



■ Made
■ in
■ Germany

HF 20
HF 30



EMUGE

Quick-change tap holder HF

Operating instruction

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Warnings, symbols

In this operating instruction the following symbols are used:



Attention

Marks special instructions, rules and prohibitions which are important in order to avoid any damage.

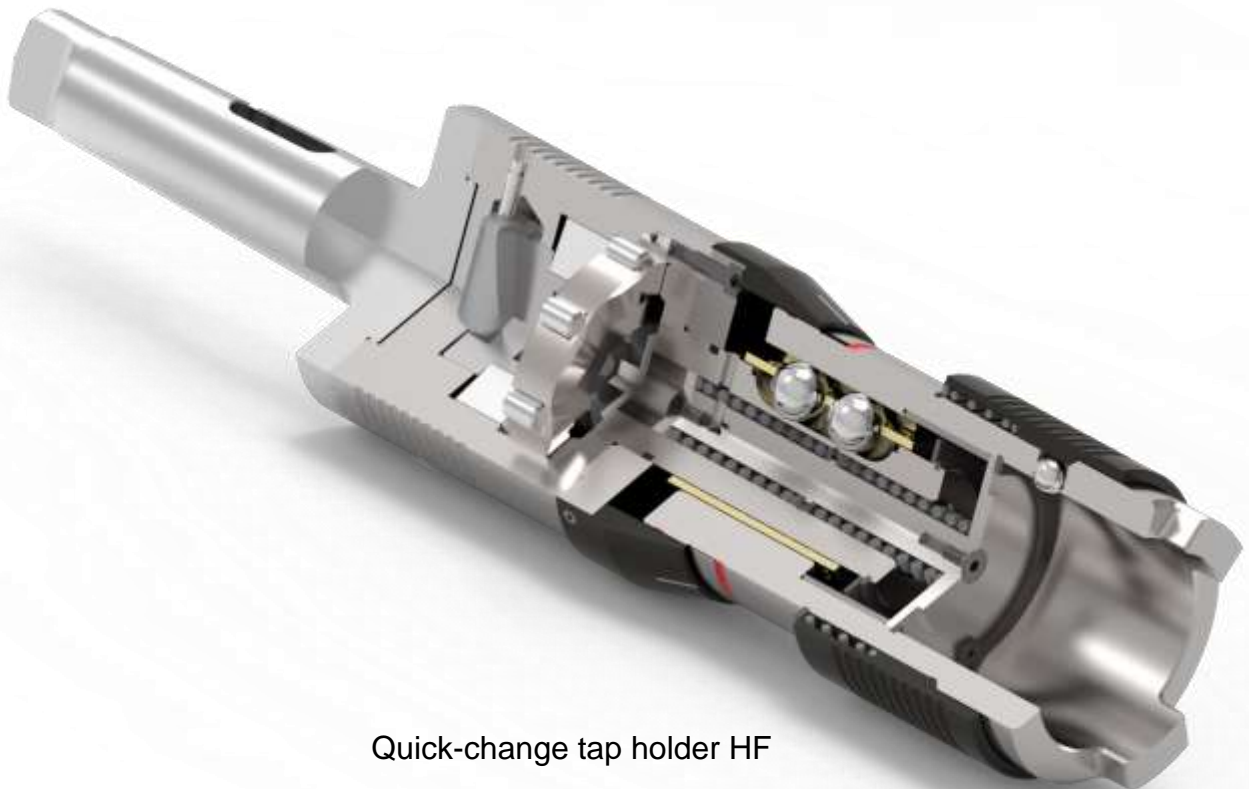
► Please observe these instructions!



Note

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 5.

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 and JIS B6339 (MAS 403 BT)

For information on the assembly of the shank, please see chapter 2.2, page 8.

The cutting range is indicated Table 1, page 7.

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 12.

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 5.

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 25. Chapter 2.5, page 10, gives you an instruction of how to adjust the torque. The overload clutch protects the quick-change tap holder, the tap/cold-forming tap 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 19 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 8

1.3 Safety instructions

For all works, i.e. 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:



Attention



- ▶ 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.



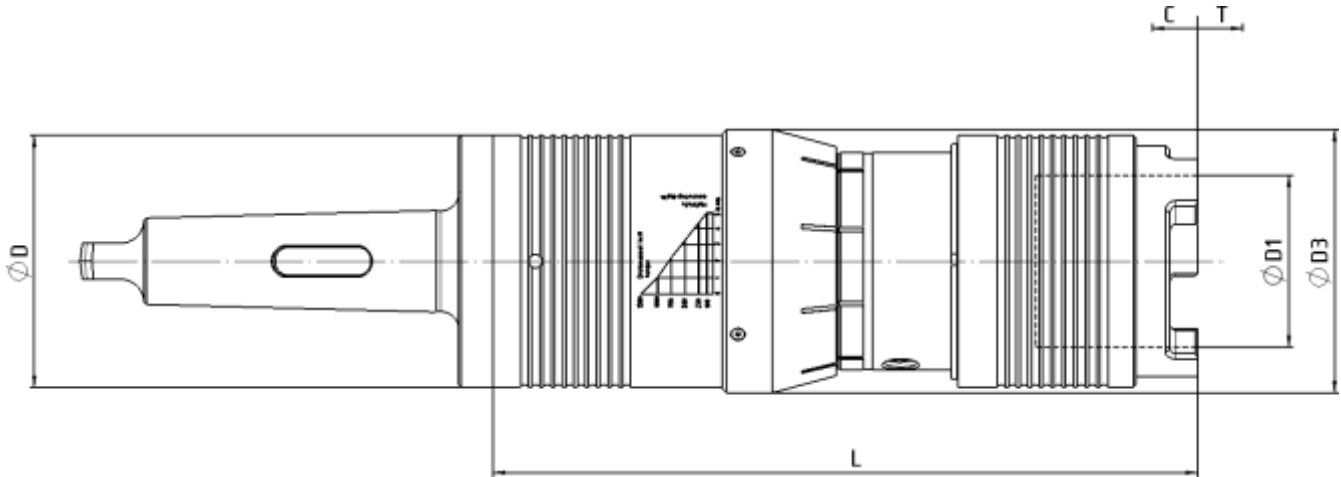
- ▶ Please wear safety shoes during tool change.
- ▶ Secure the tool when loosening the tool clamping to avoid it falling down and damaging the tool and the work piece.
- ▶ There are maximum values for cutting speeds and feeds for every kind of machining. Please observe such data.
- ▶ Please observe the maximum tool dimensions.
- ▶ Furthermore, the instructions of the tool manufacturers are valid!

1.4 Proprietary rights

The entire contents of these operating instructions are subject to German proprietary rights legislation.

Any form of multiplication, processing, broadcasting, passing on to third parties - also in the form of extracts - and any kind of use outside the boundaries of proprietary rights requires the written consent of EMUGE GmbH&Co.KG.

1.5 Dimensions and technical data



Picture 1: Quick-change tap holder HF

Table 1: Technical Data of the quick-change tap holder type HF

Type	Cutting range	Quick-change adapter	Max. clamping Ø [mm]	ØD [mm]	ØD ₁ [mm]	ØD ₃ [mm]	L [mm]	C ¹ [mm]	T ² [mm]	Max. torque ³ [Nm]
HF 20	M24 – M76 1" – 2 1/2"	HE 2	56	110	75	115	308	15	15	1300
HF 30	M36 – M160 1 3/8" – 3 1/2"	HE 3	70	160	90	160	372	20	20	3000

The dimensions may be taken from the EMUGE main catalogue.

¹ Length compensation on compression

² Length compensation on tension

³ Maximum permitted torque

2 Putting the quick-change tap holders into operation

2.1 Unpacking

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

Note

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

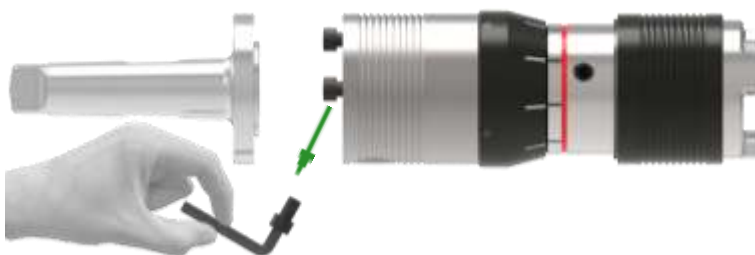
- ✓ If the quick-change tap holder was ordered with a shank, it is now ready for operation.
If the quick-change tap holder was ordered without or with separate shank, please continue with the procedure described in chapter 2.2.

2.2 Assembly of the shank

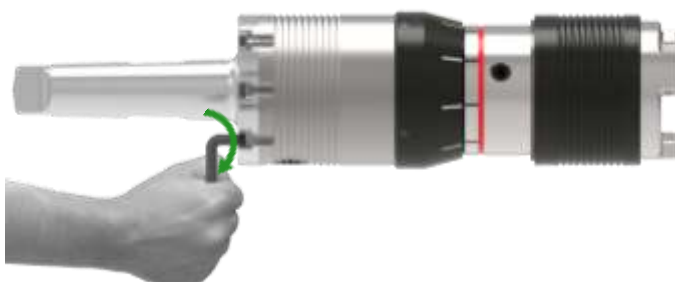
Note

Required tool:

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



1. Remove all internal hex screws.



2. Put on shank and tighten its screws equally.

Note

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.



Attention

- ▶ 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.
Otherwise: 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 indications in the operating instruction of your machine tool!

2.4 Reputting into operation

If the quick-change tap holder is re-put into operation, as described in chapter 5, page 23, please go through the following steps:

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



Note

- ▶ Do not use any aggressive solvents.
- ▶ Do not use fibrous materials i.e. 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 25, the reference values for the torque adjustment for standard machinings are listed.



Attention

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



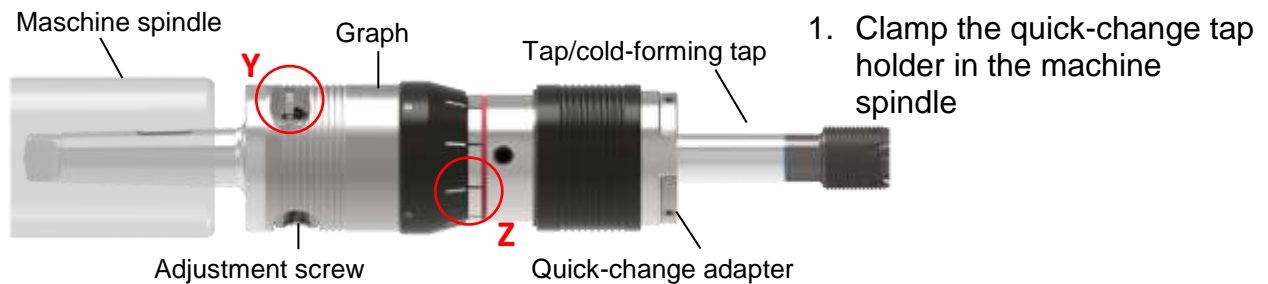
Note

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

Required tool:

Hexagon socket wrench with pin, width across flats 10 (part of delivery)

Depth measurement device or caliper gauge with depth measurement



Detail: **Z**



Marking lines



2. For torque adjustment, the marking rings must coincide, see detail **Z**.

If not:

- Put machine into operation.
- Cut tap/cold-forming tap.
- Stop machine.



Note

Repeat this until the marking lines coincide!



3. Adjust torque by turning adjustment screw:

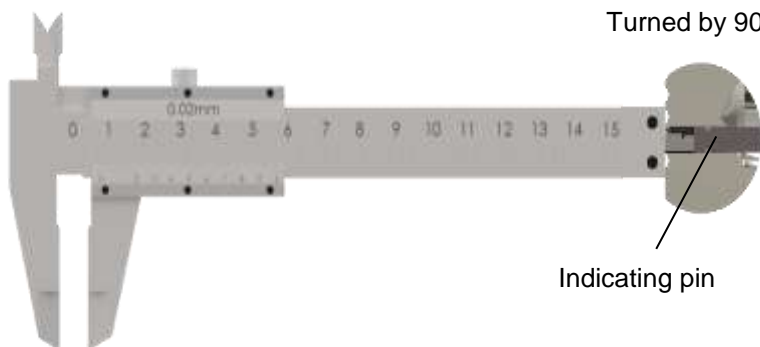
Right turn
⇒ Increase of torque

Left turn
⇒ Reducing torque



Attention

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 24.

Example:

HF20, measuring depth 2,7 mm
⇒ Torque read from graph: 625 Nm
(see also chapter 6, page 24)



Note

The maximum 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 tap/cold-forming tap is locked and centered via three screws at the shank. The torque arising during the thread producing cycle is transferred via the square integrated in the quick-change adapter.
Type HE ..-MK	Model for drill or countersink. The tool is clamped form-fitted in the quick-change adapter via the inner taper according to DIN 228 B.

The 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 7. The clamping diameter is defined by the used tool. Each diameter and each morse taper shank requires a separate adapter.

2.6.2 Insert taps / cold-forming taps



Attention

Choose the appropriate quick-change adapter for the used tap/cold-forming tap!



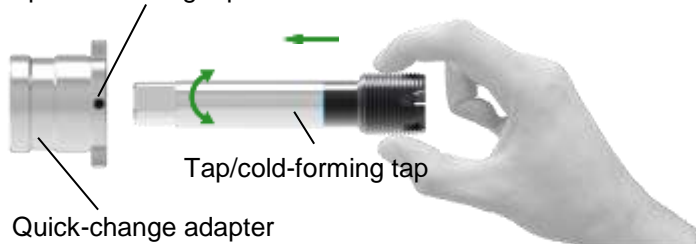
Note

Required tool:

Type HE 2-1KZ(Z): Hexagon socket wrench, width across flats 4

Type HE 3: Hexagon socket wrench, width across flats 5

Screws for tightening the
tap/cold-forming tap



1. Push tap/cold-forming tap into the adapter.



Note

Bring square into correct position by turning the tool.



1. Tighten all three screws equally



Note

Tightening torque:
10 Nm

⇒ the tap/cold-forming tap is locked at the shank



Note

This instruction is valid for all quick-change adapters types:

HE 2-1KZ(Z) and HE 3

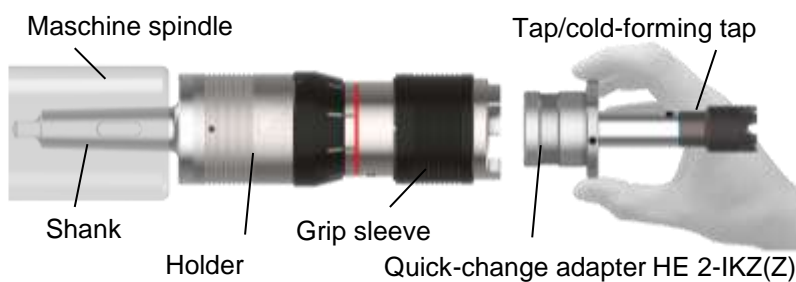
2.6.3 Quick-change tap holder type HF 20

2.6.3.1 Insert quick-change adapter



Attention

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



1. Fix the shank.

i.e. 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



Note

The drivers of the holder must be located in the grooves of the adapter!



4. Let go grip sleeve.

⇒ Grip sleeve returns to its initial position



Note

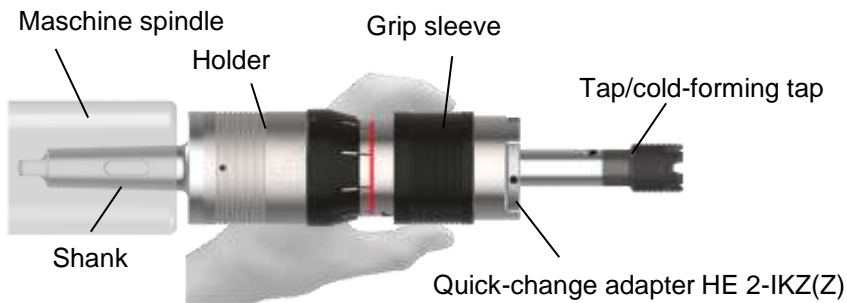
The instruction is valid for quick-change tap holders type **HF 20** and for quick-change adapters type **HE 2-1KZ(Z)** and **HE 2- MK**

2.6.3.2 Remove quick-change adapter

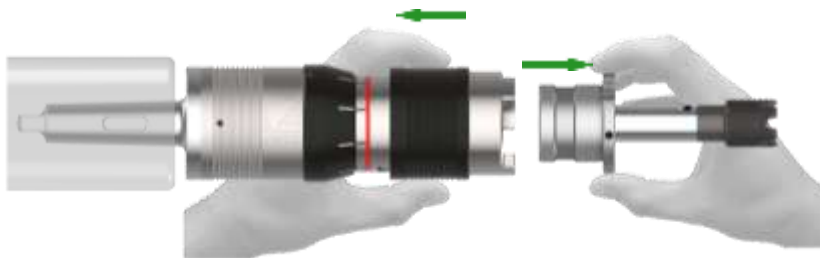


Attention

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



Note

The instruction is valid for quick-change tap holders type **HF 20** and for quick-change adapters type **HE 2-1KZ(Z)** and **HE 2- MK**

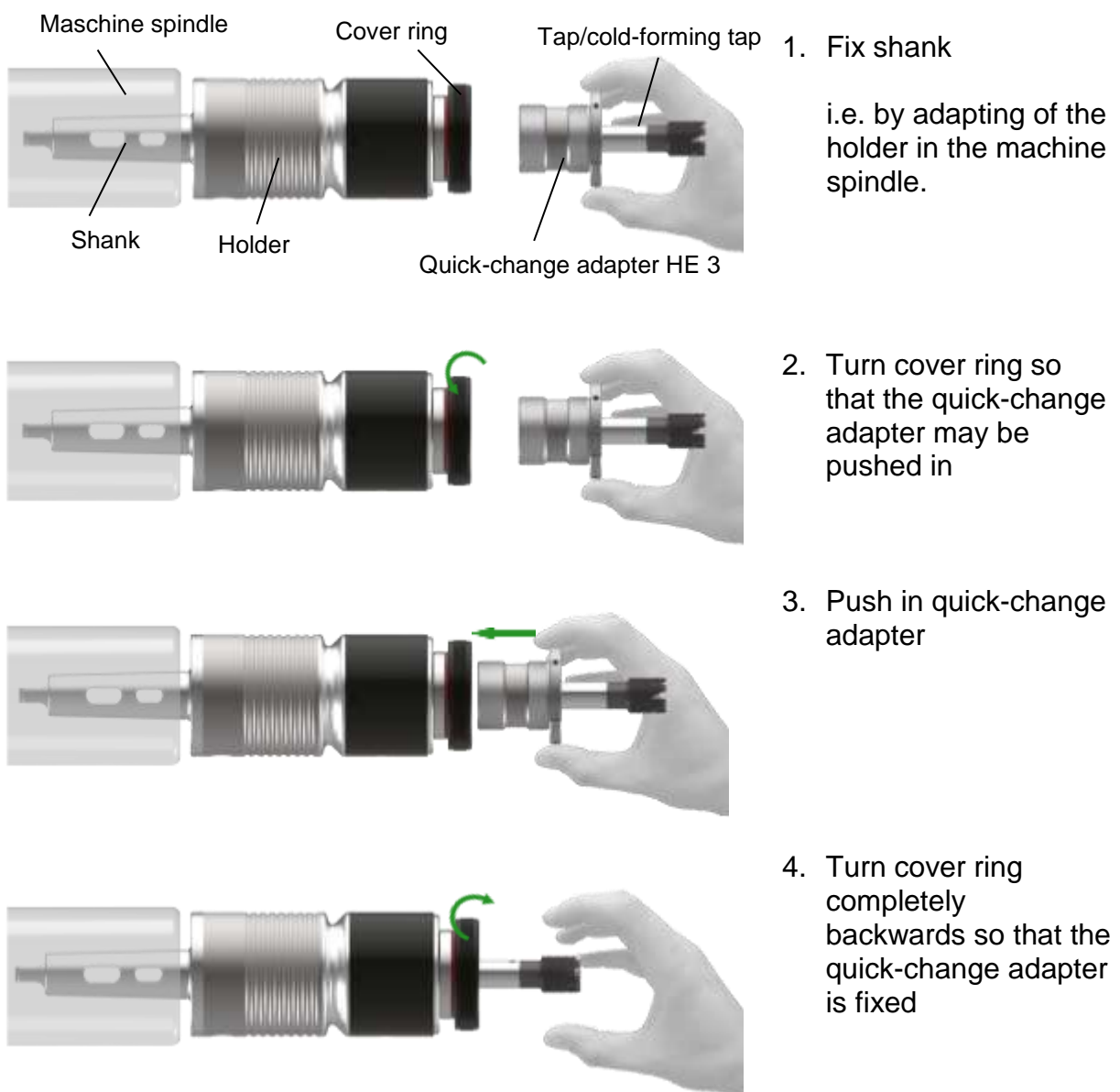
2.6.4 Quick-change adapter of type HF 30

2.6.4.1 Insert of quick-change adapter



Attention

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



Note

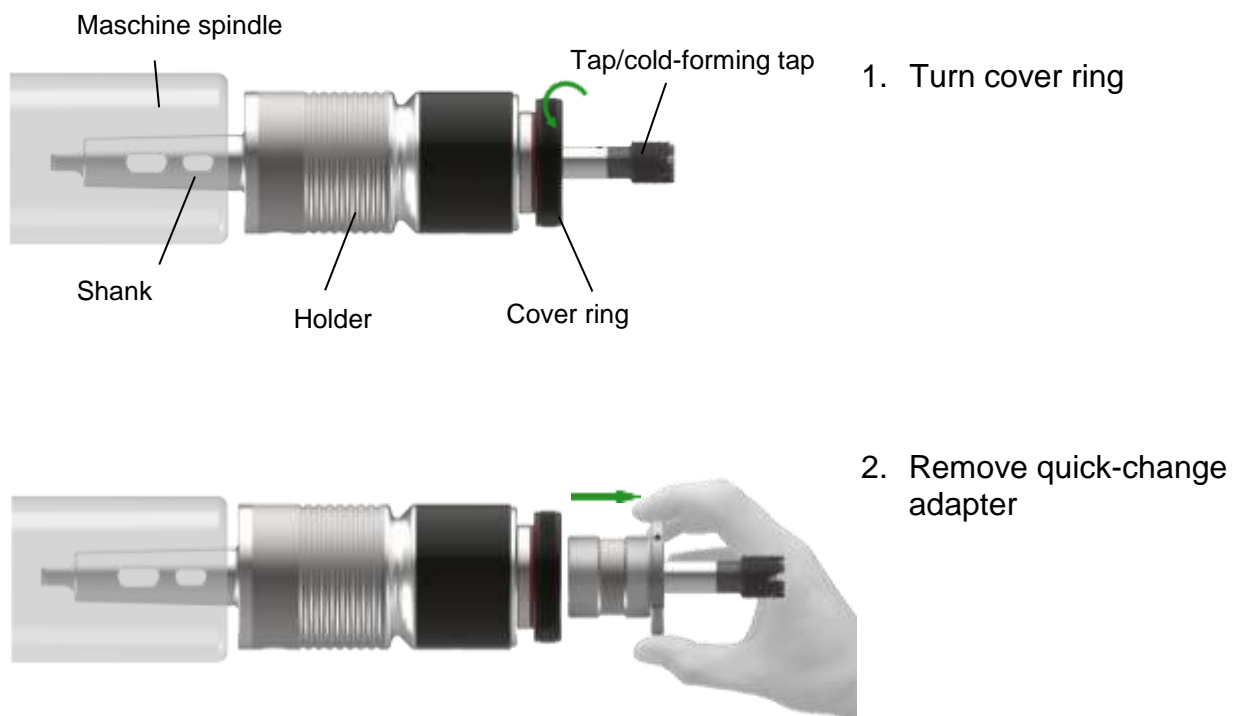
The instruction is valid for quick-change tap holders **HF 30** and for the quick-change adapters type **HE 3** and **HE 3-MK**

2.6.4.2 Remove quick-change adapter



Attention

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



Note

The instruction is valid for quick-change tap holders type **HF 30** and for quick-change adapters type **HE 3** and **HE 3-MK**

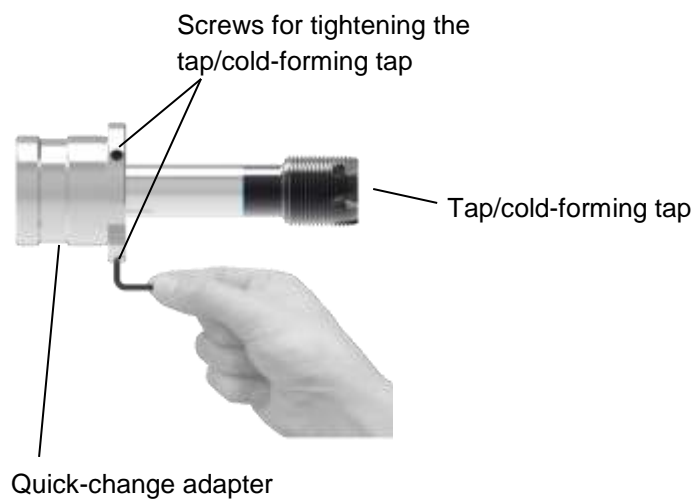
2.6.5 Detach tap/cold-forming tap

Note

Required tool:

Type HE 2-1KZ(Z): 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 tap/cold-forming tap

Note

The instruction is valid for all quick-change adapters types:
HE 2-1KZ(Z) and HE 3

2.7 Use the quick-change tap holder as drill holder

2.7.1 Conversion to drill holder

 **Attention**

Only carry out the conversion while machine is stationary!

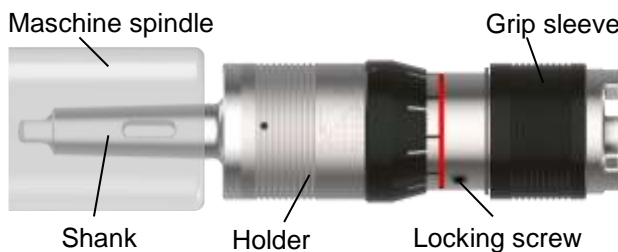
 **Note**

Required tool:

Stable pad, i.e. 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 i.e. using the spindle feed

 **Attention**

Use stable pad!



3. **HF20:**
Tighten locking screws

HF30:
Turn locking screw by 180°

⇒ Length compensation is blocked



Release pressure
⇒ there may be no length movement of the quick-change tap holder

2.7.2 Conversion back to tap holder



Attention

Only carry out the conversion while machine is stationary!



Note

Required tool:

Stable pad, i.e. wooden plate

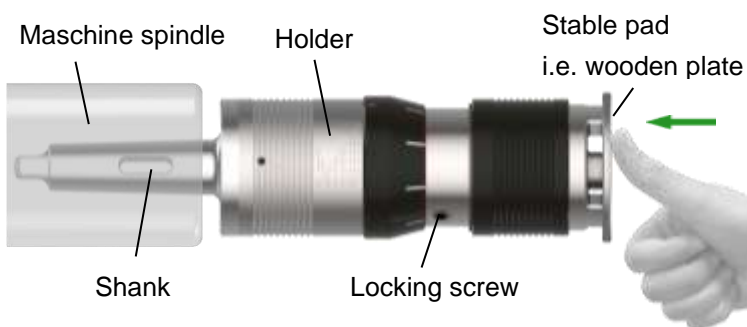
HF20: Hexagon socket wrench with pin, width across flats 8 (part of the delivery)

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 17 for HF30

1. Remove quick-change adapter



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



HF20:

Loosen locking screws until they are flush with the tap holder body

HF30:

Turn locking screw by 180°



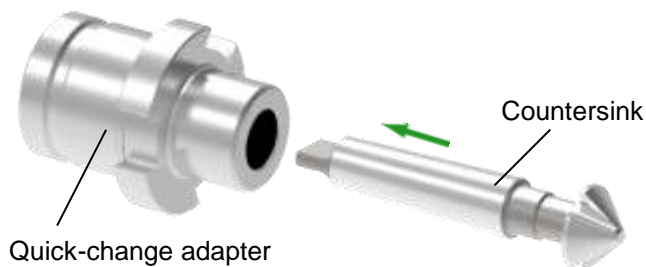
3. Run back machine spindle until the complete length compensation on compression has moved out

2.7.3 Insert drill or countersink



Attention

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



Strongly push drill or countersink into quick-change adapter



Note

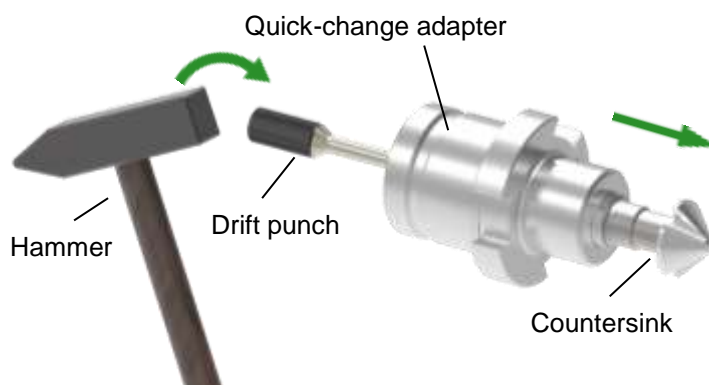
The instruction is valid for all quick-change adapters type: **HE-MK**
 The quick-change adapter is used according to the instruction in chapter 2.6.3.1 page 14 for HF20 and chapter 2.6.4.1, page 16 for HF30.

2.7.4 Detach drill or countersink



Note

Required tool: Drift punch and hammer



Drive out drill or countersink using drift punch and hammer



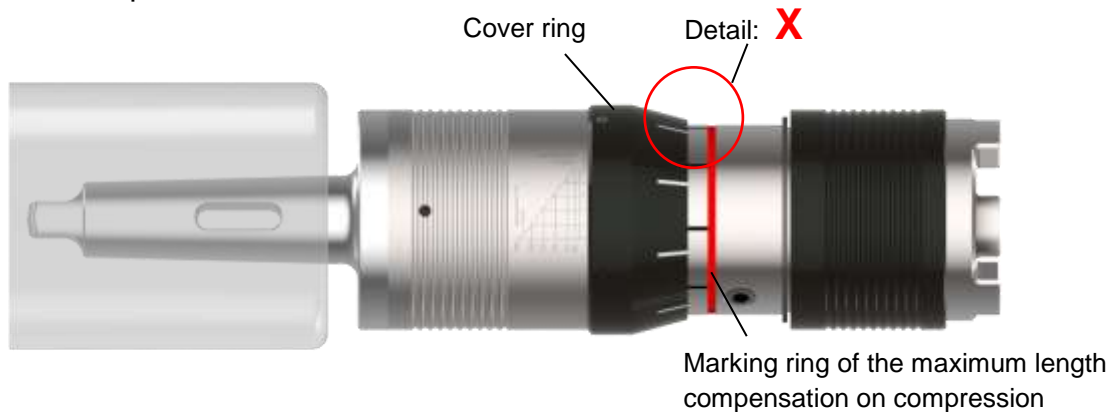
Note

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 15 for HF20 and chapter 2.6.4.2, page 17 for HF30.

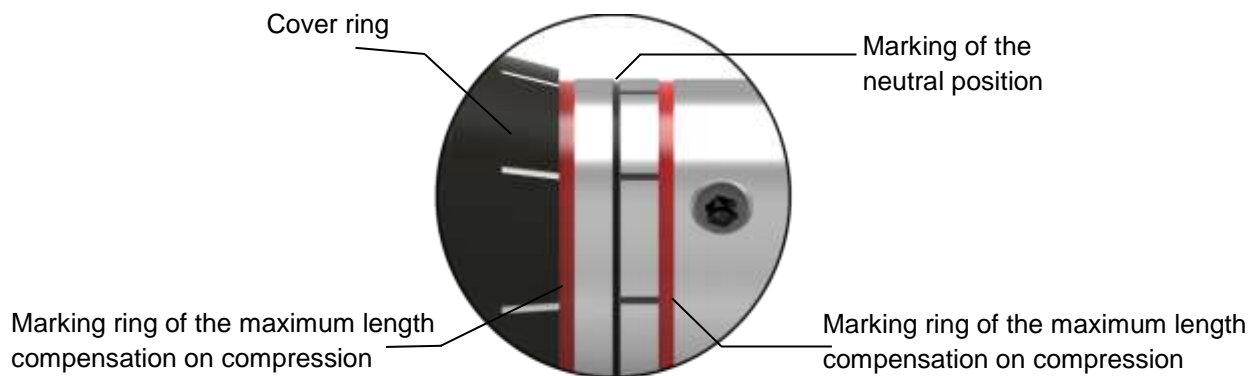
3 Details for the use of quick-change tap holders type HF

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.



Detail **X**: Picture shows the length compensation completely pulled out



Attention

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



Note

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

What?	When?	Who?
External cleaning	Periodically, depending on the degree of dirt.	Operator

4.2 External cleaning

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



Note

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

5 Storage when not in use

If the collet holder is taken out of service, please go through the following steps:

1. Clean the quick-change tap holder with a duster, see 4.2.
2. Spray the quick-change tap holder with preservation oil to avoid rusting and to preserve the easy running of the holder.



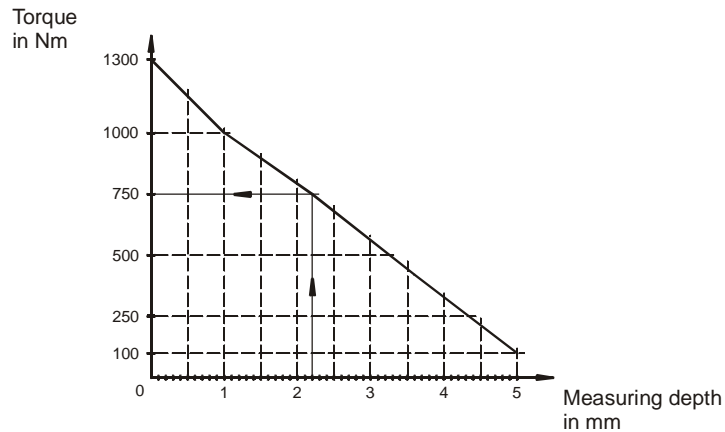
Attention

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.

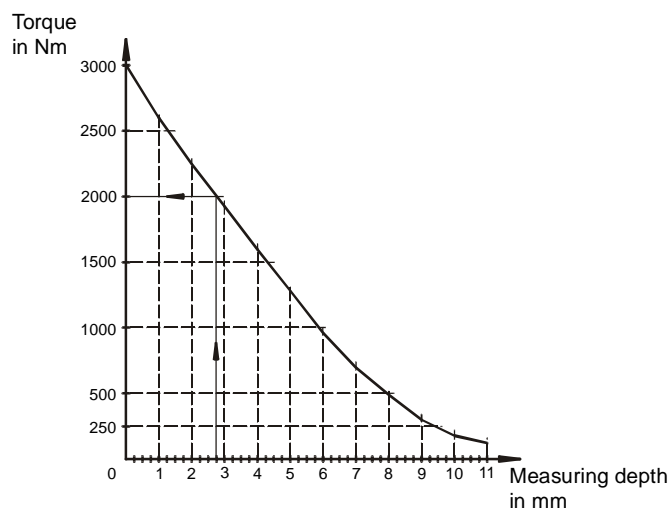
6.1 Torque progression for the quick-change tap holder HF20



Picture 2: Torque progression for the quick-change tap holder type HF20

Example: Measuring depth 2,2 mm
from graph: 750 Nm adjusted torque

6.2 Torque progression for the quick-change tap holder HF 30



Picture 3: Torque progression for the quick-change tap holder type 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).

Torque		Thread type								
[Nm]	[Ft.lbs]	M	UNC	UNF	BSW	BSF	G (Whw) BSP	NPT NPTF	Rc (BSPT)	Pg
0,3	0,2	M2	Nr.2	Nr.2						
0,4	0,3	M2,5		Nr.3						
0,5	0,4		Nr.3	Nr.4						
0,6	0,5	M3								
0,8	0,6		Nr.4	Nr.5						
1,0	0,7	M3,5	Nr.5	Nr.6	1/8					
1,2	0,9		Nr.6	Nr.8						
1,6	1,2	M4	Nr.8		5/32					
2,0	1,5			Nr.10						
2,5	1,8	M5		Nr.12		3/16				
3	2,2		Nr.10	1/4"						
4	3,0		Nr.12		3/16	7/32				
5	3,7	M6		5/16	1/32	1/4				
6	4,4		1/4	3/8	1/4	9/32	G 1/8			
8	6,0					5/16				
10	7,4	M8	5/16	7/16	5/16					
12	8,9			1/2		3/8				
16	12		3/8		3/8			1/16	Rc 1/16	Pg 7
18	13	M10		9/16		7/16	G 1/4			
20	15			5/8						
22	16		1/16		1/16		G 3/8			Pg 9
25	18	M12				1/2		1/8	Rc 1/8	Pg 11

Torque		Thread type								
[Nm]	[Ft.lbs]	M	UNC	UNF	BSW	BSF	G (Whw) BSP	NPT NPTF	Rc (BSPT)	Pg
28	21									Pg 13,5
32	24		1/2	3/4	1/2	9/16				Pg 16
40	30		9/16		9/16	5/8				
45	33	M14		7/8		11/16				Pg 21
50	37	M16	5/8		5/8		G 1/2			
56	41						G 5/8		Rc 1/4	
63	46							1/4		Pg 29
70	52		3/4	1	3/4	3/4	G 3/4			
80	59	M18		1 1/8		13/16	G 7/8			Pg 36
90	66	M20		1 1/4		7/8		3/8	Rc 3/8	Pg 42
100	74	M22	7/8	1 3/8	7/8					Pg 48
110	81			1 1/2						
125	92					1				
140	103	M24	1		1		G 1			
160	118	M27					G 1 1/8	1/2	Rc 1/2	
180	133					1 1/8	G 1 1/4			
200	148					1 1/4	G 1 3/8	3/4	Rc 3/4	
220	162	M30	1 1/8		1 1/8		G 1 1/2			
240	177	M33	1 1/4		1 1/4		G 1 3/4			
260	192					1 3/8	G 2			
280	207	M36								
300	221					1 1/2	G 2 1/4			
320	236	M39				1 5/8				
340	250		1 3/8		1 3/8		G 2 1/2	1	Rc 1	
360	266		1 1/2		1 1/2		G 2 3/4			
400	295	M42					G 3			
420	310	M45					G 3 1/4			
450	332					1 3/4	G 3 1/2	1 1/4	Rc 1 1/4	
480	354						G 3 3/4			
500	369					2	G 4			
560	413	M48			1 5/8			1 1/2	Rc 1 1/2	
630	465	M52	1 3/4		1 3/4					
710	524	M56				2 1/4		2	Rc 2	
800	590	M60			1 7/8	2 1/2				
900	664	M64				2 3/4				
1000	738	M68	2		2					
1100	811		2 1/4		2 1/4	3				
1170	863	M72								

Torque		Thread type								
[Nm]	[Ft.lbs]	M	UNC	UNF	BSW	BSF	G (Whw) BSP	NPT NPTF	Rc (BSPT)	Pg
1230	907	M76								
1300	959	M80								
1380	1018	M85								
1400	1033		2 1/2		2 1/2			2 1/2	Rc 2 1/2	
1460	1077	M90								
1540	1136	M95								
1620	1195	M100								
1700	1254	M105								
1780	1313	M110								
1860	1372	M115								
1940	1431	M120								
2000	1475		2 3/4		2 3/4			3	Rc 3	
2020	1490	M125								
2110	1556	M130								
2200	1623				3					
2270	1674	M140								
2430	1792	M150								
2680	1977	M160								

EMUGE quick-change tap holder HF
Operating instruction


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Please keep this for future use!


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