HEINZ
Qualität in Kurven

OPERATING & MAINTENANCE INSTRUCTIONS

Cylindrical index table HR

- Type of indexer:

- Fabrication Number:

Table of Contents

2 General

2.1 Scope

These operating instructions apply to > Cylindrical index table – Type HR

Note

These operating instructions have to be read and used by every person who is responsible for the installation, commissioning, operation, maintenance or repair of this indexer in the user's company.

Please keep these operating instructions in a safe place for future reference.
In particular, make yourself familiar with the safety regulations first.

In the following text these „Cylindrical index table – Type HR“ will be named „Indexers“.

Each indexer is built according to the state of the art and recognized safety regulations.
The indexers are intended exclusively for intermittent movements of a load that cannot endanger people, property or the environment when moving.

Note

These indexers may only be used within the framework of the specifications agreed in the operating instructions or in the sales documents. Any other or additional use, e.g. higher speeds and / or larger loads or other installation positions are considered improper.

THE MANUFACTURER WILL NOT BE LIABLE FOR ANY DAMAGE.

THE RISK IS ALONE BEARED BY THE OPERATOR.

Intended use also includes reading the operating and maintenance instructions and observing the inspection and maintenance conditions.

Note

Maintenance work may only be carried out by qualified personnel who are familiar with the functional principle of the indexer.

2.2 Safety instructions

Note

Before commissioning the indexer, the operating and maintenance instructions have to be read carefully.

The indexer complies with the recognized safety rules.
When used as part of a machine or system, e.g. bolted levers, cogwheels with chains and the like can pose a risk to life and limb of the user or third parties. The indexer may only be put into operation if the entire machine complies with the Machinery Directive 2006/42 / EC.

Warning

Output shaft or flange with high torque!
Never reach into the work area of the output element and its superstructures and attachments!

Warning

Risk of crushing from parts attached to the output!
Never reach into the work area of the output element and its superstructures and attachments! In such a case, suitable protective measures have to be taken by the user on site.

Warning

E.g. Protective grids, covers or light grids have to be installed in such a way that the operating personnel is protected from injuries caused by these indexers.

Note

Relevant accident prevention regulations as well as all generally recognized safety and occupational health regulations must be observed. Inadmissible changes and the use of spare parts and additional devices that are not recommended by the manufacturer can lead to personal injury and property damage.

Warning

Before starting any maintenance or repair work, it must be ensured that the indexer cannot start up. All work on the indexer requires a certain amount of experience and should therefore be carried out by HEINZ fitters or trained specialists.

Warning

It is not possible to turn such indexers on the output side by hand into one of the end positions. The intermittent movement to the positions may only take place via the movement of the input shaft.

The indexers are intended exclusively for the generation of intermittent movements of a load which do not endanger persons, property or the environment during this movement. These indexers may only be used within the scope of the specifications specified in these operating instructions and in the special sales documents. Any other or additional use is considered improper and excludes any warranty from the manufacturer.

If the indexer is completed with an electric motor, this must always be protected from overload.

Before starting up the indexer, the plug of the oil inlet must be replaced with the vent screw.

2.3 Shipping

Every indexer was checked before dispatch and properly packed.
Nevertheless, we ask you to unpack the indexer immediately upon arrival at the installation site and to examine it for transport damage. Any complaints must be reported to the transport company immediately.

2.4 Transport regulations

Only transport the indexer with means of transport that are approved for the corresponding weight.
Eye bolts can be screwed into the existing mounting holes. Suspension ropes or chains may only be attached to these eye bolts.
The respective weight of the individual indexer types can be found in the weight table [see point 2.5].

2.5 Indexer weights

Cylindrical index table		
Indexer type	Housing	Weight [kg]
HR 800	Cast iron	240
HR 1100	Cast iron	360
HR 1250	Cast iron	605
HR 1600	Cast iron	810

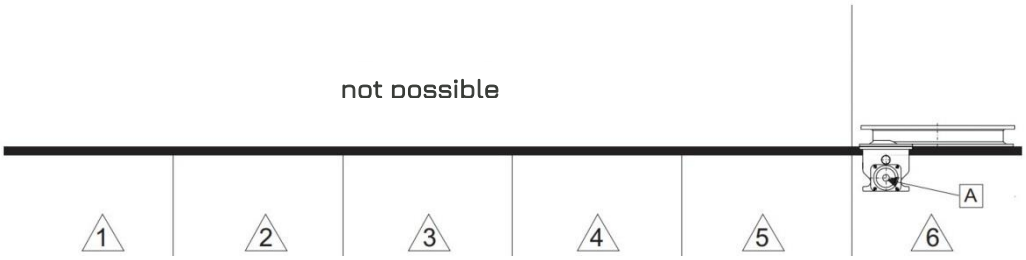
3 Notes on using the indexer

3.1 Mounting position

Due to the universal design, the indexers can be integrated into a machine or system in almost any position.

Note

The specified installation position is decisive for the lubrication of the indexers components and must therefore not be changed in the system.



3.2 Indexer assembly

Due to the functional principle of the indexers, variable torques occur on the output flange or shaft as well as on the input shaft. Therefore:

- the indexer need to be mounted on a stable and machined base.
- the fastening screws need to be secured and if possible an additional fixation via dowel pins need to be done.
- the connection between the load and the output of the indexer need to be direct, backlash free and torsional rigid. This also applies to the drive of the indexer.

3.3 Indexer operation

The following points must be observed when operating the indexer:

Note

Elasticity and backlash in the driven masses can cause vibrations and must be avoided.

4 Installation

4.1 Indexer functions

The indexers form a compact, robust unit and, through the use of precisely calculated cam profiles, enable a constant input speed to be converted into an optimal, precisely predetermined, smooth and shock free, intermittent output movement. The cam followers mounted in the turret are precisely guided in the cam by the hardened and ground cam track. This cam track is designed with a different gradient and divided into a dwell angle and index angle range.
During the rotation of the cam, the predetermined smooth and shock free movement of the output is generated via the cam track and the cam roller. Since the cam is designed symmetrically as standard, rotation in both directions is possible.
The dwell angle range has a slope of zero. As a result, the cam rollers achieve an exact, self-locking positioning of the output without additional locking.
When using a brake motor, the positioning of the output is independent of the braking accuracy of the motor, since the exact position is given by the position of the cam rollers in the dwell angle range. The entire dwell angle range is available for braking and start up. [see point 4.4]

4.2 Oil level

Note

The oil level has to be checked before commissioning. It is sufficient if the oil is visible in the sight glass. The average filling quantity can be found in the table of oil quantities [see point 4.3].

Warning

If the oil level is insufficient, the function and service life of the indexers are not sufficiently ensured.

4.3 Oil quantities of Indexers

Cylindrical index table	
Indexer type	Oil quantity [l]
HR 800	2,0
HR 1100	3,0
HR 1250	3,5
HR 1600	4,0

Certain housing variants are designed without an oil sight glass. The following must be observed for these variants:

Note

The indexers are filled with oil before delivery and the fill quantity is noted in the test report. Upon delivery, the entry in the test report must be checked and a visual inspection of the indexer must be carried out to check for any leaks. If there are no visible leaks, the oil level in the indexer is sufficient.

Note

If there is no entry for the oil fill quantity in the test report, fill the indexer with the required quantity. The corresponding fill quantities for the indexers can be found in the oil quantity table [see point 4.3].

4.4 Interruption operation

Note

If the dwell angle range of the cam is not sufficient for the production-related standstill, this time can be extended with the help of a brake motor.

The braking process is triggered by a limit switch, which is activated by a cam connected to the cylindrical cam. The cam rollers should be positioned in the middle of the corresponding cam's detent.

4.5 Important Note

Note

In the case of drives with two speeds, normal operation is always due to the higher speed. [HIGH SPEED]
The lower speed [SLOW SPEED] may only be used to set up the system or after an "emergency shutdown" to move to the dwell angle range of the next station.

Warning

During the movement range in automatic operation, it is not allowed to switch to slow speed. In the case of controls that only allow the high speed to be switched via slow speed, this may only take place within the dwell angle range, i.e. only within the marking plate or while the output shaft or the output flange is at a standstill.

Warning

If this information is not observed, the manufacturer will exclude any warranty in the event of damage.

5 Maintenance regulations

5.1 General remark

If you have any questions or if you want to order spare parts, please state the indexer type and the fabrication number of the indexer concerned.

5.2 Drive

The maintenance instructions for the geared brake motor or other drives can be found in the instructions supplied by the manufacturer of the drive.

5.3 Brake of motor

Note

Because of the wear and tear of the motor brake, the shutdown in the dwell angle range should be checked from time to time. If necessary, the brake must be readjusted or replaced [see Point 4.4].

5.4 Indexer lubrication

5.4.1 Oil lubrication

The following oils have been tested with our indexers and can be used for refilling.
Our indexers are lubricated for life, meaning an oil change is only necessary if the condition of the oil has significantly changed compared to its original state. The oil level should be checked at regular intervals. It is sufficient if oil is visible in the sight glass when the indexer is at a standstill – this ensures the lubrication of cam followers and the cam.

At speeds below 150 rpm	At speeds higher 150 rpm
Shell Omala S4 WE 460	Shell Omala S4 WE 150
Mobile Glygoyle HE 460 [ISO V6 460]	Mobile Glygoyle 22 [ISO V6 150]
Klübersynth GHE 6 – 460	Klübersynth GHE 6 – 100

Attention
Never mix different types of oil!

Attention
Only top up the lubricant mentioned above!

For oil fillings with an NSF H1-registered food-grade oil that complies with FDA 21 CFR § 178.3570, the indexer can be filled with one of the oils listed below.
Our indexers are lubricated for life, meaning an oil change is only necessary if the condition of the oil has significantly changed compared to its original state. The oil level should be checked at regular intervals. It is sufficient if oil is visible in the sight glass when the indexer is at a standstill – this ensures the lubrication of cam followers and the cam.

At speeds below 150 rpm	At speeds higher 150 rpm
Klübersynth UH1 6 – 460	Klübersynth UH1 6 – 150

Attention
Never mix different types of oil!

Attention
Only top up the lubricant mentioned above!

5.4.2 Grease lubrication

It is lubricated for life and, accordingly, a grease change should only be carried out if the condition of the grease changes significantly compared to the original condition.

usual grease lubrication	NSF H1 registered, conforms to FDA 21 CFR § 178.3570
TRIBOL GR00	Klüberfood NH1 94-6000
Microlube GB 00	Klübersynth UH1 14-1600

Attention
Never mix different types of grease!

Attention
Only top up the lubricant mentioned above!

6 Inspection notes

6.1 Inspection cycle

Note

To ensure mechanical functional reliability, the following checks are recommended at regular intervals, but at least after 8,000 operating hours:

- Oil condition check and, if necessary, oil change if there are significant changes in comparison to the original condition of the oil (e.g. discoloration).
- Oil level check and, if necessary, top up with lubricating oil.
- Check of housing and bearing cover for overheating and discoloration.
- Check indexer for unusual noises.
- Check indexer for functional reliability and freedom from backlash.
- Check of functional reliability of all sealing elements.

Note

The following measures are to be initiated for the relevant points if the current status no longer corresponds to the initial status:

- Topping up the lubricant. [see Point 4.2, 5.4 and 6.2]
- Change of bearings on input and output shaft. [see Point 7.2.2]
- Change of cam followers. [see Point 7.2.1.1]
- Change of turret ring. [see Point 7.2.1.2]
- Change of cylindrical cam. [see Point 7.2.1.3]
- Change of complete mechanism. [see Point 7.2.1.4]

After an estimated service life of approx. 30,000 operating hours, it is recommended that all rolling bearings and cam followers be replaced.

The sealing elements must be replaced in the same cycle in order to avoid damage to the indexer due to possible loss of lubricant.

6.2 Lubricant replacement

Note

To ensure proper mechanical function, it is essential that all active elements are adequately lubricated. Regular checks of the indexer for leaks are a prerequisite for ensuring proper functionality.

Note

Arrangement of the oil filling / exhaust valve and oil drain for the respective size.

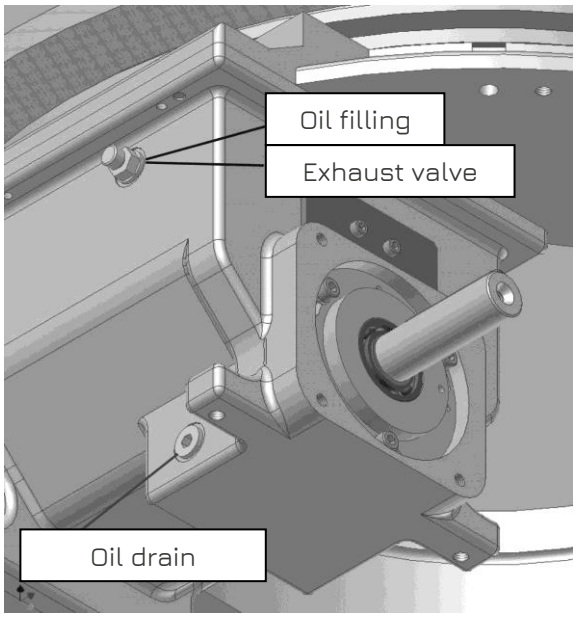


Figure 1: Oil fittings HR 800

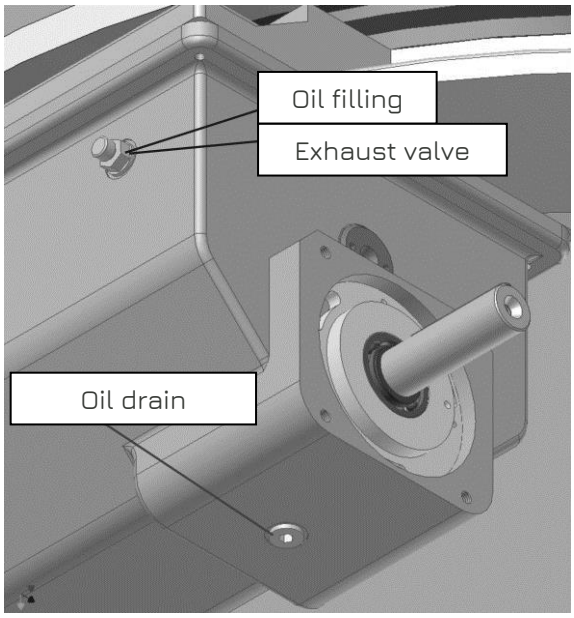


Figure 2: Oil fittings HR 1100

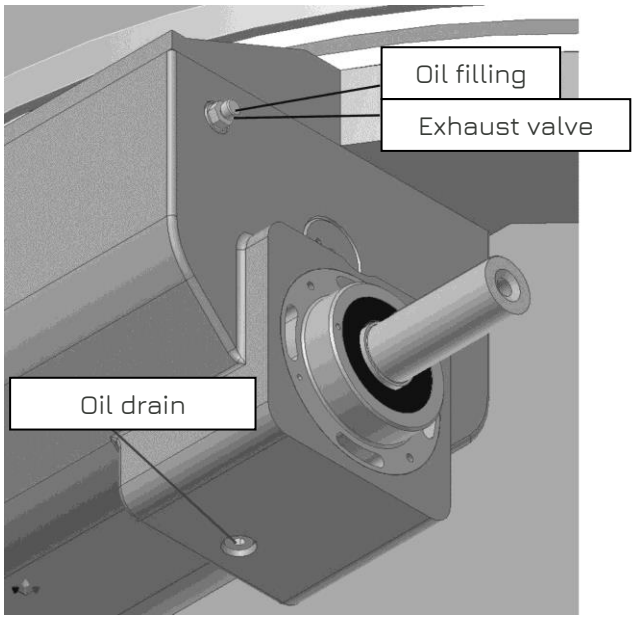


Figure 3: Oil fittings HR 1250 / 1600

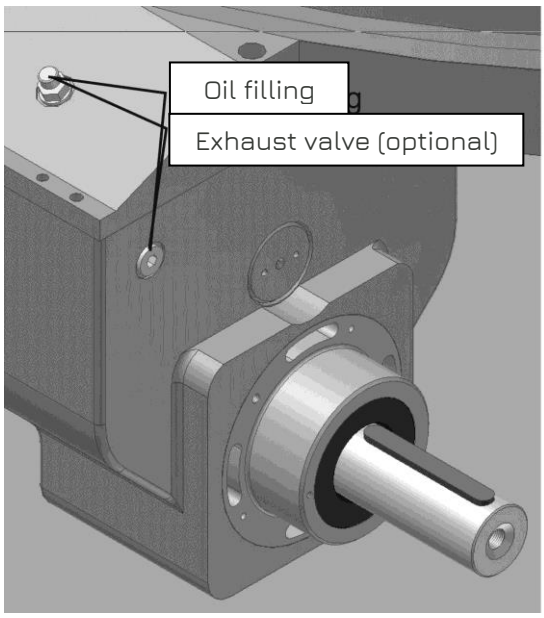


Figure 4: Oil fittings HR 1250 / 1600 (optional)

6.2.1 Lubricant change

If an oil change is necessary due to the condition of the lubricant, the oil should be drained from the indexer housing by opening the oil drain.

Make sure that no foreign objects or residues of the old oil remain in the housing after draining the oil!

If necessary, flush the indexer using suitable means.

After closing the indexer housing by tightening the oil drain, the new lubricant can be filled in.

Observe the corresponding fill quantity for the iondexer from the oil quantity table! [see point 4.3]

6.2.2 Refilling lubricant

If it is necessary to top up the lubricant due to leaks and lubricant loss, the required amount of lubricant should be added via the open vent screw on the indexer.

The lubricant level must be checked. It is sufficient if the lubricant is visible in the sight glass. The average fill quantity can be found in the oil quantity table. [see point 4.3]

Certain housing variants are designed without an oil level.

If the necessary refill quantity cannot be clearly determined. [see point 6.2.1]

If the oil level is insufficient, the function and service life of the indexer cannot be adequately guaranteed.

7 Spare parts and assembly

7.1 General remark

Note

Before starting the following dismantling work, read the entire text carefully.

All components must be cleaned and checked for perfect condition before installation. The spare parts list is helpful for dismantling and assembling the individual parts.
When using solvents, make sure that they do not come into contact with the O-rings or the shaft sealing rings.
Please have the type and serial number ready for any queries and spare parts orders for faster processing.

Note

All repair work requires a certain amount of experience and should therefore be carried out by fitters from HEINZ AUTOMATIONS-SYSTEME GmbH.

7.2 Assembly instructions

7.2.1 Globoidal-mechanism

The mechanism is a sub-assembly and consists of a cylindrical cam, cam followers and turret ring. Due to possible wear on cam followers and cylindrical cam, it is possible needed to replace the

- cam follower
- turret ring
- cylindrical cam
- complete mechanism

7.2.1.1 Replacing the cam followers

- Drain the oil.
- Rotate the pinion shaft to the dwell angle range.
- Unscrew the roraty plate.
- Remove V-seal on the inside and on the outside.
- Unscrew the bearing ring.
- Remove wire ball bearing (see also adaption supplement!).
- Take out turret ring with cam followers of housing (pay attention to the sealing profile!).
- Turn cylinder head screws from turret ring, remove cam followers.
- Check shaft bore of cam followers regarding damage and possibly extension.
- In case of faulty bore hole (see point 7.2.1.2).
- In case of faultless bore holes press new cam followers into turret ring.
- Secure cam followers with cylinder head screws.
- Check cylindrical cam and replace – if necessary - by new one (see point 7.2.1.3).
- Put back the turret ring into housing (pay attention to the sealing profile!).
- Put in wire ball bearing.
- Check the sealing profile, replace if necessary.
- Assemble bearing ring (adjust initial bearing tension with adaption supplement).
- Assemble V-seal inside and outside.
- Bolt on rotary plate.
- Turn pinion shaft and check mechanism for even running.
- Refill oil.

7.2.1.2 Replacing the turret ring

- Drain the oil.
- Rotate the pinion shaft to the dwell angle range.
- Unscrew the roraty plate.
- Remove V-seal on the inside and on the outside.
- Unscrew the bearing ring.
- Remove wire ball bearing (see also adaption supplement!).
- Take out turret ring with cam followers of housing (pay attention to the sealing profile!).
- Check cylindrical cam and replace – if necessary - by new one (see point 7.2.1.3).
- Put turret ring and possibly new new cam followers into housing. For assembly of cam followers (see point 7.2.1.1).
- Put in wire ball bearing.
- Check the sealing profile, replace if necessary.
- Assemble bearing ring (adjust initial bearing tension with adaption supplement).
- Assemble V-seal inside and outside.
- Bolt on rotary plate.
- Turn pinion shaft and check mechanism for even running.
- Refill oil.

7.2.1.3 Replacing the cylindrical cam

- Drain oil.
- Rotate the pinion shaft to the dwell angle range.
- Unscrew housing tray.
- Measure and record position of cylindrical cam (distance between the cam flank and the pin holes).
- Release lock washer and remove lock nuts.
- Drive out stub axle from cylindrical cam (Attention: It is necessary to fix the position of cylindrical cam).
- Take cylindrical cam out of housing tray.
- Dismantle spur wheel, flange and switch cam.
- Replace angular ball bearings and insert into new cylindrical cam.

Note

Damaged bearings must be replaced with new ones!
[see Point 7.2.2]

- Fit spur wheel, flange and switch cam to cylindrical cam.
- Place cylindrical cam into housing tray.
- Drive stub axle into housing tray and cylindrical cam (Attention! Position fixing of the cylindrical cam necessary).
- Check the position of the cylindrical cam. It must be identical to the original position. If necessary, use a new spacer sleeve and adjust accordingly.
- Tighten lock nuts and safeguard lock washer.
- Bolt on housing tray.
- It is important to have an even contact reflection of the cam followers and the cylindrical cam during the dwell angle.

Note

A check with spotting paste must be carried out!

- Turn pinion shaft and check mechanism for even running.
- Refill oil.

7.2.1.4 Replace mechanism completely

Disassembly and assembly of turret ring and cylindrical cam: [see Point 7.2.1.1 to 7.2.1.3]

7.2.2 Roller bearing

Note

With regard to the installation of new roller bearings, please consider that the bearing has to be adjusted free of play. In case the bearing play should be to big or too small, this can be corrected by adjustment of the shim and distance bushing, or also with the torque of the lock nut. Afterwards check the perfect running of the mechanism by turning the pinion shaft, re-adjust if necessary.

7.2.2.1 Roller bearing output side

- Rotate the pinion shaft to the dwell angle range.
- Unscrew the roraty plate.
- Remove V-seal on the inside and on the outside.
- Unscrew the bearing ring.
- Remove wire ball bearing (see also adaption supplement!).
- Take out turret ring with cam followers of housing (pay attention to the sealing profile!).
- Check the fit of the bearing seats and polish/clean them if necessary.
- Put back the turret ring into housing (pay attention to the sealing profile!).
- Put in wire ball bearing.
- Check the sealing profile, replace if necessary.
- Assemble bearing ring (adjust initial bearing tension with adaption supplement).
- Assemble V-seal inside and outside.
- Bolt on rotary plate.
- Turn pinion shaft and check mechanism for even running.

7.2.2.2 Roller bearing input side

- Drain oil.
- Rotate the pinion shaft to the dwell angle range.
- Unscrew housing tray.
- Measure and record position of cylindrical cam (distance between the cam flank and the pin holes).
- Release lock washer and remove lock nuts.
- Drive out stub axle from cylindrical cam (Attention: It is necessary to fix the position of cylindrical cam).
- Take cylindrical cam out of housing tray.
- Dismantle spur wheel, flange and switch cam
- Remove the bearings off the input shaft using a suitable tool.
- Check the fit of the bearing seats and polish/clean them if necessary.
- Insert new bearings into the cylindrical cam.
- Fit spur wheel, flange and switch cam to cylindrical cam.
- Place cylindrical cam into housing tray.
- Drive stub axle into housing tray and cylindrical cam (Attention! Position fixing of the cylindrical cam necessary).
- Check the position of the cylindrical cam. It must be identical to the original position. If necessary, use a new spacer sleeve and adjust accordingly.
- Tighten lock nuts and safeguard lock washer.
- Unscrew the eccentric flange.
- Remove the outer rings from the eccentric covers using a suitable tool.
- Pull the inner rings of the bearings off the input shaft using a suitable tool.
- Check fit quality of bearing seats and polish / clean if necessary.
- Fit new bearings (heat inner rings slightly, up to max. 80°C).
- Mount pinion shaft together with eccentric cover.
- Turn pinion shaft and check mechanism for even running.
- Refill oil.

7.3 Spare and wear parts

MECHANISM:

- Cylindrical cam
- Turret ring
- Cam follower

BEARINGS:

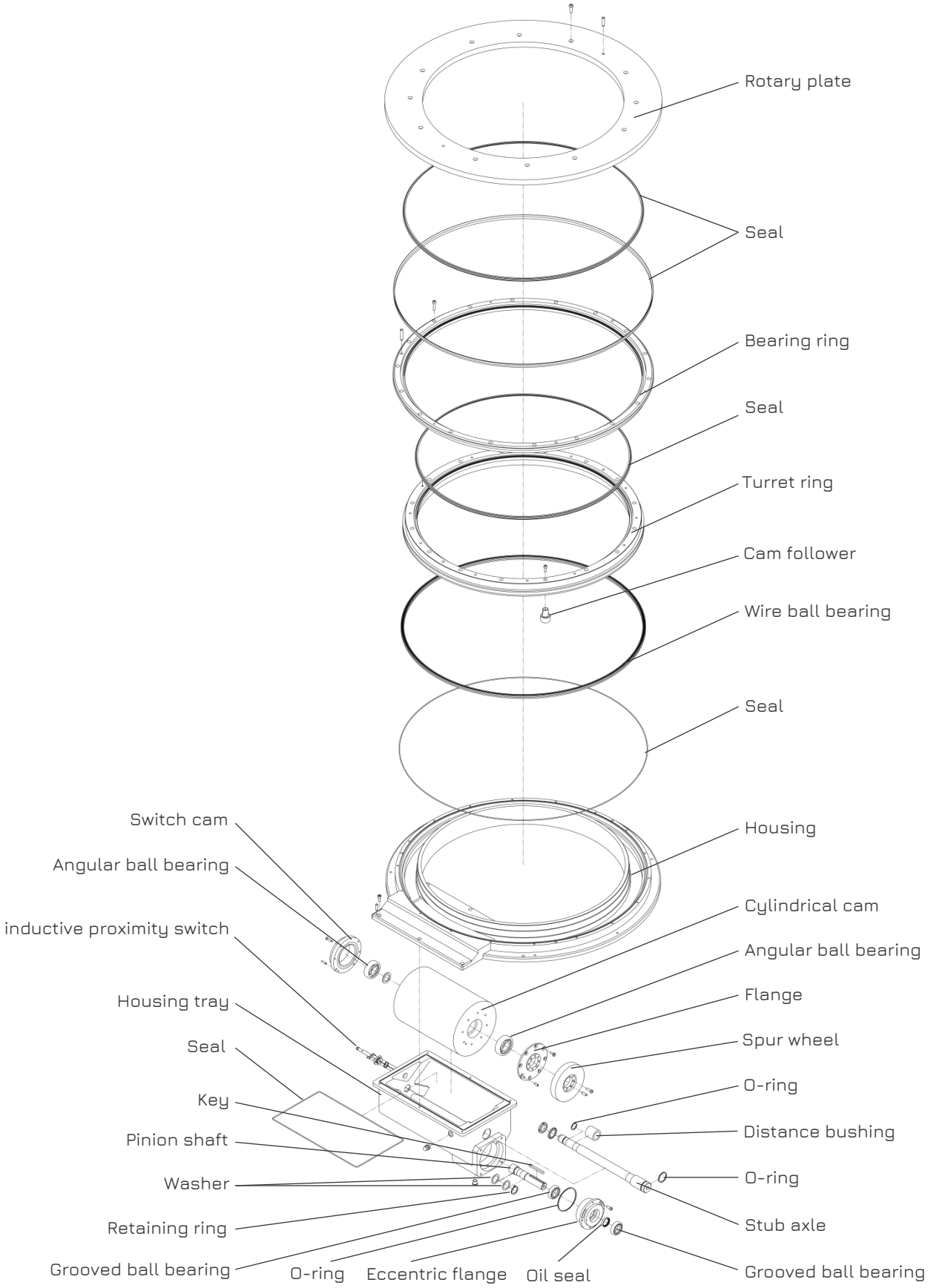
• Wire ball bearing	Output
• Tapered roller bearing / deep groove ball bearing	Input

SEALINGS:

• Radial shaft seal	Input
• O-ring	Input
• Various sealing elements	Output

PINION SHAFT

7.3.1 Spare parts drawing • Cylindrical index table HR



8 Contact

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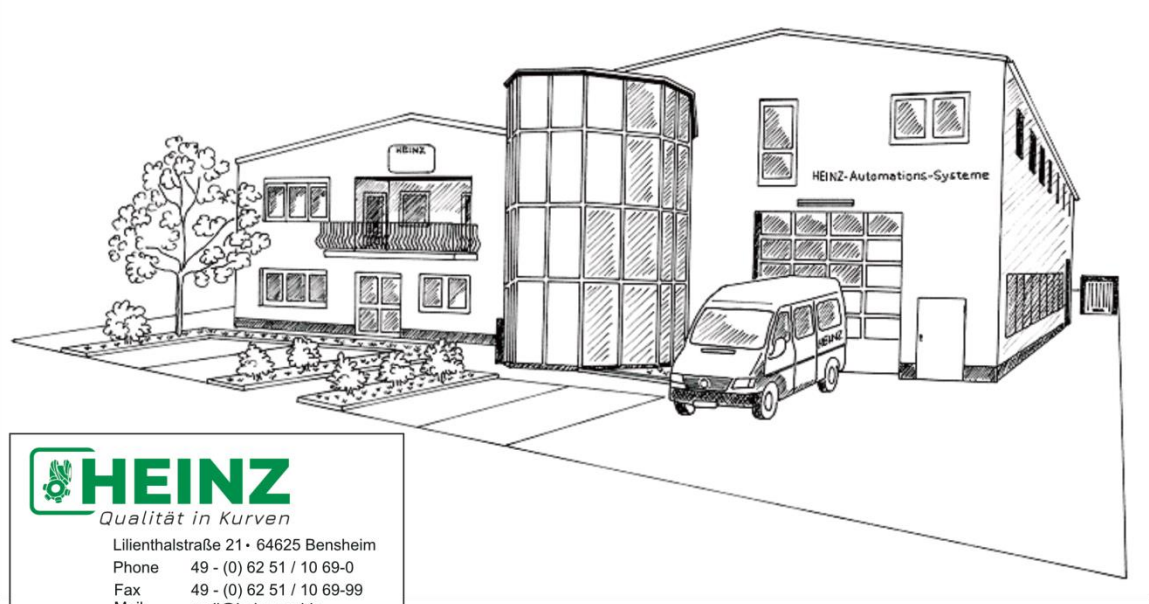

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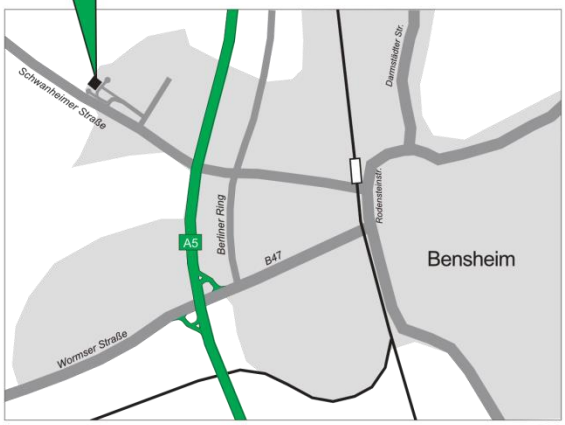

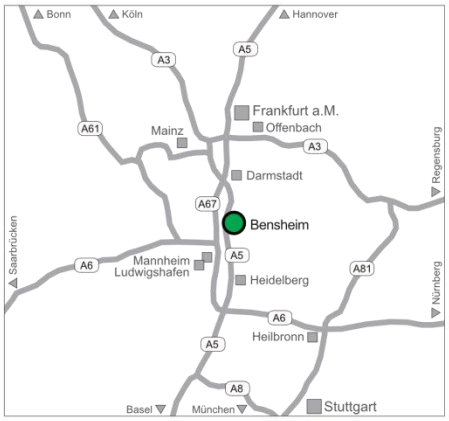

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