

# ZOLLERN

Solid metals. Fine solutions.

Hydrostatics

Hydrostatic  
linear  
guide-way  
systems



#### **The ZOLLERN Group**

ZOLLERN is one of the pioneers in the metal industry. At several locations in Europe, North America and Asia, 2,000 employees develop, produce and service a wide range of high-quality metal products. ZOLLERN supplies sophisticated solutions for a wide range of applications with its business areas of drive technology, investment casting, sand casting and forging as well as steel profiles.

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# ZOLLERN hydrostatic guides make the difference



» The globally unique » ZOLLERN clearance compensator «, which is mechanically integrated directly into the pocket. «

**In addition to hydrostatic bearing components, the ZOLLERN product portfolio also offers complete systems.**

Hydrostatic systems are used worldwide in precision machine tools, test benches, and large machine tools and enable optimum machining results thanks to their excellent properties. In addition to hydrostatic rotary tables and spindles, ZOLLERN offers a wide range of hydrostatic linear guide systems.

#### **Advantages compared to roller bearing guides**

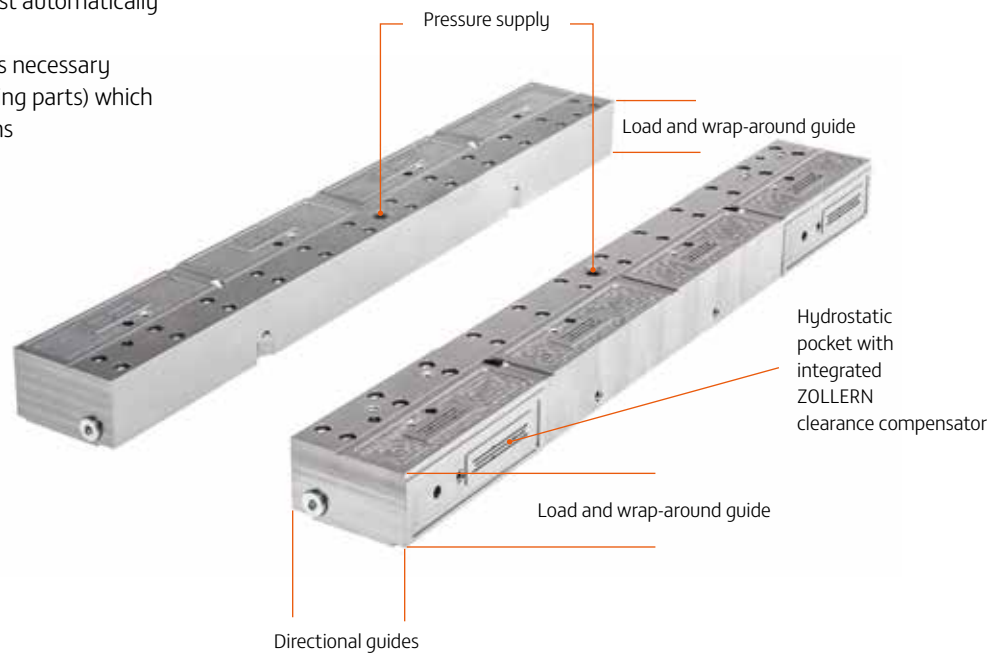
- Unlimited service life
- Excellent for fast oscillating movements
- No stick-slip effect
- Maximum positioning accuracy
- Excellent damping
- Thermally stable
- High running accuracy
- High load capacity and tilting stability

# Advantages of ZOLLERN guide systems

The hydrostatic linear guide from ZOLLERN is robust, reliable, and powerful. In oscillation axes as well as positioning axes with high loads, the integrated ZOLLERN Clearance Compensator enables high process reliability.

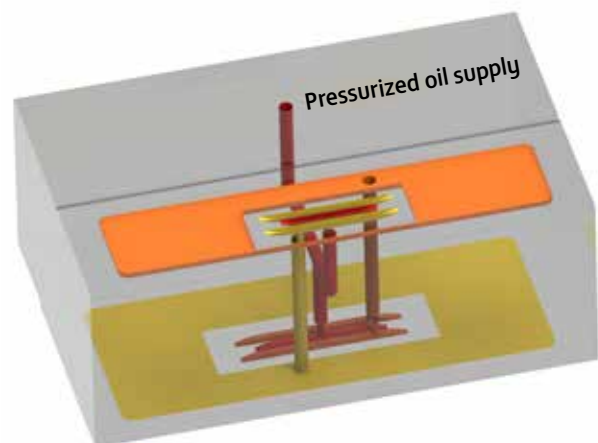
» The ZOLLERN clearance compensator eliminates any adjustment effort «

- Pocket pressures adjust automatically
- Minimal piping effort
- No external regulators necessary
- No membranes (moving parts) which can be set in vibrations
- No capillaries to clog
- Simple monitoring



## The operating principle of the ZOLLERN Clearance Compensator

Constant pressure is applied to the central groove in the plateau of each pocket. By the clearance the grooves near by as well as the opposite pocket are supplied with pressure. With load and the resulting shift, the appropriate pocket pressure is automatically set.






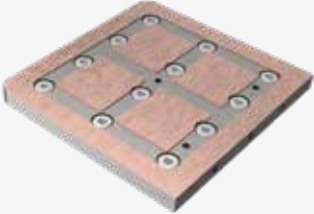
# Storage systems

In addition to standardised guide elements, you will also find customised solutions in the ZOLLERN product portfolio. These solutions are optimised to meet your individual requirements.

◐ = applies to a small extent

◑ = applies for the most part

● = applies in full

|   | Customer-specific | Standard components | Compact installation space | Low assembly effort |
|---|-------------------|---------------------|----------------------------|---------------------|
| <b>Guide element ZHGE</b><br>Page 6    | ◐                 | ●                   | ◑                          | ◐                   |
| <b>Guide bar ZHGB</b><br>Page 7       | ◑                 | ◑                   | ◑                          | ◑                   |
| <b>Guide slide ZHGS</b><br>Page 8    | ●                 | ◐                   | ●                          | ●                   |
| <b>Round guides ZHRG</b><br>Page 9   | ◑                 | ●                   | ●                          | ●                   |
| <b>Guide plates ZHGP</b><br>Page 10  | ●                 | ◐                   | ◑                          | ◐                   |

# Guide element ZHGE



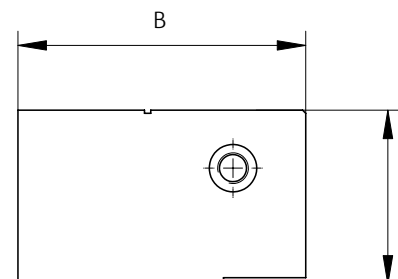
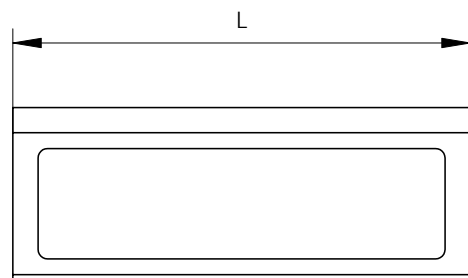
» The hydrostatic guide elements can be extended as required. «

- Modular structure
- Only one pressure connection per unit necessary
- Small installation space, as no external controllers or valves are necessary

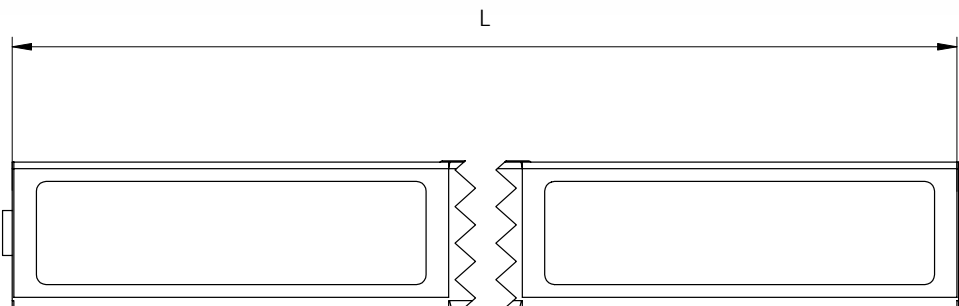
## // Technical data

| Designation | Guide element |      |      |
|-------------|---------------|------|------|
|             | L             | W    | H    |
|             | (mm)          | (mm) | (mm) |
| ZHGE 35-60  | 90            | 60   | 35   |
| ZHGE 35-60  | 90            | 60   | 35   |
| ZHGE 45-60  | 140           | 60   | 45   |
| ZHGE 45-60  | 140           | 60   | 45   |
| ZHGE 50-100 | 130           | 100  | 50   |
| ZHGE 50-100 | 130           | 100  | 50   |
| ZHGE 50-100 | 200           | 100  | 50   |
| ZHGE 50-100 | 200           | 100  | 50   |
| ZHGE 70-140 | 180           | 140  | 70   |
| ZHGE 70-140 | 180           | 140  | 70   |
| ZHGE 70-140 | 180           | 140  | 70   |
| ZHGE 70-140 | 180           | 140  | 70   |

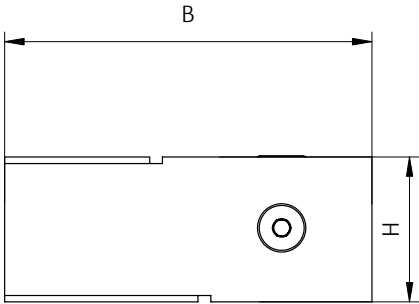
Other dimensions on request



# Guide bar ZHGB

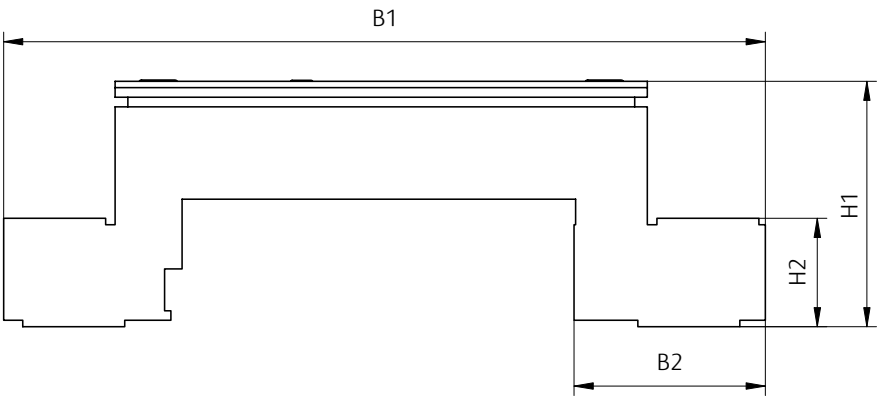


| // Technical data |           |      |      |
|-------------------|-----------|------|------|
| Designation       | Guide bar |      |      |
|                   | L         | W    | H    |
|                   | (mm)      | (mm) | (mm) |
| ZHGB 50-100       | 600       | 100  | 50   |
| ZHGB 50-100       | 600       | 100  | 50   |
| ZHGB 70-140       | 800       | 140  | 70   |
| ZHGB 70-140       | 800       | 140  | 70   |

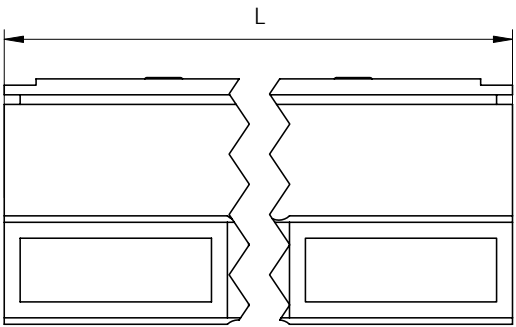


Other dimensions on request

# Guide slide ZHGS



| // Technical data |             |      |      |
|-------------------|-------------|------|------|
| Designation       | Guide slide |      |      |
|                   | L           | W1   | H1   |
|                   | (mm)        | (mm) | (mm) |
| ZHGS 35-60        | 300         | 60   | 35   |
| ZHGS 35-60        | 300         | 60   | 35   |
| ZHGS 35-60        | 300         | 60   | 35   |
| ZHGS 45-60        | 500         | 60   | 45   |
| ZHGS 45-60        | 500         | 60   | 45   |
| ZHGS 45-60        | 500         | 60   | 45   |



Other dimensions on request



# Round guide ZHRG

Depending on customer requirements and the engineering environment, Zollern offers the round guide in two different installation variants.

In addition, the bearing surface can be designed with a plain bearing coating, which enables excellent emergency running properties.

## Optional for both installation variants:

- Integrated oil return
- Sealing air gasket
- Seat for sealing element



### Press-fit variant

- No fitting tolerance
- Minimum installation space
- After joining, the hole must be spindled out

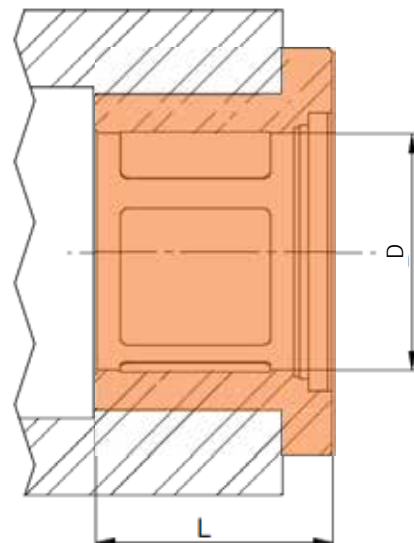


### Push-in variant

- Exchangeable
- Ready for installation

| // Technical data |            |      |
|-------------------|------------|------|
| Designation       | Dimensions |      |
|                   | D          | L    |
|                   | (mm)       | (mm) |
| ZHRG 35           | 35         | 40   |
| ZHRG 40           | 40         | 45   |
| ZHRG 45           | 45         | 50   |
| ZHRG 50           | 50         | 50   |
| ZHRG 55           | 55         | 50   |
| ZHRG 60           | 60         | 50   |
| ZHRG 65           | 65         | 50   |
| ZHRG 70           | 70         | 80   |
| ZHRG 80           | 80         | 80   |
| ZHRG 90           | 90         | 80   |
| ZHRG 100          | 100        | 80   |
| ZHRG 110          | 110        | 80   |
| ZHRG 120          | 120        | 80   |
| ZHRG 130          | 130        | 80   |
| ZHRG 140          | 140        | 80   |
| ZHRG 150          | 150        | 80   |
| ZHRG 190          | 190        | 80   |
| ZHRG 200          | 200        | 80   |
| ZHRG 250          | 250        | 80   |
| ZHRG 300          | 300        | 90   |
| ZHRG 350          | 350        | 100  |
| ZHRG 400          | 400        | 120  |

Other dimensions on request

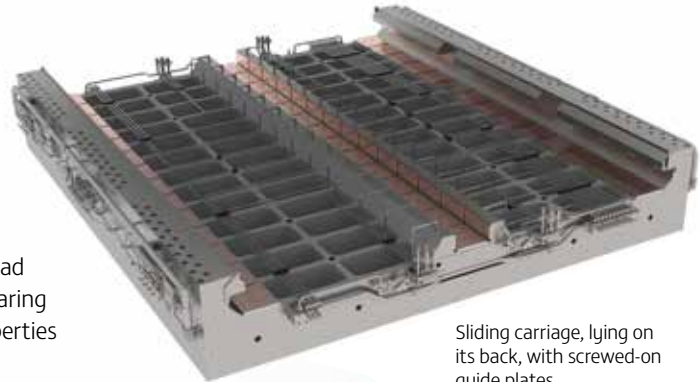


# Further guide components and control systems

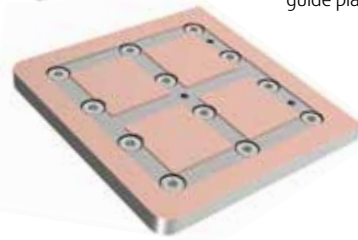
## Control systems

### Guide plates with plain bearing coating

For large guide dimensions, guide plates can be used in large numbers and thus enable a high load capacity. The individual segments with plain bearing coating have excellent emergency running properties and are also extremely easy to service and can be replaced if damaged.



Sliding carriage, lying on its back, with screwed-on guide plates.



### Control systems

As an alternative to the ZOLLERN Clearance Compensator, the guides presented in the preceding pages can be designed according to the following systems.



#### Capillary

- + No wrap-around necessary
- + High load capacity
- + High rigidity
- High adjustment effort
- Low control quality
- Susceptible to serving



#### Pump per pocket

- + No wrap-around necessary
- + Pressure intensifying
- + Pressure ratio possible
- + Simple volume flow monitoring
- Significant integration effort required
- Temperature-dependent bearing properties



#### Membran regulator

- + No wrap-around necessary
- + High load capacity
- + High rigidity
- Significant integration effort required
- Cannot be adjusted to production clearance

# Versions complete system

Encapsulated guide units with integrated Zollern guide system and other peripheral elements offer a ready-to-install solution for a wide range of applications.

## Standard guide unit



### Description

- X-axis
- Modular construction
- Different dimensions on request

## Cross slide



### Description

- X and Y axis
- Different dimensions on request

## Round guide



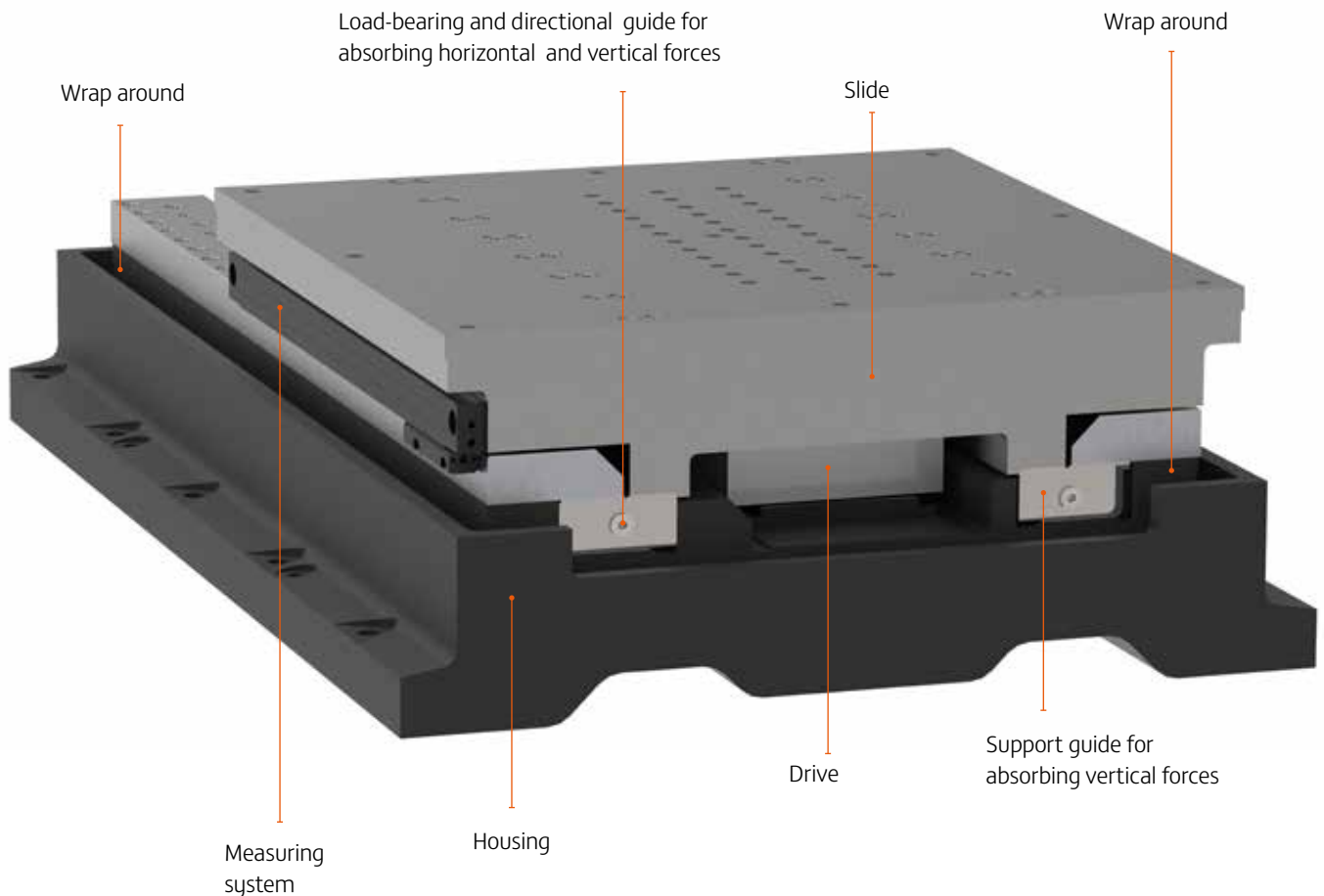
### Description

- X-C axis
- Different dimensions on request

# Hydrostatic guide unit standard design

» The optimum  
pocket pressure adjusts  
automatically. «

- Time saving during assembly
- High bearing rigidity
- Fast reaction time
- Minimal piping effort
- Simple monitoring



» The integrated clearance compensator realises the optimal pocket pressure without any adjustment effort during assembly. «

# ZOLLERN products for precision machines



ZOLLERN rotary  
tables MRT for  
milling machines

- Table top:  
320 - 4,500 mm
- Load capacity:  
300 kg – 260 to



ZOLLERN rotary  
tables TRT for lathes

- Table top:  
600 - 6,500 mm
- Load capacity:  
2,000 – 250,000 kg



ZOLLERN pallet  
changer systems  
for machine tools



ZOLLERN  
hydrostatic centre  
drive

- Integrated torque motor
- Centre passage from  
Ø 100 to 300 mm



ZOLLERN aerostatic  
rotary tables ZART

- For measuring machines and  
ultra-precision machine tools
- Table diameter:  
Ø 200 – 2,000 mm
- Operating pressure:  
5-6 bar



ZOLLERN torque  
motors for machine  
tools

- Size:  
TM0140 – TM2070
- Outer diameter:  
Ø 160 – 2,200 mm
- Torque:  
20 – 43,500 Nm



ZOLLERN  
hydrostatic rotary tables ZHRT

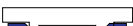


- For grinding machines and heavy duty applications
- Table diameter: Ø 200 – 4,000 mm



ZOLLERN hydrostatic spindle

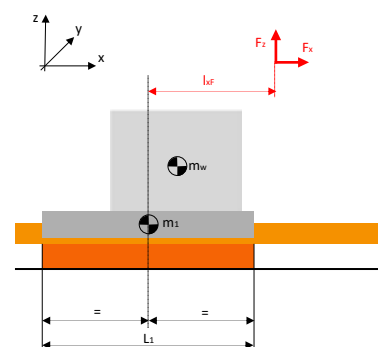
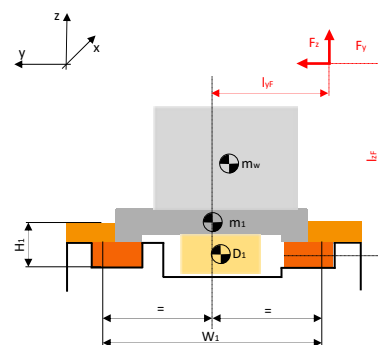
- Concentricity and axial runout accuracy < 0.1 µm
- Thermally stable

|         |            |
|---------|------------|
| Company | Contact    |
| Project | Department |
| Email   | Telephone  |


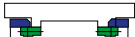




| // Installation position  |   |   |       | // Application  |
|---|---|---|-------|---|
| standing  | hanging   | vertical  | other | Grinding <input type="checkbox"/><br>Turning <input type="checkbox"/><br>Milling <input type="checkbox"/><br>Measuring <input type="checkbox"/><br>other <input type="checkbox"/> |
|  |  |  |       |   |

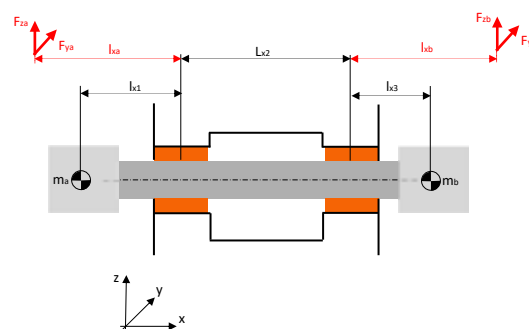
| // Drive                   |  |                  |                   |                   | // Running accuracy |  |  |  |  |
|----------------------------|--|------------------|-------------------|-------------------|---------------------|--|--|--|--|
| Linear motor or ball screw |  | $F_{YD1}$<br>(N) | $l_{XD1}$<br>(mm) | $l_{YD1}$<br>(mm) | $l_{ZD1}$<br>(mm)   |  |  |  |  |
|                            |  |                  |                   |                   |                     |  |  |  |  |

| // Dimensions |               |               |        | // Table mass |                   |                   |                   |
|---------------|---------------|---------------|--------|---------------|-------------------|-------------------|-------------------|
| $L_1$<br>(mm) | $W_1$<br>(mm) | $H_1$<br>(mm) | Stroke | $m_1$<br>(kg) | $I_{XM1}$<br>(mm) | $I_{YM1}$<br>(mm) | $I_{ZM1}$<br>(mm) |
|               |               |               |        |               |                   |                   |                   |

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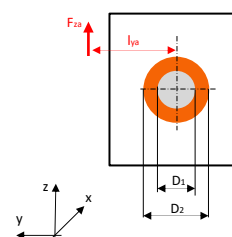
|         |            |
|---------|------------|
| Company | Contact    |
| Project | Department |
| Email   | Telephone  |

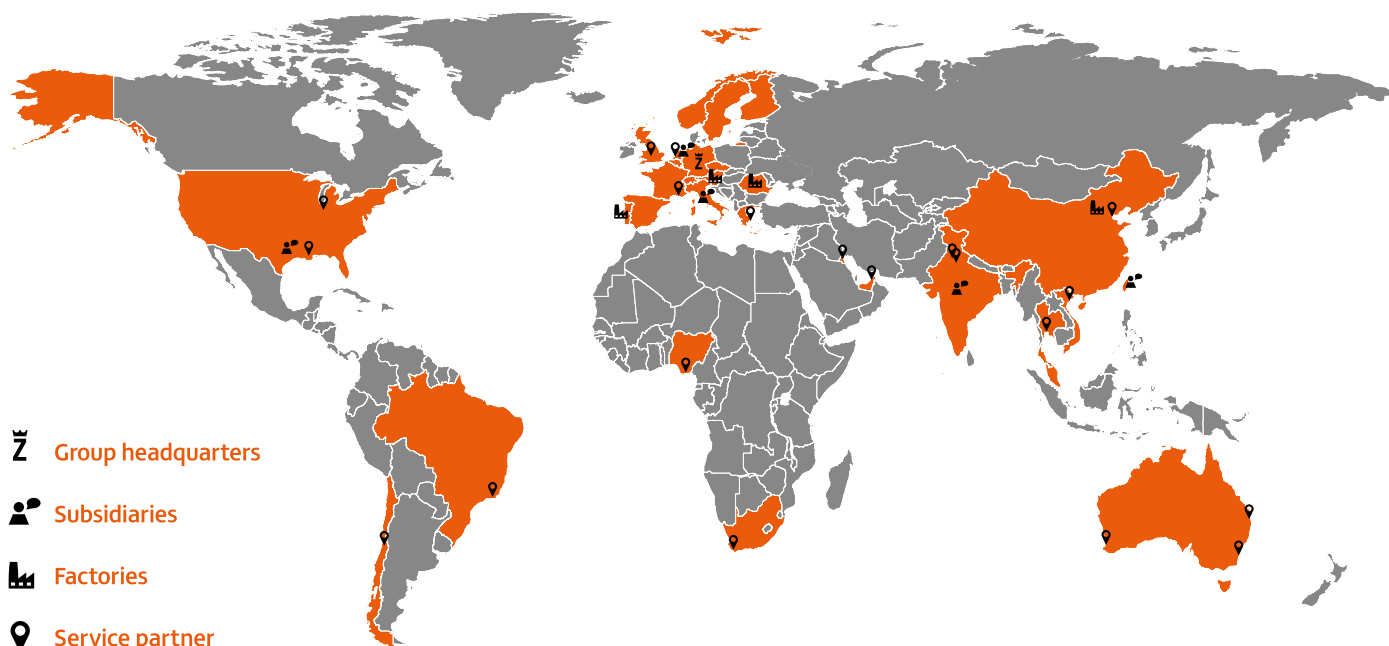
| // Installation position  |          | // Version  |
|---|----------|---|
| standing  | vertical | Press-fit variant  |
|   |          | Push-in variant    |
| // Application  |          |   |
| Grinding  |          |                    |
| Turning   |          |                    |



| // Dimensions |            |             |                |
|---------------|------------|-------------|----------------|
| D1<br>(mm)    | D2<br>(mm) | lx2<br>(mm) | Stroke<br>(mm) |
|               |            |             |                |

### // Run-out accuracy

[illegible]



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