

OPERATING & MAINTENANCE INSTRUCTIONS

Cylindrical index table HTT • HTS



• Type of indexer: []

• Fabrication Number: []

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2 General

2.1 Scope

These operating instructions apply > [Cylindrical index table – Type HTT und HTS](#)



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 HTT und HTS](#)“ 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 Safty 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 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]
HTT 45	Cast iron	14
HTT 50	Cast iron	18
HTT 63	Cast iron	24
HTT 80	Cast iron	37
HTT 100	Cast iron	85
HTT 115	Cast iron	76
HTT185	Cast iron	185
HTT 300	Cast iron	575
HTT 315	Cast iron	600
HTS 1000	Cast iron	480

3 Notes on using the indexer

3.1 Mounting position

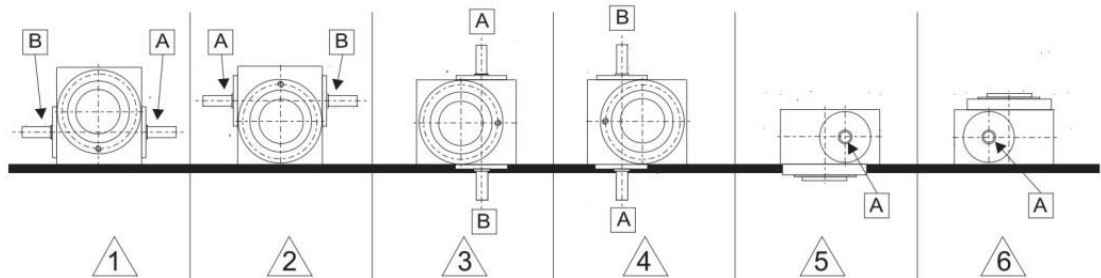
Due to the universal design, the indexers can be integrated into a machine or system in almost any position.



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



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 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:



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



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

Cylindrical index table	
Indexer type	oil quantity [l]
HTT 45	0,15
HTT 50	0,17
HTT 63	0,80
HTT 80	0,60
HTT 100	3,50
HTT 115	1,50
HTT 185	6,10
HTT 300	7,50
HTT 315	12,00
HTS 1000	8,50

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 6 and points to the axis of rotation of the output flange.

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	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:

- Change of lubricant. [\[see Point 4.2 and 5.4\]](#)
- 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 turret. [\[see Point 7.2.1.2\]](#)
- Change of globoidal cam. [\[see Point 7.2.1.3\]](#)

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 Globoidal-mechanism

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

- cam follower
- turret
- cylindrical cam
- complete mechanism

7.2.1.1 Replacing the cam followers

- Drain the oil.
- Rotate the input shaft to the dwell angle range.
- Unscrew the bearing cover of the output flange.
- Lift output flange out of the indexer housing.
- Turn set screws out of the turret [\[are glued in\]](#) and remove the cam followers.
- Check cam roller shaft bores in roller spider for damage and possible enlargement.
- If damaged holes are present: [\[see Point 7.2.1.2\]](#).
- If the shaft bores are in good condition, press new cam follower into the turret.
- in the case of stud type cam follower without notch, drill a centring hole in each stud type cam follower shaft using a core hole drill; the centring depth is based on the centring point of the DIN914 grub screw.
- Secure cam followers with set screws [\[glue thread\]](#).
- Check cylindrical cam and replace with new one if necessary [\[see Point 7.2.1.3\]](#).
- Put the output shaft with turret back into the housing [\[pay attention to the position of the keyway of the output shaft\]](#).
- Apply a suitable permanently elastic sealant to the cleaned sealing surface and fit the bearing cover.
- Rotate the drive shaft and check the installation kit for smooth running.
- Fill up oil.

7.2.1.2 Replacing the turret

- Drain the oil.
- Remove all parts or devices mounted on the output flange by the customer.
- Rotate the input shaft to the dwell angle range.
- Unscrew the bearing cover of the output flange.
- Lift output flange out of the indexer housing.
- Turn the grub screws out of the turret (they are glued in) and remove the cam followers.
- Check the cam followers shaft bores in the turret for damage and possible widening.
- If the cam followers bores are damaged, remove the crossed roller bearing.
- Screw the new turret back on with the cam follower fitted and re-pin it.
- Heat the taper roller bearing slightly [\[max. 80°C\]](#) and slide it over the output shaft / flange.
- All other assembly work: [\[see point 7.2.1.1\]](#).

7.2.1.3 Replacing the cylindrical cam

- Disassemble the engine / external unit.
- Drain the oil.
- Turn the drive shaft into the locking angle range.
- To be able to replace the cylindrical cam, it is necessary to remove the turret beforehand [\[see point 7.2.1.2\]](#).
- Loosen the bearing cover screws and pull the cover out of the housing.
- Loosen the screws and remove the housing cover.
- Pull the inner rings of the tapered roller bearings off the drive shaft, unlock the locking plates and loosen the locknuts.
- Pull the drive shaft out of the cylindrical cam and remove the cam from the housing.
- Check the seat of the feather key and its groove for damage.
- Insert the new cylindrical cam into the housing and push in the drive shaft. Ensure that the cylindrical cam is installed in the correct position. If installed incorrectly, the indexer cannot be turned or major damage may occur. Lightly tighten the locknuts. Use a new locking plate.
- Before reassembling the bearing, check the roller bearings and their seats.



Note

Damaged bearings must be replaced with new ones!
[\[see Point 7.2.2.2\]](#)

- Reassemble the remaining parts in reverse order (shaft seals and O-rings must be replaced).
- Fit the roller spider [\[see point 7.2.1.2\]](#).
- Turn the drive shaft by hand and check the installation kit for smooth running, ease of movement and function. Fine adjustment of the cylindrical cam is carried out using the locknuts. Ensure that the cam followers bear over the entire width.



Note

A check with spotting paste must be carried out!

- Tighten and secure the groove nuts.
- Tighten the eccentric cover.
- Rotate drive shaft by hand and check for smooth running, repeat adjustment if necessary.
- Cover all openings.
- Pin the eccentric cover.
If necessary, drill new pinholes with the same drilling depth on the same pitch circle.
[\[Remove swarf\]](#)
- Unscrew eccentric cover, seal in, align over pin holes, tighten slightly, drive in pins and screw tight.
- Fit new shaft sealing rings, seal in housing cover and screw tight, fill with oil.

7.2.1.4 Replace mechanism completely

Disassembly and assembly of turret and cylindrical cam: [\[see Point 7.2.1.1 to 7.2.1.3\]](#)

7.2.2 Roller bearing



Note

When fitting new rolling 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 bearing output side

- Drain oil.
- Remove all parts or devices mounted on the output flange by the customer.
- Rotate the input shaft to the dwell angle range.
- Unscrew the bearing cover of the output shaft.
- Lift output flange out of indexer housing.
- Pull the inner rings of the bearings off the output shaft using a suitable tool.
- Dismantle outer rings from housing and bearing cover using suitable tool.
- Check fit quality of bearing seats and polish / clean if necessary.
- Mount new bearings (heat inner rings slightly, up to max. 80°C).
- Lift the output shaft into the indexer housing.
- Refill oil.



Note

When inserting the output shaft, make sure to thread the cam followers into the cam track without tilting them.
Cam followers and cam can be damaged by tilting.

- Mount the bearing cover of the output flange.

7.2.2.2 Roller bearing input side

- Drain oil.
- Remove all parts or devices mounted on the output flange by the customer.
- Rotate the input shaft to the dwell angle range.
- Unscrew both eccentric covers.
- 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 input shaft together with eccentric cover.
- Replace all parts or devices on the output flange
- Refill oil.

7.3 Spare and wear parts

MECHANISM:

- Cylindrical cam
- Turret
- Cam follower

BEARINGS:

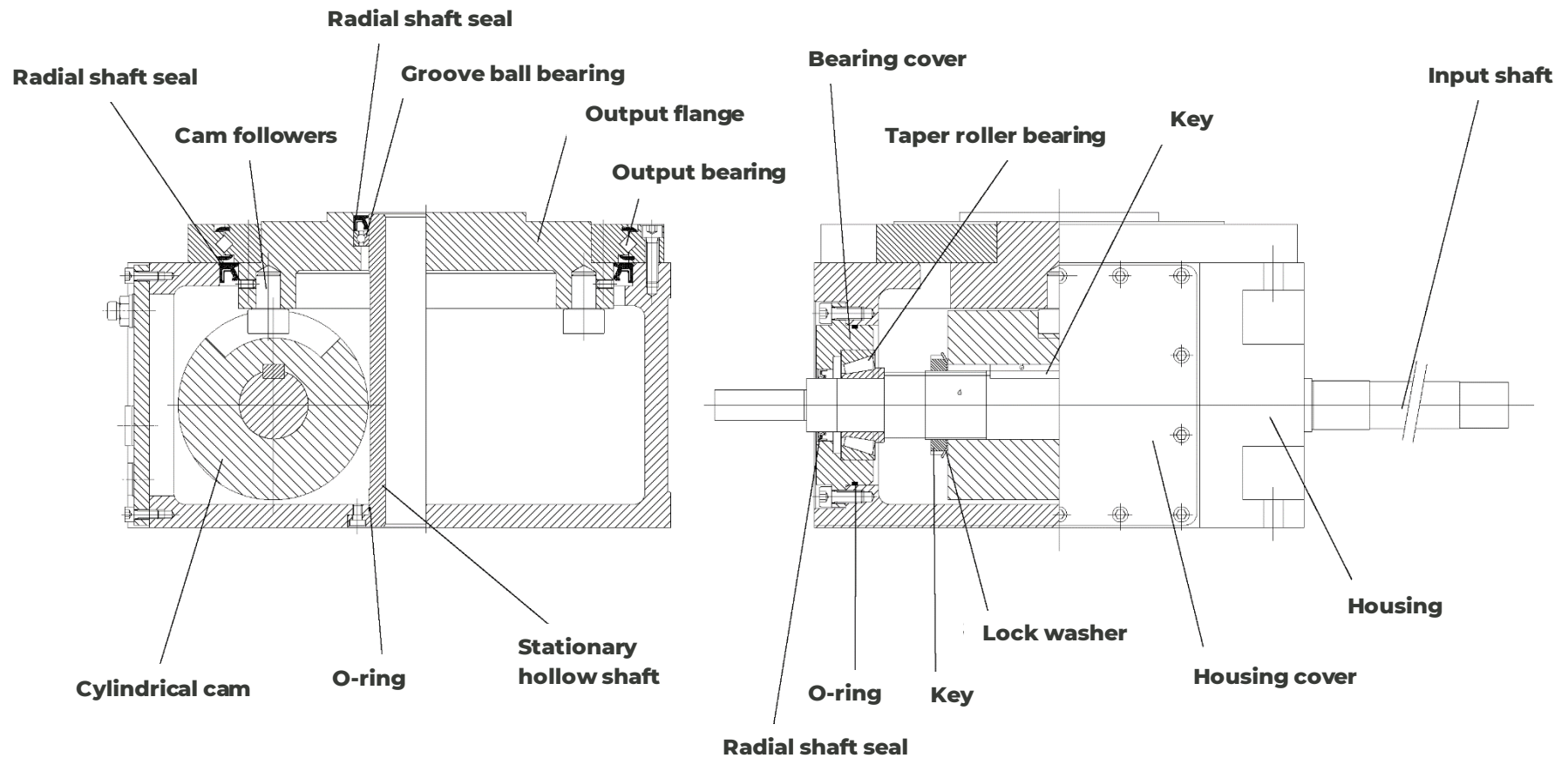
- | | |
|---|--------|
| • Tapered roller bearing | Output |
| • Tapered roller bearing / deep groove ball bearing | Output |
| • Tapered roller bearing / deep groove ball bearing | Input |

SEALINGS:

- | | |
|---------------------|----------|
| • Radial shaft seal | Output 1 |
| • Radial shaft seal | Output 2 |
| • Radial shaft seal | Input |
| • O-ring | Output |
| • O-ring | Input |

INPUT SHAFT

7.3.1 Spare part drawing • Cylindrical index table HTT und HTS

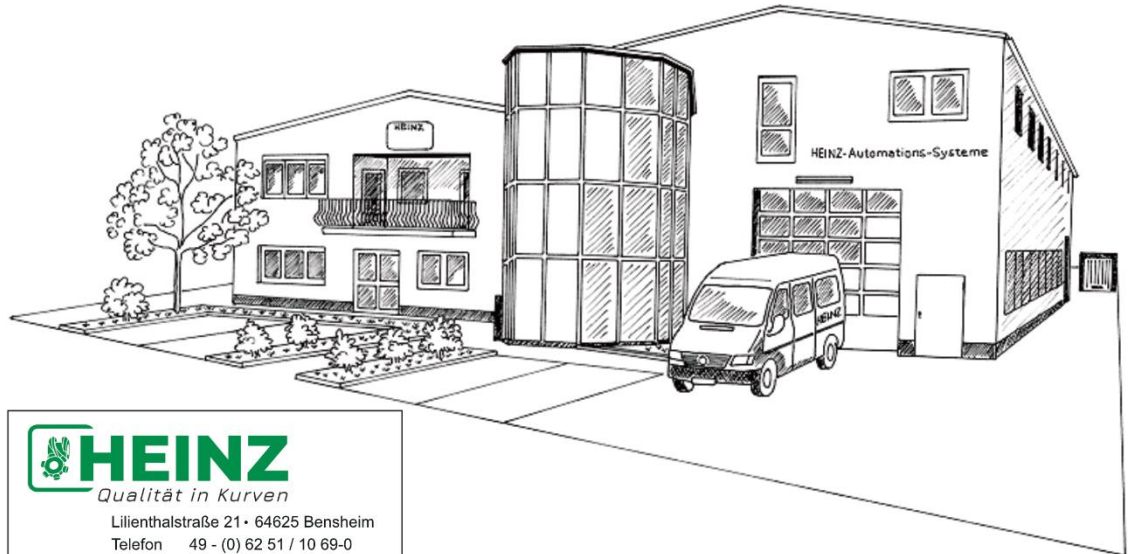




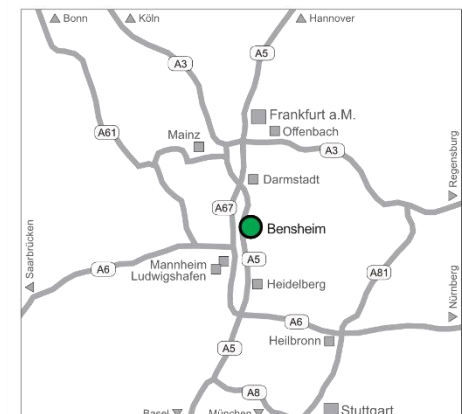
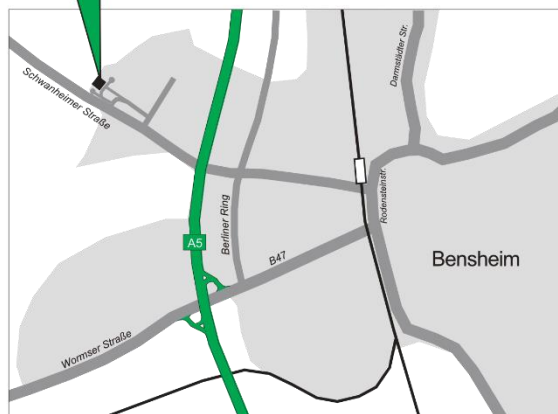
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