Planetary gears GSD

High-end gearbox with the highest positioning precision for dynamic applications.

Its short design makes the GSD line the ideal high-end gearbox for space restricted applications. The flange output produces highest torsional rigidity. The low standard backlash of the GSD line makes it the perfect fit for highly dynamic applications where highest positioning and speed accuracy is required.

You benefit from:

- Short construction
- Highest torsional rigidity
- High permissible radial and axial forces
- Low backlash, standard as low as <=3 arcmin, optional as low as <= 1 arcmin
- Low noise level
- Protection class IP 65

Output flange for robotics

Short design and stiff connection.

Taper roller bearing

Accommodation of particularly high axial loads, optional for 90 mm diameter or higher.

One-piece output flange / planetary carrier

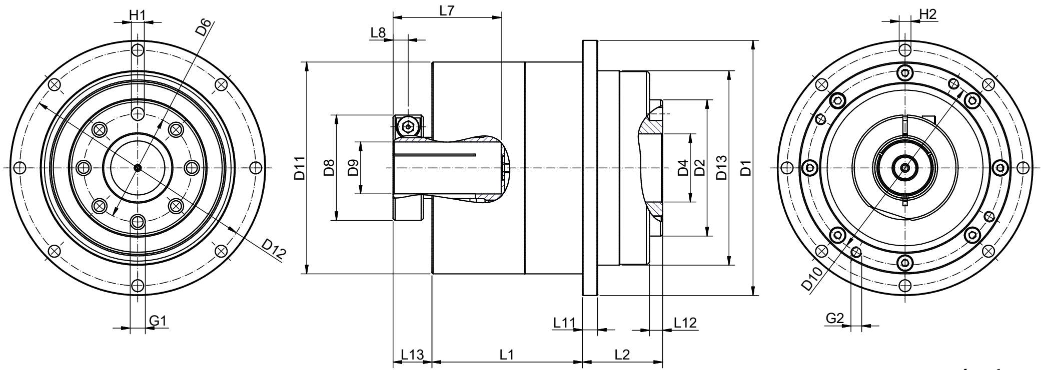
High torsional rigidity and exact positioning precision.

Typical application example

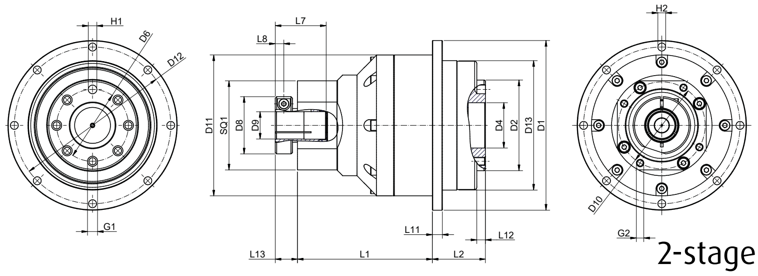
Wheel hub drive for AGVs

Automated guided vehicles (AGV) distribute picked goods in roomy warehouse and trucking company halls. They usually work self-sufficiently. The AGVs are especially productive and economical if they are allowed to reach long travel distances and travel times without requiring repeated recharging of the energy storage units. This places special demands on construction and design. In particular, the vehicles and the installed components in it have to be lightweight and compact. Thanks to high bending rigidity, the high absorption of axial and radial loads and the compact design, the GSD line offers numerous advantages.

ISO-projection metric



1-stage



2-stage

Planetary gears GSD • Dimensions

			Stage	GSD047	GSD064	GSD090	GSD110	GSD140
Housing diameter	D_1			72	86	118	146	179
Outer centering diameter output	D_2	h7		28	40	63	80	100
Inner centering diameter output	D_4	H7		12	20	31.5	40	50
Hole circle diameter output	D_6			20	31.5	50	63	80
Clamping system diameter	D_8		1	27	40	49	67	80
			2	27	29	40	49	67
Input hollow shaft diameter	D_9	F7	1	11	19	24	28	38
			2	11	14	19	24	35
Hole circle diameter input	D_{10}		1	42	60.5	90	120	143
			2	42	42	60.5	90	120
Housing diameter input	D_{11}	h7		59	70	98	125	156
Hole circle diameter (2) output	D_{12}			67	79	109	135	168
Output flange diameter	D_{13}	h7		47	64	90	110	140
Housing length	L_1		1	33.5	46.5	69.5	80.5	103
			2	61.5	68.5	94	125.5	161
Shaft length output	L_2			23.5	24.5	37	37	40
Max. input length motor shaft	L_7		1	27	28	49.5	57	100
			2	21	25.5	27.5	50	57
Distance to center of screw	L_8		1	4.5	6	7	9	10.5
			2	4.5	5	6	7	9
Flange thickness output	L_{11}			4	5	7	8	10
Flange length output	L_{12}			1.5	4	6	6	6
Distance clamping ring - housing	L_{13}		1	10	15.5	18	25.5	25.5
			2	10	11.5	15.5	18	25.5
Square housing	SQ_1			44	44	62	90	120
Min. mounting thread x depth	G_1			4 x M3 x 6.5	7 x M5 x 8	7 x M6 x 12	11 x M6 x 12	11 x M8 x 16
Min. mounting thread x depth	G_2		1	M4 x 8	M5 x 10	M5 x 10	M8 x 16	M8 x 16
			2	M4 x 8	M4 x 8	M5 x 10	M6 x 12	M8 x 16
Hole bore	H_1	H7		3 x 4	5 x 6	6 x 6	6 x 7	8 x 8
Hole bore	H_2			8 x 3.4	8 x 4.5	8 x 5.5	8 x 5.5	12 x 6.6

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

			GSD047	GSD064	GSD090	GSD110	GSD140	Stage
Service lifetime*1	t_L	h	30000					
Nominal input speed	n_1	rpm	5000	4500	4500	4000	3500	
Max. input speed	$n_{1\,max.}$	rpm	10000	10000	8000	8000	6500	
Standard backlash	j_t	arcmin	<= 3 (opt. <=1)					1
			<= 5 (opt. <=3)					2
Noise level*2	Q_g	dB (A)	<= 56	<= 58	<= 60	<= 63	<= 65	
Efficiency	η	%	>= 97					1
			>= 94					2
Protection class			IP65					
Torsional rigidity	c_t	Nm/arcmin	6	14	30	86	155	
Max. radial force (ball bearing)*3	F_{2r}	N	1530	1890	6345	9540	10550	
Max. axial force (ball bearing)*3	F_{2a}	N	1020	1260	4230	6360	7035	
Max. radial force (tapered bearing)*3	F_{2r}	N	-	-	6345	9540	10550	
Max. axial force (tapered bearing)*3	F_{2a}	N	-	-	7330	11500	18600	
Operating temperature	T_B	°C	-25°C - +90°C					
Lubrication			Synthetic grease (lifetime-lubricated)					
Weight with flange*4	m_g	kg	0.7	1.4	4.2	7.4	13.9	1
			1	1.9	4.8	9.4	16.7	2
Mounting position			Any					

Output torques			GSD047	GSD064	GSD090	GSD110	GSD140	Ratio	Stage
Nominal output torque*5	T_{2N}	Nm	23	63	168	352	683	4	1
			21	53	163	350	649	5	1
			20	49	149	324	602	7	1
			17	45	143	309	576	10	1
			23	63	168	352	683	20	2
			21	53	163	350	649	25	2
			20	49	149	324	602	35	2
			23	63	168	352	683	40	2
			21	53	163	350	649	50	2
			20	49	149	324	602	70	2
			17	45	143	309	576	100	2
Max. acceleration torque*6	T_{2B}	Nm	41	113	302	634	1229	4	1
			38	95	293	630	1168	5	1
			36	89	268	583	1084	7	1
			31	81	257	556	1037	10	1
			41	113	302	634	1229	20	2
			38	95	293	630	1168	25	2
			36	88	268	583	1084	35	2
			41	113	302	634	1229	40	2
			38	95	293	630	1168	50	2
			36	88	268	583	1084	70	2
			31	81	257	556	1037	100	2
Emergency stop torque*7	T_{2Not}	Nm	69	189	504	1056	2049	4	1
			63	159	489	1050	1947	5	1
			60	148	447	972	1806	7	1
			51	135	429	927	1728	10	1
			69	189	504	1056	2049	20	2
			63	159	489	1050	1947	25	2
			60	147	447	972	1806	35	2
			69	189	504	1056	2049	40	2
			63	158	489	1050	1947	50	2
			60	147	447	972	1806	70	2
			51	135	429	927	1728	100	2

Mass moment of inertia			GSD047	GSD064	GSD090	GSD110	GSD140	Ratio	Stage
Mass moment of inertia*8	J_1	$kgcm^2$	0.03	0.13	0.47	2.75	7.46	4	1
			0.03	0.12	0.45	2.70	7.41	5	1
			0.03	0.12	0.45	2.64	7.12	7	1
			0.03	0.12	0.43	2.56	7.01	10	1
			0.03	0.03	0.15	0.45	2.7	20	2
			0.03	0.03	0.15	0.45	2.7	25	2
			0.03	0.03	0.15	0.45	2.7	35	2
			0.03	0.03	0.15	0.45	2.7	40	2
			0.03	0.03	0.14	0.40	2.6	50	2
			0.03	0.03	0.14	0.40	2.6	70	2
			0.03	0.03	0.14	0.40	2.6	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