PSN

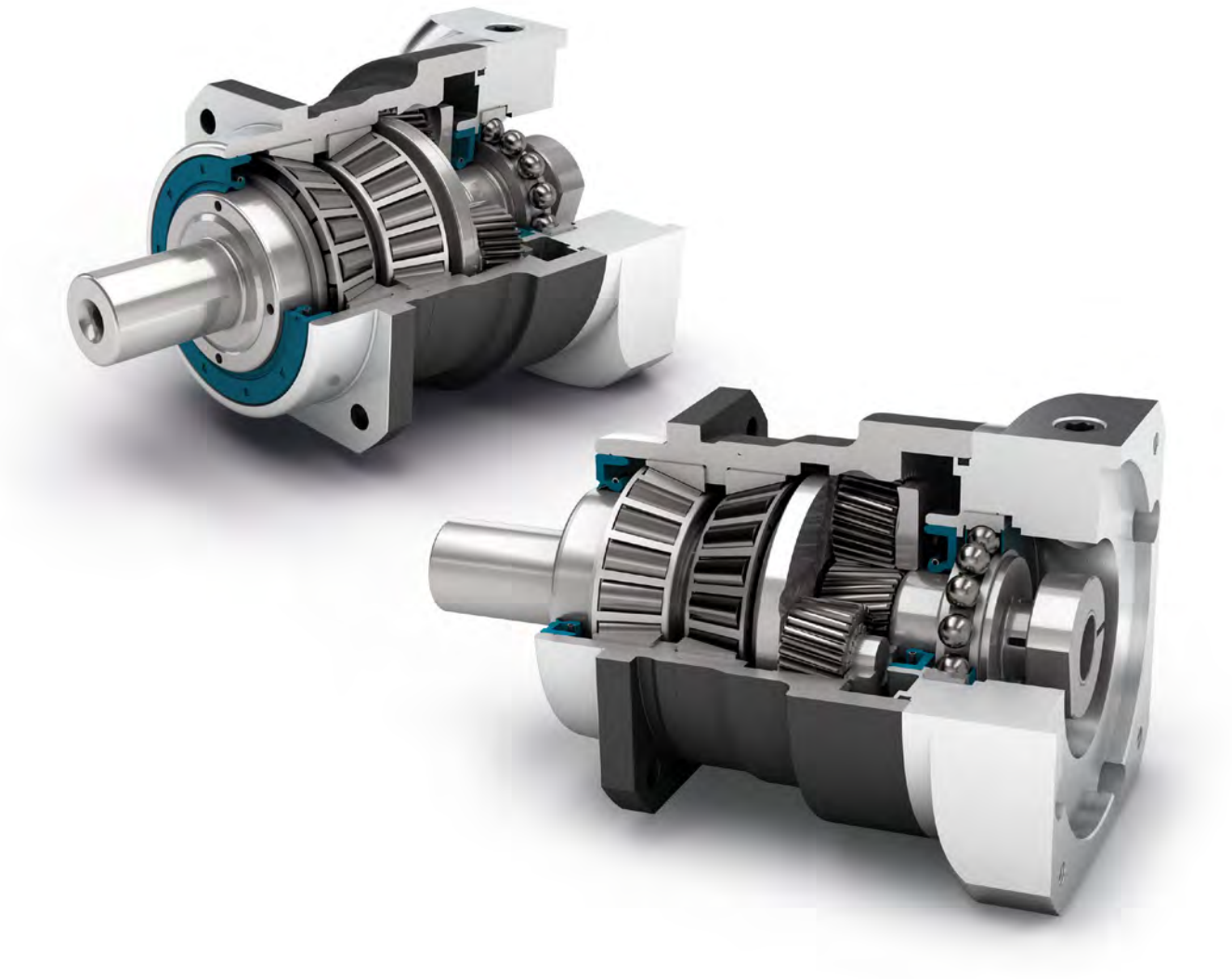
The helical precision planetary gearbox for low-noise operation and high bearing loads

Our **PSN** is pure progress: Its helical gearing ensures low-noise synchronization. With this precision planetary gearbox, vibrations are reduced to a minimum. Precision even under very high loads makes the **PSN** one of the most high-performance gearboxes in the world.

Cyclic torque	**14 - 950 Nm**
Radial force	**950 - 20000 N**
Axial force	**2200 - 17000 N**
Torsional backlash	**1 - 8 arcmin**
Protection class	**IP65**

Frame sizes

55	**70**	**90**	**115**	**142**	**190**



- Precision Line
- Helical gear
- Preloaded tapered roller bearings
- Extra long centering collar
- Option: Reduced backlash
- Option: Rack and pinion Planetary gearbox (Details on page 158)
- Coaxial gearbox
- Equidirectional rotation
- Square type output flange
- Rotary shaft seal
- Planet carrier in cage design
- Option: Painted surface – RAL 9005 Jet black

Detailed explanations of the technical features starting on page 201.

Code	Gearbox characteristics			PSN055	PSN070	PSN090	PSN115	PSN142	PSN190	p(1)
	Service life(2)	L_h	h	20,000						
	Efficiency(3)	η	%	98						1
				97						2
	Min. operating temperature	T_{min}	°C (°F)	-25 (-13)						
	Max. operating temperature	T_{max}		90 (194)						
	Protection class			IP65						
S	Standard lubrication			Oil (lifetime lubrication)						
F	Food grade lubrication			Oil (lifetime lubrication)						
	Installation position			Any						
S	Standard backlash	φ	arcmin	< 6	< 3	< 3	< 3	< 3	< 3	1
				< 8	< 5	< 5	< 5	< 5	< 5	2
R	Reduced backlash			< 4	< 2	< 1	< 1	< 1	< 1	1
				< 6	< 2	< 1	< 1	< 1	< 1	2
	Torsional stiffness(3)	C_{2t}	Nm / arcmin (lb_f.in/ arcmin)	1.3 - 1.9 (11 - 17)	3.6 - 5.0 (32 - 44)	10.5 - 13.9 (93 - 123)	28.0 - 39.0 (248 - 345)	62.0 - 88,0 (549 - 779)	181.0 - 246.0 (1602 - 2177)	1
				1.3 - 1.9 (11 - 17)	3.6 - 5.0 (32 - 44)	10.3 - 13.8 (91 - 122)	28.5 - 39.5 (252 - 350)	61.0 - 86.0 (540 - 761)	179.0 - 255.0 (1584 - 2257)	2
	Gearbox weight(3)	m	kg (lb_m)	0.8 (1.7 - 1.9)	2.2 (4.8 - 4.9)	4.0 - 4.1 (8.8 - 8.9)	6.9 - 7.3 (15.3 - 16.1)	15.1 - 15.5 (33.3 - 34.2)	34.5 - 36.3 (76.1 - 80.1)	1
				1.1 (2.4 - 2.5)	2.8 - 2.9 (6.2 - 6.3)	4.2 (9.2 - 9.4)	8.4 - 8.6 (18.5 - 18.9)	16.7 - 17.3 (36.9 - 38.1)	38.6 - 40.5 (85.2 - 89.3)	2
S	Standard surface			Housing: Steel – heat-treated and post-oxidized (black)						
B	Painted surface(4)			RAL 9005 Jet black						
	Running noise(3)	L_{pA}	dB(A)	56	57	58	63	66	68	

Output shaft loads			PSN055	PSN070	PSN090	PSN115	PSN142	PSN190	p(1)
Maximum radial force	$F_{r\,max}$	N (lb_f)	950 (214)	3200 (719)	5500 (1236)	6000 (1349)	13000 (2923)	20000 (4496)	
Maximum axial force	$F_{a\,max}$		2200 (495)	3400 (764)	4500 (1012)	6500 (1461)	12000 (2698)	17000 (3822)	
Maximum tilting moment	$M_{k\,max}$	Nm (lb_f.in)	40 (353)	203 (1800)	419 (3709)	562 (4972)	1566 (13856)	2887 (25552)	

Input characteristics			PSN055	PSN070	PSN090	PSN115	PSN142	PSN190	p(1)
Clamping system diameter input (Code)	D26	mm	11 (C)(5)	11 (C)	14 (D)	19 (E)	35 (G)(5)	48 (K)(5)	1
			14 (D)	14 (D)(5)	19 (E)(5)	24 (F)(5)	42 (H)	-	
			-	19 (E)	24 (F)	35 (G)	-	-	
			11 (C)(5)	11 (C)	11 (C)	14 (D)	19 (E)	35 (G)(5)	2
			14 (D)	14 (D)(5)	14 (D)(5)	19 (E)(5)	24 (F)(5)	42 (H)	
			-	19 (E)	19 (E)	24 (F)	35 (G)	-	
Mass moment of inertia input(3)(5)	J_1	$kgcm^2$ (lb_f.in.$s^2 10^{-4}$)	0.096 - 0.126 (0.850 - 1.115)	0.150 - 0.294 (1.328 - 2.602)	0.439 - 0.920 (3.885 - 8.143)	1.147 - 2.775 (10.152 - 24.561)	6.475 - 13.112 (57.309 - 116.051)	21.695 - 53.182 (192.017 - 470.700)	1
			0.095 - 0.109 (0.841 - 0.965)	0.146 - 0.199 (1.292 - 1.761)	0.146 - 0.227 (1.292 - 2.009)	0.431 - 0.710 (3.815 - 6.284)	1.131 - 2.252 (10.010 - 19.932)	6.360 - 10.654 (56.291 - 94.296)	2
Average idle torque(3)(5)	T_0	Nm (lb_f.in)	0.15 - 0.30 (1 - 3)	0.20 - 0.65 (2 - 6)	0.40 - 1.25 (4 - 11)	0.75 - 2.70 (7 - 24)	2.05 - 9.60 (18 - 85)	4.30 - 20.30 (38 - 180)	1
			0.15 - 0.25 (1 - 2)	0.15 - 0.45 (1 - 4)	0.25 - 0.55 (2 - 5)	0.40 - 1.35 (4 - 12)	0.70 - 3.40 (6 - 30)	1.75 - 7.30 (15 - 65)	2
Max. bending moment based on the gearbox input flange	M_{b1}		10 (89)	18 (159)	38 (336)	80 (708)	180 (1593)	300 (2655)	1
			10 (89)	18 (159)	18 (159)	38 (336)	80 (708)	180 (1593)	2

(1) Number of stages
(2) Application specific configuration with NCP – www.neugart.com
(3) The ratio-dependent values can be retrieved in Tec Data Finder – www.neugart.com
(4) More information on page 183
(5) Reference clamping system diameter

Output torques			PSN055	PSN070	PSN090	PSN115	PSN142	PSN190	i(1)	p(2)
Cyclic torque(3)(4)	T_{2Z}	Nm (lb_f.in)	16 (142)	29 (257)	54 (478)	135 (1195)	380 (3363)	840 (7435)	3	1
			18 (159)	39 (345)	80 (708)	180 (1593)	470 (4160)	950 (8408)	4	
			18 (159)	40 (354)	80 (708)	175 (1549)	405 (3585)	950 (8408)	5	
			18 (159)	37 (327)	78 (690)	170 (1505)	355 (3142)	900 (7966)	7	
			18 (159)	39 (345)	75 (664)	155 (1372)	350 (3098)	-	8	
			13.5 (119)	28 (248)	59 (522)	140 (1239)	270 (2390)	730 (6461)	10	
			16 (142)	29 (257)	54 (478)	135 (1195)	380 (3363)	840 (7435)	12	2
			16 (142)	29 (257)	54 (478)	135 (1195)	380 (3363)	840 (7435)	15	
			18 (159)	39 (345)	80 (708)	180 (1593)	470 (4160)	950 (8408)	16	
			18 (159)	39 (345)	80 (708)	180 (1593)	470 (4160)	950 (8408)	20	
			18 (159)	40 (354)	80 (708)	175 (1549)	405 (3585)	950 (8408)	25	
			18 (159)	40 (354)	80 (708)	175 (1549)	405 (3585)	950 (8408)	35	
			18 (159)	39 (345)	80 (708)	180 (1593)	470 (4160)	950 (8408)	40	
			18 (159)	40 (354)	80 (708)	175 (1549)	405 (3585)	950 (8408)	50	
			18 (159)	37 (327)	78 (690)	170 (1505)	355 (3142)	900 (7966)	70	
			13.5 (119)	28 (248)	59 (522)	140 (1239)	270 (2390)	730 (6461)	100	
Maximum torque(3)(4)	T_{2max}	Nm (lb_f.in)	25 (221)	46 (407)	86 (761)	215 (1903)	520 (4602)	1110 (9824)	3	1
			28 (248)	62 (549)	128 (1133)	285 (2522)	700 (6196)	1480 (13099)	4	
			28 (248)	64 (566)	128 (1133)	280 (2478)	640 (5664)	1520 (13453)	5	
			28 (248)	59 (522)	124 (1097)	270 (2390)	560 (4956)	1440 (12745)	7	
			28 (248)	62 (549)	120 (1062)	245 (2168)	490 (4337)	-	8	
			21 (186)	44 (389)	94 (832)	220 (1947)	435 (3850)	1050 (9293)	10	
			25 (221)	46 (407)	86 (761)	215 (1903)	600 (5310)	1350 (11949)	12	2
			25 (221)	46 (407)	86 (761)	215 (1903)	600 (5310)	1350 (11949)	15	
			28 (248)	62 (549)	128 (1133)	285 (2522)	750 (6638)	1520 (13453)	16	
			28 (248)	62 (549)	128 (1133)	285 (2522)	750 (6638)	1520 (13453)	20	
			28 (248)	64 (566)	128 (1133)	280 (2478)	640 (5664)	1520 (13453)	25	
			28 (248)	64 (566)	128 (1133)	280 (2478)	640 (5664)	1520 (13453)	35	
			28 (248)	62 (549)	128 (1133)	285 (2522)	750 (6638)	1520 (13453)	40	
			28 (248)	64 (566)	128 (1133)	280 (2478)	640 (5664)	1520 (13453)	50	
			28 (248)	51 (451)	124 (1097)	270 (2390)	560 (4956)	1440 (12745)	70	
			21 (186)	44 (389)	94 (832)	220 (1947)	435 (3850)	1050 (9293)	100	

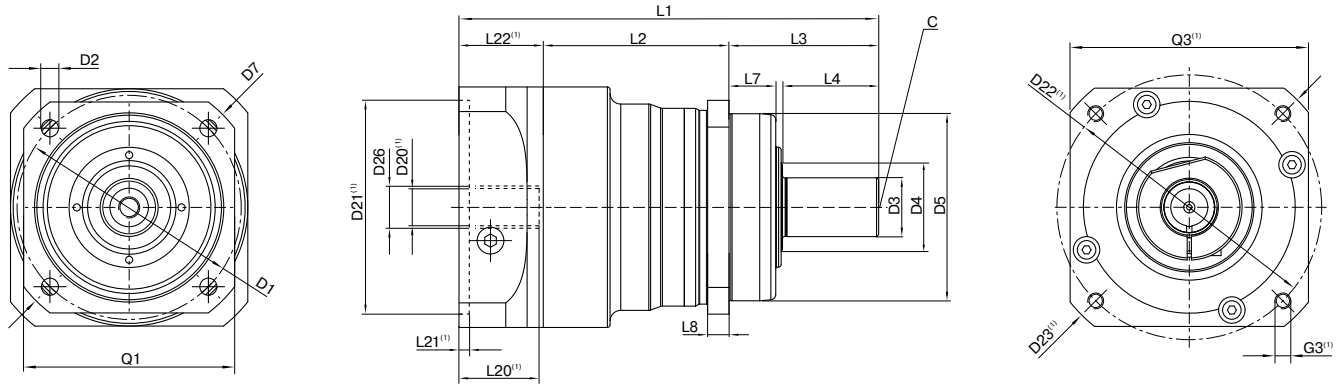
(1) Ratios ($i=n_1/n_2$)
(2) Number of stages
(3) Application specific configuration with NCP – www.neugart.com
(4) Based on reference clamping system diameter

Output torques			PSN055	PSN070	PSN090	PSN115	PSN142	PSN190	i(1)	p(2)
Continuous torque(3)	T_{2D}	Nm (lb_f.in)	11 (97)	24 (212)	45 (398)	114 (1009)	320 (2832)	710 (6284)	3	1
			15 (133)	33 (292)	68 (602)	153 (1354)	395 (3496)	800 (7081)	4	
			15 (133)	34 (301)	68 (602)	148 (1310)	340 (3009)	800 (7081)	5	
			15 (133)	31 (274)	66 (584)	148 (1310)	300 (2655)	760 (6727)	7	
			15 (133)	33 (292)	63 (558)	131 (1159)	295 (2611)	-	8	
			11 (97)	23 (204)	50 (443)	119 (1053)	255 (2257)	630 (5576)	10	
			13.5 (119)	24 (212)	45 (398)	114 (1009)	320 (2832)	710 (6284)	12	2
			13.5 (119)	24 (212)	45 (398)	114 (1009)	320 (2832)	710 (6284)	15	
			15 (133)	33 (292)	68 (602)	153 (1354)	395 (3496)	800 (7081)	16	
			15 (133)	33 (292)	68 (602)	153 (1354)	395 (3496)	800 (7081)	20	
			15 (133)	34 (301)	68 (602)	148 (1310)	340 (3009)	800 (7081)	25	
			15 (133)	34 (301)	68 (602)	148 (1310)	340 (3009)	800 (7081)	35	
			15 (133)	33 (292)	68 (602)	153 (1354)	395 (3496)	800 (7081)	40	
			15 (133)	34 (301)	68 (602)	148 (1310)	340 (3009)	800 (7081)	50	
			15 (133)	31 (274)	66 (584)	148 (1310)	300 (2655)	760 (6727)	70	
			11 (97)	23 (204)	50 (443)	119 (1053)	255 (2257)	630 (5576)	100	

Input speeds			PSN055	PSN070	PSN090	PSN115	PSN142	PSN190	i(1)	p(2)
Continuous input speed(3)(4)	n_{1D}	rpm	4050	2500	2150	1600	1000	610	3	1
			4150	3150	2150	1750	1050	610	4	
			4950	3800	2600	2200	1500	800	5	
			5000	4500	3450	3200	2200	1100	7	
			5000	4500	3500	3150	2550	-	8	
			5000	4500	4000	3500	3000	1550	10	
			5000	4500	4450	3100	2000	1350	12	2
			4500	4500	4500	3850	2500	1750	15	
			5000	4500	4300	3150	2000	1450	16	
			4600	4500	4500	3900	2500	1900	20	
			5000	4500	4500	4000	3150	2250	25	
			5000	4500	4500	4000	3500	3000	35	
			5000	4500	4500	4000	3500	3000	40	
			5000	4500	4500	4000	3500	3000	50	
			5000	4500	4500	4000	3500	3000	70	
			5000	4500	4500	4000	3500	3000	100	
Max. mechanical input speed(3)	n_{1max}	rpm	10000	10000	10000	8500	6500	6000		1
			10000	10000	10000	10000	8500	6500		2

Output torques			PSN055	PSN070	PSN090	PSN115	PSN142	PSN190	i(1)	p(2)
Emergency stop torque(4)(5)	T_{2Stop}	Nm (lb_f.in)	48 (425)	90 (797)	210 (1859)	490 (4337)	1050 (9293)	2220 (19649)	3	1
			48 (425)	120 (1062)	280 (2478)	650 (5753)	1400 (12391)	2960 (26198)	4	
			48 (425)	130 (1151)	280 (2478)	650 (5753)	1650 (14604)	3200 (28322)	5	
			48 (425)	80 (708)	175 (1549)	340 (3009)	1300 (11506)	3200 (28322)	7	
			48 (425)	90 (797)	200 (1770)	380 (3363)	850 (7523)	-	8	
			24 (212)	52 (460)	121 (1071)	295 (2611)	600 (5310)	1700 (15046)	10	
			48 (425)	135 (1195)	220 (1947)	500 (4425)	1250 (11063)	2400 (21242)	12	2
			48 (425)	135 (1195)	220 (1947)	500 (4425)	1250 (11063)	2400 (21242)	15	
			48 (425)	150 (1328)	300 (2655)	650 (5753)	1650 (14604)	3200 (28322)	16	
			48 (425)	150 (1328)	300 (2655)	650 (5753)	1650 (14604)	3200 (28322)	20	
			48 (425)	150 (1328)	300 (2655)	650 (5753)	1650 (14604)	3200 (28322)	25	
			48 (425)	150 (1328)	300 (2655)	650 (5753)	1650 (14604)	3200 (28322)	35	
			48 (425)	150 (1328)	210 (1859)	485 (4293)	1180 (10444)	2680 (23720)	40	
			48 (425)	150 (1328)	260 (2301)	600 (5310)	1480 (13099)	3200 (28322)	50	
			48 (425)	80 (708)	175 (1549)	340 (3009)	1300 (11506)	3200 (28322)	70	
			24 (212)	52 (460)	121 (1071)	295 (2611)	600 (5310)	1700 (15046)	100	

(1) Ratios ($i=n_1/n_2$)
(2) Number of stages
(3) Application specific configuration with NCP – www.neugart.com
(4) Based on reference clamping system diameter
(5) Permitted 1000 times



Drawing corresponds to a PSN090 / 1-stage / smooth output shaft / 14 mm clamping system / motor adaptation – 2-part – round universal flange / B5 flange type motor

(1) The dimensions vary with the motor/gearbox flange. The input flange dimensions can be retrieved for each specific motor in Tec Data Finder at www.neugart.com

Geometry(2)			**PSN055**	**PSN070**	**PSN090**	**PSN115**	**PSN142**	**PSN190**	**p**(3)	**Code**
Pitch circle diameter output	D1		63 (2.480)	68 - 75 (2.677 - 2.953)	85 (3.346)	120 (4.724)	165 (6.496)	215 (8.465)		
Mounting bore output	D2	4x	5.5 (0.217)	5.5 (0.217)	6.5 (0.256)	9.0 (0.354)	11.0 (0.433)	13.5 (0.531)		
Shaft diameter output	D3	k6	12 (0.472)	16 (0.630)	22 (0.866)	32 (1.260)	40 (1.575)	55 (2.165)		
Shaft collar output	D4		16 (0.630)	21.5 (0.846)	31.5 (1.240)	41.5 (1.634)	57.5 (2.264)	76.5 (3.012)		
Centering diameter output	D5	g7	50 (1.969)	60 (2.362)	70 (2.756)	90 (3.543)	130 (5.118)	160 (6.299)		
Diagonal dimension output	D7		74 (2.913)	92 (3.622)	100 (3.937)	140 (5.512)	185 (7.283)	240 (9.449)		
Flange cross section output	Q1	■	55 (2.165)	70 (2.756)	80 (3.150)	110 (4.331)	142 (5.591)	190 (7.480)		
Min. total length	L1		103.5 (4.075)	134 (5.276)	157 (6.181)	202.5 (7.972)	261.5 (10.295)	310.5 (12.224)	1	
			127 (5.000)	162.5 (6.398)	179 (7.047)	224.5 (8.839)	292.5 (11.516)	355.5 (13.996)	2	
Housing length	L2		43 (1.693)	60.5 (2.382)	69.5 (2.736)	71 (2.795)	101.5 (3.996)	130.5 (5.138)	1	
			66.5 (2.618)	89 (3.504)	98 (3.858)	104.5 (4.114)	139 (5.472)	194 (7.638)	2	
Centering depth output	L7		12 (0.472)	19 (0.748)	17.5 (0.689)	28 (1.102)	28 (1.102)	28 (1.102)		
Flange thickness output	L8		6 (0.236)	7 (0.276)	8 (0.315)	10 (0.394)	12 (0.472)	15 (0.591)		
Center hole (DIN 332. type DR)	C		M4x10	M5x12.5	M8x19	M12x28	M16x36	M20x42		
Motor shaft diameter j6/k6	D20		More information on page 191/192							
Clamping system diameter input	D26		More information on page 112							
Output shaft with feather key (DIN 6885-1)			A 4x4x18	A 5x5x25	A 6x6x28	A 10x8x50	A 12x8x65	A 16x10x70		
Feather key width (DIN 6885-1)	B1		4 (0.157)	5 (0.197)	6 (0.236)	10 (0.394)	12 (0.472)	16 (0.630)		
Shaft height including feather key (DIN 6885-1)	H1		13.5 (0.531)	18 (0.709)	24.5 (0.965)	35 (1.378)	43 (1.693)	59 (2.323)		
Shaft length output	L3		36 (1.417)	48 (1.890)	56 (2.205)	88 (3.465)	110 (4.331)	112 (4.409)		**A**
Shaft length from shoulder	L4		23 (0.906)	28 (1.102)	36 (1.417)	58 (2.283)	80 (3.150)	82 (3.228)		
Feather key length	L5		18 (0.709)	25 (0.984)	28 (1.102)	50 (1.969)	65 (2.559)	70 (2.756)		
Distance from shaft end	L6		2 (0.079)	2 (0.079)	4 (0.157)	4 (0.157)	8 (0.315)	6 (0.236)		
Smooth output shaft										
Shaft length output	L3		36 (1.417)	48 (1.890)	56 (2.205)	88 (3.465)	110 (4.331)	112 (4.409)		**B**
Shaft length from shoulder	L4		23 (0.906)	28 (1.102)	36 (1.417)	58 (2.283)	80 (3.150)	82 (3.228)		
Splined output shaft (DIN 5480)			-	W16x 0.8x18x6m	W22x 1.25x16x6m	W32x 1.25x24x6m	W40x 2.0x18x6m	W55x 2.0x26x6m		
Width of gearing	L_v		-	15 (0.591)	15 (0.591)	15 (0.591)	20 (0.787)	22 (0.866)		**C**
Shaft length output	L3		-	46 (1.811)	46 (1.811)	56 (2.205)	70 (2.756)	71.5 (2.815)		
Shaft length from shoulder	L4		-	26 (1.024)	26 (1.024)	26 (1.024)	40 (1.575)	41.5 (1.634)		

(2) Dimensions in mm
(3) Number of stages