

Tungaloy

Member IMC Group

Keeping the Customer First

Tungaloy Report No. 413-E

TOOLLINE Tooling system

TUNGHOLD

NEW

BT Interface Series

Tooling system for unique function and wide variation



Tooling system TUNGHOLD BT Interface

P. 6
Shell mill holder



P. 11
ER Collet chuck systems
TUNGSHORT



P. 28
Power chuck endmill holder
TUNGMAX



P. 32
Side lock endmill chuck holder



P. 34
Side lock drill chuck holder



P. 36
Adjustable drilling diameter holder
TUNGBORE



P. 38
Modular tooling system
TUNGFLEX TUNGFIT



P. 45
Hydraulic chucking system
TUNGHYDRO



P. 52
Balanceable collet chuck
TUNGBALANCE



P. 53
Centering tooling system
TUNGFINE



P. 53
Tapping attachment
TUNGGTI



P. 57
Thermal shrinking holder
TUNGSHRINK



P. 70
Pull stud



P. 72
Electrical nut-clamping
torque control device
EASYLOCK



Product introduction

TUNGSHORT

P. 11

- Short overhang.
- Applicable for standard ER collets.
- Provides high gripping force and less runout with short overhang.
- Balanced to G2.5, max. n : 20,000 min⁻¹
- Symmetric design for high speed machining.



TUNGMAX

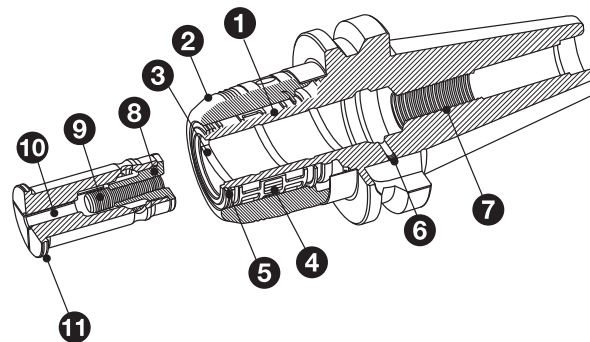
P. 28

- Provides extremely high gripping force with only a small tightening torque.
- High runout accuracy at 100mm. Over hang is 0.009 mm
- High stiffness is achieved with the clamping mechanism that utilises the face contact between clamping nut and the face of the shank.
- The highly rigid system prolongs tool life considerably.
- Prevents interference with the work piece due to the slim design.
- Preset screws available for all SC straight collets for positioning of the tool.
- Produced from a special steel for vibration damping.
- Sealed nut structure.
- No axial drawback of the tool shank when chuck is tightened.



Structure

- ① Shallow tapered front end cone
- ② Clamping nut
- ③ Helical slot
- ④ Needle bearing
- ⑤ Front Seal
- ⑥ Ventilation bore (thread M4)
- ⑦ Preset screw thread
- ⑧ Cap screw (for the preset screw)
- ⑨ Preset screw
- ⑩ Ground bore
- ⑪ Grip groove (for collet release)



TUNGHYDRO

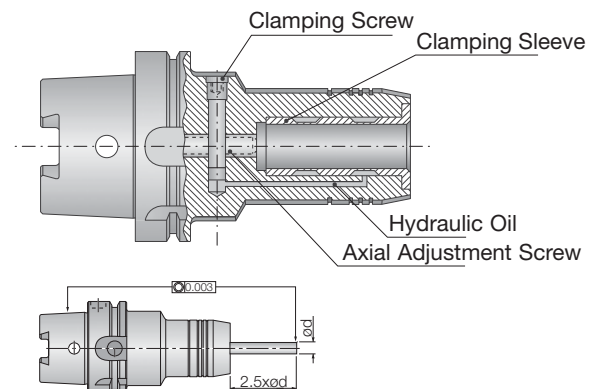
P. 45

- High runout accuracy of less than 0.003 mm
- Very low torque required to activate the clamping mechanism.
- Easy tool overhang presetting by using an internal preset screw.
- Symmetrical and balanced design for high speed machining of up to 15,000 min⁻¹
- Very convenient and safe tool change on the machine.
- Quick and easy operation for clamping and unclamping.



Operating Instructions

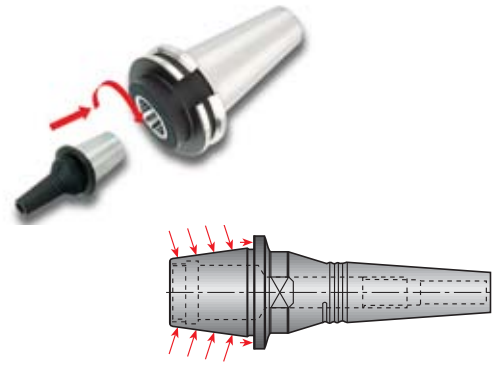
- Clean any grease and dirt from the chuck mounting hole and the tool shank. Insert the tool shank up to the stopper. Make sure that the minimum chucking length is maintained.
- Do not attempt to clamp the chuck without a tool. It may break the clamping sleeve.
- Tools with cylindrical shanks in accordance with DIN1835 and DIN6535 shape (HA) and B (HB) up to 20 mm diameters should be manufactured according to h6 tolerance and Ra = min 0.3 ground.
- Tools with DIN6535 HE (whistle notch) shanks are not recommended. These may damage the chucking hole.



TUNGCLICK

P. 64

- Assembly structure: the taper goes inside the holder, achieving short overhang.
- High rigidity and high runout due to the short overhang.
- Taper and face make contact for maximum rigidity.
- Balanced to G2.5, max. n : 20,000 min⁻¹
- Quick changing: the taper shank and the holder connect in a quick half turn.



TUNGFLEX

P. 38

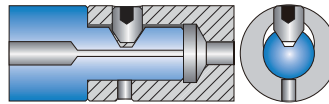
- Screw clamp head type promotes easy tool management.
- Suitable for deep machining of metal molds due to the slim structure.
- Provides wide machining variations with numerous combinations.
- Provides high rigidity similar to integrated type holders.



TUNGFIT

P. 38

- Provides high rigidity comparable to a solid part credit to the elastic deformation properties of the clamping system.
- Reduces vibration by taper and face contact.
- Easy clamping with only one screw.

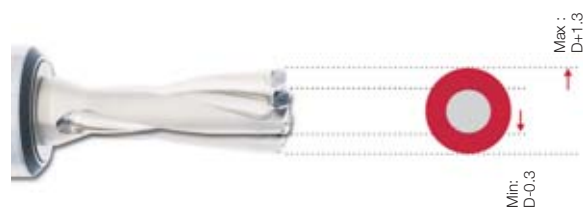


TUNGBORE

P. 36

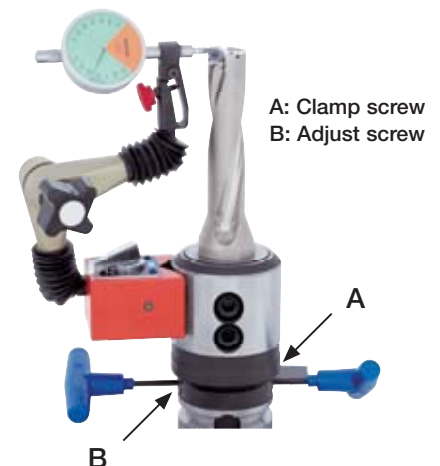
- Enables the diameter of TungdrillTwisted (TDX) to be adjusted. Diameter adjusting range of -0.3 ~ +1.3 mm
- With TungBore, standard TDX drills can cover the usage of special diameter drills.

* Adjustable range of diameter in TDX drill is different by each item. Therefore, please refer to the maximum offset value shown in TDX drill leaflet.



Operating Instructions

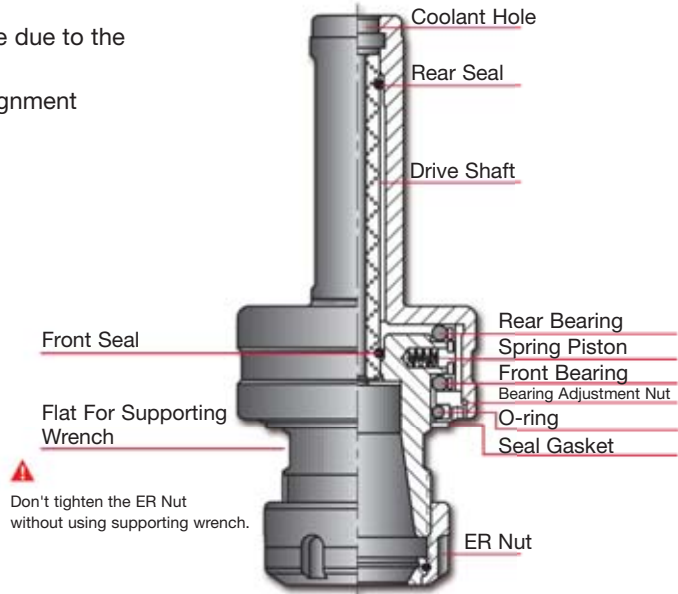
- ① Fix the TDX drill with the clamping screw.
- ② Adjust the screw "A". Preset should be made on a pre-setter to -0.2 mm from the required diameter. Tighten the clamp screw "B".
- ③ On the machine, make a test cut.
- ④ Measure the bore diameter.
- ⑤ Make the adjustment to the desired diameter on the machine with dial indicator or on the pre-setter.
- ⑥ Loosen the clamping screw.
- ⑦ Adjust to the required diameter
("Desired diameter" - "Measured diameter") / 2 = "Adjusted amount"
- ⑧ Tighten the clamping screw.



- Provides high accuracy reaming and extended tool life due to the unique floating mechanism.
- The radial self-floating mechanism corrects the misalignment between reamer and work piece hole.



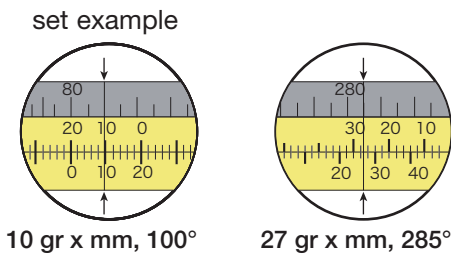
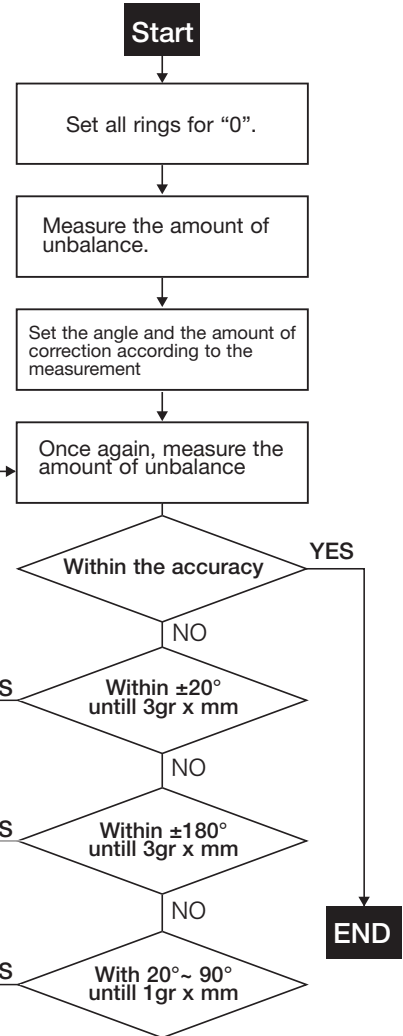
Radial Float



- Easy to adjust dynamic balance. It is possible to correct it by simply turning the ring and adjusting the unbalanced amount measured with the balance measuring instrument.
- Corrects unbalance up to:
 - TUNGBALANCE** Collet Chuck 61 gr. x mm
 - TUNGBALANCE** Top Nut 54 gr. x mm
- Simple balancing procedure on all types of balancing machines.
- An existing collet chuck can be changed to the balance holder by simply exchanging the nut.



- Attention 1** Do not use Weldon shanks.
- Attention 2** For extremely high balance levels, tools with even number of flutes are recommended.

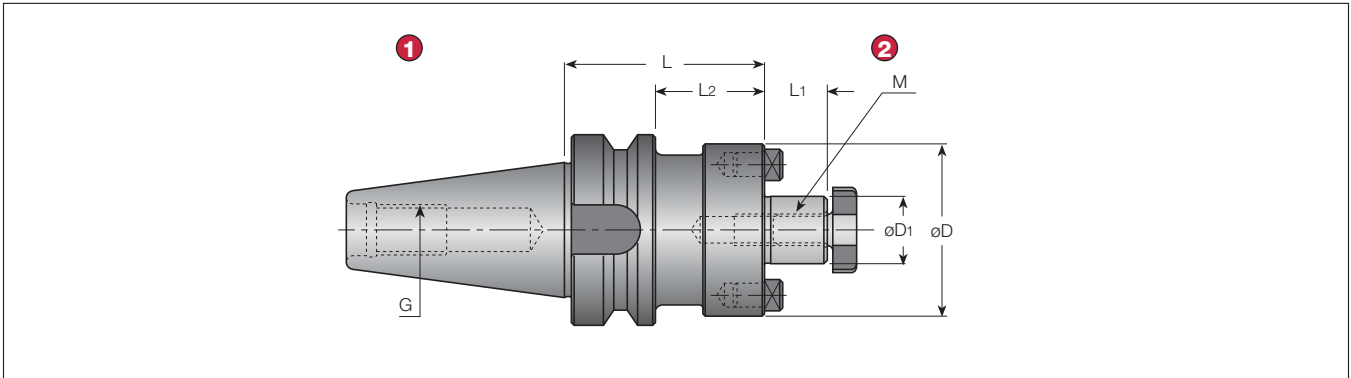


- Contains the mechanisms of tension, compression, and floating.
- No tap collets necessary.
- Compact geometry with high rigidity.

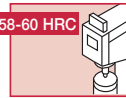
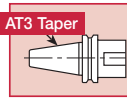
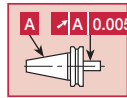


Shell Mill Holder

BT-SEM



- 1 BT MAS 403 Form A
- 2 ISO 3937



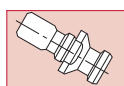
BT-SEM Shell Mill Holder

Cat. No.	Stock	Dimensions (mm)						
		øD ₁	L ₁	øD	L	L ₂	G	M
BT30SEM16X50 (*)	●	16	17	38	50	28	M12	M8
BT30SEM22X50 (*)	●	22	19	47	50	18	M12	M10
BT30SEM25.4-45V1 (*)	●	25.4	22	50	45	18	M12	M12
BT30SEM27X50 (*)		27	21	58	50	18	M12	M12
BT40SEM16X60 (*)	●	16	17	38	60	33	M16	M8
BT40SEM16X120 (*)		16	17	38	120	93	M16	M8
BT40SEM22X60 (*)	●	22	19	47	60	33	M16	M10
BT40SEM22X120 (*)		22	19	47	120	93	M16	M10
BT40SEM25.4X45V1 (*)	●	25.4	22	50	45	18	M16	M12
BT40SEM27X45 (*)		27	21	58	45	18	M16	M12
BT40SEM27X105 (*)		27	21	58	105	78	M16	M12
BT40SEM31.75X45V1 (*)	●	31.75	30	64	45	20	M16	M16
BT40SEM31.75X75V1 (*)	●	31.75	30	64	75	48	M16	M16
BT40SEM32X60 (*)		32	24	65	60	23	M16	M16
BT40SEM32X75 (*)		32	24	65	75	36	M16	M16
BT40SEM40X60 (*)		32	27	82	60	23	M16	M20
BT40SEM40X75 (*)		32	27	82	75	38	M16	M20
BT50SEM16X75 (*)		16	17	38	75	37	M24	M8
BT50SEM16X120 (*)		16	17	38	120	82	M24	M8
BT50SEM22X50X220		22	19	50	220	182	M24	M10
BT50SEM22X64X320		22	19	64	320	282	M24	M10
BT50SEM22X75 (*)	●	22	19	47	75	37	M24	M10
BT50SEM22X120 (*)		22	19	47	120	82	M24	M10
BT50SEM25.4x90V1 (*)	●	25.4	22	50	90	52	M24	M12
BT50SEM27X60 (*)		27	21	58	60	22	M24	M12
BT50SEM27X105 (*)		27	21	58	105	67	M24	M12
BT50SEM31.75X75V1 (*)	●	31.75	30	75	64	26	M24	M16
BT50SEM32X48 (*)		32	24	66	48	10	M24	M16
BT50SEM32X75 (*)		32	24	66	75	37	M24	M16
BT50SEM38.1X75V1 (*)	●	38.1	34	80	75	37	M24	M20
BT50SEM40X48 (*)		40	27	82	48	10	M24	M20
BT50SEM40X75 (*)		40	27	82	75	37	M24	M20
BT50SEM50.8X75V1 (*)	●	50.8	36	100	75	37	M24	M24

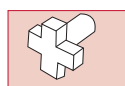
(*): Available center trough by lock screw with coolant hole. TMBA-**H, CM****H (option)

Tungaloy mills with coolant hole is attached screw with coolant hole.

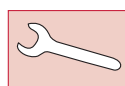
Wrench is not included.



Pull Stud



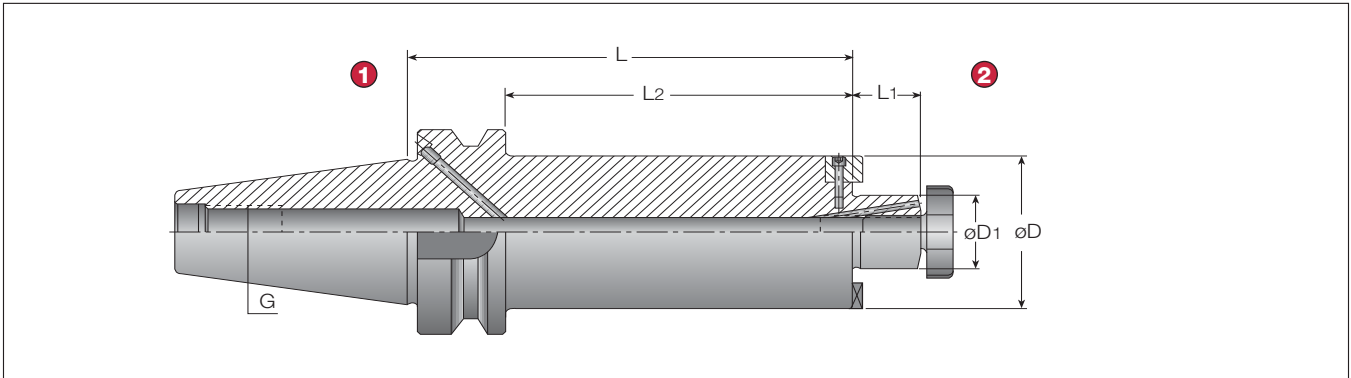
Lock Screw



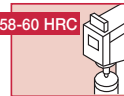
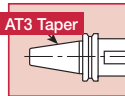
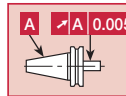
Wrench

Shell Mill Holder

BT-SEM-C



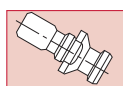
- 1 BT MAS 403 Form A/B
- 2 ISO 3937



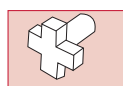
BT-SEM-C Extra Long Shell Mill Holder with Coolant Hole

Cat. No.	Stock	Dimensions (mm)						
		øD ₁	øD	L	L ₁	L ₂	G	M
BT40SEM16X60C		16	38	60	33	17	M16	M8
BT40SEM16X100C		16	38	100	73	17	M16	M8
BT40SEM22X60C	●	22	47	60	33	19	M16	M10
BT40SEM22X100C		22	47	100	73	19	M16	M10
BT40SEM27X45C	●	27	58	45	18	21	M16	M12
BT40SEM27X100C		27	58	100	73	21	M16	M12
BT40SEM32X60C		32	66	60	33	24	M16	M16
BT50SEM16X75C	●	16	38	75	37	17	M24	M8
BT50SEM16X100C		16	38	100	62	17	M24	M8
BT50SEM22X75C		22	47	75	37	19	M24	M10
BT50SEM22X100C		22	47	100	62	19	M24	M10
BT50SEM22X48X220C		22	48	220	182	19	M24	M10
BT50SEM22X61X320C		22	61	320	282	19	M24	M10
BT50SEM25.4X60C	●	25.4	50	60	22	22	M24	M12
BT50SEM27X60C	●	27	58	60	22	21	M24	M12
BT50SEM27X100C		27	58	100	62	21	M24	M12
BT50SEM27X61X320C		27	61	320	282	21	M24	M12
BT50SEM32X75C		32	66	75	37	24	M24	M16
BT50SEM32X100C		32	66	100	62	24	M24	M16
BT50SEM32X78X390C		32	78	390	352	24	M24	M16

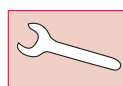
If the "B type" option is required, the plug screw must be removed from the flange cooling hole (use a 2 mm hex key).
Wrench is not included.



Pull Stud



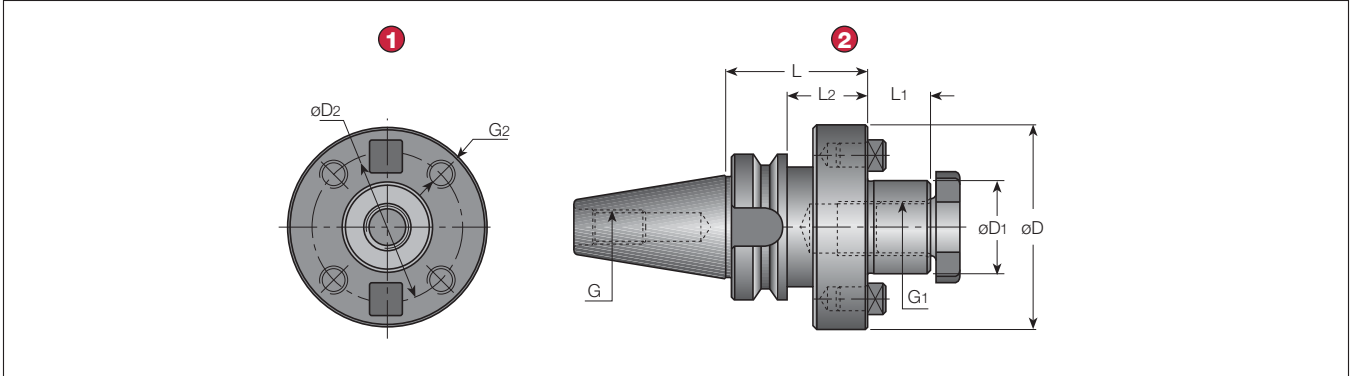
Lock Screw



Wrench

Face Mill Holder

BT-FM



1 BT MAS 403 Form A 2 DIN6357

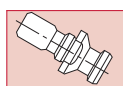
BT-FM Face Mill Holder - Metric

Cat. No.	Stock	Dimensions (mm)								
		ϕD_1	L_1	L	L_2	ϕD	ϕD_2	G_1	G_2	G
BT40FM40		40	27	60	22	88	66.7	M20	M12	M16
BT50FM40		40	27	50	12	88	66.7	M20	M12	M24
BT50FM60		60	38	88	40	128	101.6	-	M16	M24

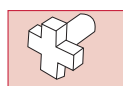
BT-FM Face Mill Holder - Inch

Cat. No.	Stock	Dimensions (mm)								
		ϕD_1	L_1	L	L_2	ϕD	ϕD_2	G_1	G_2	G
BT50-FMA47.625-75	●	47.625	38	75	-	128.6	101.6	-	M16	M24

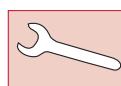
Wrench is not included.



Pull Stud 70



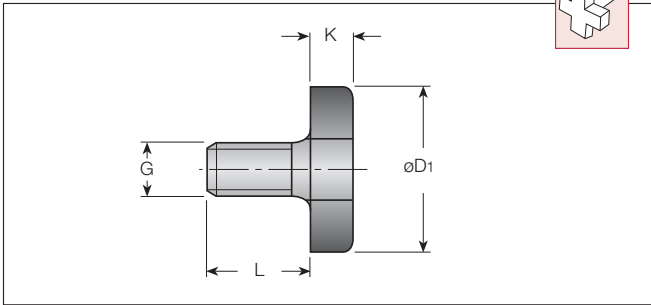
Lock Screw 9



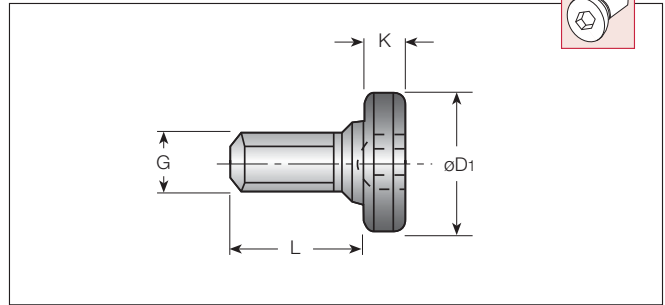
Wrench 9

Shell Mill Holder • Lock Screw • Wrench

A SCREW-SEM



B SCREW-SEM



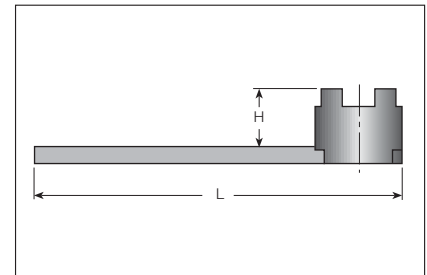
A SCREW-SEM Lock Screw for Shell Mill Holder

Cat. No.	Stock	Dimensions (mm)				
		Inner diameter of cutter body ϕ	G	ϕD_1	K	L
M8CLAMPSCREWSEM16	●	16	M8	20	6	16
M10CLAMPSCREWSEM22	●	22	M10	28	7	18
M12CLAMPSCREWSEM27	●	25.4, 27	M12	35	8	22
M16CLAMPSCREWSEM32	●	31.75, 32	M16	42	9	26
M20CLAMPSCREWSEM40	●	38.1, 40	M20	52	10	30
M24CLAMPSCREWSEM50	●	50, 50.8	M24	63	12	36

WRENCH SEMC (Option)

Cat. No.	Stock	Dimensions (mm)			
		Inner diameter of cutter body ϕ	Screw Size	H	L
WRENCHM8SEMC16	●	16	M8	20	180
WRENCHM10SEMC22	●	22	M10	25	200
WRENCHM12SEMC27	●	25.4, 27	M12	32	225
WRENCHM16SEMC32	●	31.75, 32	M16	36	250
WRENCHM20SEMC40	●	38.1, 40	M20	40	280
WRENCHM24SEMC50	●	50, 50.8	M24	50	315

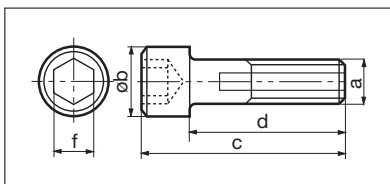
Wrench DIN 6368 for COMBI Shell End mill Holder



B TMBA-M**H Lock Screw with coolant slot for Shell Mill Holder

Cat. No.	Stock	Dimensions (mm)				
		Inner diameter of cutter body ϕ	G	ϕD_1	K	L
TMBA-M12H	●	25.4, 27	M12	33	8.5	26
TMBA-M16H	●	31.75, 32	M16	40	10	32.5
TMBA-M20H	●	38.1, 40	M20	50	10	34
TMBA-M24H	●	50, 50.8	M24	65	14	43

CM**H

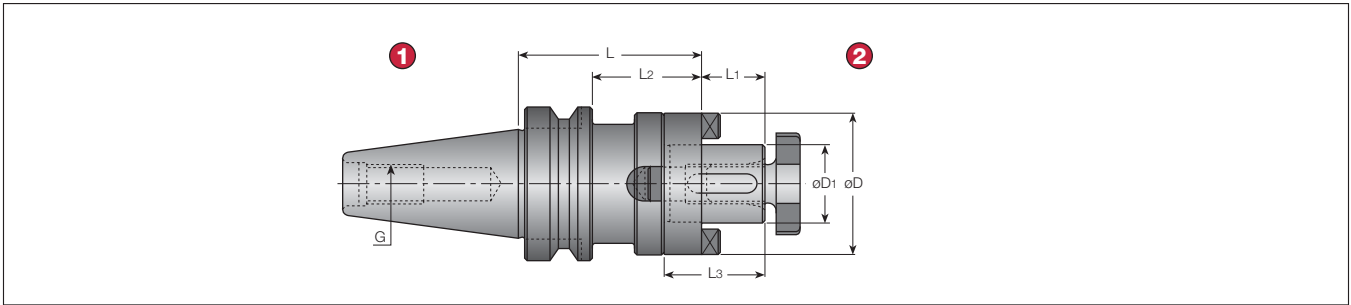


CM**H Lock Screw with coolant slot for Shell Mill Holder

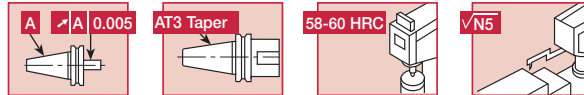
Cat. No.	Stock	Dimensions (mm)				
		a	ϕb	c	d	f
CM8×30H	●	M8×1.25	13	36	30	5
CM10×30H	●	M10×1.5	16	38	30	6
CM12×30H	●	M12×1.75	18	40	30	8
CM16×40H	●	M16×2	24	54	40	10

Shell Mill Holder / Side Mill Holder

BT-SEMC



- 1 BT MAS 403 Form A
- 2 DIN6358



BT-SEMC COMBI – Shell Mill Holder (Combination type)

Cat. No.	Stock	Dimensions (mm)						
		øD ₁	L ₁	øD	L	L ₂	L ₃	G
BT40SEMC16X50		16	17	32	50	23	27	M16
BT40SEMC16X100		16	17	32	100	73	27	M16
BT40SEMC22X53		22	19	40	53	26	31	M16
BT40SEMC22X100		22	19	40	100	73	31	M16
BT40SEMC27X55		27	21	48	55	28	33	M16
BT40SEMC27X100		27	21	48	100	73	33	M16
BT40SEMC32X60		32	24	58	60	33	38	M16
BT40SEMC32X100		32	24	58	100	73	38	M16
BT40SEMC40X80		40	27	70	80	53	41	M16
BT50SEMC16X100		16	17	32	100	62	27	M24
BT50SEMC16X150		16	17	32	150	112	27	M24
BT50SEMC22X68		22	19	40	68	30	31	M24
BT50SEMC22X100		22	19	40	100	62	31	M24
BT50SEMC22X150		22	19	40	150	112	31	M24
BT50SEMC27X78		27	21	48	78	40	33	M24
BT50SEMC27X100		27	21	48	100	62	33	M24
BT50SEMC27X150		27	21	48	150	112	33	M24
BT50SEMC32X78		32	24	58	78	40	38	M24
BT50SEMC32X100		32	24	58	100	62	38	M24
BT50SEMC32X150		32	24	58	150	112	38	M24
BT50SEMC40X78		40	27	70	78	40	41	M24
BT50SEMC40X100		40	27	70	100	62	41	M24
BT50SEMC40X150		40	27	70	150	112	41	M24
BT50SEMC50X79		50	30	90	79	41	46	M24
BT50SEMC50X150		50	30	90	150	112	46	M24

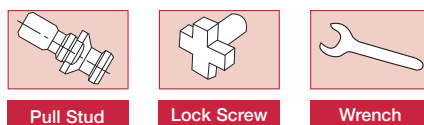
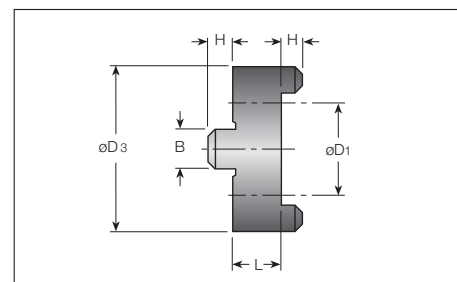
Wrench is not included.

Accessories • Wrench for Shell Mill Holder

DRIVING RING SEMC

Cat. No.	Stock	Dimensions (mm)				
		øD ₁	øD ₃	L	B	H
16D.RINGSEMC	●	16	32	10	8	5.0
22D.RINGSEMC	●	22	40	12	10	6.0
27D.RINGSEMC	●	27	48	12	12	6.3
32D.RINGSEMC	●	32	58	14	14	7.0
40D.RINGSEMC	●	40	70	14	16	8.0
50D.RINGSEMC	●	50	90	16	18	9.0

Driving Ring DIN 6366/1 for COMBI Shell and Mill Holder



ER Collet Chucking System

Shanks

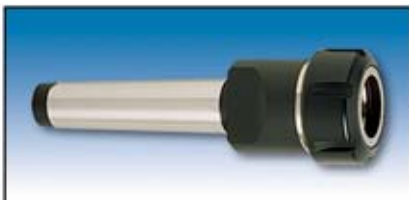
BT MAS-403



ST Straight Shank



MT Morse Taper

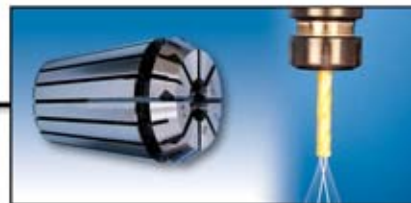


Collet Options

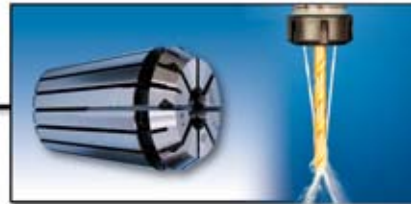
ER-SPR (ER Spring Collet)



**ER-SEAL
(ER SEAL Collet for Internal coolant)**



**ER-SEAL JET2
(ER SEAL Collet for External coolant)**



**ER-SRK
(ER Collet with SHRINK Holder)**



**ER32 GTIN
(ER Collet with Tapping Holder)**



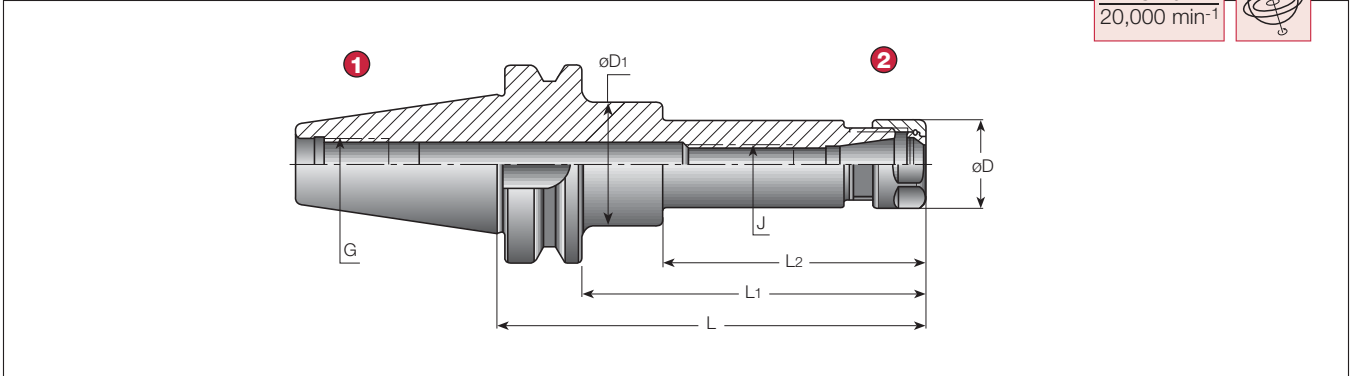
**ER32 ODP
(ER Collet with Indexable Modular System)**



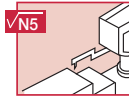
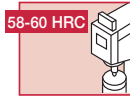
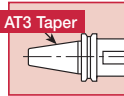
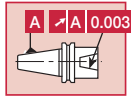
Collet Chuck Holder

BT-ER16/20

G2.5
20,000 min⁻¹



- 1 BT MAS 403 Form A/B
- 2 DIN6499



BT-ER16/20 ER Collet Chuck Holder

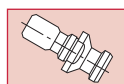
Cat. No.	Stock	Dimensions (mm)							
		Range	L	L ₁	L ₂	øD	øD ₁	J	G
BT30ER16X70 ⁽¹⁾	●	0.5-10	70	48	-	28	-	M10	M12
BT30ER20X70 ⁽¹⁾	●	1-13	70	48	-	34	-	M12	M12
BT40ER11X100M ⁽²⁾	●	0.5-7	100	73	-	16	-	M6	M16
BT40ER16X70		0.5-10	70	43	-	28	-	M12	M16
BT40ER16X100	●	0.5-10	100	73	-	28	-	M12	M16
BT40ER16X150	●	0.5-10	150	123	110	28	40	M12	M16
BT40ER16X200	●	0.5-10	200	173	85	28	40	M10	M16
BT40ER20X70		1-13	70	43	-	34	-	M12	M16
BT40ER20X100	●	1-13	100	73	-	34	-	M12	M16
BT40ER20X120	●	1-13	120	93	-	34	-	M12	M16
BT40ER20X150	●	1-13	150	123	-	34	-	M12	M16
BT50ER16X100 ⁽¹⁾		0.5-10	100	62	-	28	-	M12	M24
BT50ER16X125 ⁽¹⁾	●	0.5-10	125	87	-	28	-	M12	M24
BT50ER16X150 ⁽¹⁾	●	0.5-10	150	112	-	28	-	M12	M24
BT50ER16X200 ⁽¹⁾	●	0.5-10	200	162	85	28	40	M10	M24
BT50ER20X100 ⁽¹⁾		1-13	100	62	-	34	-	M12	M24
BT50ER20X125 ⁽¹⁾	●	1-13	125	87	-	34	-	M12	M24
BT50ER20X150 ⁽¹⁾	●	1-13	150	112	-	34	-	M12	M24
BT50ER20X200 ⁽¹⁾	●	1-13	200	162	85	34	50	M12	M24

Add B for coolant through the flange.

⁽¹⁾ Balanced to G6.3 at max. n: 12,000 min⁻¹

⁽²⁾ ER11 MINI Collet Chuck Spec.

Wrench is not included.



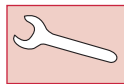
Pull Stud

70



Nut

26



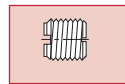
Wrench

27



ER Collet

16



Preset Screw

27

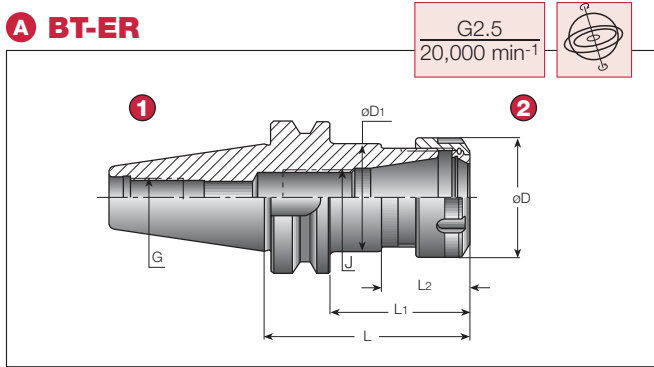


User Guide

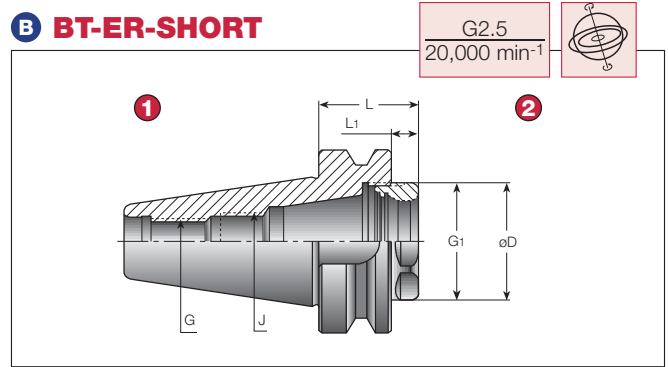
23

Collet Chuck Holder • TUNGSHORT

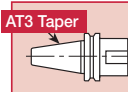
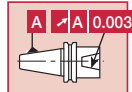
A BT-ER



B BT-ER-SHORT



- 1 BT MAS 403 Form A/B
- 2 DIN6499



- 1 BT MAS 403 Form A/B
- 2 DIN6499 ER-SHORT

A BT-ER ER Collet Chuck Holder

Cat. No.	Stock	Dimensions (mm)							
		Range	L	L ₁	L ₂	øD	øD ₁	J	G
BT30ER25X60 ⁽¹⁾	●	1-16	60	38	-	42	-	M16	M12
BT30ER32X60 ⁽¹⁾	●	2-20	60	38	-	50	-	M18x1.5	M12
BT40ER25X60		1-16	60	33	-	42	-	M16	M16
BT40ER25X100	●	1-16	100	73	-	42	-	M16	M16
BT40ER25X150	●	1-16	150	123	-	42	-	M16	M16
BT40ER32X60		2-20	60	33	-	50	-	M22X1.5	M16
BT40ER32X100	●	2-20	100	73	-	50	-	M22X1.5	M16
BT40ER32X120	●	2-20	120	93	-	50	-	M22X1.5	M16
BT40ER32X150	●	2-20	150	123	-	50	-	M22X1.5	M16
BT40ER40X80		3-26	80	53	-	63	-	M28X1.5	M16
BT40ER40X100		3-26	100	73	-	63	-	M28X1.5	M16
BT40ER40X150		3-26	150	123	-	63	-	M28X1.5	M16
BT40ER50X90		10-34	90	63	-	78	-	M28X1.5	M16
BT50ER25X100 ⁽¹⁾		1-16	100	62	-	42	-	M16	M24
BT50ER25X150 ⁽¹⁾	●	1-16	150	112	-	42	-	M16	M24
BT50ER25X200 ⁽¹⁾	●	1-16	200	162	87	42	55	M16	M24
BT50ER32X100 ⁽¹⁾		2-20	100	62	-	50	-	M22X1.5	M24
BT50ER32X125 ⁽¹⁾	●	2-20	125	87	-	34	-	M22X1.5	M24
BT50ER32X150 ⁽¹⁾	●	2-20	150	112	-	50	-	M22X1.5	M24
BT50ER32X200 ⁽¹⁾	●	2-20	200	162	88	50	63	M22X1.5	M24
BT50ER40X100 ⁽¹⁾		3-26	100	62	-	63	-	M28X1.5	M24
BT50ER40X150 ⁽¹⁾		3-26	150	112	-	63	-	M28X1.5	M24
BT50ER40X200 ⁽¹⁾		3-26	200	162	-	63	-	M28X1.5	M24
BT50ER50X100 ⁽¹⁾		10-34	100	62	-	78	-	M36X1.5	M24
BT50ER50X150 ⁽¹⁾		10-34	150	112	-	78	-	M36X1.5	M24

Add B for coolant through the flange.

⁽¹⁾ Balanced to G6.3 at max. *n*: 12,000 min⁻¹

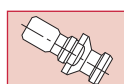
Wrench is not included.

B BT-ER-SHORT Short ER Collet Chuck Holder

Cat. No.	Stock	Dimensions (mm)						
		Range	L	L ₁	øD	J	G	G ₁
BT30ER20SHORT	●	1-13	27.2	5.2	25	M12	M12	M25x1.5
BT40ER32SHORT	●	2-20	36.5	9.5	40	M12	M16	M40x1.5
BT40ER40SHORT		3-26	46.5	9.5	50	M16	M16	M50x1.5
BT50ER32SHORT	●	2-20	47.5	9.5	40	M22x1.5	M24	M40x1.5
BT50ER40SHORT		3-26	47.5	9.5	50	M28x1.5	M24	M50x1.5

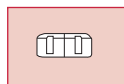
Add B for coolant through the flange.

Wrench is not included.



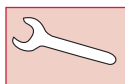
Pull Stud

70



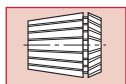
Nut

26



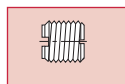
Wrench

27



ER Collet

16



Preset Screw

27

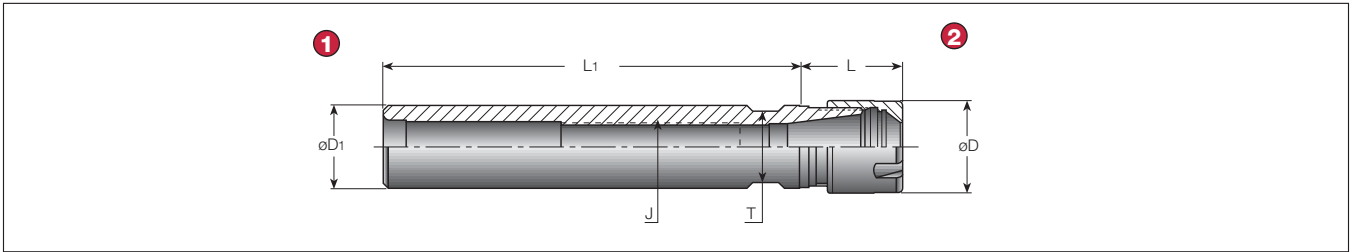


User Guide

23

Collet Chuck • Straight Shank

ST-ER-M / MF



- 1 Straight Shank
- 2 DIN6499

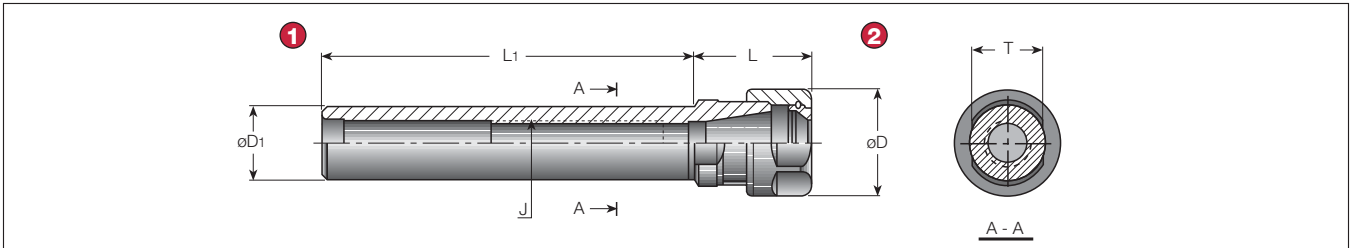


ST-ER-M/MF Mini ER Collet Chuck Holder

Cat. No.	Stock	Dimensions (mm)						
		Range	L ₁	L	J	øD	øD ₁	T
ST12X80ER11M		0.5-7	80	26.5	-	16	12	11
ST16X50ER11MF		0.5-7	50	18.5	M8	16	16	13
ST16X100ER11M		0.5-7	100	18.5	M8	16	16	13
ST16X150ER11M		0.5-7	150	18.5	M8	16	16	13
ST12X80ER16M		0.5-10	80	36.5	M12	22	12	17
ST20X100ER16M		0.5-10	100	25.0	M12	22	20	17
ST20X150ER16M		0.5-10	150	25.0	M12	22	20	17
ST20X100ER20M		1-13	100	40.0	M12	28	20	21
ST20X150ER20M		1-13	150	40.0	M12	28	20	21

F indicates a flat on the shank.
Wrench is not included.

ST-ER



- 1 Straight Shank
- 2 DIN6499



ST-ER ER Collet Chuck Holder

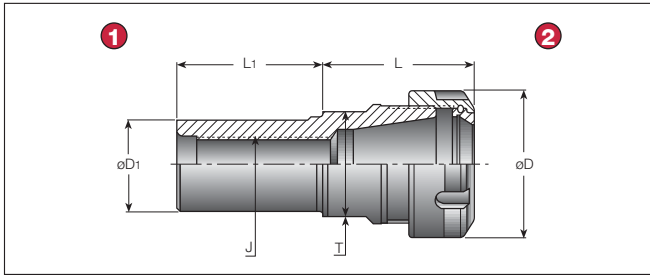
Cat. No.	Stock	Dimensions (mm)						
		Range	L ₁	L	J	øD	øD ₁	T
ST16X50ER11F		0.5-7	50	18.5	M8	19	16	13
ST20X50ER11F		0.5-7	50	18.5	M10	19	20	17
ST20X100ER11		0.5-7	100	18.5	M10	19	20	17
ST20X150ER11		0.5-7	150	18.5	M10	19	20	17
ST20X50ER16F		0.5-10	50	32.3	M12	28	20	19
ST20X100ER16		0.5-10	100	30.0	M12	28	20	19
ST20X150ER16		0.5-10	150	30.0	M12	28	20	19
ST20X50ER20F		1-13	50	42.5	M12	34	20	22
ST25X100ER20		1-13	100	36.0	M16	34	25	22
ST25X100ER20F		1-13	100	36.0	M16	34	25	22
ST25X150ER20		1-13	150	36.0	M16	34	25	22

F indicates a flat on the shank.
Wrench is not included.

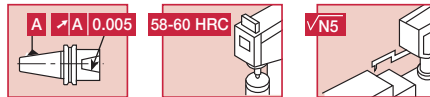


Collet Chuck • Straight Shank

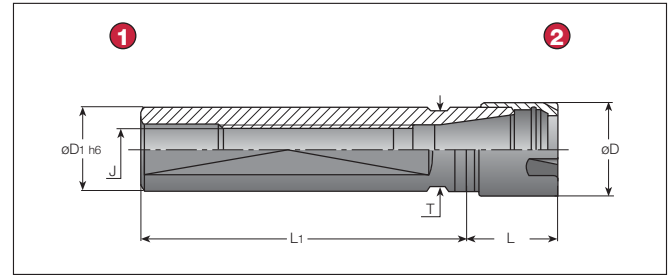
A ST-ER



- 1 Straight Shank
- 2 DIN6499



B ST-ER-MF



A ST-ER ER Collet Chuck Holder

Cat. No.	Stock	Dimensions (mm)						
		Range	L ₁	L	J	øD	øD ₁	T
ST20X50ER25F		1-16	50	46	M12	42	20	28
ST20X100ER25		1-16	100	46	M12	42	20	28
ST20X50ER32F		2-20	50	54	M12	50	20	36
ST20X100ER32		2-20	100	54	M12	50	20	36
ST25X50ER25F		1-16	50	46	M16	42	25	28
ST25X100ER25		1-16	100	46	M16	42	25	28
ST25X50ER32F		2-20	50	52	M16x2	50	25	36
ST25X50ER40F		3-26	50	60	M16x2	63	25	45
ST30X50ER32F		2-20	50	52	M18x1.5	50	30	36
ST30X50ER40F		3-26	50	60	M18x1.5	63	30	45
ST32X50ER32F		2-20	50	52	M18x1.5	50	32	36
ST32X150ER32		2-20	150	52	M18x1.5	50	32	36
ST32X50ER40F		3-26	50	60	M18x1.5	63	32	45
ST40X75ER32F		2-20	75	46	M22x1.5	50	40	44
ST40X75ER40F		3-26	75	55	M22x1.5	63	40	45
ST50X80ER40F		3-26	80	60	M28x1.5	63	50	54
ST50X80ER50F		10-34	80	77	M36x1.5	78	50	58

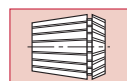
F indicates a flat on the shank.
Wrench is not included.

B ST-ER-MF Mini Collet Chuck with a Flat (Swiss type)

Cat. No.	Stock	Dimensions (mm)							Machine type
		Range	L ₁	L	J	øD	øD ₁	T	
ST16X35ER16MF		0.5-7	35.00	36.00	M8X1	22.0	16.00	17	(4)
ST16X38ER11MF		0.5-7	38.00	18.50	M8X1	16.0	16.00	14	(4)
ST16X140ER11MF		0.5-7	140.00	18.50	M8X1	16.0	16.00	14	-
ST20X50ER16MF		0.5-10	50.00	26.00	M12X1	22.0	20.00	17	(1)
ST20X70ER16MF		0.5-10	70.00	26.00	M12X1	22.0	20.00	17	(1)
ST20X120ER16MF		0.5-10	120.00	26.00	M12X1	22.0	20.00	17	(1)
ST20X140ER16MF		0.5-10	140.00	26.00	M12X1	22.0	20.00	17	(1)
ST22X38ER16MF		0.5-10	38.00	26.00	M12X1	22.0	22.00	19	(4)
ST22X70ER16MF		0.5-10	70.00	26.00	M12X1	22.0	22.00	19	(4)
ST22X70ER25MF		0.5-10	70.00	47.00	M12X1	35.0	22.00	27	(4)
ST22X80ER20MF		1-13	80.00	39.00	M12X1	28.0	22.00	21	(4)
ST22X100ER16MF		1-16	100.00	28.00	M12X1	22.0	22.00	19	(4)
ST25X65ER16MF		0.5-10	65.00	28.00	M12X1	22.0	25.00	22	-
ST25X75ER25MF		1-13	75.00	48.00	M14X1	35.0	25.00	27	(2)
ST25X100ER20MF		1-13	100.00	28.00	M14X1	28.0	25.00	22	(5)
ST25X145ER25MF		1-16	145.00	36.00	M14X1	35.0	25.00	27	(5)
ST25X154ER20MF		1-16	154.00	28.00	M14X1	28.0	25.00	22	(5)
ST32X70ER25MF		1-16	70.00	30.00	M18X1	35.0	32.00	27	(3)

Wrench is not included.

- (1) Citizen
- (2) Manurhin
- (3) Schutte
- (4) Star
- (5) Tornos-Bechler



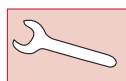
ER Collet

16



Nut

26



Wrench

27



Preset Screw

27



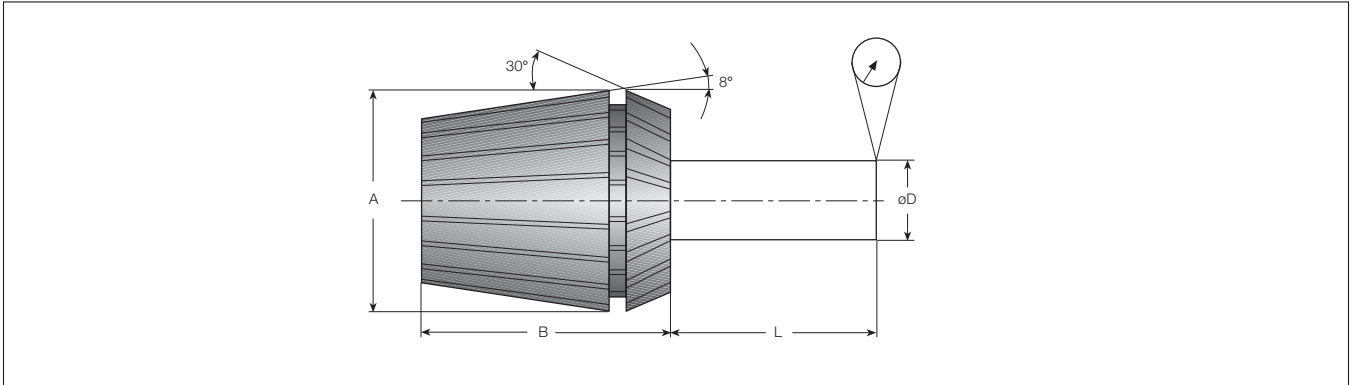
User Guide

23

ER Collet

Standard

ER Collet type DIN6499



Collet type	Dimensions (mm)					
	A	B	L	øD	T.I.R Precision Standard type	T.I.R Precision "AA" Ultra Precision type
ER-11	11.5	18	6	1.0-1.6	0.01	0.005
ER-16	17	27	10	1.6-3.0	0.01	0.005
ER-20	21	31	16	3.0-6.0	0.01	0.005
ER-25	26	35	25	6.0-10.0	0.01	0.005
ER-32	33	40	40	10.0-18.0	0.01	0.005
ER-40	41	46	50	18.0-26.0	0.01	0.005
ER-50	52	60	60	26.0-34.0	0.01	-

ER 50 DIN6499

ER - Coolant Sealed Collet



Sealed Collet Jet

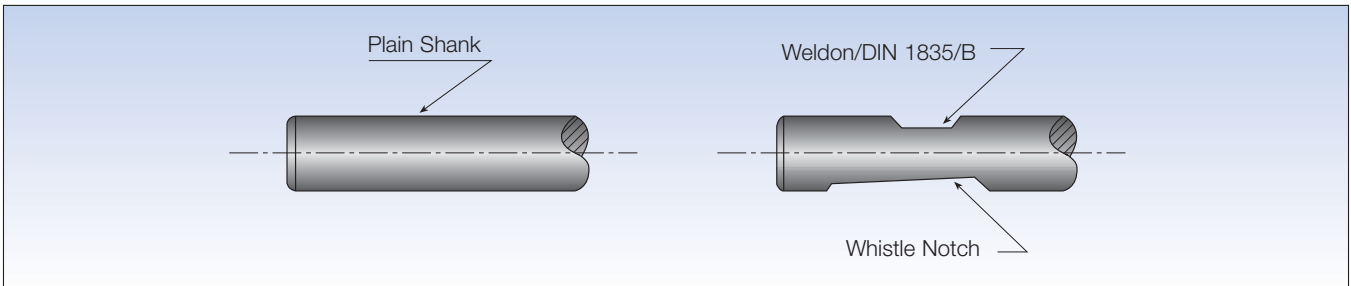
For straight shank cutting tools with internal coolant supply.



Sealed Collet JET2

With angular double nozzles. Coolant flow is direct to the cutting edge - for use with standard straight shank cutting tools (without coolant hole).

Standard Shank which can be used in Sealed Collets



Note: The front end of the sealed collet should be located beyond weldon or the whistle notch.

ER Collet

ER Spring Collet DIN 6499 (ULTRA PRECISION)



ER11, 16, 20-SPR-AA

Cat. No.	Stock	Range (mm)
ER11SPR0.5-1AA	●	0.5-1
ER11SPR1-2AA	●	1-2
ER11SPR2-3AA	●	2-3
ER11SPR3-4AA	●	3-4
ER11SPR4-5AA	●	4-5
ER11SPR5-6AA	●	5-6
ER11SPR6-7AA	●	6-7
ER16SPR0.5-1AA	●	0.5-1
ER16SPR1-2AA	●	1-2
ER16SPR2-3AA	●	2-3
ER16SPR3-4AA	●	3-4
ER16SPR4-5AA	●	4-5
ER16SPR5-6AA	●	5-6
ER16SPR6-7AA	●	6-7
ER16SPR7-8AA	●	7-8
ER16SPR8-9AA	●	8-9
ER16SPR9-10AA	●	9-10
ER20SPR1-2AA	●	1-2
ER20SPR2-3AA	●	2-3
ER20SPR3-4AA	●	3-4
ER20SPR4-5AA	●	4-5
ER20SPR5-6AA	●	5-6
ER20SPR6-7AA	●	6-7
ER20SPR7-8AA	●	7-8
ER20SPR8-9AA	●	8-9
ER20SPR9-10AA	●	9-10
ER20SPR10-11AA	●	10-11
ER20SPR11-12AA	●	11-12
ER20SPR12-13AA	●	12-13

ER25, 32-SPR-AA

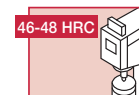
Cat. No.	Stock	Range (mm)
ER25SPR1-2AA	●	1-2
ER25SPR2-3AA	●	2-3
ER25SPR3-4AA	●	3-4
ER25SPR4-5AA	●	4-5
ER25SPR5-6AA	●	5-6
ER25SPR6-7AA	●	6-7
ER25SPR7-8AA	●	7-8
ER25SPR8-9AA	●	8-9
ER25SPR9-10AA	●	9-10
ER25SPR10-11AA	●	10-11
ER25SPR11-12AA	●	11-12
ER25SPR12-13AA	●	12-13
ER25SPR13-14AA	●	13-14
ER25SPR14-15AA	●	14-15
ER25SPR15-16AA	●	15-16
ER32SPR2-3AA	●	2-3
ER32SPR3-4AA	●	3-4
ER32SPR4-5AA	●	4-5
ER32SPR5-6AA	●	5-6
ER32SPR6-7AA	●	6-7
ER32SPR7-8AA	●	7-8
ER32SPR8-9AA	●	8-9
ER32SPR9-10AA	●	9-10
ER32SPR10-11AA	●	10-11
ER32SPR11-12AA	●	11-12
ER32SPR12-13AA	●	12-13
ER32SPR13-14AA	●	13-14
ER32SPR14-15AA	●	14-15
ER32SPR15-16AA	●	15-16
ER32SPR16-17AA	●	16-17
ER32SPR17-18AA	●	17-18
ER32SPR18-19AA	●	18-19
ER32SPR19-20AA	●	19-20

ER40-SPR-AA

Cat. No.	Stock	Range (mm)
ER40SPR3-4AA		3-4
ER40SPR4-5AA		4-5
ER40SPR5-6AA		5-6
ER40SPR6-7AA		6-7
ER40SPR7-8AA		7-8
ER40SPR8-9AA		8-9
ER40SPR9-10AA		9-10
ER40SPR10-11AA		10-11
ER40SPR11-12AA		11-12
ER40SPR12-13AA		12-13
ER40SPR13-14AA		13-14
ER40SPR14-15AA		14-15
ER40SPR15-16AA		15-16
ER40SPR16-17AA		16-17
ER40SPR17-18AA		17-18
ER40SPR18-19AA		18-19
ER40SPR19-20AA		19-20
ER40SPR20-21AA		20-21
ER40SPR21-22AA		21-22
ER40SPR22-23AA		22-23
ER40SPR23-24AA		23-24
ER40SPR24-25AA		24-25
ER40SPR25-26AA		25-26



Sets & Kits



ER Collet

ER Spring Collet DIN 6499



ER11, 16, 20-SPR

Cat. No.	Stock	Range (mm)
ER11SPR0.5-1		0.5-1
ER11SPR1-2		1-2
ER11SPR2-3		2-3
ER11SPR3-4		3-4
ER11SPR4-5		4-5
ER11SPR5-6		5-6
ER11SPR6-7		6-7
ER16SPR0.5-1		0.5-1
ER16SPR1-2		1-2
ER16SPR2-3		2-3
ER16SPR3-4		3
ER16SPR4-5		4-5
ER16SPR5-6		5-6
ER16SPR6-7		6-7
ER16SPR7-8		7-8
ER16SPR8-9		8-9
ER16SPR9-10		9-10
ER20SPR1-2		1-2
ER20SPR2-3		2-3
ER20SPR3-4		3-4
ER20SPR4-5		4-5
ER20SPR5-6		5-6
ER20SPR6-7		6-7
ER20SPR7-8		7-8
ER20SPR8-9		8-9
ER20SPR9-10		9-10
ER20SPR10-11		10-11
ER20SPR11-12		11-12
ER20SPR12-13		12-13

ER25, 32-SPR

Cat. No.	Stock	Range (mm)
ER25SPR1-2		1-2
ER25SPR2-3		2-3
ER25SPR3-4		3-4
ER25SPR4-5		4-5
ER25SPR5-6		5-6
ER25SPR6-7		6-7
ER25SPR7-8		7-8
ER25SPR8-9		8-9
ER25SPR9-10		9-10
ER25SPR10-11		10-11
ER25SPR11-12		11-12
ER25SPR12-13		12-13
ER25SPR13-14		13-14
ER25SPR14-15		14-15
ER25SPR15-16		15-16
ER32SPR2-3		2-3
ER32SPR3-4		3-4
ER32SPR4-5		4-5
ER32SPR5-6		5-6
ER32SPR6-7		6-7
ER32SPR7-8		7-8
ER32SPR8-9		8-9
ER32SPR9-10		9-10
ER32SPR10-11		10-11
ER32SPR11-12		11-12
ER32SPR12-13		12-13
ER32SPR13-14		13-14
ER32SPR14-15		14-15
ER32SPR15-16		15-16
ER32SPR16-17		16-17
ER32SPR17-18		17-18
ER32SPR18-19		18-19
ER32SPR19-20		19-20

ER40, 50-SPR

Cat. No.	Stock	Range (mm)
ER40SPR3-4		3-4
ER40SPR4-5		4-5
ER40SPR5-6		5-6
ER40SPR6-7		6-7
ER40SPR7-8		7-8
ER40SPR8-9		8-9
ER40SPR9-10		9-10
ER40SPR10-11		10-11
ER40SPR11-12		11-12
ER40SPR12-13		12-13
ER40SPR13-14		13-14
ER40SPR14-15		14-15
ER40SPR15-16		15-16
ER40SPR16-17		16-17
ER40SPR17-18		17-18
ER40SPR18-19		18-19
ER40SPR19-20		19-20
ER40SPR20-21		20-21
ER40SPR21-22		21-22
ER40SPR22-23		22-23
ER40SPR23-24		23-24
ER40SPR24-25		24-25
ER40SPR25-26		25-26
ER50SPR10-12		10-12
ER50SPR12-14		12-14
ER50SPR14-16		14-16
ER50SPR16-18		16-18
ER50SPR18-20		18-20
ER50SPR20-22		20-22
ER50SPR22-24		22-24
ER50SPR24-26		24-26
ER50SPR26-28		26-28
ER50SPR28-30		28-30
ER50SPR30-32		30-32
ER50SPR32-34		32-34



Sets & Kits



ER Collet • Internal Coolant

ER Coolant - Sealed JET Collets 10Mpa



ER16, 20, 25-SEAL

Cat. No.	Stock	Range (mm)
ER16SEAL3-4	●	3-4
ER16SEAL4-5	●	4-5
ER16SEAL5-6	●	5-6
ER16SEAL6-7	●	6-7
ER16SEAL7-8	●	7-8
ER16SEAL8-9	●	8-9
ER16SEAL9-10	●	9-10
ER20SEAL3-4	●	3-4
ER20SEAL4-5	●	4-5
ER20SEAL5-6	●	5-6
ER20SEAL6-7	●	6-7
ER20SEAL7-8	●	7-8
ER20SEAL8-9	●	8-9
ER20SEAL9-10	●	9-10
ER20SEAL10-11	●	10-11
ER20SEAL11-12	●	11-12
ER20SEAL12-13	●	12-13
ER25SEAL3-4	●	3-4
ER25SEAL4-5	●	4-5
ER25SEAL5-6	●	5-6
ER25SEAL6-7	●	6-7
ER25SEAL7-8	●	7-8
ER25SEAL8-9	●	8-9
ER25SEAL9-10	●	9-10
ER25SEAL10-11	●	10-11
ER25SEAL11-12	●	11-12
ER25SEAL12-13	●	12-13
ER25SEAL13-14	●	13-14
ER25SEAL14-15	●	14-15
ER25SEAL15-16	●	15-16

ER32-SEAL

Cat. No.	Stock	Range (mm)
ER32SEAL3-4	●	3-4
ER32SEAL4-5	●	4-5
ER32SEAL5-6	●	5-6
ER32SEAL6-7	●	6-7
ER32SEAL7-8	●	7-8
ER32SEAL8-9	●	8-9
ER32SEAL9-10	●	9-10
ER32SEAL10-11	●	10-11
ER32SEAL11-12	●	11-12
ER32SEAL12-13	●	12-13
ER32SEAL13-14	●	13-14
ER32SEAL14-15	●	14-15
ER32SEAL15-16	●	15-16
ER32SEAL16-17	●	16-17
ER32SEAL17-18	●	17-18
ER32SEAL18-19	●	18-19
ER32SEAL19-20	●	19-20

ER40-SEAL

Cat. No.	Stock	Range (mm)
ER40SEAL3-4		3-4
ER40SEAL4-5		4-5
ER40SEAL5-6		5-6
ER40SEAL6-7		6-7
ER40SEAL7-8		7-8
ER40SEAL8-9		8-9
ER40SEAL9-10		9-10
ER40SEAL10-11		10-11
ER40SEAL11-12		11-12
ER40SEAL12-13		12-13
ER40SEAL13-14		13-14
ER40SEAL14-15		14-15
ER40SEAL15-16		15-16
ER40SEAL16-17		16-17
ER40SEAL17-18		17-18
ER40SEAL18-19		18-19
ER40SEAL19-20		19-20
ER40SEAL20-21		20-21
ER40SEAL21-22		21-22
ER40SEAL22-23		22-23
ER40SEAL23-24		23-24
ER40SEAL24-25		24-25
ER40SEAL25-26		25-26



Sets & Kits



ER Collet • External Coolant

ER Coolant - Sealed JET2 Collets 10Mpa



ER16, 20, 25-SEAL-JET2

Cat. No.	Stock	Range (mm)
ER16SEAL3-4JET2	●	3-4
ER16SEAL4-5JET2	●	4-5
ER16SEAL5-6JET2	●	5-6
ER16SEAL6-7JET2	●	6-7
ER16SEAL7-8JET2	●	7-8
ER16SEAL8-9JET2	●	8-9
ER16SEAL9-10JET2	●	9-10
ER20SEAL3-4JET2	●	3-4
ER20SEAL4-5JET2	●	4-5
ER20SEAL5-6JET2	●	5-6
ER20SEAL6-7JET2	●	6-7
ER20SEAL7-8JET2	●	7-8
ER20SEAL8-9JET2	●	8-9
ER20SEAL9-10JET2	●	9-10
ER20SEAL10-11JET2	●	10-11
ER20SEAL11-12JET2	●	11-12
ER20SEAL12-13JET2	●	12-13
ER25SEAL3-4JET2	●	3-4
ER25SEAL4-5JET2	●	4-5
ER25SEAL5-6JET2	●	5-6
ER25SEAL6-7JET2	●	6-7
ER25SEAL7-8JET2	●	7-8
ER25SEAL8-9JET2	●	8-9
ER25SEAL9-10JET2	●	9-10
ER25SEAL10-11JET2	●	10-11
ER25SEAL11-12JET2	●	11-12
ER25SEAL12-13JET2	●	12-13
ER25SEAL13-14JET2	●	13-14
ER25SEAL14-15JET2	●	14-15
ER25SEAL15-16JET2	●	15-16

ER32-SEAL-JET2

Cat. No.	Stock	Range (mm)
ER32SEAL3-4JET2	●	3-4
ER32SEAL4-5JET2	●	4-5
ER32SEAL5-6JET2	●	5-6
ER32SEAL6-7JET2	●	6-7
ER32SEAL7-8JET2	●	7-8
ER32SEAL8-9JET2	●	8-9
ER32SEAL9-10JET2	●	9-10
ER32SEAL10-11JET2	●	10-11
ER32SEAL11-12JET2	●	11-12
ER32SEAL12-13JET2	●	12-13
ER32SEAL13-14JET2	●	13-14
ER32SEAL14-15JET2	●	14-15
ER32SEAL15-16JET2	●	15-16
ER32SEAL16-17JET2	●	16-17
ER32SEAL17-18JET2	●	17-18
ER32SEAL18-19JET2	●	18-19
ER32SEAL19-20JET2	●	19-20

ER40-SEAL-JET2

Cat. No.	Stock	Range (mm)
ER40SEAL3-4JET2		3-4
ER40SEAL4-5JET2		4-5
ER40SEAL5-6JET2		5-6
ER40SEAL6-7JET2		6-7
ER40SEAL7-8JET2		7-8
ER40SEAL8-9JET2		8-9
ER40SEAL9-10JET2		9-10
ER40SEAL10-11JET2		10-11
ER40SEAL11-12JET2		11-12
ER40SEAL12-13JET2		12-13
ER40SEAL13-14JET2		13-14
ER40SEAL14-15JET2		14-15
ER40SEAL15-16JET2		15-16
ER40SEAL16-17JET2		16-17
ER40SEAL17-18JET2		17-18
ER40SEAL18-19JET2		18-19
ER40SEAL19-20JET2		19-20
ER40SEAL20-21JET2		20-21
ER40SEAL21-22JET2		21-22
ER40SEAL22-23JET2		22-23
ER40SEAL23-24JET2		23-24
ER40SEAL24-25JET2		24-25
ER40SEAL25-26JET2		25-26



Sets & Kits

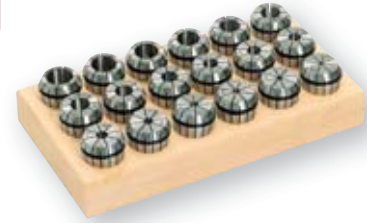


ER Collet

ER Spring Collet Sets

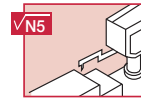
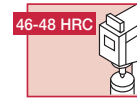
SET-ER SPR Spring Collet DIN6499

Cat. No.	Stock	Pcs.	Range (mm)
SETER11SPR7		7	0.5-7
SETER16SPR10		10	0.5-10
SETER20SPR12		12	1-13
SETER25SPR15		15	1-16
SETER32SPR18		18	2-20
SETER40SPR23		23	3-26
SETER50SPR12		12	10-34



SET-ER-SPR-AA Spring Collet DIN6499 AA (Ultra Precision)

Cat. No.	Stock	Pcs.	Range (mm)
SETER11SPR7AA		7	0.5-7
SETER16SPR10AA		10	0.5-10
SETER20SPR12AA		12	1-13
SETER25SPR15AA		15	1-16
SETER32SPR18AA		18	2-20
SETER40SPR23AA		23	3-26



ER Coolant - Sealed Jet type Collet Sets

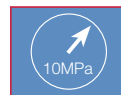
SET-ER-SEAL Collet

Cat. No.	Stock	Pcs.	Range (mm)
SETER16SEAL7		7	3-10
SETER20SEAL10		10	3-13
SETER25SEAL13		13	3-16
SETER32SEAL17		17	3-20
SETER40SEAL23		23	3-26



SET-ER-SEAL-JET2 Collet DIN6499 (External Coolant)

Cat. No.	Stock	Pcs.	Range (mm)
SETER16SEAL7JET2		7	3-10
SETER20SEAL10JET2		10	3-13
SETER25SEAL13JET2		13	3-16
SETER32SEAL17JET2		17	3-20
SETER40SEAL23JET2		23	3-26



ER Spring Collet Sets DIN6499

SET ER SPR-EM (1)

Cat. No.	Stock	Pcs.	Collet Sizes (mm)
SETER16SPR8EM		8	3, 4, 5, 6, 7, 8, 9, 10
SETER20SPR5EM		5	4, 6, 8, 10, 12
SETER25SPR6EM		6	4, 6, 8, 10, 12, 16
SETER32SPR6EM		6	6, 8, 10, 12, 16, 20
SETER40SPR7EM		7	6, 8, 10, 12, 16, 20, 25

(1) Contains popular endmill sizes only.

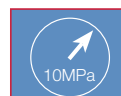


ER Coolant - Sealed type Jet Collet Sets (Internal Coolant)

SET-ER SEAL-EM (1)

Cat. No.	Stock	Pcs.	Collet Sizes (mm)
SETER16SEAL5EM		5	4, 5, 6, 8, 10
SETER20SEAL5EM		5	4, 6, 8, 10, 12
SETER25SEAL6EM		6	4, 6, 8, 10, 12, 16
SETER32SEAL6EM		6	6, 8, 10, 12, 16, 20
SETER40SEAL7EM		7	6, 8, 10, 12, 16, 20, 25

(1) Contains popular endmill sizes only.



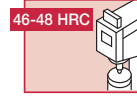
ER Collet

ER Coolant - Sealed type Jet Collet Sets (External Coolant)

SET ER-SEAL-EM JET2 (1)

Cat. No.	Stock	Pcs.	Collet Sizes (mm)
SETER16SEAL5EMJET2		5	4, 5, 6, 8, 10
SETER20SEAL5EMJET2		5	4, 6, 8, 10, 12
SETER25SEAL6EMJET2		6	4, 6, 8, 10, 12, 16
SETER32SEAL6EMJET2		6	6, 8, 10, 12, 16, 20
SETER40SEAL7EMJET2		7	6, 8, 10, 12, 16, 20, 25

(1) Contains popular endmill sizes only.

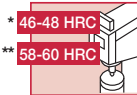
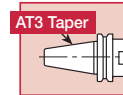
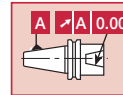


Taper Shank ER Collet type and Collet Kits

KIT

Cat. No.	Stock	Pcs.	Range (mm)
KITR-810ER16		10	0.5-10
KITR-818ER32		18	2-20
KITR-823ER40		23	3-26
KITDIN20803018ER32		18	2-20
KITDIN20804018ER32		18	2-20
KITDIN20803023ER40		23	3-26
KITDIN20804023ER40		23	3-26
KITDIN20805023ER40		23	3-26
KITDIN20804012ER50		12	10-34
KITDIN20805012ER50		12	10-34
KITMT318ER32		18	2-20
KITMT418ER32		18	2-20
KITMT423ER40		23	3-26

Each kit contains one collet chuck, a full set of ER collets and a Wrench.



* Collet
** Toolholder

Straight Shank ER Collet type and Collet Kits

KIT ST-ER-Mini MINI Collet Chuck type DIN6499

Cat. No.	Stock	Pcs.	Range (mm)
KITST12X807ER11M		7	0.5-7
KITST12X8010ER16M		10	0.5-10
KITST16X507ER11MF		7	0.5-7
KITST16X1007ER11M		7	0.5-7
KITST16X1507ER11M		7	0.5-7
KITST20X10010ER16M		10	0.5-10
KITST20X15010ER16M		10	0.5-10
KITST20X10012ER20M		12	1-12
KITST20X15012ER20M		12	1-12

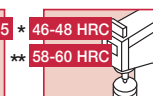
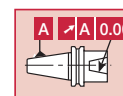
Each kit contains one collet chuck, a full set of ER collets and a Wrench
F indicates a flat on the shank.



KIT ST-ER Collet Chuck type DIN6499

Cat. No.	Stock	Pcs.	Range (mm)
KITST16X507ER11F		7	0.5-7
KITST20X507ER11F		7	0.5-7
KITST20X1007ER11		7	0.5-7
KITST20X1507ER11		7	0.5-7
KITST20X5010ER16F		10	0.5-10
KITST20X10010ER16		10	0.5-10
KITST20X15010ER16		10	0.5-10
KITST20X5012ER20F		12	1-12
KITST25X10012ER20		12	1-12

Each kit contains one collet chuck, a full set of ER collets and a Wrench
F indicates a flat on the shank.



* Collet
** Toolholder

ER Collet

ER - Top Clamping Nut DIN 6499

Description:

Friction bearing ER nut is a nut with a unique two-piece exclusive friction mechanism combining radial and angular self-centering movements.

Features:

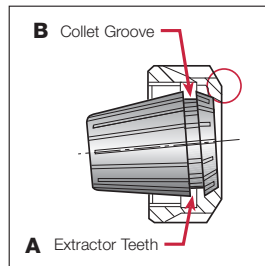
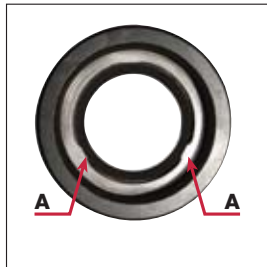
- Unique two-piece friction bearing.
- Radial and angular float for better concentricity.
- Powerful gripping force, 50-100% higher than the standard ER nut due to the friction bearing mechanism.
- Balanced for higher spindle spin due to unique extractor teeth design.
- Compact design - general dimensions and size range are the same as the standard nut.

- Designed for use with sealed collets.

Always assemble the collet into the nut before mounting onto the collet chuck.

Insertion Procedure:

1. Insert the collet at an angle, fitting the two extractor teeth which protrude **(A)** into the collet's groove **(B)**.
2. Place the two parts on a clean and horizontal work surface.
3. Press down with your thumb on the back end of the collet until it clicks into place **(C)**.



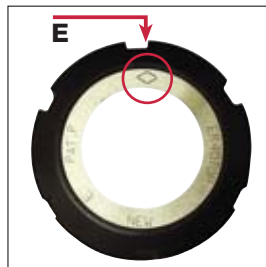
Important: Never insert the collet parallel to the extractor ring. Doing this will chip or break the extractor's teeth.

When unclamping the nut, the collet will self-release from the chuck by means of extractor teeth.

2. Place the nut with the collet facing down on a clean and horizontal work surface.
3. Insert a screwdriver vertically between the nut slots and the collet on the reverse side of the engraved diamond shape **(D)**.
4. Tilt the screwdriver outwards, while helping the extraction by pushing the collet's back end in the opposite direction **(F)**.

Extraction Procedure

1. Align the engraved diamond shape which is on the silver ring **(D)**, with any of the key slots **(E)** of the nut.



! Note:

For maximum performance the clamping nut thread and collet taper must be cleaned and oiled before use.

Recommended Clamping Torque for Standard ER & ER-Top Clamping Nut

Important:

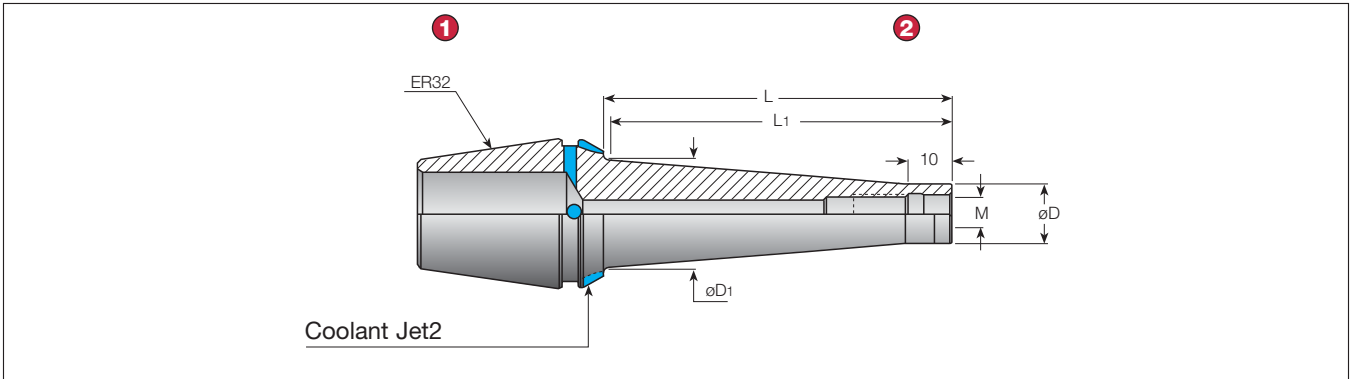
This torque is calculated with the maximum diameter capacity per collet which should be gradually reduced when used with a smaller shank size.



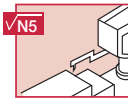
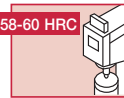
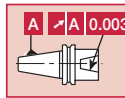
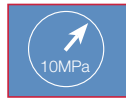
Nut type	N-m
ER-11	49
ER-11M	29.4
ER-16	68.7
ER-16M	39.2
ER-20	117.7
ER-20M	78.5
ER-25	196.1
ER-32	215.7
ER-40	245.1
ER-50	343.2

ER Collet • TUNGFLEX

ER-ODP



- 1 ER Collet
- 2 TungFlex

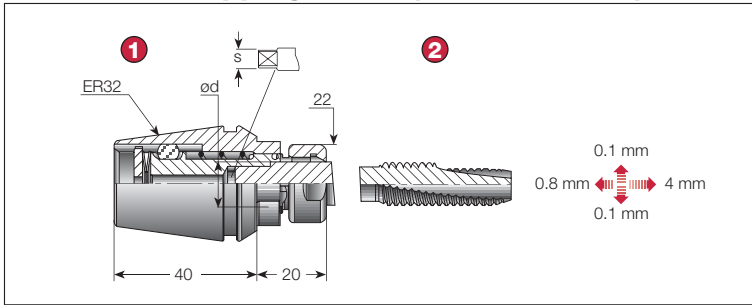


ER-ODP ER Collet with Indexable Modular System

Cat. No.	Stock	Dimensions (mm)				
		M	øD	øD ₁	L	L ₁
ER32ODPM6X25		M6	9.8	14	25	22
ER32ODPM6X50		M6	9.8	20	50	48
ER32ODPM6X75		M6	9.8	23	75	74
ER32ODPM8X25		M8	13.1	15	25	22
ER32ODPM8X50		M8	13.1	23	50	49
ER32ODPM8X75		M8	13.1	23	75	74
ER32ODPM10X25		M10	18.0	20	25	23
ER32ODPM10X50		M10	18.0	24	50	49
ER32ODPM12X25		M12	21.0	24	25	24
ER32ODPM12X50		M12	21.0	24	50	49

TUNGSTI • ER Collet for Tapping

GTIN ER32 Tapping Collet (ISO / DIN / JIS)

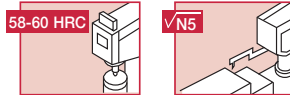


GTIN ER Tapping Collet

Features:

- Fits every type of ER32 collet chuck, stationary and rotating.
- Compensates for machine feed and tap pitch variance.
- Floating mechanism compensates for misalignment between tap and work piece.
- Hard start for rigid tapping.
- Compact design for minimal clearance.

- ① ER32
- ② ISO / DIN / JIS type



GTIN ER-ISO

Cat. No.	Stock	Dimensions (mm)		T Wrench	Tap size
		ød	S		
GTINER32ISO2.24X1.80		2.24	1.80	20	M3
GTINER32ISO2.50X2.00		2.50	2.00	20	M3.5
GTINER32ISO2.80X2.24		2.80	2.24	20	M2.2-M2.5
GTINER32ISO3.15X2.50		3.15	2.50	20	M3-M4
GTINER32ISO3.55X2.80		3.55	2.80	20	M3.5-M4.5
GTINER32ISO4.00X3.15		4.00	3.15	20	M4-M5
GTINER32ISO4.50X3.55		4.50	3.55	20	M6
GTINER32ISO5.00X4.00		5.00	4.00	20	M5
GTINER32ISO5.60X4.50		5.60	4.50	20	UNC#12-24
GTINER32ISO6.30X5.00		6.30	5.00	20	M6-M8
GTINER32ISO7.10X5.60		7.10	5.60	20	UNC# - 3/8 - 16
GTINER32ISO8.00X6.30		8.00	6.30	20	M8-M10
GTINER32ISO9.00X7.10		9.00	7.10	20	M12
GTINER32ISO10.00X8.00		10.00	8.00	20	M10
GTINER32ISO11.20X9.00		11.20	9.00	20	M14
GTINER32ISO12.50X10.00		12.50	10.00	20	M16

GTIN ER-DIN

Cat. No.	Stock	Dimensions (mm)		T Wrench	Tap size
		ød	S		
GTINER32DIN2.50X2.10		2.50	2.10	20	M1-M1.8
GTINER32DIN2.80X2.10		2.80	2.10	20	M2-M4
GTINER32DIN3.50X2.70		3.50	2.70	20	M3-M5
GTINER32DIN4.00X3.00		4.00	3.00	20	M3-M5
GTINER32DIN4.50X3.40		4.50	3.40	20	M4-M6
GTINER32DIN6.00X4.90		6.00	4.90	20	M5-M8
GTINER32DIN7.00X5.50		7.00	5.50	20	M10
GTINER32DIN8.00X6.20		8.00	6.20	20	M8
GTINER32DIN9.00X7.00		9.00	7.00	20	M12
GTINER32DIN10.00X8.00		10.00	8.00	20	M10
GTINER32DIN11.00X9.00		11.00	9.00	20	M14
GTINER32DIN12.00X9.00		12.00	9.00	20	M16

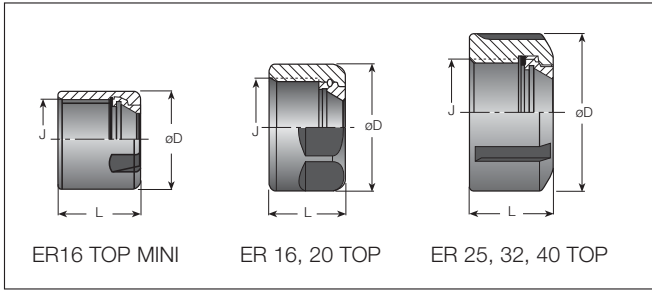
GTIN ER-JIS

Cat. No.	Stock	Dimensions (mm)		T Wrench	Tap size
		ød	S		
GTINER32JIS3.00X2.50		3.0	2.5	20	M1-M2.6
GTINER32JIS4.00X3.20		4.0	3.2	20	M3-M3.5
GTINER32JIS5.00X4.00		5.0	4.0	20	M4
GTINER32JIS5.50X4.50		5.5	4.5	20	M5
GTINER32JIS6.00X4.50		6.0	4.5	20	M6
GTINER32JIS6.20X5.00		6.2	5.0	20	M8
GTINER32JIS7.00X5.50		7.0	5.5	20	M10
GTINER32JIS8.50X6.50		8.5	6.5	20	M12
GTINER32JIS10.50X8.00		10.5	8.0	20	M14
GTINER32JIS12.50X10.00		12.5	10.0	20	M16

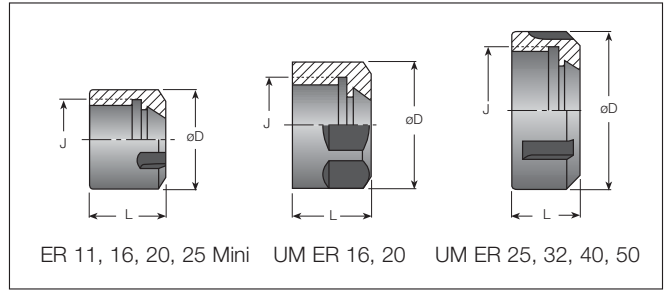
No coolant should be induced through the tapping collet, as it will cause malfunctioning of the mechanism.

ER NUT

A NUT ER-TOP



B NUT E-UM / MINI



A NUT-ER-TOP ER Clamping NUT (DIN6499)

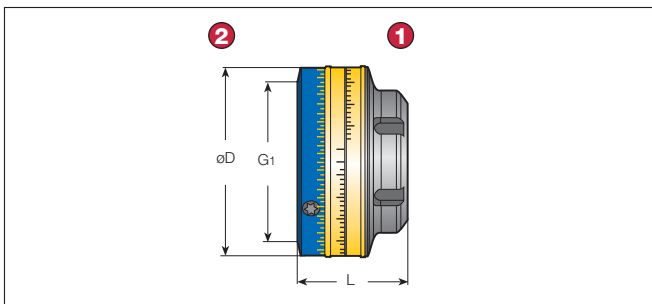
Cat. No.	Stock	Dimensions (mm)			N·m
		øD	L	J	
NUTER16TOPMINI	●	22	18	M19X1.0	39.2
NUTER16TOP	●	28	17	M22X1.5	68.7
NUTER20TOP	●	34	19	M25X1.5	117.7
NUTER25TOP	●	42	20	M32X1.5	196.1
NUTER32TOP	●	50	22	M40X1.5	215.7
NUTER40TOP	●	63	25	M50X1.5	245.1

B NUT ER-UM / Mini UM & Mini Clamping NUT (DIN6499)

Cat. No.	Stock	Dimensions (mm)			N·m
		øD	L	J	
NUTER11MINI	●	16	10.8	M13X0.75	29.4
NUTER11UM	●	19	11.3	M14X0.75	49
NUTER16MINI	●	22	18.0	M19X1.0	39.2
NUTER16UM	●	28	17.0	M22X1.5	68.7
NUTER20MINI	●	28	19.0	M24X1.0	78.5
NUTER20UM	●	34	19.0	M25X1.5	117.7
NUTER25MINI	●	35	20.0	M30X1.0	98
NUTER25UM	●	42	20.0	M32X1.5	196.1
NUTER32UM	●	50	22.0	M40X1.5	215.7
NUTER40UM	●	63	25.0	M50X1.5	245.1
NUTER50UM	●	78	35.0	M64X2.0	343.2

TUNGBALANCE • TUNGSHORT

NUT ER-BALANCE

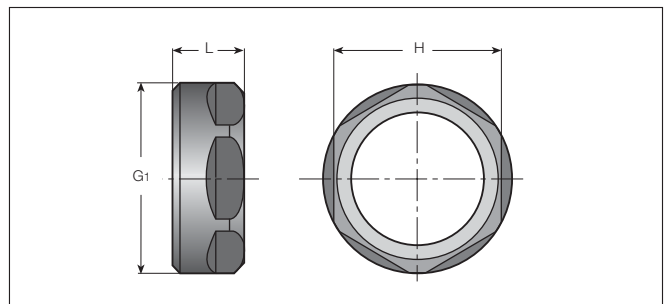


- ① DIN6499
- ② TungBalance

NUT ER-BALANCE Balanceable ER Top Nut (NUT According to DIN6499)

Cat. No.	Stock	Dimensions (mm)			N·m
		L	øD	G1	
NUTER16TOPBIN	●	36.0	44	M22x1.5	68.7
NUTER20TOPBIN	●	37.0	50	M25x1.5	117.7
NUTER25TOPBIN	●	37.5	58	M32x1.5	196.1
NUTER32TOPBIN	●	38.0	66	M40x1.5	215.7

NUT ER-SHORT



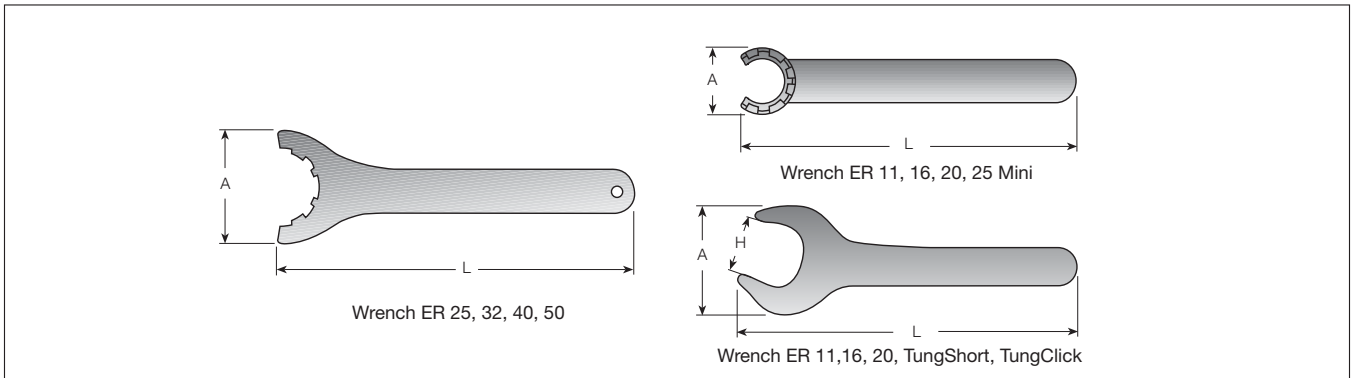
For Short Collet Chuck ER32

NUT ER-SHORT NUT ER32 TungShort

Cat. No.	Stock	Dimensions (mm)			N·m
		H	L	G1	
NUTER20SHORT	●	22	10.7	M25X1.5	117.7
NUTER32SHORT	●	36	15.0	M40X1.5	215.7
NUTER40SHORT	●	46	16.0	M50X1.5	245.1

ER Collet Chuck • Wrench

WRENCH-ER



WRENCH-ER Wrench for ER DIN 6499

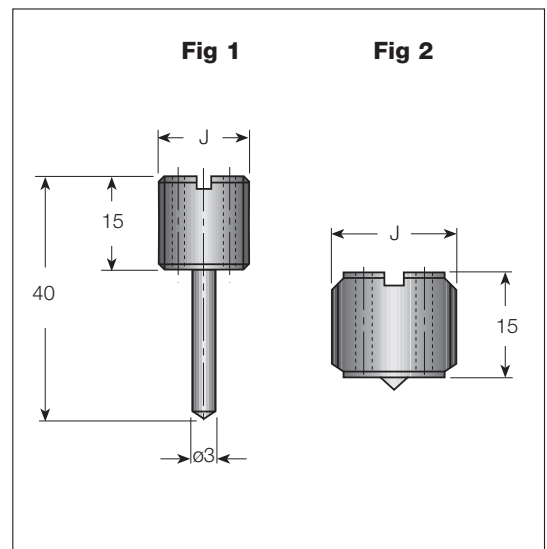
Cat. No.	Stock	Dimensions (mm)		
		A	H	L
WRENCHER11MINI	●	16.8	-	95
WRENCHER11	●	32	17	95
WRENCHER16MINI	●	22.5	-	117
WRENCHER16	●	42.8	25	143
WRENCHER20MINI	●	28	-	128
WRENCHER20	●	53.5	30	172
WRENCHER25MINI	●	29	-	120
WRENCHER25	●	70	-	207
WRENCHER32	●	78	-	255
WRENCHER40		95	-	285
WRENCHER50		110	-	350
WRENCHER20SHORTRING22	●	48	22	260
WRENCHER32SHORT	●	75	36	303
WRENCHER40SHORT		94	46	378
WRENCHER32CLICKIN27		57	27	239
WRENCHER32CLICKIN32		67	32	273

ER Collet Chuck • Preset Screws

Preset Screws for ER Collet Chuck

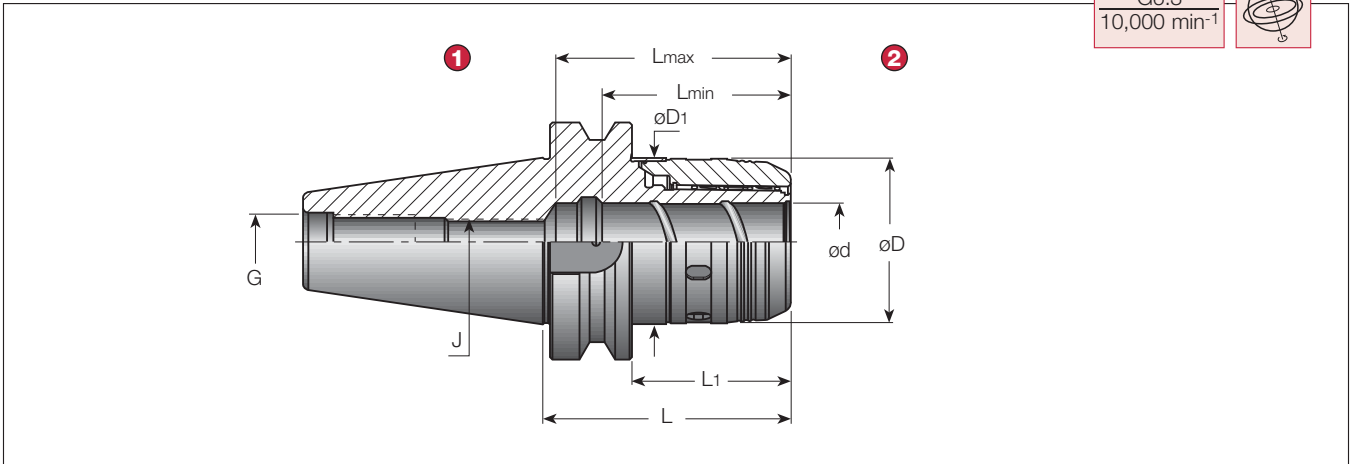
PRESET ER-JET

Cat. No.	Stock	J	Fig
PRESETER-JET8X1		M8X1.0	2
PRESETER-JET8X1.25		M8X1.25	2
PRESETER-JET10X1.5	●	M10X1.5	2
PRESETER-JET12X1		M12X1.0	2
PRESETER-JET12X1.75L		M12X1.75	1
PRESETER-JET12X1.75	●	M12X1.75	2
PRESETER-JET14X1	●	M14X1.0	2
PRESETER-JET16X2	●	M16X2	2
PRESETER-JET16X2L		M16X2	1
PRESETER-JET18X1		M18X1.0	2
PRESETER-JET18X1.5	●	M18X1.5	2
PRESETER-JET18X1.5L		M18X1.5	1
PRESETER-JET22X1.5	●	M22X1.5	2
PRESETER-JET22X1.5L		M22X1.5	1
PRESETER-JET28X1.5		M28X1.5	2



TUNGMAX • Power Chuck Holder

BT-MAX



- ① BT MAS 403 Form A/B
- ② TungMax



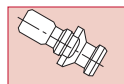
BT-MAX Power Chuck Holder

Cat. No.	Stock	Dimensions (mm)									
		Range	ød	øD	øD1	L	L1	Lmin	Lmax	J	G
BT40TUNGMAX20x85	●	6-20	20	51	53	85	58	56	68	M16	M16
BT40TUNGMAX32x108	●	6-32	32	69	70	108	81	70	83	M16	M16
BT50TUNGMAX20x105 ⁽¹⁾	●	6-20	20	51	53	105	67	56	69	M16	M24
BT50TUNGMAX32x106 ⁽¹⁾	●	6-32	32	69	70	106	68	69	83	M20x2	M24
BT50TUNGMAX32x135 ⁽¹⁾	●	6-32	32	69	70	135	97	69	84	M20x2	M24

Add B for coolant through the flange.

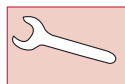
⁽¹⁾ Balanced to G6.3 at max. n : 8,000 min⁻¹

Wrench and Extracting Hook is not included.



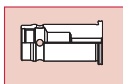
Pull Stud

70



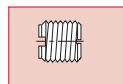
Wrench

30



SC Collet

29



Preset Screw

30

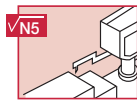
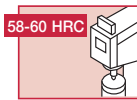
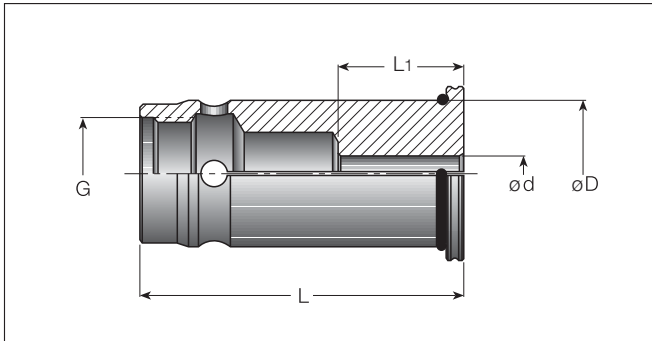


User Guide

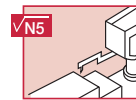
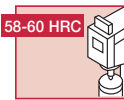
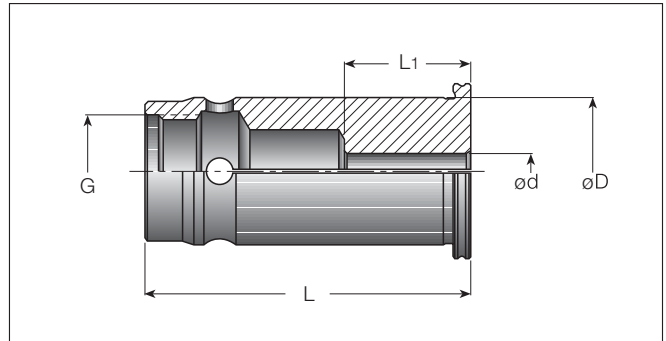
3

TUNGMAX • Collet for Power Chuck

A SC-SEAL



B SC-SPR



A SC-SEAL SC Sealed Straight Collet

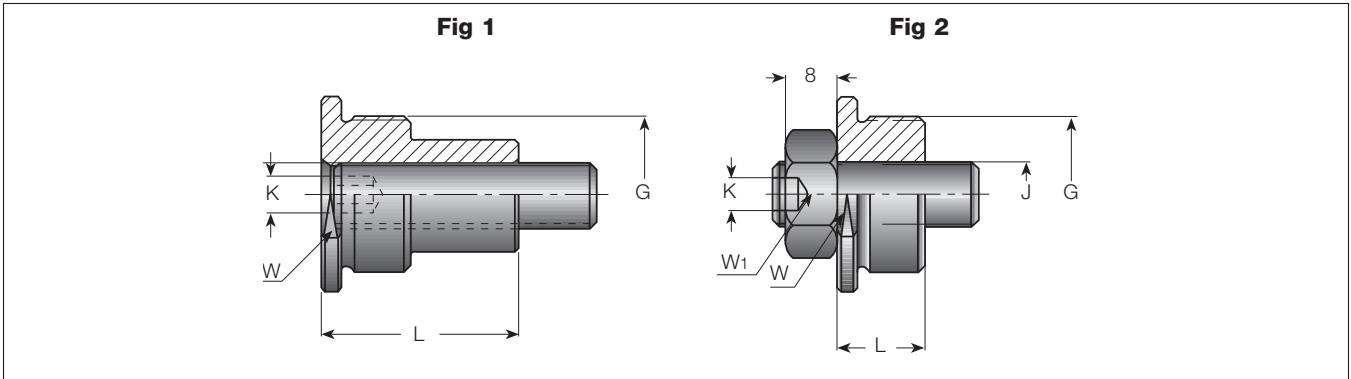
Cat. No.	Stock	Dimensions (mm)				
		ød	øD	L	L ₁	G
SC20SEAL6	●	6	20	60	28	M16
SC20SEAL8	●	8	20	60	28	M16
SC20SEAL10	●	10	20	60	35	M16
SC20SEAL12	●	12	20	60	40	M16
SC20SEAL14	●	14	20	60	40	M16
SC20SEAL15	●	15	20	60	40	M16
SC20SEAL16	●	16	20	60	39	M16
SC32SEAL6	●	6	32	72	28	M24x1.5
SC32SEAL8	●	8	32	72	28	M24x1.5
SC32SEAL10	●	10	32	72	35	M24x1.5
SC32SEAL12	●	12	32	72	40	M24x1.5
SC32SEAL14	●	14	32	72	40	M24x1.5
SC32SEAL15	●	15	32	72	40	M24x1.5
SC32SEAL16	●	16	32	72	44	M24x1.5
SC32SEAL18	●	18	32	72	44	M24x1.5
SC32SEAL19	●	19	32	72	44	M24x1.5
SC32SEAL20	●	20	32	72	46	M24x1.5
SC32SEAL24	●	24	32	72	46	M24x1.5
SC32SEAL25	●	25	32	72	51	M24x1.5

B SC-SPR SC Straight Collet

Cat. No.	Stock	Dimensions (mm)				
		ød	øD	L	L ₁	G
SC20SPR6		6	20	60	28	M16
SC20SPR8		8	20	60	28	M16
SC20SPR10		10	20	60	35	M16
SC20SPR12		12	20	60	40	M16
SC20SPR14		14	20	60	40	M16
SC20SPR15		15	20	60	40	M16
SC20SPR16		16	20	60	39	M16
SC32SPR6		6	32	72	28	M24x1.5
SC32SPR8		8	32	72	28	M24x1.5
SC32SPR10		10	32	72	35	M24x1.5
SC32SPR12		12	32	72	40	M24x1.5
SC32SPR14		14	32	72	40	M24x1.5
SC32SPR15		15	32	72	40	M24x1.5
SC32SPR16		16	32	72	44	M24x1.5
SC32SPR18		18	32	72	44	M24x1.5
SC32SPR19		19	32	72	44	M24x1.5
SC32SPR20		20	32	72	46	M24x1.5
SC32SPR24		24	32	72	45	M24x1.5
SC32SPR25		25	32	72	51	M24x1.5

TUNGMAX • Preset Screw for Power Chuck

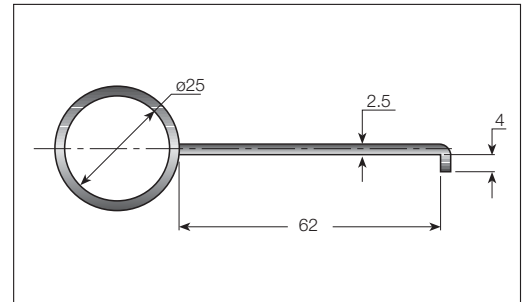
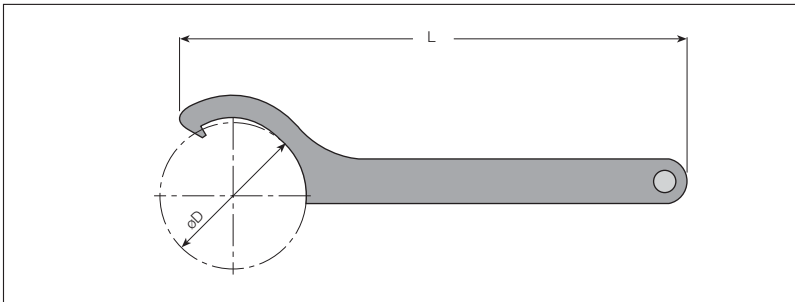
SC-SPR



PRESET SC CAP Preset Screw for SC Collets (Power Chuck)

Cat. No.	Stock	Dimensions (mm)					Fig	Wrench	Collet size
		L	W	J	G	Collet Range			
PRESETSCCAP8x1.25L	●	28	16	M8x25	M16	6-8	1	4	SC20
PRESETSCCAP8x1.25	●	15	16	M8x25	M16	10-16	2	4	
PRESETSCCAP10x1.5L	●	30.0	27	M10x30	M24x1.5	6-14	1	5	SC20
PRESETSCCAP10x1.5	●	13.5	27	M10x30	M24x1.5	16-25	2	5	

TUNGMAX • Wrench



Wrench for TungMax Collets

Cat. No.	Stock	Dimensions (mm)	
		øD	L
WRENCHTUNGMAX20HOOK	●	26	205
WRENCHTUNGMAX32HOOK	●	68	240

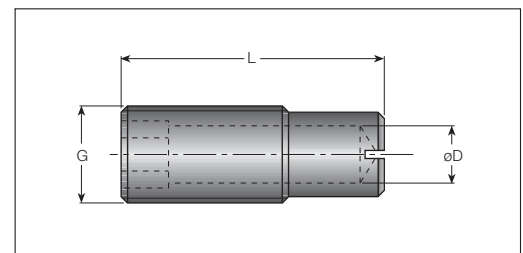
SC Collet Extracting Hook for TungMax

Cat. No.	Stock
EXTRACTORSCCOLLETS	●

TUNGMAX • Preset Screws

PRESET MAXIN Preset Screw for TungMax

Cat. No.	Stock	Dimensions (mm)			
		G	L	øD	K
PRESETTUNGMAX16X30	●	M16	30	8	8
PRESETTUNGMAX16X44	●	M16	44	8	8
PRESETTUNGMAX20X55	●	M20	55	12	12



MAX Kits • TUNGMAX

Max Kit

Cat. No.	Stock	SC-SPR	Pcs.	Collet Range (mm)
KITSK40TUNGMAX20X956		SC 20	6	6, 8, 10, 12, 14, 16
KITSK40TUNGMAX32X1067		SC 32	7	6, 8, 10, 12, 16, 20, 25
KITSK50TUNGMAX20X1056		SC 20	6	6, 8, 10, 12, 14, 16
KITSK50TUNGMAX32X1007		SC 32	7	6, 8, 10, 12, 16, 20, 25
KITHSKA63TUNGMAX20X956		SC 20	6	6, 8, 10, 12, 14, 16
KITHSKA63TUNGMAX32X1137		SC 32	7	6, 8, 10, 12, 16, 20, 25
KITHSKA100TUNGMAX20X1156		SC 20	6	6, 8, 10, 12, 14, 16
KITHSKA100TUNGMAX32X1067		SC 32	7	6, 8, 10, 12, 16, 20, 25
KITBT40TUNGMAX20X856		SC 20	6	6, 8, 10, 12, 14, 16
KITBT40TUNGMAX32X1087		SC 32	7	6, 8, 10, 12, 16, 20, 25
KITBT50TUNGMAX20X1056		SC 20	6	6, 8, 10, 12, 14, 16
KITBT50TUNGMAX32X1067		SC 32	7	6, 8, 10, 12, 16, 20, 25



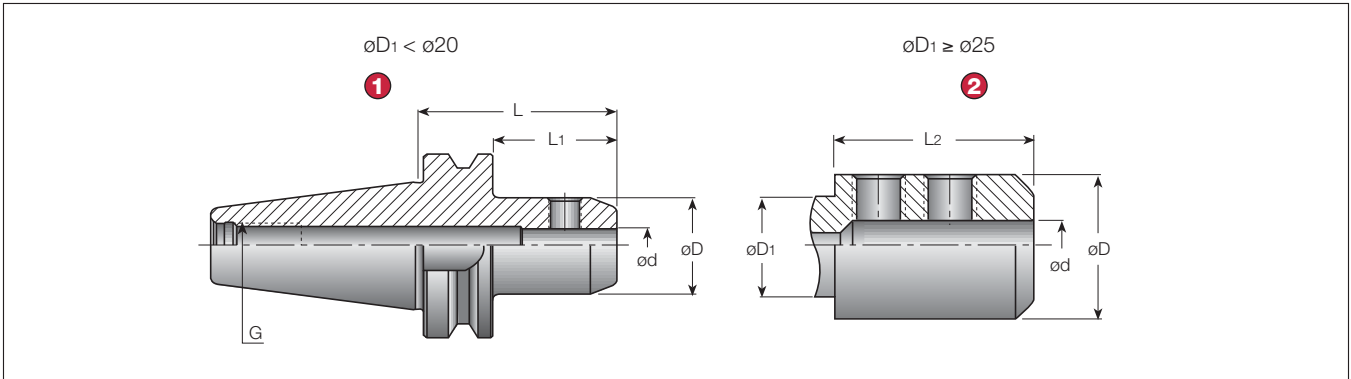
SET SC-SPR, SEAL SC Collet Set (for TungMAX)

Cat. No.	Stock	Pcs.	Collet Range (mm)
SETSC20SPR6		6	6, 8, 10, 12, 14, 16
SETSC32SPR9		9	6, 8, 10, 12, 14, 16, 18, 20, 25
SETSC20SEAL6		6	6, 8, 10, 12, 14, 16
SETSC32SEAL9		9	6, 8, 10, 12, 14, 16, 18, 20, 25

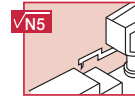
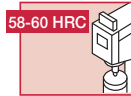
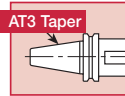
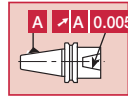


Side Lock holder for Endmills

BT-EM



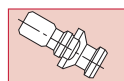
- 1 BT MAS 403 Form A/B
- 2 DIN6359
DIN1835 Form B (Weldon type)



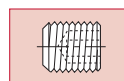
BT-EM Endmill Chuck Holder (Weldon type)

Cat. No.	Stock	Dimensions (mm)						
		ϕd	ϕD	ϕD_1	L	L ₁	L ₂	G
BT30EM6X50		6	25	-	50	28	-	M12
BT30EM8X60		8	28	-	60	38	-	M12
BT30EM10X60		10	35	-	60	38	-	M12
BT30EM12X60	●	12	42	-	60	38	-	M12
BT30EM14X60		14	44	-	60	38	-	M12
BT30EM16X60	●	16	48	44.4	60	38	37	M12
BT30EM18X60	●	18	50	44.4	60	38	28	M12
BT30EM20X80	●	20	52	44.4	80	53	43	M12
BT40EM6X50		6	25	-	50	23	-	M16
BT40EM8X50		8	28	-	50	23	-	M16
BT40EM10X65		10	35	-	65	38	-	M16
BT40EM12X65	●	12	42	-	65	38	-	M16
BT40EM14X65		14	44	-	65	38	-	M16
BT40EM16X65	●	16	48	-	65	38	-	M16
BT40EM18X65	●	18	50	-	65	38	-	M16
BT40EM20X75	●	20	52	-	75	48	-	M16
BT40EM25X105	●	25	65	61.0	105	78	68	M16
BT40EM32X110	●	32	71	61.0	110	83	73	M16
BT50EM6X70		6	25	-	70	32	-	M24
BT50EM8X70		8	28	-	70	32	-	M24
BT50EM10X70		10	35	-	70	32	-	M24
BT50EM12X100	●	12	42	-	100	62	-	M24
BT50EM14X100		14	44	-	100	62	-	M24
BT50EM16X100	●	16	48	-	100	62	-	M24
BT50EM18X100	●	18	50	-	100	62	-	M24
BT50EM20X100	●	20	52	-	100	62	-	M24
BT50EM25X115	●	25	65	-	115	77	-	M24
BT50EM32X115	●	32	72	-	115	77	-	M24
BT50EM40X115		40	90	-	115	77	-	M24
BT50EM42X115		42	90	-	115	77	-	M24
BT50EM50X125		50	98	-	125	87	-	M24

Add B for coolant through the flange.



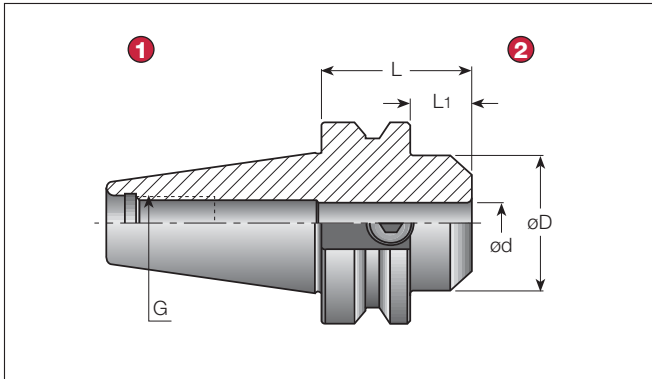
Pull Stud



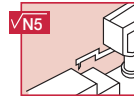
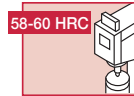
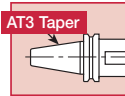
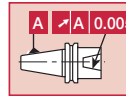
Lock Screw

Side Lock holder for Endmills

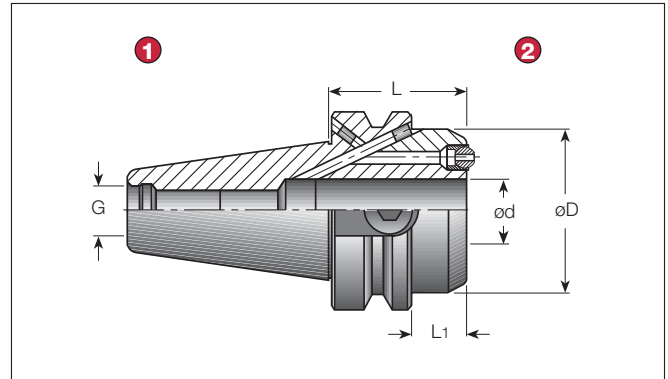
A BT-EM



- 1 BT MAS 403 Form A/B
- 2 DIN6359
DIN1835 Form B (Weldon type)



B BT-EM-C



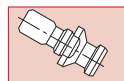
A BT-EM Short Endmill Holder (Weldon type)

Cat. No.	Stock	Dimensions (mm)				
		ød	L	L1	øD	G
BT40EM10X45		10	45	18	35	M16
BT40EM12X45		12	45	18	42	M16
BT40EM14X45		14	45	18	44	M16
BT40EM16X45		16	45	18	48	M16
BT40EM18X45		18	45	18	50	M16
BT40EM20X45		20	45	18	52	M16
BT40EM25X45		25	45	-	63	M16

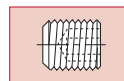
Add B for coolant through the flange.

B BT-EM-C Short Endmill Chuck Holder with Adjustable Nozzle (Weldon type)

Cat. No.	Stock	Dimensions (mm)				
		ød	L	L1	øD	G
BT40EM6X50C		6	50	23	32	M16
BT40EM8X50C		8	50	23	28	M16
BT40EM10X45C		10	45	18	35	M16
BT40EM12X45C		12	45	18	42	M16
BT40EM16X45C		16	45	18	48	M16
BT40EM20X45C		20	45	18	52	M16
BT40EM25X45C		25	45	-	63	M16



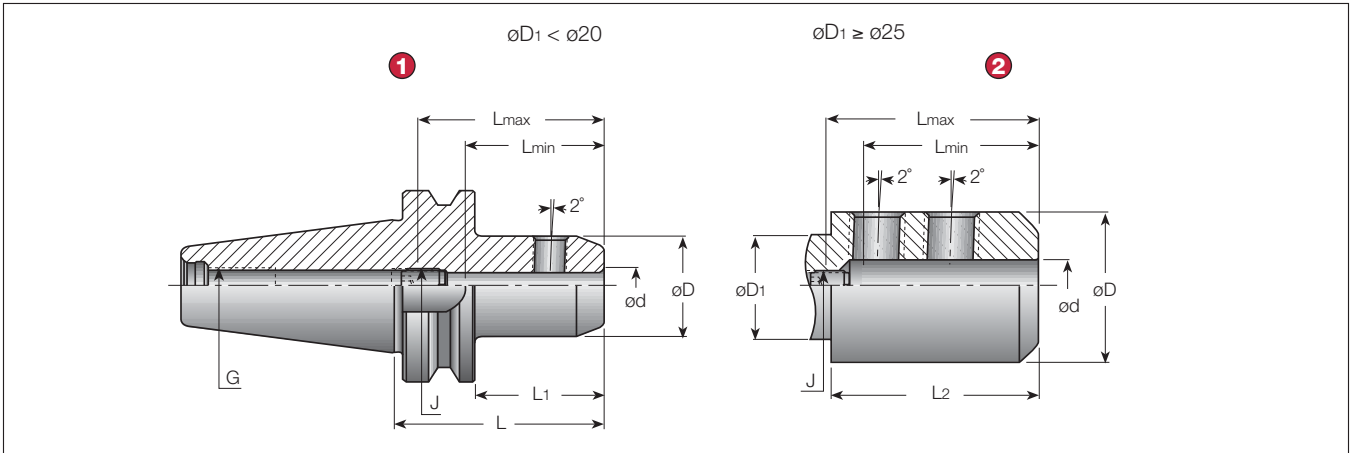
Pull Stud



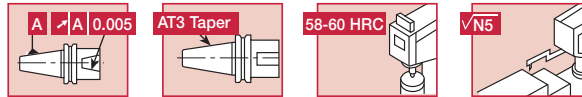
Lock Screw

Side Lock holder for Drills

BT-EM-E



- 1 BT MAS 403 Form A/B
- 2 DIN6359
DIN1835 Form E (whistle notch type)

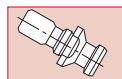


BT-EM-E Drill Chuck Holder (whistle notch type)

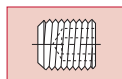
Cat. No.	Stock	Dimensions (mm)										Hex Key
		ϕd	ϕD	ϕD_1	L	L ₁	L ₂	L _{min}	L _{max}	J ⁽¹⁾	G	
BT40EM6X50E		6	25	-	50	23	-	35	45	M5	M16	2.5
BT40EM8X50E		8	28	-	50	23	-	35	45	M6	M16	3
BT40EM10X65E		10	35	-	65	38	-	39	49	M8	M16	4
BT40EM12X65E	●	12	42	-	65	38	-	44	54	M10	M16	5
BT40EM14X65E		14	44	-	65	38	-	44	54	M10	M16	5
BT40EM16X65E	●	16	48	-	65	38	-	47	57	M12	M16	6
BT40EM18X65E		18	50	-	65	38	-	47	57	M12	M16	6
BT40EM20X75E	●	20	52	-	75	48	-	49	59	M16	M16	8
BT40EM25X105E	●	25	65	61	105	78	68	54	64	M20X1.5	M16	10
BT40EM32X110E	●	32	71	61	110	83	73	58	68	M20X1.5	M16	10
BT50EM6X70E		6	25	-	70	32	-	35	45	M5	M24	2.5
BT50EM8X70E		8	28	-	70	32	-	35	45	M6	M24	3
BT50EM10X70E		10	35	-	70	32	-	39	49	M8	M24	4
BT50EM12X100E	●	12	42	-	100	62	-	44	54	M10	M24	5
BT50EM14X100E		14	44	-	100	62	-	44	54	M10	M24	5
BT50EM16X100E	●	16	48	-	100	62	-	47	57	M12	M24	6
BT50EM18X100E		18	50	-	100	62	-	47	57	M12	M24	6
BT50EM20X100E	●	20	52	-	100	62	-	49	59	M16	M24	8
BT50EM25X115E	●	25	65	-	115	77	-	54	64	M20X1.5	M24	10
BT50EM32X115E	●	32	72	-	115	77	-	58	68	M20X1.5	M24	10
BT50EM40X115E	●	40	90	-	115	77	-	68	78	M20X1.5	M24	10
BT50EM50X125E	●	50	98	-	125	67	-	78	88	M20X1.5	M24	10

Add B for coolant through the flange.

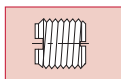
(1) The adjustment screw has an internal coolant hole.



Pull Stud



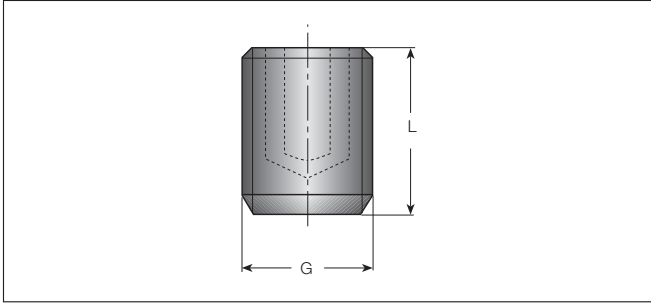
Lock Screw



Preset Screw

Side Lock holder • Lock Screw / Present Screw

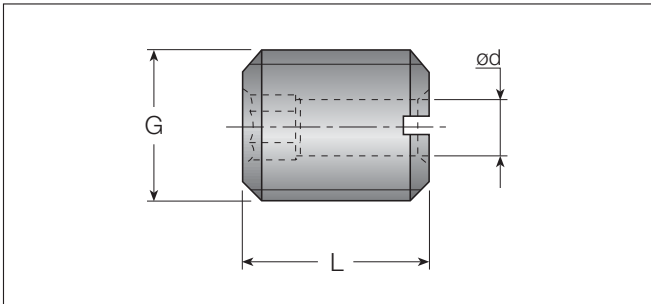
SCREW-EM



SCREW-EM Lock Screw for Endmill Holder

Cat. No.	Stock	Dimensions (mm)		Used for Shanks
		G	L	
SRM6X10DIN1835B		M6	10.0	6
SRM8X10DIN1835-B		M8	10.0	8
SRM10X12DIN1835-B		M10	12.0	10
SRM12X16DIN1835-B		M12	16.0	12, 14
SRM14X16DIN1835-B		M14	16.0	16, 16
SRM16X16DIN1835-B		M16	16.0	20
SRM18X2X20DIN1835-B		M18X2	20.0	25, 32
SRM20X2X20DIN1835-B		M20X2	20.0	40
SRM24X2X25DIN1835-B		M24X2	25.0	50
SRM16X10.3EMSHORT		M16	10.3	20
SRM18X2X10EMSHORT		M18X2	10.0	2

PRESET SCREW

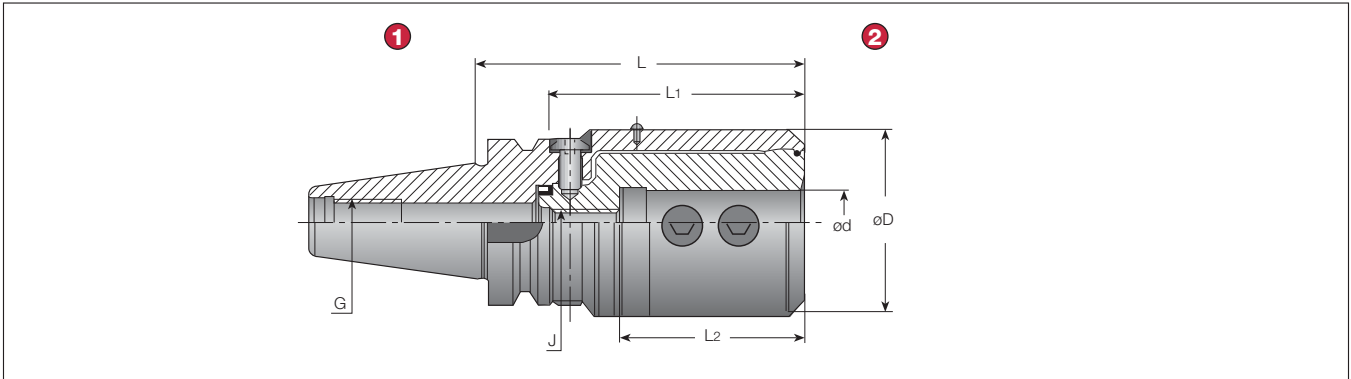


PRESET SCREW with Coolant Holes for SRKIN THERMAL SHRINK COLLETS

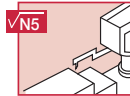
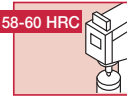
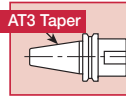
Cat. No.	Stock	Dimensions (mm)			Used for Shanks	Wrench
		G	L	ød		
PRESETSCREWM5X20B		M5X0.8	20	2.1	EME/SRKIN	2.5
PRESETSCREWM6X20B		M6X1	20	2.5	EME/SRKIN	3.0
PRESETSCREWM8X20B		M8X1.25	20	3.5	EME/SRKIN	4.0
PRESETSCREWM10X18B		M10X1.5	18	4.5	EME/SRKIN	5.0
PRESETSCREWM12X18B		M12X1.75	18	5.5	EME/SRKIN	6.0
PRESETSCREWM16X20B		M16X2	20	7.5	EME/SRKIN	6.0
PRESETSCREWM16X25B		M16X2	25	7.5	SRKIN	6.0
PRESETSCREWM20X20B		M20X2.5	20	6.0	EME	6.0
PRESETSCREWM20X25B		M20X2	25	9.5	EME	10.0

TUNGBORE • Diameter Adjustable holder

BORE BT-EM



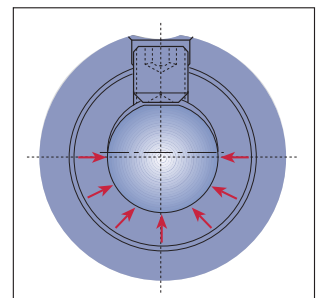
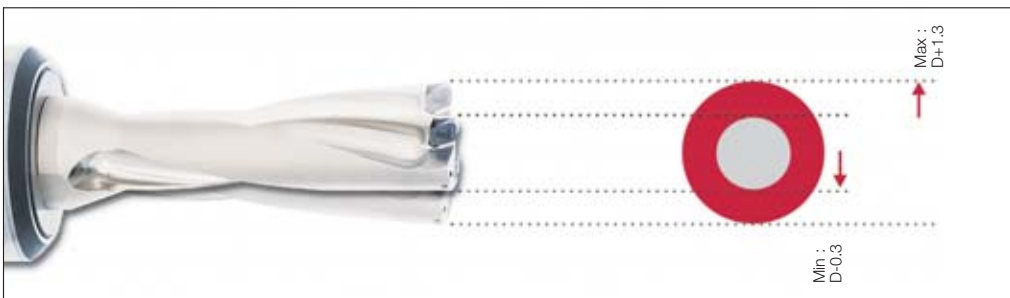
- 1 BT MAS 403 Form A/B
- 2 ISO 9766



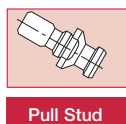
BORE BT-EM Adjustable Drilling Diameter Holder

Cat. No.	Stock	Dimensions (mm)						
		ød	øD	L	L1	L2	J	G
TUNGBOREBT40EM16		16	72	123.5	96.5	71	M10	M16
TUNGBOREBT40EM20	●	20	72	123.5	96.5	71	M10	M16
TUNGBOREBT40EM25	●	25	72	123.5	96.5	71	M10	M16
TUNGBOREBT40EM32	●	32	72	123.5	96.5	71	M10	M16
TUNGBOREBT40EM40	●	40	72	123.5	96.5	71	M10	M16
TUNGBOREBT50EM16		16	72	134.5	96.5	71	M10	M24
TUNGBOREBT50EM20	●	20	72	134.5	96.5	71	M10	M24
TUNGBOREBT50EM25	●	25	72	134.5	96.5	71	M10	M24
TUNGBOREBT50EM32	●	32	72	134.5	96.5	71	M10	M24
TUNGBOREBT50EM40	●	40	72	134.5	96.5	71	M10	M24

Add B for coolant through the flange.

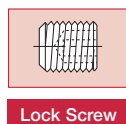


The bore's section is actually made from two shifted circular sections. The clamping screw pushes the drill shank through a narrowed opening, forcing elastic deformation of the holder. Contact is made around more than 180°, providing a high clamping force.



Pull Stud

70



Lock Screw

35



Preset Screw

35



User Guide

4

TUNGFLEX Indexable Modular System

MILLING HEADS

TUNGFLEX / TUNGSHRINK



Cat. No.	Connection
CDP_M-SRK	M10, M12

TUNGFLEX / Collet Chuck



Cat. No.	Connection
CDP_ER-M	M10, M12, M16

Square Endmills



Cat. No.	Connection
VGC	S05, S06, S08, S10
VEE-A	S05, S06, S08, S10, S12
VEE, VEC	S05, S06, S08, S10, S12
VEE-I	S05, S06, S08, S10, S12
VEE-C	S05, S06, S08, S10, S12
VEE-R	S05, S06, S08, S10, S12

Ball Endmills, Toroidal Endmills



Cat. No.	Connection
VBE-BGA	S05, S06, S08, S10, S12
VBD-BG	S05, S06, S08, S10, S12
VBB-BG	S05, S06, S08, S10
VRC	S05, S06, S08, S10
VBB-BM	S05, S06, S08, S10
VBB-SG	S05, S06, S08, S10
VRB	S06, S08, S10, S12
VRD	S05, S06, S08, S10

High feed Endmills



Cat. No.	Connection
VFX-SG	S06, S08, S10, S12

ADAPTERS



Cat. No.	Connection
CAB	M06, M08
CAB	M08, M10
CAB	M10, M12
CAB	M12, M16

Legend

TUNGMEISTER

Connection screw size

- S05
- S06
- S08
- S10
- S12

TUNGFLEX

Connection

- M06
- M08
- M10
- M12
- M16

Centering Endmills



Cat. No.	Connection
VDP	S06

Concave radii milling Endmills



Cat. No.	Connection
VCR	S05, S06, S08, S10, S12

Chamfering Endmills



Cat. No.	Connection
VCA	S06, S08, S10, S12
VCP	S05, S06, S08, S10
VCW	S06

Thread Endmills



Cat. No.	Connection
VTB	S05, S06, S08, S10
VST	S06, S08, S10



Cat. No.	Connection	Connection
VAD-M	S08	M08
VAD-M	S08	M10
VAD-M	S08	M12

Features

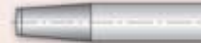
- Modular system reduces stock cost by using the same head with different shank options.
- Enables machining with larger overhang.
- Same head can be mounted on metric and inch combinations.

SHANKS



S-M

Connection	Shank size
M06	C10
M08	C16
M10	C20
M12	C25
M16	C32



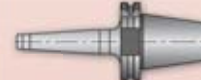
S-M

Connection	Shank size
M06	C10 / C12 / C16
M08	C16 / C20
M10	C20 / C25
M12	C25 / C32
M16	C32



S-M-CF4

Cat. No.	Connection
M12	CF4
M16	CF4



Connection	Cat. No.
M06	DIN 69871-ODP
M08	
M10	
M12	
M16	



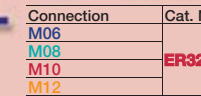
Connection	Cat. No.
M06	HSK A-ODP HSK E-ODP
M08	
M10	
M12	
M16	



Connection	Cat. No.
M06	BT-ODP
M08	
M10	
M12	
M16	



Connection	Cat. No.
M06	ER32-ODP
M08	
M10	
M12	



Connection	Cat. No.
M06	ER32-ODP
M08	
M10	
M12	



VSS-D

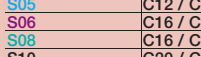
Connection	Cat. No.
S05	W12 / C08
S06	W16 / C10
S08	W16 / C12
S10	W20 / C16
S12	W25 / C20



Connection	Cat. No.
S05	V TSD
S06	
S08	
S10	
S12	
S12	



Connection	Cat. No.
S05	V TSD
S06	
S08	
S10	
S12	
S12	




Connection	Cat. No.
S05	V TSD
S06	
S08	
S10	
S12	
S12	

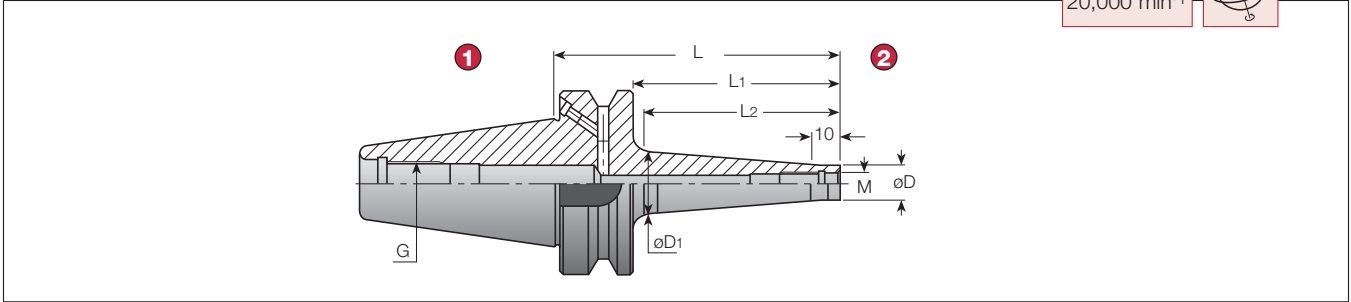


Connection	Cat. No.
S05	V TSD
S06	
S08	
S10	
S12	
S12	

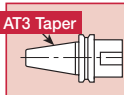
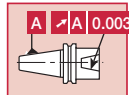
TUNGFLEX • Indexable Modular System

BT-ODP

G2.5
20,000 min⁻¹ 



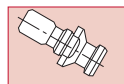
- 1 BT MAS 403 Form A/B
- 2 TungFlex



BT-ODP Indexable Modular System

Cat. No.	Stock	Dimensions (mm)						
		M	øD	øD ₁	L	L ₁	L ₂	G
BT40ODP6X66		M6	9.8	13.0	66	39	30	M16
BT40ODP6X106		M6	9.8	23.0	106	79	70	M16
BT40ODP8X66		M8	13.0	15.0	66	39	30	M16
BT40ODP8X106		M8	13.0	23.0	106	79	70	M16
BT40ODP10X66		M10	18.0	20.0	66	39	30	M16
BT40ODP10X106		M10	18.0	28.0	106	79	70	M16
BT40ODP12X66		M12	21.0	24.0	66	39	30	M16
BT40ODP12X106		M12	21.0	31.0	106	79	70	M16
BT40ODP16X66		M16	29.0	28.6	66	39	-	M16
BT40ODP16X106		M16	29.0	34.0	106	79	70	M16
BT50ODP12X94		M12	23.0	30.0	94	56	50	M24
BT50ODP12X144 ⁽¹⁾		M12	23.0	40.0	144	106	100	M24
BT50ODP12X194 ⁽¹⁾		M12	23.0	40.0	194	156	150	M24
BT50ODP12X244 ⁽¹⁾		M12	23.0	46.0	244	206	200	M24
BT50ODP16X94 ⁽¹⁾		M16	29.0	34.0	94	56	50	M24
BT50ODP16X144 ⁽¹⁾		M16	29.0	40.0	144	106	100	M24
BT50ODP16X194 ⁽¹⁾		M16	29.0	55.0	194	156	150	M24
BT50ODP16X244 ⁽¹⁾		M16	29.0	60.0	244	206	200	M24

⁽¹⁾ Balanced to G6.3 at max. n: 12,000 min⁻¹



Pull Stud

70

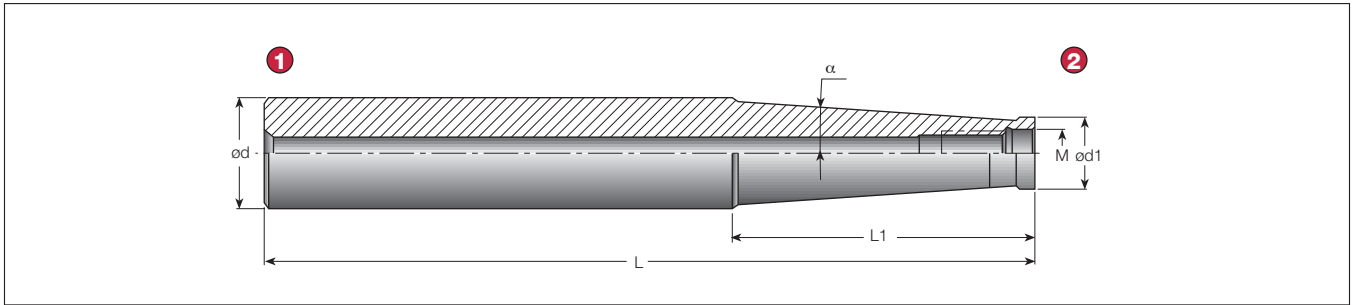


Wrench

27

TUNGFLEX • Indexable Modular System

S M



1 Straight Shank

2 TungFlex



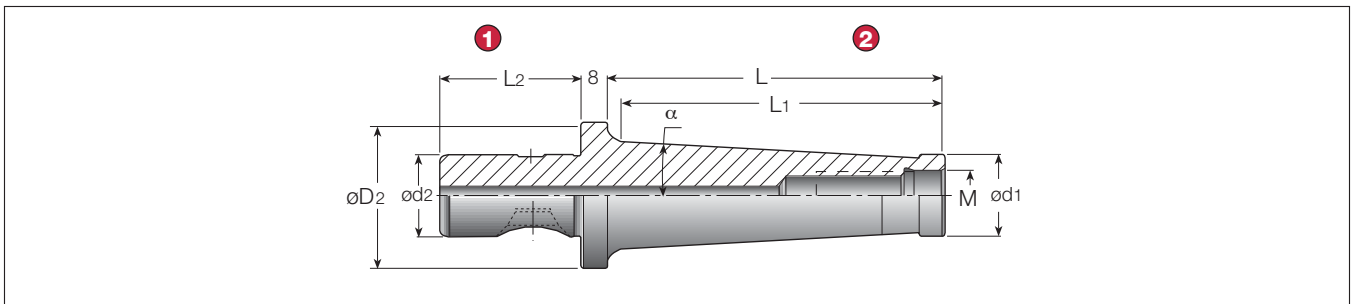
S M Straight Shank

Cat. No.	Stock	Dimensions (mm)						Shank type
		L	L ₁	∅d	∅d ₁	M	α	
SM06-L60C10		60	20.0	10	9.7	M6	0°	C
SM06-L105-C12		105	60.0	12	9.7	M6	1.2°	C
SM06-L125-C16		125	60.0	16	9.7	M6	3.3°	C
SM08-L73C16		73	25.0	16	13.0	M8	0°	C
SM08-L128-C16		128	80.0	16	13.0	M8	0.9°	C
SM08-L170-C20		170	66.8	20	13.0	M8	3.3°	C
SM10-L80C20		80	30.0	20	18.0	M10	0°	C
SM10-L130-C20		130	80.0	20	18.0	M10	0.6°	C
SM10-L200-C25		200	57.2	25	19.0	M10	3.3°	C
SM12-L86-C25		86	30.0	25	21.0	M12	5.1°	C
SM12-L200-C32		200	78.0	32	21.0	M12	4.4°	C
SM16-L95-C32		95	35.0	32	29.0	M16	1.7°	C
SM16-L230-C32		230	50.0	32	29.0	M16	1.8°	C

Note: All of the shanks have coolant holes.

TUNGFIT • TUNGFLEX • Modular System

S M-CF



1 TungFit

2 TungFlex

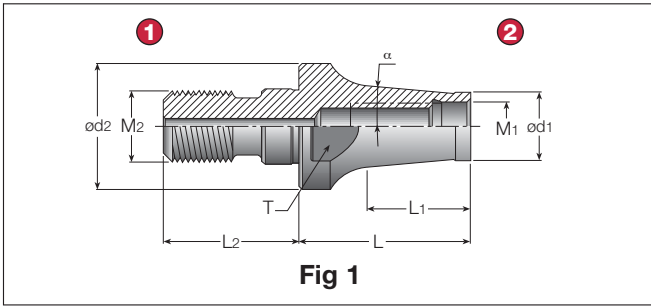


S M-CF Conversion Adapter

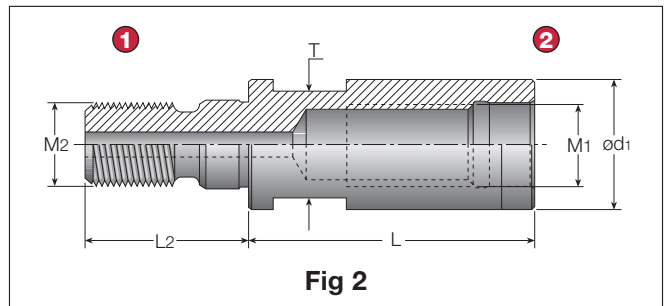
Cat. No.	Stock	Dimensions (mm)							
		L	L ₁	∅d ₁	M	∅d ₂	∅D ₂	L ₂	α
SM12-L85/3.30-CF4		93	81.3	21	M12	25	44	42	4.4°
SM16-L130/5.11-CF4		138	126.8	29	M16	25	44	42	2.6°
SM12-L140/5.50-CF4		148	139.1	21	M12	25	44	42	4.4°
SM16-L170/6.70-CF4		178	168.6	29	M16	25	44	42	2.0°

TUNGFLEX • Indexable Modular System

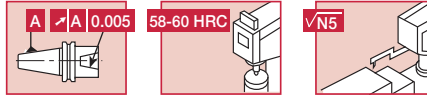
CAB M-M



CAB-M-M-C



- ① TungFlex
- ② TungFlex



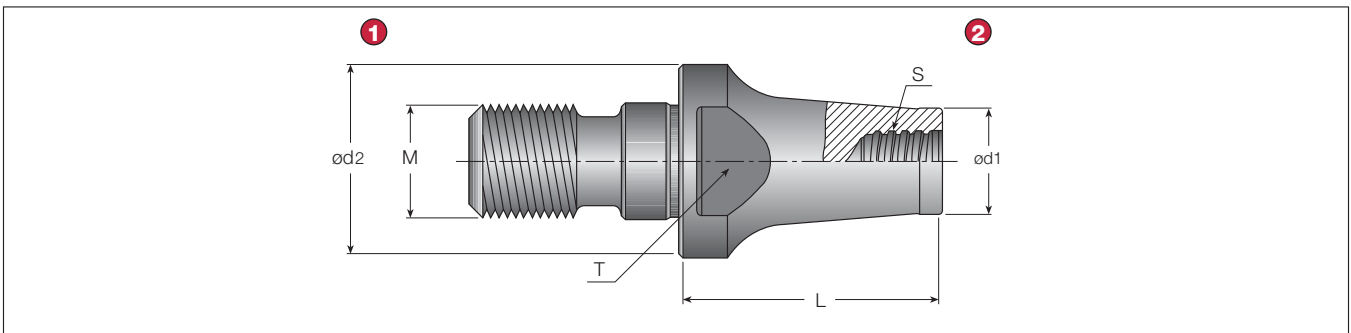
CAB M-M FLEX Reducer and Extensions

Cat. No.	Stock	Dimensions (mm)									Fig
		M ₁	ød ₁	L	L ₁	M ₂	ød ₂	L ₂	T	α	
CABM06M06-C ⁽¹⁾		M6	9.8	25	-	M6	-	14.5	8.00	-	2
CABM06M08		M6	9.7	30	24.8	M8	13	17.5	9.50	5.7°	1
CABM08M08-C ⁽¹⁾		M8	13.0	30	-	M8	-	17.5	9.60	-	2
CABM08M10		M8	13.0	40	33.4	M10	18	20.0	15.00	5.2°	1
CABM10M10-C ⁽¹⁾		M10	18.0	35	-	M10	-	20.0	15.00	-	2
CABM10M10/15.8-C ⁽¹⁾		M10	15.8	35	-	M10	-	20.0	12.75	-	2
CABM10M12		M10	18.0	45	36.4	M12	21	22.0	17.00	2.5°	1
CABM12M12-C ⁽¹⁾		M12	21.0	40	-	M12	-	22.0	17.00	-	2
CABM12M16		M12	21.0	50	42.5	M16	29	25.0	25.00	6.3°	1
CABM16M16-C ⁽¹⁾		M16	29.0	40	-	M16	-	25.0	25.00	-	2

⁽¹⁾ With coolant holes.

TUNGMEISTER • TUNGFLEX • Indexable Modular System

VAD-M Adapter



- ① TungFlex
- ② TungMeister

VAD-M Conversion Adapter

Cat. No.	Stock	Dimensions (mm)					
		S	L	ød ₁	ød ₂	M	T
VAD130L016S08-S-M8	●	S08	16	11.7	13.0	M8	11
VAD130L025S08-S-M8	●	S08	25	11.7	13.0	M8	11
VAD180L020S08-S-M10	●	S08	20	11.7	18.0	M10	13
VAD180L025S08-S-M10	●	S08	25	11.7	18.0	M10	11
VAD210L020S08-S-M12	●	S08	20	11.7	21.0	M12	12.75
VAD210L025S08-S-M12	●	S08	25	11.7	21.0	M12	12.75

Wrench size, used on flats for tightening (not supplied).

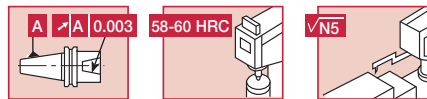
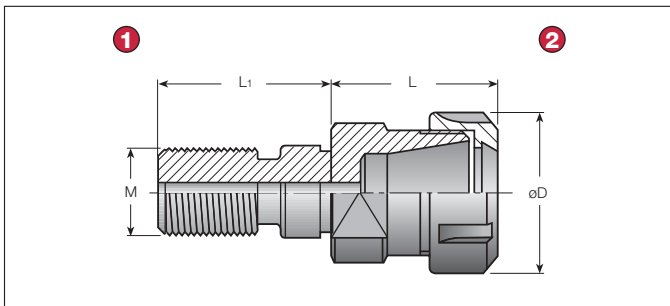
Do not apply lubricant to the threaded connection.



User Guide

TUNGFLEX • Collet Chuck

CDP ER



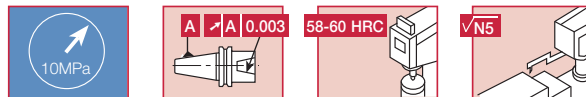
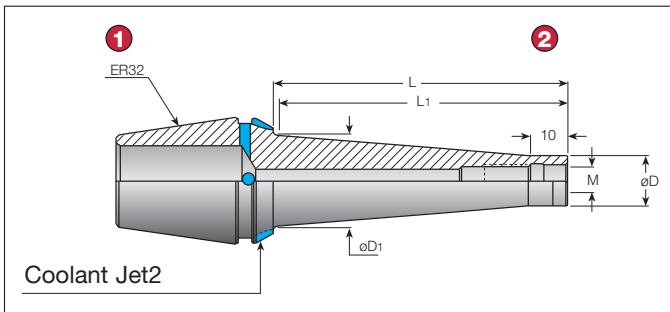
- 1 TungFlex
- 2 DIN6499

CDP-ER-M Adapter with ER Collet Chuck

Cat. No.	Stock	Dimensions (mm)					
		Range	L	L ₁	øD	M	T
CDPER11M10M		0.5-7	27.0	20	16	M10	15
CDPER11M12M		0.5-7	27.0	22	16	M12	17
CDPER16M10M		0.5-10	38.1	20	22	M10	17
CDPER16M12M		0.5-10	37.1	22	22	M12	17
CDPER16M16		0.5-10	36.6	25	28	M16	25
CDPER20M16		1-13	45.5	25	34	M16	25
CDPER25M16		1-16	44.5	25	42	M16	28

ER Collet • TUNGFLEX

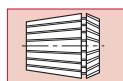
ER-ODP



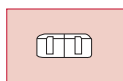
- 1 ER Collet
- 2 TungFlex

ER-ODP ER Collet with Indexable Modular System

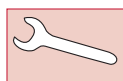
Cat. No.	Stock	Dimensions (mm)				
		M	øD	øD ₁	L	L ₁
ER32ODPM6X25		M6	9.8	14	25	22
ER32ODPM6X50		M6	9.8	20	50	48
ER32ODPM6X75		M6	9.8	23	75	74
ER32ODPM8X25		M8	13.1	15	25	22
ER32ODPM8X50		M8	13.1	23	50	49
ER32ODPM8X75		M8	13.1	23	75	74
ER32ODPM10X25		M10	18.0	20	25	23
ER32ODPM10X50		M10	18.0	24	50	49
ER32ODPM12X25		M12	21.0	24	25	24
ER32ODPM12X50		M12	21.0	24	50	49



ER Collet



Nut



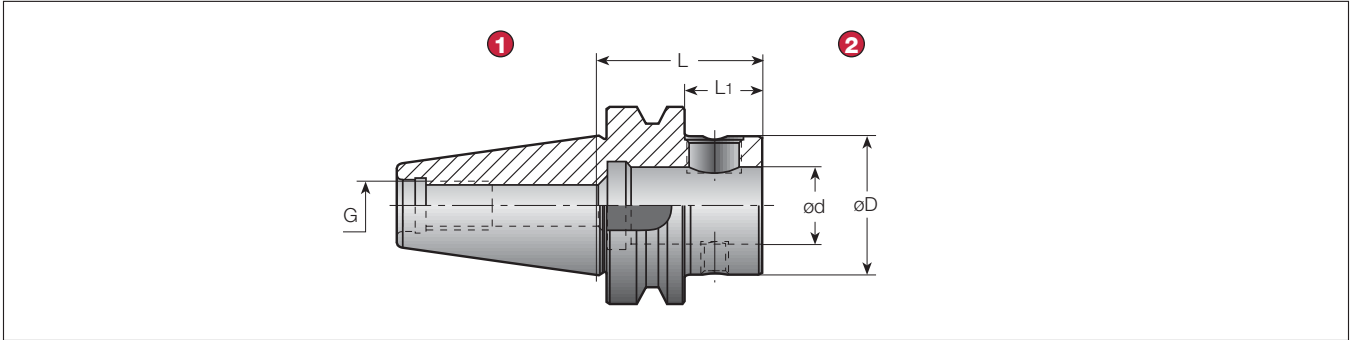
Wrench



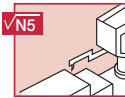
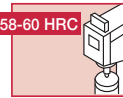
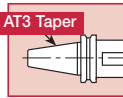
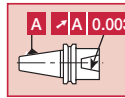
User Guide

TUNGFIT • Modular System

BT-CF



- 1 BT MAS 403 Form A/B
- 2 TungFit



BT-CF Modular System

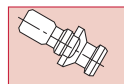
Cat. No.	Stock	Taper	Dimensions (mm)				
			L	L1	øD	ød	G
BT40CF4-L		40	110	83	44.5	CF4	M16
BT40CF4-S		40	52	25	44.5	CF4	M16
BT50CF4-L		50	115	77	44.5	CF4	M24
BT50CF4-S		50	63	25	44.5	CF4	M24

⚠ Tightening torque: 58.8 N·m
Add B for coolant through the flange.

Spare Parts for TungFit Holders

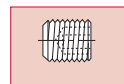


Size	Locking Screw	Wrench	Wrench	O-Ring
CF4	M16X1.5-CF	HW8.0	M8-CF	ORING3ID15



Pull Stud

70



Lock Screw

35

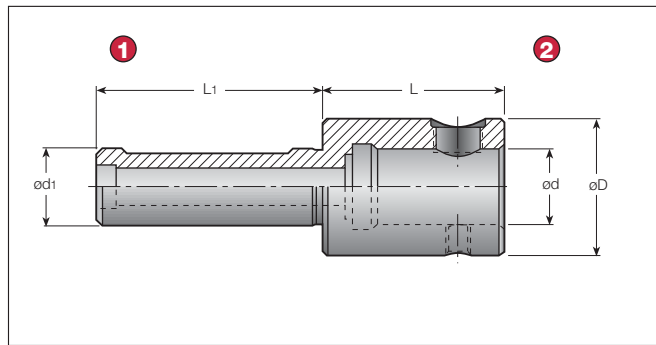


User Guide

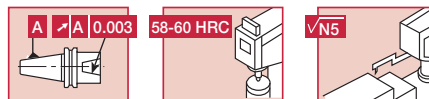
4

TUNGFIT • Modular System Adapter

A ST-CF

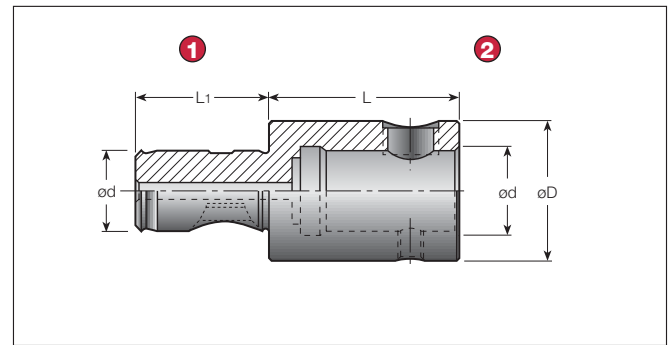


- 1 Straight Shank
- 2 TungFit



- 1 TungClick
- 2 TungClick

B EX CF



A ST CF Straight Shank Adapter

Cat. No.	Stock	Dimensions (mm)				
		ød ₁	L	L ₁	øD	ød
ST25CF4		25	60	80	44	CF4
ST32CF4		32	60	80	44	CF4

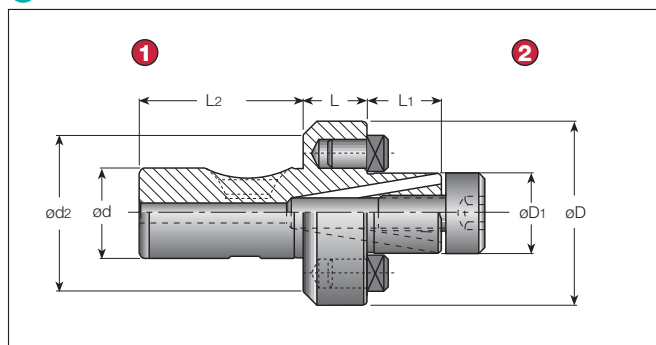
▲ Tightening torque: 58.8 N·m

B EX CF Extension Adapter

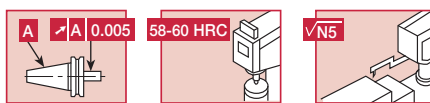
Cat. No.	Stock	Dimensions (mm)			
		L	L ₁	øD	ød
EXCF4-S		60	42	44	CF4
EXCF4-L		100	42	44	CF4

▲ Tightening torque: 58.8 N·m

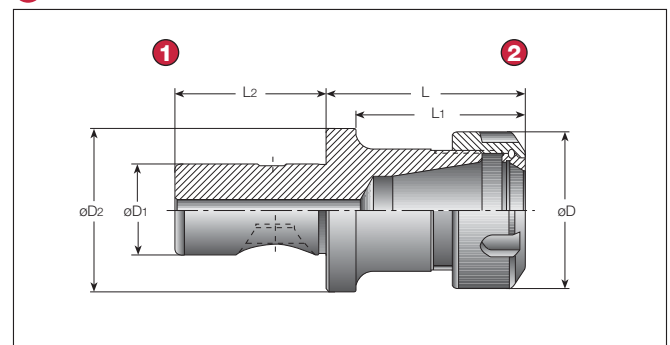
C SEM CF



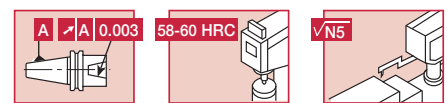
- 1 TungClick
- 2 DIN3937



D ER-CF



- 1 TungClick
- 2 DIN6499



C SEM CF Shell Mill Adapter - Metric

Cat. No.	Stock	Dimensions (mm)						
		L	L ₁	L ₂	øD	ød	øD ₁	øD ₂
SEM22CF4C		16	19	42	47	CF4	22	44

▲ Tightening torque: 58.8 N·m

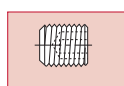
C SEM CF Shell Endmill Holder - Inch

Cat. No.	Stock	Dimensions (mm)						
		L	L ₁	L ₂	øD	ød	øD ₁	øD ₂
SEM3/4CF4C		19.1	17	41.9	45	CF4	19.05	44
SEM1CF4C		25.4	17	41.9	54	CF4	25.4	44

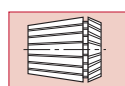
D ER-CF ER Collet Adapter

Cat. No.	Stock	Dimensions (mm)						
		Range	L	L ₁	L ₂	øD	øD ₁	øD ₂
ER11CF4-S		0.5-7	55	47	42	19	25	44
ER16CF4-L		0.5-10	100	92	42	28	25	44
ER16CF4-S		0.5-10	55	47	42	28	25	44
ER20CF4-S		1-13	55	92	42	34	25	44
ER25CF4-S		1-16	55	47	42	42	25	44
ER32CF4-L		2-20	100	92	42	50	25	44
ER32CF4-S		2-20	55	47	42	50	25	44

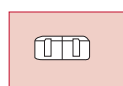
▲ Tightening torque: 58.8 N·m



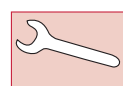
Lock Screw



ER Collet



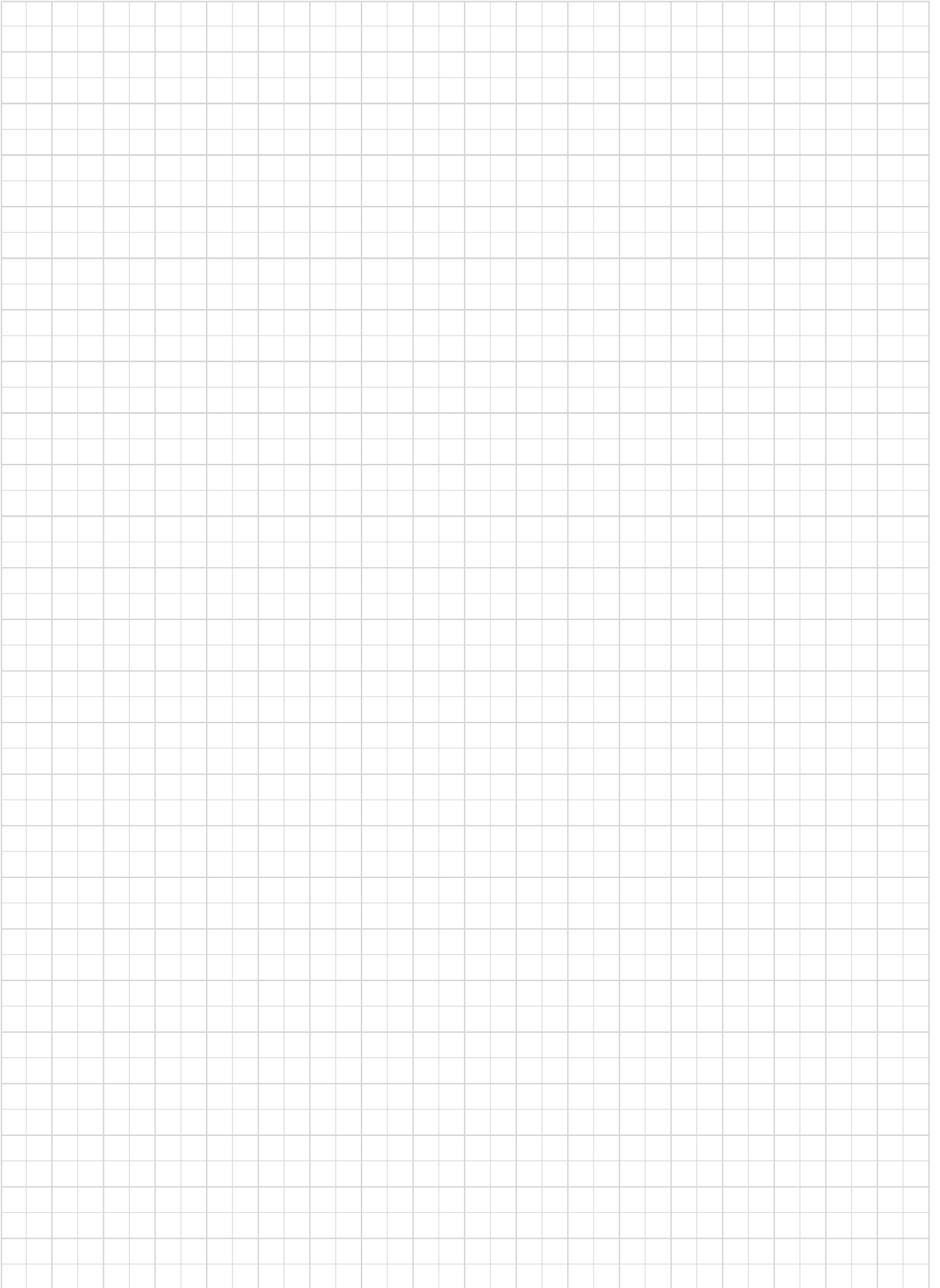
Nut



Wrench



User Guide



Accurate Hydraulic Chucking System

3 μ

High Accuracy and Repeatability

TUNGHYDRO
TUNGALOY



TUNGHYDRO

TUNGHYDRO is expanding its toolholder clamping options by adding hydraulic chucks. The new hydraulic chucks range from $\varnothing 6$ -32 mm. This type of chucking system is used for rotating and stationary applications.

Main applications

- Fine and accurate machining
- Reaming
- Drilling
- Finish milling
- Internal turning

Features

- High runout accuracy of less than 0.003 mm
- Very low torque required to activate the clamping mechanism, by using a 4 mm Allen key
- Prolongs cutting tool life and improves surface finish due to vibration damping
- Easy presetting by using an internal preset screw
- All rotating chucks feature a symmetrical and balanced design

for high speed machining of up to 15,000 min⁻¹

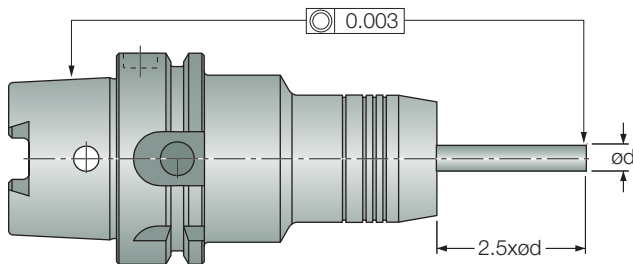
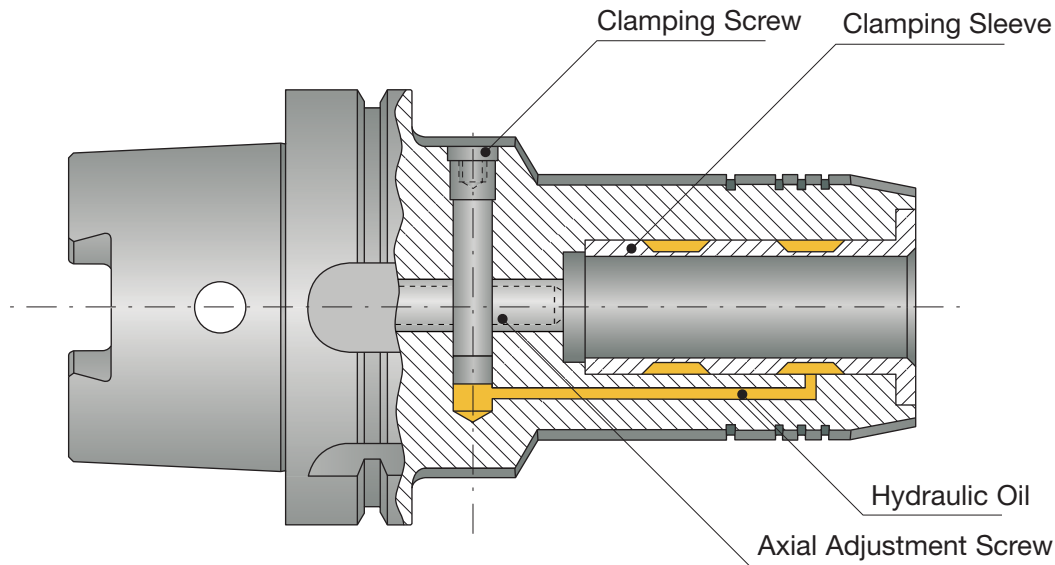
- Available with threaded holes for fine balancing
- Consistent and secure clamping force when used within the recommended speed range
- Suitable for both Weldon and cylindrical shank clamping
- Very convenient and safe tool change on the machine

Two main TUNGHYDRO chuck types are available:

- Taper shanks for rotating applications
- VDI DIN 69880 in sizes 30 and 40 for stationary applications on CNC lathes



Hydraulic Chucks System



Operating Instructions

To ensure correct functioning of the hydraulic chuck, the following instructions should be followed:

Tools with cylindrical shanks in accordance with DIN 1835 and DIN 6535 shape (HA) and B (HB) up to $\varnothing 20$ mm diameters should be manufactured according to h6 tolerance and $R_{a\min} = 0.3$ ground.

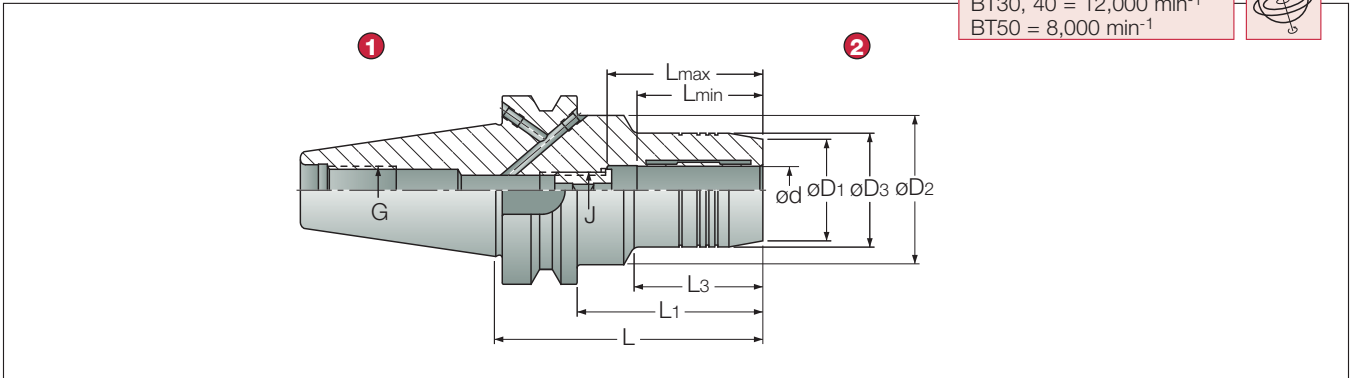
Tools with DIN 6535 HE (whistle notch) shanks should be used in reduction elements, to avoid damaging the chucking hole.

- Clean any grease and dirt from the chuck mounting hole and the tool shank. Insert the tool shank up to the stopper. Make sure that the minimum chucking length is maintained.
- Using the hexagonal-headed key, rotate the clamping screw in a clockwise direction until the end. Do not attempt to clamp the chuck without a shank inside as it may break the expansion clamping sleeve.
- To release the tool, turn the clamping screw in a counterclockwise direction by about 5 or 6 revolutions and remove the tool.

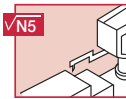
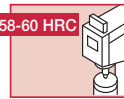
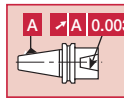
TUNG HYDRO • Hydraulic Chuck Holder

BT-HYDRO

G6.3
BT30, 40 = 12,000 min⁻¹
BT50 = 8,000 min⁻¹



- 1 BT MAS 403 Form A/B
- 2 TungHydro



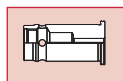
BT-HYDRO Hydraulic Chuck Holder

Cat. No.	Stock	Dimensions (mm)										
		ød	øD1	øD3	øD2	L	L1	L3	Lmin	Lmax	J	G
BT30HYDRO6X60		6	23	26	50	60	38	43	27	37	M5	M12
BT30HYDRO8X64		8	25	28	50	64	42	43.5	27	37	M6	
BT30HYDRO10X64		10	27	30	50	64	42	44	32	42	M8x1	
BT30HYDRO12X72		12	29	32	50	72	50	44.5	37	47	M10x1	
BT30HYDRO14X70		14	30	34	50	70	48	47.5	37	47	M10x1	
BT30HYDRO16X90		16	34	38	50	90	68	47.5	42	52	M12x1	
BT30HYDRO18X90		18	36	40	50	90	68	47.5	42	52	M12x1	
BT30HYDRO20X90		20	38	42	50	90	68	47.5	42	52	M12x1	
BT40HYDRO6X90		6	23	26	50	90	63	43	27	37	M5	M16
BT40HYDRO8X90		8	25	28	50	90	63	43.5	27	37	M6	
BT40HYDRO10X90		10	27	30	50	90	63	44	32	42	M8x1	
BT40HYDRO12X90		12	29	32	50	90	63	44.5	37	47	M10x1	
BT40HYDRO14X90		14	30	34	50	90	63	47.5	37	47	M10x1	
BT40HYDRO16X90		16	34	38	50	90	63	47.5	42	52	M12x1	
BT40HYDRO18X90		18	36	40	50	90	63	47.5	42	52	M12x1	
BT40HYDRO20X90		20	38	42	50	90	63	47.5	42	52	M12x1	
BT40HYDRO25X90		25	46	50	63	90	51	51	48	58	M12x1	
BT40HYDRO32X110		32	56	60	60	110	81.5	81.5	52	62	M16x1	
BT50HYDRO6X110		6	23	26	80	110	72	43	27	37	M5	M24
BT50HYDRO8X110		8	25	28	80	110	72	43.5	27	37	M6	
BT50HYDRO10X110		10	27	30	80	110	72	44	32	42	M8x1	
BT50HYDRO12X110		12	29	32	80	110	72	42	37	47	M10x1	
BT50HYDRO14X110		14	30	34	80	110	72	42	37	47	M10x1	
BT50HYDRO16X110		16	34	38	80	110	72	45	42	52	M12x1	
BT50HYDRO18X110		18	36	40	80	110	72	45	42	52	M12x1	
BT50HYDRO20X110		20	38	42	80	110	72	47.5	42	52	M12x1	
BT50HYDRO25X110		25	46	50	80	110	72	47.5	48	58	M12x1	
BT50HYDRO32X110		32	56	60	80	110	72	47.5	54	64	M12x1	

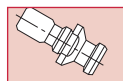
Clamping wrench (wrench HYDRO HEX 4) should be ordered separately.

Note: Available are reduction sleeves for ø12, 20, 25 and 32 mm bore diameters.

Chucking forces will significantly reduce if reduction sleeves are used (ordered separately).



SC Collet



Pull Stud

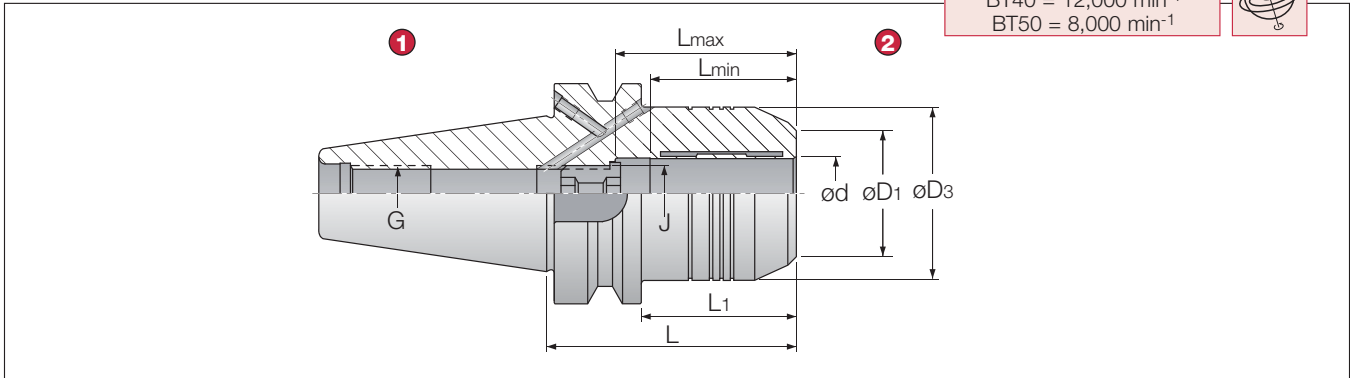


User Guide

TUNGHYDRO • Hydraulic Chuck Holder

BT-HYDRO

G6.3
BT40 = 12,000 min⁻¹
BT50 = 8,000 min⁻¹



- 1 BT MAS 403 Form A/B
- 2 TungHydro



BT-HYDRO Short Hydraulic Chuck Holder (Heavy Duty)

Cat. No.	Stock	Dimensions (mm)								
		ød	øD1	øD3	L	L1	Lmin	Lmax	J	G
BT40HYDRO20X72.5		20	40	49.5	72.5	45.5	52	62	M16x1	M16
BT50HYDRO32X90		32	56	72	90	52	65	75	M16x1	M24

Clamping wrench (wrench HYDRO HEX 4) should be ordered separately.

Note: Available are reduction sleeves for ø12, 20, 25 and 32 mm bore diameters.

Chucking forces will significantly reduce if reduction sleeves are used (ordered separately).

TUNGHYDRO • Kits

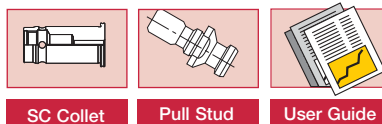
KIT HYDRO



KIT HYDRO Hydraulic Chuck Kits

Cat. No.	Stock	SC HYDRO Collets	Pcs.	Collet Range (mm)
KITBT40HYDRO20X73		SC20SHYDRO	5	8, 10, 12, 14, 16
KITBT40HYDRO32X110		SC32SHYDRO	7	6, 8, 10, 12, 16, 20, 25
KITDIN6987140HYDRO20X65		SC20SHYDRO	5	8, 10, 12, 14, 16
KITDIN6987140HYDRO32X117		SC32SHYDRO	7	6, 8, 10, 12, 16, 20, 25
KITHSKA63HYDRO20X100		SC20SHYDRO	5	8, 10, 12, 14, 16
KITHSKA63HYDRO32X125		SC32SHYDRO	7	6, 8, 10, 12, 16, 20, 25

Each kit contains one HYDROFIT chuck, a set of SC...HYDRO sealed reducers and a clamping wrench.



Page 49

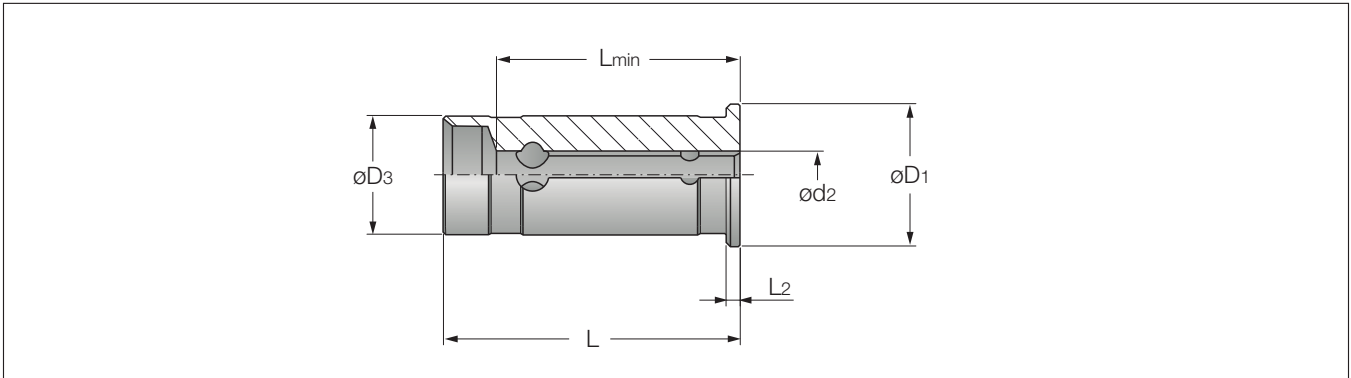
50

70

46-47

TUNG HYDRO • Collet for Hydraulic Chuck

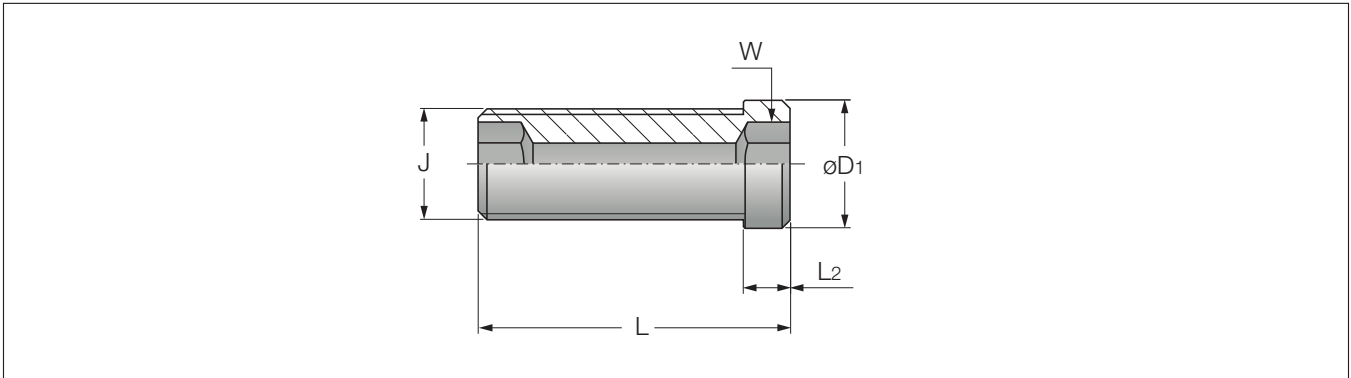
SC HYDRO



SC-HYDRO Sealed SC Collet (Reduction Sleeves)

Cat. No.	Stock	Dimensions (mm)					
		ϕd_2	L_{min}	ϕD_3	L	ϕD_1	L_2
SC12SHYDRO3		3	19	12	46.5	16	2
SC12SHYDRO4		4	24				
SC12SHYDRO5		5	28				
SC12SHYDRO6		6	33				
SC12SHYDRO8		8	39				
SC20SHYDRO3		3	20	20	53	24	2
SC20SHYDRO4		4	25				
SC20SHYDRO5		5	27				
SC20SHYDRO6		6	34				
SC20SHYDRO8		8	39				
SC20SHYDRO10		10	40				
SC20SHYDRO12		12	41				
SC20SHYDRO14		14	44				
SC20SHYDRO16		16	44				
SC25SHYDRO6		6	37	25	60	30	4
SC25SHYDRO8		8	37				
SC25SHYDRO10		10	40				
SC25SHYDRO12		12	44				
SC25SHYDRO14		14	46				
SC25SHYDRO16		16	48				
SC25SHYDRO18		18	50				
SC25SHYDRO20		20	50				
SC32SHYDRO6		6	33	32	66	40	4
SC32SHYDRO8		8	38				
SC32SHYDRO10		10	39				
SC32SHYDRO12		12	42				
SC32SHYDRO14		14	44				
SC32SHYDRO16		16	44				
SC32SHYDRO18		18	44				
SC32SHYDRO20		20	49				
SC32SHYDRO25		25	66				

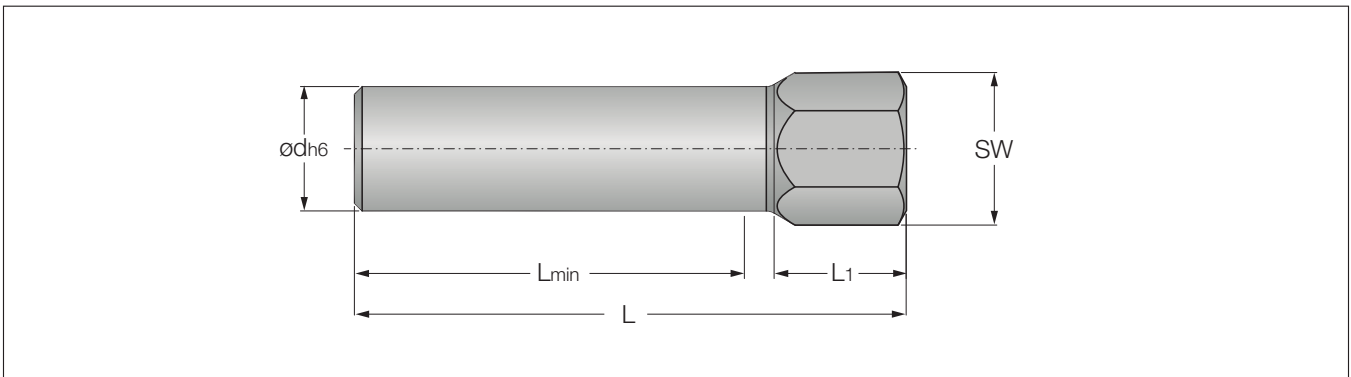
PRESET SCREW HYDRO



PRESET SCREW HYDRO Hydraulic Chuck Preset Screws

Cat. No.	Stock	Dimensions (mm)					Used for Shanks
		J	øD1	L	L2	W	
PRESETSCREWHYDROM5		M5	5	14	1	2.5	6
PRESETSCREWHYDROM6		M6	6	14	1.5	3	8
PRESETSCREWHYDROM8		M8X1	8	14	2	4	10
PRESETSCREWHYDROM10		M10X1	10	17	2	5	12, 14
PRESETSCREWHYDROM12		M12X1	12	17	2	6	16, 18, 20
PRESETSCREWHYDROM16		M16X1	14	20	2	8	20, 25, 32

TEST BAR HYDRO



TEST BAR HYDRO Torque Test Bars for Hydraulic Chucks

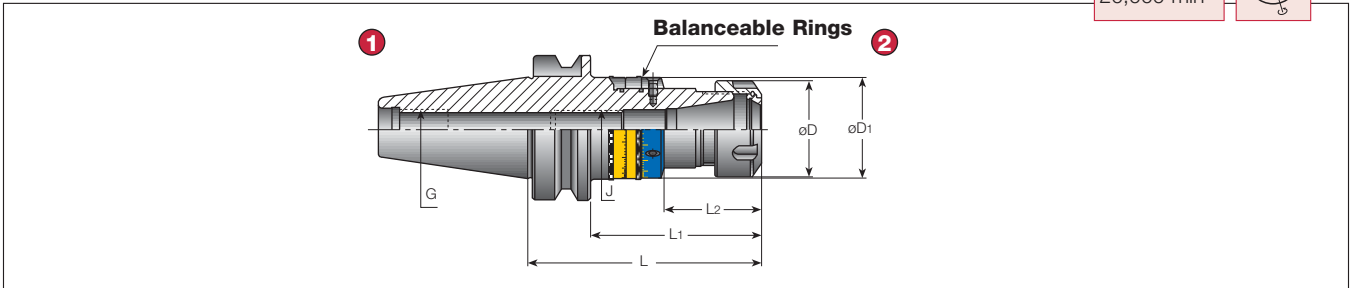
Cat. No.	Stock	Dimensions (mm)					Clamping Torque N·m
		ød	L	L1	SW	Lmin ⁽¹⁾	
TESTBARHYDRO6		6	53	42	10	27	15
TESTBARHYDRO8		8	53	42	10	27	25
TESTBARHYDRO10		10	56	45	10	32	50
TESTBARHYDRO12		12	62	51	10	37	110
TESTBARHYDRO14		14	62	51	10	37	120
TESTBARHYDRO16		16	71	54	17	37	180
TESTBARHYDRO18		18	71	54	17	42	230
TESTBARHYDRO20		20	71	55	17	42	250
TESTBARHYDRO25		25	79	61	17	48	310
TESTBARHYDRO32		32	87	65	17	52	450

⁽¹⁾ Minimum holding length.

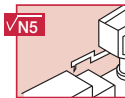
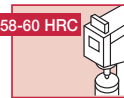
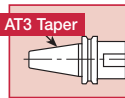
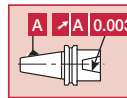
TUNGBALANCE • Balanceable Collet Chuck Holder

BT-ER-BALANCE

(1) G2.5
20,000 min⁻¹



- 1 BT MAS 403 Form A
- 2 DIN6499 ER-BALANCE



BT-ER-BALANCE Balanceable ER Collet Chuck Holder

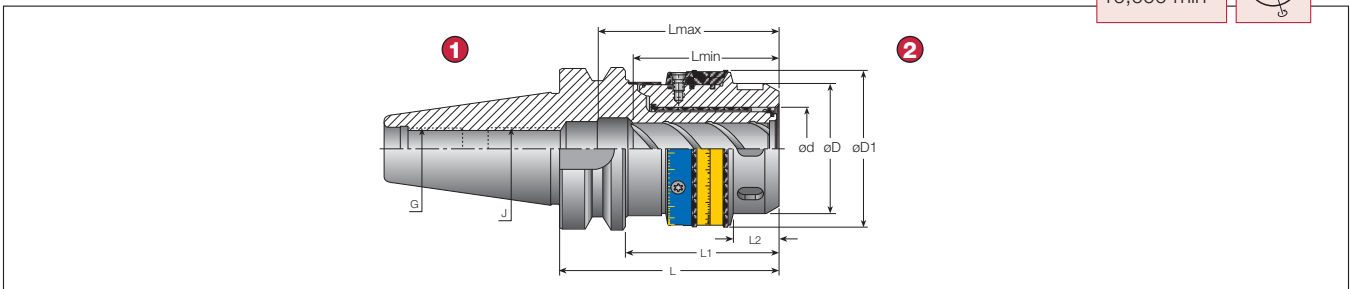
Cat. No.	Stock	Dimensions (mm)							
		Range	L	L ₁	L ₂	øD	øD ₁	G	J
BT40ER16X100BIN		0.5-10	100	73	44.0	28	44	M16	M10
BT40ER16X150BIN		0.5-10	150	123	78.7	28	44	M16	M10
BT40ER20X100BIN		1.0-13	100	73	44.6	34	44	M16	M12
BT40ER20X150BIN		1.0-13	150	123	79.6	34	44	M16	M12
BT40ER25X100BIN		1.0-16	100	73	43.0	42	44	M16	M16
BT40ER25X150BIN		1.0-16	150	123	79.0	42	44	M16	M16
BT40ER32X100BIN		2.0-20	100	73	44.0	50	60	M16	M22x1.5
BT40ER32X150BIN		2.0-20	150	123	94.0	50	60	M16	M22x1.5
BT40ER40X100BIN		3.0-26	100	73	44.0	63	60	M16	M28x1.5

(1) Blanced to G2.5 at max. n: 20,000 min⁻¹
Wrench is not included.

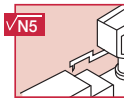
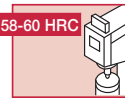
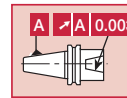
TUNGBALANCE • TUNGMAX • BALANCE • Endmill Chuck Holder

BT-MAX-BALANCE

G6.3
10,000 min⁻¹



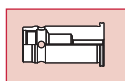
- 1 BT MAS 403 Form A
- 2 TungBalance



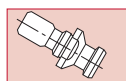
BT-MAX-BALANCE Balanceable Power Chuck Holder

Cat. No.	Stock	Dimensions (mm)										
		Range	ød	øD	øD ₁	L	L ₁	L ₂	L _{min}	L _{max}	J	G
BT40TUNGMAX20x85BIN (1)		6-20	20	51	61	85	58	18	56	68	M16	M16
BT40TUNGMAX32x108BIN (1)		6-32	32	69	80	108	81	25	70	83	M16	M16
BT50TUNGMAX20x105BIN (2)		6-20	20	51	61	105	67	18	56	69	M16	M24
BT50TUNGMAX32x106BIN (2)		6-32	32	69	80	106	68	25	69	83	M20x2	M24

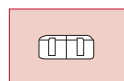
(1) Chucks with taper size 40 can be balanced by the balancing ring up to G2.5 at max. n: 20,000 min⁻¹
(2) Chucks with taper size 50 can be balanced by the balancing ring up to G2.5 at max. n: 18,000 min⁻¹
Wrench is not included.



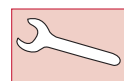
SC Collet



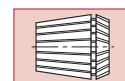
Pull Stud



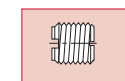
Nut



Wrench



ER Collet



Preset Screw

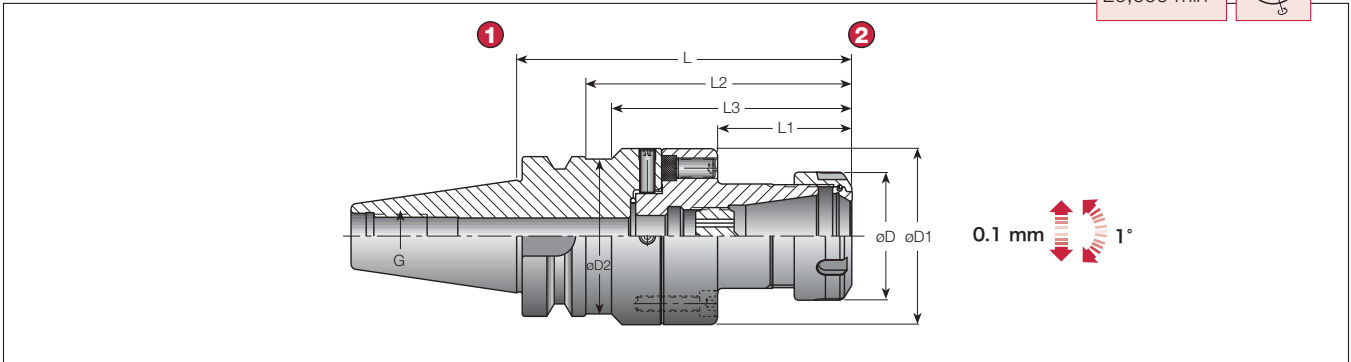


User Guide

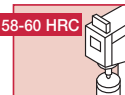
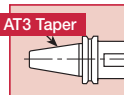
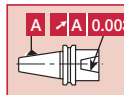
TUNGFINE • ER Collet Chuck with Center Alignment

ADJ BT-ER

G2.5
20,000 min⁻¹



- 1 BT MAS 403 Form A/B
- 2 DIN6499



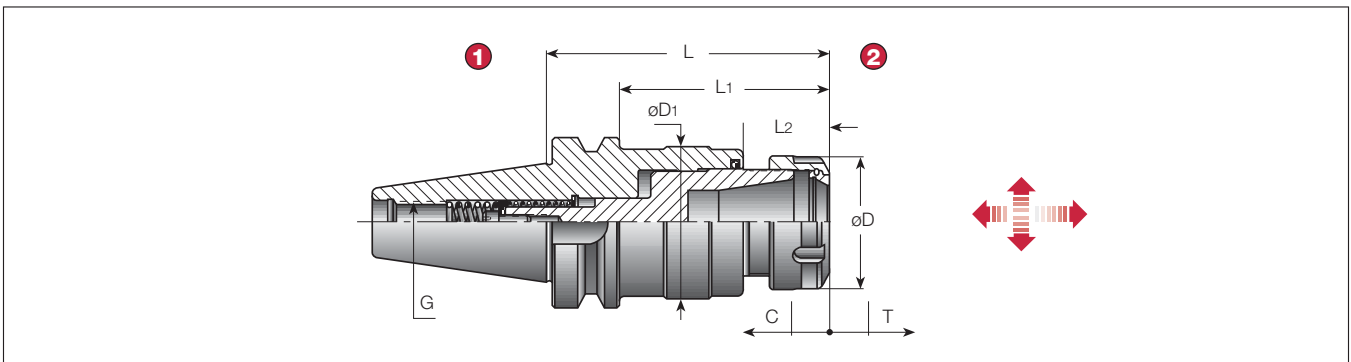
ADJ BT-ER ER Collet Chuck with Center Alignment

Cat. No.	Stock	Dimensions (mm)								
		Range	L	L1	L2	L3	øD	øD1	øD2	G
ADJBT40D70ER32		2-20	129.5	52.5	102.5	92.5	50	70	62.5	M16
ADJBT50D70ER32		2-20	144.5	52.5	106.5	-	50	70	-	M24

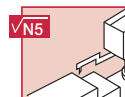
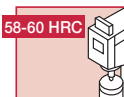
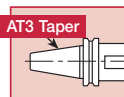
Wrench is not included.

TUNG GTI • Tapping Holder

GTI BT-ER



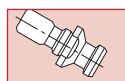
- 1 BT MAS 403 Form A
- 2 DIN6499 GTI



GTI BT-ER Tapping Holder

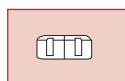
Cat. No.	Stock	Tap Capacity	Dimensions (mm)								
			Range	G	L	L1	L2	øD	øD1	T	C
GTIBT40ER16		M3-M10	0.5-10	M16	84.2	52.7	24.6	28	29.5	8	3
GTIBT40ER32		M6-M20	2-20	M16	106.8	79.8	33	50	56.5	9	4
GTIBT40ER40		M6-M28	3-26	M16	124.8	97.8	51	63	56.5	9	4
GTIBT50ER16		M3-M10	0.5-10	M24	106.8	68.8	24.6	28	29.5	8	3
GTIBT50ER32		M6-M20	2-20	M24	115.2	77.2	33	50	56.5	9	4
GTIBT50ER40		M6-M28	3-26	M24	133.2	95.2	51	63	56.5	9	4

Wrench is not included.



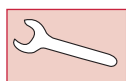
Pull Stud

70



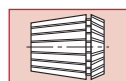
Nut

26



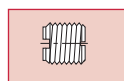
Wrench

27



ER Collet

16



Preset Screw

27

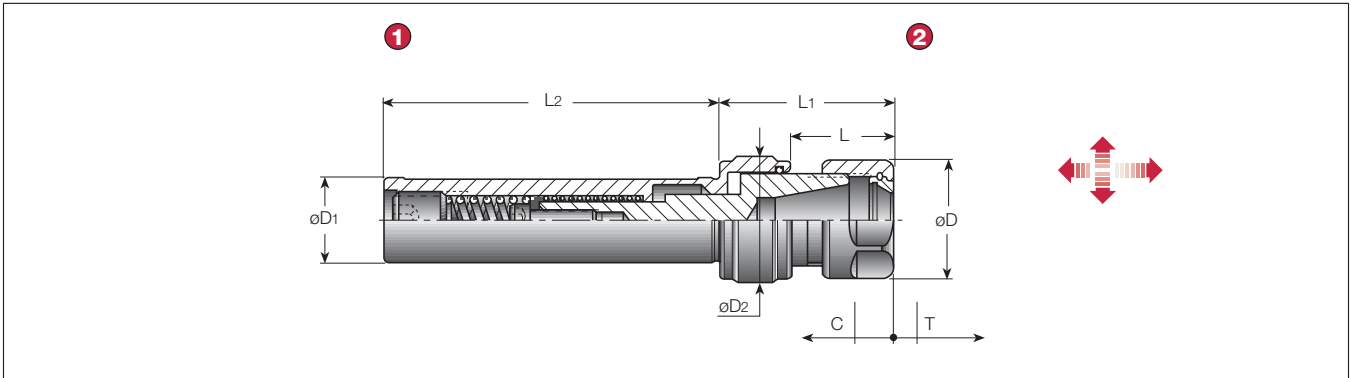


User Guide

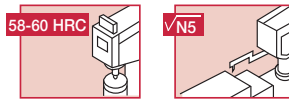
23

TUNG GTI • Straight Shank • Tapping Holder

GTI ER-ST



- 1 Straight Shank
- 2 TungGTI DIN6499



GTI ER-ST Tapping Holder

Cat. No.	Stock	Tap Capacity	Dimensions (mm)							
			L	L1	L2	øD	øD1	øD2	T	C
GTIER11ST16X150M		M2-M7	19.0	-	150	16	16	-	6	3
GTIER16ST20X80		M3-M10	24.6	41.6	80	28	20	29.5	8	3
GTIER20ST20X80		M4-M14	28.0	49.0	80	34	20	33.5	8	3
GTIER25ST25X80		M5-M16	32.0	53.0	80	42	25	40.5	9	4
GTIER32ST25X80		M6-M20	32.0	77.2	80	50	25	56.5	9	4
GTIER40ST32X80		M6-M27	51.0	95.2	80	63	32	56.5	9	4

Wrench is not included.

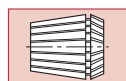


**Kit GTI ER11 - ER40
Tapping Holder Kit**

KIT GTI ER-ST

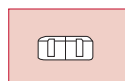
Cat. No.	Stock	Range (mm)
KITGTIER11ST16X1504M		3, 4, 5, 6
KITGTIER16ST20X804		4, 5, 6, 7
KITGTIER20ST20X804		5, 6, 8, 9
KITGTIER25ST25X805		6, 7, 9, 11, 12
KITGTIER32ST25X806		6, 7, 9, 11, 12, 16
KITGTIER40ST32X806		9, 11, 14, 16, 18, 20

Includes GTI, collets & Wrench



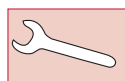
ER Collet

16



Nut

26



Wrench

27

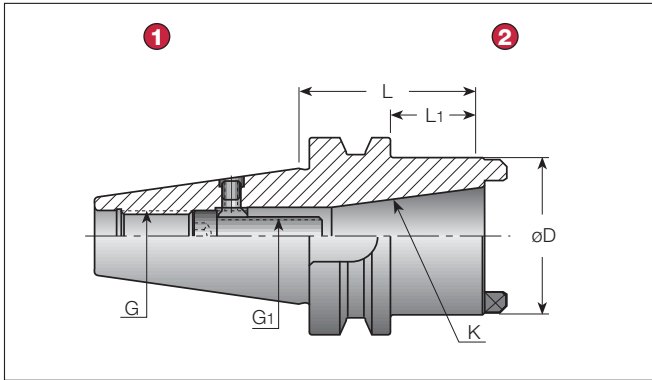


User Guide

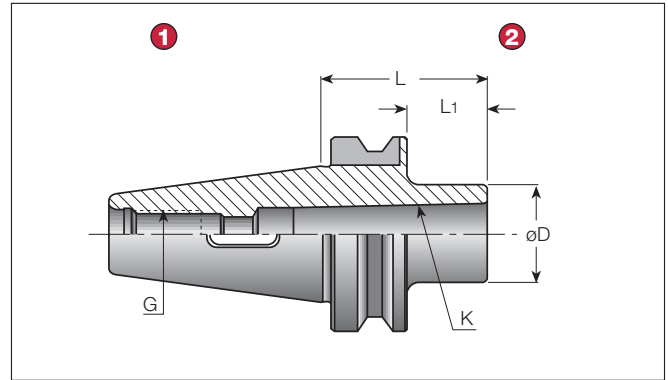
5

Conversion Adapter / Morse Taper Holder

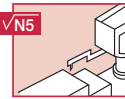
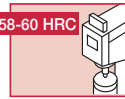
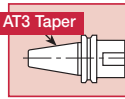
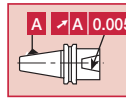
A BT-AD



B BT-MT



- 1 BT MAS 403 Form A
- 2 DIN2080
DIN69871/A
BT MAS 403



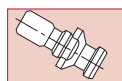
- 1 BT MAS 403 Form A
- 2 DIN6383
DIN228-2 Form D

A BT-AD Conversion Adapter

Cat. No.	Stock	Dimensions (mm)					
		K	L	L ₁	øD	G ₁	G
BT40AD30		DIN2080	60	33	50	M12	M16
BT50ADBT/SK40		DIN69871/A, BT MAS-403	75	37	66	M16	M24
BT50AD40		DIN2080	70	32	63	M16	M24

B BT-MT Morse Taper Holder

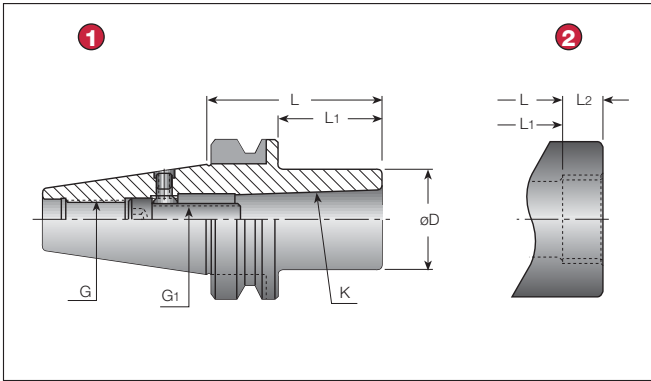
Cat. No.	Stock	Dimensions (mm)				
		K	L	L ₁	øD	G
BT30MT1X45		MT1	45	23	25	M12
BT30MT2X60		MT2	60	38	32	M12
BT40MT1X45		MT1	45	18	25	M16
BT40MT1X120		MT1	120	93	25	M16
BT40MT2X60		MT2	60	33	32	M16
BT40MT2X120		MT2	120	93	32	M16
BT40MT3X75		MT3	75	48	40	M16
BT40MT3X139		MT3	139	112	40	M16
BT40MT4X95		MT4	95	68	50	M16
BT50MT1X45		MT1	45	7	25	M24
BT50MT1X120		MT1	120	82	25	M24
BT50MT1X180		MT1	180	142	25	M24
BT50MT2X45		MT2	45	7	32	M24
BT50MT2X135		MT2	135	97	32	M24
BT50MT2X180		MT2	180	142	32	M24
BT50MT3X45		MT3	45	7	40	M24
BT50MT3X150		MT3	150	112	40	M24
BT50MT3X180		MT3	180	142	40	M24
BT50MT4X75		MT4	75	37	50	M24
BT50MT4X180		MT4	180	142	50	M24
BT50MT5X105		MT5	105	67	70	M24



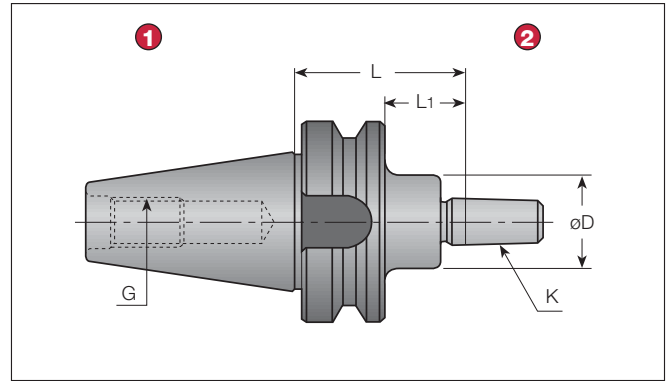
Pull Stud

Morse Taper Holder / Drill Chuck Holder

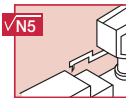
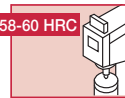
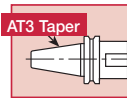
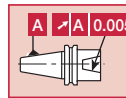
A BT-MT-DRW



B BT-DC-B



- 1 BT MAS 403 Form A
- 2 DIN6364
DIN228-2 Form B



- 1 BT MAS 403 Form A
- 2 DIN238

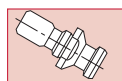
A BT-MT-DRW Morse Taper Draw Bar type Hplder

Cat. No.	Stock	Dimensions (mm)						
		K	L	L1	L2	øD	G1	G
BT40MT1DRW		MT1	50	23	-	25	M6	M16
BT40MT2DRW		MT2	50	23	-	32	M10	M16
BT40MT3DRW		MT3	70	43	-	40	M12	M16
BT40MT4DRW ⁽¹⁾		MT4	95	68	15	63	M16	M16
BT50MT1DRW		MT1	45	7	-	25	M6	M24
BT50MT2DRW		MT2	60	22	-	32	M10	M24
BT50MT3DRW		MT3	65	27	-	40	M12	M24
BT50MT4DRW ⁽¹⁾		MT4	70	32	15	63	M16	M24
BT50MT5DRW ⁽¹⁾		MT5	100	62	18	78	M20	M24

⁽¹⁾ DIN2201.

B BT-DC-B Drill Chuck Holder

Cat. No.	Stock	Dimensions (mm)				
		K	L	øD	L1	G
BT30DCB12X30		B12	30	-	8.0	M12
BT30DCB16X30		B16	30	-	8.0	M12
BT40DCB12X45		B12	45	24	18.0	M16
BT40DCB12X90		B12	90	24	63.0	M16
BT40DCB16X45		B16	45	30	18.0	M16
BT40DCB16X90		B16	90	30	63.0	M16
BT40DCB18X45		B18	45	30	18.0	M16
BT40DCB18X90		B18	90	30	63.0	M16
BT50DCB12X45		B12	45	-	6.7	M24
BT50DCB12X105		B12	105	24	67.0	M24
BT50DCB16X45		B16	45	-	7.0	M24
BT50DCB16X105		B16	105	50	67.0	M24
BT50DCB18X45		B18	45	-	7.0	M24
BT50DCB18X105		B18	105	30	67.0	M24



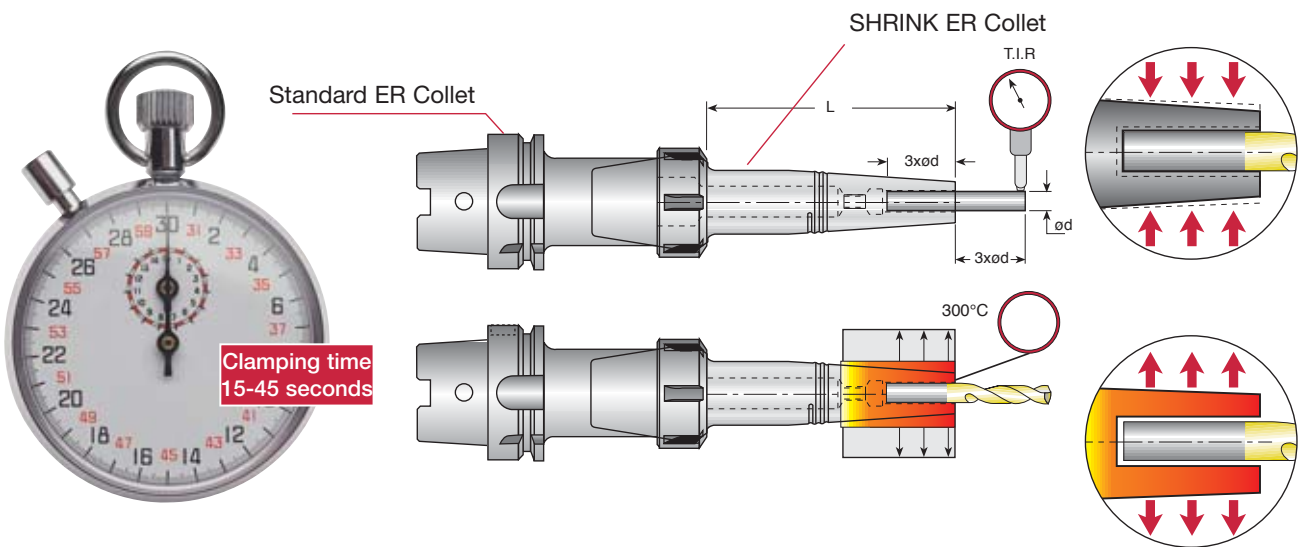
Pull Stud

Thermal Shrink Chucking System

TUNGSHRINK Thermal Shrink ER Collet Chucking System is an enhancement to the existing popular ER system.

The SHRINK collets utilize the thermal shrink phenomenon for rigid clamping of solid carbide cutters. This new system provides higher torque, precision runout and better repeatability. The SHRINK collets with their slim design and various projection lengths allow the user to reach into deeper shaped cavities and perform narrow milling applications.

Tungaloy offers a complete system for SHRINK ER collets, including a uniquely designed heating unit with a portable heating handle. The s is equipped with a high-tech temperature control for easy and practical use at the machining center or in the tool room.



L (mm)	Max T.I.R (µm)
35	7
60	9
85	10

Features:

- Slim design with various projections
- Flexible - fits into standard ER chucks
- High torque transfer
- Rigid clamping of carbide tools
- Precision runout
- Perfect repeatability
- Vibration damping
- Internal coolant
- Coolant JET2 available
- Symmetrical design for high speed machining
- Quick and easy tool changing
- Unique SHRINK heating unit with portable handle

Standard ER Collet Chuck

**SHRINK ER Collet Compatible
with Standard
ER Collets DIN 6499**

BT (30, 40, 50)



- ER20
- ER25
- ER32



SHORTIN

BT (30, 40, 50)

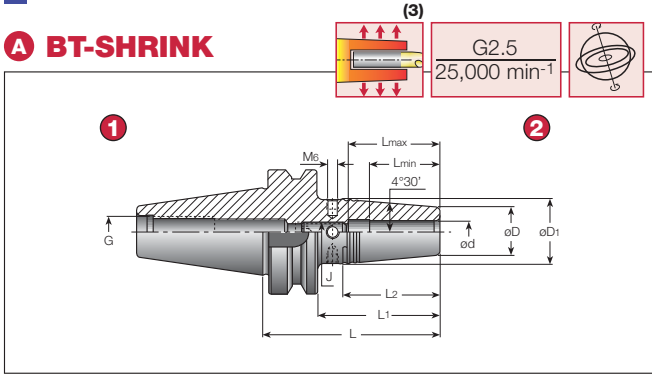


BT-SRK, SRKIN

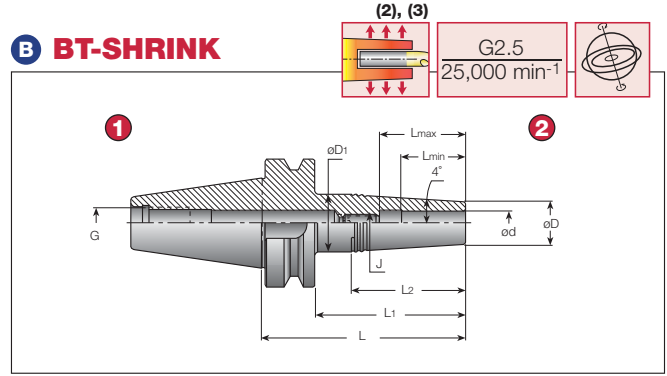


TUNGSHRINK • Thermal SHRINK Holder

A BT-SHRINK



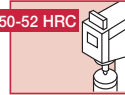
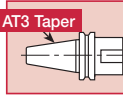
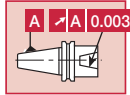
B BT-SHRINK



1 BT MAS 403 Form A

2 SRKIN

(for carbide and HSS shank)



1 BT MAS 403 Form A

2 SRK

(for carbide shank)

A BT-SHRINK Thermal SHRINK Holder (SRKIN type for carbide and HSS shank) (3)

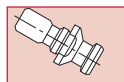
Cat. No.	Stock	Dimensions (mm)										Hex Key
		ød	øD1	øD	L	L1	L2	Lmin	Lmax	J	G	
BT40SRKIN6X90		6	27	21	90	63	38.0	25	36	M5	M16	2.5
BT40SRKIN8X90		8	27	21	90	63	38.0	25	36	M6	M16	3.0
BT40SRKIN10X90		10	32	24	90	63	50.5	31	42	M8	M16	4.0
BT40SRKIN12X90		12	32	24	90	63	50.5	36	47	M10	M16	5.0
BT40SRKIN14X90		14	34	27	90	63	44.5	36	47	M10	M16	5.0
BT40SRKIN16X90		16	34	27	90	63	44.5	39	50	M12	M16	6.0
BT40SRKIN18X90		18	42	33	90	63	57.0	39	50	M12	M16	6.0
BT40SRKIN20X90		20	42	33	90	63	57.0	41	52	M16	M16	8.0
BT40SRKIN25X110		25	53	44	110	83	57.0	47	58	M16	M16	8.0
BT50SRKIN6X100 ⁽¹⁾		6	26	21	100	62	32.0	25	36	M5	M24	2.5
BT50SRKIN8X100 ⁽¹⁾		8	27	21	100	62	38.0	25	36	M6	M24	3.0
BT50SRKIN10X100 ⁽¹⁾		10	32	24	100	62	51.0	31	42	M8	M24	4.0
BT50SRKIN12X100 ⁽¹⁾		12	32	24	100	62	51.0	36	47	M10	M24	5.0
BT50SRKIN14X100 ⁽¹⁾		14	34	27	100	62	44.5	36	47	M10	M24	5.0
BT50SRKIN16X100 ⁽¹⁾		16	34	27	100	62	44.5	39	50	M12	M24	6.0
BT50SRKIN18X100 ⁽¹⁾		18	42	33	100	62	57.0	39	50	M12	M24	6.0
BT50SRKIN20X100 ⁽¹⁾		20	42	33	100	62	57.0	41	52	M16	M24	8.0
BT50SRKIN25X120 ⁽¹⁾		25	53	44	120	82	57.0	47	58	M16	M24	8.0
BT50SRKIN32X120 ⁽¹⁾		32	53	44	120	82	57.0	47	58	M16	M24	8.0

⁽¹⁾ Balanced to G2.5 at max. n: 20,000 min⁻¹

Use only inductive heating device for SRKIN holders.

B BT-SHRINK Thermal SHRINK Holder (SRK type for carbide shank) (2) (3)

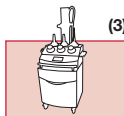
Cat. No.	Stock	Dimensions (mm)										Hex Key
		ød	øD	øD1	L	L1	L2	Lmin	Lmax	J	G	
BT40SRK3X50		3	10	15	77	50	35.5	10	16	M6	M16	3
BT40SRK3X85		3	10	19	112	85	64.1	10	16	M6	M16	3
BT40SRK4X50		4	10	15	77	50	35.5	12	18	M6	M16	3
BT40SRK4X85		4	10	19	112	85	64.1	12	18	M6	M16	3
BT40SRK5X50		5	10	15	77	50	35.5	15	21	M6	M16	3
BT40SRK5X85		5	10	19	112	85	64.1	15	21	M6	M16	3
BT40SRK6X50		6	11	16	77	50	35.5	18	24	M8	M16	4
BT40SRK6X85		6	11	20	112	85	64.1	18	24	M8	M16	4
BT40SRK8X50		8	14	20	77	50	42.5	25	31	M10	M16	5
BT40SRK8X85		8	14	23	112	85	63.9	25	31	M10	M16	5
BT40SRK10X50		10	16	22	77	50	42.4	30	36	M12	M16	6
BT40SRK10X85		10	16	25	112	85	60.2	30	36	M12	M16	6
BT40SRK12X50		12	20	26	77	50	42.3	32	42	M10	M16	5
BT40SRK12X85		12	20	28	112	85	56.6	32	42	M10	M16	5



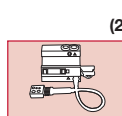
Pull Stud



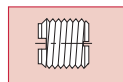
User Guide



Induction



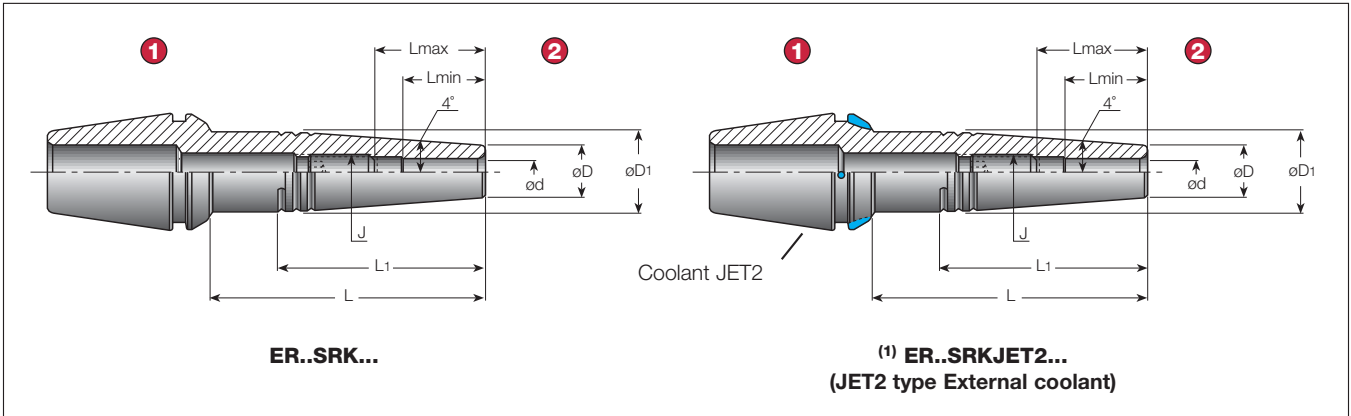
Thermal



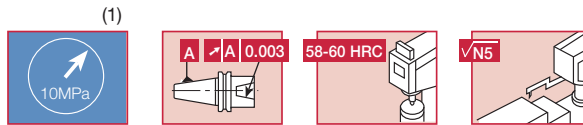
Preset Screw

TUNGSHRINK • Collet for Shrink

ER20, ER25-SHRINK



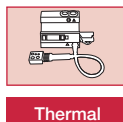
- 1 DIN6499
- 2 TungShrink



ER20, ER25-SHRINK SHRINK ER Collet SRK type (DIN6499) - Metric

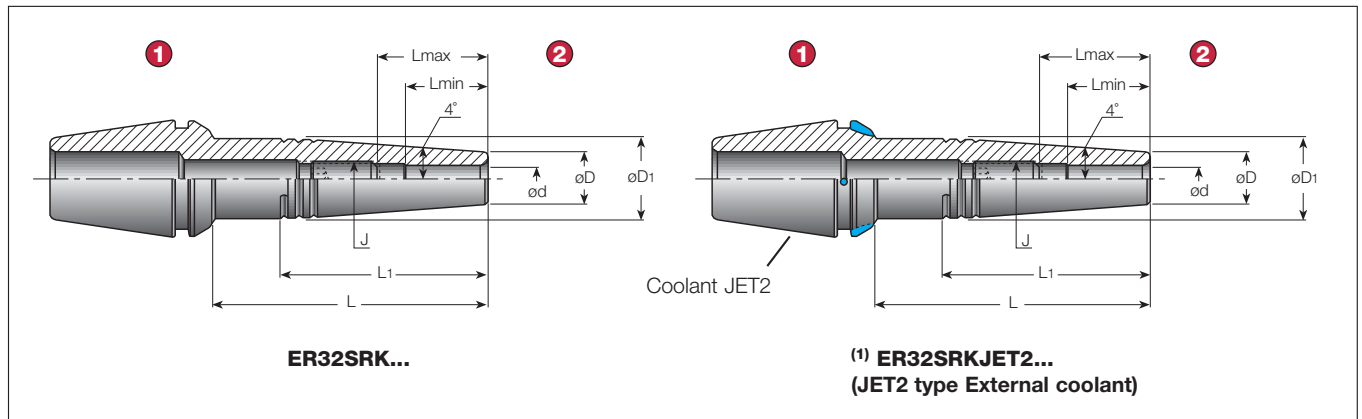
Cat. No.	Stock	Dimensions (mm)								Wrench
		ød	L	L1	Lmin	Lmax	øD1	øD	J	
ER20SRK3X35		3.00	35.00	24.5	10.0	16.00	13.5	10.0	M6	3
ER20SRK3X60		3.00	60.00	24.5	10.0	16.00	13.5	10.0	M6	3
ER20SRK4X35		4.00	35.00	24.5	12.0	18.00	13.5	10.0	M6	3
ER20SRK4X60		4.00	60.00	24.5	12.0	18.00	13.5	10.0	M6	3
ER20SRK5X35		5.00	35.00	24.5	15.0	21.00	13.5	10.0	M6	3
ER20SRK5X60		5.00	60.00	24.5	15.0	21.00	13.5	10.0	M6	3
ER20SRK6X35		6.00	35.00	25.5	18.0	24.00	14.7	11.0	M8	4
ER20SRK6X60		6.00	60.00	29.5	18.0	24.00	15.2	11.0	M8	4
ER25SRK3X35		3.00	35.00	24.5	10.0	16.00	13.5	10.0	M6	3
ER25SRK3X60		3.00	60.00	44.5	10.0	16.00	16.3	10.0	M6	3
ER25SRK4X35		4.00	35.00	24.5	12.0	18.00	13.5	10.0	M6	3
ER25SRK4X60		4.00	60.00	44.5	12.0	18.00	16.3	10.0	M6	3
ER25SRK5X35		5.00	35.00	24.5	15.0	21.00	13.5	10.0	M6	3
ER25SRK5X60		5.00	60.00	44.5	15.0	21.00	16.3	10.0	M6	3
ER25SRK6X35		6.00	35.00	26.0	18.0	24.00	14.7	11.0	M8	4
ER25SRK6X60		6.00	60.00	44.5	18.0	24.00	17.3	11.0	M8	4
ER25SRK8X35		8.00	35.00	26.5	25.0	30.00	17.8	14.0	M10	5
ER25SRK8X60		8.00	60.00	39.5	25.0	31.00	19.7	14.0	M10	5

(1) For JET2 collet, add JET2 to the designations (i.e. ER25SRK8x35JET2).

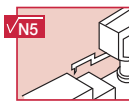
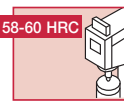
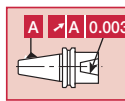
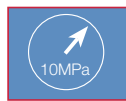


TUNGSHRINK • Collet for Shrink

ER32-SHRINK



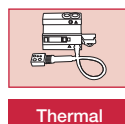
- 1 DIN6499
- 2 TungShrink



ER32-SHRINK SHRINK ER Collet SRK type (DIN6499) - Metric

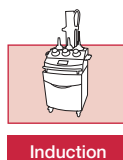
Cat. No.	Stock	Dimensions (mm)								Wrench
		ød	L	L ₁	L _{min}	L _{max}	øD ₁	øD	J	
ER32SRK3X35		3.00	35.00	22.5	10.0	16.00	13.2	10.0	M6	3
ER32SRK3X60		3.00	60.00	44.5	10.0	16.00	16.3	10.0	M6	3
ER32SRK3X85		3.00	85.00	70.0	10.0	16.00	19.8	10.0	M6	3
ER32SRK4X35		4.00	35.00	23.5	12.0	18.00	13.4	10.0	M6	3
ER32SRK4X60		4.00	60.00	44.5	12.0	18.00	16.3	10.0	M6	3
ER32SRK4X85		4.00	85.00	70.0	12.0	18.00	19.8	10.0	M6	3
ER32SRK5X35		5.00	35.00	24.5	15.0	21.00	13.5	10.0	M6	3
ER32SRK5X60		5.00	60.00	44.5	15.0	21.00	16.3	10.0	M6	3
ER32SRK5X85		5.00	85.00	70.0	15.0	21.00	19.8	10.0	M6	3
ER32SRK6X35		6.00	35.00	25.5	18.0	24.00	14.7	11.0	M8	4
ER32SRK6X60		6.00	60.00	45.0	18.0	24.00	17.3	11.0	M8	4
ER32SRK6X85		6.00	85.00	69.5	18.0	26.00	20.8	11.0	M8	4
ER32SRK8X35		8.00	35.00	33.0	25.0	31.00	18.8	14.0	M10	5
ER32SRK8X60		8.00	60.00	45.0	25.0	31.00	20.4	14.0	M10	5
ER32SRK8X85		8.00	85.00	65.0	25.0	31.00	23.2	14.0	M10	5
ER32SRK10X35		10.00	35.00	34.0	30.0	35.00	20.8	16.0	M12	6
ER32SRK10X60		10.00	60.00	44.5	30.0	36.00	22.4	16.0	M12	6
ER32SRK10X85		10.00	85.00	49.5	30.0	36.00	23.0	16.0	M12	6
ER32SRK12X35		12.00	35.00	28.0	32.0	-	24.0	20.0	-	-
ER32SRK12X60		12.00	60.00	28.0	32.0	38.00	24.0	20.0	M14	6
ER32SRK12X85		12.00	85.00	28.0	32.0	38.00	24.0	20.0	M14	6

(1) For JET2 collet, add JET2 to the designations (i.e. ER32SRK12X85JET2).



Thermal

68



Induction

66

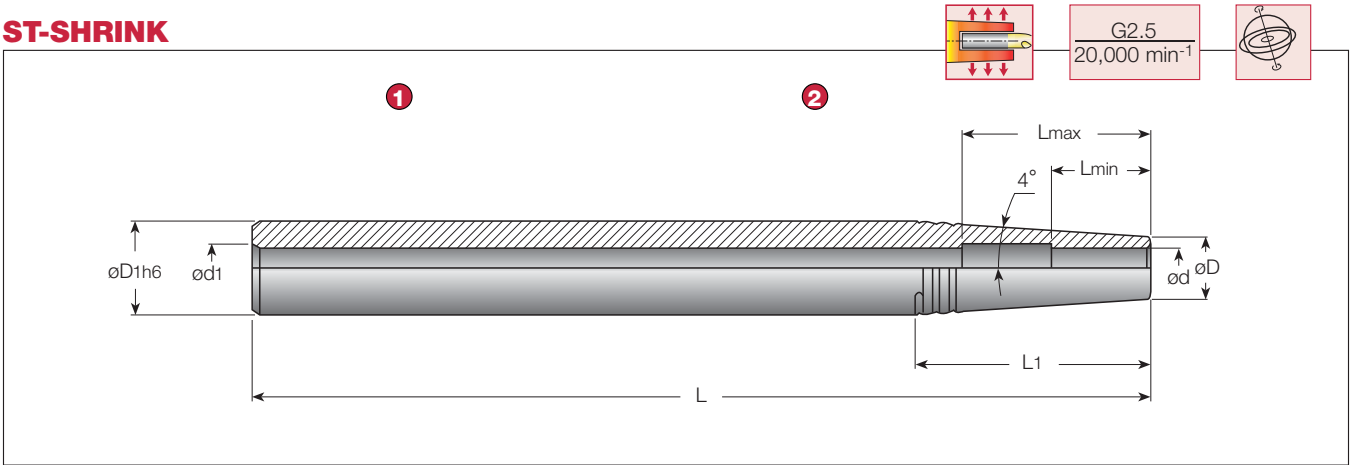


User Guide

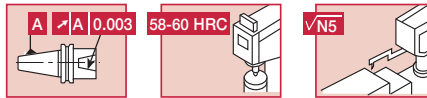
57

TUNGSHRINK • Straight Shank

ST-SHRINK

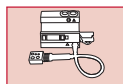


- ① Straight Shank
- ② TungShrink



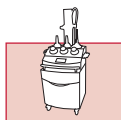
ST-SHRINK Thermal SHRINK Holder Straight Shank SRK type - Metric

Cat. No.	Stock	Dimensions (mm)							
		$\varnothing d$	$\varnothing D$	$\varnothing D_1$	$\varnothing d_1$	L	L ₁	L _{min}	L _{max}
ST12X160SRK3		3	10	12	4	160	14.3	10	-
ST12X160SRK4		4	10	12	4	160	14.3	12	27
ST16X160SRK3		3	10	16	6	160	43.0	10	-
ST16X160SRK4		4	10	16	6	160	43.0	12	-
ST16X160SRK5		5	10	16	6	160	43.0	15	-
ST16X160SRK6		6	11	16	6	160	35.5	18	35
ST20X200SRK5		5	10	20	6	200	71.5	15	-
ST20X200SRK6		6	11	20	6	200	64.5	18	40
ST20X200SRK8		8	14	20	6	200	43.0	25	40
ST25X200SRK6		6	11	25	8	200	100.0	18	35
ST25X200SRK8		8	14	25	8	200	78.6	25	40
ST25X200SRK10		10	16	25	8	200	64.3	30	50
ST25X200SRK12		12	20	25	8	200	35.7	32	52



Thermal

68



Induction

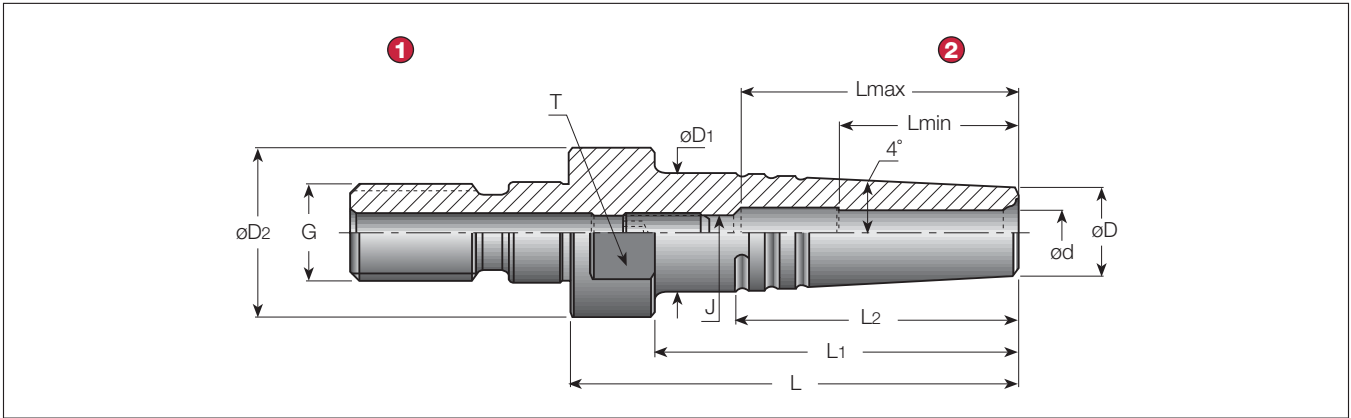
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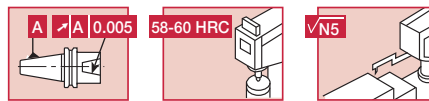
User Guide

57

CDP M-SRK

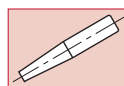


- 1 TungFlex
- 2 TungShrink



CDP M-SRK Adapter with SHRINK (SRK type) - Metric

Cat. No.	Stock	Dimensions (mm)										Hex Key	G	T
		ød	L	L ₁	L ₂	L _{min}	L _{max}	øD	øD ₁	øD ₂	J			
CDPM10SRK3X40		3	40	31.5	28.4	10	16	10	14	18	M4	2.0	M10	15
CDPM10SRK4X40		4	40	31.5	28.4	12	19	10	14	18	M4	2.0	M10	15
CDPM10SRK5X40		5	40	31.5	28.4	15	25	10	14	18	M4	2.0	M10	15
CDPM12SRK3X45		3	45	36.5	28.8	10	16	10	14	21	M5	2.5	M12	18
CDPM12SRK4X45		4	45	36.5	28.8	12	18	10	14	21	M5	2.5	M12	18
CDPM12SRK5X45		5	45	36.5	28.8	15	25	10	14	21	M5	2.5	M12	18
CDPM12SRK6X45		6	45	36.5	28.4	18	28	11	15	21	M5	2.5	M12	18
CDPM12SRK8X45		8	45	36.5	28.8	25	35	14	18	21	M5	2.5	M12	18
CDPM12SRK10X45		10	45	-	35.6	30	40	16	21	21	M5	2.5	M12	18
CDPM12SRK12X45		12	45	-	36.0	32	42	20	25	21	M5	2.5	M12	18



TungFlex

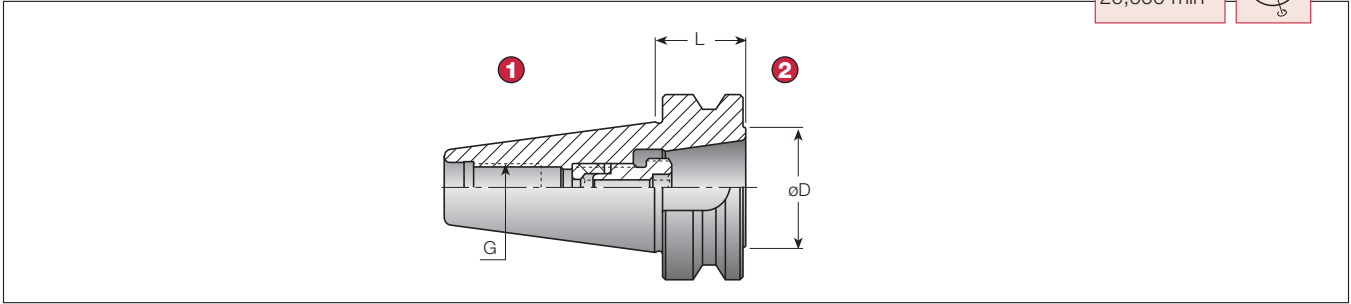


User Guide

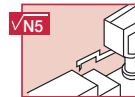
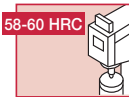
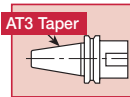
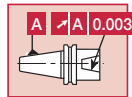
TUNGSHRINK • TUNGCLICK • Quick Change Holder

BT-ER-CLICK

G2.5
20,000 min⁻¹



- 1 BT MAS 403 Form A
- 2 DIN6499 ER-CLICK



BT-ER-CLICK Quick Change System

Cat. No.	Stock	Dimensions (mm)		
		L	øD	G
BT40ER32CLICK-IN		28	41	M16
BT50ER32CLICK-IN		39	41	M24

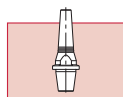
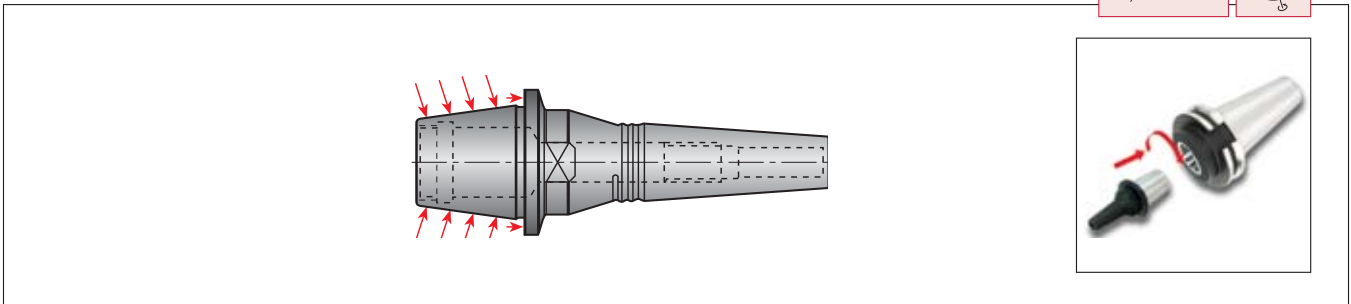
⚠ Tightening torque: 235 N·m

Quick-Change System

Face Contact Advantages:

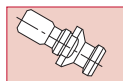
- Taper and face contact.
- Ideal for high speed machining.
- High precision runout.
- High rigidity.
- Quick and easy clamping (half a turn).

G2.5
20,000 min⁻¹



TungClick

65



Pull Stud

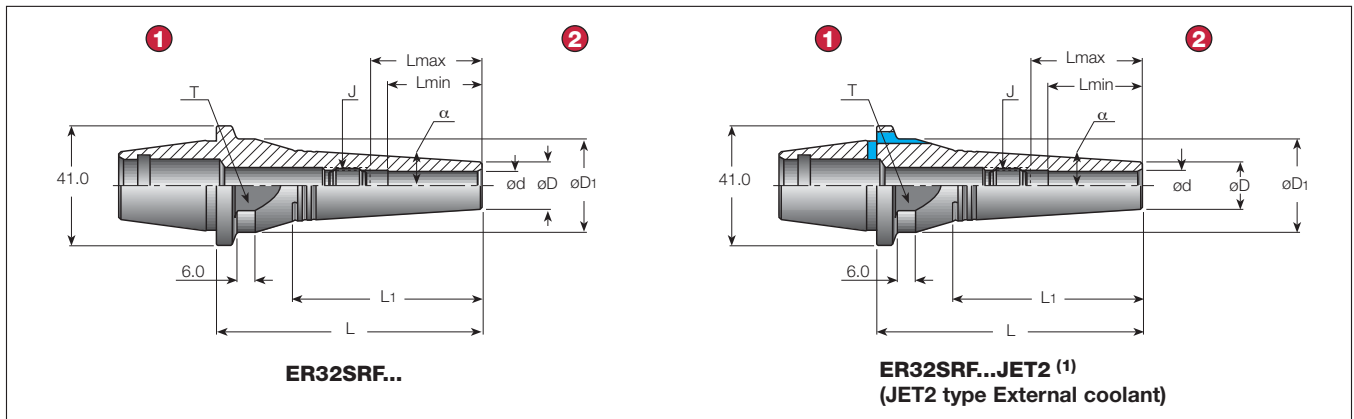
70



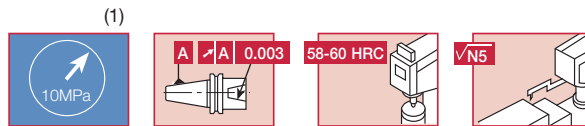
Wrench

27

ER-SRF



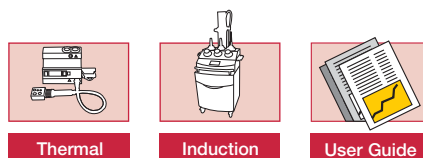
- 1 TungClick
- 2 TungShrink



ER-SRF Quick Change Collet with Thermal Shrink SRF type - Metric

Cat. No.	Stock	Dimensions (mm)									Wrench	T
		ød	L	L ₁	L _{min}	L _{max}	øD ₁	øD	J	α		
ER32SRF3X50		3	50	31.0	10	16	32	10	M6	4°	3	27
ER32SRF3X85		3	85	60.5	10	16	32	10	M6	4°	3	27
ER32SRF4X50		4	50	31.0	12	18	32	10	M6	4°	3	27
ER32SRF4X85		4	85	60.5	12	18	32	10	M6	4°	3	27
ER32SRF5X50		5	50	31.0	15	21	32	10	M6	4°	3	27
ER32SRF5X85		5	85	60.5	15	21	32	10	M6	4°	3	27
ER32SRF6X50		6	50	31.0	18	24	32	11	M8	4°	4	27
ER32SRF6X85		6	85	60.5	18	24	32	11	M8	4°	4	27
ER32SRF8X50		8	50	33.0	25	31	32	14	M10	4°	5	27
ER32SRF8X85		8	85	60.5	25	31	32	14	M10	4°	5	27
ER32SRF10X50		10	50	35.0	30	35	32	16	M12	4°	6	27
ER32SRF10X85		10	85	60.5	30	36	32	16	M12	4°	6	27
ER32SRF12X50		12	50	35.0	32	37	32	20	M14	4°	6	27
ER32SRF12X85		12	85	50.0	32	38	32	20	M14	4°	6	27

⚠ (1) For JET2 collet, add JET2 to the designations (i.e. ER32SRF10/50JET2).
Tightening torque: 235 N·m



Induction Heating Unit



Easy and efficient to operate
 Quick tool changing (5 sec.)
 Short cooling time (30 sec.)
 Range of Shank
 Solid carbide range 3-32 mm
 H.S.S. cutter range 6-32 mm

- Suitable for:
- Integral tooling
- Integral heavy duty tooling
- Extensions
 ER..SRK... unique collets

Technical Specifications:

Clamping range	: 3 ~ 32 mm	Carbide tool shank
Clamping range	: 6 ~ 32 mm	HSS & steel shank
Main power supply	: 3 x 380 ~ 500 V, 50 / 60 Hz	
Nominal power	: 10 kW	
Nominal current	: 16 AMP	
Cooling unit power supply	: 220 V, 50 / 60 Hz	
Nominal power	: 0.5 kW	
Max. tool length	: 440 mm (from gauge line)	
Max. dia. clamping chuck	: 52 mm	
Effective induction field length	: 45 mm	
Expansion time	: approx. 5 ~ 12 seconds	
Cooling time	: approx. 50 ~ 90 seconds	
Weight	: 150 kg	
Overall dimensions	: 1700 x 730 x 600 mm	

SHRINK Thermal Electrical Unit

Cat. No.
INDSHRINKINUNITEUR

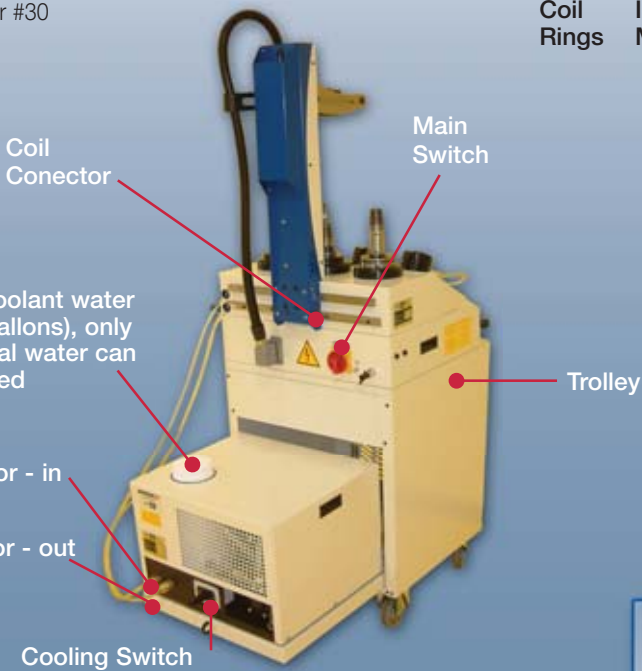
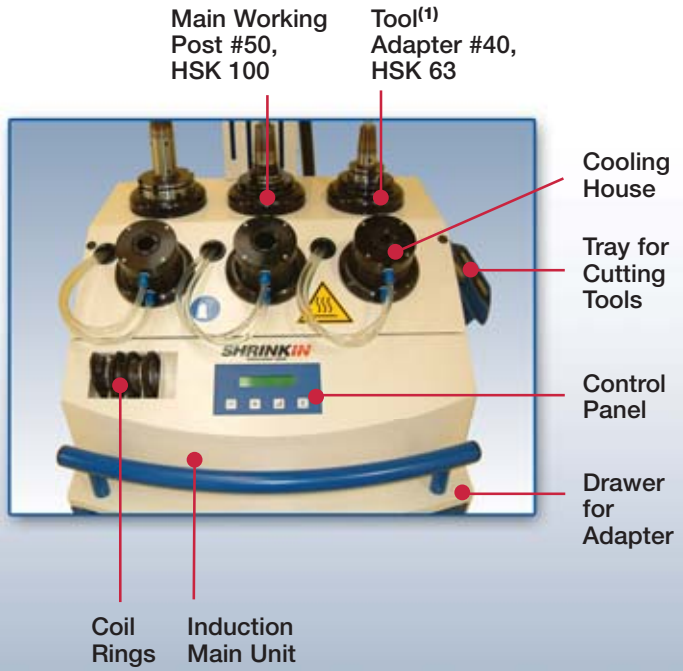
Includes:

- Induction unit
- Cooling unit
- Trolley
- Three Tool Adapter⁽¹⁾

Cooling Sleeves	Used for
INDCOOLINGCOLLET6-8	SRKIN
INDCOOLINGCOLLET10-12	
INDCOOLINGCOLLET14-16	
INDCOOLINGCOLLET18-20	
INDCOOLINGCOLLETER3-5	SRK
INDCOOLINGCOLLETER6	
INDCOOLINGCOLLETER8	
INDCOOLINGCOLLETER10	
INDCOOLINGCOLLETER12	

Optional Tool Adapter for HSK
IND32TOOLADAPTER
IND40TOOLADAPTER
IND50TOOLADAPTER⁽¹⁾
IND63TOOLADAPTER
IND80TOOLADAPTER

⁽¹⁾ For taper #30



INDUCTION Starter Unit

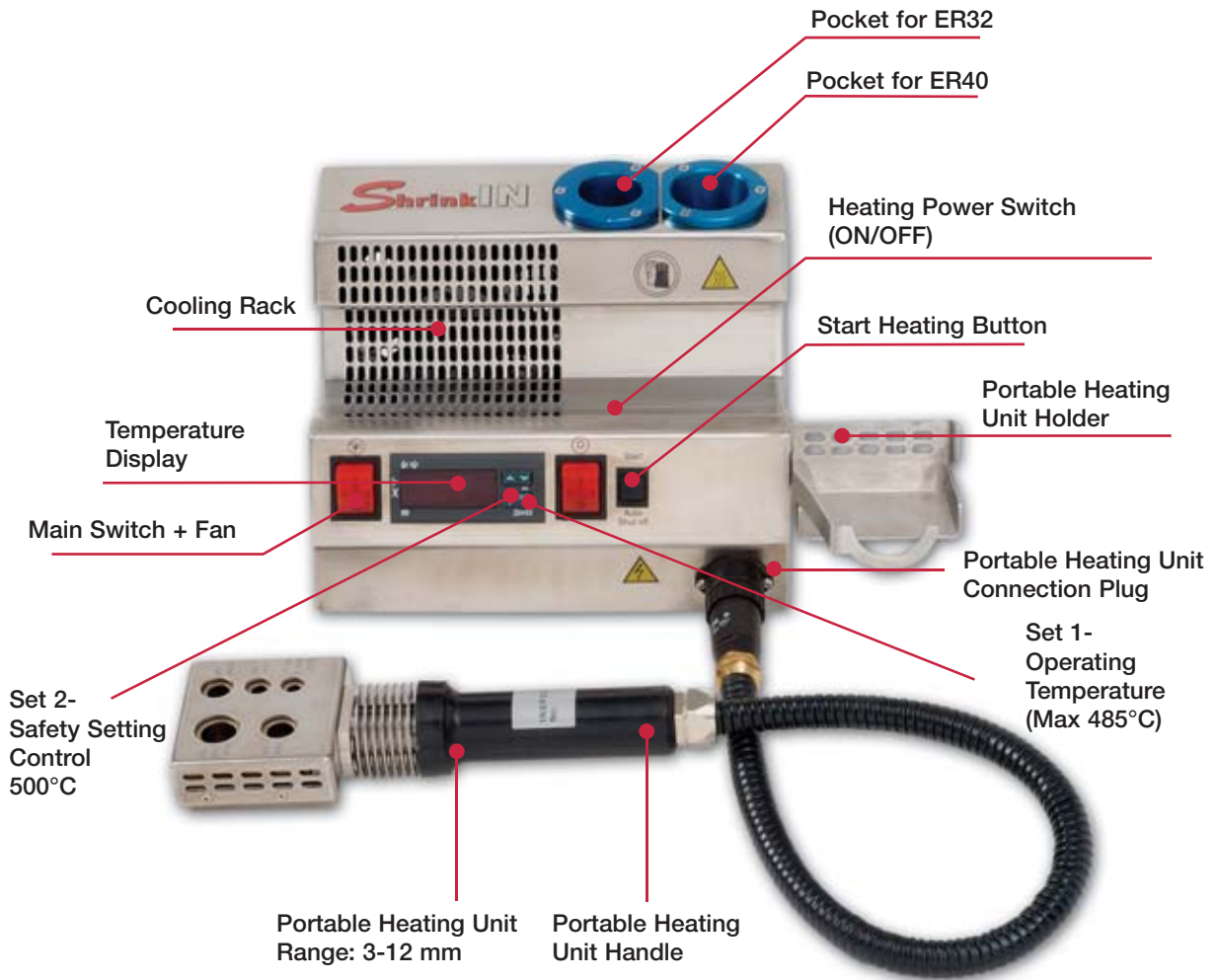
The induction starter unit is an economical starter version of the SHRINK induction unit. It was designed to help the enduser to purchase the modern shrink chucking technology in a low cost device. The starter unit is actually a simplified and limited version of the complete inductive system that we offer today:

Induction Starter Unit Cat. No. :

4505585 IND SHRINK START UNIT EUR



**Thermal Heating Unit
V2 Version**



SHRINK Thermal Electric Unit

Cat. No.
SHRINKINUNITV2EUR

220V 50/60 HZ

Portable Heating Unit Handle

Cat. No.
HEATINGHANDLE220VV2

Important Note: This thermal heating unit can be used only for heating ER.. SRK and ER.. SRF collets.

SHRINK ER 32 Collet Sets and Kits

ER32 SHRINK Set6 Collets (4-12)

Cat. No.	Collet Size (mm)
SETER32SRKS6EUR	4, 5, 6, 8, 10, 12
SETER32SRKM6EUR	4, 5, 6, 8, 10, 12
SETER32SRKL6EUR	4, 5, 6, 8, 10, 12

Cat. No.	Collet Size (inch)
SETER32SRKS6USA	0.187, 0.25, 0.312, 0.375, 0.437, 0.5
SETER32SRKM6USA	0.187, 0.25, 0.312, 0.375, 0.437, 0.5
SETER32SRKL6USA	0.187, 0.25, 0.312, 0.375, 0.437, 0.5

Note: Size table is inch.



SHRINK Thermal Electric Unit Kit with ER32 SHRINK 6 Piece Collet Set (4-12)

Cat. No.	Power Suppl	Collet Size (mm)
KITSHRINKINSV2EUR	220V 50/60 Hz	4, 5, 6, 8, 10, 12
KITSHRINKINMV2EUR	220V 50/60 Hz	4, 5, 6, 8, 10, 12
KITSHRINKINLV2EUR	220V 50/60 Hz	4, 5, 6, 8, 10, 12



Pull Stud

PS BT-JIS / MAZAK

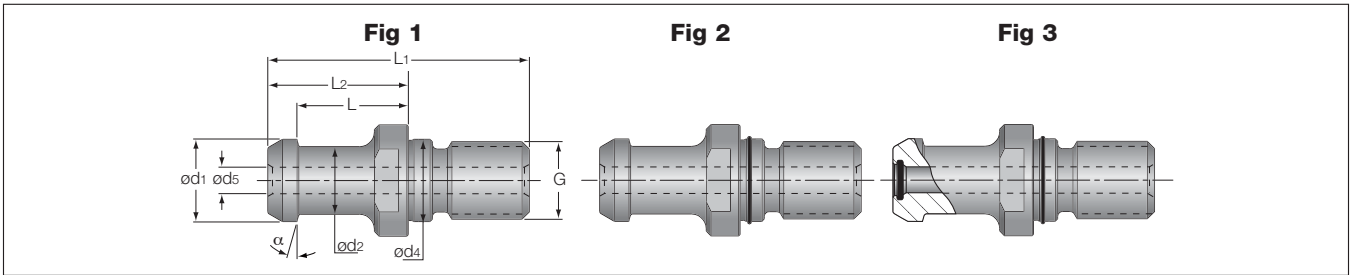
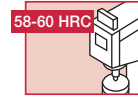


Fig 1: Coolant holes only in items with a "B" suffix.

Fig 2: With external O-ring.

Fig 3: With external and internal O-rings.



PS BT-JIS / MAZAK Pull Stud BT-JIS/ANSI - Metric

Cat. No.	Stock	Dimensions (mm)									Fig
		G	ød1	ød2	ød4	ød5	L	L1	L2	α	
PSBT3015°M12JISB	●	M12	12.00	8.0	13	4.0	18.4	43.0	23.4	15°	1
PSBT4015°M16JISB	●	M16	19.00	14.0	17	5.5	23	54.0	29.0	15°	1
PSBT4015°M16JISOB	●	M16	19.00	14.0	17	5.5	23	54.0	29.0	15°	2
PSBT4015°M16JISOBO		M16	19.00	14.0	17	5.5	23	54.0	29.0	15°	3
PSBT4015°M16JIS40B	●	M16	19.00	14.0	17	4.0	23	54.0	29.0	15°	2
PSBT5015°M24JISB	●	M24	28.00	21.0	25	8.0	25	74.0	34.0	15°	1
PSBT5015°M24JISOB	●	M24	28.00	21.0	25	8.0	25	74.0	34.0	15°	2
PSBT5015°M24JISOBO		M24	28.00	21.0	25	8.0	25	74.0	34.0	15°	3
PSBT4045°M16MAZAKB		M16	18.79	12.4	17	7.0	14.026	44.1	19.1	45°	1
PSBT5045°M24MAZAKB		M24	28.95	20.8	25	8.0	17.58	65.2	25.2	45°	1

PS BT-MAS

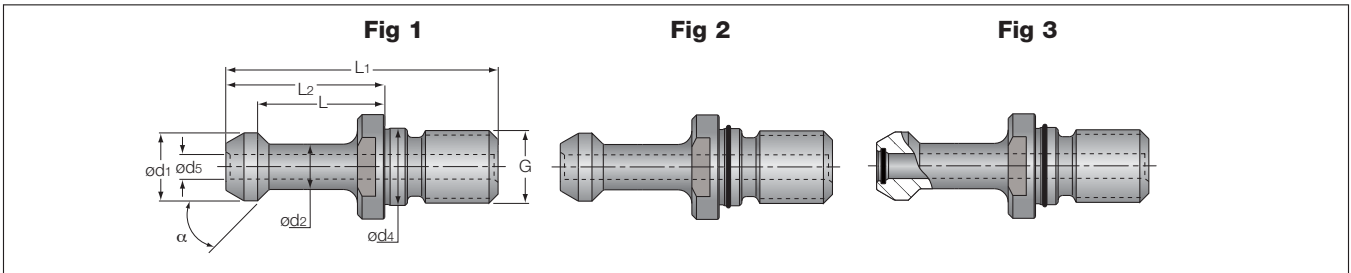
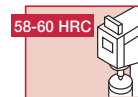


Fig 1: Coolant holes only in items with a "B" suffix.

Fig 2: With external O-ring.

Fig 3: With external and internal O-rings.

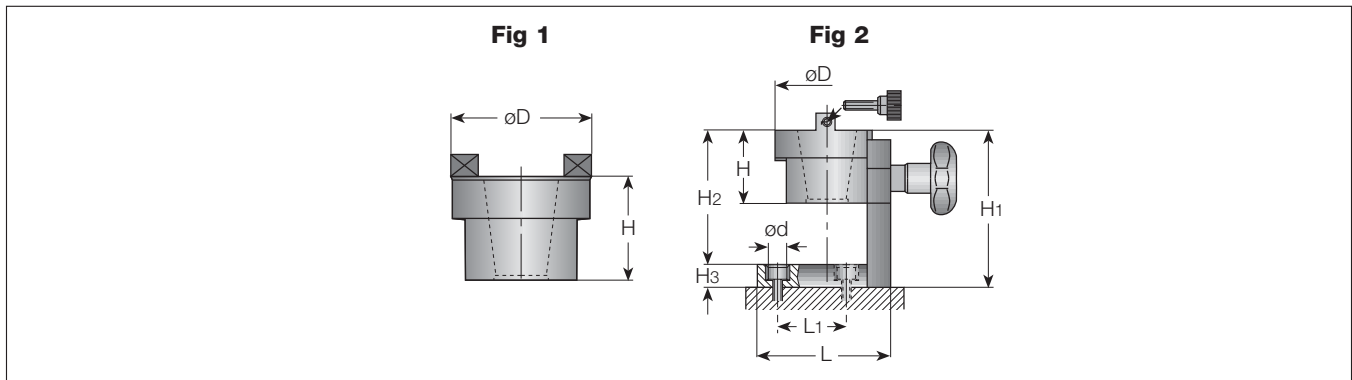


PS BT-MAS Pull Stud BT-MAS - Metric

Cat. No.	Stock	Dimensions (mm)									Fig
		G	ød1	ød2	ød4	ød5	L	L1	L2	α	
PSBT3045°M12MAS1	●	M12	11	7	12.5	-	18	43	23	45°	1
PSBT3045°M12MAS1B	●	M12	11	7	12.5	3	18	43	23	45°	1
PSBT3060°M12MAS2	●	M12	11	7	12.5	-	18	43	23	60°	1
PSBT3060°M12MAS2B		M12	11	7	12.5	3	18	43	23	60°	1
PSBT4045°M16MAS1	●	M16	15	10	17.0	-	28	60	35	45°	1
PSBT4045°M16MAS1B	●	M16	15	10	17.0	5.5	28	60	35	45°	1
PSBT4060°M16MAS2	●	M16	15	10	17.0	-	28	60	35	60°	1
PSBT4060°M16MAS2B	●	M16	15	10	17.0	5.5	28	60	35	60°	1
PSBT4090°M16MAS3	●	M16	15	10	17.0	-	28	60	35	90°	1
PSBT4090°M16MAS3B	●	M16	15	10	17.0	5.5	28	60	35	90°	1
PSBT5045°M24MAS1	●	M24	23	17	25.0	-	35	85	45	45°	1
PSBT5045°M24MAS1B	●	M24	23	17	25.0	6.0	35	85	45	45°	1
PSBT5045°M24MAS1OB	●	M24	23	17	25.0	6.0	35	85	45	45°	2
PSBT5045°M24MAS1OBO		M24	23	17	25.0	6.0	35	85	45	45°	3
PSBT5060°M24MAS2	●	M24	23	17	25.0	-	35	85	45	60°	1
PSBT5060°M24MAS2B	●	M24	23	17	25.0	6.0	35	85	45	60°	1
PSBT5060°M24MAS2OB		M24	23	17	25.0	6.0	35	85	45	60°	2
PSBT5090°M24MAS3	●	M24	23	17	25.0	-	35	85	45	90°	1
PSBT5090°M24MAS3B	●	M24	23	17	25.0	6.0	35	85	45	90°	1
PSBT5090°M24MAS3OB	●	M24	23	17	25.0	6.0	35	85	45	90°	2

Tool Clamp

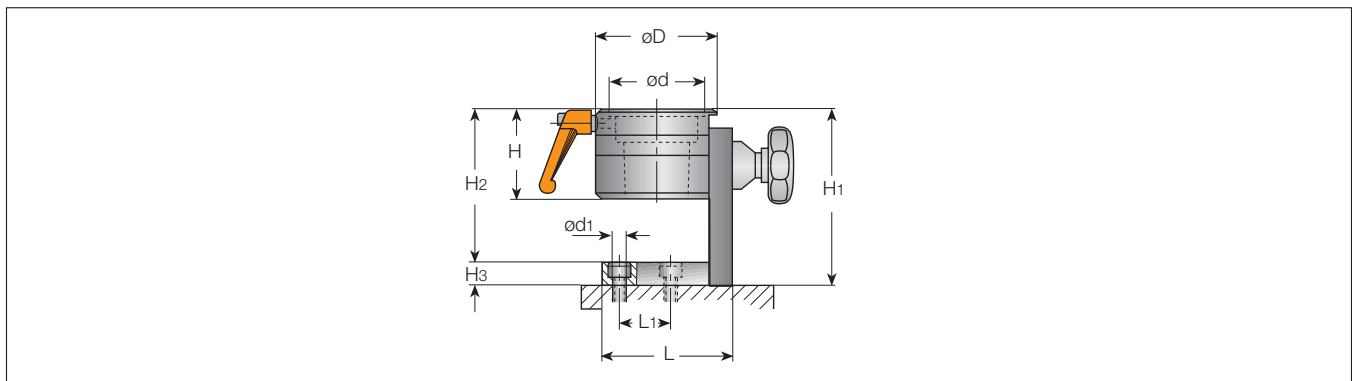
TOOL CLAMP



TOOL CLAMP Fixture for ISO, DIN 69871 and BT MAS-403 Tool Shank

Cat. No.	Stock	Dimensions (mm)								Fig
		øD	H	H ₁	H ₂	H ₃	L	L ₁	ød	
TOOLCLAMP30ROTARY		70	56	128	109	19	104	40	12.5	2
TOOLCLAMP40ROTARY		82	56	128	109	19	104	40	12.5	2
TOOLCLAMP50ROTARY		103	71	170	151	19	144	85	12.5	2
TOOLCLAMP30FIX		82	58	-	-	-	-	-	-	1
TOOLCLAMP40FIX		82	58	-	-	-	-	-	-	1
TOOLCLAMP50FIX		103	71	-	-	-	-	-	-	1

MULTI CLAMP



MULTI-CLAMP HSK E/F Rotary Fixture for HSK-E/F type Shank

Cat. No.	Stock	Dimensions (mm)								
		øD	ød	ød ₁	L	L ₁	H	H ₁	H ₂	H ₃
MULTICLAMP32E/F		113.2	32	12.5	144	40	70	133	114	19
MULTICLAMP40E/F		113.2	40	12.5	144	40	70	133	114	19
MULTICLAMP50E/F		113.2	50	12.5	144	40	70	133	114	19
MULTICLAMP63E/F		113.2	63	12.5	144	40	70	133	114	19

MULTI-CLAMP HSK A/C Rotary Fixture for HSK-A/C type Shank

Cat. No.	Stock	Dimensions (mm)								
		øD	ød	ød ₁	L	L ₁	H	H ₁	H ₂	H ₃
MULTICLAMP50A/C		82	50	12.5	104	40	72	142	123	19
MULTICLAMP63A/C		95	63	12.5	104	40	72	142	123	19
MULTICLAMP100A/C		130	100	12.5	144	85	90	178	159	19

Electrical Nut-Clamp Torque Control Device

- Ensures controlled (proper) clamping of cutting tools
- Maintains collet chuck accuracy
- Easy clamping and unclamping of cutting tools
- Handy set for various collet chuck sizes
- Main spindle taper #50
- Suitable for main shank standards #40, #50, HSK 63, HSK 100

Table Model

Specifications

Euro Motor: 1 phase 200/240V 50/60 HZ 1 Kn
Weight: Table model - 85 KG.
 Trolley (optional) - 15 Kgf.

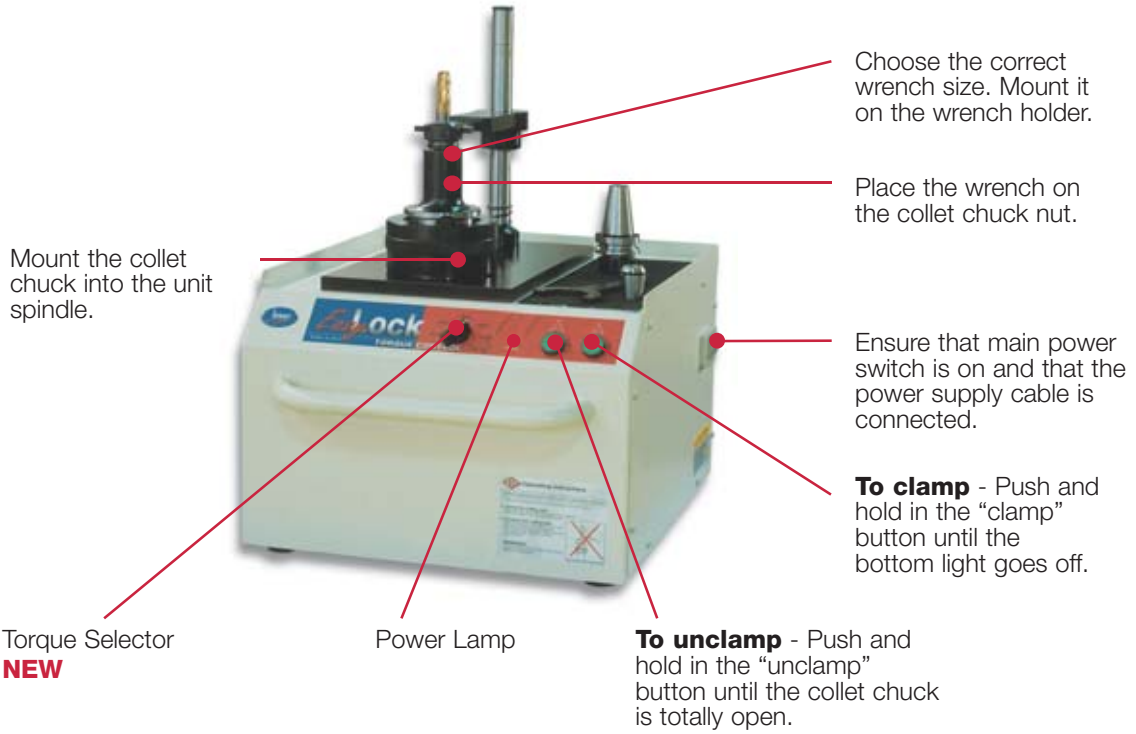


**Easy Lock Unit
 Electrical Nut-Clamp Torque Control Device**

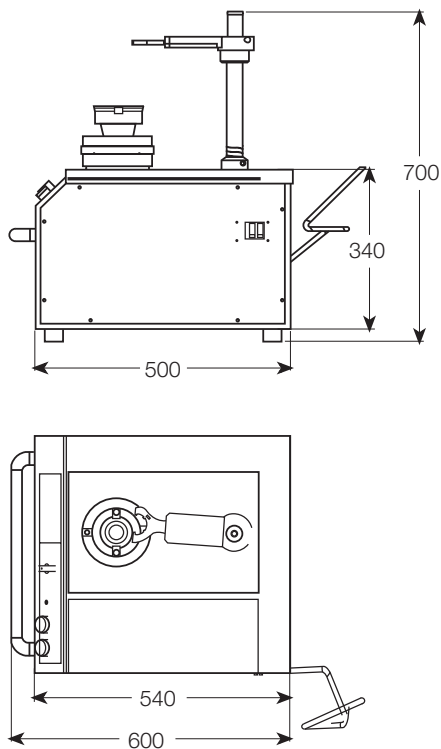
Cat. No.	Accessories	
	Standard	Optional
EASYLOCKT.CEU	TP50AD40EASY	EASYLOCKTROLLEY
	WRENCHER16EASYLOCK	TP40AD30EASY
	WRENCHER20EASYLOCK	TP50ADHSK63EASY
	WRENCHER25EASYLOCK	TP50ADHSK100EASY
	WRENCHER32EASYLOCK	
	WRENCHER40EASYLOCK	WRENCHER50EASYLOCK
		WRENCHTG100OPENEASY

Electrical Nut-Clamp Torque Control Device

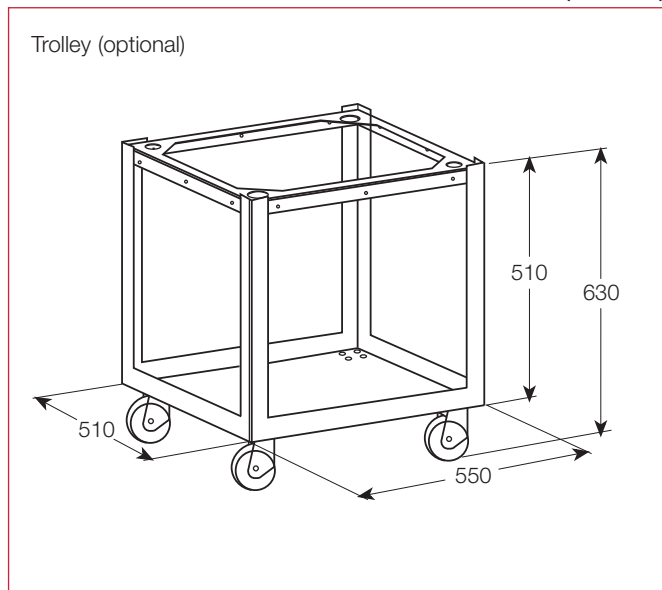
Power Clamping Unit for Collet Chucks



Note: Assemble the collet and cutting tool.
By hand, place the nut onto the collet chuck.

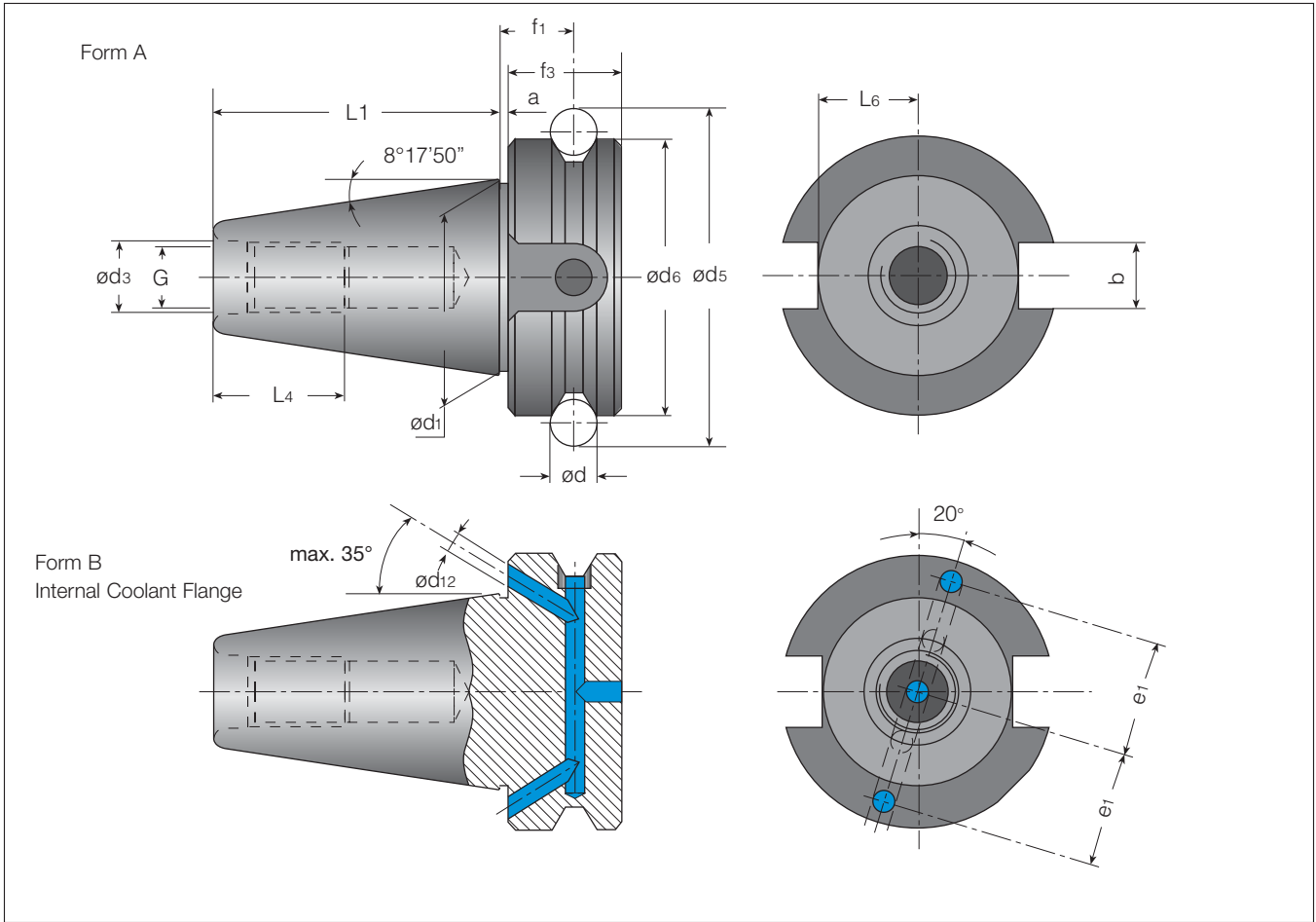


(Unit: mm)



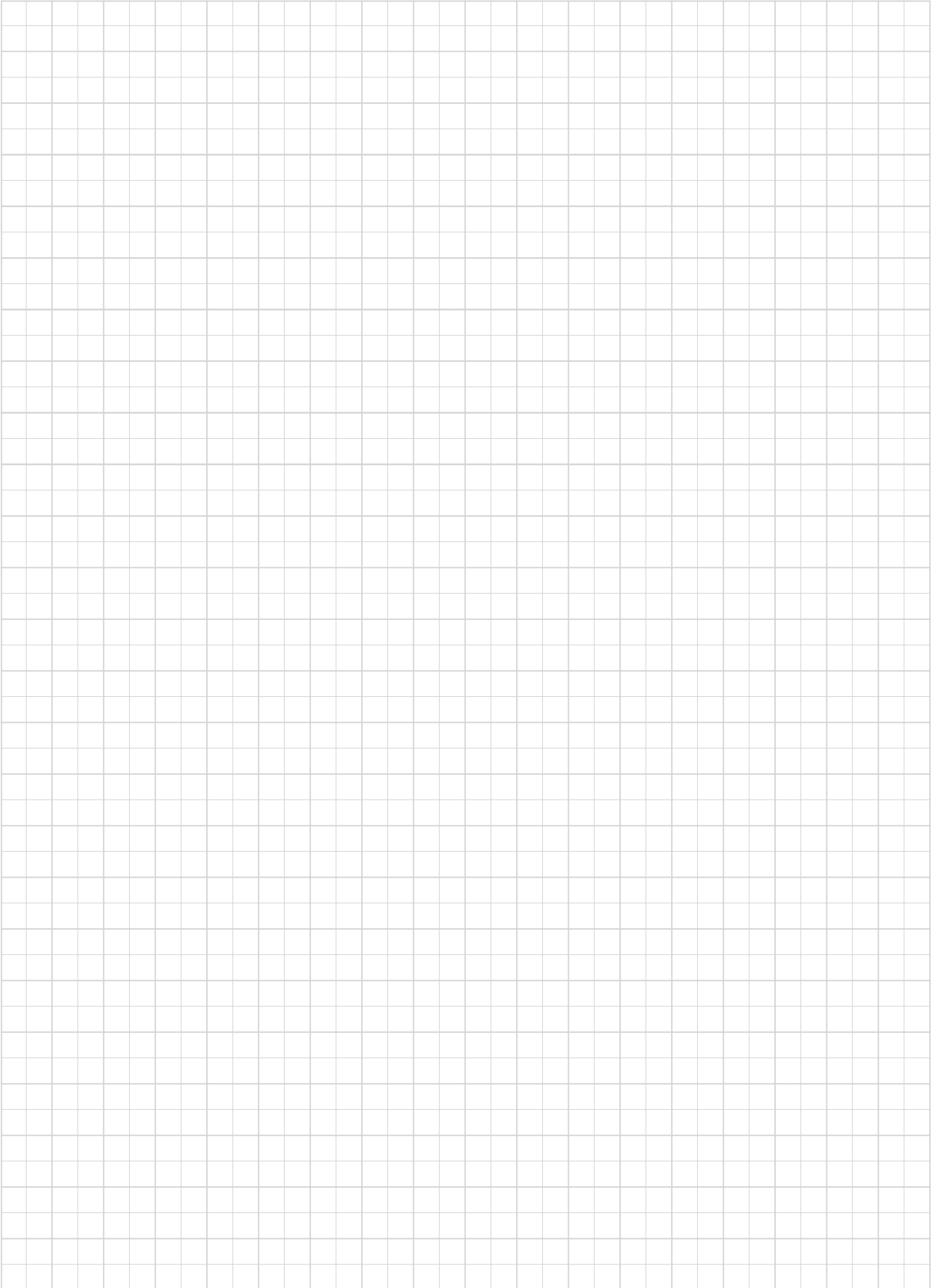
BT MAS 403 • Shank Standard

BT MAS 403 Form A/B



Shank	Stock	Dimensions (mm)								
		a	b (H ₁₂)	ød	ød ₁	G	ød ₃ (H ₈)	ød ₅	ød ₆ (H ₈)	f ₁ ±0.1
BT30		2	16.1	8	31.75	M12	12.5	56.144	46	13.6
BT40		2	16.1	10	44.45	M16	17.0	75.679	63	16.6
BT50		3	25.7	15	69.85	M24	25.0	119.020	100	23.2

Shank	Stock	Dimensions (mm)						
		f ₃	L ₁ ±0.2	L ₄ min	L ₆ -0.2	e ₁ ±0.1	ød ₁₂	TAPER AT3
BT30		20	48.4	24	16.3	21	4	0.002
BT40		25	65.4	30	22.6	27	4	0.003
BT50		35	101.8	45	35.4	42	6	0.004





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