BRITISH STANDARD

BS 4019-3: 1993
ISO 3551-1: 1992

Rotary core drilling equipment —

Part 3: Specification for System A — Metric units

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the General Mechanical Engineering Standards Policy Committee (GME/-) to Technical Committee GME/20, upon which the following bodies were represented:

British Coal Corporation
Drilling and Prospecting International Limited
English Drilling Equipment Co. Limited
Institution of Civil Engineers
Institution of Mining and Metallurgy
Natural Environment Research Council (Institute of Geological Science)

This British Standard, having been prepared under the direction of the General Mechanical Engineering Standards Policy Committee, was published under the authority of the Standards Board and comes into effect on 15 August 1993

The following BSI references relate to the work on this standard:
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Amendments issued since publication

Amd. No.	Date	Comments

Contents

National foreword

This Part of BS 4019 has been prepared under the direction of the General Mechanical Engineering Standards Policy Committee. It is identical with ISO 3551-1:1992 *Rotary core diamond drilling equipment — System A — Part 1: Metric units,* which was prepared by Technical Committee ISO/TC82/SC6 Diamond core drilling equipment, of the International Organization for Standardization (ISO) and in the development of which the United Kingdom played an active part.

To a large extent this Part of BS 4019 has been based on BS 4019-1:1974, which first was issued in 1966 and subsequently revised and converted into SI units by the UK in 1974 in cooperation with Canada and the USA and supported by Australia and South Africa and based on a proposal to ISO for an International Standard. This Part of BS 4019, together with BS 4019-4:1993, supersedes BS 4019-1:1974 which is withdrawn.

In this Part of BS 4019 all dimensions have been converted into SI units from the original inch units and the purpose of this Part is to provide, on an international basis, the dimensional interchangeability in essential rotary core drilling fittings. These fittings are designed specifically for drilling with water as the circulating medium and are not necessarily suitable for use with air or mud as the circulating media. It is proposed to produce other Parts of this standard to cover equipment for use with air flush and wire-line, but it is not intended to publish British Standards on System B or System C.

BS 4019 comprises the following Parts:

— *Part 3: Specification for system A — Metric units;*

— *Part 4: Specification for system A — Inch units.*

NOTE The title of the ISO standard is *Rotary core diamond drilling equipment*. However, the use of other cutting materials is permitted (see note to clause **1**).

Cross-references

International Standard	Corresponding British Standard
ISO 263:1973	BS 1580 *Specification for unified screw threads* Parts 1 and 2:1962 *Diameters $\frac{1}{4}$ in and larger* (Technically equivalent)

The Technical Committee has reviewed the provisions of ISO 5864 and API 7, to which normative reference is made in the text, and has decided that they are acceptable for use in conjunction with this standard.

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 76, 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

This part of ISO 3551 establishes the nomenclature and lays down the leading dimensions to ensure interchangeability within the limits of System A of the following equipment:

a) drill rods and couplings;

b) casings, casing couplings, casing bits, casing shoes, drive shoes and casing reaming shells;

c) core barrels, core bits, core lifters and reaming shells.

It specifies the characteristics of a range of equipment for drilling holes having diameters from 30 mm to 200 mm and yielding cores having diameters from 18,5 mm to 165 mm.

NOTE The title of this part of ISO 3551 specifies diamond core drilling, but it is also possible to use other cutting materials.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 3551. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 3551 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 263:1973, *ISO inch screw threads — General plan and selection for screws, bolts and nuts — Diameter range 0.06 to 6 in.*

ISO 5864:1978, *ISO inch screw threads — Allowances and tolerances.*

BS 1580:1962, *Specification for Unified screw threads — Parts 1 and 2: Diameters 1/4 in and larger.*

API 7, *Rotary shouldered connection, internal flush type (IF).*

3 Designation

Items manufactured in accordance with this part of ISO 3551 shall be designated by its number followed by the symbols as listed in Table 1.

4 Materials

Materials used in the manufacture of the equipment specified in this part of ISO 3551 shall have the mechanical properties specified in Table 2, though for special purposes other materials may be used by agreement between manufacturer and purchaser.

The method by which the mechanical properties of tubes are obtained is left to the manufacturer.

5 Dimensions and tolerances

5.1 Dimensions

All dimensions and tolerances shall be in accordance with Table 4 to Table 57. All dimensions given in this part of ISO 3551, unless otherwise stated, are in millimetres (see Introduction).

NOTE 1 In System A, maximum and minimum values are included for all dimensions.

NOTE 2 All these items have a right-hand thread. Where a left-hand thread is necessary, it is stipulated for each individual case in the footnotes to the figure or to the corresponding table.

NOTE 3 Radius (or chamfer) of the thread profile crest and radius in thread root corners are to chosen by the manufacturers (determined by national standards of manufacturers' countries).

5.2 Conformity

In those industries where drilling depths are measured in metres, the rod and casing lengths shall be 3 m, 1,5 m or 0,75 m; but when drilling in conformity with American Diamond Core Drill Manufacturers Association (DCDMA) and Canadian Diamond Drilling Association (CDDA) standards, the lengths of rods and casings may be 120 in, 60 in or 30 in.

5.3 Eccentricity

The eccentricity is defined as the distance between the centres of the outside and inside diameters and shall not exceed 10 % of the nominal wall thickness Q. The eccentricity is calculated according to the formula

$$\frac{Q_{max} - Q_{min}}{2\ Q_{nom}} \times 100$$

where Q_{max} and Q_{min} are values of the wall thickness measured in the same section.

5.4 Straightness

When measured over the whole length of the tube by rolling against a straightedge, the maximum deviation shall not be greater than 1 in 1 200.

Table 1 — Identification symbols

Drill rods (see Table 4, Table 6, Table 7 and Table 8)	RW	EW	AW	BW	NW	HW	—	—	—	—
Casing — flush coupled (see Table 4, Table 9 and Table 15 to Table 19)	RX	EX	AX	BX	NX	HX	PX	SX	UX	ZX
Casing — flush jointed (see Table 4 and Table 9 to Table 14)	RW	EW	AW	BW	NW	HW	PW	SW	UW	ZW
"WF" design, face discharge core barrel (see Figure 6)	—	—	—	—	—	HWF	PWF	SWF	UWF	ZWF
"WG" design, internal discharge core barrel (see Figure 7 and Figure 8)	—	EWG	AWG	BWG	NWG	HWG	—	—	—	—
"WM" design, internal discharge core barrel[a] (see Figure 9)	—	EWM	AWM	BWM	NWM	—	—	—	—	—
"WT" design, thin wall, internal discharge core barrel (see Figure 10, Figure 11 and Figure 12)	RWT	EWT	AWT	BWT	NWT	HWT	—	—	—	—

[a] These may be used with face discharge bits.

Table 2 — Mechanical properties

Component	**Tensile strength,** R_m, min. N/mm^2 (MPa)	**Yield stress,** R_e, min. N/mm^2 (MPa)	**Percentage elongation after fracture** A, min. %
Parallel wall rods	620	525	12
Upset or forged ends of rods	500	310	18
Casing and casing coupling sizes R to H	620	525	12
Casing and casing coupling sizes P to Z	500	310	18
Drill-rod couplings and adaptors	700	495	15
All other components	Not specified		

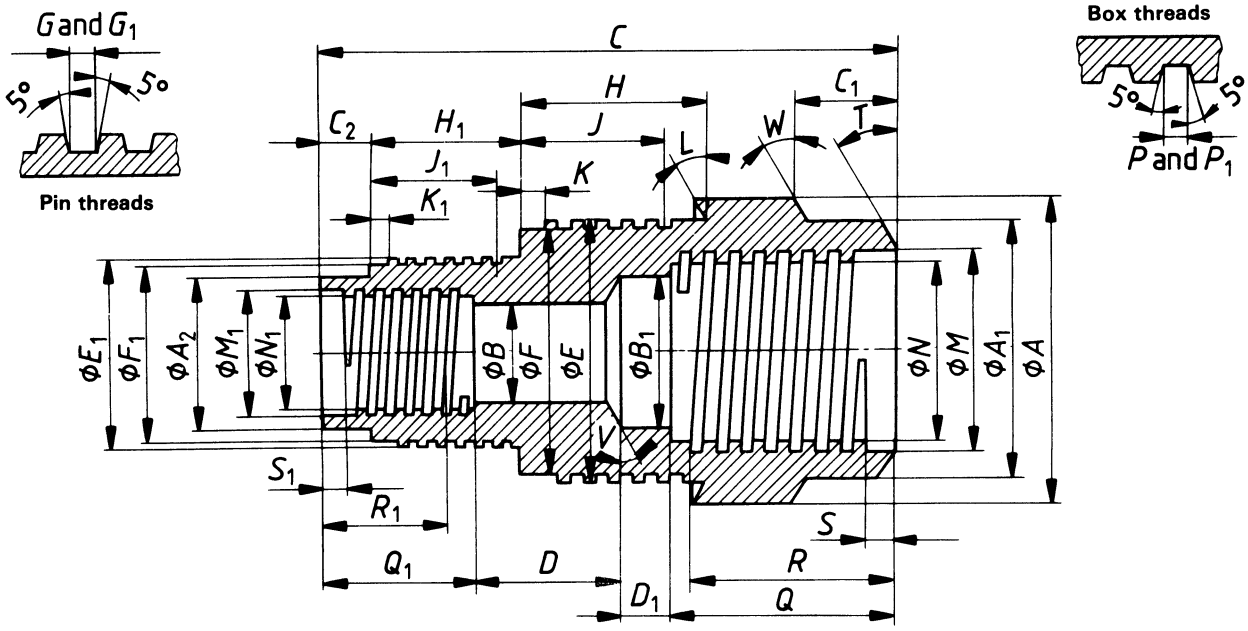


Figure 1 — System of dimensional identification letters

Table 3 — System of dimensional identification letters

A, A_1, etc.	Outside diameters — A being largest; A_1, A_2 etc. progressively smaller
B, B_1, etc.	Inside diameters — B being smallest; B_1, B_2, etc. progressively larger
C, C_1, etc.	External lengths — C being longest; C_1, C_2, etc. progressively shorter
D, D_1, etc.	Internal lengths — D being longest; D_1, D_2, etc. progressively shorter
E, E_1, etc.	Major diameter of pin threads — E being largest; E_1, E_2, etc. smaller
F, F_1, etc.	Minor diameter of pin threads F being largest; F_1, F_2, etc. smaller
Thread pitch (Threads per inch)	Pin threads
G, G_1, etc.	Width at root of pin thread
H, H_1, etc.	Length of outside diameter machined for external threading
J, J_1, etc.	Minimum thread length for pin threads
K, K_1, etc.	Length of relief at the starting-point of pin threads
L, L_1, etc.	Angle of bevel for pin thread shoulder
M, M_1, etc.	Major diameter of box threads — M being largest; M_1, M_2, etc. smaller
N, N_1, etc.	Minor diameter of box threads — N being largest; N_1, N_2, etc. smaller
Thread pitch (Threads per inch)	Box threads
P, P_1, etc.	Width at root of box threads
Q, Q_1, etc.	Length of inside diameter machined for internal threading
R, R_1, etc.	Minimum thread length for box threads
S, S_1, etc.	Length of counterbore at the starting-point of box threads
T, T_1, etc.	Angle of bevel for box thread shoulder
U, U_1, etc.	Included angles — internal and external
V, V_1, etc.	Internal angles — not pertaining to threaded connections
W, W_1, etc.	External angles — not pertaining to threaded connections
X	Diamond set dimensions — external diameter
Y	Diamond set dimensions — internal diameter

NOTE The following common abbreviations are sometimes used in tables in the English version for the sake of simplicity:
O.D. = outside diameter
I.D. = inside diameter.

Table 4 — Nomenclature and basic dimensions for drill rods and casings and their related diamond set items

Drill rod	Rod tube	Rod coupling	Casing flush coupling	Casing tube	Casing coupling	Casing flush jointed	Casing		Casing reaming shell	Casing bit		Casing shoe	
	O.D.	I.D.		O.D.	I.D.		O.D.	I.D.	Set O.D.	Set O.D.	Set I.D.	Set O.D.	Set I.D.
RW	27,89 27,76	10,57 10,19	**RX**	36,63 36,50	30,48 30,23	**RW**	36,63 36,50	30,48 30,23	not required	37,85 37,59	25,53 25,27	37,85 37,59	30,18 30,05
EW	35,05 34,93	11,35 10,97	**EX**	46,28 46,02	38,35 38,10	**EW**	46,28 46,02	38,35 38,10	48,13 47,88	47,75 47,50	35,81 35,56	47,75 47,50	38,02 37,90
AW	43,89 43,64	16,13 15,75	**AX**	57,40 57,15	48,67 48,41	**AW**	57,40 57,15	48,67 48,41	60,07 59,82	59,69 59,44	45,34 45,09	59,69 59,44	48,31 48,18
BW	54,23 53,98	19,30 18,92	**BX**	73,28 73,03	60,58 60,33	**BW**	73,28 73,03	60,58 60,33	75,82 75,56	75,44 75,18	56,39 56,13	75,44 75,18	60,25 60,12
NW	66,93 66,68	35,18 34,80	**NX**	89,28 88,90	76,58 76,20	**NW**	89,28 88,90	76,58 76,20	92,33 92,08	91,95 91,69	72,26 72,01	91,95 91,69	76,12 75,87
HW	89,28 88,90	60,71 60,32	**HX**	114,68 114,30	100,38 100,00	**HW**	114,68 114,30	101,60 101,22	not required	117,65 117,27	96,06 95,81	117,65 117,27	99,82 99,57
			PX	140,74 138,66	127,38 123,57	**PW**	140,74 138,66	127,38 123,57	not required	143,76 143,26	117,86 117,48	143,76 143,26	123,44 123,06
			SX	169,55 167,00	152,45 147,70	**SW**	169,55 167,00	155,55 151,21	not required	172,72 172,21	143,26 142,88	172,72 172,21	146,94 146,56
			UX	195,12 192,23	179,20 176,20	**UW**	195,12 192,23	180,54 175,79	not required	198,50 197,74	171,83 171,32	198,50 197,74	175,64 175,13
			ZX	220,73 217,42	205,94 201,60	**ZW**	220,73 217,42	208,46 203,00	not required	224,16 223,39	197,23 196,72	224,16 223,39	201,04 200,53

Table 5 — Nomenclature and basic dimensions for core barrels and their related diamond set items

Core barrel designs				Coring bits		Reaming shells	Kerf width mm	Kerf area cm^2	Core area cm^2	Hole area cm^2	Core-to-hole ratio %	Nominal core size	Nominal hole size
WF	**WG**	**WM**	**WT**	Set I.D.	Set O.D.	Set O.D.							
			RWT	18,80 18,54	29,59 29,34	29,97 29,72	5,59	4,25	2,74	6,99	39,1	18,5	30
	EWG	**EWM**		21,59 21,34	37,46 37,21	37,85 37,59	8,13	7,55	3,62	11,17	32,4	21,5	38
			EWT	23,11 22,86	37,46 37,21	37,85 37,59	7,37	7,03	4,15	11,17	37,1	23	38
	AWG	**AWM**		30,23 29,97	47,75 47,50	48,13 47,88	8,94	10,99	7,12	18,1	39,3	30	48
			AWT	32,66 32,41	47,75 47,50	48,13 47,88	7,72	9,79	8,32	18,1	45,9	32,5	48
	BWG	**BWM**		42,16 41,91	59,69 59,44	60,07 59,82	8,94	14,34	13,88	28,22	49,1	42	60
			BWT	44,58 44,32	59,69 59,44	60,07 59,82	7,75	12,7	15,52	28,22	55	44,5	60
	NWG	**NWM**		54,86 54,61	75,44 75,18	75,82 75,56	10,46	21,46	23,53	44,99	52,2	54,5	76
			NWT	58,88 58,62	75,44 75,18	75,82 75,56	8,46	17,88	27,11	44,99	60	58,5	76
HWF	**HWG**			76,33 76,07	98,98 98,60	99,36 99,11	11,51	31,74	45,61	77,34	59	76	99
			HWT	81,08 80,82	98,98 98,60	99,36 99,11	9,14	25,88	51,46	77,34	66,5	81	99
PWF				92,33 91,95	120,27 119,76	120,78 120,40	14,22	47,53	66,68	114,21	58,4	92	121
SWF				112,95 112,57	145,67 145,16	146,18 145,80	16,61	67,52	99,86	167,39	59,7	112,5	146
UWF				140,08 139,57	174,12 173,36	174,75 174,24	17,32	85,59	153,56	239,15	64,2	140	175
ZWF				165,48 164,97	199,52 198,76	200,15 199,64	17,32	99,43	214,41	313,84	68,3	165	200

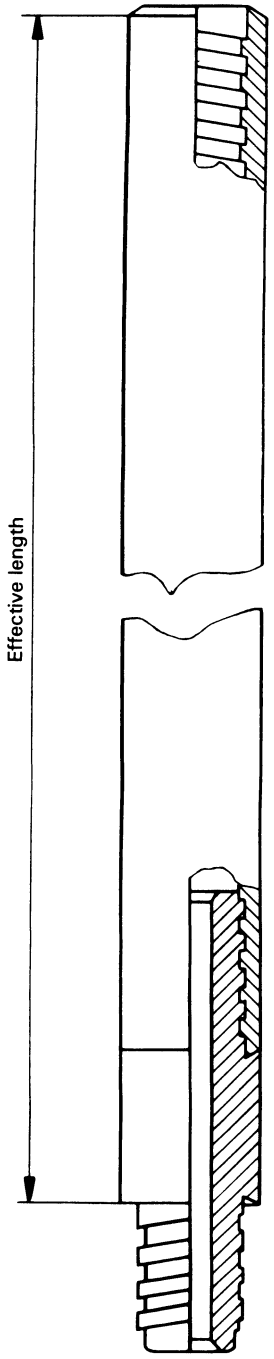
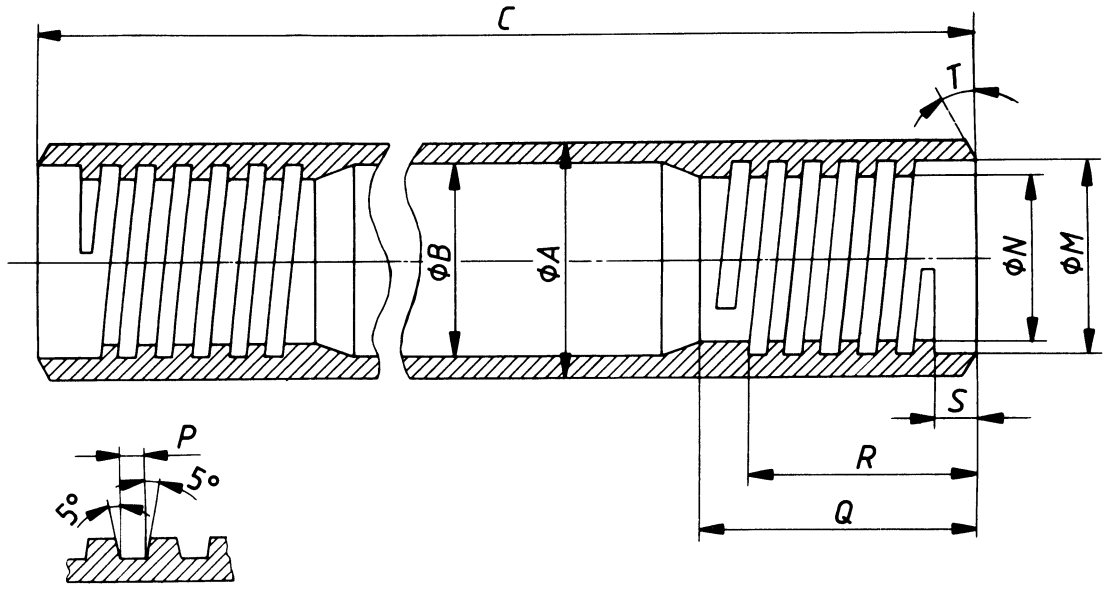


Figure 2 — Drill rod and coupling

Table 6 — Drill rod and coupling — Main dimensions

Identification symbol	Rod O.D.	Coupling I.D.	Effective lengths (see Figure 2)
RW	27,8	10,4	3 000, 1 500 or 750
EW	35	11,2	
AW	43,8	15,9	
BW	54,1	19,1	
NW	66,8	35	
HW	89,1	60,5	

NOTE 1 Thread may be left-hand if required.
NOTE 2 For detailed dimensions, see Table 7 and Table 8.



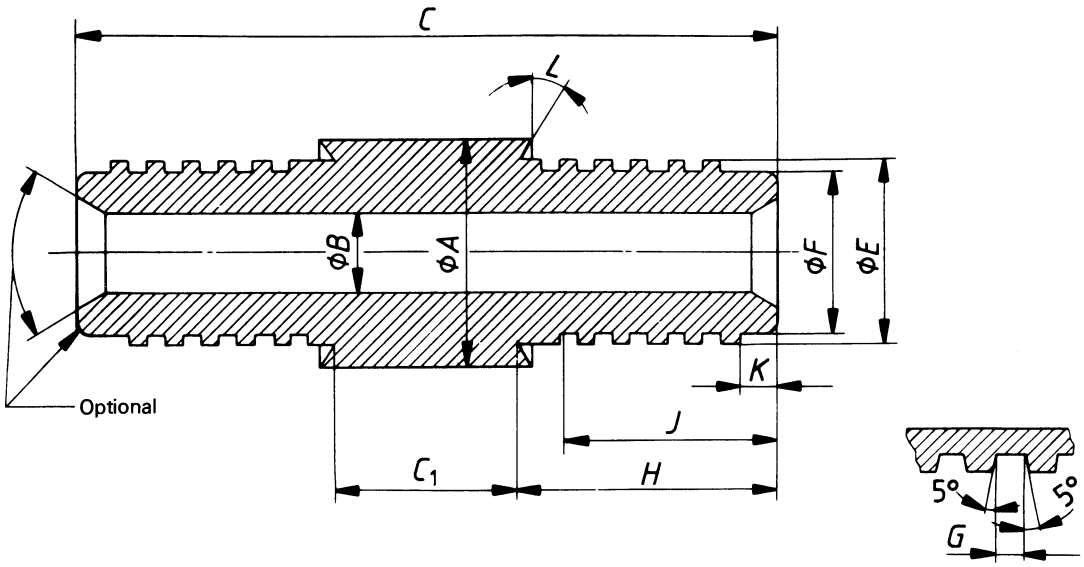
NOTE Dimensions shown apply to both ends. Not complete without coupling — see Figure 2 and Figure 4.

Figure 3 — "W" design drill rod — Drill rod tube (see Table 7)

Table 7 — "W" design drill rod — Drill rod tube

Dimension		RW	EW	AW	BW	NW	HW
A	max. min.	27,89 27,76	35,05 34,93	43,89 43,64	54,23 53,98	66,93 66,68	89,28 88,90
B[a]	max.	18,26	25,4	34,14	44,45	57,15	77,77
C	max. min.	2 972,57 2 971,04	2 967,23 2 965,71	2 968,12 2 966,60	2 956,44 2 954,92	2 955,93 2 954,41	2 943,61 2 942,09
M	max. min.	21,67 21,62	27,13 27,08	35,05 35,00	42,93 42,88	56,49 56,44	77,06 77,01
N	max. min.	18,95 18,90	23,95 23,90	31,88 31,83	38,94 38,89	51,71 51,66	72,24 72,19
Thread pitch (Threads per inch)		6,35 (4)	8,466 (3)	8,466 (3)	8,466 (3)	8,466 (3)	8,466 (3)
P	max. min.	3,18 3,10	4,22 4,11	4,22 4,11	4,22 4,11	4,22 4,11	4,22 4,11
Q	min.	39,67	44,45	53,98	63,5	76,2	90,47
R	min.	36,5	39,67	47,63	57,15	69,85	82,55
S	max. min.	6,6 6,1	8,18 7,67	9,78 9,27	9,78 9,27	9,78 9,27	9,78 9,27
T		30°	30°	30°	30°	30°	30°

[a] The dimension *B* is a maximum and can apply either to upset end rods or parallel wall rods for the RW size only. For all other sizes, this dimension refers to upset end rods only.



NOTE Dimensions shown apply to both ends.

Figure 4 — "W" design drill rod — Drill-rod coupling (see Table 8)

Table 8 — "W" design drill rod — Drill-rod coupling

Dimension		RW	EW	AW	BW	NW	HW
A	max. min.	27,89 27,69	35,05 34,85	43,89 43,54	54,23 53,87	66,93 66,55	89,28 88,77
B	max. min.	10,57 10,19	11,35 10,97	16,13 15,75	19,30 18,92	35,18 34,80	60,71 60,32
C	ref.	95,25	117,48	133,35	165,1	190,5	228,6
C_1	max. min.	28,45 27,94	33,78 33,27	32,89 32,39	44,58 44,07	45,08 44,58	57,4 56,9
E	max. min.	21,56 21,51	26,97 26,92	34,90 34,85	42,77 42,72	56,34 56,29	76,91 76,86
F	max. min.	18,85 18,72	23,80 23,67	31,72 31,60	38,79 38,66	51,56 51,44	72,09 71,96
Thread pitch (Threads per inch)		6,35 (4)	8,466 (3)	8,466 (3)	8,466 (3)	8,466 (3)	8,466 (3)
G	max. min.	3,18 3,10	4,22 4,11	4,22 4,11	4,22 4,11	4,22 4,11	4,22 4,11
H	max. min.	33,78 33,27	42,21 41,71	50,65 50,14	60,63 60,12	73,08 72,57	84,43 83,92
J	min.	28,58	36,5	44,45	53,98	66,68	79,38
K	max. min.	1,83 1,32	5,0 4,5	6,6 6,1	8,18 7,67	9,78 9,27	9,78 9,27
L		30°	30°	30°	30°	30°	30°

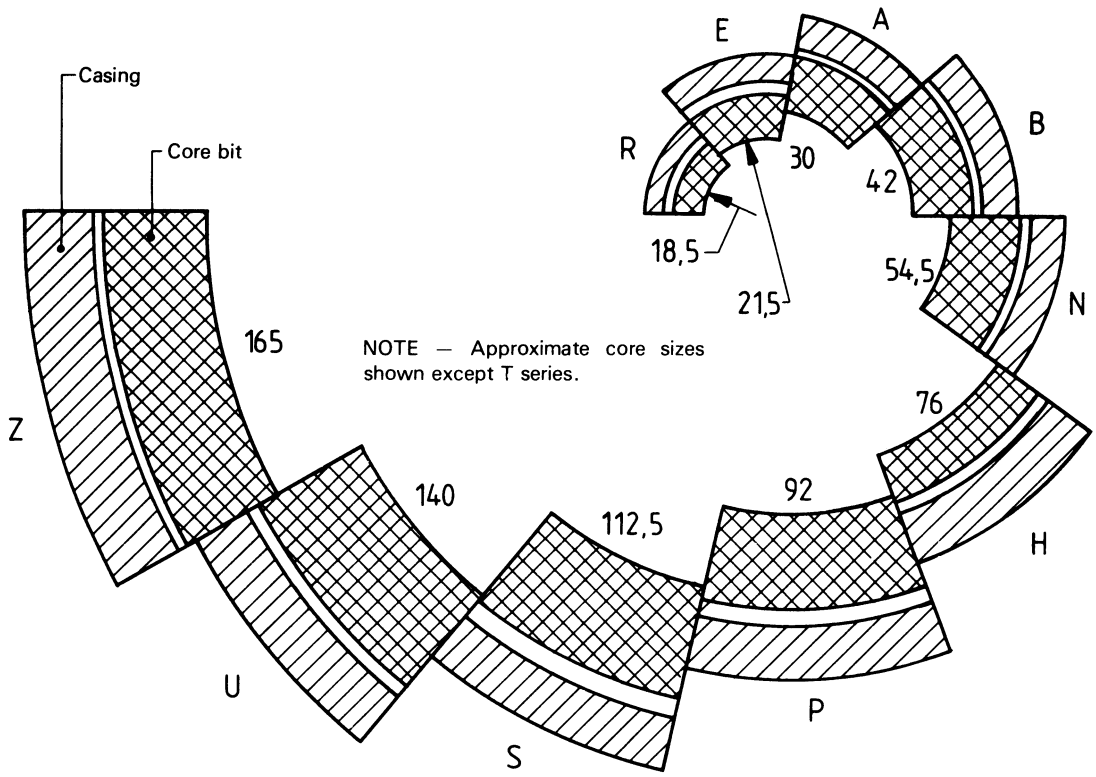
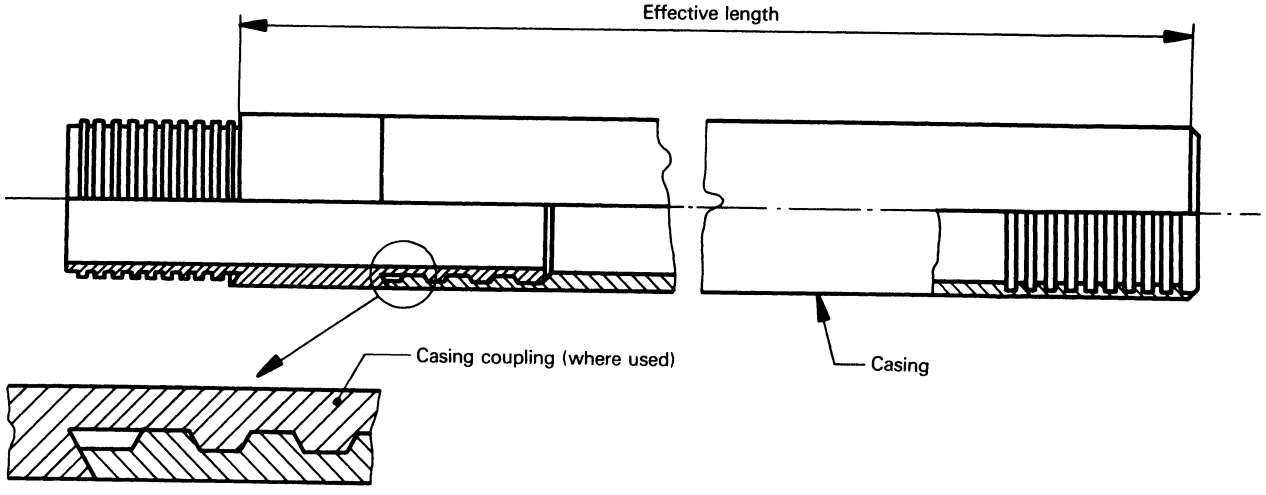


Figure 5 — General relation of casing to core bit



NOTE Threads may be left-hand if required.

Figure 6 — Casing (see Table 9)

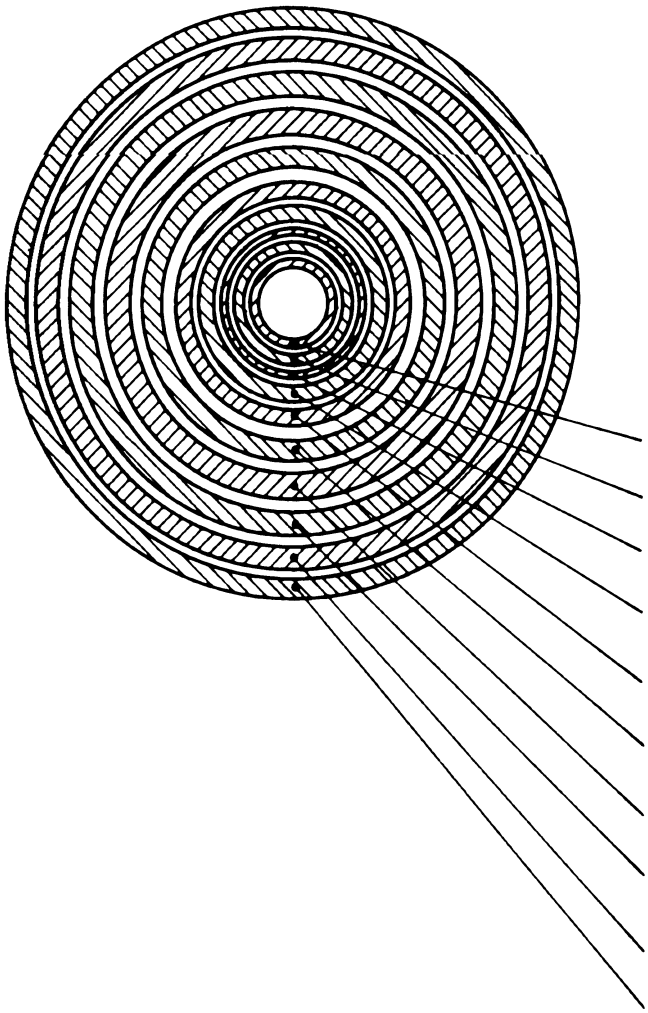


Table 9 — Casing and casing coupling (where used) — Main dimensions

Identification symbol	Outside diameter max.	Inside diameter min.	Effective lenths (see figure 6)
RX RW	36,63	30,23	3 000, 1 500 or 750
EX EW	46,28	38,1	
AX AW	57,4	48,41	
BX BW	73,28	60,33	
NX NW	89,28	76,2	
HX HW	114,68	100	
PX PW	140,74	123,57	
SX SW	169,55	147,7	
UX UW	195,12	176,2	
ZX ZW	220,73	201,6	

Figure 7 — Nesting of casing (see Table 9)

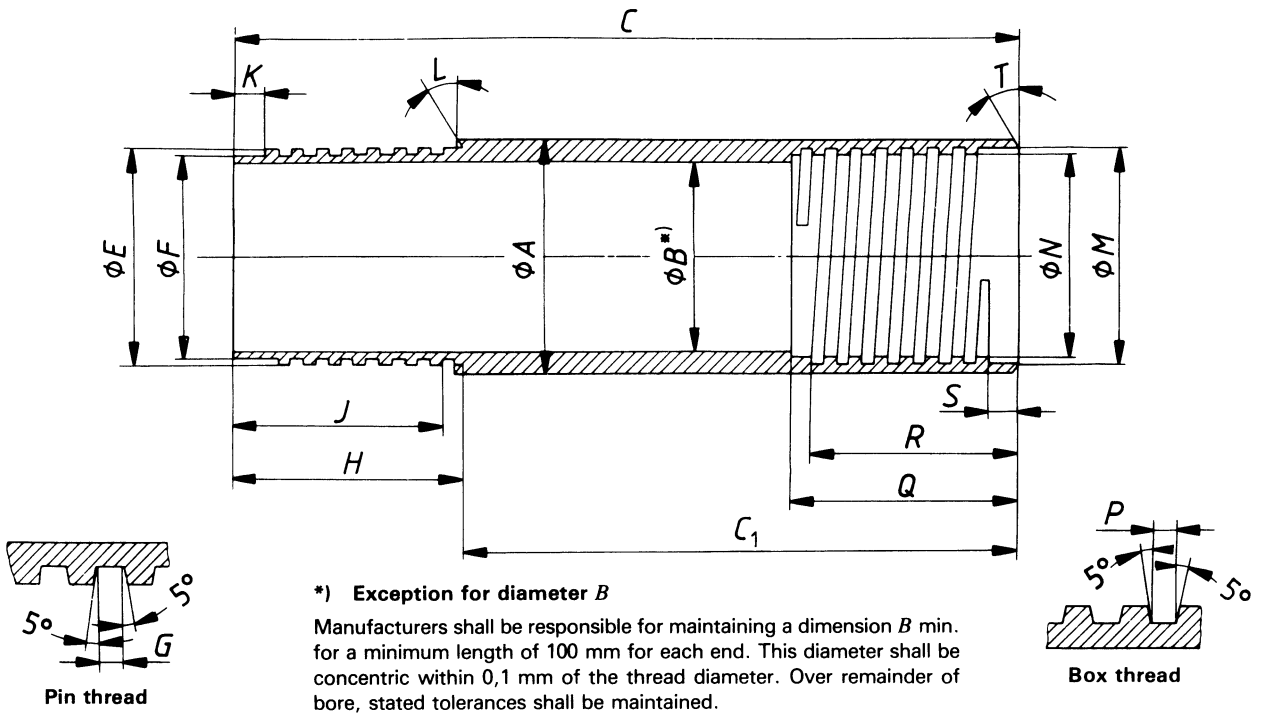


Figure 8 — "W" design flush-jointed casing — Casing (see Table 10)

Table 10 — "W" design flush-jointed casing — Casing

Dimension		RW	EW	AW	BW	NW	HW	PW	SW	UW	ZW
A	max. min.	36,63 36,50	46,28 46,02	57,40 57,15	73,28 73,03	89,28 88,90	114,68 114,30	140,74 138,66	169,55 167,00	195,12 192,23	220,73 217,42
B[a]	max. min.	30,48 30,23	38,35 38,10	48,67 48,41	60,58 60,33	76,58 76,20	101,60 101,22	127,38 123,57	155,55 151,21	180,54 175,79	208,46 203,00
C	max. (ref.) min. (ref.)	3 045,52 3 043,23	3 051,87 3 049,58	3 058,22 3 055,93	3 064,57 3 062,28	3 070,92 3 068,63	3 077,27 3 074,98	3 083,62 3 081,33	3 089,97 3 087,68	3 096,32 3 094,03	3 102,67 3 100,38
C_1	max. min.	3 001,19 2 998,78	3 001,19 2 998,78	3 001,19 2 998,78	3 001,19 2 998,78	3 001,19 2 998,78	3 001,19 2 998,78	3 001,19 2 998,78	3 001,19 2 998,78	3 001,19 2 998,78	3 001,19 2 998,78
E	max. min.	34,19 34,11	43,38 43,31	54,1 54,0	68,00 67,89	84,0 83,9	109,14 109,02	134,59 134,47	162,84 162,71	188,26 188,11	214,81 214,66
F	max. min.	32,61 32,56	41,07 41,02	51,79 51,71	65,68 65,61	81,69 81,61	106,86 106,76	131,55 131,45	159,79 159,69	184,43 184,30	210,97 210,85
Thread pitch (Threads per inch)		5,08 (5)	6,35 (4)	6,35 (4)	6,35 (4)	6,35 (4)	6,35 (4)	8,466 (3)	8,466 (3)	12,7 (2)	12,7 (2)
G	max. min.	2,64 2,54	3,25 3,15	3,25 3,15	3,25 3,15	3,25 3,15	3,25 3,15	4,29 4,19	4,29 4,19	6,4 6,3	6,4 6,3
H	max. min.	44,45 44,32	50,80 50,67	57,15 57,02	63,50 63,37	69,85 69,72	76,20 76,07	82,55 82,42	88,90 88,77	95,25 95,12	101,60 101,47
J	min.	41,28	47,62	53,98	60,33	66,68	73,02	79,38	85,73	92,08	98,43
K	max. min.	6,6 6,1	7,62 7,11	7,62 7,11	7,62 7,11	7,62 7,11	7,62 7,11	9,14 8,64	9,14 8,64	11,18 10,67	11,18 10,67
L		15°	15°	15°	15°	15°	15°	15°	15°	15°	15°
M	max. min.	34,34 34,26	43,54 43,46	54,31 54,20	68,2 68,1	84,2 84,1	109,42 109,30	134,87 134,75	163,12 162,99	188,62 188,47	215,16 215,01
N	max. min.	32,72 32,66	41,17 41,12	51,94 51,87	65,84 65,76	81,84 81,76	107,06 106,96	131,75 131,65	159,99 159,89	184,68 184,56	211,23 211,10
Thread pitch (Threads per inch)		5,08 (5)	6,35 (4)	6,35 (4)	6,35 (4)	6,35 (4)	6,35 (4)	8,466 (3)	8,466 (3)	12,7 (2)	12,7 (2)
P	max. min.	2,64 2,54	3,25 3,15	3,25 3,15	3,25 3,15	3,25 3,15	3,25 3,15	4,29 4,19	4,29 4,19	6,4 6,3	6,4 6,3
Q	max. min.	44,58 44,45	50,93 50,80	57,28 57,15	63,63 63,50	69,98 69,85	76,33 76,20	82,68 82,55	89,03 88,90	95,38 95,25	101,73 101,60
R	min.	41,28	47,63	53,98	60,33	66,68	73,03	79,38	85,73	92,08	98,43
S	max. min.	6,6 6,1	7,62 7,11	7,62 7,11	7,62 7,11	7,62 7,11	7,62 7,11	9,14 8,64	9,14 8,64	11,18 10,67	11,18 10,67
T		15°	15°	15°	15°	15°	15°	15°	15°	15°	15°

[a] See note in Figure 8.

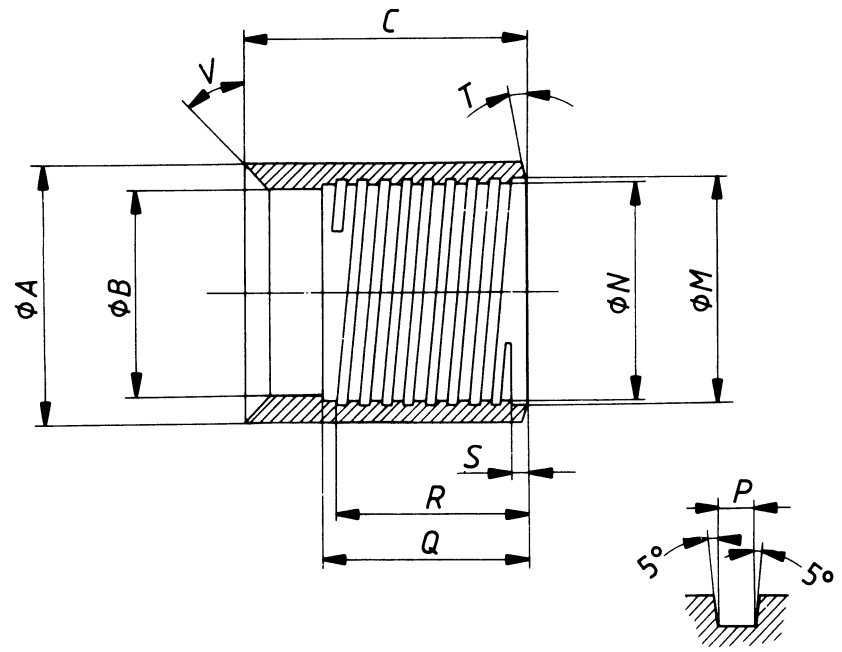


Figure 9 — "W" design flush-jointed casing — Casing drive shoe (see Table 11)

Table 11 — "W" design flush-jointed casing — Casing drive shoe

Dimension		RW	EW	AW	BW	NW	HW	PW	SW	UW	ZW
A	max. min.	37,47 37,21	47,75 47,50	59,56 58,73	75,31 74,63	92,66 91,90	118,06 117,30	144,02 142,49	172,59 171,07	197,99 196,47	223,14 221,36
B	max. min.	30,23 30,10	38,10 37,97	48,38 48,26	60,33 60,20	76,20 75,95	101,22 100,84	123,57 123,06	151,21 150,44	175,79 175,03	203,00 202,23
C	min.	95,25	101,6	107,95	114,3	120,65	165,1	171,45	177,8	184,15	190,5
M	max. min.	34,34 34,26	43,54 43,46	54,31 54,20	68,2 68,1	84,2 84,1	109,42 109,30	134,87 134,75	163,12 162,99	188,62 188,47	215,16 215,01
N	max. min.	32,72 32,66	41,17 41,12	51,94 51,87	65,84 65,76	81,84 81,76	107,06 106,96	131,75 131,65	159,99 159,89	184,68 184,56	211,23 211,10
Thread pitch (Threads per inch)		5,08 (5)	6,35 (4)	6,35 (4)	6,35 (4)	6,35 (4)	6,35 (4)	8,466 (3)	8,466 (3)	12,7 (2)	12,7 (2)
P	max. min.	2,64 2,54	3,25 3,15	3,25 3,15	3,25 3,15	3,25 3,15	3,25 3,15	4,29 4,19	4,29 4,19	6,4 6,3	6,4 6,3
Q	max. min.	44,58 44,45	50,93 50,80	57,28 57,15	63,63 63,50	69,98 69,85	76,33 76,20	82,68 82,55	89,03 88,90	95,38 95,25	101,73 101,60
R	min.	41,28	47,63	53,98	60,33	66,68	73,03	79,38	85,73	92,08	98,43
S	max. min.	6,6 6,1	7,62 7,11	7,62 7,11	7,62 7,11	7,62 7,11	7,62 7,11	9,14 8,64	9,14 8,64	11,18 10,67	11,18 10,67
T		15°	15°	15°	15°	15°	15°	15°	15°	15°	15°
V		Optional									

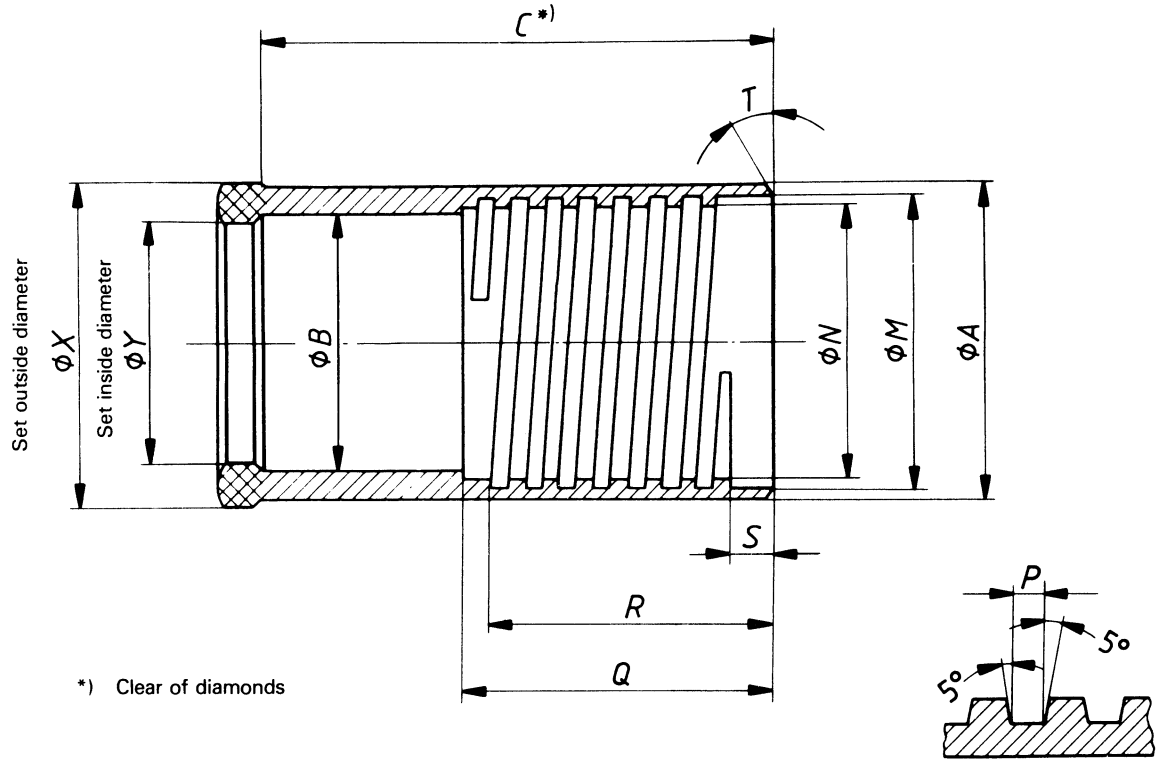


Figure 10 — "W" design flush-jointed casing — Casing shoe (see Table 12)

Table 12 — "W" design flush-jointed casing — Casing shoe

Dimension		RW	EW	AW	BW	NW	HW	PW	SW	UW	ZW
A	max. min.	36,98 36,88	46,53 46,43	58,34 58,24	73,96 73,86	90,47 90,37	115,93 115,82	141,33 141,17	169,90 169,75	195,30 195,07	220,70 220,47
B	max. min.	30,73 30,23	38,61 38,10	48,92 48,41	60,83 60,33	76,96 76,20	100,84 100,08	124,08 123,57	148,26 147,50	177,22 176,20	202,62 201,60
C	min.	82,55	88,9	95,25	107,95	114,3	127	133,35	146,05	152,4	158,75
M	max. min.	34,34 34,26	43,54 43,46	54,31 54,20	68,2 68,1	84,2 84,1	109,42 109,30	134,87 134,75	163,12 162,99	188,62 188,47	215,16 215,01
N	max. min.	32,72 32,66	41,17 41,12	51,94 51,87	65,84 65,76	81,84 81,76	107,06 106,96	131,75 131,65	159,99 159,89	184,68 184,56	211,23 211,10
Thread pitch (Threads per inch)		5,08 (5)	6,35 (4)	6,35 (4)	6,35 (4)	6,35 (4)	6,35 (4)	8,466 (3)	8,466 (3)	12,7 (2)	12,7 (2)
P	max. min.	2,64 2,54	3,25 3,15	3,25 3,15	3,25 3,15	3,25 3,15	3,25 3,15	4,29 4,19	4,29 4,19	6,4 6,3	6,4 6,3
Q	max. min.	44,58 44,45	50,93 50,80	57,28 57,15	63,63 63,50	69,98 69,85	76,33 76,20	82,68 82,55	89,03 88,90	95,38 95,25	101,73 101,60
R	min.	41,28	47,63	53,98	60,33	66,68	73,03	79,38	85,73	92,08	98,43
S	max. min.	6,6 6,1	7,62 7,11	7,62 7,11	7,62 7,11	7,62 7,11	7,62 7,11	9,14 8,64	9,14 8,64	11,18 10,67	11,18 10,67
T		15°	15°	15°	15°	15°	15°	15°	15°	15°	15°
X	max. min.	37,85 37,59	47,75 47,50	59,69 59,44	75,44 75,18	91,95 91,69	117,65 117,27	143,76 143,26	172,72 172,21	198,50 197,74	224,16 223,39
Y	max. min.	30,18 30,05	38,02 37,90	48,31 48,18	60,25 60,12	76,12 75,87	99,82 99,57	123,44 123,06	146,94 146,56	175,64 175,13	201,04 200,53

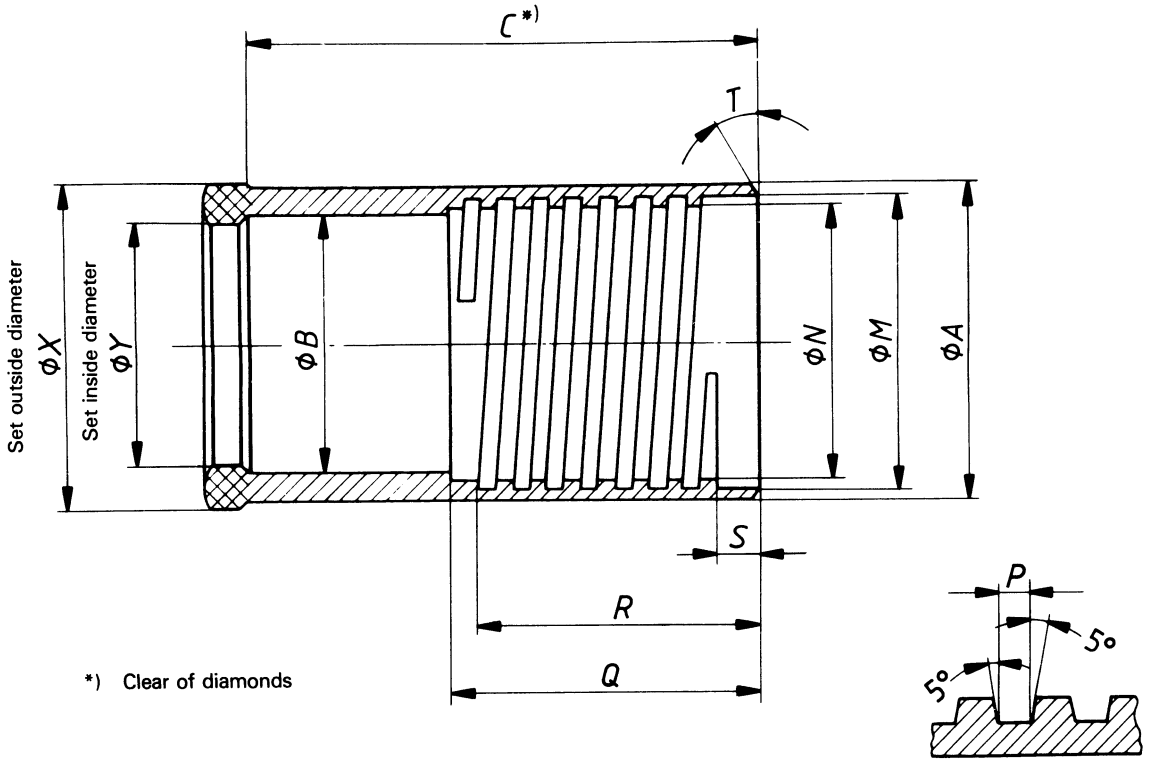


Figure 11 — "W" design flush-jointed casing — Casing bit (see Table 13)

Table 13 — "W" design flush-jointed casing — Casing bit

Dimension		RW	EW	AW	BW	NW	HW	PW	SW	UW	ZW
A	max. min.	36,98 36,88	46,53 46,43	58,34 58,24	73,96 73,86	90,47 90,37	115,93 115,82	141,33 141,17	169,90 169,75	195,30 195,07	220,70 220,47
B	max. min.	26,54 26,04	37,21 36,45	46,74 45,97	57,86 57,10	73,74 72,97	98,35 97,33	120,65 119,38	146,05 144,78	175,13 173,61	200,53 199,01
C	min.	82,55	88,9	95,25	107,95	114,3	127	133,35	146,05	152,4	158,75
M	max. min.	34,34 34,26	43,54 43,46	54,31 54,20	68,2 68,1	84,2 84,1	109,42 109,30	134,87 134,75	163,12 162,99	188,62 188,47	215,16 215,01
N	max. min.	32,72 32,66	41,17 41,12	51,94 51,87	65,84 65,76	81,84 81,76	107,06 106,96	131,75 131,65	159,99 159,89	184,68 184,56	211,23 211,10
Thread pitch (Threads per inch)		5,08 (5)	6,35 (4)	6,35 (4)	6,35 (4)	6,35 (4)	6,35 (4)	8,466 (3)	8,466 (3)	12,7 (2)	12,7 (2)
P	max. min.	2,64 2,54	3,25 3,15	3,25 3,15	3,25 3,15	3,25 3,15	3,25 3,15	4,29 4,19	4,29 4,19	6,4 6,3	6,4 6,3
Q	max. min.	44,58 44,45	50,93 50,80	57,28 57,15	63,63 63,50	69,98 69,85	76,33 76,20	82,68 82,55	89,03 88,90	95,38 95,25	101,73 101,60
R	min.	41,28	47,63	53,98	60,33	66,68	73,03	79,38	85,73	92,08	98,43
S	max. min.	6,6 6,1	7,62 7,11	7,62 7,11	7,62 7,11	7,62 7,11	7,62 7,11	9,14 8,64	9,14 8,64	11,18 10,67	11,18 10,67
T		15°	15°	15°	15°	15°	15°	15°	15°	15°	15°
X	max. min.	37,85 37,59	47,75 47,50	59,69 59,44	75,44 75,18	91,95 91,69	117,65 117,27	143,76 143,26	172,72 172,21	198,50 197,74	224,16 223,39
Y	max. min.	25,53 25,27	35,81 35,56	45,34 45,09	56,39 56,13	72,26 72,01	96,06 95,81	117,86 117,48	143,26 142,88	171,83 171,32	197,23 196,72

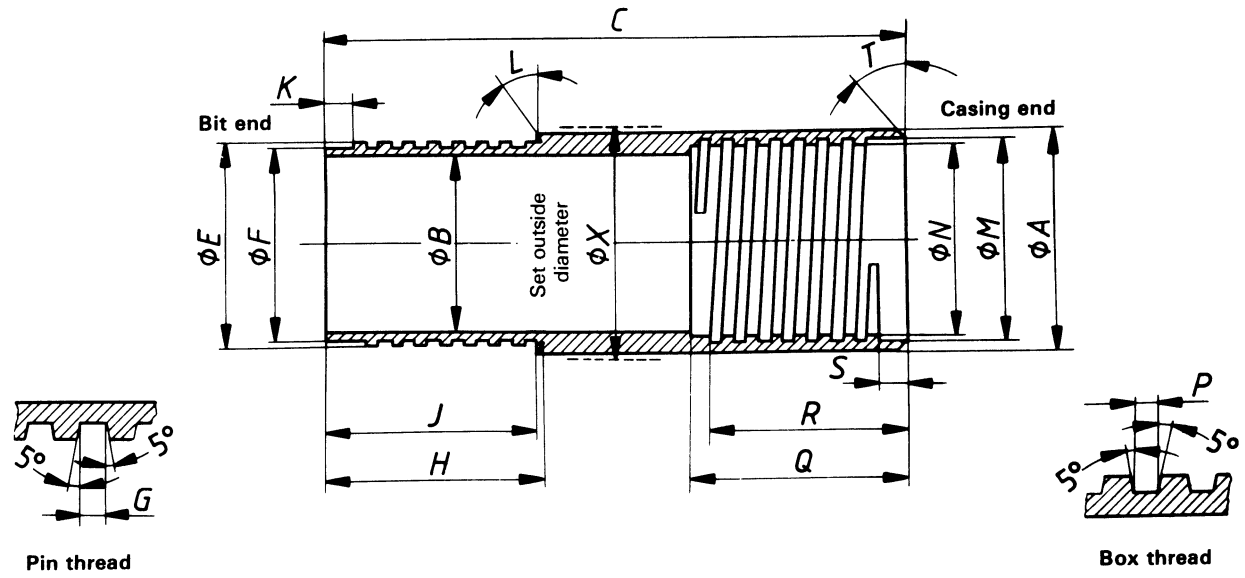
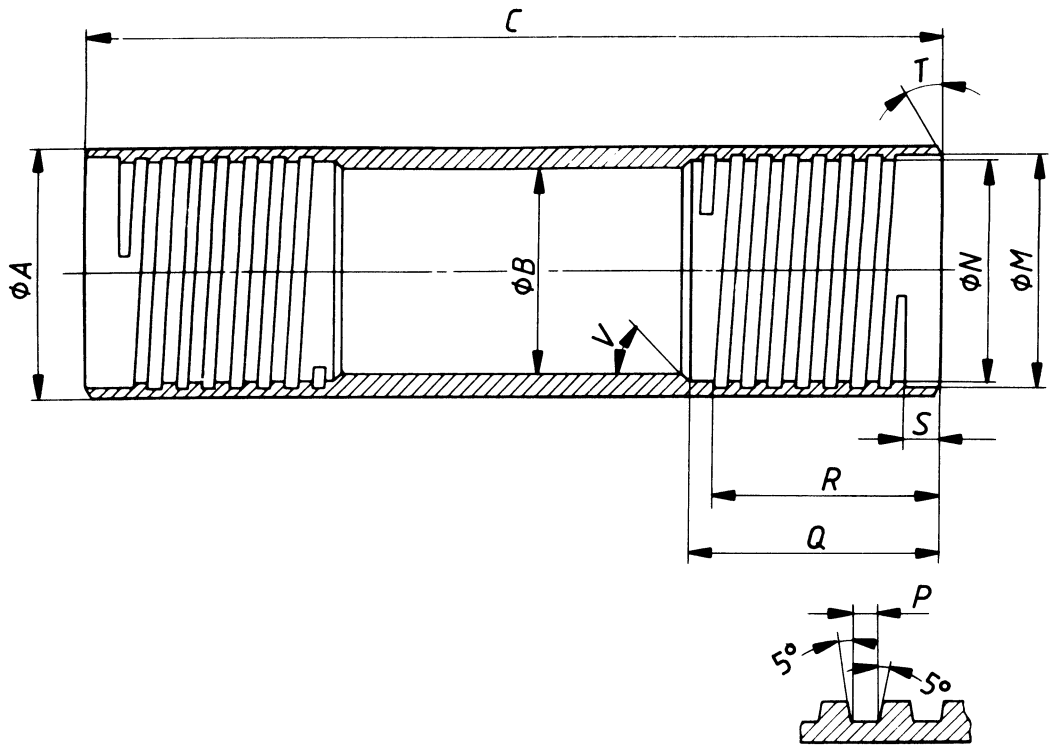


Figure 12 — "W" design flush-jointed casing — Casing reaming shell (see Table 14)

Table 14 — "W" design flush-jointed casing — Casing reaming shell

Dimension		EW	AW	BW	NW
A	max. min.	46,53 46,43	58,34 58,24	73,96 73,86	90,47 90,37
B	max. min.	38,35 38,10	48,67 48,41	60,58 60,33	76,58 76,20
C	min.	139,7	152,4	171,45	184,15
E	max. min.	43,38 43,31	54,1 54,0	68,00 67,89	84,0 83,9
F	max. min.	41,07 41,02	51,79 51,71	65,68 65,61	81,69 81,61
Thread pitch (Threads per inch)		6,35 (4)	6,35 (4)	6,35 (4)	6,35 (4)
G	max. min.	3,25 3,15	3,25 3,15	3,25 3,15	3,25 3,15
H	max. min.	50,80 50,67	57,15 57,02	63,50 63,37	69,85 69,72
J	min.	47,62	53,98	60,32	66,68
K	max. min.	7,62 7,11	7,62 7,11	7,62 7,11	7,62 7,11
L		15°	15°	15°	15°
M	max. min.	43,54 43,46	54,31 54,20	68,2 68,1	84,2 84,1
N	max. min.	41,17 41,12	51,94 51,87	65,84 65,76	81,84 81,76
Thread pitch (Threads per inch)		6,35 (4)	6,35 (4)	6,35 (4)	6,35 (4)
P	max. min.	3,25 3,15	3,25 3,15	3,25 3,15	3,25 3,15
Q	max. min.	50,93 50,80	57,28 57,15	63,63 63,50	69,98 69,85
R	min.	47,63	53,98	60,33	66,68
S	max. min.	7,62 7,11	7,62 7,11	7,62 7,11	7,62 7,11
T		15°	15°	15°	15°
X	max. min.	48,13 47,88	60,07 59,82	75,82 75,56	92,33 92,08



NOTE Dimensions shown apply to both ends.

Figure 13 — "X" design flush-coupled casing — Casing tube (see Table 15)

Table 15 — "X" design flush-coupled casing — Casing tube

Dimension		RX	EX	AX	BX	NX	HX	PX	SX	UX	ZX
A	max. min.	36,63 36,50	46,28 46,02	57,40 57,15	73,28 73,03	89,28 88,90	114,68 114,30	140,74 138,66	169,55 167,00	195,12 192,23	220,73 217,42
B	max. min.	30,48 30,23	41,28 41,02	50,80 50,55	65,07 64,82	80,95 80,57	104,78 104,39	130,51 125,30	158,80 151,21	184,00 175,79	208,99 203,00
C	max. min.	2 946,76 2 945,24	2 964,19 2 962,66	2 926,54 2 925,02	2 914,81 2 913,28	2 914,81 2 913,28	2 902,72 2 901,19	2 900,94 2 899,42	2 888,19 2 886,67	2 875,74 2 874,02	2 862,48 2 860,96
M	max. min.	34,32 34,26	43,71 43,66	54,05 54,00	68,33 68,28	84,20 84,15	108,48 108,38	133,65 133,53	162,03 161,85	187,76 187,58	212,75 212,57
N	max. min.	32,79 32,74	42,14 42,09	52,45 52,40	65,94 65,89	81,81 81,76	106,05 105,97	131,24 131,14	159,56 159,46	184,81 184,68	209,80 209,68
Thread pitch (Threads per inch)		3,175 (8)	3,175 (8)	3,175 (8)	3,175 (8)	3,175 (8)	5,08 (5)	5,08 (5)	5,08 (5)	6,35 (4)	6,35 (4)
P	max. min.	1,63 1,55	1,63 1,55	1,63 1,55	1,60 1,52	1,60 1,52	2,59 2,51	2,57 2,46	2,57 2,46	3,18 3,07	3,18 3,07
Q	min.	25,4	50,8	57,15	60,33	66,68	63,5	69,85	76,2	82,55	88,9
R	min.	23,8	47,63	53,98	57,15	63,50	57,15	66,68	73,03	79,38	85,73
S	max. min.	3,43 2,95	6,6 6,1	6,6 6,1	6,6 6,1	6,6 6,1	8,13 7,62	9,78 9,27	9,78 9,27	9,78 9,27	9,78 9,27
T		0°	30°	30°	30°	30°	30°	15°	15°	15°	15°
V		—	—	does not apply		—	—	30°	30°	30°	30°

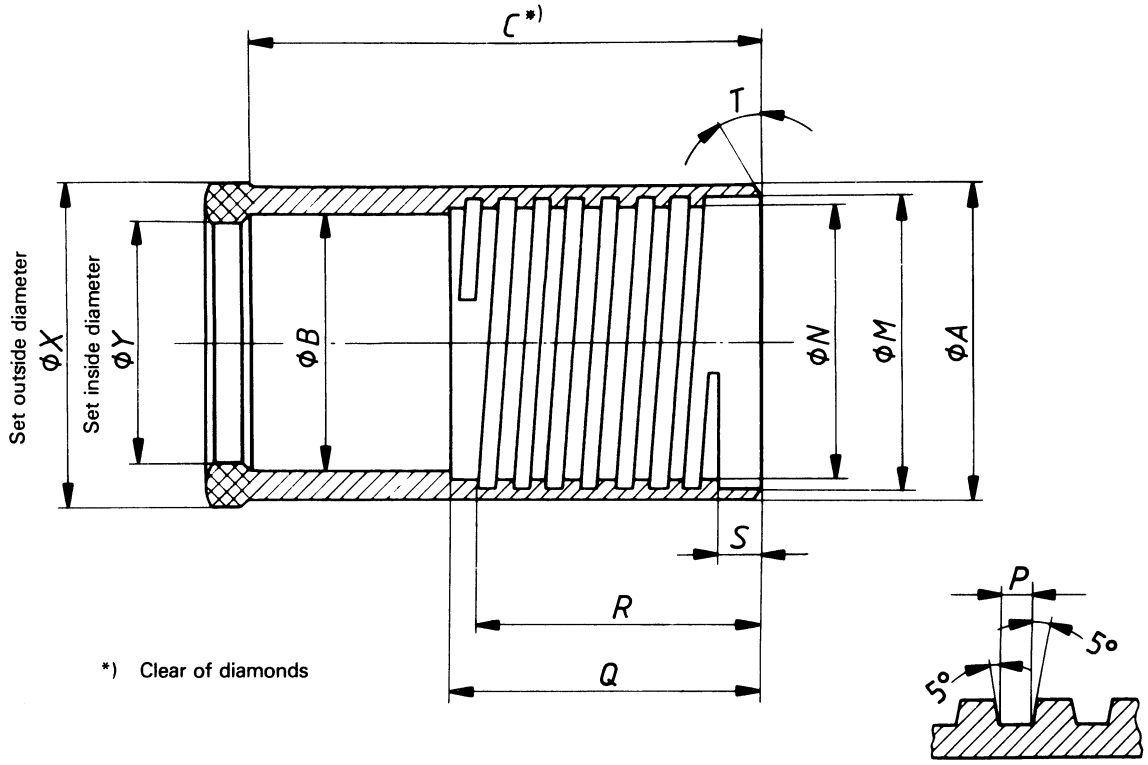


Figure 14 — "X" design flush-coupled casing — Casing shoe (see Table 16)

Table 16 — "X" design flush-coupled casing — Casing shoe

Dimension		RX	EX	AX	BX	NX	HX	PX	SX	UX	ZX
A	max. min.	36,98 36,88	46,53 46,43	58,34 58,24	73,96 73,86	90,47 90,37	115,93 115,82	141,33 141,17	169,90 169,75	195,30 195,07	220,70 220,47
B	max. min.	30,73 30,23	38,61 38,10	48,92 48,41	60,83 60,33	76,96 76,20	100,84 100,08	124,08 123,57	148,26 147,50	177,22 176,20	202,62 201,60
C	min.	63,5	88,9	95,25	104,78	111,13	114,3	133,35	146,05	152,4	158,75
M	max. min.	34,32 34,26	43,71 43,66	54,05 54,00	68,33 68,28	84,20 84,15	108,48 108,38	133,65 133,53	162,03 161,85	187,76 187,58	212,75 212,57
N	max. min.	32,79 32,74	42,14 42,09	52,45 52,40	65,94 65,89	81,81 81,76	106,05 105,97	131,24 131,14	159,56 159,46	184,81 184,68	209,80 209,68
Thread pitch (Threads per inch)		3,175 (8)	3,175 (8)	3,175 (8)	3,175 (8)	3,175 (8)	5,08 (5)	5,08 (5)	5,08 (5)	6,35 (4)	6,35 (4)
P	max. min.	1,63 1,55	1,63 1,55	1,63 1,55	1,60 1,52	1,60 1,52	2,59 2,51	2,57 2,46	2,57 2,46	3,18 3,07	3,18 3,07
Q	min.	25,4	50,8	57,15	60,33	66,68	63,5	69,85	76,2	82,55	88,9
R	min.	23,8	47,63	53,98	57,15	63,5	57,15	66,68	73,03	79,38	85,73
S	max. min.	3,43 2,95	6,6 6,1	6,6 6,1	6,6 6,1	6,6 6,1	8,13 7,62	9,78 9,27	9,78 9,27	9,78 9,27	9,78 9,27
T		0°	30°	30°	30°	30°	30°	15°	15°	15°	15°
X	max. min.	37,85 37,59	47,75 47,50	59,69 59,44	75,44 75,18	91,95 91,69	117,65 117,27	143,76 143,26	172,72 172,21	198,50 197,74	224,16 223,39
Y	max. min.	30,18 30,05	38,02 37,90	48,31 48,18	60,25 60,12	76,12 75,87	99,82 99,57	123,44 123,06	146,94 146,56	175,64 175,13	201,04 200,53

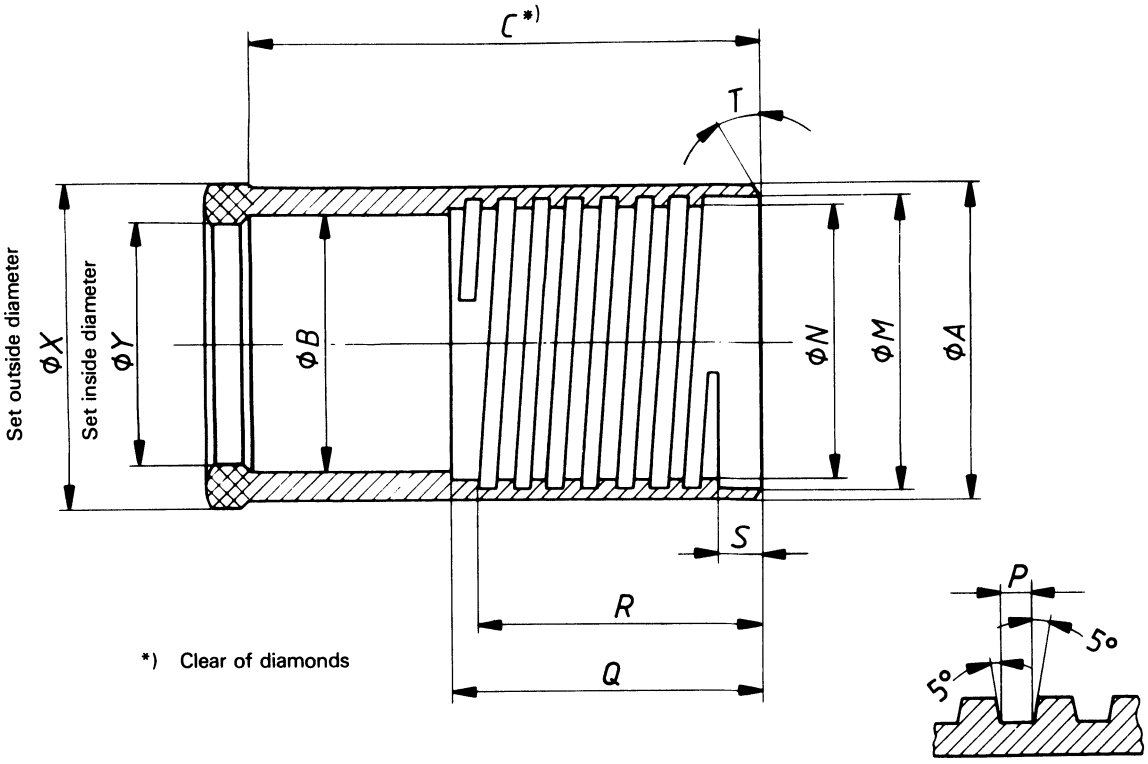


Figure 15 — "X" design flush-coupled casing — Casing bit (see Table 17)

Table 17 — "X" design flush-coupled casing — Casing bit

Dimension		RX	EX	AX	BX	NX	HX	PX	SX	UX	ZX
A	max. min.	36,98 36,88	46,53 46,43	58,34 58,24	73,96 73,86	90,47 90,37	115,93 115,82	141,33 141,17	169,90 169,75	195,30 195,07	220,70 220,47
B	max. min.	26,54 26,04	37,21 36,45	46,74 45,97	57,86 57,10	73,74 72,97	98,35 97,33	120,65 119,38	146,05 144,78	175,13 173,61	200,53 199,01
C	min.	63,5	88,9	95,25	104,78	111,13	114,3	133,35	146,05	152,4	158,75
M	max. min.	34,32 34,26	43,71 43,66	54,05 54,00	68,33 68,28	84,20 84,15	108,48 108,38	133,65 133,53	162,03 161,85	187,76 187,58	212,75 212,57
N	max. min.	32,79 32,74	42,14 42,09	52,45 52,40	65,94 65,89	81,81 81,76	106,05 105,97	131,24 131,14	159,56 159,46	184,81 184,68	209,80 209,68
Thread pitch (Threads per inch)		3,175 (8)	3,175 (8)	3,175 (8)	3,175 (8)	3,175 (8)	5,08 (5)	5,08 (5)	5,08 (5)	6,35 (4)	6,35 (4)
P	max. min.	1,63 1,55	1,63 1,55	1,63 1,55	1,60 1,52	1,60 1,52	2,59 2,51	2,57 2,46	2,57 2,46	3,18 3,07	3,18 3,07
Q	min.	25,4	50,8	57,15	60,33	66,68	63,5	69,85	76,2	82,55	88,9
R	min.	23,8	47,63	53,98	57,15	63,5	57,15	66,68	73,03	79,38	85,73
S	max. min.	3,43 2,95	6,6 6,1	6,6 6,1	6,6 6,1	6,6 6,1	8,13 7,62	9,78 9,27	9,78 9,27	9,78 9,27	9,78 9,27
T		0°	30°	30°	30°	30°	30°	15°	15°	15°	15°
X	max. min.	37,85 37,59	47,75 47,50	59,69 59,44	75,44 75,18	91,95 91,69	117,65 117,27	143,76 143,26	172,72 172,21	198,50 197,74	224,16 223,39
Y	max. min.	25,53 25,27	35,81 35,56	45,34 45,09	56,39 56,13	72,26 72,01	96,06 95,81	117,86 117,48	143,26 142,88	171,83 171,32	197,23 196,72

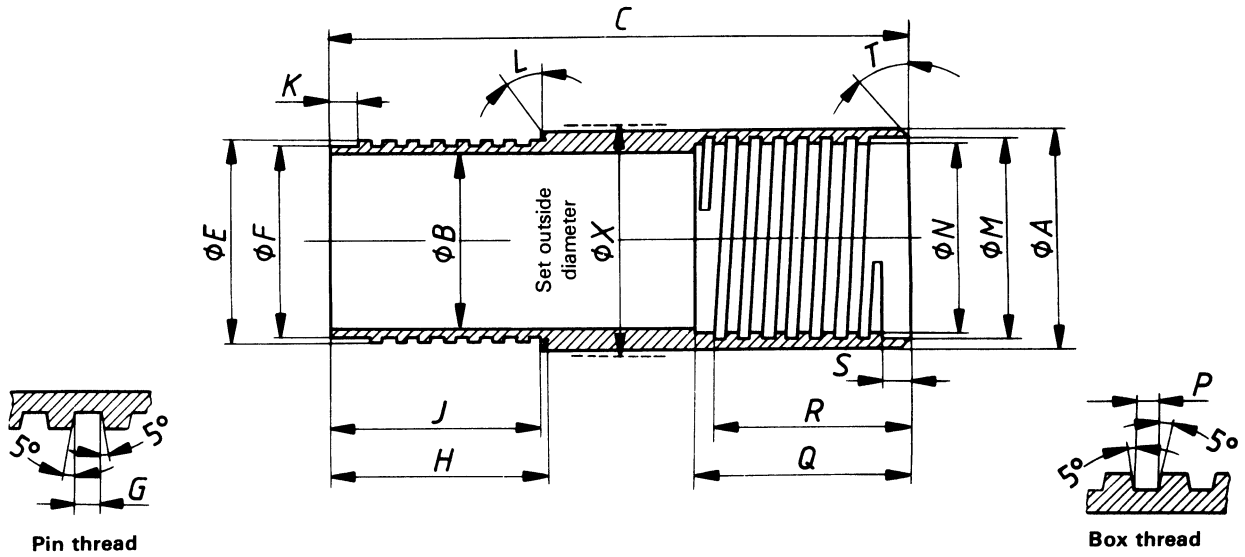
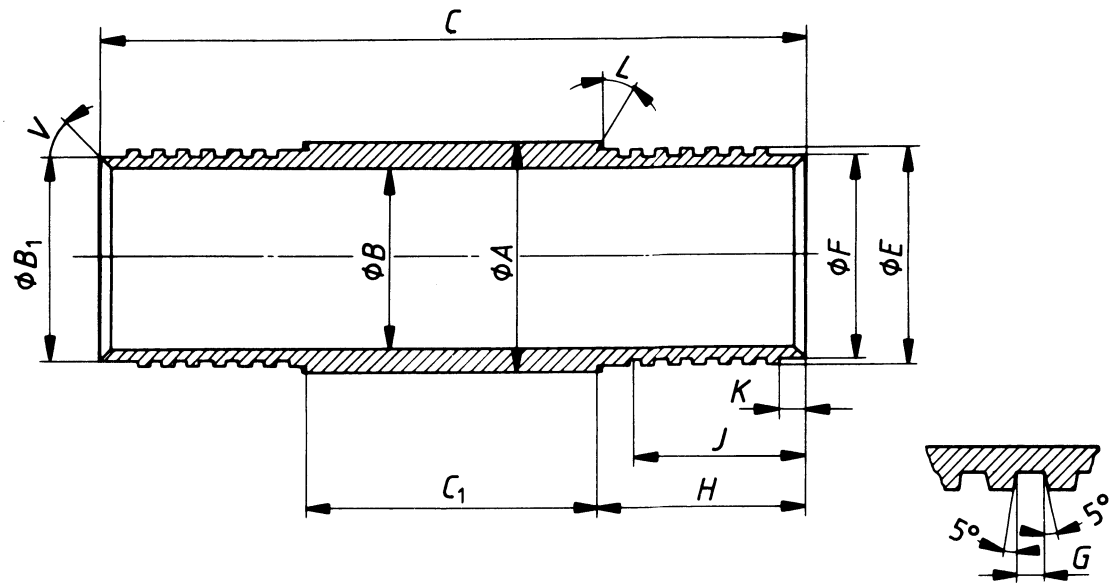


Figure 16 — "X" design flush-coupled casing — Reaming shell (see Table 18)

Table 18 — "X" design flush-coupled casing — Reaming shell

Dimension		EX	AX	BX	NX
A	max. min.	46,53 46,43	58,34 58,24	73,96 73,86	90,47 90,37
B	max. min.	38,35 38,10	48,67 48,41	60,58 60,33	76,58 76,20
C	min.	133,35	146,05	158,75	171,45
E	max. min.	43,61 43,56	53,95 53,90	68,22 68,17	84,10 84,05
F	max. min.	42,04 41,91	52,35 52,22	65,84 65,71	81,71 81,58
Thread pitch (Threads per inch)		3,175 (8)	3,175 (8)	3,175 (8)	3,175 (8)
G	max. min.	1,63 1,55	1,63 1,55	1,60 1,52	1,60 1,52
H	max. min.	45,47 44,96	52,07 51,56	55,75 55,24	61,98 61,47
J	min.	41,28	47,63	50,8	57,15
K	max. min.	5,03 4,52	5,03 4,52	5,03 4,52	5,03 4,52
L		30°	30°	30°	30°
M	max. min.	43,71 43,66	54,05 54,00	68,33 68,28	84,20 84,15
N	max. min.	42,14 42,09	52,45 52,40	65,94 65,89	81,81 81,76
Thread pitch (Threads per inch)		3,175 (8)	3,175 (8)	3,175 (8)	3,175 (8)
P	max. min.	1,63 1,55	1,63 1,55	1,60 1,52	1,60 1,52
Q	max. min.	51,56 50,80	57,91 57,15	61,09 60,33	67,44 66,68
R	min.	47,63	53,98	57,15	63,5
S	max. min.	6,6 6,1	6,6 6,1	6,6 6,1	6,6 6,1
T		30°	30°	30°	30°
X	max. min.	48,13 47,88	60,07 59,82	75,82 75,56	92,33 92,08

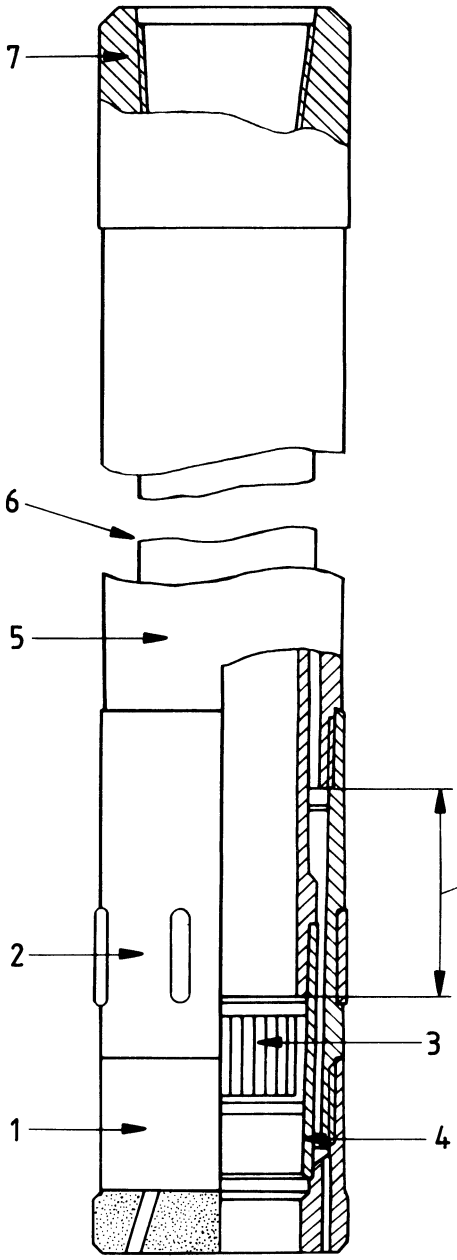


NOTE Dimensions shown apply to both ends.

Figure 17 — "X" design flush-coupled casing — Casing coupling (see Table 19)

Table 19 — "X" design flush-coupled casing — Casing coupling

Dimension		RX	EX	AX	BX	NX	HX	PX	SX	UX	ZX
A	max.	36,63	46,28	57,40	73,28	89,28	114,68	140,74	169,55	195,12	220,73
	min.	36,50	46,02	57,15	73,03	88,90	114,30	138,66	167,00	192,23	217,42
B	max.	30,48	38,35	48,67	60,58	76,58	100,38	127,38	152,45	179,2	205,94
	min.	30,23	38,10	48,41	60,33	76,20	100,00	123,57	147,70	176,2	201,60
B_1	max.	—	40,39	50,67	64,14	80,01	104,27	129,41	157,73	182,88	207,90
	min.	—	39,75	50,04	63,50	79,38	103,63	128,78	157,10	182,25	207,26
C	ref.	101,6	127	177,8	196,85	209,55	215,9	228,6	254	279,4	304,8
C_1	max.	54,25	36,83	74,47	86,21	86,21	98,30	100,08	112,83	125,48	138,53
	min.	53,75	36,32	73,96	85,70	85,70	97,79	99,57	112,32	124,97	138,02
E	max.	34,21	43,61	53,95	68,22	84,10	108,31	133,45	161,75	187,45	212,45
	min.	34,16	43,56	53,90	68,17	84,05	108,23	133,38	161,62	187,33	212,32
F	max.	32,69	42,04	52,35	65,84	81,71	105,89	131,06	159,36	184,56	209,55
	min.	32,56	41,91	52,22	65,71	81,58	105,77	130,96	159,26	184,43	209,42
Thread pitch (Threads per inch)		3,175 (8)	3,175 (8)	3,175 (8)	3,175 (8)	3,175 (8)	5,08 (5)	5,08 (5)	5,08 (5)	6,35 (4)	6,35 (4)
G	max.	1,63	1,63	1,63	1,60	1,60	2,59	2,57	2,57	3,18	3,18
	min.	1,55	1,55	1,55	1,52	1,52	2,51	2,46	2,46	3,07	3,07
H	max.	24,05	45,47	52,07	55,75	61,98	59,18	64,64	70,97	77,32	83,52
	min.	23,55	44,96	51,56	55,25	61,47	58,67	64,14	70,46	76,81	83,01
J	min.	22,22	41,28	47,62	50,8	57,15	53,98	60,33	66,68	73,03	79,38
K	max.	3,43	5,03	5,03	5,03	5,03	5,03	5,03	5,03	5,03	5,03
	min.	2,95	4,52	4,52	4,52	4,52	4,52	4,52	4,52	4,52	4,52
L		0°	30°	30°	30°	30°	30°	15°	15°	15°	15°
V		0°	30°	30°	30°	30°	30°	30°	30°	30°	30°



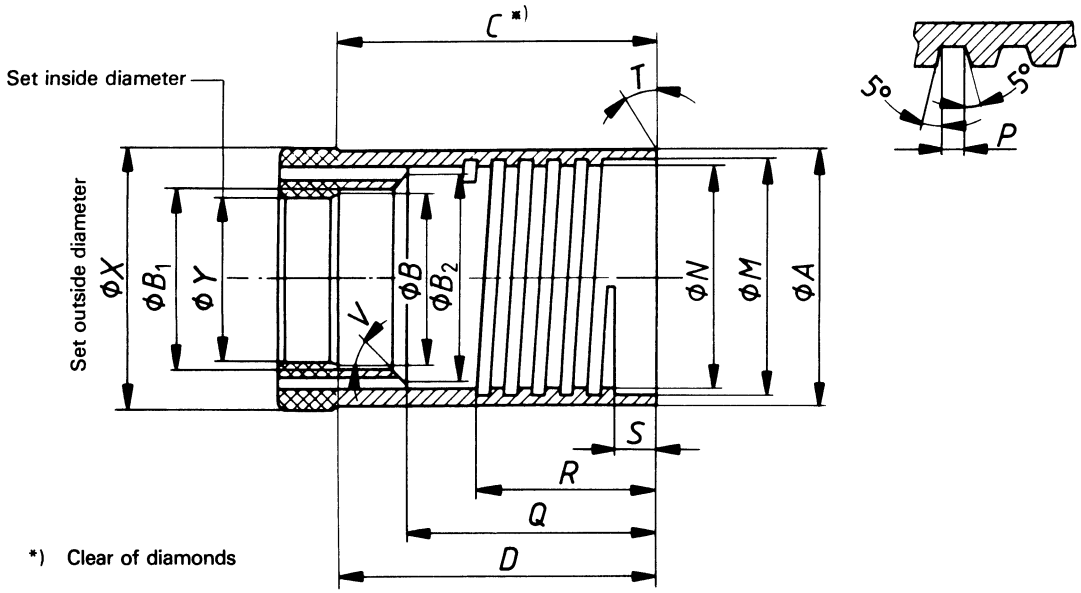
key

Ref. No.	Description
1	Core bit for use with shell, or core bit without shell
2	Reaming shell
3	Core lifter
4	Core-lifter case
5	Outer tube
6	Inner tube
7	Head (thread only)

NOTE Standards "WF" design core barrel lengths are 1,5 m and 3 m (length refer to core capacity).

		HWF	PWF	SWF	UWF	ZWF
Dimensions for checking	max.	61,11	83,31	86,28	86,36	86,36
	min.	59,16	80,98	83,85	83,64	83,64

Figure 18 — "WF" design double-tube core barrel — Swivel type — Assembly for sizes HWF, PWF, SWF, UWF and ZWF

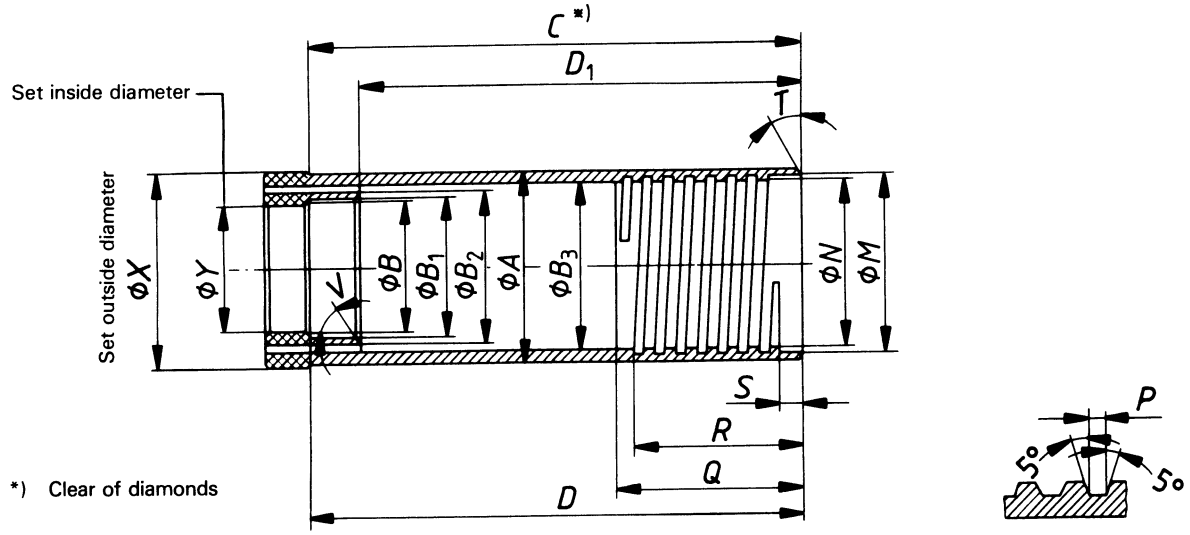


NOTE 1 Number and size of face discharge holes to be subject to agreement between manufacturer and customer.
NOTE 2 Bit design may incorporate provision for the use of a bit breaker.

Figure 19 — "WF" design double-tube core barrel — Short core bit (see Table 20)

Table 20 — "WF" design double-tube core barrel — Short core bit

Dimension		HWF	PWF	SWF	UWF	ZWF
A	max. min.	97,59 97,49	117,50 117,37	142,75 142,62	171,32 171,20	196,72 196,60
B	max. min.	77,93 77,83	94,74 94,62	115,19 115,06	142,24 142,11	167,64 167,51
B_1	max. min.	82,68 82,55	99,82 99,70	120,45 120,32	149,86 149,71	175,26 175,11
B_2	max. min.	85,09 84,58	102,87 102,36	123,95 123,44	154,94 154,43	180,34 179,83
C	min.	44,45	53,98	53,98	53,98	53,98
D	max. min.	45,47 44,70	54,74 53,98	54,74 53,98	54,74 53,98	54,74 53,98
M	max. min.	92,56 92,48	113,46 113,36	137,69 137,59	165,74 165,61	191,14 191,01
N	max. min.	90,96 90,88	111,05 110,97	135,28 135,20	163,32 163,22	188,72 188,62
Thread pitch (Threads per inch)		5,08 (5)	5,08 (5)	5,08 (5)	5,08 (5)	5,08 (5)
P	max. min.	2,59 2,51	2,57 2,46	2,57 2,46	2,57 2,46	2,57 2,46
Q	max. min.	28,70 28,45	41,40 41,15	41,40 41,15	41,40 41,15	41,40 41,15
R	min.	23,8	38,1	38,1	38,1	38,1
S	max. min.	5,0 4,5	5,0 4,5	5,0 4,5	5,0 4,5	5,0 4,5
T		0°	0°	0°	0°	0°
V		30°	30°	30°	30°	30°
X	max. min.	98,98 98,60	120,27 119,76	145,67 145,16	174,12 173,36	199,52 198,76
Y	max. min.	76,33 76,07	92,33 91,95	112,95 112,57	140,08 139,57	165,48 164,97



NOTE 1 Number and size of face discharge holes to be subject to agreement between manufacturer and customer.
NOTE 2 Bit design may incorporate provision for the use of a bit breaker.

Figure 20 — "WF" design double-tube core barrel — Long core bit (see Table 21)

Table 21 — "WF" design double-tube core barrel — Long core bit

Dimension		HWF	PWF	SWF	UWF	ZWF
A	max.	97,59	117,50	142,75	171,32	196,72
	min.	97,49	117,37	142,62	171,20	196,60
B	max.	77,93	94,74	115,19	142,24	167,64
	min.	77,83	94,62	115,06	142,11	167,51
B_1	max.	82,68	99,82	120,45	149,86	175,26
	min.	82,55	99,70	120,32	149,71	175,11
B_2	max.	85,09	102,87	123,95	154,94	180,34
	min.	84,58	102,36	123,44	154,43	179,83
B_3	max.	89,92	108,36	132,84	162,28	187,68
	min.	89,66	108,10	132,59	162,03	187,43
C	min.	174,75	223,01	235,71	248,41	248,41
D	max.	175,39	223,39	236,09	248,79	248,79
	min.	174,62	222,63	235,33	248,03	248,03
D_1	max.	158,88	210,59	223,29	235,99	235,99
	min.	158,75	210,34	223,04	235,74	235,74
M	max.	92,56	111,94	136,19	165,33	190,73
	min.	92,48	111,84	136,09	165,20	190,60
N	max.	90,96	109,52	133,78	162,92	188,32
	min.	90,88	109,45	133,71	162,81	188,21
Thread pitch (Threads per inch)		5,08 (5)	5,08 (5)	5,08 (5)	5,08 (5)	5,08 (5)
P	max.	2,59	2,57	2,57	2,57	2,57
	min.	2,51	2,46	2,46	2,46	2,46
Q	max.	32,23	57,40	57,40	63,75	63,75
	min.	32,11	57,15	57,15	63,50	63,50
R	min.	27,76	50,8	50,8	57,15	57,15
S	max.	5,0	5,0	5,0	5,0	5,0
	min.	4,5	4,5	4,5	4,5	4,5
T		15°	15°	15°	15°	15°
V		30°	30°	30°	30°	30°
X	max.	99,36	120,78	146,18	174,75	200,15
	min.	98,98	120,40	145,80	174,24	199,64
Y	max.	76,33	92,33	112,95	140,08	165,48
	min.	76,07	91,95	112,57	139,57	164,97

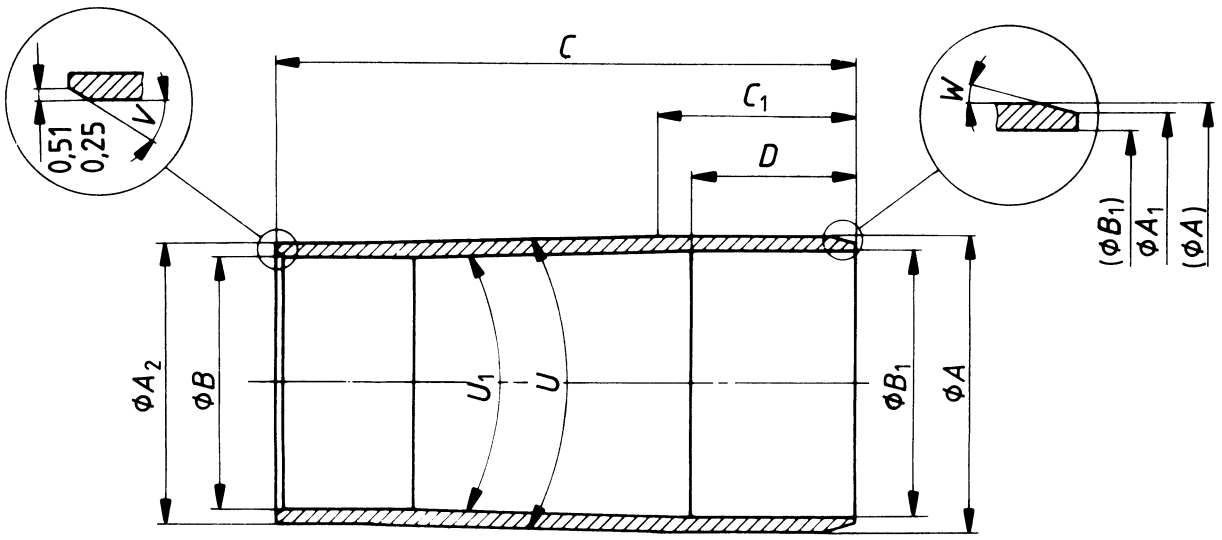
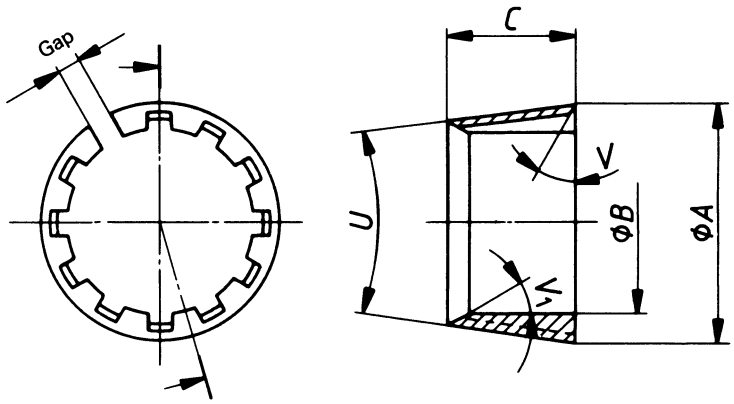


Figure 21 — "WF" design double-tube core barrel — Core-lifter case (see Table 22)

Table 22 — "WF" design double-tube core barrel — Core-lifter case

Dimension		HWF	PWF	SWF	UWF	ZWF
A	max.	87,76	105,64	129,72	157,51	182,91
	min.	87,66	105,54	129,62	157,38	182,78
A_1	max.	—	104,14	126,36	154,94	180,34
	min.	—	103,89	126,11	154,69	180,09
A_2	max.	82,22	99,44	120,07	149,45	174,85
	min.	82,12	99,31	119,94	149,33	174,73
B	max.	77,93	94,82	115,27	142,34	167,74
	min.	77,83	94,69	115,14	142,19	167,59
B_1	max.	85,47	100,48	122,66	151,05	176,45
	min.	85,42	100,38	122,56	150,93	176,33
C	max.	106,35	119,05	131,75	138,10	138,10
	min.	106,17	118,87	131,57	137,92	137,92
C_1	max.	44,7	35,18	38,35	38,35	38,35
	min.	44,2	34,67	37,85	37,85	37,85
D	max.	28,83	35,18	38,35	38,35	38,35
	min.	28,32	34,67	37,85	37,85	37,85
U	max.	7° 15′	7° 15′	7° 15′	7° 15′	7° 15′
	min.	6° 45′	6° 45′	6° 45′	6° 45′	6° 45′
U_1	max.	7° 15′	7° 15′	7° 15′	7° 15′	7° 15′
	min.	6° 45′	6° 45′	6° 45′	6° 45′	6° 45′
V		30°	30°	30°	30°	30°
W		—	15°	15°	15°	15°



NOTE Width of gap, entry angle and number of flutes are left to the manufacturer.

Figure 22 — "WF" design double-tube core barrel — Core lifter (see Table 23)

Table 23 — "WF" design double-tube core barrel — Core lifter

Dimension		HWF	PWF	SWF	UWF	ZWF
A	max. min.	83,97 83,87	99,31 99,16	120,90 120,75	149,3 149,1	174,7 174,5
B	max. min.	75,69 75,56	91,64 91,52	112,27 112,14	139,27 139,14	164,67 164,54
C	max. min.	41,66 40,89	41,66 40,89	48,01 47,24	54,36 53,59	54,36 53,59
U	max. min.	7° 15′ 6° 45′	7° 15′ 6° 45′	7° 15′ 6° 45′	7° 15′ 6° 45′	7° 15′ 6° 45′
V		0°	0°	0°	0°	0°
V_1		Optional				

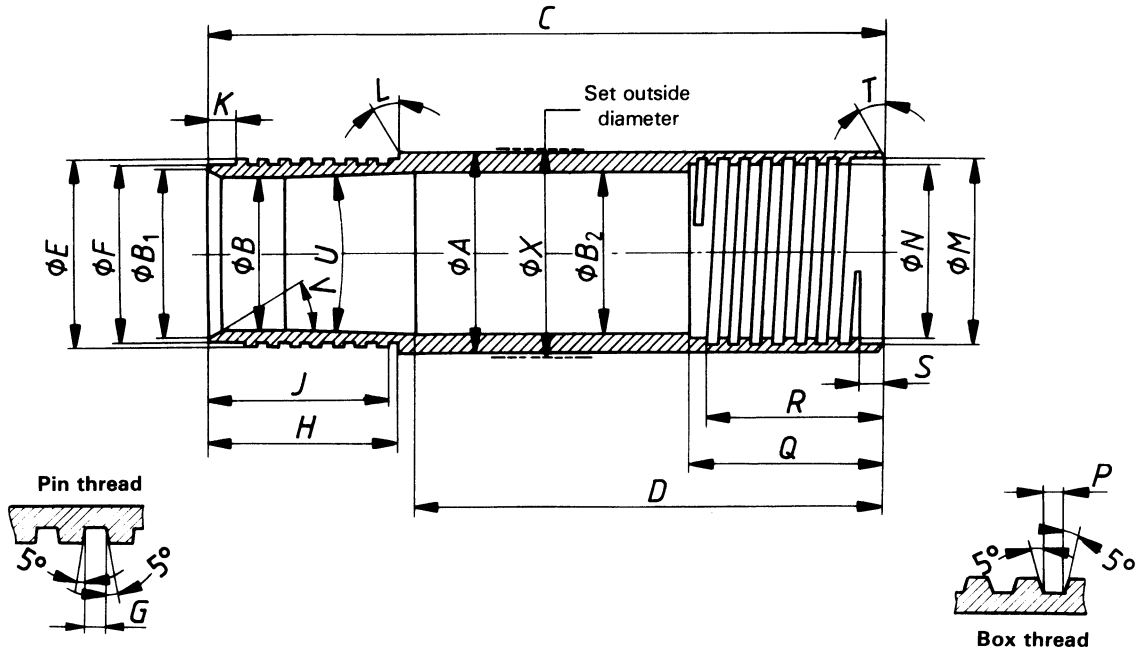


Figure 23 — "WF" design double-tube core barrel — Reaming shell (see Table 24)

Table 24 — "WF" design double-tube core barrel — Reaming shell

Dimension		HWF	PWF	SWF	UWF	ZWF
A	max. min.	97,59 97,49	117,50 117,37	142,75 142,62	171,32 171,20	196,72 196,60
B	max. min.	86,64 86,51	104,90 104,78	127,13 127,00	155,70 155,58	181,10 180,98
B_1	max. min.	89,28 88,52	109,09 108,33	133,73 132,97	161,42 160,66	186,82 186,06
B_2	max. min.	89,92 89,66	108,36 108,10	132,84 132,59	162,28 162,03	187,68 187,43
C	max. min.	157,15 156,97	207,01 206,88	219,71 219,58	232,41 232,28	232,41 232,28
D	max. min.	112,83 112,70	143,00 142,75	143,89 143,64	146,94 146,68	146,94 146,68
E	max. min.	92,41 92,33	113,28 113,21	137,52 137,44	165,51 165,40	190,91 190,80
F	max. min.	90,8 90,7	110,90 110,79	135,13 135,03	163,12 162,99	188,52 188,39
Thread pitch (Threads per inch)		5,08 (5)	5,08 (5)	5,08 (5)	5,08 (5)	5,08 (5)
G	max. min.	2,59 2,51	2,57 2,46	2,57 2,46	2,57 2,46	2,57 2,46
H	max. min.	26,97 26,85	38,23 38,10	38,23 38,10	38,23 38,10	38,23 38,10
J	min.	23,8	34,92	34,92	34,92	34,92
K	max. min.	3,43 2,92	5,0 4,5	5,0 4,5	5,0 4,5	5,0 4,5
L		0°	0°	0°	0°	0°
M	max. min.	92,58 92,48	111,94 111,84	136,19 136,09	165,33 165,20	190,73 190,60
N	max. min.	90,96 90,88	109,52 109,45	133,78 133,71	162,92 162,81	188,32 188,21
Thread pitch (Threads per inch)		5,08 (5)	5,08 (5)	5,08 (5)	5,08 (5)	5,08 (5)
P	max. min.	2,59 2,51	2,57 2,46	2,57 2,46	2,57 2,46	2,57 2,46
Q	max. min.	32,23 32,13	57,40 57,15	57,40 57,15	63,75 63,50	63,75 63,50
R	min.	27,76	50,8	50,8	57,15	57,15
S	max. min.	5,0 4,5	5,0 4,5	5,0 4,5	5,0 4,5	5,0 4,5
T		15°	15°	15°	15°	15°
U	max. min.	7° 15′ 6° 45′	7° 15′ 6° 45′	7° 15′ 6° 45′	7° 15′ 6° 45′	7° 15′ 6° 45′
V		30°	30°	30°	30°	30°
X	max. min.	99,36 99,11	120,78 120,40	146,18 145,80	174,75 174,24	200,15 199,64

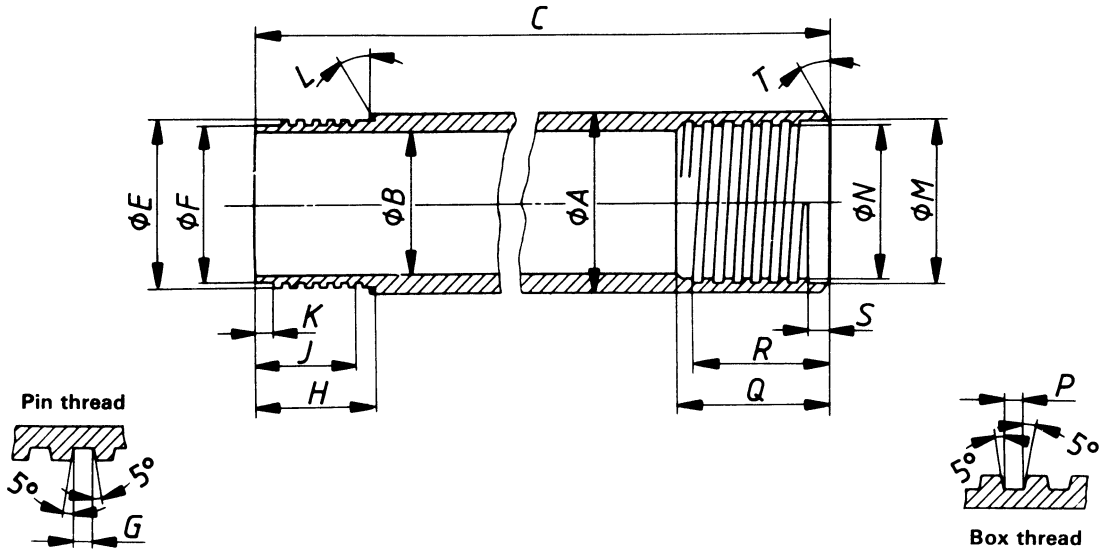


Figure 24 — "WF" design double-tube core barrel — Outer tube (see Table 25)

Table 25 — "WF" design double-tube core barrel — Outer tube

Dimension		HWF	PWF	SWF	UWF	ZWF
A	max. min.	95,63 95,25	114,68 114,30	140,74 138,66	169,54 167,00	195,12 192,23
B	max. min.	85,85 85,34	105,03 104,50	127,36 126,64	155,98 155,17	181,38 180,57
C	max. min.	3 143,48 3 142,69	3 164,66 3 163,87	3 151,96 3 151,17	3 171,82 3 171,04	3 171,82 3 171,04
E	max. min.	92,41 92,33	111,76 111,68	136,02 135,94	165,1 165,0	190,5 190,4
F	max. min.	90,8 90,7	109,37 109,27	133,63 133,53	162,71 162,59	188,11 187,99
Thread pitch (Threads per inch)		5,08 (5)	5,08 (5)	5,08 (5)	5,08 (5)	5,08 (5)
G	max. min.	2,59 2,51	2,57 2,46	2,57 2,46	2,57 2,46	2,57 2,46
H	max. min.	32,16 32,03	51,56 51,18	51,71 51,33	57,99 57,61	57,99 57,61
J	min.	28,58	47,62	47,62	53,98	53,98
K	max. min.	5,0 4,5	5,0 4,5	5,0 4,5	5,0 4,5	5,0 4,5
L		15°	15°	15°	15°	15°
M	max. min.	89,05 88,95	107,85 107,75	130,07 129,97	158,75 158,62	184,15 184,02
N	max. min.	86,64 86,56	105,44 105,36	127,66 127,58	156,34 156,24	181,74 181,64
Thread pitch (Threads per inch)		5,08 (5)	5,08 (5)	5,08 (5)	5,08 (5)	5,08 (5)
P	max. min.	2,59 2,51	2,57 2,46	2,57 2,46	2,57 2,46	2,57 2,46
Q	min.	34,92	57,15	57,15	63,5	63,5
R	min.	31,75	50,8	50,8	57,15	57,15
S	max. min.	6,05 5,54	6,6 6,1	6,6 6,1	6,6 6,1	6,6 6,1
T		15°	15°	15°	15°	15°

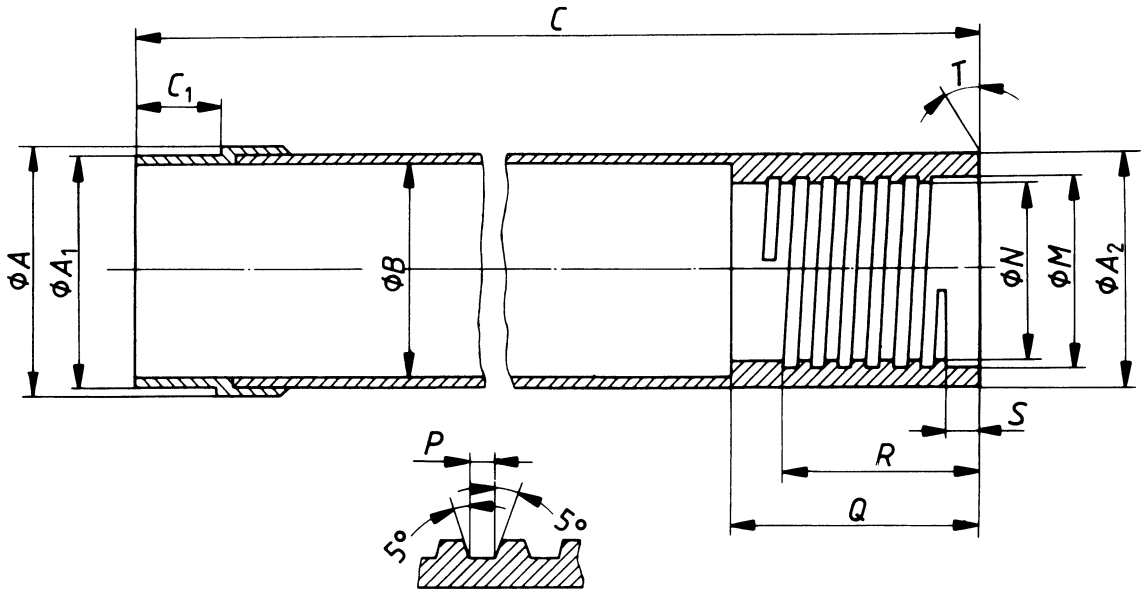


Figure 25 — "WF" design double-tube core barrel — Inner tube (see Table 26)

Table 26 — "WF" design double-tube core barrel — Inner tube

Dimension		HWF	PWF	SWF	UWF	ZWF
A	max. min.	87,76 87,66	104,14 104,01	126,36 126,24	154,94 154,81	180,34 180,21
A_1	max. min.	85,34 85,27	100,33 100,25	122,50 122,43	150,88 150,77	176,28 176,17
A_2	max. min.	82,93 82,55	98,63 98,22	120,95 120,35	149,63 148,82	175,03 174,22
B	max. min.	77,90 77,39	93,85 93,45	114,6 114,0	143,28 142,47	168,68 167,87
C	max. min.	3 069,29 3 068,50	3 071,01 3 070,22	3 058,31 3 057,52	3 058,31 3 057,52	3 058,31 3 057,52
C_1	max. min.	25,40 25,27	31,75 31,62	34,92 34,80	34,92 34,80	34,92 34,80
M	max. min.	63,65 63,55	76,35 76,25	76,35 76,25	120,85 120,73	146,25 146,13
N	max. min.	61,52 61,44	73,91 73,86	73,91 73,86	118,44 118,34	143,84 143,74
Thread pitch (Threads per inch)		5,08 (5)	5,08 (5)	5,08 (5)	5,08 (5)	5,08 (5)
P	max. min.	2,59 2,51	2,57 2,46	2,57 2,46	2,57 2,46	2,57 2,46
Q	max. min.	31,88 31,75	47,88 47,37	47,88 47,37	54,23 53,72	54,23 53,72
R	min.	31,75	47,37	47,37	53,72	53,72
S	max. min.	5,79 5,28	5,79 5,28	5,79 5,28	5,79 5,28	5,79 5,28
T		0°	0°	0°	0°	0°

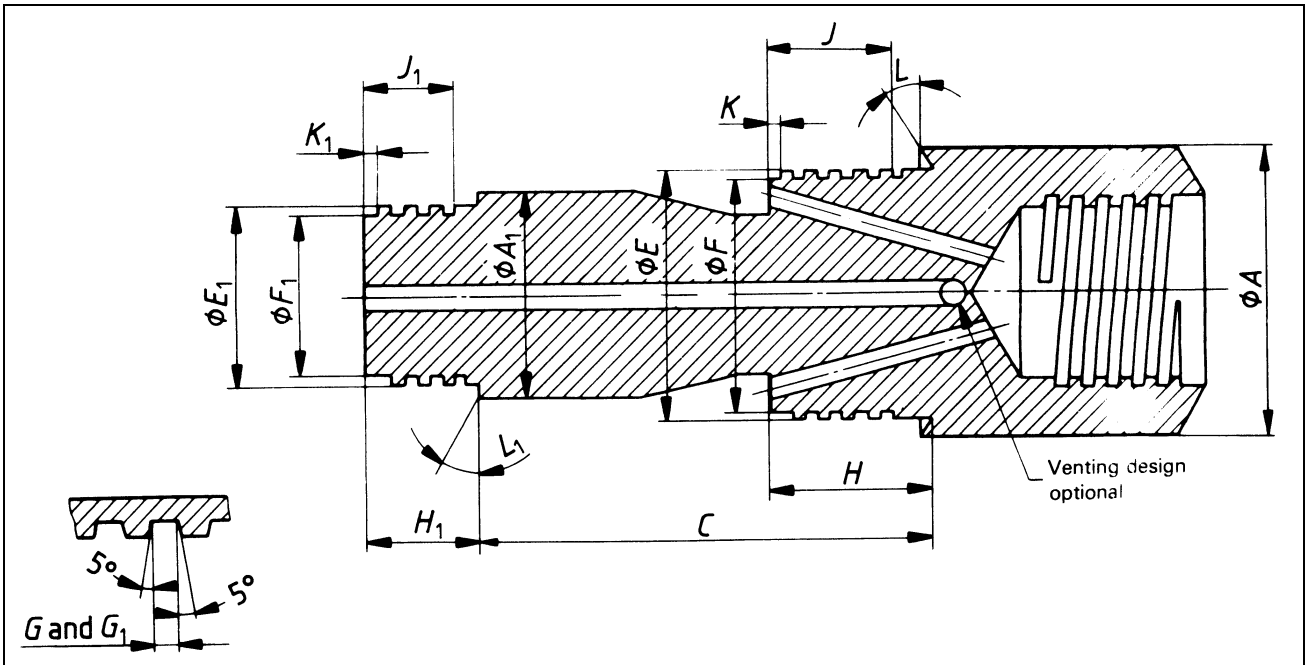
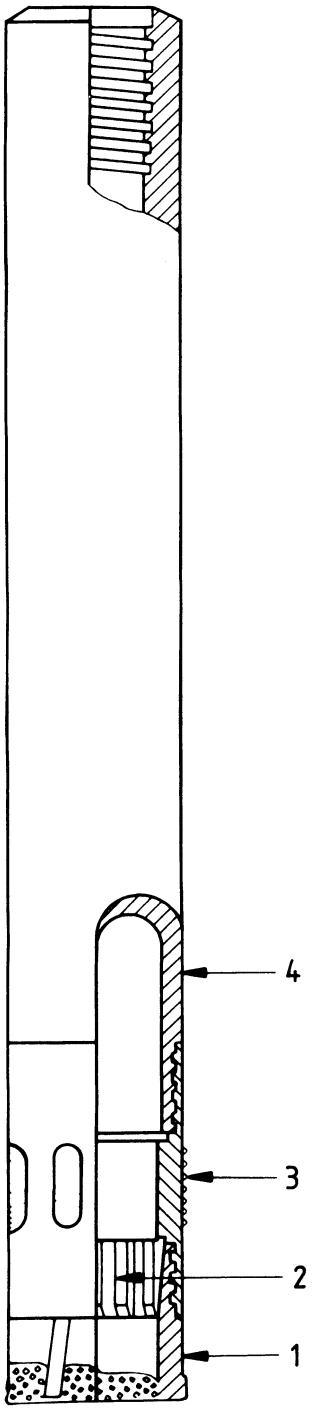


Figure 26 — "WF" design double-tube core barrel — Head (see Table 27)

Table 27 — "WF" design double-tube core barrel — Head

Dimension		HWF	PWF	SWF	UWF	ZWF
A	max. min.	95,45 95,07	114,68 114,30	140,08 139,70	168,66 168,28	194,06 193,68
A_1	max.	82,55	98,63	120,95	149,63	175,03
C	max. min.	134,52 134,14	176,17 175,41	179,15 178,38	199,09 197,94	199,09 197,94
E	max. min.	88,90 88,82	107,67 107,59	129,90 129,82	158,52 158,42	183,92 183,82
F	max. min.	86,51 86,41	105,28 105,18	127,51 127,41	156,13 156,01	181,53 181,41
Thread pitch (Threads per inch)		5,08 (5)	5,08 (5)	5,08 (5)	5,08 (5)	5,08 (5)
G	max. min.	2,59 2,51	2,57 2,46	2,57 2,46	2,57 2,46	2,57 2,46
H	max. min.	32,61 32,23	51,71 51,33	51,71 51,33	58,47 58,09	58,47 58,09
J	min.	28,58	47,62	47,62	53,98	53,98
K	max. min.	3,43 2,92	5,0 4,5	5,0 4,5	5,0 4,5	5,0 4,5
L		15°	15°	15°	15°	15°
E_1	max. min.	63,50 63,45	76,20 76,15	76,20 76,15	120,65 120,57	146,05 145,97
F_1	max. min.	61,39 61,29	73,81 73,71	73,81 73,71	118,26 118,16	143,66 143,56
Thread pitch (Threads per inch)		5,08 (5)	5,08 (5)	5,08 (5)	5,08 (5)	5,08 (5)
G_1	max. min.	2,59 2,51	2,57 2,46	2,57 2,46	2,57 2,46	2,57 2,46
H_1	max. min.	31,75 31,37	47,62 47,24	47,62 47,24	53,98 53,59	53,98 53,59
J_1	min.	28,58	44,45	44,45	50,8	50,8
K_1	max. min.	3,43 2,92	5,0 4,5	5,0 4,5	5,0 4,5	5,0 4,5
L_1		0°	0°	0°	0°	0°
Drill rod connection		HW	2 7/8 API IF[a]	2 7/8 API IF[a]	4 1/2 API IF[a]	4 1/2 API IF[a]

[a] See API 7.



Key

Ref. No.	Description
1	Core bit
2	Core lifter
3	Reaming shell
4	Tube

NOTE 1 Bit and core springs are interchangeable with double-tube barrels.
NOTE 2 Standard "WG" design core barrel lengths are 1,5 m and 3 m (lengths refer to core capacity).

Figure 27 — "WG" design single-tube core barrel — Assembly

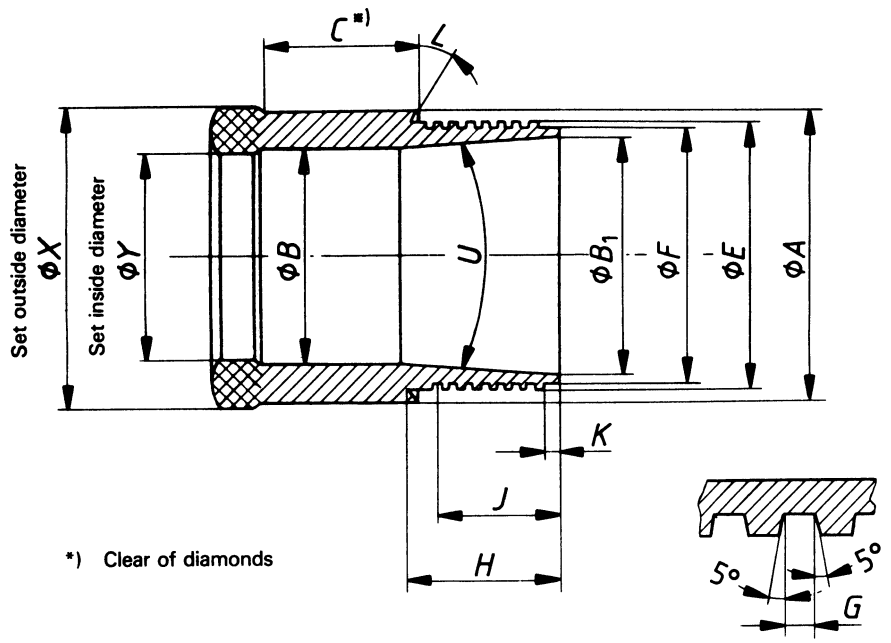
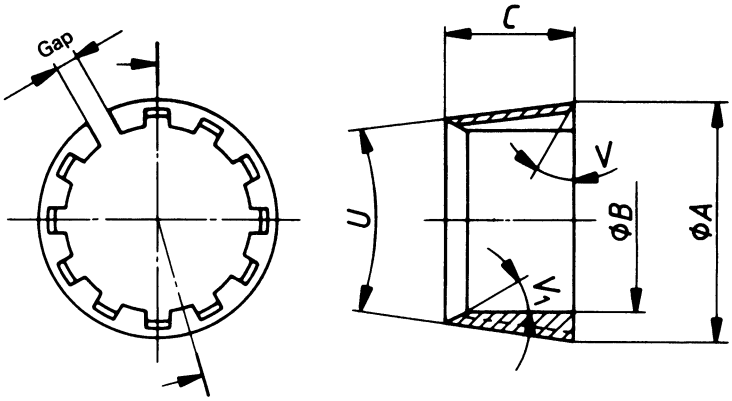


Figure 28 — "WG" design core barrel — Single- and double-tube type — Bevel wall core bit (see Table 28)

Table 28 — "WG" design core barrel — Single- and double-tube type — Bevel wall core bit

Dimension		EWG	AWG	BWG	NWG	HWG
A	max. min.	36,63 36,53	46,66 46,56	58,47 58,37	74,09 73,99	97,59 97,48
B	max. min.	22,96 22,86	31,85 31,75	44,04 43,94	57,0 56,9	79,35 79,25
B_1	max. min.	27,43 27,33	36,96 36,86	48,46 48,36	64,34 64,24	88,90 88,77
C	min.	31,75	31,75	31,75	34,92	38,1
E	max. min.	30,12 30,07	39,65 39,60	51,56 51,51	67,44 67,39	92,40 92,35
F	max. min.	28,55 28,42	38,07 37,95	49,96 49,83	65,84 65,71	90,80 90,68
Thread pitch (Threads per inch)		3,175 (8)	3,175 (8)	3,175 (8)	3,175 (8)	5,08 (5)
G	max. min.	1,63 1,55	1,63 1,55	1,63 1,55	1,63 1,55	2,59 2,51
H	max. min.	22,48 21,97	25,65 25,15	28,83 28,32	32,0 31,5	35,18 34,67
J	min.	19,05	22,22	25,4	28,58	31,75
K	max. min.	1,83 1,32	1,83 1,32	1,83 1,32	1,83 1,32	1,83 1,32
L		0°	0°	0°	0°	15°
U	max. min.	10° 15′ 9° 45′	10° 15′ 9° 45′	10° 15′ 9° 45′	10° 15′ 9° 45′	7° 15′ 6° 45′
X	max. min.	37,46 37,21	47,75 47,50	59,69 59,44	75,44 75,18	98,98 98,60
Y	max. min.	21,59 21,34	30,23 29,97	42,16 41,91	54,86 54,61	76,33 76,07



NOTE Width of gap, entry angle and number of flutes are left to the manufacturer.

Figure 29 — "WG" design core barrel — Single- and double-tube type — Core lifter (see Table 29)

Table 29 — "WG" design core barrel — Single- and double-tube type — Core lifter

Dimension		EWG	AWG	BWG	NWG	HWG
A	max. min.	26,31 26,21	35,84 35,74	47,34 47,24	63,22 63,12	87,35 87,25
B	max. min.	21,08 20,98	29,72 29,62	41,53 41,43	54,23 54,13	75,70 75,59
C	max. min.	19,43 18,67	22,61 21,84	24,18 23,42	32,13 31,37	51,18 50,42
U	max. min.	10° 15′ 9° 45′	10° 15′ 9° 45′	10° 15′ 9° 45′	10° 15′ 9° 45′	7° 15′ 6° 45′
V		0°	0°	0°	0°	0°
V_1		Optional				

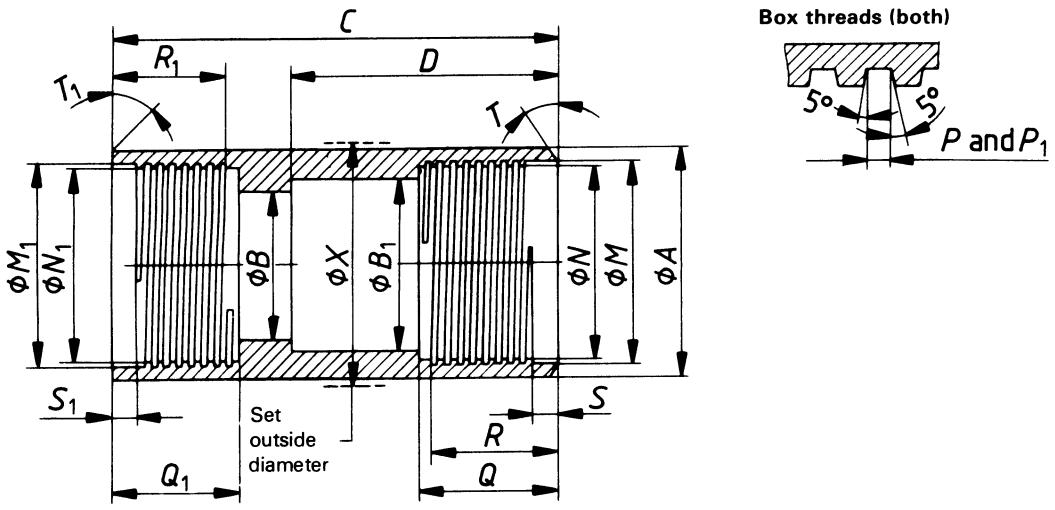
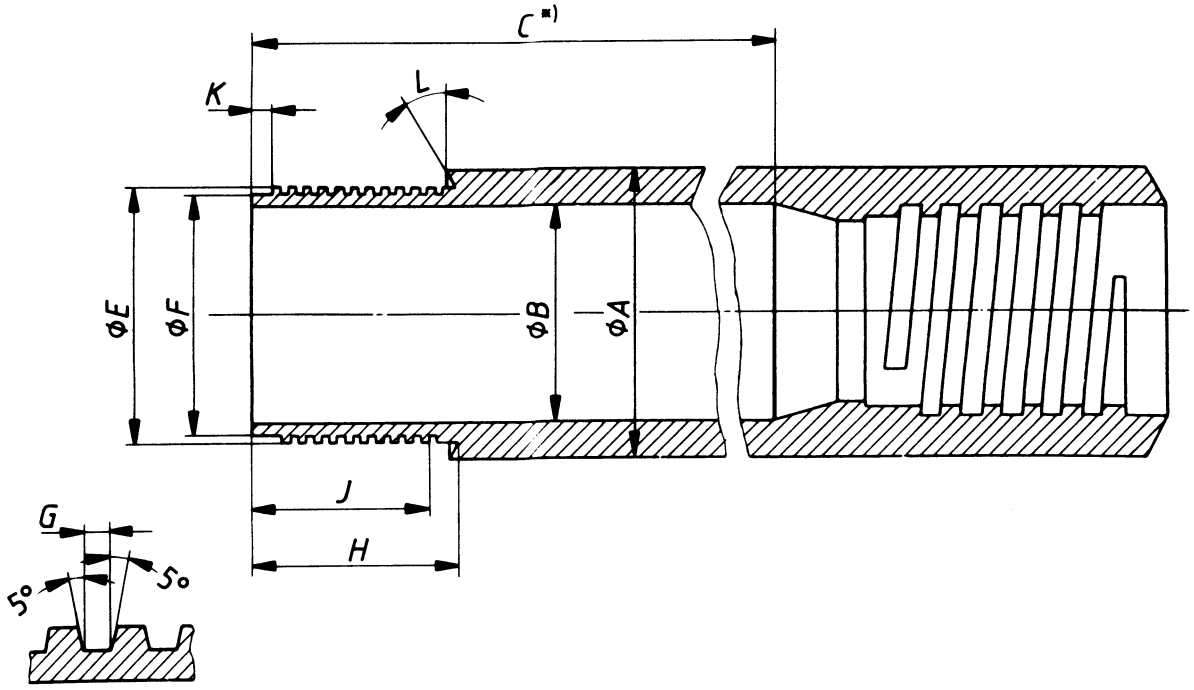


Figure 30 — "WG" design single-tube core barrel — Reaming shell (see Table 30)

Table 30 — "WG" design single-tube core barrel — Reaming shell

Dimension		EWG	AWG	BWG	NWG	HWG
A	max. min.	36,63 36,53	46,66 46,56	58,47 58,37	74,09 73,99	97,59 97,49
B	max. min.	22,78 22,68	31,47 31,37	43,38 43,28	56,08 55,98	77,88 77,77
B_1	max. min.	23,80 23,67	32,54 32,28	44,45 44,20	57,15 56,90	79,50 78,99
C	max. min.	127,25 126,75	130,43 129,92	138,35 137,85	146,3 145,8	152,65 152,15
D	max. min.	85,98 85,34	89,15 88,52	93,90 93,27	98,68 98,04	101,85 101,22
M	max. min.	30,23 30,18	39,75 39,70	51,66 51,61	67,54 67,49	89,03 88,95
N	max. min.	28,65 28,60	38,18 38,12	50,06 50,01	65,94 65,89	87,43 87,35
Thread pitch (Threads per inch)		3,175 (8)	3,175 (8)	3,175 (8)	3,175 (8)	5,08 (5)
P	max. min.	1,63 1,55	1,63 1,55	1,63 1,55	1,63 1,55	2,59 2,51
Q	max. min.	31,88 31,75	31,88 31,75	35,05 34,92	38,23 38,10	41,40 41,28
R	min.	28,58	28,58	31,75	34,92	38,1
S	max. min.	5,0 4,5	5,0 4,5	5,0 4,5	5,0 4,5	6,05 5,54
T		15°	15°	15°	15°	15°
M_1	max. min.	30,23 30,18	39,75 39,70	51,66 51,61	67,54 67,49	92,53 92,48
N_1	max. min.	28,65 28,60	38,18 38,12	50,06 50,01	65,94 65,89	90,93 90,88
Thread pitch (Threads per inch)		3,175 (8)	3,175 (8)	3,175 (8)	3,175 (8)	5,08 (5)
P_1	max. min.	1,63 1,55	1,63 1,55	1,63 1,55	1,63 1,55	2,59 2,51
Q_1	max. min.	23,93 23,80	27,10 26,97	31,88 31,75	36,63 36,50	39,24 38,86
R_1	min.	22,2	25,4	28,58	33,32	34,92
S_1	max. min.	5,0 4,5	5,0 4,5	5,0 4,5	5,0 4,5	6,05 5,54
T_1		0°	0°	0°	0°	15°
X	max. min.	37,85 37,59	48,13 47,88	60,07 59,82	75,82 75,56	99,36 99,11



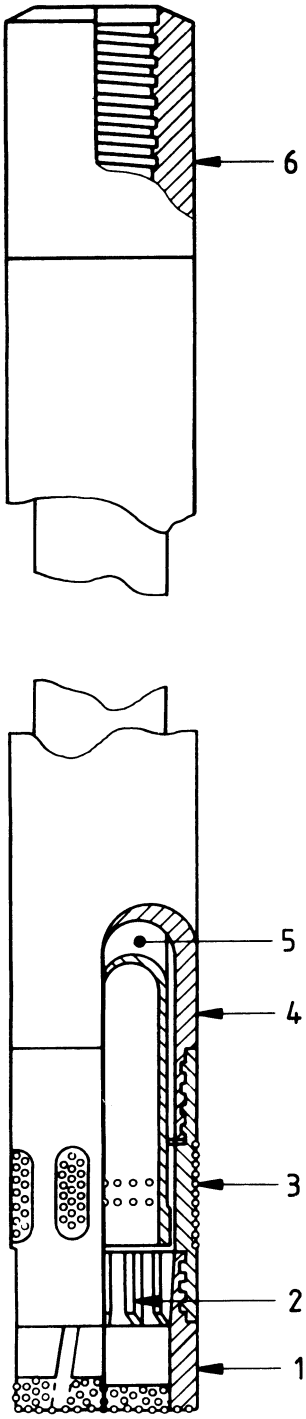
*) Length *C* equals 3 048 mm core capacity.

Figure 31 — "WG" design single-tube core barrel — Tube (see Table 31)

Table 31 — "WG" design single-tube core barrel — Tube

Dimension		EWG	AWG	BWG	NWG	HWG
A	max. min.	36,63 36,50	46,28 46,02	58,19 57,94	74,07 73,81	95,63 95,25
B	max. min.	23,80 23,67	32,54 32,28	44,45 44,20	57,15 56,90	79,50 78,99
C[a]	min.	3 003,55	3 003,55	3 003,55	3 003,55	3 000,38
E	max. min.	30,12 30,07	39,65 39,60	51,56 51,51	67,43 67,39	88,87 88,82
F	max. min.	28,55 28,42	38,07 37,95	49,96 49,83	65,84 65,71	87,27 87,15
Thread pitch (Threads per inch)		3,175 (8)	3,175 (8)	3,175 (8)	3,175 (8)	5,08 (5)
G	max. min.	1,63 1,55	1,63 1,55	1,63 1,55	1,63 1,55	2,59 2,51
H	max. min.	31,75 31,62	31,75 31,62	34,92 34,80	38,10 37,97	41,28 41,15
J	min.	28,58	28,58	31,75	34,92	37,29
K	max. min.	5,0 4,5	5,0 4,5	5,0 4,5	5,0 4,5	6,6 6,1
L		15°	15°	15°	15°	15°
Rod thread connection		EW	AW	BW	NW	HW

[a] See note in Figure 31.



Key

Ref. No.	Description
1	Core bit
2	Core lifter
3	Reaming shell
4	Outer tube
5	Inner tube
6	Head: rigid or swivel
NOTE 1 Bits and core springs are interchangeable with single-tube barrels. NOTE 2 Standard "WG" design core barrel lengths are 1,5 m and 3 m (lengths refer to core capacity).	

Figure 32 — "WG" design double-tube core barrel — Assembly — Rigid and swivel types

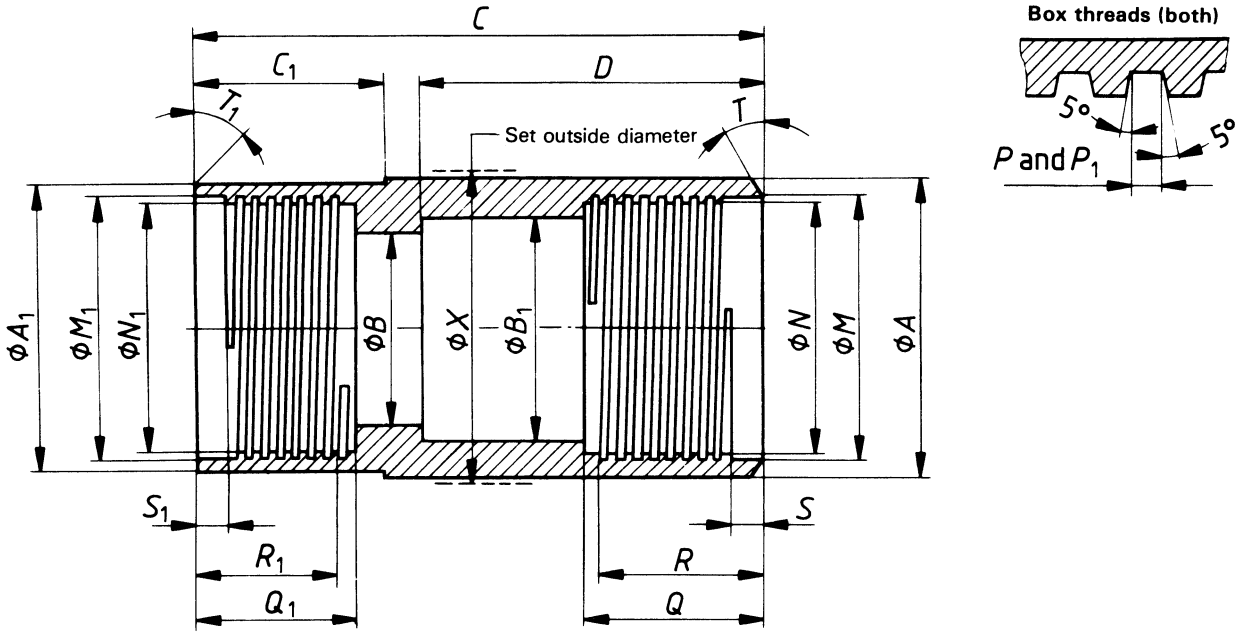


Figure 33 — "WG" design double-tube core barrel — Reaming shell (see Table 32)

Table 32 — "WG" design double-tube core barrel — Reaming shell

Dimension		EWG	AWG	BWG	NWG	HWG
A	max. min.	37,01 36,91	47,04 46,94	58,85 58,75	74,47 74,37	97,97 97,87
A_1	max. min.	36,63 36,53	46,66 46,56	58,47 58,37	74,09 73,99	97,59 97,48
B	max. min.	28,65 28,60	38,18 38,13	50,06 50,01	65,94 65,89	85,60 85,47
B_1	max. min.	30,15 30,02	38,89 38,76	50,80 50,67	66,68 66,55	87,38 87,25
C	max. min.	101,85 101,35	105,03 104,52	112,95 112,45	120,9 120,4	139,70 139,19
C_1	max. min.	33,45 33,32	36,63 36,50	41,40 41,28	46,15 46,02	47,75 47,62
D	max. min.	62,03 61,90	62,03 61,90	62,03 61,90	62,03 61,90	76,33 76,20
M	max. min.	34,59 34,54	43,97 43,92	55,83 55,78	71,70 71,65	92,53 92,48
N	max. min.	33,02 32,97	42,39 42,34	54,25 54,20	70,13 70,08	90,93 90,88
Thread pitch (Threads per inch)		3,175 (8)	3,175 (8)	3,175 (8)	3,175 (8)	5,08 (5)
P	max. min.	1,63 1,55	1,63 1,55	1,63 1,55	1,63 1,55	2,59 2,51
Q	max. min.	31,88 31,75	31,88 31,75	35,05 34,92	38,23 38,10	32,23 32,13
R	min.	28,58	28,58	31,75	34,92	30,15
S	max. min.	5,0 4,5	5,0 4,5	5,0 4,5	5,0 4,5	6,05 5,54
T		15°	15°	15°	15°	15°
M_1	max. min.	30,23 30,18	39,75 39,70	51,66 51,61	67,54 67,49	92,53 92,48
N_1	max. min.	28,65 28,60	38,18 38,13	50,06 50,01	65,94 65,89	90,93 90,88
Thread pitch (Threads per inch)		3,175 (8)	3,175 (8)	3,175 (8)	3,175 (8)	5,08 (5)
P_1	max. min.	1,63 1,55	1,63 1,55	1,63 1,55	1,63 1,55	2,59 2,51
Q_1	max. min.	This length does not exist owing to bores B and N_1 being identical				39,24 38,86
R_1	min.	22,23	25,4	28,58	33,32	34,92
S_1	max. min.	5,0 4,5	5,0 4,5	5,0 4,5	5,0 4,5	6,05 5,54
T_1		0°	0°	0°	0°	15°
X	max. min.	37,85 37,59	48,13 47,88	60,07 59,82	75,82 75,56	99,36 99,11

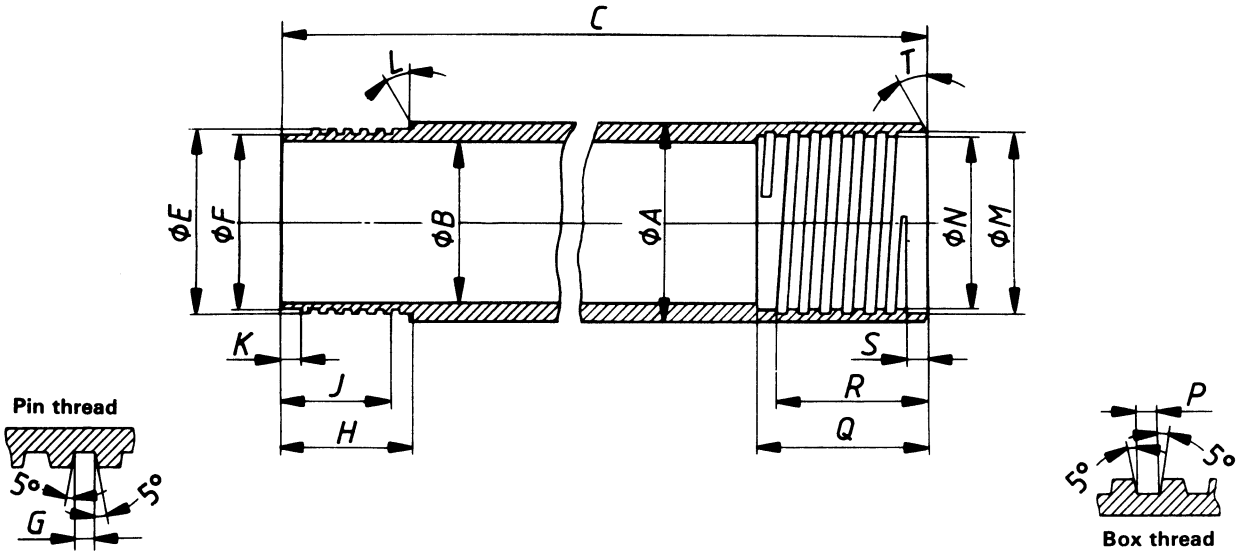


Figure 34 — "WG" design double-tube core barrel — Outer tube (see Table 33)

Table 33 — "WG" design double-tube core barrel — Outer tube

Dimension		EWG	AWG	BWG	NWG	HWG
A	max.	36,63	46,28	58,19	74,07	95,63
	min.	36,50	46,02	57,94	73,81	95,25
B	max.	30,15	38,89	50,80	66,68	85,85
	min.	30,02	38,63	50,55	66,42	85,34
C	max.	3 147,03	3 241,22	3 245,99	3 255,52	3 179,19
	min.	3 146,22	3 240,43	3 245,21	3 254,73	3 178,40
E	max.	34,49	43,87	55,73	71,60	92,40
	min.	34,44	43,81	55,68	71,55	92,33
F	max.	32,92	42,29	54,15	70,03	90,8
	min.	32,82	42,19	54,05	69,93	90,7
Thread pitch (Threads per inch)		3,175 (8)	3,175 (8)	3,175 (8)	3,175 (8)	5,08 (5)
G	max.	1,63	1,63	1,63	1,63	2,59
	min.	1,55	1,55	1,55	1,55	2,51
H	max.	31,75	31,75	34,92	38,10	32,13
	min.	31,62	31,62	34,80	37,97	32,03
J	min.	28,58	28,58	31,75	34,92	28,58
K	max.	5,0	5,0	5,0	5,0	5,0
	min.	4,5	4,5	4,5	4,5	4,5
L		15°	15°	15°	15°	15°
M	max.	31,83	42,14	54,05	69,93	89,05
	min.	31,78	42,09	54,00	69,88	88,95
N	max.	30,23	40,54	52,45	68,33	86,64
	min.	30,18	40,49	52,40	68,28	86,56
Thread pitch (Threads per inch)		3,175 (8)	3,175 (8)	3,175 (8)	3,175 (8)	5,08 (5)
P	max.	1,63	1,63	1,63	1,63	2,59
	min.	1,55	1,55	1,55	1,55	2,51
Q	min.	30,15	36,5	42,85	49,2	34,92
R	min.	26,97	33,32	39,67	46,02	31,75
S	max.	5,0	5,0	5,0	5,0	6,05
	min.	4,5	4,5	4,5	4,5	5,54
T		30°	30°	30°	30°	15°

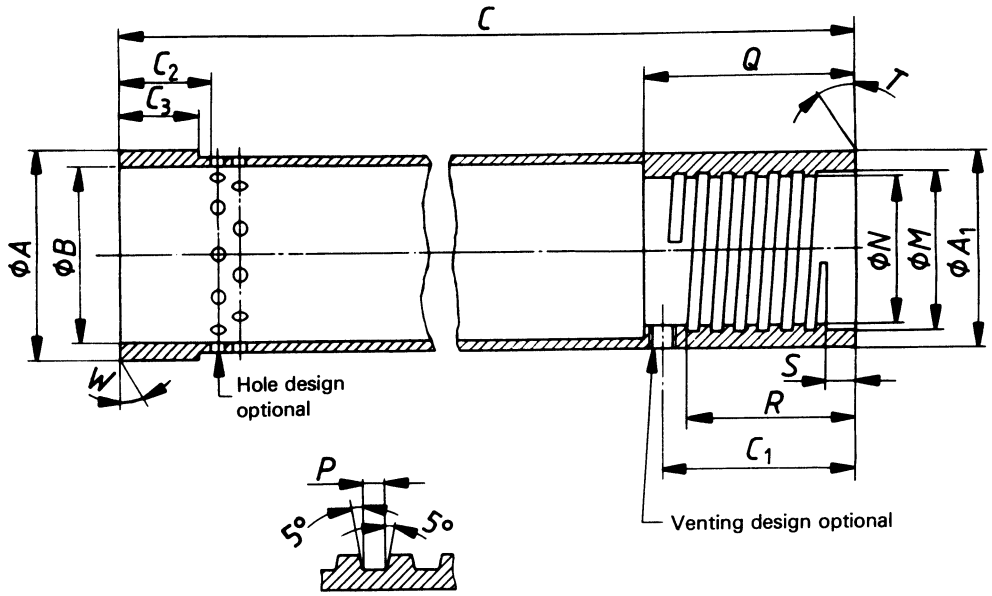


Figure 35 — "WG" design double-tube core barrel — Inner tube (see Table 34)

Table 34 — "WG" design double-tube core barrel — Inner tube

Dimension		EWG	AWG	BWG	NWG	HWG
A	max. min.	28,45 28,32	37,97 37,85	49,78 49,66	65,66 65,53	85,34 85,22
A_1	max. min.	27,10 26,97	35,97 35,71	47,88 47,62	63,75 63,50	82,93 82,55
B	max. min.	23,80 23,67	31,75 31,50	43,64 43,39	57,15 56,90	77,90 77,39
C	max. min.	3 109,11 3 108,32	3 117,04 3 116,25	3 121,81 3 121,02	3 131,34 3 130,55	3 114,68 3 113,89
C_1	max. min.	29,34 27,81	37,26 35,74	42,04 40,51	51,56 50,04	35,69 34,16
C_2	min.	19,05	19,05	22,22	25,4	26,97
C_3	max. min.	16,26 15,88	16,26 15,88	19,43 19,05	22,61 22,22	25,78 25,40
M	max. min.	20,70 20,65	29,44 29,39	41,35 41,30	57,23 57,18	63,63 63,55
N	max. min.	19,13 19,08	27,05 27,00	38,96 38,91	54,84 54,79	61,49 61,44
Thread pitch (Threads per inch)		3,175 (8)	3,175 (8)	3,175 (8)	3,175 (8)	5,08 (5)
P	max. min.	1,63 1,55	1,63 1,55	1,63 1,55	1,63 1,55	2,59 2,51
Q	max. min.	35,05 34,80	42,98 42,73	47,75 47,50	57,28 57,02	41,40 41,15
R	min.	22,22	31,75	31,75	31,75	31,75
S	max. min.	5,0 4,5	5,0 4,5	5,0 4,5	5,0 4,5	6,05 5,54
T		0°	0°	0°	0°	0°
Holes (minimum total area), mm^2		142,58	185,81	238,71	325,16	419,35
W		0°	0°	0°	0°	0°

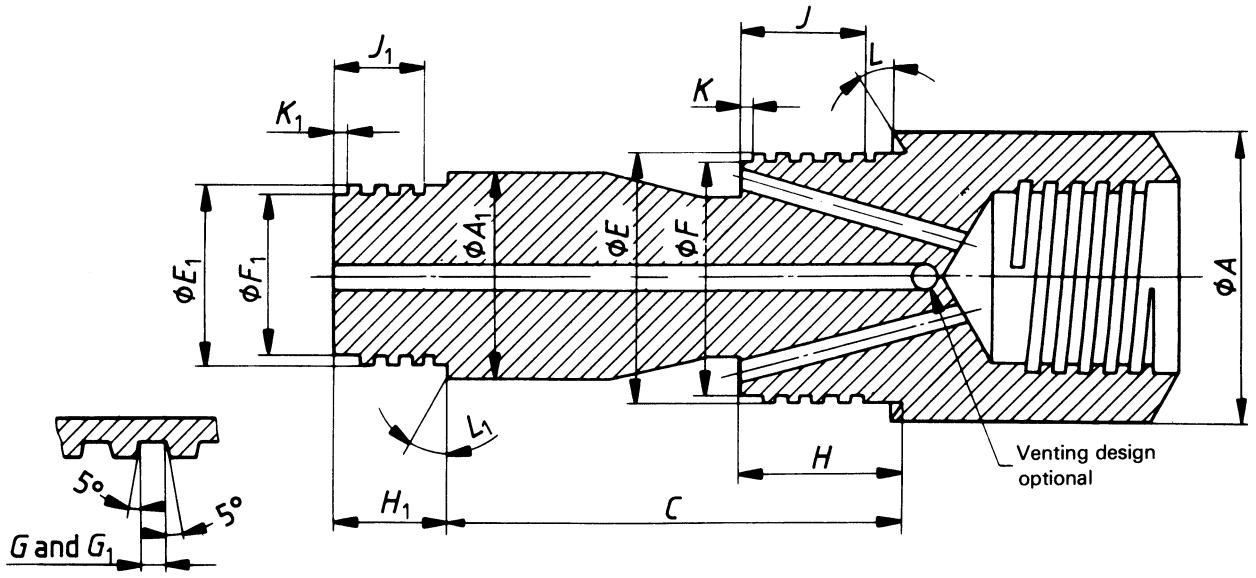
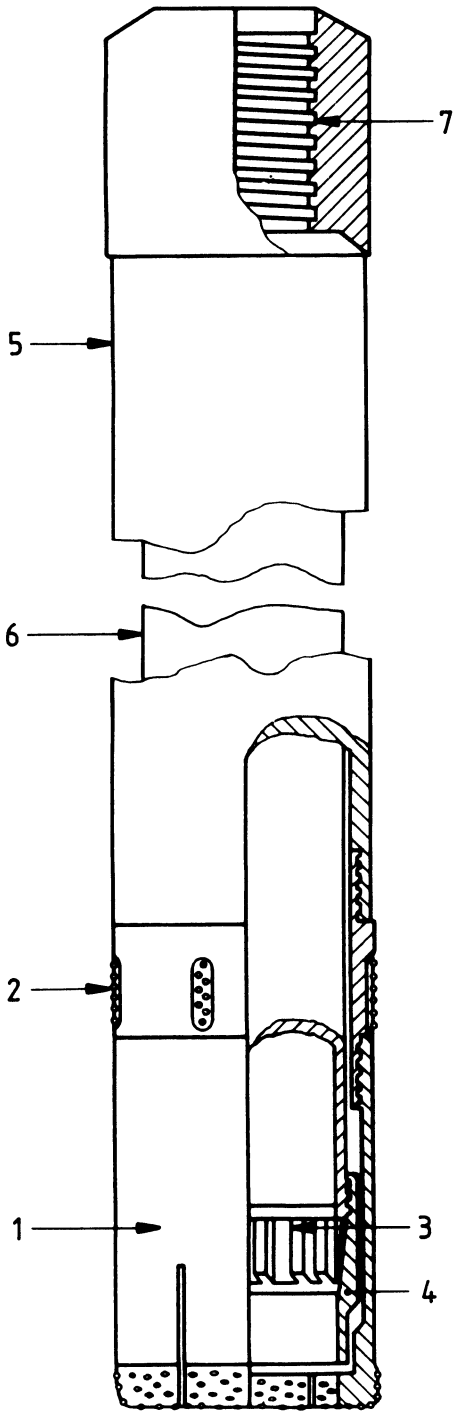


Figure 36 — "WG" design double-tube core barrel — Head (see Table 35)

Table 35 — "WG" design double-tube core barrel — Head

Dimension		EWG[a]	AWG[a]	BWG[ab]	NWG[ab]	HWG[c]
A	max. min.	36,63 36,37	46,15 45,90	58,06 57,81	73,94 73,69	95,45 95,07
A_1	max. min.	27,10 26,97	35,97 35,71	47,88 47,62	63,75 63,50	82,55 82,17
C	max. min.	84,23 83,59	170,54 169,90	170,54 169,90	170,54 169,90	134,52 134,14
E	max. min.	31,72 31,67	42,04 41,99	53,95 53,90	69,82 69,77	88,90 88,82
F	max. min.	30,12 30,00	40,44 40,31	52,35 52,22	68,22 68,10	86,51 86,41
Thread pitch (Threads per inch)		3,175 (8)	3,175 (8)	3,175 (8)	3,175 (8)	5,08 (5)
G	max. min.	1,63 1,55	1,63 1,55	1,63 1,55	1,63 1,55	2,59 2,51
H	max. min.	26,77 26,39	32,92 32,54	39,27 38,89	45,62 45,24	32,61 32,23
J	min.	22,22	28,58	34,92	41,28	28,58
K	max. min.	3,43 2,92	3,43 2,92	3,43 2,92	3,43 2,92	3,43 2,92
L		30°	30°	30°	30°	15°
E_1	max. min.	20,60 20,55	29,34 29,29	41,25 41,20	57,12 57,07	63,50 63,45
F_1	max. min.	19,02 18,90	26,95 26,82	38,86 38,74	54,74 54,61	61,39 61,29
Thread pitch (Threads per inch)		3,175 (8)	3,175 (8)	3,175 (8)	3,175 (8)	5,08 (5)
G_1	max. min.	1,63 1,55	1,63 1,55	1,63 1,55	1,63 1,55	2,59 2,51
H_1	max. min.	19,05 18,67	22,22 21,84	25,40 25,02	28,58 28,19	31,75 31,37
J_1	min.	15,88	19,05	22,22	25,4	28,58
K_1	max. min.	3,43 2,92	3,43 2,92	3,43 2,92	3,43 2,92	3,43 2,92
L_1		0°	0°	0°	0°	0°
Rod thread connection		EW	AW	BW	NW	HW

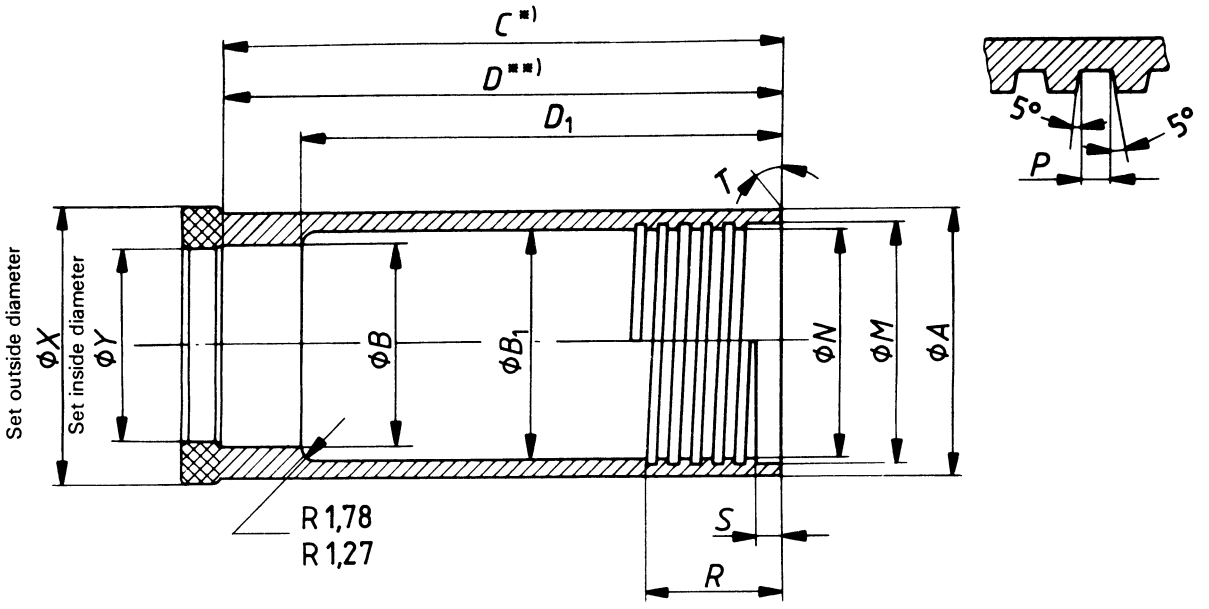
[a] These items are interchangeable with the "WM" design core barrels.
[b] These items are interchangeable with the "WM" and "WT" design core barrels.
[c] This item is interchangeable with the "WF" design core barrel.



Key

Ref. No.	Description
1	Core bit
2	Reaming shell
3	Core lifter
4	Lifter case
5	Outer tube
6	Inner tube
7	Head thread only
NOTE Standard "WM" design core barrel lengths are 1,5 m and 3 m (lengths refer to core capacity).	

Figure 37 — "WM" design double-tube core barrel — Assembly — Swivel type



*) Clear of diamonds

**) Dimension from right-hand end to bottom of counterbore (øB).

Figure 38 — "WM" design double-tube core barrel — Core bit (see Table 36)

Table 36 — "WM" design double-tube core barrel — Core bit

Dimension		EWM	AWM	BWM	NWM
A	max. min.	36,09 35,97	46,15 46,02	57,94 57,81	73,86 73,74
B	max. min.	27,10 26,97	35,31 35,18	46,81 46,69	61,24 61,11
B_1	max. min.	31,80 31,67	40,49 40,36	52,40 52,27	68,38 68,25
C and D[a]	max. min.	124,46 123,70	124,46 123,70	122,94 122,17	153,16 152,40
D_1	max. min.	104,09 103,84	104,09 103,84	104,09 103,84	132,66 132,41
M	max. min.	33,40 33,35	42,14 42,09	54,05 54,00	70,71 70,66
N	max. min.	31,83 31,78	40,54 40,49	52,45 52,40	69,11 69,06
Thread pitch (Threads per inch)		3,175 (8)	3,175 (8)	3,175 (8)	3,175 (8)
P	max. min.	1,63 1,55	1,63 1,55	1,63 1,55	1,63 1,55
R	min.	31,75	31,75	31,75	34,92
S	max. min.	3,43 2,92	3,43 2,92	3,43 2,92	3,43 2,92
T		0°	0°	0°	0°
X	max. min.	37,46 37,21	47,75 47,50	59,69 59,44	75,44 75,18
Y	max. min.	21,59 21,34	30,23 29,97	42,16 41,91	54,86 54,61

[a] See relevant note in Figure 38.

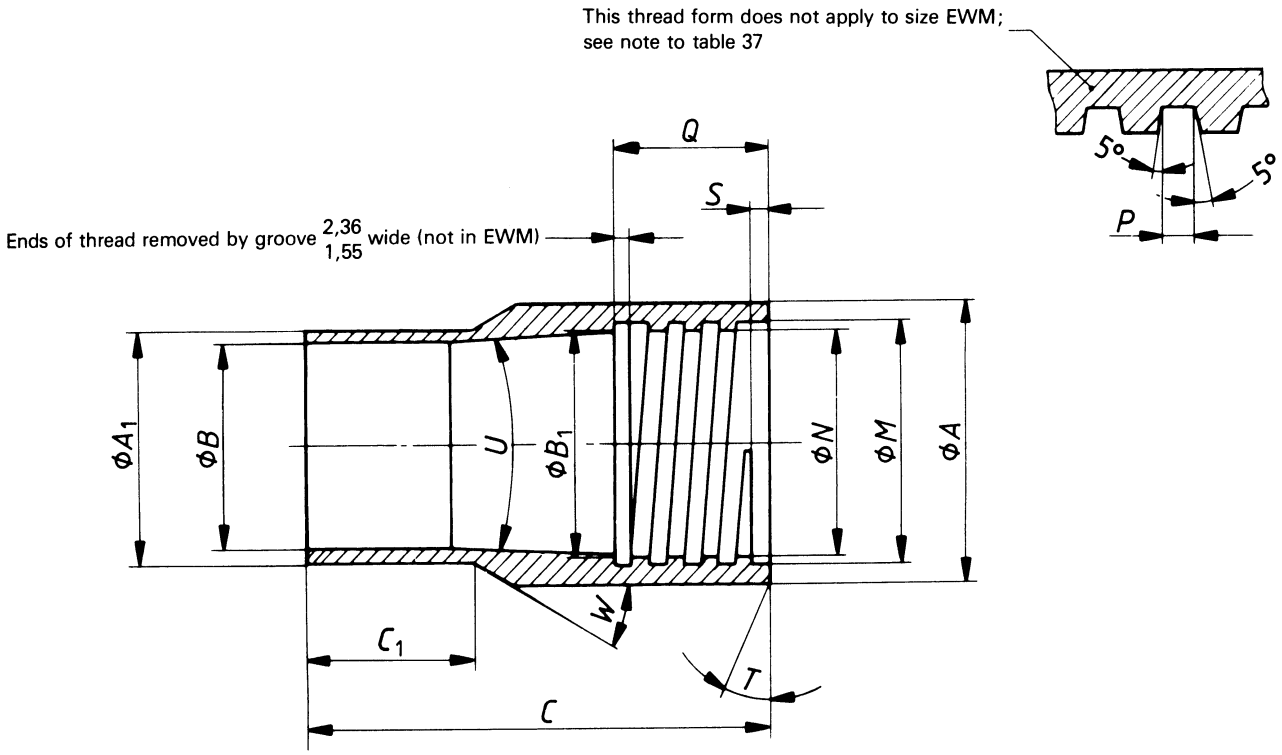
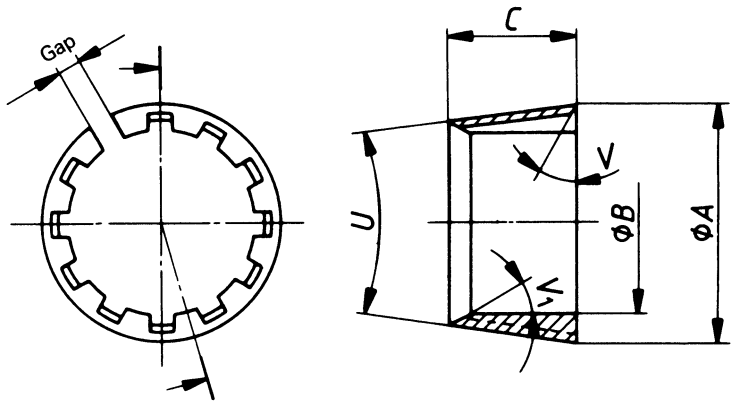


Figure 39 — "WM" design double-tube core barrel — Core lifter case (see Table 37)

Table 37 — "WM" design double-tube core barrel — Core lifter case

Dimension		EWM	AWM	BWM	NWM
A	max. min.	30,15 30,02	38,89 38,76	50,80 50,67	66,68 66,55
A_1	max. min.	25,45 25,32	33,55 33,43	45,29 45,16	59,56 59,44
B	max. min.	23,09 22,96	31,19 31,06	42,90 42,77	57,20 57,07
B_1	max. min.	26,24 26,19	34,16 34,11	46,08 46,02	61,95 61,90
C	max. min.	68,33 68,20	65,15 65,02	63,58 63,45	87,38 87,25
C_1	max. min.	20,78 20,52	20,78 20,52	19,18 18,92	20,78 20,52
M	max. min.	26,37 26,21	35,79 35,74	47,70 47,65	63,58 63,53
N	max. min.	24,76 24,71	34,19 34,14	46,10 46,05	61,98 61,93
Thread pitch (Threads per inch)		[a]	3,175 (8)	3,175 (8)	3,175 (8)
P	max. min.	[a]	1,63 1,55	1,63 1,55	1,63 1,55
Q	max. thread min. thread	11,23 10,97	12,83 12,57	12,83 12,57	16,00 15,75
S	max. min.	1,70 1,45	1,70 1,45	1,70 1,45	1,70 1,45
T		0°	0°	0°	0°
U	max. min.	5° 15′ 4° 45′	5° 15′ 4° 45′	5° 15′ 4° 45′	5° 15′ 4° 45′
W		30°	30°	30°	30°

[a] The thread for EWM is 1 1/32-20 UNS-2B (see BS 1580-1 and BS 1580-2). The dimensions are given in inches as this is established international practice.

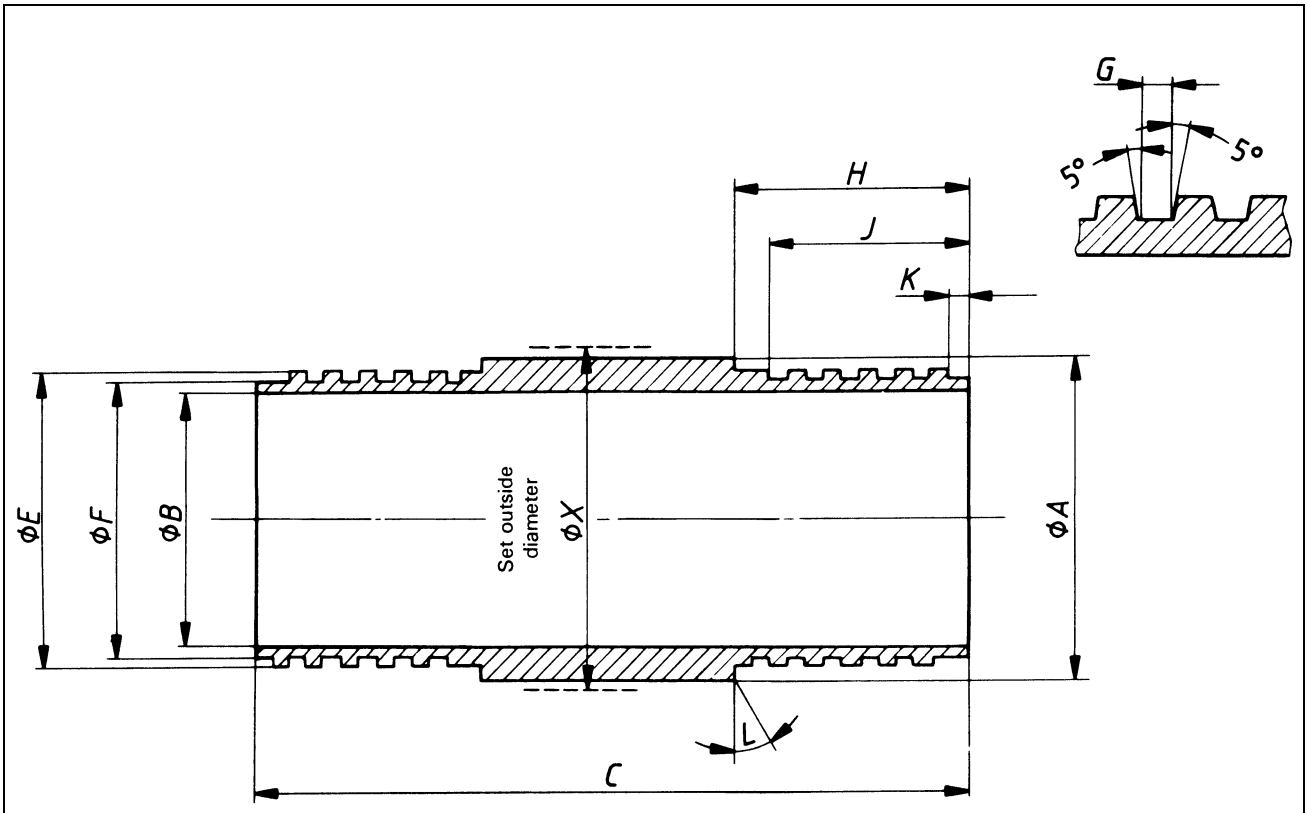


NOTE Width of gap and number of flutes are left to the manufacturer.

Figure 40 — "WM" design double-tube core barrel — Core lifter (see Table 38)

Table 38 — "WM" design double-tube core barrel — Core lifter

Dimension		EWM	AWM	BWM	NWM
A	max. min.	25,32 25,22	33,25 33,15	45,03 44,93	60,91 60,81
B	max. min.	21,08 20,98	29,72 29,62	41,53 41,43	54,23 54,13
C	max. min.	19,43 18,67	22,61 21,84	22,61 21,84	35,31 34,54
U	max. min.	5° 15′ 4° 45′	5° 15′ 4° 45′	5° 15′ 4° 45′	5° 15′ 4° 45′
V		0°	0°	0°	0°
V_1		10°	10°	10°	15°



NOTE Dimensions shown apply to both ends.

Figure 41 — "WM" design double-tube core barrel — Reaming shell (see Table 39)

Table 39 — "WM" design double-tube core barrel — Reaming shell

Dimension		EWM	AWM	BWM	NWM
A	max.	36,37	46,66	58,47	74,09
	min.	36,27	46,56	58,37	73,99
B	max.	29,44	38,18	50,04	65,99
	min.	29,31	38,05	49,91	65,86
C	max.	108,2	108,2	108,2	114,55
	min.	107,7	107,7	107,7	114,05
E	max.	33,30	42,04	53,95	70,61
	min.	33,25	41,99	53,90	70,56
F	max.	31,72	40,44	52,35	69,01
	min.	31,60	40,31	52,22	68,88
Thread pitch (Threads per inch)		3,175 (8)	3,175 (8)	3,175 (8)	3,175 (8)
G	max.	1,63	1,63	1,63	1,63
	min.	1,55	1,55	1,55	1,55
H	max.	28,83	28,83	28,83	32,0
	min.	28,32	28,32	28,32	31,5
J	min.	26,97	26,97	26,97	30,15
K	max.	5,0	5,0	5,0	5,0
	min.	4,5	4,5	4,5	4,5
L		0°	0°	0°	0°
X	max.	37,85	48,13	60,07	75,82
	min.	37,59	47,88	59,82	75,56

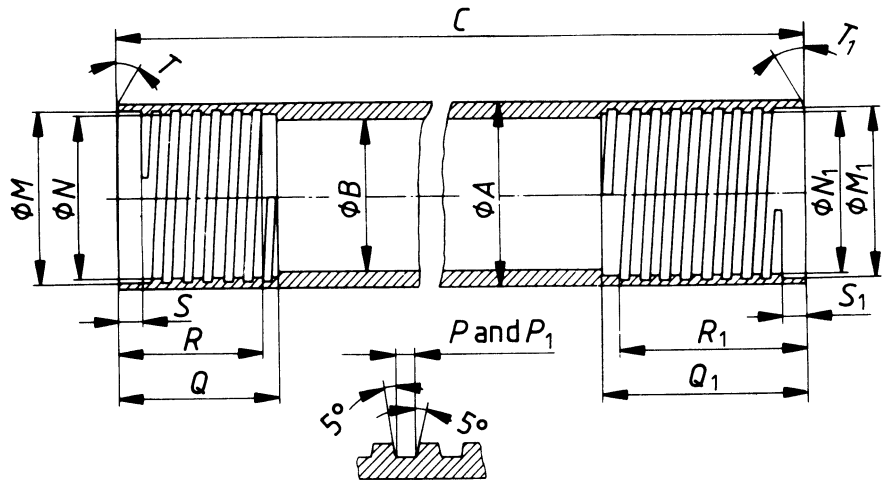


Figure 42 — "WM" design double-tube core barrel — Outer tube (see Table 40)

Table 40 — "WM" design double-tube core barrel — Outer tube

Dimension		EWM	AWM	BWM	NWM
A	max. min.	36,63 36,50	46,28 46,02	58,19 57,94	74,07 73,81
B	max. min.	30,15 30,05	38,89 38,63	50,80 50,55	66,68 66,42
C	max. min.	3 053,18 3 052,34	3 142,84 3 142,06	3 147,59 3 146,81	3 148,00 3 147,21
M	max. min.	33,40 33,35	42,14 42,09	54,05 54,00	70,71 70,66
N	max. min.	31,83 31,78	40,54 40,49	52,45 52,40	69,11 69,06
Thread pitch (Threads per inch)		3,175 (8)	3,175 (8)	3,175 (8)	3,175 (8)
P	max. min.	1,63 1,55	1,63 1,55	1,63 1,55	1,63 1,55
Q	min.	34,92	34,92	34,92	38,1
R	min.	31,75	31,75	31,75	34,92
S	max. min.	5,0 4,5	5,0 4,5	5,0 4,5	5,0 4,5
T		0°	0°	0°	0°
M_1	max. min.	31,83 31,78	42,14 42,09	54,05 54,00	69,93 69,88
N_1	max. min.	30,23 30,18	40,54 40,49	52,45 52,40	68,33 68,28
Thread pitch (Threads per inch)		3,175 (8)	3,175 (8)	3,175 (8)	3,175 (8)
P_1	max. min.	1,63 1,55	1,63 1,55	1,63 1,55	1,63 1,55
Q_1	min.	30,15	36,5	42,85	49,2
R_1	min.	26,97	33,32	39,67	46,02
S_1	max. min.	6,6 6,1	6,6 6,1	6,6 6,1	6,6 6,1
T_1		30°	30°	30°	30°

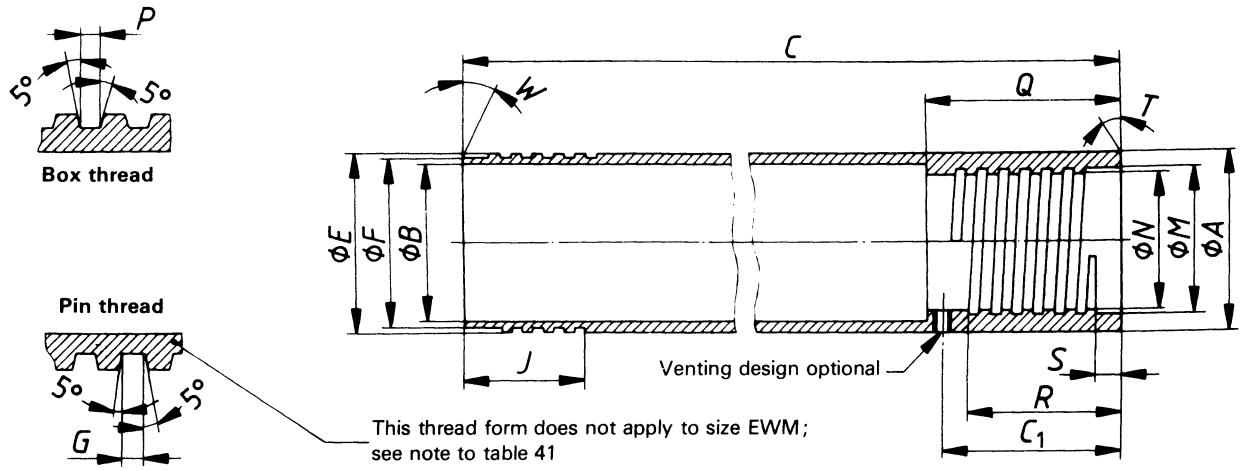


Figure 43 — "WM" design double-tube core barrel — Inner tube (see Table 41)

Table 41 — "WM" design double-tube core barrel — Inner tube

Dimension		EWM	AWM	BWM	NWM
A	max. min.	27,10 26,97	35,97 35,71	47,88 47,62	63,75 63,50
B	max. min.	23,80 23,67	31,75 31,50	43,64 43,38	57,15 56,90
C	max. min.	3 083,31 3 082,52	3 091,26 3 090,44	3 096,01 3 095,22	3 105,53 3 104,74
C_1	max. min.	29,34 27,81	37,26 35,74	42,04 40,51	51,56 50,04
E	max. min.	26,16 26,01	35,69 35,64	47,60 47,55	63,47 63,42
F	max. min.	[a]	34,09 33,96	46,00 45,87	61,87 61,75
Thread pitch (Threads per inch)		[a]	3,175 (8)	3,175 (8)	3,175 (8)
G	max. min.	[a]	1,63 1,55	1,63 1,55	1,63 1,55
J	max. min.	11,23 10,97	11,23 10,97	11,23 10,97	16,00 15,75
M	max. min.	20,70 20,65	29,44 29,39	41,35 41,30	57,23 57,18
N	max. min.	19,13 19,08	27,05 27,00	38,96 38,91	54,84 54,79
Thread pitch (Threads per inch)		3,175 (8)	3,175 (8)	3,175 (8)	3,175 (8)
P	max. min.	1,63 1,55	1,63 1,55	1,63 1,55	1,63 1,55
Q	max. min.	35,31 34,54	43,23 42,47	48,01 47,24	57,53 56,77
R	min.	22,22	31,75	31,75	31,75
S	max. min.	5,0 4,5	5,0 4,5	5,0 4,5	5,0 4,5
T		0°	0°	0°	0°
W		0°	0°	0°	0°

[a] The thread for EWM is 1 1/32-20 UNS-2A (see BS 1580-1 and BS 1580-2). The dimensions are given in inches as this is established international practice.

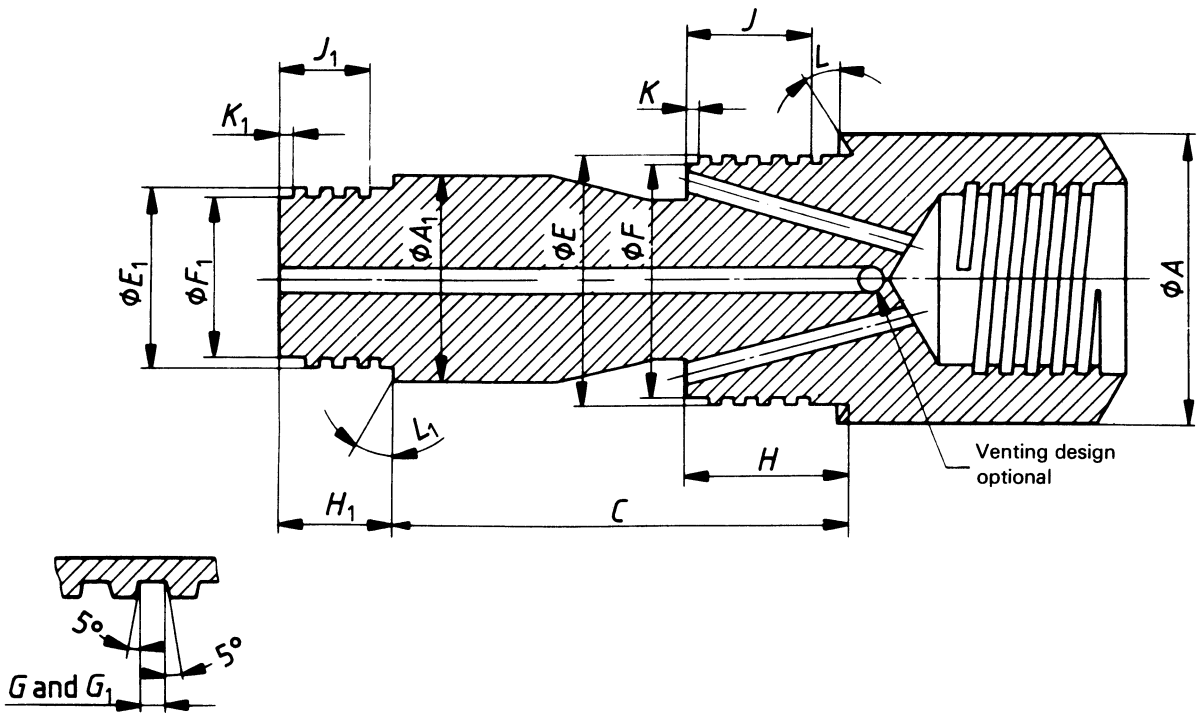
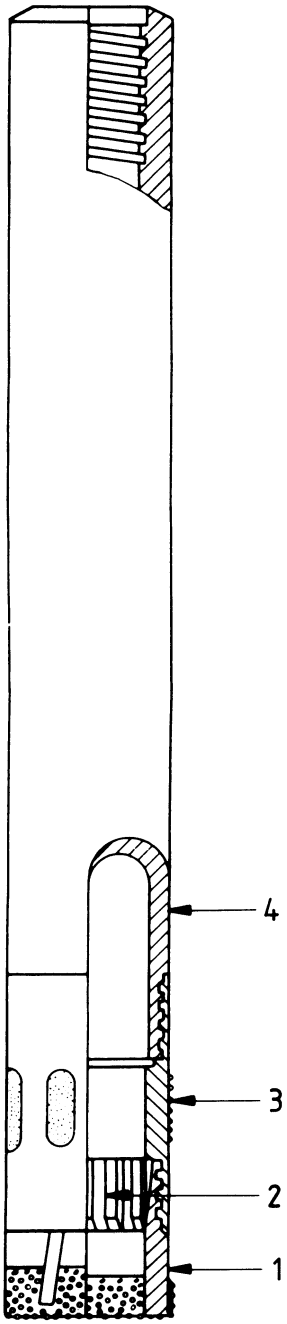


Figure 44 — "WM" design double-tube core barrel — Head (see Table 42)

Table 42 — "WM" design double-tube core barrel — Head

Dimension		EWM[a]	AWM[a]	BWM[ab]	NWM[ab]
A	max. min.	36,63 36,37	46,15 45,90	58,06 57,81	73,94 73,69
A_1	max. min.	27,10 26,97	35,97 35,71	47,88 47,63	63,75 63,50
C	max. min.	84,23 83,59	170,54 169,90	170,54 169,90	170,54 169,90
E	max. min.	31,72 31,67	42,04 41,99	53,95 53,90	69,82 69,77
F	max. min.	30,12 30,00	40,44 40,31	52,35 52,22	68,22 68,10
Thread pitch (Threads per inch)		3,175 (8)	3,175 (8)	3,175 (8)	3,175 (8)
G	max. min.	1,63 1,55	1,63 1,55	1,63 1,55	1,63 1,55
H	max. min.	26,77 26,39	32,92 32,54	39,27 38,89	45,62 45,24
J	min.	22,22	28,58	34,92	41,28
K	max. min.	3,43 2,92	3,43 2,92	3,43 2,92	3,43 2,92
L		30°	30°	30°	30°
E_1	max. min.	20,60 20,55	29,34 29,29	41,25 41,20	57,12 57,07
F_1	max. min.	19,02 18,90	26,95 26,82	38,86 38,74	54,74 54,61
Thread pitch (Threads per inch)		3,175 (8)	3,175 (8)	3,175 (8)	3,175 (8)
G_1	max. min.	1,63 1,55	1,63 1,55	1,63 1,55	1,63 1,55
H_1	max. min.	19,05 18,67	22,22 21,84	25,40 25,02	28,58 28,19
J_1	min.	15,88	19,05	22,22	25,4
K_1	max. min.	3,43 2,92	3,43 2,92	3,43 2,92	3,43 2,92
L_1		0°	0°	0°	0°
Rod thread connection		EW	AW	BW	NW

[a] These items are interchangeable with the "WG" design core barrels.
[b] These items are interchangeable with the "WT" design core barrels.



Key

Ref. No.	Description
1	Core bit bevel wall
2	Core lifter
3	Reaming shell
4	Tube

NOTE 1 Bits and core springs are interchangeable between double-tube and single-tube barrels.
NOTE 2 Standard "WT" design core barrel lengths are 1,5 m and 3 m (lengths refer to core capacity).

Figure 45 — "WT" design single-tube core barrel — Assembly — Sizes BWT, NWT and HWT

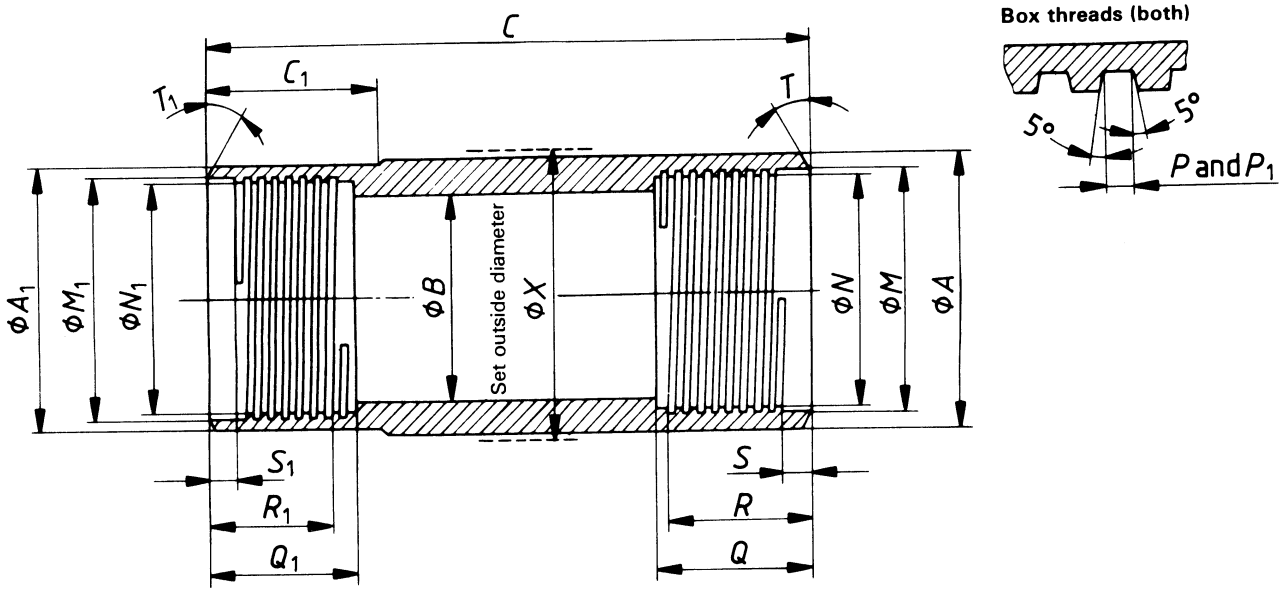
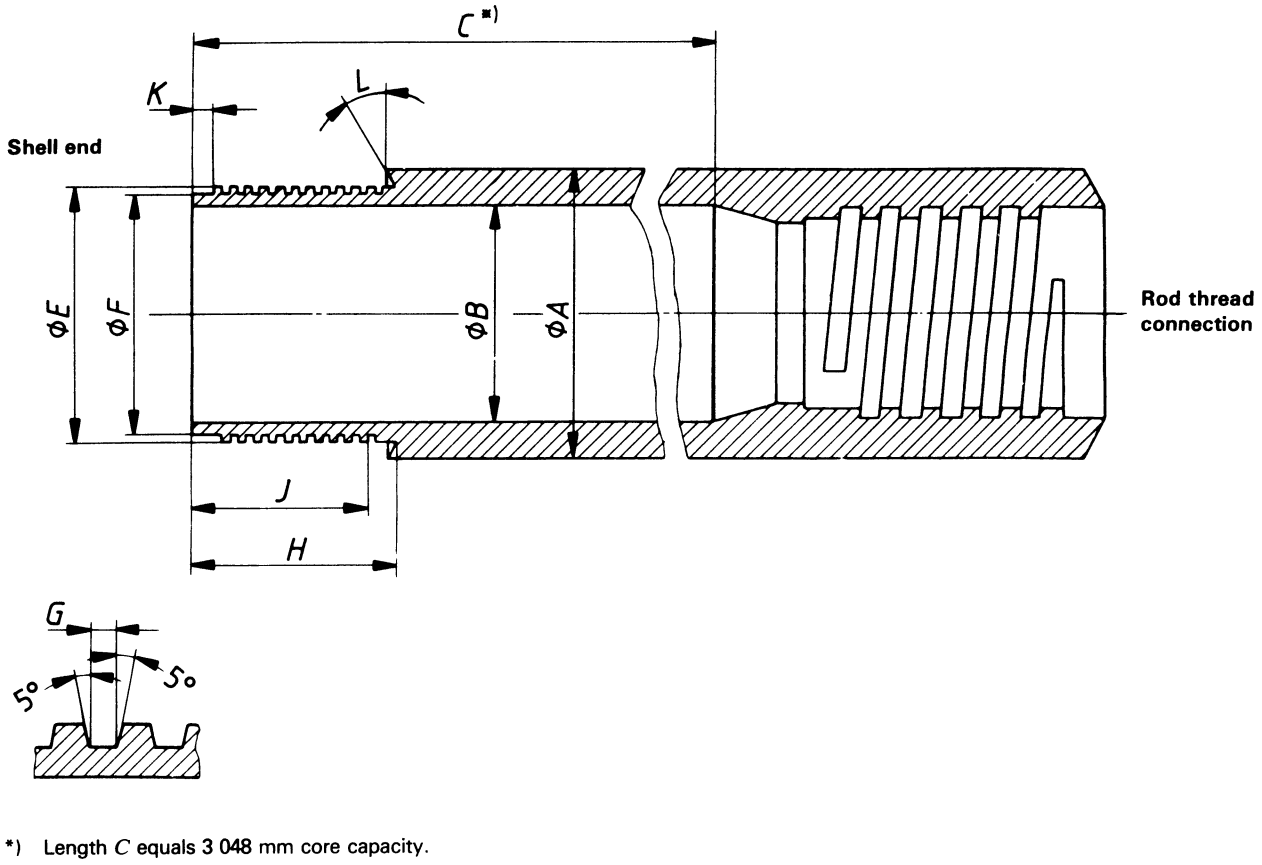


Figure 46 — "WT" design single-tube core barrel — Reaming shell (see Table 43)

Table 43 — "WT" design single-tube core barrel — Reaming shell

Dimension		BWT	NWT	HWT
A	max. min.	58,93 58,83	74,55 74,45	97,94 97,84
A_1	max. min.	58,6 58,5	74,27 74,17	97,71 97,61
B	max. min.	46,08 45,97	60,38 60,27	82,6 82,5
C	max. min.	168,91 168,28	175,26 174,62	191,14 190,50
C_1	max. min.	51,18 50,42	54,36 53,59	63,88 63,12
M	max. min.	56,34 56,29	71,70 71,65	94,59 94,54
N	max. min.	54,76 54,71	70,13 70,08	93,01 92,96
Thread pitch (Threads per inch)		3,175 (8)	3,175 (8)	5,08 (5)
P	max. min.	1,63 1,55	1,63 1,55	2,59 2,51
Q	max. min.	35,41 35,28	38,56 38,43	44,93 44,81
R	min.	31,75	34,92	41,28
S	max. min.	5,0 4,5	5,0 4,5	5,79 5,28
T		15°	15°	15°
M_1	max. min.	53,98 53,92	69,24 69,19	92,46 92,41
N_1	max. min.	52,45 52,40	67,72 67,67	90,93 90,88
Thread pitch (Threads per inch)		3,175 (8)	3,175 (8)	5,08 (5)
P_1	max. min.	1,63 1,55	1,63 1,55	2,59 2,51
Q_1	max. min.	42,85 42,34	46,02 45,52	54,25 53,75
R_1	min.	28,58	31,75	38,1
S_1	max. min.	5,0 4,5	5,0 4,5	5,79 5,28
T_1		15°	15°	15°
X	max. min.	60,07 59,82	75,82 75,56	99,36 99,11

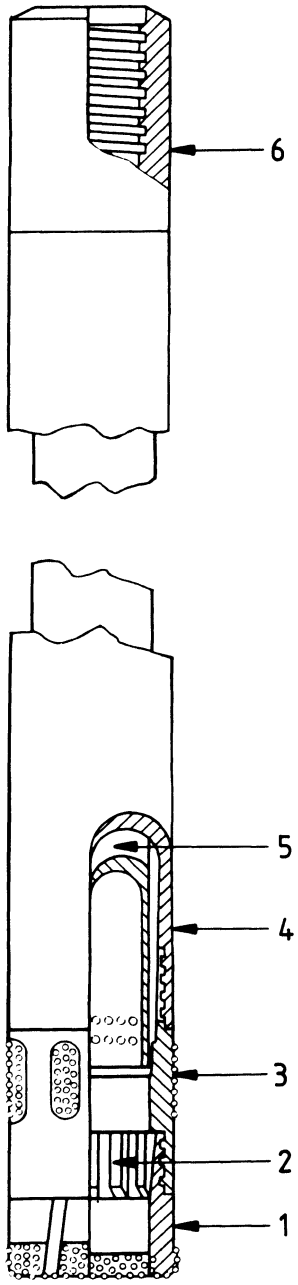


*) Length *C* equals 3 048 mm core capacity.

Figure 47 — "WT" design single-tube core barrel — Tube (see Table 44)

Table 44 — "WT" design single-tube core barrel — Tube

Dimension		BWT	NWT	HWT
A	max. min.	58,98 58,72	74,07 73,81	97,21 96,82
B	max. min.	46,84 46,58	61,90 61,65	84,12 83,62
C	min.	2 981,32	2 981,32	2 981,32
E	max. min.	56,24 56,18	71,60 71,55	94,49 94,44
F	max. min.	54,66 54,58	70,03 69,95	92,91 92,79
Thread pitch (Threads per inch)		3,175 (8)	3,175 (8)	5,08 (5)
G	max. min.	1,63 1,55	1,63 1,55	2,59 2,51
H	max. min.	35,28 35,15	38,43 38,30	44,81 44,68
J	min.	31,75	34,92	41,28
K	max. min.	5,0 4,5	5,0 4,5	5,79 5,28
L		15°	15°	15°
Rod thread connection		BW	NW	HW
NOTE Detachable head is at the manufacturer's choice.				



Key

Ref. No.	Description
1	Core bit bevel wall
2	Core lifter
3	Reaming shell
4	Outer tube
5	Inner tube
6	Head: rigid or swivel

NOTE 1 Bits and core springs are interchangeable between double-tube and single-tube barrels.
NOTE 2 Standard "WT" design core barrel lengths are 1,5 m and 3 m (lengths refer to core capacity).

Figure 48 — "WT" design double-tube core barrel — Assembly — Rigid and swivel types BWT, NWT and HWT

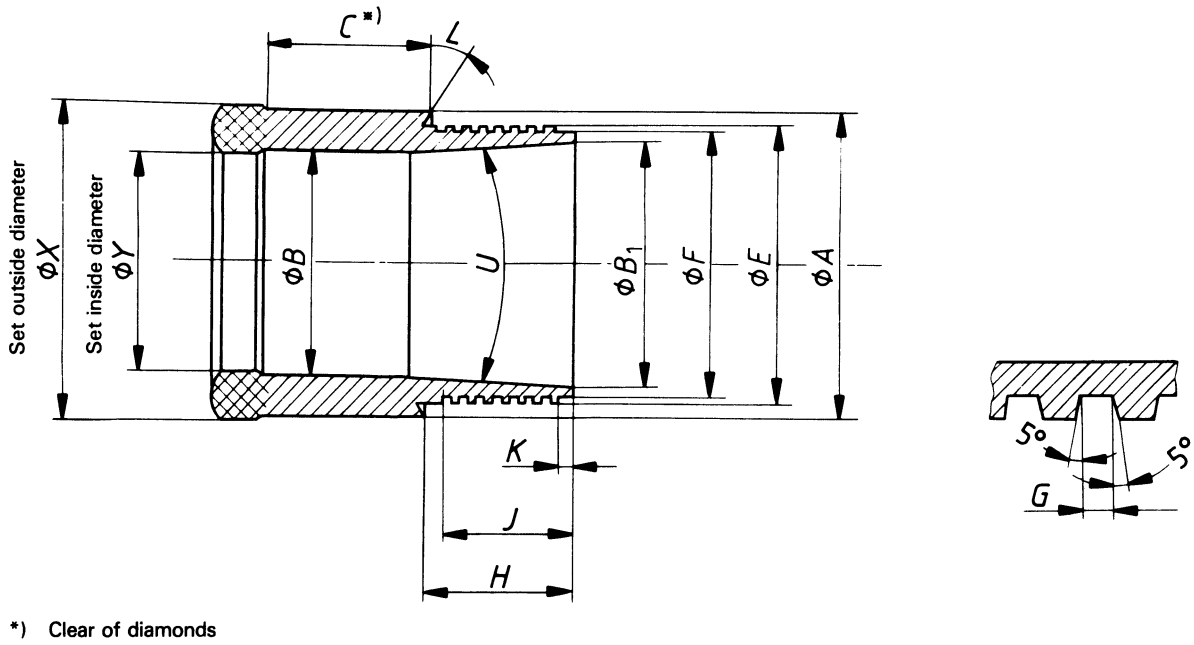
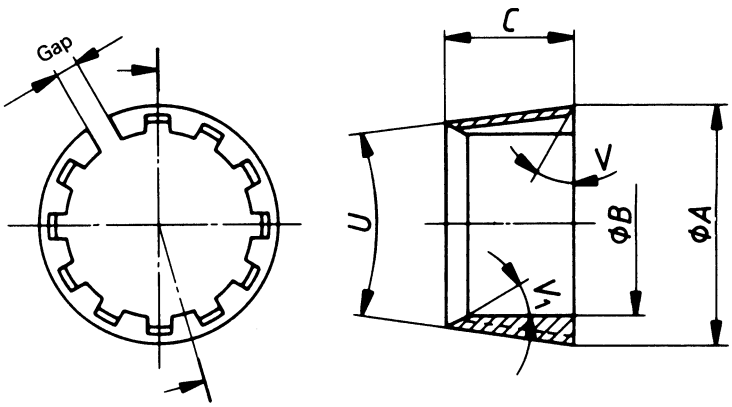


Figure 49 — "WT" design core barrel — Single and double type — Bevel wall core bit
(see Table 45)

Table 45 — "WT" design core barrel — Single and double type — Bevel wall core bit

Dimension		BWT	NWT	HWT
A	max. min.	58,6 58,5	74,27 74,17	97,71 97,61
B	max. min.	46,23 45,97	60,53 60,27	82,73 82,47
B_1	max. min.	50,39 50,29	65,74 65,63	88,75 88,65
C	min.	31,75	34,93	38,1
E	max. min.	53,87 53,82	69,14 69,09	92,35 92,30
F	max. min.	52,35 52,27	67,61 67,54	90,83 90,75
Thread pitch (Threads per inch)		3,175 (8)	3,175 (8)	5,08 (5)
G	max. min.	1,63 1,55	1,63 1,55	2,59 2,51
H	max. min.	29,46 28,96	32,69 32,18	39,07 38,56
J	min.	25,4	28,58	34,93
K	max. min.	1,83 1,32	1,83 1,32	1,83 1,32
L		15°	15°	15°
U	max. min.	6° 15′ 5° 45′	6° 15′ 5° 45′	5° 15′ 4° 45′
X	max. min.	59,69 59,44	75,44 75,18	98,98 98,60
Y	max. min.	44,58 44,32	58,88 58,62	81,08 80,82



NOTE Width of gap, entry angle and number of flutes are left to the manufacturer.

Figure 50 — "WT" design core barrel — Single and double type — Core lifter (see Table 46)

Table 46 — "WT" design core barrel — Single and double type — Core lifter

Dimension		BWT	NWT	HWT
A	max. min.	50,39 50,29	65,74 65,63	88,75 88,65
B	max. min.	43,94 43,84	58,24 58,14	80,31 80,21
C	max. min.	30,53 29,77	38,48 37,72	51,18 50,42
U	max. min.	6° 15′ 5° 45′	6° 15′ 5° 45′	5° 15′ 4° 45′
V		10°	10°	10°
V_1		Optional		

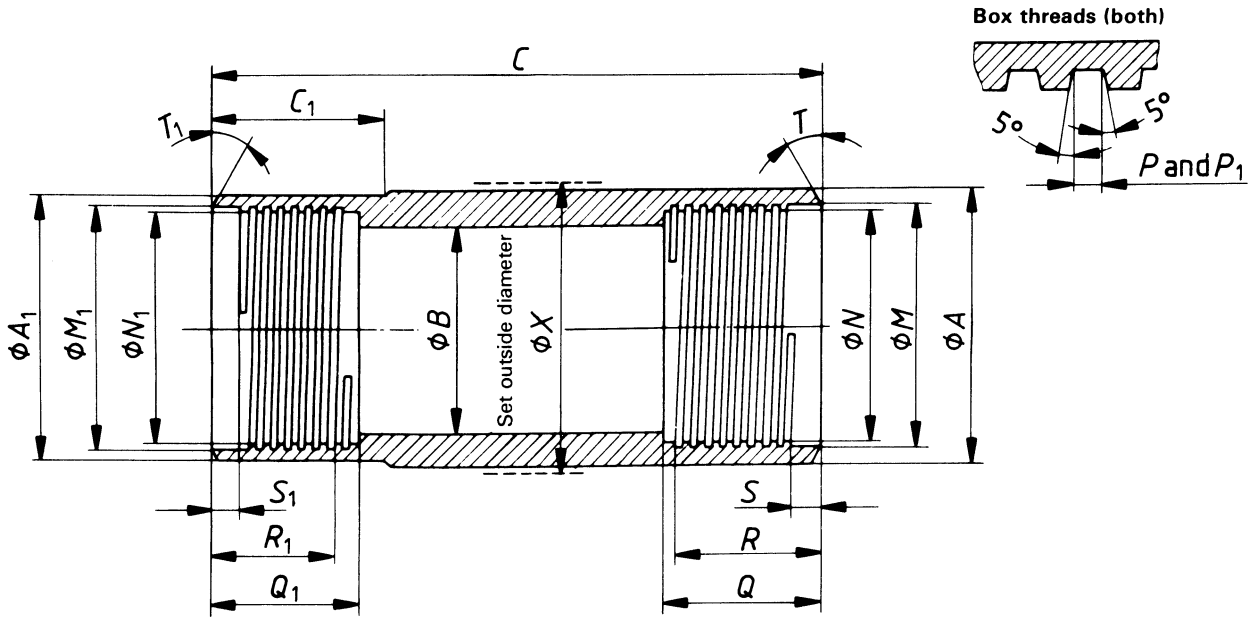


Figure 51 — "WT" design double-tube core barrel — Reaming shell (see Table 47)

Table 47 — "WT" design double-tube core barrel — Reaming shell

Dimension		BWT	NWT	HWT
A	max. min.	58,93 58,83	74,55 74,45	97,94 97,84
A_1	max. min.	58,6 58,5	74,27 74,17	97,71 97,61
B	max. min.	50,77 50,67	65,58 65,48	87,81 87,71
C	max. min.	143,56 143,05	149,86 149,35	165,76 165,25
C_1	max. min.	51,18 50,42	54,36 53,59	63,88 63,12
M	max. min.	56,34 56,29	71,70 71,65	94,59 94,54
N	max. min.	54,76 54,71	70,13 70,08	93,01 92,96
Thread pitch (Threads per inch)		3,175 (8)	3,175 (8)	5,08 (5)
P	max. min.	1,63 1,55	1,63 1,55	2,59 2,51
Q	max. min.	35,40 35,28	38,56 38,43	44,93 44,81
R	min.	31,75	34,93	41,28
S	max. min.	5,0 4,5	5,0 4,5	5,79 5,28
T		15°	15°	15°
M_1	max. min.	53,98 53,92	69,24 69,19	92,46 92,41
N_1	max. min.	52,45 52,40	67,72 67,67	90,93 90,88
Thread pitch (Threads per inch)		3,175 (8)	3,175 (8)	5,08 (5)
P_1	max. min.	1,63 1,55	1,63 1,55	2,59 2,51
Q_1	max. min.	42,85 42,34	46,02 45,52	54,25 53,75
R_1	min.	28,58	31,75	38,1
S_1	max. min.	5,0 4,5	5,0 4,5	5,79 5,28
T_1		15°	15°	15°
X	max. min.	60,07 59,82	75,82 75,57	99,36 99,11

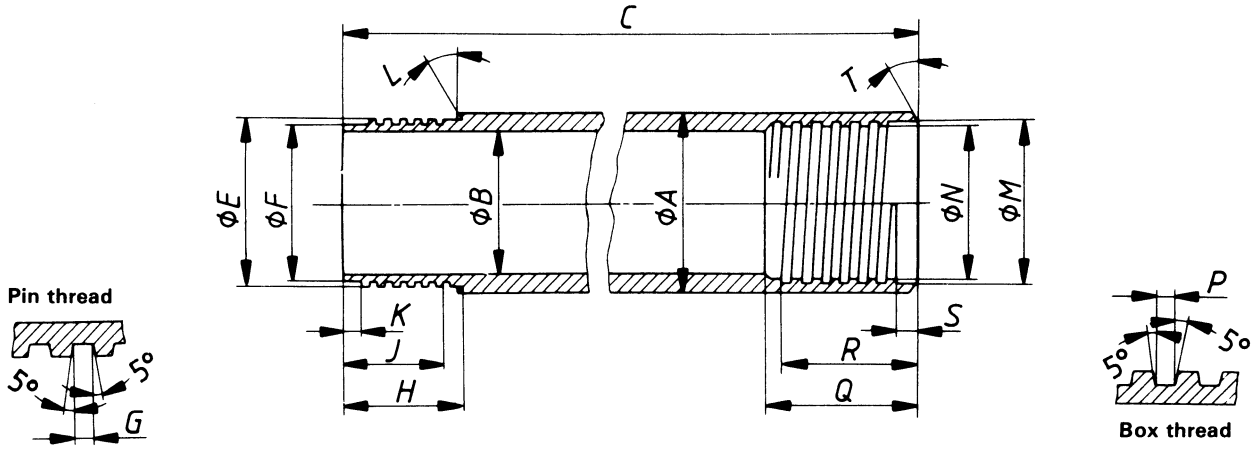


Figure 52 — "WT" design double-tube core barrel — Outer tube (see Table 48)

Table 48 — "WT" design double-tube core barrel — Outer tube

Dimension		BWT	NWT	HWT
A	max. min.	58,98 58,72	74,07 73,81	97,21 96,82
B	max. min.	51,59 51,33	66,68 66,42	88,90 88,39
C	max. min.	3 211,09 3 210,33	3 211,09 3 210,33	3 180,46 3 179,70
E	max. min.	56,24 56,18	71,60 71,55	94,49 94,44
F	max. min.	54,66 54,58	70,03 69,95	92,91 92,79
Thread pitch (Threads per inch)		3,175 (8)	3,175 (8)	5,08 (5)
G	max. min.	1,63 1,55	1,63 1,55	2,59 2,51
H	max. min.	35,28 35,15	38,43 38,30	44,81 44,68
J	min.	31,75	34,93	41,28
K	max. min.	5,0 4,5	5,0 4,5	5,79 5,28
L		15°	15°	15°
M	max. min.	54,05 54,00	69,93 69,88	91,31 91,26
N	max. min.	52,45 52,40	68,33 68,28	89,71 89,66
Thread pitch (Threads per inch)		3,175 (8)	3,175 (8)	5,08 (5)
P	max. min.	1,63 1,55	1,63 1,55	2,59 2,51
Q	min.	42,85	49,2	48,41
R	min.	39,67	46,02	45,24
S	max. min.	5,0 4,5	5,0 4,5	5,79 5,28
T		30°	30°	15°

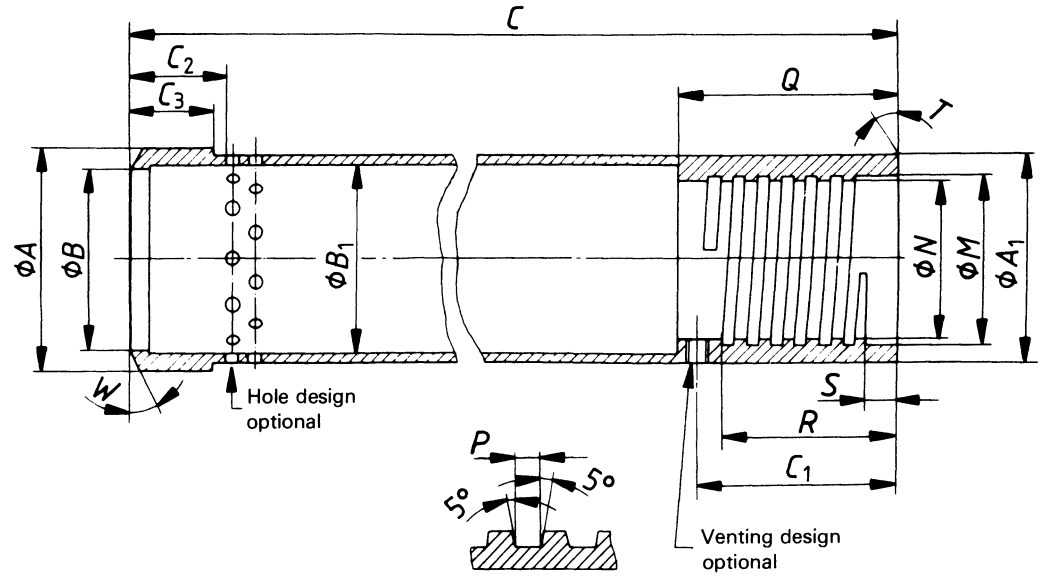


Figure 53 — "WT" design double-tube core barrel — Inner tube (see Table 49)

Table 49 — "WT" design double-tube core barrel — Inner tube

Dimension		BWT	NWT	HWT
A	max. min.	50,50 50,42	65,30 65,23	87,53 87,45
A_1	max. min.	49,45 49,20	63,75 63,50	85,98 85,73
B	max. min.	46,02 45,90	60,33 60,20	82,55 82,42
B_1	max. min.	46,02 45,77	60,33 60,07	82,55 82,04
C	max. min.	3 108,33 3 107,69	3 108,33 3 107,69	3 114,68 3 114,04
C_1	max. min.	37,26 35,74	40,44 38,91	43,61 42,09
C_2	min.	20,62	23,8	26,97
C_3	max. min.	19,43 19,05	22,61 22,23	25,78 25,40
M	max. min.	41,35 41,30	57,23 57,18	63,60 63,55
N	max. min.	38,96 38,91	54,84 54,79	61,49 61,44
Thread pitch (Threads per inch)		3,175 (8)	3,175 (8)	5,08 (5)
P	max. min.	1,63 1,55	1,63 1,55	2,59 2,51
Q	max. min.	47,75 47,50	50,93 50,67	54,10 53,85
R	min.	25,4	28,58	31,75
S	max. min.	5,0 4,5	5,0 4,5	5,79 5,28
T		0°	0°	0°
Holes (minimum total area), mm^2		238,7	325,16	419,35
W		10°	10°	10°

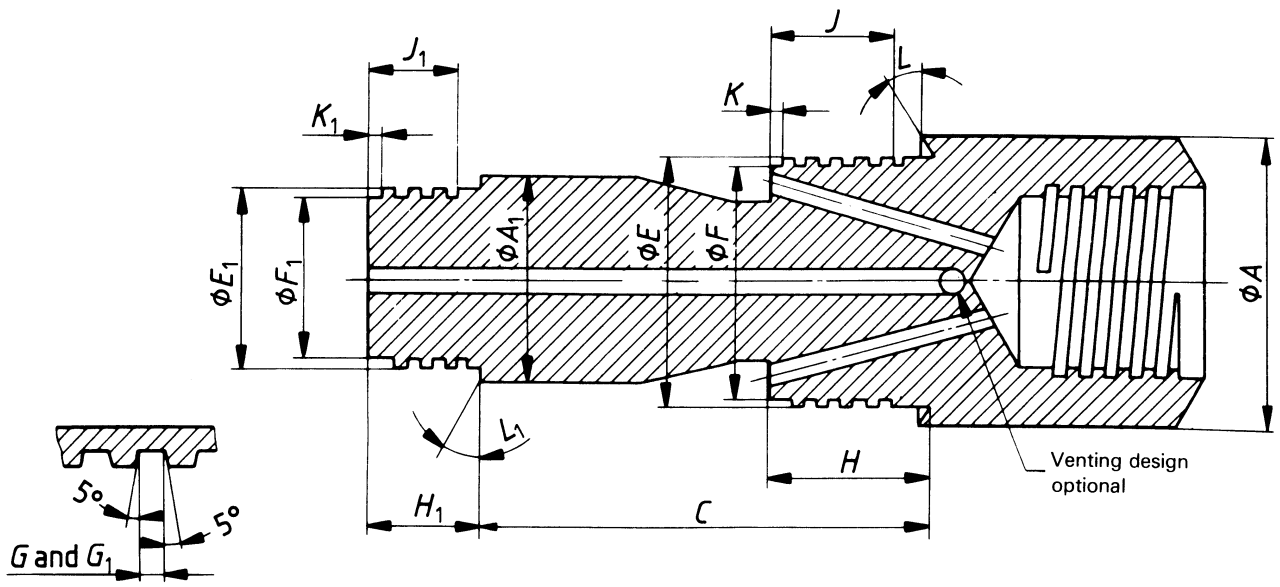
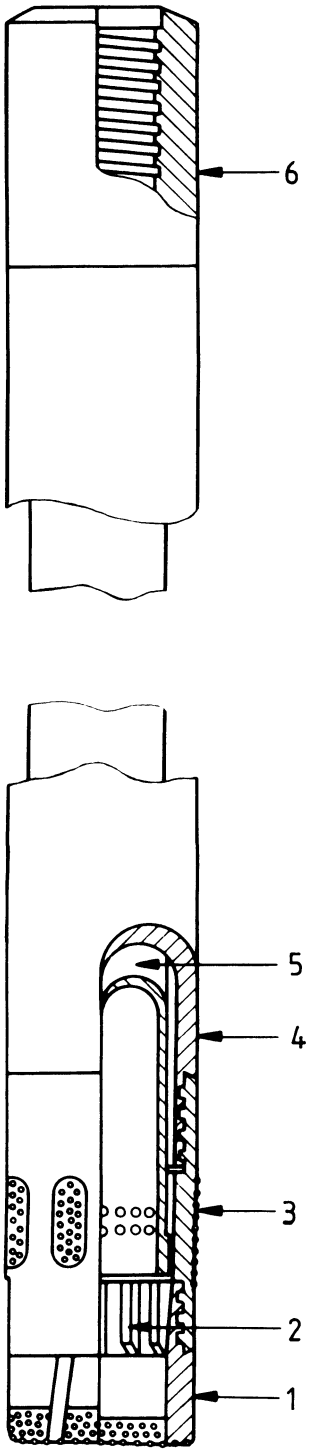


Figure 54 — "WT" design double-tube core barrel — Head (see Table 50)

Table 50 — "WT" design double-tube core barrel — Head

Dimension		BWT[a]	NWT[a]	HWT
A	max. min.	58,06 57,81	73,94 73,69	97,03 96,65
A_1	max. min.	47,88 47,63	63,75 63,50	85,98 85,73
C	max. min.	170,54 169,90	170,54 169,90	134,42 133,78
E	max. min.	53,95 53,90	69,82 69,77	91,21 91,16
F	max. min.	52,35 52,22	68,22 68,10	89,61 89,48
Thread pitch (Threads per inch)		3,175 (8)	3,175 (8)	5,08 (5)
G	max. min.	1,63 1,55	1,63 1,55	2,59 2,51
H	max. min.	39,27 38,89	45,62 45,24	45,21 44,83
J	min.	34,93	41,28	41,28
K	max. min.	3,43 2,92	3,43 2,92	3,43 2,92
L		30°	30°	15°
E_1	max. min.	41,25 41,20	57,12 57,07	63,50 63,45
F_1	max. min.	38,86 38,74	54,74 54,61	61,39 61,26
Thread pitch (Threads per inch)		3,175 (8)	3,175 (8)	5,08 (5)
G_1	max. min.	1,63 1,55	1,63 1,55	2,59 2,51
H_1	max. min.	25,40 25,02	28,58 28,19	31,75 31,37
J_1	min.	22,23	25,4	28,58
K_1	max. min.	3,43 2,92	3,43 2,92	3,43 2,92
L_1		0°	0°	0°
Rod thread connection		BW	NW	HW

[a] Interchangeable with BWM and NWM.



Key

Ref. No.	Description
1	Core bit bevel wall, or core bit straight wall
2	Core lifter
3	Reaming shell
4	Outer tube
5	Inner tube
6	Head — rigid type

NOTE 1 No core spring is used with straight-walled bits.
NOTE 2 Standard "WT" design core barrel lengths are 1,5 m and 3 m (lengths refer to core capacity).

Figure 55 — "WT" design double-tube core barrel — Assembly — Rigid type RWT, EWT and AWT

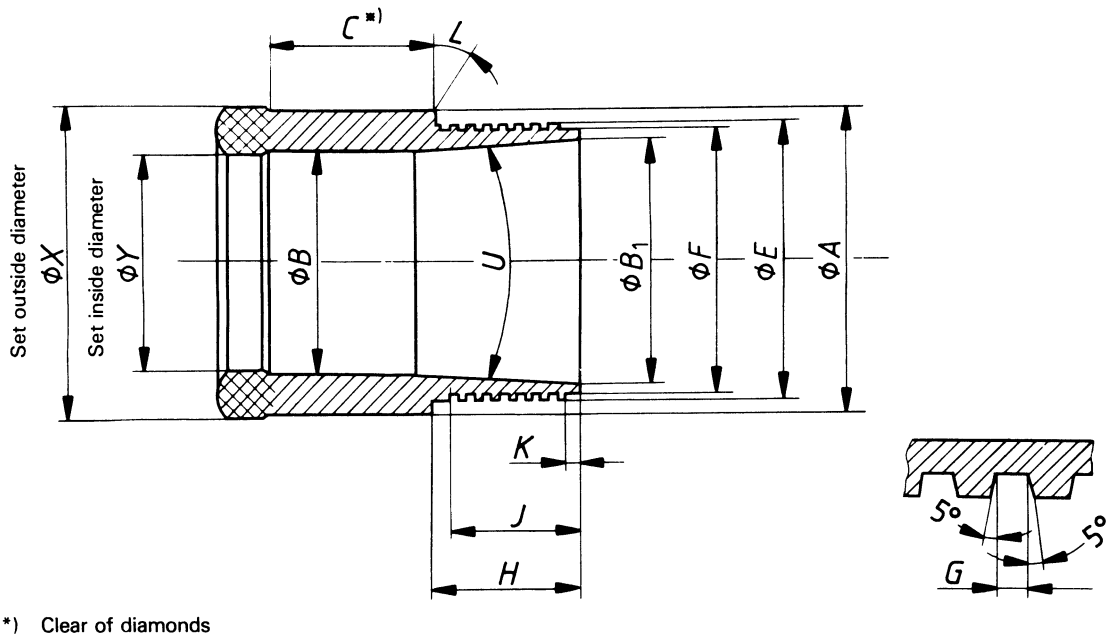


Figure 56 — "WT" design double-tube core barrel — Bevel wall core bit (see Table 51)

Table 51 — "WT" design double-tube core barrel — Bevel wall core bit

Dimension		RWT	EWT	AWT
A	max. min.	28,75 28,65	36,25 36,14	46,66 46,56
B	max. min.	19,81 19,43	24,76 24,51	34,32 34,06
B_1	max. min.	22,58 22,53	28,6 28,5	38,91 38,81
C	min.	28,58	31,75	31,75
E	max. min.	24,56 24,51	31,72 31,67	42,04 41,99
F	max. min.	23,37 23,32	30,12 30,05	40,44 40,34
Thread pitch (Threads per inch)		3,175 (8)	3,175 (8)	3,175 (8)
G	max. min.	1,63 1,55	1,63 1,55	1,63 1,55
H	max. min.	22,48 21,97	29,62 29,11	32,79 32,28
J	max.	19,84	26,97	30,15
K	max. min.	5,0 4,5	7,39 6,88	7,39 6,88
L		0°	0°	0°
U	max. min.	8° 15′ 7° 45′	7° 15′ 6° 45′	7° 15′ 6° 45′
X	max. min.	29,59 29,34	37,46 37,21	47,75 47,50
Y	max. min.	18,80 18,54	23,11 22,86	32,66 32,41

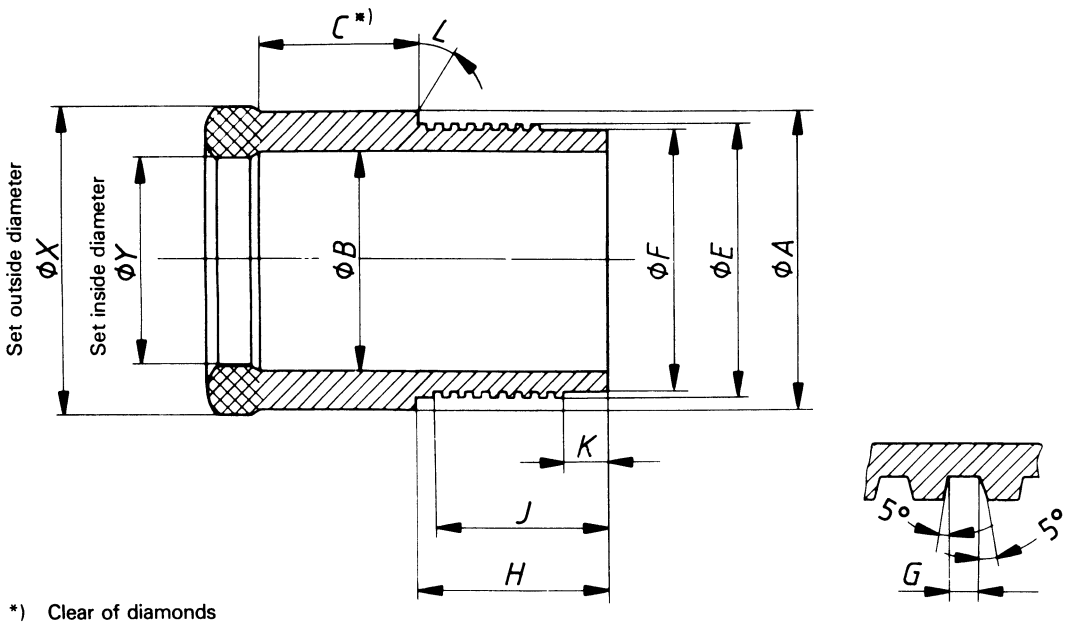
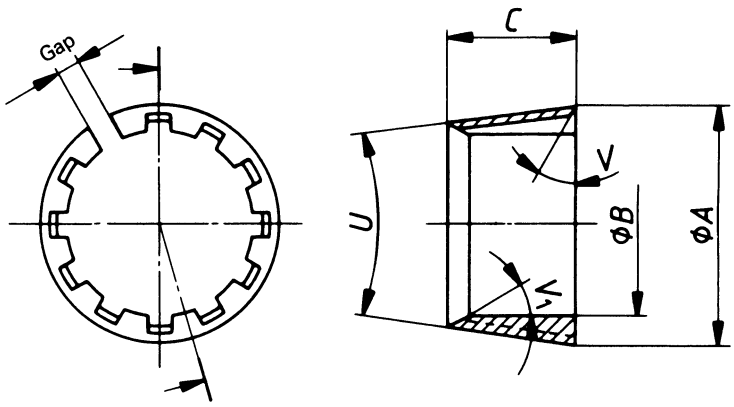


Figure 57 — "WT" design double-tube core barrel — Straight wall core bit (see Table 52)

Table 52 — "WT" design double-tube core barrel — Straight wall core bit

Dimension		RWT	EWT	AWT
A	max. min.	28,75 28,65	36,25 36,14	46,66 46,56
B	max. min.	19,81 19,43	24,76 24,51	34,32 34,06
C	min.	28,58	31,75	31,75
E	max. min.	24,56 24,51	31,72 31,67	42,04 41,99
F	max. min.	23,37 23,32	30,12 30,05	40,44 40,34
Thread pitch (Threads per inch)		3,175 (8)	3,175 (8)	3,175 (8)
G	max. min.	1,63 1,55	1,63 1,55	1,63 1,55
H	max. min.	27,2 26,7	29,62 29,11	32,79 32,28
J	min.	24,59	26,97	30,15
K	max. min.	6,6 6,1	7,39 6,88	7,39 6,88
L		0°	0°	0°
X	max. min.	29,59 29,34	37,46 37,21	47,75 47,50
Y	max. min.	18,80 18,54	23,11 22,86	32,66 32,41



NOTE Width of gap, entry angle and number of flutes are left to the manufacturer.

Figure 58 — "WT" design double-tube core barrel — Core lifter (see Table 53)

Table 53 — "WT" design double-tube core barrel — Core lifter

Dimension		RWT	EWT	AWT
A	max. min.	22,91 22,81	27,58 27,48	37,80 37,69
B	max. min.	18,29 18,19	22,61 22,50	32,16 32,05
C	max. min.	16,26 15,49	19,43 18,67	22,61 21,84
U	max. min.	8° 15′ 7° 45′	7° 15′ 6° 45′	7° 15′ 6° 45′
V		0°	0°	0°
V_1		Optional		

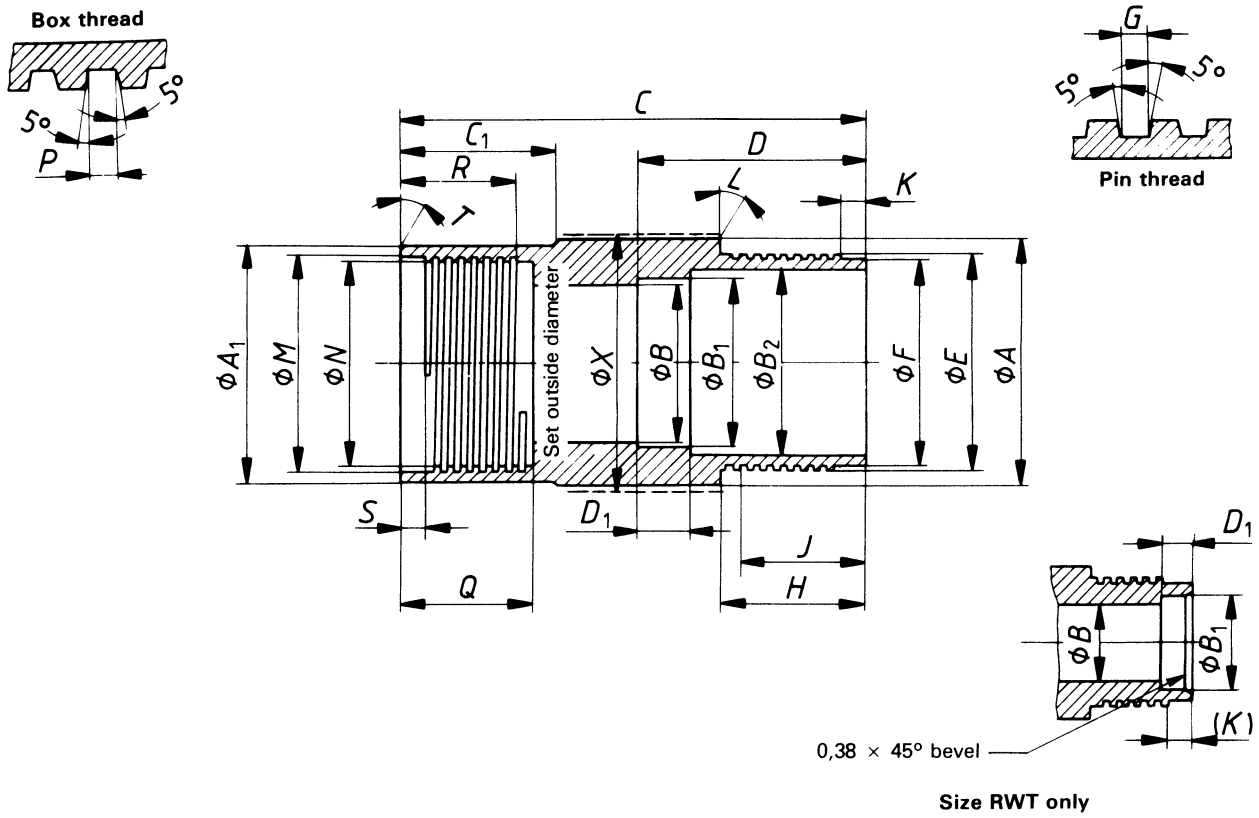


Figure 59 — "WT" design double-tube core barrel — Reaming shell (see Table 54)

Table 54 — "WT" design double-tube core barrel — Reaming shell

Dimension		RWT	EWT	AWT
A	max. min.	28,75 28,65	36,96 36,86	47,14 47,04
A_1	max. min.	28,75 28,65	36,25 36,14	46,66 46,56
B	max. min.	19,81 19,43	24,76 24,51	34,32 34,06
B_1	max. min.	21,46 21,33	27,51 27,25	37,03 36,78
B_2	max. min.	— —	28,63 28,52	37,82 37,69
C	max. min.	92,58 92,08	111,63 111,12	133,86 133,35
C_1	max. min.	— —	36,63 36,50	39,80 39,67
D	max. min.	— —	51,97 51,59	58,32 57,94
D_1	max. min.	5,21 4,83	8,26 7,87	8,26 7,87
E	max. min.	24,56 24,51	33,30 33,25	42,82 42,77
F	max. min.	23,37 23,32	31,72 31,67	41,25 41,20
Thread pitch (Threads per inch)		3,175 (8)	3,175 (8)	3,175 (8)
G	max. min.	1,63 1,55	1,63 1,55	1,63 1,55
H	max. min.	16,08 15,88	25,4 25,2	31,75 31,55
J	min.	13,49	23,01	28,58
K	max. min.	1,83 1,32	3,43 2,92	3,43 2,92
L		0°	0°	0°
M	max. min.	24,66 24,61	31,83 31,78	42,14 42,09
N	max. min.	23,47 23,42	30,23 30,18	40,54 40,49
Thread pitch (Threads per inch)		3,175 (8)	3,175 (8)	3,175 (8)
P	max. min.	1,63 1,55	1,63 1,55	1,63 1,55
Q	max. min.	28,70 28,58	30,28 30,15	33,45 33,32
R	min.	22,22	23,8	26,97
S	max. min.	3,43 2,92	3,43 2,92	3,43 2,92
T		0°	0°	0°
X	max. min.	29,97 29,72	37,85 37,59	48,13 47,88

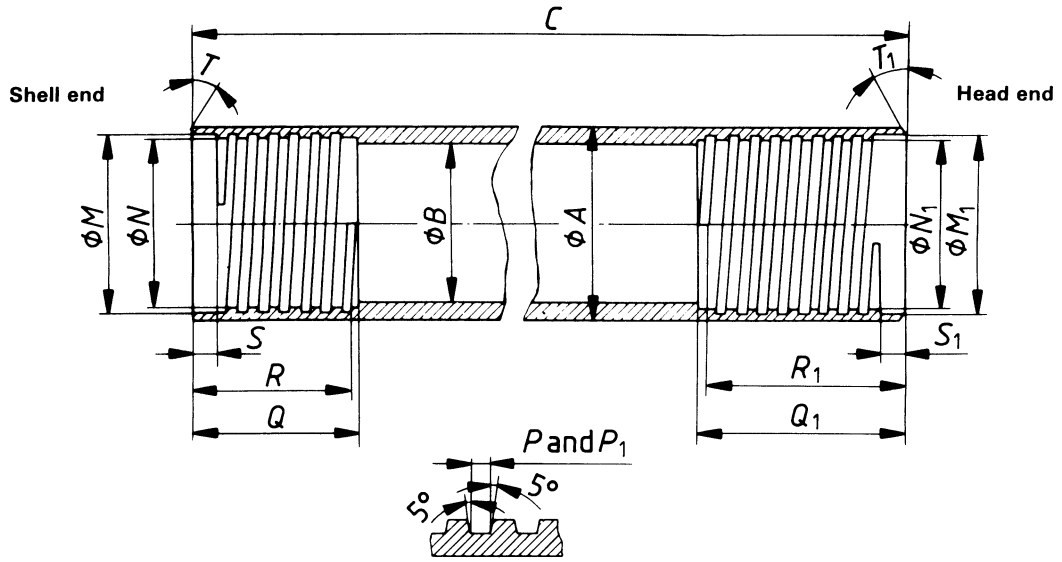


Figure 60 — "WT" design double-tube core barrel — Outer tube (see Table 55)

Table 55 — "WT" design double-tube core barrel — Outer tube

Dimension		RWT	EWT	AWT
A	max. min.	28,70 28,58	36,63 36,50	47,07 46,81
B	max. min.	22,61 22,48	28,96 28,83	38,89 38,63
C	max. min.	3 063,06 3 062,27	3 035,68 3 034,89	3 048,38 3 047,59
M	max. min.	24,66 24,61	33,40 33,35	42,93 42,88
N	max. min.	23,47 23,42	31,83 31,78	41,35 41,30
Thread pitch (Threads per inch)		3,175 (8)	3,175 (8)	3,175 (8)
P	max. min.	1,63 1,55	1,63 1,55	1,63 1,55
Q	max. min.	19,05 18,64	25,6 25,4	31,95 31,75
R	min.	15,88	22,22	28,58
S	max. min.	3,43 2,92	3,43 2,92	3,43 2,92
T		0°	0°	0°
M_1	max. min.	24,66 24,61	31,01 30,96	41,35 41,30
N_1	max. min.	23,47 23,42	29,44 29,39	39,75 39,70
Thread pitch (Threads per inch)		3,175 (8)	3,175 (8)	3,175 (8)
P_1	max. min.	1,63 1,55	1,63 1,55	1,63 1,55
Q_1	min.	30,15	44,45	50,8
R_1	min.	26,97	41,28	47,62
S_1	max. min.	4,22 3,71	5,0 4,5	5,0 4,5
T_1		30°	30°	30°

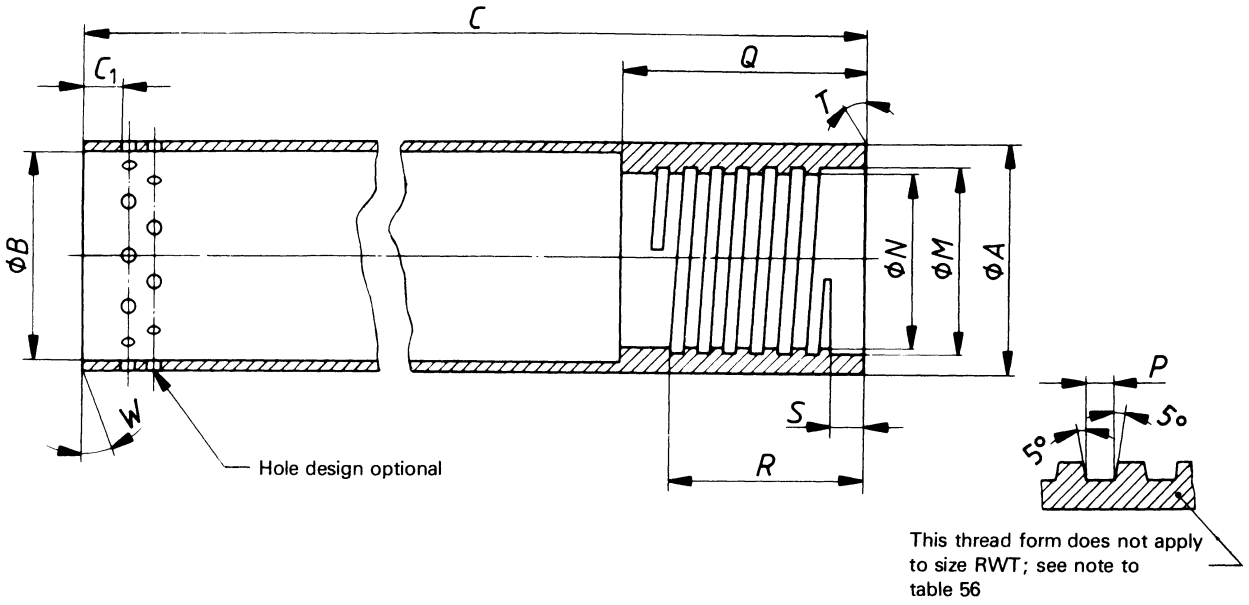


Figure 61 — "WT" design double-tube core barrel — Inner tube (see Table 56)

Table 56 — "WT" design double-tube core barrel — Inner tube

Dimension		RWT	EWT	AWT
A	max. min.	21,16 21,03	27,10 26,97	36,63 36,50
B	max. min.	19,43 19,33	24,59 24,46	34,11 33,86
C	max. min.	3 016,25 3 015,46	3 009,90 3 009,09	3 014,65 3 013,89
C_1	min.	6,73	8,33	8,33
M	max. min.	[a]	17,53 17,48	25,48 25,43
N	max. min.	[a]	15,95 15,90	23,88 23,83
Thread pitch (Threads per inch)		[a]	3,175 (8)	3,175 (8)
P	max. min.	[a]	1,63 1,55	1,63 1,55
Q	max. min.	12,83 12,57	38,23 37,97	50,93 50,67
R	min.	—	28,58	28,58
S	max. min.	3,43 2,92	3,81 3,30	3,81 3,30
T		0°	0°	0°
Holes (minimum total area), mm^2		81,92	142,55	185,76
W		0°	0°	0°

[a] The thread for RWT is 1/2-13 UNC-2B (see ISO 263 and ISO 5864). The dimensions are given in inches as this is established international practice.

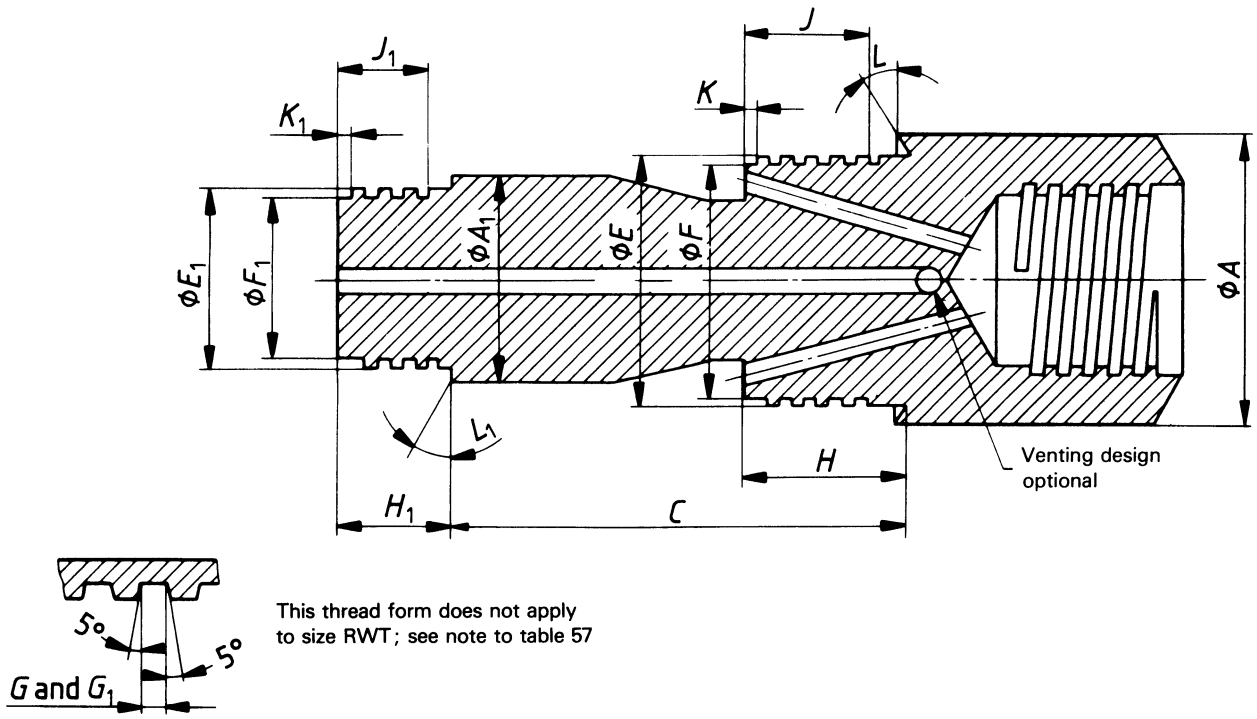


Figure 62 — "WT" design double-tube core barrel — Head — Sizes RWT, EWT and AWT (see Table 57)

Table 57 — "WT" design double-tube core barrel — Head — Sizes RWT, EWT and AWT

Dimension		RWT	EWT	AWT
A	max. min.	28,70 28,45	36,63 36,37	47,07 46,81
A_1	max. min.	21,16 21,03	25,53 25,40	35,05 34,92
C	max. min.	34,82 34,44	51,16 50,77	59,11 58,72
E	max. min.	24,56 24,51	30,91 30,86	41,25 41,20
F	max. min.	23,37 23,32	29,34 29,29	39,65 39,60
Thread pitch (Threads per inch)		3,175 (8)	3,175 (8)	3,175 (8)
G	max. min.	1,63 1,55	1,63 1,55	1,63 1,55
H	max. min.	26,57 26,19	39,73 39,34	46,10 45,72
J	min.	23,01	34,92	41,28
K	max. min.	1,70 1,45	1,70 1,45	1,70 1,45
L		30°	30°	30°
E_1	max. min.	[a]	17,42 17,37	25,37 25,32
F_1	max. min.	[a]	15,85 15,80	23,77 23,72
Thread pitch (Threads per inch)		[a]	3,175 (8)	3,175 (8)
G_1	max. min.	[a]	1,63 1,55	1,63 1,55
H_1	max. min.	12,70 12,32	25,40 25,02	25,40 25,02
J_1	min.	10,16	22,22	22,22
K_1	max. min.	1,70 1,45	1,70 1,45	1,70 1,45
L_1		0°	0°	0°
Rod thread connection		RW	EW	AW

[a] The thread for RWT is 1/2-13 UNC-2A (see ISO 263 and ISO 5864). The dimensions are given in inches as this is established international practice.

List of references

See national foreword.

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