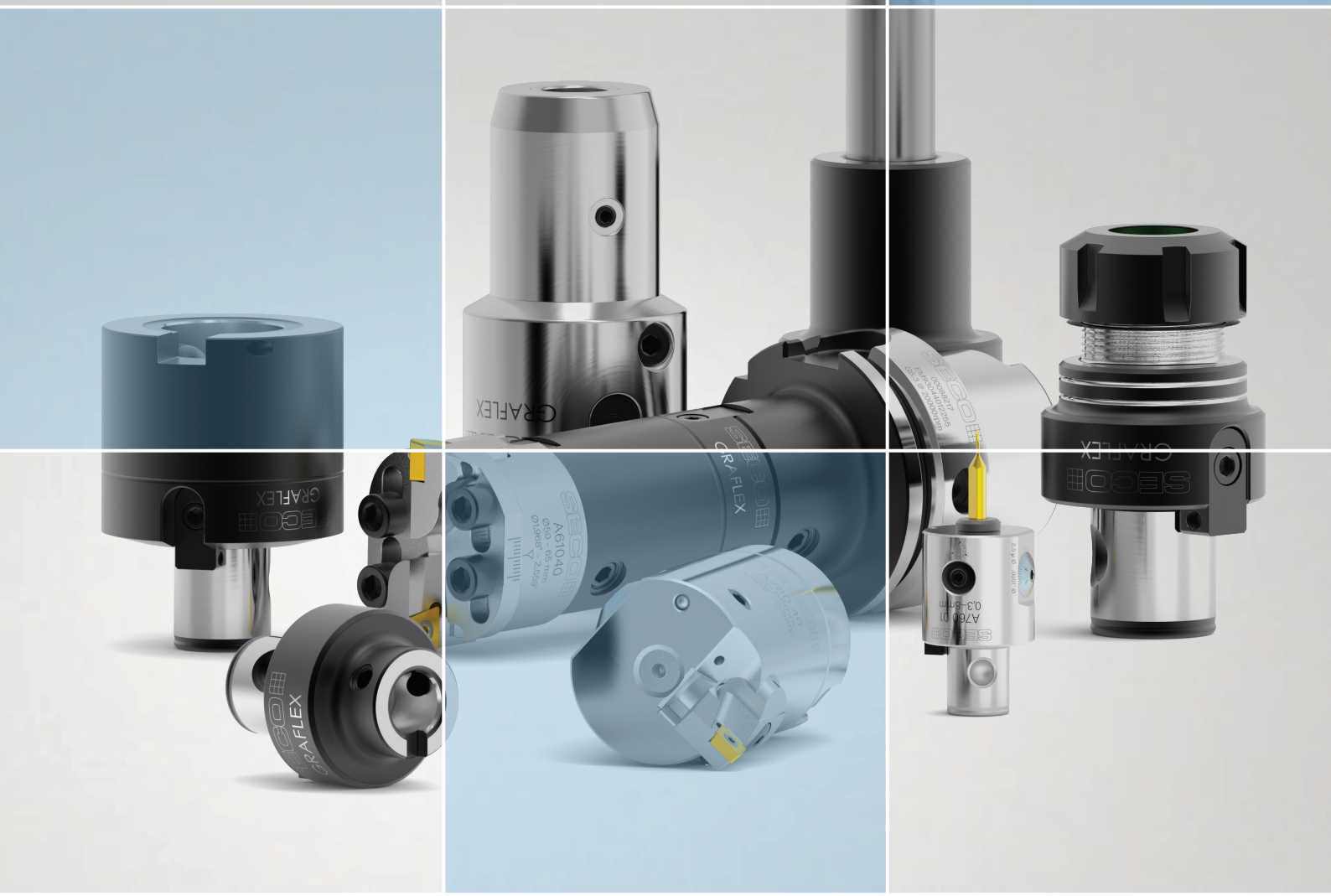
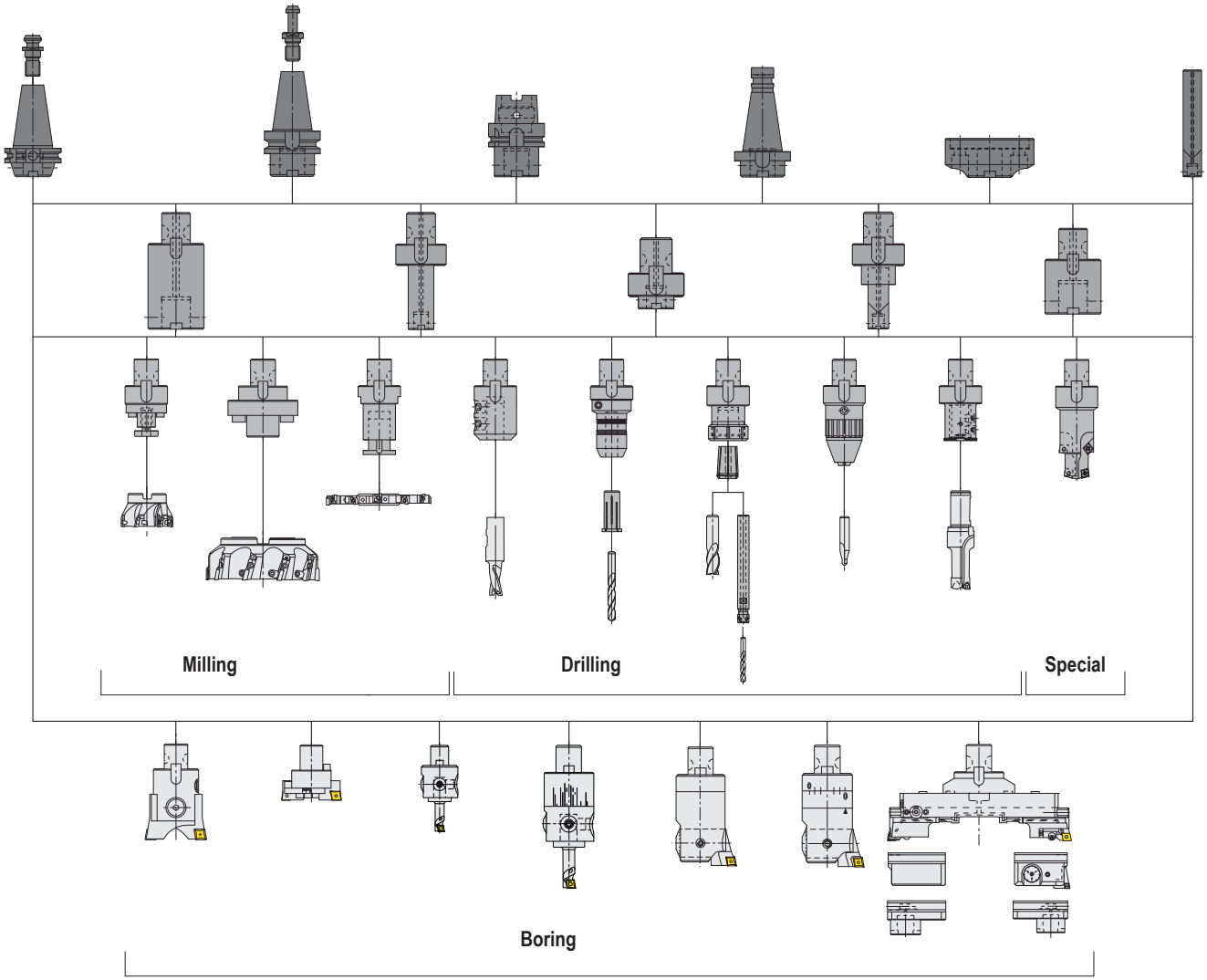
TOOLING SYSTEMS & BORING HEADS



GRAFLEX®

SECO

A complete range of modules, suitable for all machines and all machining operations



A modular tooling range for flexibility and performance

Flexibility:

Tooling of variable lengths and diameters can rapidly be built together, when they are needed. Graflex® modules e.g. tool holders and boring heads, as well as cutting tools can be fitted on all types of machines, by the substitution of only the basic Graflex® arbors, available in variety of machine side connections (HSK-A, HSK-E, DIN, BT, Seco-Capto™ ...).

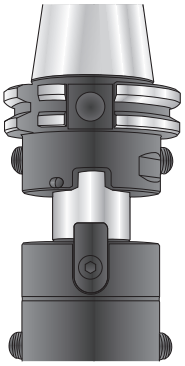
The Graflex® modules are suitable for milling, drilling, tapping, reaming and boring.

Performance:

The connection rigidity and precision, enables Graflex® assemblies to be used in similar machining conditions as the same sized Monobloc holders. The wide range of modules permits tooling dimensions closest to the required machining operation, for optimised cutting conditions.

All basic arbors, extensions and reducers, main tool holders and all boring heads have through coolant possibilities.

The Graflex® connection (patented)

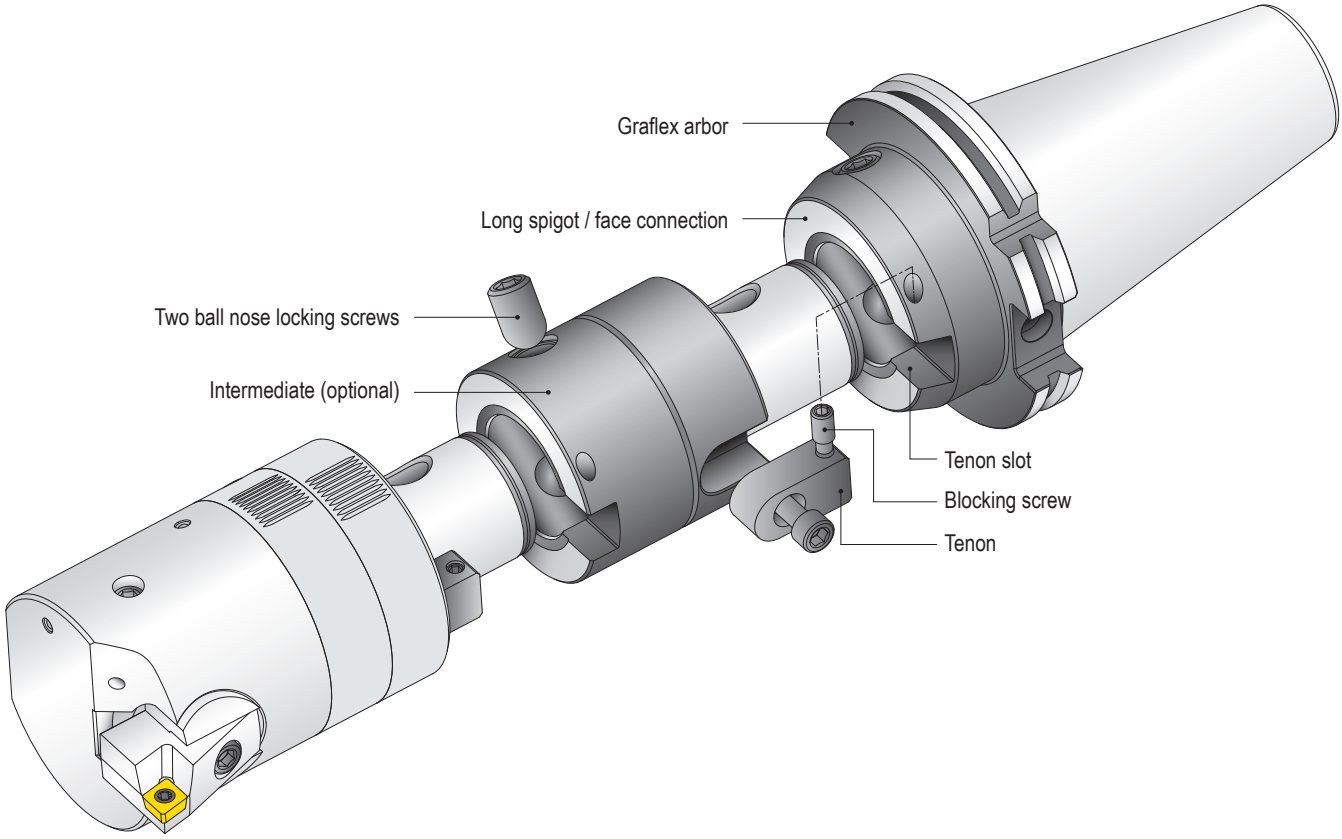


The long spigot and face connection, combined with Secotools's production quality, masters all machining requirements, e.g. strength and precision in milling as well as in boring.

Radial access to the locking screws = easy handling.

High face contact pressure which can be enhanced by self-locking of the connection during machining = improved rigidity.

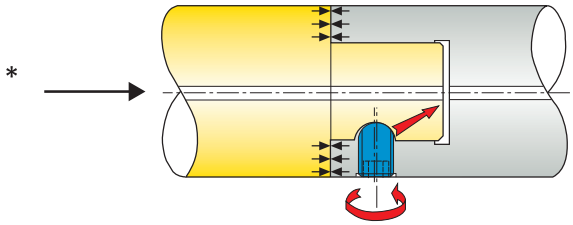
Graflex® is a registered trademark of Secotools.

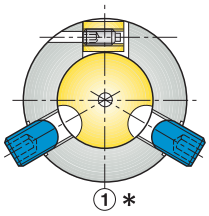


Graflex® self locking feature

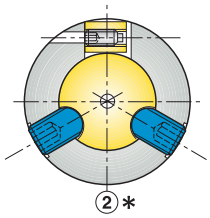
Strong machining torque e.g. during boring may create micro rotational movement of the spigot in relation to the bore, causing micro displacement of the ball nose screw's contact surfaces. This results in complementary self-locking of the connection, enhancing the system's rigidity (Drawing 3).

For operations involving intermittent cutting e.g. heavy milling, the blocking screw provided in the tenon can be tightened so as to avoid micro rotational movement and prevent self locking (Drawing 4).

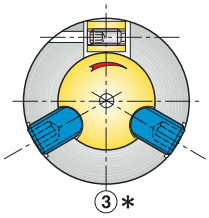




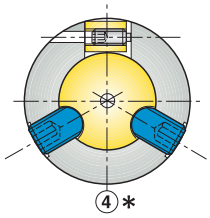
Unclamped



Normal clamping



Self locking

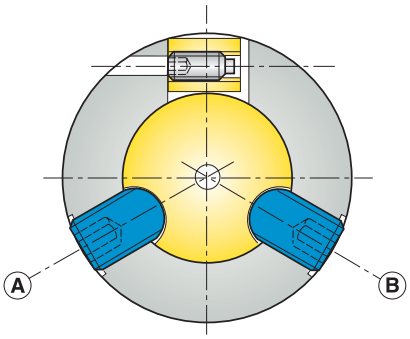


Clamping for intermittent cut

*Drawings 1, 2, 3 and 4 are viewed from the front as when normally assembled e.g. when using the Tool Boy assembly support.

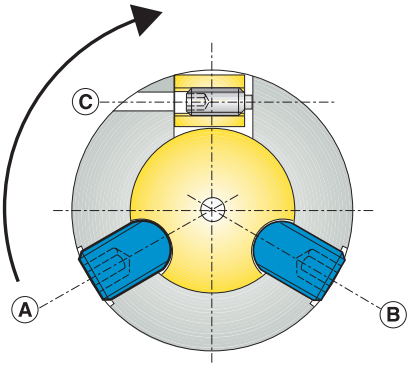
'Optimised' Graflex® assembly procedure

left face



1. Clean the parts to be assembled and apply thin oxidation protection film.
2. Position the Graflex® arbor and module(s) using the tenon(s) for easy orientation.
3. Tighten the ball nose locking screws ensuring that the left face of the tenon contacts the left face of the tenon slot.
4. Lightly tighten screw A
5. Lightly tighten screw B

left face



Normal clamping for continuous cut, e.g. boring, light duty milling

6. 'Torque' screw A (low values).
7. 'Torque' screw B (low values).

Clamping for intermittent cut, e.g. interrupted boring, heavy duty milling

6. 'Torque' the blocking screw C.
7. 'Torque' screw A (high values).
8. 'Torque' screw B (high values).
9. Double check the blocking screw tightening

Graflex® connection, recommended tightening torques

The Graflex® connection is self locking, therefore it has a low requirement for checking that the locking torques have been applied. There is usually no requirement for torque control. The table shows the recommended torque ranges, prioritising assembly precision (low values) or rigidity/heavy duty (high values).

Graflex size	Recommended Graflex connection tightening torques	
	Ball nose screws (A) & (B) Low values – High values	Tenon blocking screw (C)
G0	1,5 - 2 Nm	–
G1	1,5 - 2 Nm	–
G2	2,5 - 4 Nm	–
G3	5 - 8 Nm	0,4 Nm
G4	13 - 20 Nm	0,7 Nm
G5	17 - 25 Nm	2 Nm
G6	23 - 35 Nm	4 Nm
G7	40 - 60 Nm	8 Nm

Balancing of the Graflex® modules

The balancing quality of each tool holder is shown in its Product page balancing column.

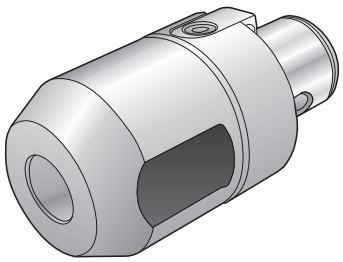
Simplified codes "G2.5", "G6.3", "PB" and "-" are used and correspond to:

"G2.5": Individually balanced at G2,5-25.000 rpm

"G6.3": Individually balanced at G6,3-20.000 rpm. Can be balanced to G2,5-25.000 on request, please enquire.

"PB": Pre-balanced by design. Most of the pre-balanced holders can be fine balanced on request, please enquire.

"-": not balanced



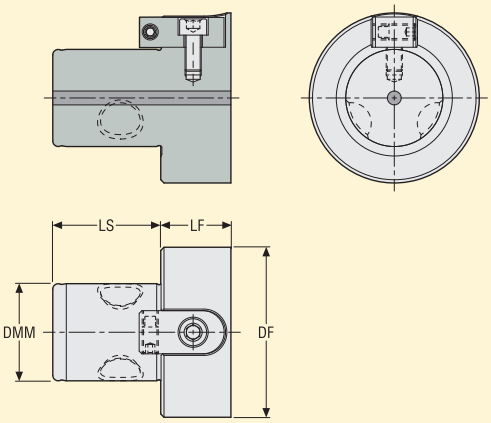
See also the 'Maximum speeds for Graflex® boring heads' Instruction pages.

Graflex® connection, Accessories and Spare Parts

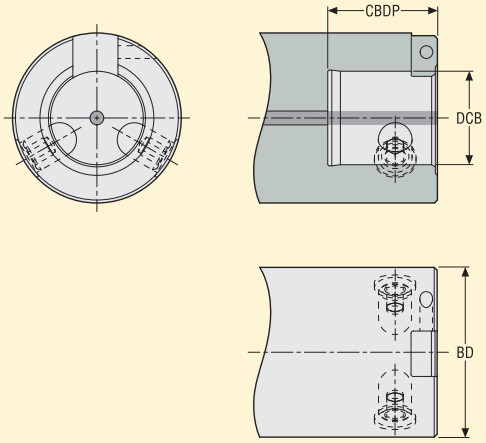
Accessories (locking keys) and spare parts (two ball nose screws kits or tenon kits), see Product pages.

Graflex® connection, Machine side and Workpiece side norms

Machine side



Workpiece side



Machine side catalogue designation	Hole for RFID carrier*	Dimensions in mm		
		CBDP	DCB	BD
G0	No	16	8	12
G1	No	20	11	13
G2	No	25	14	16
G3	No	32	18	20
G4	No	40	22	24
G5	No	50	28	30
G6	No	63	36	40
G7	No	90	46	50

Workpiece side catalogue designation	Hole for RFID carrier*	Dimensions in mm			
		DF	DMM	LS	LF
G0	No	16	8	12	8
G1	No	20	11	13	9,5
G2	No	25	14	16	11
G3	No	32	18	20	14
G4	No	40	22	24	17
G5	No	50	28	30	20
G6	No	63	36	40	26
G7	No	90	46	50	26

Note: These machine side and workpiece side dimensions are applied to all the holders shown in the Product pages.

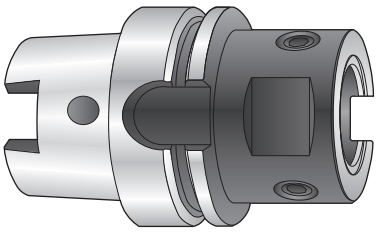
* No hole for RFID carriers

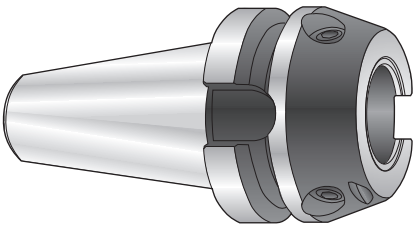
Graflex® arbors – G 401

Graflex® basic arbors are available for all machine spindles type HSK, SA and Seco-Capto™ – Type EM...

HSK-A, DIN, BT, Seco-Capto™ (...) adapters are shown as part of the respecctive chapters, where tool holders are grouped per machine side connections.

Arbors are mainly available in 3 different lengths (short, medium and long).

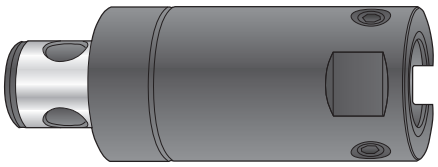




Graflex® extensions – G 402

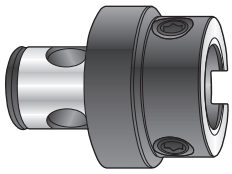
Extensions have the same Graflex® size at the workpiece side (Graflex® bore) and at the machine side (Graflex® shank). They are mainly available in different lengths: short, medium and long.

Extra long extensions are particularly suitable for creating optimum assemblies for Perfomax® modular drill heads SD 600.



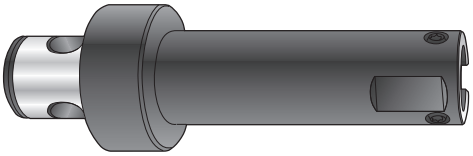
Graflex® reducers – G 403

Reducers have a smaller Graflex® size at the workpiece side (Graflex® bore) in relation to the machine side (Graflex® shank).



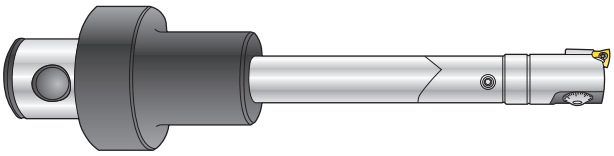
Long Graflex® reducers

When used with a Graflex® boring head, long Graflex® reducers give boring length to diameter ratio of approx. 4xD.



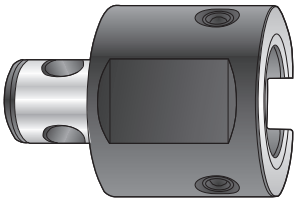
Extra long Graflex® reducers, carbide type – Type M403...C...

The extension section is manufactured from carbide.
The extra long reducers to be used with fine boring heads for boring length to diameter ratio of approx. 7xD.
Very rigid but brittle extensions, not suitable for heavy duty applications.
Maximum boring lengths are listed in the Product pages (LU).
Other lengths can be supplied on request, please enquire.



Graflex® enlargers – G 403

The enlargers enable the mounting of modules with large Graflex® connection size 6 or 7 on arbors with maximum connection size 5 or 6.



Graflex® cylindrical extensions – G 401

Cylindrical Graflex® extensions, steel type

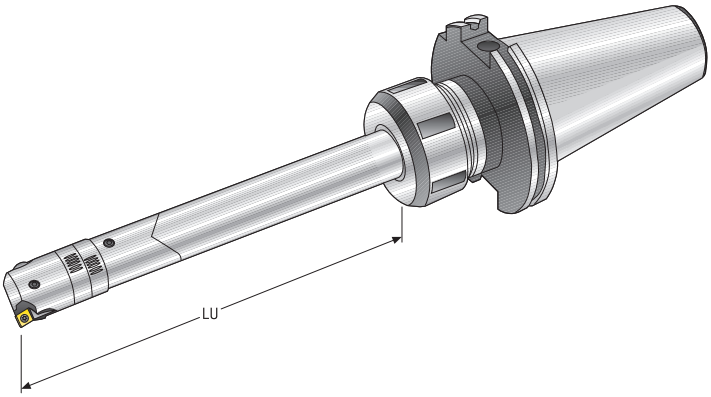
The cylindrical shank, with tolerance h5, can be held in any suitable holding system, including Shrinkfit holders.
Suitable for long rough or fine boring.
Maximum boring depths are listed in the Product pages (LU).

These extensions have a 'through' coolant channel.

Cylindrical Graflex® extensions, carbide type M401…C

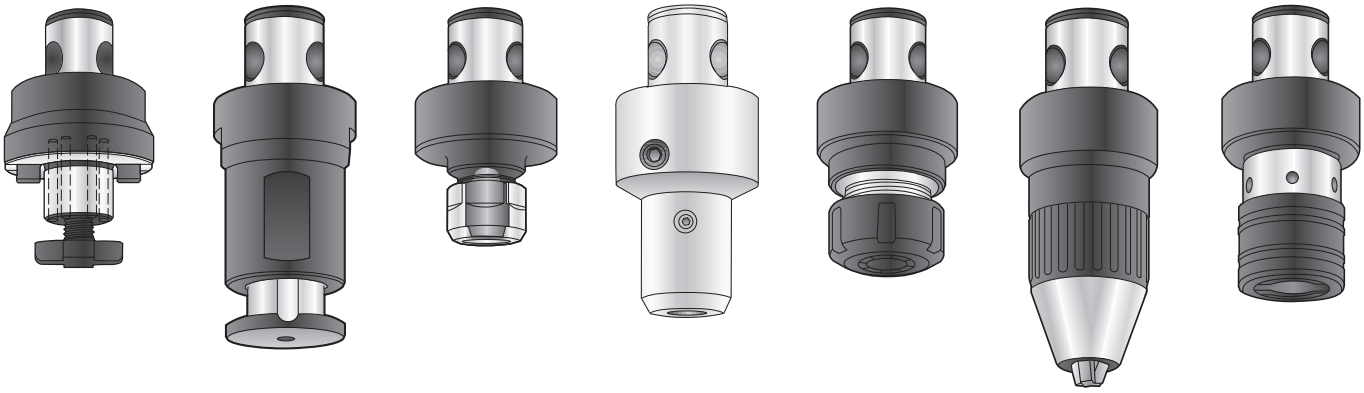
Graflex® extensions with cylindrical shank in carbide are suitable for fine boring length to diameter ratios of up to approx. 9xD
The cylindrical shank with tolerance h5 can be held in Shrinkfit holders, or any other suitable holding system.
Very rigid but brittle extensions, not suitable for heavy duty applications.
Maximum boring depths are listed in the Product pages LU).

These extensions have a 'through' coolant channel.



Graflex® tool holders – SM 5525, EM 584, etc

Graflex® holders are available with main workpiece side types similar to Monobloc holders.

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made in France
CAT 40 WE
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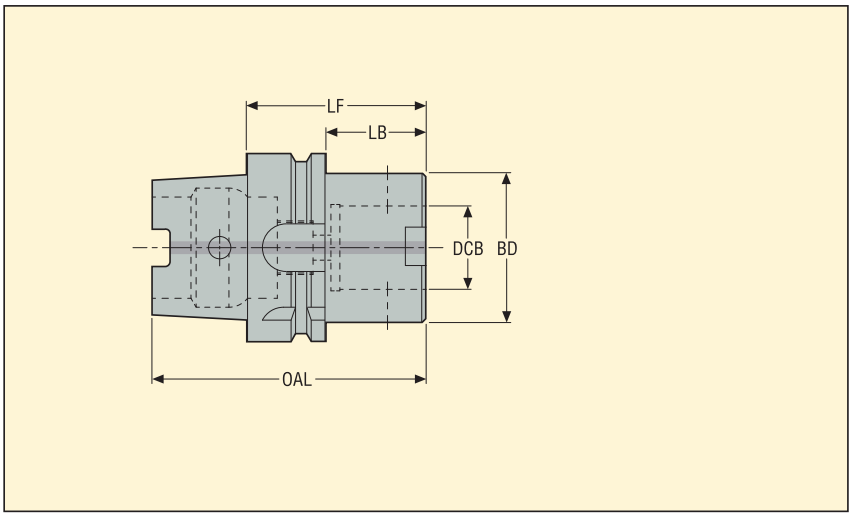
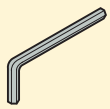
G 401 – HSK-A to Graflex® arbors

HSK-A ISO 12164-1

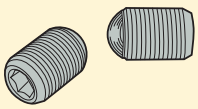


Machine side Taper	Workpiece side Graflex Size	DCB mm	Designation	Dimensions in mm LF	LB	BD	OAL	RFID hole	Balancing	KG
HSK-A50										
	G5	28	**EM93034012870**	70,0	44,0	50,0	95,0	0	PB	0,79
HSK-A63										
	G2	14	**EM93044011445**	45,0	19,0	25,0	77,0	1	G6.3	0,69
	G3	18	**EM93044011850**	50,0	24,0	32,0	82,0	1	G6.3	0,73
	G4	22	**EM93044012255**	55,0	29,0	40,0	87,0	1	G6.3	0,83
	G5	28	**EM93044012860**	60,0	34,0	50,0	92,0	1	PB	0,98
	G5	28	**EM930440128100**	100,0	74,0	50,0	132,0	1	PB	1,58
	G5	28	**EM930440128140**	140,0	114,0	50,0	172,0	1	PB	2,18
	G6	36	**EM93044013670**	70,0	44,0	63,0	102,0	1	PB	1,21
	G6	36	**EM930440136120**	120,0	94,0	63,0	152,0	1	PB	2,38
HSK-A100										
	G3	18	**EM93064011855**	55,0	26,0	32,0	105,0	1	G6.3	2,10
	G4	22	**EM93064012260**	60,0	31,0	40,0	110,0	1	G6.3	2,19
	G5	28	**EM93064012865**	65,0	36,0	50,0	115,0	1	PB	2,37
	G5	28	**EM930640128110**	110,0	81,0	50,0	160,0	1	PB	3,02
	G5	28	**EM930640128150**	150,0	121,0	50,0	200,0	1	PB	3,70
	G6	36	**EM93064013675**	75,0	46,0	63,0	125,0	1	PB	2,60
	G6	36	**EM930640136120**	120,0	91,0	63,0	170,0	1	PB	3,82
	G6	36	**EM930640136160**	160,0	131,0	63,0	210,0	1	PB	4,72
	G7	46	**EM93064014685**	85,0	56,0	90,0	135,0	1	PB	3,99
	G7	46	**EM930640146160**	160,0	131,0	90,0	210,0	1	PB	7,67

Accessories

For size	Locking key
	
G2	03H025
G3	03H03
G4	03H04
G5	03H05
G6	03H06
G7	03H10

Spare Parts

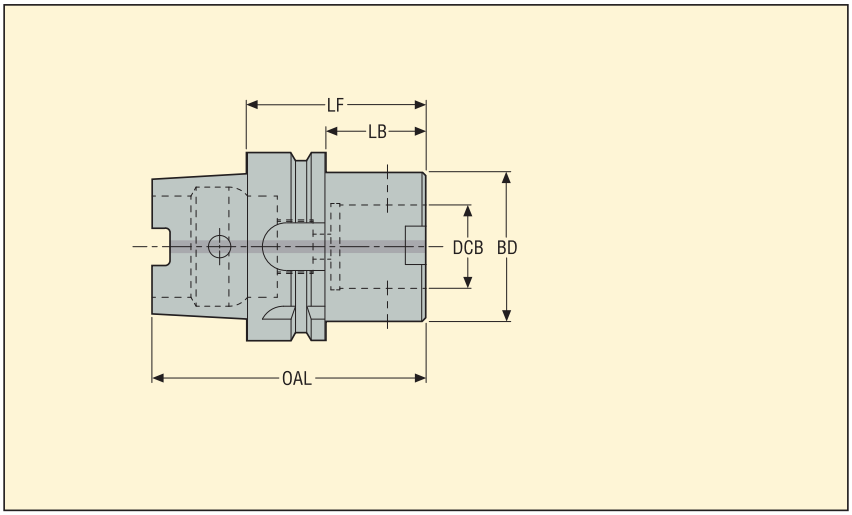
For size	Assembly screw
	
G2	90F2
G3	90F3
G4	90F4
G5	90F5
G6	90F6
G7	90F7

Please check availability in current price and stock-list

For HSK sealing plugs, coolant tubes and tube spanners, see page(s) 298

G 401 – HSK-A to Graflex® arbors

HSK-A ISO 12164-1



Machine side Taper	Workpiece side Graflex		Designation	Dimensions in mm				RFID hole	Balan-cing	KG
	Size	DCB mm		LF	LB	BD	OAL			
HSK-A125										
	G6	36	**HSKA125-G6-120**	120,0	91,0	63,0	183,0	1	PB	5,10
	G7	46	**HSKA125-G7-120**	120,0	91,0	90,0	183,0	1	PB	7,00

Accessories

For size	Locking key
G6	03H06
G7	03H10

Spare Parts

For size	Assembly screw
G6	90F6
G7	90F7

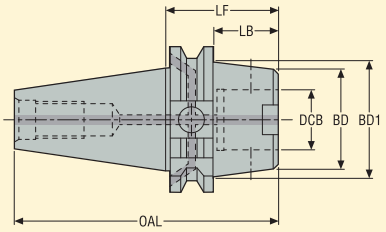
Please check availability in current price and stock-list

For HSK sealing plugs, coolant tubes and tube spanners, see page(s) 298

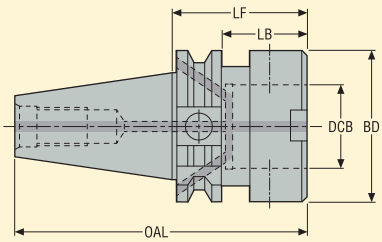
G 401 – DIN to Graflex® arbors

DIN 69871/ISO7388-1

Design 1

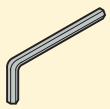


Design 2

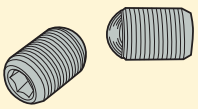
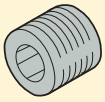


Machine side Taper	Workpiece side Graflex Size	DCB mm	Designation	Dimensions in mm LF	LB	BD1	BD	OAL	Design	RFID hole	Balan-cing	KG
DIN40 ADB												
	G1	11	**EM34694011190**	90,0	70,9	20,0	20,0	158,4	2	1	G6.3	0,94
	G2	14	**EM34694011435**	35,0	15,9	25,0	25,0	103,4	2	1	G6.3	0,83
	G2	14	**EM34694011490**	90,0	70,9	25,0	25,0	158,4	2	1	G6.3	1,02
	G3	18	**EM34694011835**	35,0	15,9	50,0	32,0	103,4	1	1	G6.3	0,91
	G3	18	**EM346940118100**	100,0	80,9	32,0	32,0	168,4	2	1	G6.3	1,22
	G4	22	**EM34694012235**	35,0	15,9	50,0	40,0	103,4	1	1	G6.3	0,92
	G4	22	**EM346940122100**	100,0	80,9	40,0	40,0	168,4	2	1	G6.3	1,44
	G5	28	**EM34694012840**	40,0	20,9	50,0	50,0	108,4	2	1	PB	0,93
	G5	28	**EM34694012880**	80,0	60,9	50,0	50,0	148,4	2	1	PB	1,50
	G5	28	**EM346940128120**	120,0	100,9	50,0	50,0	188,4	2	1	PB	2,08
	G6	36	**EM34694013660**	60,0	40,9	63,0	63,0	128,4	2	1	PB	1,24
	G6	36	**EM346940136120**	120,0	100,9	63,0	63,0	188,4	2	1	PB	2,65

Accessories

For size	Locking key
	
G1	03H02
G2	03H025
G3	03H03
G4	03H04
G5	03H05
G6	03H06

Spare Parts

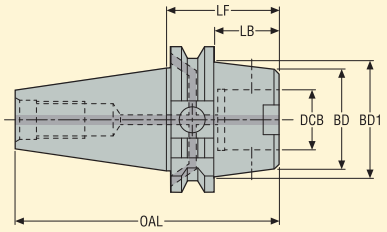
For size	Assembly screw	Plug
		
G1	90F1	950A0406
G2	90F2	950A0406
G3	90F3	950A0406
G4	90F4	950A0406
G5	90F5	950A0406
G6	90F6	950A0406

Please check availability in current price and stock-list

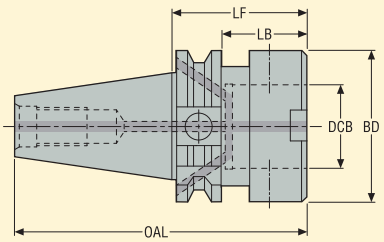
G 401 – DIN to Graflex® arbors

DIN 69871/ ISO7388-1

Design 1

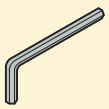


Design 2

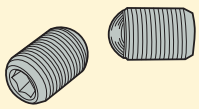
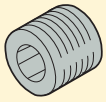


Machine side Taper	Workpiece side Graflex		Designation	Dimensions in mm					Design	RFID hole	Balan-cing	KG
	Size	DCB mm		LF	LB	BD1	BD	OAL				
DIN50 ADB												
	G2	14	**EM347140114100**	100,0	80,9	25,0	25,0	201,7	2	1	G6.3	2,80
	G3	18	**EM34714011835**	35,0	15,9	32,0	32,0	136,7	2	1	G6.3	2,67
	G3	18	**EM347140118110**	110,0	90,9	32,0	32,0	211,7	2	1	G6.3	3,00
	G4	22	**EM34714012235**	35,0	15,9	80,0	40,0	136,7	1	1	G6.3	2,88
	G4	22	**EM347140122120**	120,0	100,9	40,0	40,0	221,7	2	1	G6.3	3,36
	G5	28	**EM34714012840**	40,0	20,9	50,0	50,0	141,7	2	1	PB	2,75
	G5	28	**EM347140128100**	100,0	80,9	50,0	50,0	201,7	2	1	PB	3,56
	G5	28	**EM347140128140**	140,0	120,9	50,0	50,0	241,7	2	1	PB	4,08
	G6	36	**EM34714013645**	45,0	25,9	63,0	63,0	146,7	2	1	PB	2,88
	G6	36	**EM347140136100**	100,0	80,9	63,0	63,0	201,7	2	1	PB	4,08
	G6	36	**EM347140136140**	140,0	120,9	63,0	63,0	241,7	2	1	PB	4,99
	G7	46	**EM34714014650**	50,0	30,9	90,0	90,0	151,7	2	1	PB	3,23
	G7	46	**EM347140146120**	120,0	100,9	90,0	90,0	221,7	2	1	PB	6,48
	G7	46	**EM347140146200**	200,0	180,9	90,0	90,0	301,7	2	1	PB	10,40

Accessories

For size	Locking key
	
G2	03H025
G3	03H03
G4	03H04
G5	03H05
G6	03H06
G7	03H10

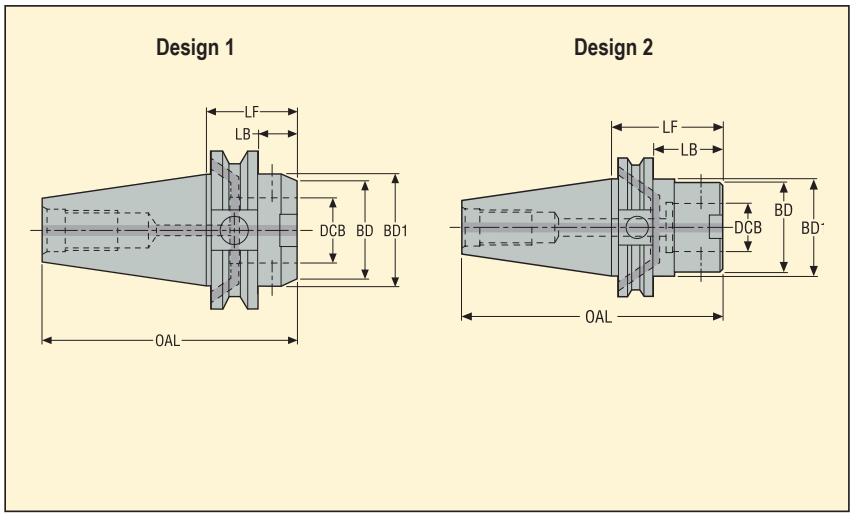
Spare Parts

For size	Assembly screw	Plug
		
G2	90F2	950A0606
G3	90F3	950A0606
G4	90F4	950A0606
G5	90F5	950A0606
G6	90F6	950A0606
G7	90F7	950A0606

Please check availability in current price and stock-list

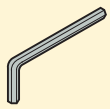
G 401 – CAT to Graflex® arbors

CAT ANSI ASME B5.50

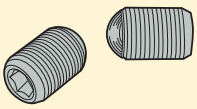
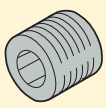


Machine side Taper	Graflex bore Size	Graflex bore DCB mm	Designation	Dimensions in mm LF	OAL	LB	BD	BD1	Design	RFID hole	Balanc-ing	lbs
CAT40 ADB												
	G2	14	**EM25024011435**	35,0	103,4	16,0	25,0	44,5	1	1	G6.3	0,95
	G3	18	**EM25024011835**	35,0	103,4	16,0	32,0	44,5	1	1	G6.3	0,95
	G4	22	**EM25024012235**	35,0	103,4	16,0	40,0	44,5	1	1	G6.3	0,90
	G5	28	**EM25024012840**	40,0	108,5	20,8	50,0	44,5	2	1	PB	0,90
	G5	28	**EM250240128100**	100,0	188,5	81,0	50,0	44,5	2	1	PB	1,77
	G6	36	**EM25024013660**	60,0	128,5	40,9	63,0	44,5	2	1	PB	1,22
CAT50 ADB												
	G3	18	**EM25044011835**	35,0	136,7	16,0	32,0	69,9	1	1	G6.3	3,03
	G4	22	**EM25044012235**	35,0	136,7	16,0	40,0	69,9	1	1	G6.3	2,95
	G5	28	**EM25044012840**	40,0	108,5	20,8	50,0	69,9	2	1	PB	2.99
	G5	28	**EM250440128100**	100,0	201,7	81,0	50,0	69,9	2	1	PB	3,81
	G6	36	**EM25044013645**	45,0	146,8	25,9	63,0	69,9	1	1	PB	3;22
	G6	36	**EM250440136120**	120,0	241,8	100,8	63,0	69,9	1	1	PB	4,58
	G7	46	**EM25044014665**	65,0	151,6	46,0	90,0	69,9	2	1	PB	3,76
	G7	46	**EM250440146120**	120,0	221,7	100,8	90,0	69,9	2	1	PB	6,25
	G7	46	**EM250440146200**	200,0	301,8	180,8	90,0	69,9	2	1	PB	10,34

Accessories

For size	Locking key
	
G2	03H025
G3	03H03
G4	03H04
G5	03H05
G6	03H06
G7	03H10

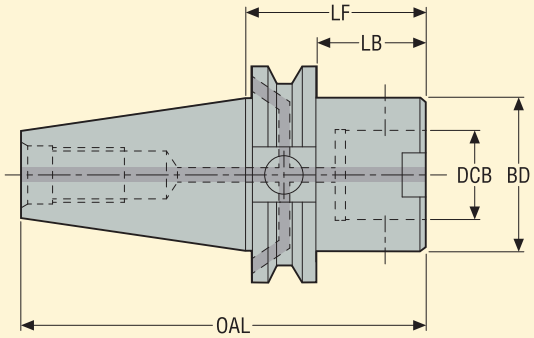
Spare Parts

For size	Assembly screw	Plug
		
CAT40, G2	90F2	950A0406
CAT40, G3	90F3	950A0406
CAT40, G4	90F4	950A0406
CAT40, G5	90F5	950A0406
CAT40, G6	90F6	950A0406
CAT50, G3	90F3	950A0606
CAT50, G4	90F4	950A0606
CAT50, G5	90F5	950A0606
CAT50, G6	90F6	950A0606
CAT50, G7	90F7	950A0606

Please check availability in current price and stock-list.

G 401 – CAT to Graflex® arbors

CAT ANSI ASME B5.50 Taper-Face



Machine side Taper	Graflex bore Size	Graflex bore DCB mm	Designation	Dimensions in mm LF	OAL	LB	BD	RFID hole	Balancing	KG
CAT TF40 ADB										
	G3	18	**EM26424011880**	80,0	148,4	60,9	32,0	1	G6.3	1,18
	G4	22	**EM26424012280**	80,0	148,4	60,9	40,0	1	G6.3	1,40
	G5	28	**EM264240128100**	100,0	168,4	80,9	50,0	1	PB	1,90
	G6	36	**EM264240136100**	100,0	168,4	80,9	63,0	1	PB	2,31
CAT TF50 ADB										
	G4	22	**EM264440122100**	100,0	201,8	80,9	40,0	1	G6.3	3,31
	G5	28	**EM264440128100**	100,0	201,8	80,9	50,0	1	PB	3,58
	G6	36	**EM264440136120**	120,0	221,8	100,9	63,0	1	PB	4,58
	G7	46	**EM264440146200**	200,0	301,8	180,9	90,0	1	PB	10,29

Accessories

For size	Locking key
G3	03H03
G4	03H04
G5	03H05
G6	03H06
G7	03H10

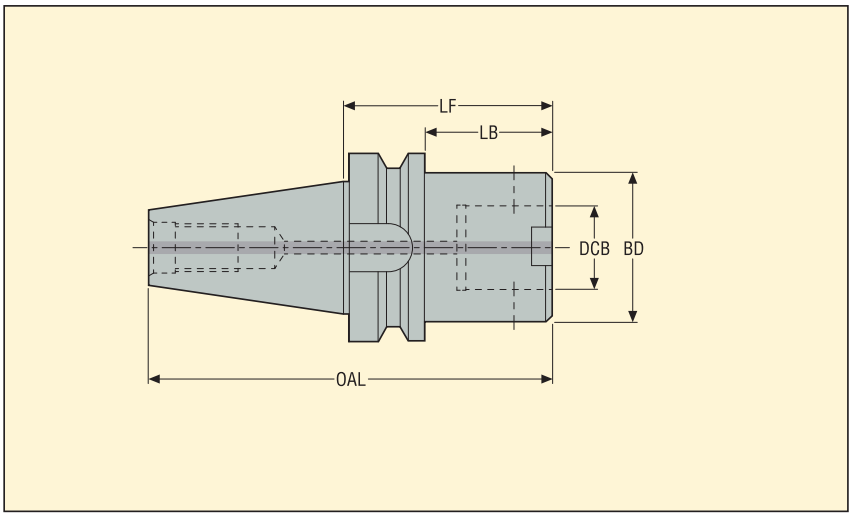
Spare Parts

For size	Assembly screw	Plug
CAT TF40, G3	90F3	950A0406
CAT TF40, G4	90F4	950A0406
CAT TF40, G5	90F5	950A0406
CAT TF40, G6	90F6	950A0406
CAT TF50, G4	90F4	950A0606
CAT TF50, G5	90F5	950A0606
CAT TF50, G6	90F6	950A0606
CAT TF50, G7	90F7	950A0606

Please check availability in current price and stock-list.

G 401 – BT to Graflex® arbors

BT ISO 7388-2



Machine side Taper	Workpiece side Graflex		Designation	Dimensions in mm				RFID hole	Balan-cing	KG
	Size	DCB mm		LF	LB	BD	OAL			
BT30 AD										
	G3	18	**EM40404011835**	35,0	13,0	32,0	83,4	0	G6.3	0,41
	G5	28	**EM40404012850**	50,0	25,0	50,0	98,4	0	PB	0,62

Accessories

For size	Locking key
G3	03H03
G5	03H05

Spare Parts

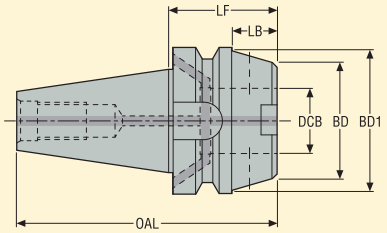
For size	Assembly screw
G3	90F3
G5	90F5

Please check availability in current price and stock-list

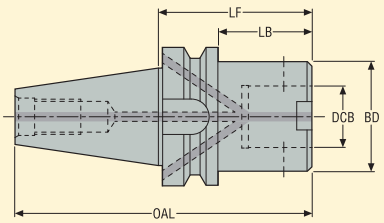
G 401 – BT to Graflex® arbors

BT ISO 7388-2

Design 1

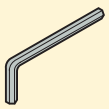


Design 2

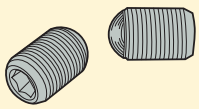
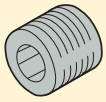


Machine side Taper	Workpiece side Graflex		Designation	Dimensions in mm					Design	RFID hole	Balan-cing	KG
	Size	DCB mm		LF	LB	BD1	BD	OAL				
BT40 ADB												
	G1	11	**EM34144011190**	90,0	63,0	20,0	20,0	155,4	2	1	G6.3	1,06
	G2	14	**EM34144011440**	40,0	13,0	25,0	25,0	105,4	2	1	G6.3	0,98
	G2	14	**EM34144011490**	90,0	63,0	25,0	25,0	155,4	2	1	G6.3	1,15
	G3	18	**EM34144011840**	40,0	13,0	62,0	32,0	105,4	1	1	G6.3	1,07
	G3	18	**EM341440118100**	100,0	73,0	32,0	32,0	165,4	2	1	G6.3	1,31
	G4	22	**EM34144012245**	45,0	18,0	62,0	40,0	110,4	1	1	G6.3	1,14
	G4	22	**EM341440122100**	100,0	73,0	40,0	40,0	165,4	2	1	G6.3	1,54
	G5	28	**EM34144012845**	45,0	18,0	62,0	50,0	110,4	1	1	PB	1,12
	G5	28	**EM34144012880**	80,0	53,0	50,0	50,0	145,4	2	1	PB	1,54
	G5	28	**EM341440128120**	120,0	93,0	50,0	50,0	185,4	2	1	PB	2,12
	G6	36	**EM34144013650**	50,0	0,0	63,0	63,0	115,4	2	0	PB	1,13
	G6	36	**EM341440136120**	120,0	0,0	63,0	63,0	185,4	2	1	PB	2,78

Accessories

For size	Locking key
	
G1	03H02
G2	03H025
G3	03H03
G4	03H04
G5	03H05
G6	03H06

Spare Parts

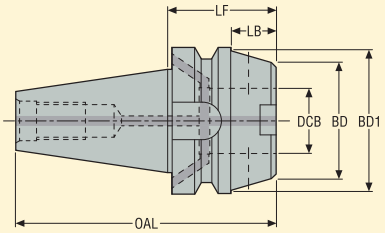
For size	Assembly screw	Plug
		
G1	90F1	950A0406
G2	90F2	950A0406
G3	90F3	950A0406
G4	90F4	950A0406
G5	90F5	950A0406
G6	90F6	950A0406

Please check availability in current price and stock-list

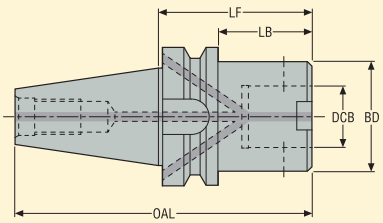
G 401 – BT to Graflex® arbors

BT ISO 7388-2

Design 1



Design 2



Machine side Taper	Workpiece side Graflex Size	DCB mm	Designation	Dimensions in mm LF	LB	BD1	BD	OAL	Design	RFID hole	Balan-cing	KG
BT50 ADB												
	G2	14	EM341640114110	110,0	72,0	25,0	25,0	211,8	2	1	G6.3	3,70
	G3	18	EM34164011845	45,0	7,0	70,0	32,0	146,8	1	1	G6.3	3,58
	G3	18	EM341640118120	120,0	82,0	32,0	32,0	221,8	2	1	G6.3	3,90
	G4	22	EM34164012250	50,0	12,0	70,0	40,0	151,8	1	1	G6.3	3,66
	G4	22	EM341640122140	140,0	102,0	40,0	40,0	241,8	2	1	G6.3	4,36
	G5	28	EM34164012855	55,0	17,0	98,0	50,0	156,8	1	1	PB	3,97
	G5	28	EM341640128100	100,0	62,0	50,0	50,0	201,8	2	1	PB	4,22
	G5	28	EM341640128140	140,0	102,0	50,0	50,0	241,8	2	1	PB	4,80
	G6	36	EM34164013663	63,0	25,0	98,0	63,0	164,8	1	1	PB	4,20
	G6	36	EM341640136100	100,0	62,0	63,0	63,0	201,8	2	1	PB	4,60
	G6	36	EM341640136140	140,0	102,0	63,0	63,0	241,8	2	1	PB	5,54
	G7	46	EM34164014665	65,0	27,0	98,0	90,0	166,8	1	1	PB	4,40
	G7	46	EM341640146120	120,0	82,0	90,0	90,0	221,8	2	1	PB	6,80
	G7	46	EM341640146200	200,0	162,0	90,0	90,0	301,8	2	1	PB	10,70

Accessories

For size	Locking key
G2	03H025
G3	03H03
G4	03H04
G5	03H05
G6	03H06
G7	03H10

Spare Parts

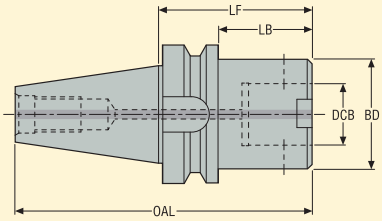
For size	Assembly screw	Plug
G2	90F2	950A0606
G3	90F3	950A0606
G4	90F4	950A0606
G5	90F5	950A0606
G6	90F6	950A0606
G7	90F7	950A0606

Please check availability in current price and stock-list

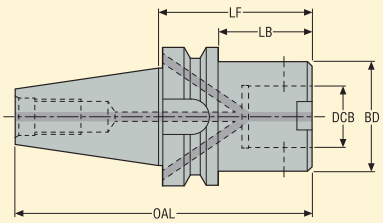
G 401 – BT to Taper face Graflex® arbors

BT ISO 7388-2 Taper face

Design 1

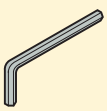


Design 2

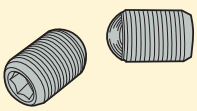
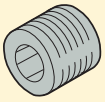


Machine side Taper	Workpiece side Graflex		Designation	Dimensions in mm				Design	RFID hole	Balan-cing	KG
	Size	DCB mm		LF	LB	BD	OAL				
BT30 TF AD											
	G3	18	**EM40024011850**	50,0	28,0	32,0	98,4	1	0	G6.3	0,50
	G4	22	**EM40024012250**	50,0	28,0	40,0	98,4	1	0	G6.3	0,60
BT40 TF ADB											
	G4	22	**EM321440122100**	100,0	73,0	40,0	165,4	2	1	G6.3	1,60
	G5	28	**EM321440128120**	120,0	93,0	50,0	185,4	2	1	PB	2,10
	G6	36	**EM321440136120**	120,0	93,0	63,0	185,4	2	1	PB	2,80
BT50 TF ADB											
	G5	28	**EM321640128140**	140,0	102,0	50,0	241,8	2	1	PB	4,90
	G6	36	**EM321640136140**	140,0	102,0	63,0	241,8	2	1	PB	5,60
	G7	46	**EM321640146200**	200,0	162,0	90,0	301,8	2	1	PB	10,70

Accessories

For	Locking key
	
EM40024011850	03H03
EM40024012250	03H04
EM321440122100	03H04
EM321440128120	03H05
EM321440136120	03H06
EM321640128140	03H05
EM321640136140	03H06
EM321640146200	03H10

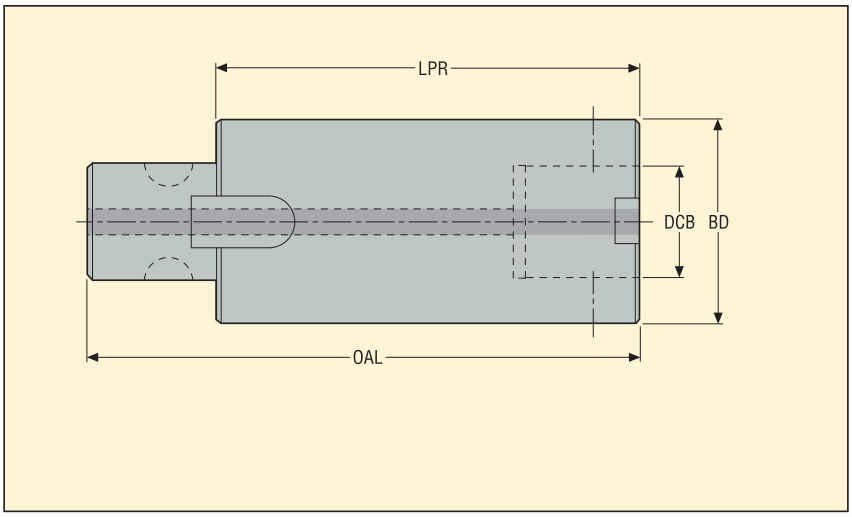
Spare Parts

For	Assembly screw	Plug
		
EM40024011850	90F3	–
EM40024012250	90F4	–
EM321440122100	90F4	950A0406
EM321440128120	90F5	950A0406
EM321440136120	90F6	950A0406
EM321640128140	90F5	950A0606
EM321640136140	90F6	950A0606
EM321640146200	90F7	950A0606

Please check availability in current price and stock-list

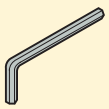

550
GRAFLEX

G 402 – Graflex® extensions

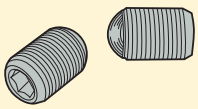
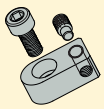


Machine side Graflex size	Workpiece side		Designation	Dimensions in mm			RFID hole	Balan-cing	KG
	DCB mm	Graflex size		LPR	BD	OAL			
G0									
	8	G0	**M402000**	30,0	16,0	42,0	0	PB	0,05
	8	G0	**M402001**	50,0	16,0	62,0	0	PB	0,08
G1									
	11	G1	**M402110**	30,0	20,0	43,0	0	PB	0,07
	11	G1	**M402111**	50,0	20,0	63,0	0	PB	0,12
G2									
	14	G2	**M402220**	30,0	25,0	46,0	0	PB	0,11
	14	G2	**M402221**	50,0	25,0	66,0	0	PB	0,18
G3									
	18	G3	**M402330**	40,0	32,0	60,0	0	PB	0,24
	18	G3	**M402331**	60,0	32,0	80,0	0	PB	0,36
G4									
	22	G4	**M402440**	40,0	40,0	64,0	0	PB	0,37
	22	G4	**M402441**	60,0	40,0	84,0	0	PB	0,57
	22	G4	**M402444**	200,0	40,0	224,0	0	PB	1,95

Accessories

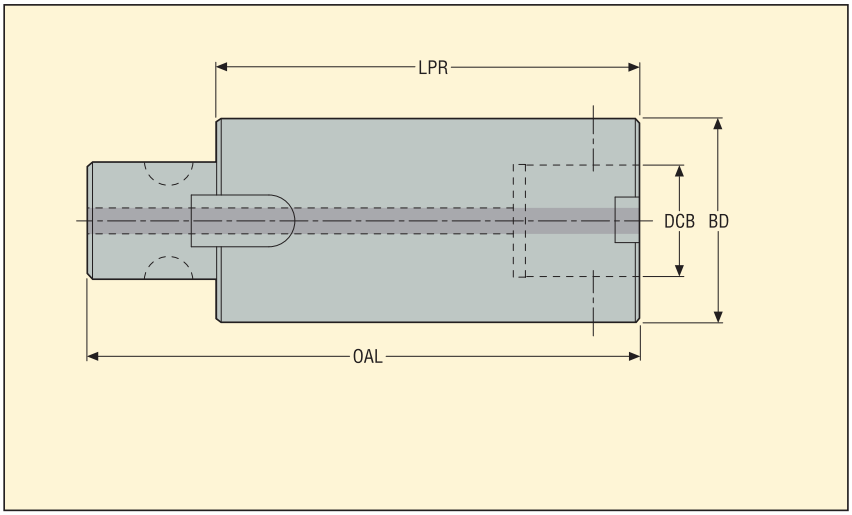
For DCB	Locking key
	
8	03H02
11	03H02
14	03H025
18	03H03
22	03H04

Spare Parts

For DCB	Assembly screw	Tenon
		
8	90F0	90M0
11	90F1	90M1
14	90F2	90M2
18	90F3	90M3
22	90F4	90M4

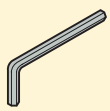
Please check availability in current price and stock-list

G 402 – Graflex® extensions

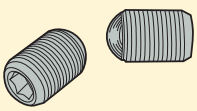


Machine side Graflex size	Workpiece side		Designation	Dimensions in mm			RFID hole	Balan-cing	KG
	DCB mm	Graflex size		LPR	BD	OAL			
G5									
	28	G5	**M402550**	50,0	50,0	80,0	0	PB	0,72
	28	G5	**M402551**	75,0	50,0	105,0	0	PB	1,12
	28	G5	**M402552**	100,0	50,0	130,0	0	PB	1,48
	28	G5	**M402554**	250,0	50,0	280,0	0	PB	3,90
G6									
	36	G6	**M402660**	60,0	63,0	100,0	0	PB	1,38
	36	G6	**M402661**	90,0	63,0	130,0	0	PB	2,10
	36	G6	**M402662**	120,0	63,0	160,0	0	PB	2,82
	36	G6	**M402664**	300,0	63,0	340,0	0	PB	7,20
G7									
	46	G7	**M402770**	60,0	90,0	110,0	0	–	2,90
	46	G7	**M402771**	90,0	90,0	140,0	0	–	4,03
	46	G7	**M402772**	120,0	90,0	170,0	0	–	5,80
	46	G7	**M402774**	300,0	90,0	350,0	0	–	14,60

Accessories

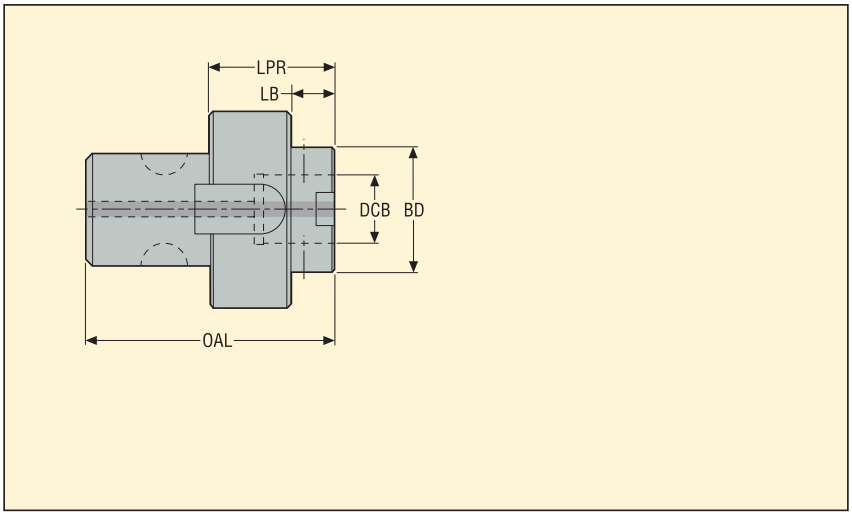
For DCB	Locking key
	
28	03H05
36	03H06
46	03H10

Spare Parts

For DCB	Assembly screw	Tenon
		
28	90F5	90M5
36	90F6	90M6
46	90F7	90M7

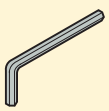
Please check availability in current price and stock-list

G 403 – Graflex® reducers

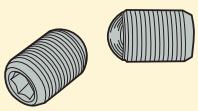


Machine side Graflex size	Workpiece side		Designation	Dimensions in mm				RFID hole	Balan-cing	KG
	DCB mm	Graflex size		LPR	LB	BD	OAL			
G1										
	8	G0	**M40310**	30,0	22,0	16,0	43,0	0	PB	0,06
G2										
	8	G0	**M40320**	30,0	19,0	16,0	46,0	0	PB	0,08
	11	G1	**M40321**	30,0	19,0	20,0	46,0	0	PB	0,10
G3										
	8	G0	**M40330**	30,0	16,0	16,0	50,0	0	PB	0,15
	11	G1	**M40331**	30,0	16,0	20,0	50,0	0	PB	0,15
	14	G2	**M40332**	30,0	16,0	25,0	50,0	0	PB	0,16
G4										
	11	G1	**M40341**	30,0	13,0	20,0	54,0	0	PB	0,25
	14	G2	**M40342**	30,0	13,0	25,0	54,0	0	PB	0,27
	18	G3	**M40343**	30,0	13,0	32,0	54,0	0	PB	0,27

Accessories

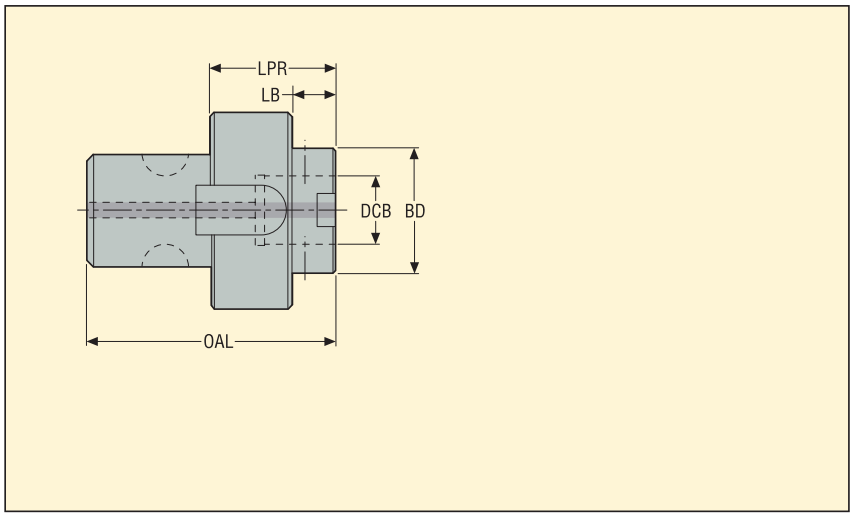
For	Locking key
	
M40310	03H02
M40320	03H02
M40321	03H02
M40330	03H02
M40331	03H02
M40332	03H025
M40341	03H02
M40342	03H025
M40343	03H03

Spare Parts

For	Assembly screw	Tenon
		
M40310	90F0	90M1
M40320	90F0	90M2
M40321	90F1	90M2
M40330	90F0	90M3
M40331	90F1	90M3
M40332	90F2	90M3
M40341	90F1	90M4
M40342	90F2	90M4
M40343	90F3	90M4

Please check availability in current price and stock-list

G 403 – Graflex® reducers



Machine side Graflex size	Workpiece side		Designation	Dimensions in mm				RFID hole	Balan-cing	KG
	DCB mm	Graflex size		LPR	LB	BD	OAL			
G5										
	8	G0	**M40350**	40,0	20,0	16,0	70,0	0	PB	0,47
	11	G1	**M40351**	40,0	20,0	20,0	70,0	0	PB	0,49
	14	G2	**M40352**	40,0	20,0	25,0	70,0	0	PB	0,49
	18	G3	**M40353**	40,0	20,0	32,0	70,0	0	PB	0,52
	22	G4	**M40354**	40,0	20,0	40,0	70,0	0	PB	0,55
G6										
	18	G3	**M40363**	40,0	14,0	32,0	80,0	0	PB	0,98
	22	G4	**M40364**	40,0	14,0	40,0	80,0	0	PB	0,97
	28	G5	**M40365**	45,0	19,0	50,0	85,0	0	PB	1,04
G7										
	28	G5	**M40375**	50,0	24,0	50,0	100,0	0	–	2,08
	36	G6	**M40376**	55,0	29,0	63,0	105,0	0	–	2,23

Accessories

For	Locking key
M40350	03H02
M40351	03H02
M40352	03H025
M40353	03H03
M40354	03H04
M40363	03H03
M40364	03H04
M40365	03H05
M40375	03H05
M40376	03H06

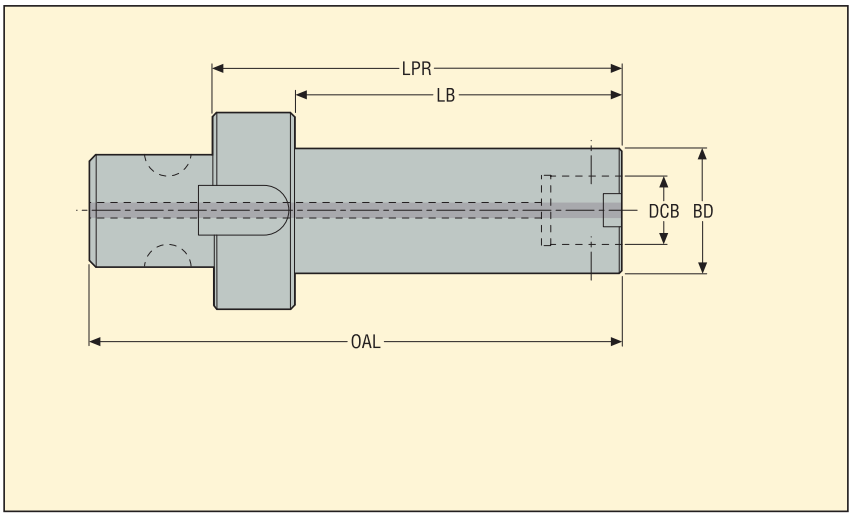
Spare Parts

For	Assembly screw	Tenon
M40350	90F0	90M5
M40351	90F1	90M5
M40352	90F2	90M5
M40353	90F3	90M5
M40354	90F4	90M5
M40363	90F3	90M6
M40364	90F4	90M6
M40365	90F5	90M6
M40375	90F5	90M7
M40376	90F6	90M7

Please check availability in current price and stock-list

G 403 – Graflex® long reducers

• For extra long reducers, see page(s) 245



Machine side Graflex size	Workpiece side		Designation	Dimensions in mm				RFID hole	Balan-cing	KG
	DCB mm	Graflex size		LPR	LB	BD	OAL			
G5										
	8	G0	**M40350070**	70,0	50,0	16,0	100,0	0	PB	0,51
	11	G1	**M40351080**	80,0	60,0	20,0	110,0	0	PB	0,57
	14	G2	**M40352100**	100,0	80,0	25,0	130,0	0	PB	0,71
	18	G3	**M40353120**	120,0	100,0	32,0	150,0	0	PB	1,02
	22	G4	**M40354150**	150,0	130,0	40,0	180,0	0	PB	1,62
G6										
	11	G1	**M40361090**	90,0	64,0	20,0	130,0	0	PB	1,08
	14	G2	**M40362110**	110,0	84,0	25,0	150,0	0	PB	1,23
	18	G3	**M40363120**	120,0	94,0	32,0	160,0	0	PB	1,46
	22	G4	**M40364150**	150,0	124,0	40,0	190,0	0	PB	2,07
	28	G5	**M40365190**	190,0	164,0	50,0	230,0	0	PB	3,20

Accessories

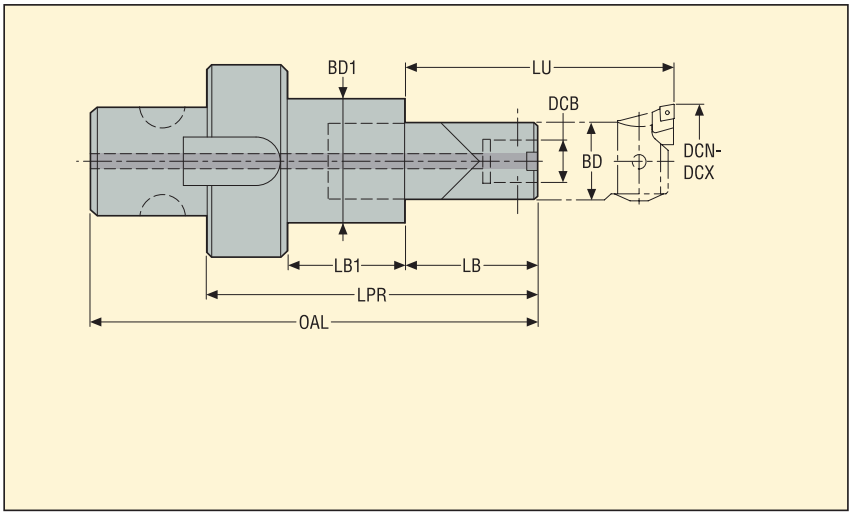
For	Locking key
M40350070	03H02
M40351080	03H02
M40352100	03H025
M40353120	03H03
M40354150	03H04
M40361090	03H02
M40362110	03H025
M40363120	03H03
M40364150	03H04
M40365190	03H05

Spare Parts

For	Assembly screw	Tenon
M40350070	90F0	90M5
M40351080	90F1	90M5
M40352100	90F2	90M5
M40353120	90F3	90M5
M40354150	90F4	90M5
M40361090	90F1	90M6
M40362110	90F2	90M6
M40363120	90F3	90M6
M40364150	90F4	90M6
M40365190	90F5	90M6

Please check availability in current price and stock-list

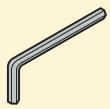
G 403 – Graflex® extra long reducers, carbide



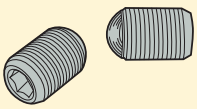
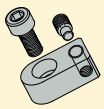
- The extension section is manufactured from carbide
- Suitable for fine boring length up to LU with fitted boring head type A780 or A790

Machine side Graflex size	Workpiece side		Capacity DCN-DCX mm	Designation	Dimensions in mm							RFID hole	Balan-cing	KG
	DCB mm	Graflex size			LPR	LU	BD	BD1	LB1	LB	OAL			
G5														
	8	G0	18,0-23,5	**M40350C150**	150,0	130,0	16,0	32,0	35,0	95,0	180,0	0	PB	1,00
	11	G1	23,0-31,0	**M40351C180**	180,0	160,0	20,0	36,0	40,0	120,0	210,0	0	PB	1,33
	14	G2	30,0-40,0	**M40352C220**	220,0	200,0	25,0	41,0	45,0	155,0	250,0	0	PB	2,01

Accessories

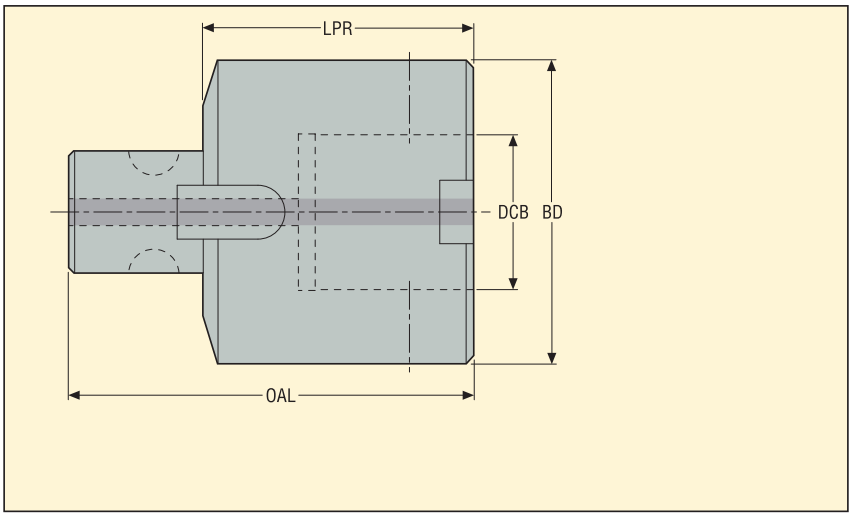
For	Locking key
	
M40350C150	03H02
M40351C180	03H02
M40352C220	03H025

Spare Parts

For	Assembly screw	Tenon
		
M40350C150	90F0	90M5
M40351C180	90F1	90M5
M40352C220	90F2	90M5

Please check availability in current price and stock-list

G 403 – Graflex® enlargers



Machine side Graflex size	Workpiece side		Designation	Dimensions in mm			RFID hole	Balan-cing	KG
	DCB mm	Graflex size		LPR	BD	OAL			
G5									
	36	G6	**M40356**	55,0	63,0	85,0	0	PB	1,08
G6									
	46	G7	**M40367**	80,0	90,0	120,0	0	PB	3,46

Accessories

For	Locking key
M40356	03H06
M40367	03H10

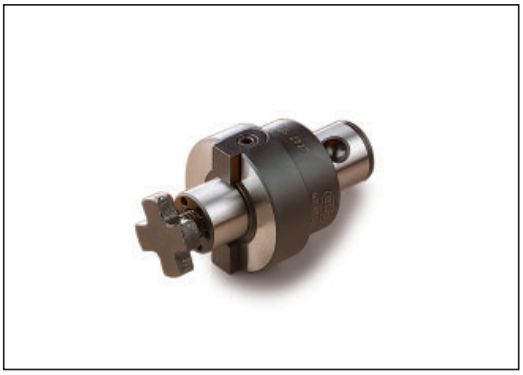
Spare Parts

For	Assembly screw	Tenon
M40356	90F6	90M5
M40367	90F7	90M6

Please check availability in current price and stock-list

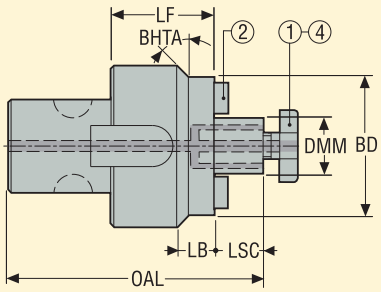

SECO
GRAFLEX

SM 5525/5524 – Shell mill holders, with through coolant channels



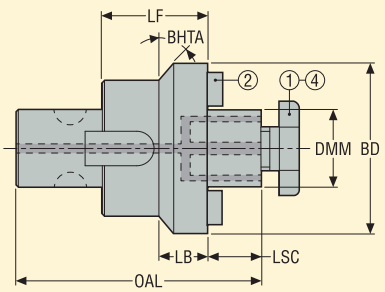
- With coolant supply channels through the spigot

Design 1



Accessories:
4 = Bolt, through coolant

Design 2

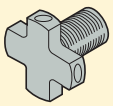
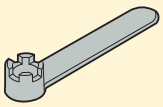


Spare parts:
1 = Bolt
2 = Tenon/Screw

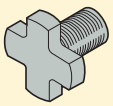
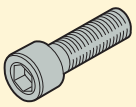
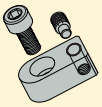
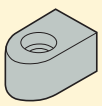
Machine side Graflex size***	Workpiece side DMM mm	Designation	Dimensions in mm					*	**	Design	BHTA°	RFID hole	Balan-cing	KG
			LF	BD	OAL	LB	LSC							
G3	16	**M55251816**	20,0	32,0	62,0	–	17,0	*		1	–	0	PB	0,19
G4R	16	**M55252216R**	25,0	38,0	66,0	–	17,0			1	–	0	PB	0,31
G4	22	**M55252222**	25,0	48,0	68,0	19,0	19,0	*		2	45,0	0	PB	0,44
G5	16	**M55252816**	32,0	38,0	79,0	6,0	17,0			1	45,0	0	PB	0,59
G5R	22	**M55252822R**	32,0	48,0	81,0	–	19,0	*		1	–	0	PB	0,64
G5	27	**M55252827**	32,0	60,0	83,0	24,0	21,0	*	**	2	45,0	0	PB	0,86
G5R	27	**M55242827R**	32,0	48,0	83,0	–	21,0	*	**	1	–	0	PB	0,68

* Suitable for long wall milling and plunging. ** Diameter BD on type 5524 is smaller than on type 5525.
*** (R) = DF reduced compared to the standard Graflex® DF.

Accessories

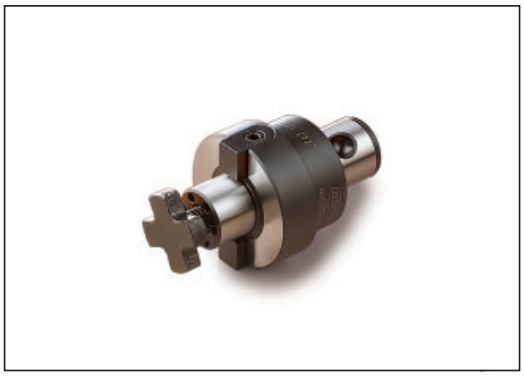
For	Bolt, through coolant	Spanner
		
M55251816	5801608L	5811608
M55252216R	5801608L	5811608
M55252222	5802210L	5812210
M55252816	5801608L	5811608
M55252822R	5802210L	5812210
M55252827	5802712L	5812712
M55242827R	5802712L	5812712

Spare Parts

Bolt	Screw	Tenon (machine side)	Tenon (workpiece side)
			
5801608	950D0308	90M3	16C116
5801608	950D0312	90M4	16C10810164
5802210	950D0416	90M4	16C11012206
5801608	950D0312	90M5	16C10810164
5802210	950D0416	90M5R	16C11012206
5802712	951D0516	90M5	16C11214243
5802712	951D0512	90M5R	16C127

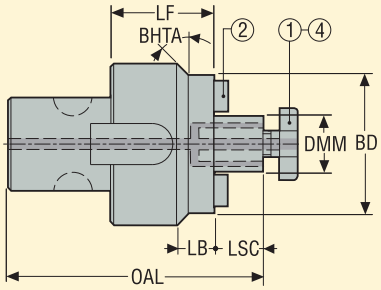
Please check availability in current price and stock-list

SM 5525/5524 – Shell mill holders, with through coolant channels



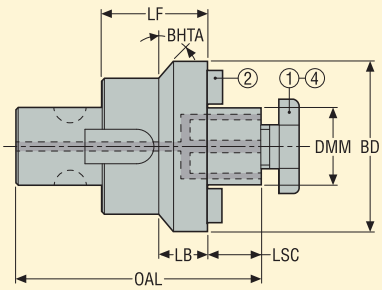
- With coolant supply channels through the spigot

Design 1



Accessories:
4 = Bolt, through coolant

Design 2

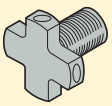
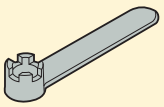


Spare parts:
1 = Bolt
2 = Tenon/Screw

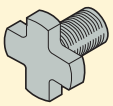
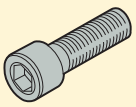
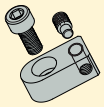
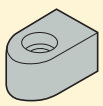
Machine side Graflex size***	Workpiece side DMM mm	Designation	Dimensions in mm LF	BD	OAL	LB	LSC	*	**	Design	BHTA°	RFID hole	Balan-cing	KG
G6	22	**M55253622**	40,0	48,0	80,0	6,5	19,0			1	45,0	0	PB	1,20
G6	22	**M55253622120**	120,0	48,0	160,0	81,0	19,0			1	30,0	0	PB	2,36
G6R	27	**M55253627R**	40,0	60,0	80,0	–	21,0	*		1	–	0	PB	1,27
G6R	27	**M55253627120R**	120,0	60,0	160,0	–	21,0	*		1	–	0	PB	3,00
G6	32	**M55253632**	40,0	78,0	80,0	14,0	24,0	*		2	30,0	0	PB	1,59
G7R	27	**M55254627R**	40,0	60,0	111,0	5,0	21,0			1	45,0	0	PB	2,00
G7	32	**M55254632**	40,0	78,0	114,0	8,0	24,0			1	45,0	0	PB	2,58

* Suitable for long wall milling and plunging. ** Diameter BD on type 5524 is smaller than on type 5525.
*** (R) = DF reduced compared to the standard Graflex® DF.

Accessories

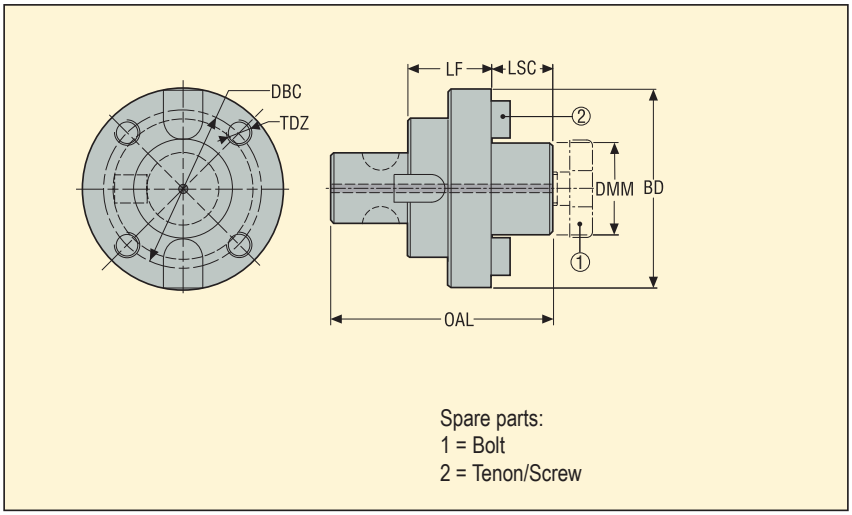
For	Bolt, through coolant	Spanner
		
M55253622	5802210L	5812210
M55253622120	5802210L	5812210
M55253627R	5802712L	5812712
M55253627120R	5802712L	5812712
M55253632	5803216L	5813216
M55254627R	5802712L	5812712
M55254632	5803216L	5813216

Spare Parts

Bolt	Screw	Tenon (machine side)	Tenon (workpiece side)
			
5802210	950D0416	90M6	16C11012206
5802210	950D0416	90M6	16C11012206
5802712	951D0516	90M6R	16C11214243
5802712	951D0516	90M6R	16C11214243
5803216	951D0516	90M6	16C2141421
5802712	951D0516	90M7R	16C11214243
5803216	951D0516	90M7	16C2141421

Please check availability in current price and stock-list

SMF 569 – Milling cutter holders, flange mounting - DIN 6357/ DIN 2079



Spare parts:
1 = Bolt
2 = Tenon/Screw

Machine side Graflex size	Workpiece side DMM mm	Designation	Dimensions in mm LF	LSC	BD	OAL	DBC	TDZ	RFID hole	Balan-cing	KG
G7											
	40	**M5694640**	46,0	27,0	89,0	123,0	66,7	M12	0	PB	3,10
	60	**M5694660**	54,0	40,0	129,0	144,0	101,6	M16	0	PB	5,50

DMM 40, with additional central thread and bolt according to ISO 3937

Accessories

For	Spanner
M5694640	5814020
M5694660	–

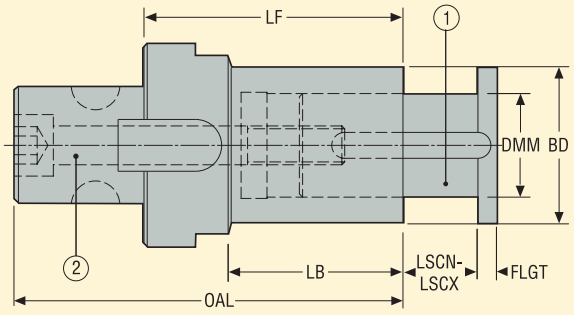
Spare Parts

Bolt	Screw	Tenon (machine side)	Tenon (workpiece side)
5804020	951D0616	90M7	16C34040
–	951D1225	90M7	16C35060

Please check availability in current price and stock-list

DM 5656 – Disc mill holders

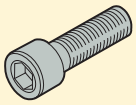
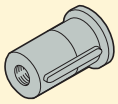
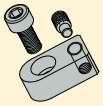
- With adjustable slide rod
- Best suitable for Seco disc mill cutters Type A



Spare parts:
1 = Slide rod
2 = Screw

Machine side Graflex size	Workpiece side DMM mm	Designation	Dimensions in mm						RFID hole	Balan-cing	KG
			LF	BD	LB	OAL	FLGT	LSCN-LSCX			
G3											
	16	**M56561816**	50,0	28,0	36,0	70,0	3,0	0,0-10,0	0	PB	0,30
G4											
	22	**M56562222**	60,0	35,0	43,0	84,0	4,0	0,0-12,0	0	PB	0,56
G5											
	27	**M56562827**	65,0	42,0	45,0	95,0	5,0	0,0-15,0	0	PB	0,95
	32	**M5656283212**	80,0	48,0	60,0	110,0	6,0	0,0-24,0	0	PB	1,32
G6											
	40	**M56563640**	110,0	58,0	84,0	150,0	7,0	0,0-30,0	0	PB	2,68
G7											
	50	**M56564650**	130,0	72,0	104,0	180,0	8,0	0,0-32,0	0	PB	5,30

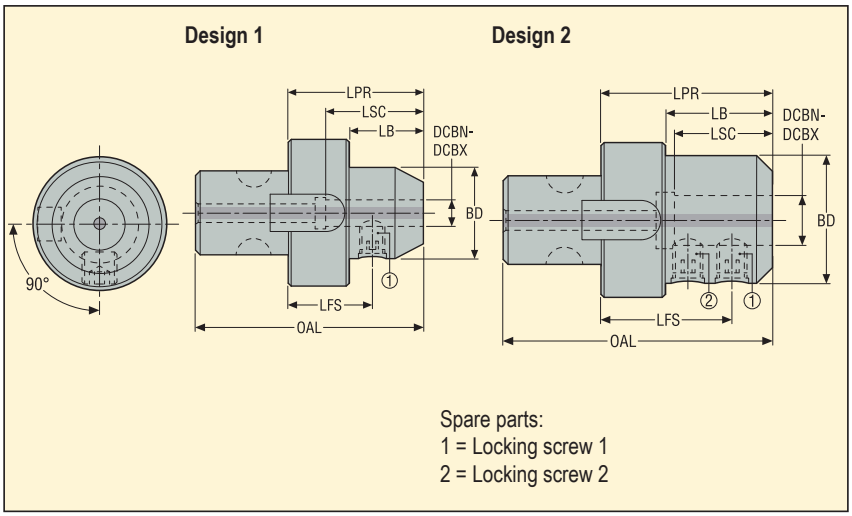
Spare Parts

For	Screw	Slide rod	Tenon
			
M56561816	950D0650	565616	90M3
M56562222	950D0860	565622	90M4
M56562827	950D1070	565627	90M5
M5656283212	950D1290	56563202	90M5
M56563640	950D16110	565640	90M6
M56564650	950D16120	565650	90M7

Please check availability in current price and stock-list

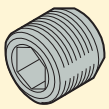
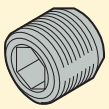
EM 584 – Side lock holders, Weldon – DIN 1835 Form B/ DIN 6535 Form HB

- Weldon ∅DCBN-DCBX 20, 25, 32 and 40 with ground face (Seco-Weldon compatible)



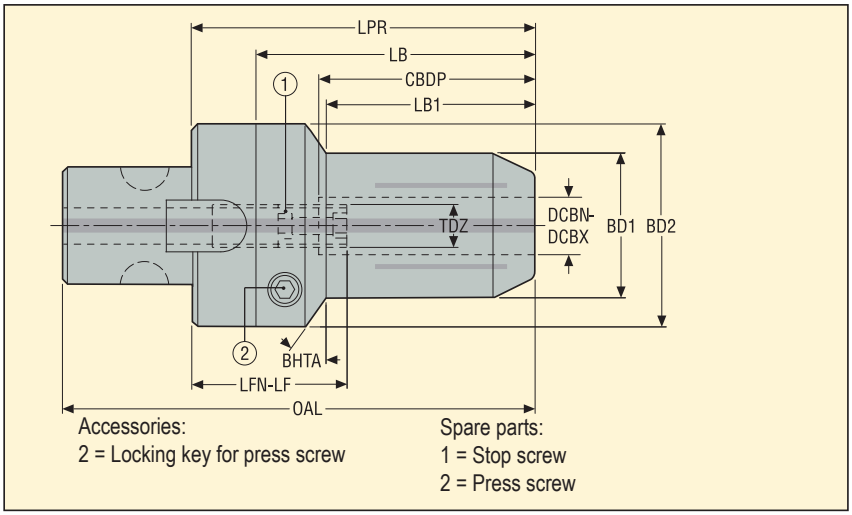
Machine side Graflex size	Workpiece side DCBN-DCBX	Designation	Dimensions in mm						Design	RFID hole	Balan-cing	KG
			LPR	LSC	LB	BD	OAL	LFS				
G5												
	6	M5842806	45,0	27,0	25,0	25,0	75,0	27,5	1	0	PB	0,51
	8	M5842808	45,0	30,0	25,0	28,0	75,0	27,5	1	0	PB	0,52
	10	M5842810	55,0	36,0	35,0	35,0	85,0	35,5	1	0	PB	0,65
	12	M5842812	60,0	43,0	40,0	42,0	90,0	38,0	1	0	PB	0,79
	14	M5842814	60,0	43,0	40,0	44,0	90,0	38,0	1	0	PB	0,81
	16	M5842816	65,0	46,0	45,0	48,0	95,0	41,5	1	0	PB	0,94
	18	M5842818	65,0	46,0	45,0	50,0	95,0	41,5	1	0	PB	0,96
	20	M5842820	65,0	48,0	45,0	52,0	95,0	40,5	1	0	PB	1,00
G6												
	16	M5843616	65,0	46,0	39,0	48,0	105,0	41,5	1	0	PB	1,34
	20	M5843620	65,0	48,0	39,0	52,0	105,0	40,5	1	0	PB	1,37
	25	M5843625	80,0	54,0	54,0	63,0	120,0	56,5	2	0	PB	1,95
	32	M5843632	80,0	58,0	54,0	72,0	120,0	56,5	2	0	PB	2,15
G7												
	40	M5844640	100,0	68,0	74,0	80,0	150,0	70,5	2	0	PB	4,00

Spare Parts

For	Locking screw 1	Locking screw 2	Tenon
			
M5842806	951C0610	–	90M5
M5842808	951C0810	–	90M5
M5842810	951C1012	–	90M5
M5842812	951C1216	–	90M5
M5842814	951C1216	–	90M5
M5842816	951C1416	–	90M5
M5842818	951C1416	–	90M5
M5842820	951C1616	–	90M5
M5843616	951C1416	–	90M6
M5843620	951C1616	–	90M6
M5843625	951C1820	951C1820	90M6
M5843632	951C2020	951C2017	90M6
M5844640	951C2020	951C2020	90M7

Please check availability in current price and stock-list

HC 5834 – Hydraulic chucks



Machine side Graflex size	Workpiece side DCBN-DCBX mm	Designation	Dimensions in mm								TDZ	BHTA°	RFID hole	Balan-cing	KG
			LPR	LB	CBDP	LB1	BD2	BD1	OAL	LFN-LF					
G5															
	20	**M58342820**	90,0	60,0	52,0	47,0	50,0	42,0	120,0	42,0-52,0	M10	30,0	0	PB	1,12
G6															
	25	**M58343625**	100,0	60,0	58,0	50,0	63,0	58,0	140,0	42,0-52,0	M10	30,0	0	PB	2,24
	32	**M58343632**	100,0	60,0	63,0	–	63,0	63,0	140,0	52,0-62,0	M10	30,0	0	PB	2,27

For reduction sleeves and control gauges, see the catalog Tooling Systems.

Accessories

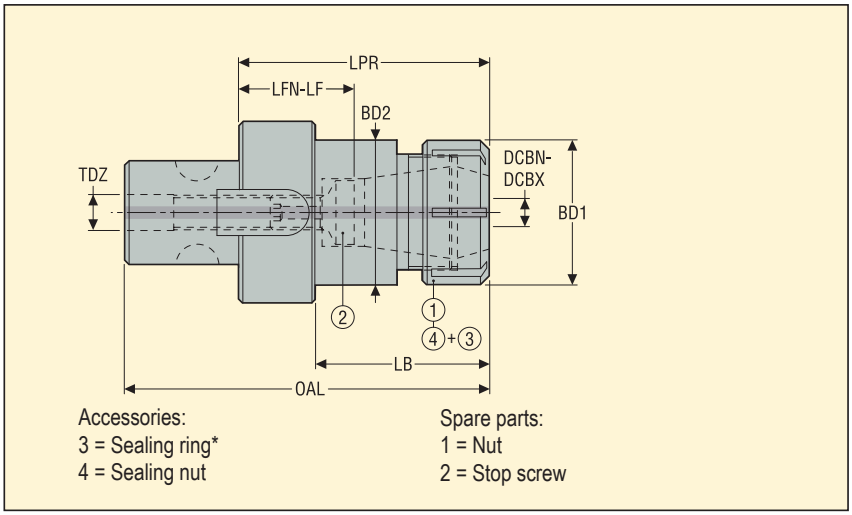
For DCBN-DCBX	Locking key
20	H04-4
25	H04-4
32	H04-4

Spare Parts

Press screw	Stop screw	Tenon
950AF1010010	19LS1020A	90M5
950AF1010010	19LS0820A	90M6
950AF1010010	19LS1020A	90M6

Please check availability in current price and stock-list

ER 5675 – ER collet chucks - ISO 15488



Machine side Graflex size	Workpiece side Capacity DCBN-DCBX mm	Designation	Chuck & Collet Size	Dimensions in mm						TDZ	RFID hole	Balan-cing	KG
				LPR	BD1	BD2	LB	OAL	LFN-LF				
G3													
	1,0-16,0	**BM03056752570R**	ER 25	70,0	35,0	32,0	–	90,0	30,0-32,0	M10	0	PB	0,35
G5													
	1,0-16,0	**BM05056752560**	ER 25	60,0	42,0	42,0	40,0	90,0	17,0-22,0	M12	0	PB	0,66
	2,0-20,0	**BM05056753275**	ER 32	75,0	50,0	50,0	–	105,0	25,0-32,0	M12	0	PB	0,92
G6													
	1,0-16,0	**BM06056752560**	ER 25	60,0	42,0	42,0	34,0	100,0	20,0-22,0	M12	0	PB	1,09
	2,0-20,0	**BM06056753275**	ER 32	75,0	50,0	50,0	49,0	115,0	25,0-32,0	M12	0	PB	1,32
	3,0-26,0	**BM06056754085**	ER 40	85,0	63,0	63,0	–	125,0	26,0-35,0	M12	0	PB	1,73

For ER extensions and ER collets, see the catalog Tooling Systems.

Accessories*

For	Seal nut	Socket	Spanner	Spanner 1	Torque key
BM03056752570R	–	03ER035	03B545025	03BR035	03DYD010100
BM05056752560	08B587525IC	03ER042	03B587525	03BR042	03DYD020200
BM05056753275	08B587532IC	03ER050	03B587532	03BR050	03DYD020200
BM06056752560	08B587525IC	03ER042	03B587525	03BR042	03DYD020200
BM06056753275	08B587532IC	03ER050	03B587532	03BR050	03DYD020200
BM06056754085	08B587540IC	03ER063	03B587540	03BR063	03DYD020200

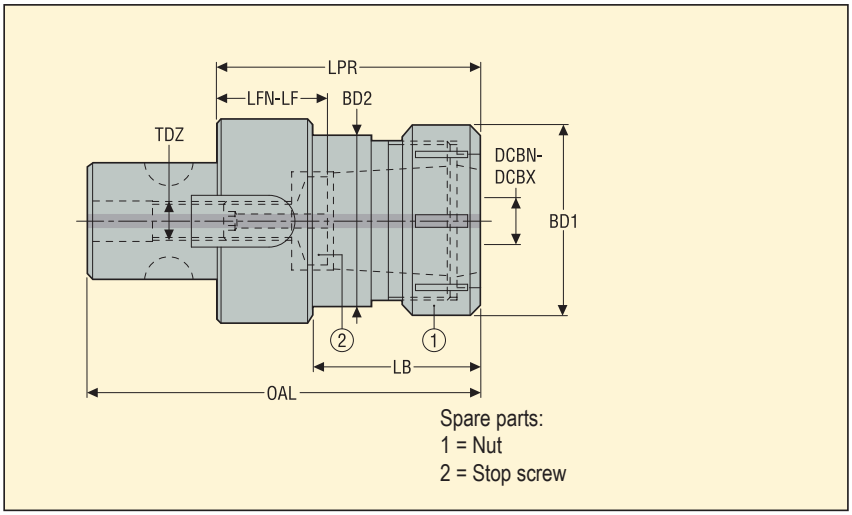
Spare Parts

Nut	Stop screw	Tenon
08B587525M	19PM1016	90M3
08B587525X	19PM1216	90M5
08B587532X	19PM1220	90M5
08B587525X	19PM1216	90M6
08B587532X	19PM1220	90M6
08B587540X	19PM1225	90M6

Please check availability in current price and stock-list

* For ER sealing rings, see the catalog Tooling Systems.

OZ 5873 – OZ collet chucks - DIN 6388



Machine side Graflex size	Workpiece side Capacity DCBN-DCBX mm	Designation	Chuck & Collet Size	Dimensions in mm						TDZ	RFID hole	Balan-cing	KG
				LPR	BD1	BD2	LB	OAL	LFN-LF				
G6													
	4,0-32,0	**M58733632**	OZ 32	90,0	72,0	63,0	64,0	130,0	25,0-30,0	M12	0	PB	1,97

For OZ collets, see the catalog Tooling Systems.

Accessories

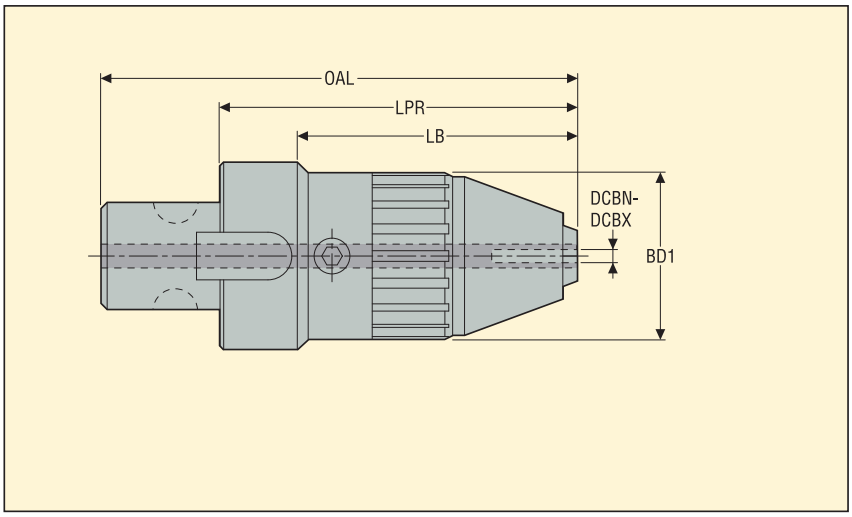
For	Key
M58733632	03B587332

Spare Parts

Nut	Stop screw	Tenon
08B587332	19PM1232	90M6

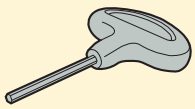
Please check availability in current price and stock-list

UDC 5085 – Universal drill chucks



Machine side Graflex size	Workpiece side Capacity DCBN-DCBX mm	Designation	Dimensions in mm				RFID hole	Balancing	KG
			LPR	LB	BD1	OAL			
G5									
	1,0-13,0	**M50852813L**	100,0	80,0	43,0	130,0	0	PB	0,92
G6									
	2,5-16,0	**M50853616L**	120,0	94,0	56,0	160,0	0	PB	2,01

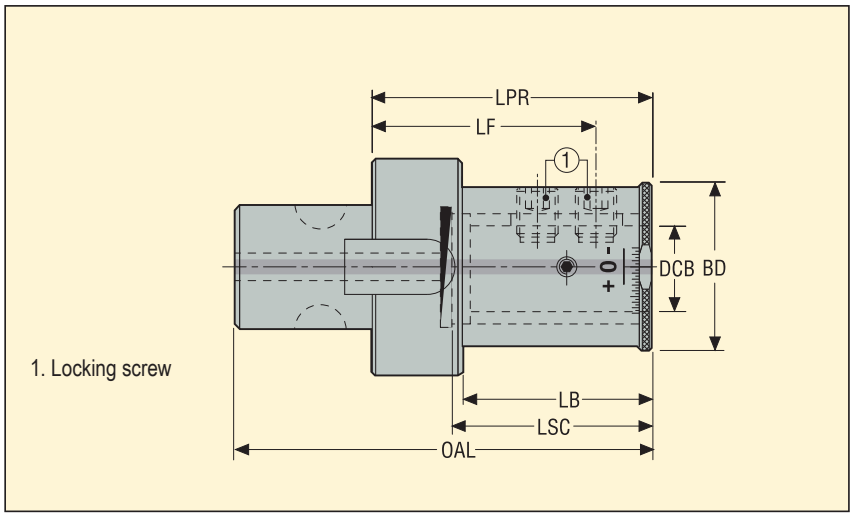
Accessories

For	Key
	
M50852813L	H06-4
M50853616L	H06-4

Please check availability in current price and stock-list

ADH 6100 – Adjustable drill holders, for type 7 drill shanks – ISO 9766 – Metric

- For Perfomax™ drills
- Adjustable from -0,3 mm to +0,8

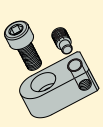
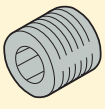


1. Locking screw

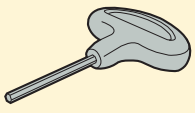
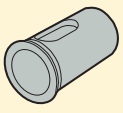
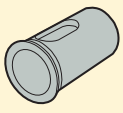
Machine side	Workpiece side			Dimensions in mm							
Graflex shank size	For drill shank type	DCB mm	Designation	LPR	LF	BD	OAL	LB	LSC	Balancing	KG
G6	R7	25,0	**BM061610025**	70,0	55,0	49,0	110,0	54,0	54,0	PB	1,12
	R7	32,0	**BM061610032**	85,0	70,0	71,0	125,0	66,0	60,5	PB	2,09
	R7	40,0	**BM061610040**	85,0	70,0	81,0	125,0	66,0	60,5	PB	2,38

PB=Pre-balanced by design (see Balancing Guide page in Tooling Systems catalogue for more details)

Spare Parts

For DCB mm	Tenon	Locking screw
		
25	90M61	950AF1210014
32	90M61	950AF1210020
40	90M61	950AF1210020

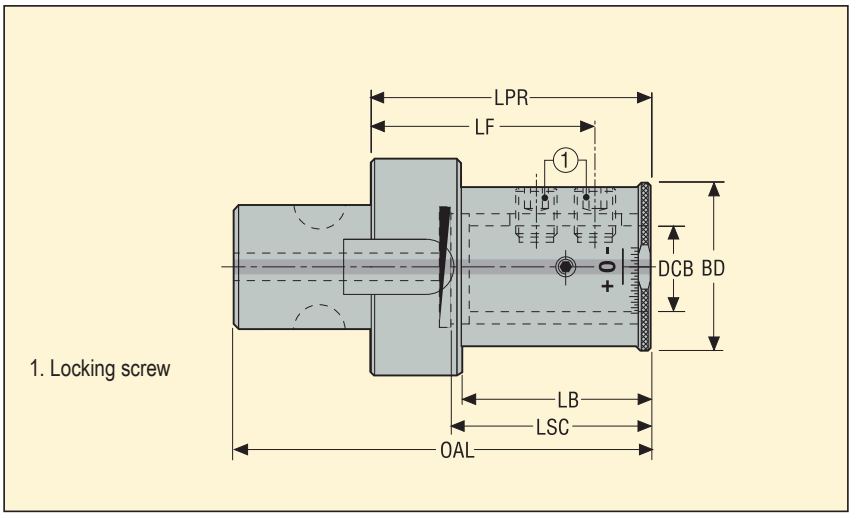
Accessories*

Key	Reducing sleeve	Reducing sleeve 2
		
H06-4	–	–
H06-4	05B61003225	–
H06-4	05B61004025	05B61004032

*Accessories not included in delivery.
Please check availability in current price and stock-list.

ADH 6101 – Adjustable drill holders, for type 7 drill shanks - Inch

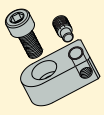
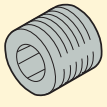
- For Perfomax™ drills
- Adjustable from -0,3 mm to +0,8



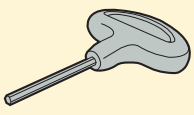
Machine side	Workpiece side		Designation	Dimensions in mm						Balancing	KG
Graflex shank size	For drill shank type	DCB mm		LPR	LF	BD	OAL	LB	LSC		
G6	R7	25,4	**BM061610125**	70,0	55,0	49,0	110,0	54,0	54,5	PB	1,11
	R7	31,75	**BM061610131**	85,0	70,0	71,0	125,0	66,0	60,5	PB	2,09
	R7	38,1	**BM061610138**	85,0	70,0	81,0	125,0	66,0	60,5	PB	2,45

PB=Pre-balanced by design (see Balancing Guide page in Tooling Systems catalogue for more details)

Spare Parts

For DCB inch	Tenon	Locking screw
		
1,00	90M61	950AF1210014
1,25	90M61	950AF1210020
1,50	90M61	950AF1210020

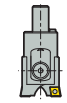
Accessories*

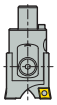
Key

H06-4

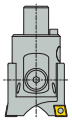
*Accessories not included in delivery.
Please check availability in current price and stock-list.

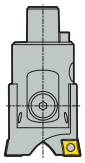

A750 40
50-65mm
1.965"-2.560"
A750 00
18-24mm

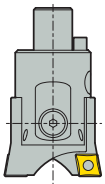
Overview Rough boring heads

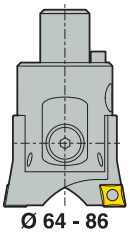

Ø 18-24

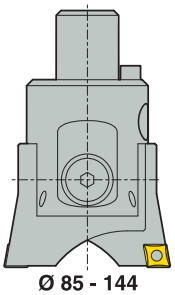

Ø 23 - 31

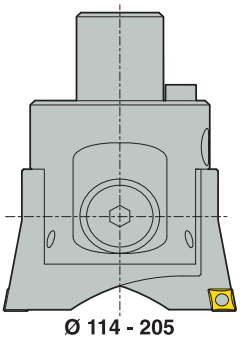

Ø 30 - 40


Ø 39 - 51

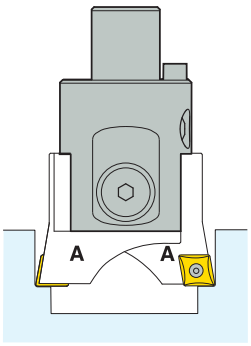

Ø 50 - 65

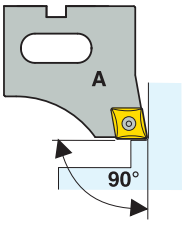

Ø 64 - 86

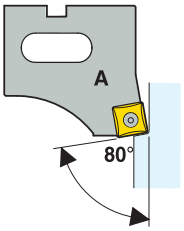

Ø 85 - 144


Ø 114 - 205

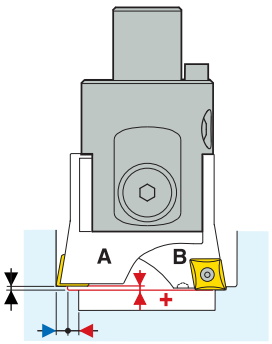
Symmetrical boring:
2 standard type A insert holders

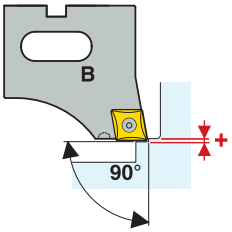


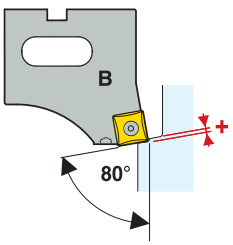




Staggered boring:
1 extended type B and 1 standard type A insert holders



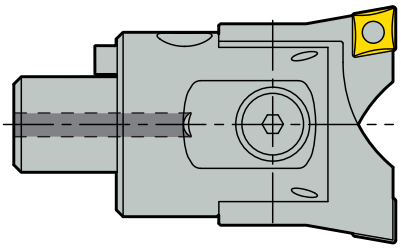




Features

Rough boring heads for bores ∅ 18 to 205 mm

8 rough boring heads RB 750 with Graflex® connection for bores ∅ 18 to 205 mm



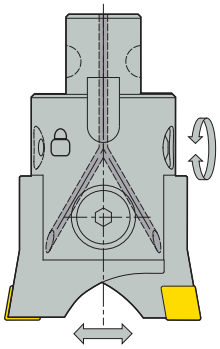
Note: Features, Instructions (insert holder fitting, diameter setting, back boring instructions, troubleshooting, recommended machining conditions, maximum speeds), **suitable insert holders and suitable inserts** are similar for both types of EPB 750 rough boring heads of similar boring capacity size, regardless of connection type.

Features

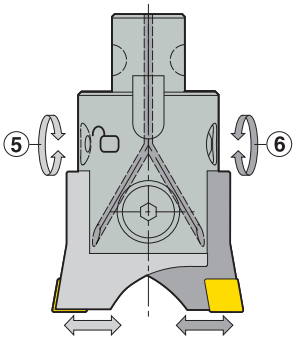
A rough boring head assembly is a combination of 1 body (head) and 2 insert holders.

Simultaneous or independent adjustments of the insert holders are possible:

Simultaneous adjustment by the insert holders coupling mechanism (no coupling mechanism in the smallest head ∅ 18 to 24 mm).
Each adjusting screw moves both insert holders simultaneously (they are gear coupled).
Diameter adjustment is possible without a presetter (1 increment = 0,1 mm on the diameter).
Independent adjustment is also possible: disengage the coupling mechanism so that each adjusting screw acts only on its insert holder.



Simultaneous adjustment



Independant adjustment

Symmetrical boring:
Symmetrical boring means both cutting edges are set on the same diameter: It requires two identical type A standard insert holders (with identical lead angle).

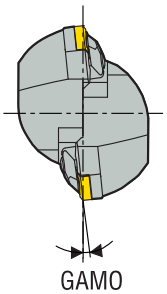
Staggered boring:
Staggered boring means one cutting edge is offset as a leading cutting edge operating on a smaller diameter than the second edge set on the diameter to be realised: It requires one type A standard insert holder and one type B extended insert holder, achieving the required (+) axial offset.

90° or 80° lead angle insert holders

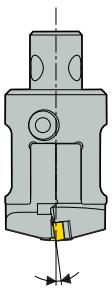
A75…CC… and A75…CP… insert holders have a 90° lead angle for rhombic inserts: mostly suitable for blind holes and requiring less spindle torque.
A75…SC… insert holders have an 80° lead angle for square inserts: mostly suitable for through holes and heavy duty.
Angular orientation of the cutting edges according to ISO.

CC, CP, SC or CN type insert holders

A750...CC..., A750...CP... and A750...SC... insert holders are with 0° rake angle (GAMO) and 0° inclination angle (LAMS).
A750...CN... insert holders are with -6° rake angle (GAMO) and -6° inclination angle (LAMS), allowing use of 'negative' CNMM inserts and particularly multi-edges CNMG inserts with 4 cutting edges. In this case, it is particularly important to select the recommended CN inserts and to respect the recommended cutting data (see page 475). Using other inserts, e.g. with smaller effective cutting angle, and/or incorrect cutting data, could result in high cutting stresses and machine / workpiece damage.



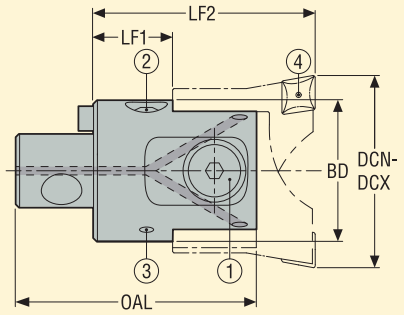
GAMO



LAMS

RB 750 – Rough boring heads

- Symmetrical and staggered boring is possible
- Simultaneous adjustment by insert holders coupling mechanism



1. Assembly screw
2. Adjusting screw
3. Locking screw of coupling mechanism
4. Insert screw

Machine side Graflex size	Workpiece side Capacity DCN-DCX ∅ mm	Ordering and Product No.	Designation	Simultaneous adjustment mode		Independent adjustment mode		Dimensions in mm				Max. RPM	KG*
				Yes	No	Yes	No	OAL	LF1	LF2	BD		
G0	18,0-24,0	**00026687**	**A75000**		[	[		38,0	12,5	35,0	16,5	15000	0,03
G1	23,0-31,0	**00026688**	**A75010**	[		[		42,5	13,5	40,0	21,5	12000	0,1
G2	30,0-40,0	**00026689**	**A75020**	[		[		51,0	16,0	46,0	27,0	9500	0,11
G3	39,0-51,0	**00026690**	**A75030**	[		[		69,0	24,0	65,0	35,0	7500	0,27
G4	50,0-65,0	**00026691**	**A75040**	[		[		78,0	27,0	72,0	43,0	5700	0,46
G5	64,0-86,0	**00026692**	**A75050**	[		[		92,0	30,0	82,0	54,0	4500	0,8
G6	85,0-144,0	**00026693**	**A75060**	[		[		119,0	37,0	105,0	70,0	3500	1,69
G7	114,0-205,0	**00026694**	**A75070**	[		[		143,0	39,0	120,0	95,0	2500	3,7

Insert holders have to be ordered separately, see page(s) 43-47.

*Without insert holder.

Spare Parts

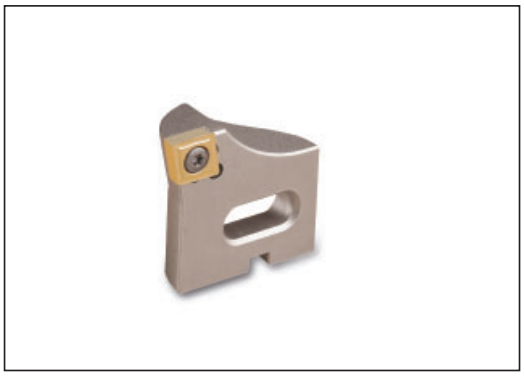
For head	Assembly screw	Clamp key	Driving key	Insert key	Key (T-handle)	Setting key	Tenon
A750 00	90A75000	03HL03	–	T07P-3	DOUBLE-T	H1.5-2D	90M0
A750 10	90A75010	03HL03	T06P-3	T07P-3	–	H1.5-2D	90M11
A750 20	90A75020	03HL04	T07P-3	T07P-3	–	H2.0-2D	90M21
A750 30	90A75030	03HL05	T08P-3	T15P-3	–	H2.0-2D	90M31
A750 40	90A75040	03HL05	T09P-3	T15P-3	–	H2.5-2D	90M41
A750 50	90A75050	03HL06	T15P-3	T15P-3	–	03M03C	90M51
A750 60	90A75060	03HL08	T15P-3	T15P-3	–	H04-4	90M61
A750 70	90A75070	03HL10	T15P-3	T15P-3	–	H04-4	90M71

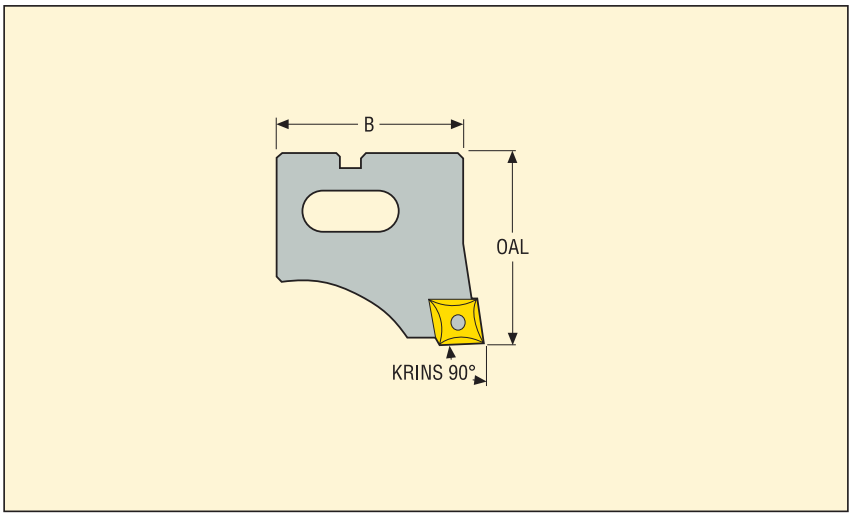
Accessories

Setting gauge
–
CAA75010
CAA75020
CAA75030
CAA75040
CAA75050
CAA75060
CAA75070

Please check availability in current price and stock-list
Accessories not included in delivery.

Rough boring insert holders 90°, for CC.. and CP.. inserts, for RB 750 heads

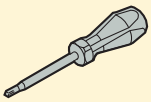
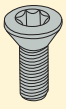




- For fitting onto heads RB 750
- Symmetrical boring requires two standard type A insert holders
- Staggered boring requires one standard type A and one extended type B insert holders

Insert holders type	For head	Capacity DCN-DCX ∅ mm	Ordering and Product No.	Designation	KRINS°	Dimensions in mm		Suitable insert size	KG
						OAL	B		
Standard type A	RB 75000	18,0-24,0	**00026695**	**A75000CP0590**	90,0	22,5	16,5	CP...0502...	0,01
	RB 75010	23,0-31,0	**00026696**	**A75010CC0690**	90,0	26,5	21,5	CC...0602...	0,02
	RB 75020	30,0-40,0	**00026697**	**A75020CC0690**	90,0	30,0	27,0	CC...0602...	0,04
	RB 75030	39,0-51,0	**00026698**	**A75030CC0990**	90,0	41,0	35,0	CC...09T3...	0,08
	RB 75040	50,0-65,0	**00026699**	**A75040CC1290**	90,0	45,0	43,0	CC...1204...	0,14
	RB 75050	64,0-86,0	**00026700**	**A75050CC1290**	90,0	52,0	54,0	CC...1204...	0,25
	RB 75060	85,0-115,0	**00026701**	**A75060CC1290**	90,0	68,0	70,0	CC...1204...	0,55
	RB 75060	85,0-115,0	**00030763**	**A75060CC1690**	90,0	68,0	70,0	CC...1605...	0,55
	RB 75060	114,0-144,0	**00026702**	**A75065CC1290**	90,0	68,0	100,0	CC...1204...	0,89
	RB 75060	114,0-144,0	**00030765**	**A75065CC1690**	90,0	68,0	100,0	CC...1605...	0,9
	RB 75070	114,0-160,0	**00026703**	**A75070CC1290**	90,0	81,0	95,0	CC...1204...	1,18
	RB 75070	114,0-160,0	**00030766**	**A75070CC1690**	90,0	81,0	95,0	CC...1605...	1,18
	RB 75070	159,0-205,0	**00026704**	**A75075CC1290**	90,0	81,0	141,0	CC...1204...	2,0
	RB 75070	159,0-205,0	**00030771**	**A75075CC1690**	90,0	81,0	141,0	CC...1605...	2,0

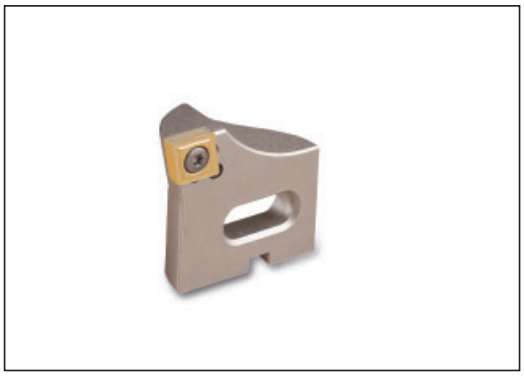
Spare Parts

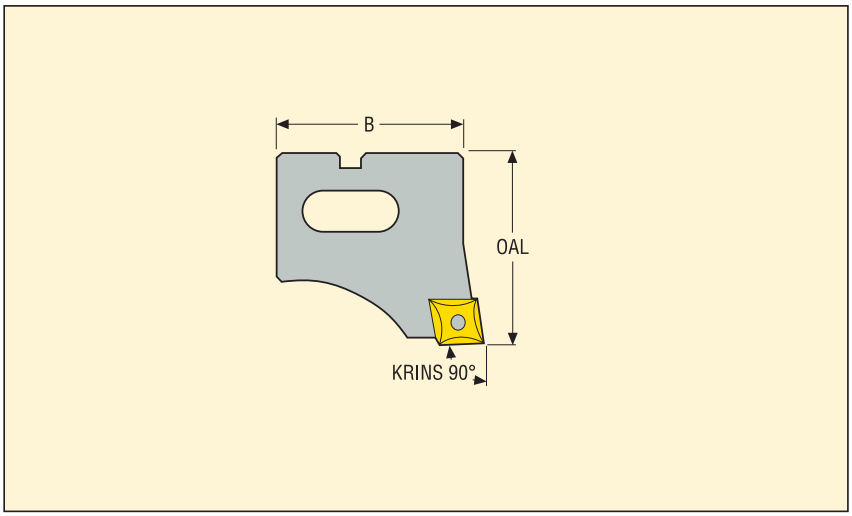
For insert size	Key	Screw
		
CC...0602...	T07P-3	C02504-T07P
CC...09T3...	T15P-3	C04008-T15P
CC...1204...	T15P-3	C05012-T15P
CC...1605...	T15P-3	C05012-T15P
CP...0502...	T07P-3	C02245-T07P

Please check availability in current price and stock-list

For insert fixing spare screws and torx keys, see page(s) 100
For rough boring recommended inserts, see page(s) 95

Rough boring insert holders 90°, for CC.. and CP.. inserts, for RB 750 heads

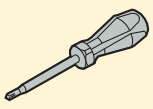
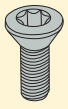




- For fitting onto heads RB 750
- Symmetrical boring requires two standard type A insert holders
- Staggered boring requires one standard type A and one extended type B insert holders

Insert holders type	For head	Capacity DCN-DCX ∅ mm	Ordering and Product No.	Designation	KRINS°	Dimensions in mm		Suitable insert size	KG
						OAL	B		
Extended type B	RB 75000	18,0-24,0	**00026705**	**A75001CP0590**	90,0	22,8	16,5	CP...0502...	0,01
	RB 75010	23,0-31,0	**00026706**	**A75011CC0690**	90,0	26,85	21,5	CC...0602...	0,02
	RB 75020	30,0-40,0	**00026707**	**A75021CC0690**	90,0	30,35	27,0	CC...0602...	0,04
	RB 75030	39,0-51,0	**00026708**	**A75031CC0990**	90,0	41,4	35,0	CC...09T3...	0,08
	RB 75040	50,0-65,0	**00026709**	**A75041CC1290**	90,0	45,5	43,0	CC...1204...	0,13
	RB 75050	64,0-86,0	**00026710**	**A75051CC1290**	90,0	52,6	54,0	CC...1204...	0,25
	RB 75060	85,0-115,0	**00026711**	**A75061CC1290**	90,0	68,6	70,0	CC...1204...	0,55
	RB 75060	85,0-115,0	**00030774**	**A75061CC1690**	90,0	68,6	70,0	CC...1605...	0,55
	RB 75060	85,0-115,0	**00092963**	**A75061SC1280**	80,0	69,8	70,0	SC...1204...	0,57
	RB 75060	114,0-144,0	**00026712**	**A75066CC1290**	90,0	68,6	100,0	CC...1204...	0,91
	RB 75060	114,0-144,0	**00030775**	**A75066CC1690**	90,0	68,6	100,0	CC...1605...	0,91
	RB 75070	114,0-160,0	**00026713**	**A75071CC1290**	90,0	81,6	95,0	CC...1204...	1,16
	RB 75070	114,0-160,0	**00030776**	**A75071CC1690**	90,0	81,6	95,0	CC...1605...	1,16
	RB 75070	159,0-205,0	**00026714**	**A75076CC1290**	90,0	81,6	141,0	CC...1204...	2,0
	RB 75070	159,0-205,0	**00030778**	**A75076CC1690**	90,0	81,6	141,0	CC...1605...	2,01

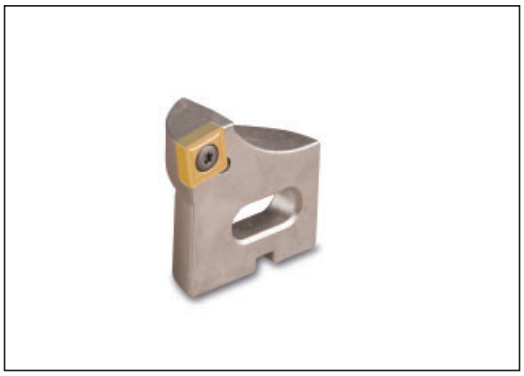
Spare Parts

For insert size	Key	Screw
		
CC...0602...	T07P-3	C02504-T07P
CC...09T3...	T15P-3	C04008-T15P
CC...1204...	T15P-3	C05012-T15P
CC...1605...	T15P-3	C05012-T15P
CP...0502...	T07P-3	C02245-T07P
SC...1204...	T15P-3	C05012-T15P

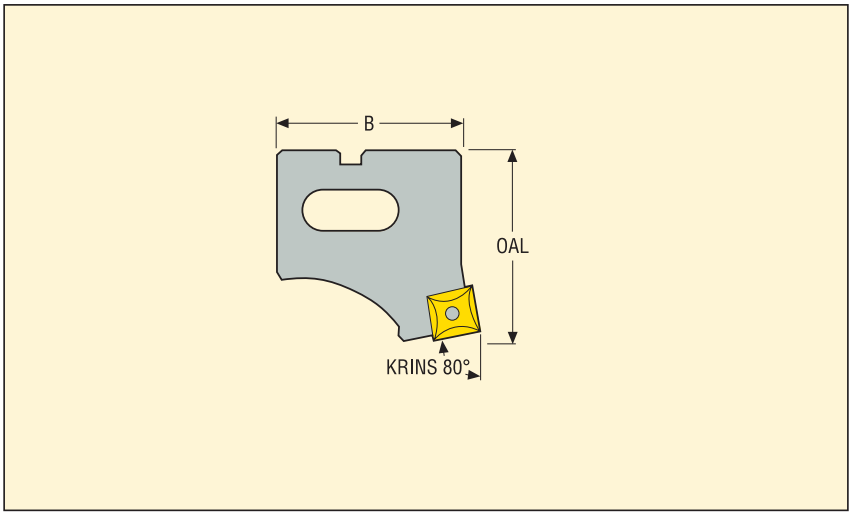
Please check availability in current price and stock-list

For insert fixing spare screws and torx keys, see page(s) 100
For rough boring recommended inserts, see page(s) 95

Rough boring insert holders 80°, for SC.. inserts, for RB 750 heads

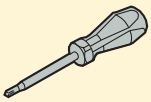
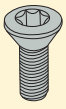


- For fitting onto heads RB 750
- Symmetrical boring requires two standard type A insert holders
- Staggered boring requires one standard type A and one extended type B insert holders



Insert holders type	For head	Capacity DCN-DCX ∅ mm	Ordering and Product No.	Designation	KRINS°	Dimensions in mm		Suitable insert size	KG
						OAL	B		
Standard type A	RB 75000	18,0-24,0	**00026715**	**A75000SC0580**	80,0	22,5	16,5	SC...0502...	0,01
	RB 75010	23,0-31,0	**00026716**	**A75010SC0680**	80,0	26,5	21,5	SC...0602...	0,02
	RB 75020	30,0-40,0	**00026717**	**A75020SC0680**	80,0	30,0	27,0	SC...0602...	0,04
	RB 75030	39,0-51,0	**00026718**	**A75030SC0980**	80,0	41,0	35,0	SC...09T3...	0,08
	RB 75040	50,0-65,0	**00026719**	**A75040SC1280**	80,0	45,0	43,0	SC...1204...	0,03
	RB 75050	64,0-86,0	**00051986**	**A75050SC1280**	80,0	52,0	54,0	SC...1204...	0,25
	RB 75060	85,0-115,0	**00052207**	**A75060SC1280**	80,0	68,0	70,0	SC...1204...	0,56
	RB 75060	85,0-115,0	**00039863**	**A75060SC1580**	80,0	68,0	70,0	SC...1505...	0,56
	RB 75060	114,0-144,0	**00051989**	**A75065SC1280**	80,0	68,0	100,0	SC...1204...	0,94
	RB 75060	114,0-144,0	**00039865**	**A75065SC1580**	80,0	68,0	100,0	SC...1505...	1,0
	RB 75070	114,0-160,0	**00026723**	**A75070SC1280**	80,0	81,0	95,0	SC...1204...	1,2
	RB 75070	114,0-160,0	**00039867**	**A75070SC1580**	80,0	81,0	95,0	SC...1505...	1,18
	RB 75070	159,0-205,0	**00026724**	**A75075SC1280**	80,0	81,0	141,0	SC...1204...	2,09
	RB 75070	159,0-205,0	**00039869**	**A75075SC1580**	80,0	81,0	141,0	SC...1505...	2,1

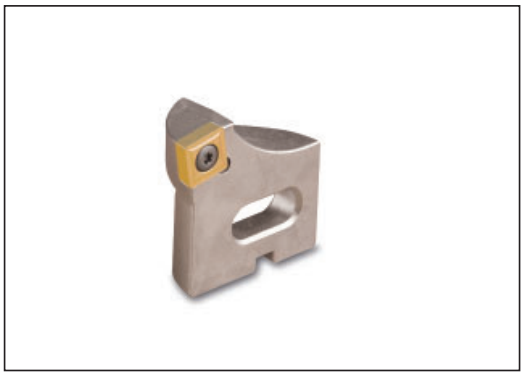
Spare Parts

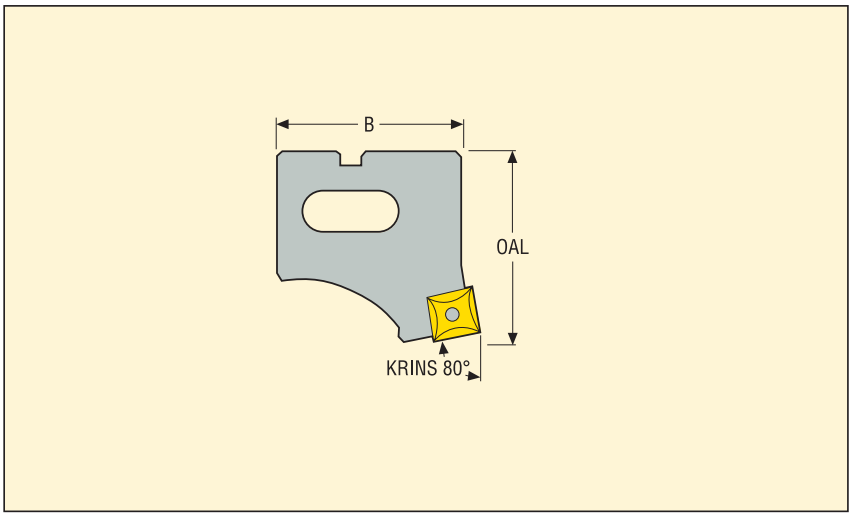
For insert size	Key	Screw
		
SC...0502...	T07P-3	C02245-T07P
SC...0602...	T07P-3	C02504-T07P
SC...09T3...	T15P-3	C04008-T15P
SC...1204...	T15P-3	C05012-T15P
SC...1505...	T15P-3	C05012-T15P

Please check availability in current price and stock-list

For insert fixing spare screws and torx keys, see page(s) 100
For rough boring recommended inserts, see page(s) 95

Rough boring insert holders 80°, for SC.. inserts, for RB 750 heads

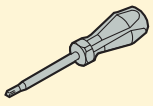
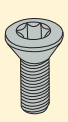




- For fitting onto heads RB 750
- Symmetrical boring requires two standard type A insert holders
- Staggered boring requires one standard type A and one extended type B insert holders

Insert holders type	For head	Capacity DCN-DCX ∅ mm	Ordering and Product No.	Designation	KRINS°	Dimensions in mm		Suitable insert size	KG
						OAL	B		
Extended type B	RB 75000	18,0-24,0	**00092946**	**A75001SC0580**	80,0	23,2	16,5	SC...0502...	0,01
	RB 75010	23,0-31,0	**00092947**	**A75011SC0680**	80,0	27,3	21,5	SC...0602...	0,02
	RB 75020	30,0-40,0	**00092948**	**A75021SC0680**	80,0	30,9	27,0	SC...0602...	0,04
	RB 75030	39,0-51,0	**00092949**	**A75031SC0980**	80,0	42,2	35,0	SC...09T3...	0,08
	RB 75040	50,0-65,0	**00092961**	**A75041SC1280**	80,0	46,4	43,0	SC...1204...	0,14
	RB 75050	64,0-86,0	**00092962**	**A75051SC1280**	80,0	53,7	54,0	SC...1204...	0,26
	RB 75060	85,0-115,0	**00039864**	**A75061SC1580**	80,0	70,3	70,0	SC...1505...	0,57
	RB 75060	114,0-144,0	**00092964**	**A75066SC1280**	80,0	69,8	100,0	SC...1204...	0,96
	RB 75060	114,0-144,0	**00039866**	**A75066SC1580**	80,0	70,3	100,0	SC...1505...	0,96
	RB 75070	114,0-160,0	**00092965**	**A75071SC1280**	80,0	82,8	95,0	SC...1204...	1,21
	RB 75070	114,0-160,0	**00039868**	**A75071SC1580**	80,0	83,3	95,0	SC...1505...	1,21
	RB 75070	159,0-205,0	**00092968**	**A75076SC1280**	80,0	82,8	141,0	SC...1204...	2,16
	RB 75070	159,0-205,0	**00039870**	**A75076SC1580**	80,0	83,3	141,0	SC...1505...	2,14

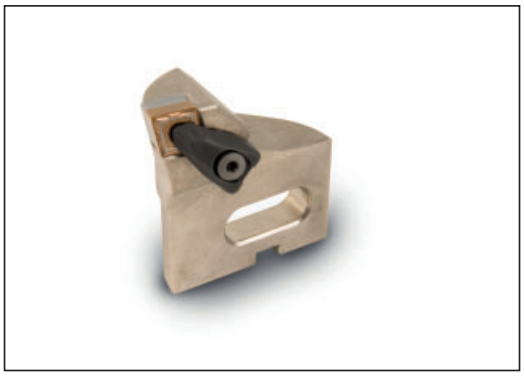
Spare Parts

For insert size	Key	Screw
		
SC...0502...	T07P-3	C02245-T07P
SC...0602...	T07P-3	C02504-T07P
SC...09T3...	T15P-3	C04008-T15P
SC...1204...	T15P-3	C05012-T15P
SC...1505...	T15P-3	C05012-T15P

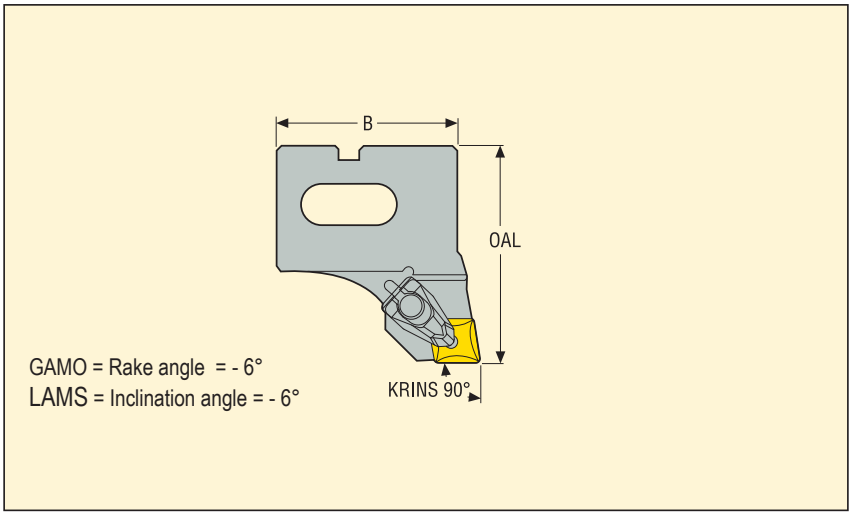
Please check availability in current price and stock-list

For insert fixing spare screws and torx keys, see page(s) 100
For rough boring recommended inserts, see page(s) 95

Rough boring insert holders 90°, for CN.. inserts, for RB 750 heads

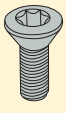
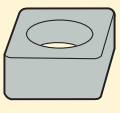
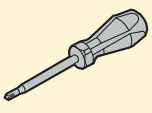


- For fitting onto heads RB 750
- Symmetrical boring requires two standard type A insert holders (Type B extended insert holders for CN.. inserts not available)



Insert holders type	For head	Capacity DCN-DCX ∅ mm	Ordering and Product No.	Designation	KRINS°	Dimensions in mm		Suitable insert size	KG
						OAL	B		
Standard type A	RB 75050	64,0-86,0	**02786307**	**A75050CN1290**	90,0	63,0	55,0	CN...1204...	0,28
	RB 75060	85,0-115,0	**02786308**	**A75060CN1290**	90,0	68,0	69,5	CN...1204...	0,58
	RB 75060	114,0-144,0	**02786309**	**A75065CN1290**	90,0	68,0	99,5	CN...1204...	0,98
	RB 75070	114,0-160,0	**02786310**	**A75070CN1290**	90,0	85,0	95,0	CN...1204...	1,25
	RB 75070	159,0-205,0	**02786311**	**A75075CN1290**	90,0	85,0	140,0	CN...1204...	2,03

Spare Parts

For insert size	Anvil screw	Clamp kit	Insert shim	Key
				
CN...1204...	CSC6312-T15P	CD12-S12	UCN443	T15P-3

Please check availability in current price and stock-list

For rough boring recommended inserts, see page(s) 96

Instructions
Recommended machining conditions

Spindle power:

As rough boring requires high machine power, we recommend to check that the machine is suitable. Staggered boring is a solution to reduce the power needs, as the feed is divided by two for the same total depth of cut, compared to symmetrical setting.
Optimum performance is obtained with through coolant (higher machining data, better surface finish, better chip evacuation, longer insert life).

For detailed user instructions, please refer to the operating instructions supplied as part of the delivery content of the boring heads and with the Steadyline® bars.
These operating instructions can also be downloaded from www.secotools.com.

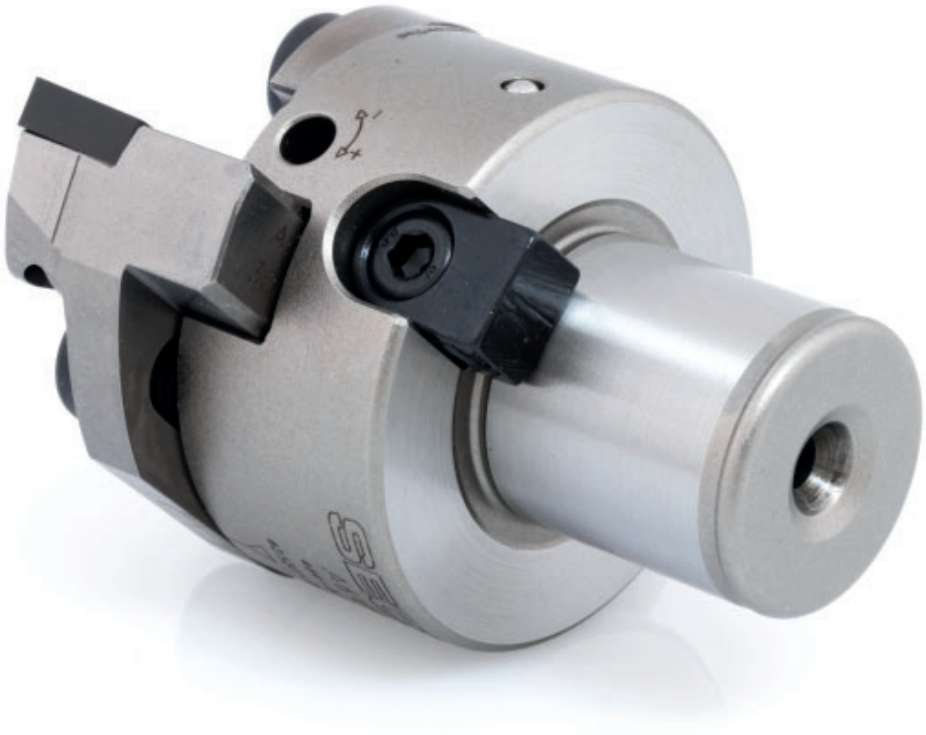
Maximum speeds for rough boring heads

Head	Capacity ∅ mm	Max. RPM	Implied max cutting speed v_c at min. Cap.	Implied max cutting speed v_c at max. Cap.
Rough boring heads (with two identical insert holders set symmetrically), with Graflex® connection				
A750 00	18-24	15000	848	1131
A750 10	23-31	12000	867	1169
A750 20	30-40	9500	895	1194
A750 30	39-51	7500	919	1202
A750 40	50-65	5700	895	1164
A750 50	64-86	4500	905	1216
A750 60	85-115	3500	935	1264
	114-144	2700	967	1221
A750 70	114-160	2500	895	1257
	159-205	2000	999	1288
Rough boring heads (with two identical insert holders set symmetrically), with Seco-Capto™ connection				
C3-391.0750-30	39-51	7500	919	1202
C4-391.0750-40	50-65	5700	895	1164
C5-391.0750-50	64-86	4500	905	1216
C6-391.0750-60	85-115	3500	935	1264
	114-144	2700	967	1221
C8-391.0750-70	114-160	2500	895	1257
	159-205	2000	999	1288

Note: The maximum speeds are related to the boring head's mechanical design and balancing quality. Speeds inside these limits have to be chosen in regard to the other machining conditions, e.g. workpiece material, cutting edge (insert), tooling length, machine spindle. At speeds from approx. 8000 RPM and above, the basic holders and the extensions/reducers should be fine balanced.

Instructions
Troubleshooting

Position	Possible cause	Solution
Poor chip control	Feed rate too low	Increase feed rate
	Excessive DOC	Use staggered method
Chatter & Vibrations	Excessive speed	Reduce cutting speed, not feed
	Extreme L/D ratio	Shorten tool to increase stiffness
		Increase holding arbor's and intermediate's OD
		Use Steadyline bar
		Use carbide or heavy metal extensions
	Too large insert radius	Use insert with smaller radius
	Unstable workpiece	Improve fixture and clamping support
	Lead angle κ is 80°	Change to κ=90°, type CC insert
Insert chipping or breaking	Wrong insert	Change to tougher grade of insert
		Use larger radius if available
	Severe interrupted cut	Decrease speed, decrease feed
	Chips packing and re-cutting	Check for boring bar/bore diameter clearance
		Improve chip control, increase feed
Poor tool life	Wrong insert	Change to higher wear resistant grade
	Excessive cutting speed	Reduce speed
	Insert chipping	Check DOC and feed rate
	Too low coolant pressure	Increase coolant pressure
Chips not evacuating	Boring assembly to large	Reduce to a smaller head with extended insert holders when possible
	Excessive DOC	Use staggered method; prefer CC.. instead of CN.. inserts (particularly when using the boring head at its small diameters).
	Inadequate space below bore	Set the workpiece higher onto the table
	Poor chip control	See above
Insufficient machine power	Excessive feed rate	Reduce feed (not less then 25% of insert radius)
	Excessive DOC	Use staggered method
	Low machine power	RPM in area of low spindle torque: increase speed
		RPM in area of gear change: adjust RPM
		Change insert to higher rake angle (to HSS in extreme cases)
		Reduce DOC
Excessive hole exit burr	Excessive feed rate	Reduce feed
	CC type insert holders 90°	Use 80° square insert holder
	Cutting forces too high	Reduce DOC
		Reduce insert radius



RB 610 Rough boring heads – Guide

Features

A rough boring head assembly is a combination of 1 body (head) and 2 insert holders

- Achieving geometrical hole precision starting from cast, flame cut or drilled hole
- Minimised unbalance thanks to a symmetrical design

Graflex

Compact

- Short body to maximise the rigidity of the boring assembly and to deliver the best damping performances when used on Steadyline® turning and boring bars
- Reduced weight for fast tool changing and spindle acceleration

Intuitive and fast setting

- Each insert holder features its push and pull setting mechanism allowing easy and fast setting of the diameter, using a pre-setter
- Diameter scales roughly visualise the insert holders positions

Insert holders

- A610…CC… insert holders achieve a 90° lead angle for rhombic inserts, 0° rake angle and 0° inclination angle
- The insert holders are suitable for both EPB 610 Graflex® and EPB 610 GL heads

Productivity

- High rigidity resulting from a tight fitting of the insert holders into the head's body, and large clamping screws
- Possibility to take a depth of cut a_p up to half of the insert's width, maximising the chip removal rate and allowing a total exploitation of the inserts
- Staggered boring using a shim (part of heads delivery contents) to offset one insert holder in order to increase or to split the radial depth of cut
- Through coolant delivery directed towards the cutting edges

Product range

- RB 610 rough boring heads are available with Graflex®, GL and BA machine side connections

RB 610 Graflex®

- Graflex®: 4 compact rough boring heads for Ø 39 to 115 mm
- The flexible Graflex® modular System allows to build up optimal boring assemblies from Graflex® adapters, intermediate modules and boring heads

RB 610 Rough boring heads – Guide

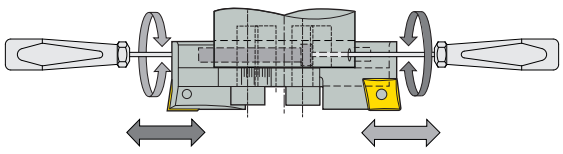
SETTING

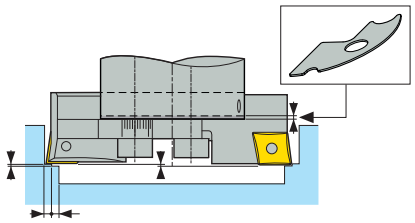
Symmetrical boring:
Symmetrical boring means both cutting edges are set on the same diameter and same height.

Staggered boring:
Staggered boring means one cutting edge is offset as a leading cutting edge (entering the bore first), operating on a smaller diameter than the second edge set on the diameter to be realised: It requires a shim (part of the head delivery content) to be fitted between the boring head's body and one insert holder to achieve the (+) axial offset, see table below.

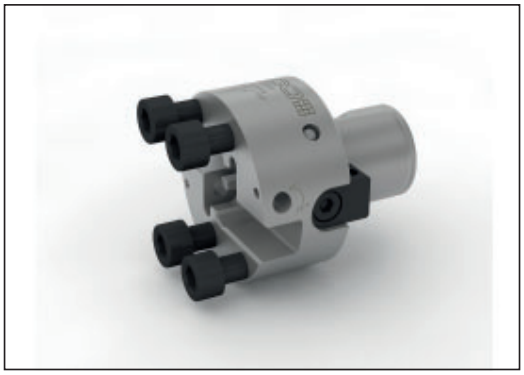
Shims thicknesses

Shim Part No.	Thickness (mm)
AU6103003	0,4
AU6104003	0,5
AU6105003	0,6
AU6106003	0,6

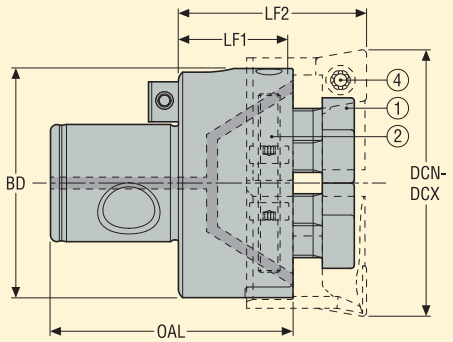




RB 610 Graflex® – Rough boring heads



- *Symmetrical and staggered boring modes are possible*
- *Individual insert holder adjusting mechanism*
- *Internal coolant supply towards cutting edge*

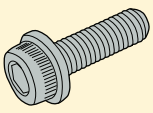
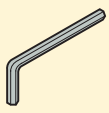
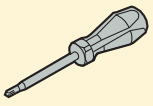


1. Assembly screw and clamp key
2 & 4. Insert key for diameter setting and insert screw clamping

Machine side Graflex size	Workpiece side Capacity DCN-DCX ∅ mm	Ordering and Product No.	Designation	Dimensions in mm				Max. RPM**	KG*
				OAL	LF1	LF2	BD		
G3	39,0-51,0	**02904453**	**A61030**	43,5	23,5	36,4	34,0	7500	0,18
G4	50,0-65,0	**02904454**	**A61040**	45,5	21,5	35,3	43,0	5700	0,27
G5	64,0-86,0	**02904455**	**A61050**	55,0	25,0	42,3	54,0	4500	0,54
G6	85,0-115,0	**02904457**	**A61060**	69,0	29,0	47,8	63,0	3500	0,93

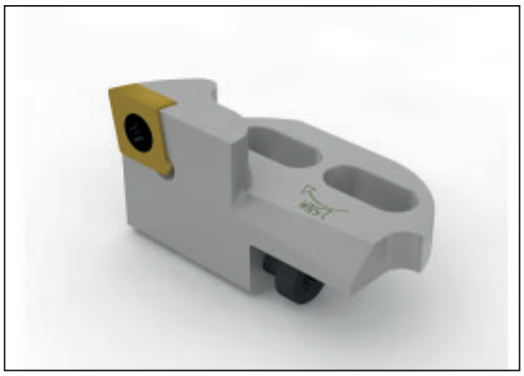
Insert holders have to be ordered separately, see page(s) 54.
** Additional information about max RPM, see Instruction pages.
*Without insert holder.

Spare Parts

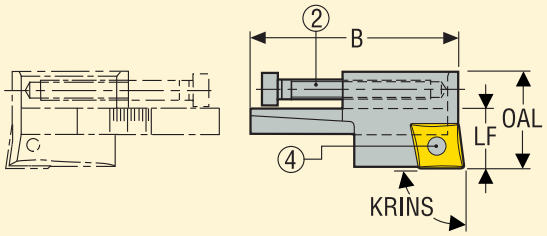
For head	Assembly screw	Clamp key	Insert key	Shim, staggered boring	Tenon
					
A610 30	950DC0616	03HL05	T15P-3	AU6103003	90M3
A610 40	950D0616	03HL05	T15P-3	AU6104003	90M4
A610 50	950D0820	03HL06	T15P-3	AU6105003	90M5
A610 60	950D0822	03HL06	T15P-3	AU6106003	90M6

Please check availability in current price and stock-list

Insert holders, for rough boring heads RB 610



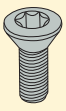
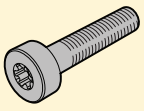
- *Suitable for boring heads RB 610 with Graflex®, GL or BA connection*



2. Setting screw
4. Insert screw

For boring head	Capacity DCN-DCX ∅ mm	Ordering and Product No.	Designation	KRINS°	Dimensions in mm			Suitable insert size	KG
					OAL	LF	B		
EPB 61020	36,0-46,0	**02971268**	**A61020CC0690**	90,0	17,6	10,9	26,0	CC...0602...	0,1
EPB 61030	39,0-56,0	**02904461**	**A61030CC0990**	90,0	21,6	12,9	33,0	CC...09T3...	0,1
EPB 61040	50,0-69,0	**02904462**	**A61040CC0990**	90,0	22,5	13,8	43,8	CC...09T3...	0,1
EPB 61050	64,0-86,0	**02904463**	**A61050CC1290**	90,0	27,5	17,3	57,4	CC...1204...	0,2
EPB 61060	85,0-115,0	**02904464**	**A61060CC1290**	90,0	30,5	18,8	75,0	CC...1204...	0,3

Spare Parts

For insert holder	Insert screw	Setting screw
		
A61020CC0690	C02504-T07P	19A61020
A61030CC0990	C04008-T15P	19A61030
A61040CC0990	C04008-T15P	19A61040
A61050CC1290	C05012-T15P	19A61050
A61060CC1290	C05012-T15P	19A61060

Please check availability in current price and stock-list
Note: A key for insert screw clamping is part of RB 610 heads delivery contents.

RB 610 Rough boring heads – Instructions

Recommended tightening torques. Maximum feed per rev. when staggered

RB 610 boring heads size	30	40	50	60
Tightening torque of clamp screws for insert holders clamping (N.m)	2 x 25	4 x 25	4 x 40	4 x 40
f Max. feed rate when staggered boring (mm/rev)	0,4	0,5	0,6	0,6

Recommended machining conditions

Spindle power:

As rough boring requires high machine power, we recommend to check that the machine is suitable. Staggered boring is a solution to reduce the power needs, as the feed is divided by two for the same total depth of cut, compared to symmetrical setting. Optimum performance is obtained with through coolant (higher machining data, better surface finish, better chip evacuation, longer insert life).

For detailed user instructions, please refer to the operating instructions supplied as part of the delivery content of the boring heads and with the Steadyline® bars. These operating instructions can also be downloaded from www.secotools.com.

Maximum speeds for RB 610 rough boring heads

Note: The maximum speeds shown in boring heads Product pages are related to the boring head's mechanical design and balancing quality. Speeds inside these limits have to be chosen in regard to the other machining conditions, e.g. workpiece material, cutting edge (insert), tooling length, machine spindle.
By boring applications with Steadyline® bars, make sure not to overpass the max. RPM of the bars : See the Operating instructions supplied with the Steadyline® turning and boring bars.

Overview

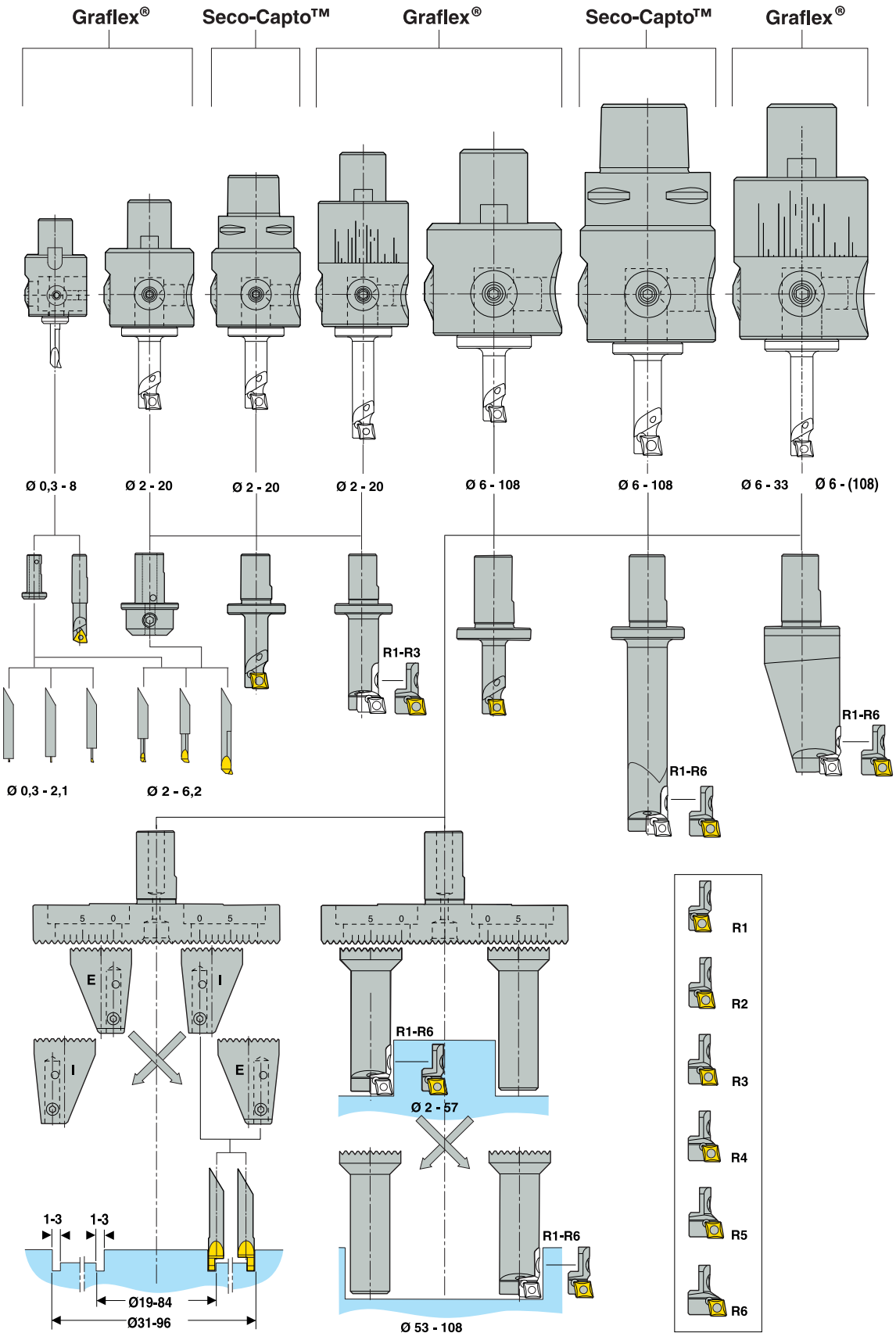
OD-overturning

Grooving

Interrupted cut boring

Boring

Overview


Graflex®
Seco-Capto™
Graflex®
Seco-Capto™
Graflex®
Ø 0,3 - 8
Ø 2 - 20
Ø 2 - 20
Ø 2 - 20
Ø 6 - 108
Ø 6 - 108
Ø 6 - 33
Ø 6 - (108)
R1-R3
R1-R6
R1-R6
Ø 0,3 - 2,1
Ø 2 - 6,2
E
I
I
E
1-3
1-3
Ø19-84
Ø31-96
R1-R6
Ø 2 - 57
R1-R6
Ø 53 - 108
R1
R2
R3
R4
R5
R6

Axiabore™ type fine boring heads for bores ∅ 0,3 to 108 mm

An Axiabore™ type head is an assembly of a body (head) and a tool.

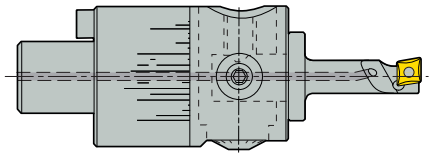
Axiabore™ type head selection

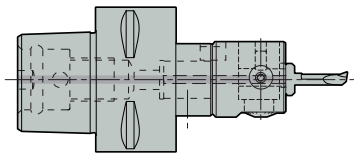
	Capacity	HSM/ Max speeds	Hole geometry	Cost effective	Multipurpose
Nanobore™ A760 01	∅ 0,3-8	30000 RPM	[[	[[	
Axiabore™ A760 02	∅ 2-20	12000 RPM	[	[[	
Axiabore™ C3-931.0760-02	∅ 2-20	12000 RPM	[	[[	
Axialibrabore™ A760 12	∅ 2-20	24000 RPM or 1500 m/min	[[	[	
Axiabore™ Plus - A760 03	∅ 6-108	8000* RPM or 1000 m/min	[	[[[	[[[
Axiabore™ Plus C5-391.0760-03	∅ 6-108	8000* RPM	[	[[[	[[[
Axialibrabore™ Plus - A760 13	∅ 6-33	20000 RPM or 1500 m/min	[[	[	

Axiabore™ type heads exists with Graflex® connection:

5 Axiabore™ fine boring heads FB 760 with Graflex® connection for bores ∅ 0,3 to 108 mm:

Nanobore™ A760 01
Axiabore™ A760 02
Axialibrabore™ A760 12
Axiabore™ Plus - A760 03
Axialibrabore™ Plus - A760 13





Seco-Capto™ adapter and Graflex® head: ∅ 0,3 to 8 mm

Note: Features, Instructions (tool fitting procedure, diameter setting, MPA assembly procedure, maximum speeds, recommended cutting speeds, troubleshooting), **suitable tools and insert holders** are similar for both types of FB 760 fine boring heads of similar boring capacity size, regardless of connection type.

Boring tools

Note: In the Product pages, it is clearly mentioned which tools are suitable for which heads.

Boring tools, solid carbide (shank ∅ 4 mm) for the smallest diameters (∅ 0,3 to 6,2 mm), lead angle 98°. Require reduction bushes to fit into Nanobore™ and Axia(libra)bore™ heads. The tools have an angled machine side for cutting edge orientation according to ISO.

Boring bars, insert type (shanks ∅ 6, 12 or 16 mm) for ∅ 6 to 13 mm, 'steel' type for short tools, 'carbide' type for long tools. For WB..0301.. or CC..0602.. inserts and 90° lead angle.
Direct fitting into the heads. The locking flat achieves a cutting edge orientation according to ISO.

Boring bars, modular composed of a 'shank' and an 'insert holder' for ∅ 13 to 63 mm.
Shanks (∅ 12 or 16 mm) in 'steel' for short, 'carbide' for long and 'Lightweight / aluminium' for the largest diameters. Direct fitting into the heads.

Six insert holders for CC..0602.. inserts and 90° lead angle, compatible with all shanks to build up a wide boring capacity on a common shank.

Multi-purpose adapter (MPA)

MPA for boring and OD-overturning, as well as face grooving on the - Axiabore™ Plus - head.
The MPA and tools have a serrated interface, for precise orientation and positioning increments (2,5 mm on diameter).
Directional through coolant nozzle included.

Select the components to build up an MPA type tool on the MPA tool selection charts. See assembly details in the Instructions chapter.

Set up a Boring or OD-overturning assembly.
Boring and OD-overturning assemblies use the same shank equipped with an insert holder, and a counterweight.
Boring assembly: Select the appropriate insert holder to be assembled onto the boring/OD-overturning shank, using the selection chart 'Boring with MPA' (part of following Product pages).
OD–overturning assembly: Select the appropriate insert holder to be assembled onto the boring/OD-overturning shank, using the selection chart 'OD-overturning with MPA' (part of following Product pages). See assembly details in the Instructions chapter.

Building a grooving assembly
A grooving assembly requires:
• a pair of grooving tool holders (one E='External' and one I='Internal'),
• one grooving tool 'against Spigot' or 'against Bore'.
When the groove is not against a spigot wall nor against a bore wall, both tool types are suitable.
See the selection charts 'Grooving tool for grooving with MPA'.

Features

Nanobore™ head **Part No. A76001** 	**Ultra small head for fine boring ∅ 0,3 – 8 mm:** External diameter 25 mm, length 25 mm, with Graflex® connection size G2, tool fitting ∅ 6 mm. Operating speeds up to 30 000 RPM allows performance machining of very small diameters. **The reduction bush** (6-4 mm) with orientation flat and pin for fitting the solid boring tools is part of the head delivery content.
Axiabore™ head **Part No. A76002 and C3-391.0760-02**  	**Small heads for fine boring ∅ 2 – 20 mm:** External diameter 36,5 mm, length 32 mm, with Graflex® connection size G3 and Seco-Capto™ connection size C3, tool fitting ∅ 12 mm. These heads sizes are optimised for difficult-to-access bores. **The reduction bush** (12-4 mm) with orientation flat and pin for fitting the solid boring tools is part of the head delivery content. Note: Smaller tools from Nanobore™ (0,3 to 2,1 mm) can also be fitted, but the machining speed will be limited to 12000 RPM: Nanobore® head should be preferred.
Axialibrabore™ head **Part No. A76012** 	**Small balanceable head for fine boring ∅ 2 – 20 mm:** Same features as the Axiabore™ head, but with fine balancing (body length 50 mm). With Graflex® connection size G3. Fine balanceable heads allow higher speeds up to 24 000 RPM or 1500 m/min (whichever is reached first without exceeding either of them), improve the hole geometry and reduce the machine spindle stress. 'LibraOne' balancing is performed by setting the graduated balancing ring (in accordance with the balancing code of the tool used, and the diameter to be bored) in line with the mark on the boring head. No chart needed.

Features

Axiabore™ Plus - head
Part No. A76003 and C5-391.0760-03

Multi-purpose heads for fine boring ∅ 6 to 108 mm, OD-overturning ∅ 2 to 57 mm and grooving ∅ 19 to 96 mm:
External diameter 54 mm, length 45 mm, with Graflex® connection size 5 and Seco-Capto™ connection size 5, tool fitting ∅ 16 mm.
Suitable tools: all tools with shank ∅ 16 mm, for direct fitting into the heads.

This head has also been designed to be equipped with the MPA (multi-purpose adapter), to perform large diameter fine boring, OD–overturning and face grooving.

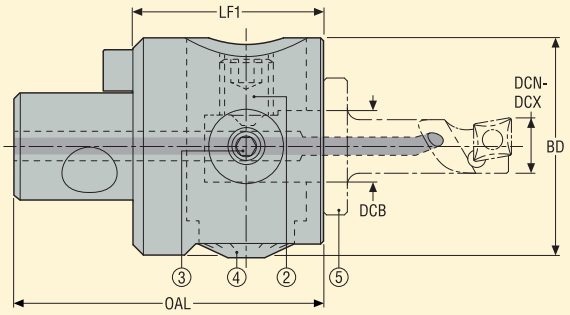
Axialibrabore™ Plus - head
Part No. A76013

Balanceable head for fine boring ∅ 6 to 33 mm:
Same features as the - Axiabore™ Plus - head, but with fine balancing (body length 65 mm).
With Graflex® connection size G5.
Fine balanceable heads allow higher speeds up to 20 000 RPM or 1500 m/min (whichever is reached first without exceeding either of them), improve the hole geometry and reduce the machine spindle stress. 'LibraOne' balancing is performed by setting the graduated balancing ring in line with the mark on the boring head (balancing code of the tool used, and the diameter to be bored). No chart needed.
Fine balancing is only possible for the smallest boring tools (∅ 6 to 33 mm).

Note: if using a larger 'Alu', or a 'MPA' tool from the - Axiabore™ Plus - onto the - Axialibrabore™ Plus - head, fine balancing is not possible and the balancing ring should be set in the head's pre-balancing position (depending on the operation to be performed, see Instructions chapter).
The maximum speed becomes the same as for the - Axiabore™ Plus.

FB 760 – Axiabore™ type heads, not balanceable

- ***With micrometric adjusting (increment 0,01 mm and vernier 2,5 µm, on the diameter)***
- ***Axiabore™ Plus – allows boring, as well as OD-overturning and face grooving***

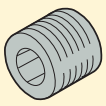
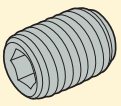
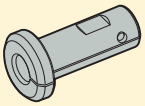
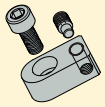


2. Assembly screw
3. Locking screw
4. Micrometric adjusting screw
5. Tool

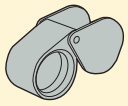
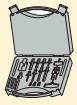
Machine side Graflex size	Workpiece side Capacity DCN-DCX ∅ mm	***	Ordering and Product No.	Designation	Dimensions in mm				Max operating speed**		****	* KG
					OAL	LF1	BD	DCB	Max. RPM**	Max. m/min**		
G2	0,3-8,0		**02462575**	**A76001**	41,0	25,0	25,0	6,0	30000	1500,0		0,1
G3	2,0-20,0		**02594930**	**A76002**	52,0	32,0	36,5	12,0	12000	1500,0		0,29
G5	6,0-108,0	***	**02594935**	**A76003**	75,0	45,0	54,0	16,0	8000	1000,0	****	0,82

For tools, see page(s) 65-67.*Without tool. **Maximum speed, whichever is reached first without exceeding either of them. ***Capacities - Axiabore™ Plus - head for boring 6 to 108 mm, OD-overturning 2 to 57 mm, face grooving 19 to 96 mm.
****Max 5000 RPM when using MPA.

Spare Parts

For head	Assembly screw	Key	Locking screw	Reduction bush	Tenon
					
A760 01	950A0406	H2.0-2D	19M4001A	05A7600604	90M21
A760 02	AU7601212	03M03C	19A71030	05A7601204	90M3A
A760 03	AU7601312	H04-4	19A71008125	–	90M5A

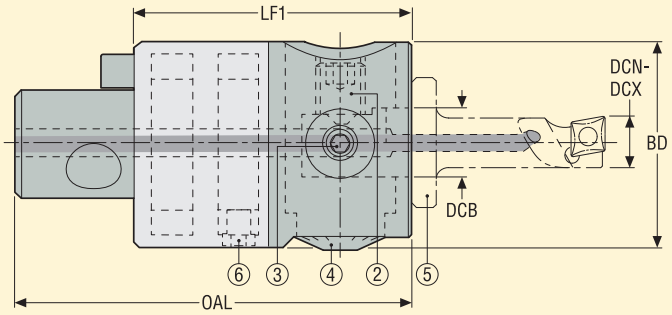
Accessories

Magnifying glass	Storage case
	
935L01	41B76001
–	42M06
–	42M07

Please check availability in current price and stock-list
Accessories not included in delivery.

FB 760 – Axiabore™ type heads, balanceable

- ***LibraOne built-in balancing system based on a single balancing setting ring***
- ***With micrometric adjusting (increment 0,01 mm and vernier 2,5 µm, on the diameter)***

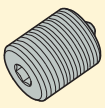
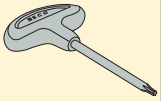
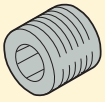
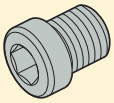
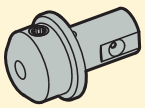
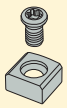


2. Assembly screw
3. Locking screw 1
4. Micrometric adjusting screw
5. Tool
6. Locking screw 2

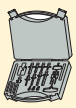
Machine side Graflex size	Workpiece side Capacity DCN-DCX ∅ mm	***	Ordering and Product No.	Designation	Dimensions in mm				Max operating speed**		KG*
					OAL	LF1	DCB	BD	Max. RPM**	Max. m/min**	
G3	2,0-20,0		**02594938**	**A76012**	70,0	50,0	12,0	36,5	24000	1500	0,39
G5	6,0-33,0	***	**02594943**	**A76013**	95,0	65,0	16,0	54,0	20000	1500	1,16

For tools, see page(s) 65-67.* Without tool.** Maximum speed, whichever is reached first without exceeding either of them.*** Capacities – Axialibrabore™ Plus - head, with balancing.

Spare Parts

For head	Assembly screw	Key	Locking screw 1	Locking screw 2	Reduction bush	Tenon
						
A760 12	AU7601212	03M03C	19A71030	AU7601218	05A7601204	90M3A
A760 13	AU7601312	H04-4	19A71008125	AU7601318	–	90M5A1

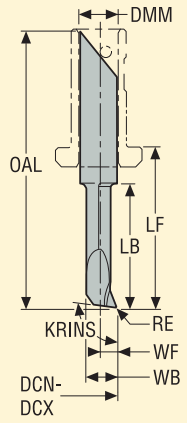
Accessories

Storage case

42M06
42M07

Please check availability in current price and stock-list
Accessories not included in delivery.

Boring tools, solid carbide, for FB 760 heads

- Cutting edge orientation ISO
- Coolant along the tool



Tool material*	For head	Capacity DCN-DCX ∅ mm***	Ordering and Product No.	Designation	KRINS°	Dimensions in mm							Recommended cutting data**		KG	Balancing code
						OAL	LB	LF	DMM	WB	WF	RE	a_p (mm)	f (mm)		
Solid carbide	FB 76001	0,3-0,6	**02462579**	**A761402**	98,0	30,7	1,2	15,5	4,0	0,25	0,1	0,0	0,02	0,01	0,01	–
	FB 76001	0,5-1,1	**02462581**	**A761412**	98,0	30,7	2,0	15,5	4,0	0,45	0,2	0,0	0,02	0,01	0,01	–
	FB 76001	1,0-2,1	**02462583**	**A761422**	98,0	30,7	5,0	15,5	4,0	0,95	0,45	0,1	0,03	0,02	0,01	–
	FB 76001/02/12	2,0-3,2	**02462584**	**A761432**	98,0	30,7	8,0	15,5	4,0	1,8	0,88	0,1	0,05	0,02	0,01	E13
	FB 76001/02/12	3,0-4,7	**02462586**	**A761442**	98,0	30,7	10,0	15,5	4,0	2,75	1,35	0,15	0,06	0,03	0,01	E14
	FB 76001/02/12	4,5-6,2	**02462587**	**A761452**	98,0	35,7	15,0	20,5	4,0	3,95	1,95	0,15	0,08	0,03	0,01	E15

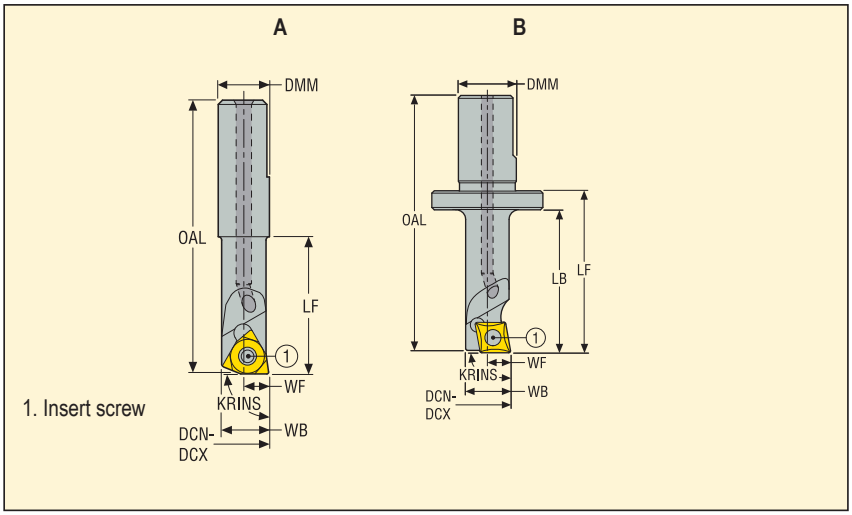
Please check availability in current price and stock-list

*These tools with shank dia 4 mm require the use of a reduction bush, delivered with the suitable heads and kits. **For cutting speeds, see page(s) 98-99

***+0,1 mm complementary capacity achievable.

Boring bars, insert type, for FB 760 heads

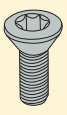
- *Cutting edge orientation ISO*
- *Through coolant*
- *Only two insert sizes for all tools*



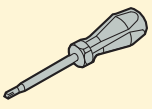
Tool material	For head	Capacity DCN-DCX ∅ mm**	Ordering and Product No.	Designation	KRINS°	Dimensions in mm						Suitable insert size	Design	KG	Balancing code
						OAL	LB	LF	DMM	WB	WF				
Steel, indexable insert type	FB 76001	6,0-8,0	**02462590**	**A762001**	90,0	31,7	0,0	16,0	6,0	5,5	2,9	WB..0301..	A	0,01	–
	FB 76002/12	6,0-8,0	**02594947**	**A762002**	90,0	39,7	16,0	20,0	12,0	5,5	2,9	WB..0301..	B	0,03	S21
	FB 76003/13	6,0-8,0	**02594967**	**A762003**	90,0	50,2	16,0	21,0	16,0	5,5	2,9	WB..0301..	B	0,07	S31
	FB 76002/12	8,0-10,0	**02594948**	**A763002**	90,0	45,7	22,0	26,0	12,0	7,4	3,9	WB..0301..	B	0,04	S22
	FB 76003/13	8,0-10,0	**02594968**	**A763003**	90,0	56,2	22,0	27,0	16,0	7,4	3,9	WB..0301..	B	0,08	S32
	FB 76002/12	10,0-13,0	**02594957**	**A765002**	90,0	53,5	30,0	34,0	12,0	9,35	4,8	CC..0602..	B	0,04	S23
	FB 76003/13	10,0-13,0	**02594969**	**A765003**	90,0	64,0	30,0	35,0	16,0	9,35	4,8	CC..0602..	B	0,08	S33
Carbide, indexable insert type	FB 76001	6,0-8,0	**02462591**	**A762201**	90,0	41,7	0,0	26,0	6,0	5,5	2,9	WB..0301..	A	0,02	–
	FB 76002/12	6,0-8,0	**02594958**	**A762202**	90,0	50,7	27,0	31,0	12,0	5,5	2,9	WB..0301..	B	0,06	E21
	FB 76003/13	6,0-8,0	**02594970**	**A762203**	90,0	61,2	27,0	32,0	16,0	5,5	2,9	WB..0301..	B	0,13	E31
	FB 76002/12	8,0-10,0	**02594961**	**A763202**	90,0	60,7	37,0	41,0	12,0	7,4	3,9	WB..0301..	B	0,07	E22
	FB 76003/13	8,0-10,0	**02594971**	**A763203**	90,0	71,2	37,0	42,0	16,0	7,4	3,9	WB..0301..	B	0,14	E32
	FB 76002/12	10,0-13,0	**02594962**	**A765202**	90,0	78,5	55,0	59,0	12,0	9,35	4,8	CC..0602..	B	0,09	E23
	FB 76003/13	10,0-13,0	**02594972**	**A765203**	90,0	89,0	55,0	60,0	16,0	9,35	4,8	CC..0602..	B	0,17	E33

**+0,2 mm complementary capacity achievable.

Spare Parts

For insert size	Insert screw
	
CC..0602..	C02504-T07P
WB..0301..	C02035-T06P

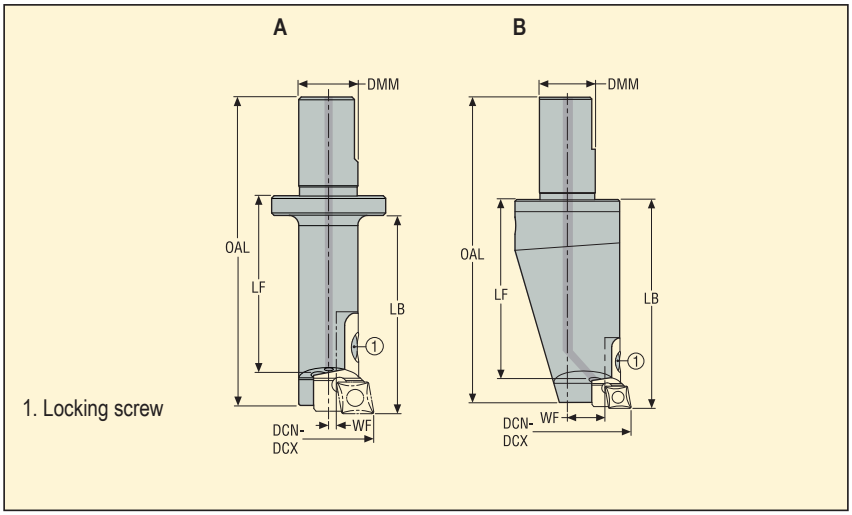
Accessories

Insert key

T07P-3
T06P-3

Please check availability in current price and stock-list
Accessories not included in delivery.

Boring shanks, for modular fine boring bars, for FB 760 heads

- *Several capacities achievable by interchangeable insert holders*
- *Shank types 'steel' for short bars, 'carbide' for long bars, 'aluminium' for large bars*
- *Through coolant*



1. Locking screw

Modular boring shank type	For head	***	Capacity DCN-DCX ∅ mm**	Ordering and Product No.	Designation	Dimensions in mm					Design	KG*
						OAL	LF	LB	DMM	WF		
Steel	A76002/12		13,0-20,0	**02594963**	**A760S20**	62,5	34,0	40,0	12,0	1,4	A	0,06
	A76003/13		13,0-18,0	**02594973**	**A760S30**	73,0	35,0	40,0	16,0	1,4	A	0,1
	A76003/13		18,0-33,0	**02594974**	**A760S31**	83,0	45,0	50,0	16,0	3,9	A	0,13
Carbide	A76002/12		13,0-20,0	**02594964**	**A760E20**	82,5	54,0	60,0	12,0	1,4	A	0,2
	A76003/13		13,0-18,0	**02594965**	**A760E30**	103,0	65,0	70,0	16,0	1,4	A	0,21
	A76003/13		18,0-33,0	**02594966**	**A760E31**	113,0	75,0	80,0	16,0	3,9	A	0,3
Aluminium	A76003	***	33,0-48,0	**02594977**	**A760A32**	88,0	50,0	60,0	16,0	11,5	B	0,14
	A76003	***	48,0-63,0	**02594978**	**A760A33**	108,0	70,0	80,0	16,0	19,0	B	0,34

*Without insert holder. **+0,2 mm complementary capacity achievable. ***When used on A760 13, no fine balancing possible.
Select the required shank and insert holder(s) combination(s) using the selection chart on page(s) 69

Spare Parts

For head	Locking screw
FB 76002/12	C04008-T15P
FB 76003/13	C04008-T15P
FB 76003	C04008-T15P

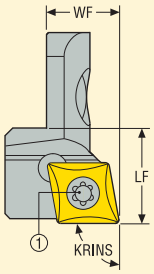
Accessories

Locking key
T15P-3
T15P-3
T15P-3

Please check availability in current price and stock-list
Accessories not included in delivery.

Insert holders, for modular fine boring bars, for FB 760 heads

- ***Single fitting size suitable for all boring (and OD-overturning) shanks***
- ***One insert size for all insert holders***



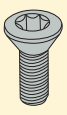
1. Insert screw

	Ordering and Product No.	Designation	Dimensions in mm		Suitable insert size	KRINS°	KG
			LF	WF*			
Insert holder	02594979	A765R1	10,0	4,95	CC..0602..	90,0	0,01
	02594983	A765R2	10,0	6,2	CC..0602..	90,0	0,01
	02594984	A765R3	10,0	7,45	CC..0602..	90,0	0,01
	02594987	A765R4	10,0	8,7	CC..0602..	90,0	0,01
	02594989	A765R5	10,0	9,97	CC..0602..	90,0	0,01
	02594990	A765R6	10,0	11,2	CC..0602..	90,0	0,01

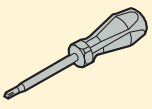
*WF when fitted with insert type CC..060204.

Select the required shank and insert holder(s) combination(s) using the selection chart on page(s) 69

Spare Parts

For insert size	Insert screw
	
CC...0602...	C02504-T07P

Accessories

Insert key

T07P-3

Please check availability in current price and stock-list
Accessories not included in delivery.

Selection chart: Boring tools and insert holders suitable for FB 760 heads

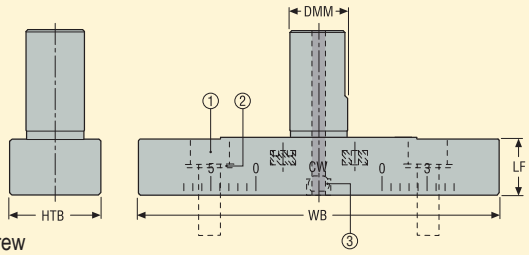
For head	Boring capacity DCN-DCX ∅ mm	Boring length LB mm	Designation		DMM (mm)	Suitable insert size	Tool type
			Boring tool	Insert holder			
A760 01	0,3-0,6	1,2	A761 402	–	4	–	Solid carbide
	0,5-1,1	2	A761 412	–	4	–	Solid carbide
	1-2,1	5	A761 422	–	4	–	Solid carbide
	2-3,2	8	A761 432	–	4	–	Solid carbide
	3-4,7	10	A761 442	–	4	–	Solid carbide
	4,5-6,2	15	A761 452	–	4	–	Solid carbide
	6-8	16	A762 001	–	6	WB..0301..	Steel, inserts type
	6-8	26	A762 201	–	6	WB..0301..	Carbide, inserts type
A760 02/ A760 12	2-3,2	8	A761 432	–	4	–	Solid carbide
	3-4,7	10	A761 442	–	4	–	Solid carbide
	4,5-6,2	15	A761 452	–	4	–	Solid carbide
	6-8	16	A762 002	–	12	WB..0301..	Steel, inserts type
	6-8	27	A762 202	–	12	WB..0301..	Carbide, inserts type
	8-10	22	A763 002	–	12	WB..0301..	Steel, inserts type
	8-10	37	A763 202	–	12	WB..0301..	Carbide, inserts type
	10-13	30	A765 002	–	12	CC..0602..	Steel, inserts type
	10-13	55	A765 202	–	12	CC..0602..	Carbide, inserts type
	13-15,5	40	A760 S20	A765 R1	12	CC..0602..	Steel shank with insert holder
	13-15,5	60	A760 E20	A765 R1	12	CC..0602..	Carbide shank with insert holder
	15,5-18	40	A760 S20	A765 R2	12	CC..0602..	Steel shank with insert holder
	15,5-18	60	A760 E20	A765 R2	12	CC..0602..	Carbide shank with insert holder
	18-20	40	A760 S20	A765 R3	12	CC..0602..	Steel shank with insert holder
	18-20	60	A760 E20	A765 R3	12	CC..0602..	Carbide shank with insert holder
A760 03/ A760 13	6-8	16	A762 003	–	16	WB..0301..	Steel, inserts type
	6-8	32	A762 203	–	16	WB..0301..	Carbide, inserts type
	8-10	22	A763 003	–	16	WB..0301..	Steel, inserts type
	8-10	37	A763 203	–	16	WB..0301..	Carbide, inserts type
	10-13	30	A765 003	–	16	CC..0602..	Steel, inserts type
	10-13	55	A765 203	–	16	CC..0602..	Carbide, inserts type
	13-15,5	40	A760 S30	A765 R1	16	CC..0602..	Steel shank with insert holder
	13-15,5	70	A760 E30	A765 R1	16	CC..0602..	Carbide shank with insert holder
	15,5-18	40	A760 S30	A765 R2	16	CC..0602..	Steel shank with insert holder
	15,5-18	70	A760 E30	A765 R2	16	CC..0602..	Carbide shank with insert holder
	18-20,5	50	A760 S31	A765 R1	16	CC..0602..	Steel shank with insert holder
	18-20,5	80	A760 E31	A765 R1	16	CC..0602..	Carbide shank with insert holder
	20,5-23	50	A760 S31	A765 R2	16	CC..0602..	Steel shank with insert holder
	20,5-23	80	A760 E31	A765 R2	16	CC..0602..	Carbide shank with insert holder
	23-25,5	50	A760 S31	A765 R3	16	CC..0602..	Steel shank with insert holder
	23-25,5	80	A760 E31	A765 R3	16	CC..0602..	Carbide shank with insert holder
	25,5-28	50	A760 S31	A765 R4	16	CC..0602..	Steel shank with insert holder
	25,5-28	80	A760 E31	A765 R4	16	CC..0602..	Carbide shank with insert holder
	28-30,5	50	A760 S31	A765 R5	16	CC..0602..	Steel shank with insert holder
	28-30,5	80	A760 E31	A765 R5	16	CC..0602..	Carbide shank with insert holder
	30,5-33	50	A760 S31	A765 R6	16	CC..0602..	Steel shank with insert holder
	30,5-33	80	A760 E31	A765 R6	16	CC..0602..	Carbide shank with insert holder
	33-35,5*	60	A760 A32	A765 R1	16	CC..0602..	Aluminium shank with insert holder
	35,5-38*	60	A760 A32	A765 R2	16	CC..0602..	Aluminium shank with insert holder
	38-40,5*	60	A760 A32	A765 R3	16	CC..0602..	Aluminium shank with insert holder
	40,5-43*	60	A760 A32	A765 R4	16	CC..0602..	Aluminium shank with insert holder
	43-45,5*	60	A760 A32	A765 R5	16	CC..0602..	Aluminium shank with insert holder
	45,5-48*	60	A760 A32	A765 R6	16	CC..0602..	Aluminium shank with insert holder
	48-50,5*	80	A760 A33	A765 R1	16	CC..0602..	Aluminium shank with insert holder
	50,5-53*	80	A760 A33	A765 R2	16	CC..0602..	Aluminium shank with insert holder
	53-55,5*	80	A760 A33	A765 R3	16	CC..0602..	Aluminium shank with insert holder
	55,5-58*	80	A760 A33	A765 R4	16	CC..0602..	Aluminium shank with insert holder
	58-60,5*	80	A760 A33	A765 R5	16	CC..0602..	Aluminium shank with insert holder
	60,5-63*	80	A760 A33	A765 R6	16	CC..0602..	Aluminium shank with insert holder

For larger diameters, see Multi-purpose adapter (MPA) section.

* When used on A760 13, no fine balancing possible.

Multi-purpose adapter (MPA), for FB 760 heads

- ***Suitable for - Axiabore™ Plus - A760 03 head only****
- ***Designed to hold a shank and a counterweight (for boring or OD-overturning) or two grooving tool holders (for face grooving)***
- ***Through coolant with an adjustable nozzle (3)***

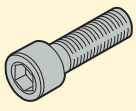


1. Assembly screw
2. Washer
3. Adjustable nozzle

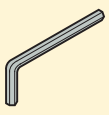
Capacity DCN-DCX ∅ mm			Ordering and Product No.	Designation	Dimensions in mm				KG
For boring ∅ (mm)	For OD-overturning ∅ (mm)	For grooving ∅ (mm)			HTB	DMM	WB	LF	
53,0-108,0	2,0-57,0	31,0-96,0	**02595014**	**BDA16BS25100**	25,0	16,0	100,0	16,0	0,28

*When used on an - Axialibrabore™ Plus - A760 13 head, no fine balancing possible, see page(s) 62.
Select the required components to realise boring, OD-overturning or grooving assemblies, using following page(s) 74-79.

Spare Parts

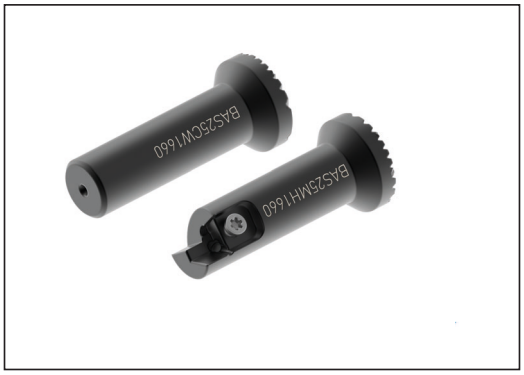
For	Assembly screw	Washer
		
BDA16BS25100	950D0618	940ZC06

Accessories

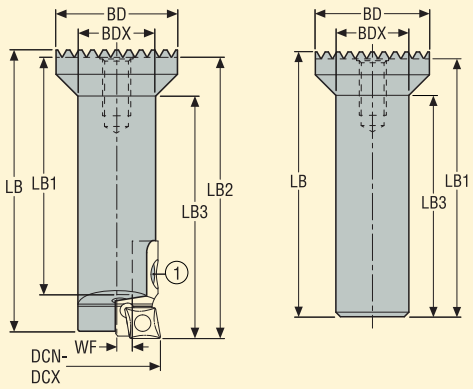
Clamp key

03HL05

Please check availability in current price and stock-list
Accessories not included in delivery.

Shank & counterweight, for boring or OD-overturning on a MPA, for FB 760 heads



- *For fitting on to the MPA*
- *Shank can be used for boring or OD-overturning*
- *Takes the same insert holders as the modular boring shanks*



1. Assembly screw

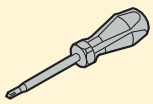
Type	Capacity DCN-DCX ∅ mm**		Ordering and Product No.	Designation	Dimensions in mm							Design	KG
	For boring ∅ (mm)	For OD-overturning ∅ (mm)			LB	LB1	LB2	LB3	WF	BDX	BD		
Shank*	53,0-108,0	2,0-57,0	**02595019**	**BAS25MH1660**	58,5	48,5	58,5	50,0	4,0	16,0	25,0	A	0,1
Counterweight	53,0-108,0	2,0-57,0	**02595016**	**BAS25CW1660**	58,0	56,6	–	48,5	–	16,0	25,0	B	0,11

*Insert holders to be ordered separately, see page(s) 68. **Capacities in boring and OD-overturning are related to the selected insert holder and the setting position of the shanks using the "Insert holders for boring or OD-overturning selection chart" on page(s) 74-79.

Spare Parts

For	Assembly screw
BAS25CW1660	–
BAS25MH1660	C04008-T15P

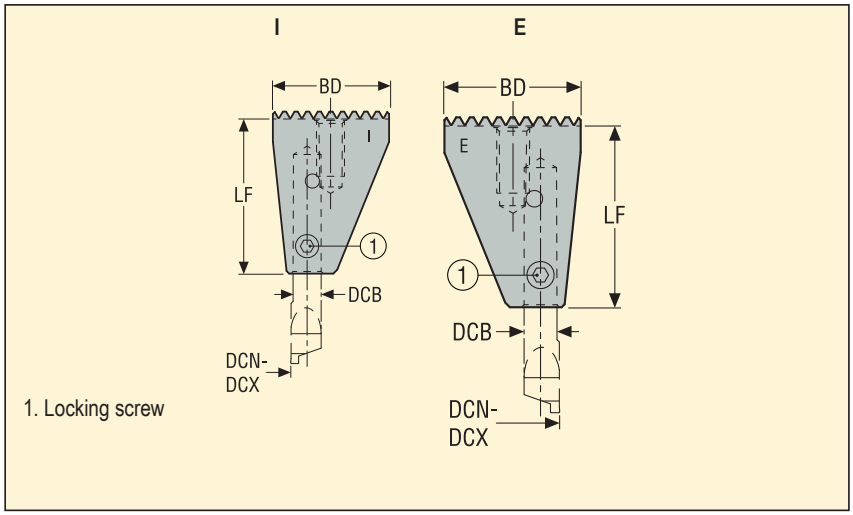
Accessories

Clamp key

–
T15P-3

Please check availability in current price and stock-list
Accessories not included in delivery.

Grooving tool holders, for face grooving on a MPA, for FB 760 heads

- *For fitting on to the MPA*
- *A grooving tool holder is used either to hold a grooving tool, or to act as a counterweight*



1. Locking screw

Type	Capacity DCN-DCX ∅ mm**	Ordering and Product No.	Designation	Dimensions in mm			Design	KG
				DCB	BD	LF		
Grooving tool holder I (internal)*	19,0-76,0	**02595021**	**BAS25FGI35**	6,0	25,0	34,0	I (Internal)	0,1
Grooving tool holder E (external)*	39,0-96,0	**02595020**	**BAS25FGE35**	6,0	25,0	34,0	E (External)	0,1

*Grooving tools to be ordered separately, see page(s) 73. *Capacity in grooving is related to the selected grooving tool, the setting position and orientation of the grooving tool holder, using the ' Grooving tool against spigot (or against bore) selection charts' see page(s) 76-79

Spare Parts

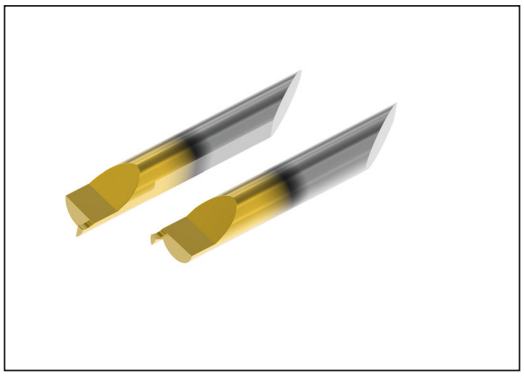
For	Locking screw
BAS25FGEI35	950L0607T15P
BAS25FGI35	950L0607T15P

Accessories

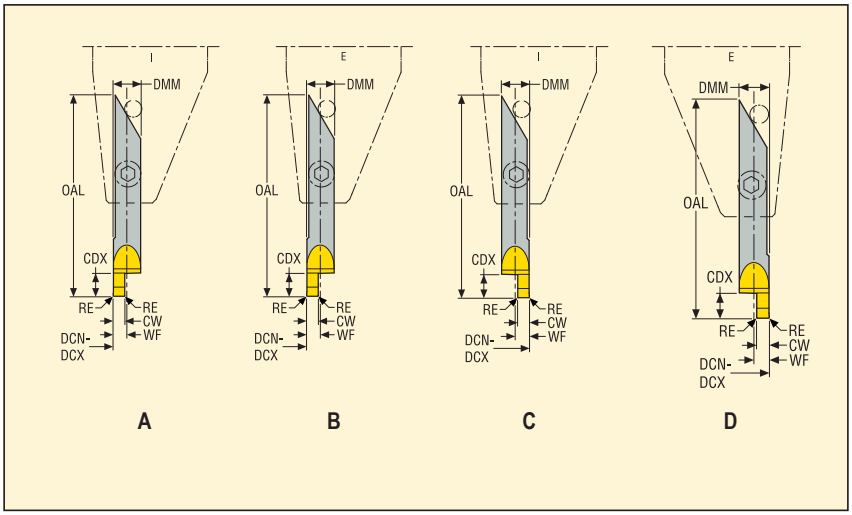
Locking key
T15P-3
T15P-3

Please check availability in current price and stock-list
Accessories not included in delivery.

Grooving tools, for FB 760 heads



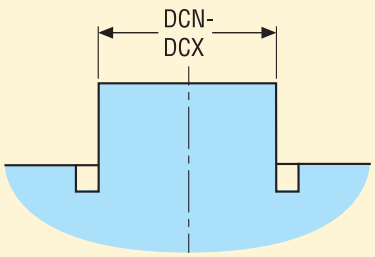
- *Can be used for either 'external' or 'internal' grooving tool holders, depending on capacity*



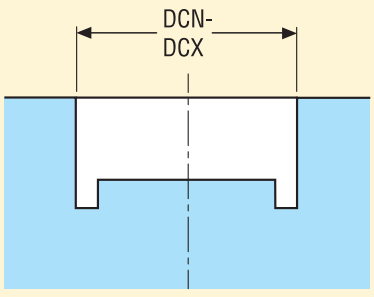
	Capacity DCN-DCX ∅ mm*				CW	Ordering and Product No.	Designation	Dimensions in mm				Groove max. depth CDX	KG
	Design A	Design B	Design C	Design D				OAL	WF	RE	DMM		
Grooving tool -against spigot-	19,0-64,0	39,0-84,0	–	–	1,0	02595028	AFG0629101582	42,0	2,95	0,15	6,0	2,0	0,07
	19,0-64,0	39,0-84,0	–	–	1,5	02595029	AFG0629151582	42,0	2,95	0,15	6,0	3,0	0,07
	19,0-64,0	39,0-84,0	–	–	2,0	02595031	AFG0629201582	42,0	2,95	0,15	6,0	5,0	0,07
	19,0-64,0	39,0-84,0	–	–	2,5	02595032	AFG0629251582	42,0	2,95	0,15	6,0	5,0	0,07
	19,0-64,0	39,0-84,0	–	–	3,0	02595033	AFG0629301582	42,0	2,95	0,15	6,0	6,0	0,07
Grooving tool -against bore-	–	–	31,0-76,0	51,0-96,0	1,0	02595022	AFG0629101581	42,0	2,95	0,15	6,0	2,0	0,02
	–	–	31,0-76,0	51,0-96,0	1,5	02595023	AFG0629151581	42,0	2,95	0,15	6,0	3,0	0,07
	–	–	31,0-76,0	51,0-96,0	2,0	02595024	AFG0629201581	42,0	2,95	0,15	6,0	4,0	0,07
	–	–	31,0-76,0	51,0-96,0	2,5	02595026	AFG0629251581	42,0	2,95	0,15	6,0	5,0	0,07
	–	–	31,0-76,0	51,0-96,0	3,0	02595027	AFG0629301581	42,0	2,95	0,15	6,0	6,0	0,07

*Capacity in grooving is related to the selected grooving tool, the setting position and orientation of the grooving tool holder, using the ' Grooving tool against spigot (or against bore) selection charts' see page(s) 76-79.

Grooving tool -against spigot-



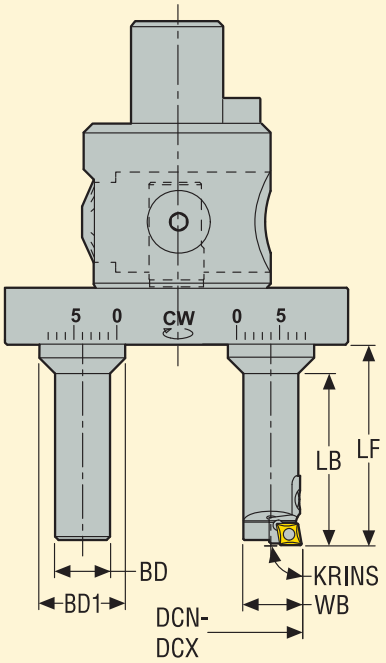
Grooving tool -against bore-



Please check availability in current price and stock-list

Selection chart: Boring tools and insert holders suitable for FB 760 heads

Select a suitable insert holder, and note the shank position on the MPA to obtain the required bore capacity.
Note: A OD-overturning assembly requires :
- an - Axiabore™ Plus - head (A760 03)
- a MPA (BDA16BS25100)
- a shank (BAS25MH1660)
- a counterweight (BAS25CW1660).
- an insert holder (A765R.) to be selected in the chart
- an insert

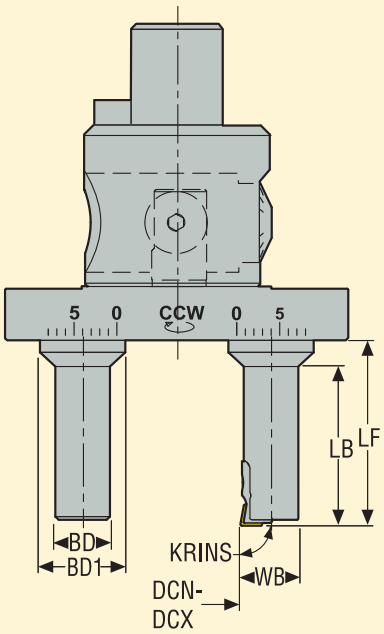


Capacity DCN-DCX ∅ mm	Insert holder Designation	Shank position	Dimensions in mm					Lead angle KRINS°	Suitable insert size
			BD	BD1	LF	LB	WB		
53-55,5	A765 R1	0	16	25	58,5	50	17	90°	CC..0602..
55,5-58	A765 R2	0	16	25	58,5	50	18,2	90°	CC..0602..
58-60,5	A765 R1	1	16	25	58,5	50	17	90°	CC..0602..
	A765 R3	0	16	25	58,5	50	19,5	90°	CC..0602..
60,5-63	A765 R2	1	16	25	58,5	50	18,2	90°	CC..0602..
	A765 R4	0	16	25	58,5	50	20,7	90°	CC..0602..
63-65,5	A765 R1	2	16	25	58,5	50	17	90°	CC..0602..
	A765 R3	1	16	25	58,5	50	19,5	90°	CC..0602..
	A765 R5	0	16	25	58,5	50	22	90°	CC..0602..
65,5-68	A765 R2	2	16	25	58,5	50	18,2	90°	CC..0602..
	A765 R4	1	16	25	58,5	50	20,7	90°	CC..0602..
	A765 R6	0	16	25	58,5	50	23,3	90°	CC..0602..
68-70,5	A765 R1	3	16	25	58,5	50	17	90°	CC..0602..
	A765 R3	2	16	25	58,5	50	19,5	90°	CC..0602..
	A765 R5	1	16	25	58,5	50	22	90°	CC..0602..
70,5-73	A765 R2	3	16	25	58,5	50	18,2	90°	CC..0602..
	A765 R4	2	16	25	58,5	50	20,7	90°	CC..0602..
	A765 R6	1	16	25	58,5	50	23,2	90°	CC..0602..
73-75,5	A765 R1	4	16	25	58,5	50	17	90°	CC..0602..
	A765 R3	3	16	25	58,5	50	19,5	90°	CC..0602..
	A765 R5	2	16	25	58,5	50	22	90°	CC..0602..
75,5-78	A765 R2	4	16	25	58,5	50	18,2	90°	CC..0602..
	A765 R4	3	16	25	58,5	50	20,7	90°	CC..0602..
	A765 R6	2	16	25	58,5	50	23,2	90°	CC..0602..
78-80,5	A765 R1	5	16	25	58,5	50	17	90°	CC..0602..
	A765 R3	4	16	25	58,5	50	19,5	90°	CC..0602..
	A765 R5	3	16	25	58,5	50	22	90°	CC..0602..
80,5-83	A765 R2	5	16	25	58,5	50	18,2	90°	CC..0602..
	A765 R4	4	16	25	58,5	50	20,7	90°	CC..0602..
	A765 R6	3	16	25	58,5	50	23,2	90°	CC..0602..
83-85,5	A765 R1	6	16	25	58,5	50	17	90°	CC..0602..
	A765 R3	5	16	25	58,5	50	19,5	90°	CC..0602..
	A765 R5	4	16	25	58,5	50	22	90°	CC..0602..
85,5-88	A765 R2	6	16	25	58,5	50	18,2	90°	CC..0602..
	A765 R4	5	16	25	58,5	50	20,7	90°	CC..0602..
	A765 R6	4	16	25	58,5	50	23,2	90°	CC..0602..
88-90,5	A765 R1	7	16	25	58,5	50	17	90°	CC..0602..
	A765 R3	6	16	25	58,5	50	19,5	90°	CC..0602..
	A765 R5	5	16	25	58,5	50	22	90°	CC..0602..
90,5-93	A765 R2	7	16	25	58,5	50	18,2	90°	CC..0602..
	A765 R4	6	16	25	58,5	50	20,7	90°	CC..0602..
	A765 R6	5	16	25	58,5	50	23,2	90°	CC..0602..
93-95,5	A765 R1	8	16	25	58,5	50	17	90°	CC..0602..
	A765 R3	7	16	25	58,5	50	19,5	90°	CC..0602..
	A765 R5	6	16	25	58,5	50	22	90°	CC..0602..
95,5-98	A765 R2	8	16	25	58,5	50	18,2	90°	CC..0602..
	A765 R4	7	16	25	58,5	50	20,7	90°	CC..0602..
	A765 R6	6	16	25	58,5	50	23,2	90°	CC..0602..
98-100,5	A765 R3	8	16	25	58,5	50	19,5	90°	CC..0602..
	A765 R5	7	16	25	58,5	50	22	90°	CC..0602..
100,5-103	A765 R4	8	16	25	58,5	50	20,7	90°	CC..0602..
	A765 R6	7	16	25	58,5	50	23,2	90°	CC..0602..
103-105,5	A765 R5	8	16	25	58,5	50	22	90°	CC..0602..
105,5-108	A765 R6	8	16	25	58,5	50	23,2	90°	CC..0602..

* +0,2 mm complementary capacity achievable.
Detailed description of insert holders, see page(s) 68.

Selection chart: Insert holders for OD-overturning with MPA, for FB 760 heads

Select a suitable insert holder, and note the shank position on the MPA to obtain the required bore capacity.
Note: A OD-overturning assembly requires :
- an - Axiabore™ Plus - head (A760 03)
- a MPA (BDA16BS25100)
- a shank (BAS25MH1660)
- a counterweight (BAS25CW1660).
- an insert holder (A765R.) to be selected in the chart
- an insert

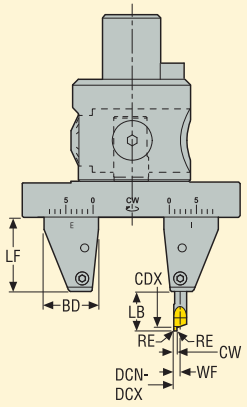


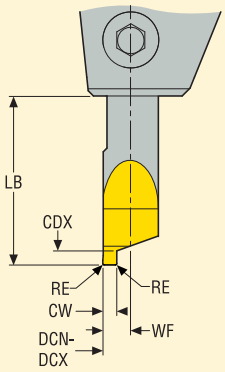
Capacity DCN-DCX ∅ mm	Insert holder Designation	Shank position	Dimensions in mm					Lead angle KRINS°	Suitable insert size
			BD	BD1	LF	LB	WB		
2-4,5	A765 R6	0	16	25	58,5	50	23,2	90°	CC..0602..
4,5-7	A765 R5	0	16	25	58,5	50	22	90°	CC..0602..
7-9,5	A765 R6	1	16	25	58,5	50	23,2	90°	CC..0602..
	A765 R4	0	16	25	58,5	50	20,7	90°	CC..0602..
9,5-12	A765 R5	1	16	25	58,5	50	22	90°	CC..0602..
	A765 R3	0	16	25	58,5	50	19,5	90°	CC..0602..
12-14,5	A765 R6	2	16	25	58,5	50	23,2	90°	CC..0602..
	A765 R4	1	16	25	58,5	50	20,7	90°	CC..0602..
	A765 R2	0	16	25	58,5	50	18,2	90°	CC..0602..
14,5-17	A765 R5	2	16	25	58,5	50	22	90°	CC..0602..
	A765 R3	1	16	25	58,5	50	19,5	90°	CC..0602..
	A765 R1	0	16	25	58,5	50	17	90°	CC..0602..
17-19,5	A765 R6	3	16	25	58,5	50	23,2	90°	CC..0602..
	A765 R4	2	16	25	58,5	50	20,7	90°	CC..0602..
	A765 R2	1	16	25	58,5	50	18,2	90°	CC..0602..
19,5-22	A765 R5	3	16	25	58,5	50	22	90°	CC..0602..
	A765 R3	2	16	25	58,5	50	19,5	90°	CC..0602..
	A765 R1	1	16	25	58,5	50	17	90°	CC..0602..
22-24,5	A765 R6	4	16	25	58,5	50	23,2	90°	CC..0602..
	A765 R4	3	16	25	58,5	50	20,7	90°	CC..0602..
	A765 R2	2	16	25	58,5	50	18,2	90°	CC..0602..
24,5-27	A765 R5	4	16	25	58,5	50	22	90°	CC..0602..
	A765 R3	3	16	25	58,5	50	19,5	90°	CC..0602..
	A765 R1	2	16	25	58,5	50	17	90°	CC..0602..
27-29,5	A765 R6	5	16	25	58,5	50	23,2	90°	CC..0602..
	A765 R4	4	16	25	58,5	50	20,7	90°	CC..0602..
	A765 R2	3	16	25	58,5	50	18,2	90°	CC..0602..
29,5-32	A765 R5	5	16	25	58,5	50	22	90°	CC..0602..
	A765 R3	4	16	25	58,5	50	19,5	90°	CC..0602..
	A765 R1	3	16	25	58,5	50	17	90°	CC..0602..
32-34,5	A765 R6	6	16	25	58,5	50	23,2	90°	CC..0602..
	A765 R4	5	16	25	58,5	50	20,7	90°	CC..0602..
	A765 R2	4	16	25	58,5	50	18,2	90°	CC..0602..
34,5-37	A765 R5	6	16	25	58,5	50	22	90°	CC..0602..
	A765 R3	5	16	25	58,5	50	19,5	90°	CC..0602..
	A765 R1	4	16	25	58,5	50	17	90°	CC..0602..
37-39,5	A765 R6	7	16	25	58,5	50	23,2	90°	CC..0602..
	A765 R4	6	16	25	58,5	50	20,7	90°	CC..0602..
	A765 R2	5	16	25	58,5	50	18,2	90°	CC..0602..
39,5-42	A765 R5	7	16	25	58,5	50	22	90°	CC..0602..
	A765 R3	6	16	25	58,5	50	19,5	90°	CC..0602..
	A765 R1	5	16	25	58,5	50	17	90°	CC..0602..
42-44,5	A765 R6	8	16	25	58,5	50	23,2	90°	CC..0602..
	A765 R4	7	16	25	58,5	50	20,7	90°	CC..0602..
	A765 R2	6	16	25	58,5	50	18,2	90°	CC..0602..
44,5-47	A765 R5	8	16	25	58,5	50	22	90°	CC..0602..
	A765 R3	7	16	25	58,5	50	19,5	90°	CC..0602..
	A765 R1	6	16	25	58,5	50	17	90°	CC..0602..
47-49,5	A765 R4	8	16	25	58,5	50	20,7	90°	CC..0602..
	A765 R2	7	16	25	58,5	50	18,2	90°	CC..0602..
49,5-52	A765 R3	8	16	25	58,5	50	19,5	90°	CC..0602..
	A765 R1	7	16	25	58,5	50	17	90°	CC..0602..
52-54,5	A765 R2	8	16	25	58,5	50	18,2	90°	CC..0602..
54,5-57	A765 R1	8	16	25	58,5	50	17	90°	CC..0602..

* +0,2 mm complementary capacity achievable.
Detailed description of insert holders, see page(s) 68 .

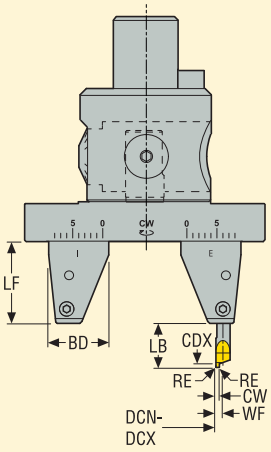
Selection chart: Grooving tool -against spigot- for grooving with MPA, for FB 760 heads

Assembly case 1

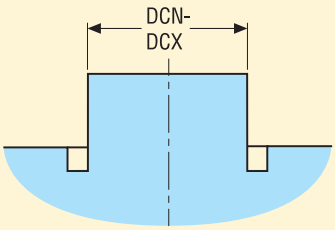




Assembly case 2



Select the suitable grooving tool, and note the grooving tool holder position on the MPA to obtain the required groove capacity.



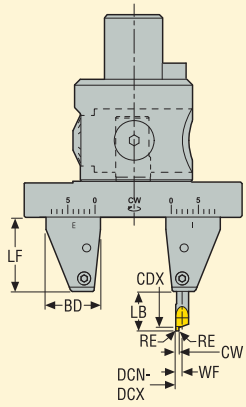
Note : An -against spigot- grooving assembly requires :
- an - Axiabore™ Plus - head (A760 03)
- a MPA (BDA16BS25100)
- an I (internal position) and an E (external position) grooving tool holder (BAS25FGI35 and BAS25FGE35) to either hold a grooving tool or act as a counterweight (see setting position in the chart)
- an -against spigot- grooving tool (AFG...82) to be selected from the chart, related to groove width and diameter.

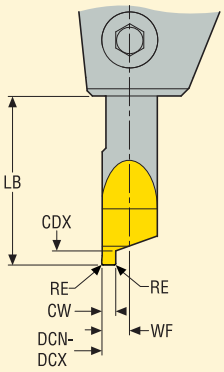
CW	Capacity DCN-DCX ∅ mm*	Against spigot grooving tool Designation	Grooving toolholder position**	Design	Dimensions in mm					Groove max. depth CDX
					BD	LF	LB	WF	RE	
1	19-24	AFG0629 10 1582	0-I	1	25	34	18	2,95	0,15	2
1	24-29		1-I	1	25	34	18	2,95	0,15	2
1	29-34		2-I	1	25	34	18	2,95	0,15	2
1	34-39		3-I	1	25	34	18	2,95	0,15	2
1	39-44		**0-E** / 4-I	1/2	25	34	18	2,95	0,15	2
1	44-49		**1-E** / 5-I	1/2	25	34	18	2,95	0,15	2
1	49-54		**2-E** / 6-I	1/2	25	34	18	2,95	0,15	2
1	54-59		**3-E** / 7-I	1/2	25	34	18	2,95	0,15	2
1	59-64		**4-E** / 8-I	1/2	25	34	18	2,95	0,15	2
1	64-69		5-E	2	25	34	18	2,95	0,15	2
1	69-74		6-E	2	25	34	18	2,95	0,15	2
1	74-79		7-E	2	25	34	18	2,95	0,15	2
1	79-84		8-E	2	25	34	18	2,95	0,15	2
1,5	19-24	AFG0629 15 1582	0-I	1	25	34	18	2,95	0,15	3
1,5	24-29		1-I	1	25	34	18	2,95	0,15	3
1,5	29-34		2-I	1	25	34	18	2,95	0,15	3
1,5	34-39		3-I	1	25	34	18	2,95	0,15	3
1,5	39-44		**0-E** / 4-I	1/2	25	34	18	2,95	0,15	3
1,5	44-49		**1-E** / 5-I	1/2	25	34	18	2,95	0,15	3
1,5	49-54		**2-E** / 6-I	1/2	25	34	18	2,95	0,15	3
1,5	54-59		**3-E** / 7-I	1/2	25	34	18	2,95	0,15	3
1,5	59-64		**4-E** / 8-I	1/2	25	34	18	2,95	0,15	3
1,5	64-69		5-E	2	25	34	18	2,95	0,15	3
1,5	69-74		6-E	2	25	34	18	2,95	0,15	3
1,5	74-79		7-E	2	25	34	18	2,95	0,15	3
1,5	79-84		8-E	2	25	34	18	2,95	0,15	3
2	19-24	AFG0629 20 1582	0-I	1	25	34	18	2,95	0,15	4
2	24-29		1-I	1	25	34	18	2,95	0,15	4
2	29-34		2-I	1	25	34	18	2,95	0,15	4
2	34-39		3-I	1	25	34	18	2,95	0,15	4
2	39-44		**0-E** / 4-I	1/2	25	34	18	2,95	0,15	4
2	44-49		**1-E** / 5-I	1/2	25	34	18	2,95	0,15	4
2	49-54		**2-E** / 6-I	1/2	25	34	18	2,95	0,15	4
2	54-59		**3-E** / 7-I	1/2	25	34	18	2,95	0,15	4
2	59-64		**4-E** / 8-I	1/2	25	34	18	2,95	0,15	4
2	64-69		5-E	2	25	34	18	2,95	0,15	4
2	69-74		6-E	2	25	34	18	2,95	0,15	4
2	74-79		7-E	2	25	34	18	2,95	0,15	4
2	79-84		8-E	2	25	34	18	2,95	0,15	4

* +0,2 mm complementary capacity achievable. ** Recommended values in bold.
Detailed description of the grooving tools, see page(s) 73.

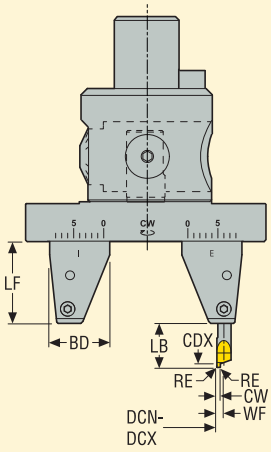
Selection chart: Grooving tool -against spigot- for grooving with MPA, for FB 760 heads (cont.)

Assembly case 1

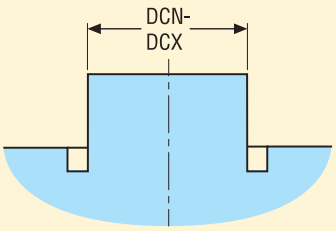




Assembly case 2



Select the suitable grooving tool, and note the grooving tool holder position on the MPA to obtain the required groove capacity.



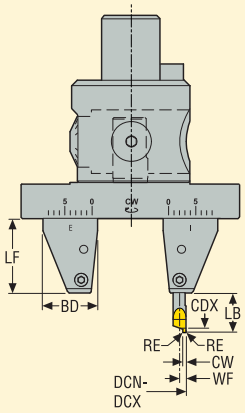
Note : An -against spigot- grooving assembly requires :
- an - Axiabore™ Plus - head (A760 03)
- a MPA (BDA16BS25100)
- an I (internal position) and an E (external position) grooving tool holder (BAS25FGI35 and BAS25FGE35) to either hold a grooving tool or act as a counterweight (see setting position in the chart)
- an -against spigot- grooving tool (AFG...82) to be selected from the chart, related to groove width and diameter.

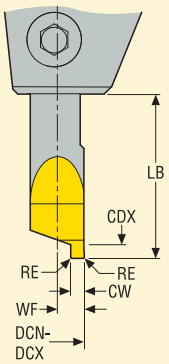
CW	Capacity DCN-DCX ∅ mm	Against spigot grooving tool Designation	Grooving toolholder position**	Design	Dimensions in mm					Groove max. depth CDX
					BD	LF	LB	WF	RE	
2,5	19-24	AFG0629 25 1582	0-I	1	25	34	18	2,95	0,15	5
2,5	24-29		1-I	1	25	34	18	2,95	0,15	5
2,5	29-34		2-I	1	25	34	18	2,95	0,15	5
2,5	34-39		3-I	1	25	34	18	2,95	0,15	5
2,5	39-44		**0-E** / 4-I	1/2	25	34	18	2,95	0,15	5
2,5	44-49		**1-E** / 5-I	1/2	25	34	18	2,95	0,15	5
2,5	49-54		**2-E** / 6-I	1/2	25	34	18	2,95	0,15	5
2,5	54-59		**3-E** / 7-I	1/2	25	34	18	2,95	0,15	5
2,5	59-64		**4-E** / 8-I	1/2	25	34	18	2,95	0,15	5
2,5	64-69		5-E	2	25	34	18	2,95	0,15	5
2,5	69-74		6-E	2	25	34	18	2,95	0,15	5
2,5	74-79		7-E	2	25	34	18	2,95	0,15	5
2,5	79-84		8-E	2	25	34	18	2,95	0,15	5
3	19-24	AFG0629 30 1582	0-I	1	25	34	18	2,95	0,15	6
3	24-29		1-I	1	25	34	18	2,95	0,15	6
3	29-34		2-I	1	25	34	18	2,95	0,15	6
3	34-39		3-I	1	25	34	18	2,95	0,15	6
3	39-44		**0-E** / 4-I	1/2	25	34	18	2,95	0,15	6
3	44-49		**1-E** / 5-I	1/2	25	34	18	2,95	0,15	6
3	49-54		**2-E** / 6-I	1/2	25	34	18	2,95	0,15	6
3	54-59		**3-E** / 7-I	1/2	25	34	18	2,95	0,15	6
3	59-64		**4-E** / 8-I	1/2	25	34	18	2,95	0,15	6
3	64-69		5-E	2	25	34	18	2,95	0,15	6
3	69-74		6-E	2	25	34	18	2,95	0,15	6
3	74-79		7-E	2	25	34	18	2,95	0,15	6
3	79-84		8-E	2	25	34	18	2,95	0,15	6

* +0,2 mm complementary capacity achievable. ** Recommended values in bold.
Detailed description of the grooving tools, see page(s) 73.

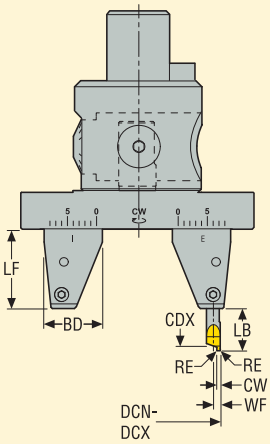
Selection chart: Grooving tool -against bore- for grooving with MPA, for FB 760 heads

Assembly case 3

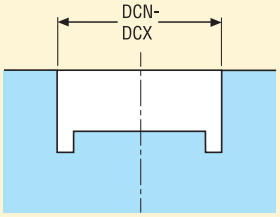




Assembly case 4



Select the suitable grooving tool, and note the grooving tool holder position on the MPA to obtain the required groove capacity.



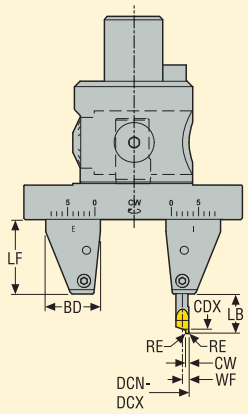
Note : An -against bore- grooving assembly requires :
- an - Axiabore™ Plus - head (A760 03)
- a MPA (BDA16BS25100)
- an I (internal position) and an E (external position) grooving tool holder (BAS25FGI35 and BAS25FGE35) to either hold a grooving tool or act as a counterweight (see setting position in the chart)
- an -against bore- grooving tool (AFG...82) to be selected from the chart, related to groove width and diameter.

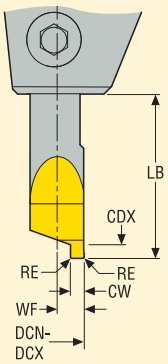
CW	Capacity DCN-DCX ∅ mm	Against bore grooving tool Designation	Grooving toolholder position**	Design	Dimensions in mm					Groove max. depth CDX
					BD	LF	LB	WF	RE	
1	31-36		0-I	3	25	34	18	2,95	0,15	2
1	36-41		1-I	3	25	34	18	2,95	0,15	2
1	41-46		2-I	3	25	34	18	2,95	0,15	2
1	46-51		3-I	3	25	34	18	2,95	0,15	2
1	51-56		**0-E** / 4-I	3/4	25	34	18	2,95	0,15	2
1	56-61		**1-E** / 5-I	3/4	25	34	18	2,95	0,15	2
1	61-66	**AFG0629 10 1581**	**2-E** / 6-I	3/4	25	34	18	2,95	0,15	2
1	66-71		**3-E** / 7-I	3/4	25	34	18	2,95	0,15	2
1	71-76		**4-E** / 8-I	3/4	25	34	18	2,95	0,15	2
1	76-81		5-E	4	25	34	18	2,95	0,15	2
1	81-86		6-E	4	25	34	18	2,95	0,15	2
1	86-91		7-E	4	25	34	18	2,95	0,15	2
1	91-96		8-E	4	25	34	18	2,95	0,15	2
1,5	31-36		0-I	3	25	34	18	2,95	0,15	3
1,5	39-41		1-I	3	25	34	18	2,95	0,15	3
1,5	41-46		2-I	3	25	34	18	2,95	0,15	3
1,5	46-51		3-I	3	25	34	18	2,95	0,15	3
1,5	51-56		**0-E** / 4-I	3/4	25	34	18	2,95	0,15	3
1,5	56-61		**1-E** / 5-I	3/4	25	34	18	2,95	0,15	3
1,5	61-66	**AFG0629 15 1581**	**2-E** / 6-I	3/4	25	34	18	2,95	0,15	3
1,5	66-71		**3-E** / 7-I	3/4	25	34	18	2,95	0,15	3
1,5	71-76		**4-E** / 8-I	3/4	25	34	18	2,95	0,15	3
1,5	76-81		5-E	4	25	34	18	2,95	0,15	3
1,5	81-86		6-E	4	25	34	18	2,95	0,15	3
1,5	86-91		7-E	4	25	34	18	2,95	0,15	3
1,5	91-96		8-E	4	25	34	18	2,95	0,15	3
2	31-36		0-I	3	25	34	18	2,95	0,15	4
2	39-41		1-I	3	25	34	18	2,95	0,15	4
2	41-46		2-I	3	25	34	18	2,95	0,15	4
2	46-51		3-I	3	25	34	18	2,95	0,15	4
2	51-56		**0-E** / 4-I	3/4	25	34	18	2,95	0,15	4
2	56-61		**1-E** / 5-I	3/4	25	34	18	2,95	0,15	4
2	61-66	**AFG0629 20 1581**	**2-E** / 6-I	3/4	25	34	18	2,95	0,15	4
2	66-71		**3-E** / 7-I	3/4	25	34	18	2,95	0,15	4
2	71-76		**4-E** / 8-I	3/4	25	34	18	2,95	0,15	4
2	76-81		5-E	4	25	34	18	2,95	0,15	4
2	81-86		6-E	4	25	34	18	2,95	0,15	4
2	86-91		7-E	4	25	34	18	2,95	0,15	4
2	91-96		8-E	4	25	34	18	2,95	0,15	4

* +0,2 mm complementary capacity achievable. ** Recommended values in bold.
Detailed description of the grooving tools, see page(s) 73.

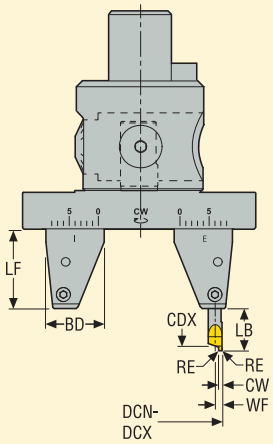
Selection chart: Grooving tool -against bore- for grooving with MPA, for FB 760 heads

Assembly case 3

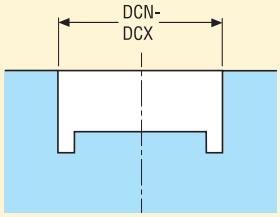




Assembly case 4



Select the suitable grooving tool, and note the grooving tool holder position on the MPA to obtain the required groove capacity.



Note : An -against bore- grooving assembly requires :
- an - Axiabore™ Plus - head (A760 03)
- a MPA (BDA16BS25100)
- an I (internal position) and an E (external position) grooving tool holder (BAS25FGI35 and BAS25FGE35) to either hold a grooving tool or act as a counterweight (see setting position in the chart)
- an -against bore- grooving tool (AFG...82) to be selected from the chart, related to groove width and diameter.

CW	Capacity DCN-DCX ∅ mm	Against bore grooving tool Designation	Grooving toolholder position**	Design	Dimensions in mm BD	LF	LB	WF	RE	Groove max. depth CDX
2,5	31-36	AFG0629 25 1581	0-I	3	25	34	18	2,95	0,15	5
2,5	36-41		1-I	3	25	34	18	2,95	0,15	5
2,5	41-46		2-I	3	25	34	18	2,95	0,15	5
2,5	46-51		3-I	3	25	34	18	2,95	0,15	5
2,5	51-56		**0-E** / 4-I	3/4	25	34	18	2,95	0,15	5
2,5	56-61		**1-E** / 5-I	3/4	25	34	18	2,95	0,15	5
2,5	61-66		**2-E** / 6-I	3/4	25	34	18	2,95	0,15	5
2,5	66-71		**3-E** / 7-I	3/4	25	34	18	2,95	0,15	5
2,5	71-76		**4-E** / 8-I	3/4	25	34	18	2,95	0,15	5
2,5	76-81		5-E	4	25	34	18	2,95	0,15	5
2,5	81-86		6-E	4	25	34	18	2,95	0,15	5
2,5	86-91		7-E	4	25	34	18	2,95	0,15	5
2,5	91-96		8-E	4	25	34	18	2,95	0,15	5
3	31-36	AFG0629 30 1581	0-I	3	25	34	18	2,95	0,15	6
3	39-41		1-I	3	25	34	18	2,95	0,15	6
3	41-46		2-I	3	25	34	18	2,95	0,15	6
3	46-51		3-I	3	25	34	18	2,95	0,15	6
3	51-56		**0-E** / 4-I	3/4	25	34	18	2,95	0,15	6
3	56-61		**1-E** / 5-I	3/4	25	34	18	2,95	0,15	6
3	61-66		**2-E** / 6-I	3/4	25	34	18	2,95	0,15	6
3	66-71		**3-E** / 7-I	3/4	25	34	18	2,95	0,15	6
3	71-76		**4-E** / 8-I	3/4	25	34	18	2,95	0,15	6
3	76-81		5-E	4	25	34	18	2,95	0,15	6
3	81-86		6-E	4	25	34	18	2,95	0,15	6
3	86-91		7-E	4	25	34	18	2,95	0,15	6
3	91-96		8-E	4	25	34	18	2,95	0,15	6

* +0,2 mm complementary capacity achievable. ** Recommended values in bold.
Detailed description of the grooving tools, see page(s) 73.

Instructions – Maximum speeds for Axiabore™ type heads

For further application details refer to the operating instructions supplied with the boring heads and with the GL bars.

Head	Capacity ⌧ mm	Max. RPM with tool (RPM)	Max. RPM with MPA (RPM)	Max. cutting speed v_c at min. Cap. (m/min)	Max. cutting speed v_c at max. Cap. (m/min)
Axiabore™ type with Graflex® connection					
A76001	0,3 – 8	30000	-	28*	754*
A76002	2 – 20	12000	-	75*	754*
A76003	6 – 108	8000**	5000	151*	1000***
A76012	2 – 20	24000**	-	151*	1500***
A76013	6 – 33	20000**	5000	377*	1500***
Axiabore™ type with Seco-Capto™ connection					
C3-391.0760-02	2-20	12000	-	75*	754*
C5-391.0760-03	6-108	8000**	5000	151*	1000**

Note: The maximum speeds are related to the boring head's mechanical design and balancing quality. Speeds inside these limits have to be chosen in regard to the other machining conditions, e.g. workpiece material, cutting edge (tools and inserts), tooling length, machine spindle. At speeds from approx. 8000 RPM and above, the holding arbors and intermediates should be fine balanced. Using balanceable heads and fine balanced holders improves the tool life and the boring performances even at lower speeds.

* Implied max. cutting speed with max. RPM.

** Not reachable with all tools, see ***.

*** Max. cutting speed not to be exceeded.

Troubleshooting

Problem	Possible cause	Solution
Poor tool life	Wrong insert grade	Change to more wear resistant grade
	Excessive cutting speed	Reduce cutting speed
	Excessive DOC	Decrease DOC
Chatter & Vibrations	Excessive cutting speed	Reduce cutting speed
	High L/D ratio	Shorten tool to increase stiffness
		Use stronger boring tool
		Use Steadyline bar
		Use carbide or heavy metal extensions
	Wrong insert	Reduce nose radius of insert
		Use ground geometry inserts
	Incorrect stock allowance	Change pre-hole diameter
Poor hole diameter tolerance & repeatability	Inaccurate tool changes	Worn and damaged tool shank: replace
		Clean spindle and tool shank
	Variation of stock allowance	Add semi-finishing boring step
	Low spindle stability	Use sharper ground geometry inserts
Poor roundness	Excessive boring tool imbalance	Check the spindle runout
		Change to LIBRAFLEX® boring head
		Check balance ring setting
		Reduce speed
	Excessive cutting forces	Check stock allowance and feed rate
	Insufficient workpiece clamping	Check for uniform workpiece clamping
	Workpiece non-symmetrical	Reduce cutting forces, change to ground insert
		Increase cutting speed, reduce feed
Poor positional tolerance	Original bore misaligned	Add a semi-finishing boring step
	Excessive DOC	Decrease DOC, make two passes
Poor surface finish	Wrong insert radius	Use larger insert radius
	Excessive feed rate	Reduce feed to be max. 30% of insert nose radius
	Poor chip evacuation	Apply through coolant
		Change insert to higher rake angle (HSS: please enquire)
		Check DOC
Tapered bore	Premature tool wear	Change to more wear resistant grade
		Modify cutting speed
		Increase coolant flow

Troubleshooting advice is also valid for the fine boring heads, radial type.


B 41
SECO
GRAFLEX

FB 780 Fine boring heads, radial types

9 precision boring heads with Graflex® machine side connection for fine boring ∅15 to 205 using radially fitted insert holders.

5 precision boring heads with Seco-Capto™ machine side connection for fine boring Ø39 to 205 mm."

Seco-Capto™ adapter and Graflex® head: ☒ 15-40 mm

Note: The minimum bore size of the smallest Seco-Capto™ fine boring head is ∅ 39 mm with the smallest available Seco-Capto™ C3 connection. For ∅ 15-40 mm use Graflex® boring heads with connection sizes G0 to G2 in conjunction with the appropriate Seco-Capto™/ Graflex® adaptor. This offers also boring length modularity when using additional Graflex® extensions.

Note: Features, Instructions (insert holder fitting, diameter setting, back boring instructions, troubleshooting, recommended machining conditions, maximum speeds), suitable insert holders and suitable inserts are similar for both types of FB 780 fine boring heads of similar boring capacity size, regardless of connection type.

FB 790 Balanceable fine boring heads, radial type

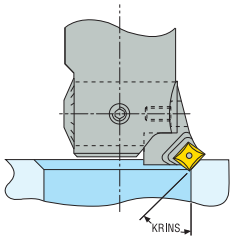
5 balanceable 'Libraflex®' boring heads with Graflex® machine side connection for fine boring ∅30 to 115 mm, at high speeds (up to 1500 m/ min), using radially fitted insert holders.
Balancing reduces spindle stress, cutting parameters can be optimized, better machining qualities are achieved even at conventional speeds.
Balancing is performed by setting both graduated rings in accordance with the diameter to be bored (no chart needed).

Features

Insert holders

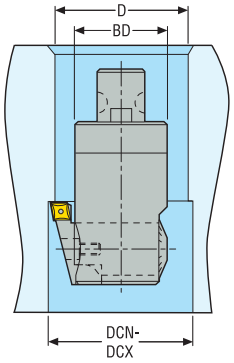
A radial type fine boring head is an assembly of a body (head) and an insert holder.

The wide range of fine boring, chamfering and back boring insert holders are suitable for FB 620, FB 780 and FB 790 fine boring heads, radial types.



Fine boring insert holders

FBIH 782: lead angle 90° for WB inserts
FBIH 724: lead angle 90° for TC inserts
FBIH 725: lead angle 90° for CC inserts
FBIH 726: lead angle 95° for CC inserts
Note: 95° lead angle insert holders should be used to avoid face contact when boring up a shoulder.

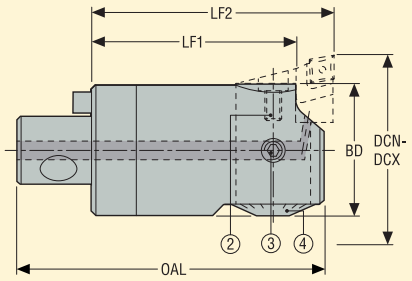


Chamfering insert holders, ⌀ 23 to 160 mm
FBIH 729: available with a 15°, 30° or 45° lead angle for CC inserts.
Libraflex® balancing can also be achieved when using chamfering insert holders.

Back-boring insert holders, ⌀ 26,5 to 164 mm
FBIH A789: lead angle 90° for WB and CC inserts..
Libraflex® balancing is not possible when using back-boring insert holders. In this case, the highest unbalance reduction is obtained when both balancing rings are set on their largest graduation.

FB 780 Graflex® – Fine boring heads, radial type

- *With micrometric adjusting (increment 0,01 mm and vernier 2,5 µm, on the diameter)*



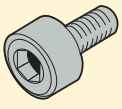
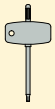
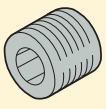
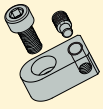
2. Assembly screw
3. Locking screw
4. Micrometric adjusting screw

Machine side Graflex size	Workpiece side Capacity DCN-DCX ∅ mm	Ordering and Product No.	Designation	Dimensions in mm				Insert holder size	KG*
				OAL	LF1	LF2	BD		
G0	15,0-18,5	**00056632**	**A78008**	44,0	27,5	35,0	14,0	09	0,1
G0	18,0-23,5	**00056633**	**A78009**	44,0	27,5	35,0	17,0	09	0,1
G1	23,0-31,0	**00072991**	**A78010**	51,5	32,5	40,0	21,5	10	0,11
G2	30,0-40,0	**00072992**	**A78020**	59,5	37,5	45,0	27,0	20	0,22
G3	39,0-51,0	**00072993**	**A78030**	82,0	54,5	65,0	35,0	30	0,5
G4	50,0-65,0	**00072995**	**A78040**	93,0	61,5	72,0	43,0	40	0,8
G5	64,0-86,0	**00072996**	**A78050**	109,0	71,5	82,0	54,0	50	1,49
G6	85,0-144,0	**00056551**	**A78060**	140,0	88,5	105,0	70,0	60/65	3,04
G7	114,0-205,0	**00056552**	**A78070**	160,0	98,5	115,0	95,0	70/75	6,3

Insert holders have to be ordered separately, see page(s) 87-89.

*Without insert holder

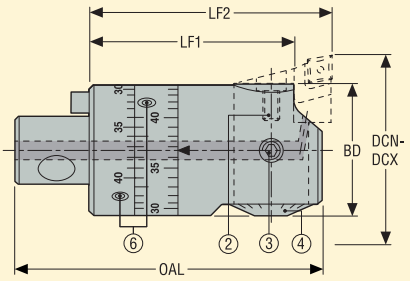
Spare Parts

For	Assembly screw	Key	Locking screw	Tenon
				
A78008	960D30050S	H2.0-2D	19A7100403	90M01
A78009	LBHF0306R	H2.0-2D	19A71000	90M0
A78010	19TB0305	H2.0-2D	19A71000	90M1
A78020	19TB0305	H2.0-2D	950L0406	90M2
A78030	19TB04075	03M03C	950L0608	90M3
A78040	19TB04075	03M03C	950L0612	90M4
A78050	950D0410	03M03C	950L0616	90M5
A78060	950D0612	H05-4	950L1016	90M6
A78070	950D0616	H05-4	950L1030	90M7

Please check availability in current price and stock-list.

FB 790 Graflex® – Libraflex® balanceable fine boring heads, radial type

- *With micrometric adjusting (increment 0,01 mm and vernier 2,5 µm, on the diameter)*
- *Balancing by setting both rings in accordance with the diameter to be bored*
- *For speeds v_c up to 1 495 m/min and more, see page(s) 90*



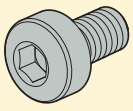
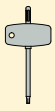
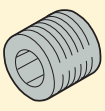
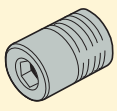
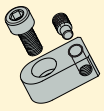
2. Assembly screw
3. Locking screw 1
4. Micrometric adjusting screw
6. Locking screw 2

Machine side Graflex size	Workpiece side Capacity DCN-DCX ⌧ mm	Ordering and Product No.	Designation	Dimensions in mm				Insert holder size	* KG
				OAL	LF1	LF2	BD		
G2	30,0-40,0	**00055932**	**A79020**	59,5	37,5	45,0	27,0	20	0,19
G3	39,0-51,0	**00056005**	**A79030**	82,0	54,5	65,0	35,0	30	0,45
G4	50,0-65,0	**00056006**	**A79040**	93,0	61,5	72,0	43,0	40	0,78
G5	64,0-86,0	**00056007**	**A79050**	109,0	71,5	82,0	54,0	50	1,42
G6	85,0-115,0	**00001451**	**A79060**	140,0	88,5	105,0	70,0	60	2,87

Insert holders have to be ordered separately, see page(s) 87-89.

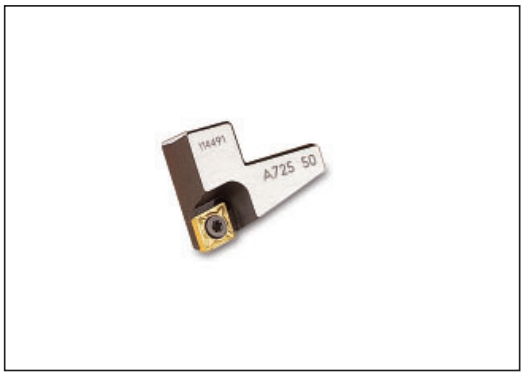
*Without insert holder

Spare Parts

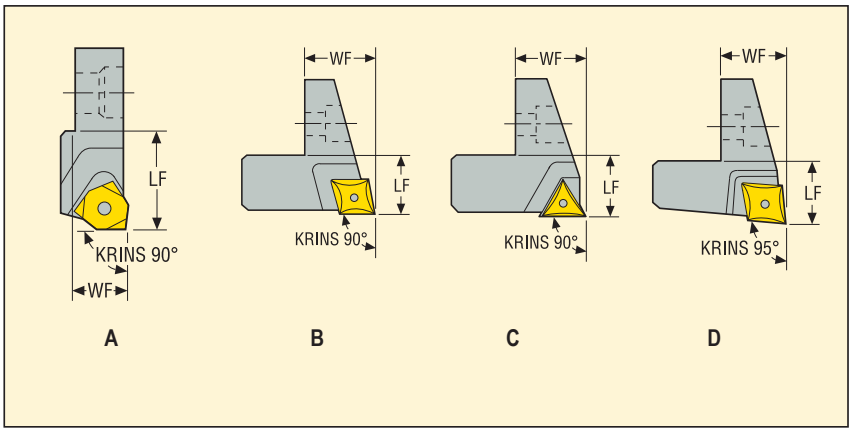
For head	Assembly screw	Key	Locking screw 1	Locking screw 2	Tenon
					
A790 20	19TB0305	H2.0-2D	950L0406	960D30045S	90M2
A790 30	19TB04075	03M03C	950L0608	AU7901030	90M3
A790 40	19TB04075	03M03C	950L0612	AU7901040	90M4
A790 50	950D0410	03M03C	950L0616	AU7901050	90M51
A790 60	950D0612	H05-4	950L1016	AU7901060	90M6

Please check availability in current price and stock-list.

Insert holders, for fine boring heads FB 620/ 780/ 790

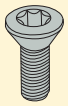


- *Suitable for radial boring heads FB 620/ 780/ 790*



Insert holders type	For boring head	**	Insert holder size	Capacity DCN-DCX ∅ mm	Ordering and Product No.	Designation	Dimensions in mm WF	Dimensions in mm LF	Suitable insert size	Design	KG
90° for WB inserts	EPB 78008 / EPB 78009		09	15.0-23.5	**00056634**	**A78209**	4,0	7,2	WB...0301...	A	0,01
90° for CC inserts	FB 78010		10	23.0-31.0	**00056580**	**A72510**	4,5	10,3	CC...0602...	B	0,01
	FB 78020 / FB 79020 / FB 62020		20	30.0-40.0/34.0-46.0	**00056581**	**A72520**	5,0	8,3	CC...0602...	B	0,02
	FB 78030 / FB 79030 / FB 62030		30	39.0-51.0/42.0-56.0	**00056582**	**A72530**	8,0	10,3	CC...0602...	B	0,02
	FB 78040 / FB 79040 / FB 62040		40	50.0-65.0/52.0-69.0	**00056583**	**A72540**	9,5	10,3	CC...0602...	B	0,02
	FB 78050 / FB 79050 / FB 62050		50	64.0-86.0	**00056584**	**A72550**	12,5	10,3	CC...0602...	B	0,02
	FB 7806AL / FB 62060		6A	85.0-115.0	**02689978**	**A7256A**	18,5	14,5	CC...09T3...	B	0,05
	FB 78060 / FB 79060 / FB 731S500		60	85.0-115.0	**00056585**	**A72560**	18,9	16,5	CC...09T3...	B	0,08
	FB 78060 / FB 79060 / FB 731S500	**	65	114.0-144.0	**00056587**	**A72565**	33,7	16,5	CC...09T3...	B	0,09
	FB 78070		70	114.0-160.0	**00056588**	**A72570**	18,9	16,5	CC...09T3...	B	0,09
	FB 78070		75	159.0-205.0	**00056589**	**A72575**	41,7	16,5	CC...09T3...	B	0,12
90° for TC inserts	FB 78030 / FB 79030 / FB 62030		30	39.0-51.0/42.0-56.0	**00056572**	**A72430**	7,9	10,3	TC...1102...	C	0,01
	FB 78040 / FB 79040 / FB 62040		40	50.0-65.0/52.0-69.0	**00056573**	**A72440**	9,4	10,3	TC...1102...	C	0,02
	FB 78050 / FB 79050 / FB 62050		50	64.0-86.0	**00056574**	**A72450**	12,4	10,3	TC...1102...	C	0,02
	FB 78060 / FB 79060 / FB 731S500		60	85.0-115.0	**00056575**	**A72460**	18,9	16,3	TC...1102...	C	0,08
	FB 78060 / FB 79060 / FB 731S500	**	65	114.0-144.0	**00056577**	**A72465**	33,7	16,5	TC...1102...	C	0,09
	FB 78070		70	114.0-160.0	**00056578**	**A72470**	18,9	16,3	TC...1102...	C	0,1
	FB 78070		75	159.0-205.0	**00056579**	**A72475**	41,7	16,5	TC...1102...	C	0,13
95° for CC inserts	FB 78010		10	23.0-31.0	**00056590**	**A72610**	4,5	10,3	CC...0602...	D	0,01
	FB 78020 / FB 79020 / FB 62020		20	30.0-40.0/34.0-46.0	**00056591**	**A72620**	5,0	8,3	CC...0602...	D	0,01
	FB 78030 / FB 79030 / FB 62030		30	39.0-51.0/42.0-56.0	**00056592**	**A72630**	8,0	10,3	CC...0602...	D	0,01
	FB 78040 / FB 79040/ FB 62040		40	50.0-65.0/52.0-69.0	**00056593**	**A72640**	9,5	10,3	CC...0602...	D	0,02
	FB 78050 / FB 79050 / FB 62050		50	64.0-86.0	**00056594**	**A72650**	12,5	10,3	CC...0602...	D	0,02
	FB 78060 / FB 79060 / A731S500		60	85.0-115.0	**00056595**	**A72660**	18,9	16,5	CC...09T3...	D	0,07
	FB 78060 / FB 79060 / FB 731S500	**	65	114.0-144.0	**00056597**	**A72665**	33,7	16,5	CC...09T3...	D	0,09
	FB 78070		70	114.0-160.0	**00056598**	**A72670**	18,9	16,5	CC...09T3...	D	0,09
	FB 78070		75	159.0-205.0	**00056599**	**A72675**	41,7	16,5	CC...09T3...	D	0,12

Spare Parts

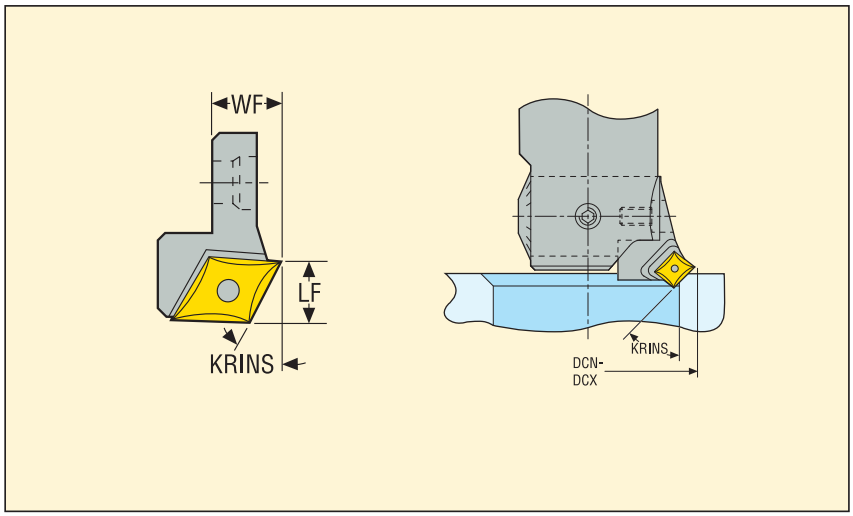
For insert size	Insert key	Insert screw
		
CC...0602...	T07P-3	C02504-T07P
CC...09T3...	T15P-3	C04008-T15P
TC...1102...	T07P-3	C02504-T07P
WB...0301...	T06P-2	C02035-T06P

Please check availability in current price and stock-list

**The precision balancing of FB A790 heads is not possible when using the large insert holders. For spare insert screws and spare insert keys, see page(s) 479

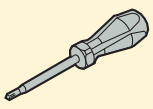
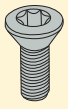
Chamfering insert holders, for fine boring heads FB 620/ 780/ 790

- *Suitable for radial boring heads FB 620/ 780/ 790*



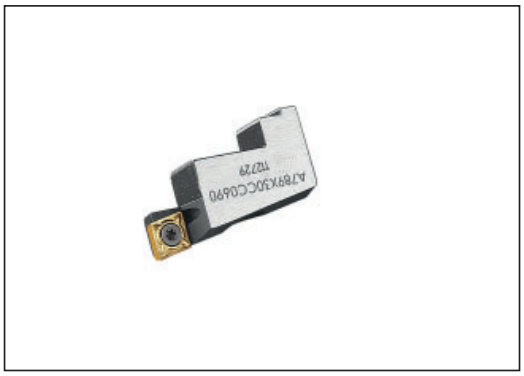
KRINS°	For boring head	Insert holder size	Capacity DCN-DCX ∅ mm	Ordering and Product No.	Designation	Dimensions in mm		Suitable insert size	KG
						WF	LF		
30,0	FB 78010	10	23,0-31,0	**00086885**	**A72910CC0630**	4,5	10,8	CC...0602...	0,01
	FB 78020 / EPB 79020/ GL32-0620-20	20	30,0-40,0/34,0-36,0	**00086888**	**A72920CC0630**	4,9	10,0	CC...0602...	0,01
	FB 78030 / EPB 79030 / FB 62030	30	39,0-51,0/42,0-56,0	**00086891**	**A72930CC0630**	8,1	10,5	CC...0602...	0,01
	FB 78040 / EPB 79040 / FB 62040	40	50,0-65,0/52,0-69,0	**00086894**	**A72940CC0630**	9,5	10,5	CC...0602...	0,02
	FB 78050 / FB 79050	50	64,0-86,0	**00086897**	**A72950CC0630**	12,5	10,5	CC...0602...	0,02
	FB 78060 / FB 79060 / A731S500	60	85,0-115,0	**00086900**	**A72960CC0930**	19,1	16,5	CC...09T3...	0,08
	FB 78070	70	114,0-160,0	**00086903**	**A72970CC0930**	18,8	16,4	CC...09T3...	0,09
45,0	FB 78010	10	23,0-31,0	**00086886**	**A72910CC0645**	4,5	11,5	CC...0602...	0,01
	FB 78020 / FB 79020 / FB 62020	20	30,0-40,0/34,0-46,0	**00086889**	**A72920CC0645**	5,0	10,0	CC...0602...	0,01
	FB 78030 / FB 79030 / FB 62030	30	39,0-51,0/42,0-56,0	**00086892**	**A72930CC0645**	8,1	10,5	CC...0602...	0,01
	FB 78040 / FB 79040 / FB 62040	40	50,0-65,0/52,0-69,0	**00086895**	**A72940CC0645**	9,5	10,5	CC...0602...	0,02
	FB 78050 / EPB 79050	50	64,0-86,0	**00086898**	**A72950CC0645**	12,4	10,3	CC...0602...	0,02
	FB 78060 / FB 79060 / A731S500	60	85,0-115,0	**00086901**	**A72960CC0945**	19,1	16,5	CC...09T3...	0,07
	FB 78070	70	114,0-160,0	**00086904**	**A72970CC0945**	18,8	16,4	CC...09T3...	0,09

Spare Parts

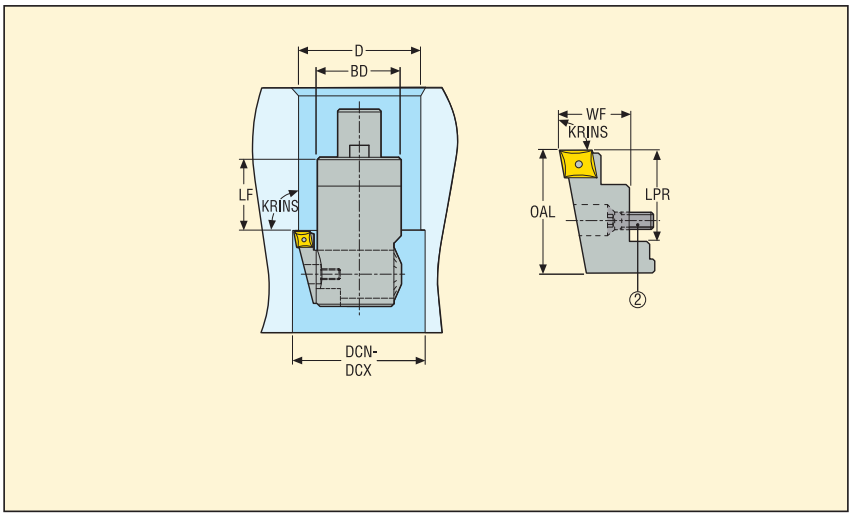
For insert size	Insert key	Insert screw
		
CC...0602...	T07P-3	C02504-T07P
CC...09T3...	T15P-3	C04008-T15P

Please check availability in current price and stock-list
For spare insert screws and spare insert keys, see page(s) 100

Fine back boring insert holders, for fine boring heads FB 620/ 780/ 790



- *Suitable for radial boring heads FB 620/ 780/ 790*
- **The precision balancing of FB 790 heads is not possible when using back-boring insert holders*



For head	Back-boring capacity DCN-DCX Ø mm	KRINS°	Ordering and Product No.	Designation	Dimensions in mm					Suitable insert size	KG
					LF	BD	OAL	LPR	WF		
A78010 // A78020 & A79020 // GL32-0620-20	39.5-47.5 // 46-56 // 49.7-61.7	90,0	**00086907**	**A789X10CC0690**	16.5 // 21.5 // 7.75	21.5 // 27 // 32	22,0	16,0	12,8	CC...0602...	0,01
A78030 & A79030 // A78040 & A79040 // A78050 & A79050 // GL40-0620-30 // GL50-0620-40	53-65 // 61-76 // 69-91 // 57.6-70.2 // 67.6-80.2	90,0	**00086910**	**A789X30CC0690**	32 // 39 // 49 // 1.75 // 2.75	35 // 43 // 54 // 40 // 50	30,0	23,0	15,0	CC...0602...	0,03
A78060 & A79060 // A731S500	89-119 // *	90,0	**00086909**	**A789X60CC0690**	50	70	50,0	38,5	21,0	CC...0602...	0,09
A78070	118-164	90,0	**00086911**	**A789X70CC0690**	60	95	50,0	38,5	21,0	CC...0602...	0,1

Spare Parts**

For	Insert screw	Key
A789X10CC0690	C02504-T07P	T07P-3
A789X30CC0690	C02504-T07P	T07P-3
A789X60CC0690	C02504-T07P	T07P-3
A789X70CC0690	C02504-T07P	T07P-3

Please check availability in current price and stock-list

For spare insert screws and spare insert keys, see page(s) 100 *The fine back boring insert holders delivery content includes a specific insert holder clamp screw, to be used instead the standard clamp screw delivered with the boring heads.

Recommended machining conditions

For further application details refer to the operating instructions supplied with the boring heads and with the GL bars.

Maximum speeds for fine boring heads, radial type

The maximum speeds shown in boring heads Product pages are related to the boring head's mechanical design and balancing quality.
Speeds inside these limits have to be chosen in regard to the other machining conditions, e.g. workpiece material, cutting edge (insert), tooling length, machine spindle.
By boring applications with Steadyline® bars, make sure not to overpass the max. RPM of the bars: See the Operating instructions supplied with the Steadyline® bars.
Below max. RPM are for boring heads equipped with boring insert holders or chamfering insert holders. When using back boring insert holders on holders on FB 620, FB 790 or FB 780 heads type heads, use max. rpm for A780.. type, similar size.

Head	Capacity ∅ mm	Max. RPM	Implied max cutting speed v_c at min. Cap.	Implied max cutting speed v_c at max. Cap.
FB 620 Fine boring heads, with GL and BA machine side connection, for Steadyline® vibration damping turning and boring bars				
GL32-0620-20	34 - 46	7000	748	1012
GL32-0620-30	42 - 56	5600	739	985
GL32-0620-40	52 - 69	4800	784	1040
BA060-FB620-50	66 - 88	4000	830	1105
BA080-FB620-60	86 - 116	3000	810	1093
FB 790 Fine boring heads, balanceable, with Graflex® connection				
A79020	30 - 40	16000	1508	2011
A79030	39 - 51	12250	1501	1963
A79040	50 - 65	10000	1571	2042
A79050	64 - 86	7500	1508	2026
A79060	85 - 115	5600	1495	2023
FB 780 Fine boring heads, with Graflex® connection				
A78008	15 - 18,5	16000	754	930
A78009	18 - 23,5	13000	735	960
A78010	23 - 31	10000	723	974
A78020	30 - 40	8000	754	1005
A78030	39 - 51	6000	735	961
A78040	50 - 65	5000	785	1021
A78050	64 - 86	3700	744	1000
A78060	85 - 115	2700	721	975
	114 - 144	2200	788	995
A78070	114 - 160	2000	716	1005
	159 - 205	1600	799	1030
FB 780 Fine boring heads with Seco-Capto™ connection				
C3-391.0780-30	39-51	6000	735	961
C4-391.0780-40	50-65	5000	785	1021
C5-391.0780-50	64-86	3700	744	1000
C6-391.0780-60	85-115	2700	721	975
	114-144	2200	788	995
C8-391.0780-70	114-160	2000	716	1005
	159-205	1600	799	1030

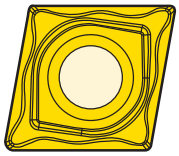
Note: The maximum speeds are related to the boring head's mechanical design and balancing quality. Speeds inside these limits have to be chosen in regard to the other machining conditions, e.g. workpiece material, cutting edge (insert), tooling length, machine spindle. At speeds from approx. 8000 RPM and above, the basic holders and the extensions/reducers should be fine balanced.

A selection of inserts for boring

This is a selection of inserts from the total Seco range, which are particularly suitable for boring. The selected insert sizes are those suitable for the range of boring heads.
Inserts for rough boring have high toughness to guarantee high metal removal and positive geometries to minimise spindle torque requirement.
Inserts for fine boring have positive geometries and sharp edge wear resistant grades for accurate control of the bore tolerance, geometry and surface finish.

Code key, examples

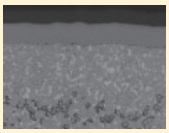
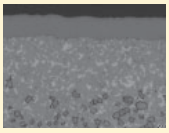
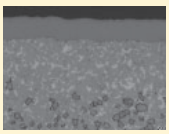
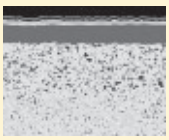
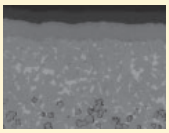
CCMT120408	-	F2	TP3501
CCGT09T304	-	03	G3
Size (ISO designation)		Seco geometry	Seco grade



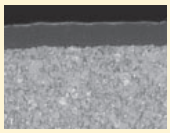
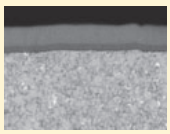
Insert grades for boring – ISO workpiece material classification

		P						M					K					N				S				H			
		P01	P10	P20	P30	P40	P50	M01	M10	M20	M30	M40	K01	K10	K20	K30	K40	N01	N10	N20	N30	S01	S10	S20	S30	H01	H10	H20	H30
CVD	TP1501																												
	TP2501																												
	TP3501																												
	TP200																												
	TP40																												
	TM4000																												
	TK1501																												
	TK0501																												
	TH1500																												
	25																												
PVD	TS2000																												
	TH1000																												
	CP500																												
	26																												
Uncoated	KX																												
	HX																												
	03																												
Cermet	TP1020																												
	TP1030																												
	51																												
PCBN	CBN10																												
	CBN010																												
	CBN200																												
	81																												
	CBN060K																												
PCD	PCD20																												
	91																												

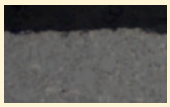
CVD coated grades recommended for boring

	**TP1501**	**Duratomic®** technology coated grade. Highly heat and wear resistant grade extremely well suited for productive general turning of steels and a useful backup in other material groups. Ti(C,N) + Al_2O_3 + ...
	**TP2501**	**Duratomic®** technology coated grade. Designed with high wear resistance and edge strength applicable in a wide range of turning applications in steels as well as many stainless steels and cast irons. Ti(C,N) + Al_2O_3 + ...
	**TP3501**	TP3501 is intended for boring operations where the primary demand is toughness and reliability in machining steels and stainless steels. Ti(C,N) + Al_2O_3 DURATOMIC®
	**TP200**	TP200 is a universal grade with high versatility. The grade is intended for a wide range of turning applications in both steel and stainless steel and is also a good choice for cast iron. Ti(C,N) + Al_2O_3 + TiN
	**TP40**	TP40 is the basic grade for turning in the P40 range. Very tough grade for demanding operations on steel castings and forging, and on all types of stainless steel. TiC/Ti(C,N) + TiN
	**TK0501**	**Duratomic®** technology coated grade. A extremely wear resistant optimized grade choice for machining of grey cast iron and easier ductile cast irons. Ti(C,N) + Al_2O_3 + Used Edge Detection (Chrome)
	**TK1501**	**Duratomic®** technology coated grade. A highly wear resistant grade for cast irons in general as well as in steels. The grade is particularly capable in machining of ductile (nodular) cast irons also in more demanding setups and interrupted cuts. Ti(C,N) + Al_2O_3 + Used Edge Detection (Chrome)
	**TM4000**	TM4000 is intended for machining of stainless steel. The wear resistance together with the superior edge toughness make the grade the first choice in stainless steel applications. Ti(C,N) + Al_2O_3 DURATOMIC®
	**TH1500**	DURATOMIC® technology coated grade. An extremetly hard super micrograin grade intended for machining of partly hardened steels and provide an alternative for cast iron finishing. Ti(C,N) + Al_2O_3
	**25 (EPB)**	Universal grade. The grade is intended for a wide range of boring applications in steel, stainless steel and cast iron. Good combination of wear resistance and toughness. Ti (C, N) + Al2O3.

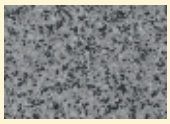
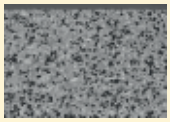
PVD coated grades recommended for boring

	**TS2000**	Hard micrograin principally intended for finishing operations in superalloys and titanium alloys. Also performs well in finishing operations on stainless steel. (Ti,Al)N + TiN
	**CP500 & 26 (EPB)**	A very tough micrograin intended for finishing and medium roughing of stainless steel. Can handle intermittent cutting operations very well. CP500 is also an alternative for aluminium alloys. (Ti,Al)N + TiN
	**TH1000**	Very hard supermicrograin grade intended for partly hardened steel components as well as generally workpiece materials such as superalloys and due to remarkable edge toughness it also provides high performance in interupted cuts and hard-surface removal.

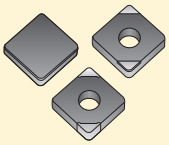
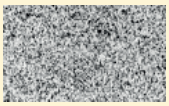
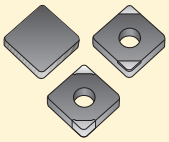
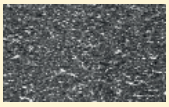
Uncoated grades recommended for boring

	**KX & 03 (EPB)**	Micrograin intended for machining aluminum and other non-ferrous materials.
	**HX**	Universal uncoated grade intended for machining of cast iron and hardened steels useful also in non-ferrous materials.

Cermet recommended for boring

	**TP1020**	Cermet with very high wear resistance intended for highest surface finish requirements with predictability and control in steel and stainless steel.
	**TP1030**	PVD-coated Cermet with very high wear resistance intended for high surface finish and productivity requirements with predictability in steel and stainless steel mainly. Ti-Al-Si-N nanolaminate coating.
	**51 (EPB)**	Cermet with very high wear resistance. Intended for finishing operations on steels, in which strict demands are made on surface finish.

CBN and PCD grades recommended for boring

	**CBN010**	Format: Solid, full-face brazed layer and brazed tips (single and double sided). Composition: 50% CBN content grade with an average grain size of 2 µm and a TiC ceramic binder. Coating: No coating.
	**CBN10 & 81 (EPB)**	CBN, Cubic boron nitride grade, for light continuous to moderate interrupted cuts. Intended for fine boring in hardened steel and in superalloys.
	**CBN060K**	Solid, brazed tips (single and double sided) or sintered layer First choice for continuous to moderate interrupted cuts in hardened steel (a_p < 0,5 mm). New (Ti,Si,Al)N PVD coating developed for high speed machining. New unique superalloy binder.
	**CBN200**	CBN, Cubic boron nitride grade, for finishing of pearlitic cast iron, and sintered iron.
	**PCD20 & 91 (EPB)**	PCD, polycrystalline diamond, for boring in aluminium and Al-alloys, copper, brass, bronze and synthetic materials.

Inserts, recommended for rough boring, with cutting data

Designation	Uncoated Ground flank and pressed chipbreaker			Coated Pressed chipbreaker							Coated Ground flank direct chipbreaker, left hand cutting	Max depth of cut a_p (mm)	Feed per tooth Fz (mm/tooth)
	KX	HX	03D3	TP2501	TP3501	TP40	TM4000	25C4	TP200	TK1501	CP500		
CPGT050204			02434654					02434652				2	0,08-0,2
CCMT060204-F1				02960857	03095430	00008505	02566087		74066010	03062942	00096854	2	0,1-0,22
CCMT060204-F2		74011732				74018652	02566088		74068123			2	0,1-0,22
CCGT060204L-UX											02497631	2	0,1-0,22
CCGT060204F-AL	00015710											2	0,1-0,22
CCMT060204-M3				02960858	03095431					03062944		2	0,1-0,22
CCMT09T308-F1				02960861	03095443	00008518	02566095		74065997	03063857	00096858	2,5	0,1-0,3
CCMT09T308-MF2				02956309	03095446		02754823				02754822	2,5	0,1-0,3
CCGT09T304L-UX											02497640	2,5	0,1-0,3
CCGT09T308F-AL	00015754											2,5	0,1-0,3
CCMT120408-F1				02960854	03095449					03062626		4	0,15-0,4
CCMT120408-MF2				02956311	03095452							4	0,15-0,4
CCGT120408L-UX											02610062	4	0,15-0,4
CCGT120408F-AL	00015790											5	0,15-0,4
SCMT060204-M3				02960423	03096621							2,5	0,1-0,22
SCMT09T308-F1				02960396	03096625				74069789	03062629	00099708	2,5	0,1-0,3
SCMT09T308-MF2				02956318	03096627						02755042	2,5	0,1-0,3
SCMT120408-F1				02960397	03096630						00099804	4	0,15-0,4
SCMT120408-M3				02960429	03096631					03063990		4	0,15-0,4
TCMT16T308-F1				02960408	03096643	74004572	02566147		74066002		00091357	5	0,15-0,4
TCMT16T308-MF2				02956323	03096645						02755046	5	0,15-0,4
TCGT16T308F-AL	00015875											4	0,15-0,4
CCMT160508-F2							02566098		00018067			7	0,2-0,5
CCMT160512-F2							02566099		00018082			7	0,2-0,5
SCMT150512-F2						74007348						7	0,2-0,5
TCMT220408-F2									74068150			7	0,2-0,5

For recommended cutting speeds, see pages 477-478.
Please check availability in current price and stock-list.

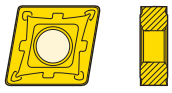
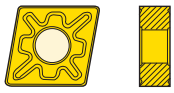
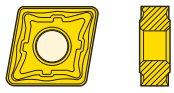
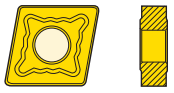
CPGT 	CCMT-F1 	CCMT-F2 	CCMT-M3 	CCMT-MF2 	CCGT-UX 
CCGT-AL 	SCMT-M3 	SCMT-F1 	SCMT-MF2 	SCMT-F2 	TCMT-F1 
TCMT-F2 	TCGT-AL 	TCMT-MF2 			

CN.. inserts, recommended for rough boring (double sided), with cutting data

Designation	Coated Pressed chipbreaker				Max depth of cut a_p (mm)	Feed f (mm/rev)
	TP3501	TP40	TM4000	TP200		
CNMG120408-M3	03093856			74037351	4,5	0,25-0,35
CNMG120408-MF3	03094138	74030598	02839059	00024328	4,5	0,25-0,35
CNMG120408-MF4	03094139		02566104		4,5	0,25-0,35
CNMG120408-MF5					4,5	0,25-,035
CNMG120408-MF1			02566103		4,5	0,25-0,35
CNMG120408-MR7	03094140	74017309	02593726		4,5	0,25-0,35

For recommended cutting speeds, see pages 477-478.

Please check availability in current price and stock-list

CNMG-M3	CNMG-MF3	CNMG-MF4	CNMG-MF5	CNMG-MF1	CNMG-MR7
					

WARNING:
When using CN.. inserts it is important to use the recommended inserts and cutting data. Using other inserts and incorrect cutting data could result in high cutting stresses and machine/workpiece damage.

Inserts, recommended for fine boring, with cutting data

Designation	Coated							Cermet			CBN				PCD		Depth of cut a_p (mm)	Feed f (mm/rev)
	TP1501	TS2000	TK1501	CP500	26G6	TH1000	TH1500	51G1	TP1020	TP1030	CBN010	CBN060K	CBN200	81B1	PCD20	91J3		
CCGT0602005-F1				02430287													0,01-0,3	0,03-0,15
CCGT060201-F1				02430307														
CCGT060204L-UX				02497631													2	0,1-0,22
CCMT060202-F1	02960383	02614299		00096853					02754786	02754435							0,01-0,3	0,03-0,15
CCMT060204-F1	02960856	02615873	03062942	00096854		02825858	02825859		02754791	02754792							2	0,1-0,22
CCMW060202F-L1															00089760		0,01-0,3	0,03-0,15
CCMW060204F-L1															00005684			
CCGW060202S-01020-LF													02464698					
CCGW060204S-01020-LF											02916281		02464699					
CCGW060204E-L1-B											02843086	02776337	02649599					
CCGT09T301-F1				02430311														
CCGT09T304L-UX				02497640													2,5	0,1-0,3
CCMT09T302-F1	02960837			00096856					02754805	02754806							0,01-0,3	0,03-0,15
CCMT09T304-F1	02960844	02615874	03063856	00096857		02731806	02731808		02754811	02754812								
CCMT09T308-F1	02960853	02615876	03063857	00096858		02731807	02731809			02754821							2,5	0,1-0,3
CCMW09T304F-L1															00005686		0,01-0,3	0,03-0,15
CCMW09T308F-L1															00095357			
CCGW09T304E-L1-B											02843126	02776338	02649607					
CCGW09T308E-L1-B											02937148		02649608					
CCGW09T304S-01020-LF											02916282		02464702					
CCGW09T308S-01020-LF													02464703					
TCGT110201-F1				02430376														
TCMT110202-F1				02430419														
TCMT110204-F1	02960401			02430421														
TCMT110208-F1	02960403			00098986														
TCGW110204E-L1-C											02848657	02776346						
TCGW110208E-L1-C											02848792							
TCGW110204S-01020-LF													02464742					
TCGW110208S-01020-LF													02464744					
TCMW110204F-L1															00005689			

For recommended cutting speeds, see pages 477-478.
Please check availability in current price and stock-list

CCGT	CCGT-UX	CCMT-F1/CCGT-F1	CCMW/CCGW-L1-B	CCGW-LF
				
TCGT	TCGT-F1	TCGW-L1-C	TCGW-LF	TCMW/TCGW-L1-C
				
TCMT-F1	WBGT	WBGW		
				

Recommended cutting speeds for boring (related to workpiece material and insert grade)

SMG	v_c											
	KX & HX	03	TP40	TM4000	TP1501	TP2501	TP3501	TK0501	TK1501	TH1000	TH1500	CP500
P1			60-180		60-350	60-250	60-230					80-200
P2			60-180		60-350	60-250	60-230					80-200
P3			60-180		60-350	60-250	60-230					80-200
P4			60-180		60-350	60-250	60-230					80-200
P5			60-150		60-300	60-250	60-230					80-200
P6			60-140		60-300	60-230	60-200					80-180
P7			60-140		60-300	60-230	60-200					80-160
P8			60-120		60-250	60-230	60-200					80-130
P11			60-120		60-300	60-250	60-200					80-180
M1			60-130	60-180	100-200	60-200	60-200					60-160
M2			60-130	60-180	100-200	60-200	60-200					60-160
M3			60-120	60-170	100-180	60-200	60-200					60-150
M4			60-110	60-160	100-180	60-190	60-190					60-150
M5			60-110	60-150	100-180	60-180	60-180					60-150
K1			60-140		100-250		60-180	60-230	60-230			60-160
K2			60-140		100-250		60-180	60-230	60-230			60-160
K3			60-140		100-250		60-180	60-230	60-230			60-160
K4			60-140		100-250		60-180	60-200	60-200			60-160
K5			60-140		100-250		60-180	60-200	60-200			60-160
K6			60-130		100-250		60-180	60-200	60-200			60-160
K7			60-130		100-250		60-180	60-200	60-200			60-160
N1	150-800	150-800										150-800
N2	150-800	150-800										150-800
N3	150-500	150-500										150-500
N11	150-400	150-400										150-400
S1	20-50	20-50										20-50
S2	20-50	20-50										20-50
S3	20-50	20-50										20-50
S11	20-50	20-50										20-50
S12	20-50	20-50										20-50
S13	20-50	20-50										20-50
H3										50-150	50-150	
H5										50-140	50-140	
H7										50-150	50-150	
H8										30-130	30-130	
H11										30-120	30-120	
H12										30-120	30-120	
H21												
H31												

SMG = Seco material group
v_c= m/min
All cutting data are start values

Recommended cutting speeds for boring (related to workpiece material and insert grade)

SMG	v_c												
	26	25	TS2000	TP1020	TP1030	51	CBN10/ CBN010	81	CBN200	82	PCD20	91	Axiabore
P1	80-200	60-180		100-350	100-350	100-350							80-250
P2	80-200	60-180		100-350	100-350	100-350							80-250
P3	80-200	60-180		100-350	100-350	100-350							80-250
P4	80-200	60-180		100-350	100-350	100-350							80-250
P5	80-200	60-180		100-350	100-350	100-350							70-230
P6	80-180	60-160		100-300	100-300	100-300							70-230
P7	80-160	60-160		100-250	100-250	100-250							70-230
P8	80-130	60-130		100-250	100-250	100-250							70-200
P11	80-180	60-150		100-300	100-300	100-300							70-200
M1	60-160	60-140	60-200	80-200	80-200	80-200							60-200
M2	60-160	60-140	60-200	80-200	80-200	80-200							60-200
M3	60-150	60-130	60-200	80-200	80-200	80-200							60-180
M4	60-150	60-120	60-180	80-180	80-180	80-180							60-170
M5	60-150	60-120	60-180	80-180	80-180	80-180							60-170
K1	60-160	60-160		100-250	100-250	100-250			300-1000	300-1000			60-150
K2	60-160	60-160		100-250	100-250	100-250			300-1000	300-1000			60-150
K3	60-160	60-160		100-250	100-250	100-250			300-1000	300-1000			60-150
K4	60-160	60-160		100-250	100-250	100-250			300-1000	300-1000			60-130
K5	60-160	60-160		100-250	100-250	100-250							50-100
K6	60-160	60-160		100-180	100-180	100-180							50-100
K7	60-160	60-160		100-180	100-180	100-180							50-100
N1	150-800										300-1500	300-1500	200-800
N2	150-800										300-1500	300-1500	200-800
N3	150-500										200-800	200-800	200-800
N11	150-400										180-800	180-800	200-800
S1	20-50		20-80										20-60
S2	20-50		20-80										20-60
S3	20-50		20-80										60-50
S11	20-50		20-80										20-50
S12	20-50		20-80										20-50
S13	20-50		20-80										20-50
H3							80-180	80-180					
H5							80-200	80-200					
H7							80-150	80-150					
H8							80-150	80-150					
H11													
H12													
H21													
H31													

SMG = Seco material group
v_c= m/min
All cutting data are start values

Insert locking keys and screws of all boring insert holders, tools and cartridges

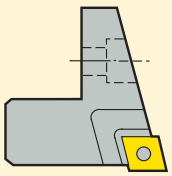
Specific clamp spare parts for CN.. inserts are shown in the CN.. type insert holders product page. Insert clamp spare parts for insert holders EPB 610 are shown in the insert holders for heads EPB 610 page 408.
Reminder: Spare parts are part of the original delivery content of insert holders, tools or cartridges.
Accessories are not included in the delivery content, to be ordered separately.

		Accessories		Spare Parts	
		Torx driver for insert locking screw*		Insert locking screw	
For rough boring insert holders	For insert size	Designation	Torx Plus	Designation	Torx Plus
	CP...0502	T07P-3	07	C02245-T07P	07
	CC...0602	T07P-3	07	C02504-T07P	07
	CC...09T3	T15P-3	15	C04008-T15P	15
	CC...1204	T15P-3	15	C05012-T15P	15
	CC...1605	T15P-3	15	C05012-T15P	15
	SC...0502	T07P-3	07	C02245-T07P	07
	SC...0602	T07P-3	07	C02504-T07P	07
	SC...09T3	T15P-3	15	C04008-T15P	15
	SC...1204	T15P-3	15	C05012-T15P	15
	SC...1505	T15P-3	15	C05012-T15P	15

* One Torx driver is delivered with each rough boring head.

		Accessories		Spare Parts	
		Torx driver for insert locking screw*		Insert locking screw	
For Axiabore™ type tool	For insert size	Designation	Torx Plus	Designation	Torx Plus
	WB...0301...	T06P-3	06	C02035-T06P	06
	CC...0602...	T07P-3	07	C02504-T07P	07
	–	T15P-3	15	C04008-T15P	15

Spare parts for insert holders

		Spare Parts			
		Insert key		Insert screw	
					
For fine boring insert holders, chamfering insert holders and back boring insert holders	For insert size		Torx Plus		Torx Plus
	WB...0301...	T06P-2	06	C02035-T06P	06
	CC...0602...	T07P-3	07	C02504-T07P	07
	CC...09T3...	T15P-3	15	C04008-T15P	15
	TC...1102...	T07P-3	07	C02504-T07P	07

		Accessories		Spare Parts	
		Torx driver for insert locking screw*		Insert locking screw	
For cartridges	For insert size	Designation	Torx Plus	Designation	Torx Plus
	CC...16...	T15P-2	15	C05012-T15P	15
	SC...15...	T15P-2	15	C05012-T15P	15
	TC...16...	T15P-2	15	C03509-T15P	15
	TC...22...	T15P-2	15	C05012-T15P	15

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