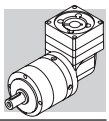
Bonfiglioli
Tecnoingranaggi

LCK series

Precision right-angle gearboxes

Bonfiglioli
power, control and green solutions



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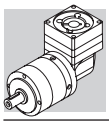
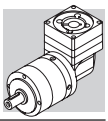
Revisions

Refer to page 20 for the catalogue revision index.

Visit www.bonfiglioli.com to search for catalogues with up-to-date revisions.





1 GENERAL INFORMATION

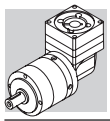
1.1 SYMBOLS, UNITS AND DEFINITIONS

Values depending on the APPLICATION

term	u.m.	definition
A_2	[N]	Thrust force on output shaft
$A_{2\ EQU}$	[N]	Equivalent thrust force applying on output shaft
$A_{2\ MAX}$	[N]	Maximum thrust force applying on output shaft
R_2	[N]	Radial force on output shaft
$R_{2\ EQU}$	[N]	Equivalent radial force applying on output shaft
$R_{2\ MAX}$	[N]	Maximum radial force applying on output shaft
ED	[min]	Loading time
ED%	[%]	Loading time %
$L_{10h\ TARGET}$	[h]	Output shaft bearings' desired basic rating life
$M_{1\ PEAK}$	[Nm]	Maximum input torque (usually motor)
$M_{2(1)}$ ... $M_{2(n)}$	[Nm]	Output torque at each of the time periods t_1 ... t_n
$M_{2\ EQU}$	[Nm]	Equivalent output torque
$M_{2\ MAX}$	[Nm]	Maximum output torque in case of emergency
$M_{T2\ EQU}$	[Nm]	Equivalent tilting moment applying on output shaft
$M_{T2\ MAX}$	[Nm]	Maximum tilting moment applying on output shaft
n_2	[min^{-1}]	Output speed
$n_{2(1)}$ ... $n_{2(n)}$	[min^{-1}]	Output speed based on the time periods t_1 ... t_n
$n_{2\ EQU}$	[min^{-1}]	Equivalent output speed
$n_{2\ MAX}$	[min^{-1}]	Maximum output speed
T	[C°]	Ambient temperature
t_1 ... t_n	[s]	Time periods of motion
t_Σ	[s]	Cycle duration including pause
Z	[1/h]	Cycle number per hour

Values depending on the GEAR DRIVE SELECTION

term	u.m.	definition
$A_{2\ 3\ max}$	[N]	Admissible thrust force on output shaft
$A_2'_{max}$	[N]	Thrust force acting simultaneously with the rated radial force
$R_{1\ max}$	[N]	Admissible radial force at midpoint of input shaft
$R_{2\ 3\ max}$	[N]	Admissible radial force at midpoint of output shaft
C_B	[Nm]	Constant for bearing's lifetime calculation
C_t	$\left[\frac{Nm}{arcmin}\right]$	Torsional stiffness
f_n	—	Speed factor
f_z	—	Cycle factor
f_T	—	Temperature adjusting factor
i	—	Gearbox ratio
J_G	[$kgcm^2$]	Mass moment of inertia of the gearhead
K_n	—	Speed constant
L_{10h}	[h]	Bearings' basic rating life
L_Z	[mm]	Factor for bearing's lifetime calculation
$M_{a\ 2}$	[Nm]	Maximum acceleration output torque
$M_{n\ 2}$	[Nm]	Rated output torque
$M_{p\ 2}$	[Nm]	Emergency stop output torque
$M_{T2\ max}$	[Nm]	Maximum tilting moment applying on output shaft
$n_{1\ max}$	[min^{-1}]	Maximum momentary input speed. The speed the unit can be driven at occasionally and in non-repetitive conditions For cycle duty type S5, it cannot be applied continuously for more than 30 seconds
p	—	Bearing lifetime exponent
η	[%]	Gear efficiency
φ_R	[arcmin]	Reduced backlash is calculated in static conditions and with the application of a torque equal to 2% of the gear unit rated torque
φ_S	[arcmin]	Standard backlash is calculated in static conditions and with the application of a torque equal to 2% of the gear unit rated torque



1.2 SELECTING THE GEAR UNIT

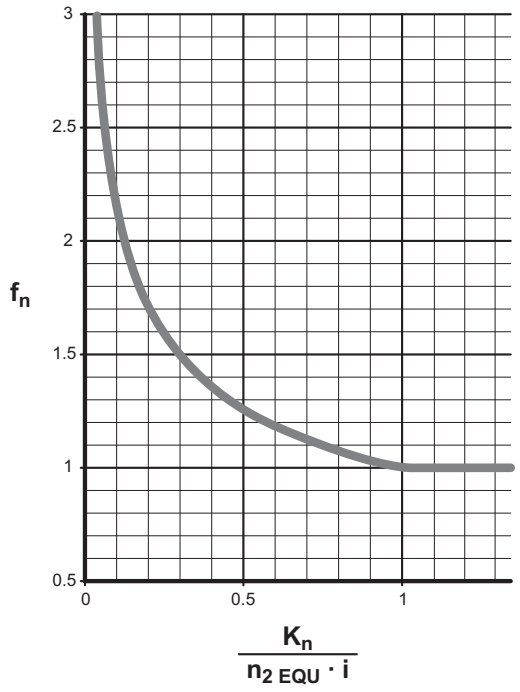
(a)	Ratio	i	—	$i = \frac{n_1}{n_2}$
(b)	Equivalent output torque	$M_{2\,EQU}$	[Nm]	$M_{2\,EQU} = \sqrt[3]{\frac{n_{2(1)} \cdot t_1 \cdot \lvert M_{2(1)} \rvert^3 + \ldots + n_{2(n)} \cdot t_n \cdot \lvert M_{2(n)} \rvert^3}{n_{2(1)} \cdot t_1 + \ldots + n_{2(n)} \cdot t_n}}$
(c)	Equivalent output speed	$n_{2\,EQU}$	[min^{-1}]	$n_{2\,EQU} = \frac{n_{2(1)} \cdot t_1 + n_{2(2)} \cdot t_2 + \ldots + n_{2(n)} \cdot t_n}{t_\Sigma}$
(d)	Speed factor	f_n	—	If $\frac{K_n}{n_{2\,EQU} \cdot i} \geq 1 \Rightarrow f_n = 1$ If $\frac{K_n}{n_{2\,EQU} \cdot i} < 1 \Rightarrow f_n$ = Obtain from diagram
(e)	Loading time % Loading time	ED% ED	[%] [min]	$ED\% = \frac{t_1 + t_2 + \ldots + t_n}{t_\Sigma} \cdot 100$ $ED = t_1 + t_2 + \ldots + t_n$
(f)	Cycle number per hour	Z	[1/h]	$Z = \frac{3600}{t_\Sigma}$
(g)	Cycle factor	f_z	—	see table below
(h)	Temperature adjusting factor	f_T	—	If T ≤ 30°C ⇨ $f_T = 1$ If T > 30°C ⇨ $f_T = 1 + \frac{T° - 30\ C}{100\,°C}$
(i)	Maximum input torque	$M_{1\,PEAK}$	[Nm]	a) maximum possible application torque b) limited motor torque by inverter c) maximum motor torque

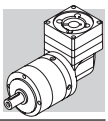
Z	f_z
Z ≤ 1000	1.00
1000 < Z ≤ 1500	1.25
1500 < Z ≤ 2500	1.50
2500 < Z ≤ 4000	1.75
4000 < Z ≤ 6000	2.00
Z > 6000	contact us

K_n - speed constant

i	LCK 050	LCK 070	LCK 090	LCK 120	LCK 155
6	2400	2400	2400	2000	1600
8	2400	2400	2400	2000	1600
10	2400	2400	2400	2000	1600
14	2400	2400	2400	2000	1600
20		2400	2400	2000	1600
24	2400	2400	2400	2000	1600
30	2400	2400	2400	2000	1600
50	2400	2400	2400	2000	1600
70	2400	2400	2400	2000	1600
80		2400	2400	2000	1600
90	2400				
100		2400	2400	2000	1600

f_n - speed factor



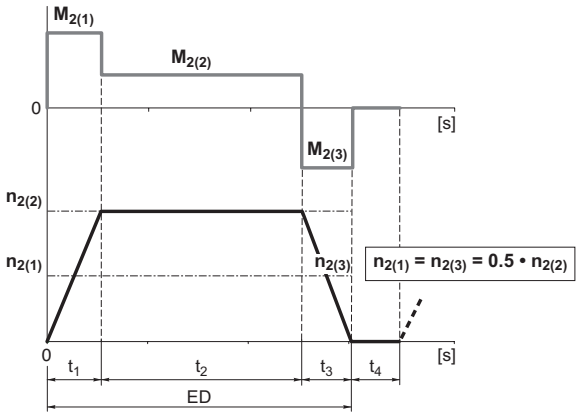


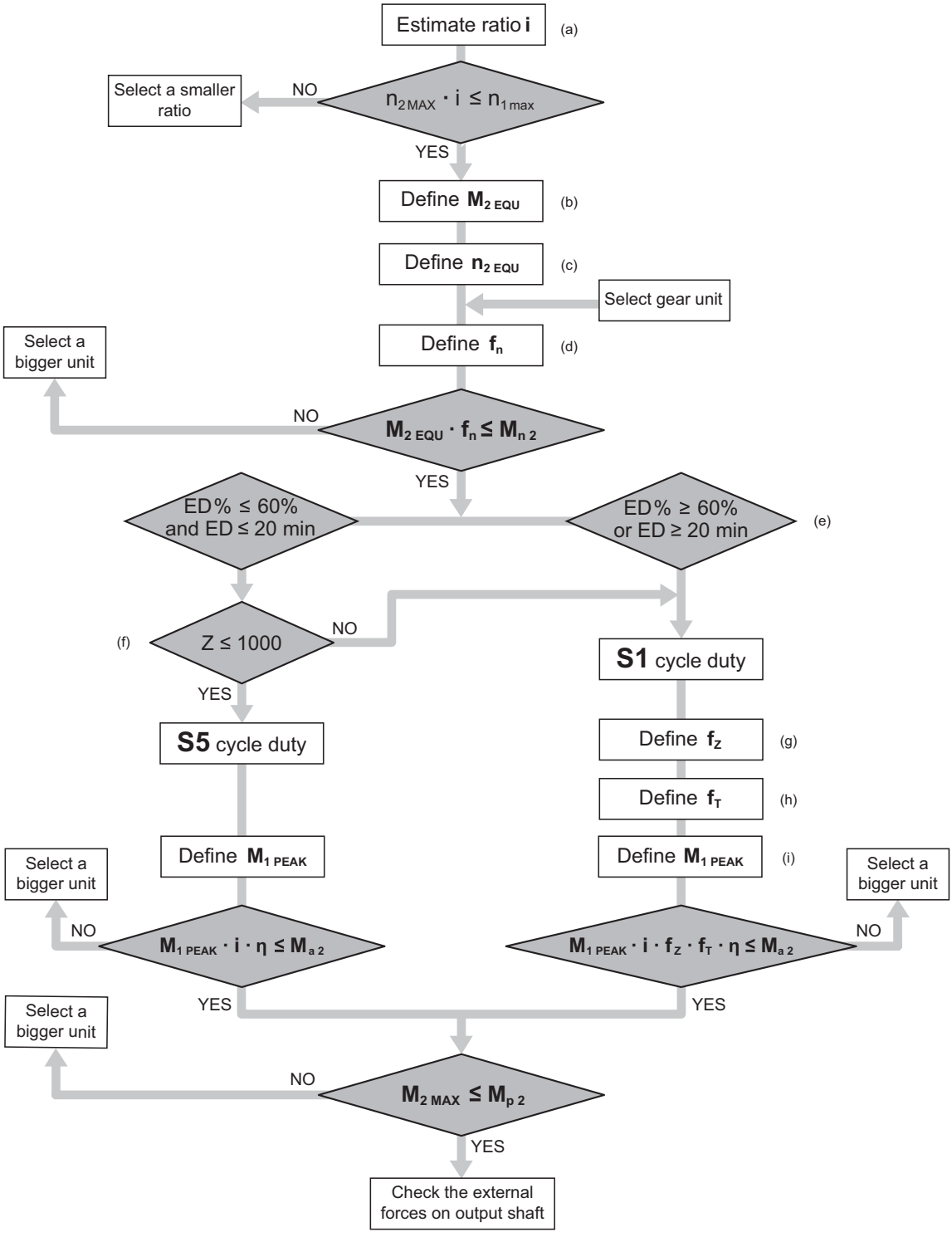
Load diagram

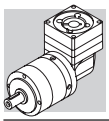
M_2: Output torque

Speed diagram

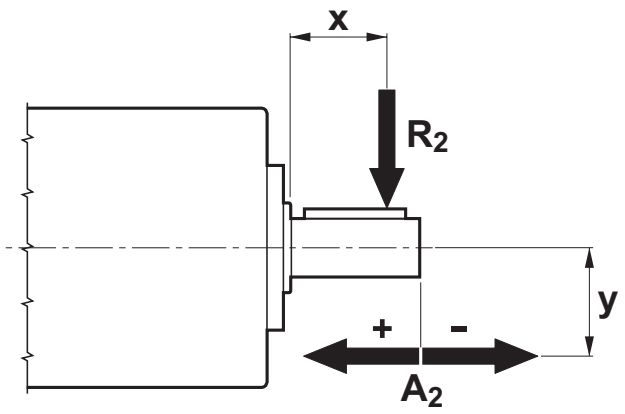
n_2: Output speed





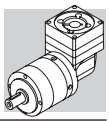


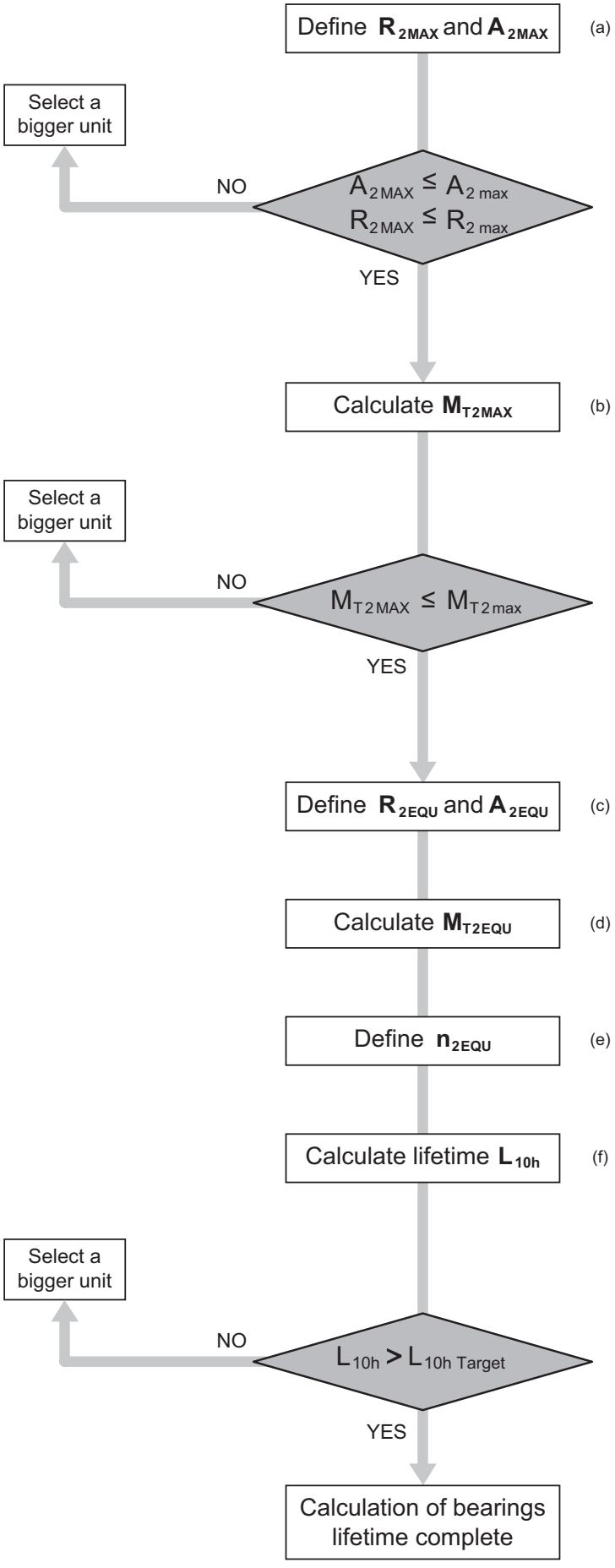
1.3 SERVICE LIFE OF BEARINGS

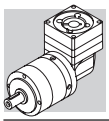


(a)	Maximum radial force applying on output shaft	$R_{2\,MAX}$	[N]	Please consider the specific conditions (e.g. belt drives under acceleration torque)
	Maximum axial force applying on output shaft	$A_{2\,MAX}$	[N]	
(b)	Maximum tilting moment applying on output shaft	$M_{T\,2\,MAX}$	[Nm]	$M_{T2MAX} = \frac{R_{2\,MAX} \cdot (x + L_Z) \pm A_{2\,MAX} \cdot y}{1000}$
(c)	Equivalent forces applying on output shaft	$R_{2\,EQU}$	[N]	$R_{2EQU} = \sqrt[3]{\frac{n_{2(1)} \cdot t_1 \cdot \lvert R_{2(1)} \rvert^3 + \ldots + n_{2(n)} \cdot t_n \cdot \lvert R_{2(n)} \rvert^3}{n_{2(1)} \cdot t_1 + \ldots + n_{2(n)} \cdot t_n}}$
		$A_{2\,EQU}$	[N]	$A_{2EQU} = \sqrt[3]{\frac{n_{2(1)} \cdot t_1 \cdot \lvert A_{2(1)} \rvert^3 + \ldots + n_{2(n)} \cdot t_n \cdot \lvert A_{2(n)} \rvert^3}{n_{2(1)} \cdot t_1 + \ldots + n_{2(n)} \cdot t_n}}$
(d)	Equivalent tilting moment applying on output shaft	$M_{T\,2\,EQU}$	[Nm]	$M_{T2EQU} = \frac{R_{2\,EQU} \cdot (x + L_Z) + A_{2\,EQU} \cdot y}{1000}$
(e)	Equivalent output speed	$n_{2\,EQU}$	[min^{-1}]	$n_{2EQU} = \frac{n_{2(1)} \cdot t_1 + n_{2(2)} \cdot t_2 + \ldots + n_{2(n)} \cdot t_n}{t_1 + t_2 + \ldots + t_n}$
(f)	Bearings' basic rating life	L_{10h}	[h]	$L_{10h} = \frac{16666}{n_{2EQU}} \cdot \left(\frac{C_B}{M_{T2EQU}} \right)^p$

		LCK 050	LCK 070	LCK 090	LCK 120	LCK 155
L_Z	[mm]	22	28	30	39	46
$M_{T\,2\,max}$	[Nm]	15	54	105	238	522
C_B	[Nm]	106	280	298	813	1588
p	—	3	3	3	3	3




Define R_{2MAX} and A_{2MAX}
(a)
Select a bigger unit
NO
$A_{2MAX} \leq A_{2\,max}$
$R_{2MAX} \leq R_{2\,max}$
YES
Calculate M_{T2MAX}
(b)
Select a bigger unit
NO
$M_{T2MAX} \leq M_{T2\,max}$
YES
Define R_{2EQU} and A_{2EQU}
(c)
Calculate M_{T2EQU}
(d)
Define n_{2EQU}
(e)
Calculate lifetime L_{10h}
(f)
Select a bigger unit
NO
$L_{10h} > L_{10h\ Target}$
YES
Calculation of bearings lifetime complete



2 FEATURES OF LCK SERIES

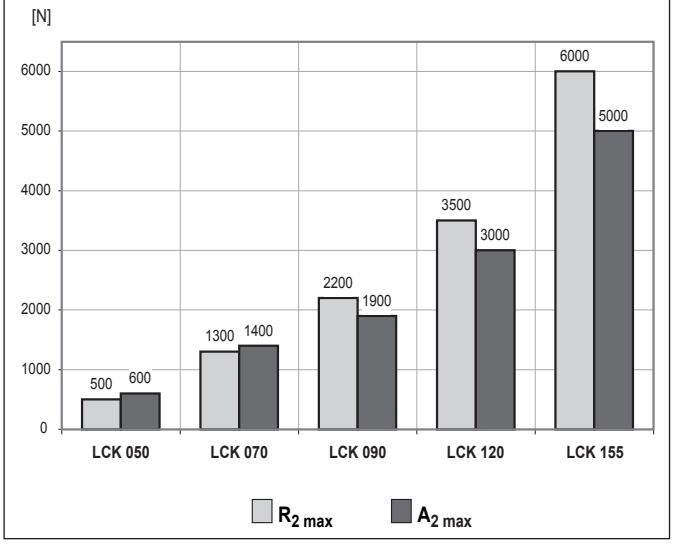
Gear units of series LCK replicate in the right angle layout the brilliant features that are already typical of the in-line products of the LC series, with the additional benefit of a facilitated installation in tight spaces.

- Available in one only backlash option, corresponding to following values:
  double reduction gearheads: φ_S = 6'
  triple reduction gearheads: φ_S = 8'
- Degree of protection IP64
- Oil seals from Viton® compound as standard
- Max. noise level $L_P \leq 70$ dB(A) @ $n_1 = 3000$ min^{-1}
- Wide range of adapter flanges matching the most popular brands of motors
- Units are factory filled with synthetic grease to NLGI consistency class 00, suitable for installation in any mounting position and at ambient temperature within the range 0°C...40°C.
  In the absence of contamination the lubricant does not require periodical changes.

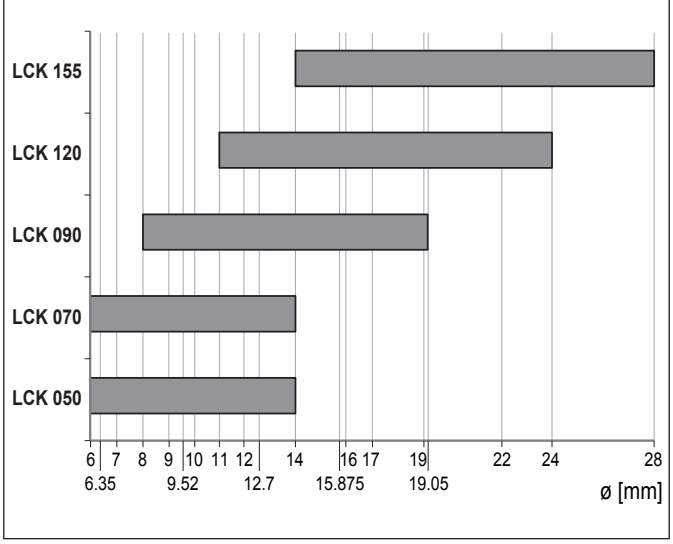
Distribution of nominal torque M_{n2} [Nm]												
[i]	6	8	10	14	20	24	30	50	70	80	90	100
LCK 050	10	12	12	12	–	12	12	12	12	–	12	–
LCK 070	18	25	25	25	18	25	25	25	25	25	–	25
LCK 090	37	43	43	43	37	43	43	43	43	43	–	43
LCK 120	95	110	110	110	95	110	110	110	110	110	–	110
LCK 155	250	300	300	300	230	300	300	300	300	300	–	300

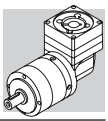
triple reduction gearheads

Output shaft max. loading capacity



Available motor shaft bores





3 ORDERING CODE

LCK **120** **2** **20** **STD** **100A** **CD** **14** **KE**

OUTPUT SHAFT CONFIGURATION
- **KE** keyed shaft
- **KL** smooth keyless shaft

INPUT SHAFT BORE

MOTOR COUPLING
- **CD** clamping device

INPUT SECTION
- **25 ... 180** motor adapter
- **FM** without motor adapter

BACKLASH

	2 reductions	3 reductions
STD	φ_s = 6'	φ_s = 8'

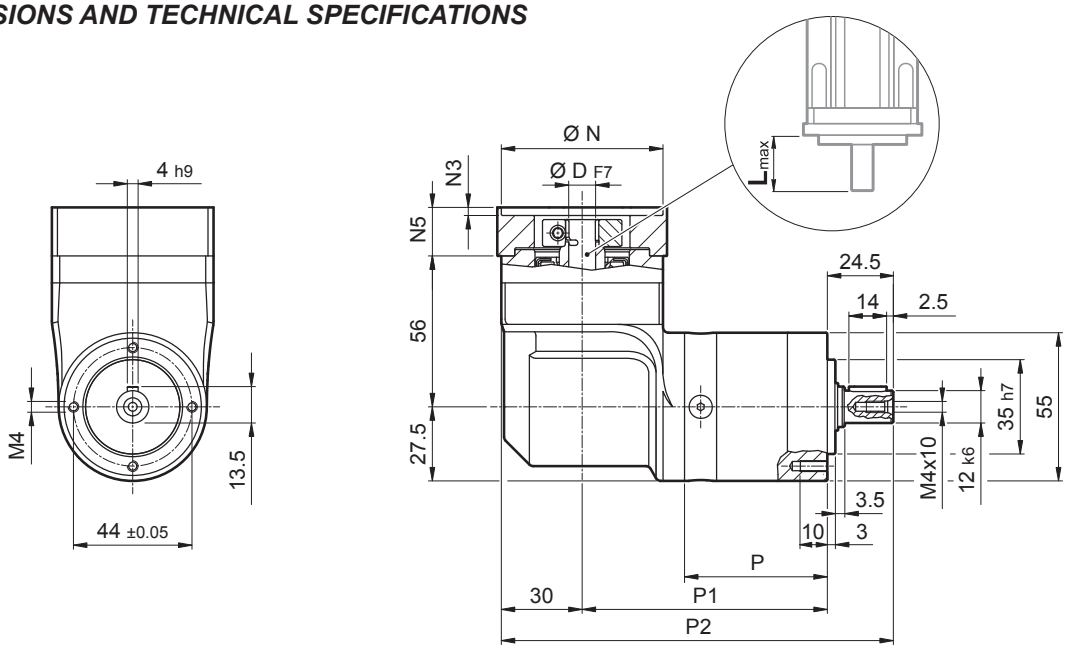
GEAR RATIO

REDUCTIONS
- **2** **3**

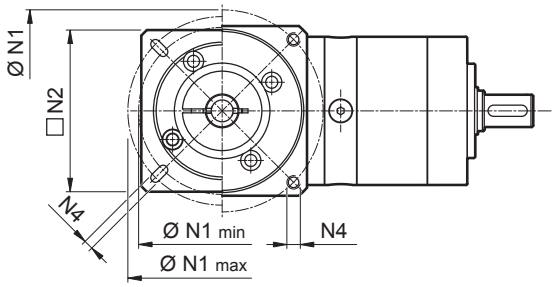
FRAME SIZE
- **050** **070** **090** **120** **155**

SERIES
- **LCK**

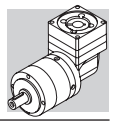
4 DIMENSIONS AND TECHNICAL SPECIFICATIONS



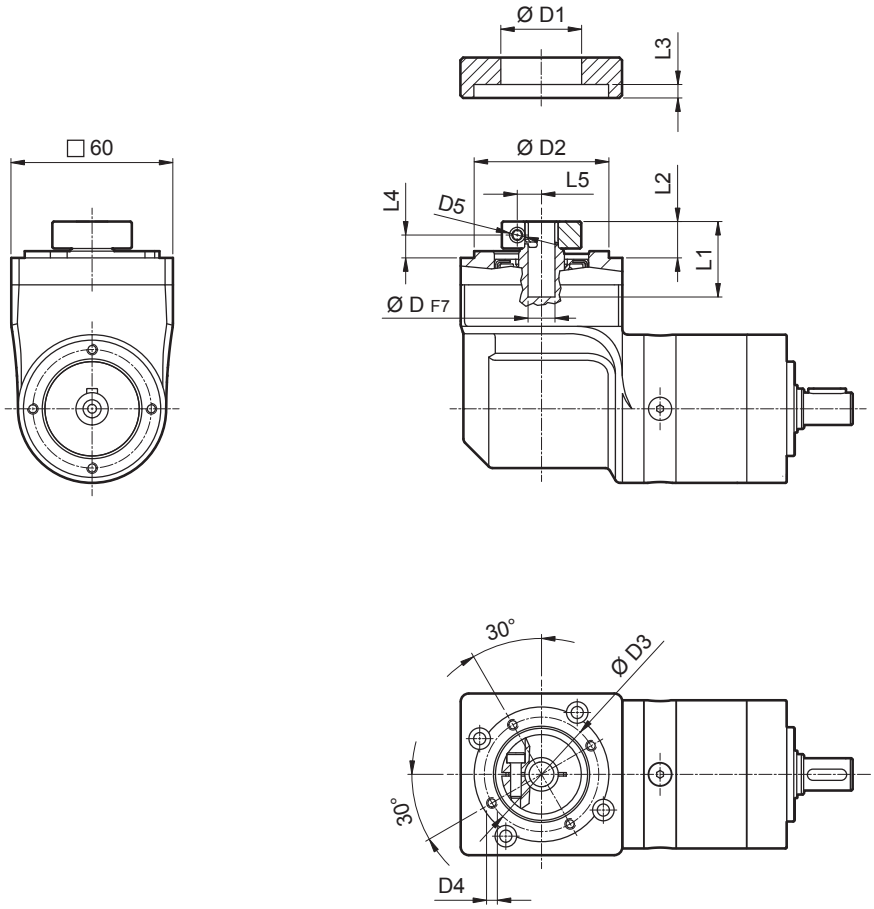
	P	P1	P2	Kg
LCK 050 2	53	91	145.5	1.6
LCK 050 3	66.8	104.8	159.3	1.8



	D											N	N1		N2	N3	N4	N5	L_{max}
													min	max					
25AH	6	6.35	7	8	9	9.52	–	–	–	–	–	25	39	56					
26AH	6	6.35	7	8	9	9.52	–	–	–	–	–	26	39	56					
28AH	6	6.35	7	8	9	9.52	–	–	–	–	–	28	39	56					
30AH	6	6.35	7	8	9	9.52	–	–	–	–	–	30	39	56					
32AH	6	6.35	7	8	9	9.52	–	–	–	–	–	32	39	56	65	3.5	4.5	25	25
34AH	6	6.35	7	8	9	9.52	–	–	–	–	–	34	40	56					
36AH	6	6.35	7	8	9	9.52	–	–	–	–	–	36	42	56					
39AH	6	6.35	7	8	9	9.52	–	–	–	–	–	39	45	56					
40AH	6	6.35	7	8	9	9.52	–	–	–	–	–	40	46	56					
38B	6	6.35	7	8	9	9.52	10	11	12	12.7	–	38.1	66.6		60	3	M4x10	18	25
40B	6	6.35	7	8	9	9.52	10	11	12	12.7	–	40	63		60	3	M4x10	18	25
50A	6	6.35	7	8	9	9.52	10	11	12	12.7	–	50	60		60	3	M4x10	18	25
50B	6	6.35	7	8	9	9.52	10	11	12	12.7	14	50	65		60	3	M5x12	23	30
50BH	6	6.35	7	8	9	9.52	10	11	12	12.7	14	50	65		65	3	5.5	25	32
50C	6	6.35	7	8	9	9.52	10	11	12	12.7	14	50	70		60	3	M4x10	23	30
55MH	6	6.35	7	8	9	9.52	10	11	12	12.7	–	55	80		65	2	5.5	16	23
60A	6	6.35	7	8	9	9.52	10	11	12	12.7	–	60	75		63	3	M5x12	18	25
60A1	6	6.35	7	8	9	9.52	10	11	12	12.7	14	60	75		63	3	M5x12	23	30
60B	6	6.35	7	8	9	9.52	10	11	12	12.7	14	60	85		75	3	M5x12	23	30
60C	6	6.35	7	8	9	9.52	10	11	12	12.7	14	60	90		75	3	M5x12	23	30
70A	6	6.35	7	8	9	9.52	10	11	12	12.7	14	70	85		75	3	M6x15	23	30
70B	6	6.35	7	8	9	9.52	10	11	12	12.7	14	70	90		75	3	M5x12	23	30
73A	6	6.35	7	8	9	9.52	10	11	12	12.7	14	73	98.4		85	3	M5x12	25	32
80A	6	6.35	7	8	9	9.52	10	11	12	12.7	14	80	100		85	3	M6x15	23	30

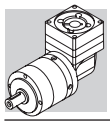


FM

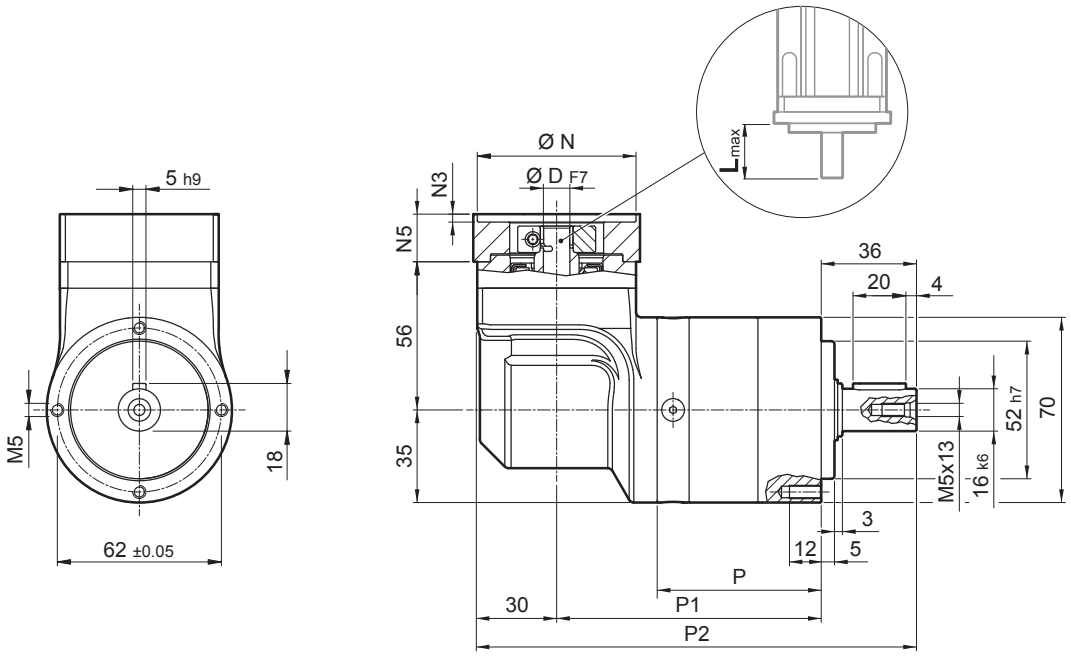


D				D1	D2	D3	D4	D5	L1	L2	L3	L4	L5
6	6.35	7		32.5	50	42.5	M4x8	M4	28	13.5	3	8.5	8
8	9	9.52	10	32.5	50	42.5	M4x8	M4	28	13.5	3	8.5	9
11	12	12.7		35.5	50	42.5	M4x8	M4	23	13.5	3	8.5	11
14				35.5	50	42.5	M4x8	M4	25	15.5	3	8.9	11.5

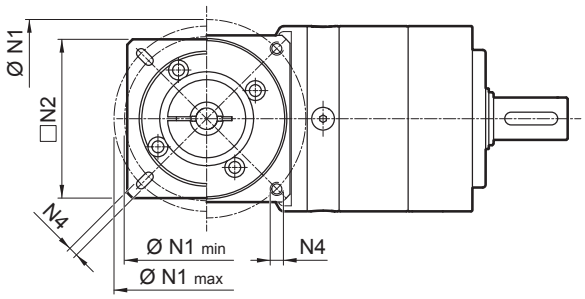
i	$M_{n\,2}$ [Nm]	$M_{a\,2}$ [Nm]	$M_{p\,2}$ [Nm]	$n_{1\,max}$ [min^{-1}]	φ_S [arcmin]	C_t [Nm/arcmin]	$R_{2\,max}$ [N]	$A_{2\,max}$ [N]	η %	J_G [kgcm^2] D 6 ... 9.52	J_G [kgcm^2] D 10 ... 14
LCK 050 2_6	10	16	28	5000	6'	0.9	500	600	94	0.23	0.25
LCK 050 2_8	12	20	30	5000	6'	0.9	500	600	94	0.23	0.24
LCK 050 2_10	12	20	30	5000	6'	0.9	500	600	94	0.23	0.24
LCK 050 2_14	12	20	30	5000	6'	0.9	500	600	94	0.23	0.24
LCK 050 3_24	12	20	30	5000	8'	0.7	500	600	91	0.23	0.25
LCK 050 3_30	12	20	30	5000	8'	0.7	500	600	91	0.23	0.25
LCK 050 3_50	12	20	30	5000	8'	0.7	500	600	91	0.23	0.24
LCK 050 3_70	12	20	30	5000	8'	0.7	500	600	91	0.23	0.24
LCK 050 3_90	12	20	30	5000	8'	0.7	500	600	91	0.22	0.24



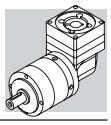
LCK 070



	P	P1	P2	Kg
LCK 070 2	62	100	166	2.7
LCK 070 3	78.7	116.7	182.7	3.0



	D											N	N1		N2	N3	N4	N5	L_{max}
													min	max					
25AH	6	6.35	7	8	9	9.52	–	–	–	–	–	25	39	56					
26AH	6	6.35	7	8	9	9.52	–	–	–	–	–	26	39	56					
28AH	6	6.35	7	8	9	9.52	–	–	–	–	–	28	39	56					
30AH	6	6.35	7	8	9	9.52	–	–	–	–	–	30	39	56					
32AH	6	6.35	7	8	9	9.52	–	–	–	–	–	32	39	56	65	3.5	4.5	25	25
34AH	6	6.35	7	8	9	9.52	–	–	–	–	–	34	40	56					
36AH	6	6.35	7	8	9	9.52	–	–	–	–	–	36	42	56					
39AH	6	6.35	7	8	9	9.52	–	–	–	–	–	39	45	56					
40AH	6	6.35	7	8	9	9.52	–	–	–	–	–	40	46	56					
38B	6	6.35	7	8	9	9.52	10	11	12	12.7	–	38.1	66.6		60	3	M4x10	18	25
40B	6	6.35	7	8	9	9.52	10	11	12	12.7	–	40	63		60	3	M4x10	18	25
50A	6	6.35	7	8	9	9.52	10	11	12	12.7	–	50	60		60	3	M4x10	18	25
50B	6	6.35	7	8	9	9.52	10	11	12	12.7	14	50	65		60	3	M5x12	23	30
50BH	6	6.35	7	8	9	9.52	10	11	12	12.7	14	50	65		65	3	5.5	25	32
50C	6	6.35	7	8	9	9.52	10	11	12	12.7	14	50	70		60	3	M4x10	23	30
55MH	6	6.35	7	8	9	9.52	10	11	12	12.7	–	55	80		65	2	5.5	16	23
60A	6	6.35	7	8	9	9.52	10	11	12	12.7	–	60	75		63	3	M5x12	18	25
60A1	6	6.35	7	8	9	9.52	10	11	12	12.7	14	60	75		63	3	M5x12	23	30
60B	6	6.35	7	8	9	9.52	10	11	12	12.7	14	60	85		75	3	M5x12	23	30
60C	6	6.35	7	8	9	9.52	10	11	12	12.7	14	60	90		75	3	M5x12	23	30
70A	6	6.35	7	8	9	9.52	10	11	12	12.7	14	70	85		75	3	M6x15	23	30
70B	6	6.35	7	8	9	9.52	10	11	12	12.7	14	70	90		75	3	M5x12	23	30
73A	6	6.35	7	8	9	9.52	10	11	12	12.7	14	73	98.4		85	3	M5x12	25	32
80A	6	6.35	7	8	9	9.52	10	11	12	12.7	14	80	100		85	3	M6x15	23	30



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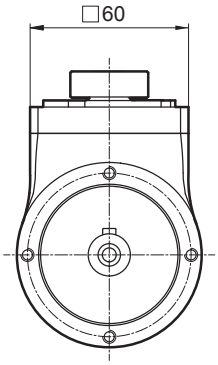
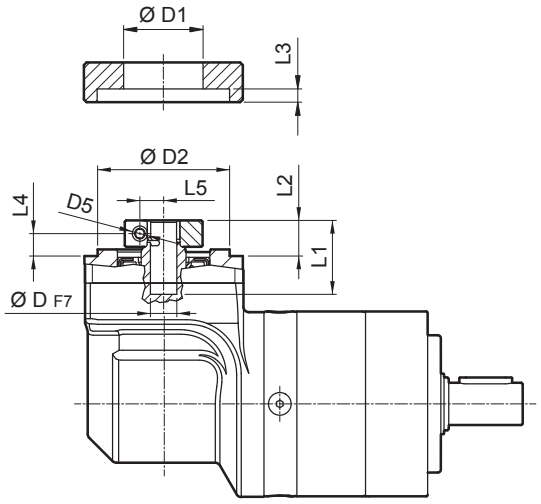
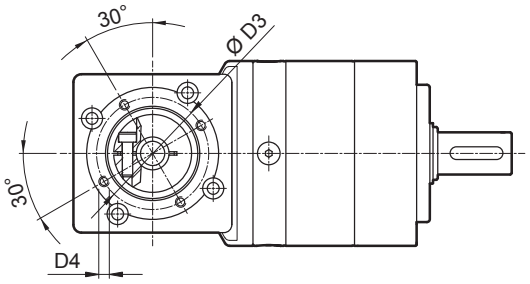
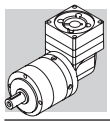




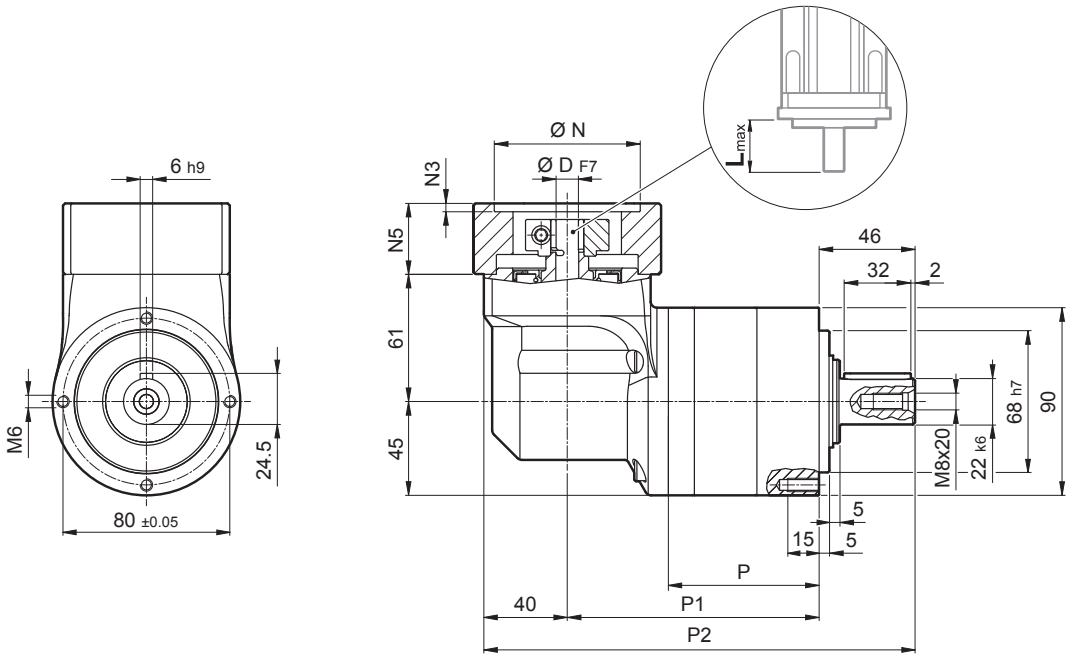


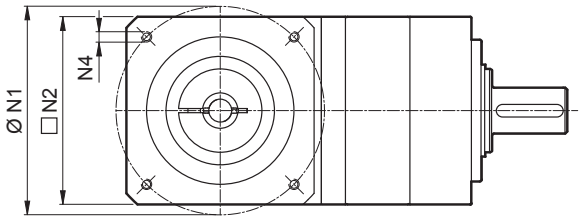
D				D1	D2	D3	D4	D5	L1	L2	L3	L4	L5
6	6.35	7		32.5	50	42.5	M4x8	M4	28	13.5	3	8.5	8
8	9	9.52	10	32.5	50	42.5	M4x8	M4	28	13.5	3	8.5	9
11	12	12.7		35.5	50	42.5	M4x8	M4	23	13.5	3	8.5	11
14				35.5	50	42.5	M4x8	M4	25	15.5	3	8.9	11.5

i	$M_{n\,2}$ [Nm]	$M_{a\,2}$ [Nm]	$M_{p\,2}$ [Nm]	$n_{1\,max}$ [min^{-1}]	φ_S [arcmin]	C_t [Nm/arcmin]	$R_{2\,max}$ [N]	$A_{2\,max}$ [N]	η %	J_G [$kgcm^2$] D 6 ... 9.52	J_G [$kgcm^2$] D 10 ... 14
LCK 070 2_6	18	30	45	5000	6'	2.8	1300	1400	94	0.25	0.26
LCK 070 2_8	25	35	60	5000	6'	2.8	1300	1400	94	0.24	0.25
LCK 070 2_10	25	35	70	5000	6'	2.8	1300	1400	94	0.23	0.25
LCK 070 2_14	25	35	70	5000	6'	2.8	1300	1400	94	0.23	0.24
LCK 070 2_20	18	30	60	5000	6'	2.8	1300	1400	94	0.23	0.24
LCK 070 3_24	25	35	70	5000	8'	2.5	1300	1400	91	0.24	0.26
LCK 070 3_30	25	35	70	5000	8'	2.5	1300	1400	91	0.24	0.26
LCK 070 3_50	25	35	70	5000	8'	2.5	1300	1400	91	0.23	0.24
LCK 070 3_70	25	35	70	5000	8'	2.5	1300	1400	91	0.23	0.24
LCK 070 3_80	25	35	70	5000	8'	2.5	1300	1400	91	0.23	0.24
LCK 070 3_100	25	35	70	5000	8'	2.5	1300	1400	91	0.23	0.24



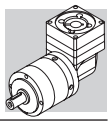
LCK 090



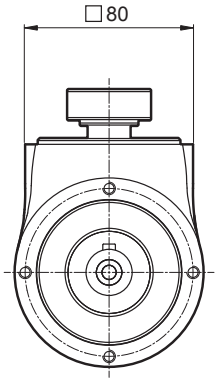


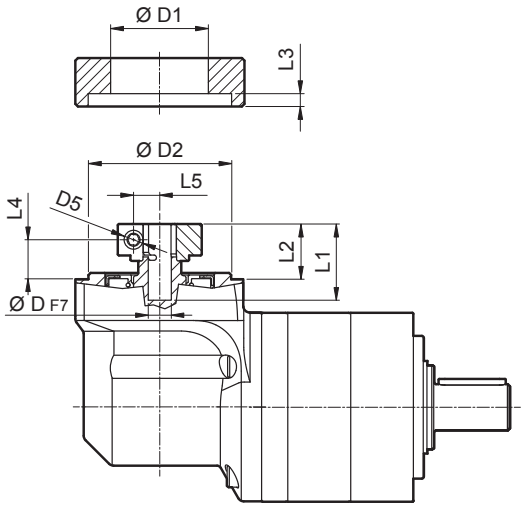
	P	P1	P2	Kg
LCK 090 2	72.3	120.8	206.8	5.2
LCK 090 3	98.8	147.3	233.3	6.3

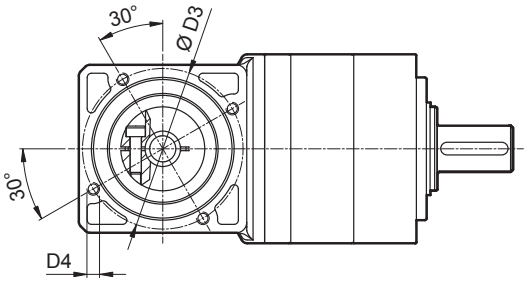
	D												N	N1	N2	N3	N4	N5	L_{max}
40B1	8	9	9.52	11	12	12.7	14	–	–	–	–	–	40	63	80	4	M4x10	34	40
45A	8	9	9.52	11	12	12.7	–	–	–	–	–	–	45	63	80	4	M4x10	34	40
50B1	8	9	9.52	11	12	12.7	14	–	–	–	–	–	50	65	80	4	M5x16	34	40
50BH1	8	9	9.52	11	12	12.7	14	–	–	–	–	–	50	65	80	4	5.5	34	40
50C1	8	9	9.52	11	12	12.7	14	–	–	–	–	–	50	70	80	4	M4x10	34	40
50D	8	9	9.52	11	12	12.7	14	–	–	–	–	–	50	95	80	4	M6x10	34	40
55A	8	9	9.52	11	12	12.7	14	15.875	16	17	19	19.05	55.5	125.7	105	4	M6x16	34	40
60A2	8	9	9.52	11	12	12.7	14	–	–	–	–	–	60	75	80	4	M5x16	34	40
60AH2	8	9	9.52	11	12	12.7	14	–	–	–	–	–	60	75	90	4	5.5	34	40
60B1	8	9	9.52	11	12	12.7	14	15.875	16	–	–	–	60	85	80	4	M5x16	34	40
60C1	8	9	9.52	11	12	12.7	14	15.875	16	–	–	–	60	90	80	4	M5x16	34	40
70A1	8	9	9.52	11	12	12.7	14	15.875	16	17	19	19.05	70	85	80	4	M6x20	34	40
70AH1	8	9	9.52	11	12	12.7	14	15.875	16	17	19	19.05	70	85	90	4	6.5	34	40
70B1	8	9	9.52	11	12	12.7	14	15.875	16	17	19	19.05	70	90	80	4	M5x16	34	40
73A1	8	9	9.52	11	12	12.7	14	–	–	–	–	–	73	98.4	85	4	M5x16	34	40
80A1	8	9	9.52	11	12	12.7	14	15.875	16	17	19	19.05	80	100	90	4	M6x16	34	40
95A	8	9	9.52	11	12	12.7	14	15.875	16	17	19	19.05	95	115	100	4	M8x20	34	40
95B	8	9	9.52	11	12	12.7	14	15.875	16	17	19	19.05	95	130	115	4	M8x20	34	40
110A	8	9	9.52	11	12	12.7	14	15.875	16	17	19	19.05	110	130	115	4	M8x20	34	40
110B	8	9	9.52	11	12	12.7	14	15.875	16	17	19	19.05	110	145	120	6.5	M8x20	44	50
110B1	8	9	9.52	11	12	12.7	14	15.875	16	17	19	19.05	110	145	120	6.5	M8x20	54	60



FM

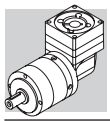




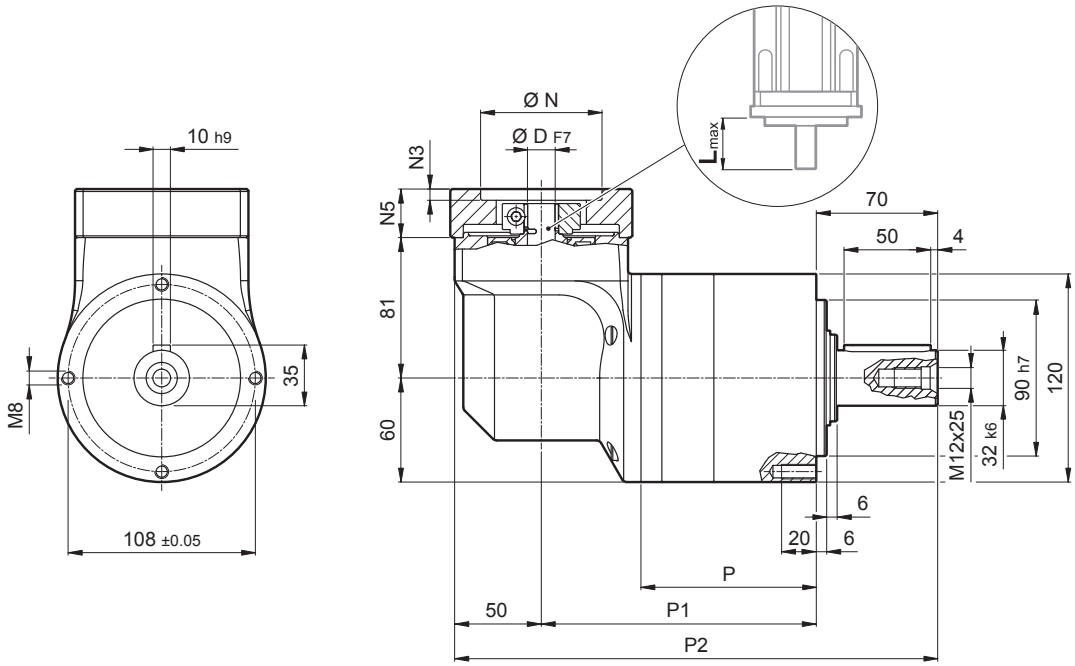


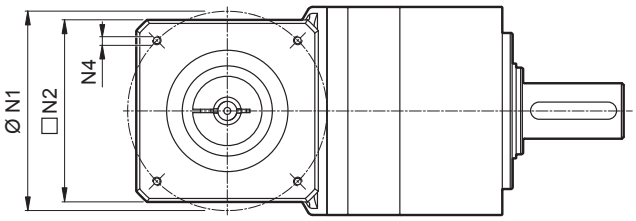
D				D1	D2	D3	D4	D5	L1	L2	L3	L4	L5
8	9	9.52		38	68	76.5	M6x10	M6	36.3	26.3	9.5	18.8	10.5
11	12	12.7		43	68	76.5	M6x10	M6	36.3	26.3	9.5	18.8	12.5
14	15.875	16	17	48	68	76.5	M6x10	M6	36.3	26.3	9.5	18.8	14.5
19	19.05			51	68	76.5	M6x10	M6	36.3	26.3	9.5	18.8	16.5

i	$M_{n\,2}$ [Nm]	$M_{a\,2}$ [Nm]	$M_{p\,2}$ [Nm]	$n_{1\,max}$ [min^{-1}]	φ_S [arcmin]	C_t [Nm/arcmin]	$R_{2\,max}$ [N]	$A_{2\,max}$ [N]	η %	J_G [kgcm^2] D 8 ... 12.7	J_G [kgcm^2] D 14 ... 19.05
LCK 090 2_6	37	63	90	5000	6'	6.1	2200	1900	94	0.85	1.03
LCK 090 2_8	43	80	120	5000	6'	6.1	2200	1900	94	0.79	0.98
LCK 090 2_10	43	80	150	5000	6'	6.1	2200	1900	94	0.77	0.96
LCK 090 2_14	43	80	160	5000	6'	6.1	2200	1900	94	0.75	0.94
LCK 090 2_20	37	70	150	5000	6'	6.1	2200	1900	94	0.74	0.93
LCK 090 3_24	43	80	160	5000	8'	5.9	2200	1900	91	0.81	1.00
LCK 090 3_30	43	80	160	5000	8'	5.9	2200	1900	91	0.81	1.00
LCK 090 3_50	43	80	160	5000	8'	5.9	2200	1900	91	0.76	0.94
LCK 090 3_70	43	80	160	5000	8'	5.9	2200	1900	91	0.74	0.93
LCK 090 3_80	43	80	160	5000	8'	5.9	2200	1900	91	0.74	0.93
LCK 090 3_100	43	80	160	5000	8'	5.9	2200	1900	91	0.74	0.93



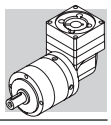
LCK 120



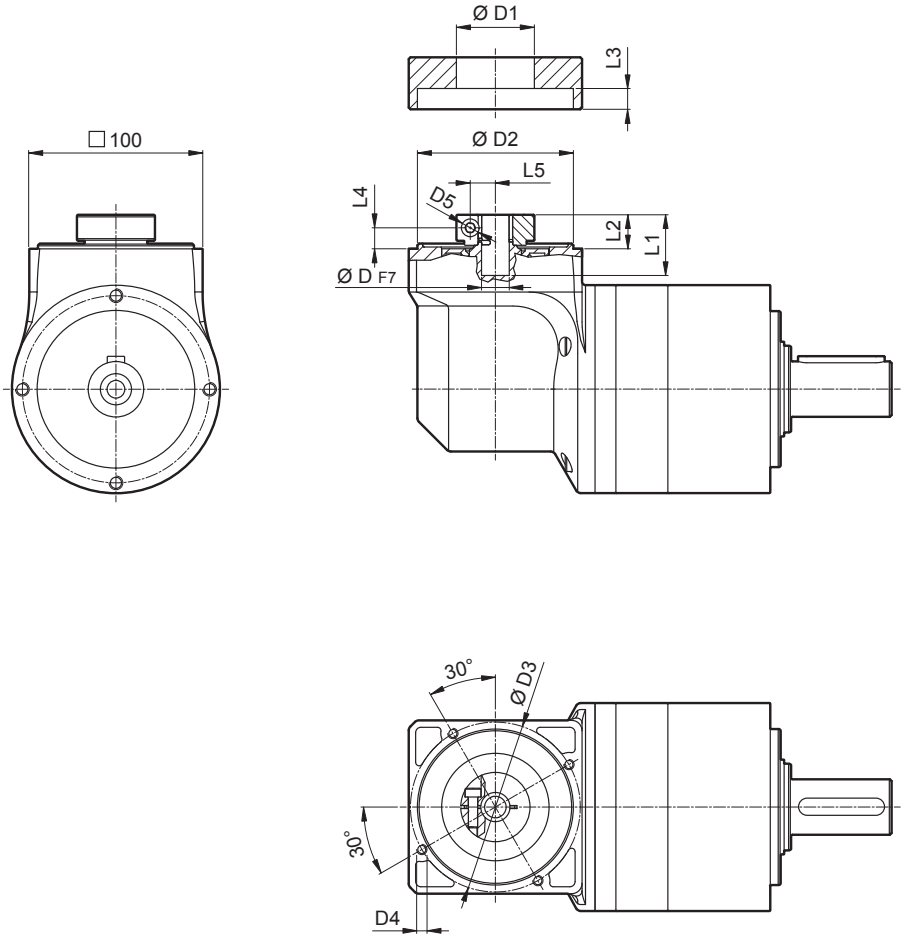


	P	P1	P2	Kg
LCK 120 2	101.1	158.6	278.6	11.3
LCK 120 3	133.6	191.1	311.1	13.8

	D										N	N1	N2	N3	N4	N5	L_{max}
50D	11	12	12.7	14	15	15.875	16	19	–	–	50	95	100	5	M6x14	28	40
55A	11	12	12.7	14	15	15.875	16	19	–	–	55.5	125.7	105	5	M6x16	28	40
60A2	11	12	12.7	14	15	15.875	16	19	–	–	60	75	100	5	M5x14	28	40
60AH2	11	12	12.7	14	15	15.875	16	19	–	–	60	75	100	5	6.5	33	40
60B1	11	12	12.7	14	15	15.875	16	19	–	–	60	85	100	6.5	M5x14	28	40
70A1	11	12	12.7	14	15	15.875	16	19	–	–	70	85	100	5	M6x14	28	40
70AH1	11	12	12.7	14	15	15.875	16	19	–	–	70	85	100	5	6	33	40
70B1	11	12	12.7	14	15	15.875	16	19	–	–	70	90	100	5	M5x12	28	40
80A1	11	12	12.7	14	15	15.875	16	19	–	–	80	100	100	5	M6x16	28	40
80AH1	11	12	12.7	14	15	15.875	16	19	–	–	80	100	100	5	6.5	28	40
95A	11	12	12.7	14	15	15.875	16	19	–	–	95	115	100	5	M8x18	28	40
95A1	11	12	12.7	14	15	15.875	16	19	22	24	95	115	100	5	M8x18	38	50
95B	11	12	12.7	14	15	15.875	16	19	–	–	95	130	115	5	M8x18	28	40
110A	11	12	12.7	14	15	15.875	16	19	–	–	110	130	115	5	M8x18	28	40
110A1	11	12	12.7	14	15	15.875	16	19	22	24	110	130	115	6.5	M8x20	38	50
110B	11	12	12.7	14	15	15.875	16	19	22	24	110	145	120	6.5	M8x20	38	50
110B1	11	12	12.7	14	15	15.875	16	19	22	24	110	145	120	6.5	M8x20	48	60
130A	11	12	12.7	14	15	15.875	16	19	22	24	130	165	140	6.5	M10x20	38	50
130A1	11	12	12.7	14	15	15.875	16	19	22	24	130	165	140	6.5	M10x25	48	60

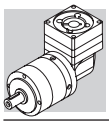


FM

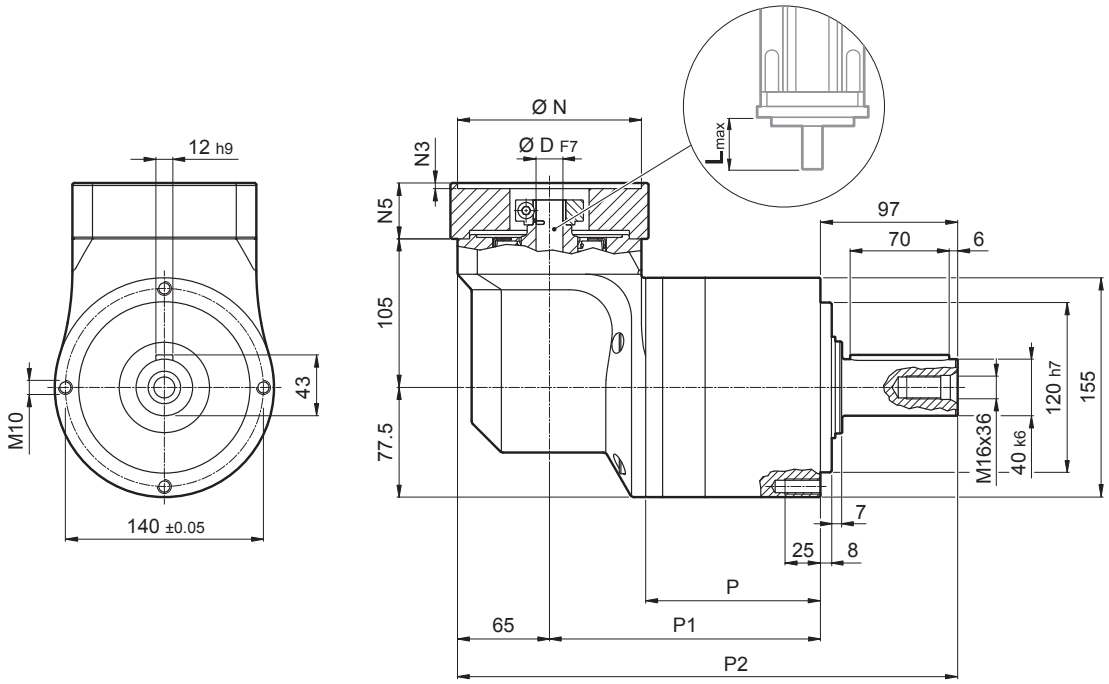


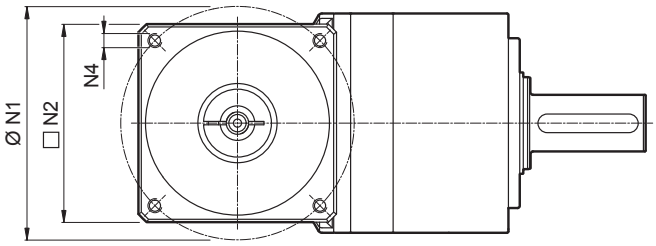
D				D1	D2	D3	D4	D5	L1	L2	L3	L4	L5
11	12	12.7		43	90	98	M6x15	M6	35	19.5	7.6	12.1	12.5
14	15	15.875	16	48	90	98	M6x15	M6	35	19.5	7.6	12.1	14.5
19				51	90	98	M6x15	M6	35	19.5	7.6	12.1	16.5
22	24			56.5	90	98	M6x15	M6	37	21.5	7.6	12.1	19

i	$M_{n\,2}$ [Nm]	$M_{a\,2}$ [Nm]	$M_{p\,2}$ [Nm]	$n_{1\,max}$ [min^{-1}]	φ_S [arcmin]	C_t [Nm/arcmin]	$R_{2\,max}$ [N]	$A_{2\,max}$ [N]	η %	J_G [kgcm^2] D 11 ... 12.7	D 14 ... 19	D 22 ; 24
LCK 120 2_6	95	156	225	4500	6'	19.9	3500	3000	94	1.74	1.82	2.01
LCK 120 2_8	110	190	300	4500	6'	19.9	3500	3000	94	1.52	1.60	1.79
LCK 120 2_10	110	190	360	4500	6'	19.9	3500	3000	94	1.44	1.52	1.71
LCK 120 2_14	110	190	360	4500	6'	19.9	3500	3000	94	1.37	1.45	1.63
LCK 120 2_20	95	160	300	4500	6'	19.9	3500	3000	94	1.32	1.40	1.59
LCK 120 3_24	110	190	360	4500	8'	20.4	3500	3000	91	1.64	1.72	1.90
LCK 120 3_30	110	190	360	4500	8'	20.4	3500	3000	91	1.63	1.71	1.89
LCK 120 3_50	110	190	360	4500	8'	20.4	3500	3000	91	1.40	1.48	1.67
LCK 120 3_70	110	190	360	4500	8'	20.4	3500	3000	91	1.34	1.42	1.61
LCK 120 3_80	110	190	360	4500	8'	20.4	3500	3000	91	1.31	1.39	1.58
LCK 120 3_100	110	190	360	4500	8'	20.4	3500	3000	91	1.31	1.39	1.58



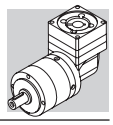
LCK 155



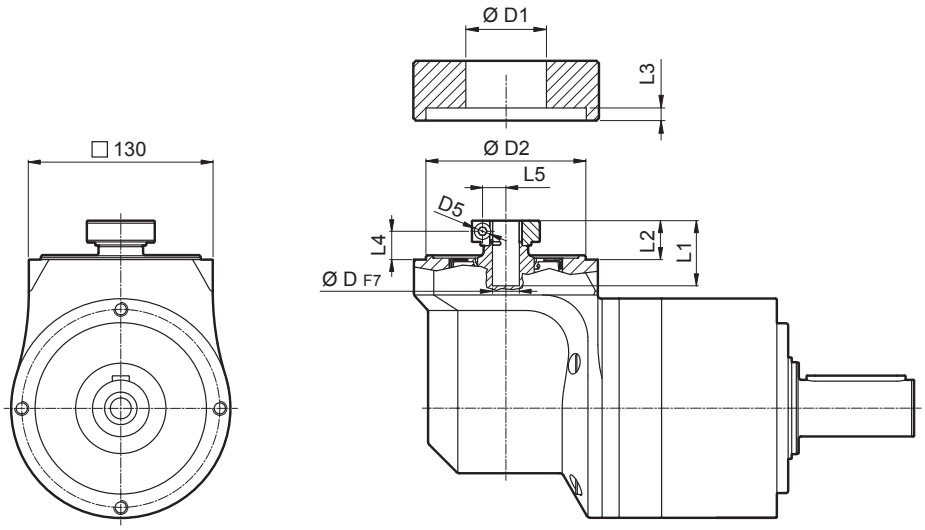


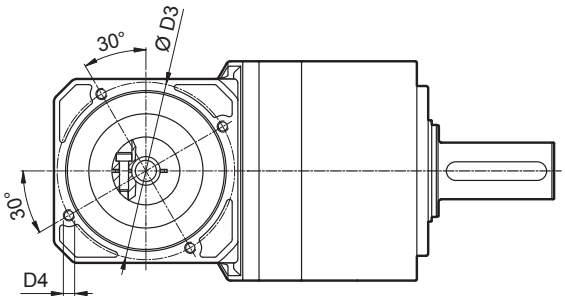
	P	P1	P2	Kg
LCK 155 2	123.5	191.5	353.5	27.8
LCK 155 3	163	231	393	32.8

	D							N	N1	N2	N3	N4	N5	L_{max}
55A1	14	15.875	16	19	–	–	–	55.5	125.7	130	4	M6x15	39.5	50
80A2	14	15.875	16	19	–	–	–	80	100	130	4	M6x15	39.5	50
95A1	14	15.875	16	19	22	24	–	95	115	130	4	M8x20	39.5	50
110A1	14	15.875	16	19	22	24	–	110	130	130	4	M8x20	39.5	50
110B1	14	15.875	16	19	22	24	–	110	145	130	6.5	M8x20	49.5	60
114A	14	15.875	16	19	22	24	28	114.3	200	170	5.5	M12x25	69.5	80
130A	14	15.875	16	19	22	24	–	130	165	140	4	M10x20	39.5	50
130A1	14	15.875	16	19	22	24	28	130	165	140	4	M10x20	49.5	60
180A	14	15.875	16	19	22	24	28	180	215	190	5.5	M14x25	49.5	60
180A1	14	15.875	16	19	22	24	28	180	215	190	5.5	M14x25	69.5	80



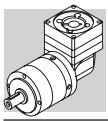
FM





D			D1	D2	D3	D4	D5	L1	L2	L3	L4	L5
14	15.875	16	48	113	125.5	M8x15	M6	46	27.5	6	20	14.5
19			51	113	125.5	M8x15	M6	46	27.5	6	20	16.5
22	24		56.5	113	125.5	M8x15	M6	47.5	29	6	20	19
28			67	113	125.5	M8x15	M8	47.5	29	6	20	22.5

i	$M_{n\,2}$ [Nm]	$M_{a\,2}$ [Nm]	$M_{p\,2}$ [Nm]	$n_{1\,max}$ [min^{-1}]	φ_S [arcmin]	C_t [Nm/arcmin]	$R_{2\,max}$ [N]	$A_{2\,max}$ [N]	η %	J_G [kgcm^2] D 14 ... 19	D 22 ; 24	D 28
LCK 155 2_6	250	360	510	4500	6'	40.7	6000	5000	94	7.94	8.13	8.53
LCK 155 2_8	300	450	680	4500	6'	40.7	6000	5000	94	7.11	7.30	7.70
LCK 155 2_10	300	450	850	4500	6'	40.7	6000	5000	94	6.78	6.96	7.36
LCK 155 2_14	300	450	900	4500	6'	40.7	6000	5000	94	6.48	6.67	7.07
LCK 155 2_20	230	350	750	4500	6'	40.7	6000	5000	94	6.31	6.49	6.90
LCK 155 3_24	300	450	900	4500	8'	37.4	6000	5000	91	7.18	7.37	7.77
LCK 155 3_30	300	450	900	4500	8'	37.4	6000	5000	91	7.14	7.33	7.73
LCK 155 3_50	300	450	900	4500	8'	37.4	6000	5000	91	6.49	6.68	7.08
LCK 155 3_70	300	450	900	4500	8'	37.4	6000	5000	91	6.33	6.52	6.92
LCK 155 3_80	300	450	700	4500	8'	37.4	6000	5000	91	6.25	6.43	6.83
LCK 155 3_100	300	450	900	4500	8'	37.4	6000	5000	91	6.24	6.43	6.83



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9	Sect 3 “Ordering code”: - ordering code for keyed output shaft (KE) newly added
10 ... 19	Sect. 4 “Dimensions and technical specifications”: - tolerance (h9) for the key of the output shaft newly added - updated weight of gear units - values for torsional stiffness (C_t) newly added - updated dimensions

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