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Specification for

Modular units for machine tools —

Part 1: Specification for basic units

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Manufacturers	

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Contents

	Page
Co-operating organizations	Inside front cover
Foreword	iii
1 Scope	1
2 Nomenclature	1
3 General	1
4 Designation of modular units	4
5 Multi-spindle heads casing and input shaft	4
6 Headstocks	6
7 Slide units	8
8 Wing bases for slide units	10
9 Vertical columns	10
10 Wing bases for columns	11
11 Centre bases	12
12 Multi-sided centre bases for rotary tables	19
13 Rotary tables	20
14 Integral way columns — base mounted type	20
15 Integral way columns — floor mounted type	21
16 Support brackets	23
17 Spindle units	24
18 Flanges for multi-spindle heads'	29
Figure 1 — Modular units	2
Figure 2 — Multi-spindle head casing	4
Figure 3 — Input drive	6
Figure 4 — Headstocks nominal sizes 125 to 250 inclusive	7
Figure 5 — Headstocks nominal sizes 320 to 800 inclusive	8
Figure 6 — Slide units	9
Figure 7 — Wing bases for slide units	10
Figure 8 — Vertical columns	11
Figure 9 — Wing bases for columns	12
Figure 10 — Centre bases	13
Figure 11 — Examples of machine classification	14
Figure 12 — Wing base fixing to centre base with tenons	15
Figure 13 — Wing base fixing to centre base with dowels	16
Figure 14 — Recommended dimensions of blocks and tenons	17
Figure 15 — Hole pattern for centre bases	18
Figure 16 — Multi-sided centre bases for rotary tables	19
Figure 17 — Rotary tables	20
Figure 18 — Integral way columns — base mounted type	21
Figure 19 — Integral way columns — floor mounted type	22
Figure 20 — Support brackets	23
Figure 21 — Quill feed (self-feeding) single spindle drilling units	25
Figure 22 — Single spindle drilling units	26
Figure 23 — Single spindle milling units	27
Figure 24 — Quill feed (self-feeding) single spindle drilling units with adjusting slide for tool changing	28
Figure 25 — Flanges for mounting multi-spindle heads	29
Table 1 — Nomenclature for modular units	3
Table 2 — Dimensions of multi-spindle head casings	5

	Page
Table 3 — Dimensions of input drive	6
Table 4 — Dimensions of headstocks nominal sizes 125 to 250 inclusive	7
Table 5 — Dimensions of headstocks nominal sizes 320 to 800 inclusive	8
Table 6 — Dimensions of slide units	9
Table 7 — Dimensions of wing bases for slide units	10
Table 8 — Dimensions of vertical columns	11
Table 9 — Dimensions of wing bases for columns	12
Table 10 — Dimensions of centre bases	13
Table 11 — Dimensions for hole pattern for centre bases	18
Table 12 — Dimensions of multi-sided centre bases for rotary tables	19
Table 13 — Dimensions of rotary tables	20
Table 14 — Dimensions of integral way columns — base mounted type	21
Table 15 — Dimensions of integral way columns — floor mounted type	22
Table 16 — Dimensions of support brackets	23
Table 17 — Dimension of quill feed (self-feeding) single spindle drilling units	25
Table 18 — Dimensions of single spindle drilling units	26
Table 19 — Dimensions of single spindle milling units	27
Table 20 — Dimensions of quill feed (self-feeding) single spindle drilling units with adjusting slide for tool changing	28
Table 21 — Dimensions of flanges for mounting multi-spindle heads	29
Publications referred to	30

Foreword

This British Standard has been prepared under the authority of the Mechanical Engineering Industry Standards Committee. It is in conformity with the following standards, prepared by the International Standards Organization (ISO):

ISO 2912, *“Multi-spindle heads — casing and input shaft dimensions”*.

ISO 2727, *“Headstocks”*.

ISO 2562, *“Slide units”*.

ISO 2769, *“Wing bases for slide units”*.

ISO 2934, *“Wing bases for columns”*.

ISO 2891, *“Centre bases and columns”*.

ISO 3371, *Rotary tables*.

ISO 3476, *Flanges for mounting multi-spindle heads*.

ISO 3589, *Integral way columns*.

ISO 3590, *Spindle units*.

ISO 3610, *Support brackets*.

ISO 3970, *Integral way columns — Floor mounted type*.

This standard deals with those units most widely used in all types of transfer machines. This standard is only concerned with dimensions which effect interchangeability of units and is not intended to be a design specification. Certain related types of units which may only be suitable for particular applications are excluded (see 3.2).

It is to be noted that there is no interchangeability between units in this metric standard and units produced in accordance with the requirements of the imperial versions of BS 3295, *“Unit heads (slide type)”*, and BS 3884, *“Machine tool unit construction”*. Basic dimensions are generally derived from the Renard series of preferred numbers; see BS 2045, *“Preferred numbers”*.

No attempt is made to influence the method of construction employed on the various units or the material or quality of manufacturing.

NOTE Examples of machine classification are shown in Figure 11.

Where technical differences exist between ISO Standards and the relevant part of this British Standard, details are stated in the clauses concerned.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 30, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

1 Scope

1.1 This British Standard specifies a nomenclature for basic modular units for machine tools.

1.2 A sizing system or classification and designation is given.

1.3 Dimensions for interchangeability are specified for the following modular units:

- 1) Multi-spindle heads-casing and input shaft dimensions.
- 2) Headstocks.
- 3) Slide units.
- 4) Wing bases for slide units.
- 5) Vertical columns.
- 6) Wing bases for vertical columns.
- 7) Centre bases.
- 8) Multi-sided centre bases for rotary tables.
- 9) Rotary tables.
- 10) Integral way columns — base mounted type.
- 11) Integral way columns — floor mounted type.
- 12) Support brackets.
- 13) Quill feed (self-feeding) single spindle drilling units.
 - a) Single spindle drilling units.
 - b) Single spindle milling units.
 - c) Quill feed (self-feeding) single spindle drilling units with adjusting slide for tool changing.
- 14) Flanges for mounting multi-spindle heads.

NOTE The titles of the British Standards referred to in this standard are listed on page 30.

2 Nomenclature

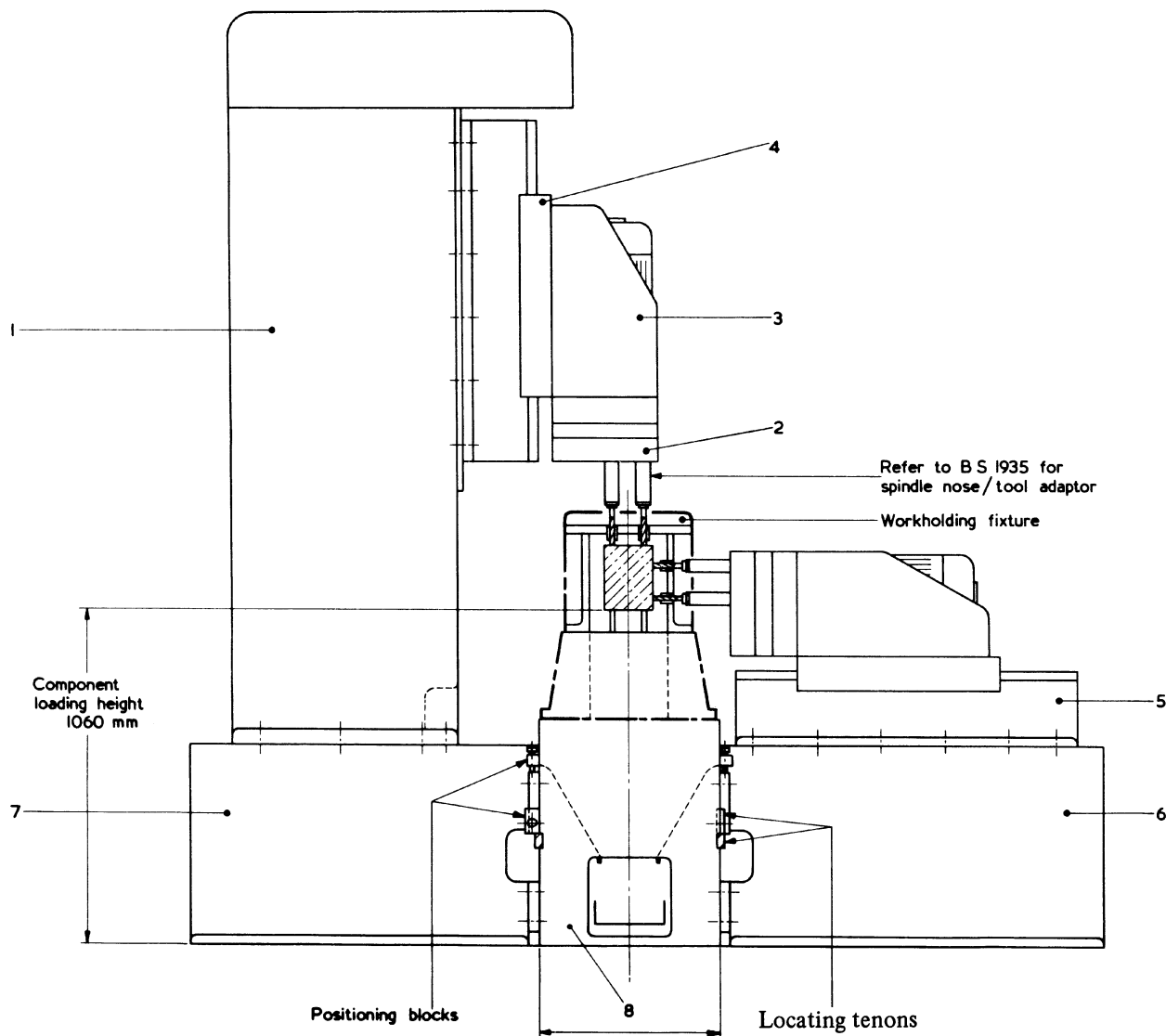
For the purposes of this British Standard the nomenclature given in Table 1 applies (see also Figure 1).

3 General

3.1 Work loading height. The dimensional requirements of modular units for machine tools are based on a nominal work loading height of 1 060 mm. It should be noted that the height is measured from the underside of the machine and not from the floor on which the machine rests.

3.2 Related units. Certain modular units frequently employed in transfer machines do not have their dimensional requirements specified in detail in this standard, because they are used for special applications. These units comprise packers (distance pieces), angular adaptors, horizontal angular adaptors, integral way wing bases (horizontal or angular) and angular wing bases.

When these units are manufactured the interface dimensions and designations should be compatible with the standard unit which it is either replacing or to which it is being attached.

Figure 1 — Modular units (*continued*)

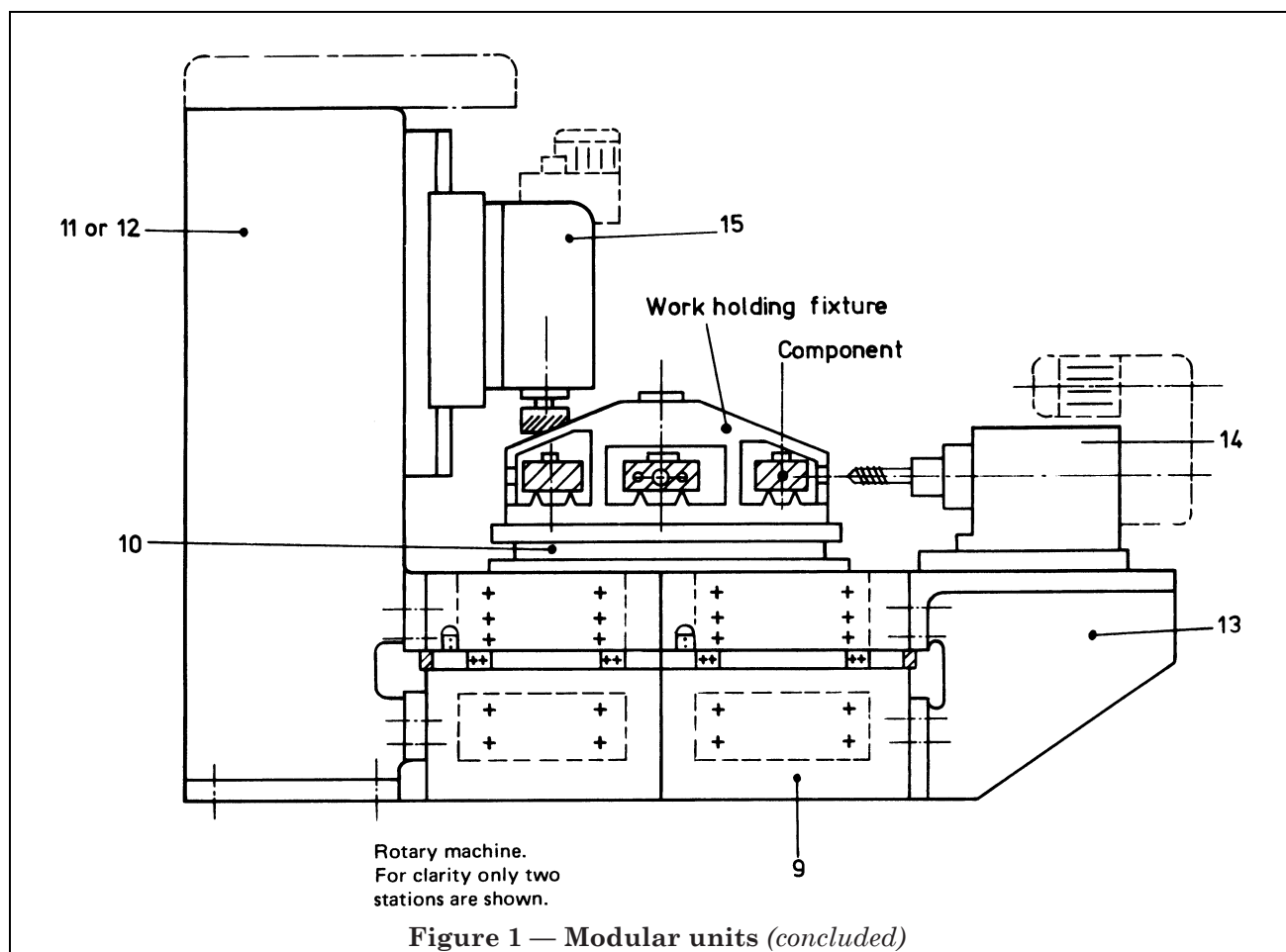


Table 1 — Nomenclature for modular units
(see Figure 1)

Item No.	Title
1	Column
2	Multi-spindle head
3	Headstock
4	Saddle
5	Slide base
6	Wing base for slide unit
7	Wing base for column
8	Centre base
9	Multi-sided centre base for rotary tables
10	Rotary table
11	Integral way column — base mounted type
12	Integral way column — floor mounted type
13	Support bracket
14	Spindle unit
15	Single spindle milling unit

4 Designation of modular units

4.1 A multi-spindle head casing shall be designated by the size of the slide unit upon which the casing is to be mounted together with the nominal envelope dimensions: width $\times$ height.

4.2 A headstock shall be designated by the size of the slide upon which it is to be mounted.

4.3 A slide unit shall be designated by the nominal width of the slide unit saddle.

4.4 A wing base for slide units shall be designated by the basic size of slide unit which it is to accommodate.

4.5 A column shall be designated by the basic size of the slide unit which it is to accommodate.

4.6 A wing base for columns shall be designated by the basic size of the slide unit which is to be accommodated upon the column. It should be noted that the width of a wing base for a column corresponds to the width of the next larger size of wing base for a given slide unit.

4.7 A centre base shall be designated by the nominal envelope dimensions: length $\times$ width $\times$ height.

4.8 A multi-sided centre base for a rotary table shall be designated by the table diameter and the diameter of its inscribed circle.

4.9 A rotary table shall be designated by the table diameter, its height and the diameter of the swarf tray.

4.10 An integral way column — base mounted type — shall be designated by the basic size of slide unit that is integral with it.

4.11 An integral way column — floor mounted type — shall be designated by the basic size of slide unit that is integral with it.

4.12 A support bracket shall be designated by the nominal width of the saddle on the related slide unit.

5 Multi-spindle head casings and input shaft

5.1 The range of basic dimensions for multi-spindle head casings shall comply with Table 2. Particular selections from this range may be made at the designer's discretion.

5.2 Drive input shaft dimensions shall comply with Table 3.

NOTE 1 Certain sizes are indicated as preferred for the purposes of this British Standard. ISO 2912 does not include this restriction.

NOTE 2 ISO 2912 includes, for information purposes, dimensions of a location spigot concentric with the drive input shaft but as this feature is not normally used in UK practice, it has not been included.

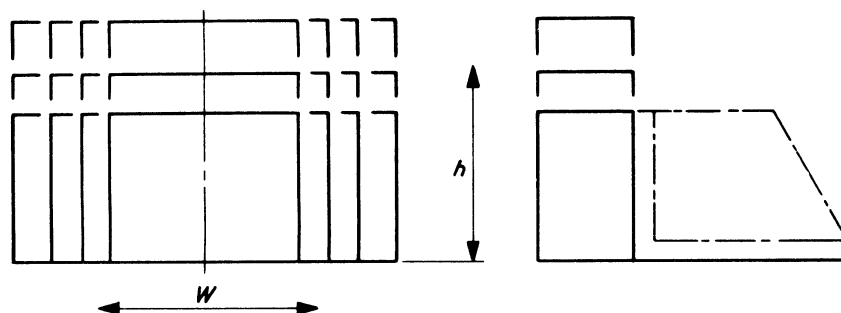


Figure 2 — Multi-spindle head casing

Table 2 — Dimensions of multi-spindle head casings

All dimensions in millimetres.

Width of casing <i>W</i>	Nominal size								
	125	160	200	250	320	400	500	630	800
	Nominal height of casing <i>H</i>								
160	125								
	160								
	200								
200	125	160							
	160	200							
	200	250							
250	125	160	200						
	160	200	250						
	200	250	320						
320	125	160	200	250					
	160	200	250	320					
	200	250	320	400					
400		160	200	250	320				
		200	250	320	400				
		250	320	400	500				
500			200	250	320	400			
			250	320	400	500			
			320	400	500	630			
630				250	320	400	500		
				320	400	500	630		
				400	500	630	800		
800					320	400	500	630	
					400	500	630	800	
					500	630	800	1 000	
1 000						400	500	630	800
						500	630	800	1 000
						630	800	1 000	1 250
1 250							500	630	800
							630	800	1 000
							800	1 000	1 250

Method of multi-spindle head casing designation: e.g. nominal size 320 × width 400 × height 500, designation 320 × 400 × 500.

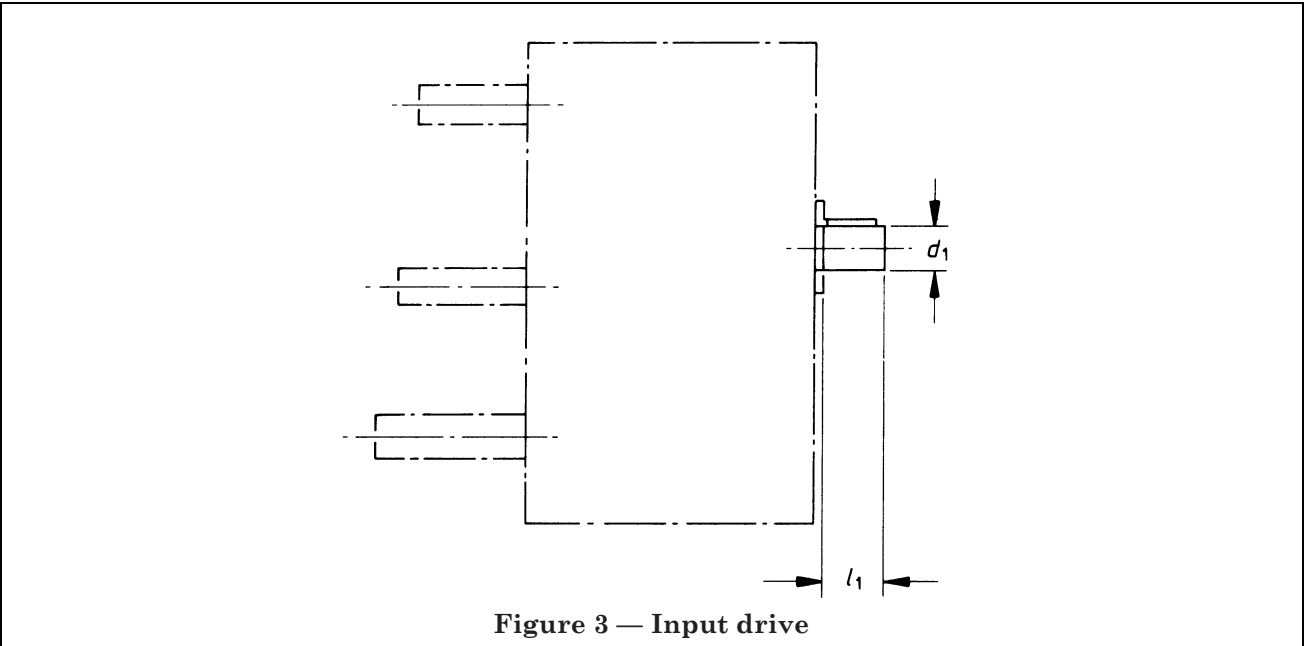


Table 3 — Dimensions of input drive

All dimensions in millimetres.

Drive shaft diameter		Spigot length
d_1	Tol.	l_1
28 ^a	j6	60
38 ^a	k6	70
42	k6	70
48 ^a	k6	85
60	m6	110

^a Preferred sizes. See note 1 to 5.2.

6 Headstocks

6.1 Range of nominal sizes 125 mm to 250 mm

6.1.1 Dimensions shall be in accordance with Table 4.

6.1.2 Either a tenon drive or a shaft and key drive may be used.

6.1.3 Multi-spindle heads should be located on the headstock either by means of the spigot and one dowel, or by means of two dowels (see Figure 4).

6.2 Range of nominal sizes 320 mm to 800 mm

6.2.1 Dimensions shall be in accordance with Table 5.

6.2.2 Any suitable form of drive may be used. For this range of nominal sizes, the height of the centre of the driving spindle is not specified.

6.3 All sizes

6.3.1 For all sizes, the first holding down bolt is situated a whole multiple of 25 mm from the front face of the headstock. Subsequent holes are also spaced in whole multiples of 25 mm (see Figure 5).

6.3.2 Headstocks should be located on slide units either by means of dowels or tenons.

6.3.3 The size of motor used and the method of mounting it is left to the discretion of the headstock manufacturer.