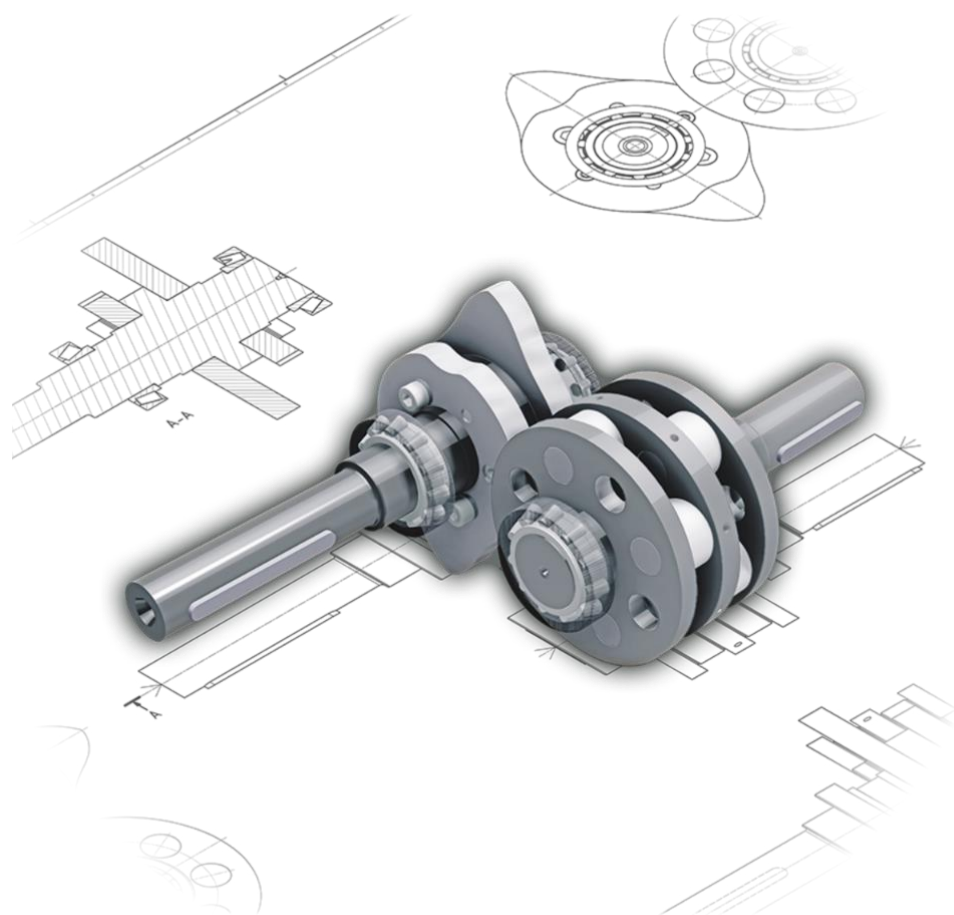


OPERATING & MAINTENANCE INSTRUCTIONS

Parallel cam gear HSP



• Type of indexer: | |

• Fabrication Number: | |

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2 General

2.1 Scope

These operating instructions apply to > [Parallel cam gear – Type HSP](#)



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 „[Parallel cam gear – Type HSP](#)“ will be named „[Indexer](#)“.

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

Parallel cam gear – Basic series			Parallel cam gear – modified series		
Indexer type	Housing	Weight [kg]	Indexer type	Housing	Weight [kg]
HSP 40	Cast iron	4,5	HSP 65	Cast iron	14,5
HSP 50	Cast iron	7,5	HSP 80 X	Cast iron	27
HSP 63	Cast iron	12,5	HSP 80 XK	Cast iron	27,5
HSP 80	Cast iron	25	HSP 105	Cast iron	48
HSP 100	Cast iron	43	HSP 130	Cast iron	85
HSP 125	Cast iron	77	HSP 130 SRS	Cast iron	68
HSP 160	Cast iron	150	HSP 165	Cast iron	151
HSP 200	Cast iron	280	HSP 335	Cast iron	980
HSP 250	Cast iron	480			
HSP 315	Cast iron	680			
HSP 400	Cast iron	1.490			
HSP 450	Cast iron	2.160			

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.



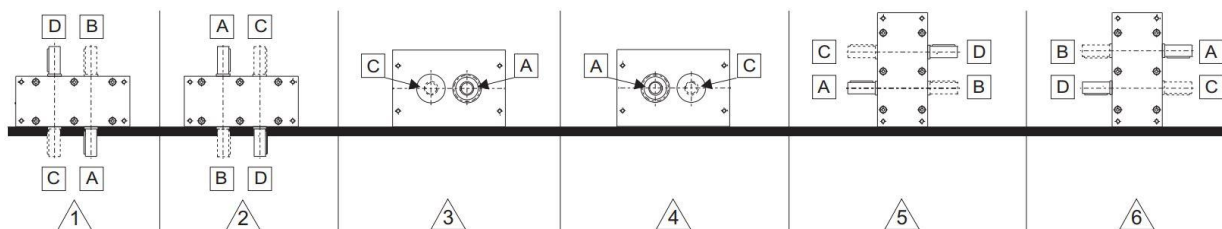
Note

When ordering, the customer must specify the installation position, the position of the mounting holes and, if applicable, the position of the oil holes.



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 needs 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 needs to be done.
- the connection between the load and the output of the indexer needs 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.



Note

Any overload protection installed should be mounted on the output flange.

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

Parallel cam gear - basic series		Parallel cam gear - modified series	
Indexer type	Oil quantity [l]	Indexer type	Oil quantity [l]
HSP 40	0,20	HSP 65	0,40
HSP 50	0,30	HSP 80X	1,00
HSP 63	0,50	HSP 80XK	1,00
HSP 80	1,00	HSP 105	2,00
HSP 100	2,00	HSP 130	3,50
HSP 125	4,00	HSP 130 SRS	7,80
HSP 160	8,00	HSP 165	5,40
HSP 200	19,00	HSP 335	33,00
HSP 250	29,00		
HSP 315	36,00		
HSP400	56,00		
HSP450	90,00		

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 that is actuated by a switching cam (flag) connected to the drive shaft. During installation and operation, it needs to be ensured that after braking, the keyway of the drive shaft is always parallel to the housing side 3 and points to the axis of rotation of the output shaft.

If the cam is double indexed, this position can also be rotated by 180 degrees.

The cam followers should be in the middle of the dwell angle range of the corresponding cam.

In the case of indexers with an additional pointer, make sure that the pointer is in the middle of the marking plate after each braking.

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
Shell Omala S4 WE 460
Mobile Glygoyle HE 460 [ISO V6 460]
Klübersynth GHE 6 – 460

At speeds higher 150 rpm
Shell Omala S4 WE 150
Mobile Glygoyle 22 [ISO V6 150]
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
Klübersynth UH1 6 – 460

At speeds higher 150 rpm
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
TRIBOL GR00
MicroLube GB 00

NSF H1 registered, conforms to FDA 21 CFR § 178.3570
Klüberfood NH1 94-6000
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. [\[see Point 4.2 and 5.4\]](#)
- 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 sealing elements. [\[see Point 7.2.1.1\]](#)

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.

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 Disk cam mechanism

The mechanism is a unit consisting of two disk cam, cam followers and turret (output shaft). Due to a possible wear of the cam followers or the parallel shaft cam, it may be necessary to replace the following parts:

- Cam followers
- Turret (output shaft)
- Parallel shaft cam (2 x cams)
- Complete mechanism

7.2.1.1 Replacing the cam followers

- Drain the oil.
- Mark the position of the eccentric covers and, if present, loosen the two setscrews (for versions with deep groove ball bearings).
- Unscrew all screws from the upper half of the housing.
- Remove the upper half of the housing (if necessary, loosen it by tapping lightly with a plastic hammer).
- For versions with deep groove ball bearings, the output shaft can be removed upwards.
- For versions with tapered roller bearings, first remove the eccentric cover from the side (if necessary, turn it and press it off via the threaded hole), then remove the output shaft upwards.
- Remove the input shaft from the housing in the same way.
- Defective cam followers, bearings and shaft seals can now be replaced.



Note

When inserting the bolts into the output shaft, ensure that they are inserted at exactly the correct angle and without tilting. Any obstructing bearings must be removed beforehand.

- The screws used to fasten the cam followers should be secured with a threaded pin in accordance with DIN 914 (glued in place).
- If the threaded pins are loosened, new threaded pins must be used. These must be secured with a suitable adhesive (e.g. Loctite).
- When assembling, pay attention to the position of the eccentric covers and the position of the keyway on the output shaft.
- All sealing surfaces must be cleaned.
- The housing and individual parts must be thoroughly cleaned with benzine.
- Check the preload on new tapered roller bearings; this can be adjusted by adjusting the eccentric cover axially [see point 7.2.2].
- Check whether the indexer can be turned by hand, if not, select a different engagement position, ensuring that the eccentric covers are in their previously marked positions.
- Apply sealant to the housing halves and screw them together without damaging any O-rings that may be present.
- For with tapered roller bearings without O-rings, all eccentric covers must be pressed off one after the other, sealed and screwed tight in the marked position. Threaded holes that have been drilled through must also be sealed.
- If there is too much play or too much preload between the cam pair and the support rollers, the eccentric covers must be turned accordingly, ensuring that the shafts remain parallel (turn both eccentric covers by the same amount) and, if necessary, a new mark is made.
- For indexers with deep groove ball bearings, the eccentric covers must be secured with threaded pins.
- Fill with gear oil until it is visible in the sight glass in the corresponding installation position.

7.2.1.2 Replacing the turret

- Drain the oil.
- Mark the position of the eccentric covers and, if present, loosen the two threaded pins (for versions with deep groove ball bearings).
- Remove all screws from the upper half of the housing.
- Remove the upper half of the housing (if necessary, loosen it by tapping lightly with a plastic hammer).
- For versions with deep groove ball bearings, the output shaft can be removed upwards.
- For versions with tapered roller bearings, first remove the eccentric covers from the side (if necessary, twist them and press them off via the threaded hole), then remove the output shaft upwards.
- Remove the input shaft from the housing in the same way.
- The defective roller star (output shaft) can now be replaced.
- Check whether the cam followers, bearings and shaft seals need to be replaced.
- If this is necessary, proceed as described in [point 7.2.1.1].
- When reassembling, pay attention to the position of the eccentric covers and the position of the keyway on the output shaft.
- All sealing surfaces must be cleaned.
- The housing and individual parts must be thoroughly cleaned with benzene.
- First, install the output shaft.
For new tapered roller bearings, check the preload (it can be adjusted by adjusting the eccentric cover axially).
- The input shaft can now be installed; here too, the preload must be checked for tapered roller bearings and adjusted if necessary.
- Check whether the indexer can be turned by hand, if not, select a different engagement position, ensuring that the eccentric covers are in their previously marked position.
- Apply sealant to the housing halves and screw them together without damaging any O-rings that may be present.
- For indexers with tapered roller bearings without O-rings, all eccentric covers must be pressed off one after the other, sealed and screwed tight in the marked position, whereby threaded holes must also be sealed.
- If there is too much play or too much preload between the cam pair and the support rollers, the eccentric covers must be turned accordingly, ensuring that the shafts remain parallel (turn both eccentric covers by the same amount) and, if necessary, a new mark is made.
- For indexers with deep groove ball bearings, the eccentric covers must be secured with threaded pins.
- Fill with gear oil until it is visible in the sight glass in the corresponding installation position.

7.2.1.3 Replacing the globoidal cam



Note

Defective cam disc pairs should only be replaced at the manufacturer's factory.

7.2.1.4 Replace mechanism completely

Disassembly and assembly of turret (output shaft), cam followers and cam disc. [see Point 7.2.1.1 to 7.2.1.3]

7.2.2 Roller bearing



Note

When fitting new tapered roller bearings or deep groove ball bearings, make sure that the bearings are adjusted to be free of backlash. Too much or too little bearing backlash can be corrected by adjusting the bearing covers or eccentric covers. Afterwards, check the proper running of all bearings by rotating the input shaft and adjust again if necessary.

7.2.2.1 Roller bearings - output shaft

- Drain the oil.
- Mark the position of the eccentric covers and, if present, loosen the two threaded pins (for versions with deep groove ball bearings).
- Remove all screws from the upper half of the housing.
- Remove the upper half of the housing (if necessary, loosen it by tapping lightly with a plastic hammer).
- For versions with deep groove ball bearings, the output shaft can be removed upwards.
- For versions with tapered roller bearings, first remove the eccentric covers from the side (if necessary, twist them and press them off via the threaded hole), then remove the output shaft upwards.
- Remove the input shaft from the housing in the same way.
- Remove the bearings using a suitable puller.
- Check the fit of the bearing seats and polish/clean if necessary.
- Install new bearings (heat the inner races slightly, up to a maximum of 80°C).
- During assembly, pay attention to the position of the eccentric covers and the position of the keyway on the output shaft.
- Install the output shaft first.
- Then install the input shaft.
- Apply sealant to the housing halves and screw them together without damaging any O-rings.
- For indexers with tapered roller bearings without O-rings, all eccentric covers must be pressed off one after the other, sealed, and screwed tight in the marked position. Drilled threaded holes must also be sealed.
- For indexers with deep groove ball bearings, the eccentric covers must be secured with the setscrews.
- Refill oil.

7.2.2.2 Roller bearings - input shaft

- Drain the oil.
- Mark the position of the eccentric covers and, if present, loosen the two threaded pins (for versions with deep groove ball bearings).
- Remove all screws from the upper half of the housing.
- Remove the upper half of the housing (if necessary, loosen it by tapping lightly with a plastic hammer).
- For versions with deep groove ball bearings, the input shaft can be removed upwards.
- For versions with tapered roller bearings, first remove the eccentric covers from the side (if necessary, twist them and press them off via the threaded hole), then remove the output shaft upwards.
- Remove the input shaft from the housing in the same way.
- Remove the bearings using a suitable puller.
- Check the fit of the bearing seats and polish/clean if necessary.
- Install new bearings (heat the inner races slightly, up to a maximum of 80°C).
- During assembly, pay attention to the position of the eccentric covers and the position of the keyway on the output shaft.
- Install the output shaft first.
- Then install the input shaft.
- Apply sealant to the housing halves and screw them together without damaging any O-rings.
- For indexers with tapered roller bearings without O-rings, all eccentric covers must be pressed off one after the other, sealed, and screwed tight in the marked position. Drilled threaded holes must also be sealed.
- For indexers with deep groove ball bearings, the eccentric covers must be secured with the setscrews.
- Refill oil.

7.3 Spare and wear parts

MECHANISM:

- Parallel shaft cam (2 x cams)
- Cam followers
- Turret (output shaft)

BEARINGS:

- | | |
|--------------------------|--------|
| • Tapered roller bearing | output |
| • Tapered roller bearing | input |

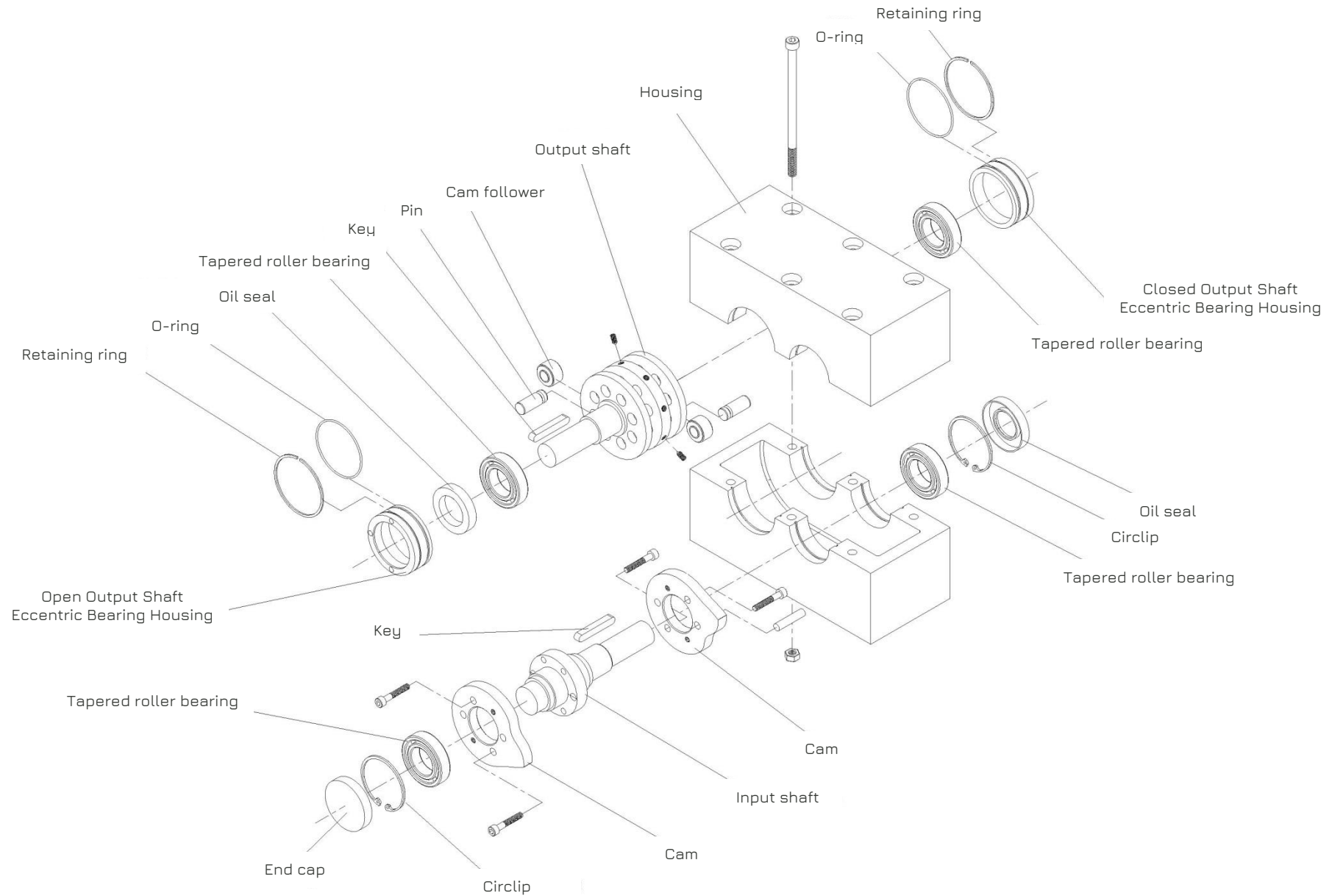
SEALINGS:

- | | |
|------------|--------|
| • Oil seal | input |
| • Oil seal | output |
| • End cap | input |
| • O-ring | input |

INPUT SHAFT

OUTPUT SHAFT (Turret)

7.3.1 Spare part drawing • Parallel shaft cam gear HSP

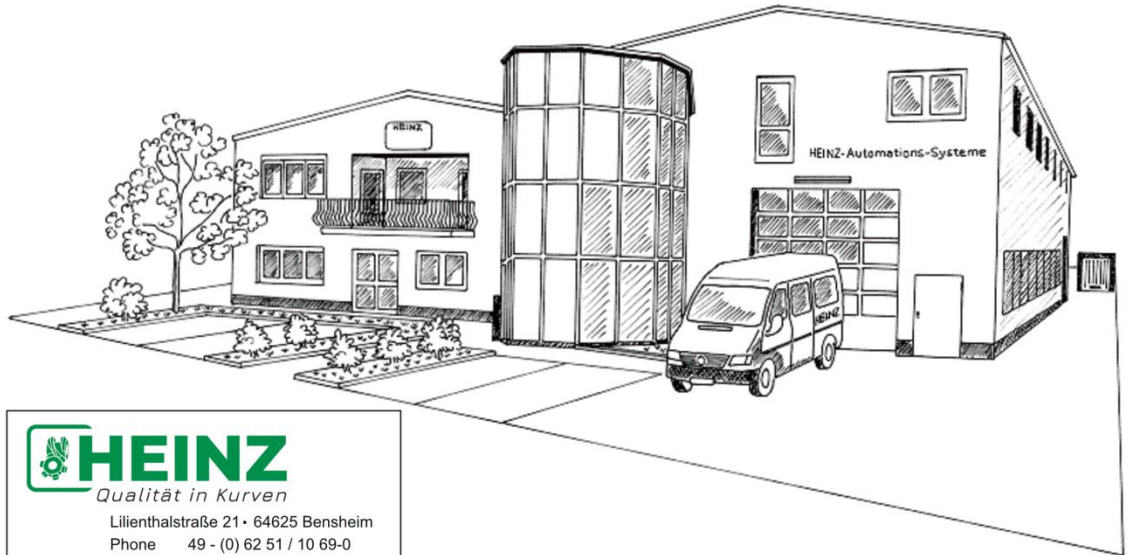




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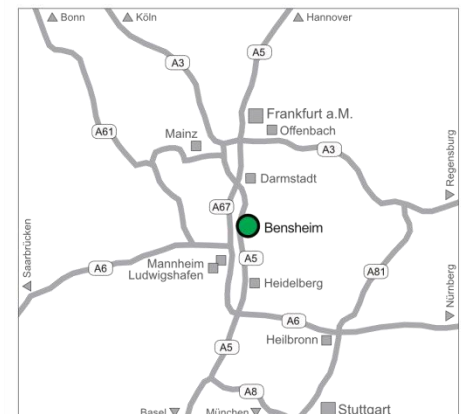
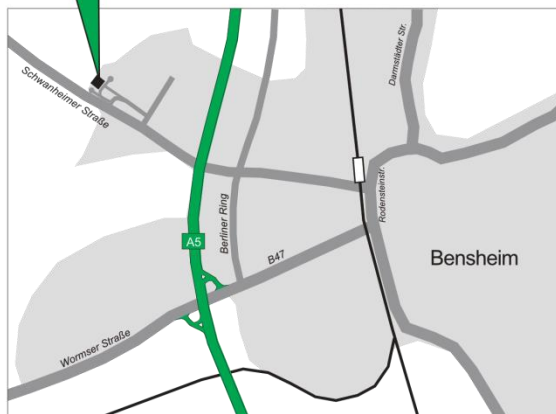
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