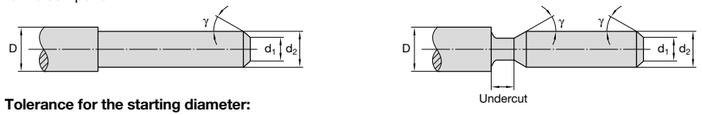
Head in fixed application:
The front part of the head is turned by using the closing pin resp. handle (9) with the ball (23), (if used on automatics, closing is accomplished by using closing roller over a cam) until the coupling rests between the spring housing (2) and shank (1).

Head in revolving application:
The front part of the head is slowed down in its revolving motion by using an additional yoke with brake shoes, the front part is then turned against the shank until the coupling rests between the spring housing (2) and the shank (1).

Machining of the component:
Starting diameter d_2 to be thread rolled must be the equivalent to the effective diameter. Deviations are possible, depending upon type of component material being used. The starting diameter arrived at now should never be increased. The components have to be chamfered under $\gamma = 10°–25°$ against the axis and must be concentric. An undercut at the thread run-out is not required. If an undercut is called for, the same should be chamfered according to sketch below. The diameter d_1 must be below the root diameter of the thread. Also important is the accurate alignment of the head to the component.



Tolerance for the starting diameter:
Once the accurate starting diameter, determined by a test rolling operation, has been found, then this should be considered as the maximum dimension, if the thread has been rolled just up to its crest and the effective diameter is approx. at the maximum dimension within the permissible thread tolerance. Among others the tolerance of the starting diameter is depending to what extent the thread has been rolled to. As a guide for standard threads with tolerance class 6 g the following may be used: starting diameter tolerance ≈ half effective diameter tolerance.

Rolling Speed:
According to component profile and spindle speeds available, the following rolling speeds are recommended:

for V-type threads approx.	20–60 m/min (65–200 ft/min)
for Acme-type threads approx.	15–30 m/min (50–100 ft/min).

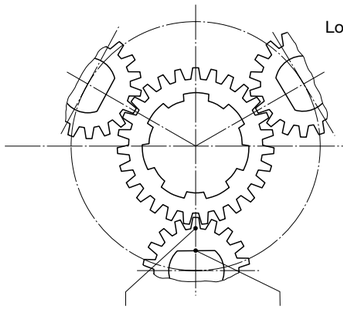
The rolling speed is arrived at by figuring the same as tor the cutting speed.

Rolling operation:
The feed rate of approach should be equivalent to the pitch of thread to be rolled. After engagement over 3–4 thread pitches, the head itself takes over the feed movement. The support respectively the adaptor sleeve should be set-up tor easy movement in either direction at any rate.

Coolants and lubricants:
Recommended coolants and lubricants are those, which are also used for cutting operations, i. e. solutions with diluted ratio of 1:10 up to 1:20 – perhaps with high pressure additives – and thin cutting oils.

Possible errors to be made:
1. Effective starting diameter selected too large or head setting was too small, that means an overload is generated, which shows up in most cases as a bead on the thread crest over a length of the roll width at the thread end.
2. Chamfering (also at the undercut) is not in line with the rolling instructions.
3. Length adjustment was selected incorrect, or component length are deviating from each other (Rolls run against a shoulder).
4. Jamming of Rolls or signs of wear on the Eccentric Spindles caused by heavy dirt of the coolant.
5. Unclean thread start and possible damage to the Rolls caused by incorrect teed approach at the start of rolling.
6. Damage on the Rolls or rolling of two-start threads caused by incorrect assembly of the Rolls.
7. Premature opening of the Rolling Head caused by the wear of the Wedges for Coupling No. 1 or Coupling No. 2.

Position for Assembly

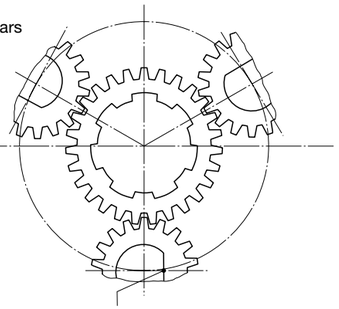


Tooth is at right angle to the flat for types K 1, K 12, K 1223, K 23, K 233400, K3, K 34.. Gap is at right angle to the flat tor type K 2

The flats in the bores of the planet gears must be in the same position relative to the centre gear.

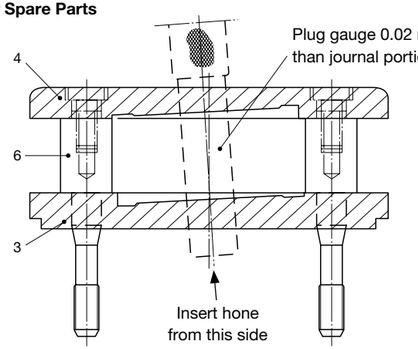
Working Position

Looking at the gears



Position of the flats for right-hand threads. For left-hand threads the flats are on the opposite side. With the assembly in the correct working position, shank and spring housing are mounted with closed coupling.

Assembly Instruction for Spare Parts



- If parts 3, 4 or 6 are re-ordered as spare parts, they should be assembled as shown on the sketch above; finishing work to be done if necessary.
- When assembling parts 5 and 8 in part 3, make sure that there is some play (clearance) between the parts. Part 5 must be able to rotate easily together with part 8.

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Operating Instructions Thread Rolling Heads

K 1, K 12, K 1223, K 2, K 23, K 233400, K 3, K 34

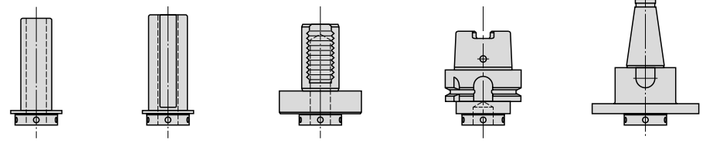
IMPORTANT:
In the case of re-ordering of Spare Parts, please state Rolling Head Type and Serial-No.

Please note marking on the Front Plate!

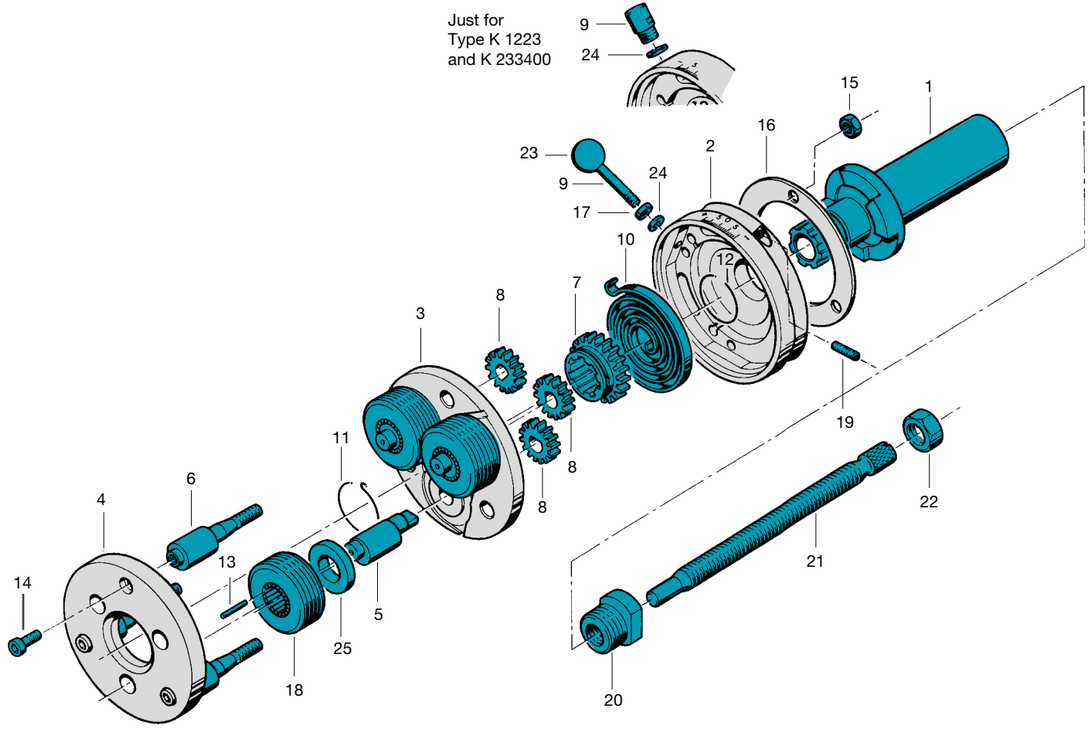
S	= Special angle	(example K 3 S)
L	= Design for Left Hand Threads	(example K 3 S)
SL	= Special angle for Left Hand Threads	(example K 3 SL)
X...	= Special design	(example K 3 X101)

In case of re-ordering of Rolls, please state the Roll-Code-No., which is marked on the letter side of the Roll in addition to the dimension (e. g. for rolling head K 3 e. g. 3/...)!

Changeable shanks



Straight shank | **Straight shank with flat** (upon request) | **VDI shank** | **HSK shank** | **Others e. g. tapered shanks** (upon request)



Spare Parts

No.	Pcs.	Description
1	1	Clutch or cupling
2	1	Spring housing
3	1	Centre plate
4	1	Front plate
5	3	Eccentric spindles
6	3	Spacing studs
7	1	Centre gear
8	3	Gear
9[1)3)]	1	Stud (handle)
10	1	Coil spring
11	1	Circlip
12	1	Circlip
13	1 set	Needle roller bearings or carbide bushings
14	3	Counter-sunk-screws
15	3	Hexagon nut
16	1	Washer (ring type)
17[1)3)]	1	Hexagon nut
18	3	Thread rolls
19	2	Grub screws (state Ø and lenght)
20	1	Stop screw body
21	1	Stop screw
22	1	Stop screw lock nut (hexagon nut)
23[1)3)]	1	Ball
24[3)]	1	Washer
25[2)]	3	Washer

[1)] Only for types K 1, K 12, K 2 and K 3 and K 34. For K 1223 and K 233400 closing pin instead of handle with ball.

[2)] only for types K 12, K 23, K 233400 and K 34

[3)] only for fixed application

Rolling Heads

K 1, K 12, K 1223, K 2, K 23, K 233400, K 3, K 34 (for fixed and rotating application)

Assembly of Thread Rolls:
Remove front plate (4), apply a very thin coat of grease or a thin layer of MOLYKOTE to the eccentric spindles (5), as well as to the inclined surfaces on front- (4) and centre plate (3). If washer (25) is fitted in the rolling head, it should also be greased. Insert rolls (18) in the order 1-2-3 or A-B-C in clockwise direction. (For left hand heads in counter-clockwise direction.) Insert needle roller bearings (13) or carbide bushings. Fit front plate (4) to this assembly and tighten screws.

Adjustment of Head to thread diameter:
The head is closed, i. e. the teeth of the coupling of parts 1 and 2 are in complete engagement. Parts 1 and 2 are spring loaded. First loosen three nuts (15) and the grub screws (19), and insert between the rolls a screw plug gauge, or threaded sample, or if neither arc available a plain plug with root diameter of the thread. The front part of the head (roller cage) is turned within the range of the three slotted holes of the spring housing (2) until the rolls (18) become fully engaged with the screw plug gauge, sample or plain plug. The three nuts (15) and also the grub screws (19), are re-tightened. If the grub screws (19), after adjustment, are looking out of the spring housing (2), they are to be replaced either by shorter or longer ones, which are also furnished. Should the effective diameter of the thread rolled not be correct, i. e. the effective diameter is too large, the three nuts (15) must be loosened and the front part of the head turned one half a calibration in the direction of the minus sign. A rolled thread should not be over rolled, or re-rolled a second time. If the length of the three slotted holes in the spring housing (2) is insufficient for the necessary adjustment and the zero mark “0” on the roller cage is at the ultimate minus setting, proceed as follows:

Head to be adjusted to a smaller diameter:
The three nuts (15) and ring type washer (16) are to be removed. The zero mark “0” on the spring housing (2) is at ultimate minus setting (–) of the scale. The roller cage is then drawn off and turned round 120° approx, in the direction of the minus sign. It is then re-assembled. The secondary zero marking now appears on the plus side (+) of the scale. Ring type washer (16) and nuts (15) are put on again, the head finally adjust ed to correct size as per previous paragraph and nuts are tightened. It is now possible to adjust the head to a smaller diameter.

Head to be adjusted to a larger diameter:
Same procedure as before, but turning direction is just reversed.

Adjustment of Head to thread length:
Adjustment to thread length is always done when the head is in an open position, i. e. the head is opened in axial direction by disengaging the dog coupling (1 and 2). This brings the front position of the head forward corresponding to the height of the dog coupling.

Operation with Inside Stop:
Stop screw (21) is adjusted to required thread length and locked by hexagon nut (22). If the component touches the stop screw (21), the dog coupling (1 and 2) is disengaged and the head opens automatically. The unclamped length of the component is not of decisive importance here.

Operation with Outside Stop:
The thread length, where chucking length is controlled, is set by a stop on the machine, which limits the forward travel of the sleeve, or the threading spindle or the turret slide. When the stop is reached, the dog coupling is disengaged and the head opens automatically.

Important: As opposed to opening by means of Inside Stop it is in this case absolutely necessary to maintain uniform component length extending beyond the clamped portion, in case rolling is done against a shoulder or similar.

Closing of Head:
When the head is closed, the rolls (18) are brought back into the rolling position.