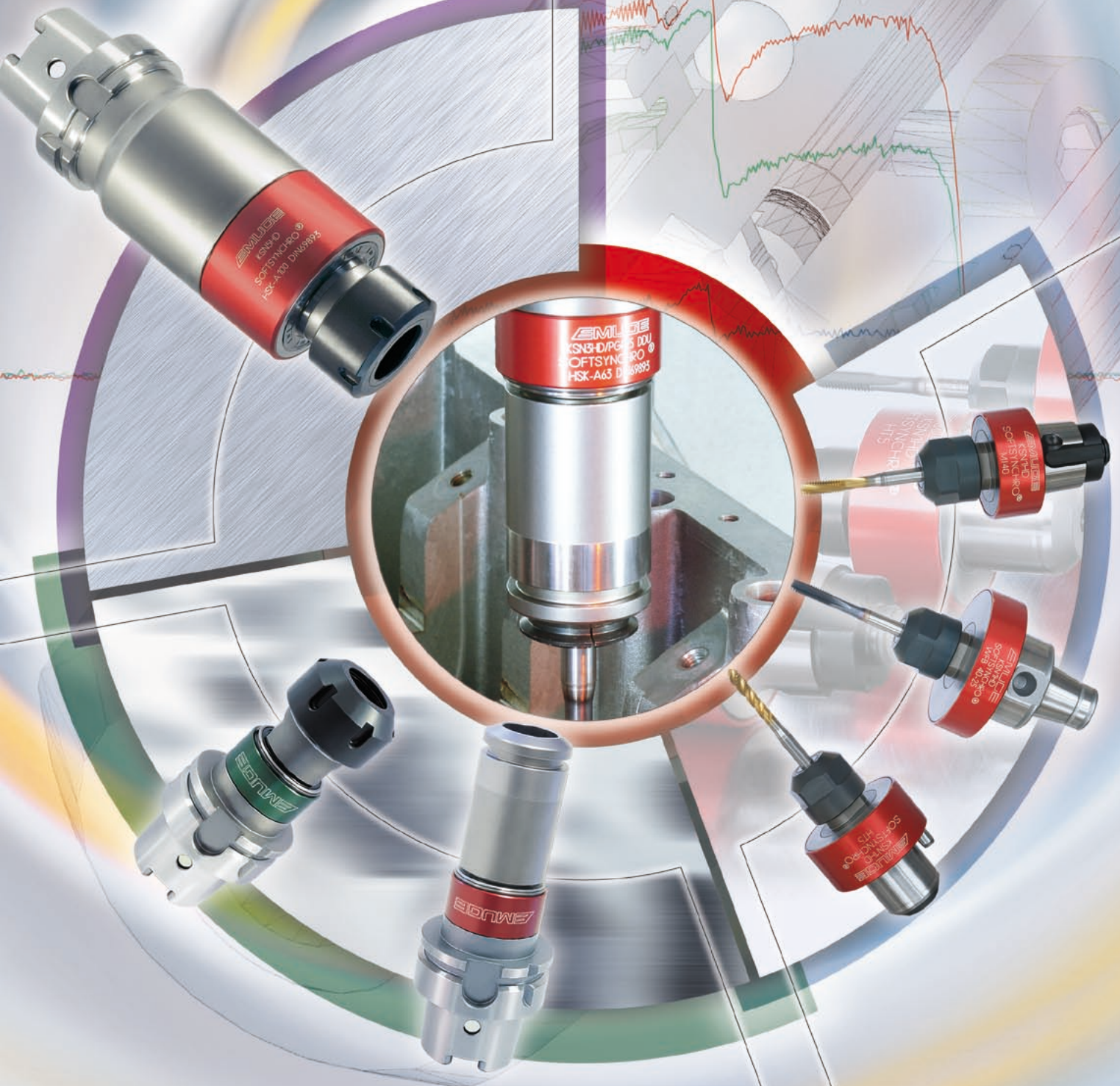


EMUGE

Clamping Technology



KSN/HD/Softsynchro®
Holders with minimum length compensation

On many modern CNC machining centres the rotation of the spindle can be synchronized with the feed axis. This makes it possible to produce threads with tool holders without length compensation. However, practical experience shows that even with this kind of "rigid tapping", synchronization errors can come up.

Possible causes are:

- machine dynamics, harmonization of spindle and linear drives, especially during the moment of changing the rotation direction
- tolerances on the threading tool

When rigid tool holders are used, these errors can lead to problems. High axial forces come into play, and can have serious negative consequences on the production process, such as:

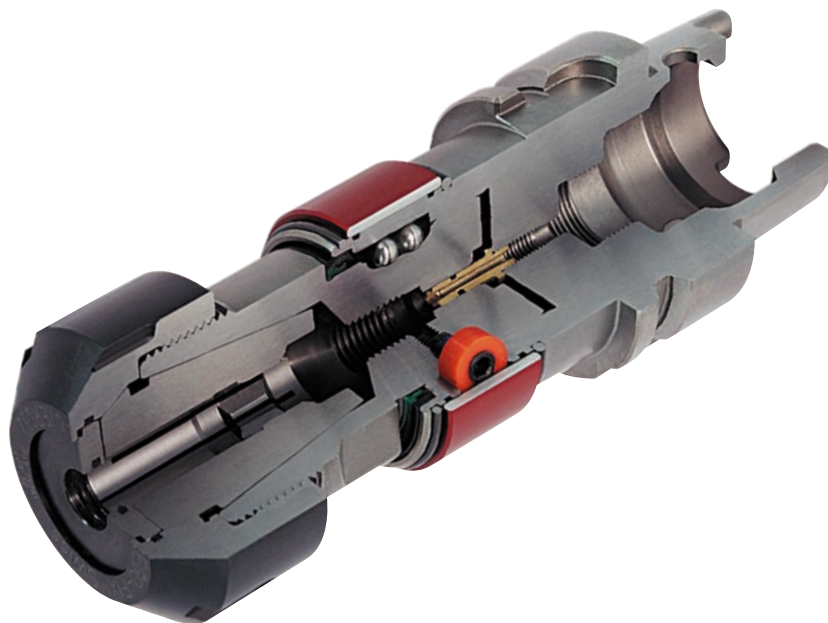
- reduced tool life, caused by high one-sided flank friction on the threading tool
- unclean thread flanks on the workpiece
- threads not true-to-gauge

EMUGE collet holders type KSN/HD/Softsynchro®

- serve as absorbing link between synchronous spindle and tap / cold-forming tap, and compensate pitch differences between threading tool and synchronous spindle
- provide the high concentricity of a rigid tool holder
- guarantee safe clamping of taps / cold-forming taps by collets with square drive
- do not necessitate tools with special shanks
- guarantee process safety in the synchronous production of threads
- clearance in the tooth flanks in the driven tool holder
- clearance in the drive between driven tool holder and machine drive

Constructional details

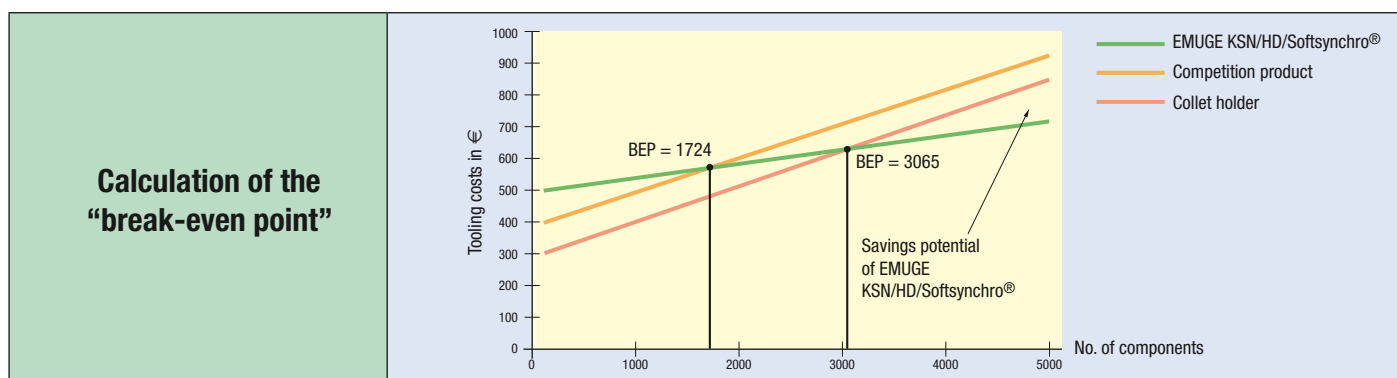
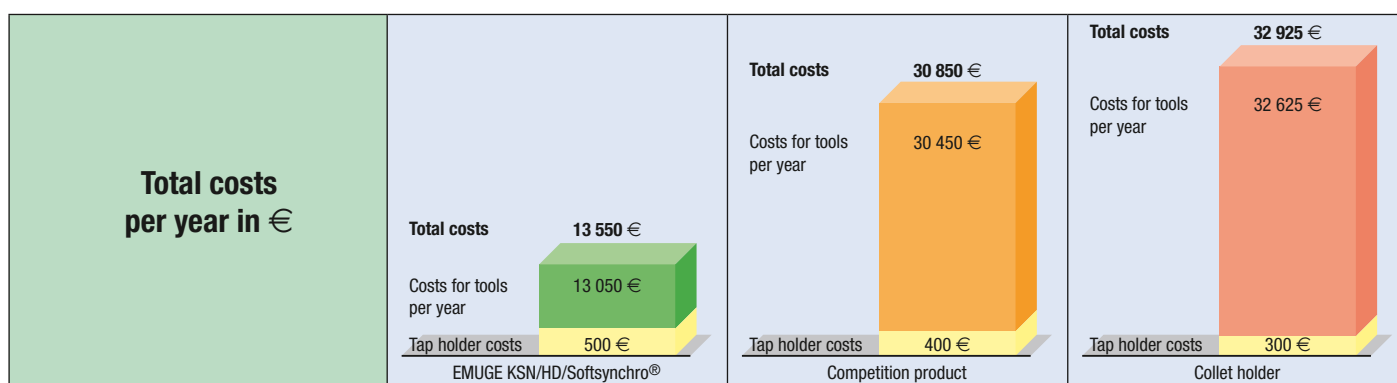
- made of two pieces (holder shank / tool seat)
 - easy to disassemble
 - allowing trouble-free maintenance
- axial force compensation and torque are separated
 - hardly any influence of torque on axial force compensation
- absorption elements made of plastic
 - no influence on the cutting edge of the tool through axial vibration during work
- pre-tensioning of absorption elements
 - allowing axial movement only after the pre-tensioning force is exceeded
- axial movement guided by balls
 - reduced friction (rolling friction), and consequently extra short reaction times
- suitable for up to 50 bar internal coolant pressure
 - no effect on axial force from coolant pressure, consequently no axial movement



Economical efficiency calculation

Work conditions	Holder with minimum length compensation (EMUGE KSN/HD/Softsynchro®)	Holder with minimum length compensation (competition product)	Holder without minimum length compensation (collet holder)
Machine	CNC machine	CNC machine	CNC machine
Feed type	Synchronous	Synchronous	Synchronous
Lubrication	Emulsion 5%	Emulsion 5%	Emulsion 5%
Workpiece	Gear case	Gear case	Gear case
Material	GAISI9	GAISI9	GAISI9
Hole type / depth	Blind hole / 2 x D	Blind hole / 2 x D	Blind hole / 2 x D
Size / tolerance	M6-6HX	M6-6HX	M6-6HX
Tool (cold-forming tap)	GFU-1 Drück-PM-ÖLN-IKZ-TIN	GFU-1 Drück-PM-ÖLN-IKZ-TIN	GFU-1 Drück-PM-ÖLN-IKZ-TIN
Circumferential speed v_c [m/min]	38	38	38
Programmed speed n [rpm]	2 000	2 000	2 000

Costs	Holder with minimum length compensation (EMUGE KSN/HD/Softsynchro®)	Holder with minimum length compensation (competition product)	Holder without minimum length compensation (collet holder)
No. of components per year	300 000	300 000	300 000
No. of threads per component	35	35	35
No. of threads per tool	70 000	30 000	28 000
No. of tools per year	150	350	375
Costs for tools per unit in €	87	87	87
Costs for tools per year in €	13 050	30 450	32 625
Tap holder costs in € (approx.)	500	400	300
Total costs per year in €	13 550	30 850	32 925
Savings per year in €	19 375	2 075	-

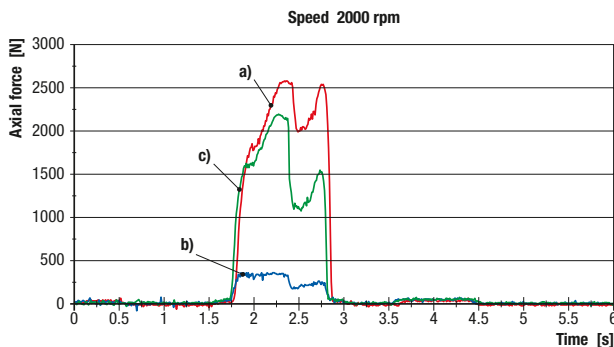
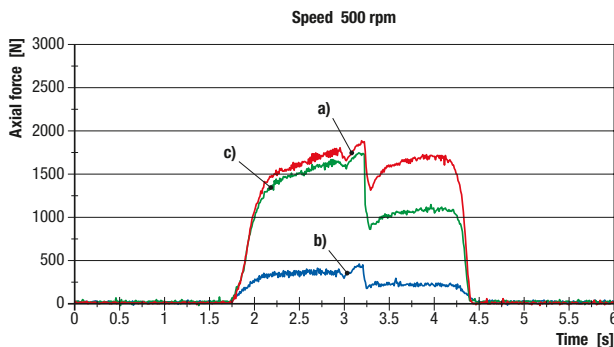


Many tests regarding this topic have been made with taps and cold-forming taps. Depending on the individual case, our customers were able to increase their tool life by up to 150%. In the following diagrams, you will find the axial forces which come into play in the cold-forming of an M10 thread in St37. We have traced the axial forces at two different speeds, 500 min⁻¹ and 2000 min⁻¹.

The following collet holders were tested:

- rigid synchronous collet holder
- EMUGE collet holder type KSN/HD/Softsynchro® size O1, with minimum length compensation on tension and compression
- synchronous collet holder of a competitor with minimum length compensation with axial absorption

All tested collet holders were used with a collet type ER20-GB, i.e. with integrated square.



The following results were verified in these tests:

- axial forces increase with the raise of speed
- the forces which come into play in the cold-forming of threads are considerably higher with a rigid collet holder than with an EMUGE collet holder type KSN/HD/Softsynchro®
- the competition collet holder can absorb the upcoming forces only lightly, in comparison with the rigid collet holder

Conclusion

The EMUGE collet holder type KSN/HD/Softsynchro® makes the optimum use of a synchronous spindle possible, with the best imaginable tool life and thread surface quality.

What is the reason for the excellent axial force characteristics of the EMUGE collet holders KSN/HD/Softsynchro® with minimum length compensation?

The most important feature is the patented constructional separation of the transmission of torque and axial force.

Other construction characteristics of the EMUGE collet holders KSN/HD/Softsynchro® include:

- freedom from play of the tap holder in the C-axis due to form-positive torque transmission by means of steel balls
- soft activation of the pre-tensioned minimum length compensation after exceeding the constructionally specified guide force by almost loss-free rolling friction of the torque transmission balls in their ball grooves
- minimum length compensation and axial force transmission by means of pre-tensioned elastomer springs
- elastomer springs which, by means of their absorption characteristics, prevent oscillation of the tool cutting edge

If the separation of the transmission of axial force and torque is not realised, then an axial error will be generated from the first stage of the thread production – this can be seen clearly on the competition holder. The logical consequence is – as can be seen in the diagrams – an immediate dramatic increase of axial force. This effect is prevented by an intelligent, practice-oriented construction of the collet holders like that of the KSN/HD/Softsynchro® holders.

With machine tools which do not offer the possibility of synchronous thread production, it is necessary to work with a more generous length compensation than the minimum length compensation of the KSN/HD/Softsynchro® collet holders.

For such applications, EMUGE offers collet holders with length compensation and internal coolant-lubricant supply, type KSN/HD/ER; these holders combine the advantages of clamping the threading tool in a collet with those of a classical length compensation holder.

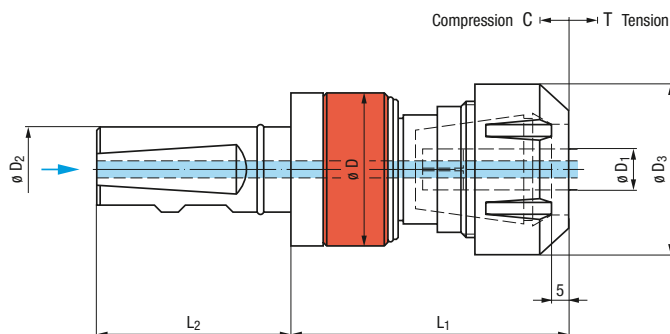
On the following pages you will find an introduction to the KSN/HD/Softsynchro® collet holders which will help you to achieve machining results that leave nothing to be desired where accuracy and tool life are concerned.

The KSN/HD/Softsynchro® series is available in the following designs:

- collet holders for collets type ER-GB with internal coolant-lubricant supply
- collet holders for collets type ER-GB with minimum-quantity lubrication (MQL or MMS)
- collet holders for collets type PGR-GB with internal coolant-lubricant supply
- collet holders for driven tools made by heimtec®, W&F and mimatic® – holders for other manufacturers available upon request

In addition to the standard designs of collet holders listed above, special solutions are available upon request for wet and minimum-quantity lubrication.

with internal coolant-lubricant supply



Internal coolant-lubricant supply

IKZ

Coolant-lubricant pressure at the entry to the holder

p_{max}
50bar
(700psi)

Length compensation on compression and tension

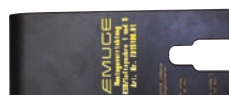
↑ C
↓ T

Tool adaptation by means of collets

ER_(GB)

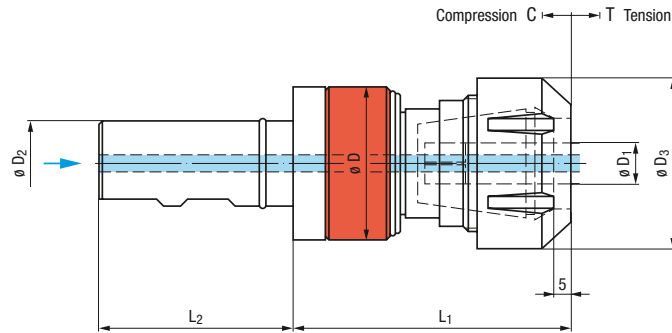
Type		$\varnothing D_1$		$\varnothing D_2$	$\varnothing D$	$\varnothing D_3$	L_1 ER	L_1 ER-GB	L_2	C	T	Article no.	
KSN0HD/Softsynchro®	M2 - M8 (No.2 - 5/16)	2.5 - 7	ER 11 (GB)	16	34	16	72.7	71	48	0.5	0.5	F3150G24.1.44	●
				20	34	16	72.7	71	51	0.5	0.5	F3150G25.1.44	●
				25	34	16	72.7	71	57	0.5	0.5	F3150G26.1.44	●
KSN1HD/Softsynchro®	M4 - M12 (No.8 - 7/16)	4.5 - 10	ER 20 (GB)	25	34	34	–	73	57	0.5	0.5	F3151G26.1.44	●
KSN3HD/Softsynchro®	M4 - M20 (No.8 - 3/4)	4.5 - 16	ER 32 (GB)	25	45	50	–	87.3	57	0.5	0.5	F3153G26.1.44	●
KSN4HD/Softsynchro®	M12 - M30 (7/16 - 1 1/8)	9 - 22	ER 40 (GB)	32	63	63	–	113.5	61	0.7	0.7	F3154G27.1	●

- Collets and adapter shanks (see pages 17-18), please order separately
- Wrenches for tightening the clamping nut and for counter-holding are available as assembly sets (see page 19), please order separately
- For checking the torque values on the clamping nuts, we recommend using torque wrenches type TORCO-FIX (see page 24)
- Further designs available upon request
- **KSN0HD/Softsynchro®:**
Clamping nut without integrated seal is included in the delivery
Clamping nut with integrated seal, type Hi-Q/ERMC 11 (see page 20), please order separately
- **KSN1-4HD/Softsynchro®:**
Sealing discs (see page 22), please order separately
Clamping nut for sealing discs is included in the delivery



F315199.01 Assembly device for KSN1/HD/Softsynchro® and KSN3/HD/Softsynchro®

with internal coolant-lubricant supply



Internal coolant-lubricant supply

IKZ

Coolant-lubricant pressure at the entry to the holder



p_{max}
50bar
(700psi)

Length compensation on compression and tension

$\uparrow C$
 $\downarrow T$

Tool adaptation by means of collets

ER_(GB)

Type		$\varnothing D_1$		$\varnothing D_2$	$\varnothing D$	$\varnothing D_3$	L_1	L_2	C	T	Article no.	
KSN1HD/Softsynchro®	M4 - M12 (No.8 - 7/16)	4.5 - 10	ER 20 (GB)	1"	34	34	73	58	0.5	0.5	F3151H36.1.44	●
KSN3HD/Softsynchro®	M4 - M20 (No.8 - 3/4)	4.5 - 16	ER 32 (GB)	1"	45	50	87.3	58	0.5	0.5	F3153H36.1.44	●

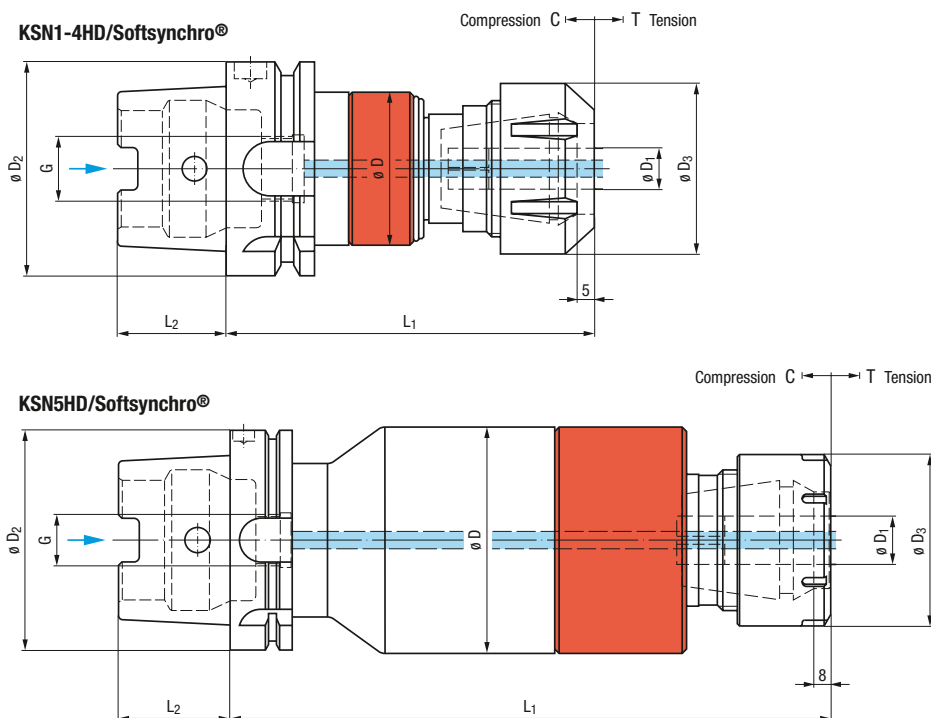
- Clamping nut for sealing discs is included in the delivery
- Wrenches for tightening the clamping nut and for counter-holding are available as assembly sets (see page 19), please order separately
- Collets and sealing discs (see pages 18-22), please order separately
- For checking the torque values on the clamping nuts, we recommend using torque wrenches type TORCO-FIX (see page 24)
- Further designs available upon request



F315199.01 Assembly device for KSN1/HD/Softsynchro® and KSN3/HD/Softsynchro®

Collet holders with hollow taper shank according to DIN 69893 A

with internal coolant-lubricant supply



Internal coolant-lubricant supply

IKZ

Coolant-lubricant pressure at the entry to the holder

p_{max}
50bar
(700psi)

Length compensation on compression and tension

↕ C
↕ T

Tool adaptation by means of collets

ER_(GB)

with bore for data chip according to DIN 69873

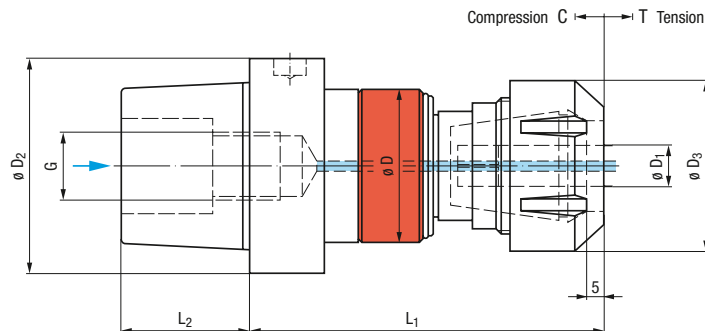
Type		$\varnothing D_1$		$\varnothing D_2$	$\varnothing D$	$\varnothing D_3$	L_1 ER	L_1 ER-GB	L_2	G	C	T	Article no.	
KSN0HD/ Softsynchro®	M2 - M8 (No.2 - 5/16)	2.5 - 7	ER 11 (GB)	HSK-A50	34	16	93.2	91.5	25	M16 x 1	0.5	0.5	F3150C03.1	●
				HSK-A63	34	16	95.2	93.5	32	M18 x 1	0.5	0.5	F3150C04.1	●
				HSK-A80	34	16	99.7	98	40	M20 x 1.5	0.5	0.5	F3150C05.1	●
				HSK-A100	34	16	101.7	100	50	M24 x 1.5	0.5	0.5	F3150C06.1	●
KSN1HD/ Softsynchro®	M4 - M12 (No.8 - 7/16)	4.5 - 10	ER 20 (GB)	HSK-A50	34	34	-	93.5	25	M16 x 1	0.5	0.5	F3151C03.1	●
				HSK-A63	34	34	-	95.5	32	M18 x 1	0.5	0.5	F3151C04.1	●
				HSK-A80	34	34	-	100	40	M20 x 1.5	0.5	0.5	F3151C05.1	●
				HSK-A100	34	34	-	102	50	M24 x 1.5	0.5	0.5	F3151C06.1	●
KSN3HD/ Softsynchro®	M4 - M20 (No.8 - 3/4)	4.5 - 16	ER 32 (GB)	HSK-A50	45	50	-	116.3	25	M16 x 1	0.5	0.5	F3153C03.1	●
				HSK-A63	45	50	-	108.8	32	M18 x 1	0.5	0.5	F3153C04.1	●
				HSK-A80	45	50	-	113.3	40	M20 x 1.5	0.5	0.5	F3153C05.1	●
				HSK-A100	45	50	-	115.3	50	M24 x 1.5	0.5	0.5	F3153C06.1	●
KSN4HD/ Softsynchro®	M12 - M30 (1 1/16 - 1 1/8)	9 - 22	ER 40 (GB)	HSK-A63	63	63	-	146.5	32	M18 x 1	0.7	0.7	F3154C04.1	●
				HSK-A80	63	63	-	136	40	M20 x 1.5	0.7	0.7	F3154C05.1	●
				HSK-A100	63	63	-	138	50	M24 x 1.5	0.7	0.7	F3154C06.1	●
KSN5HD/ Softsynchro®	M30 - M48 (1 1/8 - 1 3/4)	22 - 36	ER 50 (GB)	HSK-A100	103	78	269	265.6	50	M24 x 1.5	2	2	F3155C06.1	●

- Collets, coolant-lubricant tubes and wrenches (see pages 18-23), please order separately
- Wrenches for tightening the clamping nut and for counter-holding are available as assembly sets (see page 19), please order separately
- For checking the torque values on the clamping nuts, we recommend using torque wrenches type TORCO-FIX (see page 24)
- Further designs available upon request
- **KSN0HD/Softsynchro®:**
Clamping nut without integrated seal is included in the delivery
Clamping nut with integrated seal, type Hi-Q/ERMC 11 (see page 20), please order separately
- **KSN1-5HD/Softsynchro®:**
Sealing discs (see page 22), please order separately
Clamping nut for sealing discs is included in the delivery
Square seat for tools with shank diameter 36 mm is integrated in the body of tap holders KSN5HD/Softsynchro®



F315199.01 Assembly device for KSN1/HD/Softsynchro® and KSN3/HD/Softsynchro®

with internal coolant-lubricant supply



Internal coolant-lubricant supply

IKZ

Coolant-lubricant pressure at the entry to the holder

p_{max}
50bar
(700psi)



Length compensation on compression and tension



Tool adaptation by means of collets

ER_(GB)

with bore for data chip according to DIN 69873

Type		$\varnothing D_1$		$\varnothing D_2$	$\varnothing D$	$\varnothing D_3$	L_1 ER	L_1 ER-GB	L_2	G	C	T	Article no.	
KSN0HD/Softsynchro®	M2 - M8 (No.2 - 5/16)	2.5 - 7	ER 11 (GB)	PSC63 (Capto C6)	34	16	95	93.2	38	M20 x 2	0.5	0.5	F3150T06.1	●
KSN1HD/Softsynchro®	M4 - M12 (No.8 - 7/16)	4.5 - 10	ER 20 (GB)	PSC63 (Capto C6)	34	34	—	93.5	38	M20 x 2	0.5	0.5	F3151T06.1	●
KSN3HD/Softsynchro®	M4 - M20 (No.8 - 3/4)	4.5 - 16	ER 32 (GB)	PSC63 (Capto C6)	45	50	—	108	38	M20 x 2	0.5	0.5	F3153T06.1	●
KSN4HD/Softsynchro®	M12 - M30 (7/16 - 1 1/8)	9 - 22	ER 40 (GB)	PSC63 (Capto C6)	63	63	—	130.5	38	M20 x 2	0.7	0.7	F3154T06.1	●

- Collets (see page 18), please order separately
- Wrenches for tightening the clamping nut and for counter-holding are available as assembly sets (see page 19), please order separately
- For checking the torque values on the clamping nuts, we recommend using torque wrenches type TORCO-FIX (see page 24)
- Further designs available upon request
- **KSN0HD/Softsynchro®:**
Clamping nut without integrated seal is included in the delivery
Clamping nut with integrated seal, type Hi-Q/ERMC 11 (see page 20), please order separately
- **KSN1-4HD/Softsynchro®:**
Sealing discs (see page 22), please order separately
Clamping nut for sealing discs is included in the delivery



F315199.01 Assembly device for KSN1/HD/Softsynchro® and KSN3/HD/Softsynchro®

Collet holders with taper shank according to DIN 69871 AD or B

with internal coolant-lubricant supply

Internal coolant-lubricant supply

IKZ

Coolant-lubricant pressure at the entry to the holder

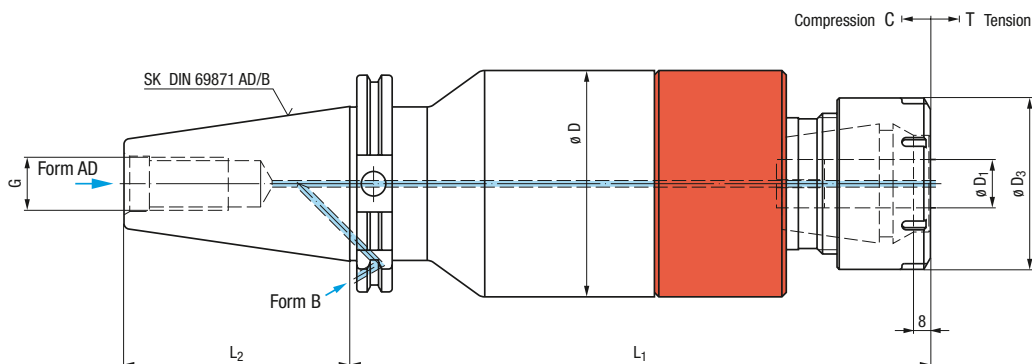
p_{max}
50bar
(700psi)

Length compensation on compression and tension

↕ C
↕ T

Tool adaptation by means of collets

ER_(GB)

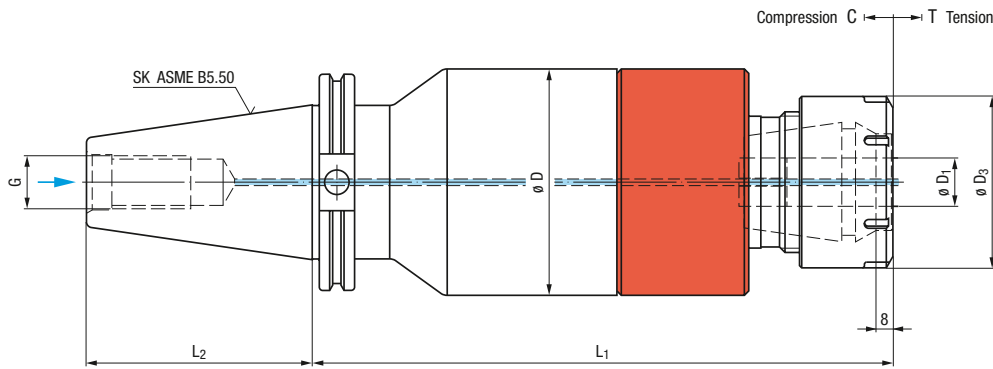


with bore for data chip according to DIN 69873

Type		ø D ₁		SK	ø D	ø D ₃	L ₁ ER	L ₁ ER-GB	L ₂	G	C	T	Article no.	
KSN5HD/ Softsynchro®	M30 - M48 (1 1/8 - 1 3/4)	22 - 36	ER 50 (GB)	ISO 50 AD	103	78	267.5	264	101.75	M24	2	2	F3155653.1	●
				ISO 50 B	103	78	267.5	264	101.75	M24	2	2	F3155653.2	●

- Clamping nut for sealing discs is included in the delivery
- Wrenches for tightening the clamping nut and for counter-holding are available as assembly sets (see page 19), please order separately
- Collets and sealing discs (see pages 18-22), please order separately
- Square seat for tools with shank diameter 36 mm is integrated in the tap holder body
- For checking the torque values on the clamping nuts, we recommend using torque wrenches type TORCO-FIX (see page 24)
- Further designs available upon request

with internal coolant-lubricant supply



Internal coolant-lubricant supply

IKZ

Coolant-lubricant pressure at the entry to the holder

p_{max}
50bar
(700psi)



Length compensation on compression and tension

↕ C
↕ T

Tool adaptation by means of collets

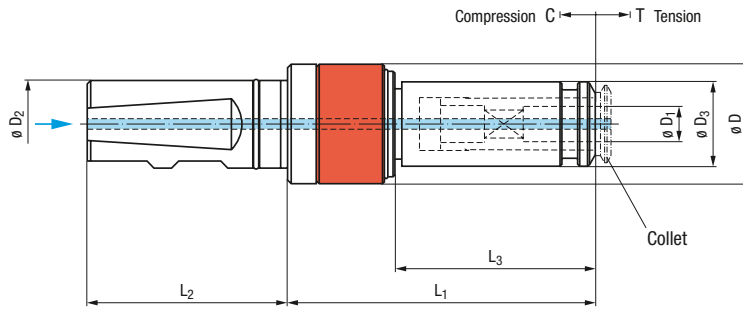
ER_(GB)

with bore for data chip according to DIN 69873

Type		$\varnothing D_1$		SK	$\varnothing D$	$\varnothing D_3$	L_1 ER	L_1 ER-GB	L_2	G	C	T	Article no.
KSN5HD/Softsynchro®	M30 - M48 (1 1/8 - 1 3/4)	22 - 36	ER 50 (GB)	ISO 50	103	78	267.5	264	101.6	1" - 8	2	2	F3155783.1.16

- Clamping nut for sealing discs is included in the delivery
- Wrenches for tightening the clamping nut and for counter-holding are available as assembly sets (see page 19), please order separately
- Collets and sealing discs (see pages 18-22), please order separately
- Square seat for tools with shank diameter 36 mm is integrated in the tap holder body
- For checking the torque values on the clamping nuts, we recommend using torque wrenches type TORCO-FIX (see page 24)
- Further designs available upon request

with internal coolant-lubricant supply



Internal coolant-lubricant supply

IKZ

Coolant-lubricant pressure at the entry to the holder


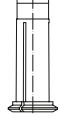
p_{max}
50bar
(700psi)

Length compensation on compression and tension



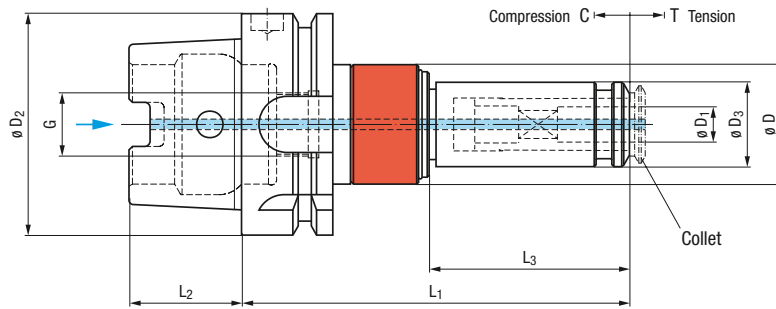
Tool adaptation by means of collets

PGR(GB)

Type		$\varnothing D_1$		$\varnothing D_2$	$\varnothing D$	$\varnothing D_3$	L_1	L_2	L_3	C	T	Article no.	
KSN1HD/Softsynchro®/PGR	M4 - M12 (No.8 - 7/16)	4.5 - 10	PGR 15 GB	25	34	24	87.5	57	57	0.5	0.5	F3221G26.1.44	●
KSN3HD/Softsynchro®/PGR	M8 - M20 (3/16 - 3/4)	8 - 16	PGR 25 GB	25	45	40	103.5	57	67	0.5	0.5	F3223G26.1.44	●

- Collets type PGR-GB and adapter shanks (see pages 17-27), please order separately
- Equipment for pressing in the PGR-GB collets (see pages 25-26), please order separately
- Further designs available upon request

with internal coolant-lubricant supply



Internal coolant-lubricant supply

IKZ

Coolant-lubricant pressure at the entry to the holder

p_{max}
50bar
(700psi)



Length compensation on compression and tension

C
T

Tool adaptation by means of collets

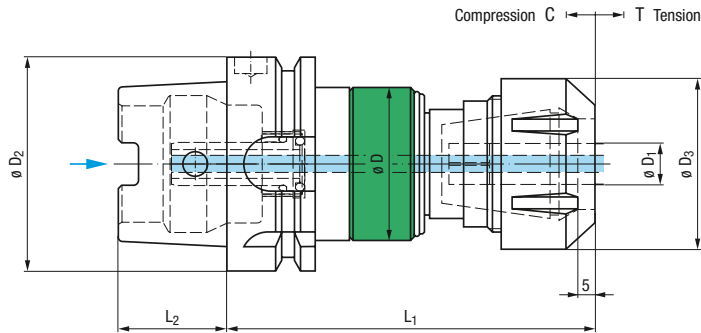
PGR_(GB)

with bore for data chip according to DIN 69873

Type		$\varnothing D_1$		$\varnothing D_2$	$\varnothing D$	$\varnothing D_3$	L_1	L_2	L_3	G	C	T	Article no.	
KSN1HD/ Softsynchro®/ PGR	M4 - M12 (No.8 - 7/16)	4.5 - 10	PGR 15 GB	HSK-A50	34	24	108	25	57	M16 x 1	0.5	0.5	F3221C03.1	●
				HSK-A63	34	24	110	32	57	M18 x 1	0.5	0.5	F3221C04.1	●
				HSK-A80	34	24	114.5	40	57	M20 x 1.5	0.5	0.5	F3221C05.1	●
				HSK-A100	34	24	116.5	50	57	M24 x 1.5	0.5	0.5	F3221C06.1	●
KSN3HD/ Softsynchro®/ PGR	M8 - M20 (9/16 - 3/4)	8 - 16	PGR 25 GB	HSK-A50	45	40	132.5	25	67	M16 x 1	0.5	0.5	F3223C03.1	●
				HSK-A63	45	40	125	32	67	M18 x 1	0.5	0.5	F3223C04.1	●
				HSK-A80	45	40	129.5	40	67	M20 x 1.5	0.5	0.5	F3223C05.1	●
				HSK-A100	45	40	131.5	50	67	M24 x 1.5	0.5	0.5	F3223C06.1	●

- Collets type PGR-GB and adapter shanks (see pages 23-27), please order separately
- Equipment for pressing in the PGR-GB collets (see pages 25-26), please order separately
- Further designs available upon request

with minimum-quantity lubrication



Minimum-quantity lubrication

MMS

Coolant-lubricant pressure at the entry to the holder

p_{max}
6bar
(85psi)

Length compensation on compression and tension



Tool adaptation by means of collets

ER_(GB)

with bore for data chip according to DIN 69873

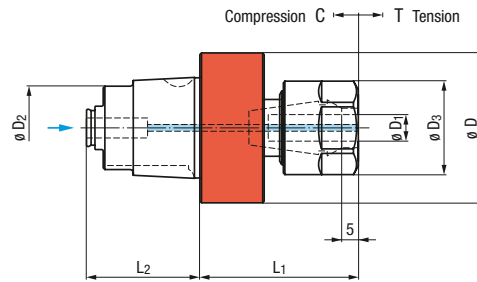
Type		$\varnothing D_1$		$\varnothing D_2$	$\varnothing D$	$\varnothing D_3$	L_1	L_2	C	T	Article no.	
KSN1HD/ Softsynchro®/ MMS	M6 - M12 (¹ / ₄ - ⁷ / ₁₆)	6 - 10	ER 20 (GB)	HSK-A50	34	34	93.5	25	0.5	0.5	F3171C03.1	●
				HSK-A63	34	34	95.5	32	0.5	0.5	F3171C04.1	●
				HSK-A80	34	34	100	40	0.5	0.5	F3171C05.1	●
				HSK-A100	34	34	102	50	0.5	0.5	F3171C06.1	●
KSN3HD/ Softsynchro®/ MMS	M6 - M20 (¹ / ₄ - ³ / ₄)	6 - 16	ER 32 (GB)	HSK-A50	45	50	116.3	25	0.5	0.5	F3173C03.1	●
				HSK-A63	45	50	108.8	32	0.5	0.5	F3173C04.1	●
				HSK-A80	45	50	113.3	40	0.5	0.5	F3173C05.1	●
				HSK-A100	45	50	115.3	50	0.5	0.5	F3173C06.1	●

- The coolant-lubricant tube is integrated into the shank and must not be removed, otherwise the function of the MQL / MMS transfer is no longer guaranteed!
- Wrenches for tightening the clamping nut and for counter-holding are available as assembly sets (see page 19), please order separately
- Clamping nut for sealing discs is included in the delivery
- In case of an order, the transfer mode for coolant-lubricant (1-/2-channel system) must be clarified
- Design with HSK-C shank for 1- and 2-channel MQL / MMS systems available upon request
- Collets and sealing discs (see pages 18-22), please order separately
- Further designs available upon request



F315199.01 Assembly device for KSN1/HD/Softsynchro® and KSN3/HD/Softsynchro®

with internal coolant-lubricant supply



Internal coolant-lubricant supply

IKZ

Coolant-lubricant pressure at the entry to the holder




p_{max}
70bar
(1015psi)

Length compensation on compression and tension



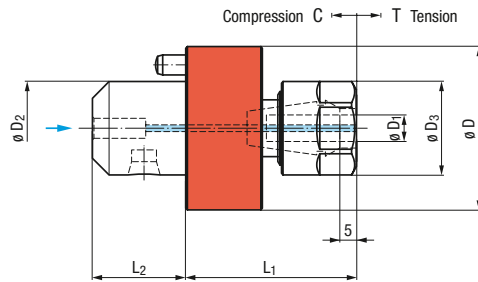
Tool adaptation by means of collets

ER_(GB)

Type		$\varnothing D_1$			$\varnothing D_2$	$\varnothing D$	$\varnothing D_3$	L_1 ER	L_1 ER-GB	L_2	C	T	Article no.	
KSN1HD/ Softsynchro®	M4 - M12 (No.8 - 3/8)	4.5 - 10	ER 16 (GB)	MI 40	25	45	28	51	47.5	34	0.5	0.5	F3151Z40.M01001	●
				MI 50	33	55	28	48	44.5	41	0.5	0.5	F3151Z50.M01001	●

- Clamping nut for sealing discs is included in the delivery
- Wrenches for tightening the clamping nut and for counter-holding are available as assembly sets (see page 19), please order separately
- Collets and sealing discs (see pages 18-22), please order separately
- Square seat for tools with shank diameter 9 and 10 mm is integrated in the tap holder body
- For checking the torque values on the clamping nuts, we recommend using torque wrenches type TORCO-FIX (see page 24)
- Further designs available upon request

with internal coolant-lubricant supply



Internal coolant-lubricant supply

IKZ

Coolant-lubricant pressure at the entry to the holder

p_{max}
70bar
(1015psi)

Length compensation on compression and tension

$\uparrow C$
 $\downarrow T$

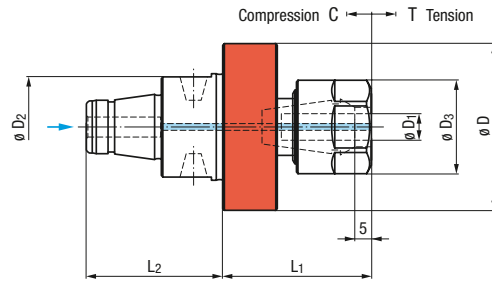
Tool adaptation by means of collets

ER_(GB)

Type		$\varnothing D_1$			$\varnothing D_2$	$\varnothing D$	$\varnothing D_3$	L_1 ER	L_1 ER-GB	L_2	C	T	Article no.	
KSN1HD/Softsynchro®	M4 - M12 (No.8 - $\frac{3}{8}$)	4.5 - 10	ER 16 (GB)	HT4	22	39	28	55	51.5	21.5	0.5	0.5	F3151Z04.H01001	●
				HT5	28	49	28	55	51.5	28	0.5	0.5	F3151Z05.H01001	●
				HT6	36	64	28	48	44.5	28	0.5	0.5	F3151Z06.H01001	●

- Clamping nut for sealing discs is included in the delivery
- Wrenches for tightening the clamping nut and for counter-holding are available as assembly sets (see page 19), please order separately
- Collets and sealing discs (see pages 18-22), please order separately
- Square seat for tools with shank diameter 9 and 10 mm is integrated in the tap holder body
- For checking the torque values on the clamping nuts, we recommend using torque wrenches type TORCO-FIX (see page 24)
- Further designs available upon request

with internal coolant-lubricant supply



Internal coolant-lubricant supply

IKZ

Coolant-lubricant pressure at the entry to the holder



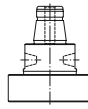
p_{max}
70bar
(1015psi)

Length compensation on compression and tension

↕ C
↕ T

Tool adaptation by means of collets

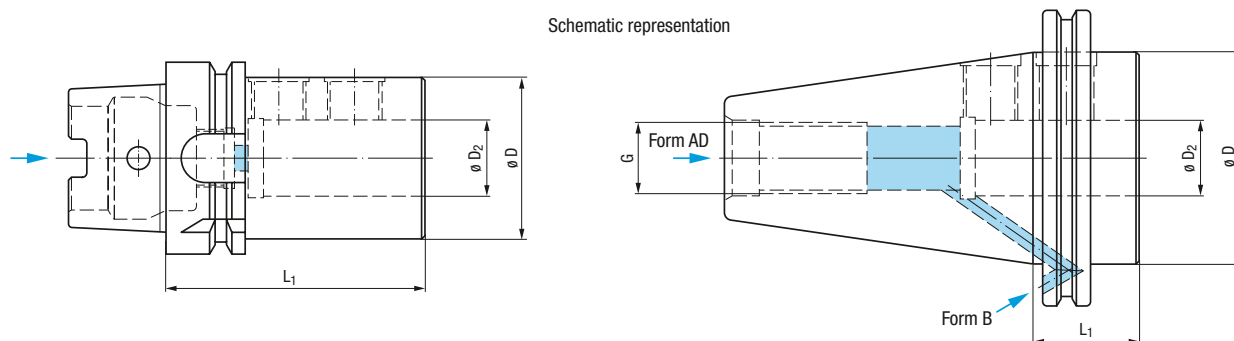
ER_(GB)

Type		$\varnothing D_1$											Article no.	
					$\varnothing D_2$	$\varnothing D$	$\varnothing D_3$	L_1 ER	L_1 ER-GB	L_2	C	T		
KSN1HD/ Softsynchro®	M4 - M12 (No.8 - 3/8)	4.5 - 10	ER 16 (GB)	WFB 32-20	32	50	28	48	44.5	41	0.5	0.5	F3151Z32.W01001	●
				WFB 40-25	40	63	28	48	44.5	46	0.5	0.5	F3151Z40.W01001	●
				WFB 50-32	48	75	28	48	44.5	54	0.5	0.5	F3151Z50.W01001	●

- Clamping nut for sealing discs is included in the delivery
- Wrenches for tightening the clamping nut and for counter-holding are available as assembly sets (see page 19), please order separately
- Collets and sealing discs (see pages 18-22), please order separately
- Square seat for tools with shank diameter 9 and 10 mm is integrated in the tap holder body
- For checking the torque values on the clamping nuts, we recommend using torque wrenches type TORCO-FIX (see page 24)
- Further designs available upon request

Adapter shanks with shank adaptation according to DIN 1835 B

with internal coolant-lubricant supply



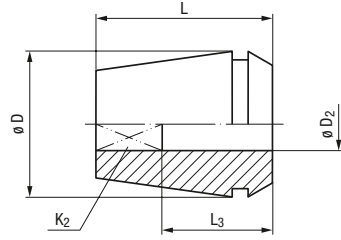
Type	Shank size					Article no.	
		$\varnothing D_2$	$\varnothing D$	G	L ₁		
DIN 69871 AD 1)	ISO 40	25	45	M16	35	F330006.01	●
	ISO 50	25	70	M24	35	F330006.02	●
	ISO 50	32	70	M24	35	F330006.05	●
DIN 69871 B 1)	ISO 40	25	45	M16	35	F330006.03	●
	ISO 50	25	70	M24	35	F330006.04	●
	ISO 50	32	70	M24	35	F330006.06	●
DIN 2080	ISO 30	20	36	M12	34	F330005.03	●
	ISO 40	25	44	M16	31.6	F330005.01	●
	ISO 50	25	70	M24	16	F330005.02	●
	ISO 50	32	70	M24	16	F330005.04	●
ASME B5.50 metr.	ISO 40	25	45	M16	35	F330007.01	●
	ISO 50	25	70	M24	35	F330007.02	●
	ISO 50	32	70	M24	35	F330007.06	●
ASME B5.50 UNC	ISO 40	25	44.5	$\frac{5}{8}$ - 11	35	F330007.03	●
	ISO 50	25	70	1" - 8	35	F330007.04	●
	ISO 50	32	70	1" - 8	35	F330007.05	●
JIS B 6339 (MAS 403 BT)	ISO 40	25	45	M16	35	F330008.01	●
	ISO 50	25	70	M24	44	F330008.02	●
	ISO 50	32	70	M24	44	F330008.03	●
DIN 69893 A 1) 2)	HSK-A40	20	52	M12 x 1	75	F33000C.02	●
	HSK-A40	25	65	M12 x 1	105	F33000C.03	●
	HSK-A50	20	52	M16 x 1	80	F33000C.04	●
	HSK-A50	25	65	M16 x 1	107	F33000C.05	●
	HSK-A50	32	77	M16 x 1	114	F33000C.06	●
	HSK-A63	25	53	M18 x 1	85	F33000C.07	●
	HSK-A63	32	72	M18 x 1	110	F33000C.08	●
	HSK-A80	25	65	M20 x 1.5	90	F33000C.09	●
	HSK-A80	32	72	M20 x 1.5	110	F33000C.10	●
	HSK-A100	25	65	M24 x 1.5	100	F33000C.11	●
	HSK-A100	32	72	M24 x 1.5	96	F33000C.12	●

1) With bore for data chip according to DIN 69873

2) Coolant-lubricant tubes and wrenches (see page 23), please order separately

The locking screw is included in the delivery

with square drive



Tool adaptation by means of collets

ER_(GB)

Internal coolant-lubricant supply

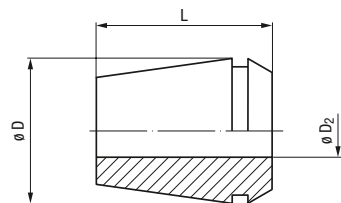
IKZ

Coolant-lubricant pressure at the entry to the holder

p_{max}
100bar
(1400psi)

Type	ER 11 GB		ER 16 GB		ER 20 GB		ER 32 GB		ER 40 GB		ER 50 GB	
	M2 - M8		M4 - M12		M4 - M12		M4 - M20		M7 - M30		M27 - M42	
	ø D		16		20		32		40		51	
	L		27.5		31.5		40		46		60	
DIN	ø D ₂	K ₂			Article no.		Article no.		Article no.		Article no.	
					•	•	•	•	•	•	•	•
					L ₃	L ₃	L ₃	L ₃	L ₃	L ₃	L ₃	L ₃
	2.5	2.1	M1 - M1.8	M3.5								
	2.8	2.1	M2 - M2.6	M4	F0942011.2.8	12						
	3.5	2.7	M3	M4.5 - M5	F0942011.3.5	14						
	4	3	M3.5	M5.5	F0942011.4	14						
	4.5	3.4	M4	M6	F0942011.4.5	14	F0942016.4.5	18	F0942020.4.5	18	F0942032.4.5	18
	6	4.9	M4.5 - M6	M8	F0942011.6	18	F0942016.6	18	F0942020.6	18	F0942032.6	18
	7	5.5	M7	M9 - M10			F0942016.7	18	F0942020.7	18	F0942032.7	18
	8	6.2	M8	M11			F0942016.8	22	F0942020.8	22	F0942032.8	22
	9	7	M9	M12			F0942016.9	22	F0942020.9	22	F0942032.9	22
	10	8	M10						F0942020.10	25	F0942032.10	25
	11	9		M14							F0942040.10	25
	12	9		M16							F0942032.11	25
	14	11		M18							F0942032.12	25
	16	12		M20							F0942032.14	25
	18	14.5		M22 - M24							F0942032.16	25
	20	16		M27							F0942040.16	25
	22	18		M30							F0942040.18	25
	25	20		M33							F0942040.20	28
	28	22		M36							F0942040.22	28
	32	24		M39 - M42							F0942040.22	28
											F0942050.22	41
											F0942050.25	41
											F0942050.28	41
											F0942050.32	41

without square drive



Tool adaptation by means of collets

ER

Internal coolant-lubricant supply

IKZ

Coolant-lubricant pressure at the entry to the holder

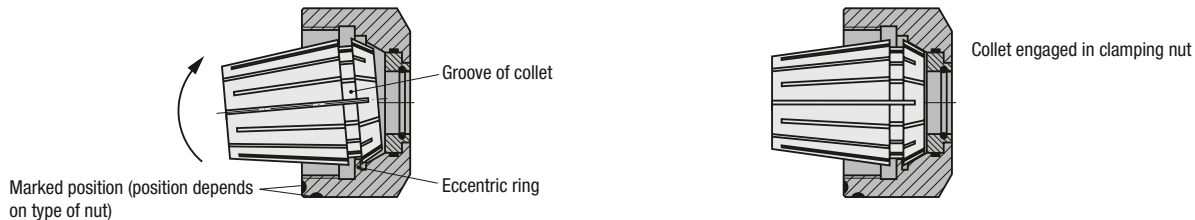
p_{max}
100bar
(1400psi)

Type	ER 16		ER 50	
	8 - 10		36	
	ø D		50	
	L		60	
	Article no.		Article no.	
	ø D ₂		ø D ₂	
	9	8	F0943016.9	•
	10	9	F0943016.10	•
	36		F0943050.36	•

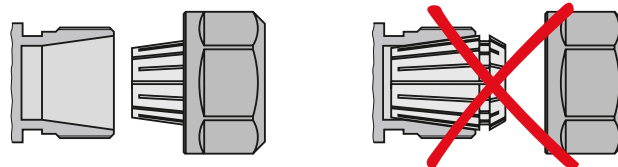
• Further designs available upon request

Assembly of collet and tool

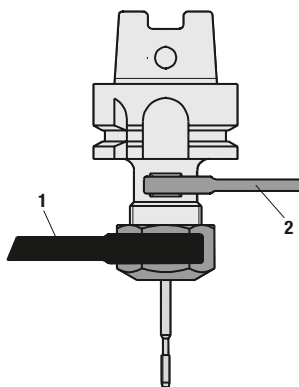
1. Insert collet into the clamping nut.
2. Tilt collet.
The groove of the collet must engage in the eccentric ring of the clamping nut at the marked position.
Tilt collet in opposite direction until it clearly engages.
Collet is flush with the clamping nut or the sealing disc.



3. Screw the engaged collet with the clamping nut manually onto the thread of the holder.
Important: Only mount clamping nuts with correctly engaged collet!



4. Insert tool.
Important: If collet and tap are provided with a square, the tap must be brought into such a position that it can be pushed into the square seat of the collet.
5. Tighten the clamping nut with the wrench.
Observe the max. torque values in the table.



Type	Max. tightening torque	
	(Nm)	
Hi-Q/ERM 11	15	
Hi-Q/ERMC 11	15	
Hi-Q/ERC 16	50	
Hi-Q/ERC 20	40	
Hi-Q/ERC 32	170	
Hi-Q/ERC 40	220	
Hi-Q/ERBC 50/AF	375	

• The specifications apply to collets type ER-GB.
We recommend a tightening torque of 80% of the max. torque.

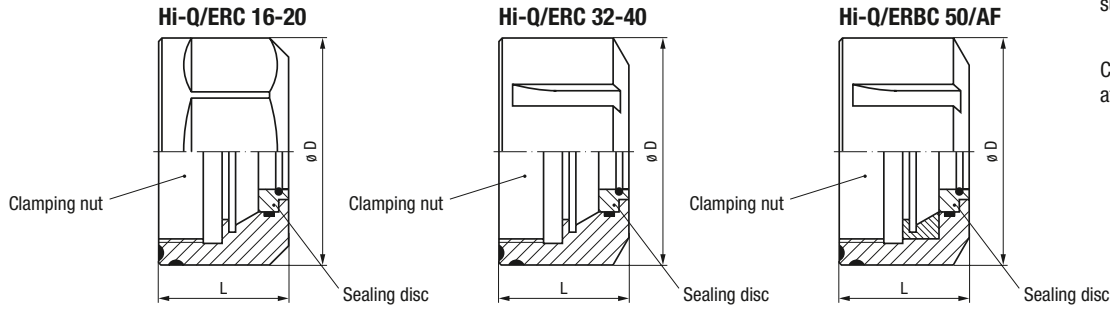
Important: In order to avoid damage to the holder, please counter with open-ended spanner **2** while tightening the clamping nut with wrench **1**.
The wrenches are not included in the delivery. Please order the following assembly sets, consisting of a wrench for tightening the clamping nut and a wrench for countering, separately:

	Article no.	
Assembly set for:		
KSN0HD/Softsynchro®	F315098.02	●
KSN1HD/Softsynchro®	F315198.02	●
KSN1HD/Softsynchro® for driven tools	F315198.03	●
KSN3HD/Softsynchro®	F315398.01	●
KSN4HD/Softsynchro®	F315498.01	●
KSN5HD/Softsynchro®	F315598.01*	●

* Wrench for clamping nut only, countering not necessary in this size

Clamping nuts

Clamping nuts for sealing discs



Internal coolant-lubricant supply

IKZ

Coolant-lubricant pressure at the entry to the holder

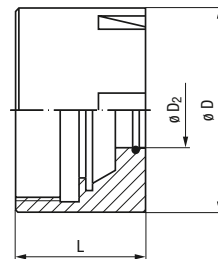
p_{max}
100bar
(1400psi)

Type		Hi-Q/ERC 16	Hi-Q/ERC 20	Hi-Q/ERC 32	Hi-Q/ERC 40	Hi-Q/ERBC 50/AF
	$\varnothing D$	28	35	50	63	77.7
	L	22.5	25	29	31	42.5
		Article no.	Article no.	Article no.	Article no.	Article no.
for collet	Sealing disc					
ER 16 (GB)	DS/ER 16	F0940716	•			
ER 20 (GB)	DS/ER 20		F0940720	•		
ER 32 (GB)	DS/ER 32			F0940732	•	
ER 40 (GB)	DS/ER 40				F0940740	•
ER 50 (GB)	DS/ER 50					F0941650
						•

• Sealing discs (see page 22) are not included in the delivery, please order separately

Clamping nuts with integrated sealing

Hi-Q/ERMC 11





Internal coolant-lubricant supply

IKZ

Coolant-lubricant pressure at the entry to the holder

p_{max}
100bar
(1400psi)

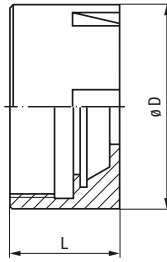
Type			Hi-Q/ERMC 11				
	$\varnothing D$		16				
	L		14.6				
DIN			Article no.				
$\varnothing D_2$	K_2			for collet			
6	4.9	M4.5 - M6	M8	ER 11 (GB)	F0943511.6	•	
7	5.5	M7	M9 - M10	ER 11 (GB)	F0943511.7	•	

• Further designs available upon request

Clamping nuts

Clamping nuts without sealing

Hi-Q/ERM 11

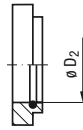




Type	Hi-Q/ERM 11					
	$\varnothing D$	16				
	L	12				
	Article no.					
for collet						
ER 11 (GB)	F0940311	•				

• Further designs available upon request

Sealing discs

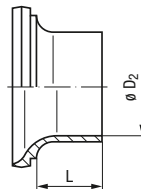
DS/ER





Type				DS/ER 16		DS/ER 20		DS/ER 32		DS/ER 40		DS/ER 50	
DIN				Article no.		Article no.		Article no.		Article no.		Article no.	
Ø D ₂	K ₂												
4	3	M3.5	M5.5	F0941516.4	●								
4.5	3.4	M4	M6	F0941516.4.5	●	F0941520.4.5	●						
6	4.9	M4.5 - M6	M8	F0941516.6	●	F0941520.6	●	F0941532.6	●	F0941540.6	●		
7	5.5	M7	M9 - M10	F0941516.7	●	F0941520.7	●	F0941532.7	●	F0941540.7	●		
8	6.2	M8	M11	F0941516.8	●	F0941520.8	●	F0941532.8	●	F0941540.8	●		
9	7	M9	M12	F0941516.9	●	F0941520.9	●	F0941532.9	●	F0941540.9	●		
10	8	M10		F0941516.10	●	F0941520.10	●	F0941532.10	●	F0941540.10	●		
11	9		M14					F0941532.11	●	F0941540.11	●		
12	9		M16					F0941532.12	●	F0941540.12	●		
14	11		M18					F0941532.14	●	F0941540.14	●		
16	12		M20					F0941532.16	●	F0941540.16	●		
18	14.5		M22 - M24							F0941540.18	●		
20	16		M27							F0941540.20	●		
22	18		M30									F0941550.22	●
25	20		M33									F0941550.25	●
28	22		M36									F0941550.28	●
32	24		M39 - M42									F0941550.32	●
36	29		M45 - M48									F0941550.36	●

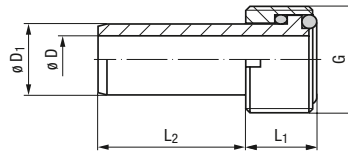
Coolant flush disks

KS/ER



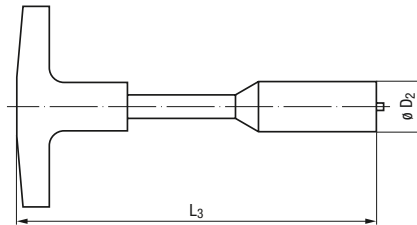
Type				KS/ER 16		KS/ER 20		KS/ER 32					
DIN				Article no.		Article no.		Article no.					
Ø D ₂	K ₂				L		L		L				
4	3	M3.5	M5.5	F0941716.4	11	●							
4.5	3.4	M4	M6										
6	4.9	M4.5 - M6	M8	F0941716.6	11	●	F0941720.6	11	●	F0941732.6	11	●	
7	5.5	M7	M9 - M10	F0941716.7	11	●	F0941720.7	11	●	F0941732.7	11	●	
8	6.2	M8	M11	F0941716.8	11	●	F0941720.8	11	●	F0941732.8	11	●	
9	7	M9	M12	F0941716.9	11	●	F0941720.9	11	●	F0941732.9	11	●	
10	8	M10		F0941716.10	2	●	F0941720.10	11	●	F0941732.10	11	●	
11	9		M14							F0941732.11	11	●	
12	9		M16							F0941732.12	11	●	
14	11		M18							F0941732.14	11	●	
16	12		M20							F0941732.16	11	●	

Coolant-lubricant tubes



for shank size	$\varnothing D$	$\varnothing D_1$	L_1	L_2	G	Article no.	
HSK-A40	5	8	8	21.5	M12 x 1	F330049.02	●
HSK-A50	6.4	10	10	23	M16 x 1	F330049.03	●
HSK-A63	8	12	12	24.5	M18 x 1	F330049.04	●
HSK-A80	10	14	14	26	M20 x 1.5	F330049.05	●
HSK-A100	12	16	16	28	M24 x 1.5	F330049.06	●

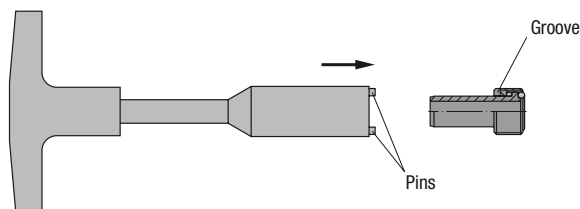
Assembly wrenches



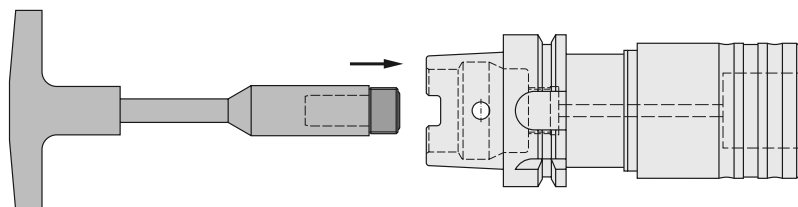
for shank size	$\varnothing D_2$	L_2	Article no.	
HSK-A40	11	111	F330099.02	●
HSK-A50	15	120	F330099.03	●
HSK-A63	17	122	F330099.04	●
HSK-A80	18.5	126	F330099.05	●
HSK-A100	22	141	F330099.06	●

Assembly of the coolant-lubricant tube in the hollow taper (HSK) shank

- Put assembly wrench on the coolant-lubricant tube.
Important: Watch the position of the pins against the grooves!

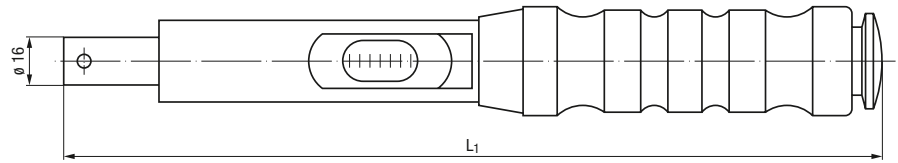


- Screw coolant-lubricant tube into the shank.



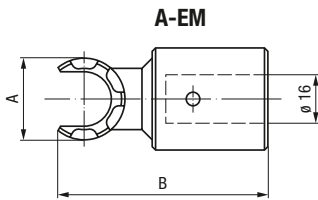
Torque wrenches

TORCO-FIX

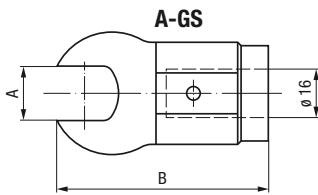


Type	Torque Nm	L_1	Article no.	
TORCO-FIX I	5 - 50	335	F0908005	●
TORCO-FIX II	20 - 200	465	F0908020	●
TORCO-FIX III	60 - 300	565	F0908060	●

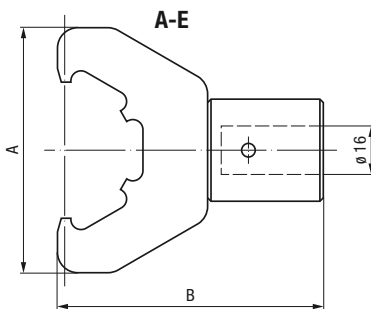
Shell-type wrenches



Type	for clamping nut	TORCO-FIX	A	B	Article no.	
A-E 11 M	Hi-Q/ERMC 11, Hi-Q/ERM 11	I	16.8	54	F0908500.AE11M	●
A-E 16 M	Hi-Q/ERMC 16	I, II	22.5	56	F0908500.AE16M	●
A-E 20 M	Hi-Q/ERMC 20	I, II	29	58	F0908500.AE20M	●



Type	for clamping nut	TORCO-FIX	A	B	Article no.	
A-GS 17	Hi-Q/ERC 11, Hi-Q/ER 11	I	17	60	F0908500.AGS17	●
A-GS 30	Hi-Q/ERC 20	II	30	65.5	F0908500.AGS30	●



Type	for clamping nut	TORCO-FIX	A	B	Article no.	
A-E 32	Hi-Q/ERC 32	II, III	75	72	F0908500.AE32	●
A-E 40	Hi-Q/ERC 40	III	90	82	F0908500.AE40	●
A-E 50	Hi-Q/ERBC 50	III	110	94	F0908500.AE50	●

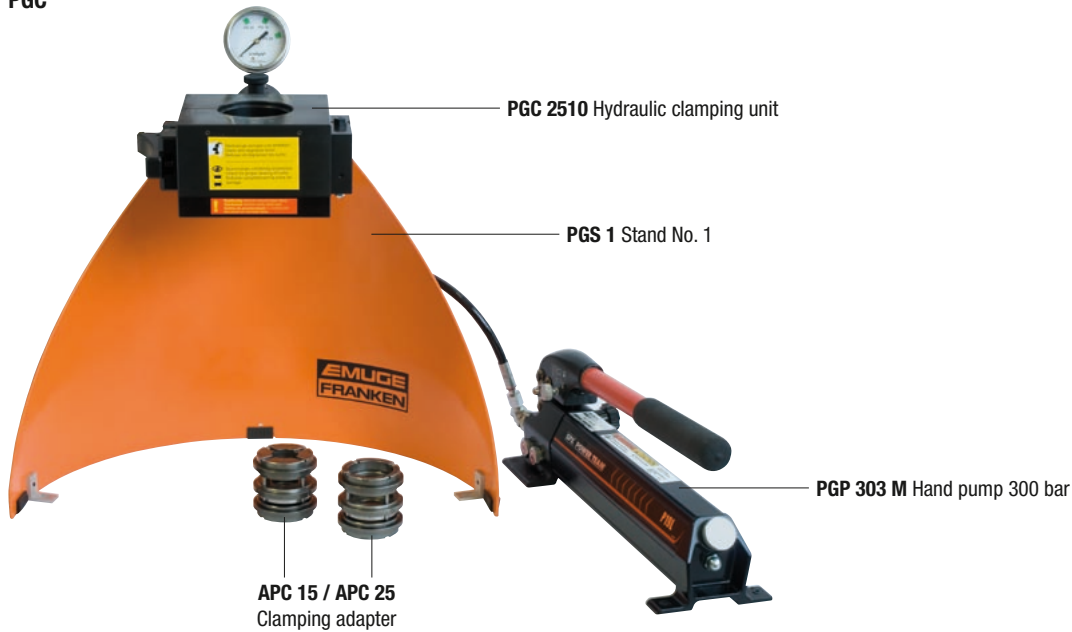
PGU



Adapter type APG not included in the delivery

Type	Voltage	Dimensions (W x D x H)	Weight	Article no.	
PGU 9000 E	230V AC	465 x 555 x 739 mm	90 kg	F0949900.9000E	●
PGU 9000 A	110V AC	465 x 555 x 739 mm	90 kg	F0949900.9000A	○
PGU 9000 J	100V AC	465 x 555 x 739 mm	90 kg	F0949900.9000J	●

PGC



PGC 2510 Hydraulic clamping unit

PGS 1 Stand No. 1

PGP 303 M Hand pump 300 bar

APC 15 / APC 25
Clamping adapter

Components	Type	Dimensions (W x D x H)	for size	Weight	Article no.	
SET PGC 2510	PGC 2510	297 x 480 x 153 mm	PGR 15, PGR 25	12,1 kg	F0949800.PGC251	●
Composed of: clamping unit,	PGP 303 M	347 x 102 x 150 mm	PGR 15, PGR 25	2,6 kg		
hand pump and stand	PGS 1	450 x 492 x 280 mm	PGR 15, PGR 25	3,5 kg		
Clamping adapter 1)	APC 15	30 x 30 x 60 mm	PGR 15	0,8 kg	F0949800.APC15	●
Clamping adapter 1)	APC 25	30 x 30 x 60 mm	PGR 25	0,8 kg	F0949800.APC25	●

1) One taper cleaner and one set of cleaning paper are included in the delivery

APG

Adapters for machines type PGU 9000



Type	for collet	Article no.	
APG 915	PGR 15	F0949915.9000	●
APG 925	PGR 25	F0949925.9000	●

- One taper cleaner and one set of cleaning paper are included in the delivery

VEW

Pre-adjustment tools



Type	for collet	Article no.	
VEW 15	PGR 15	F0949815	●
VEW 25	PGR 25	F0949825	●

- For precision length adjustment of the tools to be clamped

TKCP

Taper cleaners



Type	for collet	Article no.	
TKCP 15	PGR 15	F0949715.01	●
TKCP 25	PGR 25	F0949725.01	●

- For cleaning the internal taper of collet chucks and quick-change adapters type PGR.
- One set of cleaning paper is included in the delivery.

CPS

Set of cleaning paper (250 sheets)



Type	for taper cleaners	Article no.	
CPS 15	TKCP 15	F0949715.02	●
CPS 25	TKCP 25	F0949725.02	●

- Absorbing, specially made cleaning paper, lint-free and free of chemicals.
- For one-time use only!

AZW

Removal tool for adapters type APG



Type	for adapters	Article no.	
	APG 915, APG 925	F0949500	●

with square drive and length adjustment

Tool adaptation by means of collets

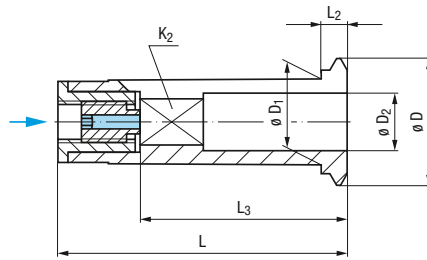
PGR(GB)


Internal coolant-lubricant supply



IKZ

Coolant-lubricant pressure at the entry to the holder

p_{max}
50bar
(700psi)



Type	PGR 15 GB	PGR 25 GB
	M4 - M12	M8 - M20
$\varnothing D$	22	33
$\varnothing D_1$	15	25
L	50.5	60.5
L ₂	4.5	6

DIN				Article no.			Article no.		
$\varnothing D_2$	K ₂			L ₃			L ₃		
				min.	max.		min.	max.	
4.5	3.4	M4	M6	F0942615.4.5	27	29	●		
6	4.9	M4.5 - M6	M8	F0942615.6	29	31	●		
7	5.5	M7	M9 - M10	F0942615.7	29	31	●		
8	6.2	M8	M11	F0942615.8	33.5	36	●	F0942625.8	33.5 36 ●
9	7	M9	M12	F0942615.9	34.5	37	●	F0942625.9	34.5 37 ●
10	8	M10		F0942615.10	35.5	38	●	F0942625.10	38.5 41 ●
11	9		M14					F0942625.11	39.5 42 ●
12	9		M16					F0942625.12	39.5 42 ●
14	11		M18					F0942625.14	41.5 44 ●
16	12		M20					F0942625.16	42.5 45 ●

• Inch sizes available upon request



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