Planetary gears GFE

The flexible high-end economy gearbox features impressively high torque.

Our GFE line is available in seven sizes ranging from 50 mm to 220 mm. Ground helical gears ensure a minimum noise level and smooth running. The GFE line stands for economic efficiency and fits perfectly for applications with high torques.

You benefit from:

- Big housing sizes up to 220 mm
- Max. input speed up to 10,000 rpm
- 30,000 h lifetime
- Nominal output torques up to 1,562 Nm
- Protection class IP 65
- Lifetime lubrication

One-piece housing

High gearbox rigidity and absorption of high radial and axial loads.

Full needle bearing

Torques that beat the competition for units of the same size.

Shaft seal for protection class IP 65

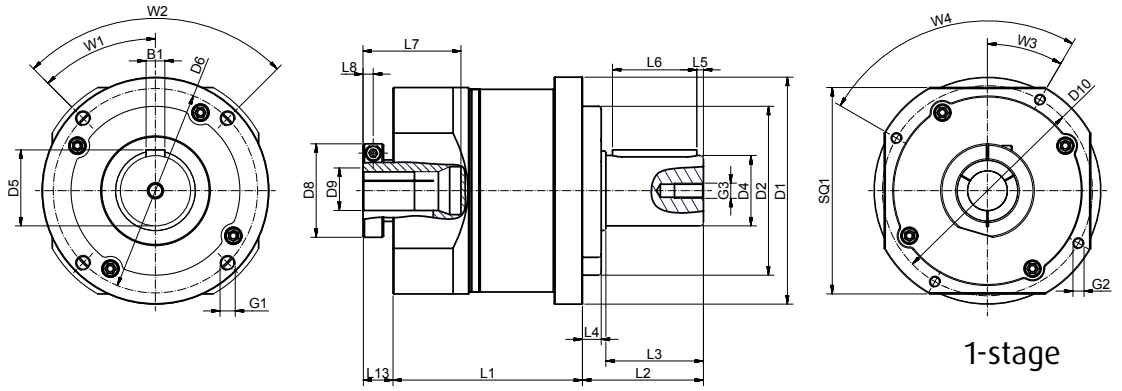
Optimal protection against dust particles and splash water.

Typical application example

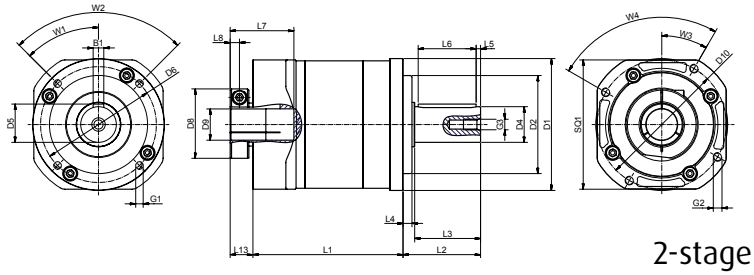
Height adjustment of operating tables

For height adjustment of OP tables, two aspects play an especially decisive role. Use in the direct vicinity of the patient means that high positioning accuracy and smoothness are indispensable. The planetary gears of the GFE line fulfill the noise minimization requirements through precision ground, helical cut gears.

ISO-projection metric



1-stage



2-stage

Planetary gears GFE • Dimensions

			GFE050	GFE070	GFE090	GFE120	GFE145	GFE180	GFE220
Housing diameter	D_1		50	70	93	122	148	205	242
Centering diameter output	D_2	h7	35	50	70	90	110	160	180
Output shaft diameter	D_4	h6	13	16	22	32	40	55	75
Shaft height including feather key	D_5		15	18	24.5	35	43	59	79.5
Hole circle diameter output	D_6		42	60	80	105	130	184	218
Clamping system diameter	D_8		27	40	49	67	80	100	107
Max. motor shaft diameter	D_9	F7	11	19	24	28	38	48	55
Hole circle diameter input	D_{10}		42	60,5	90	120	145	186	224
Housing length 1-stage	L_1		59.5	85	100	132	168.5	173.5	202
Housing length 2-stage	L_1		86	119	140	186	232.5	243	289
Shaft length output	L_2		25	34	44	60	87	106	129
Shaft length from shoulder	L_3		20	28	36	50	74	82	104
Centering depth output	L_4		4	5	6	8	10	20	20
Distance from shaft end	L_5		2.5	4	3	5	5	6	7
Feather key length	L_6		15	20	30	40	65	70	90
Max. input length motor shaft	L_7		21	27.5	42	53	71.5	102	114.5
Distance to center of screw	L_8		4.5	6	7	9	10.5	11	11
Distance clamping ring - housing	L_{13}		11	15.5	17.5	25.5	25.5	32.5	32.5
Square housing	SQ_1		45	62	90	120	145	180	220
Feather key width	B_1	h9	5	5	6	10	12	16	20
Min. mounting thread x depth	G_1	4 x	M4 x 8	M5 x 10	M6 x 12	M8 x 16	M10 x 16	M12 x 22.5	M16 x 31
Min. mounting thread x depth	G_2	4 x	M4 x 7	M5 x 10	M6 x 12	M8 x 16	M10 x 20	M12 x 24	M12 x 24
Min. mounting thread x depth	G_3		M4 x 10	M5 x 13	M6 x 20	M10 x 23	M12 x 27	M14 x 33	M16 x 36
Angle in °	W_1		45	45	45	45	45	45	45
x times angle in °	W_2		4 x 90	4 x 90	4 x 90	4 x 90	4 x 90	4 x 90	4 x 90
Angle in °	W_3		30	30	30	30	30	30	30
x times angle in °	W_4		4 x 90	4 x 90	4 x 90	4 x 90	4 x 90	4 x 90	4 x 90

Find more information regarding flanges and reduction sleeves for all common motor types on pages 48-50.

			GFE050	GFE070	GFE090	GFE120	GFE145	GFE180	GFE220	Stage
Service lifetime*1	tl	h	30000							
Nominal input speed	n_1	rpm	5000	4000	4000	4000	3000	2500	2000	
Max. input speed	n_1 max.	rpm	10000	7000	7000	7000	6000	4000	3000	
Standard backlash	j_t	arcmin	<=7							1
			<=10							2
Noise level*2	Q_g	dB (A)	<=62	<=62	<=65	<=68	<=70	<=70	<=70	
Efficiency	η	%	>=97							1
			>=94							2
Protection class			IP65							
Torsional rigidity	c_t	Nm/arcmin	2.3	5	15	45	69	140	220	
Max. radial force*3	F_{2r}	N	810	1900	3000	6500	9100	11150	35000	
Max. axial force*3	F_{2a}	N	480	590	1900	3250	4900	5575	17500	
Operating temperature	T_B	°C	-25°C - +90°C							
Lubrication			liquid grease (lifetime-lubricated)							
Weight with flange*4	mg	kg	0.63	1.57	3.22	8	16	33	54	1
			0.9	2.24	4.59	11.22	22.5	46.4	75	2
Mounting position			Any							

Output torques			GFE050	GFE070	GFE090	GFE120	GFE145	GFE180	GFE220	Ratio	Stage
Nominal output torque*5	T_{2B}	Nm	19	55	138	295	530	1034	1562	3	1
			17	50	122	262	469	946	1430	4	1
			15	46	114	245	441	1018	1397	5	1
			14	43	108	229	410	869	1298	7	1
			13	41	101	218	392	836	1254	10	1
			19	55	138	295	530	1034	1562	15	2
			17	50	122	262	469	946	1430	20	2
			15	46	114	245	441	919	1397	25	2
			19	55	138	295	530	1034	1562	30	2
			14	43	108	229	410	869	1298	35	2
			17	50	122	262	470	946	1430	40	2
			15	46	114	245	442	919	1397	50	2
			14	44	108	229	410	869	1298	70	2
			13	41	101	218	393	836	1210	100	2
Max. acceleration torque*6	T_{2N}	Nm	34	99	248	531	954	1861	2812	3	1
			30	89	220	471	843	1703	2574	4	1
			28	83	206	442	794	1832	2515	5	1
			26	77	194	412	739	1564	2336	7	1
			24	73	182	392	705	1505	2257	10	1
			34	99	248	531	954	1861	2812	15	2
			30	89	220	471	843	1703	2574	20	2
			28	83	206	442	794	1653	2515	25	2
			34	99	248	531	954	1861	2812	30	2
			26	77	194	412	739	1564	2336	35	2
			30	89	220	471	845	1703	2574	40	2
			28	83	206	442	796	1653	2515	50	2
			26	79	194	412	739	1564	2336	70	2
			24	73	182	392	707	1505	2178	100	2
Emergency stop torque*7	T_{2Not}	Nm	56	165	413	884	1591	3102	4686	3	1
			50	149	366	785	1406	2838	4290	4	1
			46	139	343	736	1323	3053	4191	5	1
			43	129	323	686	1231	2607	3894	7	1
			40	122	304	653	1175	2508	3762	10	1
			56	165	413	884	1591	3102	4686	15	2
			50	149	366	785	1406	2838	4290	20	2
			46	139	343	736	1323	2756	4191	25	2
			56	165	413	884	1591	3102	4686	30	2
			43	129	323	686	1231	2607	3894	35	2
			50	149	366	785	1409	2838	4290	40	2
			46	139	343	736	1327	2756	4191	50	2
			43	132	323	686	1231	2607	3894	70	2
			40	122	304	653	1178	2508	3630	100	2

Mass moment of inertia			GFE050	GFE070	GFE090	GFE120	GFE145	GFE180	GFE220	Ratio	Stage
Mass moment of inertia*8	J_1	kgcm²	0.04	0.14	0.61	3.25	8.75	24.63	50.67	3	1
			0.04	0.11	0.47	2.74	6.84	20.12	46.21	4	1
			0.04	0.11	0.47	2.74	6.84	19.8	45.28	5	1
			0.04	0.11	0.44	2.58	6.78	19.21	43.32	7	1
			0.04	0.11	0.47	2.74	6.84	19.13	42.98	10	1
			0.04	0.14	0.61	3.25	8.75	24.63	50.67	15	2
			0.04	0.13	0.48	2.74	7.16	20.12	46.21	20	2
			0.04	0.11	0.47	2.74	6.84	19.8	45.28	25	2
			0.04	0.14	0.61	3.25	8.75	24.63	50.67	30	2
			0.04	0.11	0.44	2.58	6.78	19.21	43.32	35	2
			0.04	0.11	0.48	2.74	7.16	20.12	46.21	40	2
			0.04	0.11	0.47	2.74	6.84	19.8	45.28	50	2
			0.04	0.11	0.44	2.58	6.78	19.21	43.32	70	2
			0.04	0.11	0.47	2.74	6.84	19.13	42.98	100	2

*1 Load factor K_A=1, n_2=100 rpm ,at room temperature T=20°C in new condition
*2 Sound pressure level at 1 m distance, measured for an input speed of 3000 rpm without load
*3 On the center of the output shaft
*4 Deviation of up to 10 % possible
*5 Service life: 30,000 h, n_2=100 rpm
*6 Max 1000 cycles per hour. Acceleration torque proportion < 5% of the total operation time
*7 Max 1000 cycles over the gear service life
*8 Related to the input shaft