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Specification for

Control plug cocks for low-pressure gases

Spécification des robinets de commande à tournant pour les gaz à basse pression

Spezifikation für Kontrollkükenhahne für Niederdruckgase

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Foreword

This British Standard has been prepared under the direction of the Gas Standards Committee. When contemplating this revision, the committees responsible considered but decided against complete metrication since the resulting dimensional changes would neither facilitate production nor give any other advantages at this time. It was considered that such changes should await international agreement on control cock requirements and meter union design which

might affect cocks. Nevertheless, it was appreciated that there would be considerable value in variety reduction and in introducing the use of metric sized material. Thus, this revision rationalizes the range of cocks, gives a requirement for lubricants and, where appropriate, permits the use of metric sized sheets and bars.

Attention is drawn to appendix A which lists the range of standard types and sizes.

British Standard Specification for

Control plug cocks for low-pressure gases

1. Scope

This British Standard specifies requirements for plug cocks made from copper alloys of nominal sizes $\frac{1}{8}$ in to 2 in of the types specified in clause 3 and summarized in appendix A. These cocks are for working pressures up to 75 mbar and are primarily intended for use with 2nd family gases but may also be used with 3rd family gases for certain applications.

2. References

The titles of the standards publications referred to in this standard are listed on the inside back cover.

3. Types

(For range of standard types and sizes see appendix A.)

3.1 Meter control cock. The meter control cock is intended for use on the service pipe to a meter. The inlet end shall be screwed internally with an R_c thread of appropriate size to the requirements of BS 21. The outlet end shall embody a union boss threaded to the requirements of BS 746. The range of sizes is from $\frac{1}{2}$ in to 2 in.

3.2 Main cock. The main cock is intended for use as a control cock on pipe lines. One end shall be screwed internally and the other end screwed externally, both to the requirements of BS 21, R or R_c . The range of sizes is from $\frac{1}{2}$ in to 2 in.

3.3 Union cock. The union cock is intended for use as a control cock on pipe lines. The inlet end shall be screwed internally and the outlet end shall embody a union with either internal or external threads, all to the requirements of BS 21, R or R_c . The range of sizes is from $\frac{1}{8}$ in to 1 in.

3.4 Nursery union cock. The nursery union cock is the same as a union cock, but with shrouding and a detachable key. The sizes are $\frac{1}{4}$ in and $\frac{1}{2}$ in.

4. Keys

Lever keys are specified for all meter control cocks and main cocks and additionally fan keys are specified for sizes up to $\frac{3}{4}$ in. The use of fan keys, however, is not recommended where the cock is used as a meter control cock. Fan keys, either rigid or drop, are specified for union cocks. Detachable fan keys are specified for nursery union cocks. A lever key shall be so fixed to the plug that when the plug is turned to the OFF position the lever arm shall be at right angles to the gasway in the cock body and when turned fully to the ON position shall point towards the union of the meter control cock or the external thread of the main cock. The alignment of the holes for the split cotter pin securing the lever key to the plug head shall be such as to make it possible to refit the key at 180° .

Pressed carbon steel shall be used for lever keys for sizes up to and including 1 in and malleable cast iron shall be used for larger sizes.

5. Materials

Materials shall comply with the requirements of the following British Standards.

Brass for hot pressings	BS 2872 CZ122
Brass for die-casting	BS 1400 DCBI
Brass rod	BS 2874 CZ121
Brass sheet	BS 2870 CZ108
Malleable cast iron for lever key	BS 310
Materials for union washers	BS 746
Carbon steel for lever key	BS 1449 : Part 1

Unless otherwise specified in tables and figures 1 to 21, components shall be made of brass and comply with the requirements of the British Standards listed above.

The lubricant shall contain molybdenum disulphide.

6. Dimensions

6.1 The cocks shall conform to the dimensions given in tables and figures 1 to 21. All dimensions are nominal unless otherwise specified. Parallel fastening threads for unions shall comply with the requirements of BS 84, BS 2779, or BS 746 as appropriate. External threads shall be free class and internal threads normal class as defined in these standards.

Internal threads in caps and external threads on bodies of nursery cocks shall be medium fit. Where BA threads are used, reference should be made to BS 93.

6.2 With all cocks the plug shall protrude beyond the taper bore in the body as shown in figure 1 and the major diameter of the taper plug shall lie within the taper bore of the body.

6.3 In the full ON position malalignment of the gasway in the plug relative to the gasway in the body in all directions shall not exceed $\frac{1}{64}$ in for cocks of nominal size $\frac{1}{8}$ in to $\frac{3}{4}$ in inclusive and $\frac{1}{32}$ in for sizes above this.

7. Manufacture

7.1 Hot pressings shall be sound and solid without laminations and shall be smooth and well finished.

7.2 Die-castings shall be in all respects sound and good, free from laps, blow holes and pitting, and all surfaces not machine finished shall be clean and smooth. The castings shall be neatly dressed, and no castings shall be rectified by burning, plugging, stopping or patching.

7.3 Machining shall be of a fine finish free from scores and tool marks, special attention being paid to all sealing surfaces, gasways and washer seatings, which shall be free from all burrs and sharp edges.

7.4 Niting washers shall be flat and, if punched, shall be free from undue stress such as would be liable to cause distortion or mechanical failure.

7.5 The washer seating of the body shall be machined square with the axis of the bore.

7.6 Self-locking niting nuts may be used provided that they conform to the *A* and *B* dimensions given in table 6.

7.7 Before assembly, all parts shall be effectively cleaned. The minimum quantity of molybdenum disulphide lubricant shall be applied to the bearing surface of the body and plug. The moving parts shall be adjusted to give a smooth action without unevenness.

The screwed portion of the plug projecting beyond the nut securing the niting washer shall not be burred over. The nut shall be a spanner-tight fit over the whole length of the spigot and meet the following requirement.

The nut shall be slackened off a half turn. The static torque to start the nut moving (unscrewing) shall then be measured and shall not be less than the figure shown below. The nut shall then be twice re-tightened on the cock and slackened off and the torque as described above shall not be less than the following figure.

NOTE. The torque requirement may be achieved by self-locking nuts or by thread pitch deviation on the niting nut.

Nut size	Torque N·m
5 mm x 0.8 mm pitch	0.17
$\frac{1}{4}$ in dia. x 26 t.p.i.	0.34
$\frac{5}{16}$ in dia. x 26 t.p.i.	0.62
$\frac{3}{8}$ in dia. x 26 t.p.i.	0.90
$\frac{7}{16}$ in dia. x 26 t.p.i.	1.25
$\frac{1}{2}$ in dia. x 26 t.p.i.	1.7
$\frac{5}{8}$ in dia. x 20 t.p.i.	4.1
$\frac{3}{4}$ in dia. x 20 t.p.i.	7.9

8. Soundness

Each assembled cock shall withstand an air pressure of 350 mbar in both the ON and OFF positions without leakage when tested for a period of 10 s in accordance with the method given in appendix B. In the OFF position, one end of the cock shall be open during the test.

9. Marking

Each cock shall be clearly and permanently marked with the manufacturer's identification mark and with the number of this British Standard, i.e. BS 1552*.

10. Certificate

The manufacturer shall supply, when so requested by the purchaser, a signed certificate that each cock supplied complies in all respects with the requirements of this British Standard.

11. Testing facilities

The manufacturer shall, at his own cost, supply the necessary labour and equipment for the test specified in clause 8 of this standard.

12. Inspection

The purchaser or his authorized representative shall have access to the works of the manufacturer at all reasonable times to inspect the cocks at any stage.

*Marking BS 1552 on or in relation to a product is a claim by the manufacturer that the product has been manufactured in accordance with the requirements of the standard. The accuracy of such a claim is therefore solely the manufacturer's responsibility. Enquiries as to the availability of third party certification to support such claims should be addressed to the Director, Quality Assurance Division, BSI, Maylands Avenue, Hemel Hempstead, Herts HP2 4SQ in the case of certification marks administered by BSI or to the appropriate authority for other certification marks.

Appendix A

Range of standard types and sizes

All dimensions are in inches unless otherwise stated.

The range of standard types and sizes of control plug cocks is as follows.

Description of cock	Size												
	1/8	1/4	1/4 × 8 mm	1/2	1/2 × 12 mm	1/2 × 15 mm	3/4	3/4 × 22 mm	1 × 3/4	1	1 1/4	1 1/2	2
Meter control, washered union, 90° and 180° niting	-	-	-	X	-	-	*	-	*	*	X	X	X
Main with lever, 90° niting	-	-	-	X	-	-	*	-	*	*	X	X	X
Main with fan, 90° niting	-	-	-	X	-	-	X	-	-	-	-	-	-
Union, diamond head with: internal threaded liner	-	-	-	X	-	-	X	-	-	X	-	-	-
external threaded liner	-	-	-	X	-	-	X	-	-	X	-	-	-
Union, drop fan with: internal threaded liner	X	X	-	X	-	-	X	-	-	-	-	-	-
capillary liner	-	-	X	-	X	X	-	-	-	-	-	-	-
Union, rigid fan with: internal threaded liner	-	-	-	X	-	-	X	-	-	-	-	-	-
capillary liner	-	-	-	-	X	X	-	X	-	-	-	-	-
Union, nursery with: internal threaded liner	-	X	-	X	-	-	-	-	-	-	-	-	-

*Supplied with integral lug or shroud for locking screw

Appendix B

Test for soundness

B.1 Apparatus. The following apparatus is required.

B.1.1 *Bubble leak indicator* (see figure 22) to which a constant pressure air supply is connected.

B.1.2 *Means of connection* from the outlet of the bubble leak indicator to the inlet of the control cock.

B.1.3 *Means of sealing* the outlet of the control cock.

B.2 Procedure

B.2.1 Connect the bubble leak indicator to the inlet of the cock. With the cock in the OFF position and the outlet open, supply air at a pressure of 350 mbar to the cock through the main tap on the indicator and then open the taps to and from the glass tubes.

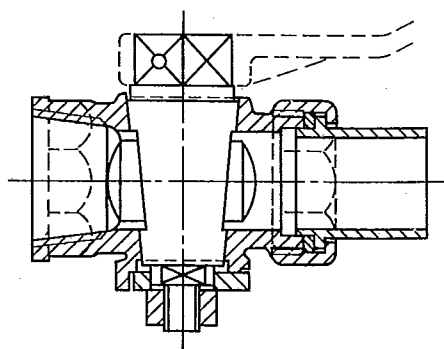
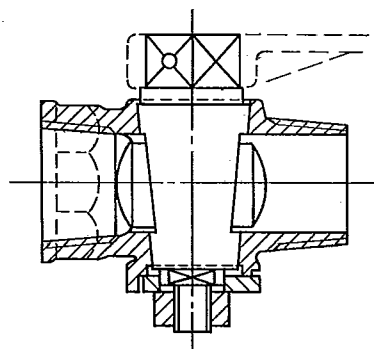
Shut the main tap and wait 1 min. During the next 10 s observe whether any bubbles break.

B.2.2 Repeat the test given in B.2.1 but with the cock in the ON position and with its outlet sealed.

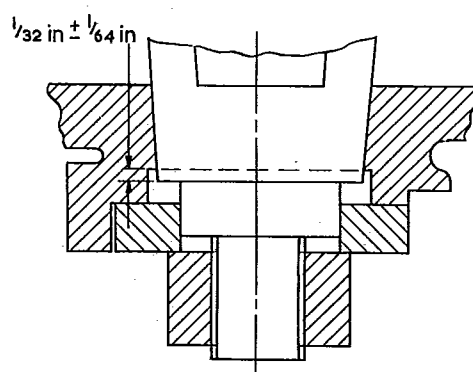
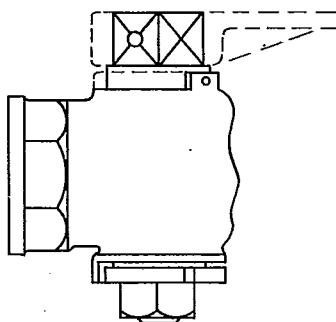
If no bubbles are seen to break during the 10 s periods, the cock shall be deemed to be sound.

Table and Figure 1. Main cock and meter control cock

(All dimensions are in inches.)

Meter control cock with
washer union

Main cock

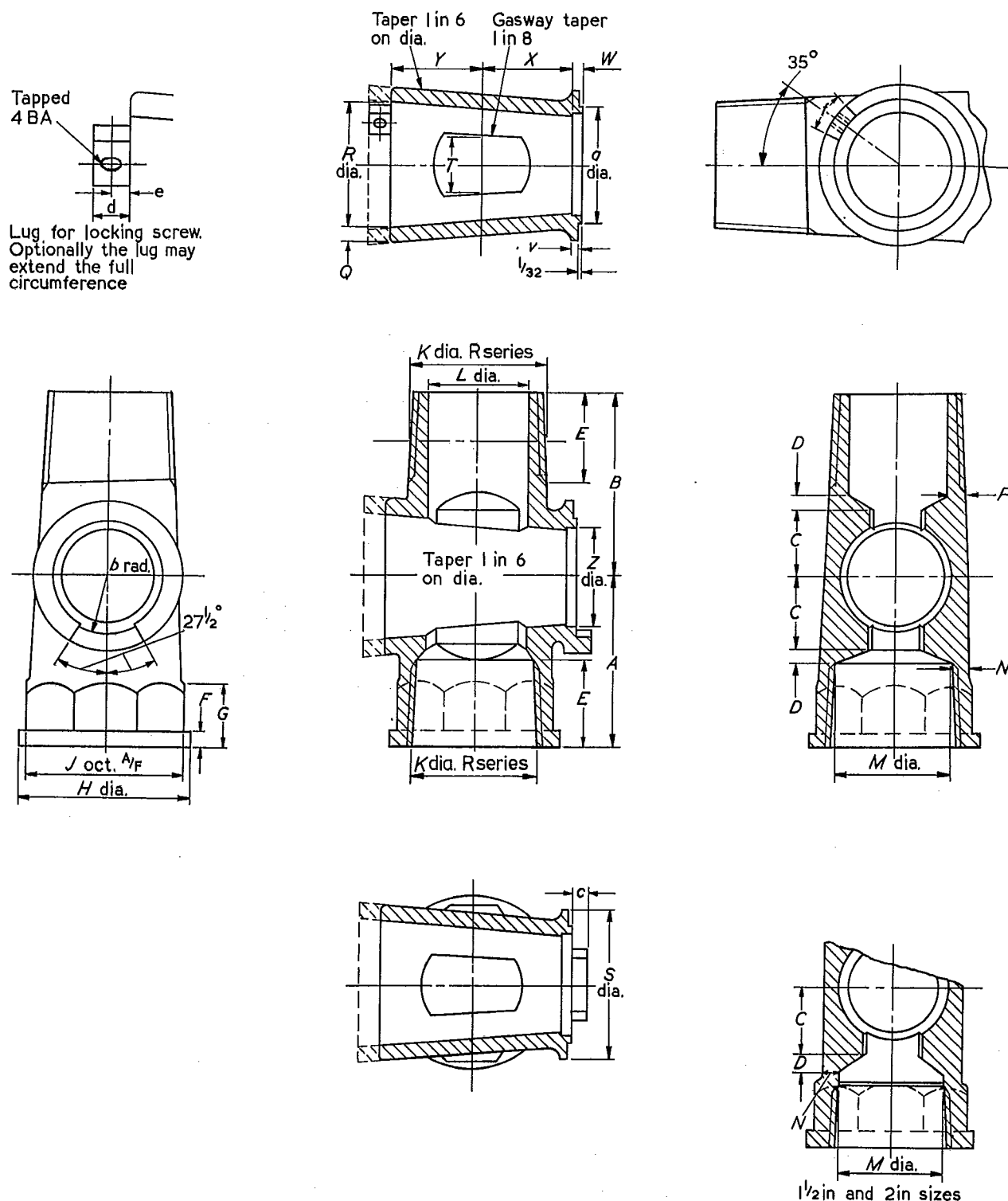
Enlarged view showing protrusion of
plug beyond taper bore in bodyMeter control cock or maincock
with tapping for locking screw

For standard range see appendix A.

(a) General view

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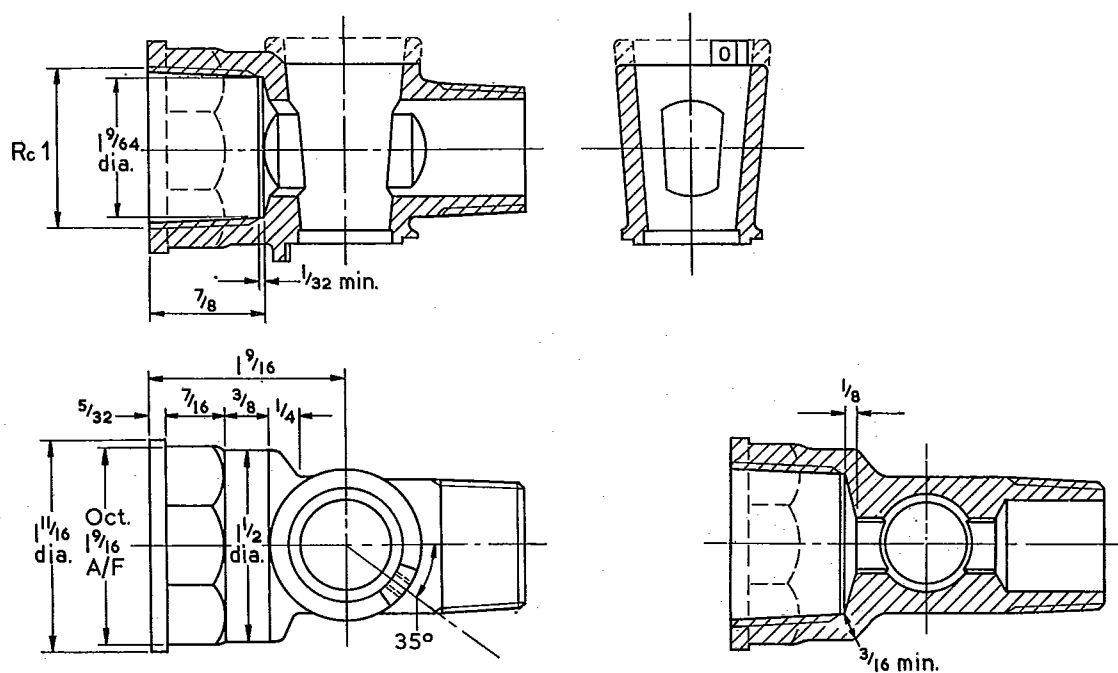
Table 1 and Figure 1 (continued)



(For dimensions see table 1.)

(b) Main cock body (except 1 in $\times$ $\frac{3}{4}$ in)

Table 1 and Figure 1 (concluded)

(c) Main cock body 1 in $\times \frac{3}{4}$ inAll other dimensions as $\frac{3}{4}$ in main cock body figure 1(b)

Dimensions for main cock body (see figure 1(b)):

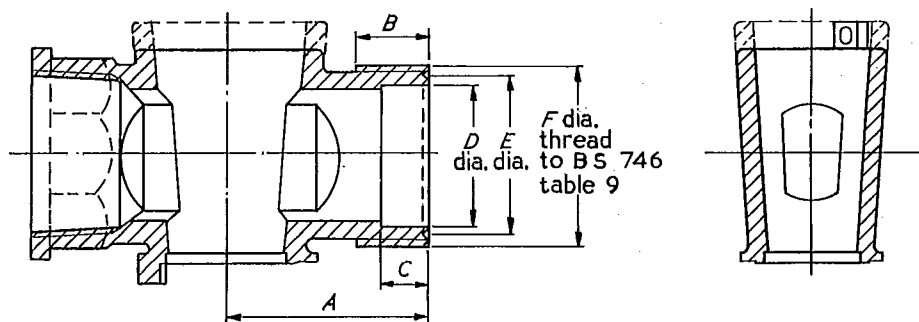
Size	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
A	$1\frac{5}{32}$	$1\frac{25}{64}$	$1\frac{11}{16}$	$1\frac{63}{64}$	$2\frac{15}{32}$	$2\frac{15}{16}$
B	$1\frac{3}{16}$	$1\frac{27}{64}$	$1\frac{13}{16}$	$2\frac{1}{16}$	$2\frac{3}{8}$	$2\frac{15}{16}$
C	$\frac{7}{16}$	$\frac{35}{64}$	$\frac{43}{64}$	$\frac{13}{16}$	$1\frac{1}{32}$	$1\frac{9}{32}$
D	$\frac{3}{32}$	$\frac{3}{32}$	$\frac{9}{64}$	$\frac{11}{64}$	$\frac{1}{4}$	$\frac{5}{16}$
E	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	1	$1\frac{1}{8}$
F	$\frac{1}{8}$	$\frac{5}{32}$	$\frac{5}{32}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{5}{16}$
G	$1\frac{7}{32}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{13}{16}$	$1\frac{1}{8}$	$1\frac{3}{16}$
H	$1\frac{1}{8}$	$1\frac{11}{32}$	$1\frac{11}{16}$	$2\frac{1}{8}$	$2\frac{1}{2}$	$3\frac{1}{8}$
J	1	$1\frac{7}{32}$	$1\frac{9}{16}$	$1\frac{15}{16}$	$2\frac{3}{16}$	$2\frac{13}{16}$
K	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
L	$\frac{9}{16}$	$\frac{3}{4}$	$\frac{63}{64}$	$1\frac{5}{16}$	$1\frac{1}{2}$	$1\frac{15}{16}$
M	$1\frac{11}{16}$	$\frac{7}{8}$	$1\frac{9}{64}$	$1\frac{15}{32}$	$1\frac{1}{2}$	$1\frac{15}{16}$
N min.	0.140	0.156	0.180	0.203	0.250	0.343
P min.	0.140	0.156	0.180	0.185	0.207	0.230
Q min.	0.112	0.139	0.159	0.169	0.216	0.297

Size	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
R	0.712	0.925	1.244	1.473	1.786	2.218
S	$1\frac{5}{16}$	$1\frac{1}{8}$	$1\frac{1}{2}$	$1\frac{3}{4}$	$2\frac{3}{16}$	$2\frac{11}{16}$
T	$\frac{5}{16}$	$\frac{7}{16}$	$\frac{9}{16}$	$\frac{11}{16}$	$\frac{7}{8}$	$1\frac{3}{32}$
V	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{5}{32}$	$\frac{5}{32}$
W	$\frac{3}{32}$	$\frac{3}{32}$	$\frac{7}{64}$	$\frac{7}{64}$	$\frac{1}{8}$	$\frac{5}{32}$
X ± 0.005	$\frac{35}{64}$	$\frac{41}{64}$	$\frac{57}{64}$	$1\frac{3}{64}$	$1\frac{13}{64}$	$1\frac{31}{64}$
Y ± 0.005	$\frac{37}{64}$	$\frac{43}{64}$	$\frac{59}{64}$	$1\frac{5}{64}$	$1\frac{15}{64}$	$1\frac{33}{64}$
Z ± 0.005	0.540	0.723	0.961	1.150	1.410	1.748
a	0.756	0.911	1.148	1.381	1.661	2.031
b	0.384	0.463	0.590	0.706	0.846	1.046
c	$\frac{9}{64}$	$\frac{5}{32}$	$\frac{11}{64}$	$\frac{15}{64}$	$\frac{1}{4}$	$\frac{9}{32}$
d		$\frac{13}{64}$	$\frac{13}{64}$			
e		$\frac{3}{32}$	$\frac{3}{32}$			
f min.		$\frac{11}{32}$	$\frac{11}{32}$			

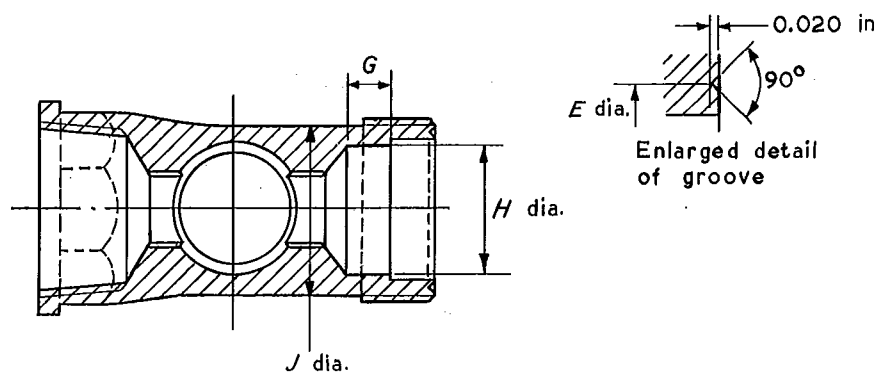
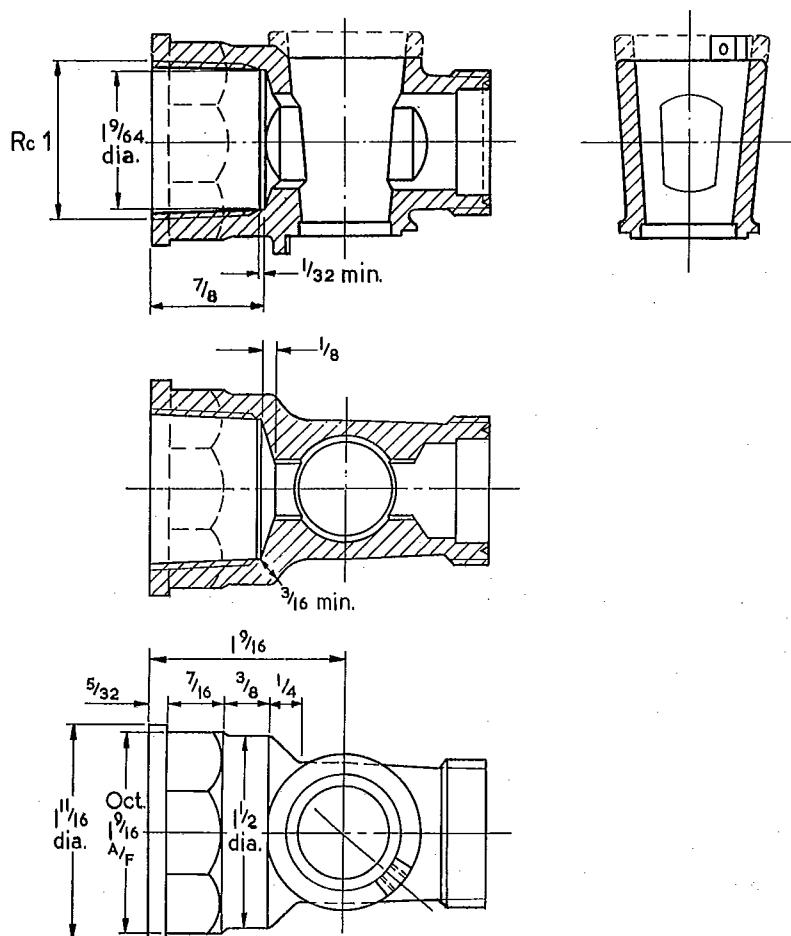
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Table 2 and Figure 2. Meter control cock bodies

(All dimensions are in inches.)



All other dimensions to be as main cock body figure 1(b) and table 1.

(a) Washered type (except 1 in x $\frac{3}{4}$ in)All other dimensions to be as $\frac{3}{4}$ in size meter control cock bodies, figures 1(b)(b) Washered type 1 in x $\frac{3}{4}$ in