UDC 621.882.215.3

DEUTSCHE NORMEN

December 1971

Cross Recessed Countersunk (Flat) Head Screws
(Countersunk Heads according to ISO)

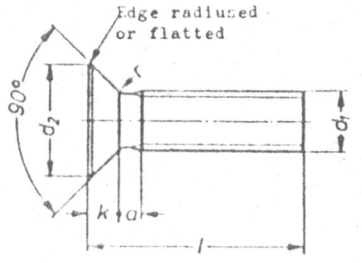
DIN 965

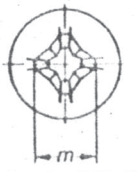
Senkschrauben mit Kreuzschlitz (Senkköpfe nach ISO)

For connection with an ISO Recommendation in preparation, see Explanations.

Dimensions in mm

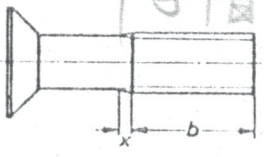
Countersunk head screw threaded to head
(above the stepped line)





a and x to DIN 76

Countersunk head screw with shank
(below the stepped line)
Shank diameter ≈ pitch diameter



Other dimensions and details as for left-hand Illustration

Designation of a countersunk head screw with thread d_1 = M 6, length l = 20 mm and strength category 4.8[1]):

Countersunk head screw M 6 × 20 DIN 965 – 4.8

d_1		M 1,6	(M 1,8)	M 2	M 2,5	M 3	(M 3,5)	M 4	M 5	M 6	M 8	M 10
b		15	15	16	18	19	20	22	25	28	34	40
d_2		3	3,4	3,8	4,7	5,6	6,5	7,5	9,2	11	14,5	18
	perm. var.	h13			h14							
k	max.	0,96	1,08	1,2	1,5	1,65	1,93	2,2	2,5	3	4	5
r	max.	0,4	0,4	0,5	0,7	0,8	0,95	1	1,3	1,6	2	2,5
Recess	Size	[2]			1		2			3	4	
	m				2,7	2,9	3,9	4,4	4,6	6,6	8,7	9,6
	Depth of gauge penetration min.				1,25	1,5	1,4	1,9	2,1	2,8	3,9	4,8
	max.				1,55	1,8	1,9	2,4	2,6	3,3	4,4	5,3
l		Weight (7,85 kg/dm³) kg/1000 pieces ≈										
2												
3					0,175							
4					0,206	0,290	0,434					
5					0,236	0,335	0,494	0,676				
6					0,266	0,379	0,554	0,754	1,21			
8					0,326	0,467	0,673	0,910	1,45	2,19		
10					0,386	0,555	0,792	1,06	1,70	2,54	5,03	
12					0,446	0,643	0,911	1,22	1,95	2,89	5,67	9,59
(14)					0,507	0,731	1,03	1,37	2,19	3,25	6,30	10,6
16					0,567	0,820	1,15	1,53	2,44	3,60	6,94	11,6
(18)					0,627	0,908	1,27	1,68	2,69	3,95	7,57	12,6
20					0,687	0,996	1,39	1,84	2,94	4,31	8,21	13,6
(22)					0,747	1,08	1,51	1,99	3,18	4,66	8,84	14,6
25					0,838	1,22	1,69	2,22	3,55	5,19	9,79	16,1
(28)						1,35	1,87	2,46	3,93	5,72	10,7	17,6
30						1,44	1,99	2,61	4,16	6,08	11,4	18,6
35							2,29	3,00	4,65	6,96	13,0	21,1
40								3,38	5,40	7,84	14,6	23,6
45									6,02	8,73	16,2	26,1
50									6,65	9,61	17,8	28,6
55											19,4	31,1
60												33,7

Bracketed sizes and intermediate lengths should be avoided where possible. Lengths above 60 mm are to be stepped in rises of 10 mm.

Continued on page 2
Explanations on page 2

[1]) and [2]) see page 2

Alleinverkauf der Normblätter durch Beuth Verlag GmbH, Berlin 30 und Köln

Technical conditions of delivery according to DIN 267

Strength category (material):

preferred: 4.8 } according to DIN 267 Sheet 3
permitted: 8.8 }

Ms = Copper-zinc alloy (brass) according to DIN 17672; type at manufacturer's choice
Other strength categories or materials by agreement

Type: m according to DIN 267 Sheet 2

If surface protection is required the designation must be augmented according to DIN 267 Sheet 9.

Normally these screws are made in the sizes for which weight details are given.

If the screws are to be supplied with captive washer components, the designation must be augmented according to DIN 6900.

Recesses and recess penetration gauges according to DIN 7962

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[1]) The countersunk head screws as illustrated, either threaded to the head or with shank, count as the regular type in the ranges separated by the stepped line in the Table. At the manufacturer's choice they may be supplied with or without point and also with shank diameter = thread diameter instead of with the shank diameter ≈ pitch diameter. If, in exceptional cases, a particular form or a different thread length are required, then the appropriate form letter or thread length must be stated in the designation. For examples of designation see DIN 962.
In the case of countersunk head screws with shank diameter = thread diameter the radius r is only allowed to be half the values stated.

[2]) Recess dimensions for sizes up to M 2 are still being determined at the present time. They should be agreed with the manufacturer where necessary.

Explanations

Countersunk head screws according to this Standard agree, in regard to dimensional provisions, with DIN 963 and hence with the ISO draft

Draft ISO Recommendation No 2009
Slotted countersunk (flat) head screws, metric series
Vis à tête fondue fraisée, série métrique.

The ISO draft, of course, only deals with slotted countersunk head screws, but the Technical Committee ISO/TC 2 recommended that the same head dimensions should also be adopted for cross recessed countersunk head screws for reasons of interchangeability.
Since the countersunk heads according to ISO are either not interchangeable at all with those specified in DIN 7987 or are only interchangeable to a limited degree, a new standard number has been adopted, the intention being that DIN 965 shall supersede DIN 7987 in due course.
So far in DIN 7987 and DIN 7988, cross recessed countersunk head screws have only been standardized in sizes starting at M 2.6. In the present Standard, the sizes M 1.6, M 1.8 and M 2 also are contained because there is an increasing demand for these sizes. The experience available at present, however, is not sufficient to allow final provisions to be made regarding the recess dimensions for these sizes and therefore no values are quoted for the present. In this case the dimensions must be agreed as necessary with the manufacturer. It is intended to include the relevant data in a future new issue of the Standard.

The international situation as it affects countersunk head screws is fully explained in connection with DIN 963. From the explanations there given, the following points affecting cross recessed countersunk head screws are reproduced:
In the ISO draft the head dimensions are given by the following equations:

d_2 (theoretical) = d_1 + 2 k (max.)
d_2 (min.) = 1.75 d_1
k (max.) = 0.6 d_1 to M 2.5
= 0.55 d_1 for M 3 to M 4
= 0.5 d_1 from M 5 inclusive
k (min.) = k (max.) − 0.04 d_1 + 0.1 mm

Hence, for the head diameters d_2, the ISO draft gives only the minimum dimensions (1.75 d_1) and the theoretical maximum dimensions. For reasons connected with the pressing operation, the latter values are in fact not attainable.
Having regard to the corresponding countersinks, however, it was desired nationally to have the (practicable) maximum dimensions defined more accurately and therefore DIN 965 quotes values which have been calculated from the minimum dimensions 1.75 d_1 allowed by ISO, i.e., in view of the h14 tolerance zone, the head diameters d_2 are in all cases larger than 1.75 d_1 and hence within the ISO limits.
The ISO draft also specifies minimum dimensions for head heights. These have not been adopted, otherwise redundant dimensioning of the countersunk heads would have existed.
The maximum dimensions of the transition radii r correspond to 0.1 d_1 + 1 × thread pitch. These are larger than the approximate dimensions in the ISO draft for slotted countersunk head screws and in line with past practice they have been adopted also for strength reasons. In addition, they take account of the countersinks specified in DIN 74 Sheet 1 on the assumption that screws of this kind are made almost exclusively with the shank diameter ≈ pitch diameter.