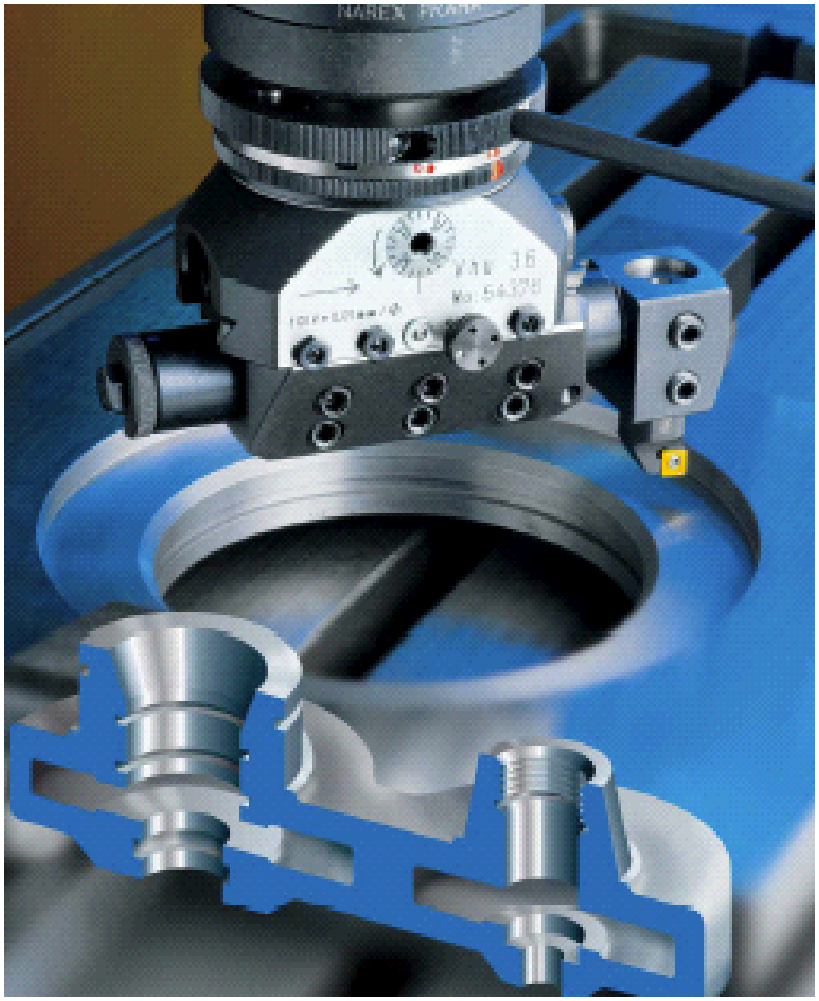
Instruction Manual
No.: 2420304



Vhu

Universal Boring Heads
Vhu 2 1/8”, 3 1/8”, 4 7/8”, 6 ¼”

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OPERATING INSTRUCTIONS

Vhu 21/8", 31/8", Vhu 47/8" and Vhu 6 ¼" Universal Boring Heads.

Utilisation:

The Vhu 21/8", 31/8",Vhu 47/8" and Vhu 61/4" universal boring heads can be utilised for boring, surfacing of front and rear facings, turning of external diameters, machining of external and internal recesses and cutting threads. The Vhu 6 ¼" is same as Vhu 4 7/8" but slide here are with 5 holes (not with 3 holes as for Vhu 4 7/8").

By a combination of the automatic transverse feed motion of the tool slide with the motion of the machine spindle it is possible to bore tapered holes, turn external tapers and cut tapered threads. The taper angle depends in this case on the feed motion of the machine.

The universal boring heads widen considerably the machining possibilities of horizontal boring machines, radial drilling machines and coordinate boring machines etc.

Examples of application:

No. of operation	Operation	Example
1.	Hole boring	Fig. No. 1
2.	Surfacing on small diameter front facing	Fig. No. 2
3.	Surfacing on large diameter from facing	Fig. No. 3
4.	Recessing in bore	Fig. No. 4
5.	Recessing on surface	Fig. No. 5
6.	External turning	Fig. No. 6
7.	Recessing of long shoulder	Fig. No. 7
8.	Taper boring	Fig. No. 8
9.	Surfacing on rear facing	Fig. No. 9
10.	Thread cutting	Fig. No. 10

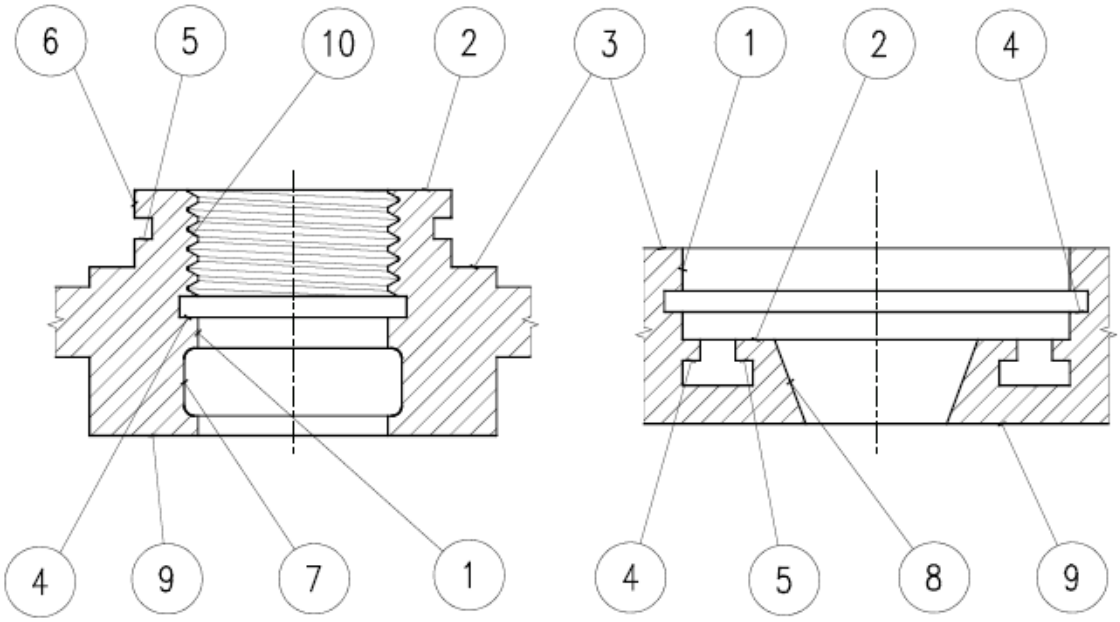


Fig. 1 – Hole boring

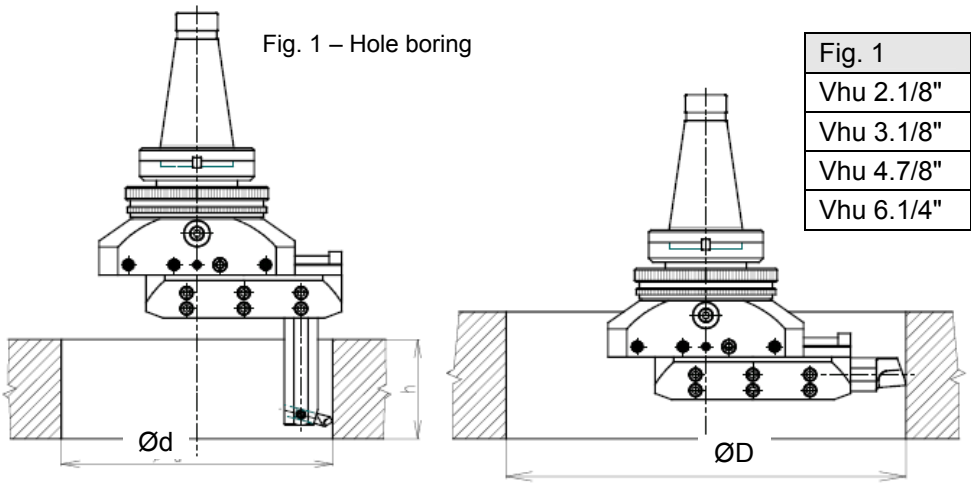


Fig. 1	Ø d max.	h max.	Ø D max.
Vhu 2.1/8"	6 1/4"	4 1/4"	9"
Vhu 3.1/8"	8"	4 1/4"	11"
Vhu 4.7/8"	11"	7 1/4"	15"
Vhu 6.1/4"	13“	7 1/4"	18“

Fig. 2 – Surfacing on small diameter front facing

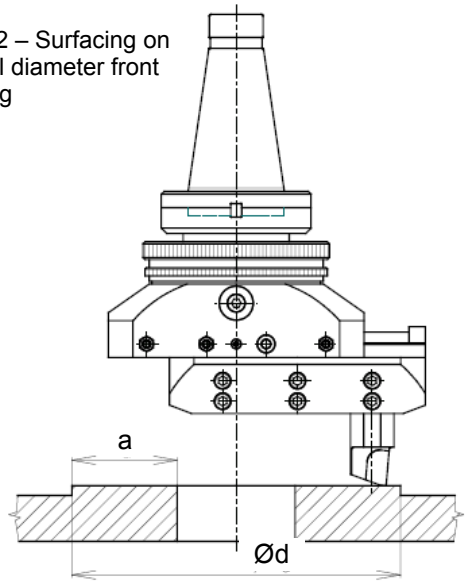


Fig. 3 Surfacing on larger diameter front facing

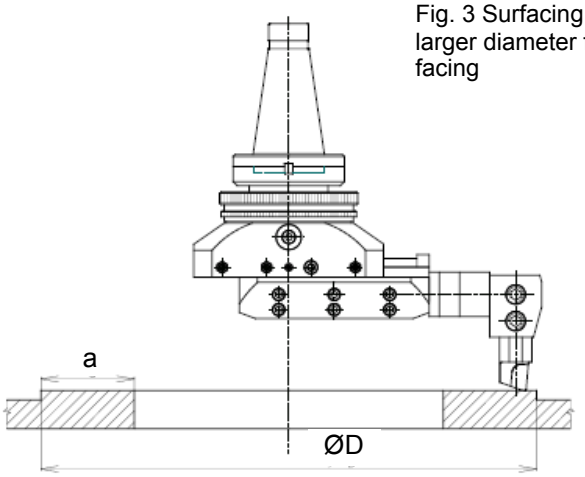


Fig. 2 & 3	Ø d max.	Ø D max.	a max.
Vhu 2.1/8"	5 1/2"	13"	2 1/8"
Vhu 3.1/8"	7"	15"	3 1/8"
Vhu 4.7/8"	9 3/4"	24"	4 7/8"
Vhu 6.1/4"	11 3/4“	27“	6 1/4"

Fig. 4 Recessing in bore

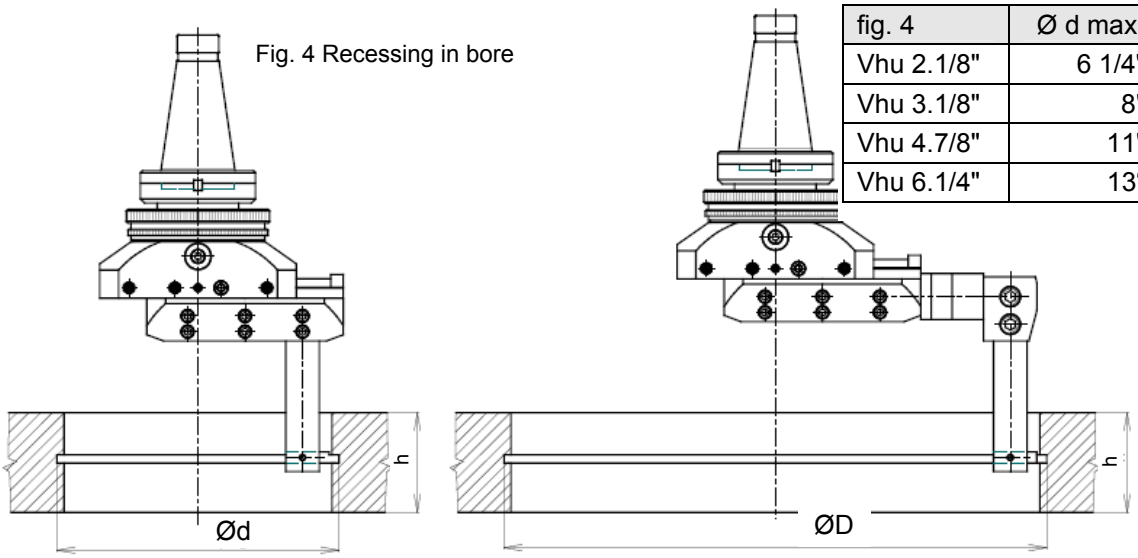


fig. 4	Ø d max.	Ø D max.	h max.
Vhu 2.1/8"	6 1/4"	13 3/4"	4"
Vhu 3.1/8"	8"	15 3/4"	4"
Vhu 4.7/8"	11"	25"	6 1/2"
Vhu 6.1/4"	13“	28“	6 1/2"

Fig.5 Recessing on surface

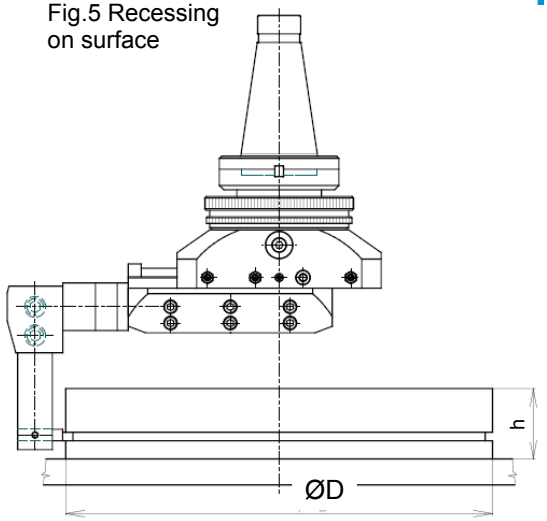


Fig. 5 & 6	Ø D max.	h max.
Vhu 2.1/8"	10 3/4"	4"
Vhu 3.1/8"	12 3/4"	4"
Vhu 4.7/8"	20 1/2"	6 1/2"
Vhu 6.1/4"	23 1/2“	6 1/2"

Fig. 6 External turning

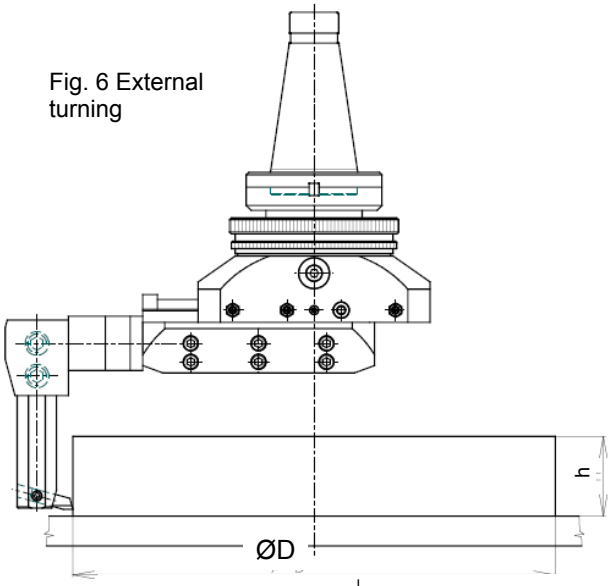


Fig. 7	h max.
Vhu 2.1/8"	4"
Vhu 3.1/8"	4"
Vhu 4.7/8"	6 1/2"
Vhu 6.1/4"	6 1/2"

Fig. 7 Recessing of long shoulder

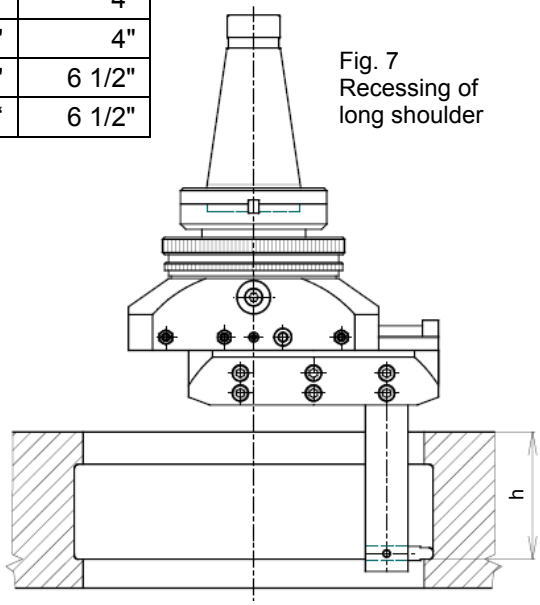


Fig. 8 Taper boring α/2 = 5° - 85°

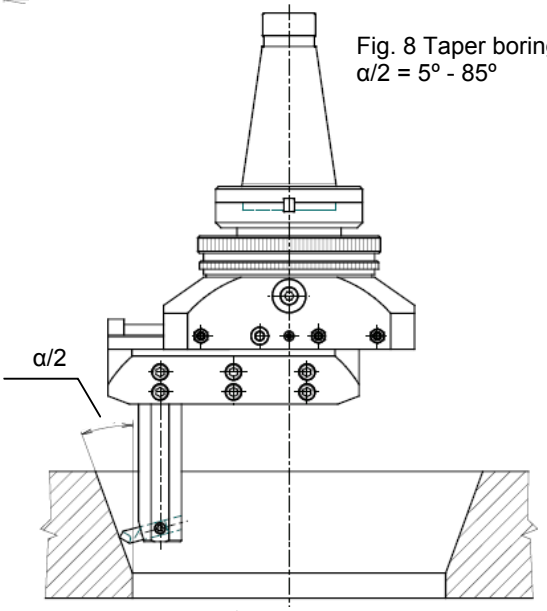


Fig. 9 Surfacing on rear facing

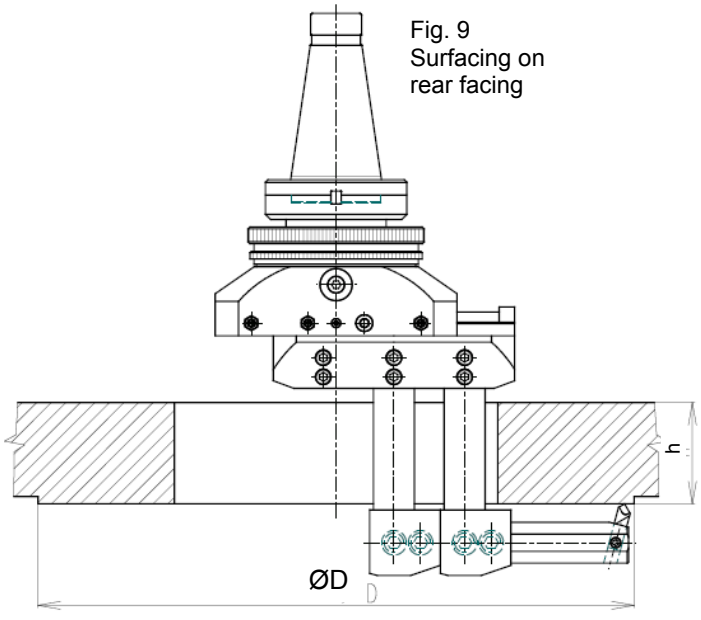


Fig. 10 Thread cutting

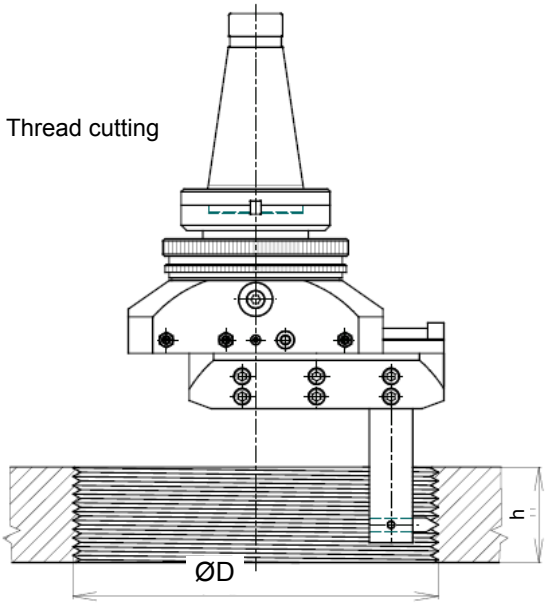


Fig. 5 & 6	Ø D max.	h max.
Vhu 2.1/8"	12 1/2"	3 1/2"
Vhu 3.1/8"	13 1/2"	3 1/2"
Vhu 4.7/8"	21 1/2"	4"
Vhu 6.1/4"	24“	4"

I. Boring and turning of external diameters.

When boring and turning external diameters the operator must avoid touching the breaking ring (1) which could cause an alteration of the set dimension.

a) To achieve a rapid resetting of the tool slide (5) it is necessary to force an extension socket spanner into the internal hexagon of the dial for rapid feed motion (12) to a depth of approx. 0,5 in. The tool slide can be now quickly traversed by turning.

One division of the dial for quick traverse of the tool slide stands for the following values:
Vhu 21/8" and 31/8" – feed motion of the tool slide by 0,04in = 0,08in on dia.

Vhu 47/8"and Vhu 6 ¼" – feed motion of the tool slide by 0,08in = 0,16 in on dia.

One turn of the screw for rapid feed traverse of the tool slide stands for the following values:

Vhu 21/8" and 31/8" – feed motion of the tool slide by 0,12in = 0,24 in on dia.

Vhu 47/8" and Vhu 6 ¼" – feed motion of the tool slide by 0,16in = 0,32in on dia.

After the slide has been reset, the quick traverse screw must be re-locked against turning. Pull out the socket spanner partly so that a length of only 0,16on will remain on the hole, then turn the screw in order to set the nearest scale line against the foxed scale mark of the tool slide (5). Check by turning the spanner to both slides whether the screw is secured against turning.

b) To achieve a fine setting of the tool slide (5) it is necessary to turn the fine setting dial (4) by means of a socket spanner. The turning of the dial (4) on the direction of the arrow will cause the tool slide (5) to move also in the direction of the arrow.

One division of the fine setting dial (4) represents a feed motion of the tool slide (5) by 0,00025in = 0,0005in on dia.

When performing precise setting from a larger diameter to a smaller one, reverse the fine setting dial by more than one half on a turn that would correspond to the dimension, and then return to the dimension. This will eliminate the effect of tolerances in the transmission (blacklash).

After the setting has been finished, lock the set dimension by means of the tool slide lock screw (9). Slight tightening of this screw will help to eliminate the backlash during fine setting.

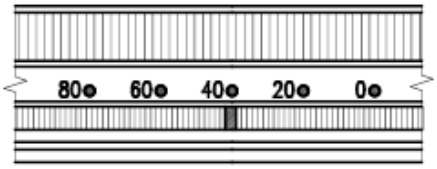
II. Surfacing on front and rear facings, recessing of external and internal recesses.

a) These operations require a transverse feed of the tool slide (5); the tool slide lock screw must be loosened (9).

b) The Vhu 2 1/8", 3 1/8", 4 7/8" and 6 ¼" universal boring heads can be set to automatic transverse feed of 0,0020, 0,0040, 0,0060 and 0,0080in/rev.

The feed is adjusted by turning the engagement ring (2) so that the dial division filled with red paint will be set opposite the red paint filled hole of the respective number indicating the magnitude of the transverse feed in 0,0001in/rev. on the automatic transverse feed dial (16). The best way to engage the feed is to take the engagement ring by its indexed part between the thumb and index finger of the one hand while taking the breaking ring 1) with engaged clutch (15) between the thumb and index finger of the other hand, then setting required feed by turning both rings against each other. An example of feed engagement is given in Fig. No. 11 which shows an automatic tool slide feed of 0,004in/rev.

Fig.11



Disengage the feed after the completation of all operations using the automatic tool slide feed. For safety reasons engage the feed only with the machine at rest.

Table of recommended chip width values at surfacing on front facings.

Type	Transverse feed	Max. dia. of surfaced facing	Max. chip width	Max.dia. of surfaced facing	Max. chip width
Vhu 2 1/8"	0,004 0,008	4 3/4"	1/8" 5/64"	13"	5/64" 1/16"
Vhu 3 1/8"	0,004 0,008	6 1/4"	1/8" 5/64"	15"	5/64" 3/64"
Vhu 4 7/8"	0,004 0,008	8"	5/32" 1/8"	24"	5/64" 3/64"
Vhu 6 1/4"	0,004 0,008	9"	1/8" 5/64"	27"	4/64" 2/64"

The Table applies to steel of $7X10^4$ – $11,5X10^4$/lbs per sq/in tensile strength. For cast iron of a hardness HB 180 – 220 the recommended values are doubled.

To engage the required transverse feed turn the braking ring (1) with the machine at rest against the direction of the spindle rotation by at least one turn! (Maximum speed = 500 r. p. m.)

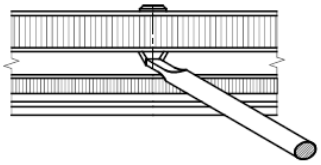
c) The automatic transverse feed of the tool slide (5) will be engaged by slowing down the control ring (3) with the aid of the braking ring (1). Into the hole of the braking ring a holding rod (17) should be inserted and held by hand only for the duration of short-term simple jobs. When surfacing on wider areas by larger chips and whenever stops are used, it is necessary – for safety reasons – to support the rod by means of a positive stop situated conveniently near the machine spindle. In both cases the braking ring (1)

d) must be connected with the control ring (3) by means of the clutch (15) situated in the braking ring (1) which should be forced with the finger into one of the two slots in the control ring.

e) By slowing down of the control ring (3), when the head is turning to the right, the tool slide (5) moves in the direction of both arrows situated on the tool slide side near the fine feed setting dial (4); when the head is turning to the left, the tool slide moves against the direction of the arrows.

f) An automatic disengagement of the transverse feed takes place when one of the trip dogs (10) strikes the trip dog pin (11) or when the cutting resistance increases due to a large cut, blunting or chipping of the tool. The sensitivity of the clutch disengagement (15) can be adjusted by the adjusting screw (14) which compresses or relieves the spring of the clutch (15). In case of excessive screwing-in of the clutch adjusting screw (14) try to disengage the clutch by means of screw driver (as shown in Fig. No. 12). If the clutch cannot be completely disengaged, the spring coils bear on each other and the clutch adjusting screw (14) must be slightly loosened; then repeat the disengagement of the clutch (15) by the described method.

Fig.12



g) Adjustment of trip dog for disengagement on accurate diameter. The trip dog (10) must be adjusted and secured so as to disengage the transverse feed at the moment the tool cutting edge reaches a certain diameter. The disengagement of the clutch (15) must be therefore adjusted so that the disengagement pressure between the trip dog and trip dog pin (11) be as small as possible, i. e. the clutch adjusting screw (14) must be screwed in as little as possible. In spite of this, however, there will be a certain overtravel exceeding the required dimension. This overtravel is within the tolerance of the recess diameters for lock rings. A more accurate adjusting for precision jobs can be attained by the following trip dog adjustment:

A) The trip dog (10) must be adjusted and firmly tightened so as to disengage shortly before the required diameter will be attained, e. g. by turning the fine setting dial (4) reverse the tool slide by approx. 0,008 inch push the trip dog (10) against the trip dog pin (11) and secure firmly by screws.
The difference between the required and actual diameter will be measured after a trial disengagement.

B) **Now, the trip dog should be adjusted as follows:**

a) Do not loosen the trip dog (10) but reverse the tool slide (5) so that a feeler gauge of any type, for example 2 mm, can be slipped between the trip dog and trip dog pin (11).

b) Secure the tool slide (5) against moving by means of the tool slide lock screw (9) so that its position can be changed when displacing the trip dog (10).

c) A new slip gauge will be assembled as follows:

1. If the actual diameter which has been attained after a trial disengagement is larger than the required diameter, the new feeler gauge must be smaller by 50% of the ascertained difference.
2. If the actual diameter is smaller than the required one, the new feeler gauge must be enlarged by 50% of the ascertained difference.

d) Now loosen the trip dog (10) and push ir against the newly assembled feeler gauge abutting on the trip dog pin (11); then push the trip dog against the gauge and tighten firmly.

e) Remove the trip dog and loosen the tool slide lock screw (9). The disengaging of the automatic transverse feed is vow set to the required diameter.
After the trip dog has been reached, the deflected mechanism must be released by a few turns of the dial for fine setting of the tool slide (4). Only than may the tool slide be reversed by means of the quick traverse dial (12).

III. Taper boring

For taper boring the transverse feed of the tool slide must be coupled to the axial feed of the machine spindle.

a) Determining of the tool slide and spindle feed in relation to the taper angle. The required tool slide and spindle feed for the respective taper angle can be determined from the taper boring chart (see enclosure) which shows that for the required taper angle of 70º a slide feed of 0,0020 inch/rev. and a machine feed of 0,00286 inch/rev., or for the tool slide feed of 0,0040 inch/rev. a machine feed of 0,00572 inch/rev. can be selected.

According to the chart also the feed of the machine spindle in mm/min in relation to the spindle speed (in r. p. m.) can be determined. It is necessary to select the smallest possible values of the machine spindle feed, but in case of small angle taper boring relatively large feeds, which lower the surface quality, are unavoidable. There are unevenesses of 0,0010in.on the taper surface caused by the interrupted transverse feed. Generally, the necessary feeds for the required tapers will not be provided by the machine so that deviations in the taper ratio will be unavoidable.

Therefore, an additional calibrating of the taper by means of another instrument is necessary.

b) Tool clamping:

In the case of clockwise spindle rotation the feed of the tool slide (5) can be effected only in one direction (see Fig. No.13). In spite of this, expanding or narrowing tapers can be bored.

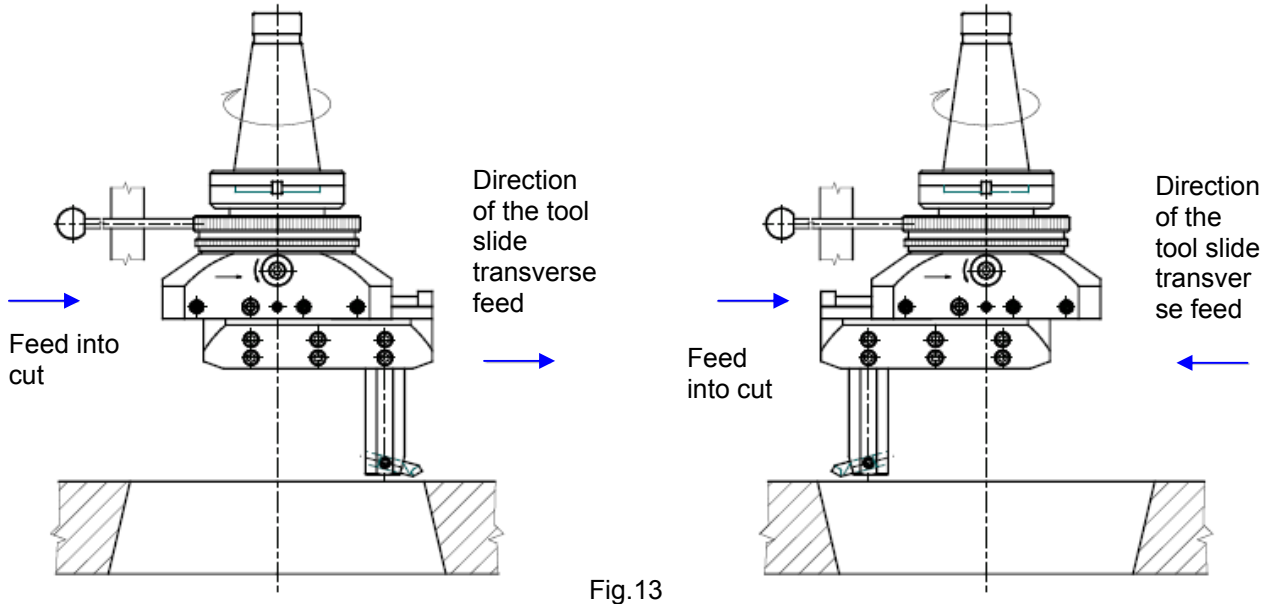
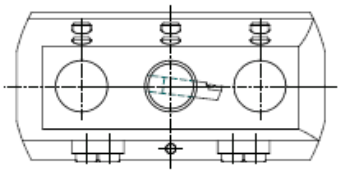


Fig.13

If the tool is clamped on the direction of the transverse feed of the tool slide, an expanding taper will be bored. If the same tool is clamped in the direction opposite to that of the transverse feed of the tool slide, a narrowing taper will be bored. When clamping the tool, be sure to set its point in the plane passing through the axes of the holes for rods and holders (7) – (see Fig. No. 14), otherwise the taper will not be accurate.

Fig.14



c) Taper boring procedure:

1. Clamps the tool according to paragraph b) and by means of the dial for the tool slide quick traverse (12) and the tool slide fine setting dial (4) set the tool to the initial boring diameter.
2. Advance the spindle so that the tool cutting edge is approx. 0,09 in above the surface of the workpiece and set the tool slide dial in this position to zero.
3. Withdraw the spindle by a few millimeters and advance to zero by the spindle feed determined from the chart. Stop the machine when reaching zero, but do not disengage the feed.
4. Adjust the trip dog according to Fig. No. 13 and tighten.
5. Engage the clutch (15) and screw in completely the clutch adjusting screw (14). Thus the disengagement of the clutch (15) in case of overloading is excluded. Accordingly, increased attention is necessary during operation.
6. Insert holding rod (17) into the hole in the braking ring (1) and support it by the positive stop on the machine.
7. Start the machine. Now tool slide (5) moves simultanously with the moving machine spindle and forms the required taper.
8. After completation of the job remove the holding rod (17), return the boring head into its original position and cut another chip by means of the trip dog (10) and gauge or dial (4). This procedure will be repeated as required. External tapers can be machined by a similar method.

IV. Thread cutting

The braking ring (1) must be caught when cutting threads as this could cause an axial motion of the tool slide (5).

Working procedure:

1. Mount the tool.
2. Engage the respective feed corresponding to the head of the thread.
3. Traverse the tool slide by means of the dial for quick traverse of the tool slide (12) and cut the chip by means of the dial for fine setting of the tool slide (4).
4. Start machine, cut the thread and stop the machine.
5. Withdraw the tool by means of the dial (12) or dial (4).
6. Cut another chip and repeat the whole procedure as required.

Also taper threads can be cut with the Vhu 21/8", 31/8", Vhu 47/8" and Vhu 6 ¼" boring heads.

The axial feed for the lead of the thread is effected by the machine spindle and the transverse motion of the tool slide effects the thread cutting. Both feeds must be permanently engaged during thread cutting. The transverse feed of the tool slide will be calculated by means of the following formula:

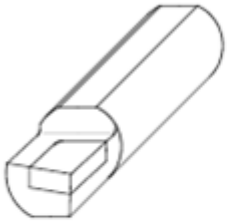
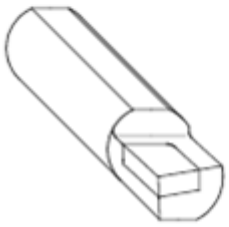
Transverse feed of the tool slide in in/rev. = (lead of the thread in in) / (cotg α/2)

The tool clamping and setting to the required diameter is the same as in the case of taper boring.

Lubrication:

The internal mechanism of the boring heads is lubricated by means of a grease gun and two nipples (13). The design of the Vhu universal boring heads is protected by the Czech Patent No. 105957.

V. Tools

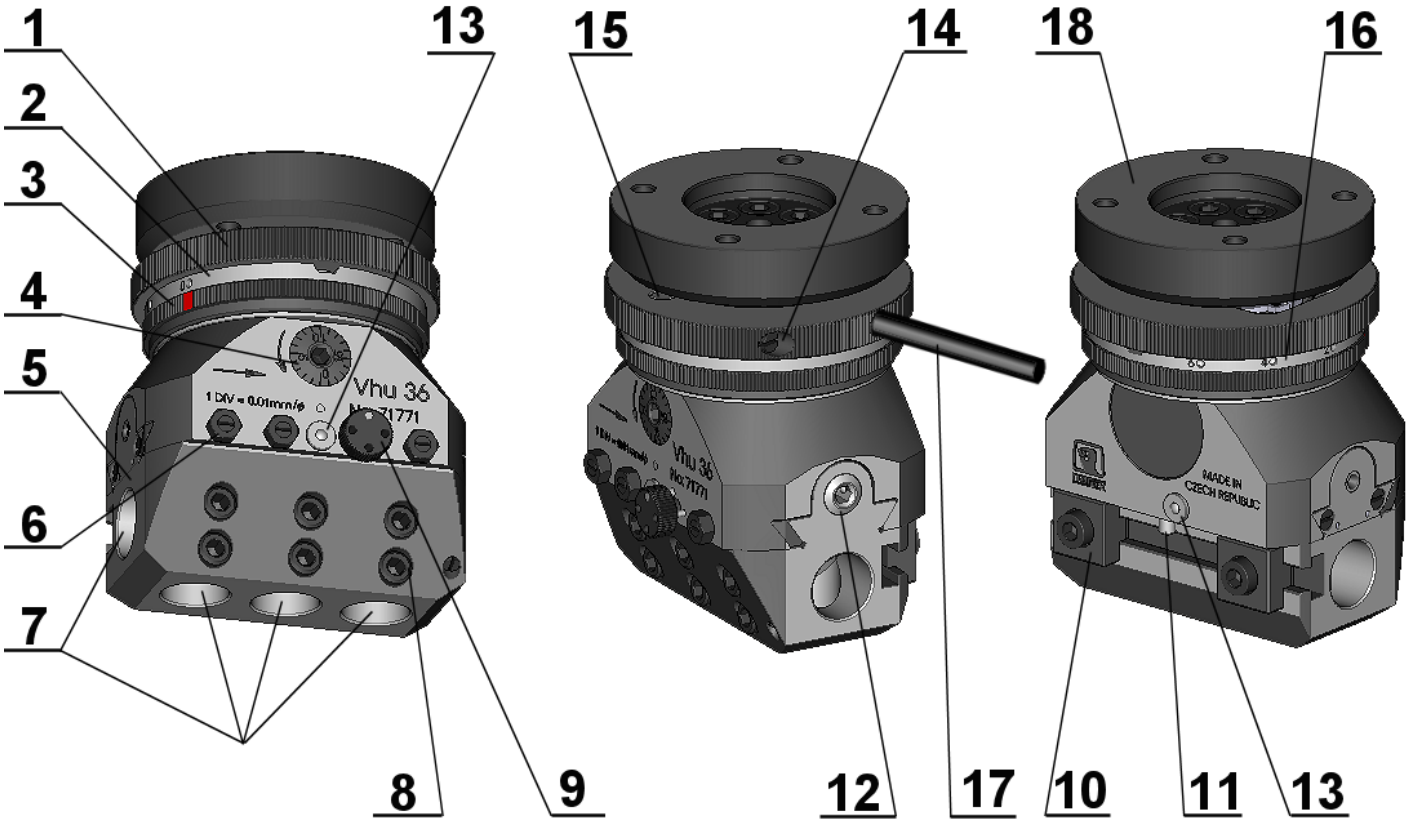
Designation	Intended for	Illustration	Application
1" - 223838 - P20	Vhu 2 1/8"		For facing and boring of large diameters and parts made of steel and cast iron
1" - 223838 - K10	Vhu 3 1/8"		
1 1/4" - 223838 - P20	Vhu 4 7/8" Vhu 6 ¼"		
1 1/4" - 223838 - K10			
1" - 223839 - P20	Vhu 2 1/8"		
1" - 223839 - K10	Vhu 3 1/8"		
1 1/4" - 223839 - P20	Vhu 4 7/8" Vhu 6 ¼"		
1 1/4" - 223839 - K10			
5/16"x5/16"x1 3/16" - HSS	Vhu 2 1/8", Vhu 3 1/8"		For boring and further operations on parts made of cast iron and steel
3/8"x3/8"x1 13/32" - HSS	Vhu 6 ¼" Vhu 4 7/8"		
5/16"x5/16"x1 3/16" - P20	Vhu 2 1/8", Vhu 3 1/8"		For boring and further operations on parts made of steel. Permitted cutting conditions: Feed 0,008 in/rev. chip width 0,1 in, cutting speed 30 in/min.
3/8"x3/8"x1 13/32" - P20	Vhu 6 ¼" Vhu 4 7/8"		

We are confident that the Vhu 21/8”, 31/8”,Vhu 47/8” and Vhu 6 ¼” universal boring heads will enable you to perform the most accurate and intricate operations on your boring machines.

The Vhu 21/8”, 31/8”, Vhu 47/8” and Vhu 6 ¼” universal boring heads enable a large number of various operations which, however, require a wide choice of tools, which – in the majority of cases – will not be utilised. Therefore, along with each Vhu boring head the above specified tool bits are supplied as standard accessories. Tools for recessing, thread cutting and other special jobs can be made by grinding from semi – products 5/16” x 6/16” x L (for Vhu 21/8”, 31/8”) or 3/8” x 3/8” x L (for Vhu 47/8” and Vhu 6 ¼”).

By using two reducing sleeves supplied as standard accessories it is possible to work with all types of standard tools with a circular cross section shank of 3/4” and 5/8” dia.

VI. Description



1. Braking ring
2. Engagement ring
3. Control ring
4. Tool slide fine setting dial
5. Tool slide
6. Adjusting screw
7. Holes for rods and holders
8. Lock screw
9. Tool slide lock screw
10. Trip dog
11. Trip dog pin
12. Dial for quick traverse of tool slide
13. Lubrication nipple
14. Clutch adjusting
15. Clutch
16. Automatic transverse feed dial
17. Holding rod
18. Flange

VII. Exchangeable Clamping Taper Shank

VK	Kód Code Код	Popis Beschreibung Описание	Vhu 36	Vhu 56	Vhu 80	Vhu 110	Vhu 125	Vhu 160	Vh 70	Vh 110	Vh 140	Vhs 50,10-125	Vhs 40-180	D [mm]	X [mm]	kg	Náčrt Zeichnung Эскиз
VK 360	208.015	MK2–M8 DIN 228A	●						●			●		70	13	0,35	DIN 228A, ISO 296–63, ČSN 220420
VK 360	208.022	MK2–M10 DIN 228A	●						●			●		70	13	0,35	
VK 360	208.039	MK2–3/8“–16 UNC	●						●			●		70	13	0,35	
VK 360	208.060	MK3–M10 DIN 228A	●						●			●		70	13	0,46	
VK 360	208.077	MK3–M12 DIN 228A	●						●			●		70	13	0,46	
VK 360	208.084	MK3–1/2“–12 UNC	●						●			●		70	13	0,46	
VK 360	208.121	MK4–M14 DIN 228A	●						●			●		70	14,5	0,75	
VK 360	208.138	MK4–M16 DIN 228A	●						●			●		70	14,5	0,75	
VK 360	208.145	MK4–5/8“–11 UNC	●						●			●		70	14,5	0,75	DIN 1806, ISO 296–63, ČSN 220424
VK 801	208.510	MK4–M14 DIN 228A		●	●	●				●	●		●	110	18,5	1,35	
VK 801	208.527	MK4–M16 DIN 228A		●	●	●				●	●		●	110	18,5	1,35	
VK 801	208.534	MK4–5/8“–11 UNC		●	●	●				●	●		●	110	18,5	1,35	
VK 801	208.572	MK5–M16 DIN 228A		●	●	●	●	●		●	●		●	110	18,5	2,29	
VK 801	208.589	MK5–M20 DIN 228A		●	●	●	●	●		●	●		●	110	18,5	2,29	
VK 801	208.596	MK5–3/4“–10 UNC		●	●	●	●	●		●	●		●	110	18,5	2,29	
VK 801	208.633	MK6–M20 DIN 228A		●	●	●	●	●		●	●		●	110	20	4,74	
VK 801	208.640	MK6–M24 DIN 228A		●	●	●	●	●		●	●		●	110	20	4,74	SPECIAL *
VK 801	208.664	MK6–1“–8 UNC		●	●	●	●	●		●	●		●	110	20	4,74	
VK 360	208.053	MK3–DIN 1806	●						●			●		70	13	0,47	
VK 360	208.114	MK4–DIN 1806	●						●			●		70	14,5	0,77	
VK 360	208.169	MK5–DIN 1806	●						●			●		70	14,5	1,5	
VK 360	208.176	MK6–DIN 1806	●						●			●		70	38	4,16	
VK 801	208.503	MK4–DIN 1806		●	●	●				●	●		●	110	18,5	1,47	
VK 801	208.565	MK5–DIN 1806		●	●	●	●	●		●	●		●	110	18,5	2,45	
VK 801	208.626	MK6–DIN 1806		●	●	●	●	●		●	●		●	110	20	4,54	DIN 2080, ISO 297, ČSN 220430
VK 360	208.046	MK2–(3/8“–16 UNC) *	●						●			●		70	13	0,36	
VK 360	208.091	MK3–(M12) *	●						●			●		70	13	0,47	
VK 360	208.107	MK3–(1/2“–13 UNC) *	●						●			●		70	13	0,47	
VK 360	208.152	MK4–(5/8“–11 UNC) *	●						●			●		70	14,5	0,75	
VK 801	208.541	MK4–(M16) *		●	●	●				●	●		●	110	18,5	1,46	
VK 801	208.558	MK4–(5/8“–12 UNC) *		●	●	●				●	●		●	110	18,5	1,46	
VK 801	208.602	MK5–(M20) *		●	●	●	●	●		●	●		●	110	18,5	2,22	
VK 801	208.619	MK5–(3/4“–10 UNC) *		●	●	●	●	●		●	●		●	110	18,5	2,22	DIN 69871/A, ISO 297, ČSN 220434
VK 801	208.671	MK6–(M24) *		●	●	●	●	●		●	●		●	110	20	4,53	
VK 801	208.688	MK6–(1“–8 UNC) *		●	●	●	●	●		●	●		●	110	20	4,53	
VK 360	208.183	ISO 30 (M12) DIN 2080	●						●			●		70	9,6	0,4	
VK 360	208.190	ISO 30 (1/2“–13 UNC)	●						●			●		70	9,6	0,4	
VK 360	208.213	ISO 40 (M16) DIN 2080	●						●			●		70	9,6	0,74	
VK 360	208.220	ISO 40 (5/8“–11 UNC)	●						●			●		70	9,6	0,74	
VK 360	208.244	ISO 50 (M24) DIN 2080	●						●			●		70	45,2	3,19	CAT
VK 801	208.695	ISO 40–(M16) DIN 2080		●	●	●	●	●		●	●		●	110	13,6	1,35	MAS – BT
VK 801	208.701	ISO 40–(5/8“–11 UNC)		●	●	●	●	●		●	●		●	110	13,6	1,35	
VK 801	208.725	ISO 50–(M24) DIN 2080		●	●	●	●	●		●	●		●	110	15,2	2,89	
VK 801	208.732	ISO 50–(1“–8 UNC)		●	●	●	●	●		●	●		●	110	15,2	2,89	
VK 360	208.206	ISO 30 (M12) DIN 69871/A	●						●			●		70	49,1	0,75	
VK 360	208.282	CAT 30 (1/2“–13 UNC)	●						●			●		70	44,2	0,75	
VK 360	208.237	ISO 40 (M16) DIN 69871/A	●						●			●		70	49,1	1,35	
VK 360	208.299	CAT 40 (5/8“–11 UNC)	●						●			●		70	49,1	1,35	
VK 360	208.251	ISO 50 (M24) DIN 69871/A	●						●			●		70	49,1	3,05	R8
VK 801	208.718	ISO 40–(M16) DIN 69871/A		●	●	●	●	●		●	●		●	110	48,1	1,95	
VK 801	208.770	CAT 40–(5/8“–11 UNC)		●	●	●	●	●		●	●		●	110	48,1	1,95	
VK 801	208.749	ISO 50–(M24) DIN 69871/A		●	●	●	●	●		●	●		●	110	65,1	4,78	
VK 801	208.787	CAT 50–(1“–8 UNC)		●	●	●	●	●		●	●		●	110	65,1	4,78	
VK 360	208.268	MAS–BT30 (M12)	●						●			●		70	34,6	0,70	
VK 360	208.275	MAS–BT40 (M16)	●						●			●		70	57,0	1,55	
VK 801	208.756	MAS–BT40 (M16)		●	●	●	●	●		●	●		●	110	43,6	2,12	
VK 801	208.763	MAS–BT50 (M24)		●	●	●	●	●		●	●		●	110	84,0	5,70	
VK 360	208.305	R8 (7/16“–20 UNF)	●						●			●		70	17,6	0,69	
VK 800	208.817	R8 (7/16“–20 UNF)		●										63	17,6	0,64	

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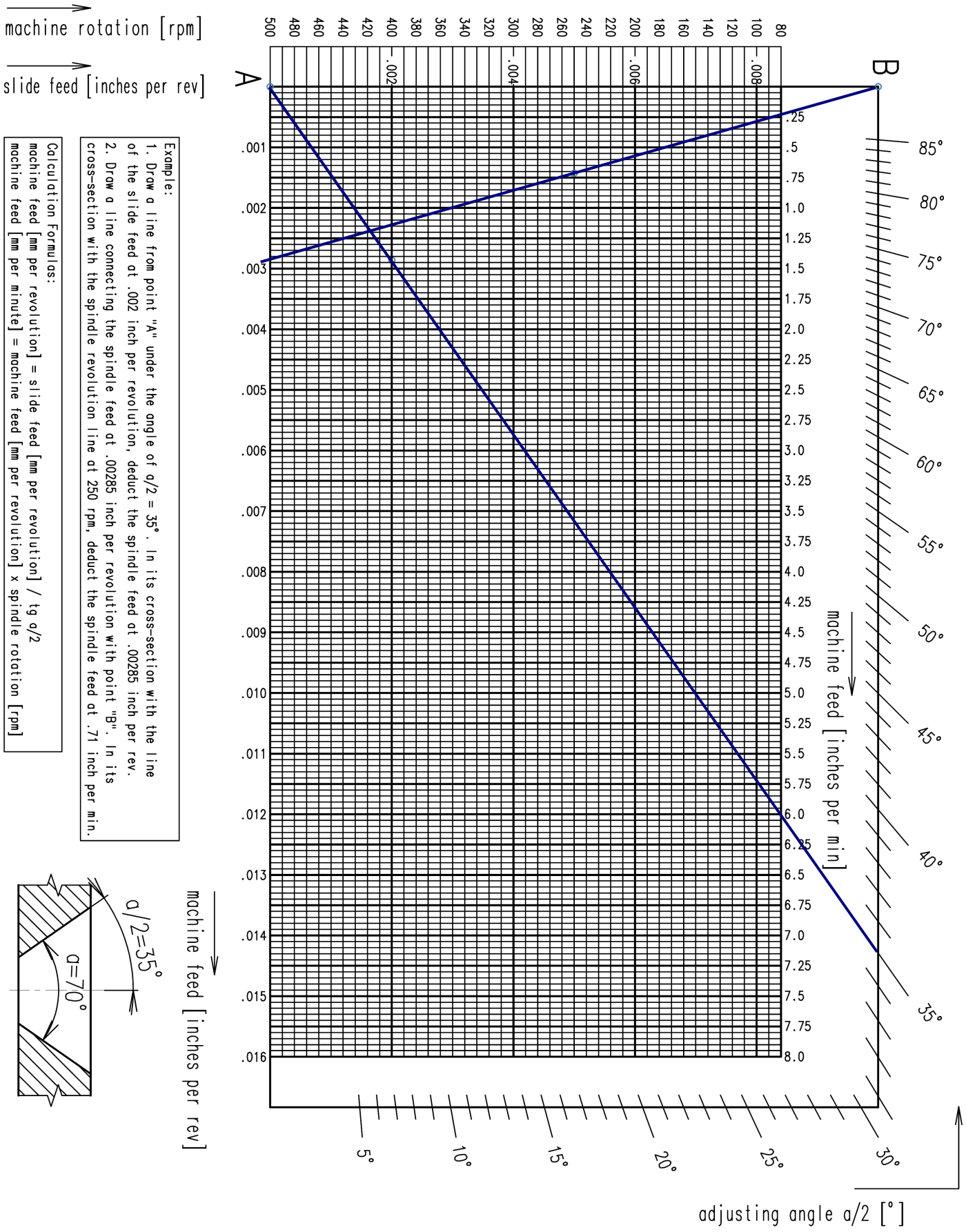
Diagram for taper boring with Vhu 2 1/8“, 3 1/8“, 4 7/8“ and 6 ¼“



Example:
1. Draw a line from point "A" under the angle of a/2 = 35°. In its cross-section with the line of the slide feed at .002 inch per revolution, deduct the spindle feed at .00285 inch per rev.
2. Draw a line connecting the spindle feed at .00285 inch per revolution with point "B". In its cross-section with the spindle revolution line at 250 rpm, deduct the spindle feed at .71 inch per min.

Calculation Formulas:
machine feed [mm per revolution] = slide feed [mm per revolution] / tg a/2
machine feed [mm per minute] = machine feed [mm per revolution] x spindle rotation [rpm]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