-114	5	7	10	26	32	-1	-2	-2	2	2	104	119	127	54	50	-137	-149	-144	-64	-55
	T2-507510, 160, 1	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	-64	-55
	T2-510520, 220, 2	16	18	20	7	6	-9	-15	-23	-126	-149	5	7	11	29	34	-2	-2	-3	3	2	87	99	106	45	41	-137	-149	-144	-61	-55
	T2-510520, 220, 1	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
	T2-510520, 300, 2	16	18	20	7	6	-12	-19	-28	-158	-186	4	6	9	26	30	-2	-2	-3	3	2	87	99	106	45	41	-137	-149	-144	-61	-55
	T2-510520, 300, 1	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

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

1 = spindle 1, 2 = spindle 2

Wet machining (water-based coolant)

Values apply for coolant temperature equal to the ambient temperature

		µm															arcsec													
		X-displacement					Y-displacement					Z-displacement					U-rotation					V-rotation					W-rotation				
	Time after start, duty cycle 20%	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
without cooling plate	EA-507, EA-508	2	3	4	6	6	0	0	0	1	1	3	4	6	7	7	-125	-138	-126	-115	-111	-4	-6	-7	-7	-7	0	0	0	0	0
	EA-510, EA-511	2	3	5	6	7	0	0	0	1	1	3	6	8	9	9	-125	-138	-126	-115	-111	-6	-8	-10	-10	-9	0	0	0	0	0
	EA-520	3	5	6	8	9	0	0	1	1	2	4	7	9	11	11	-104	-115	-105	-96	-93	-7	-10	-12	-12	-11	0	0	0	0	1
	EA-530	4	5	7	9	10	0	0	1	2	2	5	8	11	13	14	-129	-142	-130	-119	-115	-8	-12	-14	-14	-14	0	0	0	0	1
	TF-507510 TIP1c	19	21	19	18	17	-2	-3	-5	-7	-8	13	19	24	25	25	-5	-8	-9	-9	-9	124	133	120	110	107	-157	-145	-126	-112	-105
	TF-510520 TIP2c	19	21	19	18	18	-2	-3	-6	-9	-10	15	22	28	29	30	-7	-11	-13	-12	-12	103	111	100	92	89	-157	-145	-126	-112	-105
	TF-520530 TIP3c	67	73	67	63	62	-8	-10	-16	-19	-20	19	25	34	34	38	-8	-13	-15	-14	-15	-129	-142	-130	-119	-115	-131	-121	-105	-93	-88
	T1-507510 TAP1c	19	20	19	17	17	-4	-7	-10	-13	-14	10	15	18	19	19	-2	-2	-2	-2	-2	123	132	120	109	106	-159	-147	-129	-116	-109
	T1-510520 TAP2c	19	21	19	17	17	-5	-8	-12	-15	-16	12	17	21	23	23	-2	-3	-3	-3	-3	102	110	100	91	88	-159	-147	-129	-116	-109
	T1-520530 TAP3c	67	71	66	60	59	-8	-10	-16	-19	-20	15	19	26	27	29	-2	-4	-4	-4	-4	-129	-142	-130	-119	-115	-133	-123	-108	-96	-91
	T1-507510 TAP1	19	20	19	17	17	-5	-10	-14	-18	-19	10	15	18	19	19	-2	-2	-2	-2	-2	123	132	120	109	106	-159	-147	-129	-116	-109
	T1-510520 TAP2	19	21	19	17	17	-7	-12	-17	-22	-23	12	17	21	23	23	-2	-3	-3	-3	-3	102	110	100	91	88	-159	-147	-129	-116	-109
	T1-520530 TAP3	67	71	66	60	59	-12	-15	-25	-29	-30	15	19	26	27	29	-2	-4	-4	-4	-4	-129	-142	-130	-119	-115	-133	-123	-108	-96	-91
	T1-507510 TOP1	19	20	19	17	17	-5	-10	-14	-18	-19	10	15	18	19	19	-2	-2	-2	-2	-2	123	132	120	109	106	-159	-147	-129	-116	-109
	T1-510520 TOP2	19	21	19	17	17	-7	-12	-17	-22	-23	12	17	21	23	23	-2	-3	-3	-3	-3	102	110	100	91	88	-159	-147	-129	-116	-109
	T1-520530 TOP3	67	71	66	60	59	-12	-15	-25	-29	-30	15	19	26	27	29	-2	-4	-4	-4	-4	-129	-142	-130	-119	-115	-133	-123	-108	-96	-91
	T1-510520 TGR2	0	1	1	1	1	-7	-12	-17	-22	-23	20	28	35	38	38	-2	-3	-3	-3	-3	102	110	100	91	88	-159	-147	-129	-116	-109
	T1-520530 TGR3	0	1	1	1	1	-12	-15	-24	-28	-29	25	32	42	45	48	-2	-4	-4	-4	-4	-129	-142	-130	-119	-115	-133	-123	-108	-96	-91
	T2-507510, 160, 2	19	20	19	17	17	-8	-16	-23	-29	-31	7	10	12	13	13	-2	-2	-2	-2	-2	123	132	120	109	106	-159	-147	-129	-116	-109
	T2-507510, 160, 1	19	20	19	17	17	-5	-10	-14	-18	-19	10	15	18	19	19	-2	-2	-2	-2	-2	123	132	120	109	106	-159	-147	-129	-116	-109
	T2-510520, 220, 2	19	21	19	17	17	-12	-21	-30	-39	-41	7	11	13	14	14	-2	-3	-3	-3	-3	102	110	100	91	88	-159	-147	-129	-116	-109
	T2-510520, 220, 1	19	21	19	17	17	-7	-12	-17	-22	-23	12	17	21	23	23	-2	-3	-3	-3	-3	102	110	100	91	88	-159	-147	-129	-116	-109
	T2-510520, 300, 2	19	21	19	17	17	-15	-26	-37	-48	-50	7	9	12	13	13	-2	-3	-3	-3	-3	102	110	100	91	88	-159	-147	-129	-116	-109
	T2-510520, 300, 1	19	21	19	17	17	-7	-12	-17	-22	-23	12	17	21	23	23	-2	-3	-3	-3	-3	102	110	100	91	88	-159	-147	-129	-116	-109
with cooling plate* (optional)	EA-507, EA-508	2	3	4	5	5	-1	-1	-2	-2	-1	3	4	6	6	7	-126	-139	-129	-119	-114	-4	-6	-8	-8	-8	0	-1	-1	-1	-1
	EA-510, EA-511	2	3	4	5	6	-1	-1	-2	-2	-2	3	6	8	9	9	-126	-139	-129	-119	-114	-6	-9	-10	-11	-10	-1	-1	-1	-1	-1
	EA-520	3	4	6	7	8	-1	-2	-3	-3	-2	4	7	9	10	11	-105	-116	-108	-99	-96	-7	-10	-12	-13	-12	-1	-1	-2	-2	-2
	EA-530	4	5	7	8	9	-2	-3	-4	-4	-3	5	8	11	13	13	-129	-143	-133	-122	-118	-9	-13	-15	-15	-15	-1	-2	-3	-3	-2
	TF-507510 TIP1c	19	20	18	16	16	-1	-3	-5	-6	-7	13	20	24	25	25	-7	-8	-8	-10	-10	124	134	122	115	110	-159	-147	-129	-114	-108
	TF-510520 TIP2c	19	20	18	17	16	-2	-3	-5	-7	-9	15	23	28	29	29	-9	-11	-11	-14	-13	103	112	102	96	92	-159	-147	-129	-114	-108
	TF-520530 TIP3c	65	69	62	60	56	-8	-13	-16	-18	-19	19	26	34	38	34	-12	-14	-14	-16	-16	-129	-143	-133	-122	-118	-133	-122	-107	-95	-90
	T1-507510 TAP1c	19	20	19	17	16	-4	-7	-10	-12	-13	10	15	18	19	19	-2	-3	-3	-3	-3	122	131	120	108	104	-159	-148	-130	-116	-109
	T1-510520 TAP2c	19	21	19	17	17	-5	-8	-12	-14	-15	12	17	21	22	22	-3	-3	-4	-4	-4	102	110	100	90	87	-159	-148	-130	-116	-109
	T1-520530 TAP3c	66	71	64	60	57	-8	-13	-16	-18	-19	15	19	26	29	26	-4	-4	-5	-5	-5	-129	-143	-133	-122	-118	-133	-123	-108	-97	-91
	T1-507510 TAP1	19	20	19	17	16	-6	-10	-14	-17	-18	10	15	18	19	19	-2	-3	-3	-3	-3	122	131	120	108	104	-159	-148	-130	-116	-109
	T1-510520 TAP2	19	21	19	17	17	-7	-12	-18	-21	-22	12	17	21	22	22	-3	-3	-4	-4	-4	102	110	100	90	87	-159	-148	-130	-116	-109
	T1-520530 TAP3	66	71	64	60	57	-12	-19	-25	-28	-29	15	19	26	29	26	-4	-4	-5	-5	-5	-129	-143	-133	-122	-118	-133	-123	-108	-97	-91
	T1-507510 TOP1	19	20	19	17	16	-6	-10	-14	-17	-18	10	15	18	19	19	-2	-3	-3	-3	-3	122	131	120	108	104	-159	-148	-130	-116	-109
	T1-510520 TOP2	19	21	19	17	17	-7	-12	-18	-21	-22	12	17	21	22	22	-3	-3	-4	-4	-4	102	110	100	90	87	-159	-148	-130	-116	-109
	T1-520530 TOP3	66	71	64	60	57	-12	-19	-25	-28	-29	15	19	26	29	26	-4	-4	-5	-5	-5	-129	-143	-133	-122	-118	-133	-123	-108	-97	-91
	T1-510520 TGR2	0	1	1	1	1	-7	-12	-18	-21	-22	12	17	21	22	22	-3	-3	-4	-4	-4	102	110	100	90	87	-159	-148	-130	-116	-109
	T1-520530 TGR3	0	1	1	1	1	-12	-18	-24	-27	-28	15	19	26	29	26	-4	-4	-5	-5	-5	-129	-143	-133	-122	-118	-133	-123	-108	-97	-91
	T2-507510, 160, 2	19	20	19	17	16	-10	-17	-23	-28	-30	7	10	12	13	13	-2	-3	-3	-3	-3	122	131	120	108	104	-159	-148	-130	-116	-109
	T2-507510, 160, 1	19	20	19	17	16	-6	-10	-14	-17	-18	10	15	18	19	19	-2	-3	-3	-3	-3	122	131	120	108	104	-159	-148	-130	-116	-109
	T2-510520, 220, 2	19	21	19	17	17	-13	-22	-33	-38	-40	7	11	13	14	14	-3	-3	-4	-4	-4	102	110	100	90	87	-159	-148	-130	-116	-109
	T2-510520, 220, 1	19	21	19	17	17	-7	-12	-18	-21	-22	12	17	21	22	22	-3	-3	-4	-4	-4	102	110	100	90	87	-159	-148	-130	-116	-109
	T2-510520, 300, 2	19	21	19	17	17	-16	-27	-40	-47	-49	7	9	12	12	12	-3	-3	-4	-4	-4	102	110	100	90	87	-159	-148	-130	-116	-109
	T2-510520, 300, 1	19	21	19	17	17	-7	-12	-18	-21	-22	12	17	21	22	22	-3	-3	-4	-4	-4	102	110	100	90	87	-159	-148	-130	-116	-109

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

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

Cycle time calculation

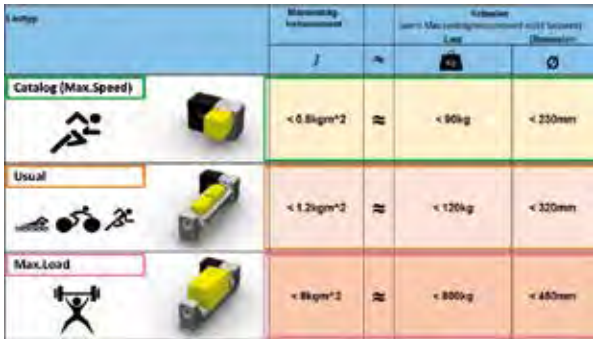
pL has specific calculation tools at its disposal. Where necessary, we can provide assistance when calculating the piece part time. Based on your information, we will prepare a detailed cycle time calculation. See the table to the right for reference values for the clapping cycle.

	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.



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

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.

Pull-out torque

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

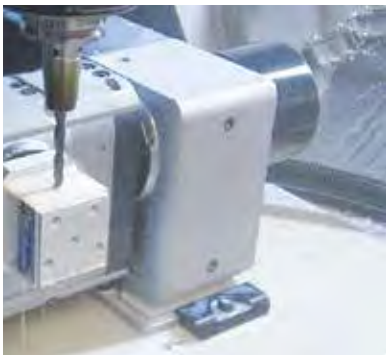
Reference values	Unit	507 / 508	510 / 511	520	530	Remarks
max. permissible depending on bearing	Nm	1,200	2,000	3,900	10,400	Pull-out load, spindle
EA and TF tilter with claw clamps	Nm	700	1,000	1,000	2,000	with max. tensile load on claw clamp, without noteworthy lifting of the housing[1)]
EA and TF tilter 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.

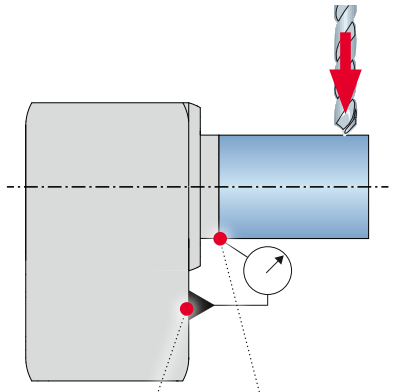
Specific reference values for individual applications and how to use them

Stiffness

Expected response (elasticity) to corresponding load:

Reference values	Unit	507 (508)	510 (511)	520	530	Remarks
Torsion, gear unit	Nm/°	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 spindle[1], relative to rotary table housing[2]; spindle clamping active (inactive approx. –10%)

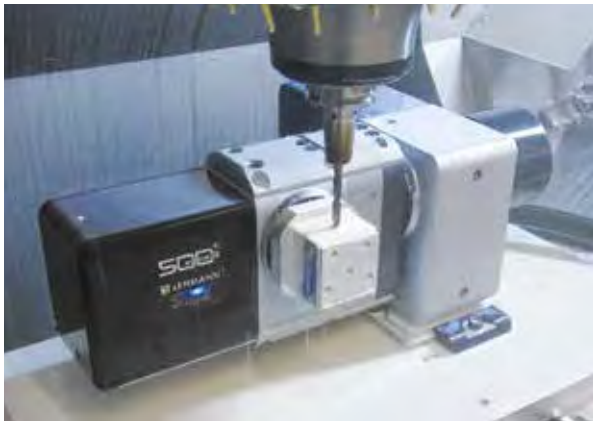


Achievable workpiece accuracies in three dimensions

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:

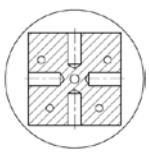
Reference values	Positioning	Simultaneous
Size	Cube 350 mm	Cube 150 mm
Weight	150 kg	34 kg
Accuracy [1]	± 10 µm/100 mm	
Accuracy [2]	± 5 µm/100 mm	not possible
Accuracy WMS [1]	± 3 µm/100 mm	
Accuracy WMS [2]	± 2 µm/100 mm	not possible

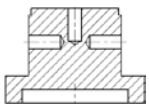
[1] only ONE workpiece zero point [2] several workpiece zero points
WMS = Angular position measuring system ± 2.5"; both axes



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)





Test workpiece

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 ($M_{gear\ max.}$) **[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 ($sl_{eccentric}$) **[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.

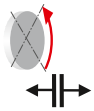
For T-type rotary tables, the excentric load usual* is identical to the gear load with sls. For an EA rotary table, this torque is equal to the value resulting from the maximum excentric load when using a rotoFIX Alu with a standard load. Please refer to the respective parameter list for usual values.
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. 109**

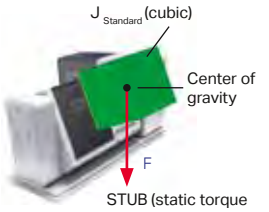
Center of gravity shift without and with load. The greater the red center of gravity, the greater is the gear unit loading in the tilting axis. The blue arrow shows the direction in which the center of gravity moves from «without load» to «with load».

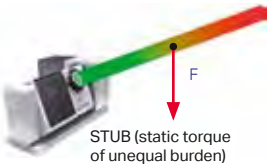
pL standard spindle load (sls = $sl_{standard}$) pp. 26–47 and 86–87 **[kg]**
…refers to the pL spindle load defined as standard, derived from practice, covering approximately 90% of all applications. All drive data and parameter lists are designed for the cubic pL standard load. All masses moving within 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. 26–47 and 86–87 **[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).

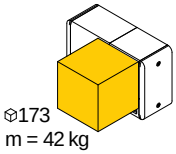
Max. perm. moment of inertia (J_{max}) **[kgm2]**
…corresponds to 10x the standard moment of inertia ($J_{standard}$) In most applications, this moment of inertia is not exceeded even with large workpieces. It should also be noted that the J ratio of 10:1 is NOT exceeded with any motorized model. Large J values can be moved, of course, but required appropriate adjustments (on request).

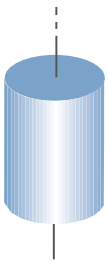






EA-510



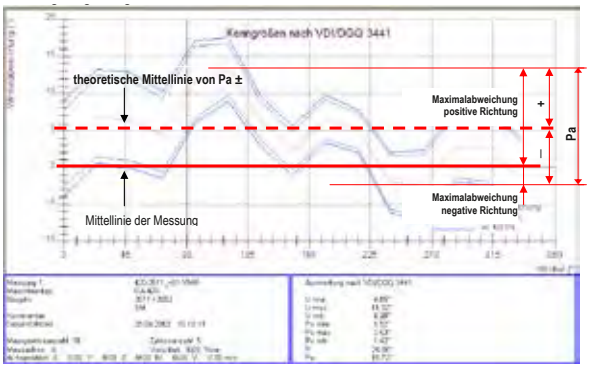


Function explanations, limit values and conditions minimize your risks

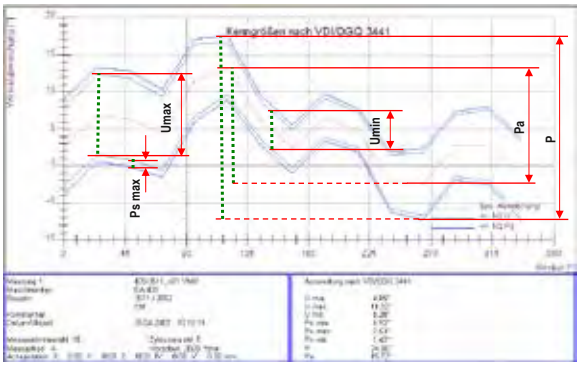
3 Gear accuracies

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 ±:



Explanation of various parameters according to VDI/DGQ 3441:

Indexing accuracy (Pa ±) [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 ± value.
This is equal to the position deviation Pa according to VDI/DGQ 3441, but accumulated (example: TG ± 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.

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»

Definition of the terms used in this catalog

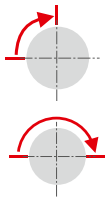
4 Speed

DIN / VDE 0530 S3, ED 20%

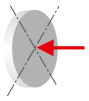
Duty cycle (ED) **[%]**
…refers to the duration of the movement per unit of time according to the DIN/VDE 0530 Standard. The pL rotary tables are designed for intermittent duty (positioning operation) S3 at ED 20%, but with a backlash time of 1 minute. If these conditions are exceeded by the respective application, the drive data must be reduced accordingly.

Rotational spindle speed (n_{spi}) **[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)

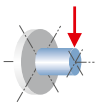
Cycle time 90° / 180° (t 90° / $t_{180°}$) **[sec]**
…refers to the time required for the entire dividing / indexing operation for a 90°/180° movement
– Dividing/indexing operation STANDARD pL = unclamping and clamping monitored using a pressure sensor. During clamping, the clamped signal is sent as 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.



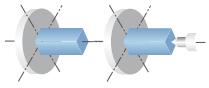
5 Spindle bearing



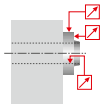
Axial force (F_{axial}) **[N]**
..refers to the maximum permissible axial load on the spindle. It includes the workpiece, devices, machining forces and other forces resulting from the rotational and tilting movement.



Pull-out torque (M_{tilt}) **[Nm]**
..refers to the maximum permissible tiling 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.

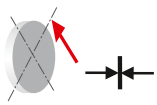


Transport load (sl_{max}) **[kg]**
…refers to the total, maximum permissible load which is installed starting from the spindle nose and performs a rotational movement together with the spindle (device and workpiece). This load does not correspond to the pL standard spindle load.



Radial and axial run-out ($ro_{con/ax}$) **[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*

The clamping torque is so high that the divider package of the 2-axis rotary tables can already exhibit considerable torsional movement before the clamp relaxes. As a result, the maximum clamping torque cannot be used in all cases.

* 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 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.

offset 1: [mm]
0.013

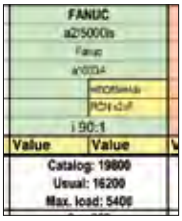
Pitch error (pe)
...refers to the effective NOMINAL-ACTUAL deviation over a specific rotation angle ("pitch error") for axis error compensation on the CNC machine. For rotary tables, this occurs typically with the movement of eccentrically arranged loads such as clamping yokes, tilting axes etc.

pitch error: [°]
0.005

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. 106**

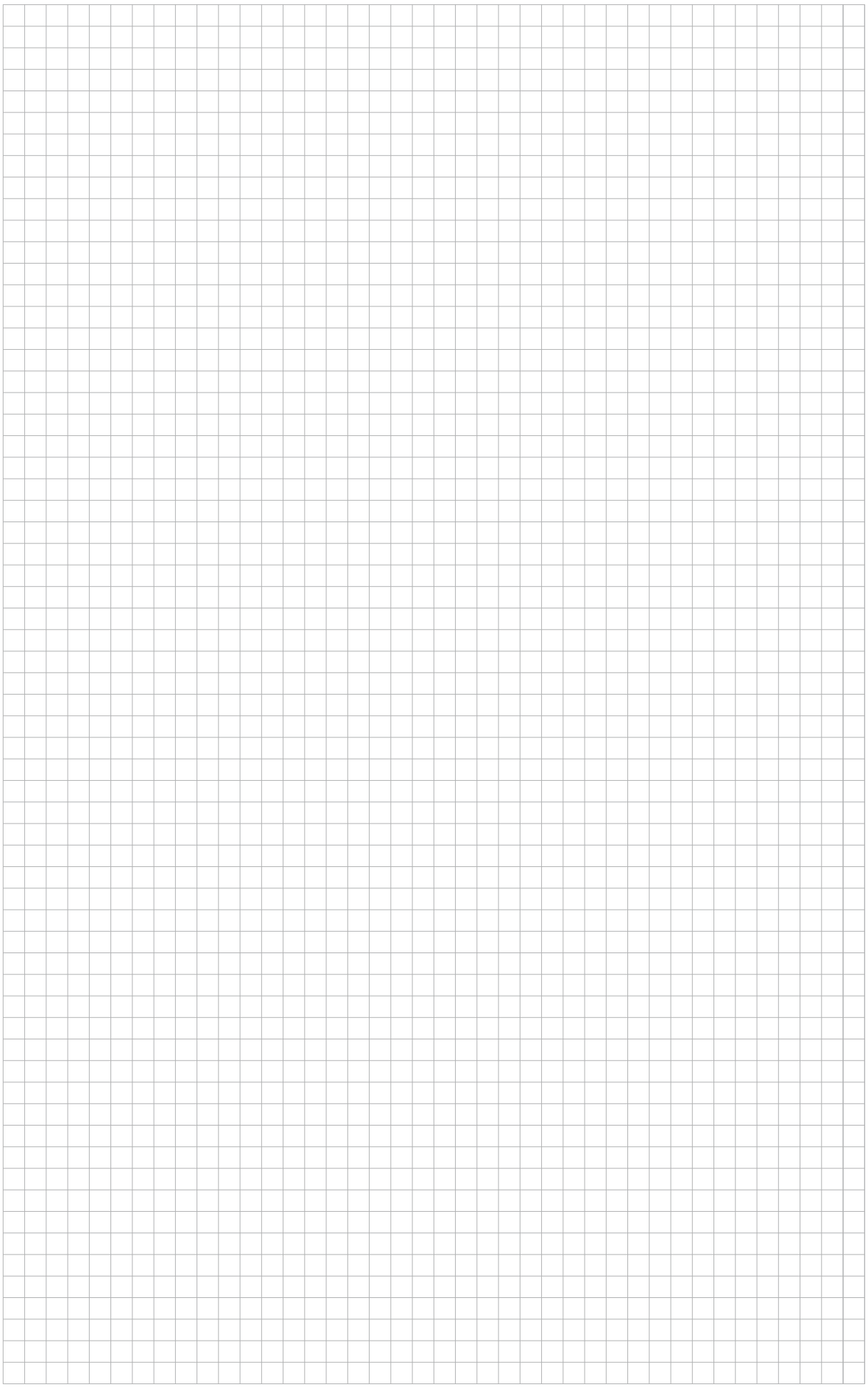
Parameter lists
To minimize commissioning time and make maximum use of the pL rotary table, you can find parameter lists for various controls at www.lehmann-rotary-tables.com. In the case of load-relevant parameters, we distinguish between...



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.



Workpiece clamping systems

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

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.

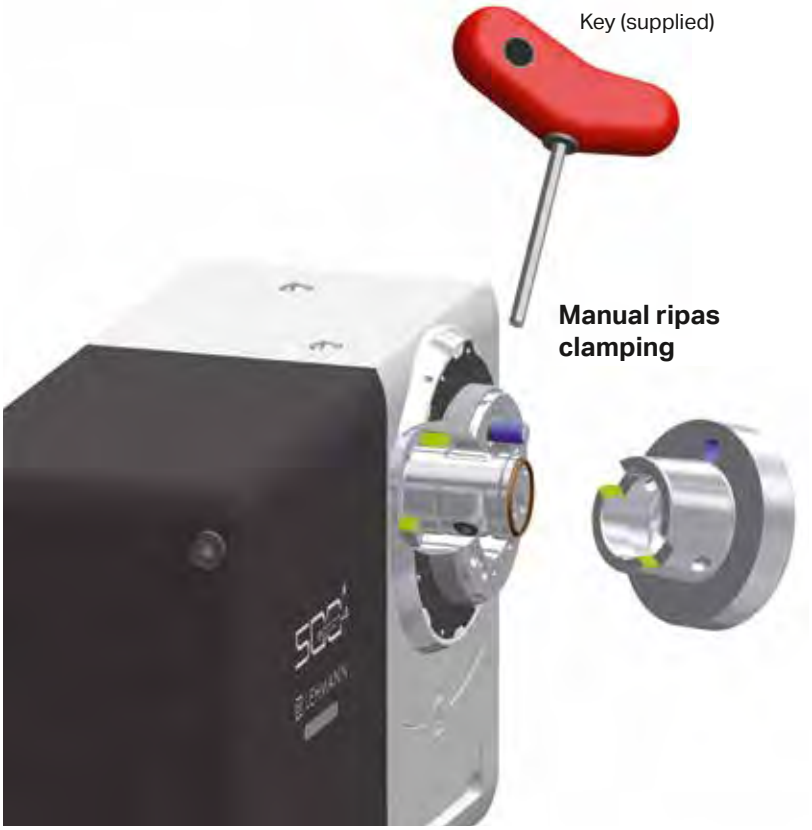
The function

ripas has 3 functions:

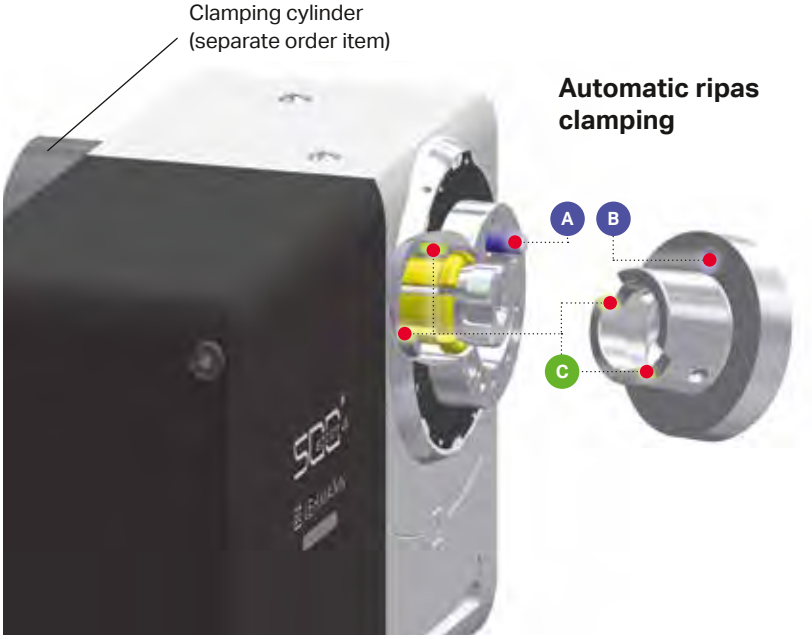
A Anti-twist protection
B Rough positioning
C Precision positioning

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.



Manual ripas clamping

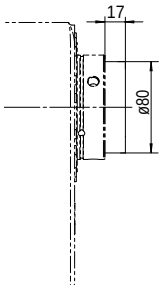


Automatic ripas clamping

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	●		
507	**RIP.507-63h**	HSK-A63		●	SPZ.5xx-9
510	**RIP.510-63m****	HSK-A63	●		
510	**RIP.510-63h**	HSK-A63		●	SPZ.5xx-9
520	**RIP.520-63m**	HSK-A63	●		
520	**RIP.520-63h**	HSK-A63		●	SPZ.520-9
all sizes	**MKx.5xx-MK4-1**	Adapter MK4			
all sizes	**RIP.63ada**	ripas adapter - Standard			
all sizes	**RIP.63ada-B**	ripas adapter with face coating for major improvement of the slip-free torque transmitted (please refer to technical data)			
all sizes	**RIP.63-KD-1**	ripas/HSK alignment pin			
all sizes	**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. 51**

** Not possible in combination with the «Labyrinth» spindle seal (see **p. 29**)

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]	
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. 50**)

CAPTO clamping

	Item no.	Designation	Manual (MAPAL)	Hydraulic (Ortlieb)	Required clamping cylinder *
507	**CAP.507-C4m**	Capto clamping, C4	●		
507	**CAP.507-C4h**	Capto clamping, C4		●	SPZ.5xx-9
510	**CAP.510-C4m**	Capto clamping, C4	●		
510	**CAP.510-C4h**	Capto clamping, C4		●	SPZ.5xx-9

Tooling for individual finish machining / finishing

Jumbo pallet 30x30 on centered chuck for easy machining

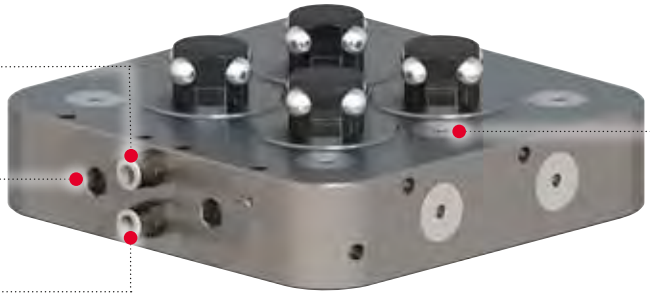
Jumbo pallet 30x30 on 4 chucks – clamped

QUATTRO chuck

Connection for contact check/ cleaning

Manual clamping: 180° turn suffices

Compressed air connection for clamping



Dimensions: 150 x 150 x 34 mm (L x W x H)

6 screws (M10) for fastening to the machine table, 100 or 50 mm pattern

UNO chuck

UNO chuck Ø 100 with 4 fastening holes (M8) in a 50 mm spacing

6 benefits (applies to QUATTRO and UNO)

+ Only 34 mm high
+ Manual and pneumatic in one
+ Easy to clean
+ Pressureless clamping
+ Easy mounting
+ Maintenance-free

Technical data

		UNO	QUATTRO
Repeat accuracy		approx. ± 0.005 mm	
Retention force, clamped	Manual	approx. 6 kN	approx. 24 kN
	pneumatic at 6 bar	approx. 10 kN	approx. 40 kN

all values tentative data

Item no.

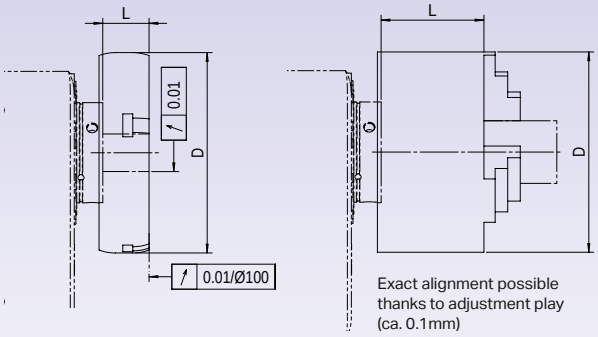
Item no.	Designation	Dimensions
AML.SPF-U	UNO chuck	Ø50x34 mm, 1 pin
AML.SPF-Q	QUATTRO chuck	150x150x34 mm, 4 pins

for more information, see AM-LOCK brochure

LEHMANN®

Clamped quickly and easily

Quickly converted for small series and express work



Exact alignment possible thanks to adjustment play (ca. 0.1mm)

Faceplates (axial discs)

	Item no.	Designation	Diameter D [mm]	Thickness [mm]	Passage [mm]	LL from spindle [mm]	Weight [kg]	Moment of inertia J [kgm²]	Niederhauser Item no.
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	
	TPL.510-200	Faceplate, 4 T-slots 12 mm	200	40	30	37	10	0.05	
	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	
	TPL.520-300	Faceplate, 8 T-slots 14 mm	300	50	45	50	27	0.31	
	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	
	TPL.530-400	Faceplate, 8 T-slots 18 mm	400	51	45	51	49	0.99	
	TPL.530-500**	Faceplate, 8 T-slots 18 mm	500	56	45	56	84	2.65	
	TPL.5xx-GEN	Increased accuracy = ½ 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. 29**)
*** Not possible for TxPc models

Scroll chucks steel (manual)

incl. appropriate adapter flange, 1 set each of hard boring and turning jaws as well as clamping wrench and fastening screw

507*	**BFU.507-100ps**	Scroll chuck	100		20	62.5	4	0.005	507-100ps
	BFU.507-125ps**	Scroll chuck	125		35	74	7	0.01	507-125ps
	BFU.507-160ps**	Scroll chuck	160		42	82.5	13	0.04	507-160ps
510	**BFU.510-125ps**	Scroll chuck	125		35	74	7	0.01	510-125ps
	BFU.510-160ps**	Scroll chuck	160		42	82	13	0.04	510-160ps
	BFU.510-200ps**	Scroll chuck	200		44	92	22	0.07	510-200ps
520	**BFU.520-160ps**	Scroll chuck	160		42	85	13	0.04	520-160ps
	BFU.520-200ps**	Scroll chuck	200		55	95	23	0.12	520-200ps
	BFU.520-250ps**	Scroll chuck	250		76	106	39	0.31	520-250ps
530	**BFU.530-250ps**	Scroll chuck	250		76	104	32	0.25	530-250ps
	BFU.530-315ps	Scroll chuck	315		80	116	56	0.69	530-315ps
	BFU.530-400ps	Scroll chuck	400		136	123	97	1.88	530-400ps
	BFU.5xx-GEN	Increased accuracy = ½ tolerance values							

For more information, please visit: www.niederhauser.ch
Request installation and operating instructions directly from manufacturer

Wedge bar chucks SMW Type HG-F (manual, modular helical gear jaw system)

incl. appropriate adapter flange, 1 set of hard, reversible ground stepped jaws in the chuck as well as clamping wrench and fastening screw

507*	**BFU.507-160ks****	Wedge bar chuck	160		42	81	11	0.04	507-160ks
510	**BFU.510-160ks****	Wedge bar chuck	160		42	81	11	0.04	510-160ks
	BFU.510-200ks**	Wedge bar chuck	200		42	102.5	22	0.11	510-200ks
520	**BFU.520-160ks**	Wedge bar chuck	160		46	70	11	0.04	520-160ks
	BFU.520-200ks**	Wedge bar chuck	210		60	92	22	0.11	520-200ks
	BFU.520-250ks**	Wedge bar chuck	260		81	110	38	0.30	520-250ks
530	**BFU.530-250ks**	Wedge bar chuck	260		81	112	38	0.30	520-250ks
	BFU.530-315ks	Wedge bar chuck	315		102	135	58	0.89	520-315ks
	BFU.530-400ks	Wedge bar chuck	400		128	153	112	2.58	520-400ks
	BFU.5xx-GEN	Increased accuracy = ½ tolerance values							

For more information, please visit: www.smw-autoblok.de and www.niederhauser.ch
Request installation and operating instructions directly from manufacturer

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

For further information, please visit: www.schunk.com
Request installation and operating instructions directly from manufacturer

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
510	**SCH.510-5-KSC40-11**		500	KSC2 40	1 sides, 1 row	6		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	Always needed:	500	KSC2 65	2 sides, 1 row	6	Always needed:	40105279
	SCH.510-5-KSC125-1	**SCH.510-LRP500**	500	KSC 125	1 sides, 1 row	3	40105326	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		600	KSC2 40	1 sides, 1 row	7		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	Always needed:	600	KSC2 65	2 sides, 1 row	8	Always needed:	40105291
	SCH.510-6-KSC125-1	**SCH.510-LRP600**	600	KSC 125	1 sides, 1 row	3	40105355	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.TOP2-150 **(p. 30)**
+ bore set RFX.510-ASa-TOP **(p. 30)**
+ base plate RFX.510-GPxxxs-TOP **(p. 30)** or hydraulic kit GLA.HYD-xxx **(p. 69)**

Hole grid plate SCHUNK 40105326, 40105355, 40105356, 40105357

Instead of the standard clamping yoke shown on **p. 30** the SCHUNK hole grid plate is used here.

For further information, please visit: www.schunk.com
Request installation and operating instructions directly from manufacturer


KSC2 40
2 sides, 2 rows


KSC2 65
1 sides, 1 rows

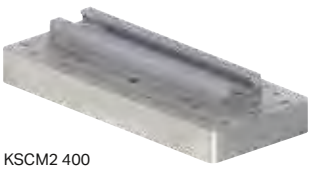

KSC2 65
2 sides, 1 rows

	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
520	**SCH.520-6-KSC40-11**		600	KSC2 40	1 sides, 1 row	7		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	Always needed:	600	KSC2 65	2 sides, 1 row	8	Always needed:	40105303
	SCH.520-6-KSC125-1	**SCH.520-LRP600**	600	KSC 125	1 sides, 1 row	3	40105356	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		800	KSC2 40	1 sides, 1 row	10		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	Always needed:	800	KSC2 65	2 sides, 1 row	10	Always needed:	40105315
	SCH.520-8-KSC125-1	**SCH.520-LRP800**	800	KSC 125	1 sides, 1 row	5	40105357	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.TOP2-180 **(p. 30)**
+ bore set RFX.520-ASa-TOP **(p. 30)**
+ base plate RFX.520-GPxxxs-TOP **(p. 30)** or hydraulic kit GLA.HYD-xxx **(p. 69)**


KSC 125
1 sides, 1 rows


KSCM2 400
1 sides, 1 rows


KSCM2 400
1 sides, 2 rows


KSC 125
2 sides, 1 rows


KSM2 400
2 sides, 1 rows


KSM2 400
2 sides, 2 rows

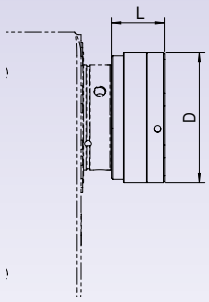
For more information, please visit: www.schunk.com
Request installation and operating instructions directly from manufacturer

	pL LEHMANN Item no.	Designation	Size [mm]	L from spindle (without jaws) [mm]	Pneumatic	Manual	Centered	Fixed jaw	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
	SCH.507-KSA100F	KSA-F-Z plus 100	100 x 100	85.2		●		●	4	18	9	8	70		0405293	40101545
510	**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
	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
	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
520	**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
530	**SCH.530-KSP250**	KSP-Z plus 250	250 x 250	128.2	●		●		5	55	6		170	DDF.530-04	0405502	on request
	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. 52/53**

KSPZ plus 250 on EA-520

SCHUNK-clamping unit on SCHUNK VERO-S **(p. 119)**



For further information, please visit: www.schunk.com
Request installation and operating instructions directly from manufacturer

	pL 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
	SCH.507-138ix	VERO-S NSE3 138-V1	●	●	●	ø138	69.5	7.5	28	75	●	●	DDF.507-04	1313723	40101342
510	**SCH.510-90ix**	VERO-S NSE mini 90-V1	●	●	●	ø90	35	0.5	15	25	●	●	DDF.510-04	0435105	40105125
	SCH.510-138ix	VERO-S NSE3 138-V1	●	●	●	ø138	79	7.5	28	75	●	●	DDF.510-04	1313723	40101344
520	**SCH.520-138ix**	VERO-S NSE3 138-V1	●	●	●	ø138	79	7.5	28	75	●	●	DDF.520-04	1313723	40105132
	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. 52/53**

Increased accuracy = ½ tolerance values; Item no. NPS.5xx-GEN

Important technical data

	Unit	NSE3 138	NSE +176
Pneumatic system	[mm]	yes	yes
Repeat accuracy	[mm]	< 0.005	< 0.005
Actuating pressure	[bar]	6	6
Draw-in force	[kN]	28	40
Retention force M16	[kN]	75	75

NSE plus 90-V1


Empty chuck


Centric clamping unit KSA plus 100

NSE3 138-V1


Empty chuck


Diaphragm chuck


ROTA-S plus


Centric clamping unit KSC2 65


Centric clamping unit KSC 125


Centric clamping unit KSO 100


Centric clamping unit KSK 65

NSE plus 176-V1

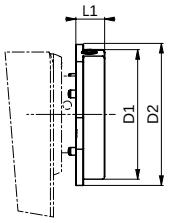

Empty chuck

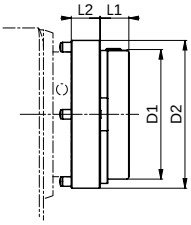
GRESSEL Spanntechnik

For further information, please visit: www.gressel.ch
Request installation and operating instructions directly from manufacturer

	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	Base body required
GRE.SOL-40	solinos 40-4V-IT	•	148 x 135 x 135	198		8	KLM.040.020.01	GRE.5xx-GRU
GRE.SOL-65	solinos 65-4V-IT	•	193 x 164 x 164	243		18.5	KLM.065.020.01	
GRE.C165-grip	C1 65 grip	•	178 x 65 x 67	117		2.9	CGM.065.001.01	
GRE.C165-präz	C1 65 precision	•	178 x 65 x 67	117		2.9	CGM.065.002.01	
GRE.C280-grip	C2 80 with reversible jaw grip	•	157 x 80 x 78	128		4	CGM.080.001.01	
GRE.C2125-grip	C2 125 L-160 with reversible jaw grip	•	208 x 125 x 83	133		8.7	CGM.125.001.01	
GRE.SPZ	gredoc collect chuck	•	ø148 x 47.5	97.5	ø148	1.5	NGS.010.030.01	
GRE.LP	empty pallet	•	ø148 x 30	80	ø148	2.0	NGA.000.002.01	
GRE.LRP	Pallet with hole grid	•	ø148 x 30	80	ø148	2.0	NGA.000.003.01	
GRE.AB	Mounting pin, incl. fastening screw	•	ø40			0.1	NGA.000.001.01	

All items must be ordered separately! (Example of Lehmann EA-507: NGS.010.015.01 + CGM.080.001.01 + NGA.000.001.01)

Possible applications

centrinos 65

centrinos 125

solinos 4 V

Empty pallets

Pallet with hole grid

Application EA

LEHMANN®

LANG TECHNIK
einfach. zukunft. greifen.

For further information, please visit: www.lang-technik.de
Request installation and operating instructions directly from manufacturer

LANG zero point clamping system

pL LEHMANN item no.	**LAN.5xx-QP52**
Designation	Quick·Point® 52 incl. adapter flange
Dimensions	Ø 116 x 43 mm
suitable for LEHMANN SPI	507 / 510 / 520
suitable for LANG 5-axis vices*	48085-46 / 48085-77 / 48120-46 / 48120-77 / 48160-77
LANG item no.	45751-1000

pL LEHMANN item no.	**LAN.5xx-QP96**
Designation	Quick·Point® 96 incl. adapter flange
Dimensions	Ø 196 x 37 mm
suitable for LEHMANN SPI	507 / 510
suitable for LANG 5-axis vices*	48155-77 / 48155-125
LANG item no.	45820-1000

pL LEHMANN item no.	**LAN.520-QP96**
Designation	Quick·Point® 96 incl. adapter flange
Dimensions	Ø 196 x 41,5 mm
suitable for LEHMANN SPI	520
suitable for LANG 5-axis vices*	48155-77 / 48155-125
LANG item no.	45820-2000

* The maximum length of the vice base body depends on the rotary axis type.
Longer vice versions may be possible. Please inquire.

Vices suitable for the LANG zero point clamping system

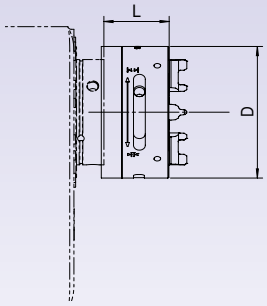
Example of application
Makro·Grip® 77 with Quick·Point® 52 on LEHMANN SPI 507

Example of application
Makro·Grip® 125 with Quick·Point® 96 on LEHMANN SPI 520

pL LEHMANN item no.	Designation	Clamping capacity [mm]	LANG item no.	Base body required
LAN.MG46-S85	Makro·Grip® 46, length 102 mm Jaw width 46 mm	0 – 85	48085-46	Quick·Point® 52 Item no. **45751-1000** and pL LEHMANN Item no. **LAN.5xx-QP52**
LAN.MG46-S120	Makro·Grip® 46, length 130 mm Jaw width 46 mm	0 – 120	48120-46	
LAN.MG77-S85	Makro·Grip® 77, length 102 mm Jaw width 77 mm	0 – 85	48085-77	
LAN.MG77-S120	Makro·Grip® 77, length 130 mm Jaw width 77 mm	0 – 120	48120-77	
LAN.MG77-S160	Makro·Grip® 77, length 170 mm Jaw width 77 mm	0 – 160	48160-77	
LAN.MG77-S155	Makro·Grip® 77, length 160 mm Jaw width 77 mm	0 – 155	48155-77	Quick·Point® 96 Item no. **45820-1000 / 45820-2000** and pL LEHMANN Item no. **LAN.5xx-QP96 / LAN.520-QP96**
LAN.MG125-S155	Makro·Grip® 125, length 160 mm Jaw width 125 mm	0 – 155	48155-125	

All LANG vices can also be attached to other zero point clamping systems (Erowa, Schunk, 3R, etc.) after being adjusted slightly. For further information, please contact your local LANG Technik representative.

EROWA



For more information, please visit: www.erowa.com
Request installation and operating instructions directly from manufacturer

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	Chuck weight (incl. adapter flange) [kg]	EROWA catalog reference	EROWA Item no., incl. adapter flange
507	**ERO.5xx-FTSix**	FTS Chuck (Inox)		●	ø74	46.5	ø72	4	●	●	1)	1.5	ER-057335	ER-073469
	ERO.5xx-Qcix	QuickChuck 100 P (Inox)	●		ø100	50	□50/ø148	35				2.6	ER-036345	ER-073351
	ERO.5xx-ITS100ix	ITS Chuck 100 P (Inox)		●	ø100	50	□50/ø148	35	●	●	1)	2.5	ER-043123	ER-073433
	ERO.5xx-PC	PowerChuck P		●	ø150	64.5	□50/ø148	50	●	●	1)	7.5	ER-115254	ER-073046
	ERO.5xx-MTS	MTS IntegralChuck S-P/A		●	ø130	60	ø148	50	●	●	1)	4	ER-036802	ER-073457
510	**ERO.5xx-FTSix**	FTS Chuck (Inox)		●	ø74	46.5	ø72	4	●	●	2)	1.5	ER-057335	ER-073469
	ERO.5xx-QCix	QuickChuck 100 P (Inox)	●		ø100	50	□50/ø148	35				2.6	ER-036345	ER-073351
	ERO.5xx-ITS100ix	ITS Chuck 100 P (Inox)		●	ø100	50	□50/ø148	35	●	●	2)	2.5	ER-043123	ER-073433
	ERO.5xx-PC	PowerChuck P		●	ø150	64.5	□50/ø148	50	●	●	2)	7.5	ER-115254	ER-073046
	ERO.5xx-MTS	MTS IntegralChuck S-P/A		●	ø130	60	ø148	50	●	●	2)	4	ER-036802	ER-073457
520	**ERO.520-PC**	PowerChuck P		●	ø150	75	□50/ø148	50	●	●	3)	8.7	ER-115254	ER-073460
	ERO.520-P210	ProductionChuck 210		●	ø81/ø210	98	ø210	120	●	●	3)	16.6	ER-032964	ER-073461
	ERO.520-P210c	Product.Chuck 210 Combi		●	ø210	98	□50/ø210	120	●	●	3)	18	ER-032388	ER-073462
530	**ERO.530-PC**	PowerChuck P		●	ø150	75	□50/ø148	50	●	●	4)	7.5	ER-115254	on request
	ERO.530-P210	ProductionChuck 210		●	ø81/ø210	98	ø210	120	●	●	4)	16.6	ER-032964	on request
	ERO.530-P210c	Product.Chuck 210 Combi		●	ø210	98	□50/ø210	120	●	●	4)	18	ER-032388	on request
	ERO.530-UPCP	UPC P Chuck		●	320x300	95	□320	250	●	●	4)	51	ER-016841	ER-077382
	ERO.530-UPCC	UPC Chuck Combi		●	280x280	90	□50/□320	200	●	●	4)	48	ER-070649	on request

Increased accuracy = ½ tolerance values; Item no. NPS.5xx-GEN

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. 52/53**):
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.


FTS Chuck (Inox)
ER-057335


ITS Chuck 100 P (Inox)
ER-043123


MTS IntegralChuck S-P/A
ER-036802


PowerChuck P
ER-115254


ProductionChuck 210 Combi
ER-032388

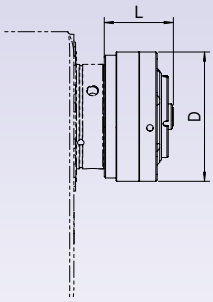

UPC Chuck with ITS Chuck 100 P
ER-070649

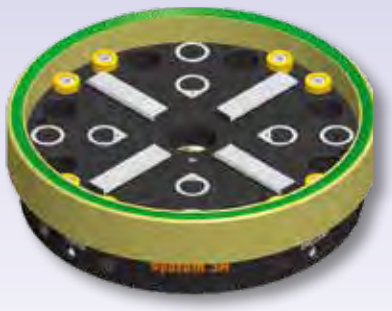

UPC P Chuck
ER-016841


Manual control valve
(option)

LEHMANN

system 3R





For more information, please visit: www.system3r.com
Request installation and operating instructions directly from manufacturer

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]	Open	Clean Z-support	Clean cams	incr. clamp force/venting	Rotary union	SYSTEM 3R catalog reference	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
510	**S3R.510-G120**	3R GPS 120	●	ø118	56	ø120	20	●	●			2)	C188770	X663010
510	**S3R.510-MGC***	3R Magnum Chuck	●	ø162	46	ø156, with index pin	100	●	●		●	2)	3R-SP26712	90940.02
510	**S3R.510-MCC**	3R Macro Chuck	●	ø100	49	54x54, 70x70	10	●	●		●	2)	3R-600.14-30	90940.01
520	**S3R.520-G120**	3R GPS 120	●	ø118	70	ø120	20	●	●			3)	C188770	X663020
520	**S3R.520-G240**	3R GPS 240	●	240x240	84	240x240	100	●	●	●	●	3)	C219200	X663030
520	**S3R.520-G240ix**	3R GPS 240, rust-resistant	●	240x240	84	240x240	100	●	●	●	●	3)	X607620	X663040
520	**S3R.520-MGC***	3R Magnum Chuck	●	ø162	60	ø156, with index pin	100	●	●		●	3)	3R-SP26712	90940.12
520	**S3R.520-MCC**	3R Macro Chuck	●	ø100	63	54x54, 70x70	10	●	●		●	3)	3R-600.14-30	90940.11
530	**S3R.530-G240**	3R GPS 240	●	240x240	84	240x240	100	●	●	●	●	4)	C219200	a.A.
530	**S3R.530-G240ix**	3R GPS 240, rust-resistant	●	240x240	84	240x240	100	●	●	●	●	4)	X607620	a.A.
Ref. Palette	**S3R.RP-GPS240**	Reference pallet GPS 240											C846600	
Ref. Palette	**S3R.RP-GPS70120**	Reference pallet GPS 70											C846360	
Ref. Palette	**S3R.RP-Macro**	Reference pallet Macro											36-606.1	
Ref. Palette	**S3R.RP-Magnum**	Reference pallet Magnum											3R-686.1-HD	

Additionally required Rotary union (see **pp. 52/53**):
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

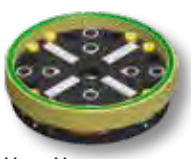
When standard pallets with open holes are used, water, metal chips etc. can get into the pallet chuck, air lines and control valve. To prevent this, seal kits are available from the respective chuck manufacturers.

Increased accuracy = ½ tolerance values; Item no. NPS.5xx-GEN


GPS 70

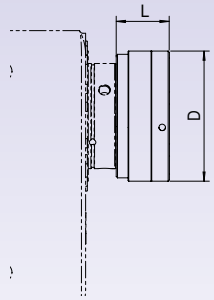

GPS 120

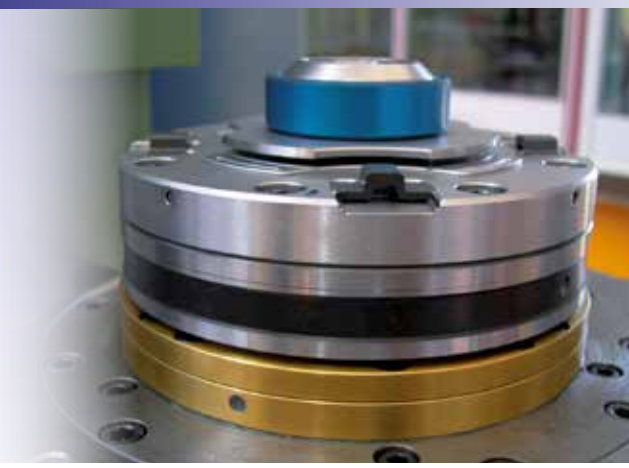

Macro


Macro Magnum


GPS 240

PAROTEC
spanntechnik · robotik · engineering





For further information, please visit: www.parotec.ch
Request installation and operating instructions directly from manufacturer

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

	pL 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					PT 1160102710
	PAR.5xx-PGp6	POWER GRIP 160		●		ø145	56	□158	100	6	●	●		DDF.507-04	PT 1160142710
	PAR.507-PGp40	POWER GRIP 160			●	ø145	35	□158	100	40	●	●	SPZ.5xx-9	SPZ.DDF-01	PT 1160112700
	PAR.5xx-PYmp130	POLY GRIP	●			ø130	55	ø70–148	30	6		o			PT 9911020710
	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.5xx-9	SPZ.DDF-01	PT 1160112710
	PAR.5xx-PYmp130	POLY GRIP	●			ø130	55	ø70–148	30	6		o			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		o			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		o			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. 52/53**

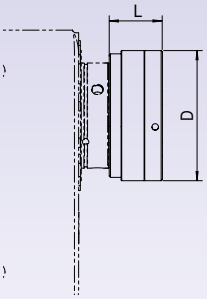
o = optional

Increased accuracy = ½ tolerance values; Item no. NPS.5xx-GEN

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.

ROEMHELD
HILMA ▪ STARK

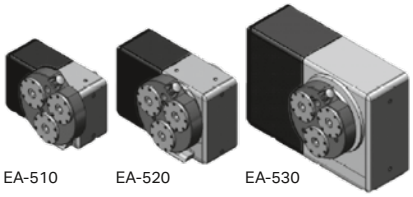


For further information, please visit: www.stark-inc.com
Request installation and operating instructions directly from manufacturer

Increased accuracy = ½ 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	●	●					●		DDF.510-04	804 331	SL1-63-0-1-2-01
	STA.510-04		●	ø250	60	2620	80	●	●					●	●	DDF.510-04	804 348	SL1-63-0-1-3-01
	STA.510-05		●	ø250	60	1740	40	●	●				●			DDF.510-04	804 331	SL1-63-1-1-2-01
	STA.510-06		●	ø250	60	2620	80	●	●				●		●	DDF.510-04	804 348	SL1-63-1-1-3-01
	STA.510-21	SVP 510 SPEEDY classic 1 Twister	●	ø250	63	1740	40	●	●	●	●	●				DDF.510-04	804 500	SL1-63-0-1-2-11
	STA.510-22		●	ø250	63	2620	80	●	●	●	●	●			●	DDF.510-04	804 501	SL1-63-0-1-3-11
	STA.510-23		●	ø250	63	1740	40	●	●	●	●	●	●			DDF.510-04	804 500	SL1-63-1-1-2-11
	STA.510-24		●	ø250	63	2620	80	●	●	●	●	●	●		●	DDF.510-04	804 501	SL1-63-1-1-3-11
520	**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	●	●					●		DDF.520-04	804 331	SL2-63-0-1-2-01
	STA.520-04		●	ø250	60	2620	80	●	●					●	●	DDF.520-04	804 348	SL2-63-0-1-3-01
	STA.520-05		●	ø250	60	1740	40	●	●				●			DDF.520-04	804 331	SL2-63-1-1-2-01
	STA.520-06		●	ø250	60	2620	80	●	●				●		●	DDF.520-04	804 348	SL2-63-1-1-3-01
	STA.520-21	SVP 512 SPEEDY classic 1 Twister	●	ø250	63	1740	40	●	●	●	●	●				DDF.520-04	804 500	SL2-63-0-1-2-11
	STA.520-22		●	ø250	63	2620	80	●	●	●	●	●			●	DDF.520-04	804 501	SL2-63-0-1-3-11
	STA.520-23		●	ø250	63	1740	40	●	●	●	●	●	●			DDF.520-04	804 500	SL2-63-1-1-2-11
	STA.520-24		●	ø250	63	2620	80	●	●	●	●	●	●		●	DDF.520-04	804 501	SL2-63-1-1-3-11
530	**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	●	●					●		DDF.530-04	804 331	SL3-63-0-1-2-01
	STA.530-04		●	ø250	60	2620	80	●	●					●	●	DDF.530-04	804 348	SL3-63-0-1-3-01
	STA.530-05		●	ø250	60	1740	40	●	●				●			DDF.530-04	804 331	SL3-63-1-1-2-01
	STA.530-06		●	ø250	60	2620	80	●	●				●		●	DDF.530-04	804 348	SL3-63-1-1-3-01
	STA.530-21	SVP 513 SPEEDY classic 1 Twister	●	ø250	63	1740	40	●	●	●	●	●				DDF.530-04	804 500	SL3-63-0-1-2-11
	STA.530-22		●	ø250	63	2620	80	●	●	●	●	●			●	DDF.530-04	804 501	SL3-63-0-1-3-11
	STA.530-23		●	ø250	63	1740	40	●	●	●	●	●	●			DDF.530-04	804 500	SL3-63-1-1-2-11
	STA.530-24		●	ø250	63	2620	80	●	●	●	●	●	●		●	DDF.530-04	804 501	SL3-63-1-1-3-11

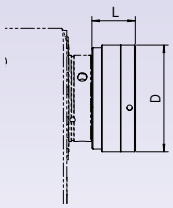
* see **pp. 52/53**



EA-510 EA-520 EA-530

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

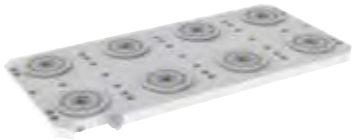
Version 20 kN			Version 30 kN		
Distance [mm]	Force [kN]	Weight [kg]	Distance [mm]	Force [kN]	Weight [kg]
200	8.8	897	200	13.1	1335
300	5.9	601	300	8.8	897
400	4.4	449	400	6.6	673
500	3.5	357	500	5.3	540
600	2.9	296	600	4.4	449



For further information, please visit: www.amf.de
Request installation and operating instructions directly from manufacturer

	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	**AMF.507-6206-S1**	6206ILA-10	●		ø112	47	10 kN	25 kN	●	●	DDF.507-04	428771	533190
510	**AMF.510-6206-S1**	6206ILA-10	●		ø112	47	10 kN	25 kN	●	●	DDF.510-04	428771	533216
520	**AMF.520-6206-S1**	6206ILA-20	●		ø138	90	17 kN	55 kN	●	●	DDF.520-04	428797	533232
530	**AMF.530-6370-S1**	6370EAIHA40		●	ø148	98	40 kN	105 kN	●	●	DDF.530-04	429845	533257

* see **pp. 52/53**


AMF zero point clamping system


EA-type rotary table with swing arm and AMF chuck

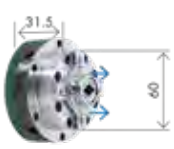

EA-type rotary table with cube and AMF chuck

For more information, please visit: http://fr.yerlymecanique.ch/
Request installation and operating instructions directly from manufacturer

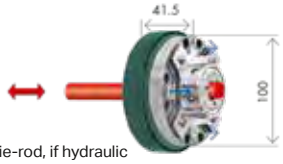
	pL LEHMANN Item no.	Designation	Hydraulic	Pneumatic	D [mm]	L from spindle [mm]	Workpiece size, approx. [mm]	Required clamping cylinder	Required rotary union**	YERLY catalog reference	YERLY Item no., incl. adapter flange
507	**YER.507-060P-***	YERLY* NPS 60		●	60	85	0.1...60		DDF.507-04	MD-60-*	YER.507-60P-*-JT
	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
510	**YER.510-060P-***	YERLY* NPS 60		●	60	85	0.1...60		DDF.510-04	MD-60-*	YER.510-60P-*-JT
	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. 52/53**

Yerly Basis 60P

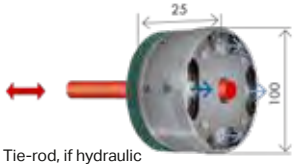


Yerly Basis 100P

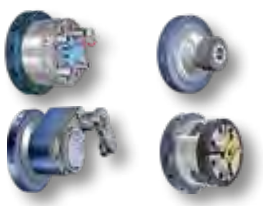


Tie-rod, if hydraulic

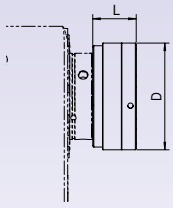
Yerly Basis 100M

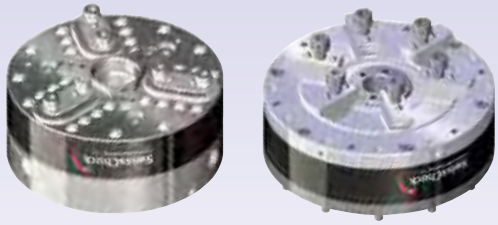


Tie-rod, if hydraulic


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

SwissChuck
Precision Workholding





For more information, please visit: www.SwissChuck.com
Request installation and operating instructions directly from manufacturer

Precision power chucks (cylinder-actuated)

	pL LEHMANN Item no.	Designation	D [mm]	Passage [mm]	L from spindle [mm]	Weight [kg]	Moment of inertia [kgm²]	Required clamping cylinder	SwissChuck Item no., incl. adapter flange
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
510	**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
520	**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
530	**SWI.530-3-250**	3KCHP 250-52	ø250	14	91	12.8	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

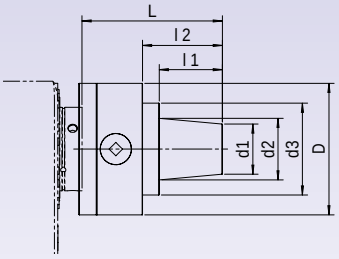
Precision diaphragm chuck (pneumatically actuated)

	pL LEHMANN Item no.	Designation	D [mm]	Passage [mm]	L from spindle [mm]	Weight [kg]	Moment of inertia [kgm²]	SwissChuck Item no., incl. adapter flange
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
510	**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
520	**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
530	**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

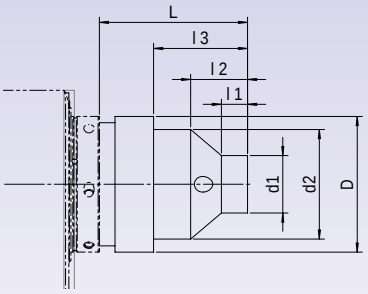
Attach complete with chuck, spindle flange, rotary feed and adapter

Interchangeable jaws and accessories on request

NIEDERHAUSER
SPANNTECHNIK UND SYSTEME



Mounting chuck, manual



Mounting chuck, automatic Type B axfix

For further information, please visit: www.niederhauser.ch
Request installation and operating instructions directly from manufacturer

SPZ.5xx = Item number for combined clamping cylinder for types 507 and 510 (see **pp. 50**)

	pL LEHMANN Item no.	Designation	System	axfix	Manual	Power-actuated	L [mm]	l 1 [mm]	l 2 [mm]	l 3 [mm]	D [mm]	d1 [mm]	d2 [mm]	d3 [mm]	Required clamping cylinder * (Option)	Niederhauser item no., incl. adapter flange
507	**ZSP.507-B32Am**	Mounting chuck	B32		●		133	59	75	–	126	53	62	88		507-B32
	ZSP.507-B32Aka	Mounting chuck	B32	●		●					130				SPZ.5xx-d2.5d25	507-B32KA
510	**ZSP.510-B32Am**	Mounting chuck	B32		●		133	59	75	–	126	53	62	88		510-B32
	ZSP.510-B32Aka	Mounting chuck	B32	●		●					130				SPZ.5xx-d2.5d25	510-B32KA
520	**ZSP.520-B32Am**	Mounting chuck	B32		●		149	59	75	–	130	53	62	88		520-B32
	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
	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. 51**

Clamping capacity and passage

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

Mounting chuck


B32, manual


B32, automatic


B45, manual

Collet holder B32

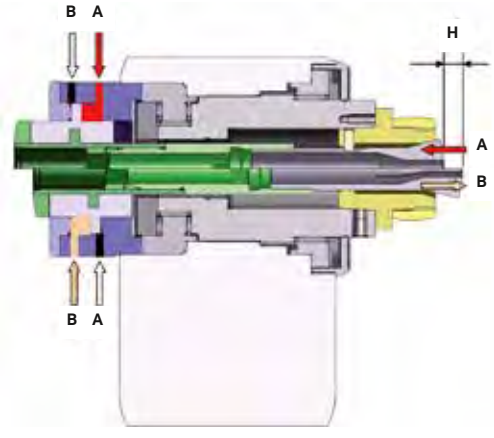
ki-mech gmbh


with pointed B32 collet

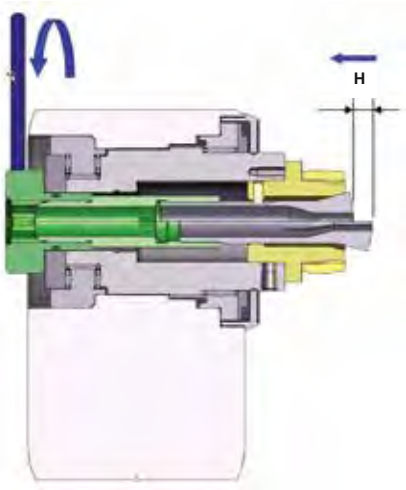

with standard B32 collet

For more, please see **p. 129**

Principle of collet clamping with HSK application



Automatic collet clamping



Manual collet clamping

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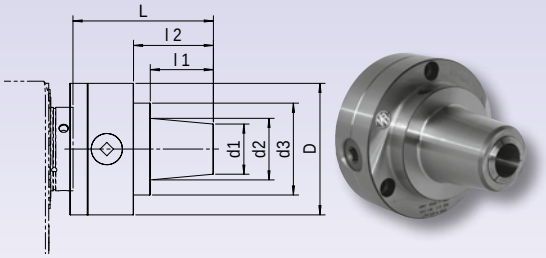
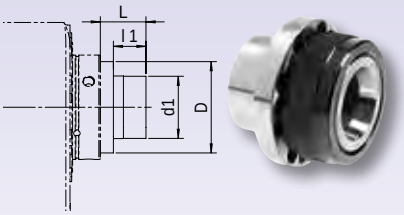
SPANNTECHNIK UND SYSTEME



Mounting chuck, manual



Collect adapter

For further information, please visit: www.niederhauser.ch
Request installation and operating instructions directly from manufacturer

SPZ.5xx = Item number for combined clamping cylinder for types 507 and 510 (see **pp. 50**)

	pL LEHMANN Item no.	Designation	System	Manual	Power-actuated	L [mm]	L1 [mm]	L2 [mm]	D [mm]	d1 [mm] * without /with threaded protective ring	d2 [mm]	d3 [mm]	Required clamping cylinder ** (Option)	Niederhauser item no., incl. adapter flange
507	**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	48/60 *	–	–		
	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	48/60 *	–	–	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	
510	**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	48/60 *	–	–		
	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	48/60 *	–	–	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	
520	**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. 51**

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
Request installation and operating instructions directly from manufacturer

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

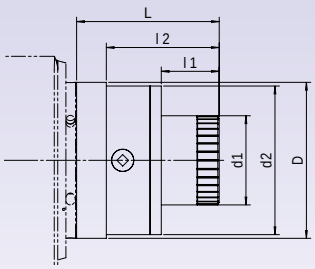
Clamping capacity and (effective) passage

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)

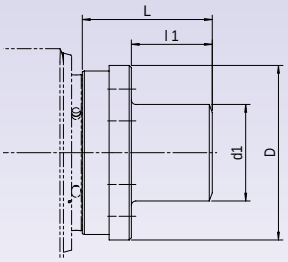
NIEDERHAUSER
SPANNTECHNIK UND SYSTEME

for sizes 507 to 530



Mounting chuck, manual Type F

for sizes 507 to 530



Mounting chuck, hydraulic Type F

For further information, please visit: www.niederhauser.ch
Request installation and operating instructions directly from manufacturer

Collet clamping Type F

	pL LEHMANN Item no.	Designation	Manual	Pneumatic	Hydraulic	System	Clamping capacity [mm]	L [mm]	l 1 [mm]	D [mm]	d 1 [mm]	Required clamping cylinder *	Niederhauser item no., incl. adapter flange
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	117.4	73.4	112	85	SPZ.5xx-9	507-F35K
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	114.4	73.4	112	85	SPZ.5xx-9	510-F35K
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	137.9	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	174.9	108.9	235	130	SPZ.530-9	530-F66K

Manual

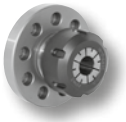
Automatic

SPZ.5xx = Item number for combined clamping cylinder for types 507 and 510 (see **pp. 50**)

* For T-type rotary tables it may be necessary to increase the center height, see **p. 51**

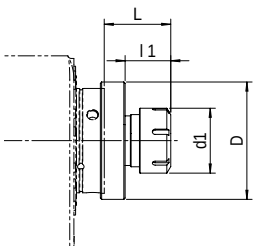
Collect clamping Type ER

	pL LEHMANN Item no.	Designation	Manual	System	Clamping capacity [mm]	L [mm]	l 1 [mm]	l 2 [mm]	D [mm]	d1 [mm]	d2 [mm]	Niederhauser item no., incl. adapter flange
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
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



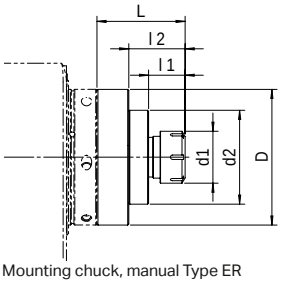
Manual

for sizes 507 and 510



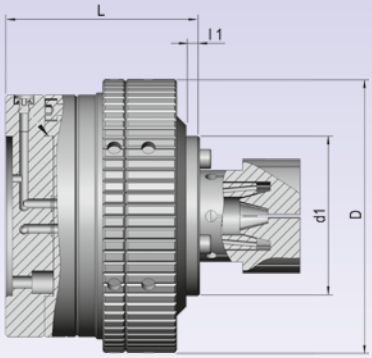
Mounting chuck, manual Type ER

for size 520



Mounting chuck, manual Type ER

NIEDERHAUSER
SPANNTECHNIK UND SYSTEME



For further information, please visit: www.niederhauser.ch
Request installation and operating instructions directly from manufacturer

OTTET collet clamping

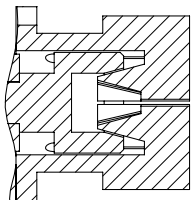
	pL LEHMANN Item no.	Designation	D [mm]	d 1 [mm]	L [mm]	l 1 [mm]	Power-actuated	Required rotary union or clamping cylinder*	Niederhauser item no., incl. adapter flange
507	**ZSP.507-OTp**	OTTET collet chuck	130	–	85	–	●	DDF.507-04	507-FNO-1
	ZSP.507-OTph		120	70	82	–	●	DDF.507-04	507-FNO-PH
	ZSP.507-OTkh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

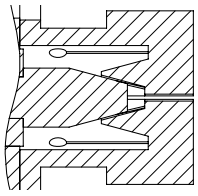

External clamping


Internal clamping

* see **pp. 50–53**

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


External clamping


Internal clamping

driven by technology

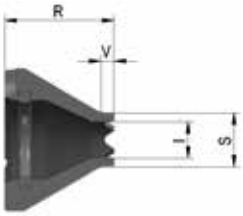
For further information, please visit: www.roehm.biz
Request installation and operating instructions directly from manufacturer

Face driver, play-free version with hydraulic compensation for clockwise and counterclockwise rotation

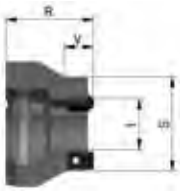
	pL LEHMANN Item no.	Designation	Overhang [mm]	Max. workpiece weight [kg]	Max. axial load [kN]	RÖHM item no. incl. adapter flange
507	**RÖH.507-SM**	Face driver	65	100	20	1340449
510	**RÖH.510-SM**	Face driver	65	100	20	1340450
520	**RÖH.520-SM**	Face driver	65	100	20	1340451
530	**RÖH.530-SM**	Face driver	65	100	20	1340452

Accessories: Driver plates / play-free / clockwise and counterclockwise rotation

	pL LEHMANN Item no.	Designation	S Clamping circle Ø	Associated center Ø	R Overhang [mm]	l [mm]	V [mm]	RÖHM item no.
direct-geared	**RÖH.MS-DV08**	Driver plate	8	4	38	4.5	4	1209000
	RÖH.MS-DV10	Driver plate	10	4	38	4.5	4	1209001
	RÖH.MS-DV12	Driver plate	12	6	36	7	4	1209002
	RÖH.MS-DV16	Driver plate	16	10	33	11	4	1209003
	RÖH.MS-DV20	Driver plate	20	12	30	13	4	1209004
	RÖH.MS-DV25	Driver plate	25	16	30	17	8	1209005
	RÖH.MS-DV32	Driver plate	32	16	30	22	10	1209006
3x select. HM plates 6 x 3.2	**RÖH.MS-HM20**	Driver plate	20	6	30	7	8	1209007
	RÖH.MS-HM25	Driver plate	25	10	30	11	8	1209008
	RÖH.MS-HM32	Driver plate	32	16	30	17.5	10	1209009
	RÖH.MS-HM40	Driver plate	40	16	30	27	16	1209010
	RÖH.MS-HM50	Driver plate	50	16	30	36		1209011
	RÖH.MS-HM63	Driver plate	63	16	30	49		1209012
	RÖH.MS-HM80	Driver plate	80	16	30	66		1209013



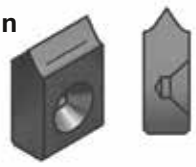
Driver plate, direct-geared1209000



Driver plate 3x select.
HM plates 6 x 3.2 1209007

Accessories: Metal carbide driver plates, clockwise and counterclockwise rotation

pL LEHMANN Item no.	Designation	Clamping circle Ø	Size	RÖHM item no.
RÖH.HMP-20	Metal carbide plate	20–32	6 x 3,2	88970
RÖH.HMP-40	Metal carbide plate	40–80	9,5 x 3,2	87931


Metal carbide driver plates 088970

Accessories: Center

pL LEHMANN Item no.	Designation	Clamping circle Ø	Y Center Ø	N1 [mm]	RÖHM item no.
RÖH.ZS-08	Center	8–10	4	90	1209016
RÖH.ZS-12	Center	12	6	90	1209017
RÖH.ZS-16	Center	16	10	90	1209018
RÖH.ZS-20	Center	20	12	90	1209019
RÖH.ZS-25	Center	25–80	16	90	1209020

Center CoAE 1209016

driven by technology

For further information, please visit: www.roehm.biz
Request installation and operating instructions directly from manufacturer

Revolving centers

	pL LEHMANN Item no.	Designation	Mount MK	Max. radial run-out [mm]	Max. workpiece weight [kg]	Max. radial load [daN]	Max. speed [rpm]	D Moving tip Ø [mm]	B Housing Ø [mm]	A [mm]	G [mm]	K [mm]	RÖHM item no.
Tailstock options / accessories	**RÖH.ZS-DAMK3**	with pressure display and length compensation; spring-loaded tip - spring travel max. 1.6 mm at axial clamping force of 550 daN; body hardened and ground – tip angle 60°	3	0.01	400	200	4000	25	64	105	23.8	31	60798
	RÖH.ZS-SAMK2	Standard version; body hardened and ground; tip angle 60°	2	0.005	200	100	7000	20	43	65	17.8	24	43115
	RÖH.ZS-SAMK3		3	0.005	400	200	6300	22	48.5	70.5	23.8	27	42315
	RÖH.ZS-GDMK2	with small housing diameter, body hardened and ground; tip angle 60°	2	0.005	200	100	7000	15	32	62	17.8	19.5	5336
	RÖH.ZS-GDMK3		3	0.005	400	200	7000	15	34	62	23.8	19.5	5429

Mikö 60798

Mikö 43115 / 42315

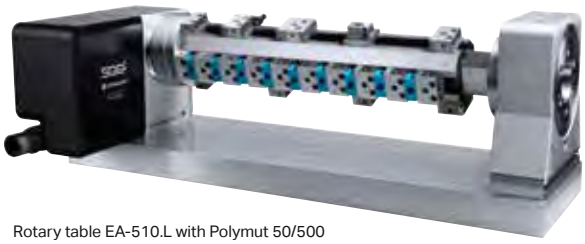
Mikö 5336 / 5429

EVARD PRECISION S.A.

For further information, please visit: www.evard-precision.ch
Request installation and operating instructions directly from manufacturer

Polymut Monoblock towers

	pL LEHMANN item no.	Designation	Size [mm]	Length [mm]	Weight [kg]	Required accessories	Evard item no.
Polymut 50	**EVA.T50280**	Monoblock tower	50	280	11	Flange set	T50280
	EVA.T50300	Monoblock tower	50	300	12	Flange set	T50300
	EVA.T50400	Monoblock tower	50	400	16	Flange set	T50400
	EVA.T50500	Monoblock tower	50	500	20	Flange set	T50500
Polymut 80	**EVA.T80280**	Monoblock tower	80	280	28	Flange set	T80280
	EVA.T80300	Monoblock tower	80	300	30	Flange set	T80300
	EVA.T80400	Monoblock tower	80	400	40	Flange set	T80400
	EVA.T80500	Monoblock tower	80	500	50	Flange set	T80500



Rotary table EA-510.L with Polymut 50/500

Simultaneously produce up to 32 workpieces 25 mm wide with a precision and repeat accuracy of +/- 0.01 mm. The modular Polymut system will meet all of your requirements regarding workpiece clamping.

Fixed and clamping jaws

	pL LEHMANN item no.	Designation	Size [mm]	Width [mm]	Weight [kg]	Required accessories	Evard item no.
Polymut 50	**EVA.50160**	Base jaw, narrow	50	20	0,310	–	50160
	EVA.50161	Clamping jaw, narrow	50	20	0,360	–	50161
	EVA.4101	Base jaw, stepped, Type A	50	49	0,226	–	4101
	EVA.4121	Base jaw, deep stepped, Type B	50	49	0,230	–	4121
	EVA.50105	Base jaw, no step, Type C	50	49	0,340	–	50105
	EVA.4102	Clamping jaw, stepped, Type A	50	49	0,373	–	4102
	EVA.4109	Clamping jaw, deep stepped, Type B	50	49	0,373	–	4109
	EVA.50101	Clamping jaw, no step, Type C	50	49	0,373	–	50101
Polymut 80	**EVA.4111**	Base jaw, stepped, Type A	80	78	0,880	–	4111
	EVA.4120	Base jaw, deep stepped, Type B	80	78	0,900	–	4120
	EVA.80107	Base jaw, no step, Type C	80	78	1,330	–	80107
	EVA.4110	Clamping jaw, stepped, Type A	80	78	1,446	–	4110
	EVA.4119	Clamping jaw, deep stepped, Type B	80	78	1,430	–	4119
	EVA.80101	Clamping jaw, no step, Type C	80	78	1,475	–	80101
	EVA.105001	Base jaw, stepped, Type A	80	105	2,050	–	105001
	EVA.105005	Base jaw, deep stepped, Type B	80	105	2,070	–	105005
	EVA.105007	Base jaw, no step, Type C	80	105	2,100	–	105007
	EVA.105002	Clamping jaw, stepped, Type A	80	105	2,650	–	105002
	EVA.105006	Clamping jaw, deep stepped, Type B	80	105	2,575	–	105006
	EVA.105008	Clamping jaw, no step, Type C	80	105	2,540	–	105008
	EVA.120001	Base jaw, stepped, Type A	80	120	2,300	–	120001
	EVA.120005	Base jaw, deep stepped, Type B	80	120	2,200	–	120005
	EVA.120007	Base jaw, no step, Type C	80	120	2,400	–	120007
	EVA.120002	Clamping jaw, stepped, Type A	80	120	2,980	–	120002
	EVA.120006	Clamping jaw, deep stepped, Type B	80	120	2,890	–	120006
	EVA.120008	Clamping jaw, no step, Type C	80	120	2,830	–	120008

EVARD PRECISION S.A.

For further information, please visit: www.evard-precision.ch
Request installation and operating instructions directly from manufacturer

Centering vice – Type CM

pL LEHMANN item no.	Designation	Size [mm]	Clamping capacity [mm]	Weight [kg]	Required accessories	Evard item no.
EVA.2020	CM centering vice	20	25	0.220	adapter flange	2020
EVA.2021	Inox CM centering vice	20	25	0.220	adapter flange	2021
EVA.5000	CM centering vice	50	89	2.3	adapter flange	5000
EVA.8000	CM centering vice	80	137	6.45	adapter flange	8000
EVA.1050	CM centering vice	105	178	15.5	adapter flange	1050

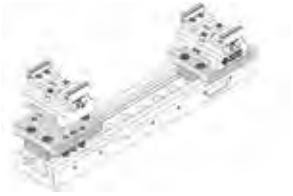
Combine the EA-507 rotary table with the CM 20 centering vice and split the µ's.

Jaws

	pL LEHMANN item no.	Designation	Size [mm]	Weight [kg]	Required accessories	Evard item no.
CM 50	**EVA.500053**	Standard jaw	50	Included in the weight of the vice	–	500053
	EVA.500051	Stepped jaw	50	Included in the weight of the vice	–	500051
	EVA.500052	Claw jaw	50	Included in the weight of the vice	–	500052
	EVA.500055	Special claw jaw	50	Included in the weight of the vice	–	500055
CM 80	**EVA.800053**	Standard jaw	80	Included in the weight of the vice	–	800053
	EVA.800051	Stepped jaw	80	Included in the weight of the vice	–	800051
	EVA.800052	Claw jaw	80	Included in the weight of the vice	–	800052
	EVA.800055	Special claw jaw	80	Included in the weight of the vice	–	800055
CM 105	**EVA.105053**	Standard jaw	105	Included in the weight of the vice	–	105053
	EVA.105051	Stepped jaw	105	Included in the weight of the vice	–	105051
	EVA.105052	Claw jaw	105	Included in the weight of the vice	–	105052
	EVA.105055	Special claw jaw	105	Included in the weight of the vice	–	105055

Adapter plate for CM 50 on Polymut

pL LEHMANN item no.	Designation	Size of the CM [mm]	Size of the Polymut [mm]	Required accessories	Evard item no.
EVA.500054	Adapter plate for CM 50 on Polymut 80	50	80	See Monoblock tower	500054
EVA.500057	Adapter plate for CM 50 on Polymut 50	50	50	See Monoblock tower	500057



For further information, please visit: www.piranha-clamp.ch
Request installation and operating instructions directly from manufacturer

Zero point clamping plates on rotary table

	pL LEHMANN Item no.	Designation	Dimensions [mm]	PiranhClamp catalog reference	PiranhaClamp item no., incl. HSK adapter
507		Flange 507	Ø 130 x 25	551158	551158
		Zero point clamping plate Ø 130 mm	Ø 130 x 26	551161	551161
510		Flange 510	Ø 130 x 25	551159	551159
		Zero point clamping plate Ø 130 mm	Ø 130 x 26	551161	551161
520		Flange 520	Ø 130 x 25	551160	551160
		Zero point clamping plate Ø 130 mm	Ø 130 x 26	551161	551161

507 with NSP

Zero point clamping plate for table plates (faceplates) from page 115

	pL LEHMANN Item no.	Designation	Dimensions [mm]	PiranhClamp catalog reference	PiranhaClamp item no.,
507		Zero point clamping plate butterfly for table plate (base plate)	170 x 170 x 26 Positioning pin Ø 30	540283	540283-507
510		Zero point clamping plate butterfly for table plate (base plate)	170 x 170 x 26 Positioning pin Ø 40	540283	540283-510

510 with NSP

For use with clamping vice

Article no.	Designation	Dimensions [mm]	Clamping capacity [mm]
551112	PV75 clamping vice	75 x 56 x 55	19 – 49 / 25 – 55, 0 – 31 / 5 – 35
540362	Snapper 170 clamping vice	170 x 90 x 55	5 – 75 / 53 – 118
540446	Snapper 170 clamping vice with higher jaws	170 x 90 x 65	5 – 75 / 53 – 118
551076	Snapper 170 double station	170 x 90 x 55	2x 6 – 30 / 2x 26 – 52
551075	Snapper 170 double station with higher jaws	170 x 90 x 65	2x 6 – 30 / 2x 26 – 52
540444	Gepard 170 clamping vice, incl. Al jaws XS	170 x 90 x 85	0 – 155, varies with jaw type
551079	Gepard 170 double station, incl. Al jaws XS	170 x 90 x 85	2 x 0 – 75

520 with NSP

Ripas

	pL LEHMANN Item no.	Designation	Manual	Clamping capacity [mm]	Centering vice length [mm]	Centering vice dimensions [mm]	PiranhClamp catalog reference	PiranhaClamp item no., incl. HSK adapter
507		PV75, incl. flange	1)	19 – 49 / 25 – 55 0 – 31 / 5 – 35	75	75 x 56 x 55	551112	551112-63
		Snapper 170, incl. flange	1)	5 – 75 / 53 – 18	170	170 x 90 x 55	540362	540362-63
		Gepard 170 with Al jaws XS, incl. flange	1)	0 – 155 varies with jaw type	170	170 x 90 x 84	540444	540444-63
510		PV75, incl. flange	2)	19 – 49 / 25 – 55 0 – 31 / 5 – 35	75	75 x 56 x 55	551112	551112-63
		Snapper 170, incl. flange	2)	5 – 75 / 53 – 18	170	170 x 90 x 55	540362	540362-63
		Gepard 170 with Al jaws XS, incl. flange	2)	0 – 155 varies with jaw type	170	170 x 90 x 84	540444	540444-63
520		PV75, incl. flange	3)	19 – 49 / 25 – 55 0 – 31 / 5 – 35	75	75 x 56 x 55	551112	551112-63
		Snapper 170, incl. flange	3)	5 – 75 / 53 – 18	170	170 x 90 x 55	540362	540362-63
		Gepard 170 with Al jaws XS, incl. flange	3)	0 – 155 varies with jaw type	170	170 x 90 x 84	540444	540444-63
		Snapper 300, incl. flange	3)	5 – 191 / 53 – 238	300	300 x 120 x 66	540401	540401-63
		Gepard 300 with Al jaws XS, incl. flange	3)	0 – 268 varies with jaw type	300	300 x 120 x 105	540400	540400-63

Additionally required clamping system (see **p. 115**)
1) = RIP.507-63m,
2) = RIP.510-63m,
3) = RIP.520-63m

All PiranhaClamp clamping means can also be attached to other zero point clamping systems (Lang, Erowa, Schunk, AMF...) after being adjusted slightly.

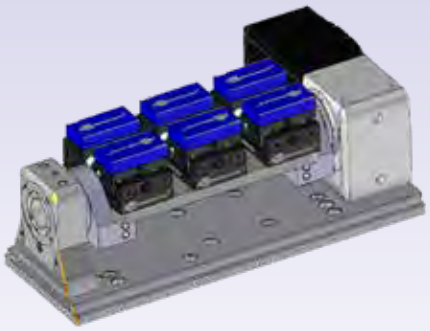
PV 75 Ripas

Snapper 170 Ripas

Snapper 300 Ripas

Gepard 170 Ripas

Gepard 300 Ripas



For further information, please visit: www.piranha-clamp.ch
Request installation and operating instructions directly from manufacturer

Clamping yoke

	pL LEHMANN item no.	L [mm]	Clamping type	Clamping system	No. of clamping elements	PiranhaClamp item no. for matrix plate	PiranhaClamp item no. for zero point clamping plate	PiranhaClamp item no. for clamping system
507*		350	mounted directly	Snapper 170	3	always needed 551167-1		540362
		350		Gepard 170	3			540444
		350	with zero point clamping plate	PV75	3	always needed 551167-2	Additionally needed 551162	551112
		350		Snapper 170	3			540362
		350		Gepard 170	3			540444
510**		500	mounted directly	Snapper 170	4	always needed 551168-1		540362
		500		Gepard 170	4			540444
		500	with zero point clamping plate	PV75	4	always needed 551168-2	Additionally needed 551163	551112
		500		Snapper 170	4			540362
		500		Gepard 170	4			540444
		600	mounted directly	Snapper 170	5	always needed 551169-1		540362
		600		Gepard 170	5			540444
		600	with zero point clamping plate	PV75	6	always needed 551169-2	Additionally needed 551164	551112
		600		Snapper 170	6			540362
		600		Gepard 170	6			540444
520***		600	mounted directly	Snapper 170	5	always needed 551170-1		540362
		600		Gepard 170	5			540444
		600	with zero point clamping plate	PV75	6	always needed 551170-2	Additionally needed 551164	551112
		600		Snapper 170	6			540362
		600		Gepard 170	6			540444
		800	mounted directly	Snapper 170	6	always needed 551171-1		540362
		800		Gepard 170	6			540444
		800	with zero point clamping plate	PV75	8	always needed 551171-2	Additionally needed 551165	551112
		800		Snapper 170	8			540362
		800		Gepard 170	8			540444

Ordering information
Always order together with pL
* Counter bearing GLA.TOP1-110 **(p. 16)**, mounting kit RFX.507-ASa-TOP **(p. 16)**, base plate RFX.507-GP350s-TOP **(p. 16)** or hydraulic kit GLA.HYD-xxx **(p. 69)**
** Counter bearing GLA.TOP2-150 **(p. 16)**, mounting kit RFX.510-ASa-TOP **(p. 16)**, base plates RFX.510-GPxxxs-TOP **(p. 16)** or hydraulic kit GLA.HYD-xxx **(p. 69)**
** Counter bearing GLA.TOP2-180 **(p. 16)**, mounting kit RFX.520-ASa-TOP **(p. 16)**, base plates RFX.520-GPxxxs-TOP **(p. 16)** or hydraulic kit GLA.HYD-xxx **(p. 69)**

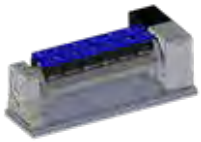
507–350 mm x165 mm 3 Gepard direct

507–350 mm x 165 mm NSP 3 PV75

510–500 mm x 215 mm 4 Gepard direct

510–500 mm x 215 mm NSP 4 Gepard

520–600 mm x 270 mm 5 Gepard direct



520–600 mm x 270 mm NSP 6 Gepard

520–800 mm x 270 mm 6 Gepard direct

520 –800 mm NSP 8x PV75

TRIAG
INTERNATIONAL

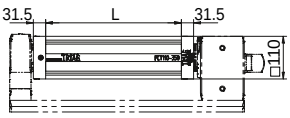
For further information, please visit: www.triag-int.ch
Request installation and operating instructions directly from manufacturer

Clamping bars

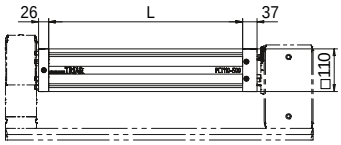
	pL LEHMANN item no.	Usable length L [mm]	Cube [mm]	Interference circle* Ø [mm]	Weight [kg]	Counter bearing **	Base plate	IVO item no.
507	**TRI.507-350**	350	110x110	156	34	GLA.TOP1-110	RFX.507-GP350s-TOP	IVO-TRI.507-350
507	**TRI.507-400**	400	110x110	156	39	GLA.TOP1-110	RFX.507-GP450s-TOP	IVO-TRI.507-400
510	**TRI.510-500**	500	110x110	156	46	GLA.TOP2-150	RFX.510-GP500s-TOP	IVO-TRI.510-500
510	**TRI.510-600**	600	110x110	156	54	GLA.TOP2-150	RFX.510-GP600s-TOP	IVO-TRI.510-600
520	**TRI.520-600**	600	110x110	198	55	GLA.TOP2-180	RFX.520-GP600s-TOP	IVO-TRI.520-600
520	**TRI.520-650**	650	110x110	198	63	GLA.TOP2-180	RFX.520-GP700s-TOP	IVO-TRI.520-650

* without jaws
** must always be ordered from pL

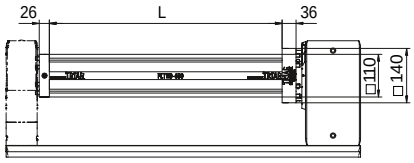
– Weight for clamping bar and adapter flanges only (without rotary table, counter bearing and common base plate).
– For more information about base plates, see **p. 31** and for counter bearings, see **p. 69**



EA-507 for GLA.TOP1-110 and RFX.507-GPxxxs-TOP



EA-510 for GLA.TOP2-150 and RFX.510-GPxxxs-TOP

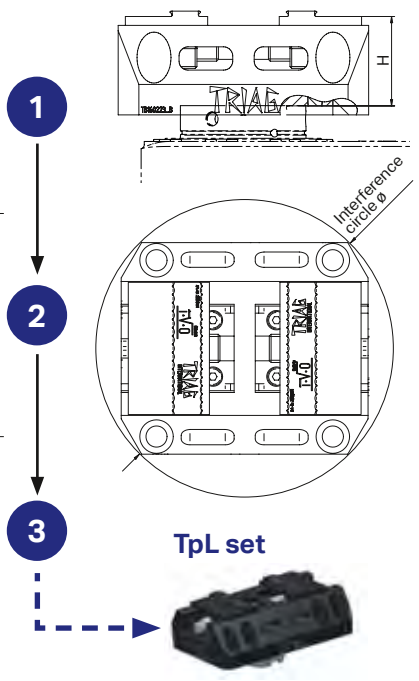


EA-520 for GLA.TOP2-180 and RFX.520-GPxxxs-TOP

LEHMANN®

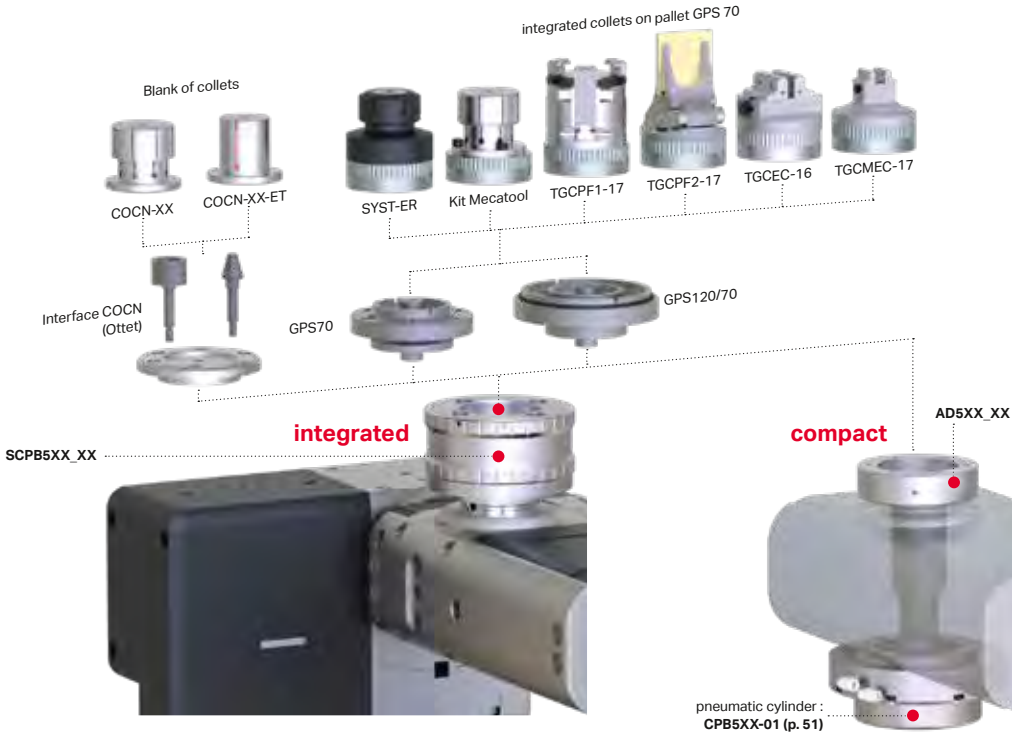
Ultra-compact self-centering vice – only 50 mm above spindle

Manufacturer for adaptation to pL rotary table: www.ivo-oesterle.de
Manufacturer for all other add-on elements: www.triag-int.ch



	pL LEHMANN item no.	1 Centric clamping unit	2 Adapter	3 Stamping jaws	H [mm]	Interference circle ø [mm]	Weight, approx. [kg]	Required	IVO item no.
HSK	IVO.5xx-140ada	ZSP 140 140 x 120 x 50	HSK adapter	A	50	184	4.8	RIP.5xx-63x	26299-1-1-1
				B			5.8	RIP.5xx-63x	26299-1-1-2
				C			5.6	RIP.5xx-63x	26299-1-1-3
	IVO.5xx-180ada	ZSP 180 180 x 120 x 50		A		216	6	RIP.5xx-63x	26299-2-1-1
				B			7	RIP.5xx-63x	26299-2-1-2
				C			6.8	RIP.5xx-63x	26299-2-1-3
507	IVO.507-140fla	ZSP 140 140 x 120 x 50	Flange	A	52.5	184	5.2		26299-1-2-1
				B			6.2		26299-1-2-2
				C			6		26299-1-2-3
	IVO.507-180fla	ZSP 180 180 x 120 x 50		A		216	6.4		26299-2-2-1
				B			7.4		26299-2-2-2
				C			7.2		26299-2-2-3
510	IVO.510-140fla	ZSP 140 140 x 120 x 50		A	52.5	184	5.1		26299-1-3-1
				B			6.1		26299-1-3-2
				C			5.9		26299-1-3-3
	IVO.510-180fla	ZSP 180 180 x 120 x 50		A		216	6.3		26299-2-3-1
				B			7.3		26299-2-3-2
				C			7.1		26299-2-3-3
520	IVO.520-140fla	ZSP 140 140 x 120 x 50		A	52.5	184	6.2		26299-1-4-1
				B			7.2		26299-1-4-2
				C			7		26299-1-4-3
	IVO.520-180fla	ZSP 180 180 x 120 x 50		A		216	7.4		26299-2-4-1
				B			8.4		26299-2-4-2
				C			8.2		26299-2-4-3

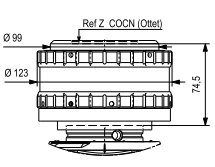
More information: www.tgcolin.ch
Request installation and operating instructions directly from manufacturer



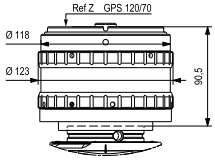
	pL LEHMANN Item no.	Designation	Functions	integrated	compact	Required rotary union or clamping cylinder*	TGColin Item no.
507	**TGC.507-COCN**	clamping fixture COCN	clamp/unclamp	●		DDF.507-04	SCPB507-01_COCN
	TGC.507-G70	clamping fixture GPS70	pallet control / clamp/unclamp	●		DDF.507-04	SCPB507-01_GPS70
	TGC.507-G12070	clamping fixture GPS120/70	pallet control / clamp/unclamp	●		DDF.507-04	SCPB507-01_GPS120/70
	TGC.507-AdaCOCN	adapter COCN	clamp/unclamp		●	TGC.507-SPZ-6.5A	AD507-01_COCN
	TGC.507-AdaGPS70	adapter GPS70	clamp/unclamp		●	TGC.507-SPZ-6.5A	AD507-01_GPS70
	TGC.507-AdaGPS12070	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.510-AdaCOCN	adapter COCN	clamp/unclamp		●	TGC.510-SPZ-6.5A	AD510-01_COCN
	TGC.510-AdaGPS70	adapter GPS70	clamp/unclamp		●	TGC.510-SPZ-6.5A	AD510-01_GPS70
	TGC.510-AdaGPS12070	adapter GPS120/70	clamp/unclamp		●	TGC.510-SPZ-6.5A	AD510-01_GPS120/70

* see **pp. 51–53**

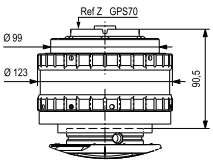
integrated versions



SCPB5XX-01_COCN

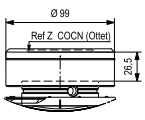


SCPB5XX-01_GPS120/70

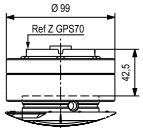


SCPB5XX-01_GPS70

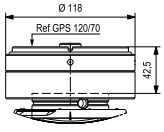
compact versions



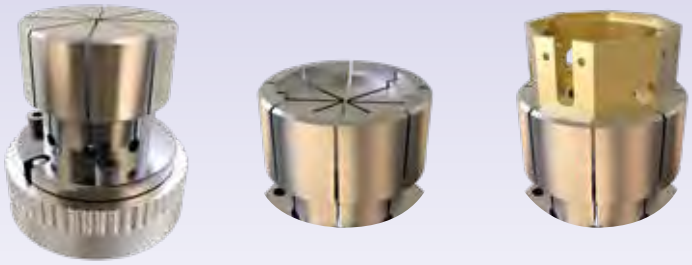
AD5XX-01_COCN



AD507-01_GPS70



AD507-01_GPS120/70

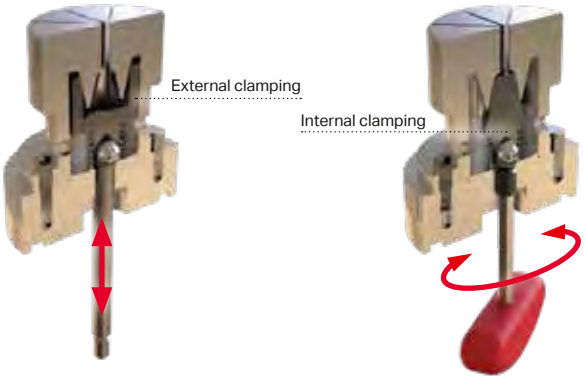


More information: www.tgcolin.ch
Request installation and operating instructions directly from manufacturer

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.

HAINBUCH
SPANNENDE TECHNIK

The clamping means serves as the starting point on the Lehmann CNC rotary table and can be 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.

For further information, please visit www. hainbuch.com
Request installation and operating instructions directly from manufacturer

Rotating clamping means

TOPlus Chuck

TOPlus mini Chuck

SPANNTOP Chuck

SPANNTOP mini Chuck

TOROK hand chuck

Stationary clamping means

MANOK plus manual vise

HYDROK hydraulic vise

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 ø 3 – 100 mm
  Clamping capacity RD ø 3 – 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 ø 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

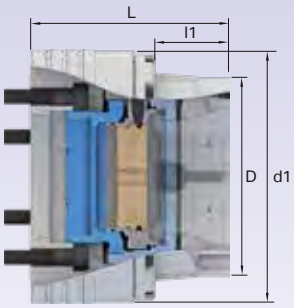
Face driver adaptation

Morse taper adaptation

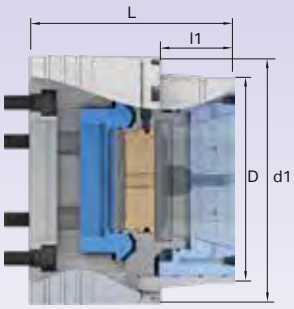
+ Enormous flexibility
+ Self-centering of adapter in the chuck ≤ 0.003 mm
+ Extremely fast conversion without disassembling the chuck [1 min.]

Magnet module

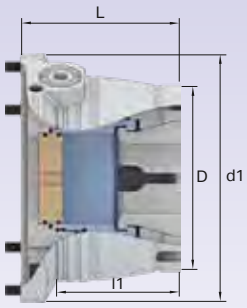
+ End face axial clamping via neodymium magnet
+ High planar changeover accuracy
+ High holding force of 140 N/cm²
+ Assembly in 30 sec. without aligning
+ Low maintenance, since resistant to contamination



TOPlus mini Axzug
SPANNTOP mini Axzug



TOPlus mini Axfix
SPANNTOP mini Axfix



TOROK SE Axzug [TOPlus]
TOROK RD Axzug [SPANNTOP]

For further information, please visit www. hainbuch.com
Request installation and operating instructions directly from manufacturer

HAINBUCH chucks TOPlus | TOROK

* For T-type rotary tables it may be necessary to increase the center height, see **p. 51**

	pL LEHMANN Item no.	Designation	Manual	Hydraulic	Size	Clamping capacity [mm]	L [mm]	l 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 Axfix		●	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 Axfix		●	52	4...52	104.5	44	119 f7	150	SPZ.5xx-9	●	10909/0002
	HAI.510-tp-to	TOROK SE Axzug	●		52	4...52	137	65.8	125 f7	174		●	10913/0001
520	**HAI.520-tp-axz**	TOPlus mini Axzug		●	52	4...52	107	42	119 f7	150	SPZ.520-9	●	10908/0003
	HAI.520-tp-axf	TOPlus mini Axfix		●	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 Axfix		●	65	4...65	105.5	50	137 f7	203	SPZ.530-9	●	10909/0004
	HAI.530-tp-to	TOROK SE Axzug	●		65	4...65	151.5	74.7	145 f7	210		●	10913/0003

TOPlus mini

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. 51**

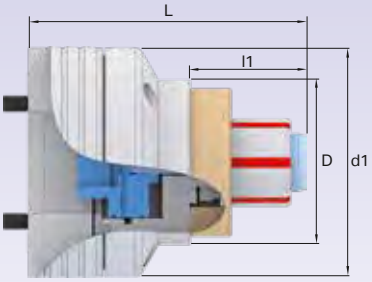
	pL LEHMANN Item no.	Designation	Manual	Hydraulic	Size	Clamping capacity [mm]	L [mm]	l 1 [mm]	D [mm]	d 1 [mm]	Required clamping cylinder *	Compatible with modular system	Hainbuch Item no., incl. adapter flange
507	**HAI.507-st-axz**	SPANNTOP mini Axzug		●	32	4...32	101	43	66 f7	133	SPZ.5xx-9		10910/0001
	HAI.507-st-axf	SPANNTOP mini Axfix		●	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 Axfix		●	52	4...52	104.5	44	98 f7	150	SPZ.5xx-9	●	10911/0002
	HAI.510-st-to	TOROK RD Axzug	●		52	4...52	137	65.8	125 f7	174		●	10912/0001
520	**HAI.520-st-axz**	SPANNTOP mini Axzug		●	52	4...52	107	42	90 f7	150	SPZ.520-9	●	10910/0003
	HAI.520-st-axf	SPANNTOP mini Axfix		●	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 Axfix		●	65	4...65	105.5	50	119 f7	203	SPZ.530-9	●	10911/0004
	HAI.530-st-to	TOROK RD Axzug	●		65	4...65	151.5	74.7	145 f7	210		●	10912/0003

SPANNTOP mini

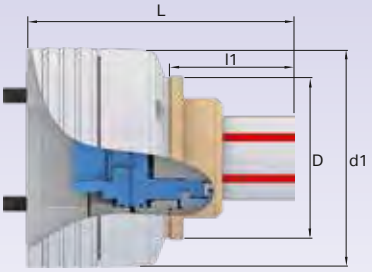
SPANNTOP

+ 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

HAINBUCH
SPANNENDE TECHNIK



MANDO T211 Axzug



MANDO T212 Axzug
MANDO T812 Axfix

For further information, please visit: www. hainbuch.com
Request installation and operating instructions directly from manufacturer

HAINBUCH clamping mandrels MANDO

* For T-type rotary tables it may be necessary to increase the center height, see **p. 51**

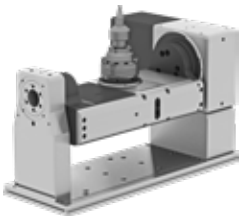
	pL LEHMANN Item no.	Designation	Hydraulic	Size	Clamping capacity [mm]	L [mm]	l 1 [mm]	D [mm]	d 1 [mm]	Required clamping cylinder *	Hainbuch Item no., incl. adapter flange
507	**HAI.507-ma-axz1**	MANDO T212 Axzug	●	xxs	8...13	121.5	45.5	65	141	SPZ.5xx-9	10915/0001
	HAI.507-ma-axf1	MANDO T812 Axfix	●	xxs	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
	HAI.510-ma-axf2	MANDO T812 Axfix	●	0	20...28	129.5	60.5	90	141	SPZ.5xx-9	10916/0004
520	**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
	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	153.5	82.5	104	141	SPZ.520-9	10916/0006
530	**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	173.5	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	180.5	97.5	138	211	SPZ.530-9	10915/0008
	HAI.530-ma-axf2	MANDO T812 Axfix	●	4	69...100	183.5	100.0	138	211	SPZ.530-9	10916/0008

MANDO T211

MANDO T212
MANDO T812

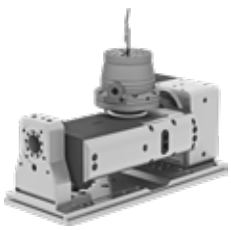
MANDO

+ 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



SPANNTOP mini Axzug size 52 on T1-520530 TAP3

MANDO T211 size 0 on T1-510520 TAP2

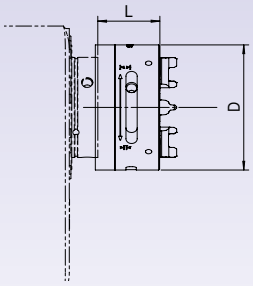


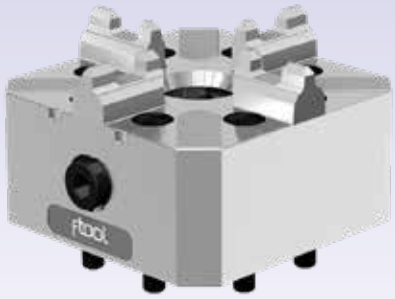
TOROK SE size 52 on T1-507510 TOP1

TOPlus mini Axfix size 52 on EA-520

pl LEHMANN®

ftool by erowa





For further information, please visit: www.f-tool.com
Request installation and operating instructions directly from manufacturer

	pL LEHMANN Item no.	Designation	Manual	D [mm]	L from spindle [mm]	Pallet sizes, max. [mm]	Workpiece weight (perm.) [kg]	Chuck weight (incl. adapter flange) [kg]	F-Tool catalog reference	F-Tool Item no., incl. adapter flange
507 / 510	**FTO.5xx-80P**	Chuck 80 P	●	ø103	51	ø148	35	2.3	FT 01043	FT 02404
	FTO.5xx-50	Chuck 50	●	ø78	50	ø72	15	1.4	FT 02110	FT 02406
	FTO.5xx-MC150P	Manual Chuck 150 P	●	ø150	55	ø148	50	4.3	FT 02443	on request
	FTO.5xx-PIN	PIN centering chuck	●	ø80	48	ø100	15	2.3	FT 01716	FT 02407

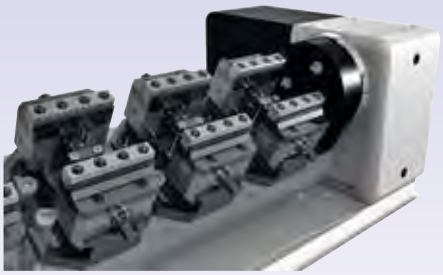

Chuck 80 P
FT 01043


Chuck 50
FT 02110


Manual Chuck 150 P
FT 02443


PIN centering chuck
FT 01716

Vischer & Bolli
Werkzeug- und Spanntechnik
Machining and workholding



For further information, please visit: www.vb-tools.com
Request installation and operating instructions directly from manufacturer

SAFE and AirLine zero point clamping systems

	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]	required rotary union*	vb Item no., incl. adapter flange
507	**VBO.507-al**	AirLine		●		120	130	52	>9	40	DDF.507-04	755 507-04
	VBO.507-SAh	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
510	**VBO.510-al**	AirLine		●		120	130	52	>9	40	DDF.510-04	755 510-04
	VBO.510-SAh	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
520	**VBO.520-al**	AirLine		●		120	140	52	>9	40	DDF.520-04	755 520-04
	VBO.520-SAh	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
530	**VBO.530-al**	AirLine		●		120	220	57	>9	40	DDF.530-04	755 530-04
	VBO.530-SAh	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. 52/53**

Clamping means for SAFE and AirLine zero point clamping systems

	pL LEHMANN Item no.	Designation	Interference circle ø [mm]	L from support [mm]	Clamping capacity [mm]	Dimensions LxWxH [mm]	vb Item no.
Center clamp	**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
Empty pallets	**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

	pL LEHMANN Item no.	Designation	Interference circle ø [mm]	L from support [mm]	Clamping capacity [mm]	Dimensions LxWxH [mm]	vb Item no.
ripas	**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
507	**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
510	**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

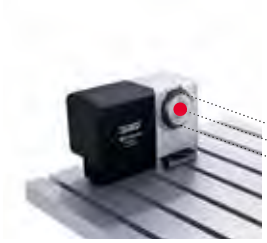
Vischer & Bolli
Werkzeug- und Spanntechnik
Machining and workholding

For further information, please visit: www.vb-tools.com
Request installation and operating instructions directly from manufacturer

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	

Type 507



Type 510

Type 520

Type 530

centro with pendulum jaw

centro

centro with pendulum jaw
on ripas adapter

centro on ripas adapter

AirLine

centro with pendulum jaw
on AirLine or SAFE

SAFE

centro on AirLine or SAFE

reinmechanic®
feinmechanische Lösungen

Control processes interactively

For further information, please visit: www.reinmechanic.de
Request installation and operating instructions directly from manufacturer

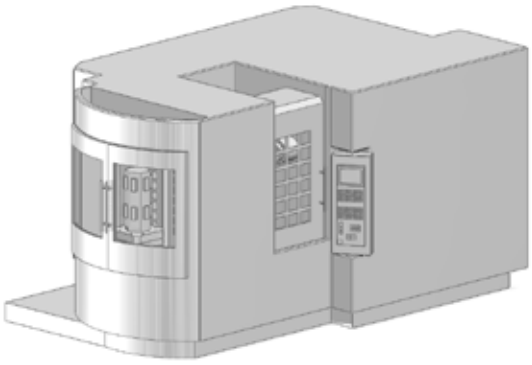
- + **mobile – wireless**
  WLAN / Bluetooth
- + **mobile – data**
  XML format; Windows-based
- + **mobile – assist**
  Intelligent and self-monitoring functions
- + **mobile – service**
  Remote maintenance and maintenance manager
- + **mobile – mail**
  Fault message and process message via e-mail
- + **mobile – processing**
  I/O Profinet for integrated automation
- + **mobile - test**
  Functions to test / simulate sequences

mobile - control

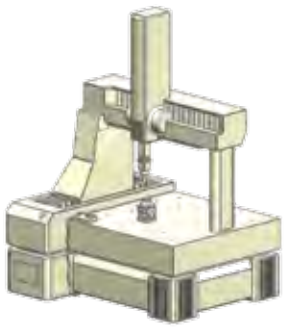
Control processes interactively

ready for real industry 4.0

LAN / WLAN



Production of parts

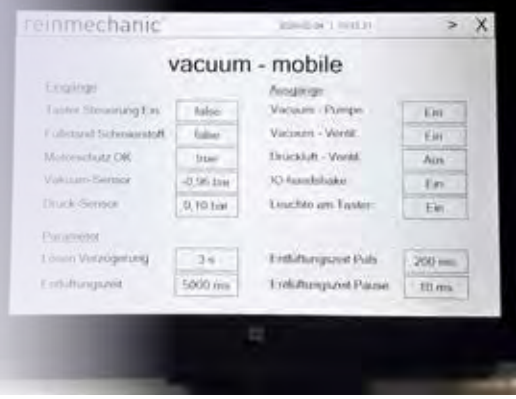


Quality assurance

Handling

LEHMANN®

reinmechanic®
feinmechanische Lösungen



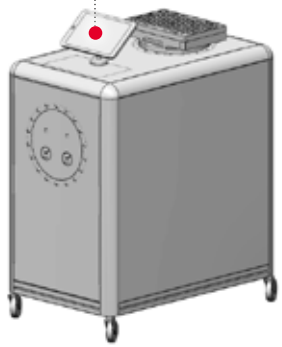
Workpiece-independent clamping technology
Monitor and control using a common platform

For further information, please visit: www.reinmechanic.de
Request installation and operating instructions directly from manufacturer

mobile - systems

Technology on a common basis

Vacuum



vacuum-mobile
(see **p. 150 / 151**)

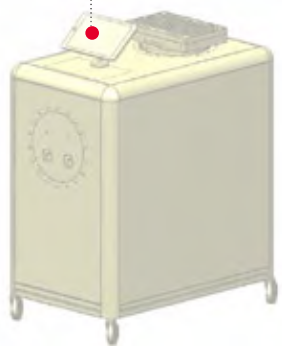
Ice

kryo-mobile
Freeze clamping technology

Hydraulics

hydro-mobile
(on request)

Magnet



magnet-mobile
(on request)

pL-compatible

Highlights

+ Flexible and mobile
+ Standardized modular system
+ Available quickly, adaptable easily
+ Reliable control & monitoring

mobile - system (e)

+ Intelligent clamping technology
+ Plug & play

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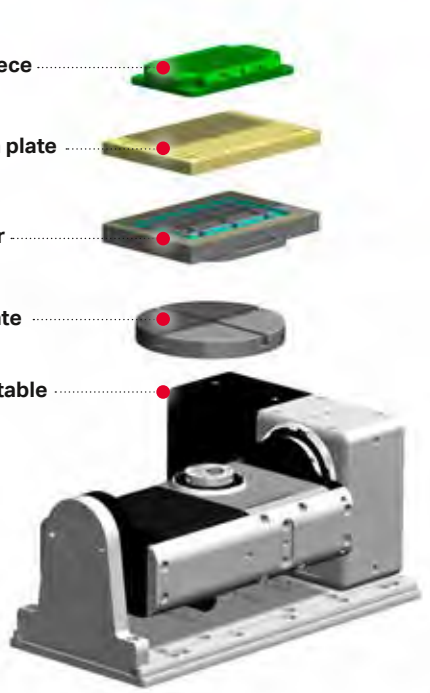
feinmechanische Lösungen

Vacuum clamping technology for mounting thin-walled workpieces, housings, plates ...

For further information, please visit: www.reinmechanic.de
Request installation and operating instructions directly from manufacturer

vacuum - mobile Workpiece mount for rotary tables

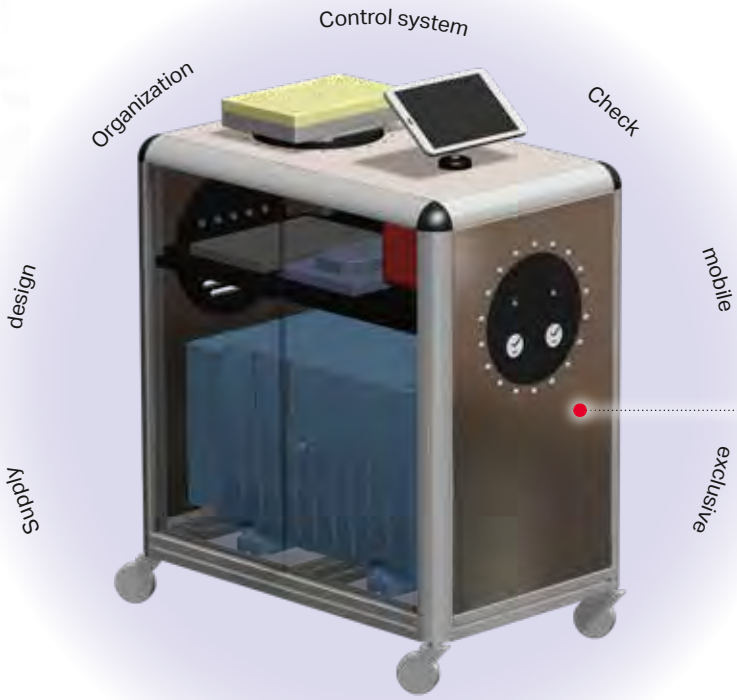


pL rotary table T1-510520 with reinmechanic-vacuum adapter and mechanical-universal suction plate

Features of the reinmechanic-vacuum system:

+ pl-compatible (ready to use)
+ Production-oriented solution (manufacturing solutions)
+ Individual sizing (lean production)
+ reinmechanic adapter service (individual adapter service)
+ Manufacturer-independent (all-round use)
+ Industry 4.0 compatible
+ Touchscreen control (easy handling)
+ Self-monitoring overall system (self-monitoring)
+ Command transfer to machine control (I/O handshake)

mobile-liquidSeparator
+ Optional liquid separator
+ Process-monitored
+ Automatic feedback



reinmechanic-vacuum-mobile «premium» with mechanical-vacuum adapter and mechanical-universal suction plate

mobile-systems available in three versions

«standard»
+ Complete design
+ Required functions
+ Economical

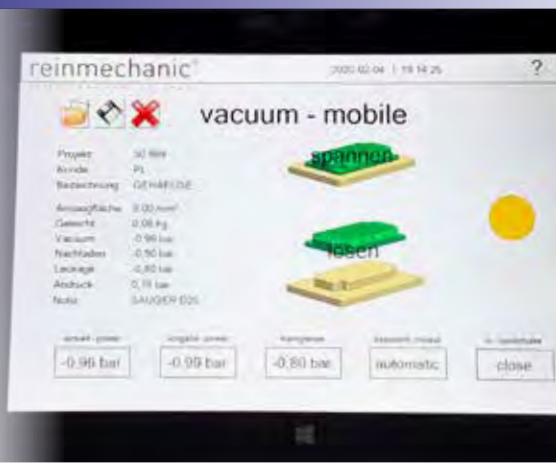
«professionell»
+ Complete design
+ Advanced functions
+ Semi-automated

«premium»
+ Complete design
+ Industry 4.0-capable
+ Touchscreen control

reinmechanic®
feinmechanische Lösungen

Readily accessible machining surfaces as ideal prerequisite for measurement tasks, precision machining ...

For further information, please visit: www.reinmechanic.de
Request installation and operating instructions directly from manufacturer

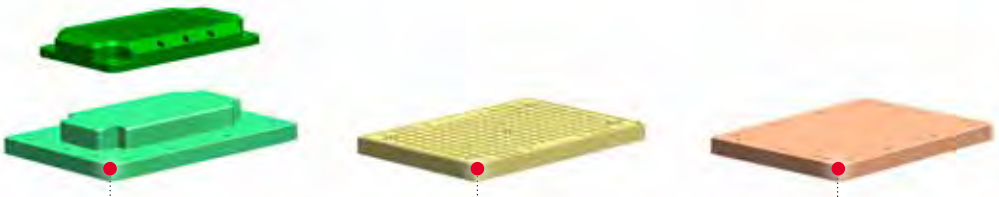


vacuum - mobile modular system

specific
designed by reinmechanic as finished solution

universal
Matrix plate freely adjustable

individual
can be modified by user



Suction plate

Adapter

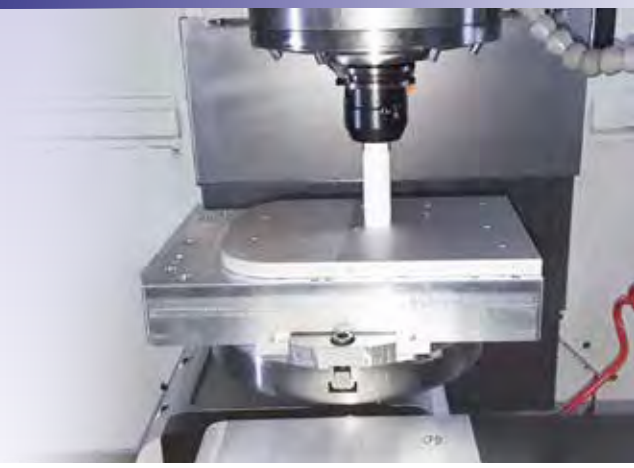
pL faceplate
Adapter plate can be fastened to faceplate or spindle nose

	pL LEHMANN Item no.	Designation	reinmechanic Item no.
Basic equipment	**RMV.BAS**	vacuum-mobile systems «basic»	Vpl-20-001-XX
	RMV.PRO	vacuum-mobile systems «professionell»	Vpl-20-002-XX
	RMV.PRE	vacuum-mobile system «premium»	Vpl-20-003-XX
	RMV.LIS	mobile-liquidSeparator	Vpl-21-001-XX
507	**RMV.507-SPE**	vacuum-mobile suction plate «specific»	Vpl-15-001-XX
	RMV.507-UNI	vacuum-mobile suction plate «universal»	Vpl-15-002-XX
	RMV.507-IND	vacuum-mobile suction plate «individual»	Vpl-15-003-XX
	RMV.507-ada	vacuum-mobile adapter plate 507	Vpl-15-004-XX
510	**RMV.510-SPE**	vacuum-mobile suction plate «specific»	Vpl-15-005-XX
	RMV.510-UNI	vacuum-mobile suction plate «universal»	Vpl-15-006-XX
	RMV.510-IND	vacuum-mobile suction plate «individual»	Vpl-15-007-XX
	RMV.510-ada	vacuum-mobile adapter plate 510	Vpl-15-008-XX
520	**RMV.520-SPE**	vacuum-mobile suction plate «specific»	Vpl-15-009-XX
	RMV.520-UNI	vacuum-mobile suction plate «universal»	Vpl-15-010-XX
	RMV.520-IND	vacuum-mobile suction plate «individual»	Vpl-15-011-XX
	RMV.520-ada	vacuum-mobile adapter plate 520	Vpl-15-012-XX
530	**RMV.530-SPE**	vacuum-mobile suction plate «specific»	Vpl-15-013-XX
	RMV.530-UNI	vacuum-mobile suction plate «universal»	Vpl-15-014-XX
	RMV.530-IND	vacuum-mobile suction plate «individual»	Vpl-15-015-XX
	RMV.530-ada	vacuum-mobile adapter plate 530	Vpl-15-016-XX

Spare parts and additional accessories available on request

reinmechanic®
feinmechanische Lösungen

Automation 4.0 – fully integrated



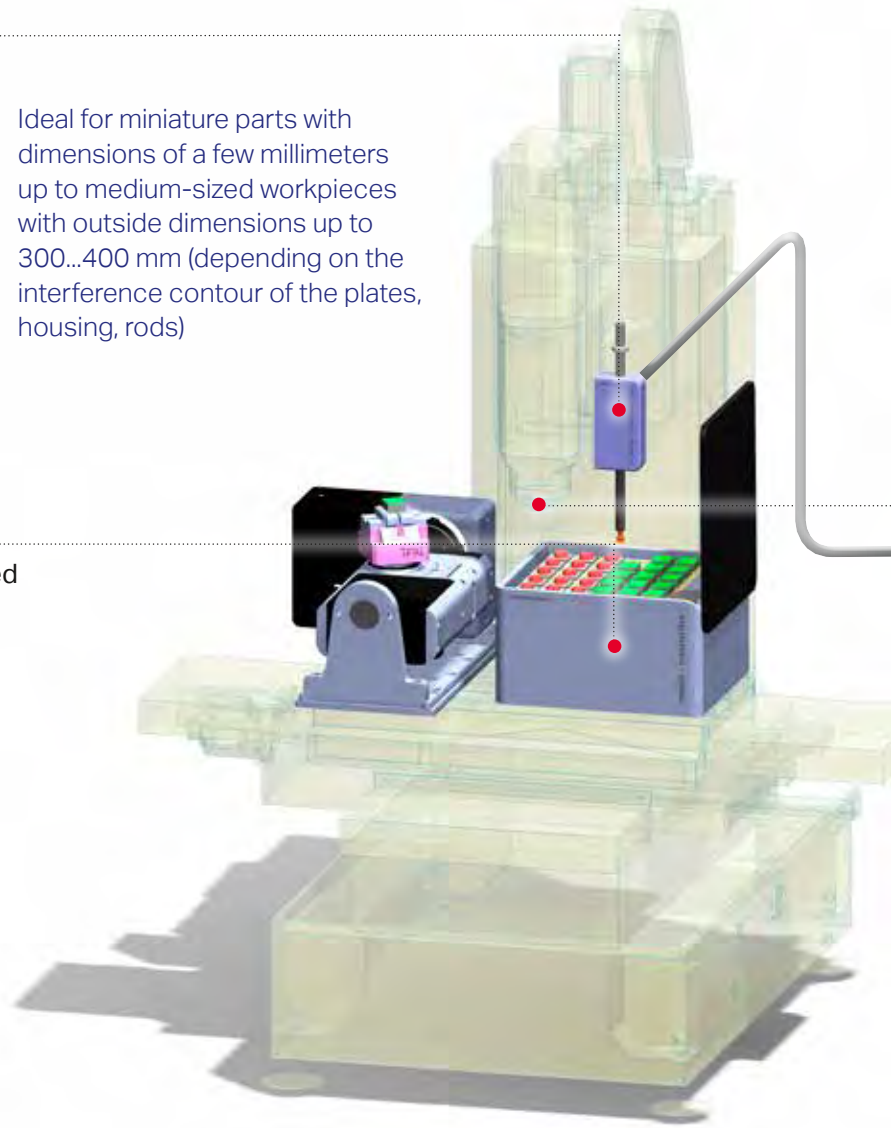
For further information, please visit: www.reinmechanic.de
Request installation and operating instructions directly from manufacturer

mobile - transferTool

handling «easy - in»

+ Integrated suction gripper system
+ Process-monitored
+ Tightly holding vacuum via suction turbine
+ Automatic suction/pressure changeover
+ With cleaning function on request

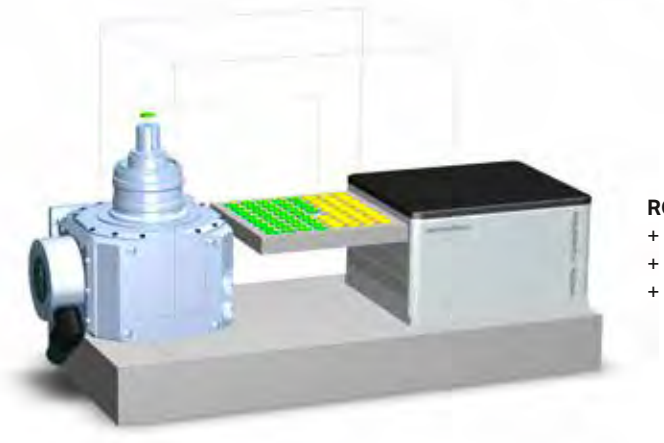
Ideal for miniature parts with dimensions of a few millimeters up to medium-sized workpieces with outside dimensions up to 300...400 mm (depending on the interference contour of the plates, housing, rods)



mobile - transferBox

Workpiece magazine directly where needed

+ Storage area protected from chips
+ Time-optimized provision
+ Short transfer paths
+ Specific placement displays
+ High reference accuracy
+ With barrier air on request
+ Available in various sizes (S, M, L...)
+ Special sizes on request (XS, XL, XXL)



ROTOMATION solution with
+ EA915 DD rotary table
+ mobile - transferBox (mtB)
+ mobile - partTablet (mpT)

reinmechanic®
feinmechanische Lösungen

Automate standard machines efficiently

For further information, please visit: www.reinmechanic.de
Request installation and operating instructions directly from manufacturer

Highlights

+ No additional handling device necessary
+ Installation area for robot cell eliminated
+ Only standard CNC program knowledge needed

transferTool

alternatively, in spindle

+ Economical (without process monitoring)

vacuum - mobile «premium»

incl. mobile control + processing

+ Fully integrated I/O Profinet solution
+ Communication with the NC system
+ Standard - M-commands

small – miniature parts magazine
Footprint 450 x 400 mm
Pallet size 350 x 350 mm

medium – Allrounder
Footprint 450 x 600 mm
Pallet size 350 x 550 mm

large – large series
Footprint 600 x 600 mm
Pallet size 450 x 550 mm

pL LEHMANN Item no.	Designation	reinmechanic Item no.
	mobile-transferBox, xs	Vpl-20-100-XX
	mobile-transferBox, small	Vpl-20-101-XX
	mobile-transferBox, medium	Vpl-20-102-XX
	mobile-transferBox, large	Vpl-20-103-XX
	mobile-transferBox, individual	Vpl-20-104-XX
	mobile-partTablet, xs	Vpl-21-100-XX
	mobile-partTablet, small	Vpl-21-101-XX
	mobile-partTablet, medium	Vpl-21-102-XX
	mobile-partTablet, large	Vpl-21-103-XX
	mobile-partTablet, individual	Vpl-21-104-XX
	mobile-partPalette, xs	Vpl-21-105-XX
	mobile-partPalette, small	Vpl-21-106-XX
	mobile-partPalette, medium	Vpl-21-107-XX
	mobile-partPalette, large	Vpl-21-108-XX
	mobile-partPalette, individual	Vpl-21-109-XX
	mobile-transferTool, small	Vpl-20-111-XX
	mobile-transferTool, medium	Vpl-20-112-XX
	mobile-transferTool, large	Vpl-20-113-XX
	mobile-transferTool, individual	Vpl-20-114-XX
	mobile-controlTablet	Vpl-50-100-XX
	mobile-controlBox	Vpl-50-100-XX
	mobile-processBox	Vpl-50-100-XX
	mobile-vacuumBox	Vpl-50-100-XX
	mobile-airBox	Vpl-50-100-XX
	mobile-control add-on, transfer-processing	Vpl-51-030-XX

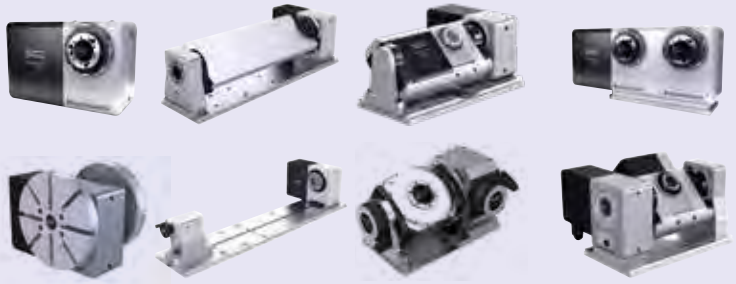
Spare parts and additional accessories available on request

ROTOLUTION – Customer-specific turnkey solutions «ontop», largely with proven standard elements, from CAD up to commissioning.

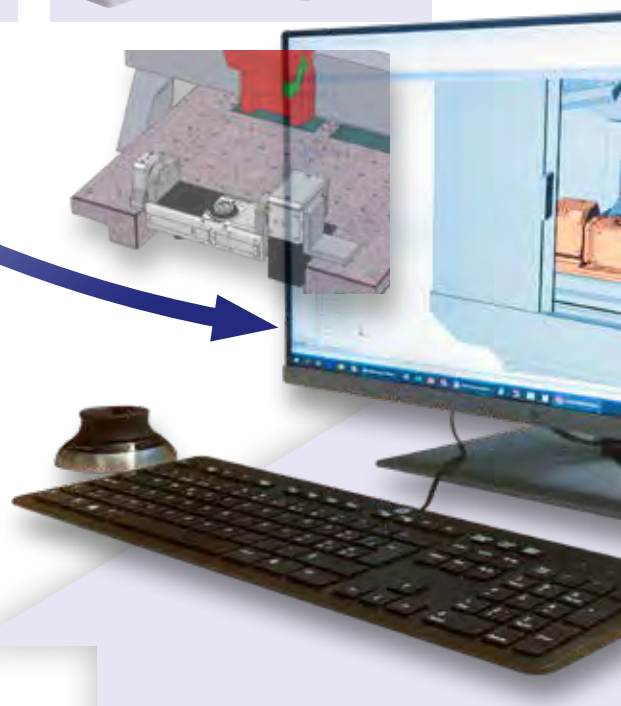
ROTOMATION – The ideal expansion with standardized Automation. Economical. Professional. Simple.

Standard

Rotary tables see **pp. 26–47**



Accessories
see **pp. 50–53, 69–71, 112–115**



Customer

Problem situation
«help me» –
don't know,
have no time,
no experience!

Vertical machining centers and grinding machines (a Selection Guide is available for all of these machines at our website)

*Examples

AMF, EROWA, EVARD PRECISION S.A., GRESSEL, HAINBUCH, LANG TECHNIK, NIEDERHAUSER, PAROTEC, PIRANHA-CLAMP, ripas, reinmechanic, ROEMHELD HILMA • STARK, RÖHM, SCHUNK, SwissChuck, system 3R, TG COLIN, TRIAG INTERNATIONAL, Vischer & Bolli vb, YERLY

ROTOLUTION

CAD & adaptation
+ Installation check
+ Adaptation for standard parts
+ Special parts

CAD & clamping means
+ Workpiece clamping
+ Standard/special

see **pp. 116–147**

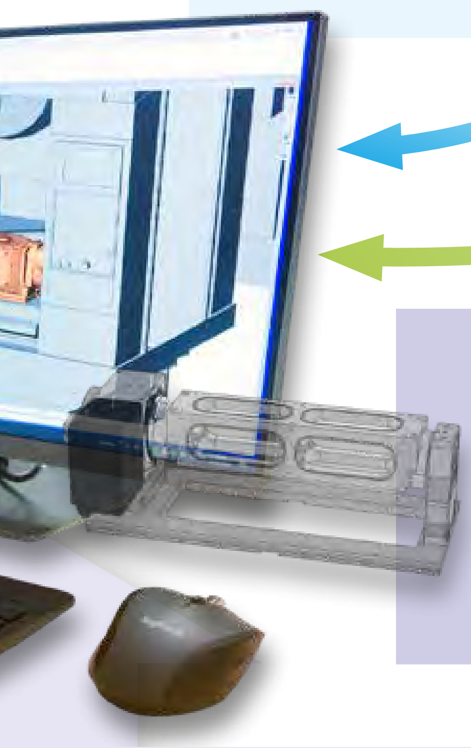
*Examples

ROTOMATION

CAD & automation
+ Workpiece handling
+ Partnerships (GU with partners), e.g. reinmechanic – mobile - concept

see **pp. 148–153**

Project management and execution, direct if needed



Plug-&-work package

Problem solution «on top» –
Standard and ROTOLUTION from a single source, ROTOMATION and machine in partnership

Customer

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

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

Services from A to Z

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

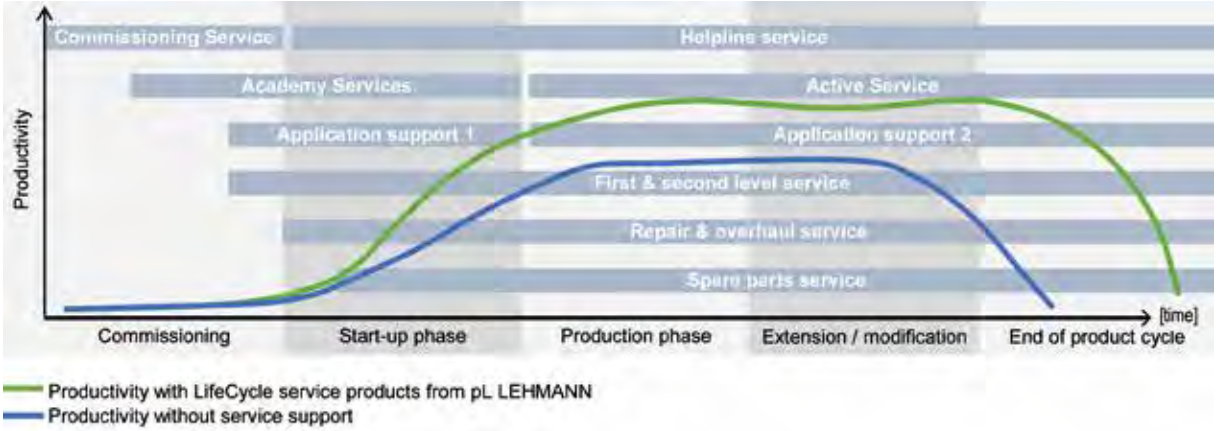
Sales & Post Sales
+ Specified offers for each machine
+ Wide range of workpiece clamping systems
+ Standardized interfaces

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

Increase productivity – Extend lifecycle

Comprehensive and professional services throughout the product life cycle – maximum availability with consistent quality and high productivity.



For more information please request our service brochure.

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

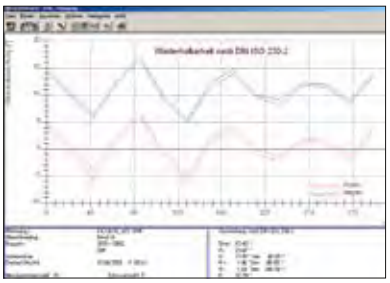

Rational equipping of spare parts packages

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 www.lehmann-rotary-tables.com

LEHMANN®

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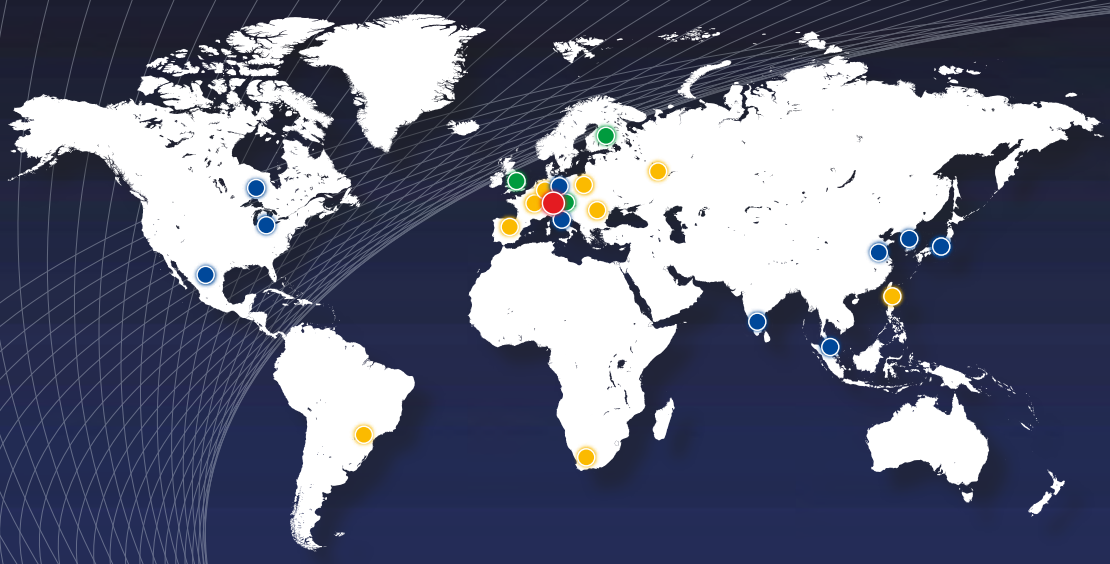

● Headquarters ● direct sales/service partner ● pL SOLUTIONS® partner ● value added reseller & partner

More information (address, telephone number...) at www.lehmann-rotary-tables.com

Subject to change / Edition: 1/2020