

## Catalog R24.1

# Adjustable Reamers



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## Experience

## Performance

## Quality

**HUNGER** - a company with experience - specializing in manufacturing precision tools for over 100 years - and offering the most comprehensive range of adjustable reamers.

Years ago, **HUNGER** pioneered precision adjustable reamers which have been further developed and refined into today's high performance tools.

The qualities of **HUNGER** tools are derived from close control of the materials and the manufacturing processes and the experience **HUNGER** has gained from over 100 years of precision tool manufacturing.

**HUNGER** adjustable reamers have been tested and approved by leading companies and are used worldwide for high performance work.







Today's demanding tolerances and finishes require **HUNGER** tools.

You can rely on **HUNGER**.



**HUNGER** also manufactures an extensive range of valve and valve seat refacing tools and machines for servicing the valves and valve seats of automotive engines and large marine and stationary diesel engines.

Please contact us for more information.

<p><b>Adjustable Reamers Type D</b> for simple reaming jobs</p>		<p>Pages <b>4 - 6</b></p>
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**Application Range**

The standard reamer for repair and assembly jobs.

**Description**

Right-hand cutting reamer with expanding blades.

Due to the unique Hunger relief grinding process the blades have a progressively increasing clearance angle giving a softer cutting action.

From size D 12 the front adjusting nut is marked with a circumferential scale.

One graduation on the scale corresponds to a 0,01 mm change in cutting diameter.

**Dimensions and Weight**



Size	Size Range		Length Overall L1 mm	Length Blades L2 mm	Size of Square a mm	No.of Blades	Weight kg
	mm	Inches					
D 6,4	6,4 - 7,2	1/4 - 9/32	111	32	3	4	0,010
D 7,2	7,2 - 8	9/32 - 5/16	111	32	3,5	4	0,020
D 8	8 - 9	5/16 - 23/64	111	32	4,3	5	0,026
D 9	9 - 10	23/64 - 25/64	115	32	4,3	5	0,030
D 10	10 - 11	25/64 - 7/16	120	35	4,9	5	0,048
D 11	11 - 12	7/16 - 15/32	125	35	6,2	5	0,060
D 12	12 - 13,5	15/32 - 17/32	130	42	6,2	5	0,075
D 13,5	13,5 - 15,5	17/32 - 39/64	145	50	7	5	0,090
D 15,5	15,5 - 18	39/64 - 45/64	165	60	8	5	0,160
D 18	18 - 21	45/64 - 53/64	180	65	9	5	0,220
D 21	21 - 24	53/64 - 15/16	190	70	10	5	0,330
D 24	24 - 27,5	15/16 - 1 5/64	205	75	11	5	0,445
D 27,5	27,5 - 31,5	1 5/64 - 1 15/64	225	80	12	6	0,620
D 31,5	31,5 - 37	1 15/64 - 1 29/64	240	90	14,5	6	0,890
D 37	37 - 45	1 29/64 - 1 49/64	285	100	16	6	1,450
D 45	45 - 55	1 49/64 - 2 5/32	320	109	20	6	2,360
D 55	55 - 65	2 5/32 - 2 9/16	350	120	24	8	3,720
D 65	65 - 80	2 9/16 - 3 5/32	460	145	29	10	9,200
D 80	80 - 95	3 5/32 - 3 47/64	490	150	32	10	13,500
D 95	95 - 110	3 47/64 - 4 21/64	490	150	36	10	17,400

**Packaging**

From size D 6,4 to D 45 individually in clear plastic tubes.

Size D 55 in a plastic net.

From size D 65 to D 95 individually in wooden boxes.

**Sets of Reamers Type D in Wooden Cases**

Symbol	Size Range		Numbe of Reamers	Weight kg
	mm	Inches		
DAN	8 - 31,5	21/64 - 1 15/64	11	3,300
DEN	8 - 45	21/64 - 1 49/64	13	6,000

### Description

The blades of the standard reamers type D are made of a special steel with excellent cutting properties.

Hunger has also manufactured a "hard chrome" version where the blades are coated with hard chrome. The hard chrome coating has a low coefficient of friction.

Hard chrome reamers are therefore particularly suitable for reaming materials with a high wear tendency and materials that tend to stick and form built-up edges.

Hard chrome reamers and hard chrome replacement blades have been discontinued.  
Remaining stocks of almost all reamer sizes are available while stocks last.

As an advanced alternative to the hard chrome version, Hunger now offers the DLC version where the blades are coated with diamond-like carbon (DLC).

See page 6 for details.

### Ordering Information

Size	Size Range mm	Reamers		Replacement Blades*		Spare Nuts Part No.
		Special Steel Part No.	Hard Chrome Part No.	Special Steel Part No.	Hard Chrome Part No.	
<b>D 6,4</b>	6,4 - 7,2	100 06 000	101 06 000	100 06 400	101 06 400	140 02 510
<b>D 7,2</b>	7,2 - 8	100 07 000	101 07 000	100 06 400	101 06 400	140 04 510
<b>D 8</b>	8 - 9	100 08 000	101 08 000	100 08 400	101 08 400	100 08 510
<b>D 9</b>	9 - 10	100 09 000	101 09 000	100 09 400	101 09 400	100 09 510
<b>D 10</b>	10 - 11	100 10 000	101 10 000	100 10 400	101 10 400	100 10 510
<b>D 11</b>	11 - 12	100 11 000	101 11 000	100 11 400	101 11 400	100 11 510
<b>D 12</b>	12 - 13,5	100 12 000	101 12 000	100 12 400	101 12 400	100 12 520
<b>D 13,5</b>	13,5 - 15,5	100 13 000	101 13 000	100 13 400	101 13 400	100 13 520
<b>D 15,5</b>	15,5 - 18	100 15 000	101 15 000	100 15 400	101 15 400	100 15 520
<b>D 18</b>	18 - 21	100 18 000	101 18 000	100 18 400	101 18 400	100 18 520
<b>D 21</b>	21 - 24	100 21 000	101 21 000	100 21 400	101 21 400	100 21 520
<b>D 24</b>	24 - 27,5	100 24 000	101 24 000	100 24 400	101 24 400	100 24 520
<b>D 27,5</b>	27,5 - 31,5	100 27 000	101 27 000	100 27 400	101 27 400	100 27 520
<b>D 31,5</b>	31,5 - 37	100 31 000	101 31 000	100 31 400	101 31 400	100 31 520
<b>D 37</b>	37 - 45	100 37 000	101 37 000	100 37 400	101 37 400	100 37 520
<b>D 45</b>	45 - 55	100 45 000	101 45 000	100 45 400	101 45 400	100 45 520
<b>D 55</b>	55 - 65	100 55 000	101 55 000	100 55 400	101 55 400	100 55 520
<b>D 65</b>	65 - 80	100 65 000	101 65 000	100 65 400	101 65 400	100 65 520
<b>D 80</b>	80 - 95	100 80 000	101 80 000	100 80 400	101 80 400	100 80 520
<b>D 95</b>	95 - 110	100 95 000	101 95 000	100 95 400	101 95 400	100 95 520

\*Replacement blades are supplied in matched sets.

### Sets of Reamers Type D in Storage Cases

Symbol	Size Range mm	Special Steel Part No.	Hard Chrome Part No.
<b>DAN</b>	8 - 31,5	100 00 100	101 00 100
<b>DEN</b>	8 - 45	100 00 200	101 00 200



### Description

The blades of the reamers type D version DLC are coated with a diamond-like hard material layer, which is applied by a complex PVD process.

The DLC coating is characterized by extreme hardness, wear resistance and smoothness (very low friction). At the same time, the sharpness of the cutting edges is maintained because the DLC coating is extremely thin.

The DLC version of the reamers type is therefore ideal for reaming aluminum alloys, titanium alloys, copper alloys (bronze and brass) as well as materials with a high wear effect and materials that tend to stick and form built-up edges.

### Ordering Information

Size	Size Range mm	Reamers DLC Part No.	Replacement Blades* DLC Part No.	Sprare Nuts Part No.
<b>D 6,4</b>	6,4 - 7,2	108 06 000	108 06 400	140 02 510
<b>D 7,2</b>	7,2 - 8	108 07 000	108 06 400	140 04 510
<b>D 8</b>	8 - 9	108 08 000	108 08 400	100 08 510
<b>D 9</b>	9 - 10	108 09 000	108 09 400	100 09 510
<b>D 10</b>	10 - 11	108 10 000	108 10 400	100 10 510
<b>D 11</b>	11 - 12	108 11 000	108 11 400	100 11 510
<b>D 12</b>	12 - 13,5	108 12 000	108 12 400	100 12 520
<b>D 13,5</b>	13,5 - 15,5	108 13 000	108 13 400	100 13 520
<b>D 15,5</b>	15,5 - 18	108 15 000	108 15 400	100 15 520
<b>D 18</b>	18 - 21	108 18 000	108 18 400	100 18 520
<b>D 21</b>	21 - 24	108 21 000	108 21 400	100 21 520
<b>D 24</b>	24 - 27,5	108 24 000	108 24 400	100 24 520
<b>D 27,5</b>	27,5 - 31,5	108 27 000	108 27 400	100 27 520
<b>D 31,5</b>	31,5 - 37	108 31 000	10831 400	100 31 520
<b>D 37</b>	37 - 45	108 37 000	108 37 400	100 37 520
<b>D 45</b>	45 - 55	108 45 000	108 45 400	100 45 520
<b>D 55</b>	55 - 65	108 55 000	108 55 400	100 55 520
<b>D 65</b>	65 - 80	108 65 000	108 65 400	100 65 520
<b>D 80</b>	80 - 95	108 80 000	108 80 400	100 80 520
<b>D 95</b>	95 - 110	108 95 000	108 95 400	100 95 520

\* Replacement blades are supplied in matched sets.

### Application Range

The reamer for reaming longer holes and adjacent inline holes.

### Description

Right-hand cutting hand reamer with expanding blades.

Extra long blades!

The blades are approximately 2/3 longer than the blades of reamer type D.

Due to the unique Hunger relief grinding process the blades have a progressively increasing clearance angle giving a softer cutting action.

### Dimensions and Weight

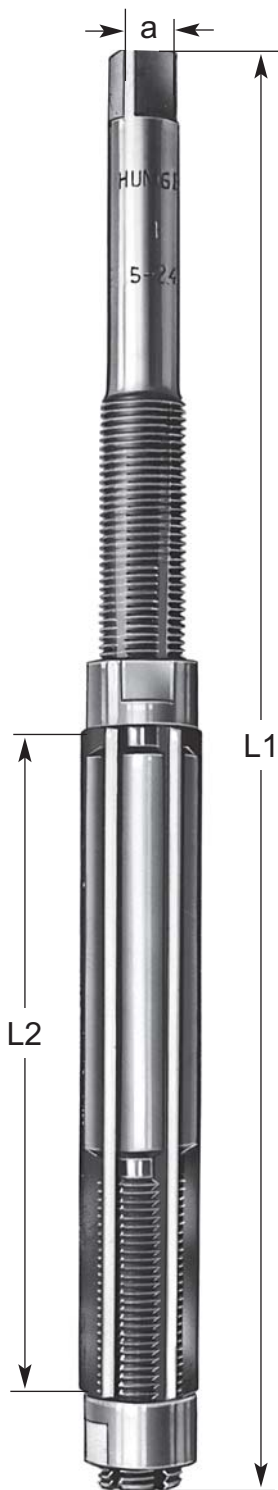
Size	Size Range		Length Overall L1 mm	Length Blades L2 mm	Size of Square a mm	No. of Blades	Weight kg
	mm	Inches					
<b>E 10,5</b>	10,5 - 12	$27/64 - 15/32$	160	65	5,5	5	0,070
<b>E 12</b>	12 - 13,5	$15/32 - 17/32$	170	70	6,2	5	0,100
<b>E 13,5</b>	13,5 - 15,5	$17/32 - 39/64$	195	80	7	5	0,140
<b>E 15,5</b>	15,5 - 17,5	$39/64 - 11/16$	215	90	8	5	0,210
<b>E 17,5</b>	17,5 - 19,5	$11/16 - 49/64$	230	100	9	5	0,280
<b>E 19,5</b>	19,5 - 21,5	$49/64 - 27/32$	240	110	10	5	0,370
<b>E 21,5</b>	21,5 - 24,5	$27/32 - 31/32$	260	120	10	5	0,470
<b>E 24,5</b>	24,5 - 27,5	$31/32 - 1 5/64$	280	130	11	5	0,640
<b>E 27,5</b>	27,5 - 31,5	$1 5/64 - 1 15/64$	310	140	12	6	0,880
<b>E 31,5</b>	31,5 - 37	$1 15/64 - 1 29/64$	320	150	14,5	6	1,240
<b>E 37</b>	37 - 45	$1 29/64 - 1 49/64$	370	165	16	6	1,970
<b>E 45</b>	45 - 55	$1 49/64 - 2 5/32$	425	180	20	6	3,240

### Packaging

Individually in clear plastic tube containers.

### Sets of Reamers Type E in Storage Cases

Symbol	Size Range		No. of Reamers	Weight kg
	mm	Inches		
<b>EA</b>	10,5 - 31,5	$27/64 - 1 15/64$	9	3,100
<b>ESO</b>	10,5 - 45	$27/64 - 1 49/64$	11	5,700



**Description**

The blades of the standard reamers type E are made of a special steel with excellent cutting properties.

Hunger has also manufactured a "hard chrome" version where the blades are coated with hard chrome. The hard chrome coating has a low coefficient of friction.

Hard chrome reamers are therefore particularly suitable for reaming materials with a high wear tendency and materials that tend to stick and form built-up edges.

Hard chrome reamers and hard chrome replacement blades have been discontinued. Remaining stocks of almost all reamer sizes are available while stocks last.

**Ordering Information**

Size	Range	Reamers		Replacement Blades*		Nuts Part No.
		Special Steel Part No.	Hard Chrome Part No.	Special Steel Part No.	Hard Chrome Part No.	
<b>E 10,5</b>	10,5 - 12	110 10 000	111 10 000	110 10 400	111 10 400	140 10 510
<b>E 12</b>	12 - 13,5	110 12 000	111 12 000	110 12 400	111 12 400	100 12 510
<b>E 13,5</b>	13,5 - 15,5	110 13 000	111 13 000	110 13 400	111 13 400	100 13 510
<b>E 15,5</b>	15,5 - 17,5	110 15 000	111 15 000	110 15 400	111 15 400	100 15 510
<b>E 17,5</b>	17,5 - 19,5	110 17 000	111 17 000	110 17 400	111 17 400	110 17 510
<b>E 19,5</b>	19,5 - 21,5	110 19 000	111 19 000	110 19 400	111 19 400	110 19 510
<b>E 21,5</b>	21,5 - 24,5	110 21 000	111 21 000	110 21 400	111 21 400	100 21 510
<b>E 24,5</b>	24,5 - 27,5	110 24 000	111 24 000	110 24 400	111 24 400	100 24 510
<b>E 27,5</b>	27,5 - 31,5	110 27 000	111 27 000	110 27 400	111 27 400	100 27 510
<b>E 31,5</b>	31,5 - 37	110 31 000	111 31 000	110 31 400	111 31 400	100 31 510
<b>E 37</b>	37 - 45	110 37 000	111 37 000	110 37 400	111 37 400	100 37 510
<b>E 45</b>	45 - 55	110 45 000	111 45 000	110 45 400	111 45 400	100 45 510

\*Replacement blades are supplied in matched sets.

**Sets of Reamers Type E in Storage Cases**

Symbol	Range mm	Special Steel Part No.	Hard Chrome Part No.
<b>EA</b>	10,5 - 31,5	110 00 100	111 00 100
<b>ESO</b>	10,5 - 45	110 00 200	111 00 200







### Application Range

The precision reamer for reaming of holes in line with each other. .

### Description

Right-hand cutting reamer with expanding blades.

Parallel shank with square at the back and integral pilot with a sliding centering cone at the front of the reamer.

Due to the unique Hunger relief grinding process the blades have a progressively increasing clearance angle giving a softer cutting action.

From size K 12 the front adjusting nut is marked with a circumferential scale.

One graduation on the scale corresponds to a 0,01 mm change in cutting diameter

### Dimensions and Weight

Size	Size Range		Length Overall L1 mm	Length Blades L2 mm	Length Pilot L3 mm	Size of Square a mm	No. of Blades	Weight kg
	mm	Inches						
K 7	7 - 8	9/32 - 5/16	175	32	65	3,5	4	0,030
K 8	8 - 9	5/16 - 23/64	175	32	65	4,3	5	0,055
K 9	9 - 10	23/64 - 25/64	175	32	65	4,3	5	0,060
K 10	10 - 11	25/64 - 7/16	185	35	68	4,9	5	0,085
K 11	11 - 12	7/16 - 15/32	195	35	72	6,2	5	0,100
K 12	12 - 13,5	15/32 - 17/32	215	42	84	6,2	5	0,130
K 13,5	13,5 - 15,5	17/32 - 39/64	235	50	89	7	5	0,180
K 15,5	15,5 - 18	39/64 - 45/64	265	60	98	8	5	0,280
K 18	18 - 21	45/64 - 53/64	290	65	109	9	5	0,410
K 21	21 - 24	53/64 - 15/16	310	70	119	10	5	0,620
K 24	24 - 27,5	15/16 - 1 5/64	335	75	129	11	5	0,820
K 27,5	27,5 - 31,5	1 5/64 - 1 15/64	365	80	137	12	6	1,040
K 31,5	31,5 - 37	1 15/64 - 1 29/64	400	90	159	14,5	6	1,550
K 37	37 - 45	1 29/64 - 1 49/64	465	100	180	16	6	2,600
K 45	45 - 55	1 49/64 - 2 5/32	530	109	198	20	6	4,100
K 55	55 - 65	2 5/32 - 2 9/16	570	120	213	24	8	6,450
K 65	65 - 80	2 9/16 - 3 5/32	670	145	250	29	10	15,100
K 80	80 - 95	3 5/32 - 3 47/64	700	150	250	32	10	21,100
K 95	95 - 110	3 47/64 - 4 21/64	700	150	250	36	10	25,400

### Packaging

From size K 7 to K 37 individually in clear plastic tube containers.

From size K 45 to K 55 individually in plastic nets.

### Sets of Reamers Type K in Storage Cases

Symbol	Size Range		No. of Reamers	Weight kg
	mm	Inches		
KAN	8 - 31,5	21/64 - 1 15/64	11	5,600
KEN	8 - 45	21/64 - 1 49/64	13	10,200



### Description

The blades of the standard reamers type K are made of a special steel with excellent cutting properties.

Hunger has also manufactured a "hard chrome" version where the blades are coated with hard chrome. The hard chrome coating has a low coefficient of friction.

Hard chrome reamers are therefore particularly suitable for reaming materials with a high wear tendency and materials that tend to stick and form built-up edges.

Hard chrome reamers and hard chrome replacement blades have been discontinued. Remaining stocks of nearly all reamer sizes are available while stocks last.

As an advanced alternative to the hard chrome version, Hunger now offers the DLC version where the blades are coated with diamond-like carbon (DLC).

See page 11 for details.

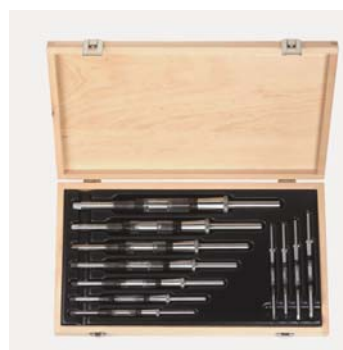
### Ordering Information

Size	Range ∅ mm	Reamers		Replacement Blades*		Spare Nuts Part No.	Spare Centering Cones Part No.
		Special Steel Part No.	Hard Chrome Part No.	Special Steel Part No.	Hard Chrome Part No.		
<b>K 7</b>	7 - 8	120 07 000	121 07 000	100 06 400	101 06 400	140 04 510	120 07 600
<b>K 8</b>	8 - 9	120 08 000	121 08 000	120 08 400	121 08 400	100 08 510	120 08 600
<b>K 9</b>	9 - 10	120 09 000	121 09 000	120 09 400	121 09 400	100 09 510	120 09 600
<b>K 10</b>	10 - 11	120 10 000	121 10 000	120 10 400	121 10 400	100 10 510	120 10 600
<b>K 11</b>	11 - 12	120 11 000	121 11 000	120 11 400	121 11 400	100 11 510	120 11 600
<b>K 12</b>	12 - 13,5	120 12 000	121 12 000	120 12 400	121 12 400	100 12 520	120 12 600
<b>K 13,5</b>	13,5 - 15,5	120 13 000	121 13 000	120 13 400	121 13 400	100 13 520	120 13 600
<b>K 15,5</b>	15,5 - 18	120 15 000	121 15 000	120 15 400	121 15 400	100 15 520	120 15 600
<b>K 18</b>	18 - 21	120 18 000	121 18 000	120 18 400	121 18 400	100 18 520	120 18 600
<b>K 21</b>	21 - 24	120 21 000	121 21 000	120 21 400	121 21 400	100 21 520	120 21 600
<b>K 24</b>	24 - 27,5	120 24 000	121 24 000	120 24 400	121 24 400	100 24 520	120 24 600
<b>K 27,5</b>	27,5 - 31,5	120 27 000	121 27 000	120 27 400	121 27 400	100 27 520	120 27 600
<b>K 31,5</b>	31,5 - 37	120 31 000	121 31 000	120 31 400	121 31 400	100 31 520	120 31 600
<b>K 37</b>	37 - 45	120 37 000	121 37 000	120 37 400	121 37 400	100 37 520	120 37 600
<b>K 45</b>	45 - 55	120 45 000	121 45 000	120 45 400	121 45 400	100 45 520	120 45 600
<b>K 55</b>	55 - 65	120 55 000	121 55 000	120 55 400	121 55 400	100 55 520	120 55 600
<b>K 65</b>	65 - 80	120 65 000	121 65 000	100 65 400	101 65 400	100 65 520	120 65 600
<b>K 80</b>	80 - 95	120 80 000	121 80 000	100 80 400	101 80 400	100 80 520	120 80 600
<b>K 95</b>	95 - 110	120 95 000	121 95 000	100 95 400	101 95 400	100 95 520	120 95 600

\*Replacement blades are supplied in matched sets.

### Sets of Reamers Type K in Storage Cases

Symbol	Size Range mm	Special Steel Part No.	Hard Chrome Part No.
<b>KAN</b>	8 - 31,5	120 00 100	121 00 100
<b>KEN</b>	8 - 45	120 00 200	121 00 200



### Description

The blades of the reamers type D version DLC are coated with a diamond-like hard material layer, which is applied by a complex PVD process.

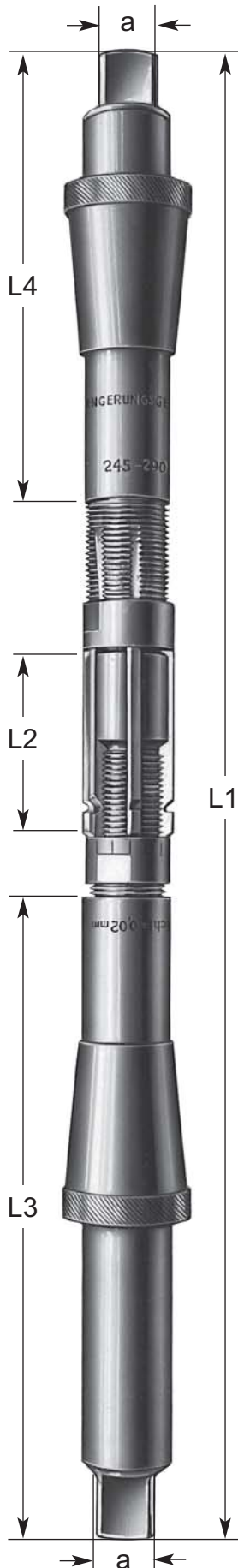
The DLC coating is characterized by extreme hardness, wear resistance and smoothness (very low friction). At the same time, the sharpness of the cutting edges is maintained because the DLC coating is extremely thin.

The DLC version of the reamers type is therefore ideal for reaming aluminum alloys, titanium alloys, copper alloys (bronze and brass) as well as materials with a high wear effect and materials that tend to stick and form built-up edges.

### Ordering Information

Größe	Range ∅ mm	Reamer Type K Version DLC Artike-Nr.	Replacement Blades* Version DLC Artike-Nr.	Spare Nut Artike-Nr.	Spare Centering Cone
<b>K 7</b>	7 - 8	128 07 000	108 06 400	140 04 510	120 07 600
<b>K 8</b>	8 - 9	128 08 000	128 08 400	100 08 510	120 08 600
<b>K 9</b>	9 - 10	128 09 000	128 09 400	100 09 510	120 09 600
<b>K 10</b>	10 - 11	128 10 000	128 10 400	100 10 510	120 10 600
<b>K 11</b>	11 - 12	128 11 000	128 11 400	100 11 510	120 11 600
<b>K 12</b>	12 - 13,5	128 12 000	128 12 400	100 12 520	120 12 600
<b>K 13,5</b>	13,5 - 15,5	128 13 000	128 13 400	100 13 520	120 13 600
<b>K 15,5</b>	15,5 - 18	128 15 000	128 15 400	100 15 520	120 15 600
<b>K 18</b>	18 - 21	128 18 000	128 18 400	100 18 520	120 18 600
<b>K 21</b>	21 - 24	128 21 000	128 21 400	100 21 520	120 21 600
<b>K 24</b>	24 - 27,5	128 24 000	128 24 400	100 24 520	120 24 600
<b>K 27,5</b>	27,5 - 31,5	128 27 000	128 27 400	100 27 520	120 27 600
<b>K 31,5</b>	31,5 - 37	128 31 000	128 31 400	100 31 520	120 31 600
<b>K 37</b>	37 - 45	128 37 000	128 37 400	100 37 520	120 37 600
<b>K 45</b>	45 - 55	128 45 000	128 45 400	100 45 520	120 45 600
<b>K 55</b>	55 - 65	128 55 000	128 55 400	100 55 520	120 55 600
<b>K 65</b>	65 - 80	128 65 000	128 65 400	100 65 520	120 65 600
<b>K 80</b>	80 - 95	128 80 000	128 80 400	100 80 520	120 80 600
<b>K 95</b>	95 - 110	128 95 000	128 95 400	100 95 520	120 95 600

\* Replacement blades are supplied in matched sets.



**Application Range**

The universal reamer for all types of holes, especially for in-line reaming of two or more aligned holes.  
Two sliding centering provide accurate alignment between the hole to be reamed and the other mating hole.

**Description**

Right-hand cutting reamer with expanding blades.  
Interchangeable pilots on both the front and back of the reamer.  
Each pilot has a square and a sliding guide sleeve.  
A special bayonet coupling between each pilot and the reamer body ensures proper alignment.  
The blades are ground to provide a rough cut followed by finish reaming.  
Due to the unique Hunger relief grinding process, the blades have a progressively increasing clearance angle, resulting in a softer cutting action.  
The front adjusting nut is marked with a circumferential scale.  
One graduation on the scale corresponds to a 0.02 mm change in cutting diameter.

**Dimensions and Weight**

Size	Range ∅ mm	Length Overall L1 mm	Length Blades L2 mm	Length Pilot L 3 mm	Length Pilot L 4 mm	Size of Square a mm	No. of Blades	Weight kg
U 12	12 - 13,5	250	30	110	82	8	5	0,170
U 13,5	13,5 - 15,5	270	33	116	84	9	5	0,245
U 15,5	15,5 - 18	295	36	127	88	10	5	0,360
U 18	18 - 21	330	40	140	100	12	5	0,545
U 19,5	19,5 - 22,5	352	44	150	110	13	5	0,700
U 21	21 - 24,5	352	44	150	110	13	5	0,800
U 24,5	24,5 - 29	385	48	157	118	13	6	1,140
U 29	29 - 34	418	52	170	130	16	6	1,670
U 34	34 - 39	440	54	180	140	18	6	2,430
U 39	39 - 45	475	60	190	150	18	6	3,310
U 45	45 - 52	500	60	200	162	18	6	4,700
U 52	52 - 59	500	60	200	162	18	6	5,700
U 59	59 - 66	500	60	200	162	18	6	6,700

**Packaging**

From Size U 12 to U 39 individually in clear plastic tube containers.  
From Size U 45 to U 59 individually in plastic nets.

**Sets of Reamers Type U in Storage Cases**

Symbol	Range		Number of Reamers	Weight kg
	mm	Inches		
USI	12 - 34	15/32 - 1 11/32	7	6,700
USE	12 - 45	15/32 - 1 49/64	9	13,100

### Description

The blades of the standard reamers type U are made of a special steel with excellent cutting properties.

Hunger has also manufactured a "hard chrome" version where the blades are coated with hard chrome. The hard chrome coating has a low coefficient of friction.

Hard chrome reamers are therefore particularly suitable for reaming materials with a high wear tendency and materials that tend to stick and form built-up edges.

Hard chrome reamers and hard chrome replacement blades have been discontinued. Remaining stocks of almost all reamer sizes are available while stocks last.

As an advanced alternative to the hard chrome version, Hunger now offers the DLC version where the blades are coated with diamond-like carbon (DLC).

See page 14 for details.

### Ordering Information

Size	Reamers		Replacement Blades*		Front Nut with Scale Part No.	Back Nut Part No.	Guide Sleeve Part No.
	Special Steel Part No.	Hard Chrome Part No.	Special Steel Part No.	Hard Chrome Part No.			
<b>U 12</b>	130 12 000	131 12 000	130 12 400	131 12 400	130 12 520	100 12 510	130 12 600
<b>U 13,5</b>	130 13 000	131 13 000	130 13 400	131 13 400	100 12 520	100 13 510	130 13 600
<b>U 15,5</b>	130 15 000	131 15 000	130 15 400	131 15 400	130 15 520	100 15 510	130 15 600
<b>U 18</b>	130 18 000	131 18 000	130 18 400	131 18 400	130 18 520	100 18 510	130 18 600
<b>U 19,5<sup>+</sup></b>	130 19 000	131 19 000	130 19 400	131 19 400	100 18 520	130 19 510	130 18 600
<b>U 21</b>	130 21 000	131 21 000	130 21 400	131 21 400	130 21 520	100 21 510	130 21 600
<b>U 24,5</b>	130 24 000	131 24 000	130 24 400	131 29 400	130 24 520	130 24 510	130 24 600
<b>U 29</b>	130 29 000	131 29 000	130 29 400	131 27 400	130 29 520	130 29 510	130 29 600
<b>U 34</b>	130 34 000	131 34 000	130 34 400	131 34 400	130 34 520	130 34 510	130 31 600
<b>U 39</b>	130 39 000	131 39 000	130 39 400	131 39 400	130 39 520	130 39 510	130 37 600
<b>U 45</b>	130 45 000	131 45 000	130 45 400	131 45 400	130 45 520	100 45 510	130 45 600
<b>U 52</b>	130 52 000	131 52 000	130 45 400	131 45 400	130 52 520	130 52 510	130 52 600
<b>U 59</b>	130 59 000	131 59 000	130 45 400	131 45 400	130 52 520	130 52 510	130 65 600

\*Replacement blades are supplied in matched sets.

### Sets of Reamers Type U in Storage Cases

Symbol	Size Range mm	Special Steel Part No.	Hard Chrome Part No.
<b>USI</b>	12 - 34	130 00 100	131 00 100
<b>USE</b>	12 - 45	130 00 200	131 00 200

<sup>+</sup> The intermediate size U 19,5 is not included in the sets.



### Description

The blades of the reamers type D version DLC are coated with a diamond-like carbon layer, which is applied by a complex PVD process.

The DLC coating is characterized by extreme hardness, wear resistance and smoothness (very low friction). At the same time, the sharpness of the cutting edges is maintained because the DLC coating is extremely thin.

The DLC version of the reamers type is therefore ideal for reaming aluminum alloys, titanium alloys, copper alloys (bronze and brass) as well as materials with a high wear effect and materials that tend to stick and form built-up edges.

### Ordering Information

Size	Reamers Part No.	Replacement Blades* Special Steel Part No.	SpareFront Nut wish scale Part No.	Spare Back Nut Part No.	Spare Guide Sleeve Part No.
<b>U 12</b>	138 12 000	138 12 400	130 12 520	100 12 510	130 12 600
<b>U 13,5</b>	138 13 000	138 13 400	100 12 520	100 13 510	130 13 600
<b>U 15,5</b>	138 15 000	138 15 400	130 15 520	100 15 510	130 15 600
<b>U 18</b>	138 18 000	138 18 400	130 18 520	100 18 510	130 18 600
<b>U 19,5<sup>+</sup></b>	138 19 000	138 19 400	100 18 520	130 19 510	130 18 600
<b>U 21</b>	138 21 000	138 21 400	130 21 520	100 21 510	130 21 600
<b>U 24,5</b>	138 24 000	138 24 400	130 24 520	130 24 510	130 24 600
<b>U 29</b>	138 29 000	138 29 400	130 29 520	130 29 510	130 29 600
<b>U 34</b>	138 34 000	138 34 400	130 34 520	130 34 510	130 31 600
<b>U 39</b>	138 39 000	138 39 400	130 39 520	130 39 510	130 37 600
<b>U 45</b>	138 45 000	138 45 400	130 45 520	100 45 510	130 45 600
<b>U 52</b>	138 52 000	138 45 400	130 52 520	130 52 510	130 52 600
<b>U 59</b>	138 59 000	138 45 400	130 52 520	130 52 510	130 65 600

\* Replacement blades are supplied in matched sets.

### Description

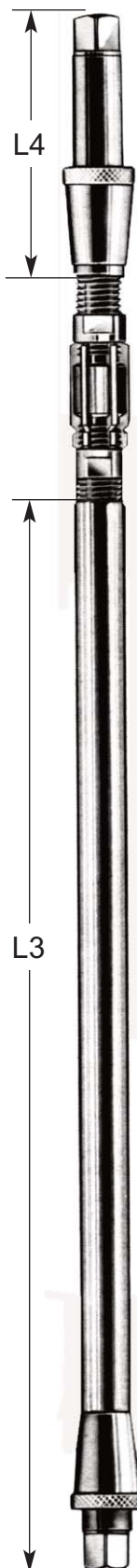
Each pilot has a square at one end and a female taper at the other end. The female taper in the pilot is designed to receive the mating male taper on the reamer body.

The pilot and reamer body are interlocked by a bayonet type coupling.

Since the mating tapers are usually tightly bonded, it is recommended that a plastic hammer be used to loosen the tight contact before removing the pilot from the reamer body. Lightly tap the pilot around the female taper.

With the contact loosened, rotate the pilot clockwise with respect to the reamer body until the triangular projection on the male taper is centered in the recess in the female taper. Then remove the pilot from the reamer body.

### Ordering Information



Size of Reamer	Standard Front Pilots		Standard Back Pilots		Extension Pilots Size I	
	Length L3 mm	Part No.	Length L4 mm	Part No.	Length mm	Part No.
U 12	110	130 12 701	82	130 12 702	210	132 12 711
U 13,5	116	130 13 701	84	130 13 702	220	132 13 712
U 15,5	127	130 15 701	88	130 15 702	230	132 15 713
U 18	140	130 18 701	100	130 18 702	240	132 18 714
U 19,5	150	130 19 701	110	130 19 702	250	132 19 715
U 21	150	130 21 701	110	130 21 702	250	132 21 715
U 24,5	157	130 24 701	118	130 24 702	260	132 24 716
U 29	170	130 29 701	130	130 29 702	270	132 29 717
U 34	180	130 34 701	140	130 34 702	280	132 34 718
U 39	190	130 39 701	150	130 39 702	290	132 39 719
U 45	200	130 45 701	162	130 45 702	400	132 45 730
U 52	200	130 52 701	162	130 52 702	400	132 52 730
U 59	200	130 52 701	162	130 59 702	400	132 52 730

Size of Reamer	Extension Pilots Size II		Extension Pilots Size III		Extension Pilots Size IV	
	Length mm	Part No.	Length mm	Part No.	Length mm	Part No.
U 12	410	132 12 731	610	132 12 751	810	132 12 771
U 13,5	420	132 13 732	620	132 13 752	820	132 13 772
U 15,5	430	132 15 733	630	132 15 753	830	132 15 773
U 18	440	132 18 734	640	132 18 754	840	132 18 774
U 19,5	450	132 19 735	650	132 19 755	-	-
U 21	450	132 21 735	650	132 21 755	850	132 21 775
U 24,5	460	132 24 736	660	132 24 756	860	132 24 776
U 29	470	132 29 737	670	132 29 757	870	132 29 777
U 34	480	132 34 738	680	132 34 758	880	132 34 778
U 39	490	132 39 739	690	132 39 759	890	132 39 779
U 45	600	132 45 750	800	132 45 770	900	132 45 780
U 52	600	132 52 750	800	132 52 770	900	132 52 780
U 59	600	132 52 750	800	132 59 770	900	132 52 780

Customized extension pilots are available in any length.

### Application Range

The special reamer for reaming the valve guide of engines.

The optional guide bush fits in the valve seat so that the reamer aligns perfectly in the valve guide.

### Description

Right-hand cutting reamer with extra long shank and an optional guide bush.

Due to the unique Hunger relief grinding operation the blades have a progressively increasing clearance angle giving a softer cutting action.

### Dimensions and Weight

Size	Range		Length Overall L1 mm	Length Blades L2 mm	WAF a mm	Blades Quantity	Gewicht kg	Guide Bush	
	mm	Inch						Conicity mm	Weight kg
V 5,4	5,4 - 6	7/32 - 15/64	160	28	4	3	0,025	14-21	0,030
V 5,9	5,9 - 6,5	15/64 - 1/4	160	28	4,3	3	0,030	17-28	0,050
V 6,4	6,4 - 7	1/4 - 17/64	160	28	4,9	3	0,035	16-28	0,050
V 6,9	6,9 - 7,5	17/64 - 19/64	160	28	5,5	3	0,040	21-38	0,070
V 7,4	7,4 - 8	19/64 - 5/16	165	28	5,5	3	0,045	22-36	0,065
V 7,9	7,9 - 8,5	5/16 - 21/64	170	28	6,2	3	0,055	23-47	0,150
V 8,4	8,4 - 9	21/64 - 23/64	175	28	6,2	3	0,065	28-44	0,155
V 8,9	8,9 - 9,5	23/64 - 3/8	180	32	7	4	0,075	25-53	0,190
V 9,4	9,4 - 10	3/8 - 25/64	190	32	7	4	0,085	26-52	0,180
V 9,9	9,9 - 11	25/64 - 7/16	200	36	8	5	0,100	25-53	0,190
V10,9	10,9 - 12	7/16 - 15/32	220	36	8	5	0,130	33-61	0,270

### Ordering Information

Hard chrome reamers and hard chrome replacement blades have been discontinued. Remaining stocks of most of all reamer sizes are available while stocks last.

As an advanced alternative to the hard chrome version, Hunger now offers the DLC version where the blades are coated with diamond-like carbon (DLC).

See page 17 for details.

-Size	Reamers		Replacement Blades		Spare Nut Part-No.	Option Guide Bush Part-No.
	Special Steel Part-No.	Hard Chrome Part-No.	Special Steel Part-No.	Hard Chrome Part-No.		
V 5,4	140 01 000	141 01 000	140 01 400	141 01 400	140 01 510	140 01 600
V 5,9	140 02 000	141 02 000	140 02 400	141 02 400	140 02 510	140 02 600
V 6,4	140 03 000	141 03 000	140 03 400	141 03 400	140 03 510	140 03 600
V 6,9	140 04 000	141 04 000	140 04 400	141 04 400	140 04 510	140 04 600
V 7,4	140 05 000	141 05 000	140 05 400	141 05 400	140 05 510	140 05 600
V 7,9	140 06 000	141 06 000	140 06 400	141 06 400	100 08 510	140 06 600
V 8,4	140 07 000	141 07 000	140 07 400	141 07 400	140 07 510	140 07 600
V 8,9	140 08 000	141 08 000	140 08 400	141 08 400	140 08 510	140 08 600
V 9,4	140 09 000	141 09 000	140 09 400	141 09 400	140 09 510	140 09 600
V 9,9	140 10 000	141 10 000	140 10 400	141 10 400	140 10 510	140 10 600
V10,9	140 11 000	141 11 000	140 11 400	141 11 400	140 11 510	140 11 600

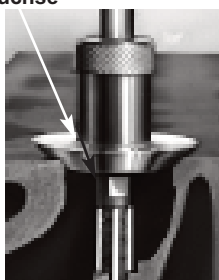
Each reamer is packaged in a clear plastic tube.

### Sets of Reamers Type V in Storage Cases

Type	Range		Reamers Quantity	Bushes Quantity	Specia Steel	Hard Chrome	Weight kg
	mm	Inch			Part No.	Part No.	
VR	5,9 - 12	15/64 - 15/32	10	-	140 00 100	141 00 100	1,140
VRB	5,9 - 12	15/64 - 15/32	10	10	140 00 200	141 00 200	3,500



Führungsbuchse





### Description

The blades of the reamers type V version DLC are coated with a diamond-like carbom layer, which is applied by a complex PVD process.

The DLC coating is characterized by extreme hardness, wear resistance and smoothness (very low friction). At the same time, the sharpness of the cutting edges is maintained because the DLC coating is extremely thin.

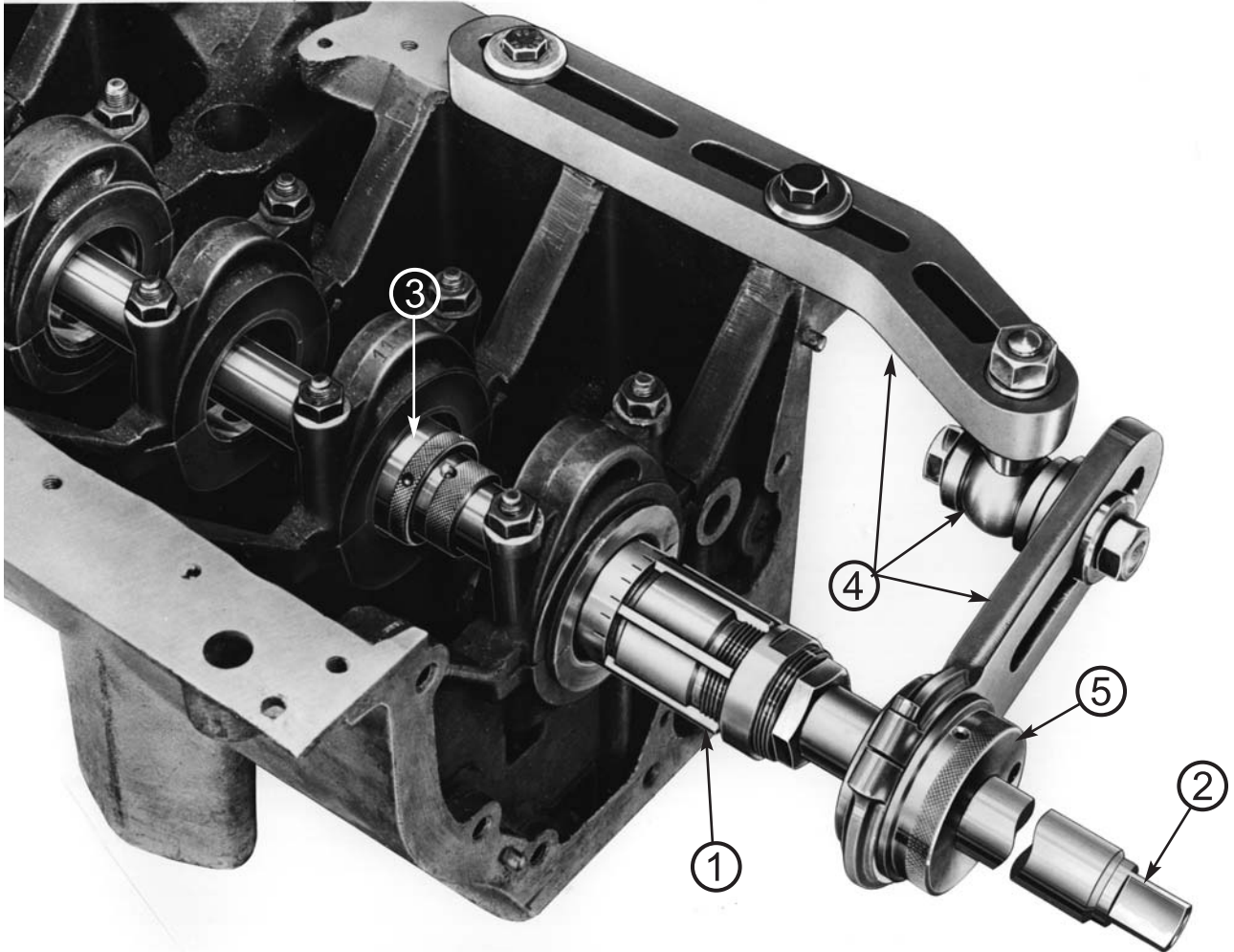
The DLC version of the reamers type is therefore ideal for titanium alloys, copper alloys (bronze and brass) as well as materials with a high wear effect and materials that tend to stick and form built-up edges.

### Ordering Information

Size	Reamer DLC Part No.	Replacement Blades DLC Part No.	Spare Nut Part No.	Option Guide Bush Part No.
<b>V 5,4</b>	148 01 000	148 01 400	140 01 510	140 01 600
<b>V 5,9</b>	148 02 000	148 02 400	140 02 510	140 02 600
<b>V 6,4</b>	148 03 000	148 03 400	140 03 510	140 03 600
<b>V 6,9</b>	148 04 000	148 04 400	140 04 510	140 04 600
<b>V 7,4</b>	148 05 000	148 05 400	140 05 510	140 05 600
<b>V 7,9</b>	148 06 000	148 06 400	100 08 510	140 06 600
<b>V 8,4</b>	148 07 000	148 07 400	140 07 510	140 07 600
<b>V 8,9</b>	148 08 000	148 08 400	140 08 510	140 08 600
<b>V 9,4</b>	148 09 000	148 09 400	140 09 510	140 09 600
<b>V 9,9</b>	148 10 000	148 10 400	140 10 510	140 10 600
<b>V10,9</b>	148 11 000	148 11 400	140 11 510	140 11 600

Each reamer is packaged in a clear plastic tube.

**Inline Reaming of a Bearing Tunnel**



**Components**

- ① Adjustable Shell Reamer Type H
- ② Tool Bar
- ③ Expanding Guide Bush
- ④ External Bearing Support
- ⑤ Plain Bearing Bush

### Application Range

The reamer for reaming aligned holes, especially widely spaced holes

### Description

Right-hand cutting shell reamer with adjustable blades and a through-hole for installing a tool bar for guiding and moving the reamer.

Adjustment is easily done with two round nuts which raise or lower the cutting blades by moving them along tapered seatings. The front nut is provided with a scale for ease of adjusting of the desired cutting diameter. One graduation mark on the scale corresponds to a change in the cutting diameter of 0.02 mm.

A clamping spring screwed into the through-hole of the reamer ensures that the reamer is taken along when the tool bar is advanced and turned.

To place the reamer on the tool bar, slide the reamer onto and along the tool bar while at the same time rotating the reamer in direction of cut.

In case that a very rigid connection of the reamer to the tool bar is required, the clamping spring can be replaced by a clamping shell that locks the reamer to the tool bar.

Expandable guide bushes available for insertion into the bores to align the tool bar in centerline with the bores. See page 5 for more details.

An external bearing support is available for guiding the tool bar in front of a bore. See page 6 for more details.

### Technical Details



Size	Range Ø mm	Bore Ø d mm	Length Reamer L1 mm	Length Blades L2 mm	Nuts WAF mm	Blades Qty	Reamer Weight kg
H 36	36 - 38	20	96	44	32	6	0,370
H 38	38 - 41	20	99	44	34	6	0,450
H 41	41 - 44	20	104	48	38	6	0,590
H 44	44 - 47	25	104	48	40	6	0,590
H 47	47 - 51	25	108	48	43	6	0,760
H 51	51 - 54	30	108	52	47	6	0,830
H 54	54 - 58	30	113	52	47	6	0,930
H 58	58 - 62	30	113	52	53	6	1,180
H 62	62 - 65	35	114	52	58	8	1,290
H 65	65 - 69	35	118	57	58	8	1,490
H 69	69 - 73	40	118	57	64	8	1,790
H 73	73 - 78	40	123	57	68	8	1,970
H 78	78 - 83	45	124	57	70	8	2,110
H 83	83 - 88	45	124	60	78	8	2,750
H 88	88 - 93	50	124	60	83	8	3,000
H 93	93 - 99	50	127	60	83	10	3,490
H 99	99 - 105	50	127	60	*	10	4,200
H 105	105 - 111	50	127	60	*	10	5,040

\* Adjustment of the nuts with hook wrench..



**Description**

The blades of the standard reamers type H are made of a special steel with excellent cutting properties.

Hunger has also manufactured a "hard chrome" version where the blades are coated with hard chrome. The hard chrome coating has a low coefficient of friction.

Hard chrome reamers are therefore particularly suitable for reaming materials with a high wear tendency and materials that tend to stick and form built-up edges.

Hard chrome reamers and hard chrome replacement blades have been discontinued. Remaining stocks of almost all reamer sizes are available while stocks last.

As an advanced alternative to the hard chrome version, Hunger now offers the DLC version where the blades are coated with diamond-like carbon (DLC).

See page 21 for details.

**Ordering Information**

Size	Reamer		Replacement Blades*		Spare Nut with Scale Part No	Spare Clamping Spring Part No.	OPTION Clamping Shell Part No.
	Special Steel Part No..	Hard Chrome Part No.	Special Steel Part No	Hard Chrome Part No.			
<b>H 36</b>	150 36 000	151 36 000	150 36 400	151 36 400	150 36 520	150 20 600	on request
<b>H 38</b>	150 38 000	151 38 000	150 38 400	151 38 400	150 38 520	150 20 600	on request
<b>H 41</b>	150 41 000	151 41 000	150 41 400	151 41 400	150 41 520	150 20 600	on request
<b>H 44</b>	150 44 000	151 44 000	150 44 400	151 44 400	150 44 520	150 25 600	on request
<b>H 47</b>	150 47 000	151 47 000	150 47 400	151 47 400	150 47 520	150 25 600	on request
<b>H 51</b>	150 51 000	151 51 000	150 51 400	151 51 400	150 51 520	150 30 600	on request
<b>H 54</b>	150 54 000	151 54 000	150 54 400	151 54 400	150 54 520	150 30 600	on request
<b>H 58</b>	150 58 000	151 58 000	150 58 400	151 58 400	150 58 520	150 30 600	on request
<b>H 62</b>	150 62 000	151 62 000	150 62 400	151 62 400	150 62 520	150 35 600	150 35 650
<b>H 65</b>	150 65 000	151 65 000	150 65 400	151 65 400	150 65 520	150 35 600	150 35 650
<b>H 69</b>	150 69 000	151 69 000	150 69 400	151 69 400	150 69 520	150 40 600	150 40 650
<b>H 73</b>	150 73 000	151 73 000	150 73 400	151 73 400	150 73 520	150 40 600	150 40 650
<b>H 78</b>	150 78 000	151 78 000	150 78 400	151 78 400	150 78 520	150 45 600	150 45 650
<b>H 83</b>	150 81 000	151 81 000	150 81 400	151 81 400	150 81 520	150 45 600	150 45 650
<b>H 88</b>	150 82 000	151 82 000	150 82 400	151 82 400	150 82 520	150 50 600	150 50 650
<b>H 93</b>	150 83 000	151 83 000	150 83 400	151 83 400	150 83 520	150 50 600	150 50 650
<b>H 99</b>	150 84 000	151 84 000	150 84 400	151 83 400	150 84 520	150 50 600	150 50 650
<b>H 105</b>	150 85 000	151 85 000	150 85 400	151 83 400	150 85 520	150 50 600	150 50 650

\*Replacement blades are supplied in matched sets.

The blades are finish ground, so no grinding is required after the blades are inserted into the reamer body.

### Description

The blades of the reamers type D version DLC are coated with a diamond-like carbon layer, which is applied by a complex PVD process.

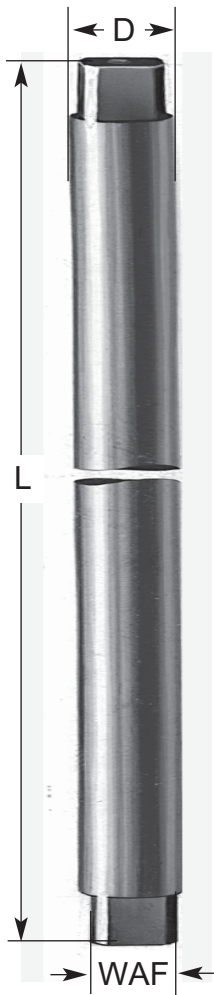
The DLC coating is characterized by extreme hardness, wear resistance and smoothness (very low friction). At the same time, the sharpness of the cutting edges is maintained because the DLC coating is extremely thin.

The DLC version of the reamers type is therefore ideal for reaming aluminum alloys, titanium alloys, copper alloys (bronze and brass) as well as materials with a high wear effect and materials that tend to stick and form built-up edges.

### Ordering Information

Size	Reamer DLC Part No	Replacement Blades DLC Part No	Spare Nut with scale Part No	Sparee Clamping Spring Part No	OPTION Clamping Shell Part No
H 36	158 36 000	158 36 400	150 36 520	150 20 600	150 20 650
H 38	158 38 000	150 38 400	150 38 520	150 20 600	150 20 650
H 41	158 41 000	158 41 400	150 41 520	150 20 600	150 20 650
H 44	158 44 000	158 44 400	150 44 520	150 25 600	150 25 650
H 47	158 47 000	158 47 400	150 47 520	150 25 600	150 25 650
H 51	158 51 000	158 51 400	150 51 520	150 30 600	150 30 650
H 54	158 54 000	158 54 400	150 54 520	150 30 600	150 30 650
H 58	158 58 000	158 58 400	150 58 520	150 30 600	150 30 650
H 62	158 62 000	158 62 400	150 62 520	150 35 600	150 35 650
H 65	158 65 000	158 65 400	150 65 520	150 35 600	150 35 650
H 69	158 69 000	158 69 400	150 69 520	150 40 600	150 40 650
H 73	158 73 000	158 73 400	150 73 520	150 40 600	150 40 650
H 78	158 78 000	158 78 400	150 78 520	150 45 600	150 45 650
H 83	158 81 000	158 81 400	150 81 520	150 45 600	150 45 650
H 88	158 82 000	158 82 400	150 82 520	150 50 600	150 50 650
H 93	158 83 000	158 83 400	150 83 520	150 50 600	150 50 650
H 99	158 84 000	158 84 400	150 84 520	150 50 600	150 50 650
H 105	158 85 000	158 85 400	151 83 520	150 50 600	150 50 650

\* Replacement blades are supplied in matched sets.  
The blades are finish ground, so no grinding is required after the blades are inserted into the reamer body.



### Tool Bars

#### Application

A tool bar is required to guide the reamer

#### Description

The tool bar has a square at each end to which a tap wrench can be attached to rotate and advance the reamer that is placed on the tool bar.

The tool bars are precision ground so that the reamer is guided precisely in every position along the tool bar.

#### Ordering Information

Standard Tool Bar*		Diameter D mm	Length L mm	Square WAF mm	Weight kg
P/N	for Reamer Sizes				
152 20 101	H 36 - H 41	20	1000	13	2,420
152 25 101	H 44 - H 47	25	1000	13	3,740
152 30 121	H 51 - H 58	30	1200	16	6,540
152 30 151	H 51 - H 58	30	1500	16	12,000
152 35 121	H 62 - H 65	35	1200	18	8,750
152 40 151	H 69 - H 73	40	1500	18	14,400
152 45 151	H 78 - H 83	45	1500	22	18,110
152 50 171	H 88 - H 105	50	1700	22	25,200

\* Customized tool bars are available in any desired length.

### Expandable Guide Bushes for the Tool Bars

#### Application

The guide bush is clamped into one of the holes to keep the toolbar centered and aligned with the hole.

#### Description

The guide bushes are equipped with clamping wedges that can be adjusted radially outward by means of an adjusting ring to clamp the guide bush in the bore.

#### Ordering Information



Expandable Guide Bush		Bore d mm	Clamping Diameter Range D mm	Weight kg
Part No..	Suitable for Reamer Sizes			
153 20 000	H 36 - H 41	20	35,5 - 54	0,200
153 25 000	H 44 - H 47	25	43,5 - 62	0,300
153 30 000	H 51 - H 58	30	49,5 - 74	0,410
153 35 000	H 62 - H 65	35	61,5 - 83	0,620
153 40 000	H 69 - H 73	40	68,5 - 93	0,800
153 45 000	H 78 - H 83	45	77,5 - 105	1,100
153 50 000	H 88 - H 105	50	87,5 - 127	1,550

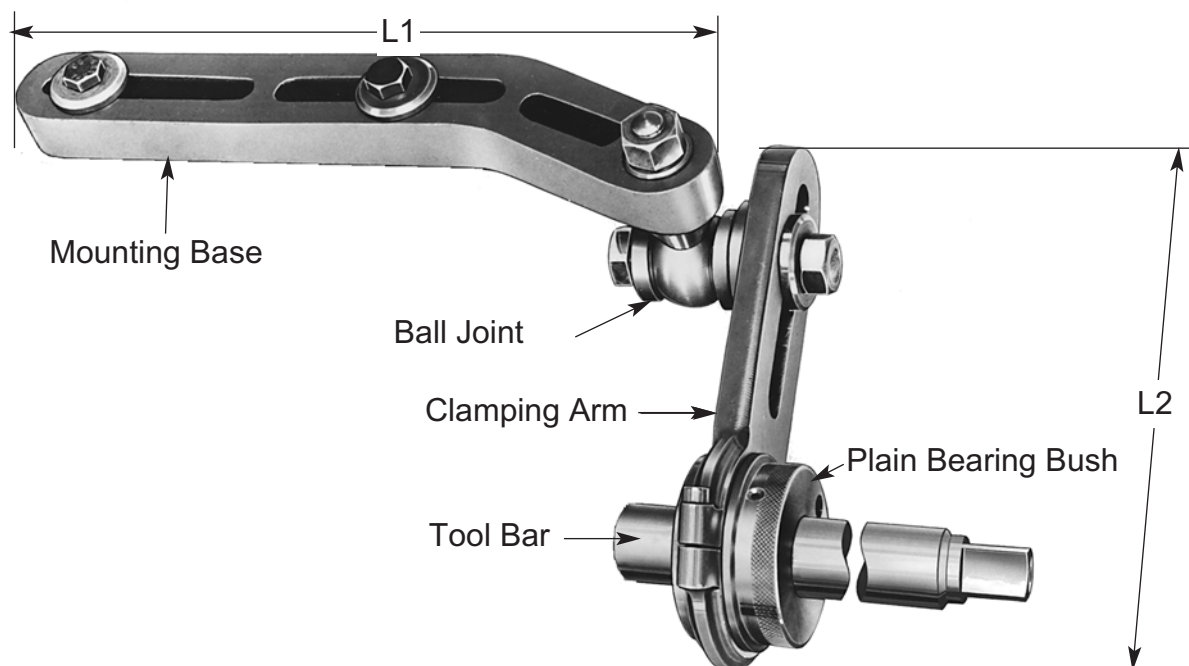
### Application

The universal bearing support is designed to locate a plain bearing bush in front of a hole for perfect alignment of the tool bar

### Description

The plain bearing bush is locked in a clamp arm that is connected by a ball joint to a mounting base that is attached to the work piece.

Both the clamp arm and ball joint are adjustable to ensure proper alignment.



### Ordering Information

Bearing Support			Components						
Size	Part No.,	Weight kg	Size	Mounting Base Part No.,	L1 mm	Size	Clamping Arm Part No.,	L2 mm	Ball Joint Part No.,
IA	156 11 100	3,140	IA	156 11 110	330	IA	156 11 120	210	156 11 130
IIA1	156 12 102	5,100	IIA	156 12 110	400	IA	156 11 120	210	156 11 130

Plain Bearing Bushes for Clamping Arm			
Size	Part No.,	Suitable for Bar Diameter	Weight kg
IA/20	156 21 200	20 mm	0,920
IA/25	156 21 250	25 mm	0,880
IA/30	156 21 300	30 mm	0,820
IA/35	156 21 350	35 mm	0,750
IA/40	156 21 400	40 mm	0,650
IA/45	156 21 450	45 mm	0,600
IA/50	156 21 500	50 mm	0,550

**Application.**

Adjustable reamers are designed to finish holes to an precise size or a precise fit where size is determined during assembly.

The blades cut away small amounts of material leaving a perfectly round, precisely finished hole. The amount of material to be removed by the reamers depends on the size of the hole and the material being reamed..

A common cutting allowance is 0,03 to 0,1mm per cut. For reamers type U the cutting allowance can be up to 0,3mm per cut.

In general, the more difficult the material being reamed the smaller the cutting allowance.

However, if too little material is removed, the blades will dull because they will push the hole open rather than cut.

A rough cut followed by finish reaming will produce a better surfacea better surface finish than reaming the holes in a single pass.

**Size Adjustment.**

The precision-ground reamer blades are held in tapered slots by nuts.

Adjustment is a simple operation performed by loosening one nut while tightening the other, allowing the blades to move along the tapered bottom slots, increasing or decreasing the reamer diameter depending on the direction of adjustment.

Reamers with an even number of blades can be checked for size with a micrometer.

Reamers with an odd number of blades can be set to size by first adjusting the reamer to a known size bush or ring and then adjusting the reamer to final size by turning of then leading nut by the required increments.

**Using Reamers.**

To set up for reaming, select the correct size reamer and adjust the blades to the required diameter.

Place the reamer in the hole to be reamed and apply moderate axial pressure so that the blades are in cutting contact with the hole from the start. Attach the tap holder to the square shank.

The tap holder must fit snugly onto the square to ensure that the reamer shank is held securely.

Check the alignment of the reamer.

Alignment should be 90° to the surface.

Verify alignment with a square.

Using the tap holder, rotate the reamer clockwise (cutting direction) while applying even pressure to advance the reamer through the hole.

**Important.**

**Always turn reamer clockwise (cutting direction), even when removing it from the hole.**

**Never turn a reamer counter-clockwise!**

Turning the reamer counterclockwise in the hole dulls the blades.

When reaming deep holes withdraw the reamer from time to time to remove chips.

When retracting the reamer, always rotate the reamer clockwise.

When reaming the back end of the hole, reduce the pressure to ensure that the reamer is not pushed through the hole, but that the back end of the hole is reamed at the same feed and speed as the main part.

When removing the reamer from the hole, rotate the reamer clockwise to avoid damaging the reamed hole and blunting the reamer blades.

**Lubrication.**

The use of a cutting fluid will improve the finish and extend the life of the reamer in many cases. Always lubricate with cutting oil or emulsion when reaming iron and steel.

Use kerosene when reaming brass, bronze, aluminum and other soft metals.

Cast iron and malleable iron can be completely dry reamed.

**Using Reamers with Guide Sleeves.**

The tapered guide sleeve sits in one hole and guides the reamer as it reams the other hole.

The guide sleeve provides precise alignment between the hole being reamed and its mating hole. As the blades ream the hole, the guide sleeve, placed in the other hole or in the back end of a deep hole, holds the reamer in precise alignment.

**Maintenance of the Reamers.**

Clean reamers thoroughly after use.

Store reamers in the clear plastic tube containers or in the wooden cases.

A light coat of oil will prevent corrosion and prolong life.

If necessary, clean the blade slots from time to time to ensure proper setting of the cutting diameter.

Remove each blade and slide the corner of the blade along the bottom of the slot to remove chips and dirt.

**Make sure each blade is inserted in the same slot as before!**