Operating instruction for the quick-change tap holders type:

HF 20
HF 30

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Please keep this for future use!
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Warning signs, symbols

This operating instruction uses the following symbols

⚠ Marks special instructions, rules and prohibitions which are important in order to avoid any damage. Please observe these instructions!

ℹ Marks application instructions and other useful information.

Sectional view: Quick-change tap holder HF
1 Application range, safety instructions and technical data

1.1 Application range, determined use

The quick-change tap holders type HF are mainly used on large drilling machines and boring mills. They are designed for producing big threads (from M24). Furthermore, the quick-change tap holder may also be used for drilling and countersinking, for more information please refer to chapter 1.2, page 4.

Normally, the following shanks are available for the quick-change tap holders type HF, which must be ordered separately:

- morse taper shank acc. to DIN 228 B with cotter slot.
- taper shank acc. to DIN 2080 resp. acc. to DIN 69871 A

For information on the assembly of the shank, please see chapter 2.2, page 7.

The cutting range is indicated in Table 1, page 6.

Locking of the tap / cold-forming tap, drill or countersink is executed via quick-change adapters type HE or HE-MK. The quick-change adapters must be chosen according to the size and to the used tool, please see chapter 2.6, page 11.

The quick-change tap holders type HF are equipped with a length compensation on tension and on compression as well as with an overload clutch, please see chapter 1.2, page 4.

The quick-change tap holders type HF are not suited for internal coolant-lubricant supply.
Models with internal coolant-lubricant supply up to 10 bar are available on request.

The non-determined use exempts the manufacturer from any liability!
1.2 Specifications

Further features of the quick-change tap holders type HF are:

- **Length compensation on compression:**
  Compensates differences between spindle feed and pitch of the thread to be produced. In case of overload, the length compensation on compression compensates the spindle feed.

- **Length compensation on tension:**
  Compensates differences between spindle feed and pitch of the thread to be produced as well as an overrun of the spindle in the reversing point of the thread producing cycle.

- **Integrated, adjustable overload clutch:**
  The overload clutch can be adjusted according to the kind of machining. A choice of torque reference values may be taken from chapter 7, page 24. Chapter 2.5, page 9, gives you an instruction of how to adjust the torque. The overload clutch protects the quick-change tap holder, the tool and the work piece against damage caused by:
  - Tap blunting
  - Chip locking
  - Cold weldings in the thread flanks
  - Thread core hole not deep enough
  - Thread core hole diameter too small

- **Drilling and countersinking with HF holders:**
  The holder may be used for drilling and countersinking by blocking the length compensation. Advantages:
  - Small deviation of the coaxiality between drill hole and thread, as the work piece must not be re-clamped.
  - Faster machining with reduced costs, as exchange of holders is not necessary.
  Please refer to chapter 2.7, page 18 for how to convert the quick-change tap holder.

- The quick-change tap holders type HF are suitable for producing right- and left-hand threads.
  ⇒ The quick-change tap holders may be used on machines with turning direction reverse.

- The shanks are flange-mounted to the holder which allows an easy change of the shank form, please see chapter 2.2, page 7.
1.3 Safety instructions

For all works, ie putting into operation, production or maintenance, please observe the details given in the operating instruction.

All relevant safety regulations as well as local instructions are to be observed when working with the quick-change tap holders.

Below please find some basic rules:

- Please wear safety shoes during tool change.
- Please wear gloves during tool change to avoid injury.
- Basically change the tool yourself to avoid the sudden start of the spindle caused by mis-operating.
- Secure the tool when loosening the tool clamping to avoid it falling down and damaging the tool and workpiece.
- There are maximum values for cutting speeds and feeds. Please observe such data.
- Please observe the maximum tool dimensions.
- Furthermore, the instructions of the tool manufacturers are valid!
1.4 Dimensions and technical data

Table 1: Technical data of quick-change tap holders HF

<table>
<thead>
<tr>
<th>Type</th>
<th>Cutting range</th>
<th>Quick-change adapters</th>
<th>Max. Clamping [mm]</th>
<th>∅D [mm]</th>
<th>∅D₁ [mm]</th>
<th>∅D₃ [mm]</th>
<th>L [mm]</th>
<th>C¹ [mm]</th>
<th>T² [mm]</th>
<th>Max. Torque³ [Nm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>HF 20</td>
<td>M24 – M76⁴¹/₂</td>
<td>HE 2</td>
<td>56</td>
<td>110</td>
<td>75</td>
<td>115</td>
<td>308</td>
<td>15</td>
<td>15</td>
<td>1300</td>
</tr>
<tr>
<td>HF 30</td>
<td>M36 – M160⁴³/₈</td>
<td>HE 3</td>
<td>70</td>
<td>160</td>
<td>90</td>
<td>160</td>
<td>372</td>
<td>20</td>
<td>20</td>
<td>3000</td>
</tr>
</tbody>
</table>

Please refer to the EMUGE main catalogue for the outer dimensions of the single shank types.

¹ Length compensation on compression
² Length compensation on tension
³ Maximum permitted torque
⁴ Fine threads possible until M120x4
2 Putting the quick-change tap holders into operation

2.1 Unpacking

- Take the quick-change tap holder from the plastic case.
- Clean the quick-change tap holder with a duster to remove any conservation oil.

⚠️ Do not use any aggressive solvents.
Do not use any fibrous materials, ie steel wool.

If the quick-change tap holder was ordered with a shank, it is now ready for operation.
If the quick-change tap holder was ordered without or with separate shank, please continue with the procedure described in chapter 2.2.

2.2 Assembly of the shank

Required tool:
Hexagon socket wrench, width across flats 8 (part of the delivery)

1. Remove all internal hexagon screws.
2. Put on shank and tighten its screws equally.

⚠️ Check correct position of the through drill hole against the threads!
2.3 First putting into operation

The quick-change tap holders are inserted into the machine manually

⚠️ The tool change must not be executed while the machine spindle rotates!

- Only use tool shanks and tightening bolts suitable for the specific machine.
- Make sure the tool is correctly clamped.
  ⇒ Risk of accident by spinning of the tool!
- For morse taper shanks please secure the shank additionally by a cotter slot against falling out!
- Please see also the operating instruction of your machine tool!

2.4 Reputting into operation

If the quick-change tap holder is reput into operation, as described in chapter 5, page 22, please go through the following steps:

1. Clean the quick-change tap holder with a duster to remove any conservation oil.

⚠️ Do not use any aggressive solvents.
Do not use any fibrous materials, ie steel wool.

2. Insert the quick-change tap holder into the machine as described in chapter 2.3.
2.5 Adjusting the torque of the overload clutch

The torque to be adjusted is defined among other things by the kind of machining and the material to be machined. In chapter 7, page 24, the reference values for the torque adjustment for standard machinings are listed.

If you do not know the torque, adjust a low value and slowly approach to the correct torque.

The adjustment must not be carried out while the machine spindle rotates!

Required tool:
- Hexagon socket wrench with pin, width across flats 10 (part of delivery)
- Depth measurement device or caliper gauge with depth measurement

1. Clamp the quick-change tap holder in the machine spindle

2. For torque adjustment, the marking rings must coincide, see detail Z. If not:
   - Put machine into operation.
   - Cut tool.
   - Stop machine.

Repeat this until the marking lines coincide!
3. Adjust torque by turning adjustment screw:

Right turn ⇒ Increase of torque
Left turn ⇒ Reducing torque

Do not use any extension for adjusting the torque!

4. Check torque by:
   - Measure position of the indicating pin using the depth measurement device
   - Read torque from the graph. The graph is fixed on the quick-change tap holder body or in chapter 6, page 23.

Example:
HF20, measuring depth 2,7 mm
⇒ Torque read from graph: 625 Nm
(see also chapter 6, page 23)

The max. torque is adjusted if the indicating pin matches with the quick-change tap holder diameter.
2.6 Quick-change adapters

2.6.1 Application and choice

The adaptation of the tap / cold-forming tap, drill or countersink is executed via quick-change adapters. The following quick-change adapters are available:

Type **HE..**  
Model for **taps / cold-forming taps.**  
The tool is locked via three screws at the shank.

Type **HE ..-MK**  
Model for **drill or countersink.**  
The tool is clamped via the inner taper acc. to DIN 228 B.

The tap / cold-forming tap is clamped via three screws and centered. The torque arising during the thread producing cycle is transferred via the square integrated in the quick-change adapter. The drill or countersink is clamped form-fitted via the inner morse taper in the quick-change adapter.

All quick-change adapters are suited for producing right/ and left-hand threads.

The adapter sizes for the appropriate quick-change tap holder are listed in Table 1, page 6. The clamping diameter is defined by the tool used. Each diameter and each morse taper shank requires a separate adapter.
2.6.2 Insert taps / cold-forming taps

Choose the appropriate quick-change adapter and required tool for the holder size used!

Required tool:
Type HE 2: Hexagon socket wrench, width across flats (size) 4
Type HE 3: Hexagon socket wrench, width across flats (size) 5

1. Push tool into the adapter.
   Bring square into correct position by turning the tool.

2. Tighten all three screws equally
   ⇒ the tool is locked at the shank

This instruction is valid for all quick-change adapters types:
HE 2 and HE 3
2.6.3 Quick-change tap holder type HF 20

2.6.3.1 Insert quick-change adapter

⚠️ The change of the adapter must not be executed while the machine spindle rotates!

1. Fix the shank.
   ie by adapting the holder in the machine spindle

2. Push grip sleeve in direction of the holder shank and hold it.

3. Push in quick-change adapter
   The drivers of the holder must be located in the grooves of the adapter!

4. Let go of grip sleeve.
   → Grip sleeve returns to its initial position

The instruction is valid for quick-change tap holders type HF 20 and for quick-change adapters type HE2 and HE2-MK.
2.6.3.2 Remove quick-change adapter

The change of the adapter must not be executed while the machine spindle rotates!

1. Push grip sleeve in direction of shank and hold it.

2. Remove quick-change adapter

3. Let go of grip sleeve

The instruction is valid for quick-change tap holders type HF20 and for quick-change adapters type HE2 and HE2-MK.
2.6.4 Quick-change tap holder type HF 30

2.6.4.1 Insert quick-change adapter

⚠️ The change of the adapter must not be executed while the machine spindle rotates!

1. Fix shank
   ie by adapting of the holder in the machine spindle

2. Turn cover ring so that the quick-change adapter may be pushed in

3. Push in quick-change adapter

4. Turn cover ring completely backwards so that the quick-change adapter is fixed

The instruction is valid for quick-change tap holders HF30 and for quick-change adapters type HE3 and HE3-MK.
2.6.4.2 Remove quick-change adapter

⚠️ The change of the adapter must not be executed while the machine spindle rotates!

1. Turn cover ring
2. Remove quick-change adapter

The instruction is valid for quick-change tap holders type HF30 and for quick-change adapters type HE3 and HE3-MK.
2.6.5 Detach tool

**Required tool:**
- Type HE 2: Hexagon socket wrench, width across flats (size) 4
- Type HE 3: Hexagon socket wrench, width across flats (size) 5

1. Loosen the three screws
2. Remove tool

The instruction is valid for all quick-change adapters types: HE 2 and HE 3
2.7 Use the quick-change tap holder as drill holder

2.7.1 Conversion to drill holder

Only carry out the conversion while machine is stationary!

Required tool:
Stable pad, ie wooden plate
HF20: Hexagon socket wrench with pin, width across flats 8 (part of the delivery)
HF30: Hexagon socket wrench with pin, width across flats 10 (part of the delivery)

1. Fix the shank in the machine spindle and remove the quick-change adapter

2. Compress the holder in direction of the shank until the total length compensation is over-ridden ie using the spindle feed

Use stable pad!

3. HF20:
   Tighten locking screws
HF30:
   Turn locking screw by 180°
⇒ Length compensation is blocked

4. Release pressure
⇒ there may be no length movement of the quick-change tap holder
2.7.2 Conversion back to tap holder

**Only carry out the conversion while machine is stationary!**

**Required tool:**
- Stable pad, ie wooden plate
- HF20: Hexagon socket wrench with pin, width across flats 8 (part of the delivery)
- HF30: Hexagon socket wrench with pin, width across flats 10 (part of the delivery)

See chapter 2.6.3.2, page 14 for HF20
And chapter 2.6.4.2, page 16 for HF30.

1. Remove quick-change adapter

2. Hold holder together ie by using the machine spindle and a stable pad

3. **HF20:** Loosen locking screw until it is flush with the tap holder body
   **HF30:** Turn locking screw by 180°

4. Run back machine spindle until the complete length compensation on compression has moved out
2.7.3 Insert drill or countersink

Choose the appropriate quick-change adapter for the holder size used and required drill or countersink!

The instruction is valid for all quick-change adapters type: HE-MK

The quick-change adapter is used according to the instruction in chapter 2.6.3.1, page 13 for HF20 and chapter 2.6.4.1, page 15 for HF30.

2.7.4 Detach drill or countersink

Required tool:
Drift punch and hammer

The instruction is valid for all quick-change adapters type: HE-MK

The quick-change adapter is loosened according to the instruction in chapter 2.6.3.2, page 14 for HF20 and chapter 2.6.4.2, page 16 for HF30.
3 Details for the use of quick-change tap holders type HF

3.1 Length compensation

The complete length compensation is marked on the quick-change tap holder by two red marking rings. The neutral position is marked by a black ring. If the cover ring matches with the marking of the neutral position, the length compensation is not active, see Picture 2.

During the thread producing cycle, the front edge of the cover ring must be positioned between the two red marking rings.

Recommendation for thread producing on machines with manual feed: during the thread producing cycle, the maximum possible length compensation on compression can be used, however, only half of the length compensation on tension should be activated.
4 Maintenance

4.1 Maintenance schedule

<table>
<thead>
<tr>
<th>What</th>
<th>When</th>
<th>Who?</th>
</tr>
</thead>
<tbody>
<tr>
<td>External cleaning</td>
<td>Periodically, depending on the degree</td>
<td>Operator</td>
</tr>
<tr>
<td></td>
<td>of dirt.</td>
<td></td>
</tr>
</tbody>
</table>

4.2 External cleaning

Clean the quick-change tap holder at periodic intervals with a duster depending on how dirty the holder is.

- Do not use any aggressive solvents.
- Do not use any fibrous materials, i.e., steel wool.

5 Storage when not in use

If the quick-change tap holder is taken out of service, please go through the following steps:

1. Clean the quick-change tap holder with a duster.

   - Do not use any aggressive solvents.
   - Do not use any fibrous materials, i.e., steel wool.

2. Spray the quick-change tap holder with a preservation oil to avoid rusting and to preserve the easy running of the holder.

   - Before storage all evidence of coolant and machining residues must be removed.
6 Torque progression

The following graphs are printed onto the quick-change tap holder near the adjustment unit in similar form.

6.1 Torque progression for the quick-change tap holder HF20

Example: Measuring depth 2.2 mm
from graph: 750 Nm adjusted torque

6.2 Torque progression for the quick-change tap holder HF30

Example: Measuring depth 2.75 mm
from graph: 2000 Nm adjusted torque
# 7 Torque reference values for thread producing

Generally speaking, the torque to be set depends on:

- Size
- Geometry and coating of the tool
- Workpiece material
- Type and quality of the coolant-lubricant
- Drilled hole diameter

The table contains standard values for thread cutting in steel with a tensile strength of 600-800 N/mm². These values generally need to be adjusted to the individual work case (e.g. for cold-forming of threads).

<table>
<thead>
<tr>
<th>Torque</th>
<th>Thread type</th>
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<tbody>
<tr>
<td>[Nm]</td>
<td>[Ft.lbs]</td>
</tr>
<tr>
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## Operating instruction for the quick-change tap holders

### type HF

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<th>Torque [Nm]</th>
<th>Thread type</th>
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Notes: