UDC 621.882.215.1.091.4

August 1990

Product grade A slotted pan head screws

DIN 85

Flachkopfschrauben mit Schlitz; Produktklasse A

Supersedes October 1988 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 1580. For details, see Explanatory notes. It is intended to withdraw the present standard by 31 July 1995 at the latest.

Dimensions in mm

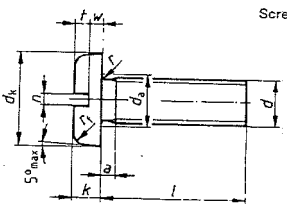
1 Scope and field of application

This standard specifies requirements for M 3 to M 10 slotted pan head screws assigned to product grade A.

See DIN 962 (or the standards referred to therein) for special screw types and finishes. If, in special cases, screws are to comply with specifications other than those given in this standard (e.g. regarding property class or material), these shall be selected in accordance with the relevant standards.

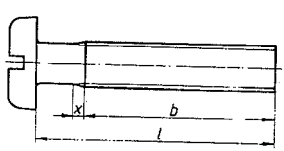
2 Dimensions

Pan head screw threaded up to the head
(specified in table 1 above dashed line)



Pan head screw with unthreaded portion of shank
(specified in table 1 below dashed line)[1]

Screws to be provided with DIN 78 – Ko end.



Other dimensions and details as at left.

The shank diameter may be equal to the thread diameter (normal shank) or approximately equal to the pitch diameter (reduced shank), at the manufacturer's discretion.

[1] If pan head screws with lengths given below the dashed line are to be supplied with their shank threaded up to the head, letter A shall be given in the designation, in accordance with DIN 962.

Continued on pages 2 to 4

Table 1.

Thread size (d)[1]		M3	(M3,5)	M4	M5	M6	(M8)	(M10)
P[2]		0,5	0,6	0,7	0,8	1	1,25	1,5
a	max.	1	1,2	1,4	1,6	2	2,5	3
b	min.	25	38	38	38	38	38	38
d_k	max. = nominal size	6	7	8	10	12	16	20
	min.	5,7	6,64	7,64	9,64	11,57	15,57	19,48
d_s	max.	3,6	4,1	4,7	5,7	6,8	9,2	11,2
k	max. = nominal size	1,8	2,1	2,4	3	3,6	4,8	6
	min.	1,66	1,96	2,26	2,86	3,3	4,5	5,7
n	Nominal size	0,8	1	1,2	1,2	1,6	2	2,5
	min.	0,86	1,06	1,26	1,26	1,66	2,06	2,56
	max.	1	1,2	1,51	1,51	1,91	2,31	2,81
r	min.	0,1	0,1	0,2	0,2	0,25	0,4	0,4
r_f	min.	0,6	0,7	0,8	1	1,2	1,6	2
	max.	1,2	1,4	1,6	2	2,4	3,2	4
t	min.	0,7	0,8	1	1,2	1,4	1,9	2,4
w	min.	0,7	0,9	1	1,3	1,4	2,1	2,7
x	max.	1,25	1,5	1,75	2	2,5	3,2	3,8

Nominal size	l[1], [3] min.	l[1], [3] max.	Approximate mass (7,85 kg/dm³), per 1000 units, in kg						
3	2,8	3,2							
4	3,76	4,24	0,503						
5	4,76	5,24	0,548	0,825	1,16				
6	5,76	6,24	0,591	0,885	1,24	2,27			
8	7,71	8,29	0,680	1,00	1,39	2,52	4,02		
10	9,71	10,29	0,768	1,12	1,55	2,76	4,37	9,38	
12	11,65	12,35	0,856	1,24	1,70	3,00	4,72	10,0	18,2
(14)	13,65	14,35	0,945	1,36	1,86	3,25	5,10	10,6	19,2
16	15,65	16,35	1,03	1,48	2,01	3,50	5,45	11,2	20,2
(18)	17,65	18,35	1,12	1,60	2,17	3,75	5,79	11,9	21,2
20	19,58	20,42	1,21	1,72	2,32	4,00	6,14	12,6	22,2
(22)	21,58	22,42	1,30	1,84	2,48	4,25	6,49	13,2	23,2
25	24,58	25,42	1,43	2,02	2,71	4,62	7,01	14,1	24,7
(28)	27,58	28,42	1,56	2,20	2,94	5,00	7,53	15,0	26,2
30	29,58	30,42	1,65	2,32	3,10	5,24	7,90	15,7	27,2
35	34,5	35,5		2,62	3,48	5,86	8,78	17,3	29,7
40	39,5	40,5			3,87	6,48	9,66	18,9	32,2
45	44,5	45,5				7,10	10,5	20,5	34,7
50	49,5	50,5				7,72	11,4	22,1	37,2
(55)	54,05	55,95					12,3	23,7	39,7
60	59,05	60,95					13,2	25,3	42,2
(65)	64,05	65,95						26,9	44,7
70	69,05	70,95						28,5	47,2
(75)	74,05	75,95						30,1	49,7
80	79,05	80,95						31,7	52,2

[1] Use of sizes given in brackets should be avoided where possible.

[2] P = pitch of coarse thread.

[3] Screws with lengths above the dashed line are threaded up to the head ($b = l - a$).
Lengths over 80 mm shall be graded in 10 mm steps.
For commercial lengths (given between stepped lines), values of mass have been specified.

3 Technical delivery conditions

Table 2.

Material		Steel	Stainless steel	Non-ferrous metal
General requirements		As specified in DIN 267 Part 1.		
Thread	Tolerance	6g [1]		
	As specified in	DIN 13 Parts 13 and 15.		
Mechanical properties[3]	Property class (material)	4.8, 5.8 or 8.8	A2-70, A4-70	CuZn = Copper-zinc alloy[2]
	As specified in	ISO 898 Part 1.	DIN 267 Part 11.	DIN 267 Part 18.
Limit deviations and geometrical tolerances	Product grade	A		
	Standard	ISO 4759 Part 1[4]		
Surface finish		As processed. Property class 8.8 (thermally or chemically) blackened.	Bright.	Bright.
		DIN 267 Part 2 shall apply with regard to surface roughness.		
		DIN 267 Part 19 shall apply with regard to permissible surface discontinuities.		
		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] Only for screws without surface protection, the 6g tolerance makes it possible for normal coating thicknesses to be applied in accordance with DIN 267 Part 9, the reference line not being exceeded. Depending on the coating thickness required, a larger fundamental deviation shall be selected than that for the g position. This might, however, impair the resistance to stripping of the bolt/nut assembly.

[2] CuZn = CU2 or CU3, at the manufacturer's discretion.

[3] Other property classes or materials, or a particular grade of material, e.g. CU3, shall be subject to agreement.

4 Designation

Designation of an M 5 pan head screw, of length l (nominal size) = 20 mm and assigned to property class 4.8:

Pan head screw DIN 85 – M 5 × 20 – 4.8

DIN 962 shall apply for the designation of type and finish, with additional information to be given on ordering.

DIN 6900 shall apply for screws with captive washers (screw assemblies) and DIN 7500 Part 1 for thread rolling screws.

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

Standards referred to

DIN	13 Part 13	ISO metric screw threads; series of preferred sizes for screws, bolts and nuts from 1 mm to 52 mm diameter and limits of size
DIN	13 Part 15	ISO metric screw threads; fundamental deviations and tolerances for screw threads of 1 mm diameter and larger
DIN	78	Thread ends and lengths of projection of bolt ends for ISO metric screw threads in accordance with DIN 13
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 11	Fasteners; technical delivery conditions with addenda to ISO 3506; stainless and acid resistant steel components
DIN	267 Part 18	Fasteners; technical delivery conditions; nonferrous metal components
DIN	267 Part 19	Fasteners; technical delivery conditions; surface discontinuities on bolts
DIN	962	Bolts, screws, studs and nuts; designations, types and finishes

DIN 4000 Part 2	Tabular layouts of article characteristics for screws and nuts
DIN 6900	Screw and washer assemblies
DIN 7500 Part 1	Thread rolling screws for ISO metric threads; dimensions, requirements and testing
ISO 898 Part 1	Mechanical properties of fasteners; bolts, screws and studs
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

Previous editions

DIN 572: 02.23; DIN 576: 02.23; DIN 85: 08.21, 01.26, 01.37, 10.42, 12.52, 04.64, 06.70, 12.72, 10.88.

Amendments

The following amendments have been made to the October 1988 edition.

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

b) For M 3 up to M 5 screws, k_{min} values have been corrected.

c) For M 3,5, M 5, M 8 and M 10 screws, w_{min} values have been amended.

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 in 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 1580 and the present standard, is intended to make it easier for the user to see whether screws are interchangeable.

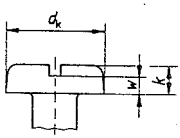


Table 3.

Values given in mm

Thread size (d)		M1,6	M2	M2,5	M3	M3,5	M4	M5	M6	M8	M10
$d_{k\,max}$	ISO 1580	3,2	4	5	5,6	7	8	9,5	12	16	20
	DIN 85	–	–	–	6	7	8	10	12	16	20
k_{max}	ISO 1580	1	1,3	1,5	1,8	2,1	2,4	3	3,6	4,8	6
	DIN 85	–	–	–	1,8	2,1	2,4	3	3,6	4,8	6
w_{min}	ISO 1580	0,3	0,4	0,5	0,7	0,8	1	1,2	1,4	1,9	2,4
	DIN 85	–	–	–	0,7	0,9	1	1,3	1,4	2,1	2,7

International Patent Classification

F 16 B 35/06