UDC 621.882.215.3.082.8.091.2

August 1990

Cross recessed pan head tapping screws

DIN 7981

Linsen-Blechschrauben mit Kreuzschlitz

Supersedes December 1984 edition.

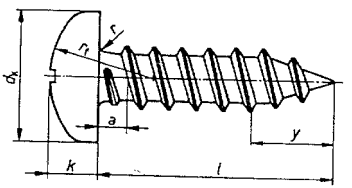
In keeping with current practice in standards published by the International Organization for Standardization (ISO), a comma has been used throughout as the decimal marker.

This standard should be used together with ISO 7049. For details, see Explanatory notes. It is intended to withdraw the present standard by 31 July 1995 at the latest.

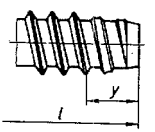
Dimensions in mm

1 Dimensions

Type C, with cone point
(previously, type B)

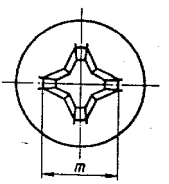


Type F, with long dog point
(previously, type BZ)

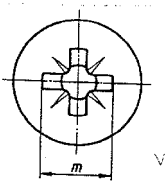


Other dimensions as shown at left

Cross recess type H



Cross recess type Z



Continued on pages 2 to 4

Table 1.

Thread size				ST2,2	ST2,9	ST3,5	(ST3,9)	ST4,2	ST4,8	ST5,5	ST6,3
P[1]				0,8	1,1	1,3	1,3	1,4	1,6	1,8	1,8
a			max.	0,8	1,1	1,3	1,3	1,4	1,6	1,8	1,8
d_k		max. = nominal size		4,2	5,6	6,9	7,5	8,2	9,5	10,8	12,5
			min.	3,9	5,3	6,54	7,14	7,84	9,14	10,37	12,07
k		max. = nominal size		1,8	2,2	2,6	2,8	3,05	3,55	3,95	4,55
			min.	1,55	1,95	2,35	2,55	2,75	3,25	3,65	4,25
r			max.	0,3	0,4	0,5	0,5	0,6	0,7	0,8	0,9
r_f			≈	3,4	4,4	5,4	5,8	6,2	7,2	8,2	9,5
Cross recess	Cross recess No.			1		2				3	
	Type H	m	≈	2,6	3	4,2	4,4	4,6	5	6,5	7,1
		Penetration depth	min.	0,86	1,35	1,4	1,63	1,8	2,26	2,49	3
			max.	1,32	1,8	2,03	2,26	2,46	2,87	3,15	3,66
	Type Z	m	≈	2,4	2,9	3,9	4,1	4,3	4,7	6,2	6,7
		Penetration depth	min.	1,1	1,58	1,47	1,7	1,88	2,28	2,51	3,02
			max.	1,35	1,83	1,93	2,16	2,34	2,74	2,97	3,48
y max.			Type C	2	2,6	3,2	3,5	3,7	4,3	5	6
			Type F	1,6	2,1	2,5	2,7	2,8	3,2	3,6	3,6

Nominal size	l Type C min.	Type C max.	Type F min.	Type F max.	Approximate mass (7,85 kg/dm³), per 1000 units, in kg							
4,5	3,7	5,3	3,7	4,5	0,174							
6,5	5,7	7,3	5,7	6,5	0,214	0,424						
9,5	8,7	10,3	8,7	9,5	0,274	0,532	0,840	1,07	1,26	1,85		
13	12,2	13,8	12,2	13	0,344	0,658	1,02	1,29	1,50	2,18	3,24	4,32
16	15,2	16,8	15,2	16	0,404	0,766	1,17	1,48	1,71	2,46	3,62	4,86
19	18,2	19,8	18,2	19		0,874	1,32	1,67	1,92	2,74	4,00	5,40
22	21,2	22,8	20,7	22			1,47	1,86	2,13	3,02	4,38	5,94
25	24,2	25,8	23,7	25			1,62	2,05	2,34	3,30	4,76	6,48
32	30,7	33,3	30,7	32					2,83	3,96	5,67	7,74
38	36,7	39,3	36,7	38						4,52	6,45	8,82

Commercial sizes are those screws for which a value of mass has been specified. These values are for guidance only.
The thread size in brackets should be avoided if possible.
The core hole diameter shall be as specified in DIN 7975.
[1]) P = pitch of thread.

2 Technical delivery conditions

Table 2.

Material	Steel
General requirements	As specified in DIN 267 Part 1.
Screw threads and thread ends	As specified in DIN 7970.
Cross recesses	As specified in DIN 7962.
Mechanical properties and material	As specified in DIN 267 Part 12.
Limit deviations and geometrical tolerances	Product grade A as specified in ISO 4759 Part 1[1].
Surface finish	As processed. DIN 267 Part 2 shall apply with regard to surface roughness. DIN 267 Part 19 shall apply with regard to permissible surface discontinuities[2]. DIN 267 Part 9 shall apply with regard to electroplating, other types of surface protection being subject to agreement.
Acceptance inspection	DIN 267 Part 5 shall apply with regard to acceptance inspection.

[1] Although ISO 4759 Part 1 covers only screws with ISO metric thread, the tolerances specified there have been adopted by analogy for tapping screws.

[2] Although DIN 267 Part 19 covers only screws with ISO metric thread, the specifications for surface discontinuities given there have been adopted by analogy for tapping screws.

3 Designation

Designation of an ST 3,5 pan head tapping screw of length, *l* (nominal size) = 13 mm, with cone point (type C) and type H cross recess[1]):

Tapping screw DIN 7981 – ST 3,5 × 13 – C – H

DIN 6901 shall apply with regard to captive tapping screws (screw assemblies).

DIN 7504 shall apply with regard to tapping screws with drilling tip (self-drilling screws).

The DIN 4000 – 2 – 1 tabular layout of article characteristics shall apply for screws as covered in this standard.

Standards referred to

DIN 267 Part 1	Fasteners; technical delivery conditions; general requirements
DIN 267 Part 2	Fasteners; technical delivery conditions; design and dimensional accuracy
DIN 267 Part 5	Fasteners; technical delivery conditions; acceptance inspection (modified version of ISO 3269, 1984 edition)
DIN 267 Part 9	Fasteners; technical delivery conditions; electroplated parts
DIN 267 Part 12	Fasteners; technical delivery conditions; tapping screws
DIN 267 Part 19	Fasteners; technical delivery conditions; surface discontinuities on bolts
DIN 4000 Part 2	Tabular layouts of article characteristics for screws and nuts
DIN 6901	Tapping screw assemblies
DIN 7504	Drilling screws with tapping screw thread in accordance with DIN 7970; dimensions, requirements and testing
DIN 7962	Cross recesses for screws (modified version of ISO 4757)
DIN 7970	Threads and thread ends for tapping screws (modified version of ISO 1478)
DIN 7975	Tapping screws; application and core hole diameters
ISO 4759 Part 1	Tolerances for fasteners; bolts, screws and nuts with thread diameters from 1,6 to 150 mm; product grades A, B and C

[1] Should symbols H and Z not be used in existing documentation based on previous editions of this standard, it shall be assumed that type H is meant. In the future, the cross recess type shall be identified for new designs and in purchase order documents with the symbol H or Z.

Previous editions

DIN 7981: 07.53, 12.56, 08.59, 07.70, 12.84.

Amendments

The following amendments have been made to the December 1984 edition.

a) A note on the period of validity has been included.

b) For thread size ST 3,9, the values of pitch, *P*, and dimension *a* have been amended.

c) For type F, the minimum values of *l* have been amended for nominal lengths 22 mm and 25 mm.

d) The standard has been editorially revised.

Explanatory notes

Following its decision to make the specifications regarding the head of countersunk head screws to comply with those specified in ISO 7721, the responsible committee agreed to issue national standards for all existing ISO Standards on slotted and cross recessed head screws. To facilitate the changeover to the new head dimensions, an adequate transition period has been granted (cf. foreword on page 1).

The decision to adopt the ISO head was seen to be justified by the formation of CEN/TC 185, Fasteners, in 1989 since relevant European Standards dealing with such screws will be published shortly. Note that such EN Standards will be accepted only if they agree with existing ISO Standards, to avoid another transition, and that the transition period mentioned on page 1 may be shorter if the EN Standards appear sooner than expected.

There are only relatively small differences for most screw types between head dimensions as specified in DIN Standards and those in the revised ISO Standards. Thus, serious interchangeability problems would only arise in exceptional cases. The screws should be checked for interchangeability where automatic feed and bolting systems are used.

The following table, which compares the most essential head dimensions of screws as specified in ISO 7049 and the present standard, is intended to make it easier for the user to see whether screws are interchangeable.

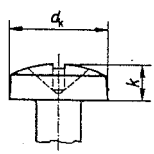


Table 3.

Values given in mm

	Thread size	ST 2,2	ST 2,9	ST 3,5	ST 3,9	ST 4,2	ST 4,8	ST 5,5	ST 6,3	ST 8	ST 9,5
d_k max.	ISO 7049	4	5,6	7	–	8	9,5	11	12	16	20
	DIN 7981	4,2	5,6	6,9	7,5	8,2	9,5	10,8	12,5	–	–
k max.	ISO 7049	1,6	2,4	2,6	–	3,1	3,7	4	4,6	6	7,5
	DIN 7981	1,8	2,2	2,6	2,8	3,05	3,55	3,95	4,55	–	–

International Patent Classification

F 16 B 35/00