

# SDD<sup>+</sup>

## CNC Rotary Tables edition 3



Swiss Rotary Table  
Technology

pl

Program  
& Facts

05/2015



PGD inside **NEW**



pl LEHMANN®

# Swiss Rotary Table Technology

**pL LEHMANN** is a medium-sized business that has specialized in rotary tables for over 40 years – today is present in 25 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

## Further catalogs



Overview of branches



Main catalog



Service – Lifecycle

## Applications Catalogs

pL LEHMANN provides detailed elaborate application catalogs for various vertical machining centers, e.g. for BROTHER, FANUC Robodrive, DMG MORI, DOOSAN, HAAS, HYUNDAI, YCM, AVMAC and HURCO.

In which you will find details about collision points, collision-free traverse paths and max. possible machining areas for various types of machines with varying pL rotary tables.

For more information see [www.lehmann-rotary-tables](http://www.lehmann-rotary-tables), or request your desired catalog from the nearest pL representative.

# CNC rotary tables for economic manufacturing: Suitable and rational solutions for nearly every industry



Automotive



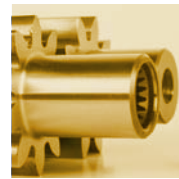
Medical/Dental



Watches/  
Micro Technology



Aerospace/Turbines



Mechanics



Please note the following color points starting on **page 10**

pL LEHMANN – your partner.

Benefits for the...

**OEM** ...OEM's themselves (manufacturer, importer)

**USE** ...users and OEM application technicians

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

**5** ... 5 axis machines

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

**DD** ... Direct drives up to ø250 mm

... not applicable

**Green % values:** pL better than benchmark

**Red % values:** pL not as good as benchmark

\* **best of** ... best benchmark values in all sizes with respect to GD, DD or overall

**unique** ... unique compared to other manufacturers

**NEW** ... Innovation in this edition

**best of** \*

**best of** \*

**best of** \*

## Content

|                                           |    |
|-------------------------------------------|----|
| + Program Overview                        | 4  |
| + Technical Data                          | 6  |
| + 3+2 – the 5 Axis Alternative            | 10 |
| + Compact and Light                       | 12 |
| + Spindle System and Accessories          | 13 |
| + Rotary Table in Use – <b>PGD</b>        | 14 |
| + Technology from the Outside             | 16 |
| + Technology from the Inside – <b>PGD</b> | 18 |
| + Modular System, combiFlex®              | 20 |
| + Sales and Service                       | 22 |

A wide range of products is available:  
More than 240 possible configurations  
from only 4 basic models

Some samples from product range

## 4. Axis



EA-510.L



EA-510.L TM,  
manual swiveling  
on request



EA-520.L rotoFIX centered



EA-507 INOX,  
fully sealed on request



EA-510.OL



EA-520.L rotoFIX bottom

## 4. + 5. Axis



TF-510520.LL fix



TF-510520.LL fixX



TF-510520.LL vario



T1-510520.LL fix



T1-510520.ORR fix



T1-510520.LL fixX

All standard, all modular - maximum guarantee  
for best quality at short delivery times

See **main catalog** for details



EA-510.L longFLEX RST



EA-510.L longFLEX GLA



TF-510520.LL varioX



T1-510520.LL vario



T1-510520.LL varioX



M2-510.L



M3-510.L



M4-510.L  
on request



T2-510520.LL fix



T3-510520.LL fix



T4-510520.LL fix  
on request

Multi-Spindle Rotary Tables



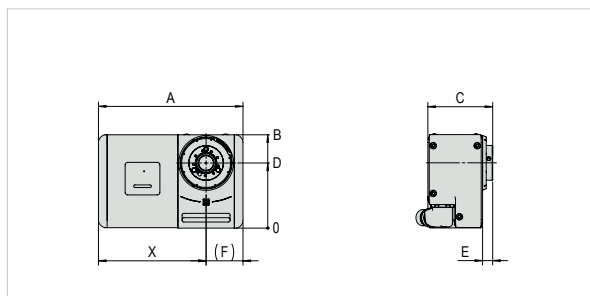
See **main catalog** for details and further models and our conditions

|                           |                        |                       |                   | EA-507 | EA-510<br>(EA-511) | EA-520    | EA-530     |
|---------------------------|------------------------|-----------------------|-------------------|--------|--------------------|-----------|------------|
| <b>Dimensions</b>         | max. workpiece ø       |                       | mm                | 160    | 240                | 350       | 430        |
|                           | Center height          |                       | mm                | 110    | 150                | 180       | 220        |
|                           | Total weight           | with motor            | kg                | 30     | 35                 | 65        | 150        |
|                           | Center bore            |                       | mm                | 31     | 34                 | 46 / (64) | 90 / (102) |
| <b>Bearing / Clamping</b> | Max clamping torque    |                       | Nm                | 300    | 800 (600)          | 2'000     | 4'500      |
|                           | Max spindle load       | with tailstock        | kg                | 240    | 400                | 800       | 1'600      |
|                           |                        | without tailstock     | kg                | 120    | 200                | 400       | 800        |
|                           |                        | standard load*        | kg                | 17     | 42 (21)            | 90        | 161        |
|                           | Max axial force        |                       | kN                | 44     | 46                 | 100       | 210        |
| <b>Gear Unit</b>          | Max pull-out torque    |                       | Nm                | 1'200  | 2'000              | 3'900     | 10'400     |
|                           | Max moment of inertia  | standard load*        | kgm <sup>2</sup>  | 0.05   | 0.2 (0.07)         | 0.8       | 2          |
|                           |                        | J max                 | kgm <sup>2</sup>  | 0.5    | 2 (0.7)            | 8         | 20         |
|                           | Max feed torque        |                       | Nm                | 120    | 250 (150)          | 440       | 650        |
| <b>Precision</b>          | Pa **                  |                       | ± arc sec         | 20/12  | 17/10              | 12/8      | 10/6       |
|                           | Ps mid                 |                       | ± arc sec         | 2      | 2                  | 2         | 2          |
|                           | Max speed              | with standard load*   | min <sup>-1</sup> | 111    | 80 (160)           | 50        | 42         |
|                           | Cycle time 90° min     | with standard load*   | sec               | 0.26   | 0.31 (0.23)        | 0.42      | 0.5        |
| <b>Precision</b>          | Concentricity **       | on spindle ø          | µm                | 6 / 3  | 6 / 3              | 6 / 3     | 6 / 3      |
|                           | Axial concentricity ** | at spindle end face   | µm                | 6 / 3  | 6 / 3              | 6 / 3     | 6 / 3      |
|                           | Parallelism **         | Dividing axis to base | µm/100mm          | 10 / 5 | 10 / 5             | 10 / 5    | 10 / 5     |

\*Mutually dependent

\*\*Standard / increased

## Dimensions



|        | A   | B   | C   | D   | E  | F   | X   |
|--------|-----|-----|-----|-----|----|-----|-----|
| EA-507 | 311 | 165 | 136 | 110 | 23 | 75  | 236 |
| EA-510 | 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 |

## Options and Accessories

Wide range available, always the same for all rotary table versions. See **main catalog** for more information.

## Parameter lists

Specific parameter lists are available for almost all rotary table versions

...for machines from

- + Brother
- + DMG MORI
- + Doosan
- + Fanuc Robodrill
- + Haas
- + Hurco
- + Quaser

- + Tongtai
- + YCM

...for CNC control systems from

- + Fanuc
- + Heidenhain
- + Mitsubishi
- + Siemens



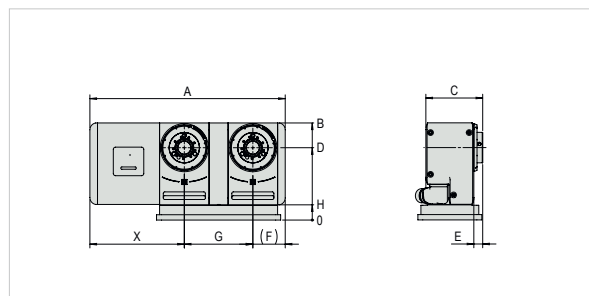
See **main catalog** for details and further models and our conditions

|                           |                              |                       |                   | M2-507 | M2-510<br>(M2-511) | M3-507 | M3-510<br>(M3-511) |
|---------------------------|------------------------------|-----------------------|-------------------|--------|--------------------|--------|--------------------|
| <b>Dimensions</b>         | max. workpiece 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                | 30     | 34                 | 30     | 34                 |
| <b>Bearing / Clamping</b> | Max clamping torque          |                       | Nm                | 300    | 800 (600)          | 300    | 800 (600)          |
|                           | Max spindle load per spindle | with tailstock        | kg                | 240    | 400                | 240    | 400                |
|                           |                              | without tailstock     | kg                | 120    | 200                | 120    | 200                |
|                           |                              | standard load*        | kg                | 12     | 27 (14)            | 9      | 21 (12)            |
|                           | Max axial force              | per spindle           | kN                | 44     | 46                 | 44     | 46                 |
| <b>Gear Unit</b>          | Max pull-out torque          | per spindle           | Nm                | 1'200  | 2'000              | 1'200  | 2'000              |
|                           | Max moment of inertia        | standard load*        | kgm <sup>2</sup>  | 0.05   | 0.2 (0.07)         | 0.05   | 0.2 (0.07)         |
|                           |                              | J max                 | kgm <sup>2</sup>  | 0.5    | 2 (0.7)            | 0.5    | 2 (0.7)            |
|                           | Max feed torque              |                       | Nm                | 120    | 240 (150)          | 75     | 225 (150)          |
|                           | Pa **                        |                       | ± arc sec         | 20/12  | 17/10              | 20/12  | 17/10              |
| <b>Precision</b>          | Ps mid                       |                       | ± arc sec         | 2      | 2                  | 2      | 2                  |
|                           | Max speed                    | with standard load*   | min <sup>-1</sup> | 100    | 65 (110)           | 70     | 50 (65)            |
|                           | Cycle time 90° min           | with standard load*   | sec               | 0.26   | 0.37 (0.24)        | 0.32   | 0.41 (0.31)        |
| <b>Precision</b>          | Concentricity **             | on spindle ø          | µm                | 6 / 3  | 6 / 3              | 6 / 3  | 6 / 3              |
|                           | Axial concentricity **       | at spindle end face   | µm                | 6 / 3  | 6 / 3              | 6 / 3  | 6 / 3              |
|                           | Parallelism **               | Dividing axis to base | µm/100mm          | 10 / 5 | 10 / 5             | 10 / 5 | 10 / 5             |

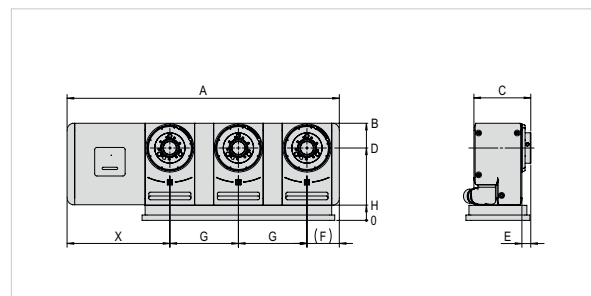
\*Mutually dependent

\*\*Standard / increased

## Dimensions



|        | A   | B   | C   | D   | E  | F  | G   | H  | X   |
|--------|-----|-----|-----|-----|----|----|-----|----|-----|
| M2-507 | 451 | 205 | 136 | 150 | 23 | 75 | 140 | 40 | 236 |
| M2-510 | 513 | 255 | 150 | 190 | 23 | 85 | 180 | 40 | 248 |



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

# Technical Data on TF- and T1-fix\* Rotary Tables



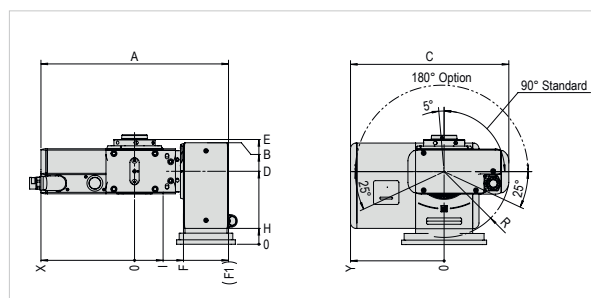
See **main catalog** for details and further models (\*fixX, vario, varioX...) and our conditions

|                           |                                     |                            |           | TF-507510                         | TF-510520<br>(TF-511520) | T1-507510 | T1-510520<br>(T1-511520) | T1-520520 |
|---------------------------|-------------------------------------|----------------------------|-----------|-----------------------------------|--------------------------|-----------|--------------------------|-----------|
| <b>Dimensions</b>         | max. workpiece ø                    |                            | mm        | 200                               | 240                      | 200       | 240                      | 350       |
|                           | Swiveling range                     |                            | degrees   | 90° +5°/-25° (optional 180° ±25°) |                          |           |                          |           |
|                           | Center height                       |                            | mm        | 150                               | 180                      | 190       | 220                      | 250       |
|                           | Total weight                        | with motor                 | kg        | 61                                | 104                      | 96        | 136                      | 187       |
|                           | Center bore                         |                            | mm        | 30                                | 34                       | 30        | 34                       | 46 / (64) |
| <b>Bearing / Clamping</b> | Max clamping torque                 | 4. axis                    | Nm        | 300                               | 800 (600)                | 300       | 800 (600)                | 2'000     |
|                           |                                     | 5. axis                    | Nm        | 800                               | 2'000                    | 1'100     | 2'600                    | 4'000     |
|                           | Max spindle load                    | 0°-30°                     | kg        | 40                                | 66                       | 80        | 133                      | 200       |
|                           |                                     | 30°-90°                    | kg        | 27                                | 44                       | 53        | 89                       | 133       |
|                           |                                     | standard load*             | kg        | 17                                | 42 (21)                  | 17        | 42 (21)                  | 67        |
| <b>Gear Unit</b>          | Max axial force                     | 4. axis                    | kN        | 6                                 | 10                       | 12        | 20                       | 40        |
|                           | Max pull-out torque                 | 4. axis                    | Nm        | 1'200                             | 2'000                    | 1'200     | 2'000                    | 3'900     |
|                           |                                     | 5. axis                    | Nm        | 2'000                             | 3'900                    | 2'000     | 3'900                    | 3'900     |
|                           | Max moment of inertia               | standard load*             | kgm²      | 0.05                              | 0.2 (0.07)               | 0.05      | 0.2 (0.07)               | 0.8       |
|                           |                                     | J max                      | kgm²      | 0.5                               | 2 (0.7)                  | 0.5       | 2 (0.7)                  | 8         |
| <b>Precision</b>          | Feed torque max                     | 4. axis                    | Nm        | 120                               | 250 (150)                | 120       | 250 (150)                | 440       |
|                           |                                     | 5. axis                    | Nm        | 250                               | 440                      | 250       | 440                      | 440       |
|                           | Pa **                               | 4. axis                    | ± arc sec | 20/12                             | 17/10                    | 20/12     | 17/10                    | 12/8      |
|                           |                                     | 5. axis                    | ± arc sec | 23/16                             | 28/21                    | 23/16     | 16/12                    | 20/16     |
|                           | Ps mid                              | 4. axis                    | ± arc sec | 2                                 | 2                        | 2         | 2                        | 2         |
| <b>Max speed</b>          |                                     | 5. axis                    | ± arc sec | 2                                 | 2                        | 2         | 2                        | 2         |
|                           | Max speed at standard load          | 4. axis                    | min⁻¹     | 111                               | 80 (160)                 | 111       | 80 (160)                 | 50        |
|                           |                                     | 5. axis                    | min⁻¹     | 60                                | 40                       | 60        | 40                       | 30        |
|                           | Cycle time 90° min at standard load | 4. axis                    | sec       | 0.26                              | 0.31 (0.23)              | 0.26      | 0.31 (0.23)              | 0.41      |
|                           |                                     | 5. axis                    | sec       | 0.41                              | 0.53                     | 0.41      | 0.53                     | 0.71      |
| <b>Concentricity</b>      | Concentricity **                    | on spindle ø               | µm        | 6 / 3                             | 6 / 3                    | 6 / 3     | 6 / 3                    | 6 / 3     |
|                           | Axial concentricity **              | at spindle end face        | µm        | 6 / 3                             | 6 / 3                    | 6 / 3     | 6 / 3                    | 6 / 3     |
|                           | Max axial offset                    | Dividing to swiveling axis | µm        | 20                                | 20                       | 20        | 20                       | 20        |
|                           | Parallelism **                      | Spindle to base            | µm/100mm  | 10 / 5                            | 10 / 5                   | 10 / 5    | 10 / 5                   | 10 / 5    |

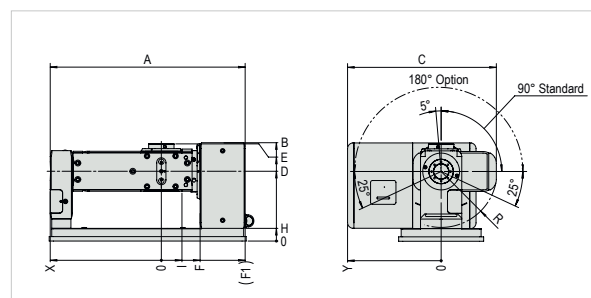
\*Mutually dependent (valid for fix models; for further details see **main catalog**)

\*\* Standard / increased

## Dimensions



|           | A   | B   | C   | D   | E   | F   | FI  | H  | I  | R   | X   | Y   |
|-----------|-----|-----|-----|-----|-----|-----|-----|----|----|-----|-----|-----|
| TF-507510 | 466 | 245 | 382 | 180 | 260 | 104 | 230 | 30 | 55 | 136 | 236 | 248 |
| TF-510510 | 490 | 265 | 422 | 200 | 287 | 116 | 242 | 50 | 65 | 177 | 248 | 248 |
| TF-510520 | 512 | 310 | 469 | 220 | 307 | 122 | 264 | 40 | 65 | 177 | 248 | 295 |
| TF-520520 | 591 | 320 | 499 | 230 | 330 | 154 | 296 | 50 | 90 | 207 | 295 | 295 |



|           | A   | B   | C   | D   | E   | F   | FI  | H  | I  | R   | X   | Y   |
|-----------|-----|-----|-----|-----|-----|-----|-----|----|----|-----|-----|-----|
| T1-507510 | 569 | 255 | 382 | 190 | 269 | 104 | 230 | 40 | 55 | 136 | 339 | 248 |
| T1-510520 | 615 | 310 | 469 | 220 | 307 | 122 | 264 | 40 | 65 | 177 | 351 | 295 |
| T1-520520 | 704 | 340 | 499 | 250 | 350 | 154 | 296 | 40 | 90 | 207 | 408 | 295 |

# Technical Data on T2- and T3 Rotary Tables



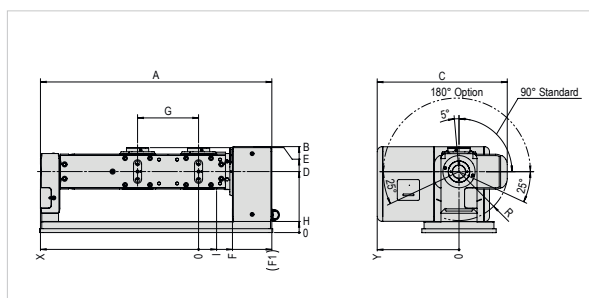
See **main catalog** for details and further models (\*fixX, vario, varioX...) and our conditions

|                           |                                     |                            |                   | T2-507510 | T2-510520<br>(T2-511520) | T3-507510 | T3-510520<br>(T3-511520) |
|---------------------------|-------------------------------------|----------------------------|-------------------|-----------|--------------------------|-----------|--------------------------|
| <b>Dimensions</b>         | max. workpiece ø                    |                            | mm                | 160       | 220                      | 160       | 220                      |
|                           | Spindle distance                    |                            | mm                | 160       | 220                      | 160       | 220                      |
|                           | Center height                       |                            | mm                | 190       | 220                      | 190       | 220                      |
|                           | Total weight                        | with motor                 | kg                | 116       | 186                      | 151       | 236                      |
|                           | Center bore                         |                            | mm                | 30        | 34                       | 30        | 34                       |
| <b>Bearing / Clamping</b> | Max clamping torque                 | 4. axis                    | Nm                | 300       | 800 (600)                | 300       | 800 (600)                |
|                           |                                     | 5. axis                    | Nm                | 1'100     | 2'600                    | 1'100     | 2'600                    |
|                           | Max spindle load per spindle        | 0°–30°                     | kg                | 40        | 67                       | 40        | 67                       |
|                           |                                     | 30°–90°                    | kg                | 27        | 45                       | 27        | 45                       |
|                           |                                     | standard load*             | kg                | 12        | 21 (11)                  | 9         | 14 (7)                   |
|                           | Max axial force                     | 4. axis per spindle        | kN                | 12        | 20                       | 12        | 20                       |
|                           | Max pull-out torque                 | 4. axis                    | Nm                | 1'200     | 2'000                    | 1'200     | 2'000                    |
|                           |                                     | 5. axis                    | Nm                | 2'000     | 3'900                    | 2'000     | 3'900                    |
| <b>Gear Unit</b>          | Max moment of inertia               | standard load*             | kgm <sup>2</sup>  | 0.05      | 0.2 (0.07)               | 0.05      | 0.2 (0.07)               |
|                           |                                     | J max                      | kgm <sup>2</sup>  | 0.5       | 2 (0.7)                  | 0.5       | 2 (0.7)                  |
|                           | Feed torque max                     | 4. axis                    | Nm                | 120       | 240 (150)                | 120       | 225 (150)                |
|                           |                                     | 5. axis                    | Nm                | 250       | 440                      | 250       | 440                      |
|                           | Pa **                               | 4. axis                    | ± arc sec         | 20/12     | 17/10                    | 20/12     | 17/10                    |
|                           |                                     | 5. axis                    | ± arc sec         | 30/23     | 20/16                    | 36/29     | 24/20                    |
|                           | Ps mid                              | 4. axis                    | ± arc sec         | 2         | 2                        | 2         | 2                        |
|                           |                                     | 5. axis                    | ± arc sec         | 2         | 2                        | 2         | 2                        |
|                           | Max speed at standard load          | 4. axis                    | min <sup>-1</sup> | 100       | 65 (110)                 | 70        | 50 (65)                  |
|                           |                                     | 5. axis                    | min <sup>-1</sup> | 65        | 40                       | 55        | 35                       |
| <b>Precision</b>          | Cycle time 90° min at standard load | 4. axis                    | sec               | 0.26      | 0.37 (0.24)              | 0.32      | 0.41 (0.31)              |
|                           |                                     | 5. axis                    | sec               | 0.41      | 0.53                     | 0.48      | 0.58                     |
|                           | Concentricity **                    | on spindle ø               | µm                | 6 / 3     | 6 / 3                    | 6 / 3     | 6 / 3                    |
|                           | Axial concentricity **              | at spindle end face        | µm                | 6 / 3     | 6 / 3                    | 6 / 3     | 6 / 3                    |
|                           | Max axial offset                    | Dividing to swiveling axis | µm                | 40        | 40                       | 40        | 40                       |
|                           | Parallelism **                      | Spindle to base            | µm/100mm          | 10 / 5    | 10 / 5                   | 10 / 5    | 10 / 5                   |

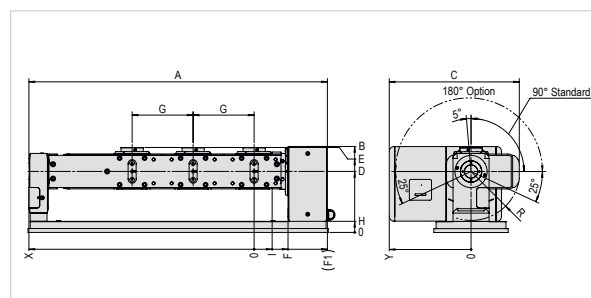
\*Mutually dependent (valid for fix models; for further details see **main catalog**)

\*\* Standard / increased

## Dimensions



|                  | A   | B   | C   | D   | E   | F   | FI  | G   | H  | R   | X   | Y   |
|------------------|-----|-----|-----|-----|-----|-----|-----|-----|----|-----|-----|-----|
| <b>T2-507510</b> | 729 | 255 | 382 | 190 | 269 | 104 | 230 | 160 | 40 | 136 | 499 | 248 |
| <b>T2-510520</b> | 835 | 310 | 469 | 220 | 307 | 122 | 264 | 220 | 40 | 177 | 571 | 295 |



|                  | A    | B   | C   | D   | E   | F   | FI  | G   | H  | R   | X   | Y   |
|------------------|------|-----|-----|-----|-----|-----|-----|-----|----|-----|-----|-----|
| <b>T3-507510</b> | 888  | 255 | 382 | 190 | 269 | 104 | 230 | 160 | 40 | 136 | 658 | 248 |
| <b>T3-510520</b> | 1055 | 310 | 469 | 220 | 307 | 122 | 264 | 220 | 40 | 177 | 791 | 295 |

## pL LEHMANN Rotary Tables on Vertical Machining Centers: The Advantages Compared to 5 Axis Machines

Efficient manufacturing of workpieces ... to Ø350 mm / 150 kg (positioning) or ø150mm/34kg (simultaneous) with workpiece precision of 0.01 ... 0.002 mm per 100 mm spatial diagonal.  
(For more information and our conditions see the **main catalog, page 81**)

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%

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

OEM USE | GD DD

5

### Machine Floor Space

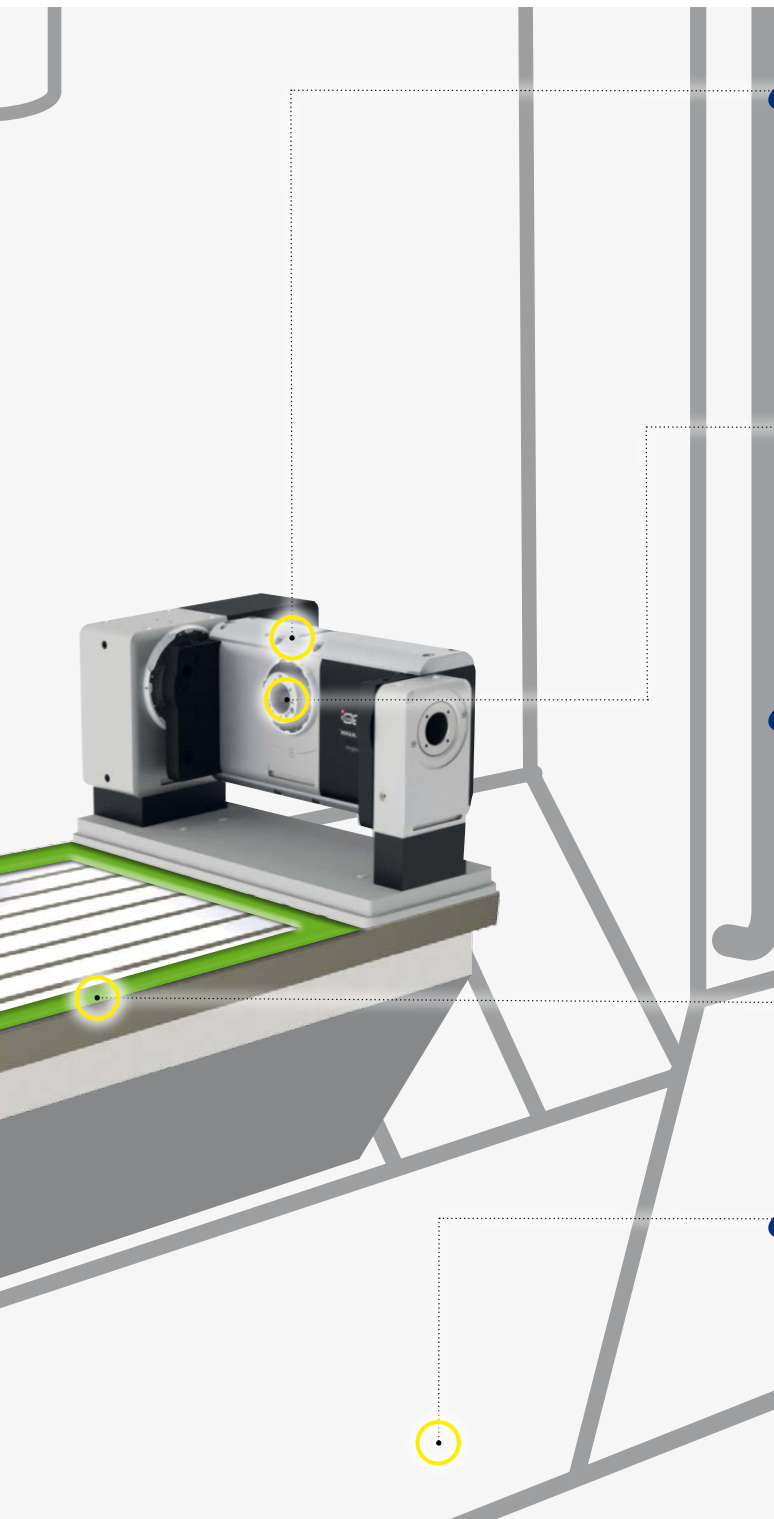
-40%

- + 5 machines on a floor space for 3
- + 67% higher productivity per m<sup>2</sup>

best of

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

All % values and color notes are according to pl-Benchmark 2015 with a total of 16 machines. For explanation see [page 3](#)



best of

OEM USE | GD DD **5**  
**Low Projecting Edge** **-52%**

- + Very good accessibility across the C axis (from the top)
- + Cutting tools very shortly preloaded: Maximum service life, 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 e.g. large workpieces, and parallel to this a genuine 5-axis for the machining of e.g. impellers
- + 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-level buildings
- + Lower transport costs

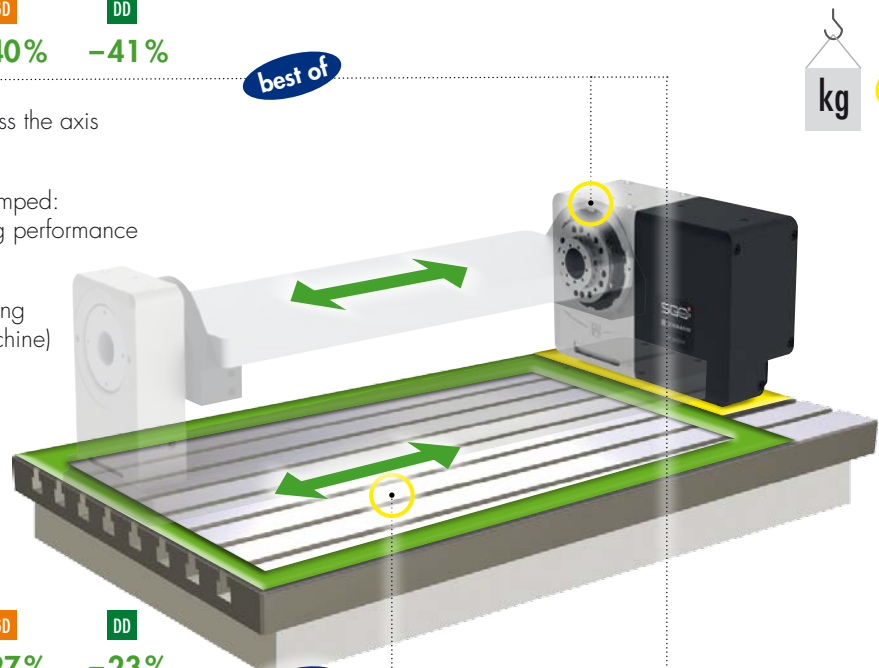
## A Major Advantage Over Conventional CNC Rotary Tables: Extremely Compact with Comparable or Better Performance

OEM USE | 5

### Low projecting edge

GD -40% DD -41%

- + Very good accessibility across the axis (from the top)
- + Cutting tools very shortly clamped: Maximum service life, milling performance and surface quality
- + Good accessibility for grinding wheel (Surface grinding machine)

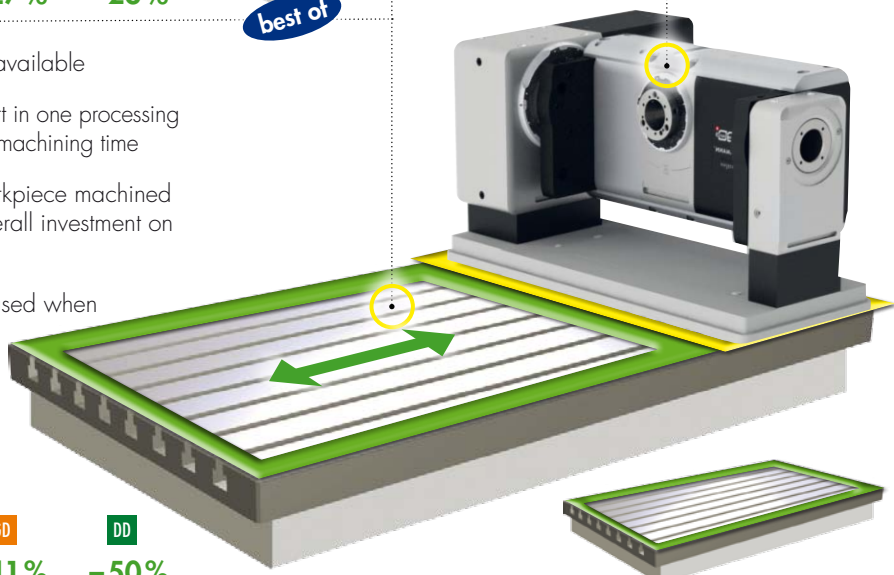


OEM USE | 5

### Space Requirement

GD -27% DD -23%

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

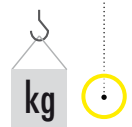


OEM USE | 5

### Weight

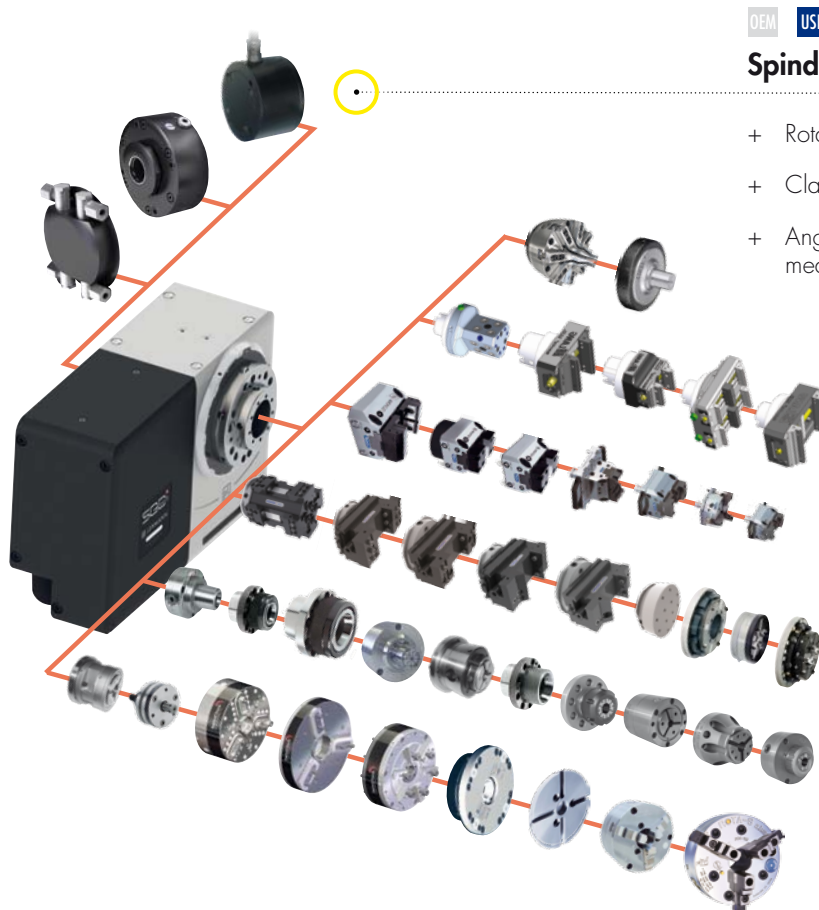
GD -41% DD -50%

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



Standardized interface in front and rear:  
maximum universality, more than 20 different  
standard clamping systems available

All % values and color notes are according to pl-Benchmark 2015 with a total of 129 rotary tables from renowned manufacturers. For explanation see **page 3**



## Spindle accessories in rear

- + Rotary union
- + Clamping cylinder
- + Angular position measuring system

**ripas**

**LANG**  
TECHNIK.de

EROWA

**system 3R**

**SwissChuck**  
Precision Workholding

**ROEMHELD**  
HILMA • STARK

**SCHUNK**

**GRESSEL**  
Spanntechnik

**PAROTEC**  
spanntechnik - robotik - engineering

**tobler**  
a member of **MORI SEIKI** group

**YERLY**

**NIEDERHAUSER**  
SPANNTÉCHNIK UND SYSTEME

**AMF**

## Tailstock and counter bearing

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



## Medium transfer dividing axis

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



The user is interested in the facts:  
How much profit can be made with the technology

All criteria is based on the max. achievable limits

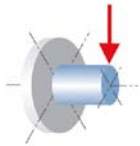
OEM | USE | 5

## Pull-out torque

GD DD  
+147% +233%

best of

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



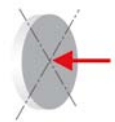
OEM | USE | 5

## Axial force

GD DD  
+324% not available

best of

- + Withstands very high compressive and tensile forces

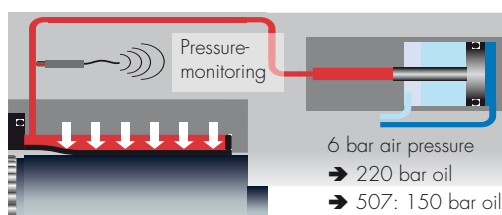
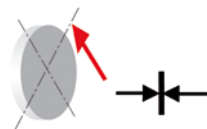


OEM | USE | 5

## Clamping torque

GD DD  
+115% +236%

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



Fully integrated BRAKY pressure intensifier

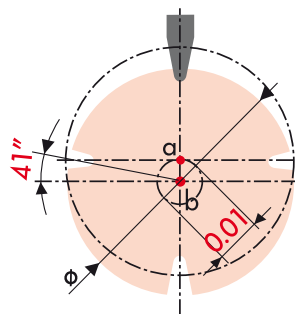
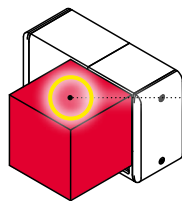
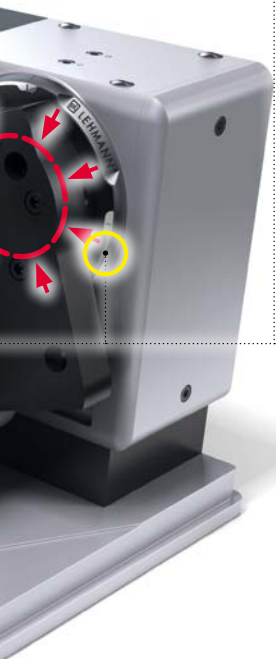


# PGD\* Advantages as Compared to Direct Drives (DD) at a Glance

- + ONE rotary table for everything: Standard or high speed, for CNC's from Siemens, Heidenhain, Fanuc...
- + NO cooling unit needed
- + NO safety brake
- + Several SMALLER drive enhancers
- + Much LOWER electrical power consumption
- + Significantly EASIER commissioning/tuning

All % values and color notes are according to pl-Benchmark 2015 with a total of 129 rotary tables from renowned manufacturers. For explanation see [page 3](#)

\*For more information see [page 18](#)



OEM USE | 5 **GD** **DD**  
**Rotational speed** **+78%** **-11%**

best of

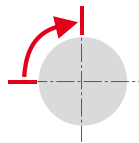
- + High rotational speed



OEM USE | 5 **GD** **DD**  
**Cycle time** **-67%** **+4%**

best of

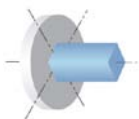
- + Short cycle times (with clamping)



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 concentricity** **-34%** **-31%**

best of

- + High concentricity and degree of axial runout for optimum workpiece precision

Functional design – from practical sources for practical applications: Good chip and coolant flow, service-friendly

OEM USE | 5 GD DD

## Transport and bleeding holes

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

OEM USE | 5 GD DD

## Service access cover

- + combiFlex® interface (remove service cover with only two screws)
- + Service access: Change gear unit preload, bleeding, counter bearing clamping circuit connecting/disconnecting, seal change on worm drive
- + Service access for BRAKY (seal replacement in the integrated pressure intensifier)

OEM USE | 5 GD DD

## USB slot

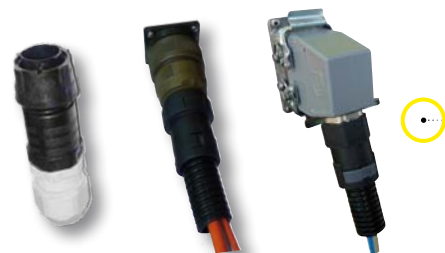
- + Fast, simple data output for evaluation on a PC in case of malfunction
- + Licensing possibility with registration code via USB stick (OEM feature)
- + Fully sealed, placed in well protected location
- + PC connection for remote diagnostics

unique

OEM USE | 5 GD DD

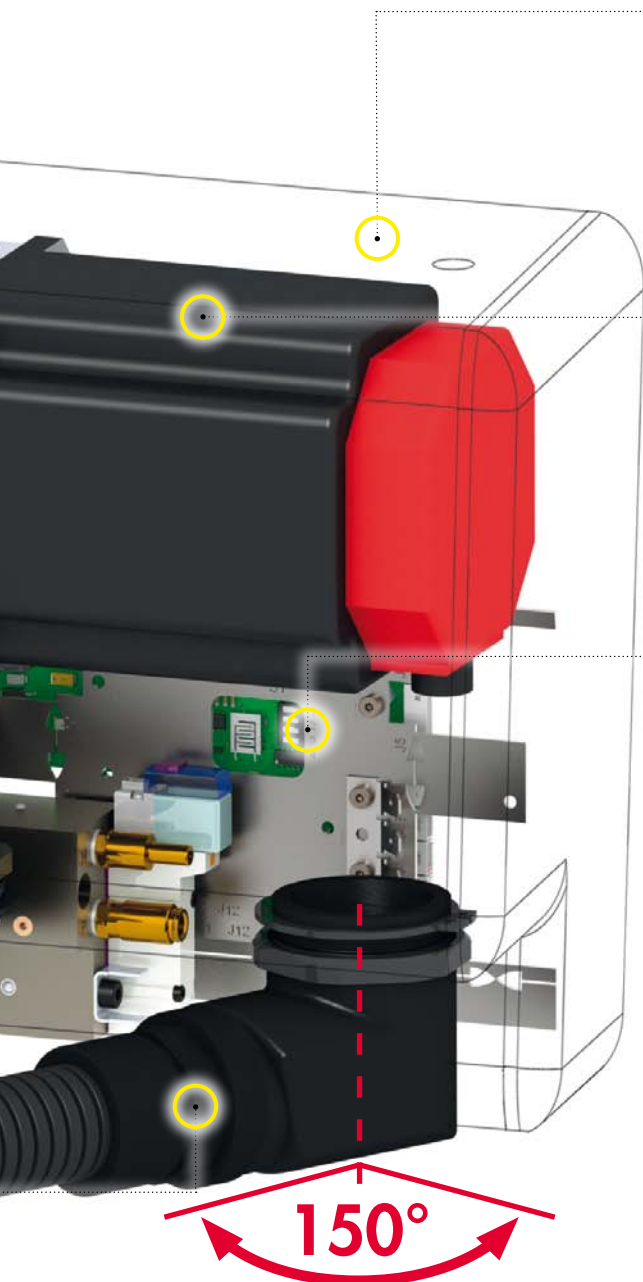
## Wire guide

- + 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



Innovative technology in a noble package:  
new possibilities and functions,  
Industry 4.0 can be implemented

All % values and color notes are according to pl-Benchmark 2015 with a total of 129 rotary tables from renowned manufacturers. For explanation see **page 3**



best of

OEM USE | S GD DD

### Fully sealed IP 67 (IP 68)

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

best of

OEM USE | S GD DD

### Drive motor

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

unique

OEM USE | S GD DD

### blackBOX – for Industry 4.0

- + Measurement of speed, internal pressure in the motor housing, temperature, humidity and shocks
- + Monitoring and control of spindle clamping system
- + History of important data with a real-time clock
- + Quick location of malfunctions and preventative maintenance
- + Increases availability and reduces maintenance costs
- + Connection for remote maintenance

For details see operating manual

OEM USE | S GD DD

### Connector interfaces

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

## PGD – the Preloaded Gear Unit with Direct Drive Properties: High Speed and High Torque

OEM USE | 5 GD DD

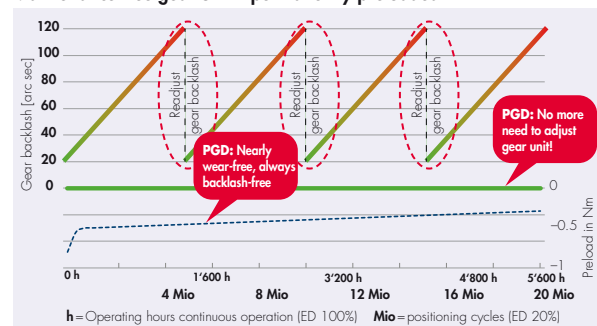
### PGD (Preloaded Gear Drive)

- + Strong teeth
- + Wheel and worm 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
- + 20'000 h or 20 Mio. \* 90° positioning
- + Easy to adjust, if ever necessary
- + Up to 30% of perm. feed torque without clamping (time saving)
- + 5'000 h highly dynamic simultaneous processing\*

\* Extrapolated figures with safety factor of 1.5, based on long-term tests more than 10,500h / 10.6 million 90° cycles; valid under appropriate use; the limit reached first is valid

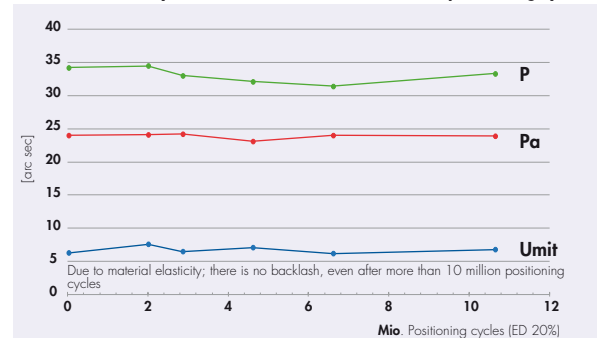
**NEW**

#### Maintenance free gear unit – permanently preloaded



All values based on internal testing using standard load and catalog values (speed, cycle time). ED as defined in the **main catalog, page 84**

#### Consistent accuracy - even after more than 10 million positioning cycles



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

OEM USE | 5 GD DD

### Fully sealed IP 67 (IP 68)

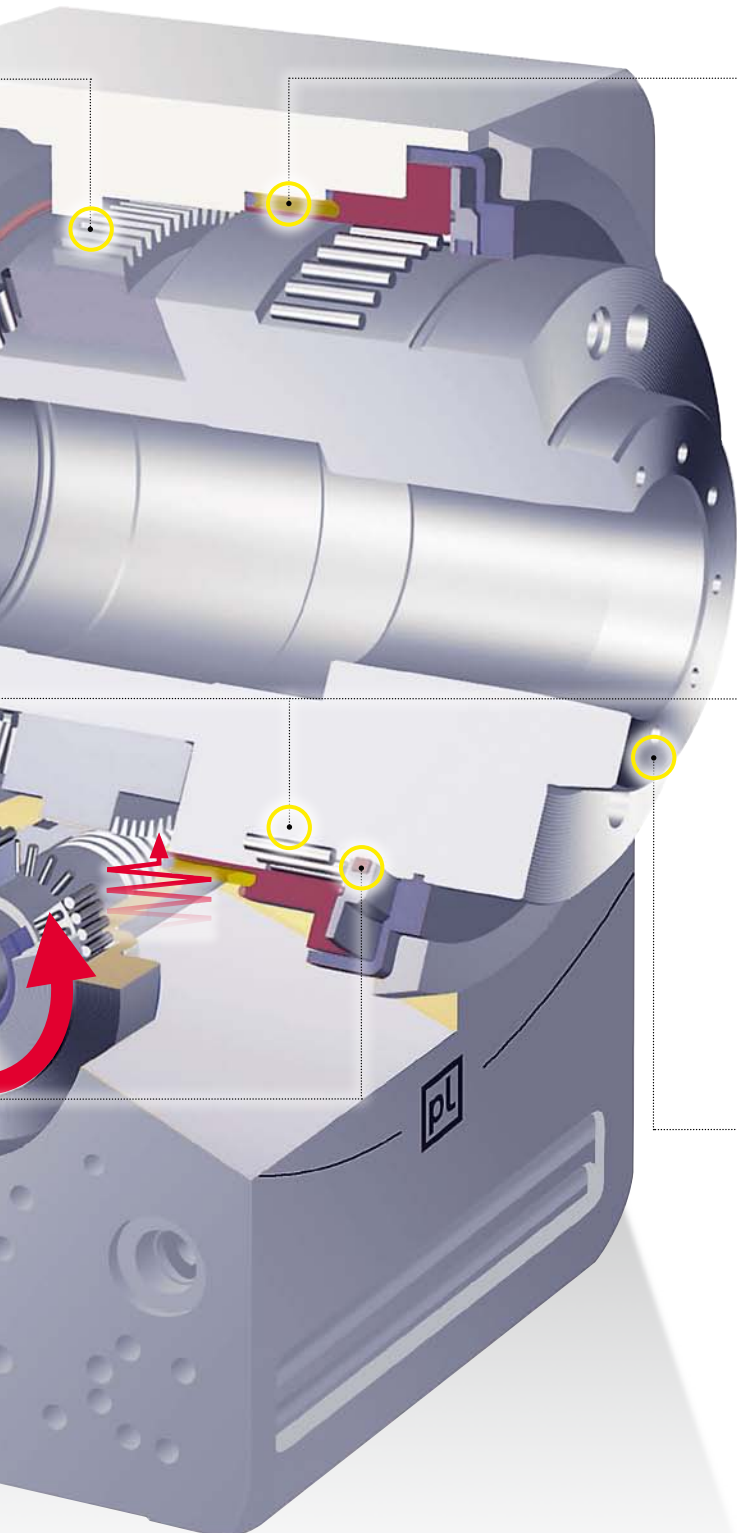
- + All models are fully sealed
- + Spindle housing with pressurized oil lubrication system
- + Additional spindle labyrinth seal (optional) for use with high pressure coolant (e.g. production grinding) and aggressive materials such as glass, graphite, ceramic, etc.

**best of**



Preloaded with absolutely no backlash (permanently),  
wear resistant,: Requirements for simultaneous  
processing

All % values and color notes are according to pl-Benchmark 2015 with a total of 129 rotary tables from renowned manufacturers. For explanation see **page 3**



OEM USE | 5 GD DD

best of

### 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 (micro processor controlled)
- + Long service life
- + Consistent clamping force throughout the entire service life

OEM USE | 5 GD DD

### Spindle bearing

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

OEM USE | 5 GD DD

best of

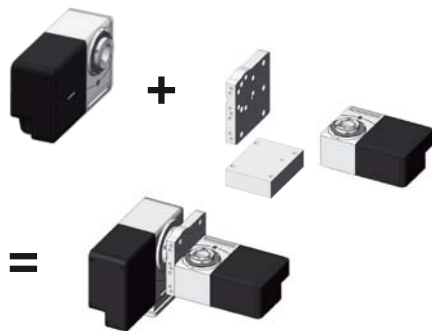
### Spindle

- + Steel, hardened and ground
- + Radial and axial concentricity 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...

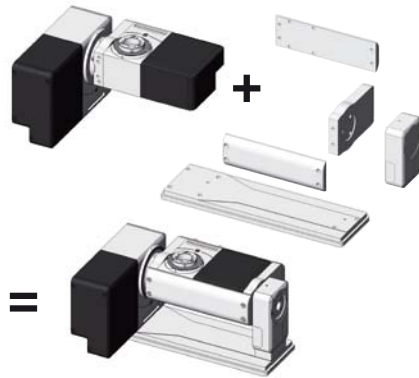
Only 4 sizes  $\varnothing 100 - 500$  mm – more than 240 standard configurations



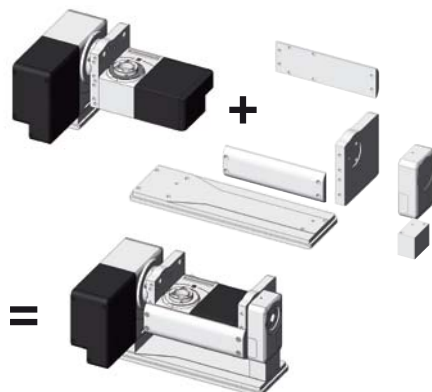
## EA → TF vario



## TF fix → T1 fix



## TF vario → T1 vario



OEM USE | 5 GD DD **Diversity of products** approx. **-50%** approx. **-50%** **unique**

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

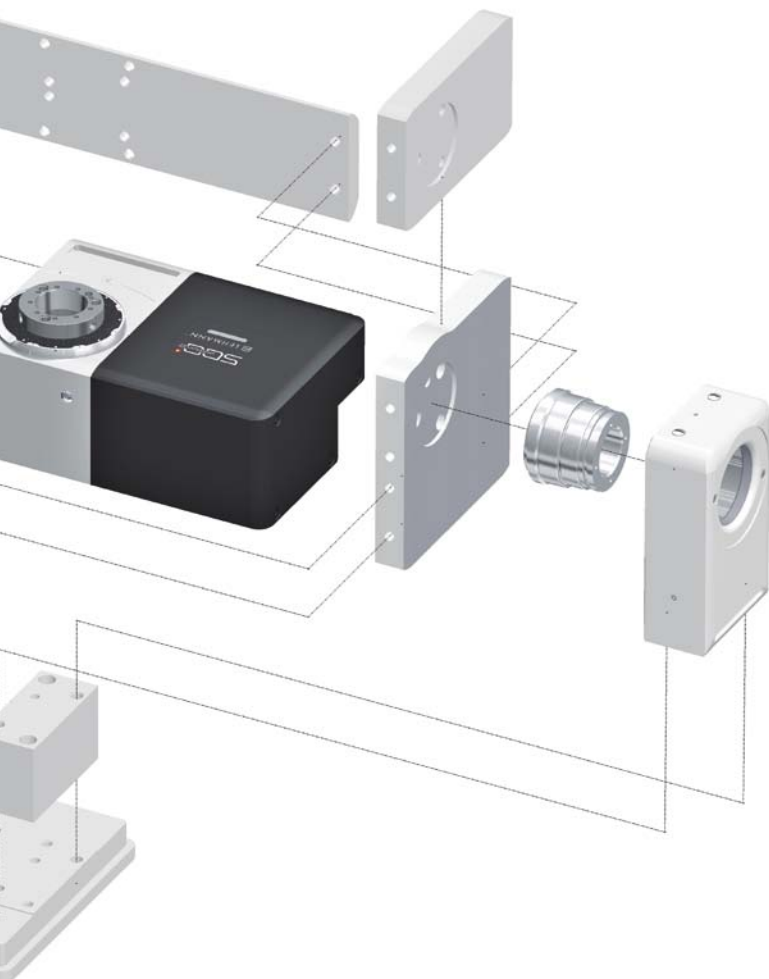


# High value retention: Always adaptable to new requirements

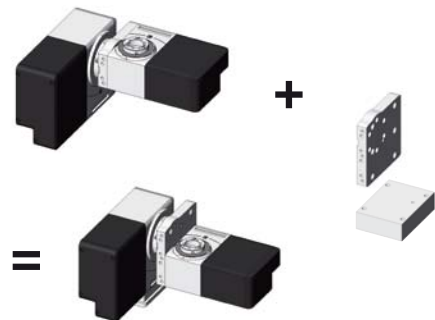
All % values and color notes are according to pl-Benchmark 2015 with a total of 129 rotary tables from renowned manufacturers. For explanation see **page 3**

## OEM USE | 5 GD DD **Highest level of flexibility** *unique*

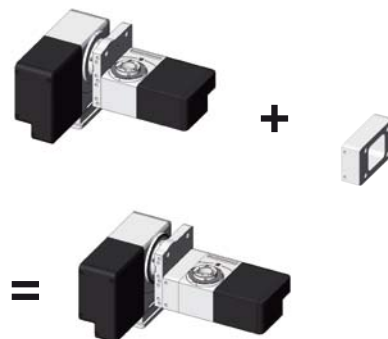
- + Standard machine in stock, available at short notice, equipped with matching rotary table
- + Rotary table is readily available and can be converted by the OEM
- + If the needs change, the investment is not lost
- + Pay in installments: First, the machine later the rotary table - can be retrofitted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



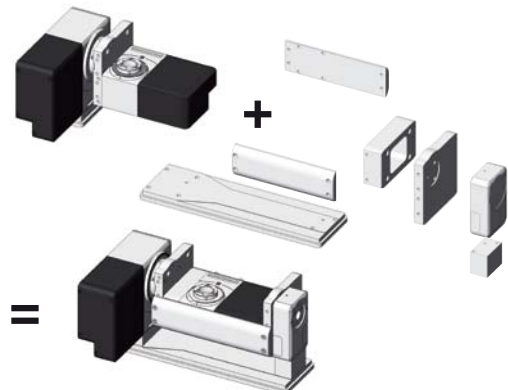
### TF fix → TF vario



### TF vario → TF varioX



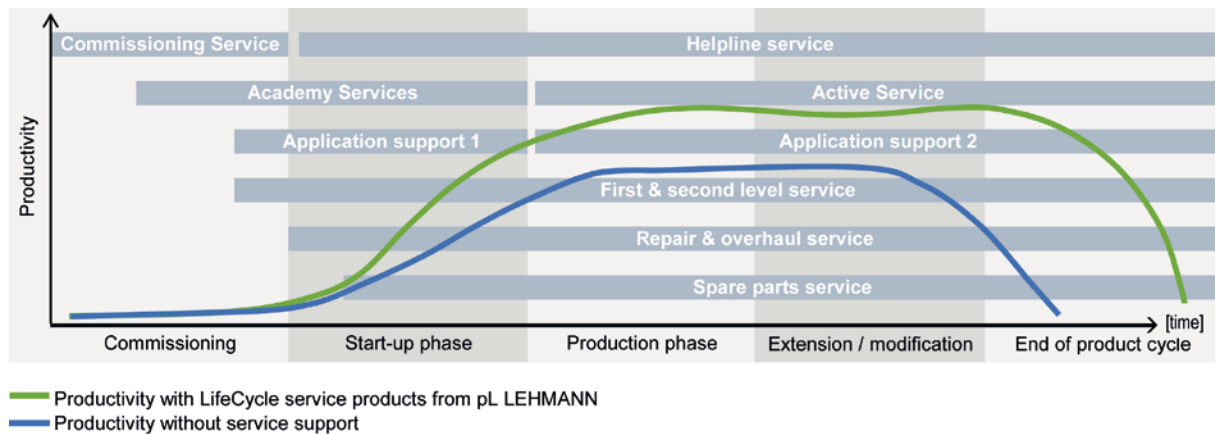
### TF vario → T1 varioX



Present in 25 countries with 16 country representatives: from sales consultation to the final service

## Life Cycle Services

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.

## Worldwide sales and service centers

### Europe

Germany –  
IVO OESTERLE



France –  
AND PRECISION



Turkey –  
ORSA



Italy/Slovenia –  
MULTI-MATIC



Benelux –  
BOKHOVEN BTM



Spain/Portugal –  
DELFIN COMPON.



UK –  
AVON



Russia –  
AXTO



Scandinavia –  
CNC-TEKNO AB



### America

Brazil –  
SISFIX



USA –  
ROTEC



### Asia

China –  
SHANGHAI RUIMAN



India –  
STITCH



Taiwan –  
GTW



Japan –  
FUKUDA



South Korea –  
HIOIL



Singapore –  
VAKANT



### Africa / Oceania

South Africa –  
ROTHCO



# 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

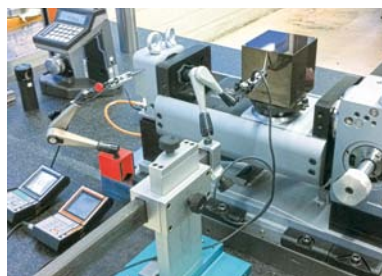


Rational equipping of spare parts packages

## Quality control



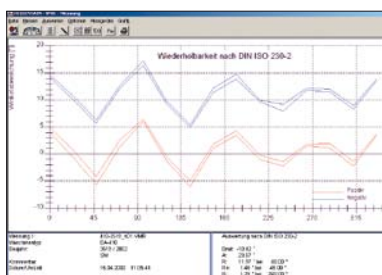
Measuring a housing on a 3D measuring unit



Measuring a Trotary table with Kubus



Measuring the accuracy of parts - fully automatically



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

Interested? Contact us or visit our website at [www.lehmann-rotary-tables.com](http://www.lehmann-rotary-tables.com)



ROTARY TABLES • PRECISION TECHNOLOGY • SOFTWARE

#### Headquarters

PETER LEHMANN AG  
CH-3552 Bärau  
Telephone +41 (0)34 409 66 66  
Fax +41 (0)34 409 66 00  
pls@plehmann.com  
www.lehmann-rotary-tables.com

#### Representatives / Agencies

##### Europe

- Benelux
- Germany
- Finland
- France
- Italy
- Norway
- Austria
- Portugal
- Russia
- Sweden
- Slovenia
- Spain
- Turkey
- Czech Republic (vacant)
- UK

##### America

- Brazil
- Canada
- USA

##### Asia

- China
- India
- Japan
- Malaysia (vacant)
- South Korea
- Taiwan

##### Africa

- South Africa



● Headquarters   ● Country representatives   ● vacant

More information (address, telephone number...) at [www.lehmann-rotary-tables.com](http://www.lehmann-rotary-tables.com)