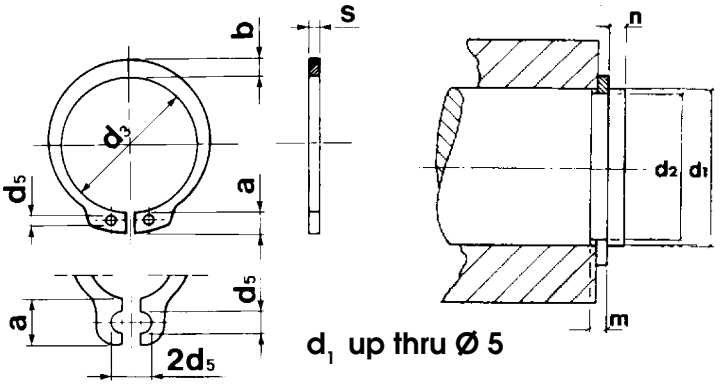
External Retaining Rings (A) DIN 471



d_1 up thru Ø 5

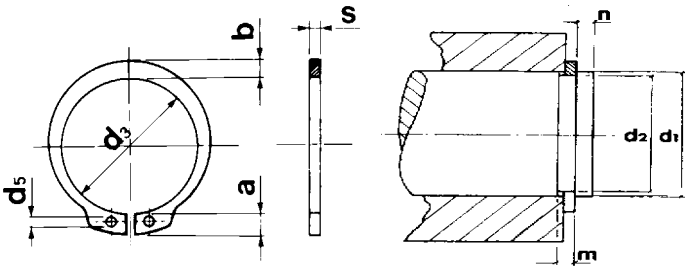
d_1 up thru Ø 27 = C60-DIN 17222
d_1 Ø 28 and above = C75 DIN 17222
d_1 up thru Ø 48 =47- 54 HRc hardness
d_1 Ø 50 and above =44 - 51 HRc hardness

d_1	S h11	d_3	a max.	b	d_5 min.	d_2	Groove Width min.	Weight kg/1000
A 3	0.40	2.7	2.0	1.6	1	2.8	0.50	0.017
A 4	0.40	3.7	2.2	0.9	1	3.8	0.50	0.035
A 5	0.60	4.7	2.5	1.1	1	4.8	0.70	0.081
A 6	0.70	5.6	2.7	1.3	1.2	5.7	0.80	0.124
A 7	0.80	6.5	3.1	1.4	1.2	6.7	0.90	0.198
A 8	0.80	7.4	3.2	1.5	1.2	7.6	0.90	0.227
A 9	1.00	8.4	3.3	1.7	1.2	8.6	1.10	0.382
A 10	1.00	9.3	3.3	1.8	1.5	9.6	1.10	0.416
A 11	1.00	10.2	3.3	1.8	1.5	10.5	1.10	0.465
A 12	1.00	11.0	3.3	1.8	1.7	11.5	1.10	0.487
A 13	1.00	11.9	3.4	2.0	1.7	12.4	1.10	0.587
A 14	1.00	12.9	3.5	2.1	1.7	13.4	1.10	0.655
A 15	1.00	13.8	3.6	2.2	1.7	14.3	1.10	0.746
A 16	1.00	14.7	3.7	2.2	1.7	15.2	1.10	0.794
A 17	1.00	15.7	3.8	2.3	1.7	16.2	1.10	0.901
A 18	1.20	16.5	3.9	2.4	2	17.0	1.30	1.19
A 19	1.20	17.5	3.9	2.5	2	18.0	1.30	1.27
A 20	1.20	18.5	4.0	2.6	2	19.0	1.30	1.36
A 21	1.20	19.5	4.1	2.7	2	20.0	1.30	1.47
A 22	1.20	20.5	4.2	2.8	2	21.0	1.30	1.62
A 23	1.20	21.5	4.3	2.9	2	22.0	1.30	1.77
A 24	1.20	22.2	4.4	3.0	2	22.9	1.30	1.87
A 25	1.20	23.2	4.4	3.0	2	23.9	1.30	1.92
A 26	1.20	24.2	4.5	3.1	2	24.9	1.30	2.11
A 27	1.20	24.9	4.6	3.1	2	25.6	1.30	2.19
A 28	1.50	25.9	4.7	3.2	2	26.6	1.60	2.88
A 29	1.50	26.9	4.8	3.4	2	27.6	1.60	3.11
A 30	1.50	27.9	5.0	3.5	2	28.6	1.60	3.39
A 31	1.50	28.6	5.0	3.5	2.5	29.3	1.60	3.42
A 32	1.50	29.6	5.2	3.6	2.5	30.3	1.60	3.55
A 33	1.50	30.5	5.2	3.7	2.5	31.3	1.60	4.01
A 34	1.50	31.5	5.4	3.8	2.5	32.3	1.60	4.14
A 35	1.50	32.2	5.6	3.9	2.5	33.0	1.60	4.34
A 36	1.75	33.2	5.6	4.0	2.5	34.0	1.85	4.80
A 37	1.75	34.2	5.7	4.1	2.5	35.0	1.85	5.50
A 38	1.75	35.2	5.8	4.2	2.5	36.0	1.85	5.82
A 39	1.75	36.0	5.9	4.3	2.5	37.0	1.85	6.10
A 40	1.75	36.5	6.0	4.4	2.5	37.5	1.85	6.30
A 41	1.75	37.5	6.2	4.5	2.5	38.5	1.85	6.45
A 42	1.75	38.5	6.5	4.5	2.5	39.5	1.85	6.65
A 44	1.75	40.5	6.6	4.6	2.5	41.5	1.85	7.20
								7.50

d_1	S h11	d_3	a max.	b	d_5 min.	d_2	Groove Width min.	Weight kg/1000
A 45	1.75	41.5	6.7	4.7	2.5	42.5	1.85	7.65
A 46	1.75	42.5	6.7	4.8	2.5	43.5	1.85	7.80
A 47	1.75	43.5	6.8	4.9	2.5	44.5	1.85	7.90
A 48	1.75	44.5	6.9	5.0	2.5	45.5	1.85	10.20
A 50	2.00	45.8	6.9	5.1	2.5	47.0	2.15	11.10
A 52	2.00	47.8	7.0	5.2	2.5	49.5	2.15	11.20
A 54	2.00	49.8	7.1	5.3	2.5	51.0	2.15	11.50
A 55	2.00	50.8	7.2	5.4	2.5	52.0	2.15	11.80
A 56	2.00	51.8	7.3	5.5	2.5	53.0	2.15	12.25
A 57	2.00	52.8	7.3	5.5	2.5	54.0	2.15	12.60
A 58	2.00	53.8	7.3	5.6	2.5	55.0	2.15	12.90
A 60	2.00	55.8	7.4	5.8	2.5	57.0	2.15	14.30
A 62	2.00	57.8	7.5	6.0	2.5	59.0	2.15	15.90
A 63	2.00	58.8	7.6	6.2	2.5	60.0	2.15	18.20
A 65	2.50	60.8	7.8	6.3	3	62.0	2.65	20.30
A 67	2.50	62.5	7.9	6.4	3	64.0	2.65	21.80
A 68	2.50	63.5	8.0	6.5	3	65.0	2.65	22.10
A 70	2.50	65.5	8.1	6.6	3	67.0	2.65	22.50
A 72	2.50	67.5	8.2	6.8	3	69.0	2.65	24.60
A 75	2.50	70.5	8.4	7.0	3	72.0	2.65	25.30
A 77	2.50	72.5	8.5	7.2	3	74.0	2.65	26.20
A 78	2.50	73.5	8.6	7.3	3	75.0	2.65	27.30
A 80	2.50	74.5	8.6	7.4	3	76.5	2.65	31.20
A 82	2.50	76.5	8.7	7.6	3	78.5	2.65	36.40
A 85	3.00	79.5	8.7	7.8	3.5	81.5	3.15	39.70
A 87	3.00	81.5	8.8	7.9	3.5	83.5	3.15	41.20
A 88	3.00	82.5	8.8	8.0	3.5	84.5	3.15	44.50
A 90	3.00	84.5	8.8	8.2	3.5	86.5	3.15	47.10
A 92	3.00	86.5	9.0	8.4	3.5	88.5	3.15	49.00
A 95	3.00	89.5	9.4	8.6	3.5	91.5	3.15	51.30
A 97	3.00	91.5	9.4	8.8	3.5	93.5	3.15	52.10
A 98	3.00	92.5	9.5	9.0	3.5	94.5	3.15	53.70
A 100	3.00	94.5	9.6	9.0	3.5	96.5	3.15	78.70
A 102	4.00	95.0	9.7	9.2	3.5	98.0	4.15	80.0
A 105	4.00	98.0	9.9	9.3	3.5	101.0	4.15	81.2
A 107	4.00	100.0	10.0	9.5	3.5	103.0	4.15	81.9
A 108	4.00	101.0	10.0	9.5	3.5	104.0	4.15	82.5
A 110	4.00	103.0	10.1	9.6	3.5	106.0	4.15	83.4
A 112	4.00	105.0	10.3	9.7	3.5	108.0	4.15	84.7
A 115	4.00	108.0	10.6	9.8	3.5	111.0	4.15	85.2
A 117	4.00	110.0	10.8	10.0	3.5	113.0	4.15	85.8

ISO/ DIN No. Heat-treatable Steel	C %	Si %	Mn %	P ≤%	S ≤%	Cr %	Mo %	Ni %
C60 (Nr.1.0601)	0.57-0.65	≤0.40	0.60-0.90	0.045	0.045	≤0.40	≤0.10	≤0.40
C75 (Nr.1.0605)	0.70-0.80	0.15-0.35	0.60-0.80	0.045	0.045	-	-	-

External Retaining Rings (A) DIN 471



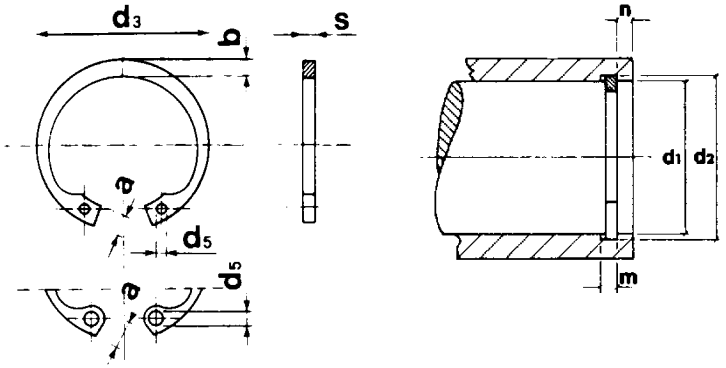
d_1 up thru Ø 27 = C60-DIN 17222
d_1 Ø 28 and above = C75 DIN 17222
d_1 up thru Ø 48 =47- 54 HRc hardness
d_1 Ø 50 and above =44 - 51 HRc hardness

d_1	S h11	d_3	a max.	b	d_5 min.	d_2	Groove Width min.	Weight kg/1000
A 118	4.00	111.0	10.9	10.1	3.5	114.0	4.15	86.3
A 120	4.00	113.0	11.0	10.2	3.5	116.0	4.15	88.1
A 122	4.00	115.0	11.2	10.3	4	118.0	4.15	
								90
A 125	4.00	118.0	11.4	10.4	4	121.0	4.15	94
A 127	4.00	120.0	11.4	10.5	4	123.0	4.15	96
A 128	4.00	121.0	11.5	10.6	4	124.0	4.15	100
A 130	4.00	123.0	11.6	10.7	4	126.0	4.15	102
A 132	4.00	125.0	11.7	10.8	4	128.0	4.15	
								104
A 135	4.00	128.0	11.8	11.0	4	131.0	4.15	106
A 137	4.00	130.0	11.9	11.0	4	133.0	4.15	107
A 138	4.00	131.0	11.9	11.1	4	134.0	4.15	110
A 140	4.00	133.0	12.0	11.2	4	136.0	4.15	112
A 142	4.00	135.0	12.1	11.3	4	138.0	4.15	
								115
A 145	4.00	138.0	12.2	11.5	4	141.0	4.15	117
A 147	4.00	140.0	12.3	11.6	4	143.0	4.15	118
A 148	4.00	141.0	12.4	11.7	4	144.0	4.15	120
A 150	4.00	142.0	13.0	11.8	4	145.0	4.15	135
A 155	4.00	146.0	13.0	12.0	4	150.0	4.15	
								150
A 160	4.00	151.0	13.3	12.2	4	155.0	4.15	160
A 165	4.00	155.5	13.5	12.5	4	160.0	4.15	170
A 170	4.00	160.5	13.5	12.9	4	165.0	4.15	180
A 175	4.00	165.5	13.5	12.9	4	170.0	4.15	190
A 180	4.00	170.5	14.2	13.5	4	175.0	4.15	
								200
A 185	4.00	175.5	14.2	13.5	4	180.0	4.15	210
A 190	4.00	180.5	14.2	14.0	4	185.0	4.15	220
A 195	4.00	185.5	14.2	14.0	4	190.0	4.15	230
A 200	4.00	190.5	14.2	14.0	4	195.0	4.15	248
A 210	5.00	198.0	14.2	14.0	4	204.0	5.15	
								255
A 215	5.00	203.0	14.2	14.0	4	209.0	5.15	265
A 220	5.00	208.0	14.2	14.0	4	214.0	5.15	290
A 230	5.00	218.0	14.2	14.0	4	224.0	5.15	310
A 240	5.00	228.0	14.2	14.0	4	234.0	5.15	335
A 250	5.00	238.0	14.2	14.0	4	244.0	5.15	
								345
A 255	5.00	240.0	16.2	16.0	5	247.0	5.15	355
A 260	5.00	245.0	16.2	16.0	5	252.0	5.15	375
A 270	5.00	255.0	16.2	16.0	5	262.0	5.15	398
A 280	5.00	265.0	16.2	16.0	5	272.0	5.15	418
A 290	5.00	275.0	16.2	16.0	5	282.0	5.15	
								440
A 300	5.00	285.0	16.2	16.0	5	292.0	5.15	770
A 320	6.00	303.0		20.0	5			800
A 330	6.00	313.0		20.0	6			840

d_1	S h11	d_3	a max.	b	d_5 min.	d_2	Groove Width min.	Weight kg/1000
A 340	6.00	323.0	20.0	6				880
A 360	6.00	343.0	20.0	6				
								930
A 380	6.00	363.0	20.0	6				1600
A 460	7.00	440.0	26.0	6				1660
A 480	7.00	460.0	26.0	6				1725
A 490	7.00	470.0	26.0	6				1790
A 500	7.00	480.0	26.0	6				

ISO/ DIN No. Heat-treatable Steel	C %	Si %	Mn %	P ≤%	S ≤%	Cr %	Mo %	Ni %
C60 (Nr.1.0601)	0.57-0.65	≤0.40	0.60-0.90	0.045	0.045	≤0.40	≤0.10	≤0.40
C75 (Nr.1.0605)	0.70-0.80	0.15-0.35	0.60-0.80	0.045	0.045	-	-	-

Internal Retaining Rings (J) DIN 471



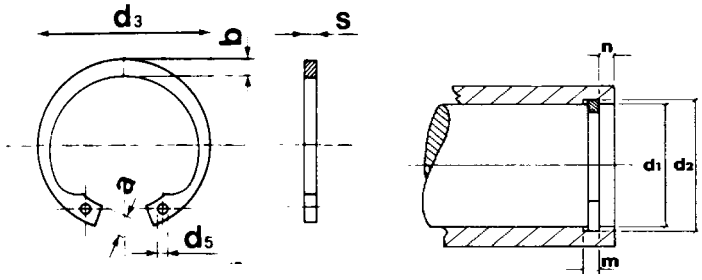
d_1 up thru Ø 33 = C60-DIN 17222
d_1 Ø 34 and above = C75-DIN 17222
d_1 up thru Ø 49 =47- 54 HRc hardness
d_1 Ø 50 and above =44 - 51 HRc hardness

d_1	S h11	d_3	a max.	b	d_5 min.	d_2	Groove Width min.	Weight kg/1000
J 8	0.8	8.7	2.4	1.1	1	8.4	0.09	0.135
J 9	0.8	9.8	2.5	1.3	1	9.4	0.09	0.146
J 10	1	10.8	3.2	1.4	1.2	10.4	1.10	0.272
J 11	1	11.8	3.3	1.5	1.2	11.4	1.10	0.298
J 12	1	13.0	3.4	1.7	1.5	12.5	1.10	0.333
J 13	1	14.1	3.6	1.8	1.5	13.6	1.10	0.360
J 14	1	15.1	3.7	1.9	1.7	14.6	1.10	0.450
J 15	1	16.2	3.7	2.0	1.7	15.7	1.10	0.481
J 16	1	17.3	3.8	2.0	1.7	16.8	1.10	0.521
J 17	1	18.3	3.9	2.1	1.7	17.8	1.10	0.60
J 18	1	19.5	4.1	2.2	2	19.0	1.10	0.67
J 19	1	20.5	4.1	2.2	2	20.0	1.10	0.71
J 20	1	21.5	4.2	2.3	2	21.0	1.10	0.76
J 21	1	22.5	4.2	2.4	2	22.0	1.10	0.86
J 22	1	23.5	4.2	2.5	2	23.0	1.10	0.94
J 23	1.2	24.6	4.2	2.5	2	24.1	1.30	1.20
J 24	1.2	25.9	4.4	2.6	2	25.2	1.30	1.32
J 25	1.2	26.9	4.5	2.7	2	26.2	1.30	1.36
J 26	1.2	27.9	4.7	2.8	2	27.2	1.30	1.47
J 27	1.2	29.1	4.7	2.9	2	28.4	1.30	1.57
J 28	1.2	30.1	4.8	2.9	2	29.4	1.30	1.62
J 29	1.2	31.1	4.8	3.0	2	30.4	1.30	1.67
J 30	1.2	32.1	4.8	3.0	2	31.4	1.30	1.85
J 31	1.2	33.4	5.2	3.2	2.5	32.7	1.30	1.95
J 32	1.2	34.4	5.4	3.2	2.5	33.7	1.30	2.10
J 33	1.2	35.5	5.4	3.3	2.5	34.7	1.60	2.20
J 34	1.5	36.5	5.4	3.3	2.5	35.7	1.60	2.91
J 35	1.5	37.8	5.4	3.4	2.5	37.0	1.60	3.02
J 36	1.5	38.8	5.4	3.5	2.5	38.0	1.60	3.10
J 37	1.5	39.8	5.5	3.6	2.5	39.0	1.60	3.34
J 38	1.5	40.8	5.5	3.7	2.5	40.0	1.60	3.50
J 39	1.5	42.5	5.6	3.8	2.5	41.0	1.85	3.90
J 40	1.75	43.5	5.8	3.9	2.5	42.5	1.85	4.70
J 41	1.75	44.5	5.9	4.0	2.5	43.5	1.85	5.15
J 42	1.75	45.5	5.9	4.1	2.5	44.5	1.85	5.40
J 43	1.75	46.5	5.9	4.2	2.5	45.5	1.85	5.60
J 44	1.75	47.5	6.0	4.2	2.5	46.5	1.85	5.80
J 45	1.75	48.5	6.2	4.3	2.5	47.5	1.85	6.00
J 46	1.75	49.5	6.3	4.4	2.5	48.5	1.85	6.10
J 47	1.75	50.5	6.4	4.4	2.5	49.5	1.85	6.20
J 48	1.75	51.5	6.4	4.5	2.5	50.5	1.85	6.70
J 49	1.75	52.5	6.5	4.5	2.5			6.90

d_1	S h11	d_3	a max.	b	d_5 min.	d_2	Groove Width min.	Weight kg/1000
J 50	2	54.2	6.5	4.6	2.5	53.0	2.15	7.80
J 51	2	55.2	6.5	4.7	2.5	54.0	2.15	8.05
J 52	2	56.2	6.7	4.7	2.5	55.0	2.15	8.40
J 53	2	57.2	6.7	4.9	2.5	56.0	2.15	8.60
J 54	2	58.2	6.7	5.0	2.5	57.0	2.15	8.75
J 55	2	59.2	6.8	5.0	2.5	58.0	2.15	9.10
J 56	2	60.2	6.8	5.1	2.5	59.0	2.15	9.65
J 57	2	61.2	6.8	5.1	2.5	60.0	2.15	10.20
J 58	2	62.2	6.9	5.2	2.5	61.0	2.15	10.50
J 60	2	64.2	7.3	5.4	2.5	63.0	2.15	11.10
J 62	2	66.2	7.3	5.5	2.5	65.0	2.15	11.25
J 63	2	67.2	7.3	5.6	2.5	66.0	2.15	11.70
J 64	2	68.2	7.6	5.8	2.5			14.30
J 65	2.5	69.2	7.6	5.8	3	68.0	2.65	14.30
J 67	2.5	71.5	7.7	6.0	3	70.0	2.65	15.35
J 68	2.5	72.5	7.8	6.1	3	71.0	2.65	16.00
J 70	2.5	74.5	7.8	6.2	3	73.0	2.65	16.60
J 72	2.5	76.5	7.8	6.4	3	75.0	2.65	18.10
J 75	2.5	79.5	7.8	6.6	3	78.0	2.65	18.80
J 77	2.5	81.5	7.9	6.7	3	80.0	2.65	19.60
J 78	2.5	82.5	8.5	6.8	3	81.0	2.65	20.40
J 80	2.5	85.5	8.5	7.0	3	83.5	2.65	22.00
J 82	2.5	87.5	8.5	7.0	3	85.5	2.65	24.00
J 85	3	90.5	8.6	7.2	3.5	88.5	3.15	25.30
J 87	3	92.5	8.6	7.3	3.5	90.5	3.15	27.10
J 88	3	93.5	8.6	7.4	3.5	91.5	3.15	28.00
J 90	3	95.5	8.6	7.6	3.5	93.5	3.15	31.00
J 92	3	97.5	8.7	7.8	3.5	95.5	3.15	32.00
J 95	3	100.5	8.8	8.1	3.5	98.5	3.15	35.00
J 97	3	102.5	8.8	8.2	3.5	100.5	3.15	36.00
J 98	3	103.5	9.0	8.3	3.5	101.5	3.15	37.00
J 100	3	105.5	9.2	8.4	3.5	103.5	3.15	38.00
J 102	4	108.0	9.5	8.5	3.5	106.0	4.15	55.00
J 105	4	112.0	9.5	8.7	3.5	109.0	4.15	56.00
J 107	4	114.0	9.5	8.8	3.5	111.0	4.15	58.50
J 108	4	115.0	9.5	8.9	3.5	112.0	4.15	60.00
J 110	4	117.0	10.4	9.0	3.5	114.0	4.15	64.50
J 112	4	119.0	10.5	9.1	3.5	116.0	4.15	72.00
J 115	4	122.0	10.5	9.3	3.5	119.0	4.15	74.50
J 117	4	124.0	10.6	9.5	3.5	121.0	4.15	76.00
J 118	4	125.0	10.7	9.6	3.5	122.0	4.15	76.50
J 120	4	127.0	11.0	9.7	3.5	124.0	4.15	77.50

ISO/ DIN No. Heat-treatable Steel	C %	Si %	Mn %	P ≤%	S ≤%	Cr %	Mo %	Ni %
C60 (Nr.1.0601)	0.57-0.65	≤0.40	0.60-0.90	0.045	0.045	≤0.40	≤0.10	≤0.40
C75 (Nr.1.0605)	0.70-0.80	0.15-0.35	0.60-0.80	0.045	0.045	-	-	-

Internal Retaining Rings (J) DIN 471



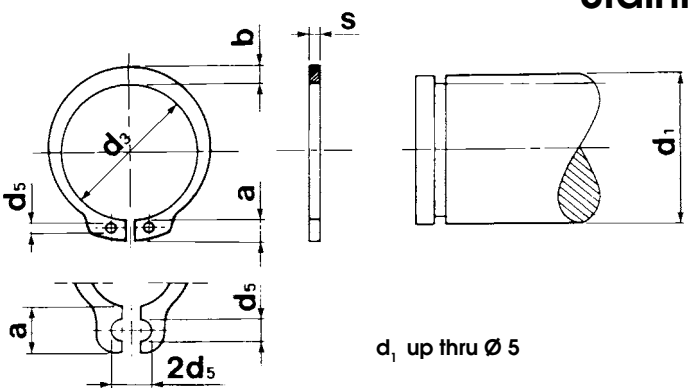
d_1 up thru Ø 33 = C60-DIN 17222
d_1 Ø 34 and above = C75-DIN 17222
d_1 up thru Ø 49 =47- 54 HRc hardness
d_1 Ø 50 and above =44 - 51 HRc hardness

d_1	S h11	d_3	a max.	b	d_5 min.	d_2	Groove Width min.	Weight kg/1000
J 122	4	129.0	11.0	9.8	4	126.0	4.15	78.50
J 125	4	132.0	11.0	10.0	4	129.0	4.15	79.50
J 127	4	134.0	11.0	10.1	4	131.0	4.15	80.50
J 128	4	135.0	11.0	10.2	4	132.0	4.15	81.00
J 130	4	137.0	11.0	10.2	4	134.0	4.15	82.00
J 132	4	139.0	11.0	10.3	4	136.0	4.15	83.00
J 135	4	142.0	11.2	10.5	4	139.0	4.15	84.00
J 137	4	144.0	11.2	10.5	4	141.0	4.15	85.50
J 138	4	145.0	11.2	10.6	4	142.0	4.15	86.00
J 140	4	147.0	11.2	10.7	4	144.0	4.15	87.50
J 142	4	149.0	11.3	10.8	4	146.0	4.15	91.00
J 145	4	152.0	11.4	10.9	4	149.0	4.15	93.00
J 147	4	154.0	11.6	11.0	4	151.0	4.15	96.00
J 148	4	155.0	11.8	11.1	4	152.0	4.15	97.00
J 150	4	158.0	12.0	11.2	4	155.0	4.15	99.00
J 152	4	161.0	12.0	11.4	4	157.0	4.15	103.0
J 155	4	164.0	12.0	11.4	4	160.0	4.15	105.0
J 158	4	167.0	13.0	11.6	4	163.0	4.15	108.0
J 160	4	169.0	13.0	11.6	4	165.0	4.15	110.0
J 165	4	174.5	13.0	11.8	4	170.0	4.15	125.0
J 168	4	177.5	13.5	12.2	4	173.0	4.15	130.0
J 170	4	179.5	13.5	12.2	4	175.0	4.15	140.0
J 175	4	184.5	13.5	12.7	4	180.0	4.15	150.0
J 178	4	187.5	14.2	13.2	4	183.0	4.15	160.0
J 180	4	189.5	14.2	13.2	4	185.0	4.15	165.0
J 185	4	194.5	14.2	13.7	4	190.0	4.15	170.0
J 190	4	199.5	14.2	13.8	4	195.0	4.15	175.0
J 195	4	204.5	14.2	13.8	4	200.0	4.15	183
J 200	4	209.5	14.2	14.0	4	205.0	4.15	195
J 205	5	217.0	14.2	14.0	4	211.0	5.15	225
J 210	5	222.0	14.2	14.0	4	216.0	5.15	270
J 215	5	227.0	14.2	14.0	4	221.0	5.15	300
J 220	5	232.0	14.2	14.0	4	226.0	5.15	315
J 225	5	237.0	14.2	14.0	4	231.0	5.15	323
J 230	5	242.0	14.2	14.0	4	236.0	5.15	330
J 235	5	247.0	14.2	14.0	4			338
J 240	5	252.0	14.2	14.0	4	246.0	5.15	345
J 245	5	257.0	14.2	14.0	4	251.0	5.15	353
J 250	5	262.0	14.2	14.0	4	256.0	5.15	360
J 255	5	270.0	16.2	16.0	5			368
J 260	5	275.0	16.2	16.0	5	268.0	5.15	375

d_1	S h11	d_3	a max.	b	d_5 min.	d_2	Groove Width min.	Weight kg/1000
J 265	5	280.0	16.2	16.0	5			
J 270	5	285.0	16.2	16.0	5	278.0	5.15	
J 275	5	290.0	16.2	16.0	5	283.0	5.15	
J 280	5	295.0	16.2	16.0	5	288.0	5.15	
J 285	5	300.0	16.2	16.0	5			
J 290	5	305.0	16.2	16.0	5			
J 300	5	315.0	16.2	16.0	5	308.0	5.15	
J 305	6	322.0		20.0	6			
J 310	6	327.0		20.0	6			
J 320	6	337.0		20.0	6			
J 330	6	347.0		20.0	6			
J 340	6	357.0		20.0	6			
J 350	6	367.0		20.0	6			
J 360	6	377.0		20.0	6			
J 380	6	397.0		20.0	6			
J 390	6	407.0		20.0	6			
J 400	6	417.0		20.0	6			
J 420	7	440.0		26.0	6			
J 430	7	450.0		26.0	6			
J 440	7	460.0		26.0	6			
J 450	7	470.0		26.0	6			
J 460	7	480.0		26.0	6			
J 470	7	490.0		26.0	6			
J 480	7	500.0		26.0	6			
J 500	7	520.0		26.0	6			

ISO/ DIN No. Heat-treatable Steel	C %	Si %	Mn %	P ≤%	S ≤%	Cr %	Mo %	Ni %
C60 (Nr.1.0601)	0.57-0.65	≤0.40	0.60-0.90	0.045	0.045	≤0.40	≤0.10	≤0.40
C75 (Nr.1.0605)	0.70-0.80	0.15-0.35	0.60-0.80	0.045	0.045	-	-	-

External Retaining Rings (A) DIN 471
Stainless Steel



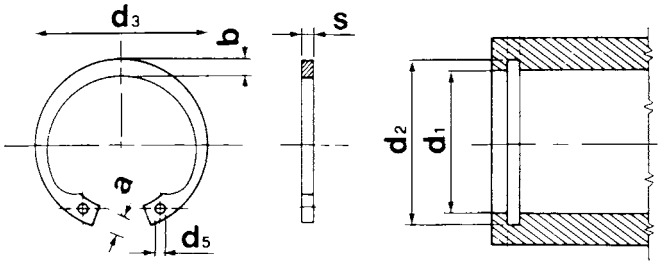
d_1 up thru Ø 5

d_1 up thru Ø 27 = DIN X 45 CrMoV 15
d_1 Ø 28 and above = DIN X 35 CrMo 17
(~ AISI 420)
d_1 up thru Ø 48 =47- 54 HRc hardness
d_1 Ø 50 and above =44 - 51 HRc hardness

d_1	S h11	d_3	a max	b	d_5 min.	Weight kg/1000
4	0.4	3.7	2.2	0.9	1	0.034
5	0.6	4.7	2.5	1.1	1	0.081
6	0.7	5.6	2.7	1.3	1.2	0.121
7	0.8	6.5	3.1	1.4	1.2	0.189
8	0.8	7.4	3.2	1.5	1.2	0.220
9	1	8.4	3.3	1.7	1.2	0.368
10	1	9.3	3.3	1.8	1.5	0.402
11	1	10.2	3.3	1.8	1.5	0.445
12	1	11.0	3.3	1.8	1.7	0.469
13	1	11.9	3.4	2.0	1.7	0.571
14	1	12.9	3.5	2.1	1.7	0.644
15	1	13.8	3.6	2.2	1.7	0.704
16	1	14.7	3.7	2.2	1.7	0.771
17	1	15.7	3.8	2.3	1.7	0.881
18	1.2	16.5	3.9	2.4	2	1.154
19	1.2	17.5	3.9	2.5	2	1.230
20	1.2	18.5	4.0	2.6	2	1.321
21	1.2	19.5	4.1	2.7	2	1.450
22	1.2	20.5	4.2	2.8	2	1.599
23	1.2	21.5	4.3	2.9	2	1.724
24	1.2	22.2	4.4	3.0	2	1.776
25	1.2	23.2	4.4	3.0	2	1.907
26	1.2	24.2	4.5	3.1	2	1.980
27	1.2	24.9	4.6	3.1	2	2.149
28	1.5	25.9	4.7	3.2	2	2.781
29	1.5	26.9	4.8	3.4	2	3.027
30	1.5	27.9	5.0	3.5	2	3.335
31	1.5	28.6	5.0	3.5	2.5	3.228
32	1.5	29.6	5.2	3.6	2.5	3.430
33	1.5	30.5	5.2	3.7	2.5	3.917
34	1.5	31.5	5.4	3.8	2.5	4.086
35	1.5	32.2	5.6	3.9	2.5	4.329
36	1.75	33.2	5.6	4.0	2.5	4.860
37	1.75	34.2	5.7	4.1	2.5	5.300
38	1.75	35.2	5.8	4.2	2.5	5.360
39	1.75	36.0	5.9	4.3	2.5	5.650
40	1.75	36.5	6.0	4.4	2.5	5.420
41	1.75	37.5	6.2	4.5	2.5	6.550
42	1.75	38.5	6.5	4.5	2.5	6.620
44	1.75	40.5	6.6	4.6	2.5	6.820
45	1.75	41.5	6.7	4.7	2.5	7.100
46	1.75	42.5	6.7	4.8	2.5	7.290
47	1.75	43.5	6.8	4.9	2.5	7.690
48	2	44.5	6.9	5.0	2.5	7.960
50	2	45.8	6.9	5.1	2.5	9.750
52	2	47.8	7.0	5.2	2.5	10.100
54	2	49.8	7.1	5.3	2.5	10.700
55	2	50.8	7.2	5.4	2.5	10.900
56	2	51.8	7.3	5.5	2.5	11.280
57	2	52.8	7.3	5.5	2.5	11.800
58	2	53.8	7.3	5.6	2.5	12.090
60	2	55.8	7.4	5.8	2.5	12.570
62	2	57.8	7.5	6.0	2.5	14.030
63	2.5	58.8	7.6	6.2	2.5	14.850
65	2.5	60.8	7.8	6.3	3	19.310
67	2.5	62.5	7.9	6.4	3	20.900
68	2.5	63.5	8.0	6.5	3	21.010
70	2.5	65.5	8.1	6.6	3	21.730
72	2.5	67.5	8.2	6.8	3	23.490
75	2.5	70.5	8.4	7.0	3	24.770
77	2.5	72.5	8.5	7.2	3	25.800
78	2.5	73.5	8.6	7.3	3	26.900
80	2.5	74.5	8.6	7.4	3	27.120
82	3	76.5	8.7	7.6	3	27.430
85	3	79.5	8.7	7.8	3.5	37.300
87	3	81.5	8.8	7.9	3.5	39.000
88	3	82.5	8.8	8.0	3.5	39.600
90	3	84.5	8.8	8.2	3.5	39.890
92	3	86.5	9.0	8.4	3.5	43.800
95	3	89.5	9.4	8.6	3.5	45.000
97	3	91.5	9.4	8.8	3.5	52.310
98	3	92.5	9.5	9.0	3.5	48.950
100		94.5	9.6	9.0	3.5	49.720

DIN No. Stainless Steel	C %	Si ≤%	Mn ≤%	P ≤%	S ≤%	Cr %	Mo %	Ni %	V %
X 45 CrMoV 15	0.42-0.50	1.00	1.00	0.045	0.030	13.8-15.0	0.45-0.60	-	0.10-0.15
X 35 CrMo 17	0.35-0.45	1.00	1.00	0.045	0.030	15.5-17.5	0.80-1.30	≤1.00	-

Internal Retaining Rings (J) DIN 471
Stainless Steel



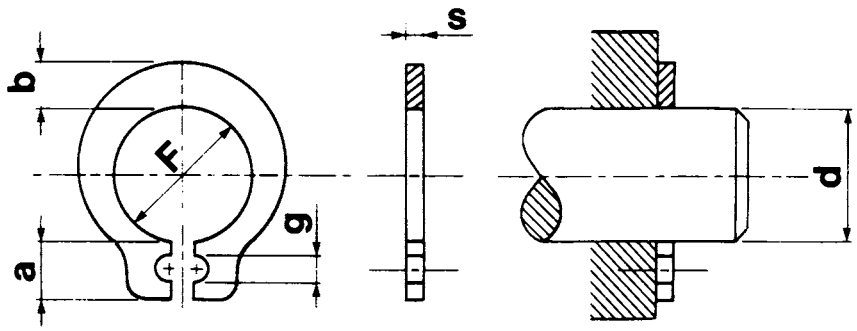
d_1 up thru Ø 33 = DIN X 45 CrMoV 15
d_1 Ø 34 and above = DIN X 35 CrMo 17
(~ AISI 420)
d_1 up thru Ø 49 =47- 54 HRc hardness
d_1 Ø 50 and above =44 - 51 HRc hardness

d_1	S h11	d_3	a max	b	d_5 min.	Weight kg/1000
8	0.8	8.7	2.4	1.1	1	0.116
9	0.8	9.8	2.5	1.3	1	0.146
10	1	10.8	3.2	1.4	1.2	0.261
11	1	11.8	3.3	1.5	1.2	0.289
12	1	13.0	3.4	1.7	1.5	0.309
13	1	14.1	3.6	1.8	1.5	0.363
14	1	15.1	3.7	1.9	1.7	0.421
15	1	16.2	3.7	2.0	1.7	0.481
16	1	17.3	3.8	2.0	1.7	0.510
17	1	18.3	3.9	2.1	1.7	0.568
18	1	19.5	4.1	2.2	2	0.648
19	1	20.5	4.1	2.2	2	0.682
20	1	21.5	4.2	2.3	2	0.743
21	1	22.5	4.2	2.4	2	0.803
22	1	23.5	4.2	2.5	2	0.875
23	1.2	24.6	4.2	2.5	2	1.140
24	1.2	25.9	4.4	2.6	2	1.270
25	1.2	26.9	4.5	2.7	2	1.320
26	1.2	27.9	4.7	2.8	2	1.440
27	1.2	29.1	4.7	2.9	2	1.530
28	1.2	30.1	4.8	2.9	2	1.600
29	1.2	31.1	4.8	3.0	2	1.700
30	1.2	32.1	4.8	3.0	2	1.820
31	1.2	33.4	5.2	3.2	2.5	1.973
32	1.2	34.4	5.4	3.2	2.5	2.070
33	1.2	35.5	5.4	3.3	2.5	2.240
34	1.5	36.5	5.4	3.3	2.5	2.870
35	1.5	37.8	5.4	3.4	2.5	2.970
36	1.5	38.8	5.4	3.5	2.5	3.110
37	1.5	39.8	5.5	3.6	2.5	3.250
38	1.5	40.8	5.5	3.7	2.5	3.520
39	1.5	42.5	5.6	3.8	2.5	3.810
40	1.75	43.5	5.8	3.9	2.5	4.580
41	1.75	44.5	5.9	4.0	2.5	5.080
42	1.75	45.5	5.9	4.1	2.5	5.260
43	1.75	46.5	5.9	4.2	2.5	5.480
44	1.75	47.5	6.0	4.2	2.5	5.560
45	1.75	48.5	6.2	4.3	2.5	5.860
46	1.75	49.5	6.3	4.4	2.5	6.100
47	1.75	50.5	6.4	4.4	2.5	6.740
48	1.75	51.5	6.4	4.5	2.5	6.530
49	1.75	52.5	6.5	4.5	2.5	7.050

d_1	S h11	d_3	a max	b	d_5 min.	Weight kg/1000
50	2	54.2	6.5	4.6	2.5	8.370
51	2	55.2	6.5	4.7	2.5	8.600
52	2	56.2	6.7	4.7	2.5	8.340
53	2	57.2	6.7	4.9	2.5	9.380
54	2	58.2	6.7	5.0	2.5	9.420
55	2	59.2	6.8	5.0	2.5	9.560
56	2	60.2	6.8	5.1	2.5	10.000
57	2	61.2	6.8	5.1	2.5	10.170
58	2	62.2	6.9	5.2	2.5	10.680
60	2	64.2	7.3	5.4	2.5	10.820
62	2	66.2	7.3	5.5	2.5	11.190
63	2	67.2	7.3	5.6	2.5	11.690
65	2.5	69.2	7.6	5.8	3	16.100
67	2.5	71.5	7.7	6.0	3	17.340
68	2.5	72.5	7.8	6.1	3	17.920
70	2.5	74.5	7.8	6.2	3	18.640
72	2.5	76.5	7.8	6.4	3	19.000
75	2.5	79.5	7.8	6.6	3	21.150
77	2.5	81.5	7.9	6.7	3	22.750
78	2.5	82.5	8.5	6.8	3	23.040
80	2.5	85.5	8.5	7.0	3	24.310
82	2.5	87.5	8.5	7.0	3	24.900
85	3	90.5	8.6	7.2	3.5	31.900
87	3	92.5	8.6	7.3	3.5	34.000
88	3	93.5	8.6	7.4	3.5	35.120
90	3	95.5	8.6	7.6	3.5	35.420
92	3	97.5	8.7	7.8	3.5	38.170
95	3	100.5	8.8	8.1	3.5	40.450
97	3	102.5	8.8	8.2	3.5	40.320
98	3	103.5	9.0	8.3	3.5	40.800
100	3	105.5	9.2	8.4	3.5	43.150

DIN No. Stainless Steel	C %	Si ≤%	Mn ≤%	P ≤%	S ≤%	Cr %	Mo %	Ni %	V %
X 45 CrMoV 15	0.42-0.50	1.00	1.00	0.045	0.030	13.8-15.0	0.45-0.60	-	0.10-0.15
X 35 CrMo 17	0.35-0.45	1.00	1.00	0.045	0.030	15.5-17.5	0.80-1.30	≤1.00	-

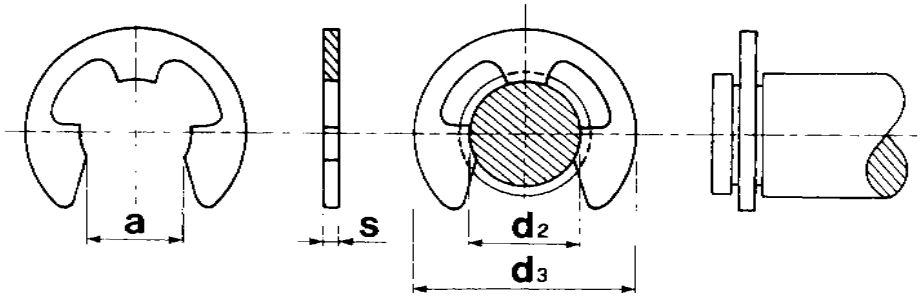
Metric Grip Rings
For Shafts Without Grooves



Part No.	For Shaft Ø d mm	F	s	a	b	g min
GR 2	2	1.90	0.5	1.85	1.45	1
GR 2.5	2.5	2.35	0.6	1.90	1.50	1
GR 3	3	2.80	0.6	2	1.60	1.10
GR 4	4	3.80	0.8	2.80	1.80	1.20
GR 5	5	4.75	0.8	2.90	2.20	1.30
GR 6	6	5.70	1	3	2.50	1.40
GR 7	7	6.65	1	3.20	2.80	1.40
GR 8	8	7.65	1	3.40	3	1.50
GR 9	9	8.60	1.20	3.50	3.20	1.70
GR 10	10	9.60	1.20	3.50	3.50	1.70
GR 11	11	10.50	1.20	3.90	3.90	1.70
GR 12	12	11.50	1.30	4.40	4.30	2

Material
C60-DIN (AISI 1060) HRc 47-54
phosphate finish hardened spring steel

Metric "E" Rings
DIN 6799
Plain, Zinc Plated & Stainless Steel



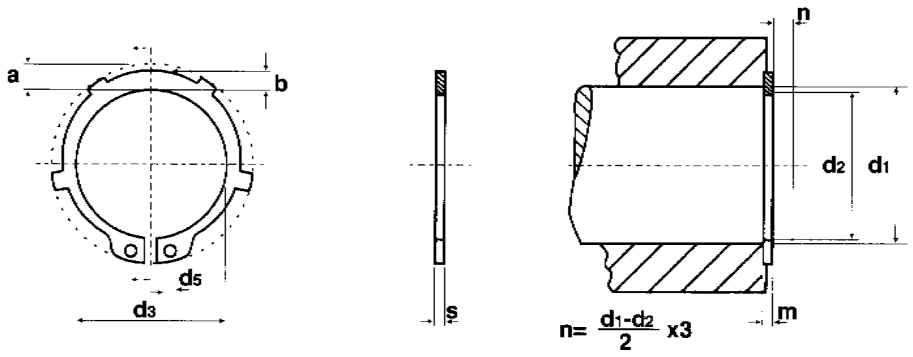
Groove Dia. h 11 d_2	Shaft Diameter		Ring Specifications			
	from	to	$d_{3\ max.}$	S	a	Kg/ 1000
1.2	1.4	2.0	3.25	0.30	1.01	0.007
1.5	2.0	2.5	4.25	0.40	1.28	0.019
1.9	2.5	3.0	4.8	0.50	1.61	0.028
2.3	3.0	4.0	6.3	0.60	1.94	0.060
3.2	4.0	5.0	7.3	0.60	2.70	0.075
4.0	5.0	7.0	9.3	0.70	3.34	0.147
5.0	6.0	8.0	11.3	0.70	4.11	0.215
6.0	7.0	9.0	12.3	0.70	5.26	0.230
7.0	8.0	11.0	14.3	0.90	5.84	0.416
8.0	9.0	12.0	16.3	1.00	6.52	0.613
9.0	10.0	14.0	18.8	1.10	7.63	0.905
10.0	11.0	15.0	20.4	1.20	8.32	1.14
12.0	13.0	18.0	23.4	1.30	10.45	1.55
15.0	16.0	24.0	29.4	1.50	12.61	3.01
19.0	20.0	31.0	37.6	1.75	15.92	5.56
24.0	25.0	38.0	44.6	2.00	21.88	8.15
30.0	32.0	42.0	52.6	2.50	25.80	13.50

Hardness = HRc 46-54
Stainless Steel = DIN X2 CrNiMo 18 14 3 (AISI 316L)

DIN No. Stainless Steel	C %	Si ≤%	Mn ≤%	P ≤%	S ≤%	Cr %	Mo %	Ni %	V %
X 2 CrNiMo 18 14 3	≤030	1.00	2.00	0.045	0.025	17.0-18.5	2.50-3.00	12.5-15.0	-

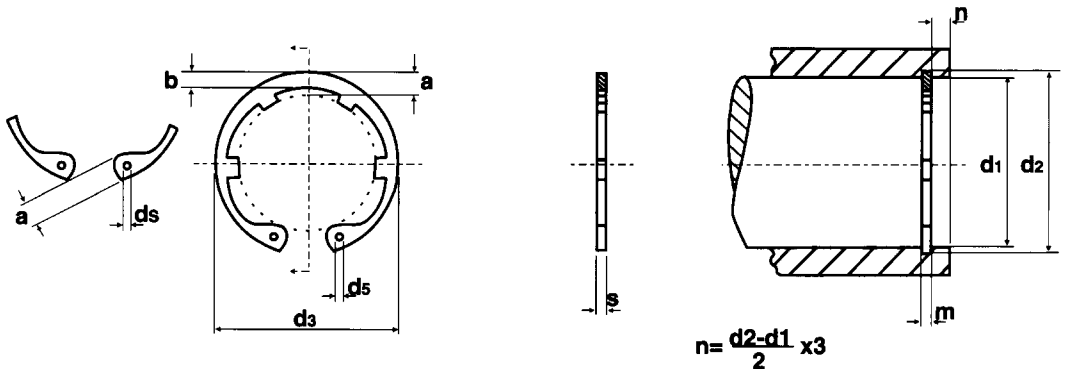
Ordering Examples:
E 4 = Plain E-Ring **E 4 ST = Plain Stacked**
E 4 Z = Zinc Plated E-Ring **E 4 Z ST= Zinc Plated Stacked**
E 4 SS = Stainless Steel E-Ring **E 4 SS ST Stainless Steel Stacked**

Metric Retaining Rings (DIN 983)



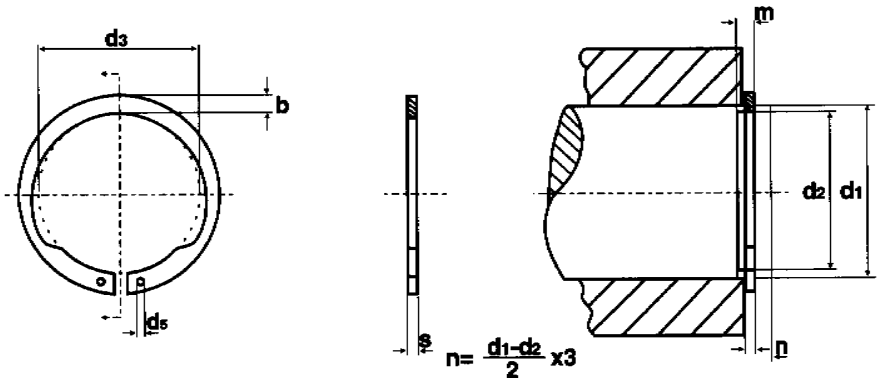
Part No.	d_1	S	d_3	a max	b	d_5 min	Weight kg/ 1000
AK 18	18	1.2	16.5	3.7	2.5	2	1.24
AK 20	20	1.2	18.5	3.8	2.6	2	1.45
AK 22	22	1.2	20.5	4.0	2.8	2	1.77
AK 25	25	1.2	23.2	4.3	3.0	2	2.12
AK 26	26	1.2	24.2	4.4	3.1	2	2.18
AK 30	30	1.5	27.9	4.7	3.4	2	3.65
AK 35	35	1.5	32.2	5.2	3.8	2.5	4.38
AK 40	40	1.75	36.5	7.2	4.2	2.5	7.00
AK 45	45	1.75	41.5	7.2	4.6	2.5	8.50
AK 50	50	2	45.8	8.2	5.0	2.5	11.55
AK 55	55	2	50.8	8.2	5.4	2.5	12.99
AK 65	65	2.5	60.8	10.2	6.2	3	21.70

Metric Retaining Rings (DIN 984)



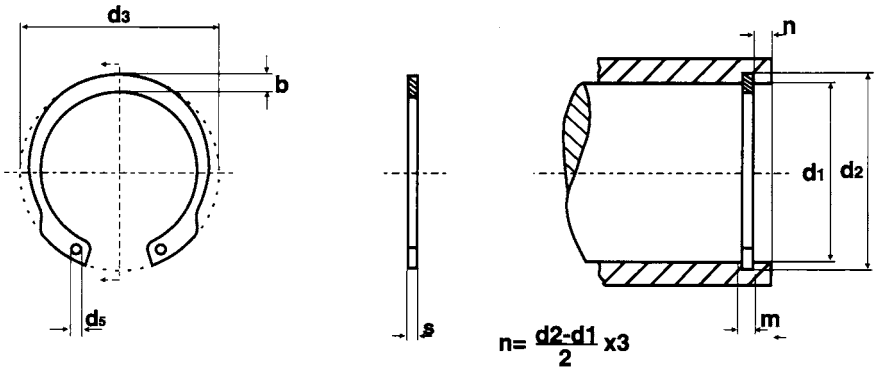
Part No.	d_1	S	d_3	a max	b	d_5 min	Weight kg/ 1000
IK 17	17	1	18.3	3.7	2.2	1.7	0.80
IK 18	18	1	19.5	4.1	2.3	2	0.90
IK 19	19	1	20.5	3.8	2.3	2	0.99
IK 20	20	1	21.5	3.9	2.4	2	1.06
IK 22	22	1	23.5	4.0	2.6	2	1.28
IK 24	24	1.2	25.9	4.2	2.6	2	1.60
IK 26	26	1.2	28.5	4.4	2.8	2	2.00
IK 27	27	1.2	29.1	4.5	2.9	2	2.00
IK 30	30	1.2	32.1	4.9	3.2	2	2.35
IK 32	32	1.2	34.4	5.1	3.3	2.5	2.50
IK 34	34	1.5	36.5	5.3	3.4	2.5	3.80
IK 35	35	1.5	37.8	5.5	3.6	2.5	4.00
IK 36	36	1.5	38.8	5.6	3.6	2.5	4.15
IK 38	38	1.5	40.8	6.1	3.8	2.5	4.40
IK 40	40	1.75	43.5	7.2	4.0	2.5	5.30
IK 42	42	1.75	45.5	7.2	4.1	2.5	6.00
IK 45	45	1.75	48.5	7.2	4.3	2.5	6.60
IK 47	47	1.75	50.5	7.2	4.5	2.5	6.90
IK 50	50	2	54.2	8.2	4.7	2.5	8.50
IK 52	52	2	56.2	8.2	4.7	2.5	9.40
IK 57	57	2	61.2	8.2	5.2	2.5	11.65
IK 75	75	2.5	79.5	10.2	6.6	3	22.60

AV Type Metric Retaining Rings



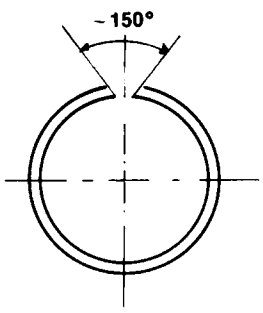
Part No.	d_1	s	d_3	b	d_5 min	Weight kg/ 1000
AV 12	12	1	11.0	1.8	1.3	0.25
AV 13	13	1	11.9	2.1	1.3	0.56
AV 14	14	1	12.9	2.1	1.3	0.58
AV 16	16	1	14.7	2.3	1.3	0.72
AV 17	17	1	15.7	2.4	1.3	0.81
AV 18	18	1.2	16.5	2.6	1.5	1.14
AV 20	20	1.2	18.5	2.8	1.5	1.43
AV 22	22	1.2	20.5	3.0	1.5	1.63
AV 25	25	1.2	23.2	3.4	1.5	2.10
AV 30	30	1.5	27.9	3.9	2.0	3.58
AV 32	32	1.5	29.6	4.0	2.0	3.88
AV 35	35	1.5	32.2	4.2	2.0	4.53
AV 40	40	1.75	36.5	4.7	2.0	6.49
AV 50	50	2	45.8	5.2	2.5	9.84
AV 60	60	2	55.8	5.8	2.5	13.80
AV 65	65	2.5	60.8	6.0	2.5	20.75
AV 75	75	2.5	70.5	6.5	2.5	27.50

IV Type Metric Retaining Rings

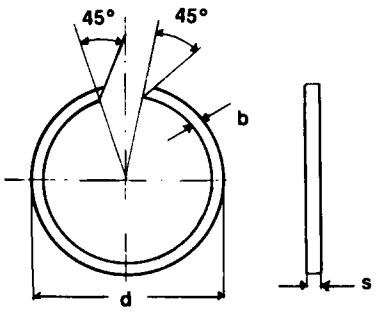


Part No.	d_1	s	d_3	b	d_5 min	Weight kg/ 1000
IV 16	16	1	17.3	2.1	1.3	0.53
IV 17	17	1	18.3	2.1	1.3	0.58
IV 19	19	1	20.5	2.2	1.3	0.66
IV 20	20	1	21.5	2.3	1.3	0.80
IV 22	22	1	23.5	2.4	1.3	0.83
IV 24	24	1.2	25.9	2.8	1.5	1.30
IV 25	25	1.2	26.9	2.8	1.5	1.40
IV 26	26	1.2	27.9	3.0	1.5	1.50
IV 27	27	1.2	29.1	3.0	1.5	1.53
IV 28	28	1.2	30.1	3.1	1.5	1.80
IV 30	30	1.2	32.1	3.2	1.5	2.03
IV 32	32	1.2	34.4	3.3	1.5	2.05
IV 33	33	1.2	35.5	3.3	1.5	2.35
IV 35	35	1.5	37.8	3.4	1.7	3.20
IV 36	36	1.5	38.8	3.6	1.7	3.23
IV 38	38	1.5	40.8	3.8	1.7	3.68
IV 40	40	1.75	43.5	4.2	2.0	4.75
IV 42	42	1.75	45.5	4.2	2.0	5.20
IV 45	45	1.75	48.5	4.2	2.0	6.00
IV 47	47	1.75	50.5	4.7	2.0	6.50
IV 50	50	2	54.2	5.2	2.5	8.50
IV 55	55	2	59.2	5.2	2.5	10.00
IV 58	58	2	62.2	5.2	2.5	10.50
IV 60	60	2	64.2	5.2	2.5	11.25
IV 62	62	2	66.2	5.2	2.5	11.75
IV 68	68	2.5	72.5	5.7	2.5	17.75
IV 80	80	2.5	85.5	6.0	2.5	22.90
IV 85	85	3	90.5	6.6	3.0	30.00

Metric Snap Rings



b ≤ Ø24 mm



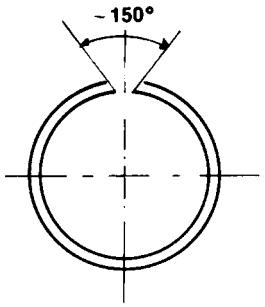
b ≥ Ø25 mm

SB Type Snap Ring

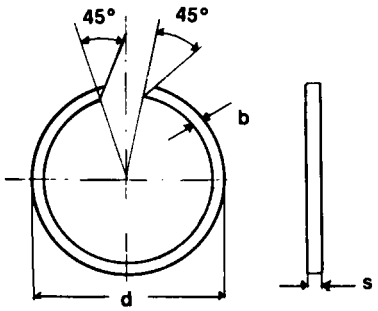
Part No.	Shaft Ø mm	s -0.1	b -0.1	d min.
SB 7*	7	0.8	1.0	7.5
SB 8*	8	0.8	1.0	8.5
SB 9*	9	0.8	1.1	9.5
SB 10*	10	0.8	1.2	10.6
SB 11*	11	1.0	1.3	11.6
SB 12*	12	1.0	1.3	12.7
SB 13*	13	1.0	1.3	13.8
SB 14*	14	1.0	1.3	14.8
SB 15*	15	1.0	1.3	15.8
SB 16	16	1.2	1.6	16.8
SB 17	17	1.2	1.7	17.8
SB 18	18	1.2	1.75	18.9
SB 19	19	1.2	1.75	19.9
SB 20	20	1.2	1.75	21.0
SB 21	21	1.2	1.75	22.0
SB 22	22	1.2	1.75	23.0
SB 23	23	1.2	1.75	24.0
SB 24	24	1.2	1.75	25.2
SB 25	25	1.2	1.75	26.2
SB 26	26	1.2	1.75	27.2
SB 27	27	1.2	1.75	28.2
SB 28	28	1.2	1.75	29.2
SB 29	29	1.2	1.75	30.2
SB 30	30	1.5	2.3	31.4
SB 31	31	1.5	2.3	32.4
SB 32	32	1.5	2.3	33.4
SB 33	33	1.5	2.3	34.4
SB 34	34	1.5	2.3	35.4
SB 35	35	1.5	2.3	36.4
SB 37	37	1.5	2.3	38.8
SB 38	38	1.5	2.3	39.8
SB 39	39	1.5	2.3	40.8
SB 40	40	1.5	2.3	41.8
SB 42	42	1.5	2.3	43.8
SB 43	43	1.5	2.3	44.8
SB 44	44	1.5	2.3	45.8
SB 45	45	1.5	2.3	46.8
SB 46	46	1.5	2.3	47.8
SB 47	47	1.5	2.3	48.8
SB 48	48	1.5	2.3	49.8
		1.5	2.3	
SB 50	50	1.5	2.3	51.8
SB 52	52			54.3
		1.5	2.3	
SB 53	53	1.5	2.3	55.3
SB 55	55	1.5	2.3	57.3
SB 57	57			59.3
		1.5	2.3	
SB 58	58	1.5	2.3	60.3
SB 60	60	1.5	2.3	62.3
SB 62	62			64.3
		1.5	2.3	
SB 63	63	1.5	2.3	65.3
SB 65	65	1.5	2.3	67.3
SB 68	68			70.3
		1.5	2.3	
SB 70	70	2.0	2.8	72.3
SB 72	72	2.0	2.8	74.6
SB 73	73			75.6
		2.0	2.8	
SB 74	74	2.0	2.8	76.6
SB 76	76	2.0	2.8	78.6
SB 78	78			80.6
		2.0	2.8	
SB 79	79	2.0	2.8	81.6
SB 80	80	2.0	2.8	82.6
SB 81	81			83.6
		2.0	2.8	
SB 82	82	2.0	2.8	84.6
SB 83	83	2.0	2.8	85.6
SB 85	85			87.6
		2.0	2.8	
SB 86	86	2.5	3.4	88.6
SB 88	88	2.5	3.4	91.0
SB 90	90			93.0
		2.5	3.4	
SB 92	92	2.5	3.4	95.0
SB 93	93	2.5	3.4	96.0
SB 95	95			98.0
		2.5	3.4	
SB 97	97	2.5	3.4	100.0
SB 98	98	2.5	3.4	101.0
SB 100	100			103.0
		2.5	3.4	
SB 102	102	2.5	3.4	105.3
SB 103	103	2.5	3.4	106.3
SB 105	105			108.3
		2.5	3.4	
SB 107	107	2.5	3.4	110.3
SB 108	108	2.5	3.4	111.3
SB 110	110			113.3
		2.5	3.4	
SB 112	112	2.5	3.4	115.3
SB 113	113	2.5	3.4	116.3

*** Items only available by special quote.**

Metric Snap Rings



b ≤ Ø24 mm



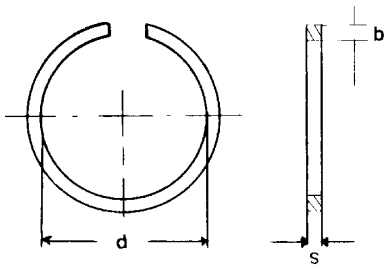
b ≥ Ø25 mm

SB Type Snap Ring

Part No.	Shaft Ø mm	s -0.1	b -0.1	d min.
SB 115	115			118.3
		2.5	3.4	
SB 117	117	2.5	3.4	120.3
SB 118	118	2.5	3.4	121.3
SB 120	120			123.3
		2.5	3.4	
SB 123	123	2.5	3.4	126.3
SB 125	125	2.5	3.4	128.3
SB 127	127			130.3
		2.5	3.4	
SB 130	130	2.5	3.4	133.3
SB 133	133	2.5	3.4	136.3
SB 135	136			138.3
		2.5	3.4	
SB 137	137	2.5	4.0	140.3
SB 140	140	2.5	4.0	143.6
SB 143	143			146.6
		2.5	4.0	
SB 150	150	2.5	4.0	153.6
SB 153	153	2.5	4.0	156.6
SB 160	160			163.6
		2.5	4.0	
SB 163	163	2.5	4.0	166.6
SB 165	165	2.5	4.0	168.6
SB 170	170			173.6
		2.5	4.0	
SB 173	173	2.5	4.0	176.6
SB 175	175	2.5	4.0	178.6
SB 180	180			183.6
		2.5	4.0	
SB 183	183	3.0	5.0	186.6
SB 190	190	3.0	5.0	194.5
SB 195	195			199.5
		3.0	5.0	
SB 200	200	3.0	5.0	204.5
SB 205	205	3.0	5.0	209.5
SB 210	210			214.5
		3.0	5.0	
SB 215	215	3.0	5.0	219.5
SB 220	220	3.0	5.0	224.5
SB 225	225			229.5
		3.0	5.0	
SB 230	230	3.0	5.0	234.5
SB 240	240	3.0	5.0	244.5
SB 250	250			254.5
		4.0	7.5	
SB 260	260	4.0	7.5	267.0
SB 270	270	4.0	7.5	277.0
SB 280	280			287.0
		4.0	7.5	

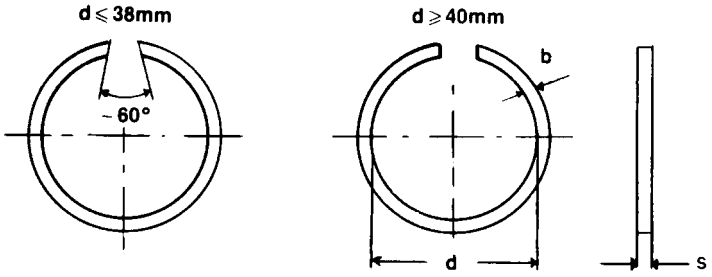
Part No.	Shaft Ø mm	s -0.1	b -0.1	d min.
SB 290	290	4.0	7.5	297.0
SB 300	300	4.0	7.5	307.0
SB 310	310			317.0
		4.0	7.5	
SB 320	320	4.0	7.5	327.0
SB 325	325	4.0	7.5	332.0
SB 330	330			337.0
		4.0	7.5	
SB 340	340	4.0	7.5	347.0
SB 350	350	4.0	7.5	357.0
SB 355	355			362.0
		4.0	7.5	
SB 360	360	4.0	7.5	367.0
SB 370	370	4.0	7.5	377.0
SB 375	375			382.0
		4.0		
SB 380	380	4.0	7.5	387.0
SB 390	390	4.0	7.5	397.0
SB 395	395		7.5	402.0
		4.0		
SB 400	400	4.0	7.5	407.0
SB 410	410	4.0	7.5	417.0
SB 415	415		7.5	422.0
		4.0		
SB 420	420	4.0	7.5	427.0
SB 430	430	4.0	7.5	437.0
SB 440	440		7.5	447.0

Metric Snap Rings



SP Type Snap Ring (DIN 5417)

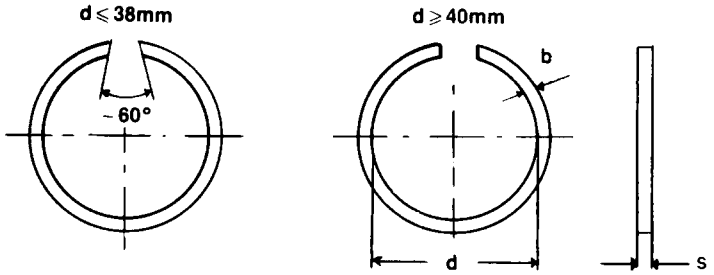
Part No.	Shaft Ø mm	s -0.1	b -0.15	d min.	Part No.	Shaft Ø mm	s -0.1	b -0.15	d min.
SP 30	30	1.12	3.25	27.4	**SP 115**	115	2.46	4.85	110.2
SP 32	32	1.12	3.25	29.4	**SP 120**	120	2.82	7.21	113.6
SP 35	35	1.12	3.25	32.4	**SP 125**	125	2.82	7.21	118.6
SP 37	37	1.12	3.25	34.0	**SP 130**	130	2.82	7.21	123.6
SP 40	40	1.12	3.25	37.3	**SP 140**	140	2.82	7.21	133.0
SP 42	42	1.12	3.25	38.9	**SP 145**	145	2.82	7.21	138.0
SP 44	44	1.12	3.25	40.9	**SP 150**	150	2.82	7.21	142.9
SP 47	47	1.12	4.04	43.7	**SP 160**	160	2.82	7.21	152.9
SP 50	50	1.12	4.04	46.7	**SP 170**	170	3.10	9.60	161.3
SP 52	52	1.12	4.04	48.8	**SP 180**	180	3.10	9.60	171.2
SP 62	62	1.70	4.04	58.2	**SP 200**	200	3.10	9.60	191.0
SP 65	65	1.70	4.04	61.2	**SP 210**	210	3.10	9.60	200.9
SP 68	68	1.70	4.85	63.4	**SP 215**	215	3.10	9.60	205.9
SP 72	72	1.70	4.85	67.4	**SP 225**	225	3.50	10.00	214.3
SP 75	75	1.70	4.85	70.4	**SP 230**	230	3.50	10.00	219.2
SP 80	80	1.70	4.85	75.4					
SP 85	85	1.70	4.85	80.4					
SP 90	90	2.46	4.85	85.4					
SP 95	95	2.46	4.85	90.4					
SP 100	100	2.46	4.85	95.2					
SP 110	110	2.46	4.85	105.2					



SW Type Snap Ring

Part No.	Shaft Ø mm	s -0.1	b -0.15	d min.	Part No.	Shaft Ø mm	s -0.1	b -0.15	d min.
SW 4	4	0.5	0.80	3.7	**SW 11**	11	1.0	1.30	10.2
SW 5	5	0.5	1.00	4.7	**SW 12**	12	1.0	1.30	11.2
SW 6	6	0.7	1.10	5.6	**SW 13**	13	1.0	1.30	12.2
SW 7	7	0.7	1.20	6.5	**SW 14**	14	1.2	1.50	13.1
SW 8	8	1.0	1.30	7.4	**SW 15**	15	1.2	1.75	14.0
SW 9	9	1.0	1.30	8.4	**SW 16**	16	1.2	1.75	15.0
SW 10	10	1.0	1.30	9.4	**SW 17**	17	1.2	1.75	16.0

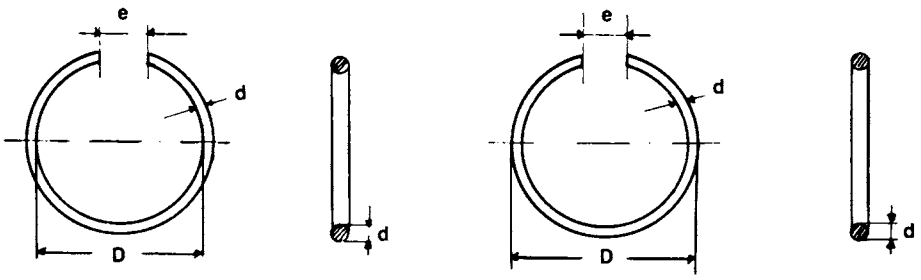
Metric Snap Rings



SW Type Snap Ring

Part No.	Shaft Ø mm	s -0.1	b -0.1	d min.
SW 18	18	1.2	1.75	17.0
SW 19	19	1.2	1.75	17.9
SW 20	20	1.2	1.75	18.7
SW 21	21	1.2	1.75	19.7
SW 22	22	1.2	1.75	20.7
SW 24	24	1.2	1.75	22.5
SW 25	25	1.2	1.75	23.5
SW 26	26	1.2	1.75	24.5
SW 27	27	1.5	2.30	25.5
SW 28	28	1.5	2.30	26.5
SW 30	30	1.5	2.30	28.5
SW 32	32	1.5	2.30	30.2
SW 35	35	1.5	2.30	33.2
SW 37	37	1.5	2.30	35.2
SW 38	38	1.5	2.30	36.2
SW 40	40	1.5	2.30	37.8
SW 42	42	1.5	2.30	39.8
SW 43	43	1.5	2.30	40.8
SW 45	45	1.5	2.30	42.8
SW 47	47	1.5	2.30	44.8
SW 48	48	1.5	2.30	45.8
SW 50	50	1.5	2.30	47.8
SW 52	52	1.5	2.30	49.8
SW 55	55	1.5	2.30	52.6
SW 58	58	1.5	2.30	55.6
SW 60	60	1.5	2.30	57.6
SW 63	63	1.5	2.30	60.6
SW 65	65	1.5	2.30	62.6
SW 68	68	2.0	2.80	65.4
SW 70	70	2.0	2.80	67.4
SW 72	72	2.0	2.80	69.4
SW 73	73	2.0	2.80	70.4
SW 75	75	2.0	2.80	72.4
SW 80	80	2.0	2.80	77.4
SW 85	85	2.5	3.40	82.0
SW 90	90	2.5	3.40	87.0
SW 95	95	2.5	3.40	92.0
SW 100	100	2.5	3.40	97.0
SW 105	105	2.5	3.40	101.7
SW 110	110	2.5	3.40	106.7
SW 115	115	2.5	3.40	111.7
SW 120	120	2.5	3.40	116.7
SW 125	125	2.5	3.40	121.7
SW 130	130	2.5	3.40	126.7
SW 135	135	2.5	4.00	131.6
SW 140	140	2.5	4.00	136.6
SW 145	145	2.5	4.00	141.6
SW 150	150	2.5	4.00	146.6
SW 155	155	2.5	4.00	151.6
SW 160	160	2.5	4.00	156.6
SW 165	165	2.5	4.00	161.6
SW 170	170	2.5	4.00	166.6
SW 175	175	2.5	4.00	171.6
SW 180	180	3.0	5.00	175.6
SW 185	185	3.0	5.00	180.6
SW 190	190	3.0	5.00	185.6
SW 195	195	3.0	5.00	190.6
SW 200	200	3.0	5.00	195.6
SW 210	210	3.0	5.00	205.6
SW 220	220	3.0	5.00	215.6
SW 230	230	3.0	5.00	225.6
SW 240	240	3.0	5.00	235.6
SW 250	250	3.0	5.00	245.6
SW 260	260	4.0	7.50	253.0
SW 265	265	4.0	7.50	258.0
SW 270	270	4.0	7.50	263.0
SW 280	280	4.0	7.50	273.0
SW 285	285	4.0	7.50	278.0
SW 290	290	4.0	7.50	283.0
SW 300	300	4.0	7.50	293.0
SW 305	305	4.0	7.50	298.0
SW 310	310	4.0	7.50	303.0
SW 320	320	4.0	7.50	313.0
SW 330	330	4.0	7.50	332.0
SW 340	340	4.0	7.50	333.0
SW 350	350	4.0	7.50	343.0
SW 360	360	4.0	7.50	353.0
SW 370	370	4.0	7.50	363.0
SW 380	380	4.0	7.50	373.0
SW 390	390	4.0	7.50	383.0
SW 400	400	4.0	7.50	393.0

Metric Snap Rings



RW (External) Type Snap Ring (DIN 7993)

Part No.	Shaft Ø mm	d	D	e
RW 20	20	2.0	17.7	3
RW 22	22	2.0	19.7	3
RW 24	24	2.0	21.7	3
RW 25	25	2.0	22.7	3
RW 26	26	2.0	23.7	3
RW 28	28	2.0	25.7	3
RW 30	30	2.0	27.7	3
RW 32	32	2.5	29.1	4
RW 35	35	2.5	32.1	4
RW 38	38	2.5	35.1	4
RW 40	40	2.5	37.1	4
RW 45	45	2.5	42.0	4
RW 50	50	2.5	47.0	4
RW 55	55	3.2	51.5	4
RW 60	60	3.2	56.1	4
RW 65	65	3.2	61.1	4
RW 70	70	3.2	66.0	5
RW 75	75	3.2	71.0	5
RW 80	80	3.2	76.0	5
RW 85	85	3.2	81.0	5
RW 90	90	3.2	86.0	5
RW 95	95	3.2	91.0	5
RW 105	105	3.2	100.8	5
RW 110	110	3.2	105.8	5
RW 120	12	3.2	115.8	5

RB (Internal) Type Snap Ring (DIN 7993)

Part No.	Shaft Ø mm	d	D	e
RB 20	20	2.0	22.3	10
RB 22	22	2.0	24.3	10
RB 25	25	2.0	27.3	10
RB 26	26	2.0	28.3	10
RB 28	28	2.0	30.3	10
RB 30	30	2.0	32.3	10
RB 32	32	2.5	34.9	12
RB 35	35	2.5	37.9	12
RB 38	38	2.5	40.9	12
RB 40	40	2.5	42.9	12
RB 42	42	2.5	45.0	16
RB 48	48	2.5	51.0	16
RB 60	60	3.2	63.9	20
RB 65	65	3.2	68.9	20
RB 70	70	3.2	74.0	25
RB 75	75	3.2	79.0	25
RB 80	80	3.2	84.0	25
RB 85	85	3.2	89.0	25
RB 90	90	3.2	94.0	25
RB 100	100	3.2	104.2	32
RB 105	105	3.2	109.2	32
RB 110	110	3.2	114.2	32

Retaining Ring And E-Ring Kits

RETAINING RINGS

E-RINGS

FOR BORES DIN 472		FOR SHAFTS DIN 471	
Size	**Quantity**	**Size**	**Quantity**
15 mm	20	8 mm	20
16 mm	20	10 mm	20
18 mm	15	12 mm	15
20 mm	15	14 mm	15
22 mm	15	15 mm	15
24 mm	15	16 mm	15
25 mm	10	17 mm	10
26 mm	10	18 mm	10
28 mm	10	20 mm	10
30 mm	10	22 mm	10
32 mm	10	24 mm	10
34 mm	10	25 mm	10
35 mm	10	28 mm	10
38 mm	10	30 mm	10
40 mm	10	32 mm	10
		35 mm	10
		40 mm	10

E-RINGS DIN 6799	
Size	**Quantity**
1.2 mm	500
1.5 mm	500
1.9 mm	500
2.3 mm	500
3.2 mm	500
4 mm	500
5 mm	300
6 mm	200
7 mm	100
8 mm	100
9 mm	50
10 mm	50