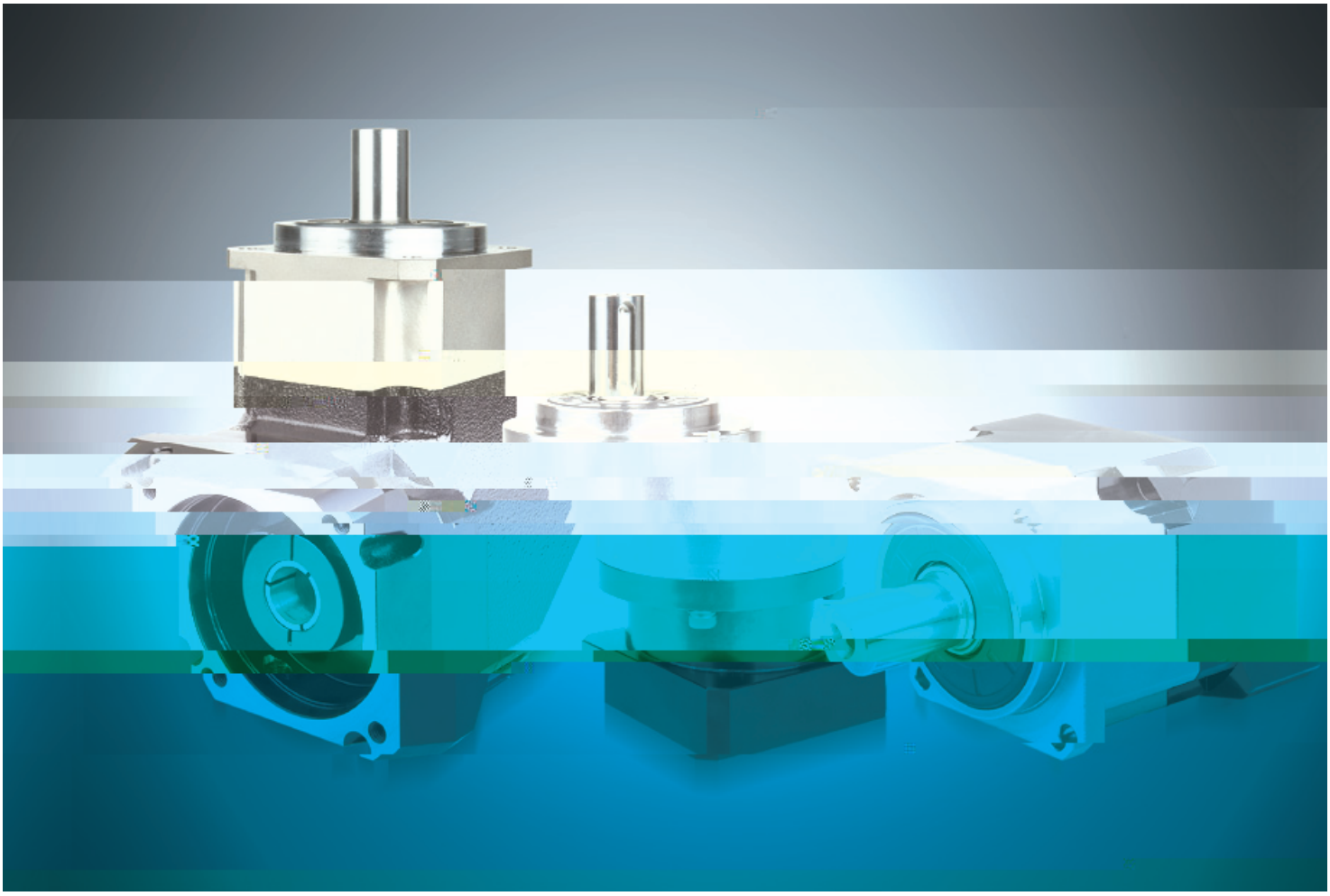
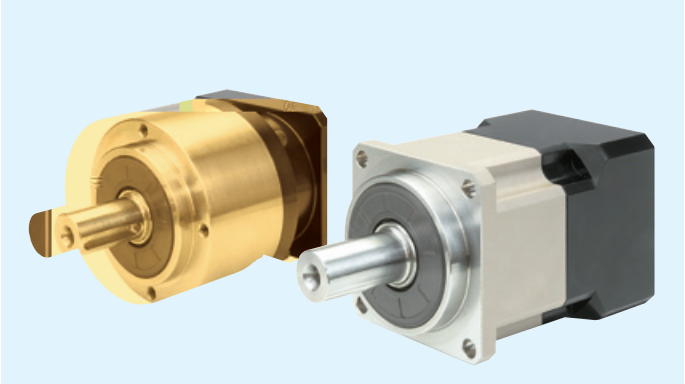


HIGH PRECISION PLANETARY GEARBOXES

DECELERATOR & MOTORS

GTPG MOTOR



Ordering Code 001

GE

- Technical Performance 003
- Dimensions 005

GER

- Technical Performance 007
- Dimensions 009
- 011

Permitted Radial and Axial Loads on Output Shaft of the Gearbox

- Front plate option 012

GB

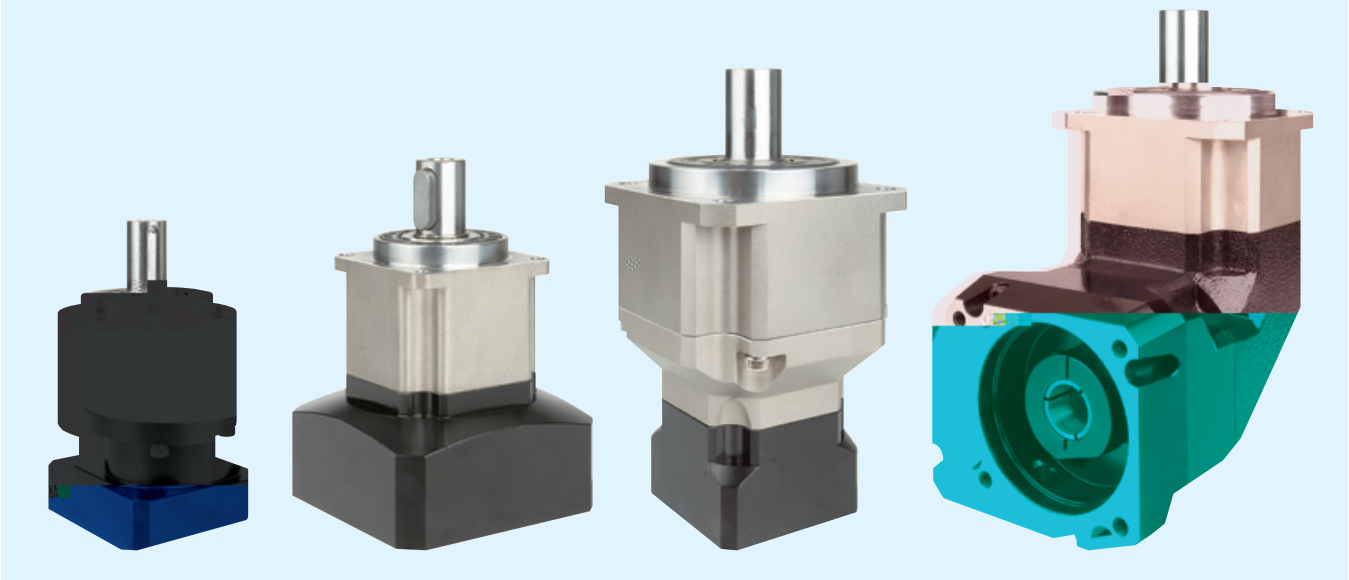
- Technical Performance 014
- Dimensions 016

GBR

- Technical Performance 019
- Dimensions 021
- Selection of the Optimum Gearbox 023
- 024

Permitted Radial and Axial Loads on Output Shaft of the Gearbox

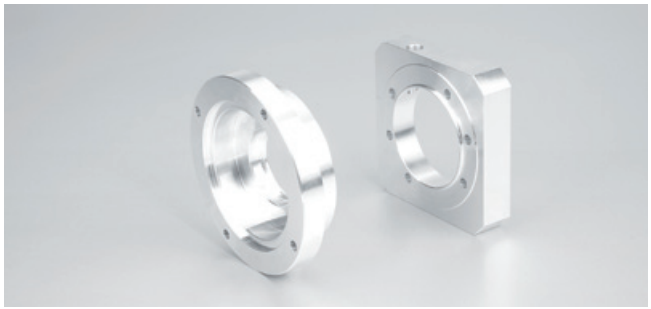
HIGH PRECISION PLANETARY GEARBOXES



Ordering Code

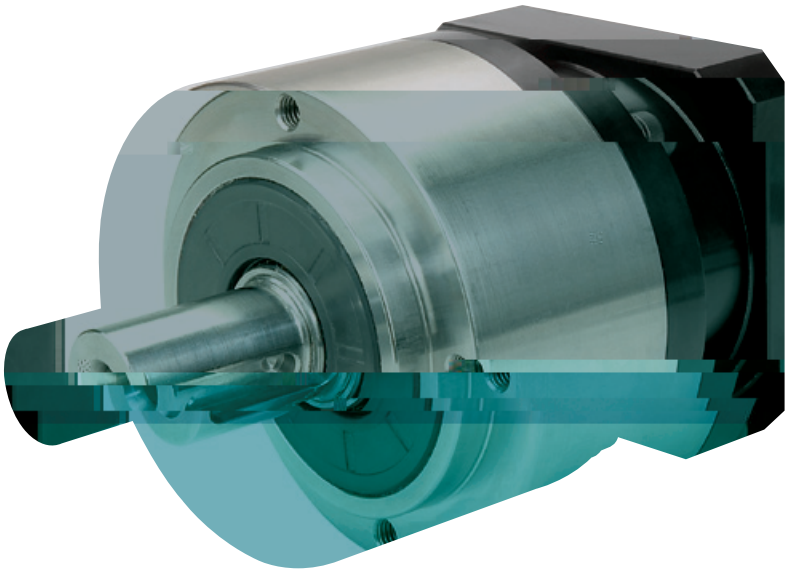
GB | 090 | - | 030 | - | S1 | - | P0

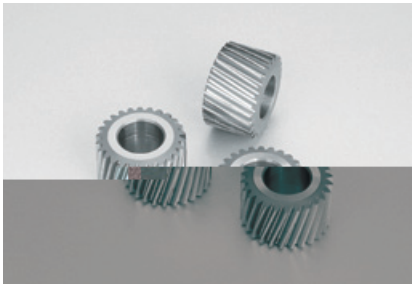
Reducer series code	GB:	GB: High-Precision Square Flange output
	GBR:	GBR: High-Precision Right Angle Square Flange output
	GE:	GE: High-Precision Round Flange output
	GER:	GER: High-Precision Right Angle Round Flange output
Reducer frame output number	050: Φ50mm	050: External diameter Φ50mm
	070: Φ70mm	070: External diameter Φ70mm
	090: Φ90mm	090: External diameter Φ90mm
	120: Φ120mm	120: External diameter Φ120mm
	155: Φ155mm	155: External diameter Φ155mm
	205: Φ205mm	205: External diameter Φ205mm
	235: Φ235mm	235: External diameter Φ235mm
	042: □ 42 × 42mm	042: □ 42 × 42mm
	060: □ 60 × 60mm	060: □ 60 × 60mm
	090: □ 90 × 90mm	090: □ 90 × 90mm
	115: □ 115 × 115mm	115: □ 115 × 115mm
	142: □ 142 × 142mm	142: □ 142 × 142mm
	180: □ 180 × 180mm	180: □ 180 × 180mm
	220: □ 220 × 220mm	220: □ 220 × 220mm
Reduction ratio	030 1/30 Reduction ration 1:30	030: Reduction ration 1:30
Output shaft type	S1:	S1: Smooth output shaft
	S2:	S2: Output shaft with key
Reducer backlash	P0:	P0: Micro backlash
	P1:	P1: Reduced backlash
	P2:	P2: Standard backlash

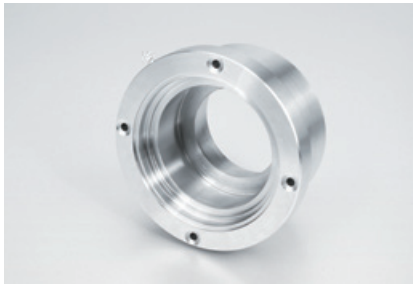


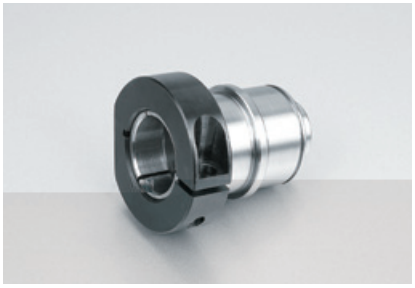
One piece planet carrier with extended bearing design. Provides maximum radial load capacity and increases system reliability and stiffness. Using the complete process in one time, Improve the whole planet carrier output shaft and high precision, high rigidity.

Unique motor connection plate modular design, by transforming the connection plate is applicable to any type of servo motor fast connection. Adopts aviation aluminum alloy material and the anti oxidation treatment, improve the environment of the resistance and abrasion resistance.









Using computer to optimize the design of the helical gear, and uses the hard tooth face hobbing machining, enhance the capacity of gear impact, reducing gear noise, improve the service life of gear.

Gear box and the inner gear adopts the integration of design and manufacturing, is made of high qualified steel box, by hot forging process, has a higher strength, rigidity and toughness, make internal tooth, further improve the precision and intensity.

Input terminal connected to the motor of the collet type locking mechanism, and the dynamic balance analysis, to ensure that under the high input speed joint concentricity and zero back lash power transmission.

GE GE HIGH PRECISION PLANETARY GEARBOXES

Technical Performance

Item	Number of stage	Reduction ratio	GE050	GE070	GE090	GE120	GE155	GE205	GE235

Technical Performance

Unit: Kg·cm^2

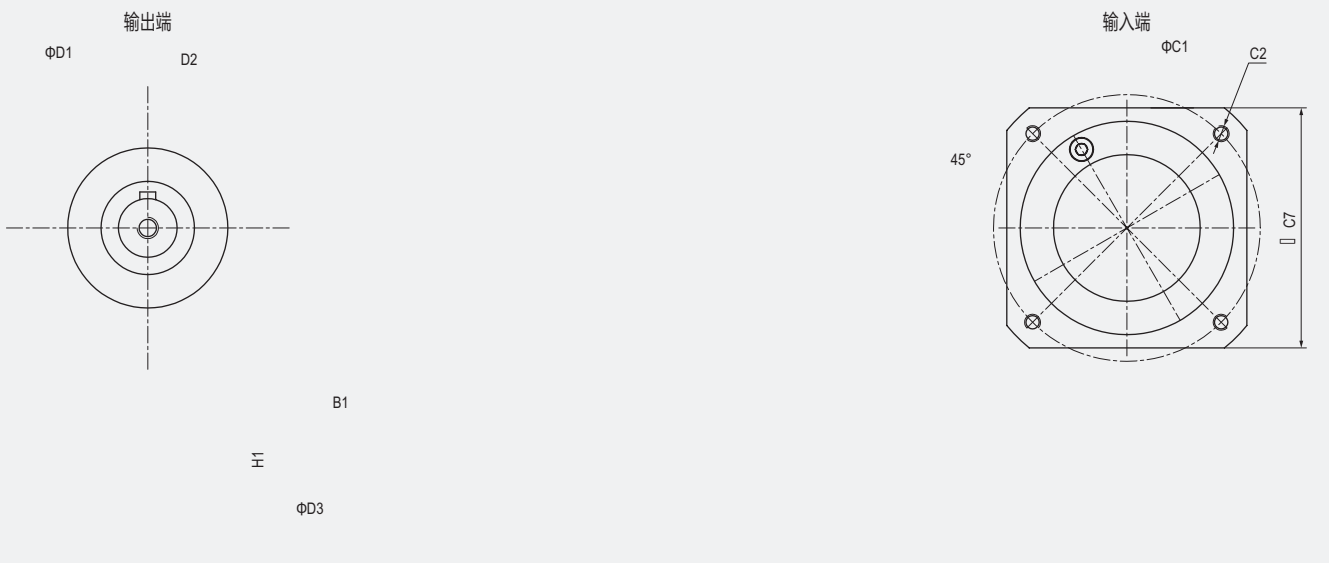
Item	Number of stage	Reduction ratio	GE050	GE070	GE090	GE120	GE155	GE205	GE235
Moment of inertia	1	3	0.03	0.16	0.61	3.25	9.21	28.98	69.91
		4	0.03	0.14	0.48	2.74	7.54	23.67	54.37
		5	0.03	0.13	0.47	2.71	7.42	23.29	53.27
		6	0.03	0.13	0.45	2.65	7.25	22.75	51.72
		7	0.03	0.13	0.45	2.62	7.14	22.48	50.97
		8	0.03	0.13	0.44	2.58	7.07	22.59	50.84
		9	0.03	0.13	0.44	2.57	7.04	22.53	50.63
		10	0.03	0.13	0.44	2.57	7.03	22.51	50.56
	2	15	0.03	0.03	0.13	0.47	2.71	7.42	23.29
		20	0.03	0.03	0.13	0.47	2.71	7.42	23.29
		25	0.03	0.03	0.13	0.47	2.71	7.42	23.29
		30	0.03	0.03	0.13	0.47	2.71	7.42	23.29
		35	0.03	0.03	0.13	0.47	2.71	7.42	23.29
		40	0.03	0.03	0.13	0.47	2.71	7.42	23.29
		45	0.03	0.03	0.13	0.47	2.71	7.42	23.29
		50	0.03	0.03	0.13	0.44	2.57	7.03	22.51
		60	0.03	0.03	0.13	0.44	2.57	7.03	22.51
		70	0.03	0.03	0.13	0.44	2.57	7.03	22.51
		80	0.03	0.03	0.13	0.44	2.57	7.03	22.51
		90	0.03	0.03	0.13	0.44	2.57	7.03	22.51
		100	0.03	0.03	0.13	0.44	2.57	7.03	22.51

1) The moment of inertia is related with input shaft.

Item		Number of stage	GE050	GE070	GE090	GE120	GE155	GE205	GE235
	Ultra-Precision P0	1	≤1	≤1	≤1	≤1	≤1	≤1	≤1
		2	≤3	≤3	≤3	≤3	≤3	≤3	≤3
	recision P1	1	≤3	≤3	≤3	≤3	≤3	≤3	≤3
		2	≤5	≤5	≤5	≤5	≤5	≤5	≤5
	Standard P2	1	≤5	≤5	≤5	≤5	≤5	≤5	≤5
		2	≤7	≤7	≤7	≤7	≤7	≤7	≤7
Torsional stiffness M/arcmin)		1	3	7	14	25	50	145	225
		2	3	7	14	25	50	145	225
Noise(dB)		-	56	58	60	63	65	67	70
speed (rpm)		-	5000	5000	4000				

5

GE GE HIGH PRECISION PLANETARY GEARBOXES(i=3~10)



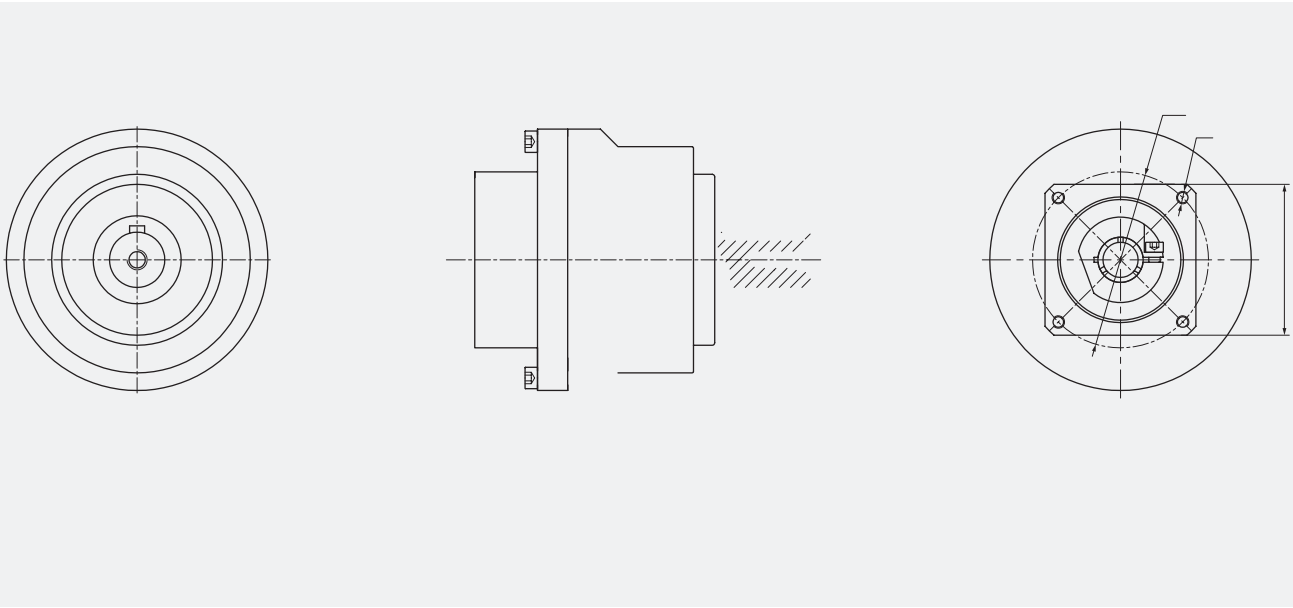
Dimensions

(Unit: mm)

Item		GE050	GE070	GE090	GE120	GE155	GE205	GE235
D1	D1 mounting hole distribution circle	44	62	80	108	140	184	210
D2	D2 mounting screw hole	M4 × 0.7P	M5 × 0.8P	M6 × 1P	M8 × 1.25P	M10 × 1.5P	M12 × 1.75P	M16 × 2P
D3	D3 output shaft diameter	12	16	22	32	40	55	75
D4	D4 spigot diameter	35	52	68	90	120	160	180
D5	D5 output shaft mounting screw	M4 × 0.7P	M5 × 0.8P	M8 × 1.25P	M12 × 1.75P	M16 × 2P	M20 × 2.5P	M20 × 2.5P
D6	D6 body diameter	53	70	104	130	162	205	260
D7	D7 body mounting surface diameter	50	70	90	120	155	205	235
L1	L1 output shaft lenght	24.5	36	46	65	97	100	126
L2	L2 spigot lenght	4	6.5	8.5	12	15	15	18
L3	L3 key lenght	14	25	32	40	63	70	90
L4	L4 key lenght to the shaft end	2	2	3	5	5	6	7
L5	L5 mounting screw depth	8	10	12	16	20	22	28
L6	L6 mounting surface to the front length	47	62	80.5	97	119.5	159	175.5
L7	L7 output shaft center cone	4.5	4.8	7.2	10	12	15	15
L8	L8 depth of center hole	10	12.5	19	28	36	42	42
C1	C1 input terminal mounting hole	46	70	100	130	165	215	235
C2	C2 mounting screw hole	M4 × 0.7P	M5 × 0.8P	M6 × 1P	M8 × 1.25P	M10 × 1.5P	M12 × 1.75P	M12 × 1.75P
C3	C3 input hole diameter	≤ 11	≤ 14/ ≤ 16	≤ 19/ ≤ 24	≤ 32	≤ 38	≤ 48	≤ 55
C4	C4 hole depth of input shaft	30	34	40	50	60	85	116
C5	C5 input end positioning stop diameter	30	50	80	110	130	180	200
C6	C6 input end positioning stop depth	3.5	8	4	5	6	6	6
C7	C7 input flange	48	60	90	115	142	190	220
C8	C8 overall lenght	91	117	143.5	186.5	239	288	364.5
C9	C9 flange two mounting end dimensions	19.5	37	35.5	46	53.5	79.5	106.5
B1	B1 key width	4	5	6	10	12	16	20
H1	H1 key height	14	18	24.5	35	43	59	79.5

C1~C9 C1~C9 are motor specific dimensions (metric std shown).

GE GE HIGH PRECISION PLANETARY GEARBOXES(i=15~100)



Dimensions

(Unit: mm)

Item		GE050	GE070	GE090	GE120	GE155	GE205	GE235
D1	D1 mounting hole distribution circle	44	62	80	108	140	184	210
D2	D2 mounting screw hole	M4 × 0.7P	M5 × 0.8P	M6 × 1P	M8 × 1.25P	M10 × 1.5P	M12 × 1.75P	M16 × 2P
D3	D3 output shaft diameter	12	16	22	32	40	55	75
D4	D4 spigot diameter	35	52	68	90	120	160	180
D5	D5 output shaft mounting screw	M4 × 0.7P	M5 × 0.8P	M8 × 1.25P	M12 × 1.75P	M16 × 2P	M20 × 2.5P	M20 × 2.5P
D6	D6 body diameter	53	70	104	130	162	205	260
D7	D7 body mounting surface diameter	50	70	90	120	155	205	235
L1	L1 output shaft lenght	24.5	36	46	65	97	100	126
L2	L2 spigot lenght	4	6.5	8.5	12	15	15	18
L3	L3 key lenght	14	25	32	40	63	70	90
L4	L4 key lenght to the shaft end	2	2	3	5	5	6	7
L5	L5 mounting screw depth	8	10	12	16	20	22	28
L6	L6 mounting surface to the front length	74	87.5	113.5	138.5	176	214.5	260
L7	L7 output shaft center cone	4.5	4.8	7.2	10	12	15	15
L8	L8 depth of center hole	10	12.5	19	28	36	42	42
C1	C1 input terminal mounting hole	46	46	70	100	130	165	215
C2	C2 mounting screw hole	M4 × 0.7P	M4 × 0.7P	M5 × 0.8P	M6 × 1P	M8 × 1.25P	M10 × 1.5P	M12 × 1.75P
C3	C3 input hole diameter	≤ 11	≤ 11/ ≤ 12	≤ 14/ ≤ 16	≤ 19/ ≤ 24	≤ 32	≤ 38	≤ 48
C4	C4 hole depth of input shaft	30	30	34	40	50	60	85
C5	C5 input end positioning stop diameter	30	30	50	80	110	130	180
C6	C6 input end positioning stop depth	3.5	3.5	8	4	5	6	6
C7	C7 input flange	48	48	60	90	115	142	190
C8	C8 overall lenght	118	143	178.5	225.5	292.5	337	415
C9	C9 flange two mounting end dimensions	19.5	19.5	37	35.5	46	53.5	79.5
B1	B1 key width	4	5	6	10	12	16	20
H1	H1 key height	14	18	24.5	35	43	59	79.5

~C9 C1~C9 are motor specific dimensions (metric std shown).

GER GER HIGH PRECISION PLANETARY GEARBOXES

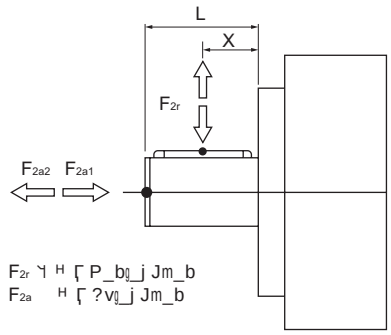
Technical Performance

Item	Number of stage	Reduction ratio	GER050	GER070	GER090	GER120	GER155	GER205	GER235
Rated output torque	1	3	9	36	90	195	342	588	1140
		4	12	48	120	260	520	1040	1680
		5	15	60	150	325	650	1200	2000
		6	18	55	150	310	600	1100	1900
		7	19	50	140	300	550	1100	1800
		8	17	45	120	260	500	1000	1600
		9	14	40	100	230	450	900	1500
		10	14	40	100	230	450	900	1500
		14	-	42	140	300	550	1100	1800
		20	-	40	100	230	450	900	1500
	2	15	14	-	-	-	-	-	-
		20	14	-	-	-	-	-	-
		25	15	60	150	325	650	1200	2000
		30	20	55	150	310	600	1100	1900
		35	19	50	140	300	550	1100	1800
		40	17	45	120	260	500	1000	1600
		45	14	40	100	230	450	900	1500
		50	14	60	100	230	650	1200	2000
		60	20	55	150	310	600	1100	1900
		70	19	50	140	300	550	1100	1800
		80	17	45	120	260	500	1000	1600
		90	14	40	100	230	450	900	1500
		100	14	40	100	230	450	900	1500
		120	-	-	150	310	600	1100	1900
		140	-	-	140	300	550	1100	1800
		160	-	-	120	260	550	1000	1600
		180	-	-	100	230	450	900	1500
		200	-	-	100	230	450	900	1500

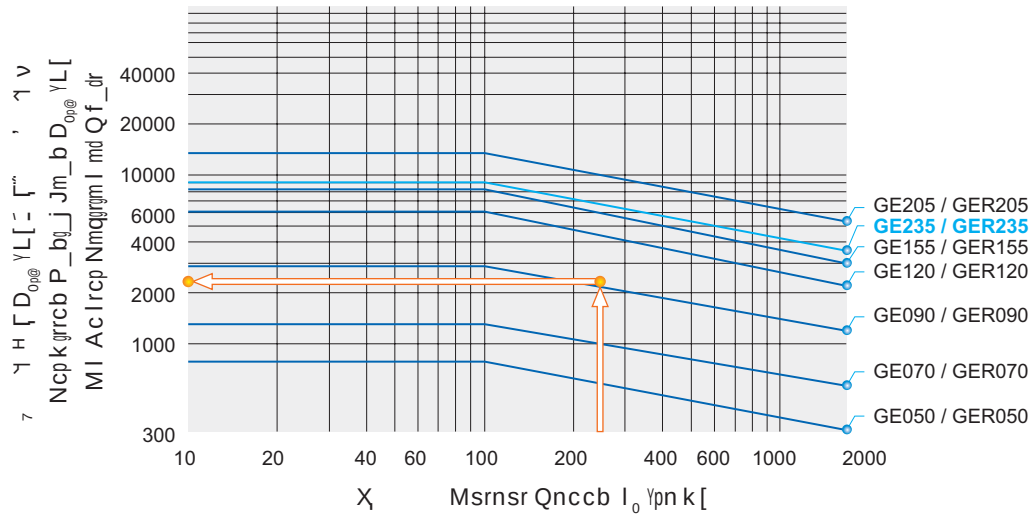
Item	Number of stage	GER050	GER070	GER090	GER120			

Dimensions

Permitted Radial and Axial Loads on Output Shaft of the Gearbox



The permitted radial and axial loads on output shaft of the gearbox depend on the design of the gearbox supporting bearings. GPG use the extension straddle oversized ball bearing design. It can take heavy load from both axes.



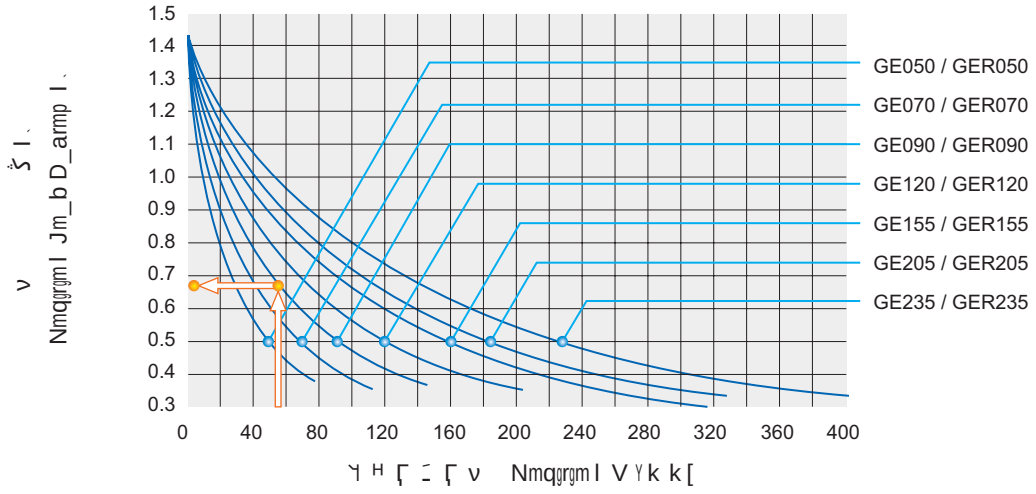
F_{2r}

X=1/2 x L

20000Hr

F_{2rB}

If radial force F_{2r} exert on the center of the output shaft X=1/2 x L. Under various operating condition the lifetime is over 20,000 hours.
The permitted radial load is given on left diagram.



F_{2r}

X<1/2 x L

X>1/2 x L

X

K_b

If radial force F_{2r} not exert on the center of the output shaft X<1/2 x L or X>1/2 x L
The permitted radial and axial load can be calculated by the position load factor K_b on the left diagram.

GB GB HIGH PRECISION PLANETARY GEARBOXES

Technical Performance

Unit: N.M

Item	Number of stage	Reduction ratio	GB042	GB060	GB060A	GB090	GB090A	GB115	GB142	GB180	GB220
Rated output torque	1	3	20	55	-	130	-	208	342	588	1140
		4	19	50	-	140	-	290	542	1050	1700
		5	22	60	-	160	-	330	650	1200	2000
		6	20	55	-	150	-	310	600	1100	1900
		7	19	50	-	140	-	300	550	1100	1800
		8	17	45	-	120	-	260	500	1000	1600
		9	14	40	-	100	-	230	450	900	1500
		10	14	40	-	100	-	230	450	900	1500
	2	15	20	55	55	130	130	208	342	588	1140
		20	19	50	50	140	140	290	542	1050	1700
		25	22	60	60	160	160	330	650	1200	2000
		30	20	55	55	150	150	310	600	1100	1900
		35	19	50	50	140	140	300	550	1100	1800
		40	17	45	45	120	120	260	500	1000	1600
		45	14	40	40	100	100	230	450	900	1500
		50	22	60	60	160	160	330	650	1200	2000
		60	20	55	55	150	150	310	600	1100	1900
		70	19	50	50	140	140	300	550	1100	1800
		80	17	45	45	120	120	260	500	1000	1600
		90	14	40	40	100	100	230	450	900	1500
		100	14	40	40	100	100	230	450	900	1500

1) The torque output of the gear reducer to calibrate the strength of the shaft gear.

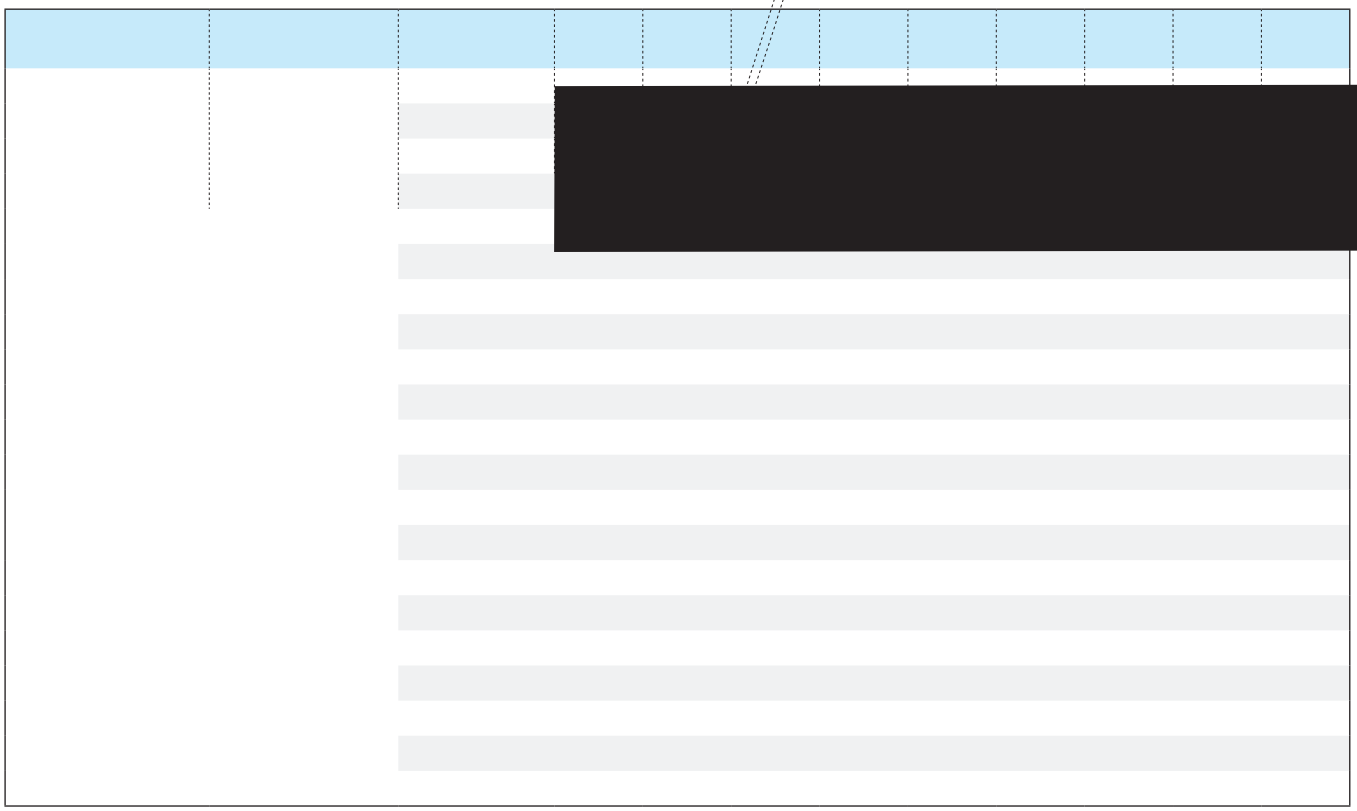
2) Please use the speed reducer matching motor power.

3) 3 Instantaneous emergency stop torque can be greater than 3 times the rated output torque.

Item	Number of stage	GB042	GB060	GB060A	GB090	GB090A	GB115	GB142	GB180	GB220
F_{2rB} Max radial torque (N) [1]	1, 2	780	1530	1530	3250	3250	6700	9400	14500	50000
F_{2a1B} Max axial torque (N) [1]	1, 2	350	630	630	1300	1300	3000	4000	6200	35000
F_{2a2B} Max axial torque (N) [1]	1, 2	390	765	765	1625	1625	3350	4700	7250	25000
Life (Hr)	1, 2	20000	20000	20000	20000	20000	20000	20000	20000	20000
(%) Full load efficiency	1	97								
	2	94								
(kg) Weight	1	0.5	1.3	-	3.7	-	7.8	14.5	29	48
	2	0.8	1.5	1.9	4.1	5.3	9	17.5	33	60
Operating temperature (°C)	1, 2	-10°C~+90°C								
IP	1, 2	IP65								
Lubrication type	1, 2	Lifetime lubrication								
Mounting type	1, 2	Any								

1. 100rpm 1. Applied to the output shaft center @ 100 rpm.

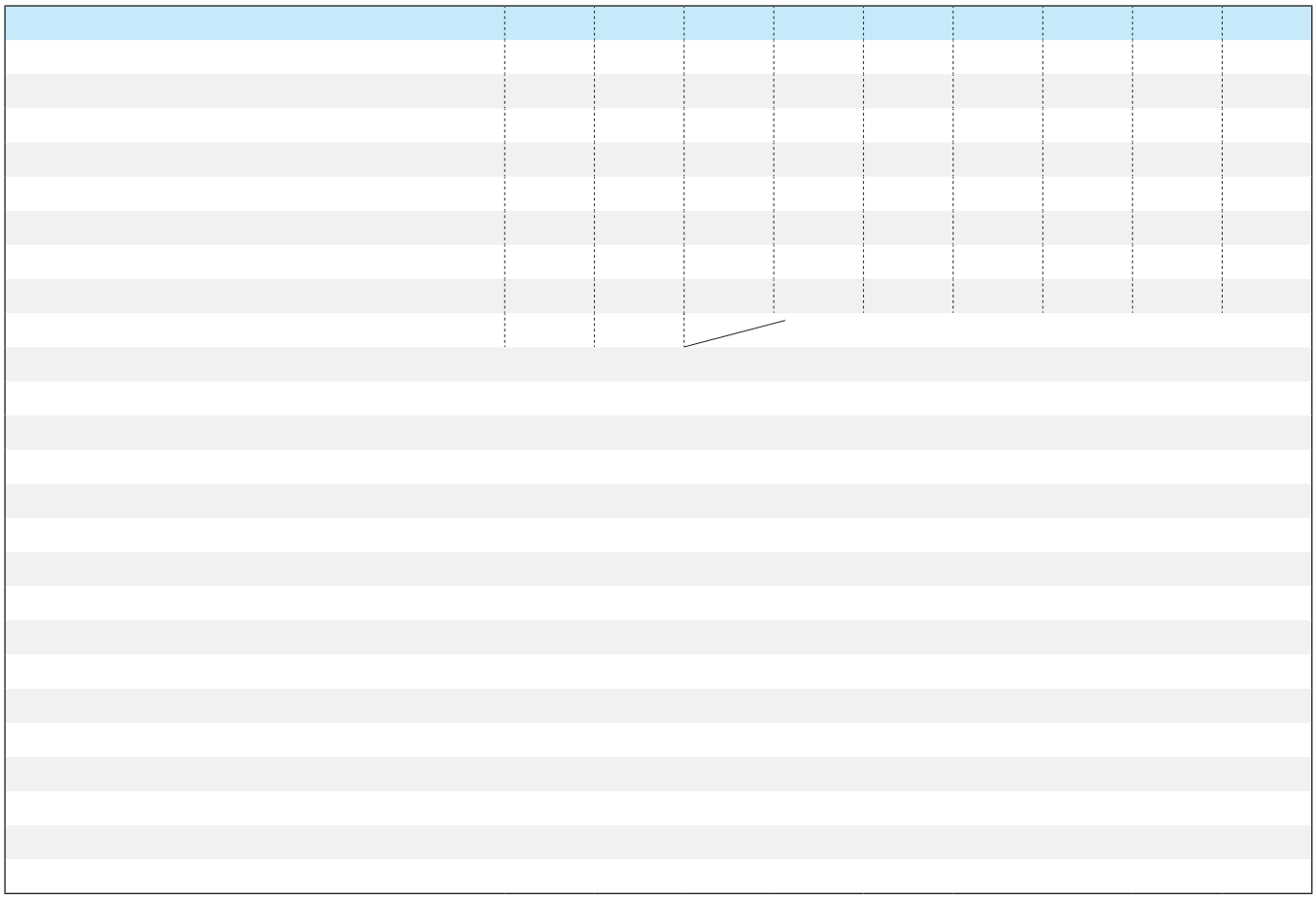
Technical Performance

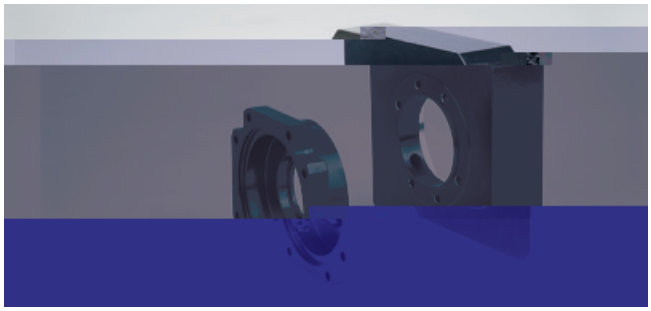


Dimensions

Item		GB042	GB060	GB090	GB115	GB142	GB180	GB220
D1	D1 mounting hole distribution circle	50	70	100	130	165	215	250
D2	D2 mounting screw hole	3.4	5.5	6.6	9	11	13	17
D3	D3 output shaft diameter	13	16	22	32	40	55	75
D4	D4 spigot diameter	35	50	80	110	130	160	180
D5	D5 output shaft mounting screw	M4 × 0.7P	M5 × 0.8P	M8 × 1.25P	M12 × 1.75P	M16 × 2P	M20 × 2.5P	M20 × 2.5P
D6	D6 body diameter	56	80	116	152	185	240	292
L1	L1 output flange	42	60	90	115	142	180	220
L2	L2 output shaft lenght	26	37	48	65	97	105	138
L3	L3 spigot lenght	5.5	7	10	12	15	20	30
L4	L4 key lenght	16	25	32	40	63	70	90
L5	L5 key lenght to the shaft end	2	2	3	5	5	6	7
L6	L6 output flange thickness	4	6	8	10	12	15	20
L7	L7 mounting surface to the front length	31	61	78.5	102			

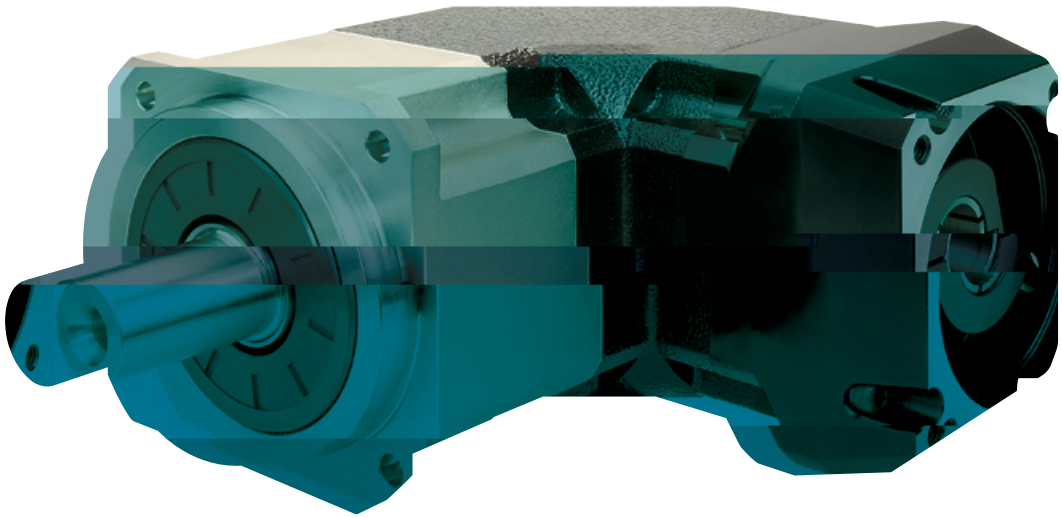
Dimensions

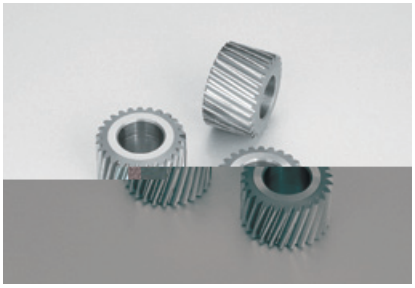


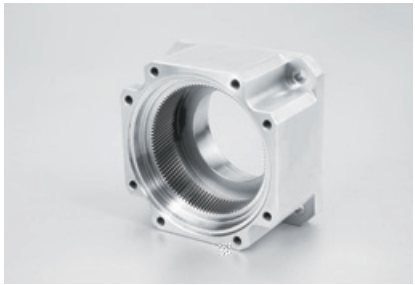


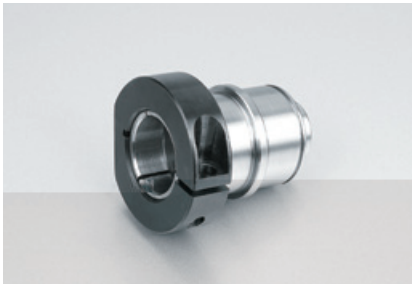
One piece planet carrier with extended bearing design. Provides maximum radial load capacity and increases system reliability and stiffness. Using the complete process in one time, Improve the whole planet carrier output shaft and high precision, high rigidity.

Unique motor connection plate modular design, by transforming the connection plate is applicable to any type of servo motor fast connection. Adopts aviation aluminum alloy material and the anti oxidation treatment, improve the environment of the resistance and abrasion resistance.









Using computer to optimize the design of the helical gear, and uses the hard tooth face hobbing machining, enhance the capacity of gear impact, reducing gear noise, improve the service life of gear.

Gear box and the inner gear adopts the integration of design and manufacturing, is made of high qualified steel box, by hot forging process, has a higher strength, rigidity and toughness, make internal tooth, further improve the precision and intensity.

Input terminal connected to the motor of the collet type locking mechanism, and the dynamic balance analysis, to ensure that under the high input speed joint concentricity and zero back lash power transmission.

GBR HIGH PRECISION PLANETARY GEARBOXES

Technical Performance

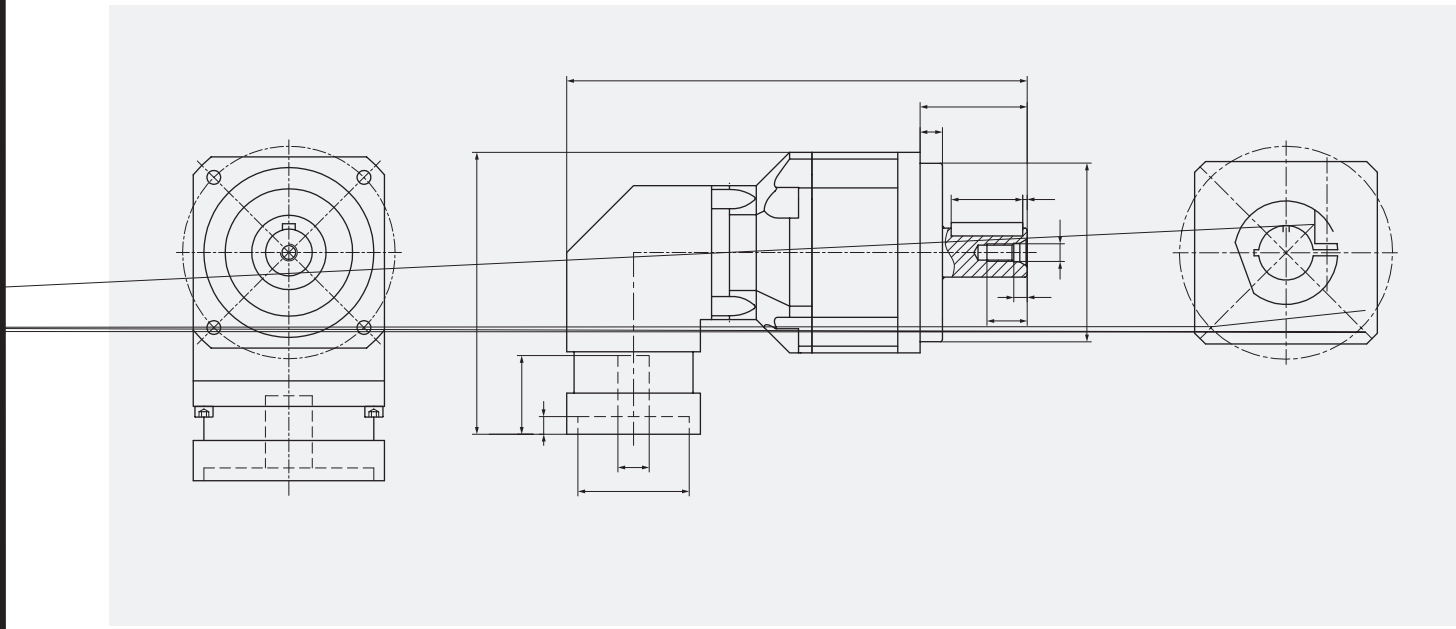
Unit: Kg·cm^2

Item	Number of stage	Reduction ratio	GBR042	GBR060	GBR090	GBR115	GBR142	GBR180	GBR220
Moment of inertia	1	3	0.09	0.35	2.25	6.84	23.4	68.9	135.4
		4	0.09	0.35	2.25	6.84	23.4	68.9	135.4
		5	0.09	0.35	2.25	6.84	23.4	68.9	135.4
		6	0.09	0.35	2.25	6.84	23.4	68.9	135.4
		7	0.09	0.35	2.25	6.84	23.4	68.9	135.4
		8	0.09	0.35	2.25	6.84	23.4	68.9	135.4
		9	0.09	0.35	2.25	6.84	23.4	68.9	135.4
		10	0.09	0.35	2.25	6.84	23.4	68.9	135.4
		14	-	0.07	1.87	6.25	21.8	65.6	119.8
		20	-	0.07	1.87	6.25	21.8	65.6	119.8
	2	15	0.09	-	-	-	-	-	-
		20	0.09	-	-	-	-	-	-
		25	0.09	0.09	0.35	2.25	6.84	23.4	68.9
		30	0.09	0.09	0.35	2.25	6.84	23.4	68.9
		35	0.09	0.09	0.35	2.25	6.84	23.4	68.9
		40	0.09	0.09	0.35	2.25	6.84	23.4	68.9
		45	0.09	0.09	0.35	2.25	6.84	23.4	68.9
		50	0.09	0.09	0.35	2.25	6.84	23.4	68.9
		60	0.09	0.09	0.35	2.25	6.84	23.4	68.9
		70	0.09	0.09	0.35	2.25	6.84	23.4	68.9
		80	0.09	0.09	0.35	2.25	6.84	23.4	68.9
		90	0.09	0.09	0.35	2.25	6.84	23.4	68.9
		100	0.09	0.09	0.35	2.25	6.84	23.4	68.9
		120	-	-	0.31	1.87	6.25	21.8	65.6
		140	-	-	0.31	1.87	6.25	21.8	65.6
		160	-	-	0.31	1.87	6.25	21.8	65.6
		180	-	-	0.31	1.87	6.25	21.8	65.6
		200	-	-	0.31	1.87	6.25	21.8	65.6

1) The moment of inertia is related with input shaft.

Dimensions

GBR GBR HIGH PRECISION PLANETARY GEARBOXES(i=15~100)



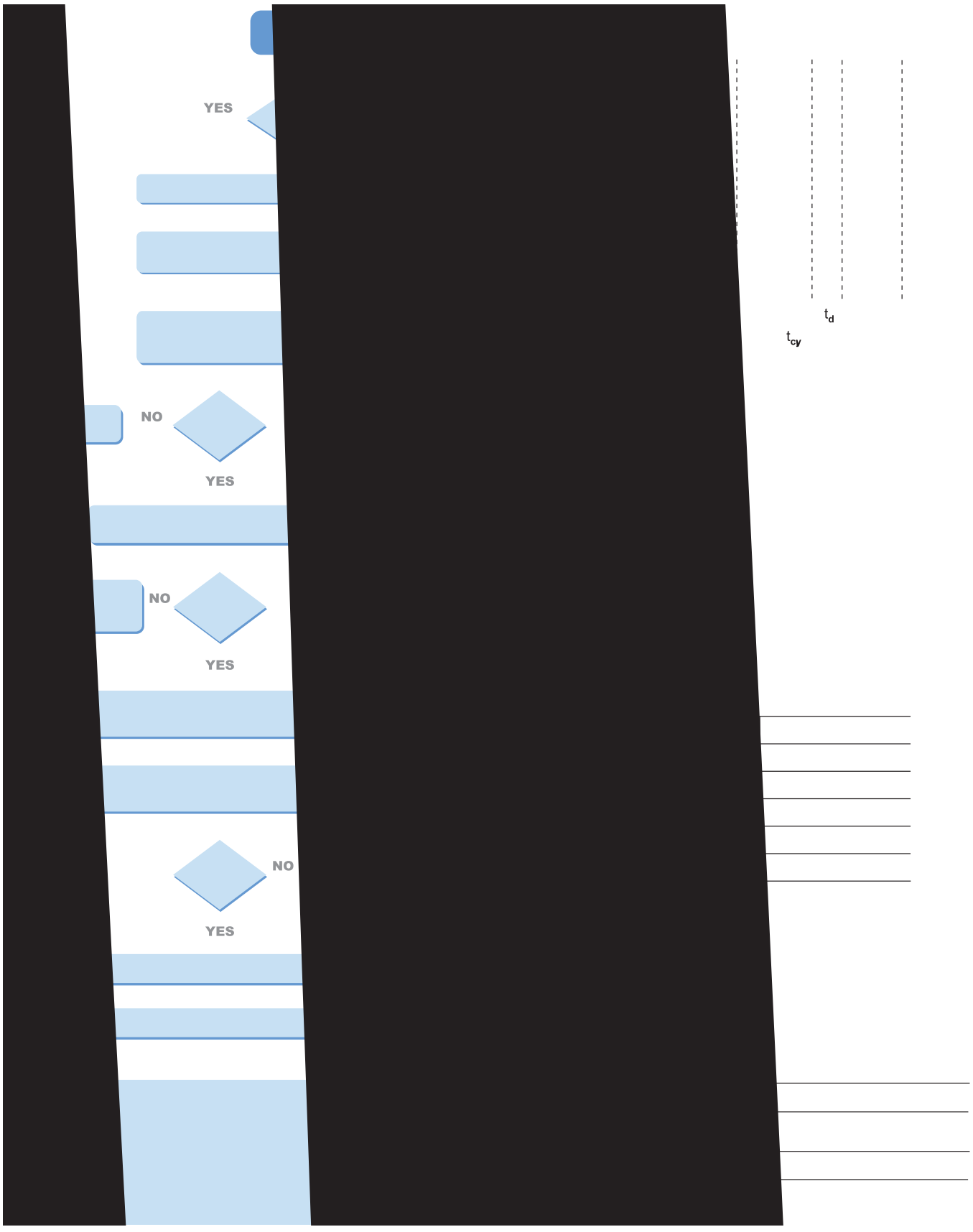
Dimensions

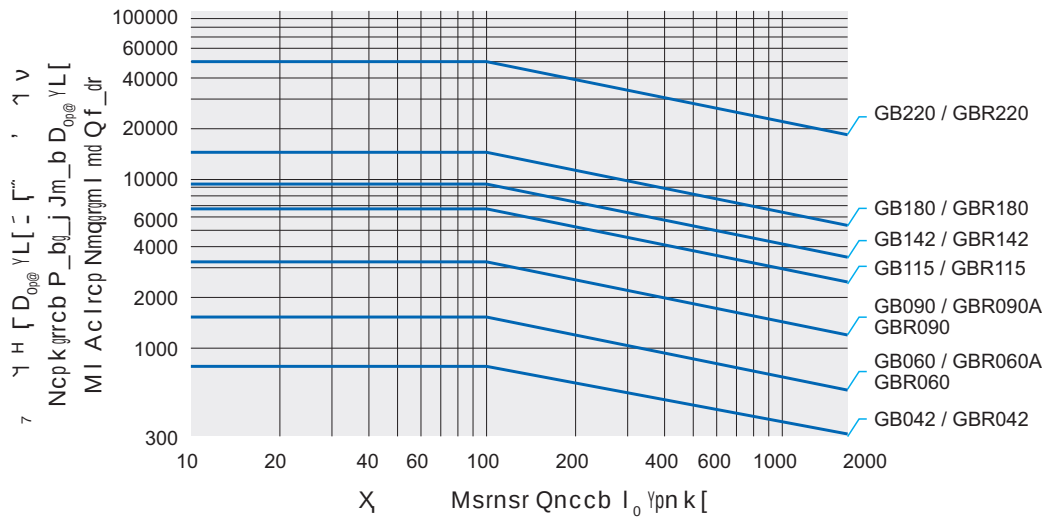
(Unit: mm)

Item		GBR042	GBR060	GBR090	GBR115	GBR142	GBR180	GBR220
D1	D1 mounting hole distribution circle	50	70	100	130	165	215	250
D2	D2 mounting screw hole	3.4	5.5	6.6	9	11	13	17
D3	D3 output shaft diameter	13	16	22	32	40	55	75
D4	D4 spigot diameter	35	50	80	110	130	160	180
D5	D5 output shaft mounting screw	M4 × 0.7P	M5 × 0.8P	M8 × 1.25P	M12 × 1.75P	M16 × 2P	M20 × 2.5P	M20 × 2.5P
D6	D6 body diameter	56	80	116	152	185	240	292
L1	L1 output flange	42	60	90	115	142	180	220
L2	L2 output shaft lenght	26	37	48	65	97	105	138
L3	L3 spigot lenght	5.5	7	10	12	15	20	30
L4	L4 key lenght	16	25	32	40	63	70	90
L5	L5 key lenght to the shaft end	2	2	3	5	5	6	7
L6	L6 output flange thickness	4	6	8	10	12	15	20
L7	L7 mounting surface to the front length	139	163.5	206.5	285	365	431	521
L8	L8 output shaft center cone	4.5	4.8	7.2	10	12	15	15
L9	L9 depth of center hole	10	12.5	19	28	36	42	42
C1	C1 input terminal mounting hole	46	46	70	100	130	165	215
C2	C2 mounting screw hole	M4 × 0.7P	M5 × 0.8P	M6 × 1P	M8 × 1.25P	M10 × 1.5P	M12 × 1.75P	M12 × 1.75P
C3	C3 input hole diameter	≤ 11	≤ 11/ ≤ 12	≤ 14/ ≤ 16	≤ 19/ ≤ 24	≤ 32	≤ 38	≤ 48
C4	C4 hole depth of input shaft	25	25	34	40	50	60	85
C5	C5 input end positioning stop diameter	30	30	50	80	110	130	180
C6	C6 input end positioning stop depth	3.5	8	4	5	6	6	6
C7	C7 input flange	42	42	60	90	115	142	190
C8	C8 overall lenght	90.5	99.5	126.5	165	205	254.5	323.5
B1	B1 key width	5	5	6	10	12	16	20
H1	H1 key height	15	18	24.5	35	43	59	79.5

C1~C8 C1~C8 are motor specific dimensions (metric std shown).

Selection of the Optimum Gearbox

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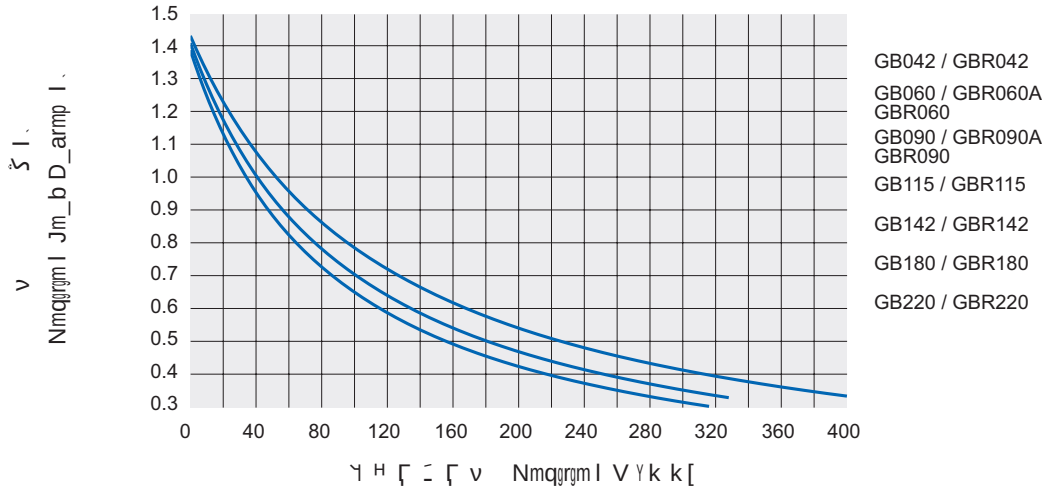
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