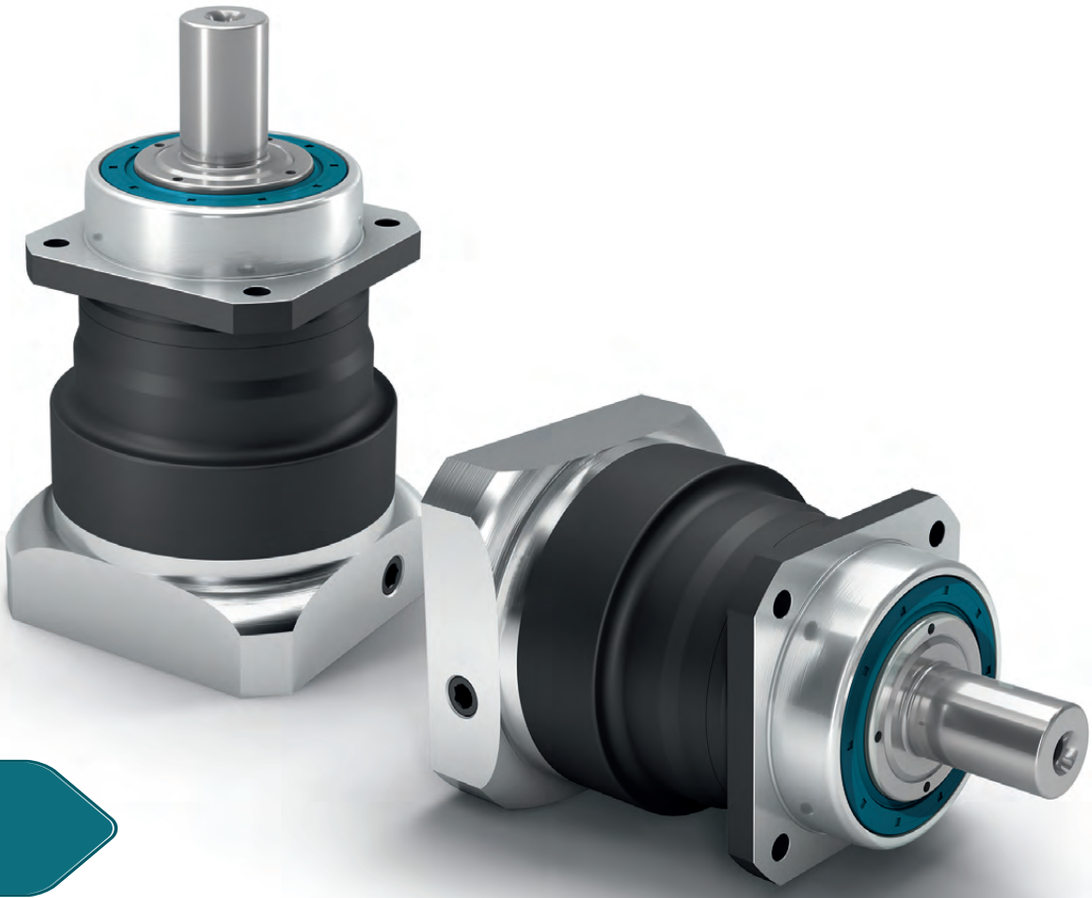


PSN

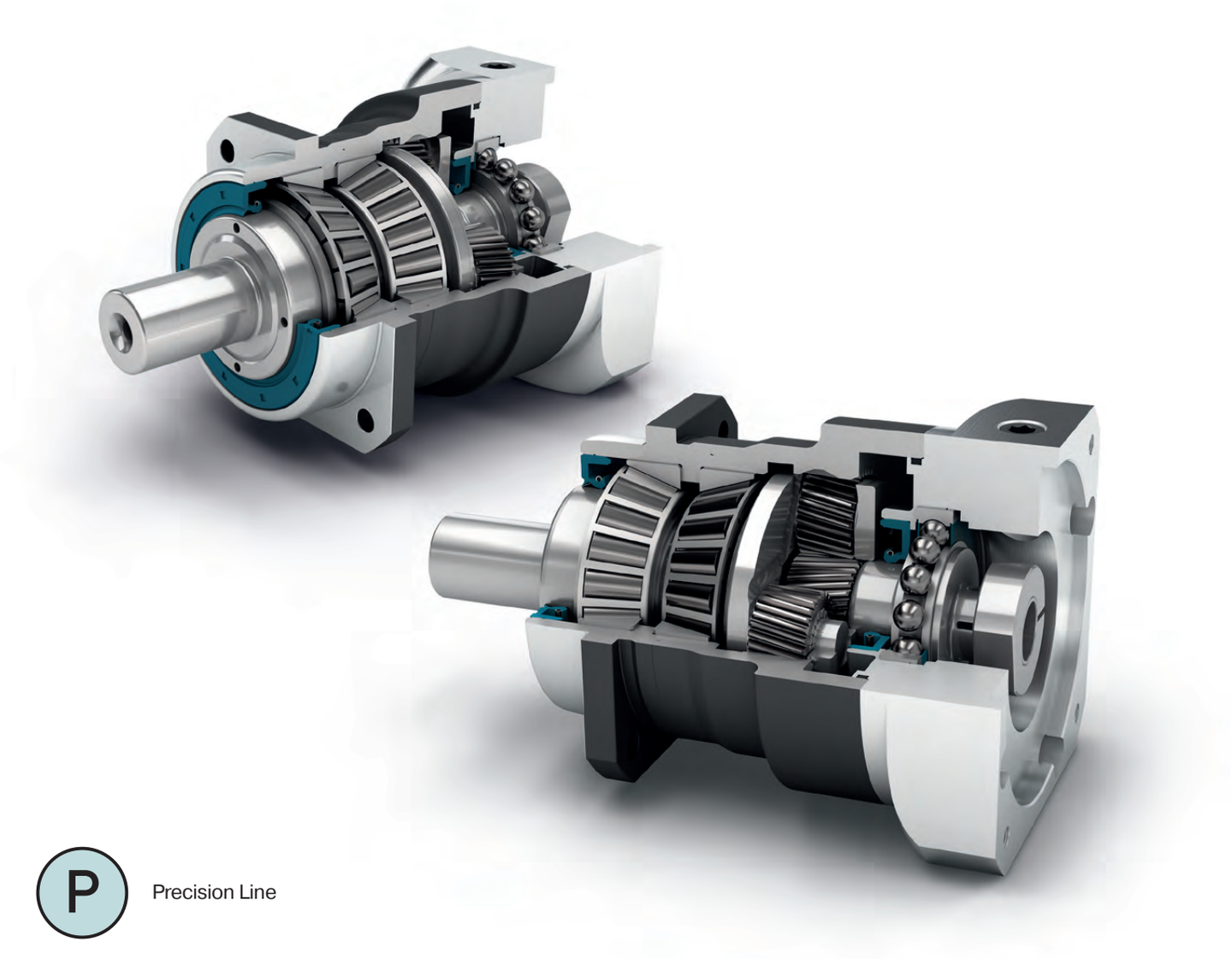
The helical precision planetary gearbox for low-noise operation and high bearing loads

Our **PSN** embodies pure progress: Its innovative helical teeth safeguard low-noise operations. This precision planetary gearbox minimizes vibrations, and therefore increases the quality of your workpiece surfaces even under the highest bearing loads.

Nominal output torque	**28 - 950 Nm**
Torsional backlash	**1 - 5 arcmin**
Tilting moment	**203 - 2887 Nm**
Protection class	**IP65**

Frame sizes

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



- Precision Line
- Coaxial gearbox
- Helical gear
- Preloaded tapered roller bearings
- Extra long centering collar
- Option: Reduced backlash
- Equidirectional rotation
- Square type output flange
- Rotary shaft seal
- Planet carrier in cage design
- Option: Splined output shaft (DIN 5480)

Code	Gearbox characteristics			PSN070	PSN090	PSN115	PSN142	PSN190	p[1]
	Service life (L_{10h})	t_L	h	20,000					
	Service life at T_{2N} x 0,88			30,000					
	Efficiency at full load[2]	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)					
L	Low temperature lubrication[3]			Oil (lifetime lubrication)					
	Installation position			Any					
S	Standard backlash	j_t	arcmin	< 3					1
				< 5					2
R	Reduced backlash			< 2	< 1	< 1	< 1	< 1	
	Torsional stiffness[2]	c_g	Nm/arcmin (lb_f.in/arcmin)	3.6 - 4.8 (32 - 42)	9.2 - 13.0 (81 - 115)	22.0 - 34.5 (195 - 305)	62.0 - 88.0 (549 - 779)	181.0 - 246.0 (1602 - 2177)	1
				3.6 - 5.0 (32 - 44)	10.2 - 13.8 (90 - 122)	28.0 - 39.5 (248 - 350)	61.0 - 85.0 (540 - 752)	179.0 - 255.0 (1584 - 2257)	2
	Gearbox weight	m_G	kg (lb_m)	1.9 (4.2)	3.3 (7.3)	6.9 (15.2)	15.7 (34.6)	36 (79.4)	1
				2.7 (6.0)	4.3 (9.5)	8.4 (18.5)	17 (37.5)	39.7 (87.6)	2
S	Standard surface			Housing: Steel – heat-treated and post-oxidized (black)					
	Running noise[4]	Q_g	dB(A)	57	58	63	66	68	
	Max. bending moment based on the gearbox input flange[5]	M_b	Nm (lb_f.in)	18 (159)	38 (336)	80 (708)	180 (1593)	300 (2655)	1
				18 (159)	18 (159)	38 (336)	80 (708)	180 (1593)	2

Output shaft loads			PSN070	PSN090	PSN115	PSN142	PSN190	p[1]
Radial force for 20,000 h[6][7]	$F_{r\ 20.000\ h}$	N (lb_f)	3200 (719)	5500 (1236)	6000 (1349)	13000 (2923)	20000 (4496)	
Axial force for 20,000 h[6][7]	$F_{a\ 20.000\ h}$		4400 (989)	6400 (1439)	8000 (1798)	15000 (3372)	19000 (4271)	
Radial force for 30,000 h[6][7]	$F_{r\ 30.000\ h}$		3200 (719)	4800 (1079)	5400 (1214)	11500 (2585)	17500 (3934)	
Axial force for 30,000 h[6][7]	$F_{a\ 30.000\ h}$		3900 (877)	5700 (1281)	7000 (1574)	13500 (3035)	18500 (4159)	
Maximum radial force[7][8]	$F_{r\ Stat}$		3200 (719)	5500 (1236)	6000 (1349)	13000 (2923)	20000 (4496)	
Maximum axial force[7][8]	$F_{a\ Stat}$		4400 (989)	6400 (1439)	8000 (1798)	15000 (3372)	19000 (4271)	
Tilting moment for 20,000 h[6][8]	$M_{K\ 20.000\ h}$	Nm (lb_f.in)	203 (1797)	419 (3708)	562 (4974)	1566 (13860)	2887 (25552)	
Tilting moment for 30,000 h[6][8]	$M_{K\ 30.000\ h}$		203 (1797)	366 (3239)	506 (4478)	1385 (12258)	2526 (22357)	

Moment of inertia			PSN070	PSN090	PSN115	PSN142	PSN190	p[1]
Mass moment of inertia[2]	J	$kgcm^2$ ($lb_f.in.s^2 10^{-4}$)	0.128 - 0.272 (1.133 - 2.407)	0.330 - 0.811 (2.921 - 7.178)	0.857 - 2.484 (7.585 - 21.985)	6.475 - 13.112 (57.309 - 116.051)	21.695 - 53.182 (192.017 - 470.700)	1
			0.123 - 0.177 (1.089 - 1.567)	0.124 - 0.204 (1.097 - 1.806)	0.321 - 0.600 (2.841 - 5.310)	0.840 - 1.962 (7.435 - 17.365)	6.360 - 10.654 (56.291 - 94.296)	2

(1) Number of stages
(2) The ratio-dependent values can be retrieved in Tec Data Finder – www.neugart.com
(3) T_{min} = -40°C. Optimal operating temperature max. 50°C
(4) Sound pressure level from 1 m, measured on input running at n_1=3000 rpm no load; i=5
Max. motor weight* in kg = 0.2 x M_b / motor length in m
* with symmetrically distributed motor weight
(5) * with horizontal and stationary mounting
(6) These values are based on an output shaft speed of n_2=100 rpm
(7) Based on center of output shaft
(8) Other (sometimes higher) values following changes to T_{2N}, F_r, F_a, cycle, and service life of bearing. Application specific configuration with NCP – www.neugart.com

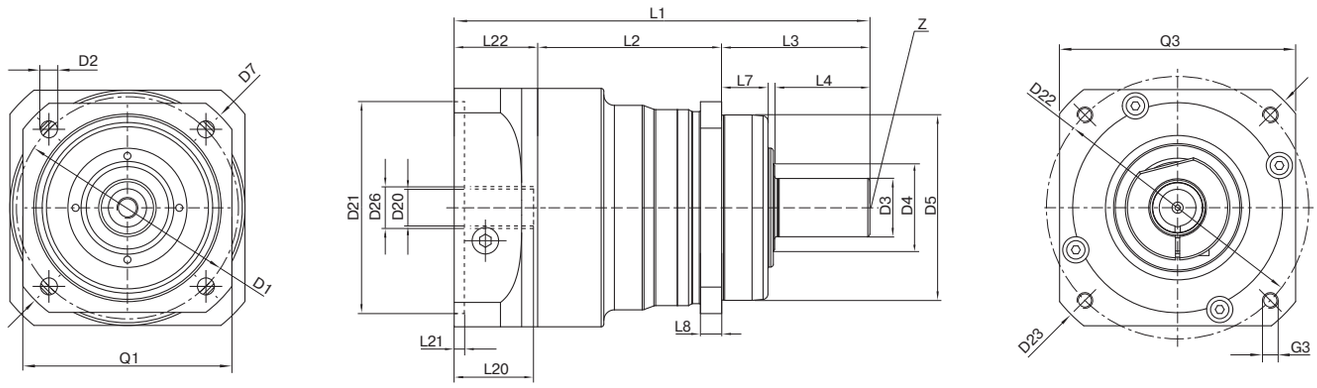
Output torques			PSN070	PSN090	PSN115	PSN142	PSN190	i[1]	p[2]
Nominal output torque[3][4]	T_{2N}	Nm (lb_f.in)	29 (257)	54 (478)	135 (1195)	380 (3363)	845 (7479)	3	1
			39 (345)	80 (708)	180 (1593)	470 (4160)	950 (8408)	4	
			40 (354)	80 (708)	175 (1549)	405 (3585)	950 (8408)	5	
			37 (327)	78 (690)	175 (1549)	355 (3142)	900 (7966)	7	
			28 (248)	59 (522)	140 (1239)	305 (2699)	750 (6638)	10	
			29 (257)	54 (478)	135 (1195)	380 (3363)	845 (7479)	12	2
			29 (257)	54 (478)	135 (1195)	380 (3363)	845 (7479)	15	
			39 (345)	80 (708)	180 (1593)	450 (3983)	950 (8408)	16	
			39 (345)	80 (708)	180 (1593)	450 (3983)	950 (8408)	20	
			40 (354)	80 (708)	175 (1549)	405 (3585)	950 (8408)	25	
			40 (354)	80 (708)	175 (1549)	405 (3585)	950 (8408)	35	
			39 (345)	80 (708)	180 (1593)	470 (4160)	950 (8408)	40	
			40 (354)	80 (708)	175 (1549)	405 (3585)	950 (8408)	50	
			37 (327)	78 (690)	175 (1549)	355 (3142)	900 (7966)	70	
			28 (248)	59 (522)	140 (1239)	305 (2699)	750 (6638)	100	
Max. output torque[4][5]	T_{2max}	Nm (lb_f.in)	46 (407)	86 (761)	216 (1912)	608 (5381)	1352 (11966)	3	1
			62 (549)	128 (1133)	288 (2549)	752 (6656)	1520 (13453)	4	
			64 (566)	128 (1133)	280 (2478)	648 (5735)	1520 (13453)	5	
			59 (522)	125 (1106)	280 (2478)	568 (5027)	1440 (12745)	7	
			45 (398)	94 (832)	224 (1983)	488 (4319)	1200 (10621)	10	
			46 (407)	86 (761)	216 (1912)	608 (5381)	1352 (11966)	12	2
			46 (407)	86 (761)	216 (1912)	608 (5381)	1352 (11966)	15	
			62 (549)	128 (1133)	288 (2549)	720 (6373)	1520 (13453)	16	
			62 (549)	128 (1133)	288 (2549)	720 (6373)	1520 (13453)	20	
			64 (566)	128 (1133)	280 (2478)	648 (5735)	1520 (13453)	25	
			64 (566)	128 (1133)	280 (2478)	648 (5735)	1520 (13453)	35	
			62 (549)	128 (1133)	288 (2549)	752 (6656)	1520 (13453)	40	
			64 (566)	128 (1133)	280 (2478)	648 (5735)	1520 (13453)	50	
			59 (522)	125 (1106)	280 (2478)	568 (5027)	1440 (12745)	70	
			45 (398)	94 (832)	224 (1983)	488 (4319)	1200 (10621)	100	

(1) Ratios ($i=n_1/n_2$)
(2) Number of stages
(3) Application specific configuration with NCP – www.neugart.com
(4) Values for feather key (code "A"): for repeated load
(5) 30,000 rotations of the output shaft permitted; see page 142

Output torques			PSN070	PSN090	PSN115	PSN142	PSN190	i[1]	p[2]
Emergency stop torque[3]	T_{2Stop}	Nm (lb_f.in)	90 (797)	210 (1859)	490 (4337)	1250 (11063)	2400 (21242)	3	1
			120 (1062)	280 (2478)	650 (5753)	1650 (14604)	3200 (28322)	4	
			130 (1151)	280 (2478)	650 (5753)	1650 (14604)	3200 (28322)	5	
			80 (708)	175 (1549)	340 (3009)	1300 (11506)	3200 (28322)	7	
			90 (797)	200 (1770)	480 (4248)	600 (5310)	1700 (15046)	10	
			135 (1195)	220 (1947)	500 (4425)	1250 (11063)	2400 (21242)	12	2
			135 (1195)	220 (1947)	500 (4425)	1250 (11063)	2400 (21242)	15	
			150 (1328)	300 (2655)	650 (5753)	1650 (14604)	3200 (28322)	16	
			150 (1328)	300 (2655)	650 (5753)	1650 (14604)	3200 (28322)	20	
			150 (1328)	300 (2655)	650 (5753)	1650 (14604)	3200 (28322)	25	
			150 (1328)	300 (2655)	650 (5753)	1650 (14604)	3200 (28322)	35	
			150 (1328)	300 (2655)	650 (5753)	1650 (14604)	3200 (28322)	40	
			150 (1328)	300 (2655)	650 (5753)	1650 (14604)	3200 (28322)	50	
			80 (708)	175 (1549)	340 (3009)	1300 (11506)	3200 (28322)	70	
			80 (708)	200 (1770)	480 (4248)	600 (5310)	1700 (15046)	100	

Input speeds			PSN070	PSN090	PSN115	PSN142	PSN190	i[1]	p[2]
Average thermal input speed at T_{2N} and S1[4][5]	n_{1N}	rpm	3000[6]	2700[6]	2000[6]	1000[6]	750[6]	3	1
			3700[6]	3050[6]	2250[6]	1250[6]	900[6]	4	
			4400[6]	3700[6]	2750[6]	1550[6]	1100[6]	5	
			4500	4000	3500[6]	2000[6]	1450[6]	7	
			4500	4000	3500	2500[6]	1900[6]	10	
			4500	4500	4000[6]	2400[6]	1550[6]	12	2
			4500	4500	4000	3000[6]	1900[6]	15	
			4500	4500	4000[6]	2600[6]	1650[6]	16	
			4500	4500	4000	3250[6]	2050[6]	20	
			4500	4500	4000	3500[6]	2200[6]	25	
			4500	4500	4000	3500	2800[6]	35	
			4500	4500	4000	3500	3000[6]	40	
			4500	4500	4000	3500	3000	50	
			4500	4500	4000	3500	3000	70	
			4500	4500	4000	3500	3000	100	
Max. mechanical input speed[4]	n_{1Limit}	rpm	14000	10000	8500	6500	6000		1
			14000	14000	10000	8500	6500		2

(1) Ratios ($i=n_1/n_2$)
(2) Number of stages
(3) Permitted 1000 times
(4) Application-specific speed configurations with NCP – www.neugart.com
(5) See page 142 for the definition
(6) Average thermal input speed at 50% T_{2N} and S1



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
All other variants can be retrieved in the Tec Data Finder at www.neugart.com

Geometry[1]			**PSN070**	**PSN090**	**PSN115**	**PSN142**	**PSN190**	**z**[2]	**Code**
Pitch circle diameter output	D1		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)	6.5 (0.256)	9.0 (0.354)	11.0 (0.433)	13.5 (0.531)		
Shaft diameter output	D3	k6	16 (0.630)	22 (0.866)	32 (1.260)	40 (1.575)	55 (2.165)		
Shaft collar output	D4		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	60 (2.362)	70 (2.756)	90 (3.543)	130 (5.118)	160 (6.299)		
Diagonal dimension output	D7		92 (3.622)	100 (3.937)	140 (5.512)	185 (7.283)	240 (9.449)		
Flange cross section output	Q1	■	70 (2.756)	80 (3.150)	110 (4.331)	142 (5.591)	190 (7.480)		
Min. total length	L1		134 (5.276)	157 (6.181)	202.5 (7.972)	261.5 (10.295)	310.5 (12.224)	1	
			162.5 (6.398)	179 (7.047)	224.5 (8.839)	292.5 (11.516)	355.5 (13.996)	2	
Housing length	L2		60.5 (2.382)	69.5 (2.736)	71 (2.795)	101.5 (3.996)	130.5 (5.138)	1	
			89 (3.504)	97.5 (3.839)	104.5 (4.114)	139 (5.472)	193.5 (7.618)	2	
Centering depth output	L7		19 (0.748)	17.5 (0.689)	28 (1.102)	28 (1.102)	28 (1.102)		
Flange thickness output	L8		7 (0.276)	8 (0.315)	10 (0.394)	12 (0.472)	15 (0.591)		
Center hole (DIN 332, type DR)	Z		M5x12.5	M8x19	M12x28	M16x36	M20x42		
Clamping system diameter input	D26		More information on page 131						
Motor shaft diameter j6/k6	D20		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						
Max. permis. motor shaft length	L20								
Min. permis. motor shaft length									
Centering diameter input	D21								
Centering depth input	L21								
Pitch circle diameter input	D22								
Motor flange length	L22								
Diagonal dimension input	D23								
Mounting thread x depth	G3	4x							
Flange cross section input	Q3	■							
Output shaft with feather key (DIN 6885-1)			A 5x5x25	A 6x6x28	A 10x8x50	A 12x8x65	A 16x10x70		
Feather key width (DIN 6885-1)	B1		5 (0.197)	6 (0.236)	10 (0.394)	12 (0.472)	16 (0.630)		
Shaft height including feather key (DIN 6885-1)	H1		18 (0.709)	24.5 (0.965)	35 (1.378)	43 (1.693)	59 (2.323)		**A**
Shaft length output	L3		48 (1.890)	56 (2.205)	88 (3.465)	110 (4.331)	112 (4.409)		
Shaft length from shoulder	L4		28 (1.102)	36 (1.417)	58 (2.283)	80 (3.150)	82 (3.228)		
Feather key length	L5		25 (0.984)	28 (1.102)	50 (1.969)	65 (2.559)	70 (2.756)		
Distance from shaft end	L6		2 (0.079)	4 (0.157)	4 (0.157)	8 (0.315)	6 (0.236)		
Smooth output shaft									
Shaft length output	L3		48 (1.890)	56 (2.205)	88 (3.465)	110 (4.331)	112 (4.409)		**B**
Shaft length from shoulder	L4		28 (1.102)	36 (1.417)	58 (2.283)	80 (3.150)	82 (3.228)		
Splined output shaft (DIN 5480)			W16x0.8 x18x6m	W22x1.25 x16x6m	W32x1.25x 24x6m	W40x2.0x 18x6m	W55x2.0x 26x6m		
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)		

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