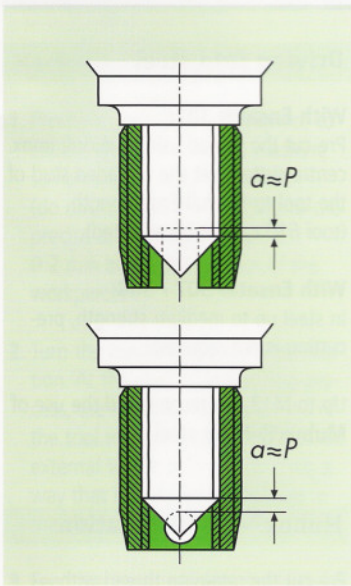


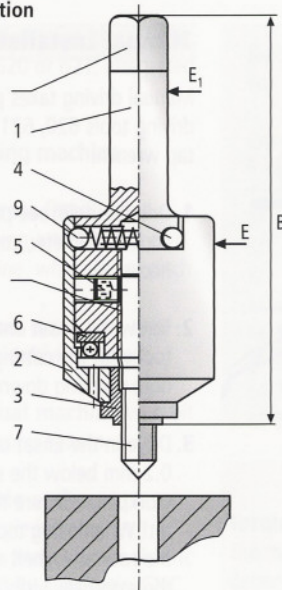
The correct length of the stud for the Ensats with cutting slot / cutting bore results from the pitch of the outside thread (see also illustration below; P=pitch of the outside thread).

Ensats® - driving tools ...

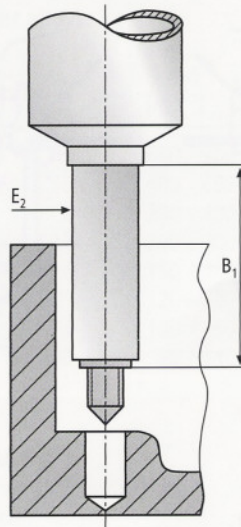


Tool 620
for flush installation

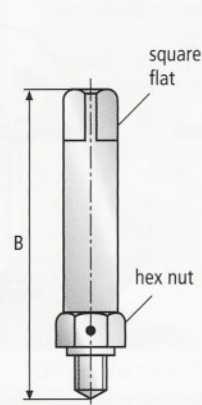
- Square flat
- 1 Shaft
- 4 Pin
- 9 Ball
- 5 Locking screw, colour marking
- 6 Ball bearing
- 2 Shell
- 3 Guide bush
- 7 Stud



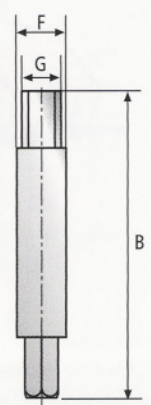
Tool 621
For deep retaining holes



Tool 610
for manual installation



Tool 6102
for Ensats-SBI



Set or exchange the stud

- Pull off the shell (2) downwards off the shaft (1).
- Release the locking screw (5).
- Screw the stud (7) in or out. The yellow colour marking indicates the flattened surfaces for the locking screws.
- When assembling, tighten both screws (5) evenly.

- Insert the ball bearing (6).
- Push on the shell (2) until the ball stop locks into place. To ensure that the tool functions perfectly, it must be possible to easily rotate the shell. For short Ensats, grind down tool 610 accordingly.
- If you wish the Ensats to be driven

deeper than 0.2 mm below the workpiece surface, screw off the guide bush (3) at the front. Diameter. 0.1 to 0.2 mm smaller than the Ensats retaining hole.

For mounting the thin-walled Ensats (Page 14), modified guide bushes (available on request) should be used.

Dimensions [mm]

For Ensats®	Tool 620				Tool 621				Manual assembly tool 610			For Ensats®-SBI	Tool 6102 Machine/Hand			
	Article-no.				Article-no.				Article-no.				Article-no.			
		Whitworth	UNC	UNF	E	E1	Square SW D	Length B	B1	E2	B	Square SW D	Collar SW D	B	Square SW G	Shank Ø F
M 2,5	-	620 000 025	-	-	18	8	6,3	78	621 000 025	40	7	610 000 025	55	5	7	-
M 3	Nr. 4	620 000 030	-	620 000 604	18	8	6,3	78	621 000 030	40	7	610 000 030	55	5	7	-
M 3,5	Nr. 6	620 000 035	-	620 000 606	18	8	6,3	78	621 000 035	40	7	610 000 035	60	5	7	-
M 4	Nr. 8	620 000 040	-	620 000 608	18	8	6,3	78	621 000 040	40	7	610 000 040	60	5	7	610 200 040
M 5	Nr. 10	620 000 050	-	620 000 610	24	12,5	10	95	621 000 050	50	9	610 000 050	75	8	13	610 200 050
M 6	1/4"	620 000 060	620 000 525	620 000 625	24	12,5	10	95	621 000 060	50	10	610 000 060	75	8	13	610 200 060
M 8	5/16"	620 000 080	620 000 531	620 000 631	24	12,5	10	95	621 000 080	50	12	610 000 080	75	8	13	610 200 080
M 10	3/8"	620 000 100	620 000 537	620 000 637	32	16	12,5	118	621 000 100	60	15	610 000 100	95	12,5	19	610 200 100
M 12	7/16"	620 000 120	620 000 544	620 000 644	32	16	12,5	118	621 000 120	60	18	610 000 120	95	12,5	19	-
M 14	1/2"	620 000 140	620 000 550	620 000 650	50	25	20	145	621 000 140	60	20	610 000 140	95	12,5	19	-
M 16	5/8"	620 000 160	620 000 562	620 000 662	50	25	20	145	621 000 160	60	22	-	-	-	-	-
M 18	-	620 000 180	-	-	50	25	20	145	621 000 180	60	24	-	-	-	-	-
M 20	-	620 000 200	-	-	58	25	20	169	621 000 200	60	26	-	-	-	-	-
M 22	-	620 000 220	-	-	58	25	20	169	621 000 220	60	28	-	-	-	-	-
M 24	-	620 000 240	-	-	70	30	25	198	621 000 240	60	32	-	-	-	-	-
M 27	-	620 000 270	-	-	70	30	25	198	621 000 270	60	35	-	-	-	-	-
M 30	-	620 000 300	-	-	70	30	25	198	621 000 300	60	38	-	-	-	-	-

Tools 620 and 621 also fit within the coloured lines for other thread dimensions, if the guide bush and stud are exchanged.



Machine installation ...

Machine driving process

1. Precisely position the workpiece to ensure that the hole and machine spindle are in exact alignment (do not tilt). Set the machine to the precise driving depth (appr. 0.1 – 0.2 mm below the surface of the workpiece).
2. Turn the machine to clockwise rotation. At the start of the driving process, the rotatable external shell of the tool must be resting against the external visible stop pins in such a way that it is driven by the pins in the clockwise direction.
3. Feed the Ensat towards the tool (slot or cutting hole facing downwards) and grip for the duration of 2 to 4 revolutions.
4. Actuate the operating lever of the machine until the Ensat cuts into the borehole. The remainder of the driving process takes place without actuating the feed.
5. Switch on the reversing function. Always avoid setting the tool down hard on the workpiece, as this can lead to breaking both the tool and the Ensat.

Excessively hard contact of the tool can damage the play-free fit of the Ensat and so reduce the pull-out strength. If necessary, the driving speed may have to be adapted in line with the necessary reversal time.

Machine installation takes place with production tool 620 or 621, integrated in a:

1. Thread tapping machine

2. Use a drill press fitted with a reversing tapping attachment or a tapping machine which is not pitch controlled.
Important: Never exceed the maximum admissible driving torque.

3. Special manual machine with bit stop and reversing system.

4. For large-scale series:

Single or multiple installation machines with pneumatic or electric drive, semi or fully automatic, CNC.

Recommended speed values for light alloys:

Ensats® Internal thread	Speed [min ⁻¹]
M 2,5 / M 3	650 - 900
M 4 / M 5	400 - 600
M 6 / M 8	280 - 400
M 10 / M 12	200 - 300
M 14 / M 16	150 - 200
M 18 / M 20	120 - 200
M 22 / M 24	100 - 160
M 27 / M 30	80 - 140

Torque M

The maximum admissible torque depends on:

1. The axial load capacity of the tool stud
2. The pressure resistance capacity of the Ensats® in the axial direction.

Maximum admissible installation torque

Ensats® M 2,5	1,5 Nm
Ensats® M 3	2,5 Nm
Ensats® M 4	5,5 Nm
Ensats® M 5	10 Nm
Ensats® M 6	15 Nm
Ensats® M 8	28 Nm
Ensats® M 10	40 Nm
Ensats® M 12	60 Nm

Lubrication

Only in the case of materials with difficult cutting properties.

For medium-hard light alloys:

Cutting oil, spirit or petroleum.

For tough light alloys and cast iron:

Cutting oil with appr. 5 – 8% molybdenum sulphide.

