GRAESSNER

GEAR SYSTEMS [2.0]

GEAR BOXES - RACKS - SPUR GEARS - LUBRICATION COMPONENTS

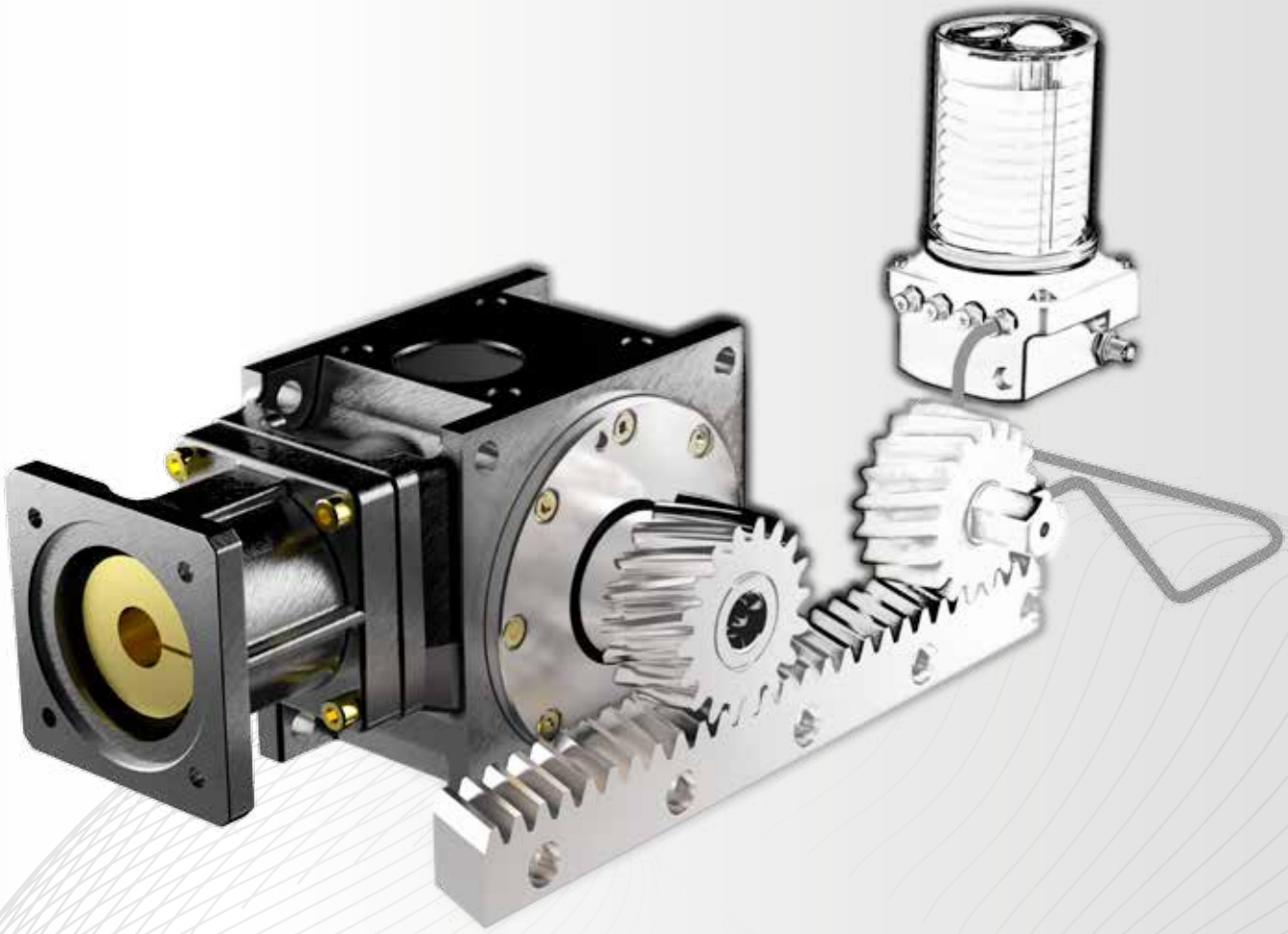


TABLE OF CONTENTS

GENERAL
HOW TO USE THIS CATALOGUE

Lubrication pump

The innovative FlexxPump enables
- Direct control via PLC
- Pump output up to 70 bar
- 4 outputs
- Up to 16 lubrication points

More detailed information on page 74

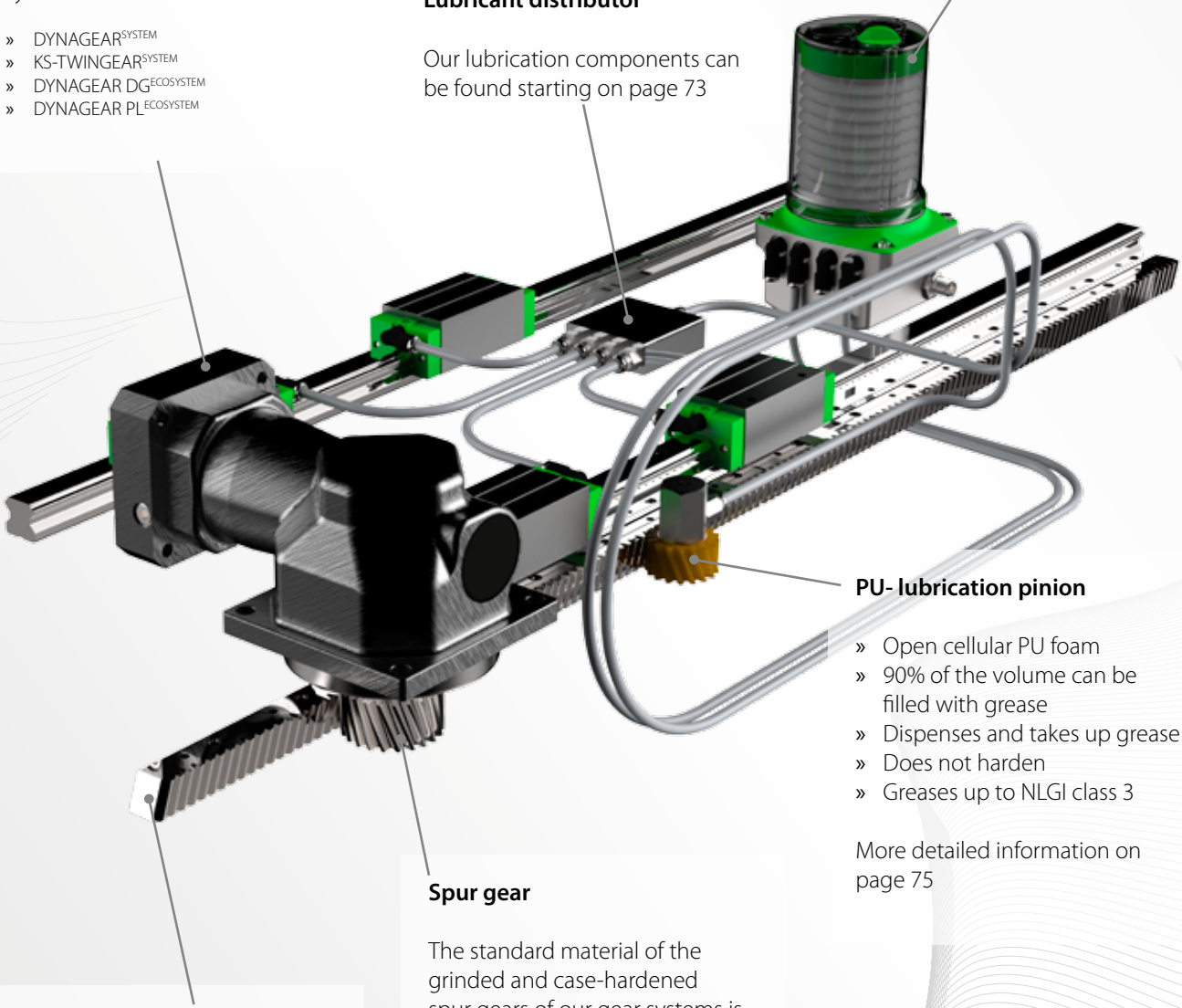
Angular gear

Gears from Graessner guarantee maximum quality and power density. We offer four gear systems

- DYNAGEAR^{SYSTEM}
- KS-TWINGEAR^{SYSTEM}
- DYNAGEAR DG^{ECOSYSTEM}
- DYNAGEAR PL^{ECOSYSTEM}

Lubricant distributor

Our lubrication components can be found starting on page 73



PU- lubrication pinion

- Open cellular PU foam
- 90% of the volume can be filled with grease
- Dispenses and takes up grease
- Does not harden
- Greases up to NLGI class 3

More detailed information on page 75

Spur gear

The standard material of the grinded and case-hardened spur gears of our gear systems is 16MnCr5.

See the catalogue, starting on page 68

Rack

Available in three precision classes

- PROFESSIONAL
- ULTIMATE
- ULTIMATEPLUS

See the catalogue, starting on page 64

HOW TO USE THIS CATALOGUE

JUST A FEW STEPS TO THE COMPLETE SPUR GEAR SYSTEM

1. Choose your desired gear system on pages 6 and 7. Four gear types are available, which depending on your application. Specific gear information can be found in the respective detailed catalogue at www.graessner.com.

2. Learn about the three available precision classes on page 7
   - » Professional
   - » Ultimate
   - » Ultimate^{PLUS}

3. Through the diagrams at the start of each section you can be have a overview of the gear sizes. These diagrams show the maximum feed force of the respective spur gear systems in depending on the feed speed.

4. Once you have made a preliminary selection, you will find the technical data and dimensions on the product pages that follow.

   - » Table with gear-specific characteristics for general information.
   - » Table with the available spur gear toothing (module and number of teeth) as well as the technical values of the chosen precision class for the complete system.

5. Every section ends with the order number key.

6. According to the selected precision class, you will find all the details about our straight and helical toothed racks, including order code, on pages 64 to 67.

7. In conclusion, the section "Lubrication System" on page 73 contains additional information on selecting all the required lubrication components and their order codes.

GENERAL
GRAESSNER GEAR SYSTEMS

In addition to its popular gear systems, Graessner also offers system solutions in the area of rack and pinion applications for machine building and plant engineering.
The DynaGear, KS-TwinGear, DynaGear DG and DynaGear PL systems consist of precise system components developed for automation systems. These include:

» Precision gears with low backlash
» Spur gears
» Racks
» Lubrication systems

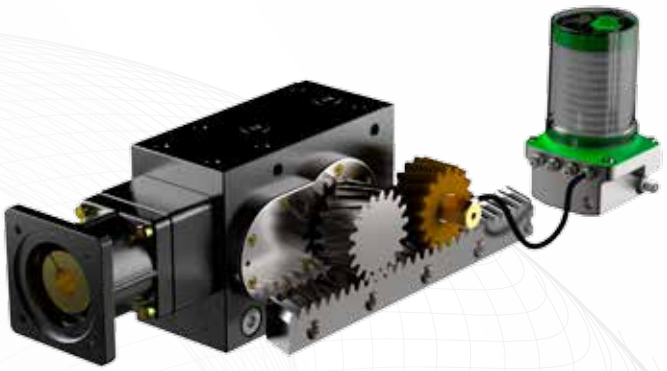
DYNAGEAR SYSTEM

Smart, light and precise

» 8 sizes from T_{2B}= 53Nm bis 2160Nm
» Feed forces up to 35kN
» 3 precision classes
» Input speeds up to n_{1MAX}= 8000min^{-1}
» Feed speeds up to 10m/s
» Gear ratios from 3:1 to 100:1
» Spur gear modules from m2 bis m6

KS-TWINGEAR SYSTEM

Compact, strong and exact



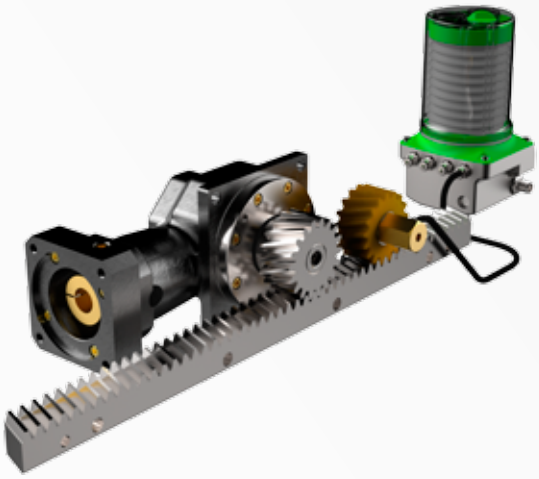
» 8 sizes from T2B= 225 Nm to 11250 Nm
» Feed forces up to 200kN
» 3 precision classes
» Input speeds up to n1MAX= 8000min^{-1}
» Feed speeds up to 4m/s
» Gear ratios from 15:1 to 75:1
» Spur gear modules from m2 to m8

Symbol directory

n_{1MAX} ..... Maximum input speed of the gear
n_{1N} ..... Nominal speed on the drive
η ..... Efficiency in [%]
v_{MAX} ..... Maximum feed speed
F_{vMAX} ..... Maximum feed force
T_{2N} ..... Nominal torque at the gear output

T_{2B} ..... Maximum acceleration at the gear output
Applies at a maximum of 1000 cycles per hour
Reduction factors can be found in our DynaGear catalogue
T_{2NOT} ..... Emergency stop torque at the gear output
Permitted a maximum of 1000 times over the gear lifespan
$P_{A\ MAX}$ ..... Absolute precision of the entire gear system
Values with respect to 300 mm and zero backlash
$P_{R\ MAX}$ ..... Repeat precision of the entire gear system
Values with respect to 300 mm and zero backlash

More information can be found in the respective gear catalogue.
All values in the system catalogue assume sufficient lubrication and a well adjusted tooth contact pattern.



DYNAGEAR DG ECOSYSTEM

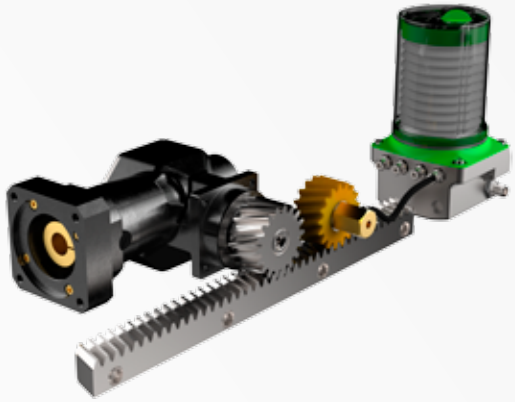
efficiency perfected

- 4 sizes from T_{2B}= 53Nm to 390Nm
- Feed forces up to 11kN
- 2 precision classes
- Input speeds up to n_{1MAX}= 6000min^{-1}
- Feed speeds up to 6m/s
- Gear ratios from 5:1 to 15:1
- Spur gear modules from m2 to m4

DYNAGEAR PL ECOSYSTEM

efficiency perfected

- With planetary gear output flange
- 3 sizes from T2B= 53Nm to 210Nm
- Feed forces up to 8kN
- 2 precision classes
- Input speeds up to n_{1MAX}= 5000min^{-1}
- Feed speeds up to 6m/s
- Gear ratios from 5:1 bis 15:1
- Spur gear modules from m2 bis m4



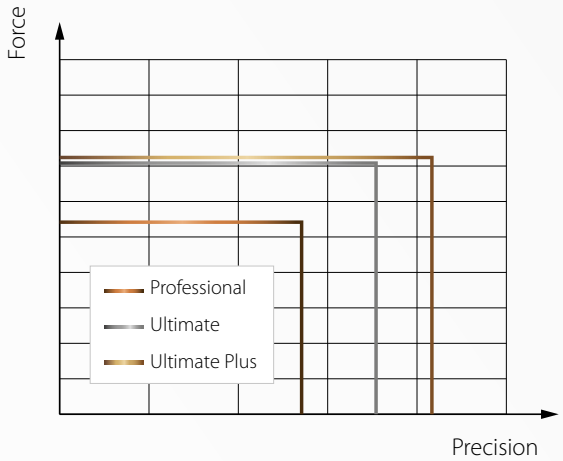
PRECISION CLASSES

Three precision classes are available to you

PROFESSIONAL
- Precision gear
- Spur gear - 16MnCr5 - hardened - grinded
- Rack - C45 - hardened - milled

ULTIMATE
- Precision gear
- Spur gear - 16MnCr5 - hardened - grinded
- Rack - C45 - hardened - grinded

ULTIMATE PLUS
- Precision gear with reduced backlash
- Spur gear - 16MnCr5 - hardened - grinded
- Rack - C45 - hardened - grinded at the highest quality

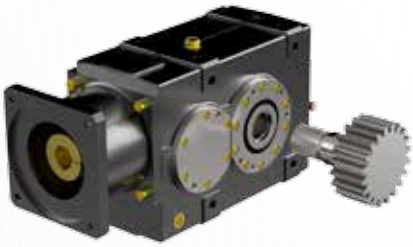


GENERAL
GEAR 4 YOU

WE BUILD THE GEAR THAT YOU WANT

Bevel gear box DesignGear P280 including labyrinth seal, pressure lubrication and DIN 5480 involute toothing at the output. Spur gear module 8 with counter-toothing integrated into the system. For use in fast, no-play master-slave turn table applications.

Hypoid gear Dynagear D115 with ratio i=5, extended output shaft and reduced backlash for axles in the robotics industry.



Robust straight bevel helical gear box TwinGear KS50 with DIN 5480 hollow-shaft toothing at the output and pinion shaft adjusted for no backlash. For use in heavy master-slave turn table applications.

Angular gear combination DynaGearTS including screwed-on flange pinion, for use in welding manipulators.

Efficiently perfected planetary gear PlanetGearECO with shrunken pinion, designed for applications and fast low-cost handling.

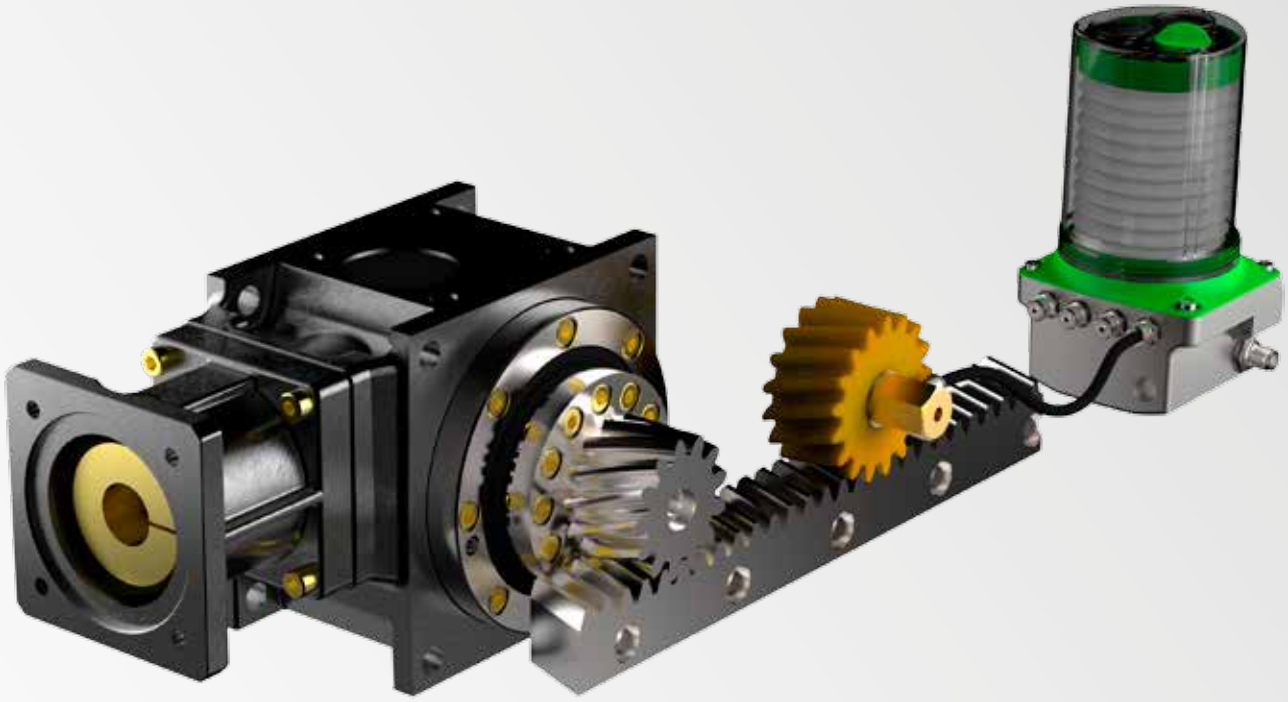
Low-play planetary gear BDB330 with ratio i=110 and backlash stiffness. Including spur gear module 6 in a grinded and hardened design of quality 6. Directly bolted to the block flange of the gear through axial bores. For master-slave feed drives on machine tools.

OUR SELECTION FOR YOU

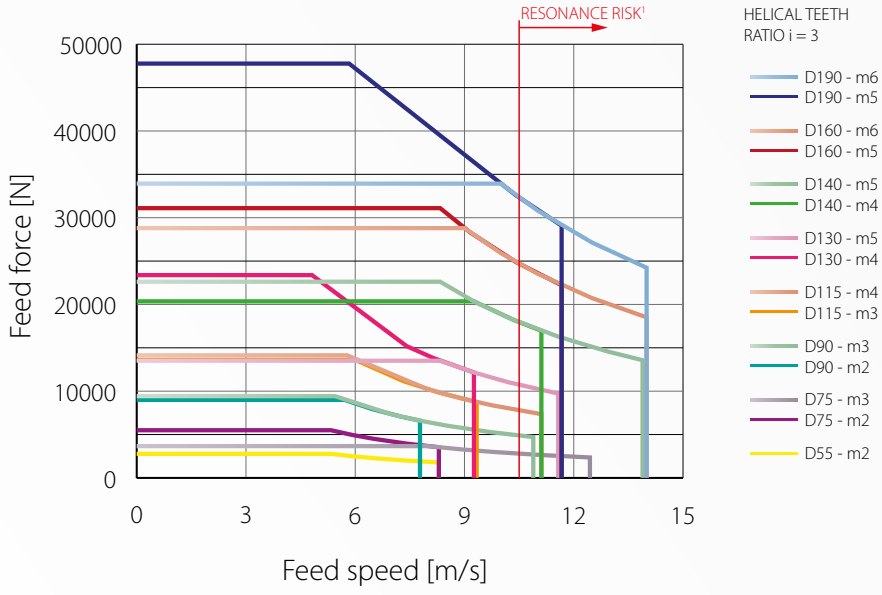
We offer many additional possibilities in addition to the customer-specific solutions shown on this page:

- User-defined numbers of teeth
- Involute toothing
- Spur gears according to your drawings
- Special measures on the gears
- And much more!

We look forward to your inquiry!

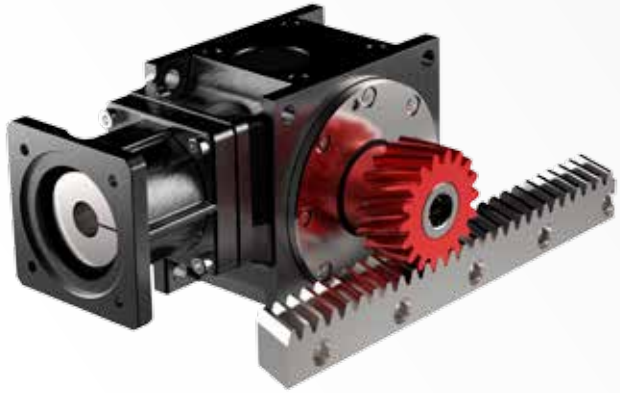


DYNAGEAR^SYSTEM - FORCES AND SPEEDS
with helical teeth and ratio i=3



[1] We ask that you contact us concerning feed speeds of 10 m/s and higher

DYNAGEAR SYSTEM
D55



TECHNICAL DATA

GEAR	Ratio i	[1]	**3**	**4**	**5**	**6**	**8**	**10**	**12**	**15**	**18**	**24**	**30**	**40**	**50**	**60**	**80**	**100**
	n_{1MAX}	[min^{-1}]	8000								6000							
	n_{1N}	[min^{-1}]	2100			3200			3900		3500							
	T_{2N}	[Nm]	35						25	18	35							
	T_{2B}	[Nm]	53						38	27	53							
	T_{2NOT}	[Nm]	70						50	36	70							
	Weight	[kg]	3,5								4							
	η^2	[%]	>96						>93		>92							

			STRAIGHT					**HELICAL**				
PROFESSIONAL	Module m	[mm]	**2**					**2**				
	Teeth z	[1]	**18**	**20**	**22**	**25**	**28**	**18**	**20**	**22**	**25**	**28**
	F_{vMAX} [3]	[N]	2650	2409	2208	1963	1767	2512	2282	2091	1858	1671
	v_{MAX} [3]	[m/s]	5,0	5,6	6,1	7,0	7,8	5,3	5,9	6,5	7,4	8,3
	T_{2N} [1]	[Nm]	35	35	35	35	35	35	35	35	35	35
	T_{2B} [1]	[Nm]	53	53	53	53	53	53	53	53	53	53
	T_{2NOT} [1]	[Nm]	70	70	70	70	70	70	70	70	70	70
	$P_{A\,MAX}$	[µm]	188	191	194	201	206	188	191	197	201	206
	$P_{R\,MAX}$	[µm]	26	29	32	36	41	26	29	32	36	41

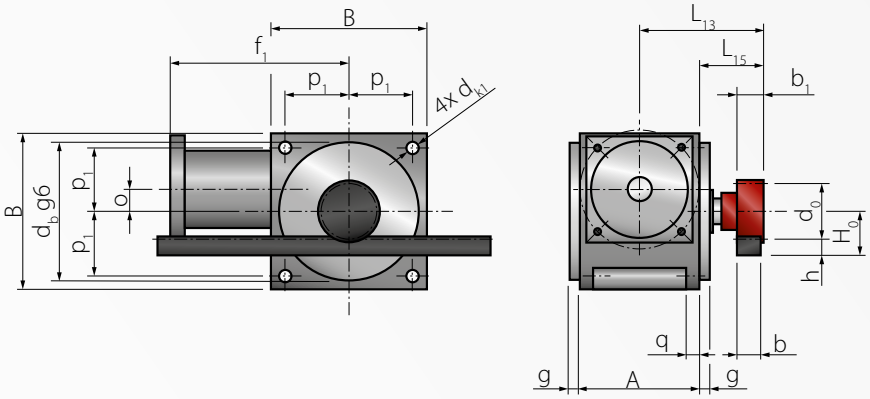
			STRAIGHT					**HELICAL**				
ULTIMATE	Module m	[mm]	**2**					**2**				
	Teeth z	[1]	**18**	**20**	**22**	**25**	**28**	**18**	**20**	**22**	**25**	**28**
	F_{vMAX} [3]	[N]	2944	2650	2409	2120	1893	2775	2498	2271	1998	1784
	v_{MAX} [3]	[m/s]	5,0	5,6	6,1	7,0	7,8	5,3	5,9	6,5	7,4	8,3
	T_{2N} [1]	[Nm]	35	35	35	35	35	35	35	35	35	35
	T_{2B} [1]	[Nm]	53	53	53	53	53	53	53	53	53	53
	T_{2NOT} [1]	[Nm]	70	70	70	70	70	70	70	70	70	70
	$P_{A\,MAX}$	[µm]	76	79	82	89	94	76	79	85	89	94
	$P_{R\,MAX}$	[µm]	26	29	32	36	41	26	29	32	36	41

			STRAIGHT					**HELICAL**				
ULTIMATE PLUS	Module m	[mm]	**2**					**2**				
	Teeth z	[1]	**18**	**20**	**22**	**25**	**28**	**18**	**20**	**22**	**25**	**28**
	F_{vMAX} [3]	[N]	2944	2650	2409	2120	1893	2775	2498	2271	1998	1784
	v_{MAX} [3]	[m/s]	5,0	5,6	6,1	7,0	7,8	5,3	5,9	6,5	7,4	8,3
	T_{2N} [1]	[Nm]	35	35	35	35	35	35	35	35	35	35
	T_{2B} [1]	[Nm]	53	53	53	53	53	53	53	53	53	53
	T_{2NOT} [1]	[Nm]	70	70	70	70	70	70	70	70	70	70
	$P_{A\,MAX}$	[µm]	58	59	61	67	69	58	59	64	67	69
	$P_{R\,MAX}$	[µm]	16	17	19	22	24	16	17	19	22	24

An explanation of how to use the tables can be found on pages 4-7.

DIMENSIONS

SOLID SHAFT
WITH SHRUNKEN PINION



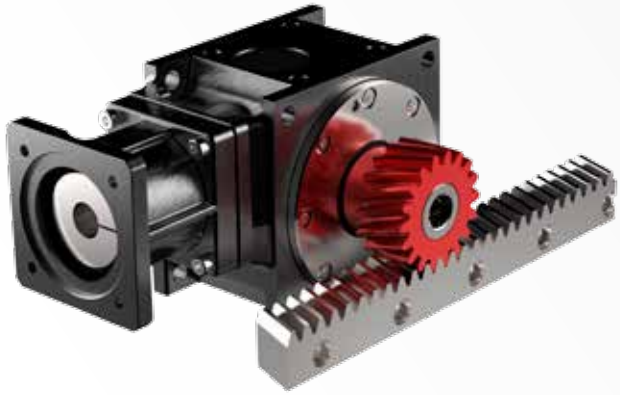
Module m	[mm]	2				
Teeth z	[1]	**18**	**20**	**22**	**25**	**28**
A	[mm]	60				
b	[mm]	24				
b_1	[mm]	25				
B	[mm]	90				
d_0 straight	[mm]	36	40	44	50	56
d_0 helical	[mm]	38,20	42,44	46,69	53,05	59,42
d_b g6	[mm]	89				
d_{k1}	[mm]	6,6				
g	[mm]	13,5				
h	[mm]	22				
H_0 straight	[mm]	40	42	44	47	50
H_0 helical	[mm]	41,10	43,22	45,34	48,53	51,71
L_{13}	[mm]	80				
L_{15}	[mm]	50				
o	[mm]	9				
p_1	[mm]	39				
q	[mm]	8				

MOTOR ATTACHMENT

Ratio i	[1]	**3-15**						**18-100**				
Flange		**V1**	**V2**	**V3**	**V4**	**V5**	**V6**	**V7**	**V8**	**V9**	**V10**	**V11**
Shaft -Ø d_1	[mm]	9	11	14	14	14	19	9	11	14	14	14
Shaft length l	[mm]	23	26	30	30	30	40	25	25	30	30	30
Square u_1	[mm]	55	75	75	90	90	90	65	70	60	90	90
Pitch circle -Ø v_1	[mm]	63	75	75	95	100	100	63	75	75	95	100
Centering-Ø w_1	[mm]	40	60	60	50	80	80	40	60	60	50	80
Threads 4x s_1	[mm]	M5	M5	M5	M6	M6	M6	M5	M5	M5	M6	M6
f_1	[mm]	130	140	140	143	143	153	153,3	153,3	158,3	158,3	158,3

[1] Reduced torques apply to the ratios 12 and 15. See the gear data for additional technical details.
[2] For bearing lifespan and gear efficiency calculations, visit www.gearfox.com
[3] Values were determined at a ratio of 3:1.
All values assume sufficient lubrication and a well adjusted tooth contact pattern. Additional axial forces reduce the torque values.
NOTE: For optimal adjustment of the backlash, it is recommended that the connection structure is designed at least 1-2 mm larger.

DYNAGEAR SYSTEM
D75



TECHNICAL DATA

GEAR	Ratio i	[1]	3	4	5	6	8	10	12	15	18	24	30	40	50	60	80	100
	n_{1MAX}	[min^{-1}]	8000								6000							
	n_{1N}	[min^{-1}]	1800			2700			3300		3000							
	T_{2N}	[Nm]	70						50	39	70							
	T_{2B}	[Nm]	105						75	58	105							
	T_{2NOT}	[Nm]	140						100	78	140							
	Weight	[kg]	5,5								6,5							
	η^2	[%]	>96						>93		>92							

			STRAIGHT										HELICAL									
PROFESSIONAL	Module m	[mm]	2					3					2					3				
	Teeth z	[1]	**18**	**20**	**22**	**25**	**28**	**18**	**20**	**22**	**25**	**28**	**18**	**20**	**22**	**25**	**28**	**18**	**20**	**22**	**25**	**28**
	F_{vMAX} [3]	[N]	3400	2955	2875	2778	2533	3500	3182	2917	2593	2333	4834	3704	3670	3506	3311	3318	3015	2762	2454	2208
	v_{MAX} [3]	[m/s]	5,0	5,6	6,1	7,0	7,8	7,5	8,4	9,2	10,5	11,7	5,3	5,9	6,5	7,4	8,3	8,0	8,9	9,8	11,1	12,4
	T_{2N} [1]	[Nm]	60	64	67	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70
	T_{2B} [1]	[Nm]	68	65	69	75	76	105	105	105	105	105	102	86	93	100	105	105	105	105	105	105
	T_{2NOT} [1]	[Nm]	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140
	$P_{A\,MAX}$	[µm]	188	191	194	201	206	204	209	216	223	229	188	191	197	201	206	204	212	216	223	229
	$P_{R\,MAX}$	[µm]	26	29	32	36	41	39	44	48	55	61	26	29	32	36	41	39	44	48	55	61

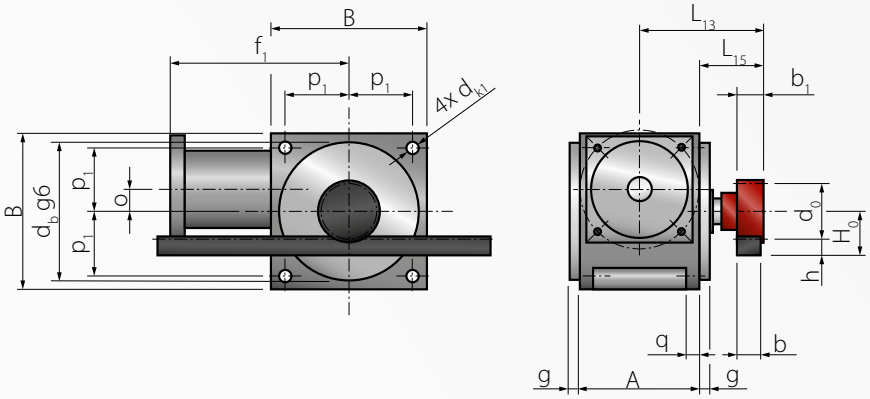
			STRAIGHT										HELICAL									
ULTIMATE	Module m	[mm]	2					3					2					3				
	Teeth z	[1]	**18**	**20**	**22**	**25**	**28**	**18**	**20**	**22**	**25**	**28**	**18**	**20**	**22**	**25**	**28**	**18**	**20**	**22**	**25**	**28**
	F_{vMAX} [3]	[N]	5833	5250	4773	4200	3750	3889	3500	3182	2800	2500	5498	4948	4498	3958	3534	3665	3299	2999	2639	2356
	v_{MAX} [3]	[m/s]	5,0	5,6	6,1	7,0	7,8	7,5	8,4	9,2	10,5	11,7	5,3	5,9	6,5	7,4	8,3	8,0	8,9	9,8	11,1	12,4
	T_{2N} [1]	[Nm]	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70
	T_{2B} [1]	[Nm]	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105
	T_{2NOT} [1]	[Nm]	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140
	$P_{A\,MAX}$	[µm]	76	79	82	89	94	92	97	104	111	117	76	79	85	89	94	92	100	104	111	117
	$P_{R\,MAX}$	[µm]	26	29	32	36	41	39	44	48	55	61	26	29	32	36	41	39	44	48	55	61

			STRAIGHT										HELICAL									
ULTIMATE PLUS	Module m	[mm]	2					3					2					3				
	Teeth z	[1]	**18**	**20**	**22**	**25**	**28**	**18**	**20**	**22**	**25**	**28**	**18**	**20**	**22**	**25**	**28**	**18**	**20**	**22**	**25**	**28**
	F_{vMAX} [3]	[N]	5833	5250	4773	4200	3750	3889	3500	3182	2800	2500	5498	4948	4498	3958	3534	3665	3299	2999	2639	2356
	v_{MAX} [3]	[m/s]	5,0	5,6	6,1	7,0	7,8	7,5	8,4	9,2	10,5	11,7	5,3	5,9	6,5	7,4	8,3	8,0	8,9	9,8	11,1	12,4
	T_{2N} [1]	[Nm]	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70
	T_{2B} [1]	[Nm]	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105
	T_{2NOT} [1]	[Nm]	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140
	$P_{A\,MAX}$	[µm]	58	59	61	67	69	69	71	77	81	85	58	59	64	67	69	69	74	77	81	85
	$P_{R\,MAX}$	[µm]	16	17	19	22	24	24	26	29	33	37	16	17	19	22	24	24	26	29	33	37

An explanation of how to use the tables can be found on pages 4-7.

DIMENSIONS

SOLID SHAFT
WITH SHRUNKEN PINION



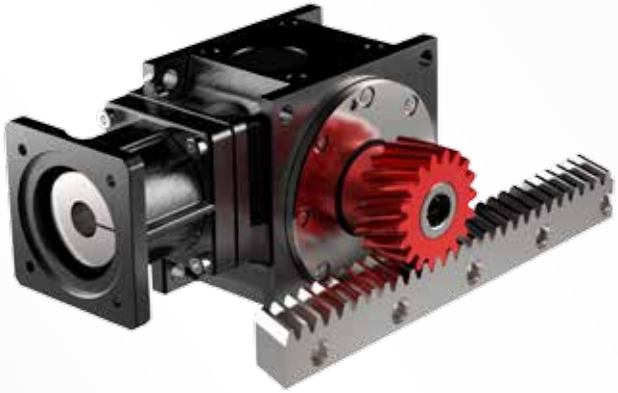
Module m	[mm]	2					3				
Teeth z	[1]	**18**	**20**	**22**	**25**	**28**	**18**	**20**	**22**	**25**	**28**
A	[mm]	80					80				
b	[mm]	24					29				
b_1	[mm]	25					30				
B	[mm]	115					115				
d_0 straight	[mm]	36	40	44	50	56	54	60	66	75	84
d_0 helical	[mm]	38,20	42,44	46,69	53,05	59,42	57,30	63,66	70,03	79,58	89,13
d_b g6	[mm]	105					105				
d_{k1}	[mm]	9					9				
g	[mm]	8,5					8,5				
h	[mm]	22					26				
H_0 straight	[mm]	40	42	44	47	50	53	56	59	64	68
H_0 helical	[mm]	41,10	43,22	45,34	48,53	51,71	54,65	57,83	61,01	65,79	70,56
L_{13}	[mm]	90					90				
L_{15}	[mm]	50					50				
o	[mm]	14					14				
p_1	[mm]	49					49				
q	[mm]	10					10				

MOTOR ATTACHMENT

Ratio i	[1]	3-15								18-100							
Flange		**V1**	**V2**	**V3**	**V4**	**V5**	**V6**	**V7**	**V8**	**V9**	**V10**	**V11**	**V12**	**V13**	**V14**	**V15**	**V16**
Shaft -Ø d_1	[mm]	11	14	14	19	19	19	19	24	14	14	14	19	19	19	19	24
Shaft length l	[mm]	26	30	30	40	40	40	40	50	30	30	30	40	40	40	40	50
Square u_1	[mm]	75	75	90	90	90	115	115	115	75	90	90	90	90	115	115	115
Pitch circle -Ø v_1	[mm]	75	75	95	95	100	130	115	130	75	95	100	95	100	130	115	130
Centering-Ø w_1	[mm]	60	60	70	70	80	95	95	110	60	70	80	70	80	95	95	110
Threads 4x s_1	[mm]	M5	M5	M6	M6	M6	M8	M8	M8	M5	M6	M6	M6	M8	M8	M8	M8
f_1	[mm]	168	168	168	168	168	180	180	180	186,6	187	187	196,6	196,6	196,6	196,6	206,6

[1] Reduced torques apply to the ratios 12 and 15. See the gear data for additional technical details.
[2] For bearing lifespan and gear efficiency calculations, visit www.gearfox.com
[3] Values were determined at a ratio of 3:1.
All values assume sufficient lubrication and a well adjusted tooth contact pattern. Additional axial forces reduce the torque values.
NOTE: For optimal adjustment of the backlash, it is recommended that the connection structure is designed at least 1-2 mm larger.

DYNAGEAR SYSTEM
D90



TECHNICAL DATA

GEAR	Ratio i	[1]	3	4	5	6	8	10	12	15	18	24	30	40	50	60	80	100
	n_{1MAX}	[min^{-1}]	7000								6000							
	n_{1N}	[min^{-1}]	1500			2200			2800		3000							
	T_{2N}	[Nm]	140						95	66	140							
	T_{2B}	[Nm]	210						143	99	210							
	T_{2NOT}	[Nm]	280						190	132	280							
	Weight	[kg]	9,5								12,5							
	η^2	[%]	>96						>93		>92							

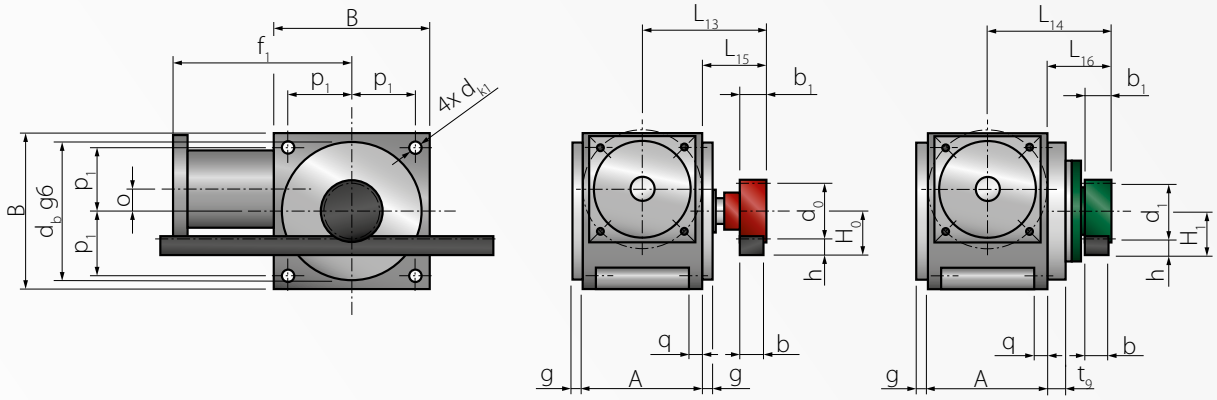
			STRAIGHT										HELICAL									
PROFESSIONAL	Module m	[mm]	2				3						2				3					
	Teeth z	[1]	22	25	28	30	15	18	20	22	25	28	22	25	28	30	14	18	20	22	25	28
	F_{vMAX} [3]	[N]	2875	2778	2533	2469	6667	7000	6364	5833	5185	4667	3078	3506	3438	3429	8306	6636	6029	5524	4908	4415
	v_{MAX} [3]	[m/s]	5,4	6,1	6,8	7,3	5,5	6,6	7,3	8,1	9,2	10,3	5,7	6,5	7,3	7,8	5,4	7,0	7,8	8,6	9,7	10,9
	T_{2N} [1]	[Nm]	67	72	73	75	140	140	140	140	140	140	91	97	106	112	140	140	140	140	140	140
	T_{2B} [1]	[Nm]	69	75	76	79	170	210	210	210	210	210	98	100	109	116	210	210	210	210	210	210
	T_{2NOT} [1]	[Nm]	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280
	$P_{A\,MAX}$	[µm]	188	194	198	200	191	196	200	206	212	217	188	194	198	200	189	196	203	206	212	217
	$P_{R\,MAX}$	[µm]	26	29	33	35	26	31	35	38	44	49	26	29	33	35	24	31	35	38	44	49

			STRAIGHT										HELICAL									
ULTIMATE	Module m	[mm]	2				3						2				3					
	Teeth z	[1]	22	25	28	30	15	18	20	22	25	28	22	25	28	30	14	18	20	22	25	28
	F_{vMAX} [3]	[N]	6636	6680	6679	6667	9333	7778	7000	6364	5600	5000	7797	7804	7069	6597	9425	7330	6597	5998	5278	4712
	v_{MAX} [3]	[m/s]	5,4	6,1	6,8	7,3	5,5	6,6	7,3	8,1	9,2	10,3	5,7	6,5	7,3	7,8	5,4	7,0	7,8	8,6	9,7	10,9
	T_{2N} [1]	[Nm]	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140
	T_{2B} [1]	[Nm]	146	167	187	200	210	210	210	210	210	210	182	207	210	210	210	210	210	210	210	210
	T_{2NOT} [1]	[Nm]	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280
	$P_{A\,MAX}$	[µm]	76	82	86	88	79	84	88	94	100	105	76	82	86	88	77	84	91	94	100	105
	$P_{R\,MAX}$	[µm]	26	29	33	35	26	31	35	38	44	49	26	29	33	35	24	31	35	38	44	49

			STRAIGHT										HELICAL									
ULTIMATE PLUS	Module m	[mm]	2				3						2				3					
	Teeth z	[1]	22	25	28	30	15	18	20	22	25	28	22	25	28	30	14	18	20	22	25	28
	F_{vMAX} [3]	[N]	6636	6680	6679	6667	9333	7778	7000	6364	5600	5000	7797	7804	7069	6597	9425	7330	6597	5998	5278	4712
	v_{MAX} [3]	[m/s]	5,4	6,1	6,8	7,3	5,5	6,6	7,3	8,1	9,2	10,3	5,7	6,5	7,3	7,8	5,4	7,0	7,8	8,6	9,7	10,9
	T_{2N} [1]	[Nm]	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140
	T_{2B} [1]	[Nm]	146	167	187	200	210	210	210	210	210	210	210	207	210	210	210	210	210	210	210	210
	T_{2NOT} [1]	[Nm]	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280
	$P_{A\,MAX}$	[µm]	55	60	61	62	58	61	62	67	70	72	55	60	61	62	57	61	65	67	70	72
	$P_{R\,MAX}$	[µm]	13	15	16	17	13	16	17	19	22	24	13	15	16	17	12	16	17	19	22	24

An explanation of how to use the tables can be found on pages 4-7.

DIMENSIONS



Module m	[mm]	2				3						
Teeth z	[1]	22	25	28	30	14	15	18	20	22	25	28
A	[mm]	100				100						
b	[mm]	24				29						
b_1	[mm]	25				30						
B	[mm]	140				140						
d_0 straight	[mm]	-	50	56	60	-		54	60	66	75	84
d_0 helical	[mm]	-	53,05	59,42	63,66	-		57,30	63,66	70,03	79,58	89,13
d_1 straight	[mm]	46	-			-	46	-				
d_1 helical	[mm]	48	-			46	-					
d_b g6	[mm]	125				125						
d_{k1}	[mm]	9				9						
g	[mm]	8				8						
h	[mm]	22				26						
H_0 straight	[mm]	-	47	50	52	-		53	56	59	64	68
H_0 helical	[mm]	-	48,53	51,71	53,83	-		54,65	57,83	61,01	65,79	70,56
H_1 straight	[mm]	45	-			-	49	-				
H_1 helical	[mm]	46	-			49	-					
L_{13}	[mm]	-	110			-		110				
L_{14}	[mm]	113	-			118		-				
L_{15}	[mm]	-	60			-		60				
L_{16}	[mm]	63	-			68		-				
o	[mm]	18				18						
p_1	[mm]	49				49						
q	[mm]	11				11						
t_9	[mm]	16	-			16		-				

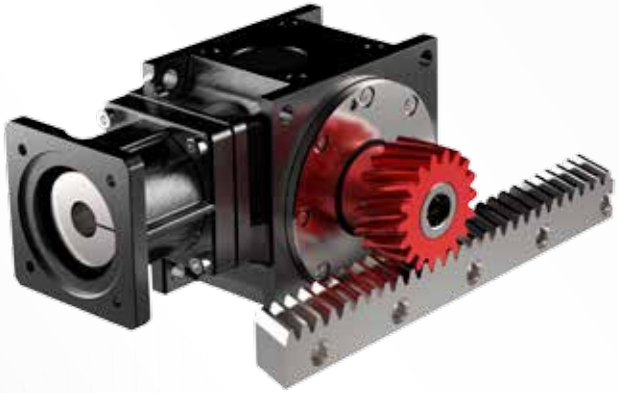
MOTOR ATTACHMENT

Ratio i	[1]	3-15										18-100								
Flange		V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12	V13	V14	V15	V16	V17	V18	V19
Shaft -Ø d_1	[mm]	14	14	19	19	19	19	24	24	24	32	14	14	19	19	19	19	24	24	24
Shaft length l	[mm]	30	30	40	40	40	40	50	50	50	60	30	30	40	40	40	40	50	50	50
Square u_1	[mm]	90	90	90	115	115	115	115	140	140	140	90	90	90	115	115	115	115	140	140
Pitch circle -Ø v_1	[mm]	100	95	100	130	115	130	130	165	165	165	100	95	100	130	115	130	130	165	165
Centering-Ø w_1	[mm]	80	80	80	95	95	110	110	110	130	130	80	80	80	95	95	110	110	110	130
Threads 4x s_1	[mm]	M6	M6	M6	M8	M8	M8	M8	M10	M10	M10	M6	M6	M6	M8	M8	M8	M8	M10	M10
f_1	[mm]	191	191	191	191	191	191	201	201	201	201	202,6	202,6	212,6	212,6	212,6	212,6	222,6	222,6	222,6

[1] Reduced torques apply to the ratios 12 and 15. See the gear data for additional technical details.
[2] For bearing lifespan and gear efficiency calculations, visit www.gearfox.com
[3] Values were determined at a ratio of 3:1.
All values assume sufficient lubrication and a well adjusted tooth contact pattern. Additional axial forces reduce the torque values.
NOTE: For optimal adjustment of the backlash, it is recommended that the connection structure is designed at least 1-2 mm larger.

DYNAGEAR SYSTEM
D115

GRAESSNER



TECHNICAL DATA

GEAR	Ratio i	[1]	3	4	5	6	8	10	12	15	18	24	30	40	50	60	80	100
	n_{1MAX}	[min^{-1}]	6000								6000							
	n_{1N}	[min^{-1}]	1150			1800			2300		2500							
	T_{2N}	[Nm]	260						180	130	260							
	T_{2B}	[Nm]	390						270	195	390							
	T_{2NOT}	[Nm]	520						360	260	520							
	Weight	[kg]	15,5								19,5							
	η^2	[%]	>96						>93		>92							

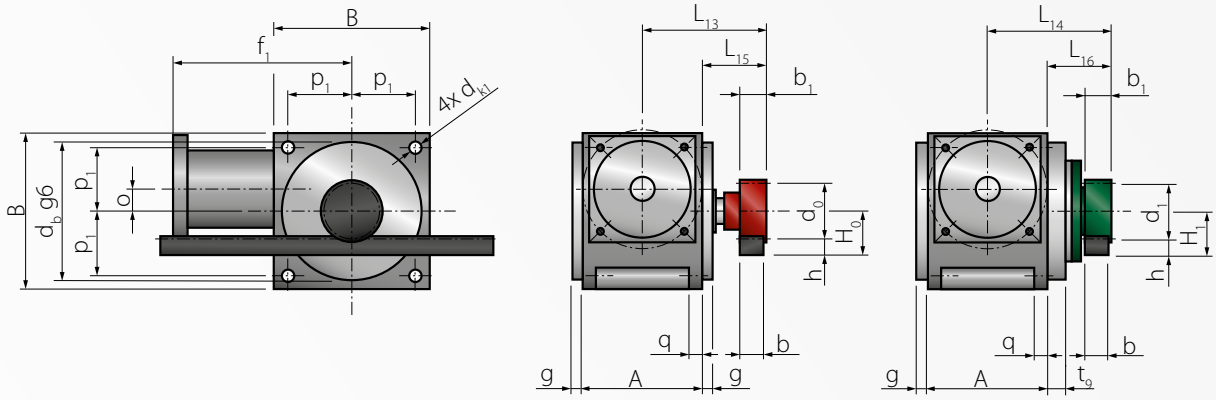
			STRAIGHT									HELICAL								
PROFESSIONAL	Module m	[mm]	3				4					3				4				
	Teeth z	[1]	**19**	**22**	**25**	**28**	**14**	**18**	**20**	**22**	**25**	**18**	**22**	**25**	**28**	**13**	**18**	**20**	**22**	**25**
	F_{vMAX} [3]	[N]	10730	7722	7556	7400	11125	9750	8864	8125	7222	12323	9418	9115	8200	12347	9242	8398	7695	6836
	v_{MAX} [3]	[m/s]	6,0	6,9	7,9	8,8	5,9	7,5	8,4	9,2	10,5	6,0	7,3	8,3	9,3	5,8	8,0	8,9	9,8	11,1
	T_{2N} [1]	[Nm]	249	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260
	T_{2B} [1]	[Nm]	338	278	306	333	356	390	390	390	390	390	358	390	390	390	390	390	390	390
	T_{2NOT} [1]	[Nm]	520	520	520	520	520	520	520	520	520	520	520	520	520	520	520	520	520	520
	$P_{A\,MAX}$	[µm]	198	206	212	217	201	210	215	219	226	196	206	212	217	195	210	215	219	230
	$P_{R\,MAX}$	[µm]	33	38	44	49	33	42	47	51	58	31	38	44	49	30	42	47	51	58

			STRAIGHT									HELICAL								
ULTIMATE	Module m	[mm]	3				4					3				4				
	Teeth z	[1]	**19**	**22**	**25**	**28**	**14**	**18**	**20**	**22**	**25**	**18**	**22**	**25**	**28**	**13**	**18**	**20**	**22**	**25**
	F_{vMAX} [3]	[N]	13684	11818	10400	9286	13929	10833	9750	8864	7800	13614	11138	9802	8752	14137	10210	9189	8354	7351
	v_{MAX} [3]	[m/s]	6,0	6,9	7,9	8,8	5,9	7,5	8,4	9,2	10,5	6,0	7,3	8,3	9,3	5,8	8,0	8,9	9,8	11,1
	T_{2N} [1]	[Nm]	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260
	T_{2B} [1]	[Nm]	390	390	390	390	390	390	390	390	390	390	390	390	390	390	390	390	390	390
	T_{2NOT} [1]	[Nm]	520	520	520	520	520	520	520	520	520	520	520	520	520	520	520	520	520	520
	$P_{A\,MAX}$	[µm]	86	94	100	105	89	98	103	107	114	84	94	100	105	83	98	103	107	118
	$P_{R\,MAX}$	[µm]	33	38	44	49	33	42	47	51	58	31	38	44	49	30	42	47	51	58

			STRAIGHT									HELICAL								
ULTIMATE^{PLUS}	Module m	[mm]	3				4					3				4				
	Teeth z	[1]	**19**	**22**	**25**	**28**	**14**	**18**	**20**	**22**	**25**	**18**	**22**	**25**	**28**	**13**	**18**	**20**	**22**	**25**
	F_{vMAX} [3]	[N]	13684	11818	10400	9286	13929	10833	9750	8864	7800	13614	11138	9802	8752	14137	10210	9189	8354	7351
	v_{MAX} [3]	[m/s]	6,0	6,9	7,9	8,8	5,9	7,5	8,4	9,2	10,5	6,0	7,3	8,3	9,3	5,8	8,0	8,9	9,8	11,1
	T_{2N} [1]	[Nm]	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260
	T_{2B} [1]	[Nm]	390	390	390	390	390	390	390	390	390	390	390	390	390	390	390	390	390	390
	T_{2NOT} [1]	[Nm]	520	520	520	520	520	520	520	520	520	520	520	520	520	520	520	520	520	520
	$P_{A\,MAX}$	[µm]	62	67	70	72	66	71	73	76	79	61	67	70	72	62	71	73	76	83
	$P_{R\,MAX}$	[µm]	17	19	22	24	16	21	23	26	29	16	19	22	24	15	21	23	26	29

An explanation of how to use the tables can be found on pages 4-7.

DIMENSIONS



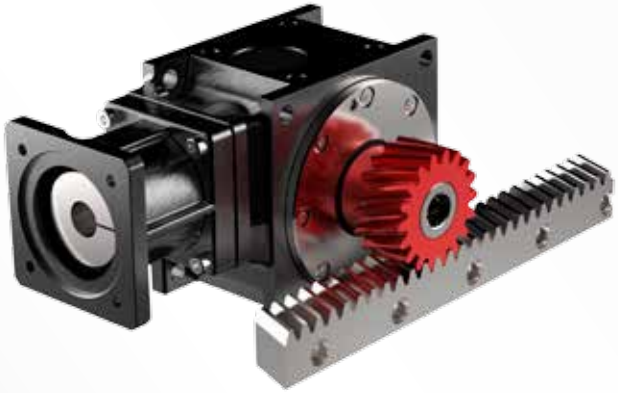
Module m	[mm]	3					4					
Teeth z	[1]	**18**	**19**	**22**	**25**	**28**	**13**	**14**	**18**	**20**	**22**	**25**
A	[mm]	120					120					
b	[mm]	29					29					
b_1	[mm]	30					30					
B	[mm]	170					170					
d_0 straight	[mm]	-		66	75	84	-		72	80	88	100
d_0 helical	[mm]	-		70,03	79,58	89,13	-		76,39	84,88	93,37	106,10
d_1 straight	[mm]	-	60	-			-	58	-			
d_1 helical	[mm]	60	-				58	-				
d_b g6	[mm]	150					150					
d_{k1}	[mm]	13,5					-					
g	[mm]	8					-					
h	[mm]	26					-					
H_0 straight	[mm]	-		55,5	57,8	60	-		71	75	79	85
H_0 helical	[mm]	-		56,51	58,89	61,28	-		73,20	77,44	81,69	88,05
H_1 straight	[mm]	-	56	-			-	64	-			
H_1 helical	[mm]	56	-				64	-				
L_{13}	[mm]	-		130			-		130			
L_{14}	[mm]	145		-			145		-			
L_{15}	[mm]	-		70			-		70			
L_{16}	[mm]	85		-			85		-			
o	[mm]	23					-					
p_1	[mm]	72					-					
q	[mm]	13					-					
t_9	[mm]	17		-			17		-			

MOTOR ATTACHMENT

Ratio i	[1]	3-15										18-100									
Flange		**V1**	**V2**	**V3**	**V4**	**V5**	**V6**	**V7**	**V8**	**V9**	**V10**	**V11**	**V12**	**V13**	**V14**	**V15**	**V16**	**V17**	**V18**	**V19**	**V20**
Shaft -Ø d_1	[mm]	19	19	24	24	24	32	32	32	38	38	19	19	24	24	24	32	32	32	36	36
Shaft length l	[mm]	40	40	50	50	50	60	60	60	80	80	40	40	50	50	50	60	60	60	80	80
Square u_1	[mm]	115	115	115	140	140	140	190	190	190	190	115	115	115	140	140	140	190	190	190	190
Pitch circle -Ø v_1	[mm]	115	130	130	165	165	165	215	215	215	215	115	130	130	165	165	165	215	215	215	215
Centering-Ø w_1	[mm]	95	95	110	110	130	130	180	130	180	130	95	95	110	110	130	130	180	130	180	130
Threads 4x s_1	[mm]	M8	M8	M8	M10	M10	M10	M12	M12	M12	M12	M8	M8	M8	M10	M10	M10	M12	M12	M12	M12
f_1	[mm]	220	220	220	220	220	235	235	235	245	245	241	241	251	251	251	261	261	261	281	281

[1] Reduced torques apply to the ratios 12 and 15. See the gear data for additional technical details.
[2] For bearing lifespan and gear efficiency calculations, visit www.gearfox.com
[3] Values were determined at a ratio of 3:1.
All values assume sufficient lubrication and a well adjusted tooth contact pattern. Additional axial forces reduce the torque values.
NOTE: For optimal adjustment of the backlash, it is recommended that the connection structure is designed at least 1-2 mm larger.

DYNAGEAR SYSTEM
D130



TECHNICAL DATA

GEAR	Ratio i	[1]	3	4	5	6	8	10	12	15	18	24	30	40	50	60	80	100
	n_{1MAX}	[min^{-1}]	5000								5000							
	n_{1N}	[min^{-1}]	1000			1500			2000		2500							
	T_{2N}	[Nm]	430						300	215	430							
	T_{2B}	[Nm]	645						450	322	645							
	T_{2NOT}	[Nm]	860						600	430	860							
	Weight	[kg]	23,5								27							
	η^2	[%]	>96						>93		>92							

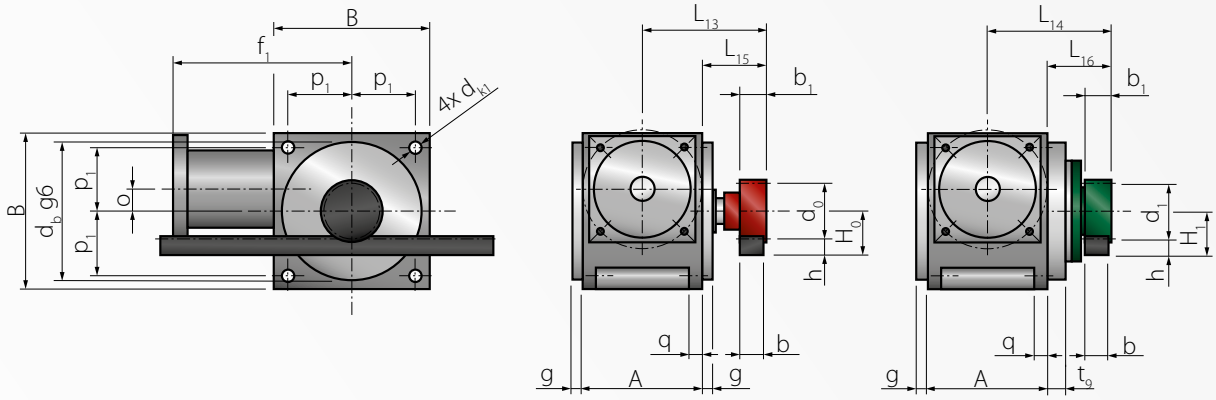
			STRAIGHT								HELICAL							
PROFESSIONAL	Module m	[mm]	4				5				4				5			
	Teeth z	[1]	14	20	22	25	18	20	22	25	13	20	22	25	18	20	22	25
	F_{vMAX} [3]	[N]	11125	14659	13438	11944	12900	11727	10750	9556	19185	13888	12726	11306	12228	11111	10180	9044
	v_{MAX} [3]	[m/s]	4,9	7,0	7,7	8,7	7,9	8,7	9,6	10,9	5,8	7,4	8,1	9,3	8,3	9,3	10,2	11,6
	T_{2N} [1]	[Nm]	362	430	430	430	430	430	430	430	430	430	430	430	430	430	430	430
	T_{2B} [1]	[Nm]	356	645	645	645	645	645	645	645	606	645	645	645	645	645	645	645
	T_{2NOT} [1]	[Nm]	860	860	860	860	860	860	860	860	860	860	860	860	860	860	860	860
	$P_{A\,MAX}$	[µm]	201	215	219	226	244	250	256	265	195	215	219	230	244	250	256	265
	$P_{R\,MAX}$	[µm]	33	47	51	58	52	58	64	73	30	47	51	58	52	58	64	73

			STRAIGHT								HELICAL							
ULTIMATE	Module m	[mm]	4				5				4				5			
	Teeth z	[1]	14	20	22	25	18	20	22	25	13	20	22	25	18	20	22	25
	F_{vMAX} [3]	[N]	15393	16125	14659	12900	14333	12900	11727	10320	23381	15197	13816	12158	13509	12158	11053	9726
	v_{MAX} [3]	[m/s]	4,9	7,0	7,7	8,7	7,9	8,7	9,6	10,9	5,8	7,4	8,1	9,3	8,3	9,3	10,2	11,6
	T_{2N} [1]	[Nm]	430	430	430	430	430	430	430	430	430	430	430	430	430	430	430	430
	T_{2B} [1]	[Nm]	431	645	645	645	645	645	645	645	645	645	645	645	645	645	645	645
	T_{2NOT} [1]	[Nm]	860	860	860	860	860	860	860	860	860	860	860	860	860	860	860	860
	$P_{A\,MAX}$	[µm]	89	103	107	114	116	122	128	137	83	103	107	118	116	122	128	137
	$P_{R\,MAX}$	[µm]	33	47	51	58	52	58	64	73	30	47	51	58	52	58	64	73

			STRAIGHT								HELICAL							
ULTIMATE PLUS	Module m	[mm]	4				5				4				5			
	Teeth z	[1]	14	20	22	25	18	20	22	25	13	20	22	25	18	20	22	25
	F_{vMAX} [3]	[N]	15393	16125	14659	12900	14333	12900	11727	10320	23381	15197	13816	12158	13509	12158	11053	9726
	v_{MAX} [3]	[m/s]	4,9	7,0	7,7	8,7	7,9	8,7	9,6	10,9	5,8	7,4	8,1	9,3	8,3	9,3	10,2	11,6
	T_{2N} [1]	[Nm]	430	430	430	430	430	430	430	430	430	430	430	430	430	430	430	430
	T_{2B} [1]	[Nm]	431	645	645	645	645	645	645	645	645	645	645	645	645	645	645	645
	T_{2NOT} [1]	[Nm]	860	860	860	860	860	860	860	860	860	860	860	860	860	860	860	860
	$P_{A\,MAX}$	[µm]	66	73	76	79	80	83	86	90	62	73	76	83	80	83	86	90
	$P_{R\,MAX}$	[µm]	16	23	26	29	26	29	32	36	15	23	26	29	26	29	32	36

An explanation of how to use the tables can be found on pages 4-7.

DIMENSIONS



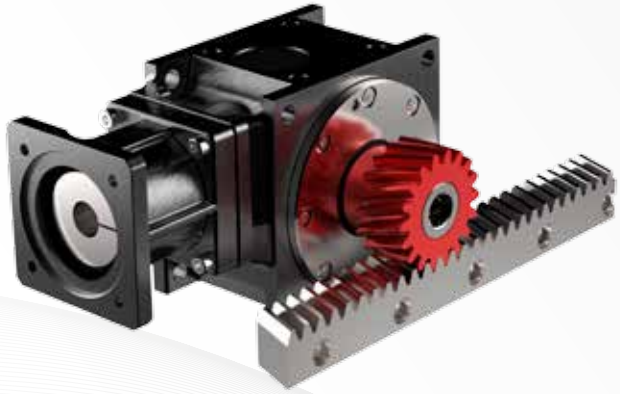
Module m	[mm]	4					5			
Teeth z	[1]	**13**	**14**	**20**	**22**	**25**	**18**	**20**	**22**	**25**
A	[mm]	138					138			
b	[mm]	39					49			
b_1	[mm]	40					50			
B	[mm]	192					192			
d_0 straight	[mm]	-		80	88	100	90	100	110	125
d_0 helical	[mm]	-		84,88	93,37	106,10	95,49	106,10	116,71	132,63
d_1 straight	[mm]	-	58	-			-			
d_1 helical	[mm]	58	-				-			
d_b g6	[mm]	173					173			
d_{k1}	[mm]	13,5					13,5			
g	[mm]	10					10			
h	[mm]	35					34			
H_0 straight	[mm]	-		75	79	85	79	84	89	96,5
H_0 helical	[mm]	-		77,44	81,69	88,05	81,75	87,05	92,36	100,31
H_1 straight	[mm]	-	64	-			-			
H_1 helical	[mm]	64	-				-			
L_{13}	[mm]	-		156			156			
L_{14}	[mm]	154,5		-			-			
L_{15}	[mm]	-		87			87			
L_{16}	[mm]	85,5		-			-			
o	[mm]	27					27			
p_1	[mm]	82					82			
q	[mm]	14					14			
t_9	[mm]	17,5		-			-			

MOTOR ATTACHMENT

Ratio i	[1]	3-15					18-100						
Flange		**V1**	**V2**	**V3**	**V4**	**V5**	**V6**	**V7**	**V8**	**V9**	**V10**	**V11**	**V12**
Shaft -Ø d_1	[mm]	24	24	32	32	32	19	19	24	24	32	32	32
Shaft length l	[mm]	50	50	60	60	60	40	40	50	50	60,0	60,0	60
Square u_1	[mm]	140	140	140	190	190	115	115	140	140	140	190	190
Pitch circle -Ø v_1	[mm]	165	165	165	215	215	115	130	165	165	165	215	215
Centering-Ø w_1	[mm]	110	130	130	180	130	95	95	110	130	130	180	130
Threads 4x s_1	[mm]	M10	M10	M10	M12	M12	M8	M8	M10	M10	M10	M12	M12
f_1	[mm]	245	245	245	245	245	257	257	267	267	277	277	277

[1] Reduced torques apply to the ratios 12 and 15. See the gear data for additional technical details.
[2] For bearing lifespan and gear efficiency calculations, visit www.gearfox.com
[3] Values were determined at a ratio of 3:1.
All values assume sufficient lubrication and a well adjusted tooth contact pattern. Additional axial forces reduce the torque values.
NOTE: For optimal adjustment of the backlash, it is recommended that the connection structure is designed at least 1-2 mm larger.

DYNAGEAR SYSTEM
D140



TECHNICAL DATA

GEAR	Ratio i	[1]	3	4	5	6	8	10	12	15	18	24	30	40	50	60	80	100
	n_{1MAX}	[min^{-1}]	5000								5000							
	n_{1N}	[min^{-1}]	700			1200			1600		2500							
	T_{2N}	[Nm]	720						510	360	720							
	T_{2B}	[Nm]	1080						765	540	1080							
	T_{2NOT}	[Nm]	1440						1020	720	1440							
	Weight	[kg]	32,5								36							
	η^2	[%]	>96						>93		>92							

			STRAIGHT									HELICAL								
PROFESSIONAL	Module m	[mm]	4			5						4			5					
	Teeth z	[1]	25	28	30	18	20	22	25	28	30	25	28	30	18	20	22	25	28	30
	F_{vMAX} [3]	[N]	14519	14267	14125	21600	19636	18000	16000	14400	13500	17773	17030	15962	20475	18604	17046	15144	13624	12769
	v_{MAX} [3]	[m/s]	8,7	9,8	10,5	7,9	8,7	9,6	10,9	12,2	13,1	9,3	10,4	11,1	8,3	9,3	10,2	11,6	13,0	13,9
	T_{2N} [1]	[Nm]	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720
	T_{2B} [1]	[Nm]	784	856	904	1080	1080	1080	1080	1080	1080	1014	1080	1080	1080	1080	1080	1080	1080	1080
	T_{2NOT} [1]	[Nm]	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440
	$P_{A\,MAX}$	[µm]	226	237	242	244	250	256	265	273	279	230	237	242	244	250	256	265	273	279
	$P_{R\,MAX}$	[µm]	58	65	70	52	58	64	73	81	87	58	65	70	52	58	64	73	81	87

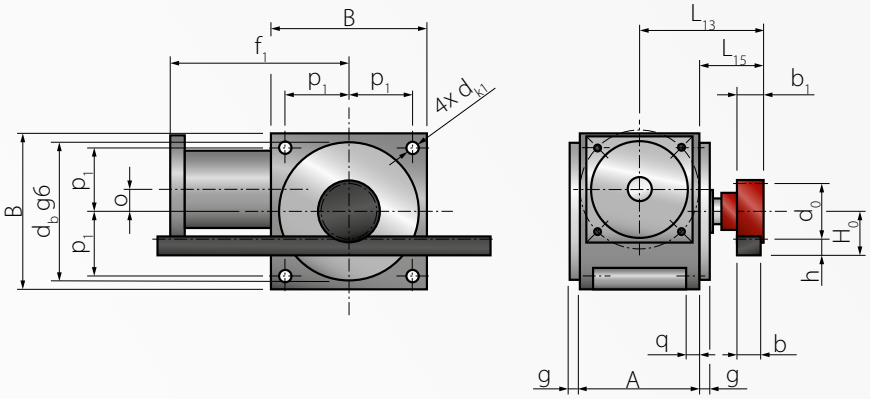
			STRAIGHT									HELICAL								
ULTIMATE	Module m	[mm]	4			5						4			5					
	Teeth z	[1]	25	28	30	18	20	22	25	28	30	25	28	30	18	20	22	25	28	30
	F_{vMAX} [3]	[N]	21600	19286	18000	24000	21600	19636	17280	15429	14400	20357	18176	16965	22619	20357	18507	16286	14541	13572
	v_{MAX} [3]	[m/s]	8,7	9,8	10,5	7,9	8,7	9,6	10,9	12,2	13,1	9,3	10,4	11,1	8,3	9,3	10,2	11,6	13,0	13,9
	T_{2N} [1]	[Nm]	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720
	T_{2B} [1]	[Nm]	1080	1080	1080	1080	1080	1080	1080	1080	1080	1080	1080	1080	1080	1080	1080	1080	1080	1080
	T_{2NOT} [1]	[Nm]	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440
	$P_{A\,MAX}$	[µm]	114	125	130	116	122	128	137	145	151	118	125	130	116	122	128	137	145	151
	$P_{R\,MAX}$	[µm]	58	65	70	52	58	64	73	81	87	58	65	70	52	58	64	73	81	87

			STRAIGHT									HELICAL								
ULTIMATE PLUS	Module m	[mm]	4			5						4			5					
	Teeth z	[1]	25	28	30	18	20	22	25	28	30	25	28	30	18	20	22	25	28	30
	F_{vMAX} [3]	[N]	21600	19286	18000	24000	21600	19636	17280	15429	14400	20357	18176	16965	22619	20357	18507	16286	14541	13572
	v_{MAX} [3]	[m/s]	8,7	9,8	10,5	7,9	8,7	9,6	10,9	12,2	13,1	9,3	10,4	11,1	8,3	9,3	10,2	11,6	13,0	13,9
	T_{2N} [1]	[Nm]	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720
	T_{2B} [1]	[Nm]	1080	1080	1080	1080	1080	1080	1080	1080	1080	1080	1080	1080	1080	1080	1080	1080	1080	1080
	T_{2NOT} [1]	[Nm]	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440
	$P_{A\,MAX}$	[µm]	79	87	89	80	83	86	90	95	98	83	87	89	80	83	86	90	95	98
	$P_{R\,MAX}$	[µm]	29	33	35	26	29	32	36	41	44	29	33	35	26	29	32	36	41	44

An explanation of how to use the tables can be found on pages 4-7.

DIMENSIONS

SOLID SHAFT
WITH SHRUNKEN PINION



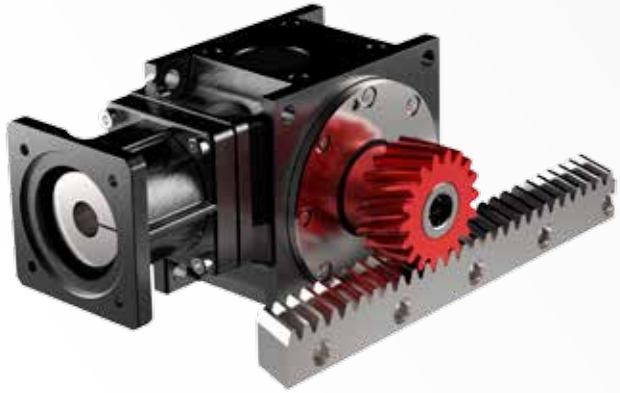
Module m	[mm]	4			5					
Teeth z	[1]	**25**	**28**	**30**	**18**	**20**	**22**	**25**	**28**	**30**
A	[mm]	146			146					
b	[mm]	39			49					
b_1	[mm]	40			50					
B	[mm]	215			215					
d_0 straight	[mm]	100	112	120	90	100	110	125	140	150
d_0 helical	[mm]	106,10	118,84	127,32	95,49	106,10	116,71	132,63	148,54	159,16
d_b g6	[mm]	195			195					
d_{k1}	[mm]	17,5			17,5					
g	[mm]	10			10					
h	[mm]	35			34					
H_0 straight	[mm]	85,00	91,00	95,00	79,00	84,00	89,00	96,50	104,00	109,00
H_0 helical	[mm]	88,05	94,42	98,66	81,75	87,05	92,36	100,31	108,27	113,58
L_{13}	[mm]	175			175					
L_{15}	[mm]	102			102					
o	[mm]	32			32					
p_1	[mm]	91			91					
q	[mm]	15			15					

MOTOR ATTACHMENT

Ratio i	[1]	3-15						18-100					
Flange		**V1**	**V2**	**V3**	**V4**	**V5**	**V6**	**V7**	**V8**	**V9**	**V10**	**V11**	**V12**
Shaft -Ø d_1	[mm]	24	24	32	32	32	38	24	24	32	32	32	38
Shaft length l	[mm]	50	50	60	60	60	80	50	50	60	60	60	80
Square u_1	[mm]	140	140	140	190	190	190	140	140	140	190	190	190
Pitch circle -Ø v_1	[mm]	165	165	165	215	215	215	165	165	165	215	215	215
Centering-Ø w_1	[mm]	110	130	130	180	130	180	110	130	130	180	130	180
Threads 4x s_1	[mm]	M10	M10	M10	M12	M12	M12	M10	M10	M10	M12	M12	M12
f_1	[mm]	260	260	280	265	265	280	300	300	310	310	310	330

[1] Reduced torques apply to the ratios 12 and 15. See the gear data for additional technical details.
[2] For bearing lifespan and gear efficiency calculations, visit www.gearfox.com
[3] Values were determined at a ratio of 3:1.
All values assume sufficient lubrication and a well adjusted tooth contact pattern. Additional axial forces reduce the torque values.
NOTE: For optimal adjustment of the backlash, it is recommended that the connection structure is designed at least 1-2 mm larger.

DYNAGEAR SYSTEM
D160



TECHNICAL DATA

GEAR	Ratio i	[1]	3	4	5	6	8	10	12	15	18	24	30	40	50	60	80	100
	n_{1MAX}	[min^{-1}]	4500								4500							
	n_{1N}	[min^{-1}]	600			1100			1350		2500							
	T_{2N}	[Nm]	1100						815	550	1100							
	T_{2B}	[Nm]	1650						1223	825	1650							
	T_{2NOT}	[Nm]	2200						1630	1100	2200							
	Weight	[kg]	46,5								49							
	η^2	[%]	>96						>93		>92							

			STRAIGHT								HELICAL							
PROFESSIONAL	Module m	[mm]	5			6					5				6			
	Teeth z	[1]	22	25	28	18	20	22	25	28	20	22	25	28	18	20	22	25	28
	F_{vMAX} [3]	[N]	26650	24444	22000	27500	25000	22917	20370	18333	28423	26043	23137	20814	26068	23686	21702	19281	17345
	v_{MAX} [3]	[m/s]	8,6	9,8	11,0	8,5	9,4	10,4	11,8	13,2	8,3	9,2	10,4	11,7	9,0	10,0	11,0	12,5	14,0
	T_{2N} [1]	[Nm]	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100
	T_{2B} [1]	[Nm]	1599	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650
	T_{2NOT} [1]	[Nm]	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200
	$P_{A\,MAX}$	[µm]	256	265	273	255	262	269	283	294	250	256	265	273	255	262	273	283	294
	$P_{R\,MAX}$	[µm]	64	73	81	63	70	77	87	98	58	64	73	81	63	70	77	87	98

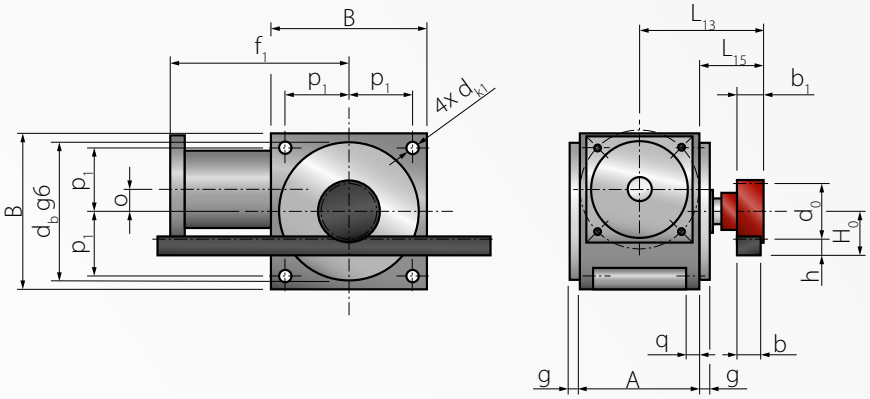
			STRAIGHT								HELICAL							
ULTIMATE	Module m	[mm]	5			6					5				6			
	Teeth z	[1]	22	25	28	18	20	22	25	28	20	22	25	28	18	20	22	25	28
	F_{vMAX} [3]	[N]	30000	26400	23571	30556	27500	25000	22000	19643	31102	28274	24881	22216	28798	25918	23562	20734	18513
	v_{MAX} [3]	[m/s]	8,6	9,8	11,0	8,5	9,4	10,4	11,8	13,2	8,3	9,2	10,4	11,7	9,0	10,0	11,0	12,5	14,0
	T_{2N} [1]	[Nm]	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100
	T_{2B} [1]	[Nm]	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650
	T_{2NOT} [1]	[Nm]	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200
	$P_{A\,MAX}$	[µm]	128	137	145	127	134	141	155	166	122	128	137	145	127	134	145	155	166
	$P_{R\,MAX}$	[µm]	64	73	81	63	70	77	87	98	58	64	73	81	63	70	77	87	98

			STRAIGHT								HELICAL							
ULTIMATE^{PLUS}	Module m	[mm]	5			6					5				6			
	Teeth z	[1]	22	25	28	18	20	22	25	28	20	22	25	28	18	20	22	25	28
	F_{vMAX} [3]	[N]	30000	26400	23571	30556	27500	25000	22000	19643	31102	28274	24881	22216	28798	25918	23562	20734	18513
	v_{MAX} [3]	[m/s]	8,6	9,8	11,0	8,5	9,4	10,4	11,8	13,2	8,3	9,2	10,4	11,7	9,0	10,0	11,0	12,5	14,0
	T_{2N} [1]	[Nm]	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100
	T_{2B} [1]	[Nm]	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650
	T_{2NOT} [1]	[Nm]	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200
	$P_{A\,MAX}$	[µm]	86	90	95	85	89	92	102	107	83	86	90	95	85	89	96	102	107
	$P_{R\,MAX}$	[µm]	32	36	41	31	35	38	44	49	29	32	36	41	31	35	38	44	49

An explanation of how to use the tables can be found on pages 4-7.

DIMENSIONS

SOLID SHAFT
WITH SHRUNKEN PINION



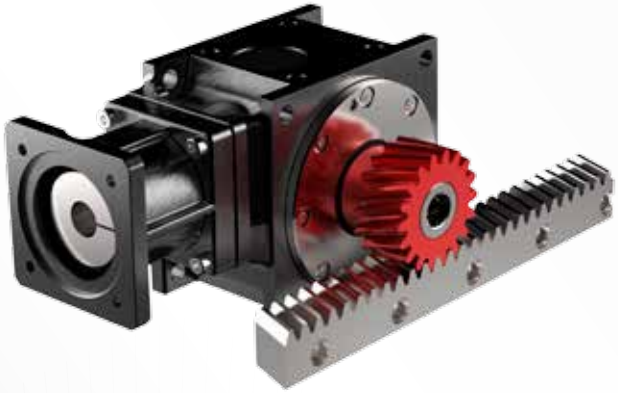
Module m	[mm]	5				6				
Teeth z	[1]	**20**	**22**	**25**	**28**	**18**	**20**	**22**	**25**	**28**
A	[mm]	166				166				
b	[mm]	49				59				
b_1	[mm]	50				60				
B	[mm]	240				240				
d_0 straight	[mm]	-	110	125	140	108	120	132	150	168
d_0 helical	[mm]	106,10	116,71	132,63	148,54	114,59	127,32	140,06	159,16	178,25
d_b g6	[mm]	225				225				
d_{k1}	[mm]	17,5				17,5				
g	[mm]	10				10				
h	[mm]	34				43				
H_0 straight	[mm]	-	89	97	104	97	103	109	118	127
H_0 helical	[mm]	87,05	92,36	100,31	108,27	100,30	106,66	113,03	122,58	132,13
L_{13}	[mm]	195				195				
L_{15}	[mm]	112				112				
o	[mm]	38				38				
p_1	[mm]	103				103				
q	[mm]	16				16				

MOTOR ATTACHMENT

Ratio i	[1]	3-15				18-100				
Flange		**V1**	**V2**	**V3**	**V4**	**V5**	**V6**	**V7**	**V8**	**V9**
Shaft -Ø d_1	[mm]	32	32	38	48	24	24	32	32	38
Shaft length l	[mm]	60	60	80	85	50	50	60	60	80
Square u_1	[mm]	190	190	190	260	140	140	190	190	190
Pitch circle -Ø v_1	[mm]	215	215	215	300	165	165	215	215	215
Centering-Ø w_1	[mm]	180	130	180	250	110	130	180	130	180
Threads 4x s_1	[mm]	M12	M12	M12	M16	M12	M12	M12	M12	M12
f_1	[mm]	298	298	308	308	320	320	330	330	350

[1] Reduced torques apply to the ratios 12 and 15. See the gear data for additional technical details.
[2] For bearing lifespan and gear efficiency calculations, visit www.gearfox.com
[3] Values were determined at a ratio of 3:1.
All values assume sufficient lubrication and a well adjusted tooth contact pattern. Additional axial forces reduce the torque values.
NOTE: For optimal adjustment of the backlash, it is recommended that the connection structure is designed at least 1-2 mm larger.

DYNAGEAR SYSTEM
D190



TECHNICAL DATA

GEAR	Ratio i	[1]	3	4	5	6	8	10	12	15	18	24	30	40	50	60	80	100
	n_{1MAX}	[min^{-1}]	4500								4500							
	n_{1N}	[min^{-1}]	550			1000			1300		2500							
	T_{2N}	[Nm]	1440						1020	735	1440							
	T_{2B}	[Nm]	2160						1530	1102	2160							
	T_{2NOT}	[Nm]	2880						2040	1470	2880							
	Weight	[kg]	60								61,5							
	η^2	[%]	>96						>93		>92							

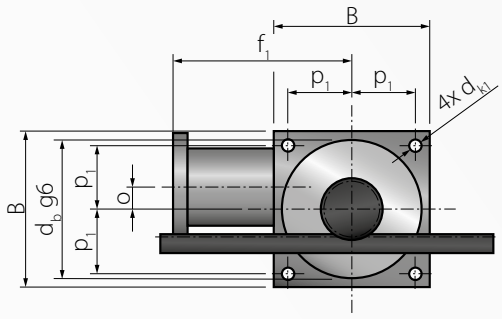
			STRAIGHT							HELICAL						
PROFESSIONAL	Module m	[mm]	5			6				5			6			
	Teeth z	[1]	15	25	28	20	22	25	28	14	25	28	20	22	25	28
	F_{vMAX} [3]	[N]	22212	26326	26000	32727	30000	26667	24000	29618	30288	27248	31007	28410	25240	22707
	v_{MAX} [3]	[m/s]	5,9	9,8	11,0	9,4	10,4	11,8	13,2	5,8	10,4	11,7	10,0	11,0	12,5	14,0
	T_{2N} [1]	[Nm]	961	1440	1440	1440	1440	1440	1440	1154	1440	1440	1440	1440	1440	1440
	T_{2B} [1]	[Nm]	944	1777	1950	2160	2160	2160	2160	1248	2160	2160	2160	2160	2160	2160
	T_{2NOT} [1]	[Nm]	2377	2880	2880	2880	2880	2880	2880	2880	2880	2880	2880	2880	2880	2880
	$P_{A\,MAX}$	[µm]	232	265	273	262	269	283	294	229	265	273	262	273	283	294
	$P_{R\,MAX}$	[µm]	44	73	81	70	77	87	98	41	73	81	70	77	87	98

			STRAIGHT							HELICAL						
ULTIMATE	Module m	[mm]	5			6				5			6			
	Teeth z	[1]	15	25	28	20	22	25	28	14	25	28	20	22	25	28
	F_{vMAX} [3]	[N]	29147	34560	30857	36000	32727	28800	25714	47770	32572	29082	33929	30845	27143	24235
	v_{MAX} [3]	[m/s]	5,9	9,8	11,0	9,4	10,4	11,8	13,2	5,8	10,4	11,7	10,0	11,0	12,5	14,0
	T_{2N} [1]	[Nm]	1113	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440
	T_{2B} [1]	[Nm]	1093	2160	2160	2160	2160	2160	2160	1774	2160	2160	2160	2160	2160	2160
	T_{2NOT} [1]	[Nm]	2451	2880	2880	2880	2880	2880	2880	2880	2880	2880	2880	2880	2880	2880
	$P_{A\,MAX}$	[µm]	104	137	145	134	141	155	166	101	137	145	134	145	155	166
	$P_{R\,MAX}$	[µm]	44	73	81	70	77	87	98	41	73	81	70	77	87	98

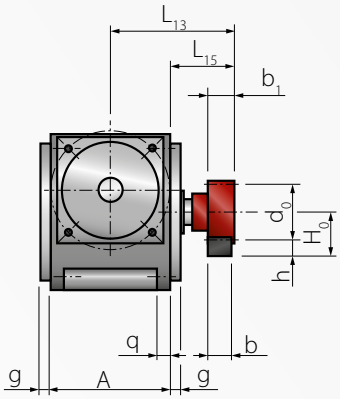
			STRAIGHT							HELICAL						
ULTIMATE PLUS	Module m	[mm]	5			6				5			6			
	Teeth z	[1]	15	25	28	20	22	25	28	14	25	28	20	22	25	28
	F_{vMAX} [3]	[N]	29147	34560	30857	36000	32727	28800	25714	47770	32572	29082	33929	30845	27143	24235
	v_{MAX} [3]	[m/s]	5,9	9,8	11,0	9,4	10,4	11,8	13,2	5,8	10,4	11,7	10,0	11,0	12,5	14,0
	T_{2N} [1]	[Nm]	1113	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440
	T_{2B} [1]	[Nm]	1093	2160	2160	2160	2160	2160	2160	1774	2160	2160	2160	2160	2160	2160
	T_{2NOT} [1]	[Nm]	2451	2880	2880	2880	2880	2880	2880	2880	2880	2880	2880	2880	2880	2880
	$P_{A\,MAX}$	[µm]	72	90	95	89	92	102	107	70	90	95	99	106	112	117
	$P_{R\,MAX}$	[µm]	22	36	41	35	38	44	49	20	36	41	35	38	44	49

An explanation of how to use the tables can be found on pages 4-7.

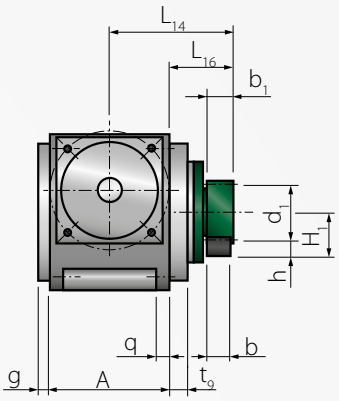
DIMENSIONS



SOLID SHAFT
WITH SHRUNKEN PINION



BLOCK FLANGE
WITH FLANGE PINION



Module m	[mm]	5				6			
Teeth z	[1]	**14**	**15**	**25**	**28**	**20**	**22**	**25**	**28**
A	[mm]	196				196			
b	[mm]	49				59			
b_1	[mm]	50				60			
B	[mm]	260				260			
d_0 straight	[mm]	-		125	140	120	132	150	168
d_0 helical	[mm]	-		132,63	148,54	127,32	140,06	159,16	178,25
d_1 straight	[mm]	-	80	-		-			
d_1 helical	[mm]	80	-			-			
d_b g6	[mm]	245				245			
d_{k1}	[mm]	17,5				18			
g	[mm]	10				10			
h	[mm]	34				43			
H_0 straight	[mm]	-		96,5	104	103	109	118	127
H_0 helical	[mm]	-		100,31	108,27	106,66	113,03	122,58	132,13
H_1 straight	[mm]	-	74	-		-			
H_1 helical	[mm]	74	-			-			
L_{13}	[mm]	-		220		220			
L_{14}	[mm]	207,5		-		-			
L_{15}	[mm]	-		122		122			
L_{16}	[mm]	109,5		-		-			
o	[mm]	42				42			
p_1	[mm]	112				112			
q	[mm]	17				17			
t_9	[mm]	22,5		-		-			

MOTOR ATTACHMENT

Ratio i	[1]	3-15				18-100				
Flange		**V1**	**V2**	**V3**	**V4**	**V5**	**V6**	**V7**	**V8**	**V9**
Shaft -Ø d_1	[mm]	32	32	38	48	24	24	32	32	38
Shaft length l	[mm]	60	60	80	85	50	50	60	60	80
Square u_1	[mm]	190	190	190	260	140	140	190	190	190
Pitch circle -Ø v_1	[mm]	215	215	215	300	165	165	215	215	215
Centering-Ø w_1	[mm]	180	130	180	250	110	130	180	130	180
Threads 4x s_1	[mm]	M12	M12	M12	M16	M12	M12	M12	M12	M12
f_1	[mm]	335	335	335	345	339	339	349	349	369

[1] Reduced torques apply to the ratios 12 and 15. See the gear data for additional technical details.
[2] For bearing lifespan and gear efficiency calculations, visit www.gearfox.com
[3] Values were determined at a ratio of 3:1.
All values assume sufficient lubrication and a well adjusted tooth contact pattern. Additional axial forces reduce the torque values.
NOTE: For optimal adjustment of the backlash, it is recommended that the connection structure is designed at least 1-2 mm larger.

DYNAGEAR SYSTEM
ORDER KEY

D90 - ULP - 080 - 1 3 2 03 - SS 030 18

Size

D55 .....DynaGear D55
D75 .....DynaGear D75
D90 .....DynaGear D90
D115 ...DynaGear D115
D130 ...DynaGear D130
D140 ...DynaGear D140
D160 ...DynaGear D160
D190 ...DynaGear D190

Precision class

PRO.....Professional
ULT.....Ultimate
ULP .....Ultimate[PLUS]

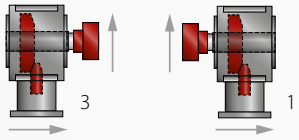
Ratio

003 .....i = 3[1]
010 .....i = 10[1]
etc.

[1] available ratios
one-stage
3, 4, 5, 6, 8, 10, 12, 15, 30
two-stage
18, 24, 30, 40, 50, 60, 80, 100

Direction of rotation / pinion location

1.....Pinion on side 1
3.....Pinion on side 3



Max. input speed

1.....< 250 min^{-1}
2.....< 1000 min^{-1}
3.....< 2000 min^{-1}
4.....< 3500 min^{-1}
5.....≥ 3500 min^{-1}

Number of teeth pinion

13, 14, 15, ..., 28, 30[2]
[2] vavailable numbers of teeth see catalogue pages
Additional executions on request

Module

020.....Module 2
030.....Module 3
040.....Module 4
050.....Module 5
060.....Module 6

Pinion

SG ..... Straight pinion
SS ..... Helical pinion
FH ..... Straight flange pinion
FS ..... Helical flange pinion

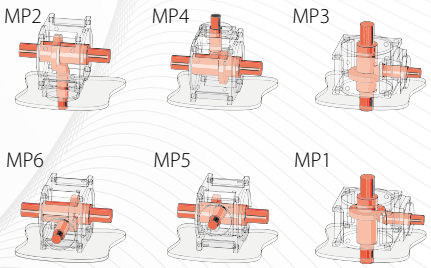
Motor attachment

03.....V3 (V1...V20[3], VX[4])

[3] See catalogue for available flange
[4] Additional flange dimensions on request

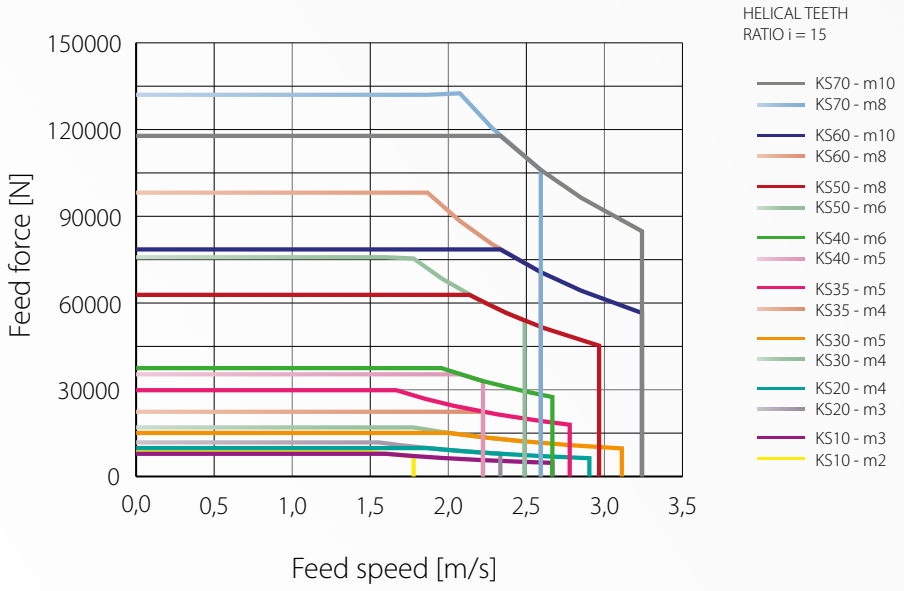
Mounting position

1.....MP1
2.....MP2
3.....MP3
4.....MP4
5.....MP5
6.....MP6



KS TWINGEAR SYSTEM - FORCES AND SPEEDS

with helical teeth and ratio i=15



KS-TWINGEAR SYSTEM
KS10

TECHNICAL DATA

GEAR	Ratio i	[1]	**15**	**20**	**25**	**30**	**40**[1]	**50**[1]	**60**	**75**
	n_{1MAX}	[min^{-1}]	8000							
	n_{1N}	[min^{-1}]	on request							
	T_{2N}	[Nm]	150				110		75	
	T_{2B}	[Nm]	225				165		110	
	T_{2NOT}	[Nm]	300				220		150	
	Weight	[kg]	10							
	η^2	[%]	>92						>90	

			STRAIGHT									**HELICAL**								
PROFESSIONAL	Module m	[mm]	**2**			**3**						**2**			**3**					
	Teeth z	[1]	**25**	**28**	**30**	**18**	**20**	**22**	**25**	**28**	**30**	**25**	**28**	**30**	**18**	**20**	**22**	**25**	**28**	**30**
	F_{vMAX}[3]	[N]	2815	2567	2500	7500	6818	6250	5556	5000	4688	3506	3469	3458	7109	6460	5919	5258	4731	4434
	v_{MAX}[3]	[m/s]	1,4	1,6	1,7	1,5	1,7	1,8	2,1	2,3	2,5	1,5	1,7	1,8	1,6	1,8	2,0	2,2	2,5	2,7
	T_{2N}[1]	[Nm]	75	76	78	150	150	150	150	150	150	98	108	114	150	150	150	150	150	150
	T_{2B}[1]	[Nm]	76	77	80	225	225	225	225	225	225	100	110	117	225	225	225	225	225	225
	T_{2NOT}[1]	[Nm]	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300
	$P_{A\,MAX}$	[µm]	211	216	220	214	220	228	237	245	250	211	216	220	214	223	228	237	245	250
	$P_{R\,MAX}$	[µm]	46	51	55	49	55	60	69	77	82	46	51	55	49	55	60	69	77	82

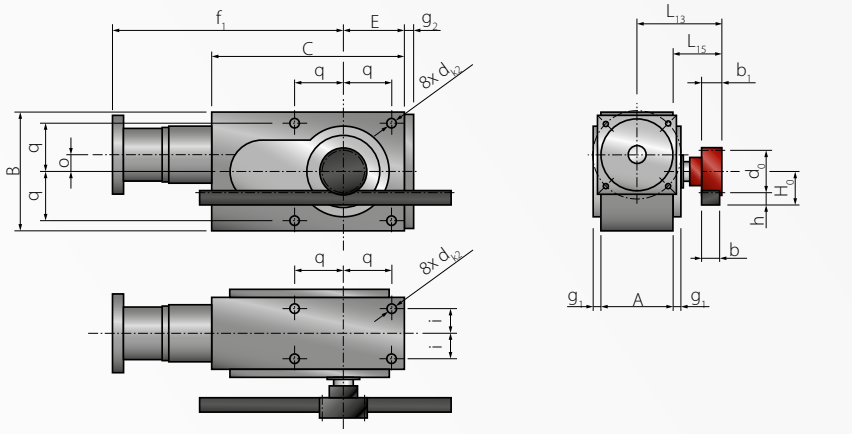
			STRAIGHT									**HELICAL**								
ULTIMATE	Module m	[mm]	**2**			**3**						**2**			**3**					
	Teeth z	[1]	**25**	**28**	**30**	**18**	**20**	**22**	**25**	**28**	**30**	**25**	**28**	**30**	**18**	**20**	**22**	**25**	**28**	**30**
	F_{vMAX}[3]	[N]	6680	6714	6700	8333	7500	6818	6000	5357	5000	7841	7573	7069	7854	7069	6426	5655	5049	4712
	v_{MAX}[3]	[m/s]	1,4	1,6	1,7	1,5	1,7	1,8	2,1	2,3	2,5	1,5	1,7	1,8	1,6	1,8	2,0	2,2	2,5	2,7
	T_{2N}[1]	[Nm]	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150
	T_{2B}[1]	[Nm]	167	188	201	225	225	225	225	225	225	208	225	225	225	225	225	225	225	225
	T_{2NOT}[1]	[Nm]	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300
	$P_{A\,MAX}$	[µm]	99	104	108	102	108	116	125	133	138	99	104	108	102	111	116	125	133	138
	$P_{R\,MAX}$	[µm]	46	51	55	49	55	60	69	77	82	46	51	55	49	55	60	69	77	82

			STRAIGHT									**HELICAL**								
ULTIMATE PLUS	Module m	[mm]	**2**			**3**						**2**			**3**					
	Teeth z	[1]	**25**	**28**	**30**	**18**	**20**	**22**	**25**	**28**	**30**	**25**	**28**	**30**	**18**	**20**	**22**	**25**	**28**	**30**
	F_{vMAX}[3]	[N]	6680	6714	6700	8333	7500	6818	6000	5357	5000	7841	7573	7069	7854	7069	6426	5655	5049	4712
	v_{MAX}[3]	[m/s]	1,4	1,6	1,7	1,5	1,7	1,8	2,1	2,3	2,5	1,5	1,7	1,8	1,6	1,8	2,0	2,2	2,5	2,7
	T_{2N}[1]	[Nm]	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150
	T_{2B}[1]	[Nm]	167	188	201	225	225	225	225	225	225	208	225	225	225	225	225	225	225	225
	T_{2NOT}[1]	[Nm]	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300
	$P_{A\,MAX}$	[µm]	87	92	96	91	96	104	111	119	124	87	92	96	91	99	104	111	119	124
	$P_{R\,MAX}$	[µm]	42	47	51	46	51	56	63	71	76	42	47	51	46	51	56	63	71	76

An explanation of how to use the tables can be found on pages 4-7.

DIMENSIONS

SOLID SHAFT
WITH SHRUNKEN PINION



Module m		[mm]	2			3					
Teeth z		[1]	**25**	**28**	**30**	**18**	**20**	**22**	**25**	**28**	**30**
A		[mm]	75			75					
b		[mm]	24			29					
b_1		[mm]	25			30					
B		[mm]	110			110					
C		[mm]	147,5			147,5					
d_0	straight	[mm]	50	56	60	54	60	66	75	84	90
	helical	[mm]	53,05	59,42	63,66	57,30	63,66	70,03	79,58	89,13	95,49
d_{k2}		[mm]	M8			M8					
E		[mm]	55			55					
g_1		[mm]	10,5			10,5					
g_2		[mm]	10,5			10,5					
h		[mm]	22			26					
H_0	straight	[mm]	47	50	52	53	56	59	64	68	71
	helical	[mm]	48,53	51,71	53,83	54,65	57,83	61,01	65,79	70,56	73,75
i		[mm]	28			28					
L_{13}		[mm]	100			100					
L_{15}		[mm]	62,5			62,5					
o		[mm]	7,5			7,5					
q		[mm]	44			44					

MOTOR ATTACHMENT

Flange		**V1**	**V2**	**V3**	**V4**	**V5**
Shaft -Ø d_1	[mm]	9	11	14	14	14
Shaft length l	[mm]	23	26	30	30	30
Square u_1	[mm]	55	75	75	90	90
Pitch circle -Ø v_1	[mm]	63	75	75	95	100
Centering-Ø w_1	[mm]	40	60	60	50	80
Threads 4x s_1	[mm]	M5	M5	M5	M6	M6
f_1	[mm]	184	194	194	197	197

[1] Reduced torques apply to the ratios 40 til 75. See the gear data for additional technical details.
[2] For bearing lifespan and gear efficiency calculations, visit www.gearfox.com
[3] Values were determined at a ratio of 15:1.
All values assume sufficient lubrication and a well adjusted tooth contact pattern. Additional axial forces reduce the torque values.

KS-TWINGEAR SYSTEM
KS20

TECHNICAL DATA

GEAR	Ratio i	[1]	15	20	25	30	40[1]	50[1]	60	75
	n_{1MAX}	[min^{-1}]	7000							
	n_{1N}	[min^{-1}]	on request							
	T_{2N}	[Nm]	250				110		75	
	T_{2B}	[Nm]	375				165		110	
	T_{2NOT}	[Nm]	500				220		150	
	Weight	[kg]	16							
	η^2	[%]	>92						>90	

			STRAIGHT									HELICAL								
PROFESSIONAL	Module m	[mm]	3				4					3				4				
	Teeth z	[1]	20	22	25	28	18	20	22	25	28	20	22	25	28	18	20	22	25	28
	F_{vMAX}[3]	[N]	8182	8056	7926	7778	9375	8523	7813	6944	6250	9647	9654	8764	7884	8887	8075	7399	6573	5913
	v_{MAX}[3]	[m/s]	1,5	1,6	1,8	2,1	1,8	2,0	2,2	2,4	2,7	1,6	1,7	1,9	2,2	1,9	2,1	2,3	2,6	2,9
	T_{2N}[1]	[Nm]	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250
	T_{2B}[1]	[Nm]	270	290	321	350	375	375	375	375	375	336	367	375	375	375	375	375	375	375
	T_{2NOT}[1]	[Nm]	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500
	$P_{A\,MAX}$	[µm]	211	219	226	233	224	230	236	245	546	214	219	226	233	224	230	236	249	258
	$P_{R\,MAX}$	[µm]	46	51	58	65	56	62	68	77	86	46	51	58	65	56	62	68	77	86

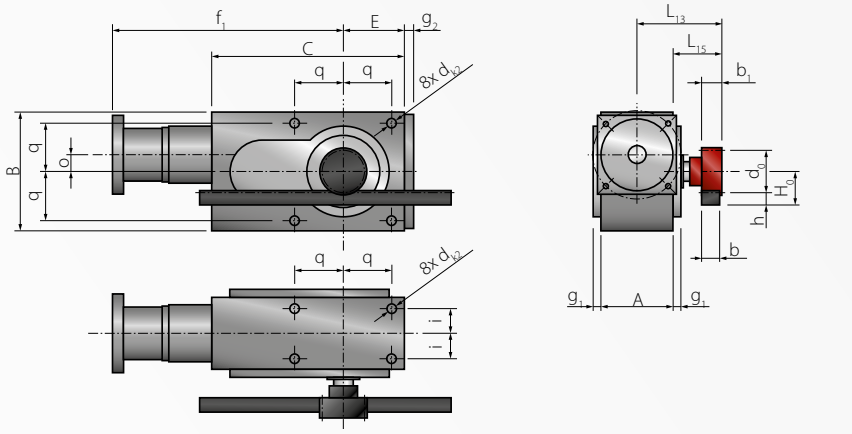
			STRAIGHT									HELICAL								
ULTIMATE	Module m	[mm]	3				4					3				4				
	Teeth z	[1]	20	22	25	28	18	20	22	25	28	20	22	25	28	18	20	22	25	28
	F_{vMAX}[3]	[N]	12500	11364	10000	8929	10417	9375	8523	7500	6696	11781	10710	9425	8415	9817	8836	8032	7069	6311
	v_{MAX}[3]	[m/s]	1,5	1,6	1,8	2,1	1,8	2,0	2,2	2,4	2,7	1,6	1,7	1,9	2,2	1,9	2,1	2,3	2,6	2,9
	T_{2N}[1]	[Nm]	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250
	T_{2B}[1]	[Nm]	375	375	375	375	375	375	375	375	375	375	375	375	375	375	375	375	375	375
	T_{2NOT}[1]	[Nm]	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500
	$P_{A\,MAX}$	[µm]	99	107	114	121	112	118	124	133	434	102	107	114	121	112	118	124	137	146
	$P_{R\,MAX}$	[µm]	46	51	58	65	56	62	68	77	86	46	51	58	65	56	62	68	77	86

			STRAIGHT									HELICAL								
ULTIMATE PLUS	Module m	[mm]	3				4					3				4				
	Teeth z	[1]	20	22	25	28	18	20	22	25	28	20	22	25	28	18	20	22	25	28
	F_{vMAX}[3]	[N]	12500	11364	10000	8929	10417	9375	8523	7500	6696	11781	10710	9425	8415	9817	8836	8032	7069	6311
	v_{MAX}[3]	[m/s]	1,5	1,6	1,8	2,1	1,8	2,0	2,2	2,4	2,7	1,6	1,7	1,9	2,2	1,9	2,1	2,3	2,6	2,9
	T_{2N}[1]	[Nm]	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250
	T_{2B}[1]	[Nm]	375	375	375	375	375	375	375	375	375	375	375	375	375	375	375	375	375	375
	T_{2NOT}[1]	[Nm]	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500
	$P_{A\,MAX}$	[µm]	88	95	101	108	101	107	113	121	422	91	95	101	108	101	107	113	125	134
	$P_{R\,MAX}$	[µm]	43	47	53	60	51	57	63	71	80	43	47	53	60	51	57	63	71	80

An explanation of how to use the tables can be found on pages 4-7.

DIMENSIONS

SOLID SHAFT
WITH SHRUNKEN PINION



Module m		[mm]	3				4				
Teeth z		[1]	**20**	**22**	**25**	**28**	**18**	**20**	**22**	**25**	**28**
A		[mm]	90				90				
b		[mm]	29				39				
b_1		[mm]	30				40				
B		[mm]	140				140				
C		[mm]	180				180				
d_0	straight	[mm]	60	66	75	84	72	80	88	100	112
	helical	[mm]	63,66	70,03	79,58	89,13	76,39	84,88	93,37	106,10	118,84
d_{k2}		[mm]	M10				M10				
E		[mm]	70				70				
g_1		[mm]	13				13				
g_2		[mm]	13				13				
h		[mm]	26				35				
H_0	straight	[mm]	56	59	63,5	68	71	75	79	85	91
	helical	[mm]	57,83	61,01	65,79	70,56	73,20	77,44	81,69	88,05	94,42
i		[mm]	30				30				
L_{13}		[mm]	115				115				
L_{15}		[mm]	70				70				
o		[mm]	9				9				
q		[mm]	55				55				

MOTOR ATTACHMENT

Flange		**V1**	**V2**	**V3**	**V4**	**V5**	**V6**	**V7**	**V8**
Shaft -Ø d_1	[mm]	11	14	14	14	19	19	19	19
Shaft length l	[mm]	26	30	30	30	40	40	40	40
Square u_1	[mm]	75	75	90	90	90	90	115	115
Pitch circle -Ø v_1	[mm]	75	75	95	100	95	100	130	115
Centering-Ø w_1	[mm]	60	60	70	80	70	80	95	95
Threads 4x s_1	[mm]	M5	M5	M6	M6	M8	M8	M8	M8
f_1	[mm]	232	232	232	232	244	244	244	244

[1] Reduced torques apply to the ratios 40 til 75. See the gear data for additional technical details.
[2] For bearing lifespan and gear efficiency calculations, visit www.gearfox.com
[3] Values were determined at a ratio of 15:1.
All values assume sufficient lubrication and a well adjusted tooth contact pattern. Additional axial forces reduce the torque values.

KS-TWINGEAR SYSTEM
KS30

TECHNICAL DATA

GEAR	Ratio i	[1]	15	20	25	30	40[1]	50[1]	60	75
	n_{1MAX}	[min^{-1}]	6000							
	n_{1N}	[min^{-1}]	on request							
	T_{2N}	[Nm]	480				360		250	
	T_{2B}	[Nm]	720				540		375	
	T_{2NOT}	[Nm]	960				720		500	
	Weight	[kg]	27							
	η^2	[%]	>92						>90	

			STRAIGHT									HELICAL								
PROFESSIONAL	Module m	[mm]	4				5					4				5				
	Teeth z	[1]	**20**	**22**	**25**	**28**	**18**	**20**	**22**	**25**	**28**	**20**	**22**	**25**	**28**	**18**	**20**	**22**	**25**	**28**
	F_{vMAX}[3]	[N]	16273	15000	13333	12000	14400	13091	12000	10667	9600	15503	14205	12620	11353	13650	12403	11364	10096	9083
	v_{MAX}[3]	[m/s]	1,7	1,8	2,1	2,3	1,9	2,1	2,3	2,6	2,9	1,8	2,0	2,2	2,5	2,0	2,2	2,4	2,8	3,1
	T_{2N}[1]	[Nm]	480	480	480	480	480	480	480	480	480	480	480	480	480	480	480	480	480	480
	T_{2B}[1]	[Nm]	716	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720
	T_{2NOT}[1]	[Nm]	960	960	960	960	960	960	960	960	960	960	960	960	960	960	960	960	960	960
	$P_{A\,MAX}$	[µm]	224	229	238	250	255	262	269	279	290	224	229	242	250	255	262	269	279	290
	$P_{R\,MAX}$	[µm]	56	61	70	78	63	70	77	87	98	56	61	70	78	63	70	77	87	98

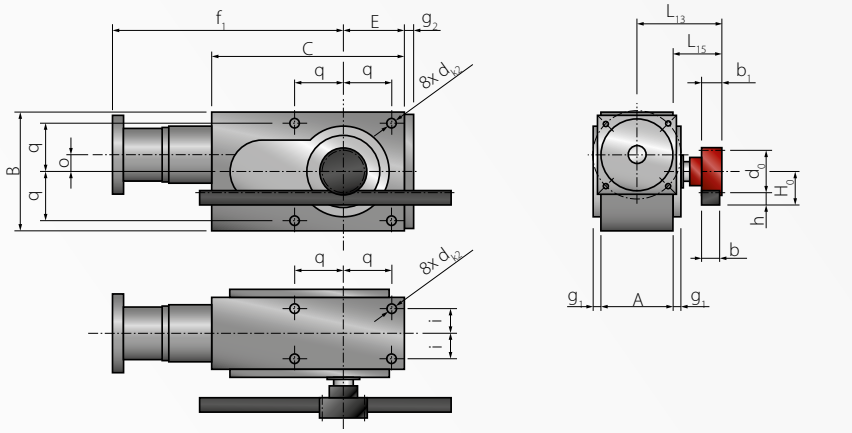
			STRAIGHT									HELICAL								
ULTIMATE	Module m	[mm]	4				5					4				5				
	Teeth z	[1]	**20**	**22**	**25**	**28**	**18**	**20**	**22**	**25**	**28**	**20**	**22**	**25**	**28**	**18**	**20**	**22**	**25**	**28**
	F_{vMAX}[3]	[N]	18000	16364	14400	12857	16000	14400	13091	11520	10286	16965	15422	13572	12118	15080	13572	12338	10857	9694
	v_{MAX}[3]	[m/s]	1,7	1,8	2,1	2,3	1,9	2,1	2,3	2,6	2,9	1,8	2,0	2,2	2,5	2,0	2,2	2,4	2,8	3,1
	T_{2N}[1]	[Nm]	480	480	480	480	480	480	480	480	480	480	480	480	480	480	480	480	480	480
	T_{2B}[1]	[Nm]	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720
	T_{2NOT}[1]	[Nm]	960	960	960	960	960	960	960	960	960	960	960	960	960	960	960	960	960	960
	$P_{A\,MAX}$	[µm]	112	117	126	138	127	134	141	151	162	112	117	130	138	127	134	141	151	162
	$P_{R\,MAX}$	[µm]	56	61	70	78	63	70	77	87	98	56	61	70	78	63	70	77	87	98

			STRAIGHT									HELICAL								
ULTIMATE[PLUS]	Module m	[mm]	4				5					4				5				
	Teeth z	[1]	**20**	**22**	**25**	**28**	**18**	**20**	**22**	**25**	**28**	**20**	**22**	**25**	**28**	**18**	**20**	**22**	**25**	**28**
	F_{vMAX}[3]	[N]	18000	16364	14400	12857	16000	14400	13091	11520	10286	16965	15422	13572	12118	15080	13572	12338	10857	9694
	v_{MAX}[3]	[m/s]	1,7	1,8	2,1	2,3	1,9	2,1	2,3	2,6	2,9	1,8	2,0	2,2	2,5	2,0	2,2	2,4	2,8	3,1
	T_{2N}[1]	[Nm]	480	480	480	480	480	480	480	480	480	480	480	480	480	480	480	480	480	480
	T_{2B}[1]	[Nm]	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720
	T_{2NOT}[1]	[Nm]	960	960	960	960	960	960	960	960	960	960	960	960	960	960	960	960	960	960
	$P_{A\,MAX}$	[µm]	101	106	114	126	112	118	124	134	144	101	106	118	126	112	118	124	134	144
	$P_{R\,MAX}$	[µm]	51	56	64	72	58	64	70	80	90	51	56	64	72	58	64	70	80	90

An explanation of how to use the tables can be found on pages 4-7.

DIMENSIONS

SOLID SHAFT
WITH SHRUNKEN PINION



Module m		[mm]	4				5				
Teeth z		[1]	**20**	**22**	**25**	**28**	**18**	**20**	**22**	**25**	**28**
A		[mm]	110				110				
b		[mm]	39				49				
b_1		[mm]	40				50				
B		[mm]	170				170				
C		[mm]	222				222				
d_0	straight	[mm]	80	88	100	112	90	100	110	125	140
	helical	[mm]	84,88	93,37	106,10	118,84	95,49	106,10	116,71	132,63	148,54
d_{k2}		[mm]	M12				M12				
E		[mm]	85				85				
g_1		[mm]	13				13				
g_2		[mm]	13				13				
h		[mm]	35				34				
H_0	straight	[mm]	75	79	85	91	79	84	89	97	104
	helical	[mm]	77,44	81,69	88,05	94,42	81,75	87,05	92,36	100,31	108,27
i		[mm]	37				37				
L_{13}		[mm]	140				140				
L_{15}		[mm]	85				85				
o		[mm]	14				14				
q		[mm]	67				67				

MOTOR ATTACHMENT

Flange		**V1**	**V2**	**V3**	**V4**	**V5**	**V6**	**V7**	**V8**	**V9**
Shaft -Ø d_1	[mm]	14	14	19	19	19	19	24	24	24
Shaft length l	[mm]	30	30	40	40	40	40	50	50	50
Square u_1	[mm]	90	90	90	115	115	115	115	140	140
Pitch circle -Ø v_1	[mm]	100	95	100	130	115	130	130	165	165
Centering-Ø w_1	[mm]	80	80	80	95	95	110	110	110	130
Threads 4x s_1	[mm]	M6	M6	M6	M8	M8	M8	M10	M10	M10
f_1	[mm]	281	281	281	281	281	281	291	291	291

[1] Reduced torques apply to the ratios 40 til 75. See the gear data for additional technical details.
[2] For bearing lifespan and gear efficiency calculations, visit www.gearfox.com
[3] Values were determined at a ratio of 15:1.
All values assume sufficient lubrication and a well adjusted tooth contact pattern. Additional axial forces reduce the torque values.

KS-TWINGEAR SYSTEM
KS35

TECHNICAL DATA

GEAR	Ratio i	[1]	**15**	**20**	**25**	**30**	**40**[1]	**50**[1]	**60**	**75**
	n_{1MAX}	[min^{-1}]	5000							
	n_{1N}	[min^{-1}]	on request							
	T_{2N}	[Nm]	950				700		475	
	T_{2B}	[Nm]	1425				1050		710	
	T_{2NOT}	[Nm]	1900				1400		950	
	Weight	[kg]	52							
	η^2	[%]	>92						>90	

			STRAIGHT							**HELICAL**						
PROFESSIONAL	Module m	[mm]	**4**	**5**						**4**	**5**					
	Teeth z	[1]	**30**	**18**	**20**	**22**	**25**	**28**	**30**	**30**	**18**	**20**	**22**	**25**	**28**	**30**
	F_{vMAX}[3]	[N]	16359	28500	25909	23750	21111	19000	17813	20011	27016	24547	22492	19982	17976	16848
	v_{MAX}[3]	[m/s]	2,1	1,6	1,7	1,9	2,2	2,4	2,6	2,2	1,7	1,9	2,0	2,3	2,6	2,8
	T_{2N}[1]	[Nm]	910	950	950	950	950	950	950	950	950	950	950	950	950	950
	T_{2B}[1]	[Nm]	1047	1425	1425	1425	1425	1425	1425	1354	1425	1425	1425	1425	1425	1425
	T_{2NOT}[1]	[Nm]	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
	$P_{A\,MAX}$	[µm]	256	255	262	269	279	290	297	256	255	262	269	279	290	297
	$P_{R\,MAX}$	[µm]	84	63	70	77	87	98	105	84	63	70	77	87	98	105

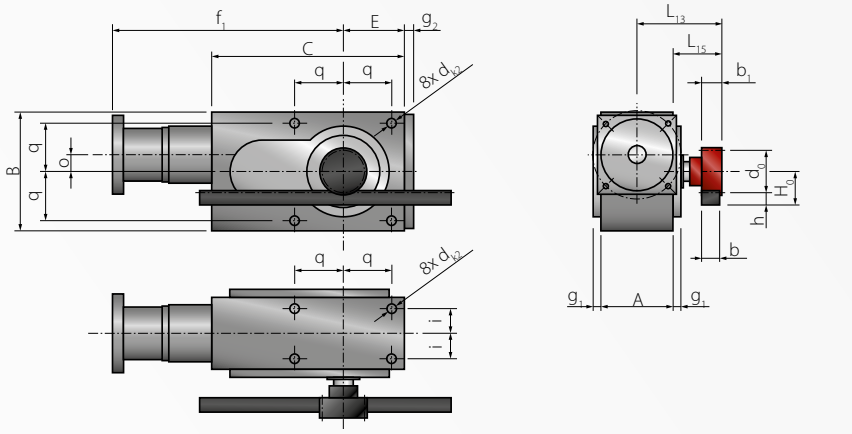
			STRAIGHT							**HELICAL**						
ULTIMATE	Module m	[mm]	**4**	**5**						**4**	**5**					
	Teeth z	[1]	**30**	**18**	**20**	**22**	**25**	**28**	**30**	**30**	**18**	**20**	**22**	**25**	**28**	**30**
	F_{vMAX}[3]	[N]	23750	31667	28500	25909	22800	20357	19000	22384	29845	26861	24419	21488	19186	17907
	v_{MAX}[3]	[m/s]	2,1	1,6	1,7	1,9	2,2	2,4	2,6	2,2	1,7	1,9	2,0	2,3	2,6	2,8
	T_{2N}[1]	[Nm]	950	950	950	950	950	950	950	950	950	950	950	950	950	950
	T_{2B}[1]	[Nm]	1425	1425	1425	1425	1425	1425	1425	1425	1425	1425	1425	1425	1425	1425
	T_{2NOT}[1]	[Nm]	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
	$P_{A\,MAX}$	[µm]	144	127	134	141	151	162	169	144	127	134	141	151	162	169
	$P_{R\,MAX}$	[µm]	84	63	70	77	87	98	105	84	63	70	77	87	98	105

			STRAIGHT							**HELICAL**						
ULTIMATE[PLUS]	Module m	[mm]	**4**	**5**						**4**	**5**					
	Teeth z	[1]	**30**	**18**	**20**	**22**	**25**	**28**	**30**	**30**	**18**	**20**	**22**	**25**	**28**	**30**
	F_{vMAX}[3]	[N]	23750	31667	28500	25909	22800	20357	19000	22384	29845	26861	24419	21488	19186	17907
	v_{MAX}[3]	[m/s]	2,1	1,6	1,7	1,9	2,2	2,4	2,6	2,2	1,7	1,9	2,0	2,3	2,6	2,8
	T_{2N}[1]	[Nm]	950	950	950	950	950	950	950	950	950	950	950	950	950	950
	T_{2B}[1]	[Nm]	1425	1425	1425	1425	1425	1425	1425	1425	1425	1425	1425	1425	1425	1425
	T_{2NOT}[1]	[Nm]	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
	$P_{A\,MAX}$	[µm]	133	113	119	126	136	146	152	133	113	119	126	136	146	152
	$P_{R\,MAX}$	[µm]	79	59	65	72	82	92	98	79	59	65	72	82	92	98

An explanation of how to use the tables can be found on pages 4-7.

DIMENSIONS

SOLID SHAFT
WITH SHRUNKEN PINION



Module m		[mm]	**4**	**5**				
Teeth z		[1]	**30**	**18**	**20**	**22**	**25**	**28**	**30**
A		[mm]	140	140					
b		[mm]	39	49					
b_1		[mm]	40	50					
B		[mm]	210	210					
C		[mm]	275	275					
d_0	straight	[mm]	120	90	100	110	125	140	150
	helical	[mm]	127,32	95,49	106,10	116,71	132,63	148,54	159,16
d_{k2}		[mm]	M16	M16					
E		[mm]	105	105					
g_1		[mm]	16	16					
g_2		[mm]	16	16					
h		[mm]	35	34					
H_0	straight	[mm]	95	79	84	89	97	104	109
	helical	[mm]	98,66	81,75	87,05	92,36	100,31	108,27	113,58
i		[mm]	50	50					
L_{13}		[mm]	174	174					
L_{15}		[mm]	104	104					
o		[mm]	18	18					
q		[mm]	85	85					

MOTOR ATTACHMENT

Flange		**V1**	**V2**	**V3**	**V4**	**V5**	**V6**	**V7**	**V8**
Shaft -Ø d_1	[mm]	19	19	24	24	24	32	32	32
Shaft length l	[mm]	40	40	50	50	50	60	60	60
Square u_1	[mm]	115	115	115	140	140	140	190	190
Pitch circle -Ø v_1	[mm]	115	130	130	165	165	165	215	215
Centering-Ø w_1	[mm]	95	95	110	110	130	130	180	130
Threads 4x s_1	[mm]	M8	M8	M8	M10	M10	M10	M12	M12
f_1	[mm]	337	337	352	352	352	362	362	362

[1] Reduced torques apply to the ratios 40 til 75. See the gear data for additional technical details.
[2] For bearing lifespan and gear efficiency calculations, visit www.gearfox.com
[3] Values were determined at a ratio of 15:1.
All values assume sufficient lubrication and a well adjusted tooth contact pattern. Additional axial forces reduce the torque values.

KS-TWINGEAR SYSTEM
KS40

TECHNICAL DATA

GEAR	Ratio i	[1]	**15**	**20**	**25**	**30**	**40[1]**	**50[1]**	**60**	**75**
	n_{1MAX}	[min^{-1}]	4000							
	n_{1N}	[min^{-1}]	on request							
	T_{2N}	[Nm]	1750				1300		900	
	T_{2B}	[Nm]	2625				1950		1350	
	T_{2NOT}	[Nm]	3500				2600		1800	
	Weight	[kg]	75							
	η^2	[%]	>92						>90	

			STRAIGHT						**HELICAL**					
PROFESSIONAL	Module m	[mm]	**5**		**6**				**5**		**6**			
	Teeth z	[1]	**28**	**30**	**22**	**25**	**28**	**30**	**28**	**30**	**22**	**25**	**28**	**30**
	F_{vMAX}[3]	[N]	31347	31175	36458	32407	29167	27344	33114	31037	34527	30674	27595	25864
	v_{MAX}[3]	[m/s]	2,0	2,1	1,8	2,1	2,3	2,5	2,1	2,2	2,0	2,2	2,5	2,7
	T_{2N}[1]	[Nm]	1610	1650	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
	T_{2B}[1]	[Nm]	2351	2494	2625	2625	2625	2625	2625	2625	2625	2625	2625	2625
	T_{2NOT}[1]	[Nm]	3220	3300	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500
	$P_{A\,MAX}$	[µm]	261	266	257	270	279	285	261	266	261	270	279	285
	$P_{R\,MAX}$	[µm]	69	74	65	74	83	89	69	74	65	74	83	89

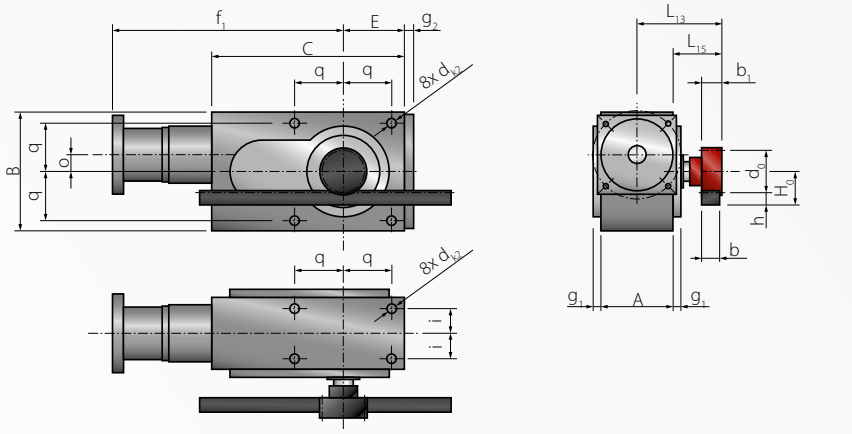
			STRAIGHT						**HELICAL**					
ULTIMATE	Module m	[mm]	**5**		**6**				**5**		**6**			
	Teeth z	[1]	**28**	**30**	**22**	**25**	**28**	**30**	**28**	**30**	**22**	**25**	**28**	**30**
	F_{vMAX}[3]	[N]	37500	35000	39773	35000	31250	29167	35343	32987	37485	32987	29452	27489
	v_{MAX}[3]	[m/s]	2,0	2,1	1,8	2,1	2,3	2,5	2,1	2,2	2,0	2,2	2,5	2,7
	T_{2N}[1]	[Nm]	1610	1650	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
	T_{2B}[1]	[Nm]	2625	2625	2625	2625	2625	2625	2625	2625	2625	2625	2625	2625
	T_{2NOT}[1]	[Nm]	3220	3300	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500
	$P_{A\,MAX}$	[µm]	133	138	129	142	151	157	133	138	133	142	151	157
	$P_{R\,MAX}$	[µm]	69	74	65	74	83	89	69	74	65	74	83	89

			STRAIGHT						**HELICAL**					
ULTIMATE^{PLUS}	Module m	[mm]	**5**		**6**				**5**		**6**			
	Teeth z	[1]	**28**	**30**	**22**	**25**	**28**	**30**	**28**	**30**	**22**	**25**	**28**	**30**
	F_{vMAX}[3]	[N]	37500	35000	39773	35000	31250	29167	35343	32987	37485	32987	29452	27489
	v_{MAX}[3]	[m/s]	2,0	2,1	1,8	2,1	2,3	2,5	2,1	2,2	2,0	2,2	2,5	2,7
	T_{2N}[1]	[Nm]	1610	1650	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
	T_{2B}[1]	[Nm]	2625	2625	2625	2625	2625	2625	2625	2625	2625	2625	2625	2625
	T_{2NOT}[1]	[Nm]	3220	3300	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500
	$P_{A\,MAX}$	[µm]	119	124	115	128	136	142	119	124	119	128	136	142
	$P_{R\,MAX}$	[µm]	65	70	61	70	78	84	65	70	61	70	78	84

An explanation of how to use the tables can be found on pages 4-7.

DIMENSIONS

SOLID SHAFT
WITH SHRUNKEN PINION



Module m		[mm]	5		6			
Teeth z		[1]	**28**	**30**	**22**	**25**	**28**	**30**
A		[mm]	170		170			
b		[mm]	49		59			
b_1		[mm]	50		60			
B		[mm]	240		240			
C		[mm]	322		322			
d_0	straight	[mm]	140	150	132	150	168	180
	helical	[mm]	148,54	159,16	140,06	159,16	178,25	190,99
d_{k2}		[mm]	M16		M16			
E		[mm]	120		120			
g_1		[mm]	16		16			
g_2		[mm]	16		16			
h		[mm]	34		43			
H_0	straight	[mm]	104	109	109	118	127	133
	helical	[mm]	108,27	113,58	113,03	122,58	132,13	138,49
i		[mm]	60		60			
L_{13}		[mm]	214		214			
L_{15}		[mm]	129		129			
o		[mm]	23		23			
q		[mm]	95		95			

MOTOR ATTACHMENT

Flange		**V1**	**V2**	**V3**	**V4**	**V5**	**V6**
Shaft -Ø d_1	[mm]	24	24	32	32	32	38
Shaft length l	[mm]	50	50	60	60	60	80
Square u_1	[mm]	140	140	140	190	190	190
Pitch circle -Ø v_1	[mm]	165	165	165	215	215	215
Centering-Ø w_1	[mm]	110	130	130	180	130	180
Threads 4x s_1	[mm]	M10	M10	M10	M12	M12	M12
f_1	[mm]	395	395	400	400	400	415

[1] Reduced torques apply to the ratios 40 til 75. See the gear data for additional technical details.
[2] For bearing lifespan and gear efficiency calculations, visit www.gearfox.com
[3] Values were determined at a ratio of 15:1.
All values assume sufficient lubrication and a well adjusted tooth contact pattern. Additional axial forces reduce the torque values.

KS-TWINGEAR SYSTEM
KS50

TECHNICAL DATA

GEAR	Ratio i	[1]	**15**	**20**	**25**	**30**	**40**[1]	**50**[1]	**60**	**75**
	n_{1MAX}	[min^{-1}]	4000							
	n_{1N}	[min^{-1}]	on request							
	T_{2N}	[Nm]	3200				3200		2550	
	T_{2B}	[Nm]	4800				4800		3825	
	T_{2NOT}	[Nm]	6400				6400		5100	
	Weight	[kg]	115							
	η^2	[%]	>92						>90	

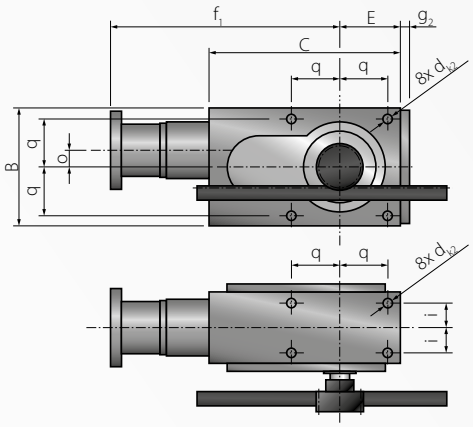
			STRAIGHT									**HELICAL**								
PROFESSIONAL	Module m	[mm]	**6**					**8**				**6**					**8**			
	Teeth z	[1]	**18**	**20**	**22**	**25**	**28**	**18**	**20**	**22**	**25**	**18**	**20**	**22**	**25**	**28**	**18**	**20**	**22**	**25**
	F_{vMAX}[3]	[N]	50517	49379	49264	48975	48689	60000	54545	50000	44444	60257	55683	56032	56089	50459	56876	51678	47351	42067
	v_{MAX}[3]	[m/s]	1,5	1,7	1,8	2,1	2,3	2,0	2,2	2,5	2,8	1,6	1,8	2,0	2,2	2,5	2,1	2,4	2,6	3,0
	T_{2N}[1]	[Nm]	2558	2792	3029	3200	3200	3200	3200	3200	3200	3019	3200	3200	3200	3200	3200	3200	3200	3200
	T_{2B}[1]	[Nm]	3031	3259	3547	3967	4382	4800	4800	4800	4800	3814	3879	4260	4800	4800	4800	4800	4800	4800
	T_{2NOT}[1]	[Nm]	6300	6300	6300	6300	6300	6300	6300	6300	6300	6301	6302	6303	6300	6300	6400	6400	6400	6400
	$P_{A\,MAX}$	[µm]	254	261	267	277	286	273	282	291	304	250	257	267	277	286	273	282	291	308
	$P_{R\,MAX}$	[µm]	58	65	71	81	90	77	86	95	108	58	65	71	81	90	77	86	95	108

			STRAIGHT									**HELICAL**								
ULTIMATE	Module m	[mm]	**6**					**8**				**6**					**8**			
	Teeth z	[1]	**18**	**20**	**22**	**25**	**28**	**18**	**20**	**22**	**25**	**18**	**20**	**22**	**25**	**28**	**18**	**20**	**22**	**25**
	F_{vMAX}[3]	[N]	60185	58600	58788	59027	57143	66667	60000	54545	48000	75800	71251	68544	60318	53856	62832	56549	51408	45239
	v_{MAX}[3]	[m/s]	1,5	1,7	1,8	2,1	2,3	2,0	2,2	2,5	2,8	1,6	1,8	2,0	2,2	2,5	2,1	2,4	2,6	3,0
	T_{2N}[1]	[Nm]	2821	3146	3200	3200	3200	3200	3200	3200	3.200	3200	3200	3200	3200	3200	3.200	3.200	3.200	3.200
	T_{2B}[1]	[Nm]	3250	3516	3880	4427	4800	4800	4800	4800	4800	4343	4536	4800	4800	4800	4800	4800	4800	4800
	T_{2NOT}[1]	[Nm]	6300	6300	6300	6300	6300	6301	6302	6303	6304	6300	6300	6300	6300	6300	6301	6302	6303	6304
	$P_{A\,MAX}$	[µm]	126	133	139	149	158	145	154	163	176	122	129	139	149	158	145	154	163	180
	$P_{R\,MAX}$	[µm]	58	65	71	81	90	77	86	95	108	58	65	71	81	90	77	86	95	108

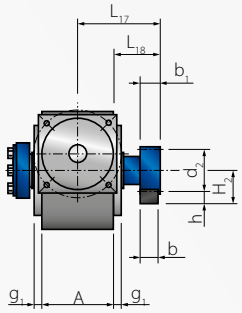
			STRAIGHT									**HELICAL**								
ULTIMATE[PLUS]	Module m	[mm]	**6**					**8**				**6**					**8**			
	Teeth z	[1]	**18**	**20**	**22**	**25**	**28**	**18**	**20**	**22**	**25**	**18**	**20**	**22**	**25**	**28**	**18**	**20**	**22**	**25**
	F_{vMAX}[3]	[N]	60185	58600	58788	59027	57143	66667	60000	54545	48000	75800	71251	68544	60318	53856	62832	56549	51408	45239
	v_{MAX}[3]	[m/s]	1,5	1,7	1,8	2,1	2,3	2,0	2,2	2,5	2,8	1,6	1,8	2,0	2,2	2,5	2,1	2,4	2,6	3,0
	T_{2N}[1]	[Nm]	2821	3146	3200	3200	3200	3200	3200	3200	3200	3200	3200	3200	3200	3200	3200	3200	3200	3200
	T_{2B}[1]	[Nm]	3250	3516	3880	4427	4800	4800	4800	4800	4800	4343	4536	4800	4800	4800	4800	4800	4800	4800
	T_{2NOT}[1]	[Nm]	6300	6300	6300	6300	6300	6301	6302	6303	6304	6300	6300	6300	6300	6300	6301	6302	6303	6304
	$P_{A\,MAX}$	[µm]	113	119	125	134	144	131	139	148	160	109	115	125	134	144	134	142	151	167
	$P_{R\,MAX}$	[µm]	55	61	67	76	86	73	81	90	102	55	61	67	76	86	73	81	90	102

An explanation of how to use the tables can be found on pages 4-7.

DIMENSIONS



PINION SHAFT WITH SHRINK DISC



Module m		[mm]	6					8			
Teeth z		[1]	**18**	**20**	**22**	**25**	**28**	**18**	**20**	**22**	**25**
A		[mm]	210					210			
b		[mm]	59					79			
b_1		[mm]	60					80			
B		[mm]	280					280			
C		[mm]	383					383			
d_2	straight	[mm]	108	120	132	150	168	144	160	176	200
	helical	[mm]	114,59	127,32	140,06	159,16	178,25	152,79	169,77	186,74	212,21
d_{k2}		[mm]	M16					M16			
E		[mm]	140					140			
g_1		[mm]	16					16			
g_2		[mm]	23					23			
h		[mm]	43					43			
H_2	straight	[mm]	97	103	109	118	127	143	151	159	171
	helical	[mm]	100,30	106,66	113,03	122,58	132,13	147,39	155,88	164,37	177,1
i		[mm]	75					75			
L_{17}		[mm]	254					254			
L_{18}		[mm]	149					149			
o		[mm]	32					32			
q		[mm]	110					110			

MOTOR ATTACHMENT

Flange		**V1**	**V2**	**V3**	**V4**
Shaft -Ø d_1	[mm]	32	32	38	48
Shaft length l	[mm]	60	60	80	85
Square u_1	[mm]	190	190	190	260
Pitch circle -Ø v_1	[mm]	215	215	215	300
Centering-Ø w_1	[mm]	180	130	180	250
Threads 4x s_1	[mm]	M12	M12	M12	M16
f_1	[mm]	481	481	490	490

[1] Reduced torques apply to the ratios 40 til 75. See the gear data for additional technical details.
[2] For bearing lifespan and gear efficiency calculations, visit www.gearfox.com
[3] Values were determined at a ratio of 15:1.
All values assume sufficient lubrication and a well adjusted tooth contact pattern.
The force transmission in the system relies on the usage of a shrink disc. Additional axial forces reduce the torque values.

KS-TWINGEAR SYSTEM
KS60

TECHNICAL DATA

GEAR	Ratio i	[1]	**15**	**20**	**25**	**30**	**40**[1]	**50**[1]	**60**	**75**
	n_{1MAX}	[min^{-1}]	3500							
	n_{1N}	[min^{-1}]	on request							
	T_{2N}	[Nm]	5000				5000		4050	
	T_{2B}	[Nm]	7500				7500		6075	
	T_{2NOT}	[Nm]	10000				1000		8100	
	Weight	[kg]	190							
	η^2	[%]	>92						>90	

			STRAIGHT								**HELICAL**							
PROFESSIONAL	Module m	[mm]	**8**				**10**				**8**				**10**			
	Teeth z	[1]	**18**	**20**	**22**	**25**	**18**	**20**	**22**	**25**	**18**	**20**	**22**	**25**	**18**	**20**	**22**	**25**
	F_{vMAX}[3]	[N]	89975	84420	78125	69444	75000	68182	62500	55556	88868	80747	73986	65730	71095	64598	59188	52584
	v_{MAX}[3]	[m/s]	1,8	2,0	2,2	2,4	2,2	2,4	2,7	3,1	1,9	2,1	2,3	2,6	2,3	2,6	2,9	3,2
	T_{2N}[1]	[Nm]	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000
	T_{2B}[1]	[Nm]	7198	7429	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500
	T_{2NOT}[1]	[Nm]	8900	8900	8900	8900	8900	8900	8900	8900	8900	8900	8900	8900	8900	8900	8900	8900
	$P_{A\,MAX}$	[µm]	250	257	263	272	268	276	283	295	250	257	263	276	288	296	303	315
	$P_{R\,MAX}$	[µm]	54	61	67	76	68	76	83	95	54	61	67	76	68	76	83	95

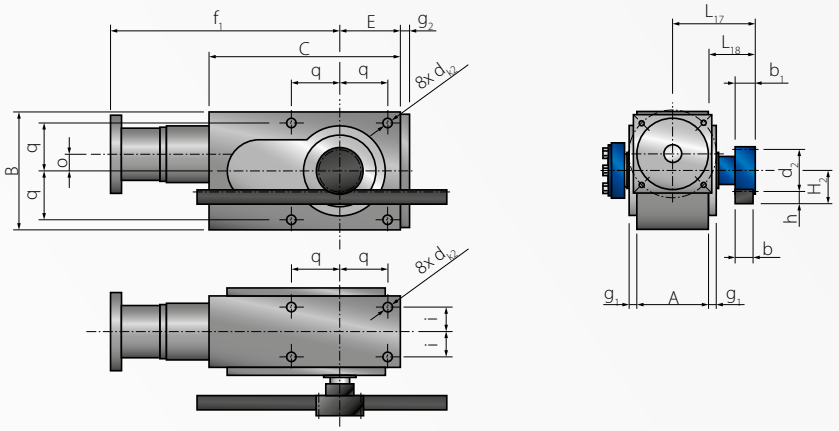
			STRAIGHT								**HELICAL**							
ULTIMATE	Module m	[mm]	**8**				**10**				**8**				**10**			
	Teeth z	[1]	**18**	**20**	**22**	**25**	**18**	**20**	**22**	**25**	**18**	**20**	**22**	**25**	**18**	**20**	**22**	**25**
	F_{vMAX}[3]	[N]	104167	93750	85227	75000	83333	75000	68182	60000	98175	88357	80325	70686	78540	70686	64260	56549
	v_{MAX}[3]	[m/s]	1,8	2,0	2,2	2,4	2,2	2,4	2,7	3,1	1,9	2,1	2,3	2,6	2,3	2,6	2,9	3,2
	T_{2N}[1]	[Nm]	5000	5000	5000	5000	5000	5000	5000	5.000	5000	5000	5000	5000	5000	5000	5000	5.000
	T_{2B}[1]	[Nm]	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500
	T_{2NOT}[1]	[Nm]	8900	8900	8900	8900	8900	8900	8900	8900	8900	8900	8900	8900	8900	8900	8900	8900
	$P_{A\,MAX}$	[µm]	122	129	135	144	140	148	155	167	122	129	135	148	144	152	159	171
	$P_{R\,MAX}$	[µm]	54	61	67	76	68	76	83	95	54	61	67	76	68	76	83	95

			STRAIGHT								**HELICAL**							
ULTIMATE^{PLUS}	Module m	[mm]	**8**				**10**				**8**				**10**			
	Teeth z	[1]	**18**	**20**	**22**	**25**	**18**	**20**	**22**	**25**	**18**	**20**	**22**	**25**	**18**	**20**	**22**	**25**
	F_{vMAX}[3]	[N]	104167	93750	85227	75000	83333	75000	68182	60000	98175	88357	80325	70686	78540	70686	64260	56549
	v_{MAX}[3]	[m/s]	1,8	2,0	2,2	2,4	2,2	2,4	2,7	3,1	1,9	2,1	2,3	2,6	2,3	2,6	2,9	3,2
	T_{2N}[1]	[Nm]	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000
	T_{2B}[1]	[Nm]	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500
	T_{2NOT}[1]	[Nm]	8900	8900	8900	8900	8900	8900	8900	8900	8900	8900	8900	8900	8900	8900	8900	8900
	$P_{A\,MAX}$	[µm]	108	114	119	128	125	132	139	149	111	117	122	135	128	135	142	152
	$P_{R\,MAX}$	[µm]	50	56	61	70	63	70	77	87	50	56	61	70	63	70	77	87

An explanation of how to use the tables can be found on pages 4-7.

DIMENSIONS

PINION SHAFT WITH SHRINK DISC



Module m		[mm]	8				10			
Teeth z		[1]	**18**	**20**	**22**	**25**	**18**	**20**	**22**	**25**
A		[mm]	240				240			
b		[mm]	79				99			
b_1		[mm]	80				100			
B		[mm]	360				360			
C		[mm]	475				475			
d_2	straight	[mm]	144	160	176	200	180	200	220	250
	helical	[mm]	152,79	169,77	186,74	212,21	190,99	212,21	233,43	265,26
d_{k2}		[mm]	M20				M20			
E		[mm]	180				180			
g_1		[mm]	18				18			
g_2		[mm]	25				25			
h		[mm]	71				71			
H_2	straight	[mm]	143	151	159	171	179	189	199	214
	helical	[mm]	147,39	155,88	164,37	177,10	184,49	195,10	205,71	221,63
i		[mm]	80				80			
L_{17}		[mm]	301				301			
L_{18}		[mm]	181				181			
o		[mm]	38				38			
q		[mm]	140				140			

MOTOR ATTACHMENT

Flange		**V1**	**V2**	**V3**	**V4**
Shaft -Ø d_1	[mm]	32	32	38	48
Shaft length l	[mm]	60	60	80	85
Square u_1	[mm]	190	190	190	260
Pitch circle -Ø v_1	[mm]	215	215	215	300
Centering-Ø w_1	[mm]	180	130	180	250
Threads 4x s_1	[mm]	M12	M12	M12	M16
f_1	[mm]	558	558	568	568

[1] Reduced torques apply to the ratios 40 til 75. See the gear data for additional technical details.
[2] For bearing lifespan and gear efficiency calculations, visit www.gearfox.com
[3] Values were determined at a ratio of 15:1.
All values assume sufficient lubrication and a well adjusted tooth contact pattern.
The force transmission in the system relies on the usage of a shrink disc. Additional axial forces reduce the torque values.

KS-TWINGEAR SYSTEM
KS70

TECHNICAL DATA

GEAR	Ratio i	[1]	**15**	**20**	**25**	**30**	**40**[1]	**50**[1]	**60**	**75**
	n_{1MAX}	[min^{-1}]	3500							
	n_{1N}	[min^{-1}]	on request							
	T_{2N}	[Nm]	7500				7500		5100	
	T_{2B}	[Nm]	11250				11250		7650	
	T_{2NOT}	[Nm]	15000				15000		10200	
	Weight	[kg]	300							
	η^2	[%]	>92						>90	

			STRAIGHT							**HELICAL**						
PROFESSIONAL	Module m	[mm]	**8**				**10**			**8**				**10**		
	Teeth z	[1]	**18**	**20**	**22**	**25**	**18**	**20**	**22**	**18**	**20**	**22**	**25**	**18**	**20**	**22**
	F_{vMAX}[3]	[N]	89975	84420	84073	83519	112500	102273	93750	107199	103012	103718	98595	106642	96896	88783
	v_{MAX}[3]	[m/s]	1,8	2,0	2,2	2,4	2,2	2,4	2,7	1,9	2,1	2,3	2,6	2,3	2,6	2,9
	T_{2N}[1]	[Nm]	6264	6731	7301	7500	7500	7500	7500	7351	7500	7500	7500	7500	7500	7500
	T_{2B}[1]	[Nm]	7198	7429	8071	9020	11250	11250	11250	9047	9568	10514	11250	11250	11250	11250
	T_{2NOT}[1]	[Nm]	13998	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000
	$P_{A\,MAX}$	[µm]	242	247	252	260	258	260	266	242	247	252	264	278	284	290
	$P_{R\,MAX}$	[µm]	46	51	56	64	58	64	70	46	51	56	64	58	64	70

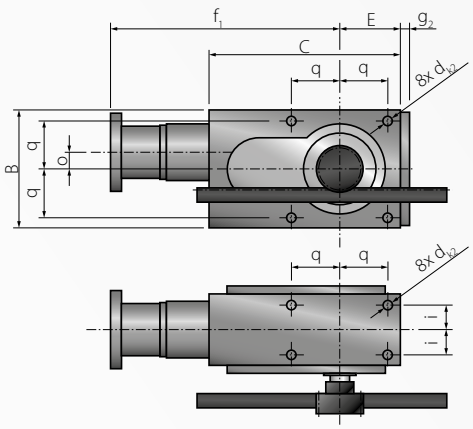
			STRAIGHT							**HELICAL**						
ULTIMATE	Module m	[mm]	**8**				**10**			**8**				**10**		
	Teeth z	[1]	**18**	**20**	**22**	**25**	**18**	**20**	**22**	**18**	**20**	**22**	**25**	**18**	**20**	**22**
	F_{vMAX}[3]	[N]	104792	105000	105330	105720	125000	112500	102273	132012	127706	120487	106029	117810	106029	96390
	v_{MAX}[3]	[m/s]	1,8	2,0	2,2	2,4	2,2	2,4	2,7	1,9	2,1	2,3	2,6	2,3	2,6	2,9
	T_{2N}[1]	[Nm]	6662	7346	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500
	T_{2B}[1]	[Nm]	7545	8400	9269	10572	11250	11250	11250	10085	10840	11250	11250	11250	11250	11250
	T_{2NOT}[1]	[Nm]	14061	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000
	$P_{A\,MAX}$	[µm]	114	119	124	132	130	132	138	114	119	124	136	134	140	146
	$P_{R\,MAX}$	[µm]	46	51	56	64	58	64	70	46	51	56	64	58	64	70

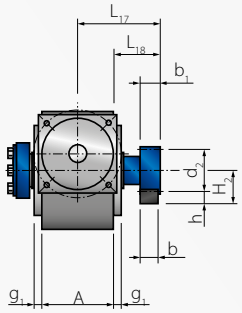
			STRAIGHT							**HELICAL**						
ULTIMATE PLUS	Module m	[mm]	**8**				**10**			**8**				**10**		
	Teeth z	[1]	**18**	**20**	**22**	**25**	**18**	**20**	**22**	**18**	**20**	**22**	**25**	**18**	**20**	**22**
	F_{vMAX}[3]	[N]	104792	105000	105330	105720	125000	112500	102273	132012	127706	120487	106029	117810	106029	96390
	v_{MAX}[3]	[m/s]	1,8	2,0	2,2	2,4	2,2	2,4	2,7	1,9	2,1	2,3	2,6	2,3	2,6	2,9
	T_{2N}[1]	[Nm]	6662	7346	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500	7500
	T_{2B}[1]	[Nm]	7545	8400	9269	10572	11250	11250	11250	10085	10840	11250	11250	11250	11250	11250
	T_{2NOT}[1]	[Nm]	14061	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000
	$P_{A\,MAX}$	[µm]	100	105	109	116	117	119	125	103	108	112	123	117	123	129
	$P_{R\,MAX}$	[µm]	42	47	51	58	52	58	64	42	47	51	58	52	58	64

An explanation of how to use the tables can be found on pages 4-7.

DIMENSIONS

PINION SHAFT WITH SHRINK DISC





Module m		[mm]	8				10		
Teeth z		[1]	**18**	**20**	**22**	**25**	**18**	**20**	**22**
A		[mm]	280				280		
b		[mm]	79				99		
b_1		[mm]	80				100		
B		[mm]	450				450		
C		[mm]	585				585		
d_2	straight	[mm]	144	160	176	200	180	200	220
	helical	[mm]	152,79	169,77	186,74	212,21	190,99	212,21	233,43
d_{k2}		[mm]	M20				M20		
E		[mm]	225				225		
g_1		[mm]	18				18		
g_2		[mm]	25				25		
h		[mm]	71				89		
H_2	straight	[mm]	143	151	159	171	179	189	199
	helical	[mm]	147,39	155,88	164,37	177,10	184,49	195,10	205,71
i		[mm]	90				90		
L_{17}		[mm]	341				341		
L_{18}		[mm]	201				201		
o		[mm]	42				42		
q		[mm]	175				175		

MOTOR ATTACHMENT

Flange		**VX**
Shaft -Ø d_1	[mm]	on request
Shaft length l	[mm]	
Square u_1	[mm]	
Pitch circle -Ø v_1	[mm]	
Centering-Ø w_1	[mm]	
Threads 4x s_1	[mm]	
f_1	[mm]	

[1] Reduced torques apply to the ratios 40 til 75. See the gear data for additional technical details.
[2] For bearing lifespan and gear efficiency calculations, visit www.gearfox.com
[3] Values were determined at a ratio of 15:1.
All values assume sufficient lubrication and a well adjusted tooth contact pattern.
The force transmission in the system relies on the usage of a shrink disc. Additional axial forces reduce the torque values.

KS-TWINGEAR SYSTEM
ORDER KEY

KS50 - PRO - 025 - 1 3 2 04 - SG 020 17

Gear size

KS10 ....KS-TwinGear KS10
KS20 ....KS-TwinGear KS20
KS30 ....KS-TwinGear KS30
KS35 ....KS-TwinGear KS35
KS40 ....KS-TwinGear KS40
KS50 ....KS-TwinGear KS50
KS60 ....KS-TwinGear KS60
KS70 ....KS-TwinGear KS70

Precision class

PRO.....Professional
ULT.....Ultimate
ULP .....Ultimate[PLUS]

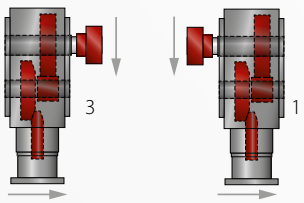
Ratio

015.....i = 15[1]
040.....i = 40[1]
etc.

[1] available ratios
two-stage
15, 20, 25, 30, 40, 50, 60, 75

Direction of rotation / pinion location

1.....Pinion on side 1
3.....Pinion on side 3



Max. input speed

1.....< 250 min^{-1}
2.....< 1000 min^{-1}
3.....< 2000 min^{-1}
4.....< 3500 min^{-1}
5.....≥ 3500 min^{-1}

Number of teeth pinion

18, 20, ..., 28, 30[2]
[2] available numbers of teeth see catalogue pages
Additional executions on request

Module

020.....Module 2
030.....Module 3
040.....Module 4
...
100.....Module 10

Pinion

SG.....Straight pinion
SS.....Helical pinion
RG.....Straight pinion shaft
RS.....Helical pinion shaft

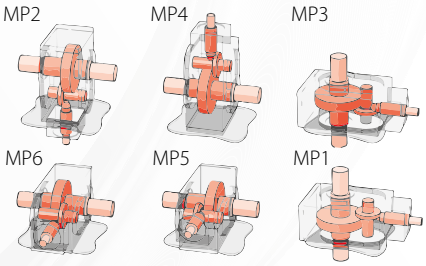
Motor attachment

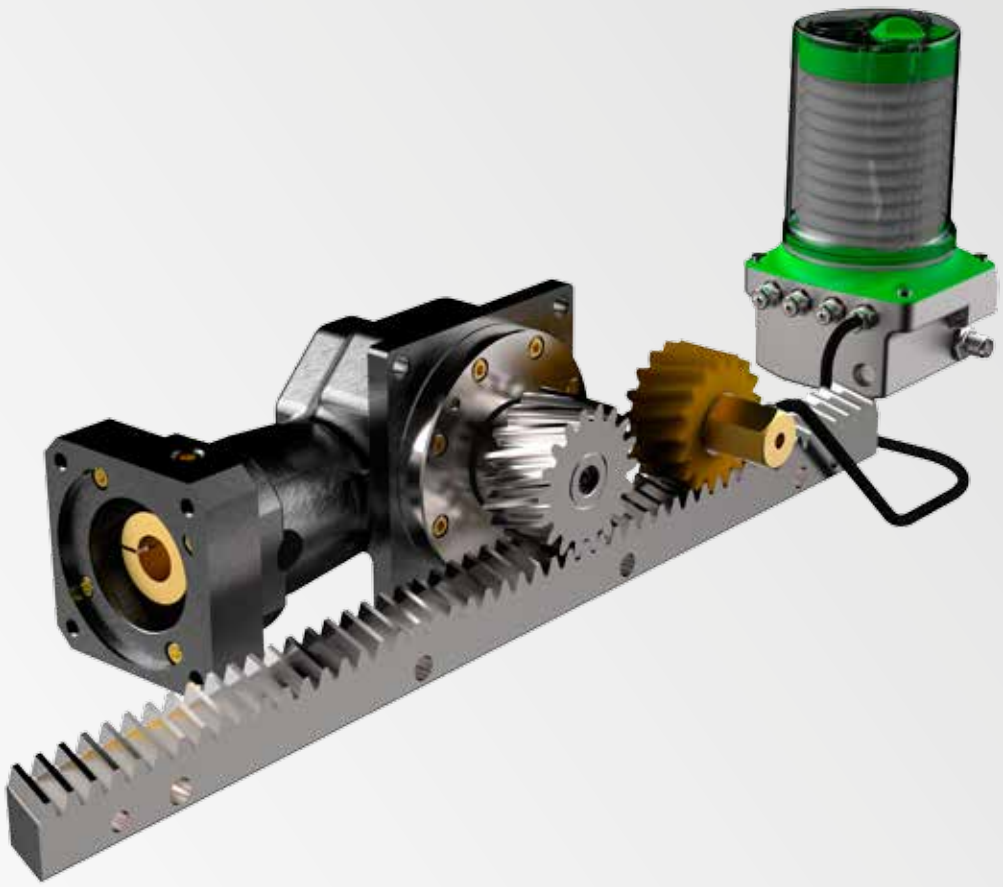
04.....V4 (V1...V9[3], VX[4])

[3] See catalogue for available flanges
[4] More dimensions on request

Mounting position

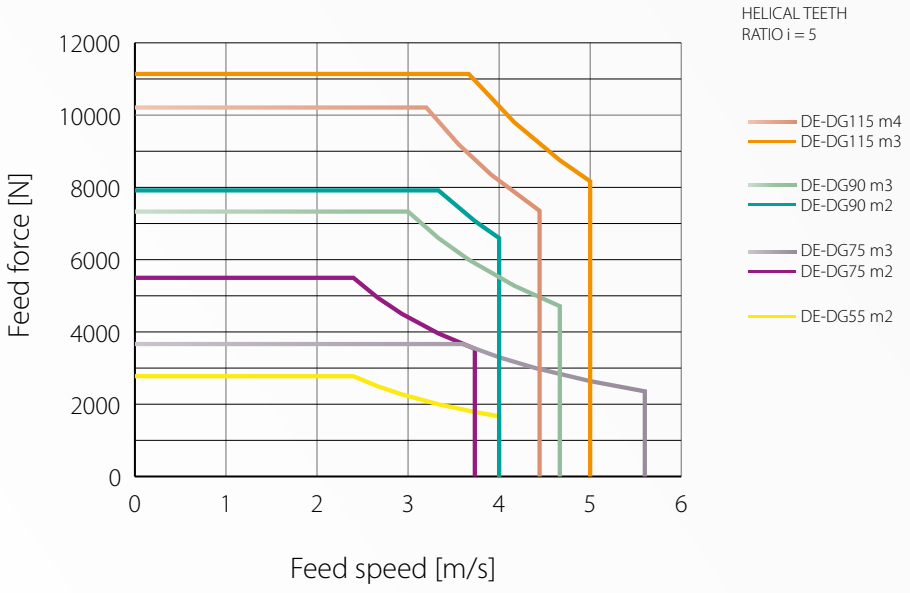
1.....MP1
2.....MP2
3.....MP3
4.....MP4
5.....MP5
6.....MP6



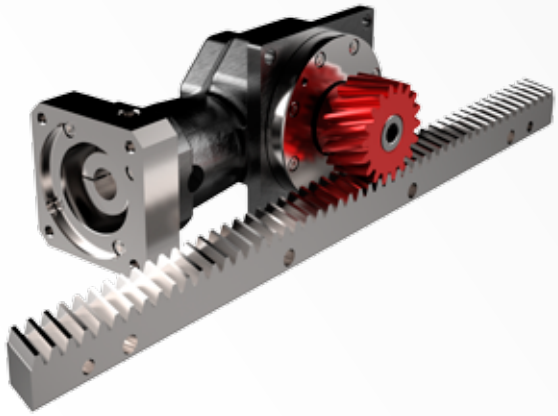


DYNAGEAR DG ECOSYSTEM - FORCES AND SPEEDS

with helical teeth and ratio i=5



DYNAGEAR DG ECOSYSTEM
DE-DG55



TECHNICAL DATA

GEAR	Ratio i	[1]	**5**	**8**	**10**	**15**
	n_{1MAX}	[min^{-1}]	6000			
	n_{1N}	[min^{-1}]	3100		3800	
	T_{2N}	[Nm]	35			25
	T_{2B}	[Nm]	53			50
	T_{2NOT}	[Nm]	70			95
	Weight	[kg]	2,5			
	η^2	[%]	>96			>93

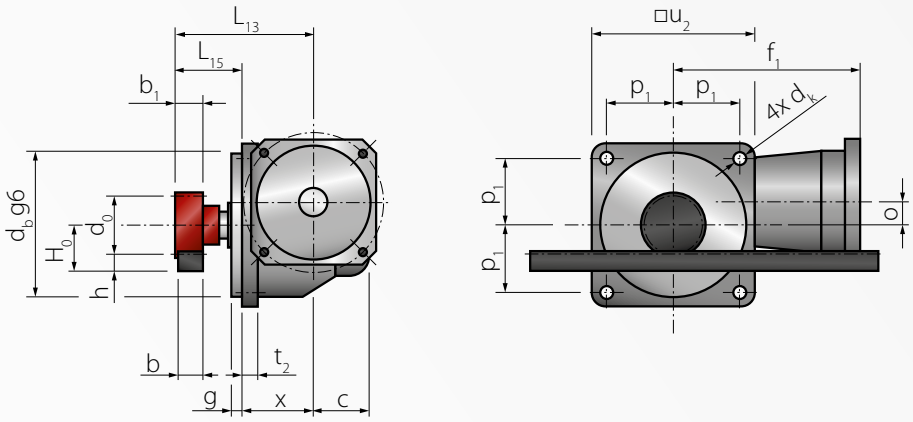
			STRAIGHT						**HELICAL**					
PROFESSIONAL	Module m	[mm]	**2**						**2**					
	Teeth z	[1]	**18**	**20**	**22**	**25**	**28**	**30**	**18**	**20**	**22**	**25**	**28**	**30**
	F_{vMAX} [3]	[N]	2650	2409	2208	1963	1767	1656	2512	2282	2091	1858	1671	1567
	v_{MAX} [3]	[m/s]	2,3	2,5	2,8	3,1	3,5	3,8	2,4	2,7	2,9	3,3	3,7	4,0
	T_{2N} [1]	[Nm]	35	35	35	35	35	35	35	35	35	35	35	35
	T_{2B} [1]	[Nm]	53	53	53	53	53	53	53	53	53	53	53	53
	T_{2NOT} [1]	[Nm]	70	70	70	70	70	70	70	70	70	70	70	70
	$P_{A\,MAX}$	[µm]	199	203	207	216	222	226	199	203	210	216	222	226
	$P_{R\,MAX}$	[µm]	37	41	45	51	57	61	37	41	45	51	57	61

			STRAIGHT						**HELICAL**					
ULTIMATE	Module m	[mm]	**2**						**2**					
	Teeth z	[1]	**18**	**20**	**22**	**25**	**28**	**30**	**18**	**20**	**22**	**25**	**28**	**30**
	F_{vMAX} [3]	[N]	2944	2650	2409	2120	1893	1767	2775	2498	2271	1998	1784	1665
	v_{MAX} [3]	[m/s]	2,3	2,5	2,8	3,1	3,5	3,8	2,4	2,7	2,9	3,3	3,7	4,0
	T_{2N} [1]	[Nm]	35	35	35	35	35	35	35	35	35	35	35	35
	T_{2B} [1]	[Nm]	53	53	53	53	53	53	53	53	53	53	53	53
	T_{2NOT} [1]	[Nm]	70	70	70	70	70	70	70	70	70	70	70	70
	$P_{A\,MAX}$	[µm]	87	91	95	104	110	114	87	91	98	104	110	114
	$P_{R\,MAX}$	[µm]	37	41	45	51	57	61	37	41	45	51	57	61

An explanation of how to use the tables can be found on pages 4-7.

DIMENSIONS

SOLID SHAFT
WITH SHRUNKEN PINION



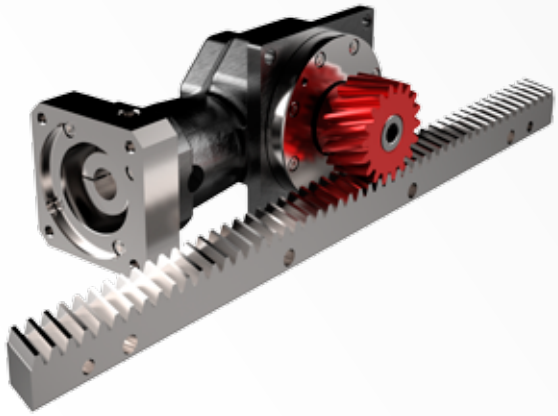
Module m		[mm]	**2**					
Teeth z		[1]	**18**	**20**	**22**	**25**	**28**	**30**
b		[mm]	24					
b_1		[mm]	25					
c		[mm]	36					
d_0	straight	[mm]	36	40	44	50	56	60
	helical	[mm]	38,20	42,44	46,69	53,05	59,42	63,66
d_bg6		[mm]	89					
d_k		[mm]	6,6					
g_2		[mm]	13					
h		[mm]	22					
H_0	straight	[mm]	40	42	44	47	50	52
	helical	[mm]	41,10	43,22	45,34	48,53	51,71	53,83
L_{13}		[mm]	87					
L_{15}		[mm]	50					
o		[mm]	9					
q		[mm]	39					
u_2		[mm]	90					
t_2		[mm]	9					
x		[mm]	37					

MOTOR ATTACHMENT

Flange		**V1**	**V2**	**V3**
Shaft -Ø d_1	[mm]	9	11	14
Shaft length l	[mm]	23	26	33
Square u_1	[mm]	60	75	75
Pitch circle -Ø v_1	[mm]	63	75	75
Centering-Ø w_1	[mm]	40	60	60
Threads 4x s_1	[mm]	M4	M5	M5
f_1	[mm]	130	130	130

[1] Reduced torques apply to the ratio 15. See the gear data for additional technical details.
[2] For bearing lifespan and gear efficiency calculations, visit www.gearfox.com
[3] Values were determined at a ratio of 5:1.
All values assume sufficient lubrication and a well adjusted tooth contact pattern. Additional axial forces reduce the torque values.
NOTE: For optimal adjustment of the backlash, it is recommended that the connection structure is designed at least 1-2 mm larger.

DYNAGEAR DG ECOSYSTEM
DE-DG75



TECHNICAL DATA

GEAR	Ratio i	[1]	**5**	**8**	**10**	**15**
	n_{1MAX}	[min^{-1}]	6000			
	n_{1N}	[min^{-1}]	2400		2900	
	T_{2N}	[Nm]	70			50
	T_{2B}	[Nm]	105			75
	T_{2NOT}	[Nm]	140			100
	Weight	[kg]	4,2			
	η^2	[%]	>96			>93

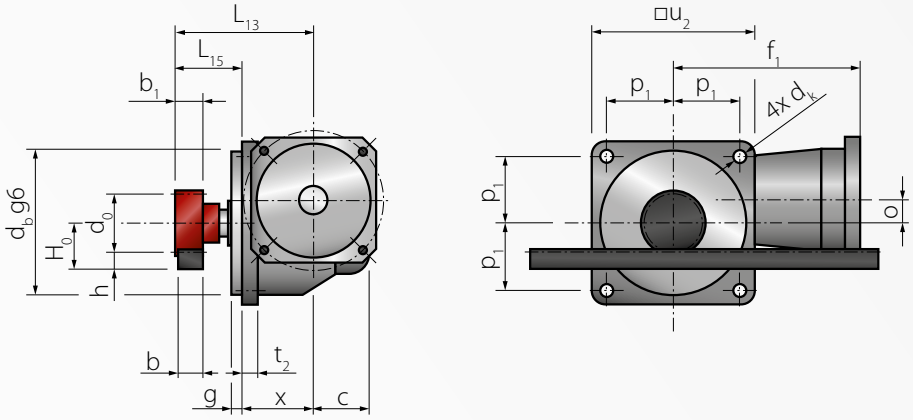
			STRAIGHT										**HELICAL**									
PROFESSIONAL	Module m	[mm]	**2**					**3**					**2**					**3**				
	Teeth z	[1]	**18**	**20**	**22**	**25**	**28**	**18**	**20**	**22**	**25**	**28**	**18**	**20**	**22**	**25**	**28**	**18**	**20**	**22**	**25**	**28**
	F_{vMAX} [3]	[N]	3400	2955	2875	2778	2533	3500	3182	2917	2593	2333	4834	3704	3670	3506	3311	3318	3015	2762	2454	2208
	v_{MAX} [3]	[m/s]	2,3	2,5	2,8	3,1	3,5	3,4	3,8	4,1	4,7	5,3	2,4	2,7	2,9	3,3	3,7	3,6	4,0	4,4	5,0	5,6
	T_{2N} [1]	[Nm]	60	64	67	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70
	T_{2B} [1]	[Nm]	68	65	69	75	76	105	105	105	105	105	102	86	93	100	105	105	105	105	105	105
	T_{2NOT} [1]	[Nm]	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140
	$P_{A\,MAX}$	[µm]	199	203	207	216	222	217	223	229	241	251	199	203	210	216	222	220	229	235	244	254
	$P_{R\,MAX}$	[µm]	37	41	45	51	57	55	61	67	76	86	37	41	45	51	57	55	61	67	76	86

			STRAIGHT										**HELICAL**									
ULTIMATE	Module m	[mm]	**2**					**3**					**2**					**3**				
	Teeth z	[1]	**18**	**20**	**22**	**25**	**28**	**18**	**20**	**22**	**25**	**28**	**18**	**20**	**22**	**25**	**28**	**18**	**20**	**22**	**25**	**28**
	F_{vMAX} [3]	[N]	5833	5250	4773	4200	3750	3889	3500	3182	2800	2500	5498	4948	4498	3958	3534	3665	3299	2999	2639	2356
	v_{MAX} [3]	[m/s]	2,3	2,5	2,8	3,1	3,5	3,4	3,8	4,1	4,7	5,3	2,4	2,7	2,9	3,3	3,7	3,6	4,0	4,4	5,0	5,6
	T_{2N} [1]	[Nm]	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70
	T_{2B} [1]	[Nm]	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105
	T_{2NOT} [1]	[Nm]	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140
	$P_{A\,MAX}$	[µm]	87	91	95	104	110	105	111	117	129	139	87	91	98	104	110	108	117	123	132	142
	$P_{R\,MAX}$	[µm]	37	41	45	51	57	55	61	67	76	86	37	41	45	51	57	55	61	67	76	86

An explanation of how to use the tables can be found on pages 4-7.

DIMENSIONS

SOLID SHAFT
WITH SHRUNKEN PINION



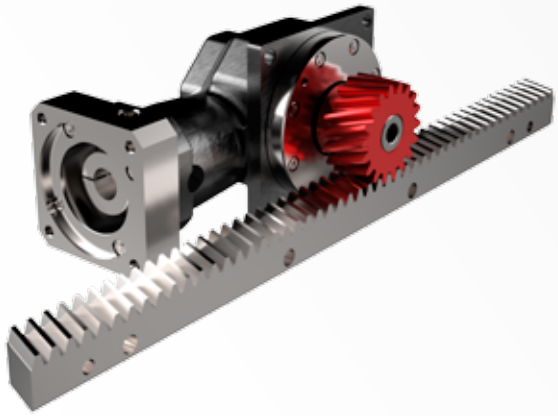
Module m		[mm]	2					3				
Teeth z		[1]	**18**	**20**	**22**	**25**	**28**	**18**	**20**	**22**	**25**	**28**
b		[mm]	24					29				
b_1		[mm]	25					30				
c		[mm]	42					42				
d_0	straight	[mm]	36	40	44	50	56	54	60	66	75	84
	helical	[mm]	38,20	42,44	46,69	53,05	59,42	57,30	63,66	70,03	79,58	89,13
d_bg6		[mm]	105					105				
d_k		[mm]	6,6					6,6				
g_2		[mm]	13					13				
h		[mm]	22					26				
H_0	straight	[mm]	40	42	44	47	50	53	56	59	63,5	68
	helical	[mm]	41,10	43,22	45,34	48,53	51,71	54,65	57,83	61,01	65,79	70,56
L_{13}		[mm]	100					100				
L_{15}		[mm]	55					55				
o		[mm]	14					14				
q		[mm]	49					49				
u_2		[mm]	11					11				
t_2		[mm]	115					115				
x		[mm]	45					45				

MOTOR ATTACHMENT

Flange		**V1**	**V2**	**V3**
Shaft -Ø d_1	[mm]	11	14	19
Shaft length l	[mm]	26	33	43
Square u_1	[mm]	75	75	90
Pitch circle -Ø v_1	[mm]	75	75	100
Centering-Ø w_1	[mm]	60	60	80
Threads 4x s_1	[mm]	M5	M5	M6
f_1	[mm]	156	156	156

[1] Reduced torques apply to the ratio 15. See the gear data for additional technical details.
[2] For bearing lifespan and gear efficiency calculations, visit www.gearfox.com
[3] Values were determined at a ratio of 5:1.
All values assume sufficient lubrication and a well adjusted tooth contact pattern. Additional axial forces reduce the torque values.
NOTE: For optimal adjustment of the backlash, it is recommended that the connection structure is designed at least 1-2 mm larger.

DYNAGEAR DG ECOSYSTEM
DE-DG90



TECHNICAL DATA

GEAR	Ratio i	[1]	**5**	**8**	**10**	**15**
	n_{1MAX}	[min^{-1}]	5000			
	n_{1N}	[min^{-1}]	2100		2600	
	T_{2N}	[Nm]	140			95
	T_{2B}	[Nm]	210			143
	T_{2NOT}	[Nm]	280			190
	Weight	[kg]	8,2			
	η^2	[%]	>96			>93

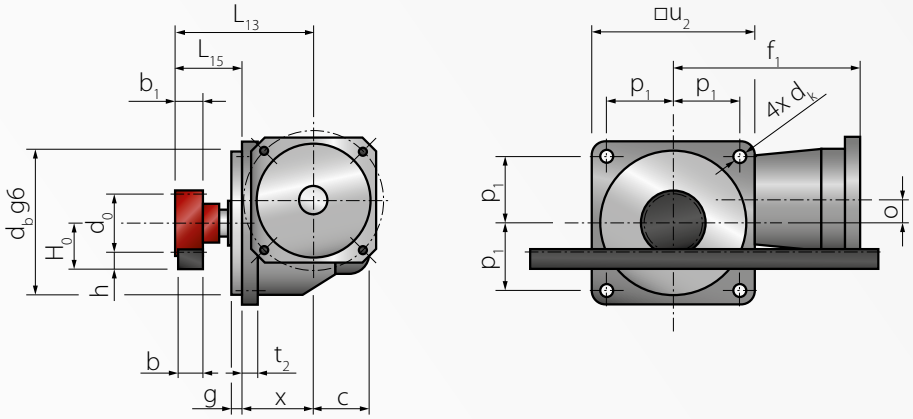
			STRAIGHT								**HELICAL**							
PROFESSIONAL	Module m	[mm]	**2**			**3**					**2**			**3**				
	Teeth z	[1]	**25**	**28**	**30**	**18**	**20**	**22**	**25**	**28**	**25**	**28**	**30**	**18**	**20**	**22**	**25**	**28**
	F_{vMAX} [3]	[N]	2778	2533	2469	7000	6364	5833	5185	4667	3506	3438	3429	6636	6029	5524	4908	4415
	v_{MAX} [3]	[m/s]	3,1	3,5	3,8	2,8	3,1	3,5	3,9	4,4	3,3	3,7	4,0	3,0	3,3	3,7	4,2	4,7
	T_{2N} [1]	[Nm]	72	73	75	140	140	140	140	140	97	106	112	140	140	140	140	140
	T_{2B} [1]	[Nm]	75	76	79	210	210	210	210	210	100	109	116	210	210	210	210	210
	T_{2NOT} [1]	[Nm]	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280
	$P_{A\,MAX}$	[µm]	209	214	217	209	214	220	230	238	209	214	217	212	220	226	233	241
	$P_{R\,MAX}$	[µm]	44	49	52	47	52	58	65	73	44	49	52	47	52	58	65	73

			STRAIGHT								**HELICAL**							
ULTIMATE	Module m	[mm]	**2**			**3**					**2**			**3**				
	Teeth z	[1]	**25**	**28**	**30**	**18**	**20**	**22**	**25**	**28**	**25**	**28**	**30**	**18**	**20**	**22**	**25**	**28**
	F_{vMAX} [3]	[N]	6680	6679	6667	7778	7000	6364	5600	5000	7804	7069	6597	7330	6597	5998	5278	4712
	v_{MAX} [3]	[m/s]	3,1	3,5	3,8	2,8	3,1	3,5	3,9	4,4	3,3	3,7	4,0	3,0	3,3	3,7	4,2	4,7
	T_{2N} [1]	[Nm]	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140
	T_{2B} [1]	[Nm]	167	187	200	210	210	210	210	210	207	210	210	210	210	210	210	210
	T_{2NOT} [1]	[Nm]	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280
	$P_{A\,MAX}$	[µm]	97	102	105	97	102	108	118	126	97	102	105	100	108	114	121	129
	$P_{R\,MAX}$	[µm]	44	49	52	47	52	58	65	73	44	49	52	47	52	58	65	73

An explanation of how to use the tables can be found on pages 4-7.

DIMENSIONS

SOLID SHAFT
WITH SHRUNKEN PINION



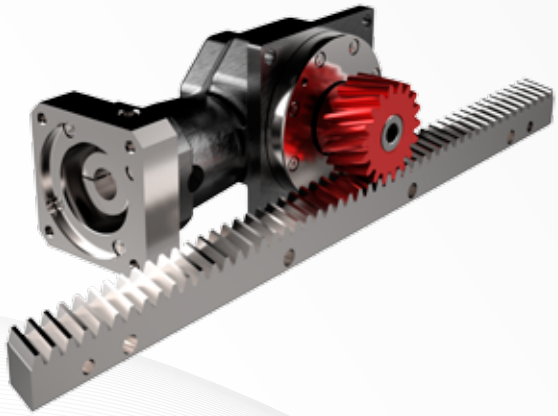
Module m		[mm]	2			3				
Teeth z		[1]	**25**	**28**	**30**	**18**	**20**	**22**	**25**	**28**
b		[mm]	24			29				
b_1		[mm]	25			30				
c		[mm]	52			52				
d_0	straight	[mm]	50	56	60	54	60	66	75	84
	helical	[mm]	53,05	59,42	63,66	57,30	63,66	70,03	79,58	89,13
d_bg6		[mm]	125			125				
d_k		[mm]	11			11				
g_2		[mm]	16			16				
h		[mm]	22			26				
H_0	straight	[mm]	47	50	52	53	56	59	63,5	68
	helical	[mm]	48,53	51,71	53,83	54,65	57,83	61,01	65,79	70,56
L_{13}		[mm]	126			126				
L_{15}		[mm]	68			68				
o		[mm]	18			18				
q		[mm]	59			59				
u_2		[mm]	14			14				
t_2		[mm]	140			140				
x		[mm]	58			58				

MOTOR ATTACHMENT

Flange		**V1**	**V2**	**V3**
Shaft -Ø d_1	[mm]	14	19	24
Shaft length l	[mm]	33	43	53
Square u_1	[mm]	90	90	115
Pitch circle -Ø v_1	[mm]	100	100	130
Centering-Ø w_1	[mm]	80	80	110
Threads 4x s_1	[mm]	M6	M6	M8
f_1	[mm]	187	187	187

[1] Reduced torques apply to the ratio 15. See the gear data for additional technical details.
[2] For bearing lifespan and gear efficiency calculations, visit www.gearfox.com
[3] Values were determined at a ratio of 5:1.
All values assume sufficient lubrication and a well adjusted tooth contact pattern. Additional axial forces reduce the torque values.
NOTE: For optimal adjustment of the backlash, it is recommended that the connection structure is designed at least 1-2 mm larger.

DYNAGEAR DG ECOSYSTEM
DE-DG115



TECHNICAL DATA

GEAR	Ratio i	[1]	5	8	10	15
	n_{1MAX}	[min^{-1}]	4000			
	n_{1N}	[min^{-1}]	1820		2250	
	T_{2N}	[Nm]	260			180
	T_{2B}	[Nm]	390			270
	T_{2NOT}	[Nm]	520			360
	Weight	[kg]	13,5			
	η^2	[%]	>96			>93

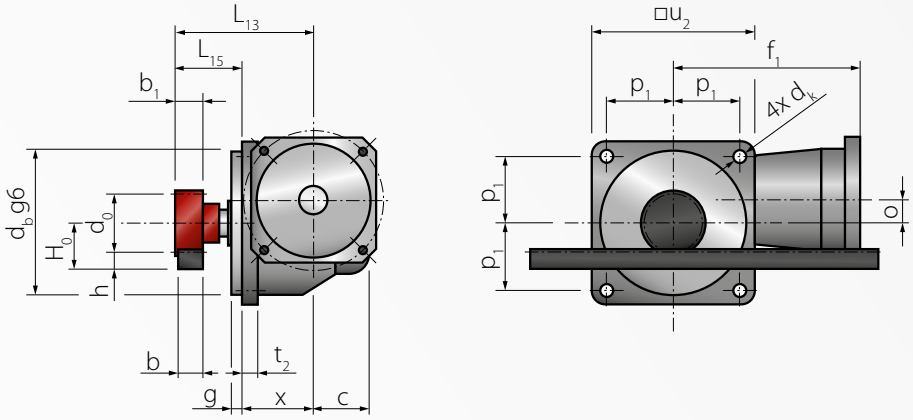
			STRAIGHT								HELICAL							
PROFESSIONAL	Module m	[mm]	3				4				3				4			
	Teeth z	[1]	**22**	**25**	**28**	**30**	**18**	**20**	**22**	**25**	**22**	**25**	**28**	**30**	**18**	**20**	**22**	**25**
	F_{vMAX} [3]	[N]	7722	7556	7400	7313	9750	8864	8125	7222	9418	9115	8200	7685	9242	8398	7695	6836
	v_{MAX} [3]	[m/s]	3,5	3,9	4,4	4,7	3,8	4,2	4,6	5,2	3,7	4,2	4,7	5,0	3,2	3,6	3,9	4,4
	T_{2N} [1]	[Nm]	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260
	T_{2B} [1]	[Nm]	278	306	333	351	390	390	390	390	358	390	390	390	390	390	390	390
	T_{2NOT} [1]	[Nm]	520	520	520	520	520	520	520	520	520	520	520	520	520	520	520	520
	$P_{A\,MAX}$	[µm]	220	230	238	244	231	238	245	255	226	233	241	247	231	238	245	259
	$P_{R\,MAX}$	[µm]	58	65	73	79	63	70	77	87	58	65	73	79	63	70	77	87

			STRAIGHT								HELICAL							
ULTIMATE	Module m	[mm]	3				4				3				4			
	Teeth z	[1]	**22**	**25**	**28**	**30**	**18**	**20**	**22**	**25**	**22**	**25**	**28**	**30**	**18**	**20**	**22**	**25**
	F_{vMAX} [3]	[N]	11818	10400	9286	8667	10833	9750	8864	7800	11138	9802	8752	8168	10210	9189	8354	7351
	v_{MAX} [3]	[m/s]	3,5	3,9	4,4	4,7	3,8	4,2	4,6	5,2	3,7	4,2	4,7	5,0	3,2	3,6	3,9	4,4
	T_{2N} [1]	[Nm]	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260
	T_{2B} [1]	[Nm]	390	390	390	390	390	390	390	390	390	390	390	390	390	390	390	390
	T_{2NOT} [1]	[Nm]	520	520	520	520	520	520	520	520	520	520	520	520	520	520	520	520
	$P_{A\,MAX}$	[µm]	108	118	126	132	119	126	133	143	114	121	129	135	119	126	133	147
	$P_{R\,MAX}$	[µm]	58	65	73	79	63	70	77	87	58	65	73	79	63	70	77	87

An explanation of how to use the tables can be found on pages 4-7.

DIMENSIONS

SOLID SHAFT
WITH SHRUNKEN PINION



Module m		[mm]	3				4			
Teeth z		[1]	**22**	**25**	**28**	**30**	**18**	**20**	**22**	**25**
b		[mm]	29				39			
b_1		[mm]	30				40			
c		[mm]	63				63			
d_0	straight	[mm]	66	75	84	90	72	80	88	100
	helical	[mm]	70,03	79,58	89,13	95,49	76,39	84,88	93,37	106,10
d_bg6		[mm]	150				150			
d_k		[mm]	13,5				13,5			
g_2		[mm]	16				16			
h		[mm]	26				35			
H_0	straight	[mm]	59	63,5	68	71	71	75	79	85
	helical	[mm]	61,01	65,79	70,56	73,75	73,20	77,44	81,69	88,05
L_{13}		[mm]	146				146			
L_{15}		[mm]	75				75			
o		[mm]	23				23			
q		[mm]	72				72			
u_2		[mm]	17				17			
t_2		[mm]	170				170			
x		[mm]	71				71			

MOTOR ATTACHMENT

Flange		**V1**	**V2**	**V3**
Shaft -Ø d_1	[mm]	19	24	32
Shaft length l	[mm]	43	53	63
Square u_1	[mm]	115	115	140
Pitch circle -Ø v_1	[mm]	130	130	165
Centering-Ø w_1	[mm]	110	110	130
Threads 4x s_1	[mm]	M8	M8	M10
f_1	[mm]	225	225	225

[1] Reduced torques apply to the ratio 15. See the gear data for additional technical details.
[2] For bearing lifespan and gear efficiency calculations, visit www.gearfox.com
[3] Values were determined at a ratio of 5:1.
All values assume sufficient lubrication and a well adjusted tooth contact pattern. Additional axial forces reduce the torque values.
NOTE: For optimal adjustment of the backlash, it is recommended that the connection structure is designed at least 1-2 mm larger.

DYNAGEAR DG ECOSYSTEM
ORDER KEY

DE-DG90 - ULP - 080 - 1 3 2 03 - SS 030 18

Gear size

DE-DG55..... DynaGear DE-DG55
DE-DG75.....DynaGear DE-DG75
DE-DG90.....DynaGear DE-DG90
DE-DG115....DynaGear DE-DG115

Precision class

PRO.....Professional
ULT.....Ultimate
ULP .....Ultimate[PLUS]

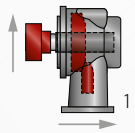
Ratio

005.....i = 5[1]
010.....i = 10[1]
etc.

[1] available ratios
one-stage
5, 8, 10, 15

Direction of rotation / pinion location

1.....Pinion on side 1



Max. input speed

1.....< 250 min^{-1}
2.....< 1000 min^{-1}
3.....< 2000 min^{-1}
4.....< 3500 min^{-1}
5.....≥ 3500 min^{-1}

Number of teeth pinion

18, 20, 22, ..., 28, 30[2]
[2] available numbers of teeth
see catalogue pages
Additional executions on request

Module

020.....Module 2
030.....Module 3
040.....Module 4

Pinion

SG.....Straight pinion
SS.....Helical pinion

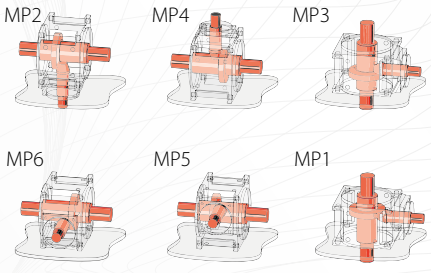
Motor attachment

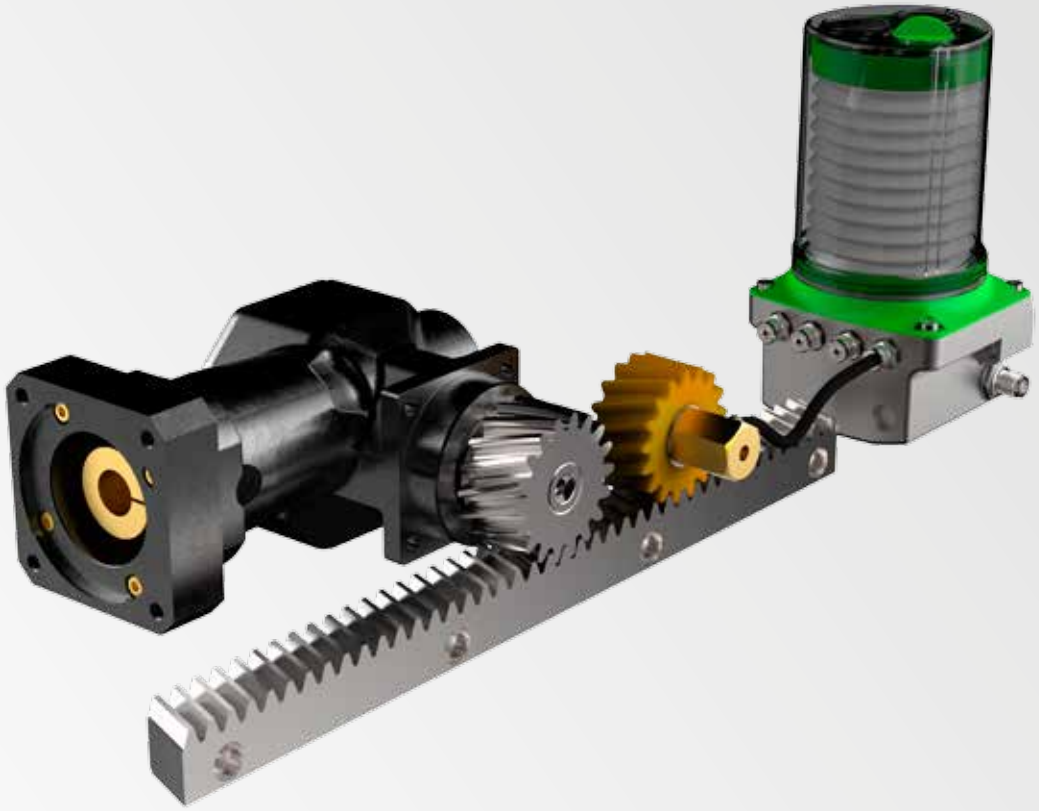
03.....V3 (V1...V3[3], VX[4])

[3] See catalogue pages for available flanges
[4] More dimensions on requet

Mounting position

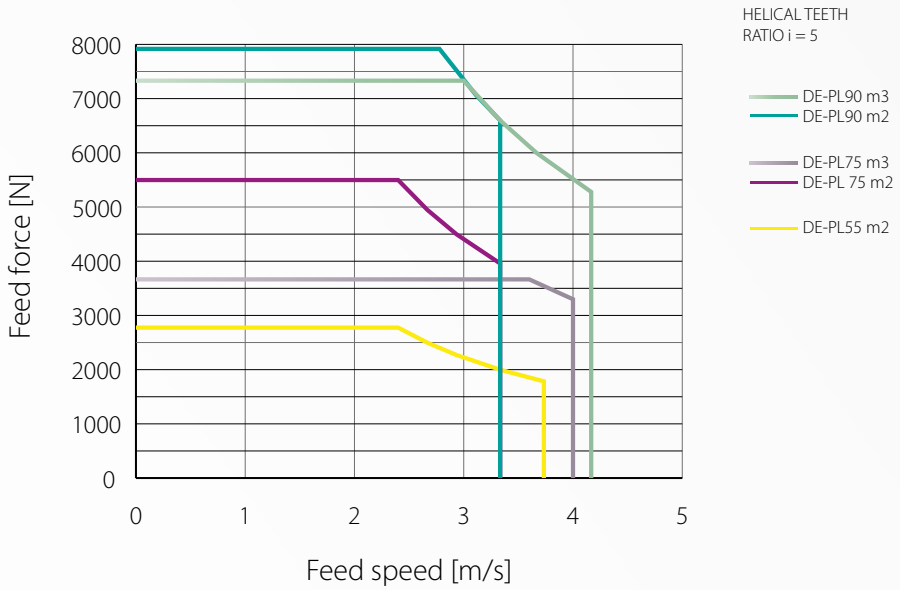
1.....MP1
2.....MP2
3.....MP3
4.....MP4
5.....MP5
6.....MP6



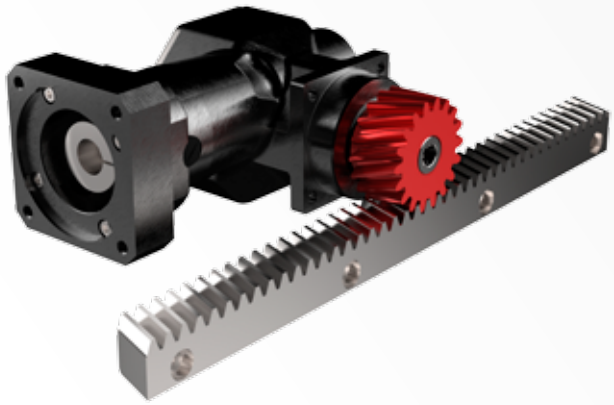


DYNAGEAR ECONOMY DE-PL - FORCES AND SPEEDS

with helical teeth and ratio i=5



DYNAGEAR PL ECOSYSTEM
DE-PL55



TECHNICAL DATA

GEAR	Ratio i	[1]	**5**	**8**	**10**	**15**
	n_{1MAX}	[min^{-1}]	6000			
	n_{1N}	[min^{-1}]	3100		3800	
	T_{2N}	[Nm]	35			25
	T_{2B}	[Nm]	53			50
	T_{2NOT}	[Nm]	70			95
	Weight	[kg]	2,6			
	η^2	[%]	>96			>93

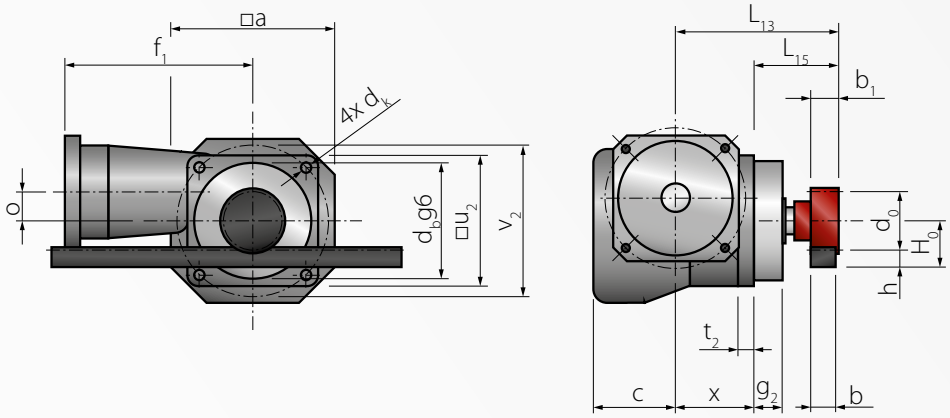
			STRAIGHT				**HELICAL**			
PROFESSIONAL	Module m	[mm]	**2**				**2**			
	Teeth z	[1]	**18**	**20**	**22**	**25**	**18**	**20**	**22**	**25**
	F_{vMAX} [3]	[N]	2650	2409	2208	1963	2512	2282	2091	1858
	v_{MAX} [3]	[m/s]	2,3	2,5	2,8	3,1	2,4	2,7	2,9	3,3
	T_{2N} [1]	[Nm]	35	35	35	35	35	35	35	35
	T_{2B} [1]	[Nm]	53	53	53	53	53	53	53	53
	T_{2NOT} [1]	[Nm]	70	70	70	70	70	70	70	70
	$P_{A\,MAX}$	[µm]	199	203	207	216	199	203	210	216
	$P_{R\,MAX}$	[µm]	37	41	45	51	37	41	45	51

			STRAIGHT				**HELICAL**			
ULTIMATE	Module m	[mm]	**2**				**2**			
	Teeth z	[1]	**18**	**20**	**22**	**25**	**18**	**20**	**22**	**25**
	F_{vMAX} [3]	[N]	2944	2650	2409	2120	2775	2498	2271	1998
	v_{MAX} [3]	[m/s]	2,3	2,5	2,8	3,1	2,4	2,7	2,9	3,3
	T_{2N} [1]	[Nm]	35	35	35	35	35	35	35	35
	T_{2B} [1]	[Nm]	53	53	53	53	53	53	53	53
	T_{2NOT} [1]	[Nm]	70	70	70	70	70	70	70	70
	$P_{A\,MAX}$	[µm]	87	91	95	104	87	91	98	104
	$P_{R\,MAX}$	[µm]	37	41	45	51	37	41	45	51

An explanation of how to use the tables can be found on pages 4-7.

DIMENSIONS

SOLID SHAFT
WITH SHRUNKEN PINION



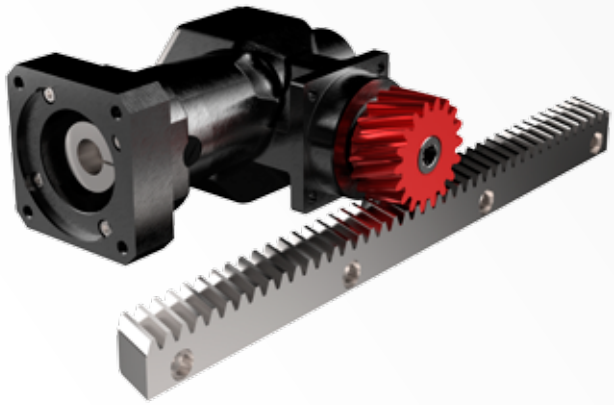
Module m		[mm]	**2**			
Teeth z		[1]	**18**	**20**	**22**	**25**
a		[mm]	84			
b		[mm]	24			
b_1		[mm]	25			
c		[mm]	46,5			
d_0	straight	[mm]	36	40	44	50
	helical	[mm]	38,20	42,44	46,69	53,05
d_b g6		[mm]	60			
d_k		[mm]	5,5			
g_2		[mm]	18			
h		[mm]	22			
H_0	straight	[mm]	40,00	42,00	44,00	47,00
	helical	[mm]	41,10	43,22	45,34	48,53
L_{13}		[mm]	95			
L_{15}		[mm]	48			
o		[mm]	9			
t_2		[mm]	8,5			
u_2		[mm]	66,0			
v_2		[mm]	68			
x		[mm]	47			

MOTOR ATTACHMENT

Flange		**V1**	**V2**	**V3**
Shaft -Ø d_1	[mm]	9	11	14
Shaft length l	[mm]	23	26	33
Square u_1	[mm]	60	75	75
Pitch circle -Ø v_1	[mm]	63	75	75
Centering-Ø w_1	[mm]	40	60	60
Threads 4x s_1	[mm]	M4	M5	M5
f_1	[mm]	130	130	130

[1] Reduced torques apply to the ratio 15. See the gear data for additional technical details.
[2] For bearing lifespan and gear efficiency calculations, visit www.gearfox.com
[3] Values were determined at a ratio of 5:1.
All values assume sufficient lubrication and a well adjusted tooth contact pattern. Additional axial forces reduce the torque values.
NOTE: For optimal adjustment of the backlash, it is recommended that the connection structure is designed at least 1-2 mm larger.

DYNAGEAR PL ECOSYSTEM
DE-PL75



TECHNICAL DATA

GEAR	Ratio i	[1]	**5**	**8**	**10**	**15**
	n_{1MAX}	[min^{-1}]	6000			
	n_{1N}	[min^{-1}]	2400		2900	
	T_{2N}	[Nm]	70			50
	T_{2B}	[Nm]	105			75
	T_{2NOT}	[Nm]	140			100
	Weight	[kg]	4,5			
	η^2	[%]	>96			>93

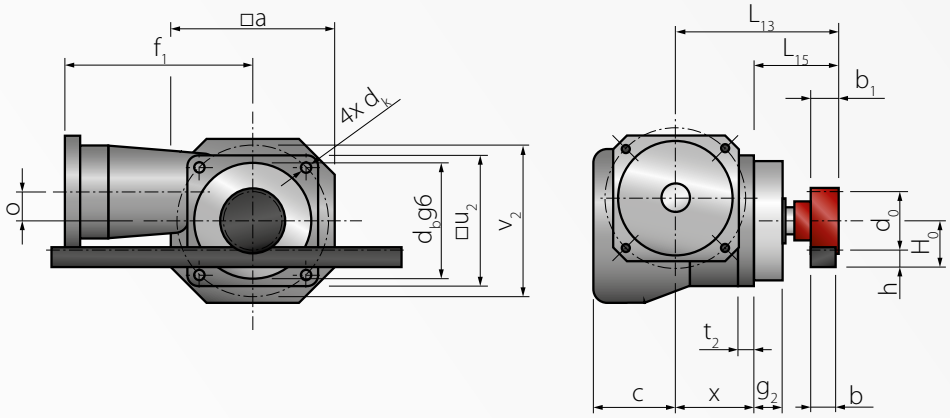
			STRAIGHT						**HELICAL**					
PROFESSIONAL	Module m	[mm]	**2**				**3**		**2**				**3**	
	Teeth z	[1]	**18**	**20**	**22**	**25**	**18**	**20**	**18**	**20**	**22**	**25**	**18**	**20**
	F_{vMAX} [3]	[N]	3400	2955	2875	2778	3500	3182	4834	3704	3670	3506	3318	3015
	v_{MAX} [3]	[m/s]	2,3	2,5	2,8	3,1	3,4	3,8	2,4	2,7	2,9	3,3	3,6	4,0
	T_{2N} [1]	[Nm]	60	64	67	70	70	70	70	70	70	70	70	70
	T_{2B} [1]	[Nm]	68	65	69	75	105	105	102	86	93	100	105	105
	T_{2NOT} [1]	[Nm]	140	140	140	140	140	140	140	140	140	140	140	140
	$P_{A\,MAX}$	[µm]	199	203	207	216	217	223	199	203	210	216	220	229
	$P_{R\,MAX}$	[µm]	37	41	45	51	55	61	37	41	45	51	55	61

			STRAIGHT						**HELICAL**					
ULTIMATE	Module m	[mm]	**2**				**3**		**2**				**3**	
	Teeth z	[1]	**18**	**20**	**22**	**25**	**18**	**20**	**18**	**20**	**22**	**25**	**18**	**20**
	F_{vMAX} [3]	[N]	5833	5250	4773	4200	3889	3500	5498	4948	4498	3958	3665	3299
	v_{MAX} [3]	[m/s]	2,3	2,5	2,8	3,1	3,4	3,8	2,4	2,7	2,9	3,3	3,6	4,0
	T_{2N} [1]	[Nm]	70	70	70	70	70	70	70	70	70	70	70	70
	T_{2B} [1]	[Nm]	105	105	105	105	105	105	105	105	105	105	105	105
	T_{2NOT} [1]	[Nm]	140	140	140	140	140	140	140	140	140	140	140	140
	$P_{A\,MAX}$	[µm]	87	91	95	104	105	111	87	91	98	104	108	117
	$P_{R\,MAX}$	[µm]	37	41	45	51	55	61	37	41	45	51	55	61

An explanation of how to use the tables can be found on pages 4-7.

DIMENSIONS

SOLID SHAFT
WITH SHRUNKEN PINION



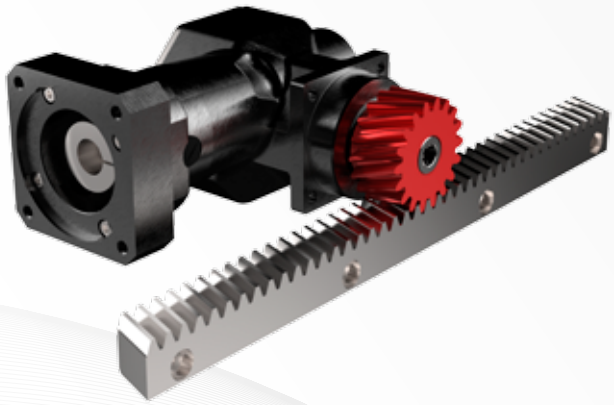
Module m		[mm]	2				3	
Teeth z		[1]	**18**	**20**	**22**	**25**	**18**	**20**
a		[mm]	100				100	
b		[mm]	24				29	
b_1		[mm]	25				30	
c		[mm]	56				56	
d_0	straight	[mm]	36	40	44	50	54	60
	helical	[mm]	38,20	42,44	46,69	53,05	57,30	63,66
d_b g6		[mm]	70				70	
d_k		[mm]	6,5				6,5	
g_2		[mm]	18				18	
h		[mm]	22				26	
H_0	straight	[mm]	40	42	44	47	53	56
	helical	[mm]	41,10	43,22	45,34	48,53	54,65	57,83
L_{13}		[mm]	110				110	
L_{15}		[mm]	56				56	
o		[mm]	14				14	
t_2		[mm]	10				10	
u_2		[mm]	76				76	
v_2		[mm]	85				85	
x		[mm]	54				54	

MOTOR ATTACHMENT

Flange		**V1**	**V2**	**V3**
Shaft -Ø d_1	[mm]	11	14	19
Shaft length l	[mm]	26	33	43
Square u_1	[mm]	75	75	90
Pitch circle -Ø v_1	[mm]	75	75	100
Centering-Ø w_1	[mm]	60	60	80
Threads 4x s_1	[mm]	M5	M5	M6
f_1	[mm]	156	156	156

[1] Reduced torques apply to the ratio 15. See the gear data for additional technical details.
[2] For bearing lifespan and gear efficiency calculations, visit www.gearfox.com
[3] Values were determined at a ratio of 5:1.
All values assume sufficient lubrication and a well adjusted tooth contact pattern. Additional axial forces reduce the torque values.
NOTE: For optimal adjustment of the backlash, it is recommended that the connection structure is designed at least 1-2 mm larger.

DYNAGEAR PL ECOSYSTEM
DE-PL90



TECHNICAL DATA

GEAR	Ratio i	[1]	**5**	**8**	**10**	**15**
	n_{1MAX}	[min^{-1}]	5000			
	n_{1N}	[min^{-1}]	2100		2600	
	T_{2N}	[Nm]	140			95
	T_{2B}	[Nm]	210			143
	T_{2NOT}	[Nm]	280			190
	Weight	[kg]	9			
	η^2	[%]	>96			>93

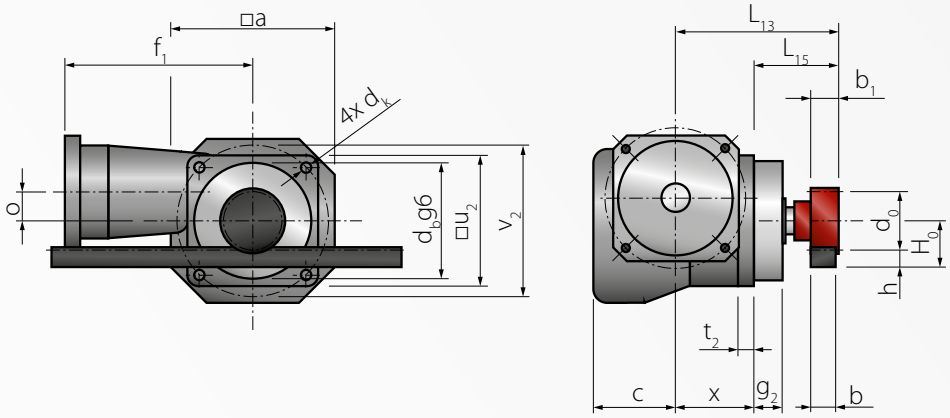
			STRAIGHT							**HELICAL**						
PROFESSIONAL	Module m	[mm]	**2**			**3**				**2**			**3**			
	Teeth z	[1]	**25**	**28**	**30**	**18**	**20**	**22**	**25**	**25**	**28**	**30**	**18**	**20**	**22**	**25**
	F_{vMAX} [3]	[N]	2778	2533	2469	7000	6364	5833	5185	3506	3438	3429	6636	6029	5524	4908
	v_{MAX} [3]	[m/s]	2,6	2,9	3,1	2,8	3,1	3,5	3,9	2,8	3,1	3,3	3,0	3,3	3,7	4,2
	T_{2N} [1]	[Nm]	72	73	75	140	140	140	140	97	106	112	140	140	140	140
	T_{2B} [1]	[Nm]	75	76	79	210	210	210	210	100	109	116	210	210	210	210
	T_{2NOT} [1]	[Nm]	280	280	280	280	280	280	280	280	280	280	280	280	280	280
	$P_{A\,MAX}$	[µm]	209	214	217	209	214	220	230	209	214	217	212	220	226	233
	$P_{R\,MAX}$	[µm]	44	49	52	47	52	58	65	44	49	52	47	52	58	65

			STRAIGHT							**HELICAL**						
ULTIMATE	Module m	[mm]	**2**			**3**				**2**			**3**			
	Teeth z	[1]	**25**	**28**	**30**	**18**	**20**	**22**	**25**	**25**	**28**	**30**	**18**	**20**	**22**	**25**
	F_{vMAX} [3]	[N]	6680	6679	6667	7778	7000	6364	5600	7804	7069	6597	7330	6597	5998	5278
	v_{MAX} [3]	[m/s]	2,6	2,9	3,1	2,8	3,1	3,5	3,9	2,8	3,1	3,3	3,0	3,3	3,7	4,2
	T_{2N} [1]	[Nm]	140	140	140	140	140	140	140	140	140	140	140	140	140	140
	T_{2B} [1]	[Nm]	167	187	200	210	210	210	210	207	210	210	210	210	210	210
	T_{2NOT} [1]	[Nm]	280	280	280	280	280	280	280	280	280	280	280	280	280	280
	$P_{A\,MAX}$	[µm]	97	102	105	97	102	108	118	97	102	105	100	108	114	121
	$P_{R\,MAX}$	[µm]	44	49	52	47	52	58	65	44	49	52	47	52	58	65

An explanation of how to use the tables can be found on pages 4-7.

DIMENSIONS

SOLID SHAFT
WITH SHRUNKEN PINION



Module m		[mm]	2			3			
Teeth z		[1]	**25**	**28**	**30**	**18**	**20**	**22**	**25**
a		[mm]	125			125			
b		[mm]	24			29			
b_1		[mm]	25			30			
c		[mm]	68			68			
d_0	straight	[mm]	50	56	60	54	60	66	75
	helical	[mm]	53,05	59,42	63,66	57,30	63,66	70,03	79,58
d_bg6		[mm]	90			90			
d_k		[mm]	9			9			
g_2		[mm]	20			20			
h		[mm]	22			26			
H_0	straight	[mm]	47	50	52	53	56	59	63,5
	helical	[mm]	48,53	51,71	53,83	54,65	57,83	61,01	65,79
L_{13}		[mm]	148			148			
L_{15}		[mm]	80			68			
o		[mm]	18			18			
t_2		[mm]	13			13			
u_2		[mm]	101			101			
v_2		[mm]	120			120			
x		[mm]	68			68			

MOTOR ATTACHMENT

Flange		**V1**	**V2**	**V3**
Shaft -Ø d_1	[mm]	14	19	24
Shaft length l	[mm]	33	43	53
Square u_1	[mm]	90	90	115
Pitch circle -Ø v_1	[mm]	100	100	130
Centering-Ø w_1	[mm]	80	80	110
Threads 4x s_1	[mm]	M6	M6	M8
f_1	[mm]	187	187	187

[1] Reduced torques apply to the ratio 15. See the gear data for additional technical details.
[2] For bearing lifespan and gear efficiency calculations, visit www.gearfox.com
[3] Values were determined at a ratio of 5:1.
All values assume sufficient lubrication and a well adjusted tooth contact pattern. Additional axial forces reduce the torque values.
NOTE: For optimal adjustment of the backlash, it is recommended that the connection structure is designed at least 1-2 mm larger.

DYNAGEAR PL ECOSYSTEM
ORDER KEY

DE-DG90 - ULP - 080 - 1 3 2 03 - SS 030 18

Gear size

DE-PL55 ..... DynaGear DE-PL55
DE-DG75..... DynaGear DE-PL75
DE-PL90 ..... DynaGear DE-PL90

Precision class

PRO.....Professional
ULT.....Ultimate
ULP .....Ultimate[PLUS]

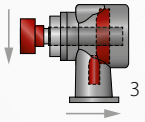
Ratio

005 .....i = 5[1]
010 .....i = 10[1]
etc.

[1] available ratios
one-stage
5, 8, 10, 15

Direction of rotation / pinion location

3.....Pinion on side 3



Max. input speed

1.....< 250 min^{-1}
2.....< 1000 min^{-1}
3.....< 2000 min^{-1}
4.....< 3500 min^{-1}
5.....≥ 3500 min^{-1}

Number of teeth pinion

18, 20, 22, ..., 28, 3[2]
[2] available numbers of teeth
see catalogue pages
Additional executions on request

Module

020.....Module 2
030.....Module 3
040.....Module 4

Pinion

SG .....Straight pinion
SS .....Helical pinion

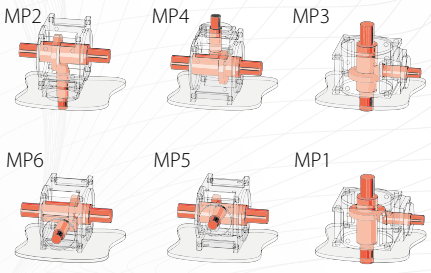
Motor attachment

03.....V3 (V1...V3[3], VX[4])

[3] See catalogue pages for available flange
[4] More dimensions on request

Mounting position

1.....MP1
2.....MP2
3.....MP3
4.....MP4
5.....MP5
6.....MP6



RACK & ACCESSORIES

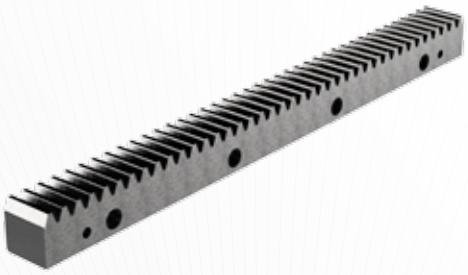
CONTENTS AT A GLANCE

We look forward to hearing from you!!

RACK & ACCESSORIES
STRAIGHT RACKS
TECHNICAL DATA

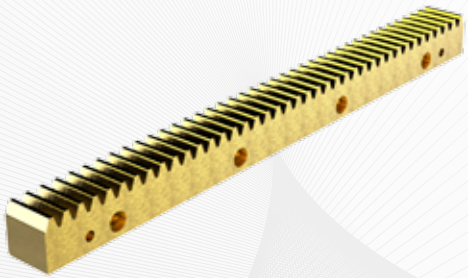
- Teeth direction: straight
- Material: C45 - 1.0503
- Teeth hardness: 50^{+5}HRC (induction hardened)
- Pressure angle: 20°
- Gear and side surface grinded

	Module	Length	Quality	Pitch error total (1000mm) [µm]	Art.-No. without bores	Art.-No. without bores
PROFESSIONAL	2	502,65	10h27	< 160	WM-144-020-905	WM-144-020-805
		1005,30			WM-144-020-910	WM-144-020-810
	3	508,93		< 180	WM-144-030-905	WM-144-030-805
		1017,87			WM-144-030-910	WM-144-030-810
	4	502,65			WM-144-040-905	WM-144-040-805
		1005,30			WM-144-040-910	WM-144-040-810
		2010,61			WM-144-040-920	WM-144-040-820
	5	502,65		< 200	WM-144-050-905	WM-144-050-805
		1005,30			WM-144-050-910	WM-144-050-810
		2010,61			WM-144-050-920	WM-144-050-820
	6	508,93			WM-144-060-905	WM-144-060-805
		1017,87			WM-144-060-910	WM-144-060-810
		2035,75			WM-144-060-920	WM-144-060-820
	8	502,65			on request	on request
		1005,30			on request	on request
		2010,61			on request	on request
	10	1005,30		< 220	on request	on request



- Teeth direction: straight
- Material: C45 - 1.0503
- Teeth hardness: 50^{+5}HRC (induction hardened)
- Pressure angle: 20°
- Gear and side surface grinded

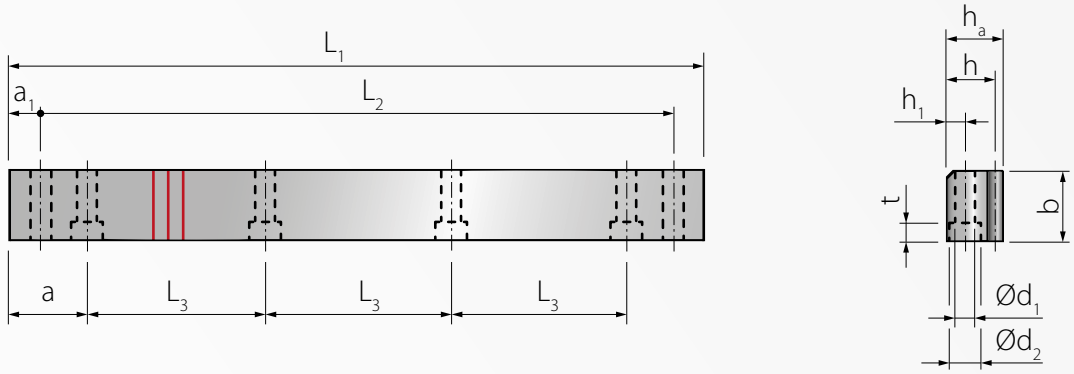
	Module	Length	Quality	Pitch error total (1000mm) [µm]	Art.-No. without bores	Art.-No. without bores
ULTIMATE	2	502,65	6h23	< 32	WM-144-020-305	WM-144-020-405
		1005,30			WM-144-020-310	WM-144-020-410
	3	508,93		< 36	WM-144-030-305	WM-144-030-405
		1017,87			WM-144-030-310	WM-144-030-410
	4	502,65			WM-144-040-305	WM-144-040-405
		1005,30			WM-144-040-310	WM-144-040-410
		2010,61	6h24		WM-144-040-320	WM-144-040-420
	5	502,65	6h23	< 40	WM-144-050-305	WM-144-050-405
		1005,30			WM-144-050-310	WM-144-050-410
		2010,61	6h24		WM-144-050-320	WM-144-050-420
	6	508,93	6h23		WM-144-060-305	WM-144-060-405
		1017,87			WM-144-060-310	WM-144-060-410
		2035,75	6h24		WM-144-060-320	WM-144-060-420
	8	502,65	6h23		WM-144-080-305	WM-144-080-405
		1005,30			WM-144-080-310	WM-144-080-410
		2010,61	6h24		WM-144-080-320	WM-144-080-420
	10	1005,30	6h23	< 45	WM-144-100-320	WM-144-100-420



- Teeth direction: straight
- Material: C45 - 1.0503
- Teeth hardness: 50^{+5}HRC (induction hardened)
- Pressure angle: 20°
- Gear and side surface grinded

	Module	Length	Quality	Pitch error total (1000mm) [µm]	Art.-No. without bores	Art.-No. without bores
ULTIMATE^{PLUS}	2	502,65	5h23	< 25	WM-144-020-305-5	WM-144-020-405-5
		1005,30			WM-144-020-310-5	WM-144-020-410-5
	3	508,93			WM-144-030-305-5	WM-144-030-405-5
		1017,87			WM-144-030-310-5	WM-144-030-410-5
	4	502,65		< 28	WM-144-040-305-5	WM-144-040-405-5
		1005,30			WM-144-040-310-5	WM-144-040-410-5
		2010,61			on request	on request
	5	502,65			WM-144-050-305-5	WM-144-050-405-5
		1005,30			WM-144-050-310-5	WM-144-050-410-5
		2010,61			on request	on request
	6	508,93			WM-144-060-305-5	WM-144-060-405-5
		1017,87			WM-144-060-310-5	WM-144-060-410-5
		2035,75			on request	on request
	8	502,65			WM-144-080-305-5	WM-144-080-405-5
		1005,30			WM-144-080-310-5	WM-144-080-410-5
		2010,61			on request	on request
	10	1005,30		< 32	WM-144-100-310-5	WM-144-100-410-5

DIMENSIONS



GENERAL	Module	[mm]	**2**		**3**		**4**			**5**			**6**			**8**			**10**
	L_1	[mm]	502,7	1005,3	508,9	1017,9	502,7	1005,3	2010,6	502,7	1005,3	2010,6	508,9	1017,9	2035,8	502,7	1005,3	2010,6	1005,3
	b	[mm]	24	24	29	29	39	39	39	49	49	49	59	59	59	79	79	79	99
	d_1	[mm]	7	7	10	10	10	10	10	14	14	14	18	18	18	22	22	22	33
	d_2	[mm]	11	11	15	15	15	15	15	20	20	20	26	26	26	33	33	33	48
	f	[mm]	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3
	h	[mm]	22	22	26	26	35	35	35	34	34	34	43	43	43	71	71	71	89
	h_a	[mm]	24	24	29	29	39	39	39	39	39	39	49	49	49	79	79	79	99
	Weight	[kg]	2,1	4,2	3,0	6,0	5,3	10,5	21,0	6,7	13,4	26,8	10,4	20,2	40,4	22,4	44,8	89,5	68,7

WITH BORES	a	[mm]	62,8	62,8	63,6	63,6	62,8	62,8	62,8	62,8	62,8	62,8	63,6	63,6	63,6	62,8	62,8	62,8	62,8
	a_1	[mm]	31,3	31,3	34,4	34,4	37,5	37,5	37,5	30,1	30,1	30,1	31,4	31,4	31,4	26,6	26,6	26,6	125,7
	d_3	[mm]	5,7	5,7	7,7	7,7	7,7	7,7	7,7	11,7	11,7	11,7	15,7	15,7	15,7	19,7	19,7	19,7	19,7
	h_1	[mm]	8	8	9	9	12	12	12	12	12	12	16	16	16	25	25	25	32
	L_2	[mm]	440,1	942,7	440,1	949,1	427,7	930,3	1935,6	442,4	945,0	1950,4	446,1	955,0	1973,0	449,5	952,0	1957,3	754
	L_3	[mm]	125,7	125,7	127,2	127,2	125,7	125,7	125,7	125,7	125,7	125,7	127,2	127,23	127,2	125,7	125,7	125,7	125,7
	t	[mm]	7	7	9	9	9	9	9	13	13	13	17	17	17	21	21	21	32

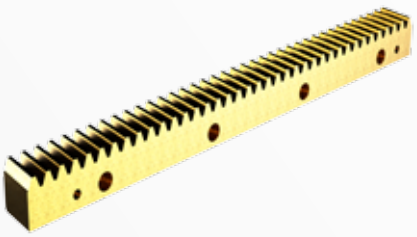
RACK & ACCESSORIES
HELICAL RACKS
TECHNICAL DATA

- Teeth direction: Right hand
- Material: C45 - 1.0503
- Teeth hardness: 50+5HRC (induction hardened)
- Pressure angle: 20°
- Helix angle: 19°31'42"
- Rear and side surface grinded

	Module	Length	Quality	Pitch error total (1000mm) [µm]	Art.-No. without bores	Art.-No. without bores
PROFESSIONAL	2	500	10h27	< 180	WM-143-020-905	WM-143-020-805
		1000			WM-143-020-910	WM-143-020-810
	3	500			WM-143-030-905	WM-143-030-805
		1000			WM-143-030-910	WM-143-030-810
	4	506,66			WM-143-040-905	WM-143-040-805
		1000			WM-143-040-910	WM-143-040-810
		2000			WM-143-040-920	WM-143-040-820
	5	500		< 200	WM-143-050-905	WM-143-050-805
		1000			WM-143-050-910	WM-143-050-810
		2000			on request	on request
	6	500			WM-143-060-905	WM-143-060-805
		1000			WM-143-060-910	WM-143-060-810
		2000			on request	on request
	8	480			on request	on request
		960			on request	on request
		1920			on request	on request
	10	1000		< 220	on request	on request

- Teeth direction: Right hand
- Material: C45 - 1.0503
- Teeth hardness: 50+5HRC (induction hardened)
- Pressure angle: 20°
- Helix angle: 19°31'42"
- Rear and side surface grinded

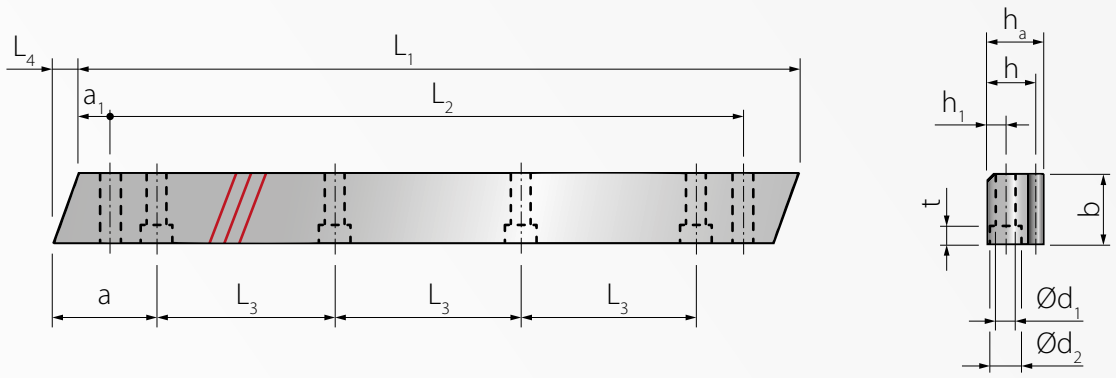
	Module	Length	Quality	Pitch error total (1000mm) [µm]	Art.-No. without bores	Art.-No. without bores
ULTIMATE	2	500	6h23	< 32	WM-143-020-305	WM-143-020-405
		1000			WM-143-020-310	WM-143-020-410
	3	500		< 36	WM-143-030-305	WM-143-030-405
		1000			WM-143-030-310	WM-143-030-410
	4	506,66			WM-143-040-305	WM-143-040-405
		1000			WM-143-040-310	WM-143-040-410
		2000	6h24		WM-143-040-320	WM-143-040-420
	5	500	6h23	< 40	WM-143-050-305	WM-143-050-405
		1000			WM-143-050-310	WM-143-050-410
		2000	6h24		WM-143-050-320	WM-143-050-420
	6	500	6h23		WM-143-060-305	WM-143-060-405
		1000			WM-143-060-310	WM-143-060-410
		2000	6h24		WM-143-060-320	WM-143-060-420
	8	480	6h23		WM-143-080-305	WM-143-080-405
		960			WM-143-080-310	WM-143-080-410
		1920	6h24		WM-143-080-320	WM-143-080-420
	10	1000	6h23	< 45	WM-143-100-310	WM-143-100-410



- Teeth direction: Right hand
- Material: C45 - 1.0503
- Teeth hardness: 50+5HRC (induction hardened)
- Pressure angle: 20°
- Helix angle: 19°31'42"
- Rear and side surface grinded

	Module	Length	Quality	Pitch error total (1000mm) [µm]	Art.-No. without bores	Art.-No. without bores
ULTIMATE PLUS	2	500	5h23	< 25	WM-143-020-305-5	WM-143-020-405-5
		1000			WM-143-020-310-5	WM-143-020-410-5
	3	500			WM-143-030-305-5	WM-143-030-405-5
		1000			WM-143-030-310-5	WM-143-030-410-5
	4	506,66		< 28	WM-143-040-305-5	WM-143-040-405-5
		1000			WM-143-040-310-5	WM-143-040-410-5
		2000			on request	on request
	5	500			WM-143-050-305-5	WM-143-050-405-5
		1000			WM-143-050-310-5	WM-143-050-410-5
		2000			on request	on request
	6	500			WM-143-060-305-5	WM-143-060-405-5
		1000			WM-143-060-310-5	WM-143-060-410-5
		2000			on request	on request
	8	480			WM-143-080-305-5	WM-143-080-405-5
		960			WM-143-080-310-5	WM-143-080-410-5
		1920			on request	on request
	10	960		< 32	WM-143-100-310-5	WM-143-100-410-5

DIMENSIONS

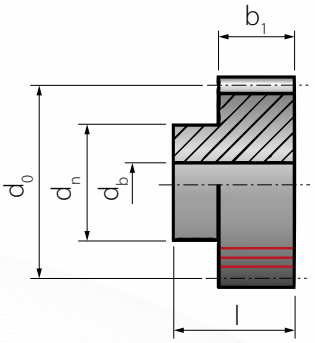


GENERAL	Module	[mm]	**2**		**3**		**4**			**5**			**6**			**8**			**10**
	L_1	[mm]	500	1000	500	1000	506,7	1000	2000	500	1000	2000	500	1000	2000	480	960	1920	1000
	b	[mm]	24	24	29	29	39	39	39	49	49	49	59	59	59	79	79	79	99
	d_1	[mm]	7	7	10	10	10	10	10	14	14	14	18	18	18	22	22	22	33
	d_2	[mm]	11	11	15	15	15	15	15	20	20	20	26	26	26	33	33	33	48
	f	[mm]	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3
	h	[mm]	22	22	26	26	35	35	35	34	34	34	43	43	43	71	71	71	89
	h_a	[mm]	24	24	29	29	39	39	39	39	39	39	49	49	49	79	79	79	99
	Weight	[kg]	2,1	4,2	2,9	5,9	5,4	10,7	21,4	6,5	13,0	26,0	9,9	19,8	36,2	21,0	42,5	85,0	68,7

WITH BORES	a	[mm]	62,5	62,5	62,5	62,5	62,5	62,5	62,5	62,5	62,5	62,5	62,5	62,5	62,5	60,0	60,0	60,0	62,5
	a_1	[mm]	31,7	31,7	35,0	35,0	33,3	33,3	33,3	37,5	37,5	37,5	37,5	37,5	37,5	120,0	120,0	120,0	125
	d_3	[mm]	5,7	5,7	7,7	7,7	7,7	7,7	7,7	11,7	11,7	11,7	15,7	15,7	15,7	19,7	19,7	19,7	19,7
	h_1	[mm]	8	8	9	9	12	12	12	12	12	12	16	16	16	25	25	25	32
	L_2	[mm]	8,5	8,5	10,3	10,3	13,8	13,8	13,8	17,4	17,4	17,4	20,9	20,9	20,9	28,0	28,0	28,0	35,1
	L_3	[mm]	125	125	125	125	125	125	125	125	125	125	125	125	125	120	120	120	125
	L_4	[mm]	436,6	936,6	430,0	930,0	433,0	933,4	1933,0	425,0	925,0	1925,0	425,0	925,0	1925,0	240,0	720,0	1680,0	750
	t	[mm]	7	7	9	9	9	9	9	13	13	13	17	17	17	21	21	21	32

RACK & ACCESSORIES
STRAIGHT MASTER GEARS

TECHNICAL DATA & DIMENSIONS



- » Teeth direction: straight
- » Material: 16MnCr5 - 1.7131
- » Finishing process: grinded
- » Toothing quality: 6e25
- » Teeth hardness: 60HRC (induction hardened)
- » Pressure angle: 20°

Module	[mm]	2							
Teeth	[1]	**18**	**20**	**22**	**25**	**28**	**30**	**32**	**36**
T_{MAX}	[Nm]	138	153	168	197	222	238	254	266
d_o	[mm]	36	40	44	50	56	60	64	72
d_bH7	[mm]	14	14	14	14	14	16	16	16
b_1	[mm]	25	25	25	25	25	25	25	25
d_n	[mm]	30	30	36	44	50	54	55	65
l	[mm]	47	47	47	53	53	53	53	53
Art.-No.		WM-117020018	WM-117020020	WM-117020022	WM-117020025	WM-117020028	WM-117020030	WM-117020032	WM-117020036

Module	[mm]	3							
Teeth	[1]	**18**	**20**	**22**	**25**	**28**	**30**	**32**	**36**
T_{MAX}	[Nm]	388	444	489	557	624	668	712	800
d_o	[mm]	54	60	66	75	84	90	96	108
d_bH7	[mm]	18	18	18	18	18	24	24	24
b_1	[mm]	30	30	30	30	30	30	30	30
d_n	[mm]	45	48	55	62	68	68	68	68
l	[mm]	52	52	52	58	58	58	58	58
Art.-No.		WM-117030018	WM-117030020	WM-117030022	WM-117030025	WM-117030028	WM-117030030	WM-117030032	WM-117030036

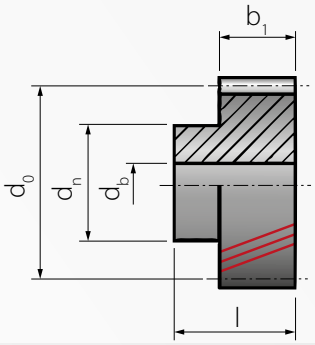
Module	[mm]	4							
Teeth	[1]	**18**	**20**	**22**	**25**	**28**	**30**	**32**	**36**
T_{MAX}	[Nm]	960	1078	1187	1348	1514	1627	1736	1950
d_o	[mm]	72	80	88	100	112	120	125	144
d_bH7	[mm]	24	24	24	24	24	30	30	30
b_1	[mm]	40	40	40	40	40	40	40	40
d_n	[mm]	62	62	68	80	80	80	110	110
l	[mm]	73	73	73	74	74	74	74	74
Art.-No.		WM-117040018	WM-117040020	WM-117040022	WM-117040025	WM-117040028	WM-117040030	WM-117040032	WM-117040036

Module	[mm]	5							
Teeth	[1]	**18**	**20**	**22**	**25**	**28**	**30**	**32**	**36**
T_{MAX}	[Nm]	1887	2128	2344	2669	3000	3216	3430	3856
d_o	[mm]	90	100	110	125	140	150	160	180
d_bH7	[mm]	24	24	18	18	22	24	24	24
b_1	[mm]	50	50	50	50	50	50	50	50
d_n	[mm]	70	80	90	110	110	110	110	110
l	[mm]	91	91	91	101	101	101	101	101
Art.-No.		WM-117050018	WM-117050020	WM-117050022	WM-117050025	WM-117050028	WM-117050030	WM-117050032	WM-117050036

Module	[mm]	6						
Teeth	[1]	**18**	**20**	**22**	**25**	**28**	**30**	**32**
T_{MAX}	[Nm]	3147	3538	4043	4607	5165	5535	5901
d_o	[mm]	108	120	132	150	168	180	192
d_bH7	[mm]	30	25	30	25	25	25	30
b_1	[mm]	60	60	60	60	60	60	60
d_n	[mm]	80	100	110	130	130	140	160
l	[mm]	140	140	140	140	140	140	140
Art.-No.		WM-117060018	WM-117060020	WM-117060022	WM-117060025	WM-117060028	WM-117060030	WM-117060032

HELICAL MASTER GEARS

TECHNICAL DATA & DIMENSIONS



- » Teeth direction: Left hand
- » Material: 16MnCr5 - 1.7131
- » Finishing process: grinded
- » Toothing quality: 6e25
- » Teeth hardness: 60HRC (induction hardened)
- » Pressure angle: 20°
- » Helix angle: 19°31‘42“

Module	[mm]	2							
Teeth	[1]	**18**	**20**	**22**	**25**	**28**	**30**	**32**	**36**
T_{MAX}	[Nm]	179	198	217	253	283	303	321	361
d_o	[mm]	38,2	42,44	46,69	53,05	59,42	63,66	67,91	76,39
d_bH7	[mm]	14	14	14	14	14	16	16	16
b_1	[mm]	25	25	25	25	25	25	25	25
d_n	[mm]	30	30	36	44	50	54	55	65
l	[mm]	47	47	47	53	53	53	53	53
Art.-No.		WM-127020018	WM-127020019	WM-127020020	WM-127020021	WM-127020022	WM-127020023	WM-127020024	WM-127020025

Module	[mm]	3							
Teeth	[1]	**18**	**20**	**22**	**25**	**28**	**30**	**32**	**36**
T_{MAX}	[Nm]	523	583	643	732	820	879	937	1053
d_o	[mm]	57,3	63,66	70,03	79,58	89,13	95,49	101,86	114,59
d_bH7	[mm]	18	18	18	18	18	24	24	24
b_1	[mm]	30	30	30	30	30	30	30	30
d_n	[mm]	45	48	55	62	68	68	68	68
l	[mm]	52	52	52	58	58	58	58	58
Art.-No.		WM-127030018	WM-127030020	WM-127030022	WM-127030025	WM-127030028	WM-127030030	WM-127030032	WM-127030036

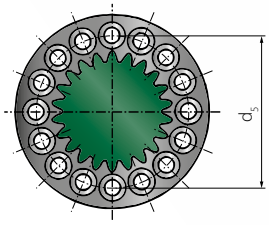
Module	[mm]	4							
Teeth	[1]	**18**	**20**	**22**	**25**	**28**	**30**	**32**	**36**
T_{MAX}	[Nm]	1258	1405	1550	1767	1984	2131	2276	2563
d_o	[mm]	76,39	84,88	93,37	106,1	118,84	127,32	135,81	152,79
d_bH7	[mm]	24	24	24	24	24	30	30	30
b_1	[mm]	40	40	40	40	40	40	40	40
d_n	[mm]	62	62	68	80	80	80	110	110
l	[mm]	73	73	73	74	74	74	74	74
Art.-No		WM-127040018	WM-127040020	WM-127040022	WM-127040025	WM-127040028	WM-127040030	WM-127040032	WM-127040036

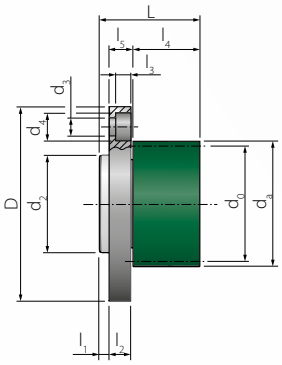
Module	[mm]	5							
Teeth	[1]	**18**	**20**	**22**	**25**	**28**	**30**	**32**	**36**
T_{MAX}	[Nm]	2472	2759	3044	3471	3903	4188	4472	5039
d_o	[mm]	95,49	106,10	116,71	132,63	148,54	159,16	169,77	190,99
d_bH7	[mm]	24	24	18	18	22	24	24	24
b_1	[mm]	50	50	50	50	50	50	50	50
d_n	[mm]	70	80	90	110	110	110	110	110
l	[mm]	91	91	91	101	101	101	101	101
Art.-No.		WM-127050018	WM-127050020	WM-127050022	WM-127050025	WM-127050028	WM-127050030	WM-127050032	WM-127050036

Module	[mm]	6						
Teeth	[1]	**18**	**20**	**22**	**25**	**28**	**30**	**32**
T_{MAX}	[Nm]	4182	4652	5128	5962	6695	7182	7833
d_o	[mm]	114,59	127,3	140,06	159,2	178,3	191	203,71
d_bH7	[mm]	30	25	30	25	25	25	30
b_1	[mm]	60	60	60	60	60	60	60
d_n	[mm]	80	100	110	130	130	140	170
l	[mm]	140	140	140	140	140	140	140
Art.-No.		WM-127060018	WM-127060020	WM-127060022	WM-127060025	WM-127060028	WM-127060030	WM-127060032

RACK & ACCESSORIES
FLANGE PINION

TECHNICAL DATA & DIMENSIONS





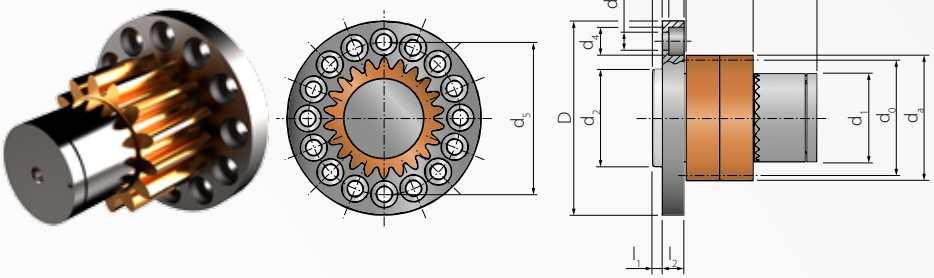
- » Material 16MnCr5 - 1.7131
- » Toothing quality 6e25
- » Teeth hardness 58 $^{+4}$HRC (case-hardened)
- » Pressure angle 20°

straight teeth							
Module	[mm]	**2**	**3**	**3**	**4**	**4**	**5**
Teeth	[1]	22	15	19	14	20	15
T_{MAX}	[Nm]	168	222	418	439	1078	1113
D	[mm]	80	80	100	100	160	160
d_2	[mm]	46	46	60	58	82	80
d_3	[mm]	40	40	50	50	80	80
d_4	[mm]	6,6	6,6	9	9	11	11
d_5	[mm]	11	11	15	15	18	18
d_a	[mm]	63 (16x22,5°)	63 (16x22,5°)	80 (12x30°)	80 (12x30°)	125 (12x30°)	125 (12x30°)
d_w	[mm]	50	52	66	66	90	90
L	[mm]	40	45	58	58	65	75
l_1	[mm]	4	4	6	6	6	6
l_2	[mm]	10	10	13	13	20	20
l_3	[mm]	6,4	6,4	8,6	8,6	10,6	10,6
l_4	[mm]	25	30	30	40	40	50
l_5	[mm]	15	15	18	18	25	25
Art.-No.		WM-112-120-022	WM-112-130-015	WM-112-230-019	WM-112-240-014	WM-112-340-020	WM-112-350-015

helical teeth - 19°31‘42“ left hand							
Module	[mm]	**2**	**3**	**3**	**4**	**4**	**5**
Teeth	[1]	22	14	18	13	19	14
T_{MAX}	[Nm]	220	380	521	787	1127	1770
D	[mm]	80	80	100	100	160	160
d_2	[mm]	48	46	60	58	82	80
d_3	[mm]	40	40	50	50	80	80
d_4	[mm]	6,6	6,6	9	9	11	11
d_5	[mm]	11	11	15	15	18	18
d_a	[mm]	63 (16x22,5°)	63 (16x22,5°)	80 (12x30°)	80 (12x30°)	125 (12x30°)	125 (12x30°)
d_w	[mm]	52	52	66	66	90	90
L	[mm]	40	45	58	58	65	75
l_1	[mm]	4	4	6	6	6	6
l_2	[mm]	10	10	13	13	20	20
l_3	[mm]	6,4	6,4	8,6	8,6	10,6	10,6
l_4	[mm]	25	30	30	40	40	50
l_5	[mm]	15	15	18	18	25	25
Art.-No.		WM-122-120-022	WM-122-130-014	WM-122-230-018	WM-122-240-013	WM-122-340-019	WM-122-350-014

PRELOAD PINION

TECHNICAL DATA & DIMENSIONS

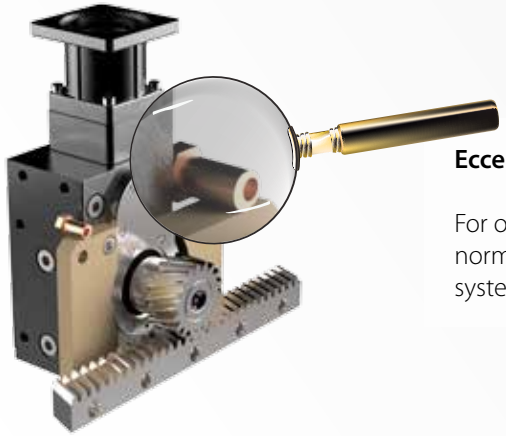


- » Material 16MnCr5 - 1.7131
- » Toothing quality 6e25
- » Teeth hardness 58 $^{+4}$HRC (case-hardened)
- » Pressure angle 20°

straight teeth					
Module	[mm]	**2**	**3**	**4**	**5**
Teeth	[1]	22	15	14	15
T_{MAX} with preload	[Nm]	46	55	119	312
T_{MAX} without preload	[Nm]	92	109	237	623
v_{MAX}	[min^{-1}]	1071	1071	865	643
D	[mm]	80	80	100	160
d_1	[mm]	36	36	45	65
d_2	[mm]	40	40	50	80
d_3	[mm]	6,6	6,6	9	11
d_4	[mm]	11	11	15	18
d_5	[mm]	63 (16x22,5°)	63 (16x22,5°)	80 (12x30°)	125 (12x30°)
d_a	[mm]	50	52	66	90
d_w	[mm]	46	46	58	80
L	[mm]	63	68	96	113
l_1	[mm]	4	4	6	6
l_2	[mm]	10	10	13	20
l_3	[mm]	6,4	6,4	8,6	10,6
l_4	[mm]	25	30	40	50
l_5	[mm]	15	15	18	25
l_6	[mm]	23	23	38	38
Art.-No.		WM-113-020-122	WM-113-030-115	WM-113-040-114	WM-113-050-115

helical teeth - 19°31‘42“ left hand					
Module	[mm]	**2**	**3**	**4**	**5**
Teeth	[1]	22	14	13	14
T_{MAX} with preload	[Nm]	66	74	153	297
T_{MAX} without preload	[Nm]	132	147	305	594
v_{MAX}	[min^{-1}]	1071	1071	865	643
D	[mm]	80	80	100	160
d_1	[mm]	36	36	45	65
d_2	[mm]	40	40	50	80
d_3	[mm]	6,6	6,6	9	11
d_4	[mm]	11	11	15	18
d_5	[mm]	63 (16x22,5°)	63 (16x22,5°)	80 (12x30°)	125 (12x30°)
d_a	[mm]	52	52	66	90
d_w	[mm]	48	46	58	80
L	[mm]	63	68	96	113
l_1	[mm]	4	4	6	6
l_2	[mm]	10	10	13	20
l_3	[mm]	6,4	6,4	8,6	10,6
l_4	[mm]	25	30	40	50
l_5	[mm]	15	15	18	25
l_6	[mm]	23	23	38	38
Art.-No.		WM-123-020-122	WM-123-030-114	WM-123-040-113	WM-123-050-114

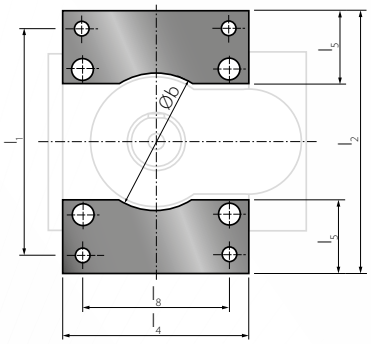
RACK & ACCESSORIES
MOUNTING PARTS

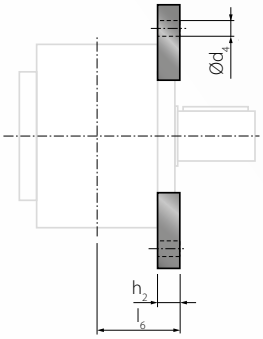


Eccentric bush

For optimal adjustment of the normal backlash of your gear system.

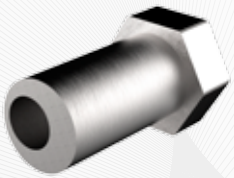
UNIVERSAL MOUNTING FEET FOR KS-TWINGEAR

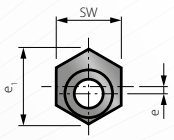


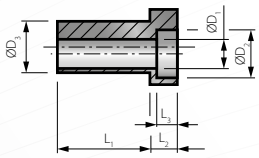


			KS10	KS20	KS30	KS35	KS40	KS50	KS60	KS70
MOUNTING FEET	Øb	[mm]	108	135	165	205	235	275	350	440
	$Ød_4$	[mm]	9	11	14	18	18	18	22	22
	h2	[mm]	54,4	65	75	95	115	135	150	170
	l1	[mm]	146	178	215	265	295	335	430	520
	l2	[mm]	168	208	250	310	345	385	480	580
	l4	[mm]	110	140	170	210	240	280	360	450
	l5	[mm]	50	60	70	90	100	100	125	140
	l6	[mm]	17	20	20	25	30	30	30	30
	l8	[mm]	88	110	134	170	190	220	280	350
	l10	[mm]	9,5	11,5	14	18	18	18	23	23
	Art.-No.		1510BL0102	1520BL0103	1530BL0104	1535BL0105	1540BL0106	1550BL0107	1560BL0108	1570BL0109

ECCENTRIC BUSH







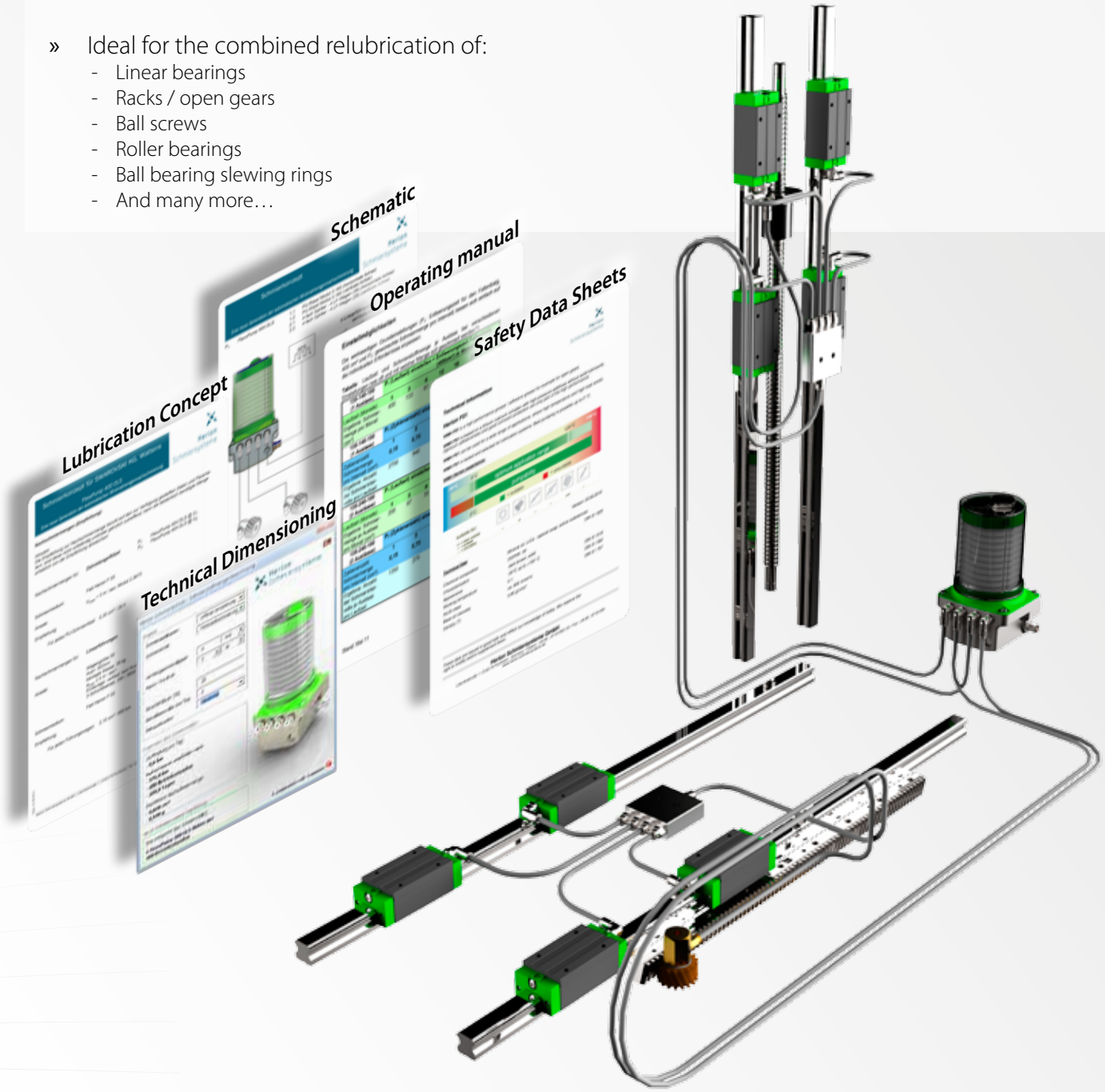
			M6	M8	M10
ECCENTRIC BUSH	D_1	[mm]	6,2	8,5	10,5
	D_2	[mm]	11	14	17
	D_3	[mm]	11	15	18
	e	[mm]	1	2	2
	e_1	[mm]	17,3	22	25,4
	L_1	[mm]	22	27	32
	L_2	[mm]	6	8	20
	L_3	[mm]	4	6	8
	SW	[mm]	15	19	22
	Art.-No.		GW-00200	GW-00210	GW-00220

LUBRICATION SYSTEM

CONTROLLED MINIMUM QUANTITY LUBRICATION FOR AXLE SYSTEMS

- Automatic, impulse-controlled relubrication transducer
- Direct control and error message via PLC
- Compact piston lubrication pump (1-2 pump elements)
- 1-4 outlets, max. 16 lubrication points
- 2 different lubrication quantities & times
- Discharge pressure max. 70 bar
- 400 cm^3 lubricant reserve in hard cartridge
- Low weight and minimal power consumption
- Greases up to NLGI class 3
- Food-grade greases
- Clean room greases

- Ideal for the combined relubrication of:
  - Linear bearings
  - Racks / open gears
  - Ball screws
  - Roller bearings
  - Ball bearing slewing rings
  - And many more…

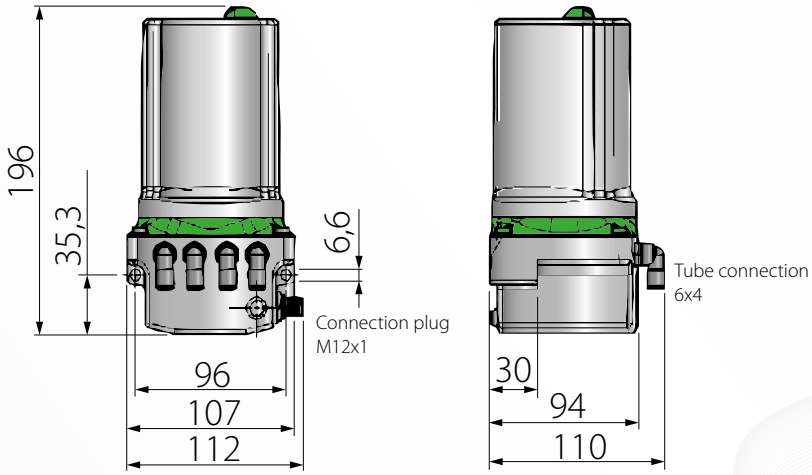


LUBRICATION SYSTEM
FLEXXPUMP

HIGHLIGHTS

- Weight (excluding lubricant) 1120g
- Lubricant volume 400 cm3 (in bellows)
- Dosing volume per stroke 1 x 0,15cm3
- Operating pressure max. 70 bar
- Lubrication medium greases to NLGI 3
- Operating temperature -25°C….+70°C
- Outlets max. 4, each 90° rotatable
- Connection PA-tube, T=6 x 4
- Operating voltage 24V DC (via cabel)
- Connection plug M12 x 1, 4-pole
- Power consumption (24V DC) Imax < 350mA
- Error message vacant / counter-pressure / internal error
- Protection class IP 65
- Material zinc, polyamide

DIMENSIONS



TECHNICAL DATA

	Type	Number of outlets	Pump elements	No. of lubrication points	Art.-No.
LUBRICATION PUMP	401DLS	1	1	max. 4	HE-135-140-210
	402DLS	2	1	max. 8	HE-135-240-210
	422DLS	2 (1+1)	2	max. 8	HE-135-240-212
	403DLS	3 (2+1)	2	max. 12	HE-135-340-210
	404DLS	4 (2+2)	2	max. 16	HE-135-440-210

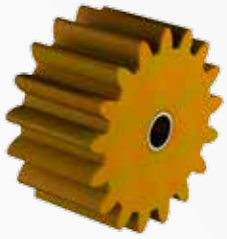
SERVICE

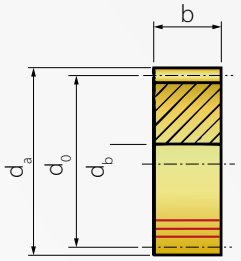
- For operating manual, see www.graessner.com
- 3D files on request

LUBRICATION PINION

LUBRICATION SPUR GEAR WITH STRAIGHT TEETH

Material: open cellular polyurethane foam
Helix angle: straight teeth

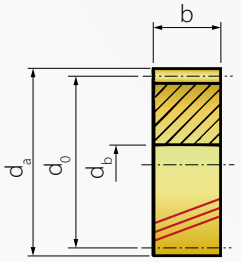




	Module	z	d_0	d_a	d_b	b	Art.-No.
LUBRICATION PINION, STRAIGHT	1,5	24	36,0	39,0	15	15	HE-130-015-024
	2	17	34,0	38,0	12	20	HE-130-020-017
	3	17	51,0	57,0	12	30	HE-130-030-017
	4	17	68,0	76,0	12	40	HE-130-040-017
	5	17	85,0	95,0	20	50	HE-130-050-017
	6	17	102,0	114,0	20	60	HE-130-060-017
	8	17	136,0	152,0	20	80	HE-130-080-017

LUBRICATION SPUR GEAR, HELICAL LEFT

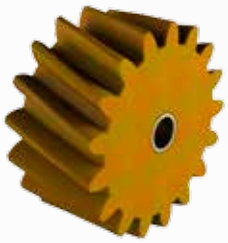
Material: open cellular polyurethane foam
Helix angle: 19°31'42" (left)

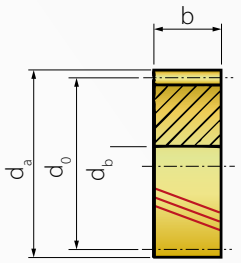


	Module	z	d_0	d_a	d_b	b	Art.-No.
LUBRICATION PINION, HELICAL LEFT	1,5	24	38,2	41,2	15	15	HE-132-015-024
	2	17	36,1	40,1	12	20	HE-132-020-017
	3	17	54,1	60,1	12	30	HE-132-030-017
	4	17	72,2	80,2	12	40	HE-132-040-017
	5	17	90,2	100,2	20	50	HE-132-050-017
	6	17	108,2	120,2	20	60	HE-132-060-017
	8	17	144,3	160,3	20	80	HE-132-080-017

LUBRICATION SPUR GEAR, HELICAL RIGHT

Material: open cellular polyurethane foam
Helix angle: 19°31'42" (right)

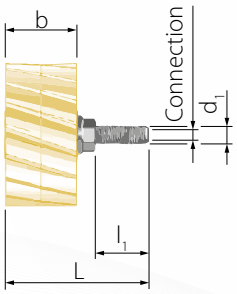




	Module	z	d_0	d_a	d_b	b	Art.-No.
LUBRICATION PINION, HELICAL RIGHT	1,5	24	38,2	41,2	15	15	HE-131-015-024
	2	17	36,1	40,1	12	20	HE-131-020-017
	3	17	54,1	60,1	12	30	HE-131-030-017
	4	17	72,2	80,2	12	40	HE-131-040-017
	5	17	90,2	100,2	20	50	HE-131-050-017
	6	17	108,2	120,2	20	60	HE-131-060-017
	8	17	144,3	160,3	20	80	HE-131-080-017

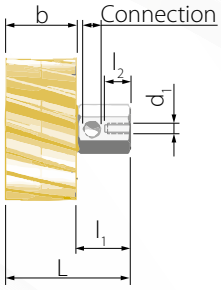
LUBRICATION SYSTEM
AXES & DISTRIBUTORS

MOUNTING AXIS, STRAIGHT



Module	L	l1	l2	d1	b	Port	Art No.
1,5	46,4	30	10	M8	15	G 1/8"	HE-133-015-001
2,0	51,0	30	10	M8	20	G 1/8"	HE-133-020-001
3,0	61,0	30	10	M8	30	G 1/8"	HE-133-030-001
4,0	71,0	30	10	M8	40	G 1/8"	HE-133-040-001
5,0	81,0	30	10	M8	50	G 1/8"	HE-133-050-001
6,0	91,0	30	10	M8	60	G 1/8"	HE-133-060-001
8,0	111,0	30	10	M8	80	G 1/8"	HE-133-080-001
10,0	131,0	30	10	M8	100	G 1/8"	HE-133-100-001

MOUNTING AXIS, RIGHT ANGLE



Module	L	l1	l2	d1	b	Port	Art No.
1,5	46,4	30	10	M8	15	G 1/8"	HE-133-015-001
2	51,0	30	10	M8	20	G 1/8"	HE-133-020-001
3	61,0	30	10	M8	30	G 1/8"	HE-133-030-001
4	71,0	30	10	M8	40	G 1/8"	HE-133-040-001
5	81,0	30	10	M8	50	G 1/8"	HE-133-050-001
6	91,0	30	10	M8	60	G 1/8"	HE-133-060-001
8	111,0	30	10	M8	80	G 1/8"	HE-133-080-001
10	131,0	30	10	M8	100	G 1/8"	HE-133-100-001

SPLITTER

Splitter with 4 outputs

Splitter with 2 outputs

Inputs	Outputs	Tube	Medium	Art.-No.
1	2	ø6	Fett	HE-134-005-002
1	3	ø6	Fett	HE-134-005-003
1	4	ø6	Fett	HE-134-005-004

Comments
- Connection with tube 6x4 as close as possible to Flexx-Pump
- Max. line length 10 m
- Only 1 splitter can be used per output on the Flexx-Pump
- Ensure the smallest possible differences in the line lengths
- The splitters can be used for greases up to NGLI class 2
- Operating temperature range +10 °C to +60 °C

PROGRESSIVE DISTRIBUTOR

Inputs		Outputs		Medium	Art.-Nro
1	ø6	8	ø4	Fett	HE-134-005-002
1	ø6	8	ø6	Fett	HE-200-373-401

TUBE CONNECTOR, STRAIGHT

Material: MS58 nickel-plated, NBR, stainless steel
Max. pressure: 80bar
Temp. range: -30°C bis 100°C

Thread	Tube	Art.-No.
M6 x 1	Ø6	HE-134-000-001
G 1/8"	Ø6	HE-134-000-002
G 1/4"	Ø6	HE-134-000-004
M8 x 1	Ø6	HE-134-000-005
M6 x 0,75	Ø6	HE-134-000-010
M10 x 1	Ø6	HE-134-000-011
M6 x 1	Ø6	HE-134-000-014
M5 x 0,8	Ø6	HE-134-000-015
M6 x 1	Ø4	HE-134-000-006
M3 x 1	Ø4	HE-134-000-007
M6 x 0,75	Ø4	HE-134-000-009
G 1/8"	Ø4	HE-134-000-012
M5 x 0,8	Ø4	HE-134-000-016

TUBE CONNECTOR, RIGHT-ANGLE

Material: MS58 nickel-plated, NBR, stainless steel
operating pressure: max. 80bar (rotated under pressure)
operating temperature: -30°C bis 100°C

Thread	Tube	Art.-No.
M6 x 1	Ø6	HE-134-001-001
G 1/8"	Ø6	HE-134-001-002
M10 x 1	Ø6	HE-134-001-006
G 1/4"	Ø6	HE-134-001-009
M8 x 1	Ø6	HE-134-001-010
M6 x 0,75	Ø6	HE-134-001-012
M5 x 0,8	Ø6	HE-134-001-013
M6 x 1	Ø6	HE-134-001-014
PT 1/8	Ø6	HE-134-001-015
R 1/8	Ø6	HE-134-001-016
M10 x 1	Ø6	HE-134-001-017
M6 x 1	Ø4	HE-134-001-007
M3 x 1	Ø4	HE-134-001-008
M6 x 0,75	Ø4	HE-134-001-011
M5 x 0,8	Ø4	HE-134-001-020

TUBE PLUG-IN CONNECTOR

Type	Inputs	Outputs	Art.-No.
Tube connector, straight	Ø6	Ø6	HE-134-000-004
Tube connector, right-angle	Ø6	Ø6	HE-134-001-004
Reducing connector, straight	Ø6	Ø4	HE-134-000-106
Y-tube connector, straight	Ø6	2x Ø6	HE-134-002-000

TUBES

Material: PA12
Sold in meter: max. 10m (max. 5m bei Ø4x2,5)

Tube	Pre-filled	Art.-No
Ø6x4	grease F01	HE-134-003-001
Ø6x4	grease F02	HE-134-003-002
Ø6x4	grease F03	HE-134-003-003
Ø6x4	not fiilled, empty	HE-134-004-001
Ø4x2,5	grease F03	HE-102-011-013

LUBRICATION SYSTEM
LUBRICATION GREASES

STANDARD GREASE F01

Standard grease for open gears and bearings
Lithium/calcium-complex with extrem-pressure additives without solid lubricants

Operative ranges
» For high loaded open gear drives
» Suitable for high temperatures and extreme loads
» Can also be recommended for ball bearings, roller bearings and slide bearing / bushes
» Operating temperature range -30°C to 150°C

Description	Art.-No.
F01 in hard cartridge 400 cm^3 for Flexx-Pump 400	HE-000-101-105
F01 in 1 kg tin	HE-000-101-210
F01 in standard cartridge for hand press DIN 1284	HE-000-101-220

STANDARD GREASE F02

Grease with H1 approval - food-grade grease
Synthetic special lubrication grease for high specific loads
Has NSF/H1 approval, the current successor to USDA/H1

Quality attributes
» Resistant to cold, hot water and steam
» High oxidation and thermal stability
» For high load, good wear protection
» Optimum high lubrication effect with low friction values
» Operating temperature range -40°C to 140°C

Description	Art.-No.
F02 in hard cartridge 400 cm^3 for Flexx-Pump 400	HE-000-102-105
F02 in 1 kg tin	HE-000-102-210
F02 in standard cartridge for hand press DIN 1284	HE-000-102-220

STANDARD GREASE F03

Special grease for linear guideways & ball screws
Short-fibred, lithium saponified universal grease
Very adhesive, water-resistance and corrosion protection

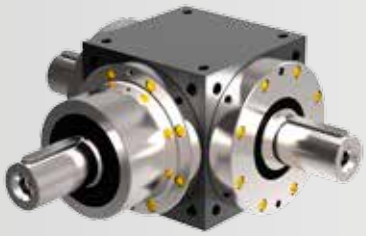
Operative range
» Lubrication of linear bearings, roller guides, ball bearing guides and ball screws
» In combination with a PU lubrication pinion suitable for open gears
» Very conveyable in relubrication units
» Operating temperature range -20°C to 120°C
» For short-stroke applications and for medium to high loads.

Description	Art.-No.
F03 in hard cartridge 400 cm^3 for Flexx-Pump 400	HE-000-103-105
F03 in 1 kg tin	HE-000-103-210
F03 in standard cartridge for hand press DIN 1284	HE-000-103-220

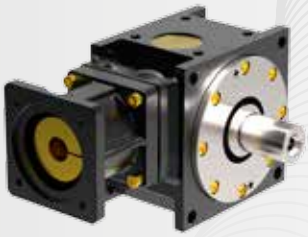
Other greases, such as clean room grease, are available upon request. We look forward to hearing from you!

OUR CORE PRODUCTS AT A GLANCE

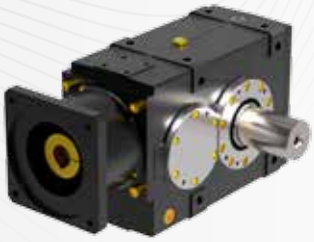
POWERGEAR



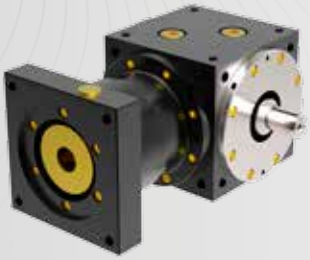
DYNAGEAR



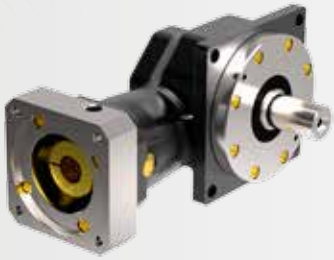
KS-TWINGEAR



POWERGEAR *High Speed*

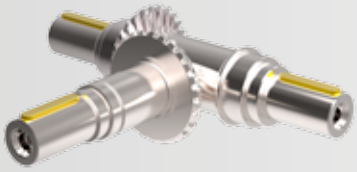


DYNAGEAR *Economy*

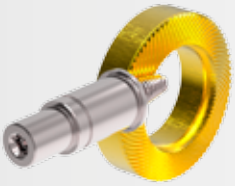


PLANETGEAR

BEVELGEAR *PG*



BEVELGEAR *DG*



DESIGNGEAR

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