

Industrial valves — Multi-turn valve actuator attachments

The European Standard EN ISO 5210:1996 has the status of a
British Standard

ICS 23.060

Committees responsible for this British Standard

The preparation of this British Standard was entrusted to Technical Committee PSE/7, Valves, upon which the following bodies were represented:

Amalgamated Engineering Union
 Association of Bronze and Brass Founders
 British Foundry Association
 British Gas plc
 British Plumbing Fittings Manufacturers' Association
 British Valve and Actuator Manufacturers' Association
 British Water
 Chartered Institution of Building Services Engineers
 Electricity Association
 Energy Industries Council
 Engineering Equipment and Materials Users' Association
 GAMBICA (BEAMA) Ltd.
 Health and Safety Executive
 Institution of Mechanical Engineers
 LP Gas Association
 Pipeline Industries Guild
 Society of British Water Industries
 Water Services Association of England and Wales
 West Midlands CBI
 Coopted members

This British Standard, having been prepared under the direction of the Engineering Sector Board, was published under the authority of the Standards Board and comes into effect on 15 December 1996

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Amendments issued since publication

Amd. No.	Date	Comments
14504 Corrigendum No.1	4 July 2003	Addition of supersession details to national foreword

The following BSI references relate to the work on this standard:
 Committee reference PSE/7
 Draft for comment 95/70494 DC

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National foreword

This British Standard has been prepared by Technical Committee PSE/7 and is identical to EN ISO 5210:1996, *Industrial valves — Multi-turn valve actuator attachments* published by the European Committee for Standardization (CEN). It is identical with ISO 5210:1991 published by the International Organization for Standardization (ISO). The standard was produced as the result of international discussions in which the United Kingdom took an active part.

Together with BS EN ISO 5211:2001, this British Standard supersedes BS 5840-1:1980 and BS 5840-2:1982, which are withdrawn.

The UK participation in its preparation was entrusted by Technical Committee PSE/7, Valves, to Subcommittee PSE/7/1, Valves — Basic standards, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this committee can be obtained on request to its secretary.

Cross-references

The British Standards which implement international or European publications referred to in this document may be found in the *BSI Catalogue* under the section entitled “International Standards Correspondence Index”, or by using the “Search” facility of the *BSI Electronic Catalogue* or of British Standards Online. Cross-reference

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the EN title page, pages 2 to 11 and a back cover.

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ICS 23.060

Descriptors: Valves, industrial valves, servomotors, junctions, specifications, dimensions, designation

English version

Industrial valves — Multi-turn valve actuator attachments

(ISO 5210:1991)

Robetterie industrielle — Raccordement des
actionneurs multitours aux appareils de robinetterie
(ISO 5210:1991)

Industriearmaturen — Anschlüsse von
Drehantriebern an Armaturen
(ISO 5210:1991)

This European Standard was approved by CEN on 1995-10-20. CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

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CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart 36, B-1050 Brussels

Foreword

The text of the International Standard from Technical Committee ISO/TC 153, Valves, of the International Organization (ISO) has been taken over as a European Standard by Technical Committee CEN/TC 69, Industrial valves, the Secretariat of which is held by BSI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by September 1996, and conflicting standards shall be withdrawn at the latest by September 1996.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

NOTE Normative references to International Standards are listed in Annex ZA (normative).

1 Scope

This International Standard specifies the requirements for the attachment of multi-turn actuators to valves.

Throughout this International Standard, “actuator” may be understood as “actuator and/or gearbox”.

It specifies

- those flange dimensions which are necessary for the attachment interface of actuators to general purpose industrial valves (see Figure 1);
- those driving component dimensions of actuators which are necessary to attach them to the driven components;
- reference values for torque and thrust for flanges having the dimensions specified in this International Standard.

NOTE 1 ISO 5211^[1] specifies requirements for part-turn valve actuator attachments.

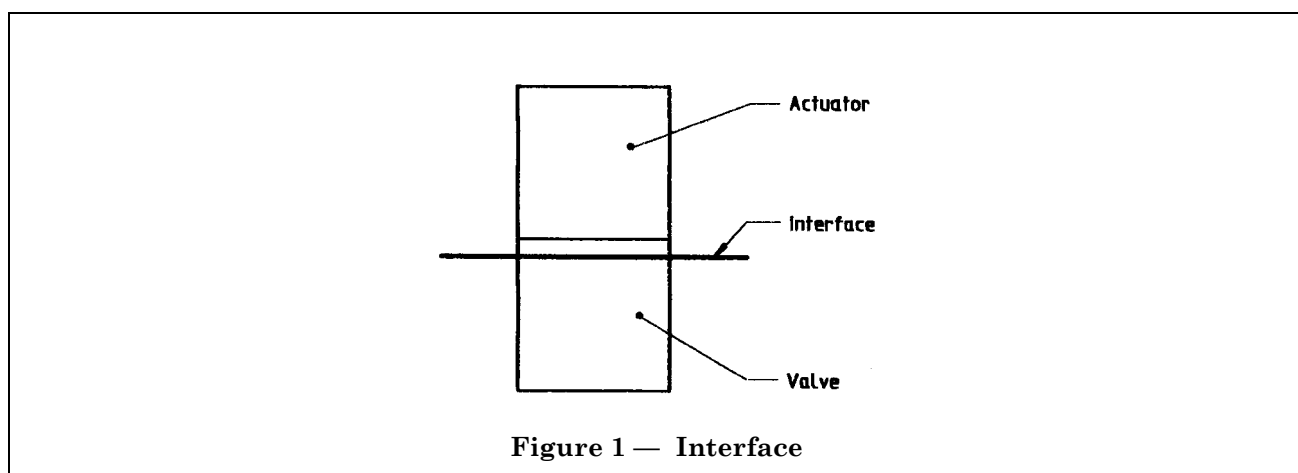


Figure 1 — Interface

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 273, Fasteners — Clearance holes for bolts and screws.

3 Definitions

For the purposes of this International Standard, the following definitions apply.

3.1

actuator

any device designed for attachment to a general purpose industrial valve in order to provide for the operation of the valve. The device is designed to operate using motive energy which may be electrical, pneumatic, hydraulic, manual, etc., or a combination of these. Movement is limited by travel, torque or thrust.

3.2

multi-turn actuator

actuator which transmits torque to the valve for at least one revolution. It may be capable of withstanding thrust

3.3**torque**

turning moment transmitted through the mounting flanges and couplings. It is expressed in newton metres

3.4**thrust**

axial force transmitted through the mounting flanges and couplings. It is expressed in kilonewtons

4 Maximum torques and thrusts

The torque and thrust values listed in Table 1 present the maximum torques and thrusts which can be transmitted simultaneously through the mounting flanges and couplings; they are based upon specified criteria.

Table 1 — Torque and thrust values

Flange type	Torque N·m	Thrust kN
F07	40	20
F10	100	40
F12	250	70
F14	400	100
F16	700	150
F25	1 200	200
F30	2 500	325
F35	5 000	700
F40	10 000	1 100

The values specified in Table 1 have been selected on the basis of the following criteria:

- bolt material: ISO quality class 8.8; yield stress 628 N/mm² ¹⁾;
- allowable stress in bolt; 200 N/mm²;
- bolts in tension only: no allowance is made for stresses induced by tightening the bolts;
- coefficient of friction between the mounting flanges: 0,3.

All variations in these calculation parameters lead to variations of the transmittable torque and thrust values.

The selection of flange sizes for a particular application should take account of additional torques that may be generated at the valve stem because of inertia or other similar factors.

5 Flange dimensions

Flanges for actuator attachment shall comply with the dimensions shown in Figure 2 and given in Table 2. The method of attachment shall be by means of studs or through bolting. When through bolting is used, the diameter of the clearance holes shall permit the use of bolts of a size given by the corresponding dimension d_4 in Table 2. Holes for the studs/bolts shall be positioned off-centre (see Figure 3), be equispaced and shall conform to the requirements of ISO 273.

¹⁾ 1 N/mm² = 1 MPa

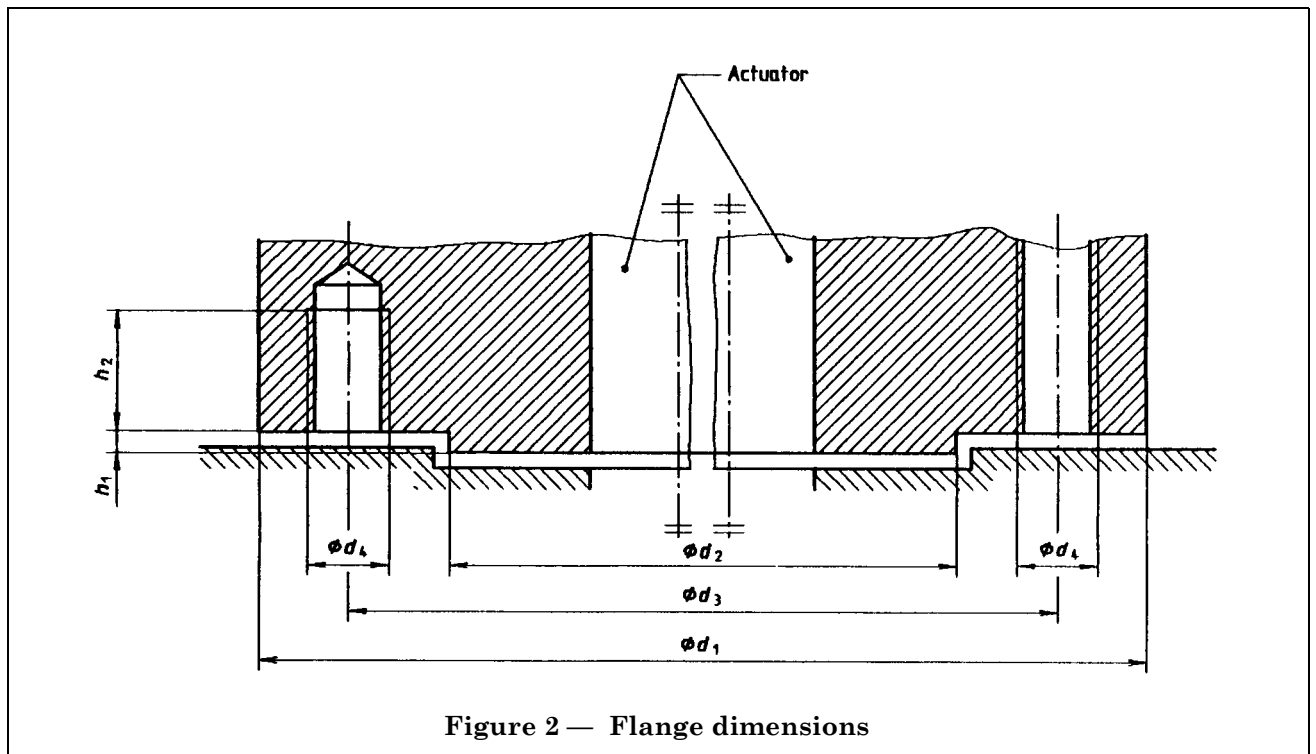


Figure 2 — Flange dimensions

Table 2 — Flange dimensions

Dimensions in millimetres

Flange type	Dimensions						Number of studs or bolts
	d_1	d_2 f8	d_3	d_4	h_1 max.	h_2 min.	
F07	90	55	70	M8	3	12	4
F10	125	70	102	M10	3	15	4
F12	150	85	125	M12	3	18	4
F14	175	100	140	M16	4	24	4
F16	210	130	165	M20	5	30	4
F25	300	200	254	M16	5	24	8
F30	350	230	298	M20	5	30	8
F35	415	260	356	M30	5	45	8
F40	475	300	406	M36	8	54	8

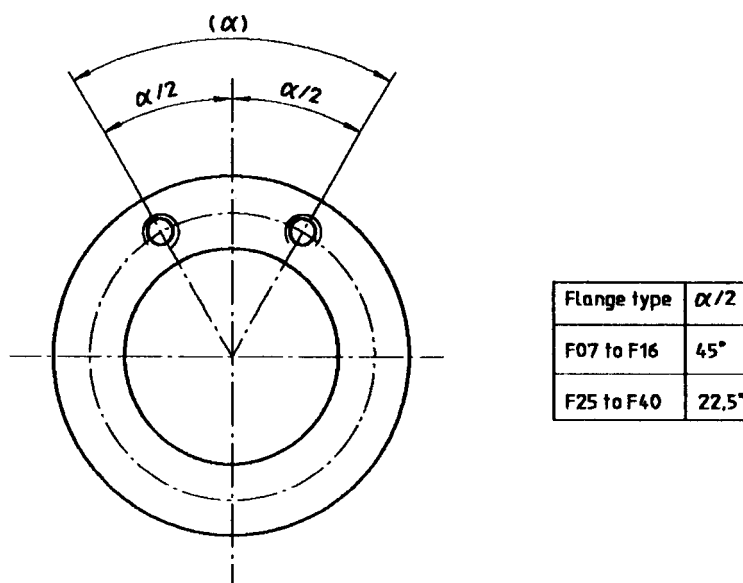


Figure 3 — Positions of the holes for the studs/bolts

The interface on the valve shall have a recess corresponding to the diameter d_2 ; a spigot on the actuator is optional.

The minimum values for dimension h_2 apply to flanges having materials of proof stress $R_{p0,2} \geq 200 \text{ N/mm}^2$.

Dimension d_1 has been based on providing sufficient landing for the nuts and bolt heads where applicable. Such landing is defined as a radius from the bolt hole centre with the dimension $(d_1 - d_3)/2$, and is a minimum. The flange shape of both valve and actuator outside these areas of landing is left to the option of the manufacturer.

6 Designation

Flanges are designated by

- the letter F;
- two digits which correspond to the values of d_3 , in principle rounded down, and divided by 10.

7 Dimensions of driving and driven components

The dimensions of the driving and driven components shall comply with the dimensions given in Table 3 and Table 4.

7.1 Dimensions for assemblies capable of transmitting both torque and thrust: Group A

Dimensions for assemblies of group A shall be as shown in Figure 4 and Figure 5, and given in Table 3.

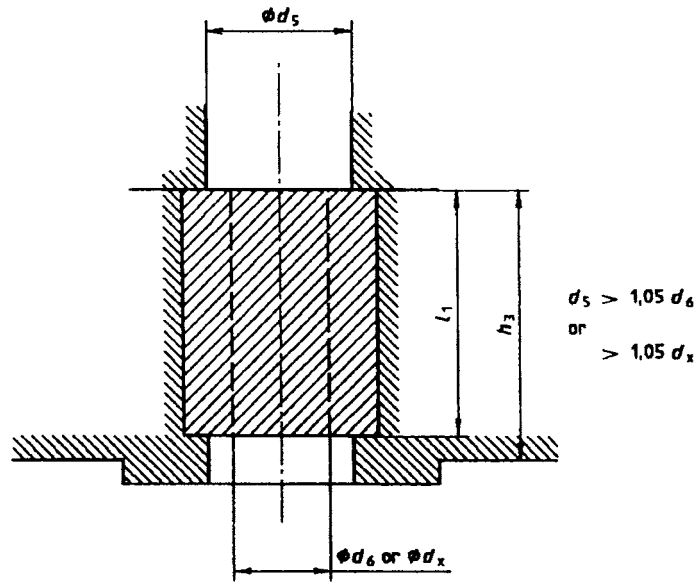


Figure 4 — Driving component, group A

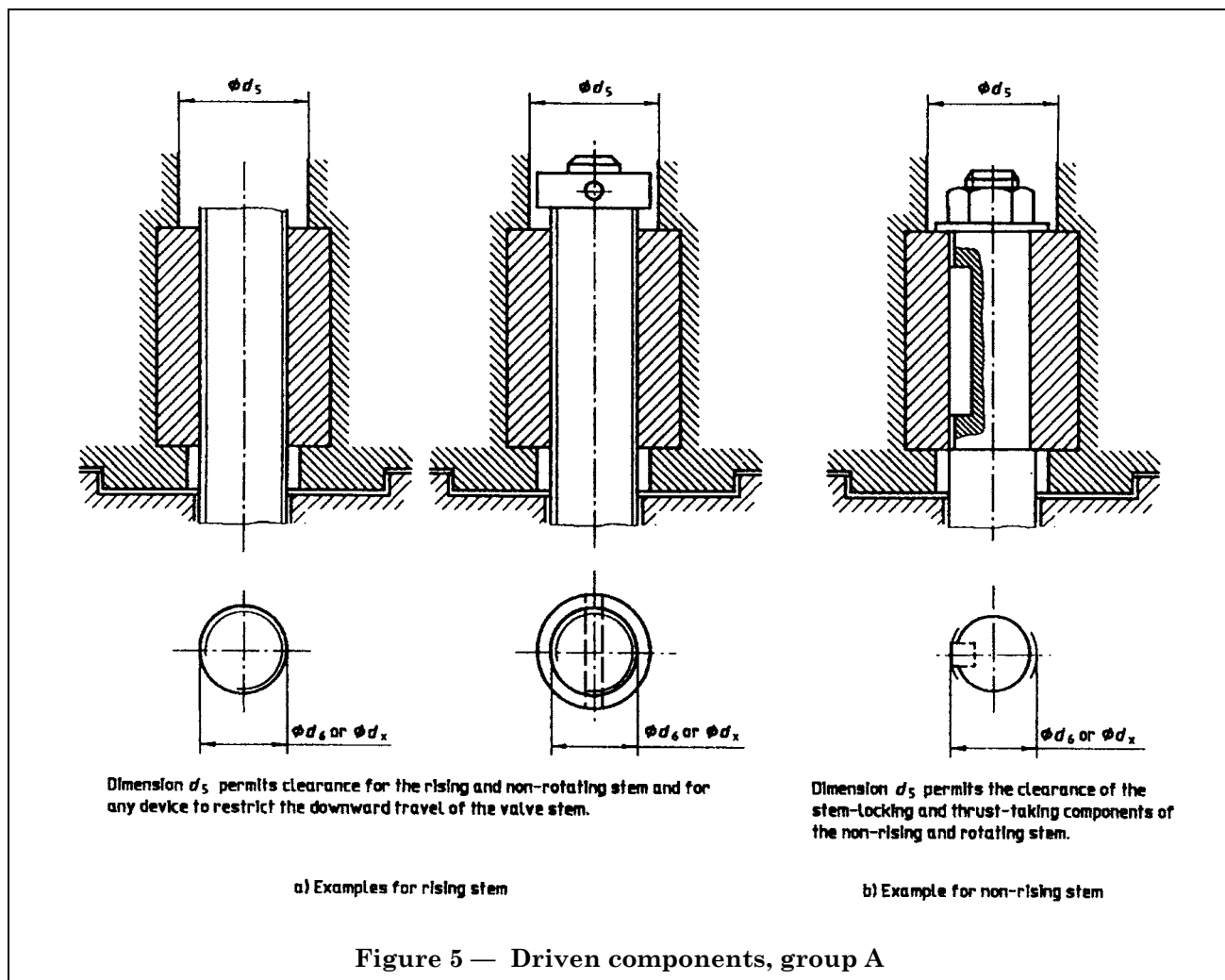


Figure 5 — Driven components, group A

Table 3 — Dimensions for group A drive components

Flange type	Dimensions in millimetres								
	F07	F10	F12	F14	F16	F25	F30	F35	F40
d_6^1	20	28	32	36	44	60	80	100	120
d_x^1	26	40	48	55	75	85	100	150	175
l_1 min.	25	40	48	55	70	90	110	150	180
h_3 max.	60	80	95	110	135	150	175	250	325

¹ The driving component shall be capable of accepting a diameter up to and including the values d_6 shown in Figure 4. Without being a requirement, the driving component may accept larger diameters up to the values of d_x .

7.2 Dimensions for assemblies capable of transmitting torque only: Group B

Dimensions for assemblies of group B shall be as shown in Figure 6 and Figure 7, and given in Table 4.

Type B1
 $\phi d = d_7$ H9
 Type B2
 $\phi d = d_{7, \max}$

Type B3
 $\phi d = d_{10}$ H9
 Type B4
 $\phi d = d_{y, \max}$

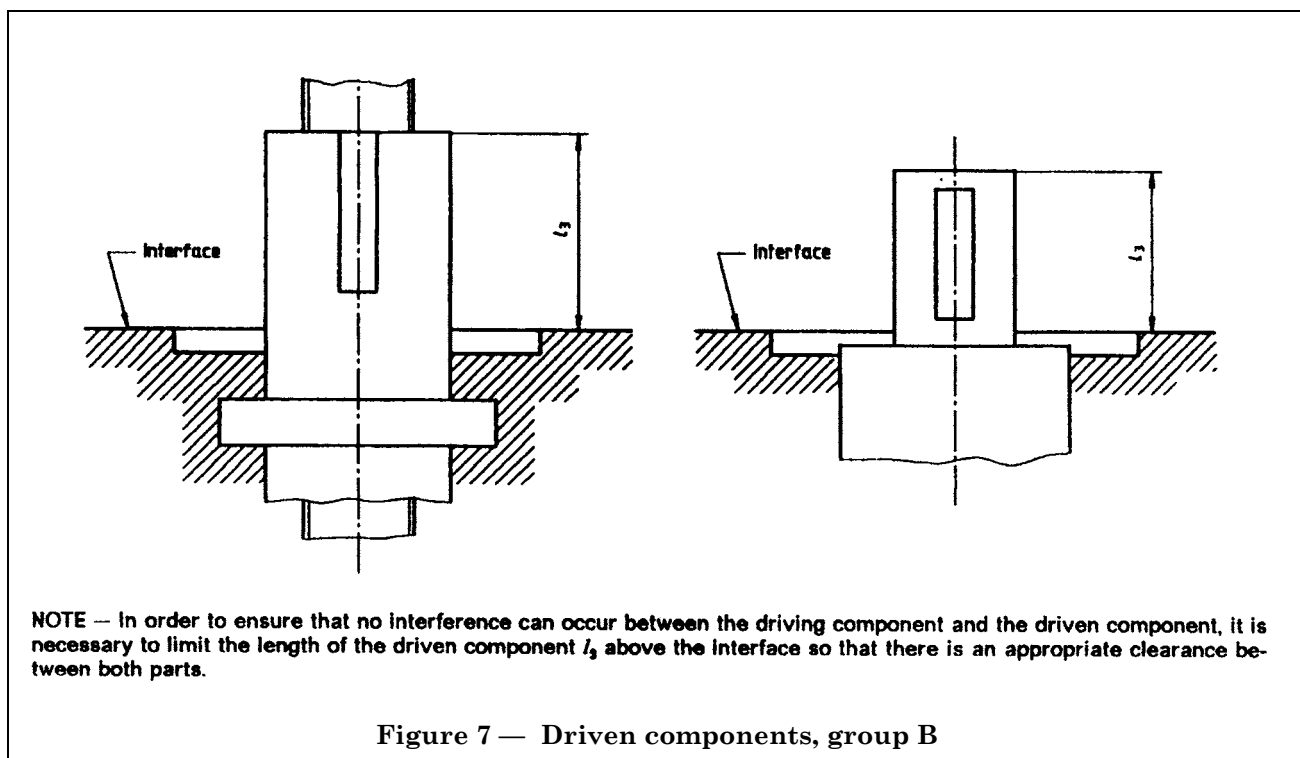
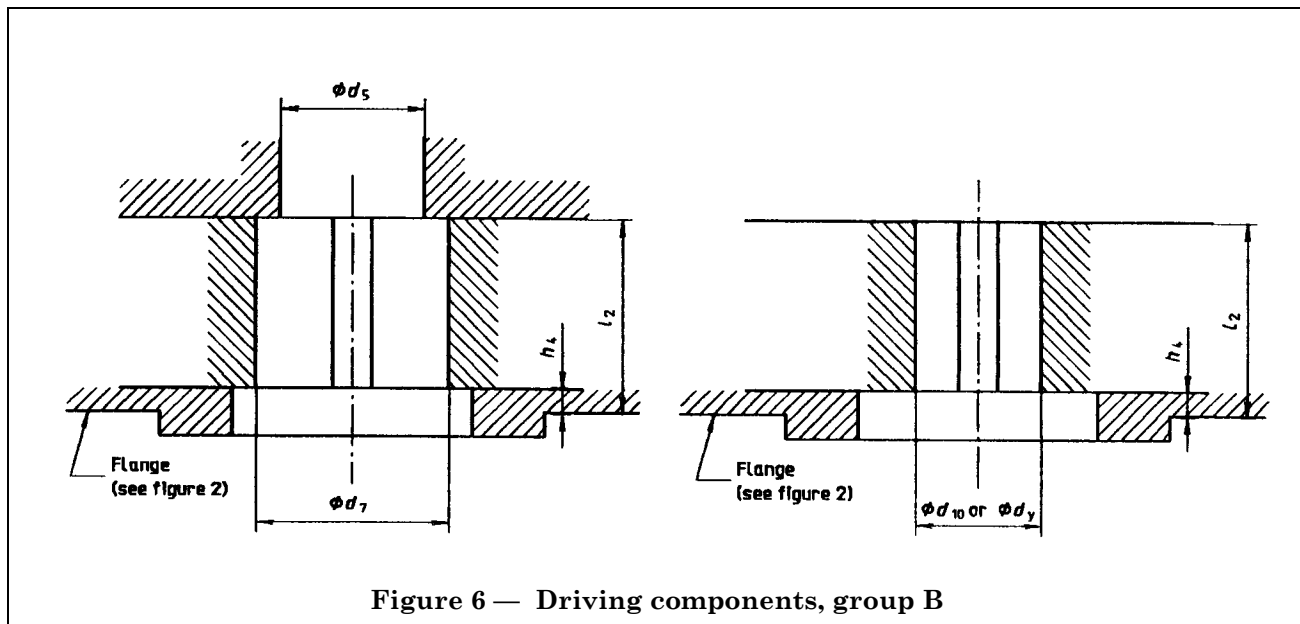


Table 4 — Dimensions for group B drive components

Dimensions in millimetres

Flange type	F07	F10	F12	F14	F16	F25	F30	F35	F40
d_5 min.	22	30	35	40	50	65	85	110	130
d_7 H9	28	42	50	60	80	100	120	160	180
d_{10}^1 H9	16	20	25	30	40	50	60	80	100
d_y max.	25	35	40	45	60	75	90	120	160
h_4 max.	3	3	3	4	5	5	5	5	8
l_2 min.	35	45	55	65	80	110	130	180	200

^a The driving component shall be capable of accepting a diameter up to and including the values d_{10} shown in Figure 6. Without being a requirement, the driving component may accept larger diameters up to the values of d_y .

Annex A (informative)

Bibliography

[1] ISO 5211:—²⁾, Industrial valves — Part-turn valve actuator attachments.

²⁾ To be published.

Annex ZA (normative)**Normative references to international publications with their relevant European publications**

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

Publication	Year	Title	EN	Year
ISO 273	1979	<i>Fasteners — Clearance holes for bolts and screws</i>	EN 20273	1991

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