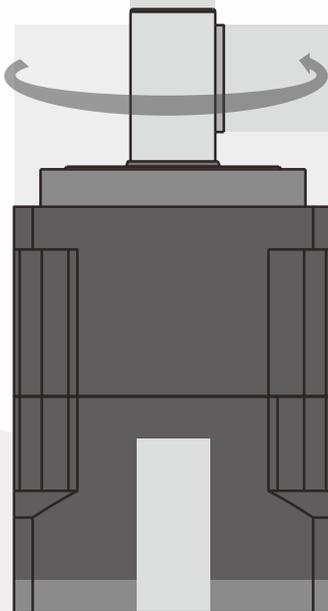




ZIPP PRECISION GEAR REDUCER
DRIVE YOU FURTHER



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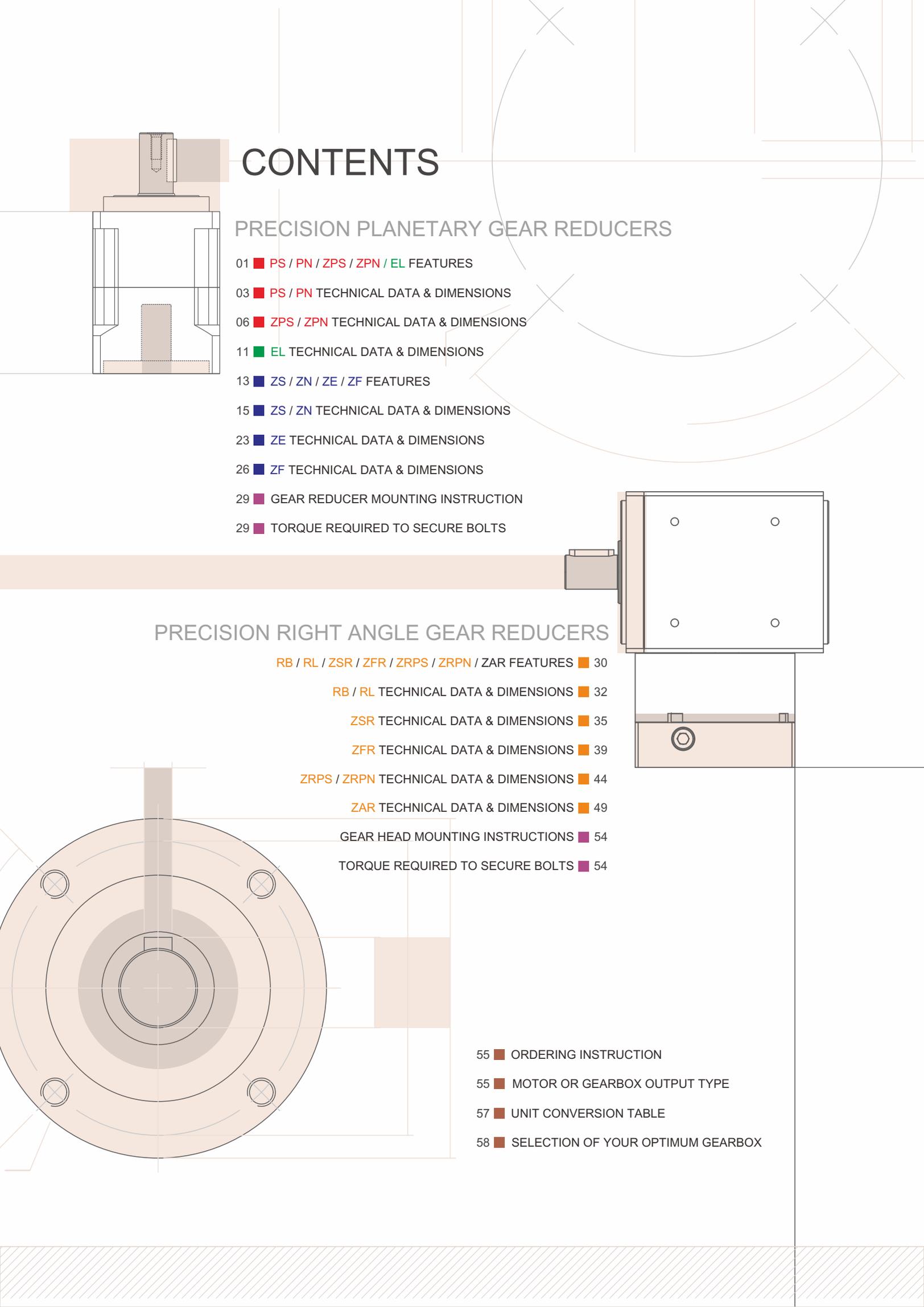
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FEATURES

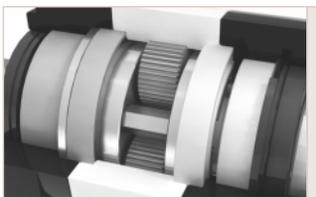
- NEMA mounting standards available for quick installation.
- Integral gear ratio available from 3:1 through 512:1 for wide range selection.
- Two types of GEAR REDUCERS with round and square output flange.
- High performance and high reduction ratio for transferring high torques in limited space.
- Precision gears to raise transmission efficiency above 96%.
- Hardened high strength steel components for reliability under severe environmental conditions.
- All grease-filled, the gear head can be used in any orientation without oil leaks.
- Available for wide range applications of automation and motion control in industries such as aerospace, medical, pharmaceutical, factory automation, printing, robotics, auto control system, automotive, textile equipment, semiconductor, manufacturing equipment, X-Y positioning systems, coordinate measuring, optical positioning equipment, telecommunications, packaging, material handling, assembly line, CCTV system, machine tools and special machinery etc.



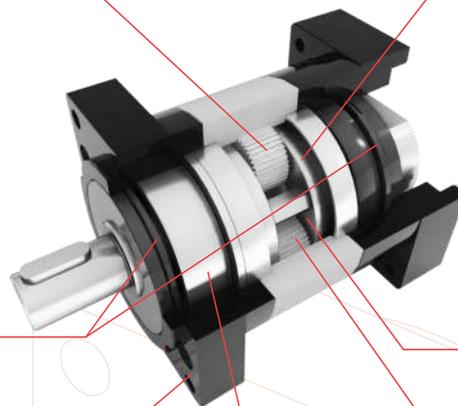
Needle bearings for high output torque.



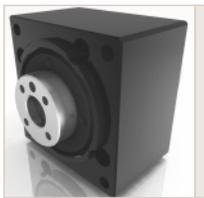
Closed planet cage provides extremely high rigidity.



All grease filled and double seal design to eliminate leakage in any orientation.



Planet gear train provides compact size yet high transmission efficiency.



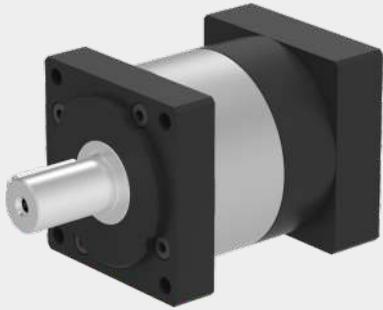
Versatile output design.



Larger bearings for increased loading.



Alloy steel made gears with carburized heat treatment for superior wear resistance and strength.



PS FEATURES

Precision performance square flange gearbox with two piece adaptor flange for flexible mounting options and optimized stock management. The semi-closed planet carrier design provides maximum radial load capacity and increase gear train reliability and stiffness. Four frame sizes are available with gear ratios from 1:3 to 1:100.



PN FEATURES

Precision performance round flange gearbox with two piece adaptor flange for flexible mounting options and optimized stock management. The semi-closed planet carrier design provides maximum radial load capacity and increased gear train reliability and stiffness. Four frame sizes are available with gear ratios from 1:3 to 1:100.



ZPS/ZPN FEATURES

Adopt straight gear drive, after carburizing uenching treatment, tooth profile modification treatment, to ensure smooth operation, low noise.

Simple structure, mass production, fast delivery time and high cost performance.

The reducer has a complete range, which can meet the replacement of most of the reducers on the market.

Easy maintenance: there is no need to replace the grease during the product life cycle, and the installation is more convenient.



EL FEATURES

Why pay the cost for a heavy-duty gearbox for a light-duty application when our highly customizable economy line can give you what you need at the price that meets your target.

The economy line gear reducer with built for purpose engineering ensures that you don't over pay for features that are not required. Frame sizes are available from 30mm, 32mm, 36mm, 42mm, 52mm, 60mm and 90mm in various of ratio combinations.

Other frame sizes and dimensions can be customized according to the actual requirement.

PRECISION PLANETARY GEAR REDUCERS / TECHNICAL DATA

PS/PN

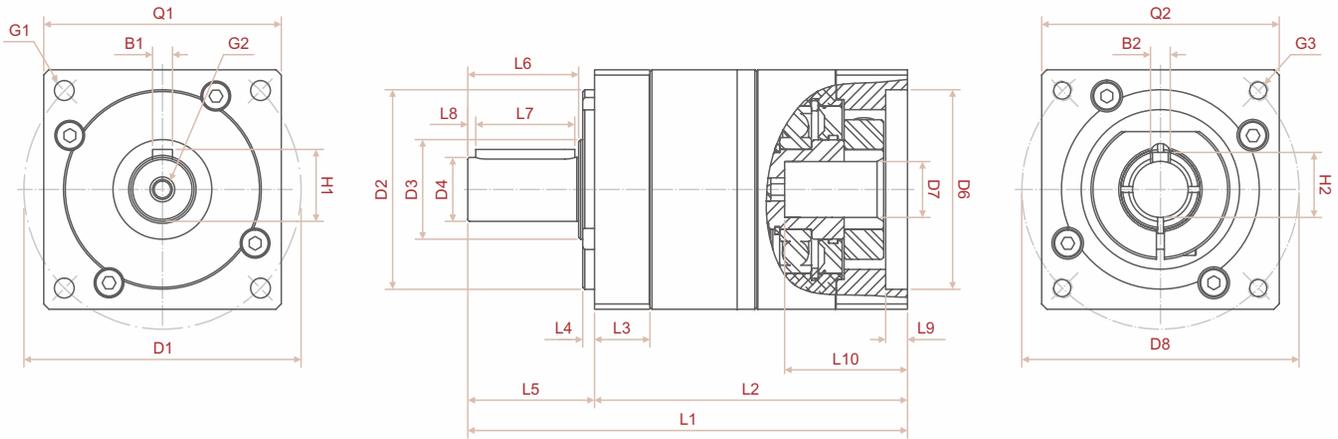
TECHNICAL DATA

- Low noise
- Compact size and optimized weight
- Economic value with quality
- Optimized inertia moment
- Stable temperature rise
- High efficiency transmission
- Optimized design with special lubricant for long service life
- Flexible mounting dimensions

PRECISION PLANETARY GEAR REDUCERS
PS/PN TECHNICAL DATA

Model / Size		Stages	42 (NEMA 17)		60 (NEMA 23)		90 (NEMA 34)	
Full load efficiency	%	1	96					
		2	92					
Standard Backlash	arcmin	1	<14	<13		<12		
		2	<17	<16		<15		
Precision Backlash	arcmin	1	<8	<7		<6		
		2	<10	<9		<8		
Noise	dB(A)		58	62		64		
Lifetime	hr		20000					
Max radial load	N		810	1150		2080		
Max axial load	N		405	575		1040		
Nominal Input Speed	rpm	1,2	4500	4000		3600		
Max input speed	rpm		9000	8000		7000		
Torsional stiffness	Nm/arcmin		0.9	2.2		8		
Weight	kg	1	0.5	1.2		3.2		
		2	0.9	1.6		4.5		
Operating temp.	°C		-20 ~ 90					
Degree of protection			IP 65					
Lubrication			Life lubrication					
Mounting direction			Any					
Model / Size		Stages	Ratio	42	60	90		
Nominal output torque	Nm	1	3	13	34	102		
			4	16	48	138		
			5	15	46	130		
			7	10	30	90		
			9	7	22	80		
			10	6	17	60		
		2	12	13	34	102		
			15	13	34	102		
			16	16	48	138		
			20	16	48	138		
			25	15	46	130		
			30	13	34	102		
			40	16	48	138		
			50	15	46	130		
			70	10	30	90		
			100	6	17	60		
MAX Output torque			2.5 times of Nominal output torque					
Model / Size		Stages	Ratio	42	60	90		
Mass Moments of Inertia	g-cm ²	1	3	21	140	800		
			4,5	18	90	500		
			7,9,10	17	60	400		
		2	12,15,21,30	23	120	750		
			20,28,40	20	80	450		
			25,35,50	16	70	400		
			49,70,100	20	80	450		

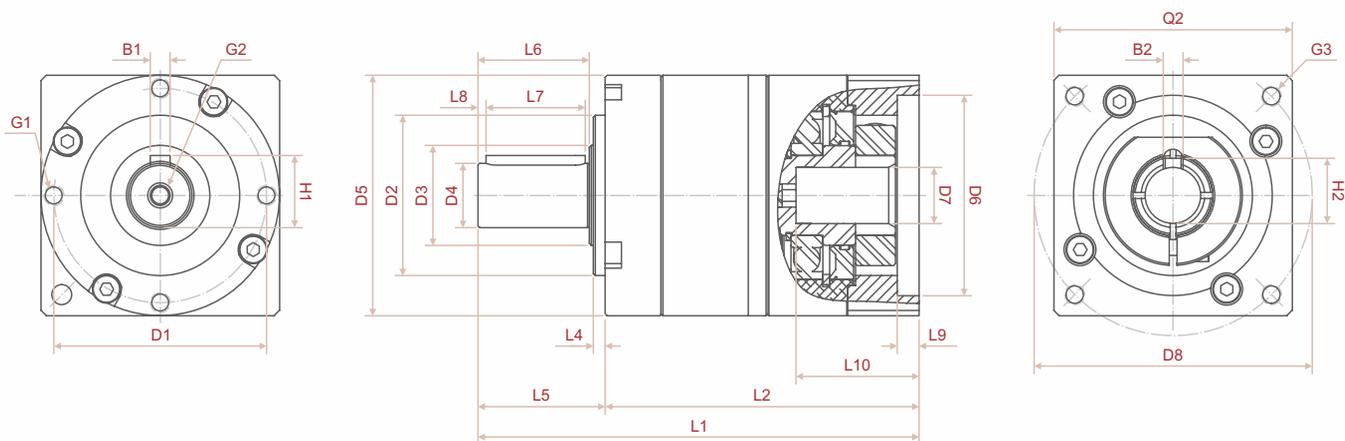
PS PROFILE DIMENSIONS



Model / Size			PS42	PS60	PS90		
Overall length	1	L1	90	111	144		
	2		113.5	138	178.5		
	3		137	165	213		
Body length	1	L2	64	79	103		
	2		87.5	106	137.5		
	3		111	133	172		
Output flange		Q1	□42	□60	□90		
Input flange		Q2	□42	□60	□90		
Output							
Flange thickness	L3		9.5	14	20		
Pilot length	L4		2.5	3	3		
Output shaft length	L5		26	32	41		
Shaft shoulder to the shaft end	L6		22.5	28	37		
Key length	L7		18	25	30		
Key length to the shaft end	L8		2	2	2.5		
Mounting hole circle	D1		Ø50	Ø70	Ø100		
Pilot diameter	D2		Ø35 g6	Ø50 g6	Ø80 g6		
Shaft shoulder diameter	D3		Ø15	Ø20	Ø35		
Output shaft diameter	D4		Ø13 h7	Ø16 h7	Ø22 h7		
Key width	B1		5	5	6		
Key Height	H1		15	18	24.5		
Mounting hole	G1		Ø4.2	Ø5.2	Ø6.8		
Center screw hole x depth	G2		M4 x 10	M5 x 12	M6 x 16		
Input							
Pilot depth	L9		3	5.5	5.5		
Motor shaft length	L10		25	30	40		
Pilot diameter	D6		Ø30 G7	Ø22 G7	Ø50 G7	Ø38.1 G7	Ø70 G7
Input shaft diameter	D7		Ø8	Ø5	Ø14	Ø6.35	Ø19
Mounting hole circle	D8		Ø46	Ø43.84(□31)	Ø70	Ø66.67(□47.14)	Ø90
Mounting thread x depth	G3		M4 x 10	Ø3.3	M5 x 12	M4 x 10	M6 x 12
Key width	B2		3	—	5	—	6
Key Height	H2		9.4	—	16.3	—	21.8

PN PROFILE DIMENSIONS

PRECISION PLANETARY GEAR REDUCERS
PN PROFILE DIMENSIONS



Model / Size			PN42	PN60	PN90		
Overall length	1	L1	90	111	144		
	2		113.5	138	178.5		
	3		137	165	213		
Body length	1	L2	64	79	103		
	2		87.5	106	137.5		
	3		111	133	172		
Output flange		D5	Ø42	Ø60	Ø90		
Input flange		Q2	□42	□60	□90		
Output							
Pilot length		L4	2.5	3	3		
Output shaft length		L5	26	32	41		
Shaft shoulder to the shaft end		L6	22.5	28	37		
Key length		L7	18	25	30		
Key length to the shaft end		L8	2	2	2.5		
Mounting hole circle		D1	Ø37	Ø53.5	Ø80		
Pilot diameter		D2	Ø26 g6	Ø40 g6	Ø60 g6		
Shaft shoulder diameter		D3	Ø15	Ø20	Ø35		
Output shaft diameter		D4	Ø13 h7	Ø16 h7	Ø22 h7		
Key width		B1	5	5	6		
Key Height		H1	15	18	24.5		
Mounting hole		G1	M4 x 10	M5 x 11	M6 x 15		
Center screw hole x depth		G2	M4 x 10	M5 x 12	M6 x 16		
Input							
Pilot depth		L9	3	5.5	5.5		
Motor shaft length		L10	25	30	40		
Pilot diameter		D6	Ø30 G7	Ø22 G7	Ø50 G7	Ø38.1 G7	Ø70 G7
Input shaft diameter		D7	Ø8	Ø5	Ø14	Ø6.35	Ø19
Mounting hole circle		D8	Ø46	Ø43.84(□31)	Ø70	Ø66.67(□47.14)	Ø90
Mounting thread x depth		G3	M4 x 10	Ø3.3	M5 x 12	M4 x 10	M6 x 12
Key width		B2	3	—	5	—	6
Key Height		H2	9.4	—	16.3	—	21.8

ZPS/ZPN TECHNICAL DATA

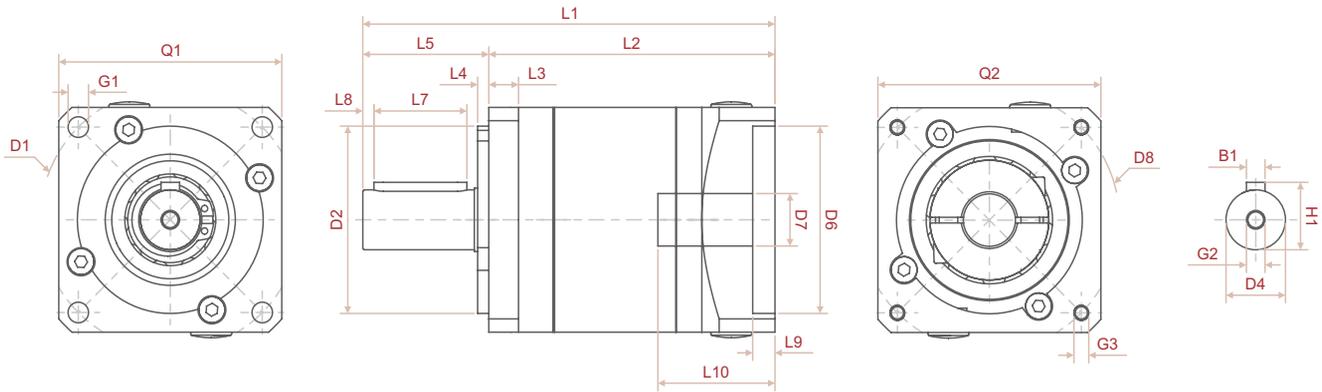
Model / Size		Stages	60	80	90	120	160*	
Full load efficiency	%	1	≥95					
		2	≥92					
Standard Backlash	arcmin	1	≤10	≤10	≤10	≤10	≤10	
		2	≤12	≤12	≤12	≤12	≤12	
Noise	dB(A)		57	58	58	58	65	
Lifetime	hr		20000					
Max radial load	N		889	1020	1020	2230	3200	
Max axial load	N		850	980	980	1150	3000	
Nominal Input Speed	rpm	1,2	3000	3000	3000	2500	2000	
Max input speed	rpm	1,2	5000	5000	5000	5000	3500	
Torsional stiffness	Nm/arcmin	1,2	2.6	7.5	7.5	15.5	35.8	
Weight	kg	1	1.1	2.2	3	6.3	18.1	
		2	1.3	2.8	3.8	8	23.1	
Operating temp.	°C		-10 ~ 90					
Degree of protection			IP 65					
Lubrication			Synthetic lubrication					
Mounting direction			Any					
Model / Size		Stages	Ratio	60	80	90	120	160*
Nominal output torque	Nm	1	3	16.5	60	60	148	310
			4	27	86	86	222	605
			5	27	94.5	94.5	235	420
			7	19.5	64	64	158	270
			10	8.5	39.5	39.5	93	245
		2	12,15	26	96	96	250	680
			16,20	30	96	96	250	680
			25	33	105.5	105.5	264	460
			28	30	96	96	250	460
			30,35	35	105.5	105.5	364	460
			40	30	96	96	250	460
			50	33	105.5	105.5	264	310
			70	21.5	71.5	71.5	177	295
			100	21.5	87	87	170	295
MAX Output torque			2 times of Nominal output torque					
Model / Size		Stages	Ratio	60	80	90	120	160*
Mass Moments of Inertia	g-cm ²	1	3	107	400	400	1650	4130
			4	94	309	309	1220	5150
			5	92	291	291	1150	4930
			7	91	285	285	1130	5840
			10	91	283	283	1100	4250
		2	12,15	94	291	291	1650	6300
			16	94	291	291	1220	6300
			20	92	291	291	1150	6300
			25	92	291	291	1130	4930
			28	91	285	285	1130	6300
			30,35,40	91	285	285	1130	4930
			50	91	283	283	1110	4930
			70	92	283	283	1110	4930
			100	92	291	291	1150	4930

* Type 160 only suitable for ZPS

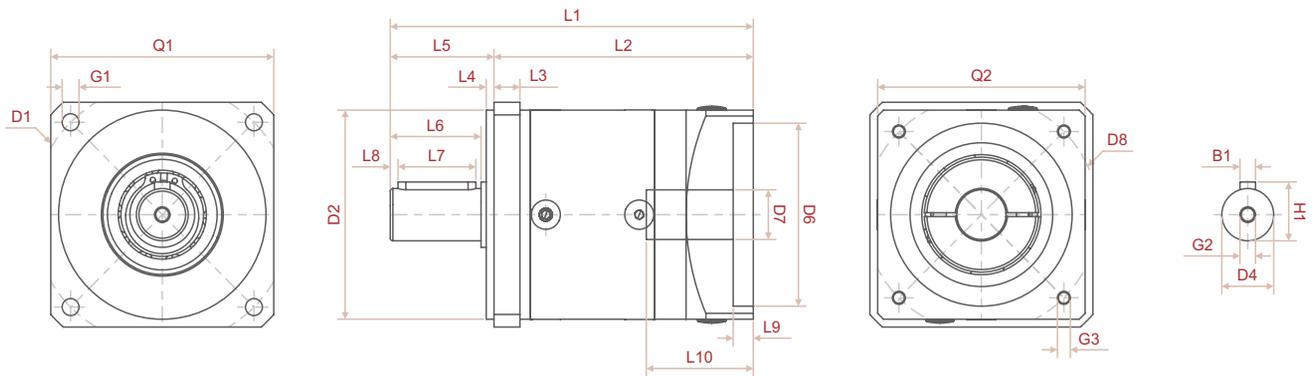
ZPS PROFILE DIMENSIONS

PRECISION PLANETARY GEAR REDUCERS
ZPS PROFILE DIMENSIONS

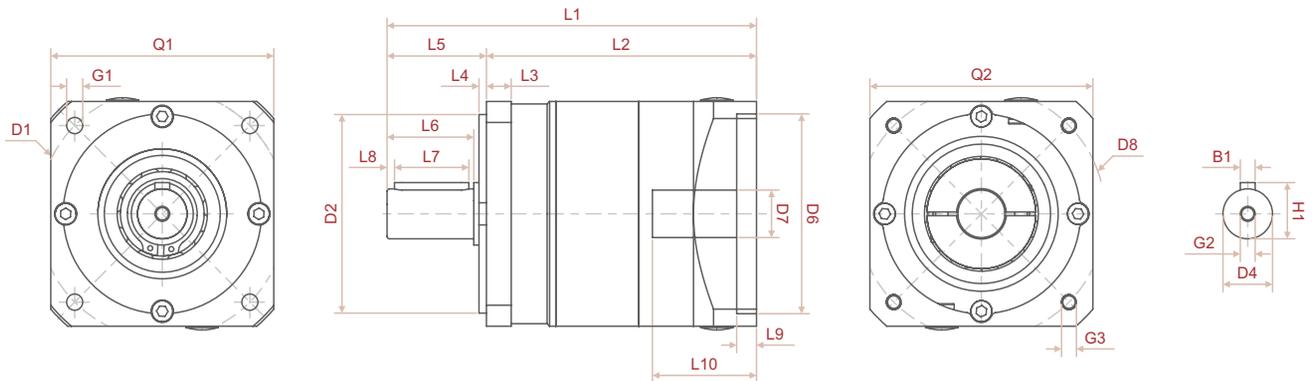
ZPS60



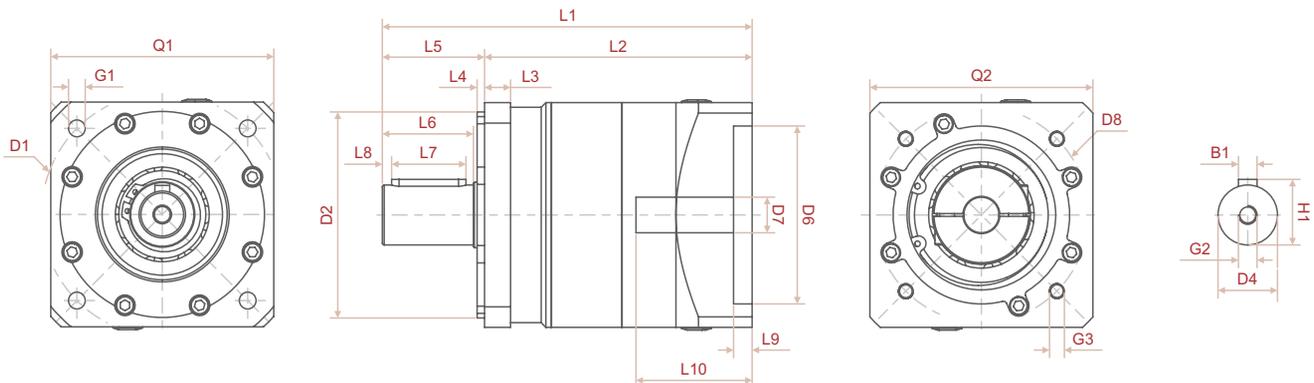
ZPS80



ZPS90

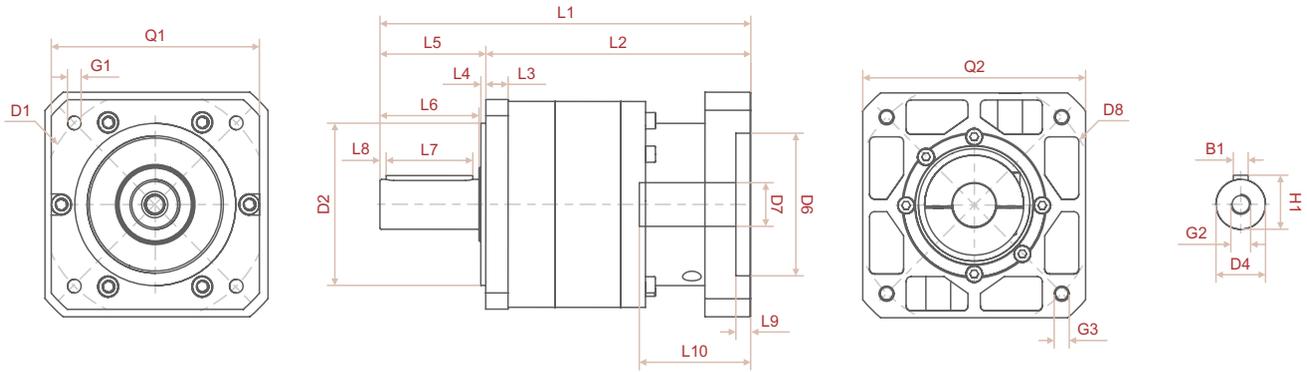


ZPS120



ZPS PROFILE DIMENSIONS

ZPS160



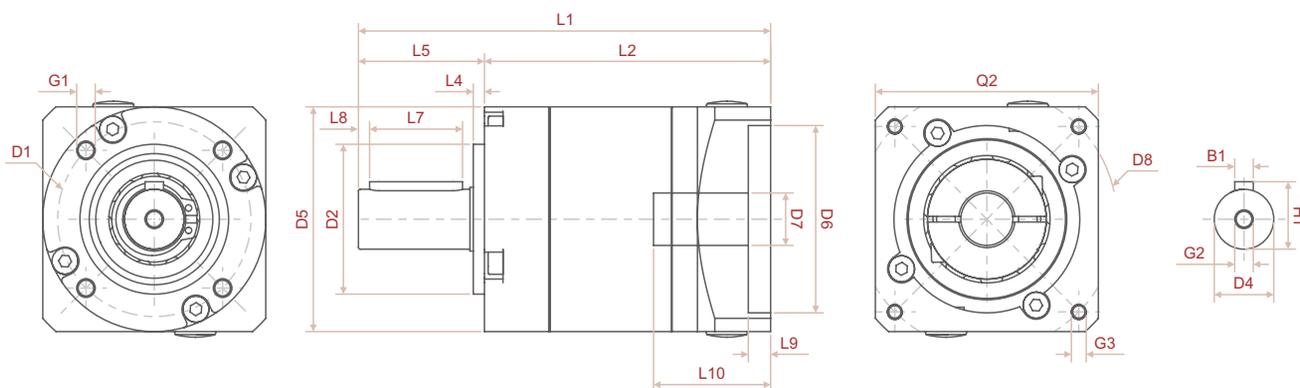
Model / Size		ZPS60	ZPS80	ZPS90	ZPS120	ZPS160		
Overall length	1	L1	111	140	149	199	287	299.5
	2		126.5	163	172	229.5	328	340.5
Body length	1	L2	77	100	109	144	201.5	214
	2		92.5	123	132	174.5	242.5	255
Output flange	Q1	□60	□80	□90	□120	□168		
Input flange	Q2	□60	□80	□90	□120	□130	□180	
Output								
Flange thickness	L3	8	10	10	14	18		
Pilot length	L4	3	3	3	4	4		
Output shaft length	L5	34	40	40	55	85.5		
Shaft shoulder to the shaft end	L6	-	35	35	49	80		
Key length	L7	25	30	30	40	70		
Key length to the shaft end	L8	3	3	3	5	5		
Mounting hole circle	D1	Ø70	Ø100	Ø100	Ø130	Ø185		
Pilot diameter	D2	Ø50 h6	Ø80 h6	Ø80 h6	Ø110 h7	Ø130 h7		
Output shaft diameter	D4	Ø14 h6 Ø16 h6	Ø20 h6 Ø22 h6	Ø20 h6 Ø22 h6	Ø25 h6 Ø32 h6	Ø40 h7		
Key width	B1	5	6	6	8 10	12		
Key Height	H1	16 18	22.5 16	22.5 16	28 35	43.3		
Mounting hole	G1	4-Ø5.5	4-Ø6.5	4-Ø6.5	4-Ø9	4-Ø11		
Center screw hole x depth	G2	M5x12	M6x13	M6x13	M10x22	M16x30		
Input								
Pilot depth	L9	6	8	8	10	10	12	
Motor shaft length	L10	31.5	41.5	42	62.5	75	90	
Pilot diameter	D6	Ø38.1 G7 Ø50 G7	Ø70 F8 Ø80 F8	Ø70 G7 Ø80 G7	Ø95 F7 Ø110 F7	Ø110 F7	Ø114.3 F7	
Input shaft diameter	D7	Ø8 H7 Ø14 H7	Ø19 H7 Ø16 H7 Ø19 H7	Ø19 H7 Ø16 H7 Ø19 H7	Ø19 G7 Ø24 G7 Ø24 G7	Ø22 G7 Ø24 G7	Ø22 G7 Ø24 G7 Ø35 G7 Ø42 G7	
Mounting hole circle	D8	Ø66.67 (□47.14)	Ø70 Ø90 Ø100	Ø90 Ø100	Ø90 Ø100 Ø115 Ø130	Ø145	Ø145 Ø200	
Mounting thread x depth	G3	4-M4x12 4-M5x12	4-M5x12 4-M6x12	4-M6x12	4-M5x12 4-M6x12 4-M6x12	4-M6x20 4-M8x20	4-M8x20 4-M8x20 4-M12x20	

PRECISION PLANETARY GEAR REDUCERS
ZPS PROFILE DIMENSIONS

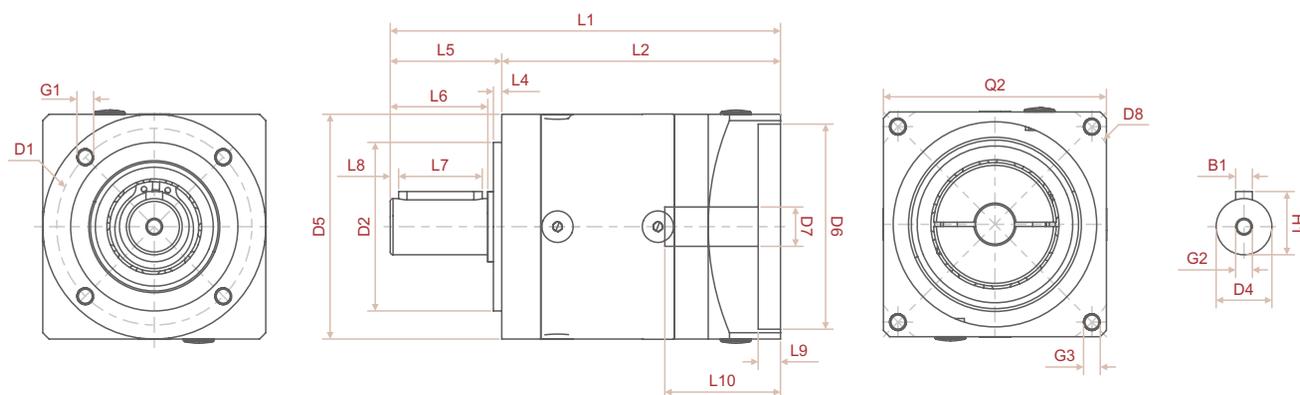
ZPN

PROFILE DIMENSIONS

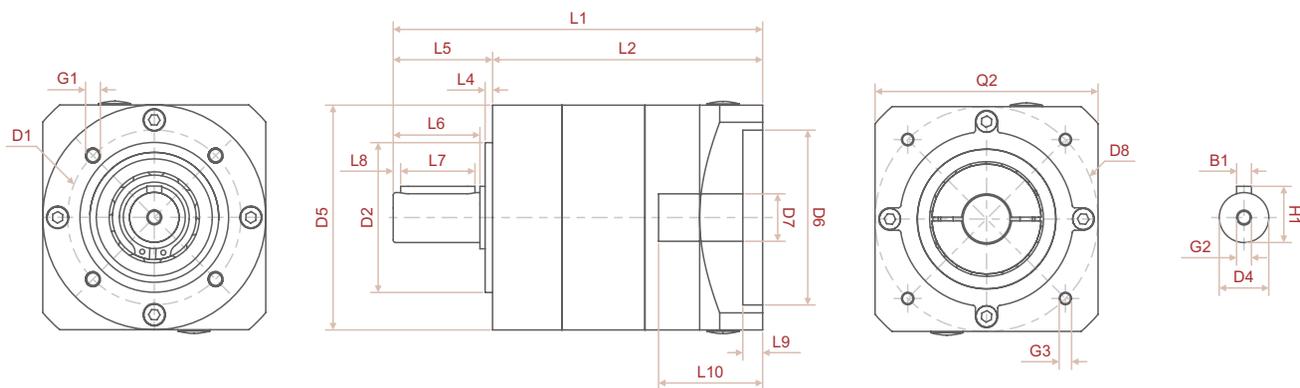
ZPN60



ZPN80



ZPN90

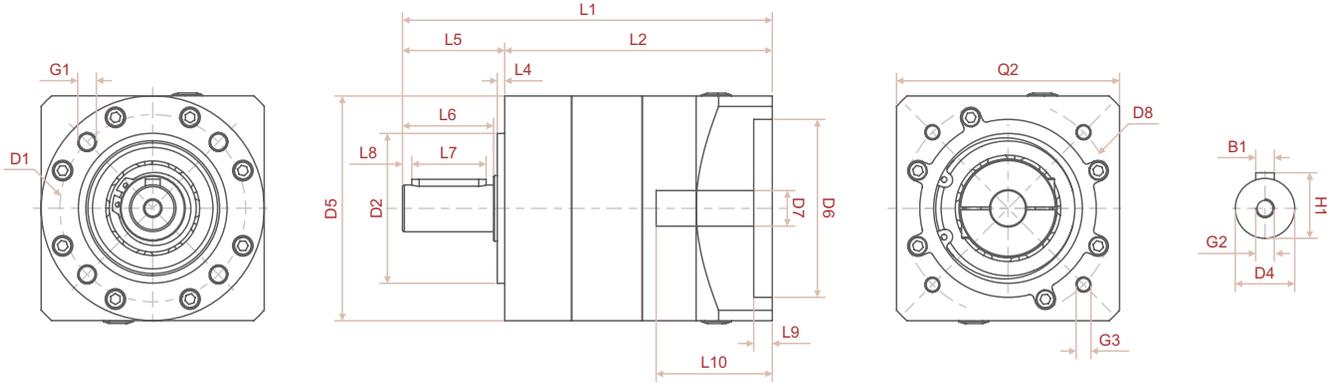


PRECISION PLANETARY GEAR REDUCERS
ZPN PROFILE DIMENSIONS

ZPN

PROFILE DIMENSIONS

ZPN120



Model / Size			ZPN60	ZPN80	ZPN90	ZPN120
Overall length	1	L1	111	140	149	199
	2		126.5	163	172	229.5
Body length	1	L2	77	100	109	144
	2		92.5	123	132	174.5
Output flange		D5	Ø60	Ø80	Ø90	Ø120
Input flange		Q2	□60	□80	□90	□120
Output						
Pilot length		L4	3	3	3	4
Output shaft length		L5	34	40	40	55
Shaft shoulder to the shaft end		L6	-	35	35	49
Key length		L7	25	30	30	40
Key length to the shaft end		L8	3	3	3	5
Mounting hole circle		D1	Ø52	Ø70	Ø70	Ø100
Pilot diameter		D2	Ø40 h6	Ø60 h6	Ø60 h6	Ø80 h7
Output shaft diameter		D4	Ø14 h6 Ø16 h6	Ø20 h6 Ø22 h6	Ø20 h6 Ø22 h6	Ø25 h6 Ø32 h6
Key width		B1	5	6	6	8 10
Key Height		H1	16 18	22.5 16	22.5 16	28 35
Mounting hole		G1	4-M5x12	4-M6x15	4-M6x15	4-Ø10x20
Center screw hole x depth		G2	M5x12	M6x13	M6x13	M10x22
Input						
Pilot depth		L9	6	8	8	10
Motor shaft length		L10	31.5	41.5	42	62.5
Pilot diameter		D6	Ø38.1 G7 Ø50 G7	Ø70 F8 Ø80 F8	Ø70 G7 Ø80 G7	Ø95 F7 Ø110 F7
Input shaft diameter		D7	Ø8 H7 Ø14 H7	Ø19 H7 Ø16 H7 Ø19 H7	Ø19 H7 Ø16 H7 Ø19 H7	Ø19 G7 Ø22 G7 Ø24 G7 Ø24 G7
Mounting hole circle		D8	Ø66.67 (□47.14) Ø70	Ø90 Ø100	Ø90 Ø100	Ø115 Ø130 Ø145
Mounting thread x depth		G3	4-M4x12 4-M5x12	4-M5x12 4-M6x12	4-M5x12 4-M6x12	4-M6x20 4-M8x20 4-M8x20

ECONOMY GEAR REDUCERS / TECHNICAL DATA



TECHNICAL DATA

- Low cost
- Compact size
- Customizable
- Stable temperature rise
- Efficient transmission
- Optimized design with special lubricant for long service life
- Flexible mounting dimensions

ECONOMY GEAR REDUCERS
EL TECHNICAL DATA

Model / Size		Stages	32	42	52	60	90
Full load efficiency	%	1	80	95			
		2	70	90			
Noise	dB(A)		54	58	60	60	65
Lifetime	hr		N/A	20000			
Max radial load	N		100	150	300	400	700
Max axial load	N		50	75	150	200	350
Max input speed	rpm		8000	8000	7000	7000	6000
Weight	kg	1	0.153	0.42	0.652	1.115	2.164
		2	0.18	0.47	0.75	1.22	3.2
Operating temp.	°C		-20 ~ 90				
Degree of protection			IP 54				
Lubrication			Life lubrication				
Mounting direction			Any				

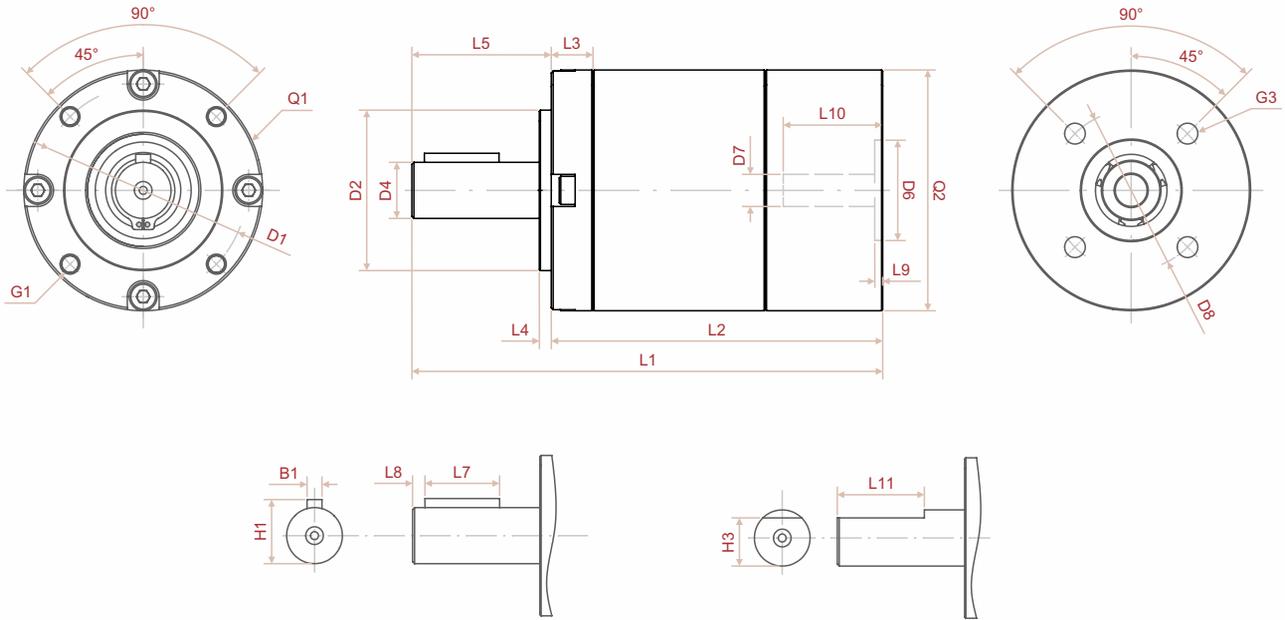
Model / Size		Stages	Ratio	32	Ratio	42	52	60	90
Nominal output torque	Nm	1	3.6	1.3	3	8	17	19	52
			4.5		4	9	18	21	60
			6.25		5	9	18	21	60
			8		7	5.5	13	13	45
					9	5	10	10	40
					10	5	10	10	40
		2	16.2	1.3	12	8	17	19	52
			22.5		15	8	17	19	52
			28.8		16	9	18	21	60
			28.125		20	9	18	21	60
			36		25	9	18	21	60
			50		30	8	17	19	52
					40	9	18	21	60
					50	9	18	21	60
					70	5.5	13	13	45
					100	5	10	10	40

MAX Output torque 2 times of Nominal output torque

- 32: All available single stage ratios

Model / Size		Stages	Ratio	42	60	90
Mass Moments of Inertia	g-cm ²	1	3	21	140	800
			4,5	18	90	500
			7,9,10	17	60	400
		2	12,15,21,30	23	120	750
			20,28,40	20	80	450
			25,35,50	16	70	400
	49,70,100	20	80	450		

EL PROFILE DIMENSIONS



Model / Size			EL32	EL42	EL52	EL60	EL90
Overall length	1	L1	54.9	84	89	106.6	122.5
	2		65.4	99.3	103.5	123.4	144
	3		75.9	114.6	118	140.2	165.5
Body length	1	L2	35.6	62	64	71.6	77.5
	2		46.1	77.3	78.5	88.4	99
	3		56.6	92.6	93	105.2	120.5
Output flange		Q1	Ø32	Ø42	Ø52	Ø60	Ø90
Input flange		Q2	Ø32	Ø42	Ø52	Ø60	Ø90
Output							
flange thickness		L3	5.5	5	9.7	10.5	13.3
Pilot length		L4	3	2	3	3	5
Output shaft length		L5	19.3	22	25	35	45
Key length		L7	—	18	25	30	40
Key length to the shaft end		L8	—	2	2	2	2.5
Flat end length		L11	12	—	—	—	—
Mounting hole circle		D1	26	34	40	52	72
Pilot diameter		D2	20	26	32	40	55
Output shaft diameter		D4	6	8	12	14	19
Key width		B1	—	3	4	5	6
Key Height		H1	—	11.2	13.5	16	22.5
Flat end height		H3	5.5	—	—	—	—
mounting thread		G1	M3	M4	M5	M5	M6
Input							
Pilot depth		L9	2	3	3	3.6	3.5
Motor shaft length		L10	15.6	24	24	31.5	41
Pilot diameter		D6	12.7	22	25	50	50
Input shaft diameter		D7	4	5	8	9	12.7
Mounting hole circle		D8	25.4	32	38.89	50	65
Mounting thread		G3	3.2	3.2	4.2	5.2	6.2

FEATURES

- Low noise
- Compact size and optimized weight
- Precision gearing
- Optimized inertia moment
- Stable temperature rise
- High efficiency transmission
- Optimized design with special lubricant for long service life
- Flexible mounting dimensions

ULTRA PLANETARY GEAR REDUCERS
FEATURES

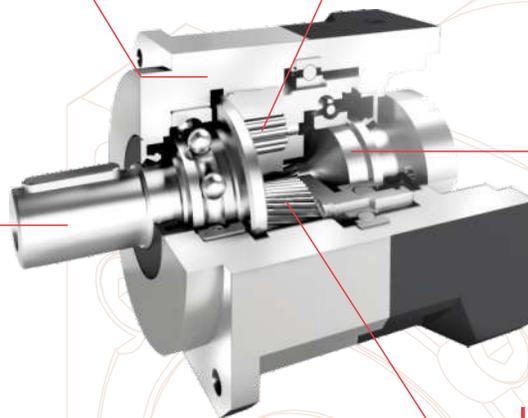
One piece and heat treated unibody designed housing for high output torque capability, longer lifespan and maintain stable precision performance.

Planet gears with full complement needle bearing provide highest structural rigidity and lifespan of the gear reducer.

One piece pinion coupler design for maximum transmission efficiency and torsional stiffness

Output shaft with oversized and large-span bearing design that ensures the highest precision and torsional stiffness.

Gears made from high strength alloy steel and vacuum carburized to 58 - 62 HRC, then are skived to ensure high precision gear profile and impact resistance.





ZS FEATURES

High output torque solid one piece square housing that provides performance and efficiency with torque and sturdiness. The helical toothed and one piece carrier design provides maximum radial load capacity as well as system reliability and stiffness. Four frame sizes are available with gear ratios from 1:3 to 1:100.



ZN FEATURES

High output torque solid one piece round housing that provides performance and efficiency with torque and sturdiness. The helical toothed and one piece carrier design provides maximum radial load capacity as well as system reliability and stiffness. Four frame sizes are available with gear ratios from 1:3 to 1:100.



ZE FEATURES

Offers low-cost precision one piece housing gear reducer combined many of the features and benefits that's upgraded from our PS / PN series with the ability to serve as an easy drop-in replacement from spur to helical toothed gear reducers. The ZE Series provides a cost-effective solution for many applications. Four frame sizes are available with gear ratios from 1:3 to 1:100.



ZF FEATURES

Flexible mounting diameter and high output torque solid round housing that provides performance and efficiency with torque and sturdiness. The helical toothed and one piece carrier design provides maximum radial load capacity as well as system reliability and stiffness. The flange type output shaft is targeted for application in Robotics, Automation and Offshore. Four frame sizes are available with gear ratios from 1:4 to 1:100.

ULTRA PRECISION PLANETARY GEAR REDUCERS / TECHNICAL DATA



ULTRA PRECISION PLANETARY GEAR REDUCERS
ZS TECHNICAL DATA

Model / Size		Stages	60	90	115	142	180	220
Full load efficiency	%	1	95					
		2	92					
Standard Backlash	arcmin	1	≤5	≤5	≤5	≤5	≤5	≤5
		2	≤8	≤8	≤8	≤8	≤8	≤8
Precision Backlash	arcmin	1	≤3	≤3	≤3	≤3	≤3	≤3
		2	≤5	≤5	≤5	≤5	≤5	≤5
Noise ②	dB(A)		58	63	63	65	67	70
Lifetime ①	hr		20000					
Max radial load	N		1530	3250	6700	9400	14500	50000
Max axial load	N		630	1300	3000	4000	6200	35000
Nominal Input Speed	rpm		5000	4000	4000	2000	2000	2000
Max input speed	rpm		10000	8000	8000	4000	4000	4000
Torsional stiffness	Nm/arcmin		7	12	23	45	148	220
Weight	kg	1	1.3	3.7	7.8	16.1	30	58
		2	2	5.6	9	19	42	65
Operating temp.	°C		-10 ~ 90					
Degree of protection			IP 65					
Lubrication			Synthetic lubrication					
Mounting direction			Any					

① Life reduced by half under continuous operation.

② Noise level measured on input running at 3000 rpm with no load (i = 5)

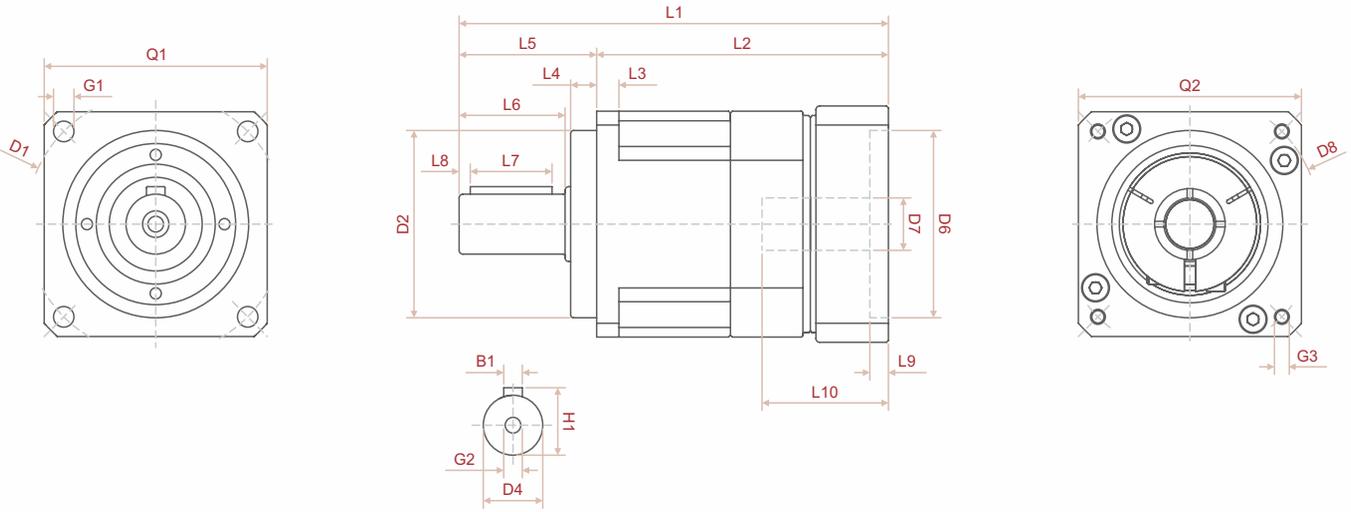
Model / Size		Stages	Ratio	60	90	115	142	180	220
Nominal output torque	Nm	1	3	55	130	208	342	588	1140
			4	50	140	290	542	1050	1700
			5	60	160	330	650	1200	2000
			7	50	140	300	550	1100	1800
			10	40	100	230	450	520	1220
		2	12,15	55	130	208	342	588	1140
			20	50	140	290	542	1050	1700
			25	60	160	330	650	1200	2000
			30	55	130	208	342	588	1140
			35	60	160	330	650	1200	2000
			40	50	140	290	542	1050	1700
			50	60	160	330	650	1200	2000
			70	50	140	300	550	1100	1800
			100	40	100	230	450	520	1220

MAX Output torque 3 times of Nominal Output Torque

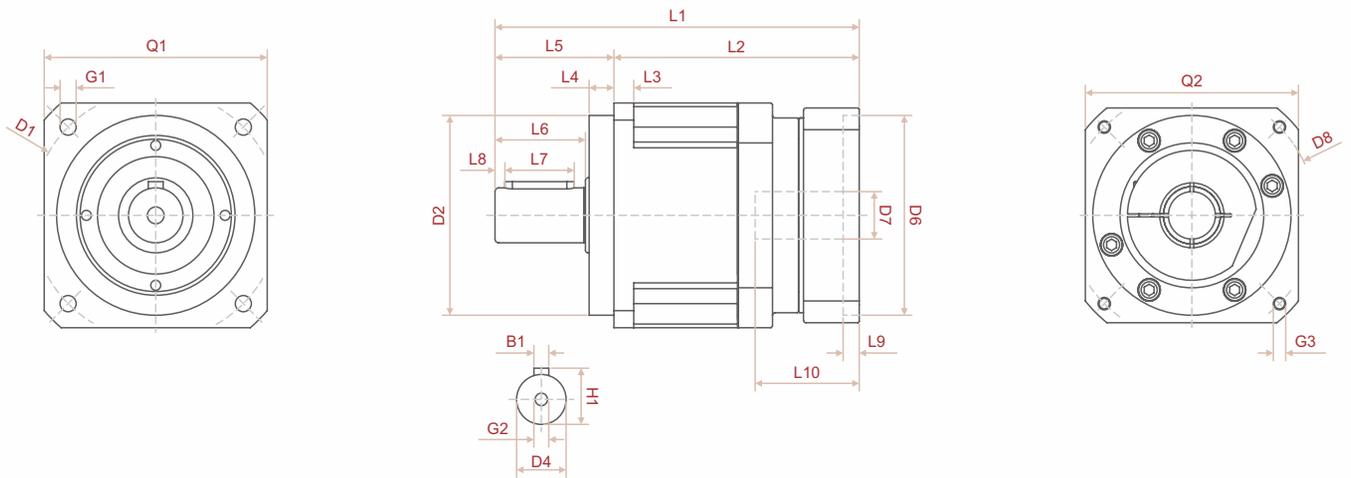
Model / Size		Stages	Ratio	60	90	115	142	180	220
Mass Moments of Inertia	Kg-cm ²	1	3	0.16	0.61	3.25	10	28.98	69.61
			4	0.14	0.48	2.74	7.17	23.67	54.37
			5	0.13	0.47	2.71	6.52	23.29	53.27
			7	0.13	0.45	2.62	6.17	22.48	50.97
			10	0.13	0.44	2.57	6.1	22.51	50.56
		2	12,15,20,25	0.13	0.13	0.47	6.52	7.42	50.56
			30,35,40	0.13	0.13	0.47	6.52	7.42	22.51
			50	0.13	0.13	0.44	6.1	7.42	22.51
			70,100	0.13	0.13	0.44	6.1	7.03	22.51

ZS PROFILE DIMENSIONS

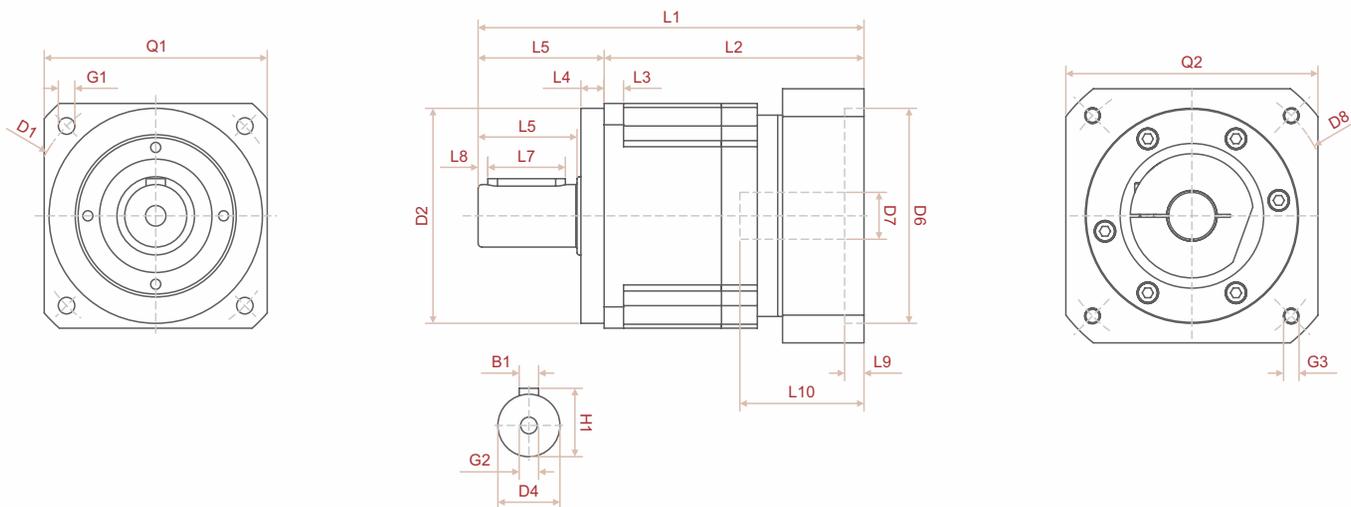
ZS060



ZS090

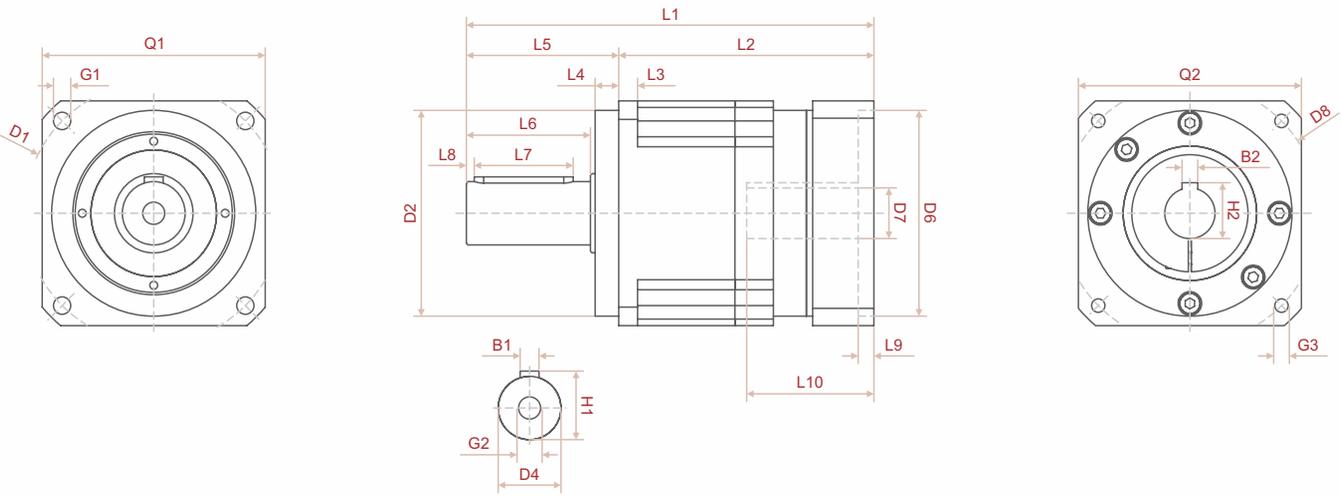


ZS115

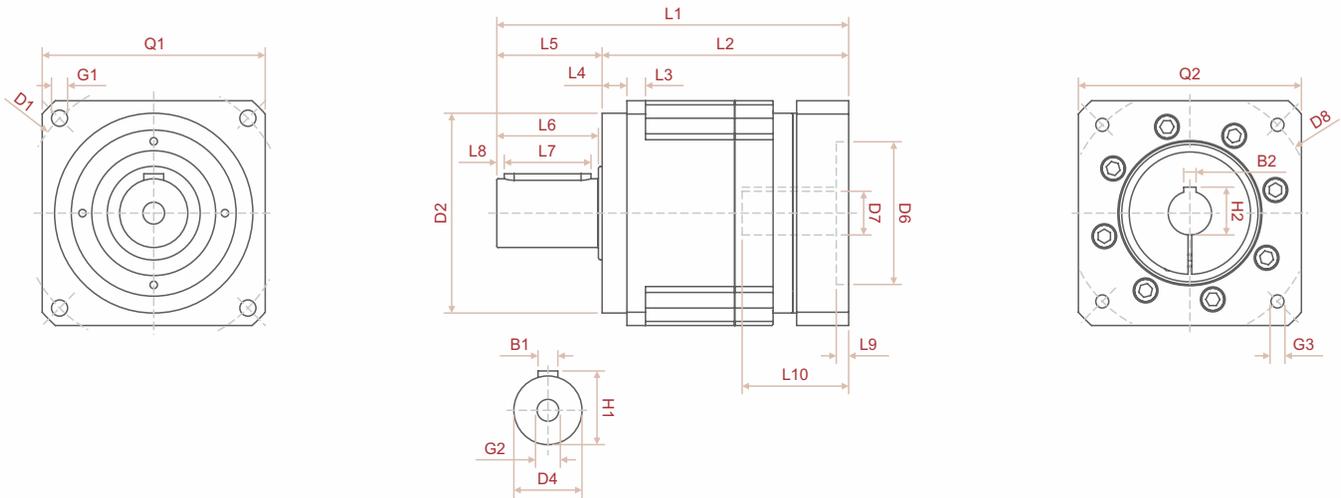




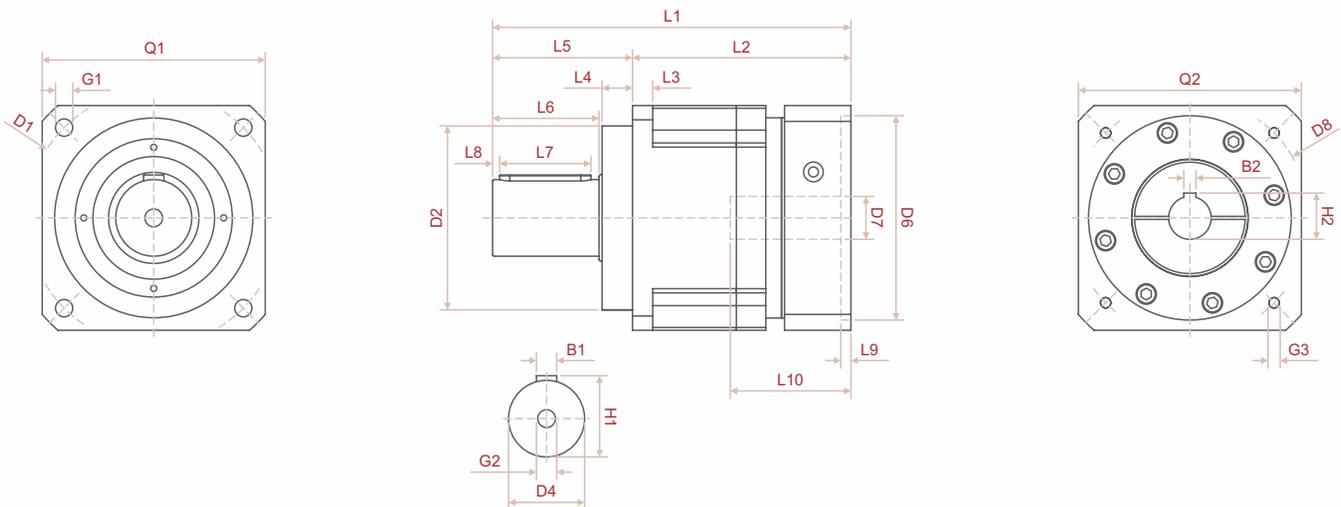
ZS142



ZS180

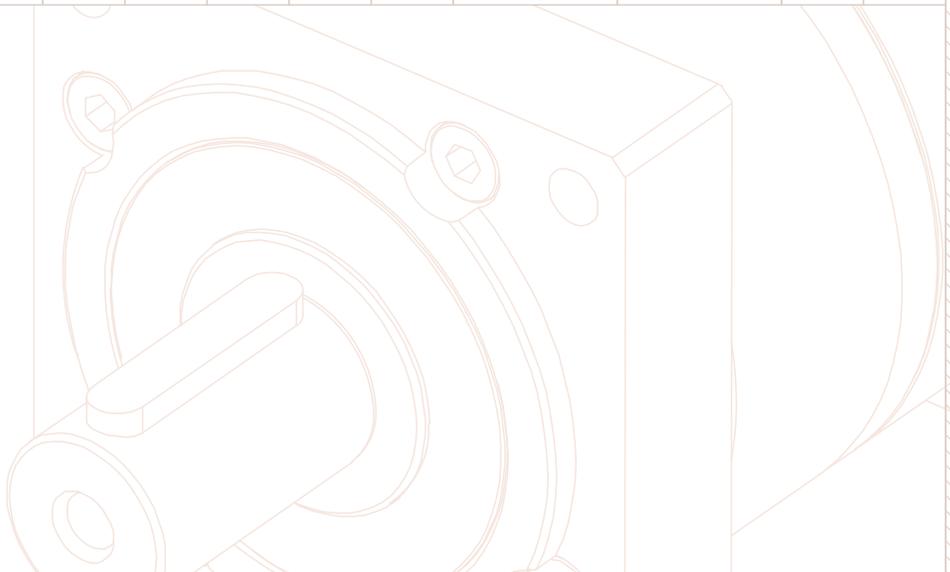


ZS220





Model / Size	Stages		ZS060	ZS090	ZS115	ZS142	ZS180	ZS220						
Overall length	1	L1	115.5	147	199	259.5	284	353.5						
	2		144.5	177.5	233.5	315	347	439.5						
Body length	1	L2	78.5	99	134	162.5	179	215.5						
	2		107.5	129.5	168.5	218	242	301.5						
Output flange		Q1	□60	□90	□115	□142	□180	□220						
Input flange		Q2	□60	□80 □86	□130	□142	□180	□220						
Output														
Length from flange		L3	6	8	10	12	15	20						
Pilot length		L4	7	10	12	15	20	30						
Output shaft length		L5	37	48	65	97	105	138						
shaft shoulder to the shaft end		L6	28.5	36.5	51	79	82	105						
Flat end length / Key length		L7	22	28	40	63	70	90						
Key length to the shaft end		L8	3	4	5	5	6	7						
Mounting hole circle		D1	Ø70	Ø100	Ø130	Ø165	Ø215	Ø250						
Pilot diameter		D2	Ø50 g6	Ø80 g6	Ø110 g6	Ø130 g6	Ø160 g6	Ø180 g6						
Output shaft diameter		D4	Ø16 h6	Ø22 h6	Ø32 h6	Ø40 h6	Ø55 h6	Ø75 h6						
Key width		B1	5	6	10	12	16	20						
Flat end height / Key Height		H1	18	24.5	35	43	59	79.5						
mounting thread x depth		G1	4-Ø5.5	4-Ø7	4-Ø9	4-Ø11	4-Ø13	4-Ø17						
center screw hole x depth		G2	M5x15	M8x20	M12x30	M16x36	M20x42	M20x42						
Input														
Pilot depth		L9	5	7	10	10	10	10						
motor shaft length		L10	34	42	59	81	86	119						
Pilot diameter		D6	Ø38.1 F8	Ø50 F8	Ø70 F8	Ø80 F8	Ø95 F8	Ø110 F8	Ø110 G7	Ø114.3 G7	Ø114.3 G7	Ø200 G7		
Input shaft diameter		D7	Ø8	Ø14	Ø19	Ø19	Ø24 G7	Ø22 G7	Ø24 G7	Ø24	Ø35	Ø42	Ø42	Ø42
Key width		B2	—	—	—	—	—	8	10	12	12	12	12	
Key Height		H2	—	—	—	—	—	27.3	38.3	45.3	45.3	45.3	45.3	
Mounting hole circle		D8	Ø66.67 (□47.14)	Ø70	Ø90	Ø100	Ø115	Ø145	Ø145	Ø200	Ø200	Ø200	Ø235	
Mounting thread x depth		G3	4-M4x12	4-M4x12 4-M5x12	4-M5x15 4-M6x15	4-M6x15	4-M8x20	4-M8x20	4-M8x20	4-M8x20	4-M12x35	4-M12x30	4-M12x30	



ULTRA PRECISION PLANETARY GEAR REDUCERS
ZS PROFILE DIMENSIONS

ULTRA PRECISION PLANETARY GEAR REDUCERS / TECHNICAL DATA



TECHNICAL DATA

ULTRA PRECISION PLANETARY GEAR REDUCERS
Zn TECHNICAL DATA

Model / Size		Stages	60	90	120	150	180	220
Full load efficiency	%	1	95					
		2	92					
Standard Backlash	arcmin	1	≤5	≤5	≤5	≤5	≤5	≤5
		2	≤8	≤8	≤8	≤8	≤8	≤8
Precision Backlash	arcmin	1	≤3	≤3	≤3	≤3	≤3	≤3
		2	≤5	≤5	≤5	≤5	≤5	≤5
Noise ②	dB(A)		58	63	63	65	67	70
Lifetime ①	hr		20000					
Max radial load	N		1530	3250	6200	9000	14500	50000
Max axial load	N		1000	2100	4000	4200	7000	35000
Nominal Input Speed	rpm		3000	3000	3000	3000	2500	2000
Max input speed	rpm		6000	6000	6000	6000	5000	4000
Torsional stiffness	Nm/arcmin		7	15	25	50	145	225
Weight	kg	1	1.3	3.7	7.8	16.1	30	58
		2	2	5.6	9	19	42	65
Operating temp.	°C		-10 ~ 90					
Degree of protection			IP 65					
Lubrication			Synthetic lubrication					
Mounting direction			Any					

① Life reduced by half under continuous operation.

② Noise level measured on input running at 3000 rpm with no load (i = 5)

Model / Size		Stages	Ratio	60	90	120	150	180	220
Nominal output torque	Nm	1	3	40	100	220	340	790	1140
			4	50	110	300	500	1050	1800
			5	60	150	360	600	1180	2000
			7	55	150	360	600	1000	1700
			10	40	100	240	380	900	1500
		2	12,15	40	100	220	340	790	1140
			20	50	110	300	500	1050	1800
			25	60	150	360	600	1180	2000
			30	40	100	220	340	790	1140
			35	60	150	360	600	1180	2000
			40	50	110	300	500	1050	1800
			50	60	150	360	600	1180	2000
			70	55	150	360	600	1000	1700
			100	40	100	240	380	900	1500

MAX Output torque

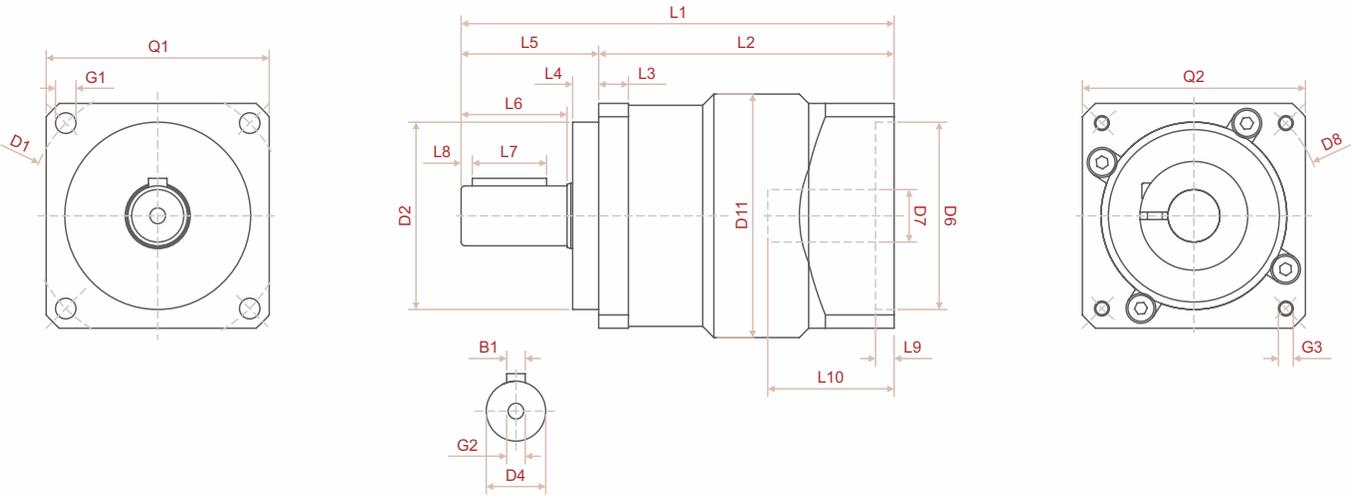
3 times of Nominal Output Torque

Model / Size		Stages	Ratio	60	90	120	150	180	220
Mass Moments of Inertia	Kg-cm ²	1	3	0.13	0.61	3.25	9.21	28.98	69.61
			4	0.13	0.48	2.74	7.54	23.67	54.37
			5	0.13	0.47	2.71	7.42	23.29	53.27
			7	0.13	0.45	2.62	7.14	22.48	50.97
			10	0.13	0.4	2.57	7.03	22.51	50.56
		2	12,15,20,25	0.03	0.13	0.48	2.63	7.42	50.56
			30,35,40	0.03	0.13	0.48	2.43	7.42	22.51
			50	0.03	0.13	0.48	2.39	7.42	22.51
			70,100	0.03	0.13	0.44	2.39	7.03	22.51

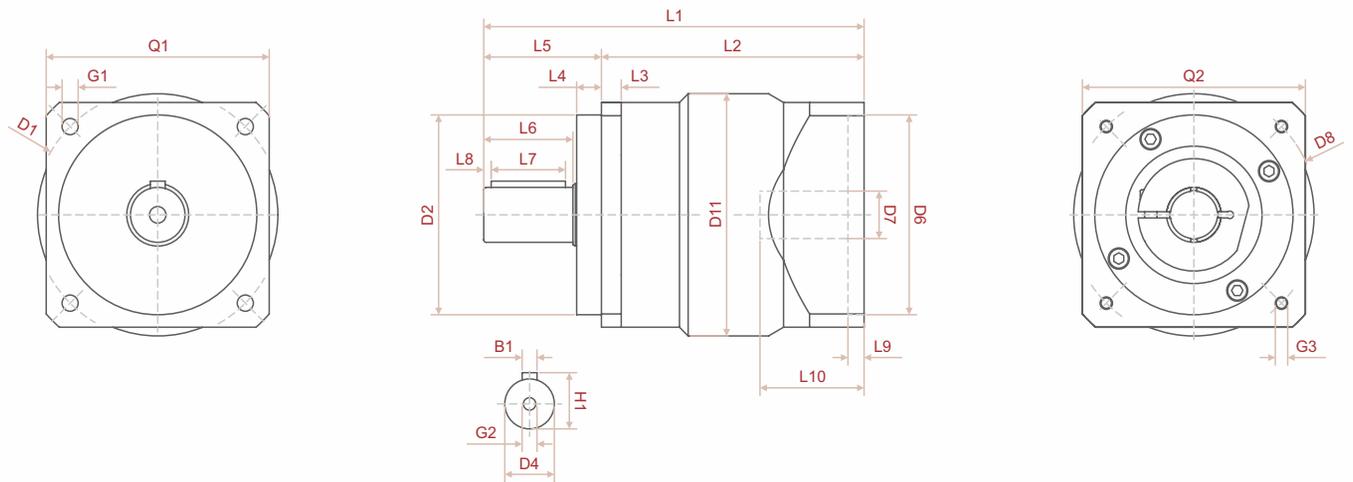


PROFILE DIMENSIONS

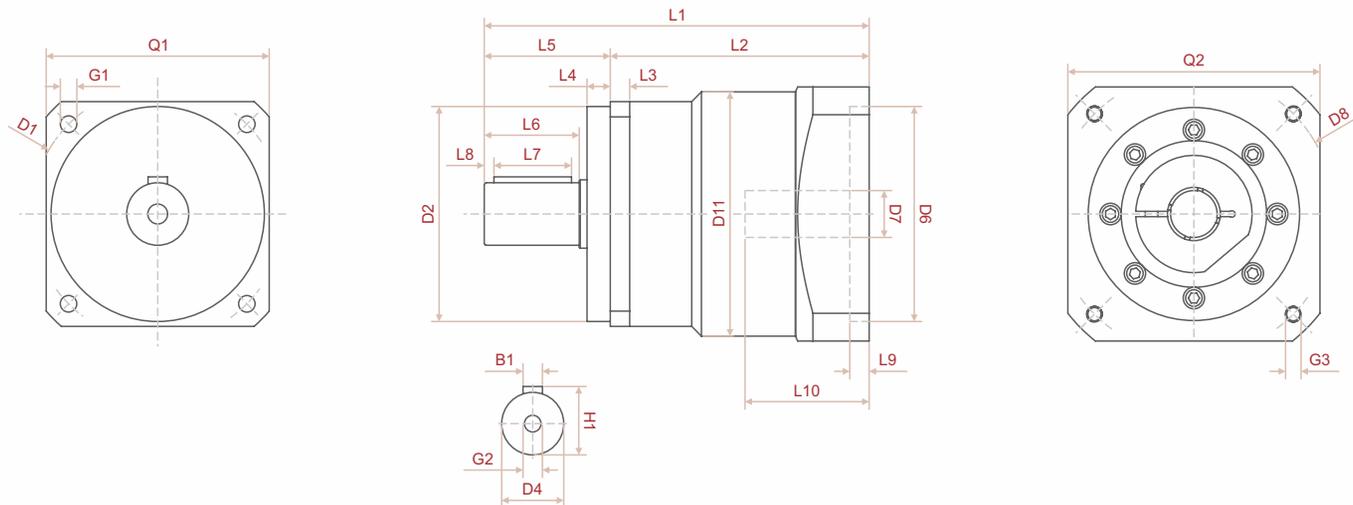
ZN060



ZN090

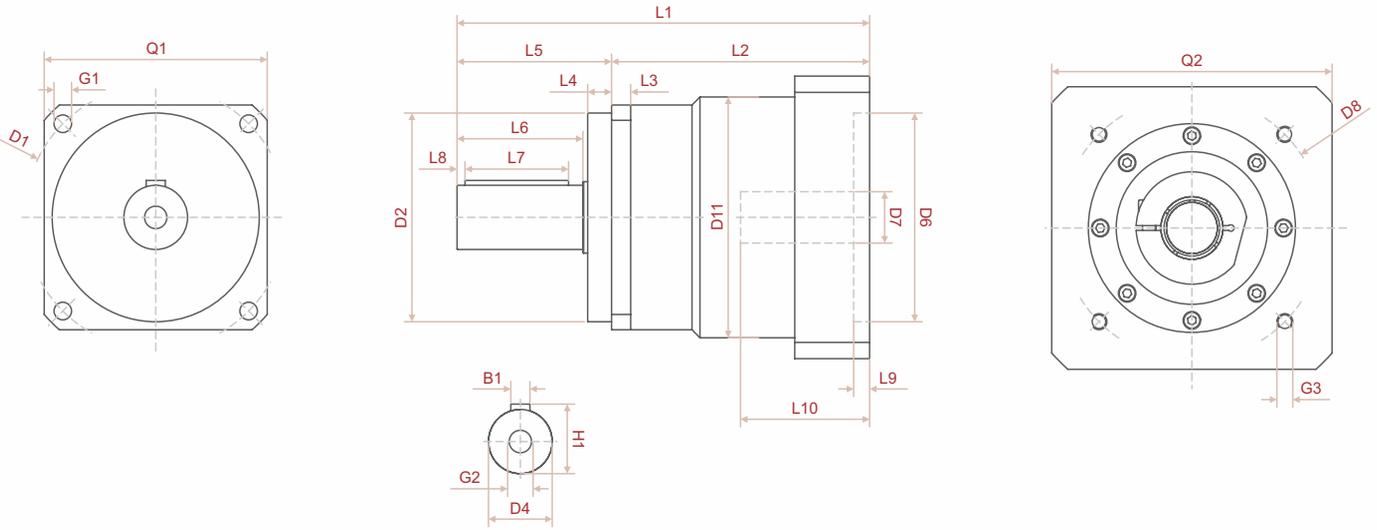


ZN120

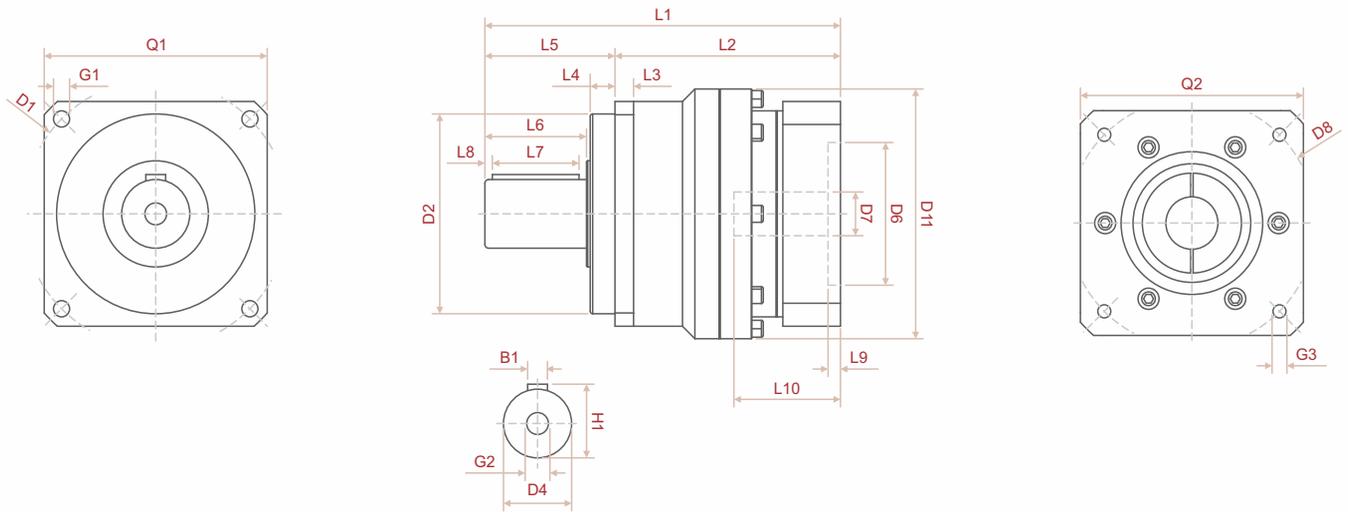




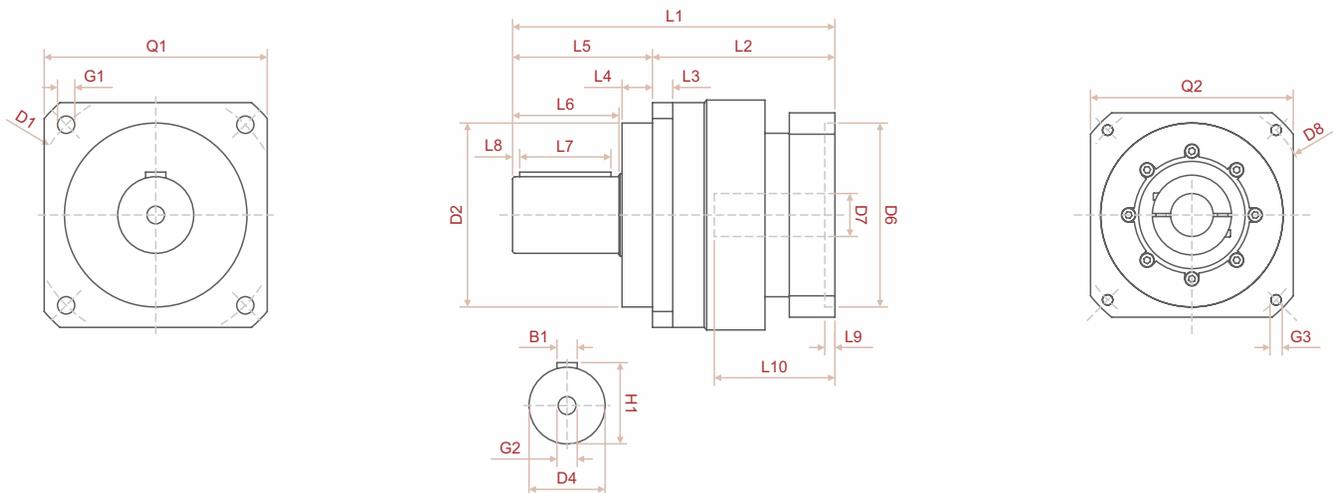
ZN150



ZN180



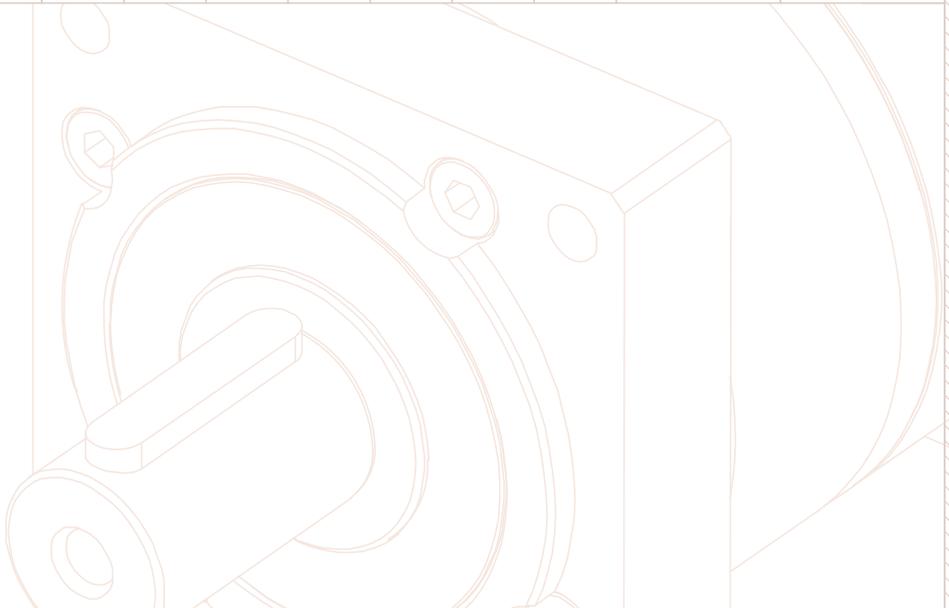
ZN220



ULTRA PRECISION PLANETARY GEAR REDUCERS / PROFILE DIMENSIONS



Model / Size	Stages		ZN060	ZN090	ZN120	ZN150		ZN180	ZN220					
Overall length	1	L1	116.5	153.5	198.5	252	259	287	318	350				
	2		136.5	183	235.5	279.5	297.5	336	382	414				
Body length	1	L2	79.5	106	133.5	155	162	182	180	212				
	2		99.5	135.5	170.5	182.5	200.5	231	244	276				
Output flange		Q1	□60	□90	□115	□140	□140	□180	□220	□220				
Input flange		Q2	□60	□90	□130	□130	□176	□180	□220	□225				
Output														
Length from flange		L3	8	8	10	12		15		20				
Pilot length		L4	7	10	12	15		20		30				
Output shaft length		L5	37	47.5	65	97		105		138				
shaft shoulder to the shaft end		L6	28.5	36	49	79		82		105				
Flat end length / Key length		L7	20	30	40	65		70		90				
Key length to the shaft end		L8	3	3	5	5		6		7				
Mounting hole circle		D1	Ø70	Ø100	Ø130	Ø165		Ø215		Ø250				
Pilot diameter		D2	Ø50 g6	Ø80 h7	Ø110 g6	Ø130 g6		Ø160 g6		Ø180 g6				
Output shaft diameter		D4	Ø16 h6	Ø22 h6	Ø32 h6	Ø40 h6		Ø55 g6		Ø75 g6				
Housing diameter		D11	Ø65	Ø97	Ø125	Ø150		Ø200		Ø225				
Key width		B1	5	6	10	12		16		20				
Flat end height / Key Height		H1	18	24.5	35	43		59		79.5				
mounting thread x depth		G1	4-Ø5.5	4-Ø6.5	4-Ø9	4-Ø11		4-Ø13		4-Ø17				
center screw hole x depth		G2	M5x13	M8x16	M12x25	M16x30		M20x42		M20x35				
Input														
Pilot depth		L9	3.5	6	6	10	10	8		10				
motor shaft length		L10	32	45	59	63	82	82		82				
Pilot diameter		D6	Ø38.1 G6	Ø50 G6	Ø70 G6	Ø80 G6	Ø95 G6	Ø110 G6	Ø110 G6	Ø130 G6	Ø114.3 G7	Ø114.3 G7	Ø180 G6	Ø200 G6
Input shaft diameter		D7	Ø6.35	Ø14	Ø19	Ø16	Ø22 G6	Ø22 G6 Ø24 G6	Ø24	Ø32	Ø35	Ø42	Ø42	Ø55
Mounting hole circle		D8	Ø66.67 (□47.14)	Ø70	Ø90	Ø100	Ø115	Ø130 Ø145	Ø145	Ø165	Ø200	Ø200	Ø215	Ø235
Mounting thread x depth		G3	4-M4x12	4-M4x12 4-M5x12	4-M6x15	4-M6x15	4-M8x20	4-M8x20	4-M8x20	4-M10x20	4-M12x30		4-M12x30	



ULTRA PRECISION PLANETARY GEAR REDUCERS
ZN PROFILE DIMENSIONS

ULTRA PRECISION PLANETARY GEAR REDUCERS / TECHNICAL DATA



ULTRA PRECISION PLANETARY GEAR REDUCERS
ZE TECHNICAL DATA

Model / Size		Stages	60	90	120	140
Full load efficiency	%	1	≥95			
		2	≥92			
Standard Backlash	arcmin	1	≤5	≤5	≤5	≤5
		2	≤8	≤8	≤8	≤8
Precision Backlash	arcmin	1	≤3	≤3	≤3	≤3
		2	≤5	≤5	≤5	≤5
Noise ②	dB(A)		≤60	≤60	≤65	≤67
Lifetime ①	hr		20000			
Max radial load	N		1300	2800	5200	9400
Max axial load	N		550	1000	2300	4700
Nominal Input Speed	rpm		5000	4000	4000	3000
Max input speed	rpm		10000	8000	8000	6000
Torsional stiffness	Nm/arcmin		5	11	18	50
Weight	kg	1	1.35	4.25	9.15	14.6
		2	1.7	7	13	19.2
Operating temp.	°C		-20 ~ 90			
Degree of protection			IP 65			
Lubrication			Synthetic lubrication			
Mounting direction			Any			

① Life reduced by half under continuous operation.

② Noise level measured on input running at 3000 rpm with no load (i = 5)

Model / Size		Stages	Ratio	60	90	120	140
Nominal output torque	Nm	1	3	35	100	170	342
			4	40	110	220	542
			5	45	125	250	650
			7	40	110	200	550
			10	30	80	180	450
		2	15	35	100	170	342
			20	45	110	220	542
			25	45	125	250	650
			30	40	110	220	600
			35	40	125	200	550
			40	40	110	220	542
			50	45	125	250	650
			70	40	110	200	550
			100	30	80	180	450

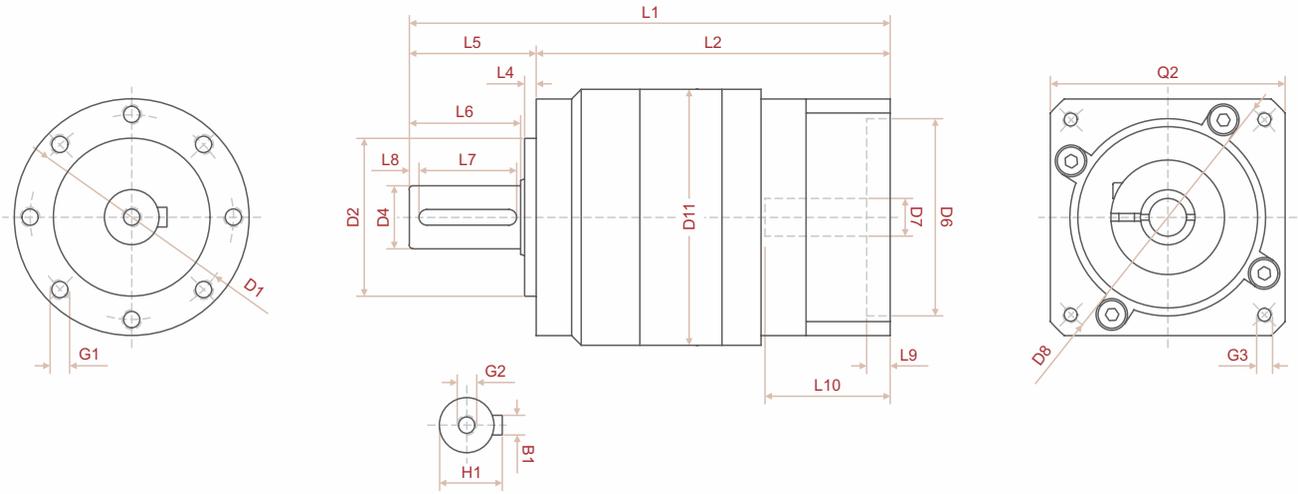
MAX Output torque 2.5 times of Nominal Output Torque

Model / Size		Stages	Ratio	60	90	120	140
Mass Moments of Inertia	Kg-cm ²	1	3	0.16	0.61	3.25	9.21
			4	0.14	0.48	2.74	7.54
			5	0.13	0.47	2.71	7.42
			7	0.13	0.45	2.62	7.14
			10	0.13	0.44	2.57	7.03
		2	15,20,25	0.13	0.47	2.71	7.42
			35	0.13	0.45	2.57	7.14
			30,40,50	0.13	0.44	2.62	7.03
			70,100	0.13	0.13	0.44	2.57

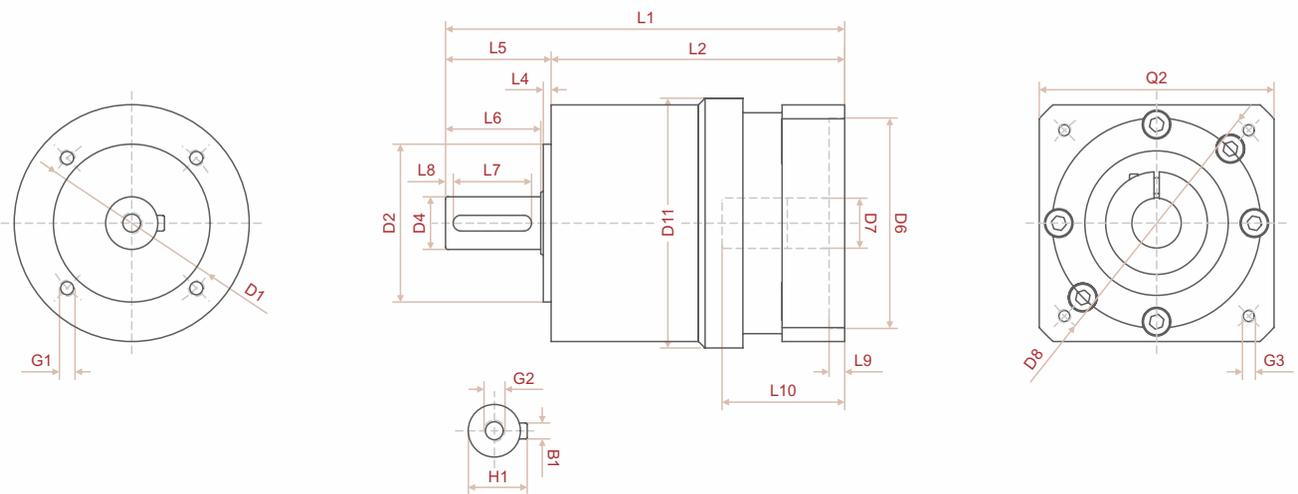


PROFILE DIMENSIONS

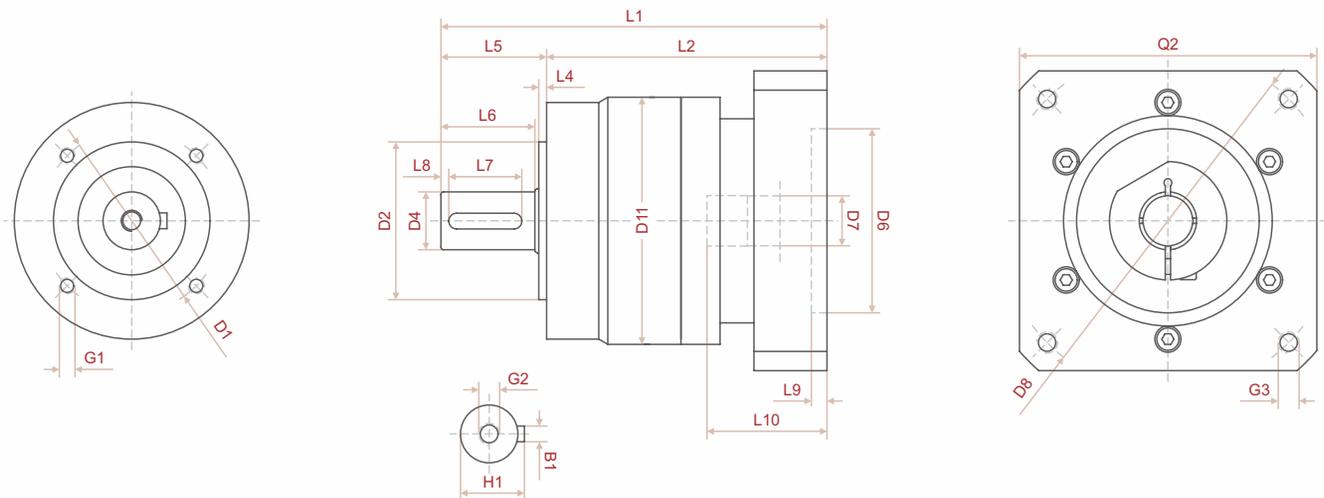
ZE60



ZE90



ZE120

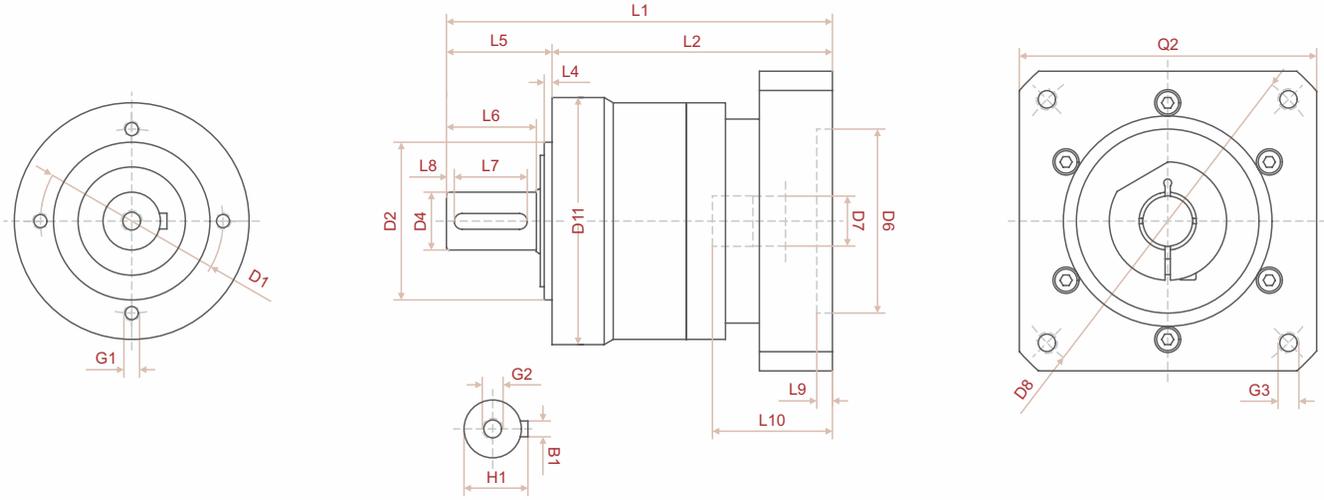


ULTRA PRECISION PLANETARY GEAR REDUCERS / PROFILE DIMENSIONS



PROFILE DIMENSIONS

ZE140



ULTRA PRECISION PLANETARY GEAR REDUCERS
ZE PROFILE DIMENSIONS

Model / Size	Stages		ZE60	ZE90	ZE120	ZE140
Overall length	1	L1	123	146.5	191.5	262
	2		151	183	234	330
Body length	1	L2	90.5	105.5	136.5	166.5
	2		118.5	142	179	233
Input flange		Q2	□60	□90	□130	□180
Output						
Pilot length		L4	3	3	4	12
Output shaft length		L5	32.5	40.5	55	97
shaft shoulder to the shaft end		L6	28.5	36.5	49	82
Flat end length / Key length		L7	20	30	40	65
Key length to the shaft end		L8	3	3	5	5
Mounting hole circle		D1	Ø52	Ø70	Ø100	Ø140
Pilot diameter		D2	Ø40 g6	Ø60 g6	Ø80 g6	Ø120 g6
Output shaft diameter		D4	Ø16 g6	Ø20 g6	Ø25 g6	Ø40 g6
Housing diameter		D11	Ø65	Ø95	Ø125	Ø155
Key width		B1	5	6	8	12
Flat end height / Key Height		H1	18	22.5	28	43
mounting thread x depth		G1	8-M5	4-M6	4-M10	4-M10
center screw hole x depth		G2	M5x12	M8	M8	M16
Input						
Pilot depth		L9	6	6	8	8
motor shaft length		L10	32	47	62.5	81.5
Pilot diameter		D6	Ø50 G6	Ø80 G6	Ø110 G6	Ø114.3 G6
Input shaft diameter		D7	Ø14 G6	Ø19 G6	Ø22 G6	Ø35 G6
Mounting hole circle		D8	Ø70	Ø100	Ø145	Ø200
mounting thread x depth		G3	4-M4	4-M6	4-M8	4-M12

ULTRA PRECISION PLANETARY GEAR REDUCERS / TECHNICAL DATA



TECHNICAL DATA

- Low noise
- Compact size and optimized weight
- Precision gearing
- Optimized inertia moment
- Stable temperature rise
- Higher performance & torsional stiffness
- High efficiency transmission
- Optimized design with special lubricant for long service life
- Flexible mounting dimension

Model / Size		Stages	60	90	110	140	200
Full load efficiency	%	1	95				
		2	92				
Standard Backlash	arcmin	1	≤5	≤5	≤5	≤5	≤5
		2	≤7	≤7	≤7	≤7	≤7
Precision Backlash	arcmin	1	≤3	≤3	≤3	≤3	≤3
		2	≤6	≤6	≤5	≤5	≤5
Noise ②	dB(A)		60	63	65	65	67
Lifetime ①	hr		20000				
Max. Bending moment M_{2KB}	Nm		120	241	430	1320	3200
Max axial load	N		1800	2000	4800	6100	7250
Nominal Input Speed	rpm		5000	4000	4000	2000	2000
Max input speed	rpm		10000	8000	8000	4000	4000
Torsional stiffness	Nm/arcmin		11	30	82	150	435
Weight	kg	1	1.3	3.7	5.6	16.1	30
		2	2.1	5.6	9	19	42
Operating temp.	°C		-10 ~ 90				
Degree of protection			IP 65				
Lubrication			Synthetic lubrication				
Mounting direction			Any				

① Life reduced by half under continuous operation.

② Noise level measured on input running at 3000 rpm with no load (i = 5)

Model / Size		Stages	Ratio	60	90	110	140	200
Nominal output torque	Nm	1	3	55	130	—	—	—
			4	50	140	270	542	1050
			5	60	160	330	650	1200
			7	50	140	300	550	1100
			10	40	100	230	450	520
		2	12,15	55	130	—	—	—
			20	50	140	285	542	1145
			25	60	160	335	650	1220
			30	55	130	—	—	—
			35	60	160	335	650	1220
			40	50	140	285	542	1145
			50	60	160	335	650	1220
			70	50	140	310	550	1120
			100	40	100	250	450	920

MAX Output torque 3 times of Nominal Output Torque

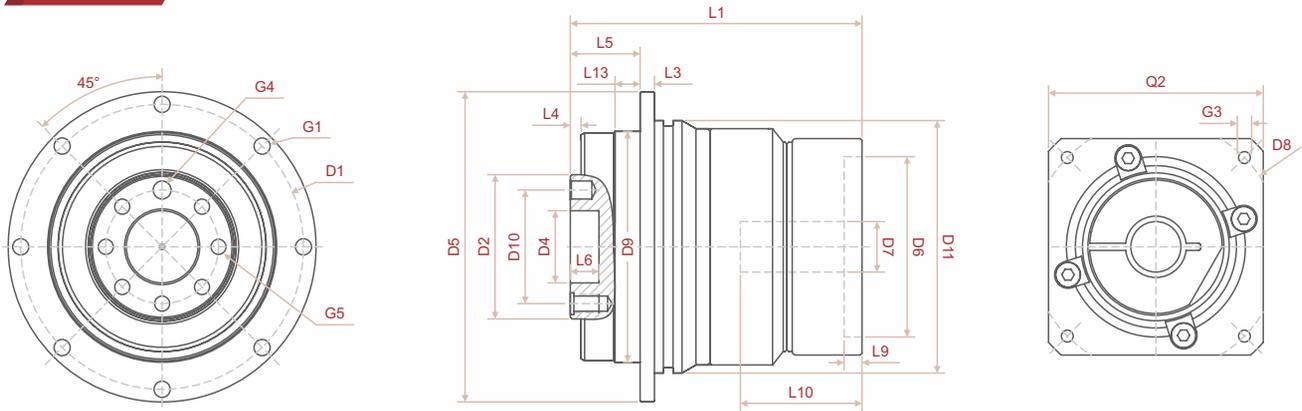
Model / Size		Stages	Ratio	60	90	110	140	200
Mass Moments of Inertia	Kg-cm ²	1	3	0.16	0.61	—	—	—
			4	0.14	0.48	2.87	7.17	24.92
			5	0.13	0.47	2.71	6.52	23.29
			7	0.13	0.45	2.65	6.17	22.64
			10	0.13	0.44	2.57	6.1	20.72
		2	12,15	0.16	0.13	—	—	—
			20,25	0.16	0.13	0.65	6.52	7.56
			30	0.14	0.13	—	—	—
			35	0.14	0.13	0.6	6.52	7.56
			40	0.14	0.13	0.6	6.52	7.06
			50,70,100	0.14	0.13	0.58	6.1	7.06



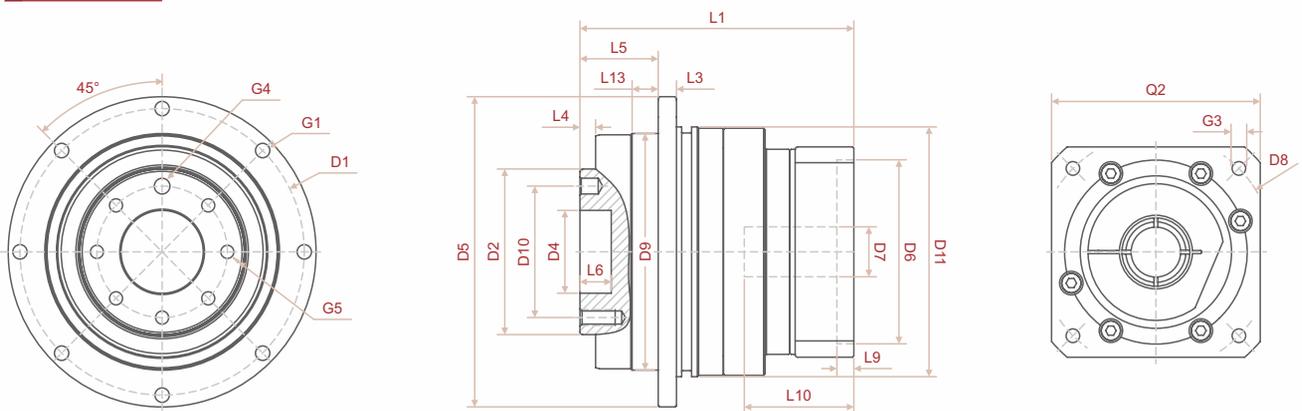
PROFILE DIMENSIONS

ULTRA PRECISION PLANETARY GEAR REDUCERS
ZF PROFILE DIMENSIONS

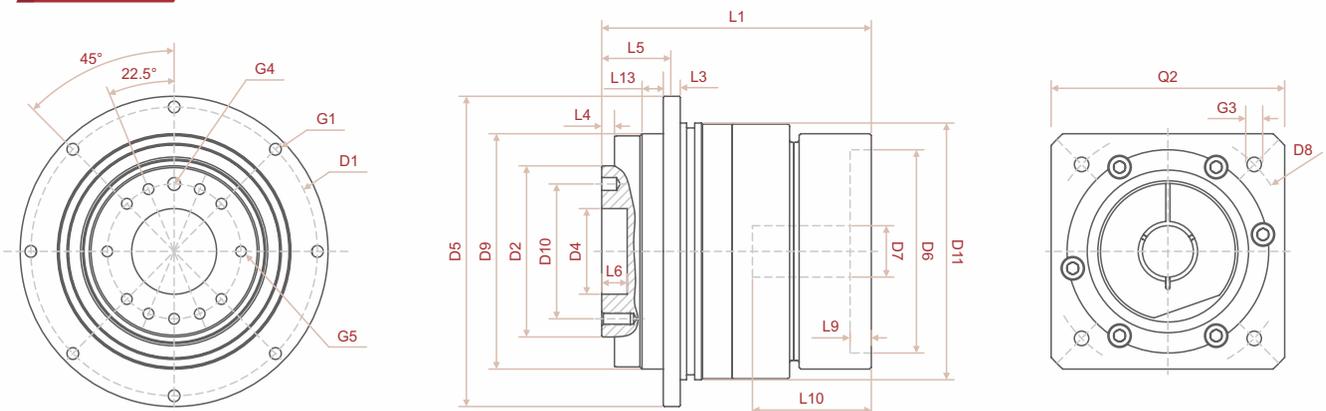
ZF60



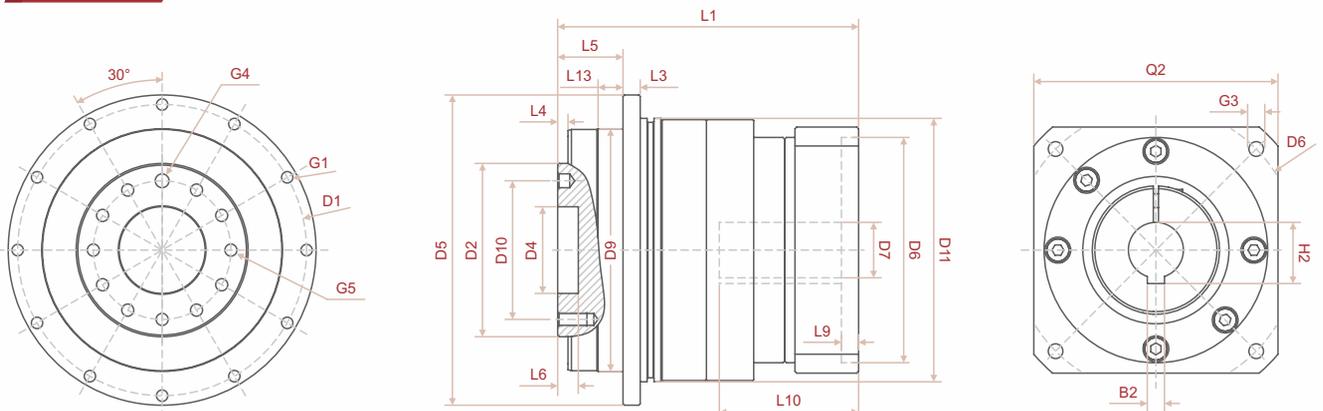
ZF90



ZF110



ZPS120

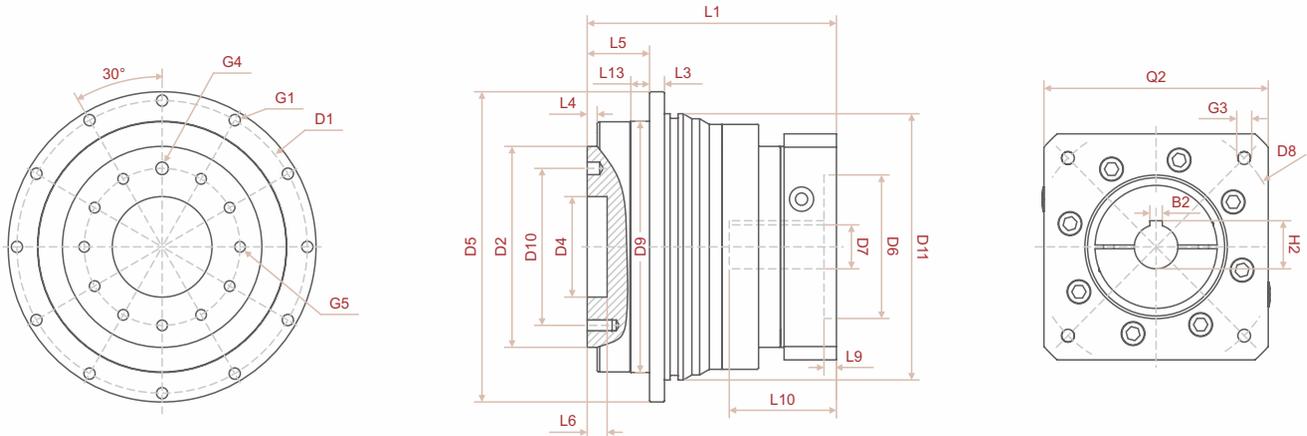




PROFILE DIMENSIONS

ZF200

ZF200



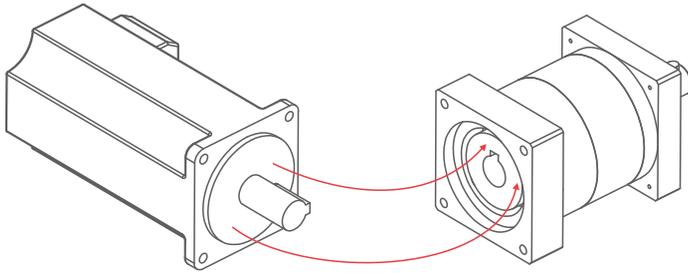
ULTRA PRECISION PLANETARY GEAR REDUCERS
ZF PROFILE DIMENSIONS

Model / Size	Stages		ZF60	ZF90		ZF110		ZF140		ZF200		
Overall length	1	L1	81.5	105	104	127	135	175	177	200		
	2		110.5	134.5	135.5	159.5	169.5	230.5	232.5	263		
Input flange		Q2	□60	□80	□86	□110	□130	□142	□180	□180		
Output												
Length from flange		L3	4	7		8		10		12		
Pilot length		L4	3	6		6		60		8		
Output shaft length		L5	19.5	30		29		38		50		
shaft shoulder to the shaft end		L6	8	12		12		12		16		
Spigot depth		L13	7	10		10		15		15		
Hole circle diameter		D1	Ø79	Ø109		Ø135		Ø168		Ø233		
Mounting hole circle		D2	Ø40 h7	Ø63 h7		Ø80 h7		Ø100 h7		Ø160 h7		
Centering		D4	Ø20 H7	Ø31.5 H7		Ø40 H7		Ø50 H7		Ø80 H9		
Output shaft diameter		D5	Ø86	Ø118		Ø145		Ø179		Ø247		
Centering		D9	Ø64 h7	Ø90 h7		Ø110 h7		Ø140 h7		Ø200 h7		
Hole circle diameter		D10	Ø31.5	Ø50		Ø63		Ø80		Ø125		
Housing diameter		D11	Ø70	Ø95		Ø119		Ø152		Ø212		
Pinion bore		G1	8-Ø4.5 THRU.	8-Ø5.5 THRU.		8-Ø5.5 THRU.		12-Ø6.6 THRU.		12-Ø9.0 THRU.		
mounting thread x depth		G4	Ø5 H7x6 DP.	Ø6 H7x7 DP.		Ø6 H7x7 DP.		Ø8 H7x7 DP.		Ø10 H7x10 DP.		
		G5	7-M5x8	7-M6x13		11-M6x13		11-M8x17		11-M10x20		
Input												
Pilot depth		L9	5	6.5		10		10		10		
motor shaft length		L10	34	42		56	64	84	83	83		
Pilot diameter		D6	Ø38.1 G6	Ø50 G6	Ø70 F8	Ø80 F8	Ø95 G7	Ø110 G7	Ø130 G7	Ø114.3 G7		
Input shaft diameter		D7	Ø8	Ø14	Ø19	Ø19	Ø24 G7	Ø22 G7 Ø24 G7	Ø32	Ø42	Ø35	Ø42
Key width		B2	—	—		—		10	12	10	12	
Key Height		H2	—	—		—		35.3	45.3	38.3	45.3	
Mounting hole circle		D8	Ø66.67 (□47.14)	Ø70	Ø90	Ø100	Ø115	Ø145	Ø165	Ø200	Ø200	
mounting thread x depth		G3	4-M4x10	4-M4x10 4-M5x12	4-M5x15 4-M6x15	4-M6x14	4-M8x20	4-M8x20	4-M10x30	4-M12x35	4-M12x35	

GEAR REDUCER MOUNTING INSTRUCTION / TORQUE REQUIRED TO SECURE BOLT

GEAR REDUCER MOUNTING INSTRUCTION

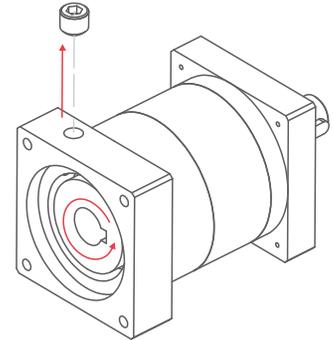
STEP 1



- A. Verify fit before assembly
- B. Clean both surfaces thoroughly

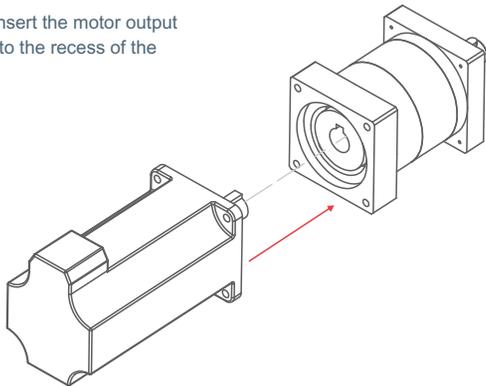
STEP 2

- A. Loosen the plug screw on the side of gearbox input flange.
- B. Rotate the gearbox inlet bushing until the head of the lock bolt is aligned with access hole.
- C. Loosen the lock bolt on the gearbox inlet bushing.

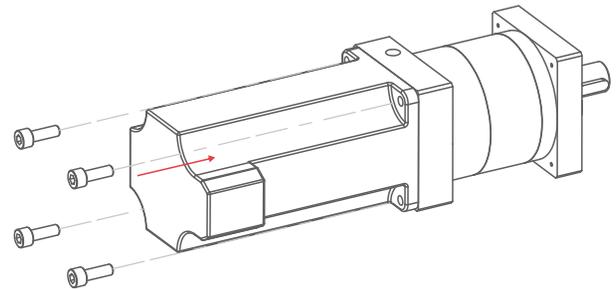


STEP 3

Position and then insert the motor output shaft and flange into the recess of the gearbox.



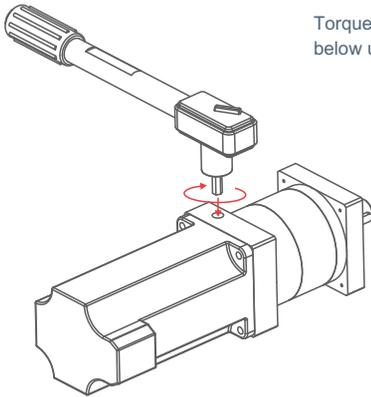
STEP 4



Secure motor to gearbox using specified hardware.

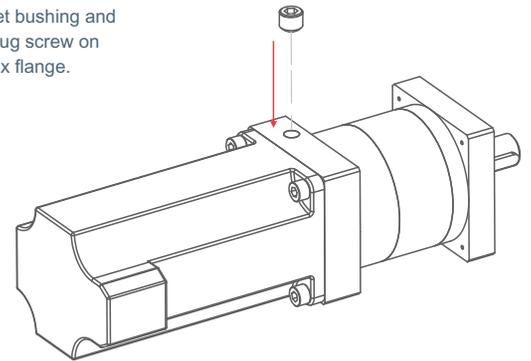
STEP 5

Torque motor coupling according to table below using calibrated torque wrench.



STEP 6

Tighten the lock bolt on the side of the gearbox inlet bushing and then tighten the plug screw on the side of gearbox flange.



Tightening Torque Recommended For Motor Mounting Bolt & Motor Lock Sleeve Bolt

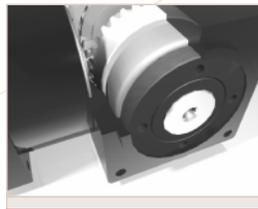
Bolt Size		M3	M4	M5	M6	M8	M10	M12	M14
Width Across Flats	mm	2.5	3	4	5	6	8	10	14
Strength 12.9 Tightening Torque	Nm	2.1	4.9	9.8	17	41	80	139	343
	In-lbs	19	44	87	151	364	709	1232	3038

Note:

Torques shown above are minimum tightening values. Bolts can be safely tightened up to 25% higher for increasing holding torques. Optionally, Loctite can be applied to the threads of the Lock Bolt. (Use Loctite 242 for screw sizes above M5 and Loctite 222MS for screws sizes M5 and below)

FEATURES

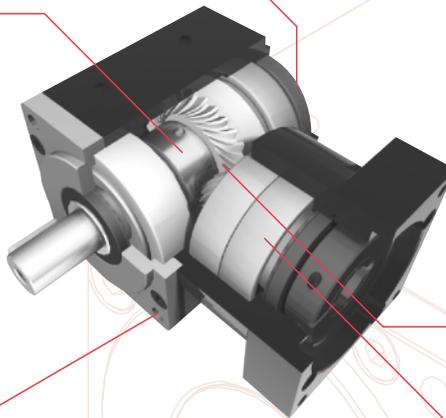
- Precision spiral bevel gears raise efficiency above 96%.
- Reduction ratios for transferring high torques in limited space.
- Hardened high strength steel components for reliability under severe conditions.
- All grease-filled, the gear head can be used in any orientation without oil leaks.
- Backlash under 5 arc-mins low backlash design and 7 arc-min as standard backlash.
- Various of output options available in applications of automation and motion control in industries such as aerospace, medical, pharmaceutical, factory automation, printing, robotics, auto control system, automotive, textile equipment, semiconductor, manufacturing equipment, X-Y positioning systems, coordinate measuring, optical positioning equipment, telecommunications, packaging, material handling, assembly line, CCTV system, machine tools and special machinery, etc.



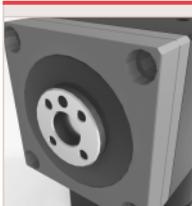
Axil compression mechanism to increase concentricity and ebgement between shaft and bearing.



Patented design provides unique backlash adjustment.



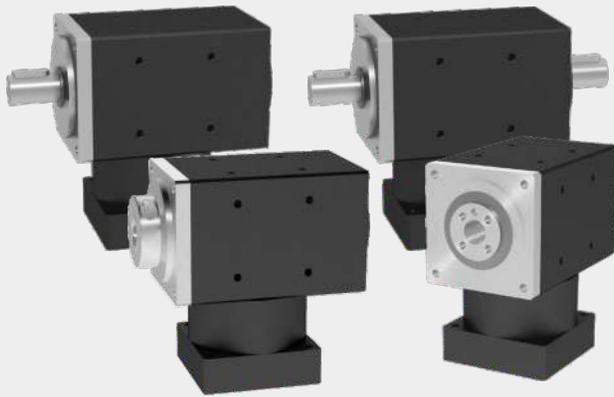
Unique wear resistant treatment for spiral bevel reliability.



Patented output mount design for versatility.



Double ball bearing for stable operation at high speed.



RB/RL FEATURES

The compact and rigid right angle design ensures the highest performance while being space and weight efficient. Ground spiral bevel gear set provides the highest efficiency and lower meshing noise with long service life. Available with solid or hollow shafts on the output end. For output with a hollow shaft, the shaft is extended so a shrink disc can be fitted.

Lubricated for life, the gear reducers are virtually maintenance-free (When used under normal conditions).

Three frame sizes are available with gear ratios 1:1, 1:2, 1:3, 1:4 and 1:5



ZSR FEATURES

- It adopts helical gear drive, after carburizing and quenching treatment, tooth profile modification treatment to ensure low noise and stable operation, bearing capacity is increased by 20% compared with straight tooth.
- Integral output shaft, planetary wheel bearing support at both ends, to achieve high accuracy, strength
- High Precision: return clearance is small, precision single-stage can be done within 3-5 arcmin.
- Easy Maintenance: no need to replace grease during product life, installation is more convenient.



ZFR FEATURES

- Adopt helical gear drive, after carburizing quenching treatment, tooth profile modification treatment, to ensure low noise and smooth operation; The bearing capacity is 20% higher than that of straight teeth.
- High precision: back clearance less than 3 arc minutes, fine positioning.
- High load capacity: The main bearing adopts conical needle roller bearings to achieve high load capacity.
- Easy maintenance: there is no need to replace the grease during the product life cycle, and the installation is more convenient.



ZRPS/ZRPN FEATURES

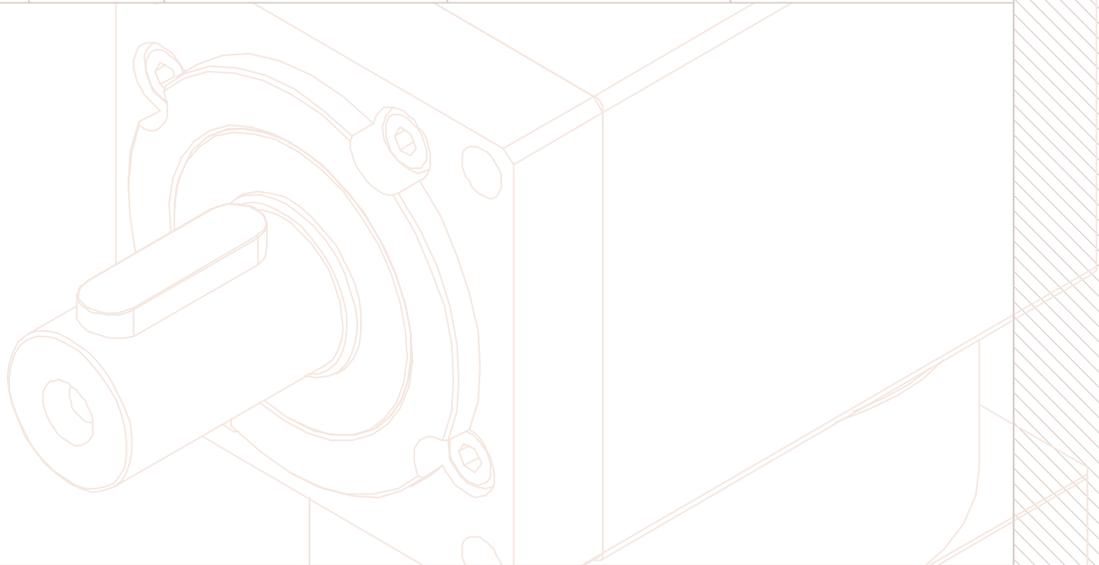
- Space saving: The right Angle reducer uses spiral bevel gear, and the installation of the motor can achieve 90 degree bending, saving space.
- Adopt straight gear drive, after carburizing rate fire treatment, tooth profile modification treatment, to ensure smooth operation, low noise
- Simple structure, mass production, fast delivery time and high cost performance:
- Easy maintenance: there is no need to replace the grease during the product life cycle, and the installation is more convenient.

RB/RL TECHNICAL DATA

- Low noise
- Compact size and optimized weight
- Precision spiral gearing
- Optimized inertia moment
- Stable temperature rise
- High efficiency transmission
- Optimized design with special lubricant for long service life
- Flexible mounting dimensions

Model / Size		42	60	90
Full load efficiency	%	96		
Backlash	arcmin	<6	<6	<6
Noise	dB(A)	70	72	75
Lifetime	hr	20000		
Max radial load	N	600	800	1700
Max axial load	N	700	900	1500
Nominal Input Speed	rpm	4000	4000	3000
Max input speed	rpm	12000	8000	7000
Torsional stiffness	Nm/arcmin	1.5	2.4	6.6
Weight	kg	0.6	1.7	5.4
Operating temp.	°C	-20 ~ 90		
Degree of protection		IP 65		
Lubrication		Life lubrication		
Mounting direction		Any		

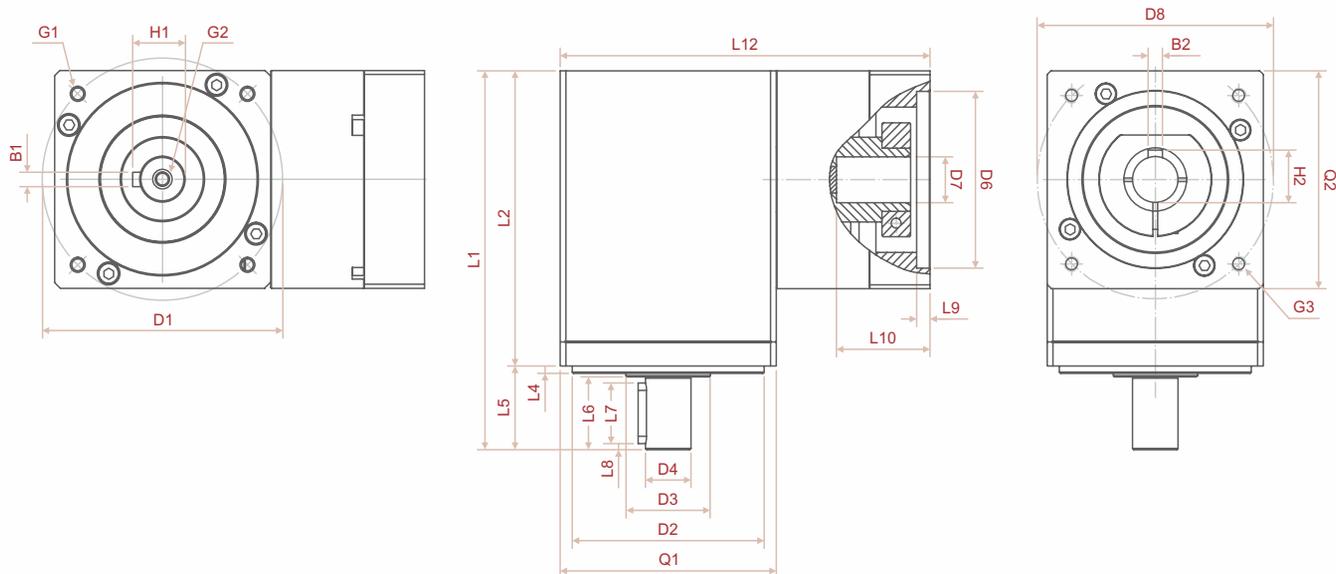
Model / Size		Ratio	42	60	90
Nominal output torque	Nm	1	10	26	73
		2	8	23	69
		3	5	21	54
		4	3	15	44
		5	3	14	43
MAX Output torque		2 times of Nominal Output Torque			
Model / Size		Ratio	42	60	90
Mass Moments of Inertia	kg-cm ²	1	70	360	1910
		2	60	230	1050
		3	60	210	940
		4	60	210	900
		5	60	200	900



PRECISION RIGHT ANGLE GEAR REDUCERS
RB / RL TECHNICAL DATA

PRECISION RIGHT ANGLE GEAR REDUCERS / PROFILE DIMENSIONS

RB PROFILE DIMENSIONS



Model / Size		RB32	RB42	RB60	RB90		
Output flange	Q1	□32	□42	□60	□90		
Input flange	Q2	□32	□42	□60	□90		
Output							
Overall length	L1	56.5	85	122	165		
Body length	L2	41	65	94	130		
Pilot length	L4	2.5	2.5	3	3		
Output shaft length	L5	15.5	20	28	35		
shaft shoulder to the shaft end	L6	12.5	17	24	31		
Flat end length / Key length	L7	12.5	12	18	25		
Key length to the shaft end	L8	—	2	2	2.5		
Mounting hole circle	D1	Ø38	Ø50	Ø70	Ø100		
Pilot diameter	D2	Ø28 g6	Ø35 g6	Ø50 g6	Ø80 g6		
shaft shoulder diameter	D3	Ø12	Ø15	Ø20	Ø35		
Output shaft diameter	D4	Ø6 h7	Ø10 h7	Ø14 h7	Ø19 h7		
Key width	B1	—	3	5	6		
Flat end height / Key Height	H1	5.5	11.2	16	21.5		
mounting thread x depth	G1	M3x8	M4x8	M5x12	M6x15		
center screw hole x depth	G2	—	M4x8	M5x12	M6x15		
Input							
Pilot depth	L9	3	3	5.5	5.5		
motor shaft length	L10	20	25	30	40		
Overall length	L12	59	75	105.3	154		
Pilot diameter	D6	22	Ø30 G7	Ø22 G7	Ø50 G7	Ø38.1 G7	Ø70 G7
Input shaft diameter	D7	5	Ø8	Ø5	Ø14	Ø6.35	Ø19
Mounting hole circle	D8	Ø32.53(□23)	Ø46	Ø43.84(□31)	Ø70	Ø66.67(□47.14)	Ø90
mounting thread x depth	G3	Ø2.7	M4 x 10	Ø3.3	M5 x 12	M4 x 10	M6 x 12
Key width	B2	—	3	—	5	—	6
Key Height	H2	—	9.4	—	9.4	—	21.8

ZSR TECHNICAL DATA

PRECISION RIGHT ANGLE GEAR REDUCERS
ZSR TECHNICAL DATA

Model / Size		Stages	060	090	115	142	180	220
Full load efficiency	%	1	95					
		2	92					
Standard Backlash	arcmin	1	≤9	≤9	≤9	≤6	≤6	≤4
		2	≤12	—	—	—	—	—
Precision Backlash	arcmin	1	≤7	≤7	≤7	≤4	≤4	≤4
		2	≤10	—	—	—	—	—
Noise ②	dB(A)		63	65	70	65	72	74
Lifetime ①	hr		20000					
Max radial load	N		1530	3250	6700	9400	14500	50000
Max axial load	N		765	1300	3000	4000	6200	35000
Nominal Input Speed	rpm		3000	3000	3000	2000	2000	2000
Max input speed	rpm		6000	6000	6000	4000	4000	4000
Torsional stiffness	Nm/arcmin		6	12	23	45	148	220
Weight	kg	1	2.6	7	14	30	50	68
		2	3.0	—	—	—	—	—
Operating temp.	°C		-10 ~ 90					
Degree of protection			IP 65					
Lubrication			Synthetic lubrication					
Mounting direction			Any					

① Life reduced by half under continuous operation.

② Noise level measured on input running at 3000 rpm with no load (i = 5)

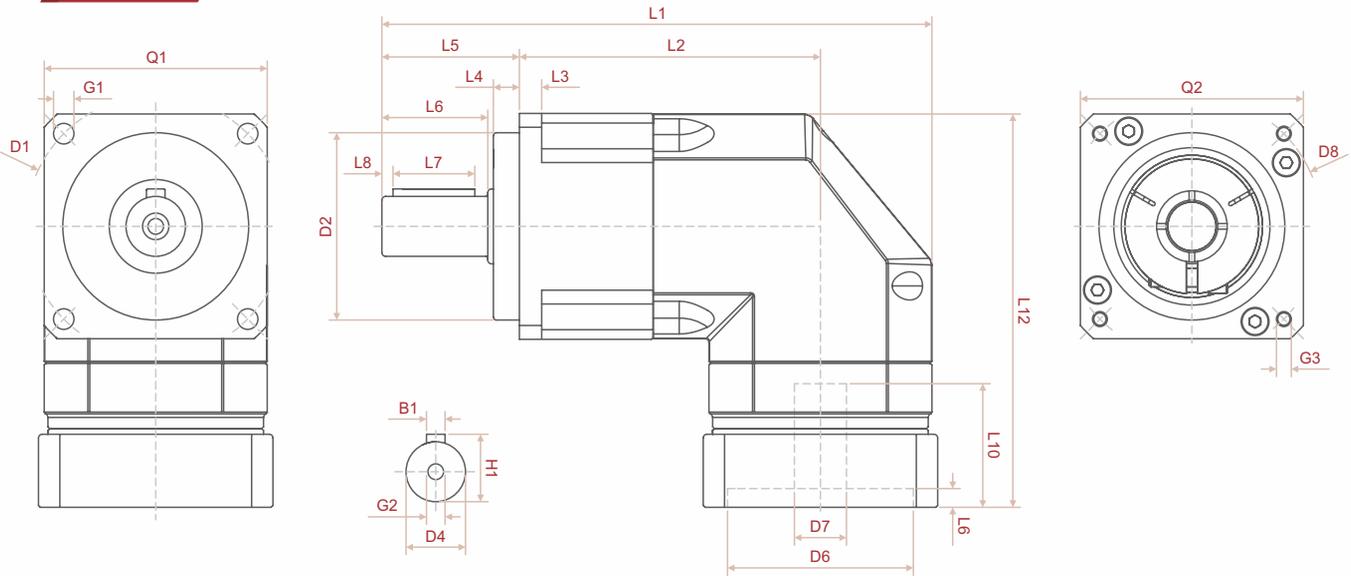
Model / Size		Stages	Ratio	060	090	115	142	180	220
Nominal output torque	Nm	1	3	55	145	290	342	588	1140
			4	50	150	300	542	1050	1700
			5	60	140	290	650	1200	2000
			7	50	125	270	550	1100	1800
			10	40	140	290	650	520	1220
			14	50	125	270	550	1100	1800
			20	40	95	220	450	520	1220
		2	25	54	/	/	/	/	/
			30	53	/	/	/	/	/
			35	54	/	/	/	/	/
			40	55	/	/	/	/	/
			50	54	/	/	/	/	/
			70	54	/	/	/	/	/
			100	54	/	/	/	/	/

MAX Output torque 3 times of Nominal output torque

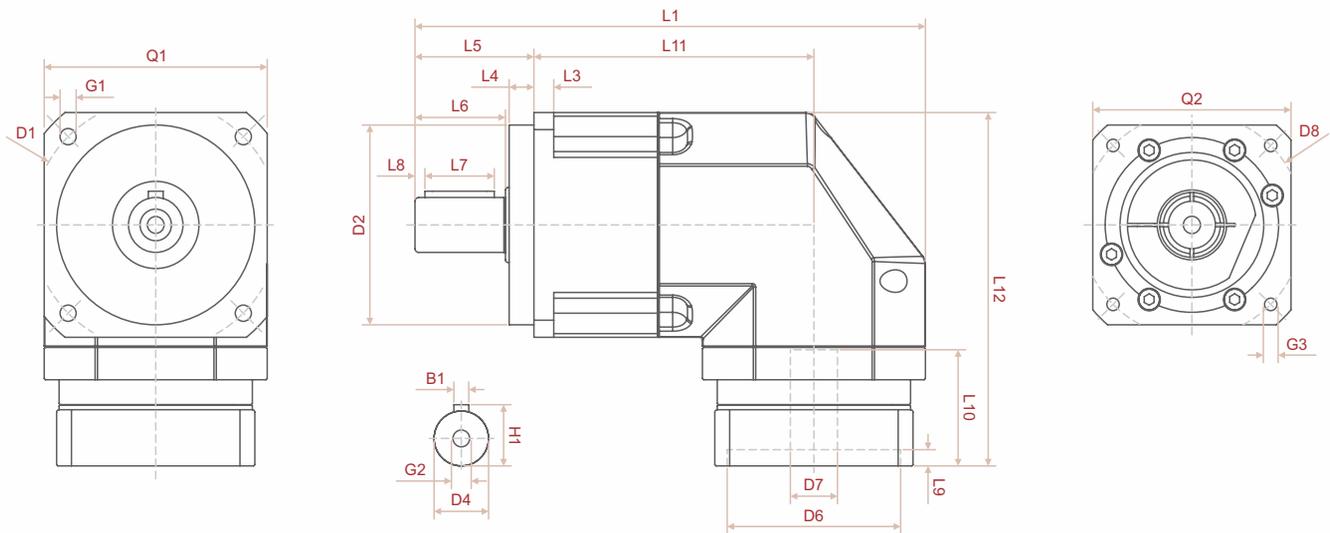
Model / Size		Stages	Ratio	060	090	115	142	180	220
Mass Moments of Inertia	Kg-cm ²	1	3	0.23	0.98	2.36	23.4	68.9	135.4
			4	0.18	0.68	1.68	23.4	68.9	135.4
			5	0.17	0.66	1.55	23.4	68.9	135.4
			7	0.15	0.60	1.48	23.4	68.9	135.4
			10	0.14	0.58	1.45	21.8	65.6	119.8
			14,20	0.18	0.58	1.45	21.8	65.6	119.8
		2	25	0.18	/	/	/	/	/
			30,35,40	0.15	/	/	/	/	/
			50,70	0.15	/	/	/	/	/
			100	0.14	/	/	/	/	/

ZSR PROFILE DIMENSIONS

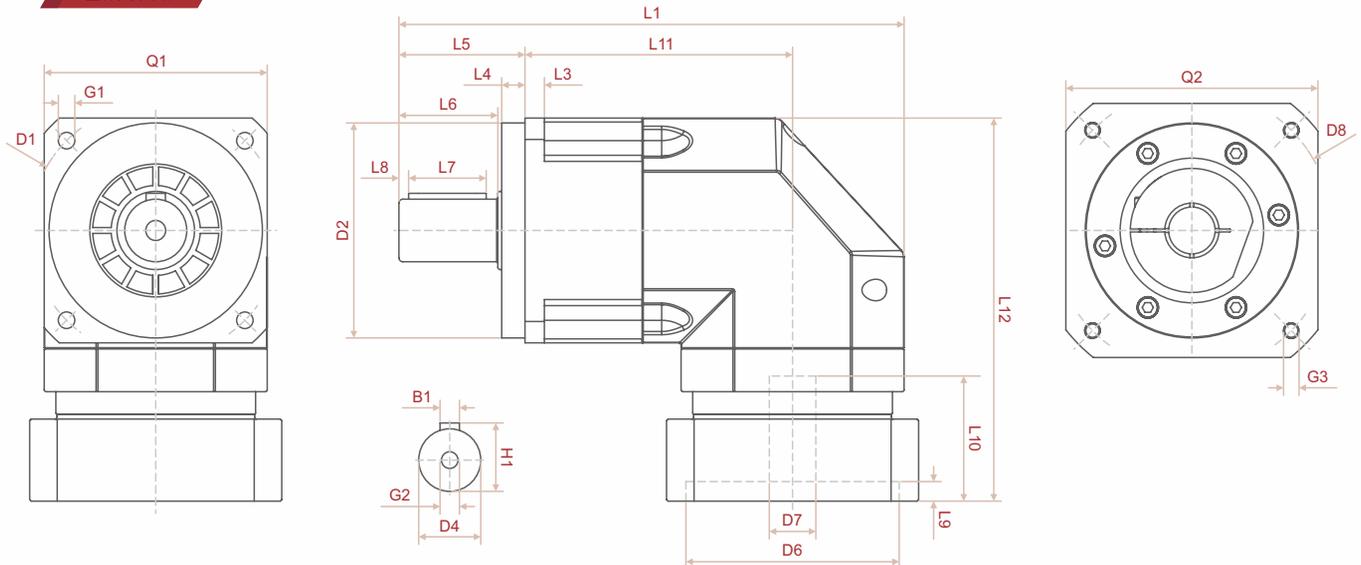
ZSR060



ZSR090

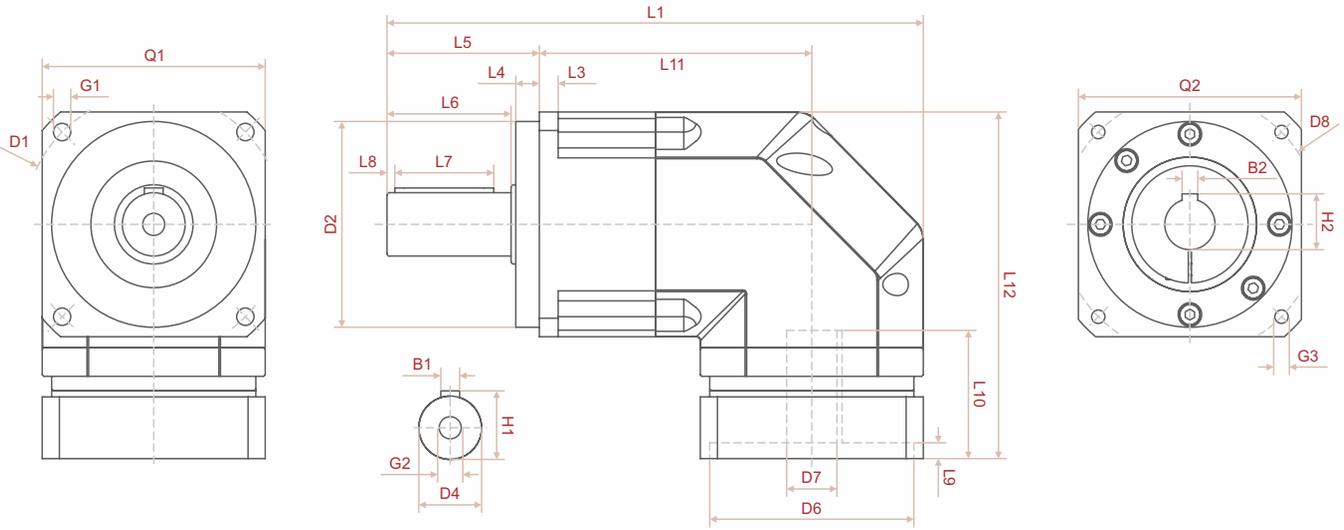


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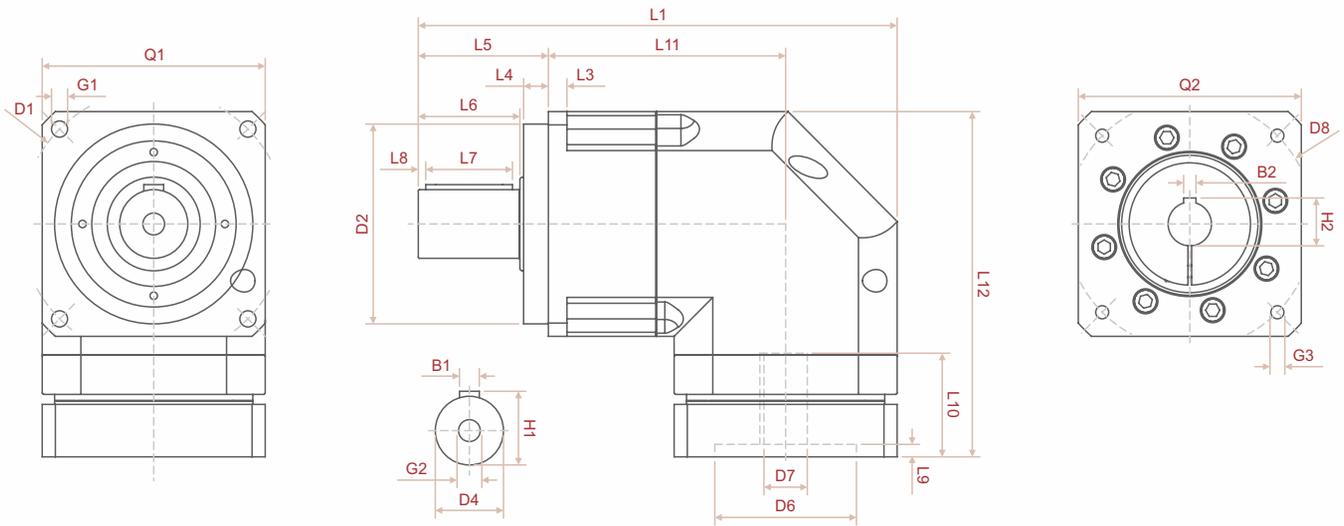


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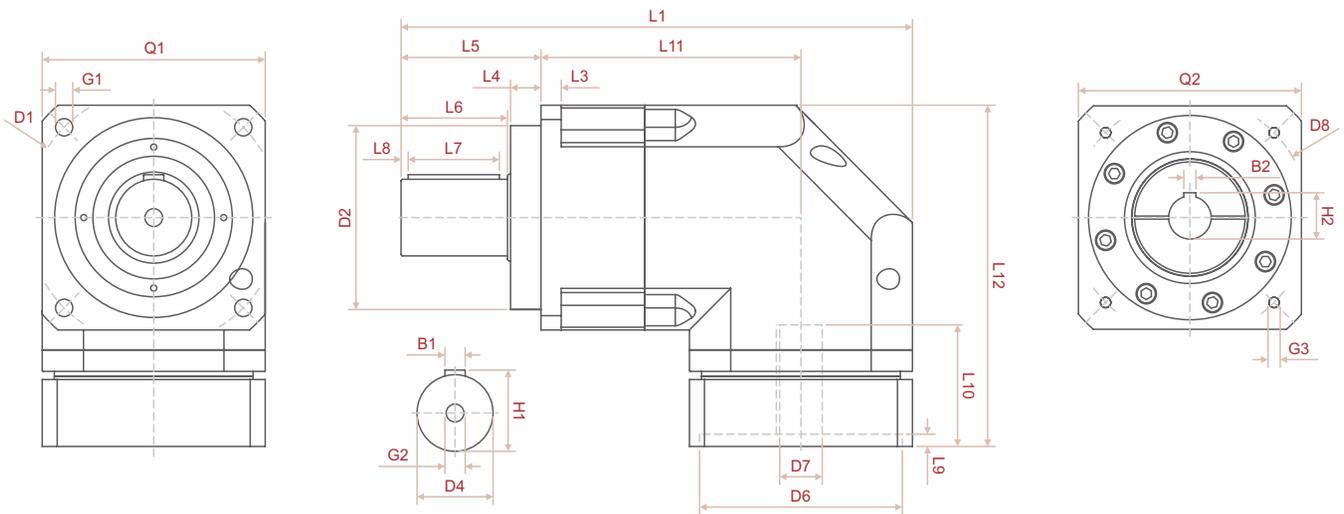
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ZSR180



ZSR220

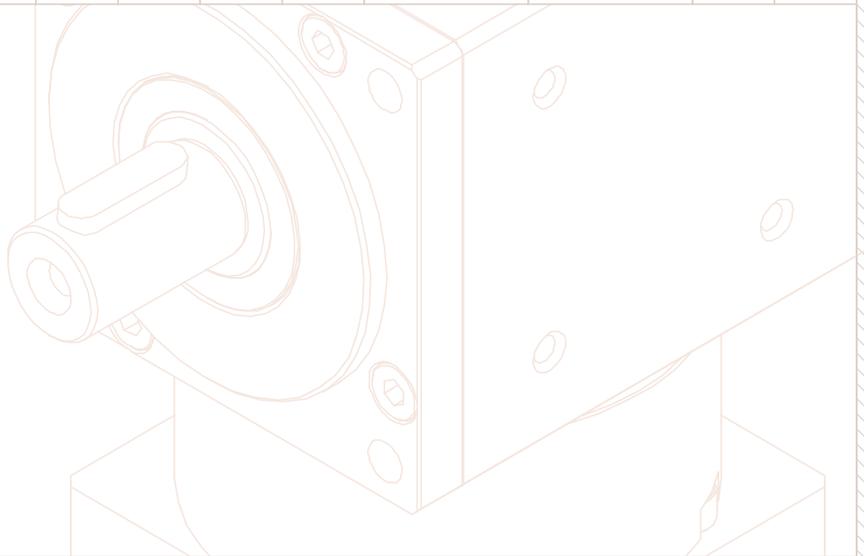


ZSR

PROFILE DIMENSIONS

Model / Size	Stages		ZSR060	ZSR090	ZSR115	ZSR142	ZSR180	ZSR220						
Overall length	1	L1	148	206	260.5	341.5	386.5	504.5						
	2		177	—	—	—	—	—						
Offset length	1	L11	81	113	138	173.5	191.5	256.5						
	2		110	—	—	—	—	—						
Output flange		Q1	□60	□90	□115	□142	□180	□220						
Input flange		Q2	□60	□90	□115	□142	□180	□220						
Output														
Length from flange		L3	6	8	10	12	15	20						
Pilot length		L4	7	10	12	15	20	30						
Output shaft length		L5	37	48	65	97	105	138						
shaft shoulder to the shaft end		L6	28.5	36.5	51	79	82	105						
Flat end length / Key length		L7	22	28	40	63	70	90						
Key length to the shaft end		L8	3	4	5	5	6	7						
Mounting hole circle		D1	Ø70	Ø100	Ø130	Ø165	Ø215	Ø250						
Pilot diameter		D2	Ø50 g6	Ø80 g6	Ø110 g6	Ø130 g6	Ø160 g6	Ø180 g6						
Output shaft diameter		D4	Ø16 h6	Ø22 h6	Ø32 h6	Ø40 h6	Ø55 h6	Ø75 h6						
Key width		B1	5	6	10	12	16	20						
Flat end height / Key Height		H1	18	24.5	35	43	59	79.5						
mounting thread x depth		G1	4-Ø5.5	4-Ø7	4-Ø9	4-Ø11	4-Ø13	4-Ø17						
center screw hole x depth		G2	M5x15	M8x20	M12x30	M16x36	M20x42	M20x42						
Input														
Pilot depth		L9	6.5	7	10	10	10	10						
motor shaft length		L10	33	42	59	81	83	119						
Overall length		L12	105	141.5	196	219	276.5	334						
Pilot diameter		D6	Ø38.1 F8	Ø50 F8	Ø70 F8	Ø80 F8	Ø95 F8	Ø110 F8	Ø130 G7	Ø114.3 G7	Ø114.3 G7	Ø200 G7		
Input shaft diameter		D7	Ø8	Ø14	Ø19	Ø19	Ø24 G7	Ø22 G7	Ø24 G7	Ø32	Ø35	Ø42	Ø42	Ø42
Key width		B2	—	—	—	—	10	10	12	12	12	12	12	
Key Height		H2	—	—	—	—	35.3	38.3	45.3	45.3	45.3	45.3	45.3	
Mounting hole circle		D8	Ø66.67 (□47.14)	Ø70	Ø90	Ø100	Ø115	Ø145	Ø165	Ø200	Ø200	Ø200	Ø235	
mounting thread x depth		G3	4-M4x12	4-M4x12 4-M5x12	4-M5x15 4-M6x15	4-M6x15	4-M8x20	4-M8x20	4-M10x30	4-M12x35	4-M12x30	4-M12x30	4-M12x30	

PRECISION RIGHT ANGLE GEAR REDUCERS
ZSR PROFILE DIMENSIONS



ZFR TECHNICAL DATA

PRECISION RIGHT ANGLE GEAR REDUCERS
ZFR TECHNICAL DATA

Model / Size		Stages	060	090	110	140	200
Full load efficiency	%	1	95				
		2	92				
Standard Backlash	arcmin	1	≤9	≤9	≤9	≤9	≤9
		2	≤12	≤12	≤12	≤12	≤12
Precision Backlash	arcmin	1	≤7	≤7	≤7	≤7	≤7
		2	≤10	≤10	≤10	≤10	≤10
Noise ②	dB(A)		63	68	70	70	67
Lifetime ①	hr		20000				
Max. Bending moment M2KB	N		120	241	417	1320	1450
Max axial load	N		765	2000	4550	6100	7250
Nominal Input Speed	rpm		3000	3000	3000	2000	2000
Max input speed	rpm		6000	6000	6000	4000	4000
Torsional stiffness	Nm/arcmin		11	30	84	150	435
Weight	kg	1	1.7	3.9	5.9	16.5	43.1
		2	2.5	5.9	9.3	19.4	55.3
Operating temp.	°C		-10 ~ 90				
Degree of protection			IP 65				
Lubrication			Synthetic lubrication				
Mounting direction			Any				

① Life reduced by half under continuous operation.

② Noise level measured on input running at 3000 rpm with no load (i = 5)

Model / Size		Stages	Ratio	060	090	110	140	200
Nominal output torque	Nm	1	3	—	—	290	—	—
			4	50	150	300	582	1050
			5	54	140	290	600	1200
			7	44	125	270	540	1100
			10	54	140	290	600	1200
			14	44	125	270	540	1100
		2	20	37	95	220	500	800
			25	66	176	335	600	1220
			35	66	176	310	600	1220
			40	50	142	285	582	1145
		50,70,100	66	176	335	600	1220	
		140	54	145	310	540	1220	

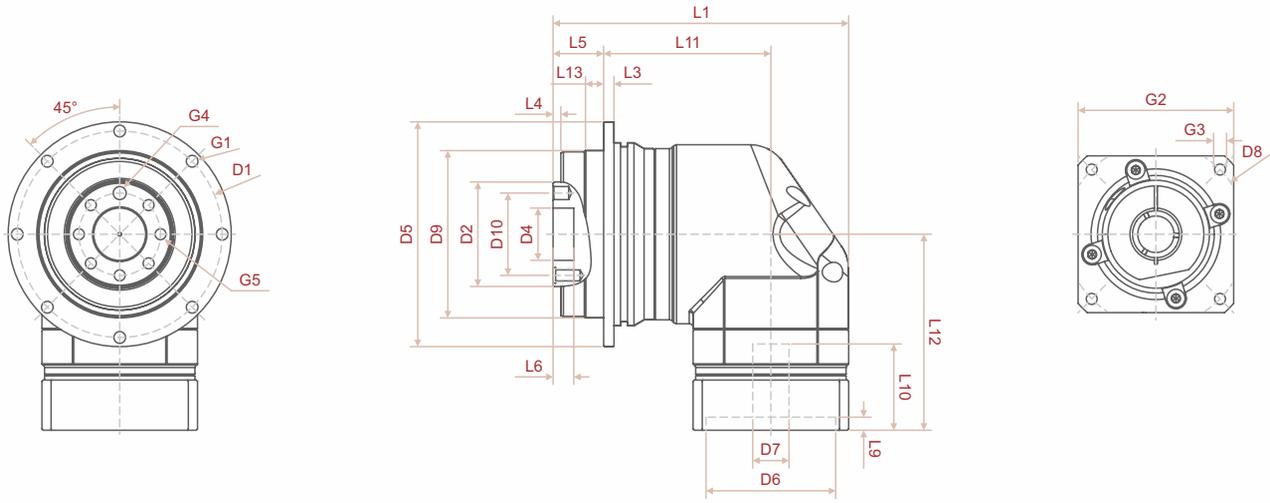
MAX Output torque 3 times of Nominal output torque

Model / Size		Stages	Ratio	060	090	110	140	200
Mass Moments of Inertia	Kg-cm ²	1	3	—	—	2.36	—	—
			4	0.18	0.68	1.68	7.17	26
			5	0.17	0.66	1.55	6.52	13.8
			7	0.15	0.6	1.48	6.17	23
		2	10,14,20	0.14	0.58	1.45	6.1	22.9
			25	0.18	0.18	0.65	2.8	7.56
			35,40	0.14	0.14	0.6	2.59	7.56
			50,70	0.14	0.14	0.58	2.54	7.06
		100,140	0.14	0.14	0.58	2.54	2.54	

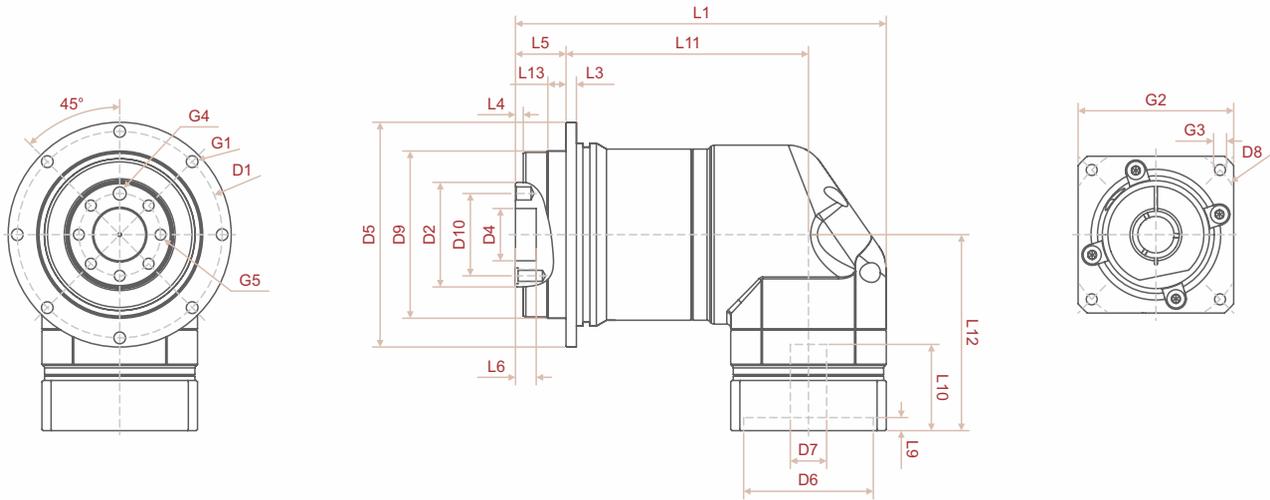
ZFR

PROFILE DIMENSIONS

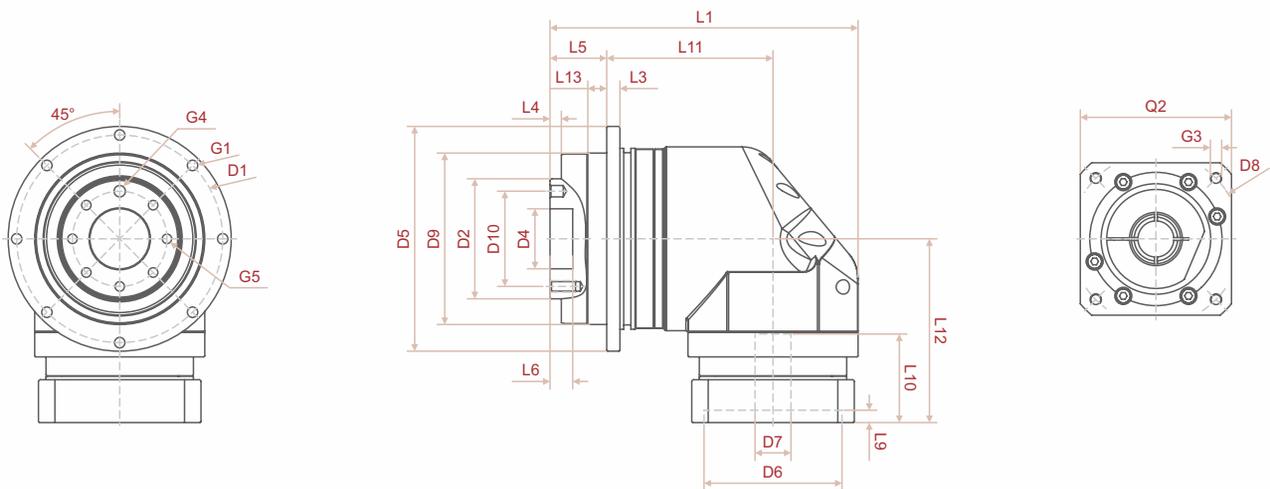
ZFR060-1



ZFR060-2

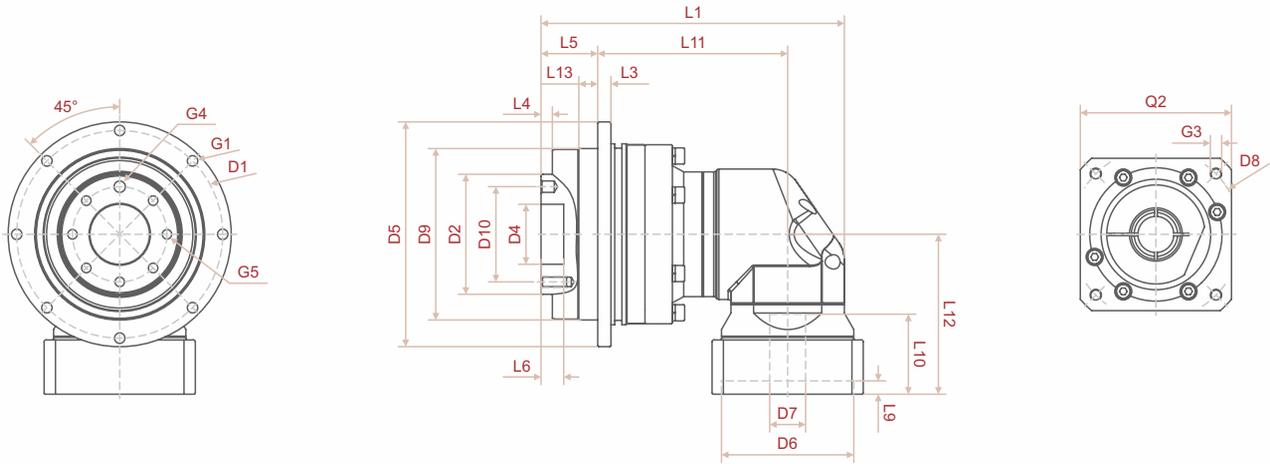


ZFR090-1

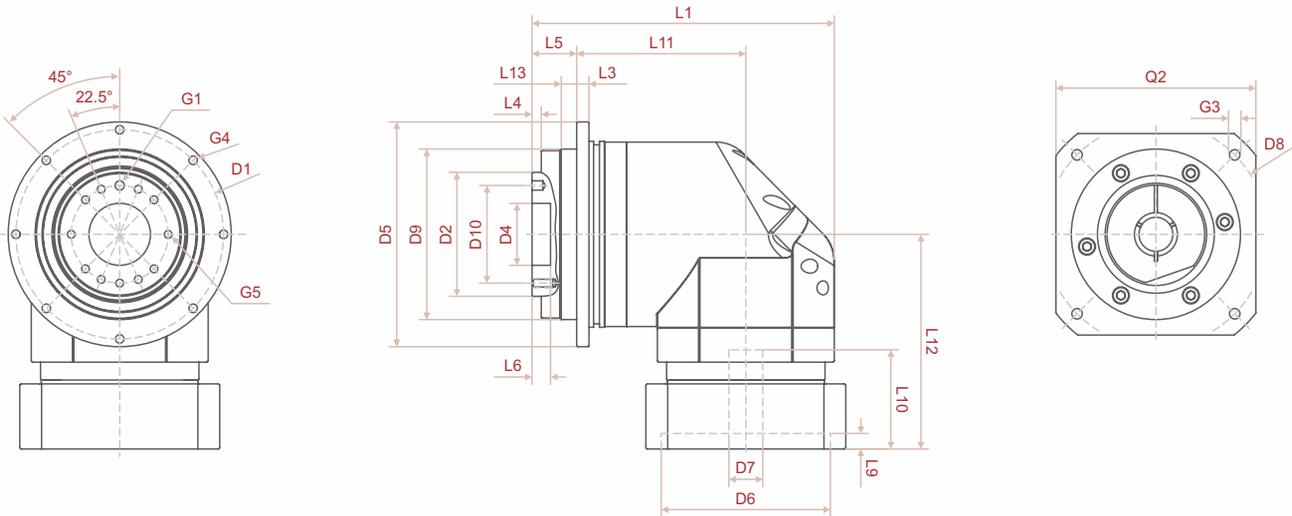


ZFR PROFILE DIMENSIONS

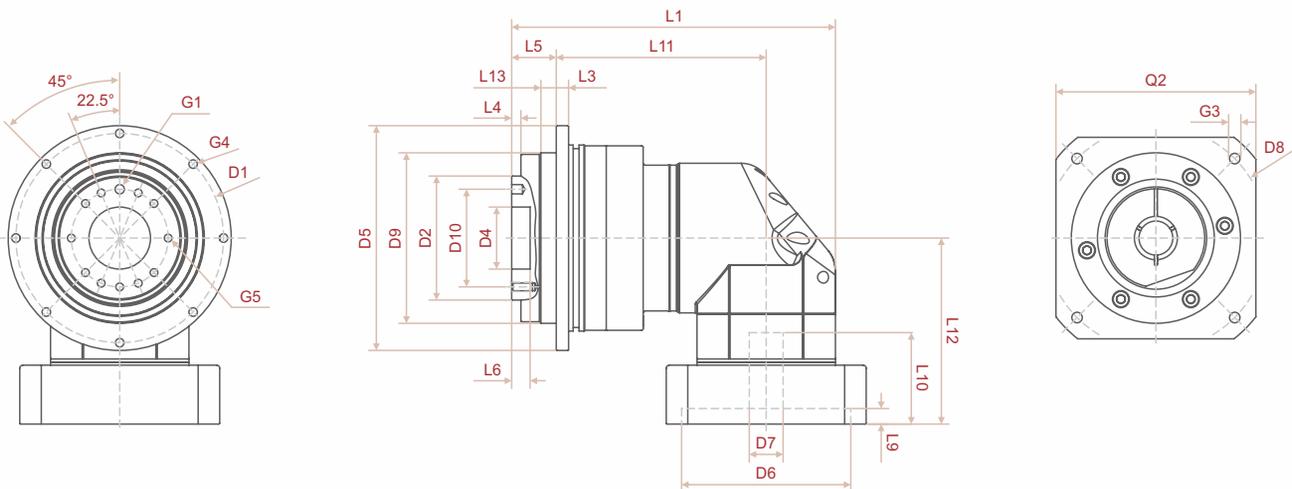
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ZFR110-1



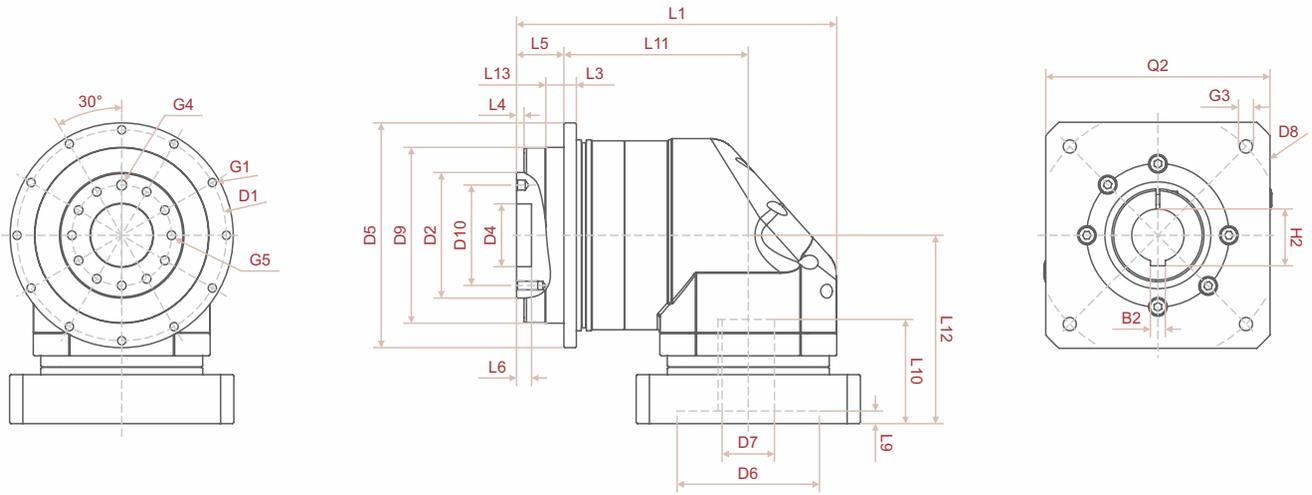
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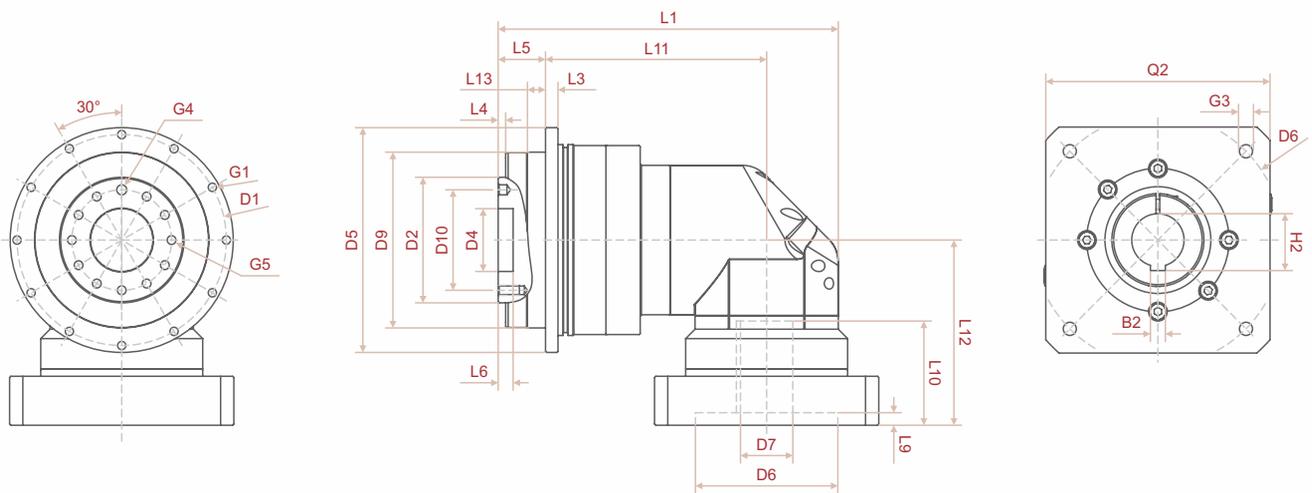
PRECISION RIGHT ANGLE GEAR REDUCERS
ZFR PROFILE DIMENSIONS

ZFR PROFILE DIMENSIONS

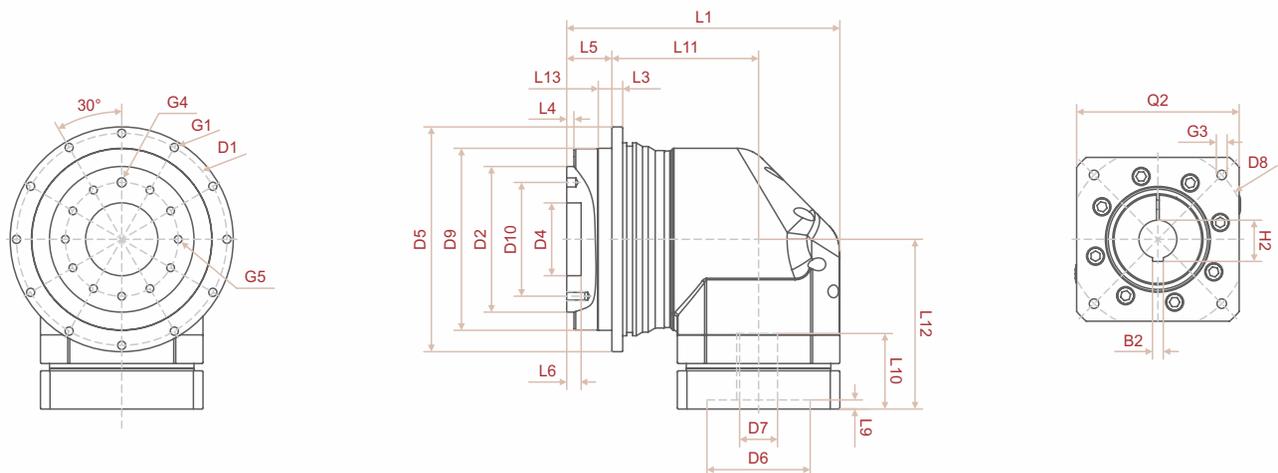
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ZFR140-2



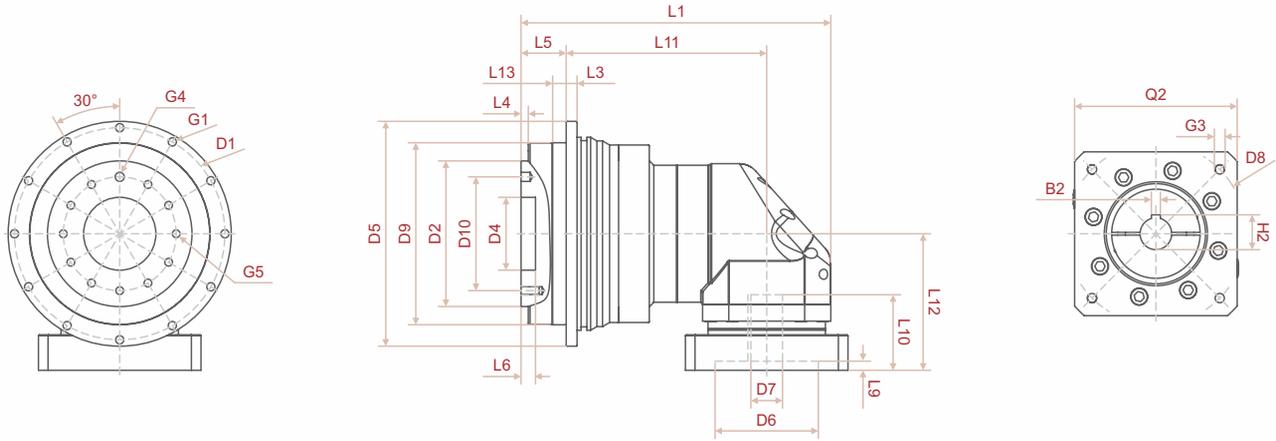
ZFR200-1



ZFR

PROFILE DIMENSIONS

ZFR200-2



Model / Size	Stages		ZFR060	ZFR090	ZFR110	ZFR140	ZFR180				
Overall length	1	L1	114	163	196.5	257	302.5				
	2		143	160.5	210.5	280.5	343				
Offset length	1	L11	64.5	88	167.5	148	162.5				
	2		93.5	100.5	136.5	177.5	222				
Input flange		Q2	□60	□80	□86	□130	□180				
Output											
Length from flange		L3	4	7	8	10	12				
Pilot length		L4	3	6	6	6	8				
Output shaft length		L5	19.5	30	29	38	50				
Shaft shoulder to the shaft end		L6	8	12	12	12	16				
Spigot depth		L13	7	10	10	15	15				
Mounting hole circle		D1	Ø79	Ø109	Ø135	Ø168	Ø233				
Pilot diameter		D2	Ø40 h7	Ø63 h7	Ø80 h7	Ø100 h7	Ø160 h7				
Output shaft diameter		D4	Ø20 H7	Ø31.5 H7	Ø40 H7	Ø50 H7	Ø80 H9				
Output shaft diameter		D5	Ø86	Ø118	Ø145	Ø179	Ø247				
Centering		D9	Ø64 h7	Ø90 h7	Ø110 h7	Ø140 h7	Ø200 h7				
Hole circle diameter		D10	Ø31.5	Ø50	Ø63	Ø80	Ø125				
Pinion bore		G1	8-Ø4.5 THRU.	8-Ø5.5 THRU.	8-Ø5.5 THRU.	12-Ø6.6 THRU.	12-Ø9.0 THRU.				
Mounting thread x depth		G4	Ø5 H7x6 DP.	Ø6 H7x7 DP.	Ø6 H7x7 DP.	Ø8 H7x7 DP.	Ø10 H7x10 DP.				
		G5	7-M5x8	7-M6x13	11-M6x13	11-M8x17	11-M10x20				
Input											
Pilot depth		L9	5	6.5	10	10	10				
Motor shaft length	1	L10	33	46.5	64	83	83				
	2		33	42	59	83	83				
Offset length	1	L12	75	96.5	138.5	150	186.5				
	2		75	84	120	147.5	150				
Pilot diameter		D6	Ø38.1 G7	Ø50 G7	Ø70 F8	Ø80 F8	Ø110 G7	Ø110 G7	Ø130 G7	Ø114.3 G7	Ø114.3 G7
Input shaft diameter		D7	Ø14	Ø19	Ø22 F7	Ø24 F7	Ø35	Ø42	Ø35	Ø42	
Key width		B2	—	—	—	10	12	10	12		
Key Height		H2	—	—	—	38.3	45.3	38.3	45.3		
Mounting hole circle		D8	Ø66.67 (□47.14)	Ø70	Ø90	Ø100	Ø145	Ø130	Ø165	Ø200	Ø200
mounting thread x depth		G3	4-M4x12	4-M4x12 4-M5x12	4-M6x15	4-M6x12	4-M8x20	4-M8x20	4-M10x30	4-M12x35	4-M12x35

PRECISION RIGHT ANGLE GEAR REDUCERS
ZFR PROFILE DIMENSIONS

ZRPS/ZRPN

TECHNICAL DATA

Model / Size		Stages	060	090	120
Full load efficiency	%	1		95	
		2		92	
Standard Backlash	arcmin	1	≤10	≤10	≤10
		2	≤12	≤12	≤12
Precision Backlash	arcmin	1	≤8	≤8	≤8
		2	≤10	≤10	≤10
Noise ②	dB(A)		57	58	58
Lifetime ①	hr			20000	
Max radial load	N		889	1020	2230
Max axial load	N		850	980	1550
Nominal Input Speed	rpm		3000	3000	3000
Max input speed	rpm		6000	6000	6000
Torsional stiffness	Nm/arcmin		2.6	7.5	15.5
Weight	kg	1	3.0	7.5	12.1
		2	3.8	9.2	15.5
Operating temp.	°C			-10 ~ 90	
Degree of protection				IP 65	
Lubrication				Synthetic lubrication	
Mounting direction				Any	

① Life reduced by half under continuous operation.

② Noise level measured on input running at 3000 rpm with no load (i = 5)

Model / Size		Stages	Ratio	060	090	120
Nominal output torque	Nm	1	3	16.5	60	148
			4	27	86	222
			5	27	94.5	235
			7	19.5	64	158
			10	8.5	39.5	93
		2	12,15	26	96	250
			16,20	30	96	250
			25	33	105.5	264
			30	30	96	250
			35	35	105.5	264
			40	30	96	250
			50	33	105.5	264
			70	21.5	71.5	177
			100	21.5	87	170

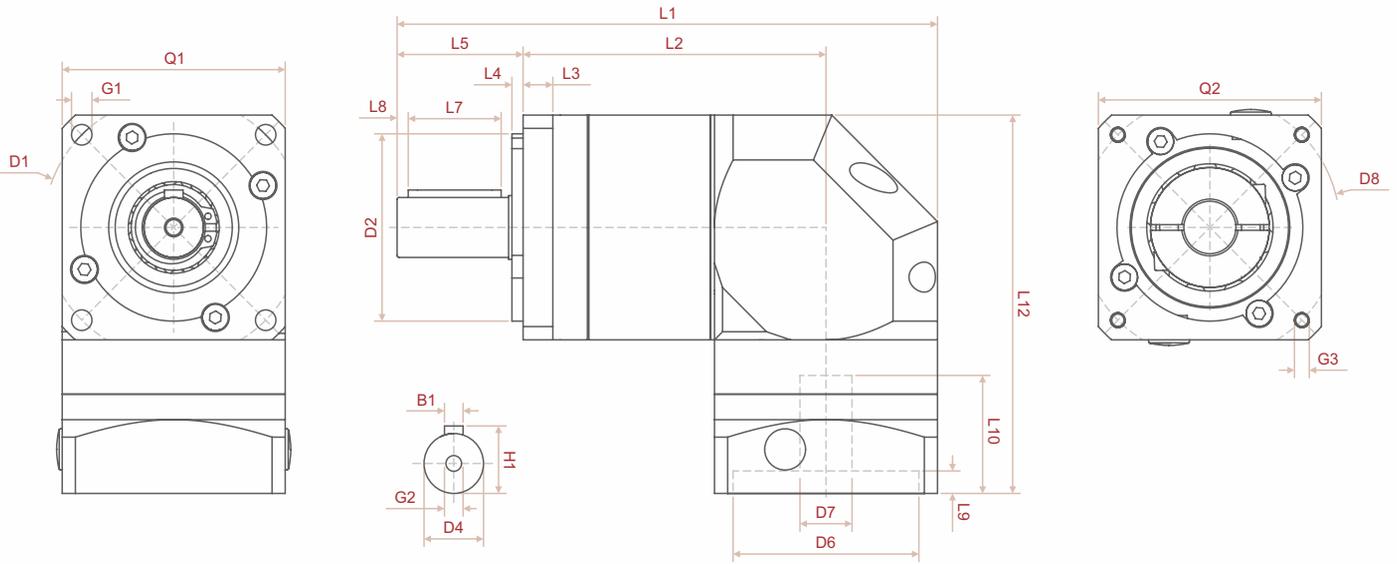
MAX Output torque 2 times of Nominal output torque

Model / Size		Stages	Ratio	060	090	120
Mass Moments of Inertia	Kg-cm ²	1	3	0.107	0.400	1.650
			4	0.094	0.309	1.220
			5	0.092	0.291	1.150
			7	0.091	0.285	1.130
			10	0.091	0.283	1.110
		2	12,15	0.094	0.291	1.650
			16	0.094	0.291	1.220
			20	0.092	0.291	1.150
			25	0.092	0.291	1.130
			30,35,40	0.091	0.285	1.130
			50	0.091	0.283	1.110
			70	0.092	0.283	1.110
			100	0.092	0.291	1.150

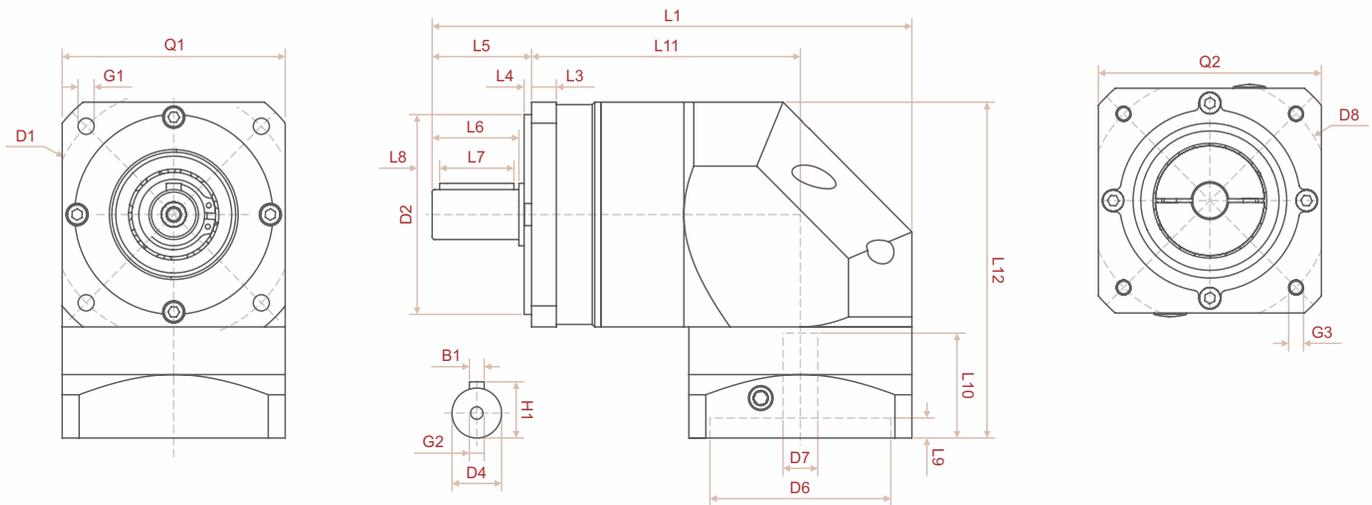
ZRPS PROFILE DIMENSIONS

PRECISION RIGHT ANGLE GEAR REDUCERS
ZRPS PROFILE DIMENSIONS

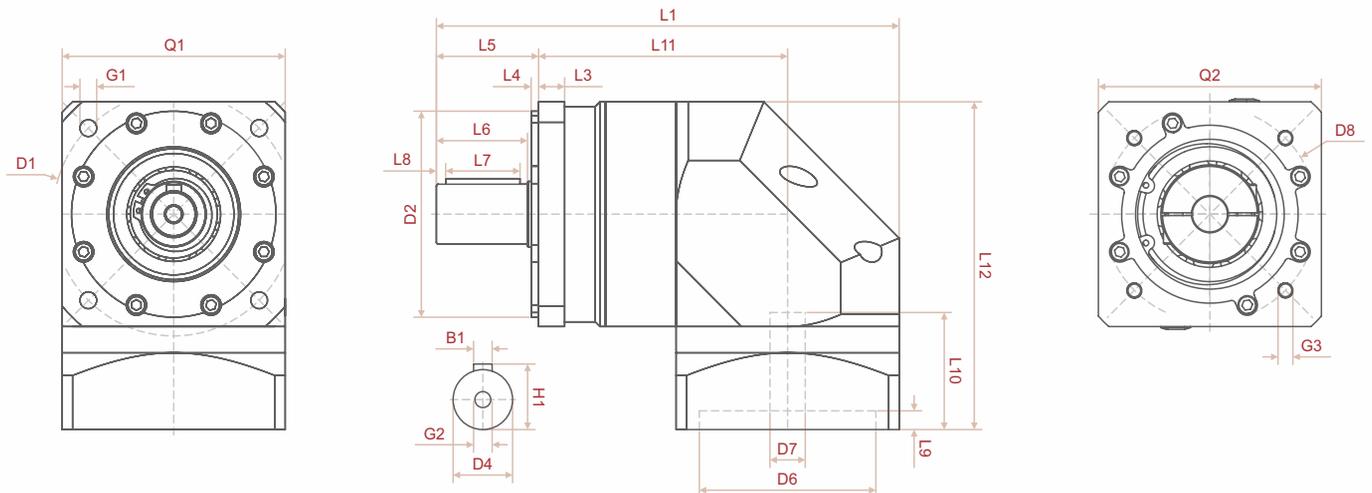
ZRPS060



ZRPS090



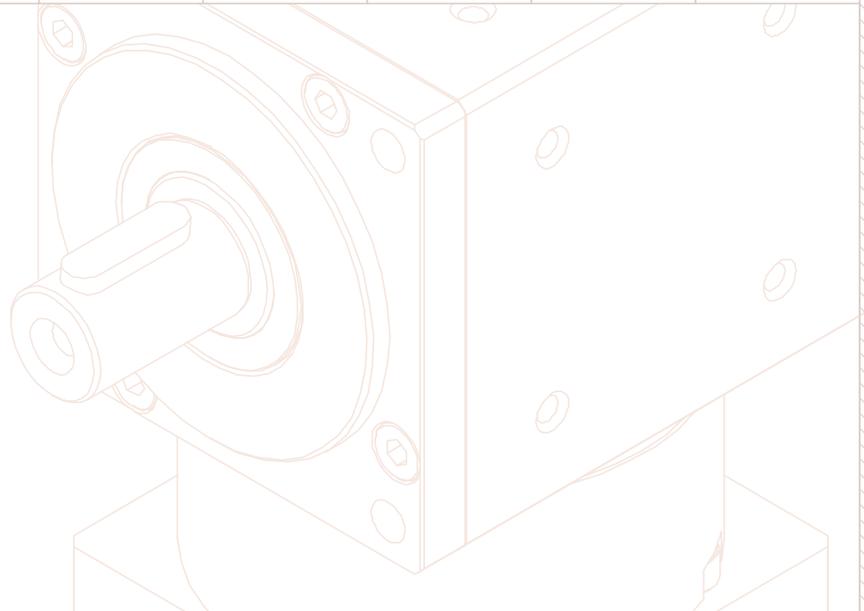
ZRPS120



ZRPS PROFILE DIMENSIONS

Model / Size	Stages		ZRPS060		ZRPS090		ZRPS120	
Overall length	1	L1	145.5		193.5		249	
	2		161.5		216.5		279.5	
Offset length	1	L11	81.5		108.5		134	
	2		97		131.5		164.5	
Output flange		Q1	□60		□90		□120	
Input flange		Q2	□60		□90		□120	
Output								
Length from flange		L3	8		10		14	
Pilot length		L4	3		3		4	
Output shaft length		L5	34		40		55	
shaft shoulder to the shaft end		L6	—		35		49	
Flat end length / Key length		L7	25		30		40	
Key length to the shaft end		L8	3		3		5	
Mounting hole circle		D1	Ø70		Ø100		Ø130	
Pilot diameter		D2	Ø50 h6		Ø80 h6		Ø110 h7	
Output shaft diameter		D4	Ø14 h6	Ø16 h6	Ø20 h6	Ø22 h6	Ø25 h6	Ø32 h6
Key width		B1	5		6		8 10	
Flat end height / Key Height		H1	16	18	22.5	24.5	28	35
mounting thread x depth		G1	4-Ø5.5		4-Ø6.5		4-Ø9	
center screw hole x depth		G2	M5x12		M6x13		M10x22	
Input								
Pilot depth		L9	6		8		10	
motor shaft length		L10	31.5		42		62.5	
Overall length		L12	101		—		—	
Pilot diameter		D6	Ø38.1 G7	Ø50 G7	Ø70 G7	Ø80 G7	Ø95 F7	Ø110 F7
Input shaft diameter		D7	Ø8 H7	Ø14 H7	Ø19 H7	Ø16H7/Ø19H7	Ø19G7/Ø24G7	Ø22G7/Ø24G7
Key width		B2	—		—		—	
Key Height		H2	—		—		—	
Mounting hole circle		D8	Ø66.67(□47.14)	Ø70	Ø90	Ø100	Ø115/Ø130	Ø145
mounting thread x depth		G3	4-M4x12	4-M4x12 4-M5X12	4-M5x12 4-M6X12	4-M6x12	4-M6x20 4-M8X20	4-M8x20

PRECISION RIGHT ANGLE GEAR REDUCERS
ZRPS PROFILE DIMENSIONS

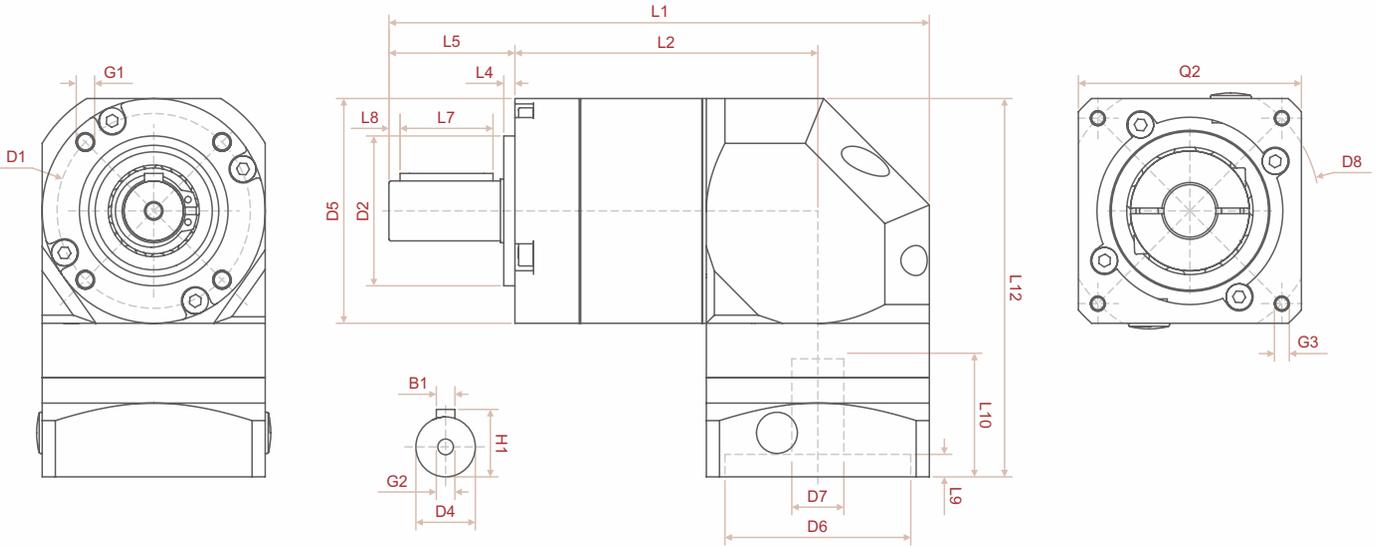


ZRPN

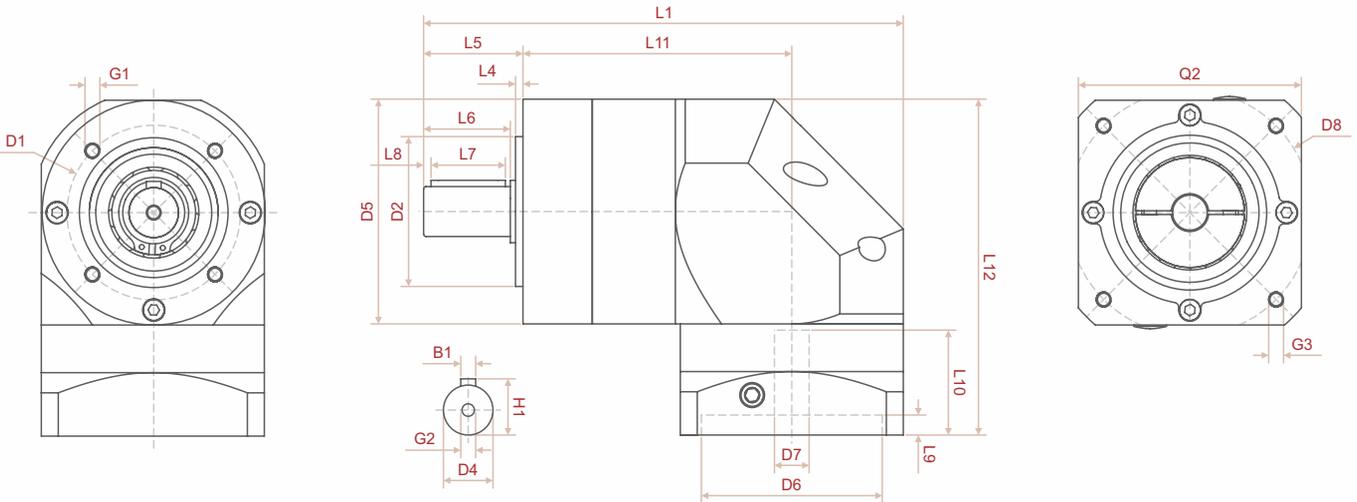
PROFILE DIMENSIONS

PRECISION RIGHT ANGLE GEAR REDUCERS
ZRPN PROFILE DIMENSIONS

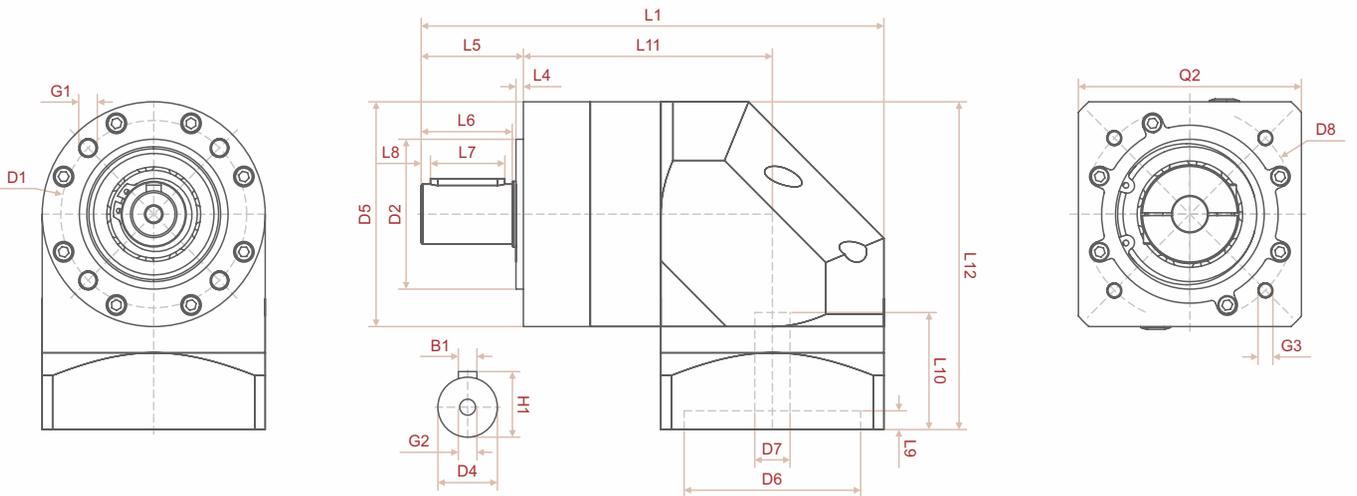
ZRPN060



ZRPN090



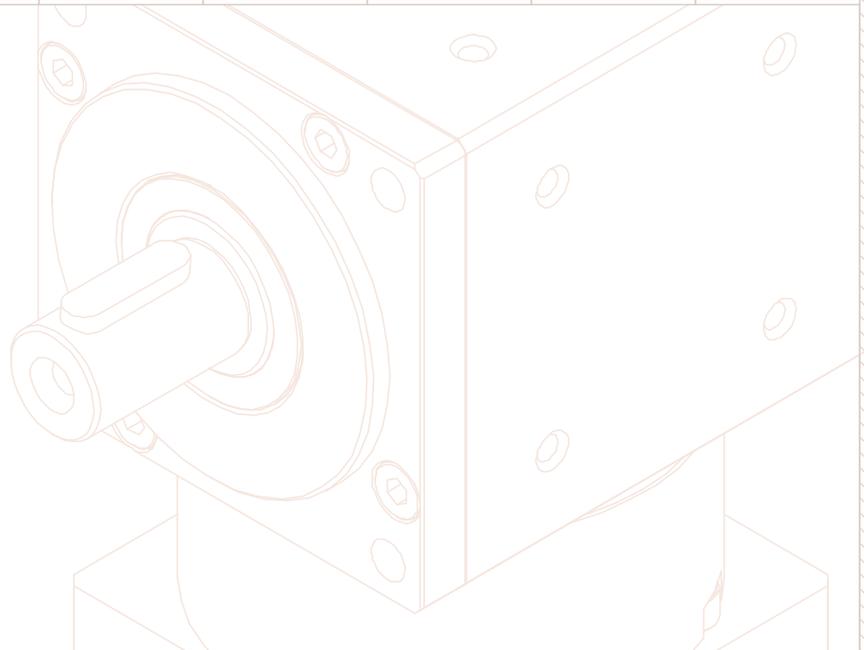
ZRPN120



ZRPN

PROFILE DIMENSIONS

Model / Size	Stages		ZRPN060		ZRPN090		ZRPN120	
Overall length	1	L1	145.5		193.5		249	
	2		161.5		216.5		279.5	
Offset length	1	L11	81.5		108.5		134	
	2		97		131.5		164.5	
Output flange		Q1	Ø60		Ø90		Ø120	
Input flange		Q2	□60		□90		□120	
Output								
Pilot length		L4	3		3		4	
Output shaft length		L5	34		40		55	
shaft shoulder to the shaft end		L6	—		35		49	
Flat end length / Key length		L7	25		30		40	
Key length to the shaft end		L8	3		3		5	
Mounting hole circle		D1	Ø52		Ø70		Ø100	
Pilot diameter		D2	Ø40 h6		Ø60 h6		Ø80 h7	
Output shaft diameter		D4	Ø14 h6	Ø16 h6	Ø20 h6	Ø22 h6	Ø25 h6	Ø32 h6
Key width		B1	5		6		8	
Flat end height / Key Height		H1	16	18	22.5	24.5	28	35
mounting thread x depth		G1	4-M5x12		4-M6x15		4-M10x20	
center screw hole x depth		G2	M5x12		M6x13		M10x22	
Input								
Pilot depth		L9	6		8		10	
motor shaft length		L10	31.5		42		62.5	
Overall length		L12	101		—		—	
Pilot diameter		D6	Ø38.1 G7	Ø50 G7	Ø70 G7	Ø80 G7	Ø95 F7	Ø110 F7
Input shaft diameter		D7	Ø8 H7	Ø14 H7	Ø19 H7	Ø16H7/Ø19H7	Ø19G7/Ø24G7	Ø22G7/Ø24G7
Key width		B2	—	—	—	—	—	—
Key Height		H2	—	—	—	—	—	—
Mounting hole circle		D8	Ø66.67(□47.14)	Ø70	Ø90	Ø100	Ø115/Ø130	Ø145
mounting thread x depth		G3	4-M4x12	4-M4x12 4-M5X12	4-M5x12 4-M6X12	4-M6x12	4-M6x20 4-M8X20	4-M8x20



PRECISION RIGHT ANGLE GEAR REDUCERS / TECHNICAL DATA

ZAR

TECHNICAL DATA

PRECISION RIGHT ANGLE GEAR REDUCERS
ZAR TECHNICAL DATA

Model / Size		Stages	042	060	
Full load efficiency	%	1	97		
Standard Backlash	arcmin	1	≤6	≤6	
Noise ②	dB(A)		62	62	
Lifetime ①	hr		2000	2000	
Max radial load	N		350	560	
Max axial load	N		160	230	
Nominal Input Speed	rpm		1500	1500	
Max input speed	rpm		3000	3000	
Torsional stiffness	Nm/arcmin		4	6	
Weight	kg	1	1.5	2.5	
Operating temp.	°C		-10 ~ 90		
Degree of protection			IP 65		
Lubrication			Synthetic lubrication		
Mounting direction			Any		
① Life reduced by half under continuous operation.					
② Noise level measured on input running at 3000 rpm with no load (i = 5)					
Model / Size		Stages	Ratio	42	60
Nominal output torque	Nm	1	2	18	24
			3	18	22
			5	15	20
			MAX Output torque		
Model / Size		Stages	42	60	
Mass Moments of Inertia	kg-cm ²	1	0.03	0.08	

PRECISION RIGHT ANGLE GEAR REDUCERS / PROFILE DIMENSIONS

ZAR

PROFILE DIMENSIONS

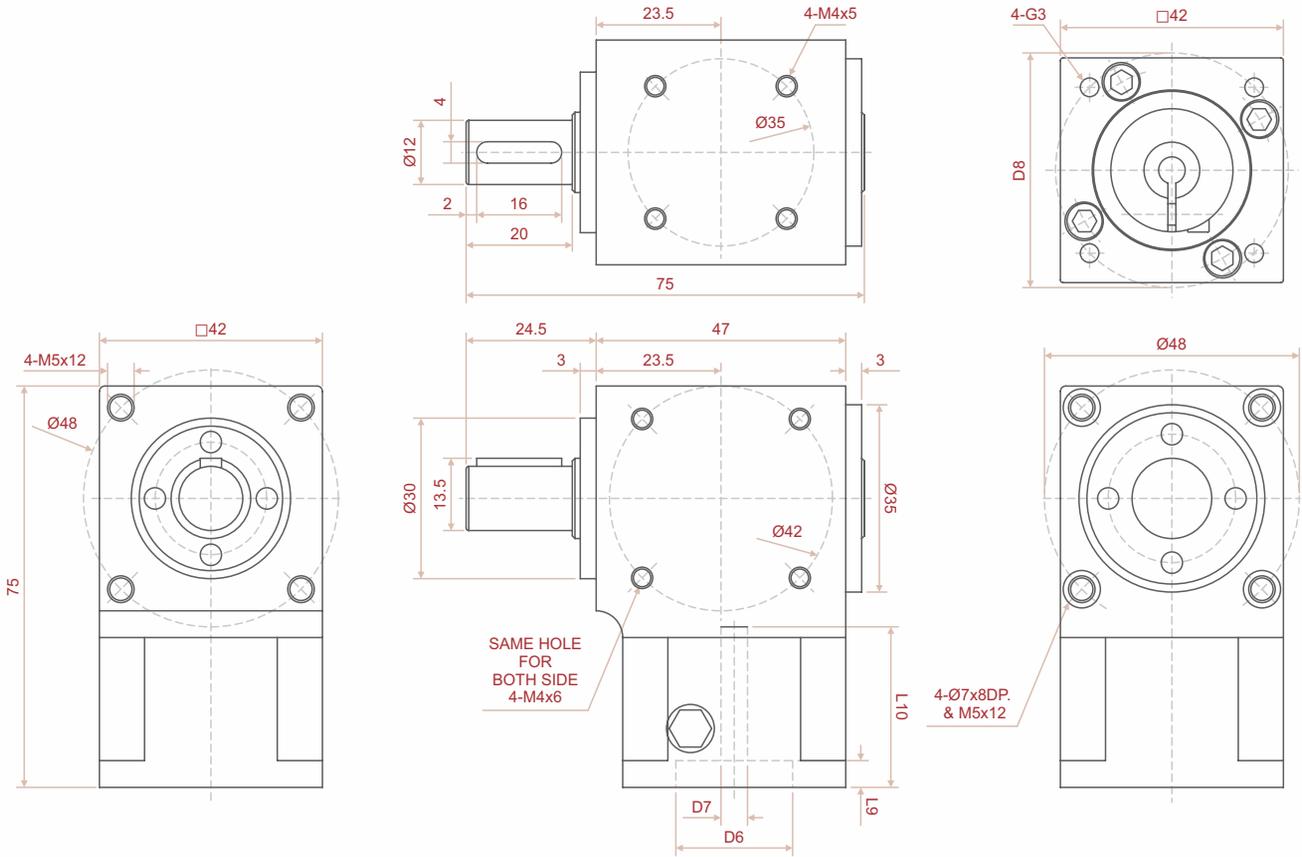
PRECISION RIGHT ANGLE GEAR REDUCERS
ZAR PROFILE DIMENSIONS

Input		ZAR042		ZAR060	
Pilot depth	L9	5		5	
motor shaft length	L10	30		32	
Pilot diameter	D6	Ø22	Ø30	Ø38.1 F8	Ø50 F8
Input shaft diameter	D7	Ø5	Ø8	Ø8	Ø14
Key width	B2	—	—	—	—
Key Height	H2	—	—	—	—
Mounting hole circle	D8	Ø43.8(□31)	Ø45	Ø66.67(□47.14)	Ø70
mounting thread x depth	G3	4-Ø3.5	4-M3x8	4-M4X12	4-M4x12 4-M5x12

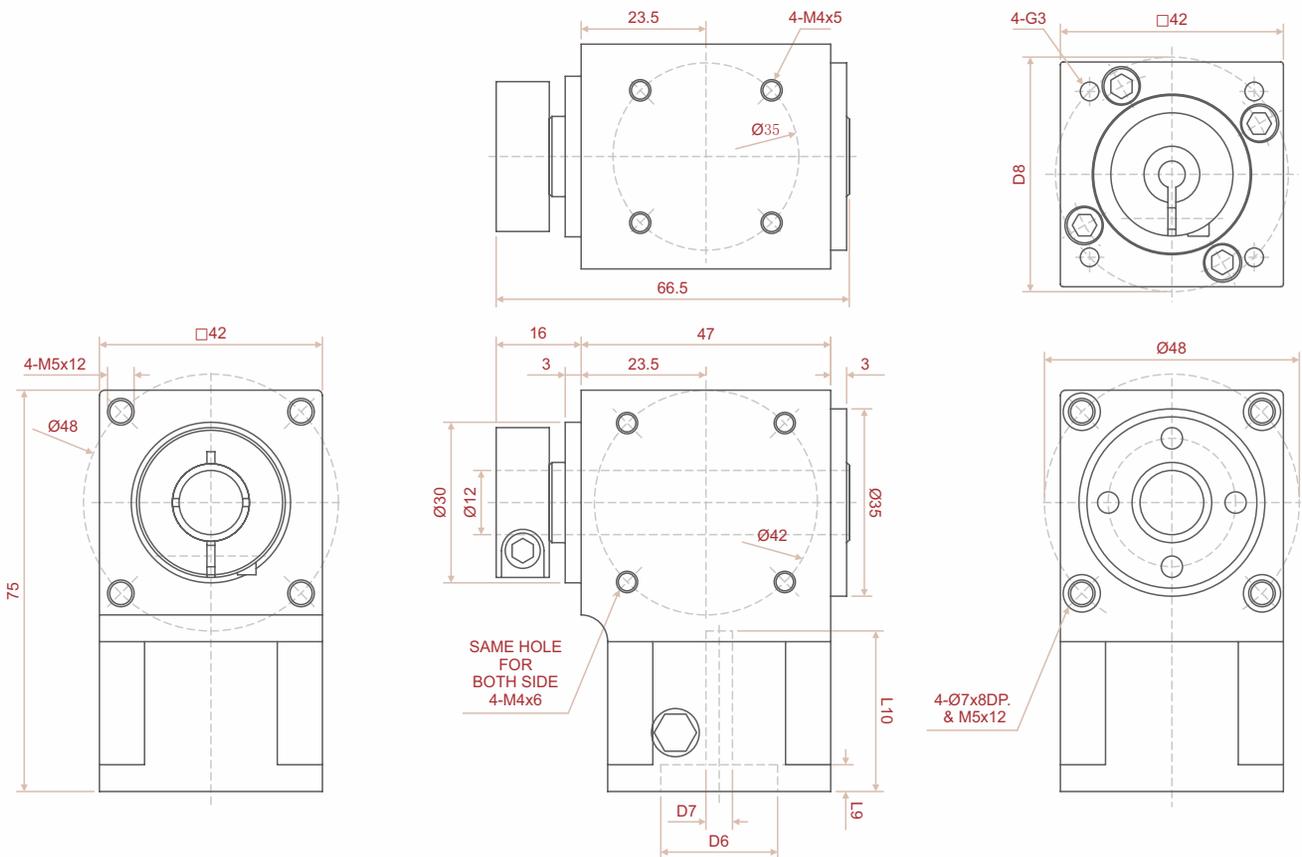


PROFILE DIMENSIONS

ZAR42-AS



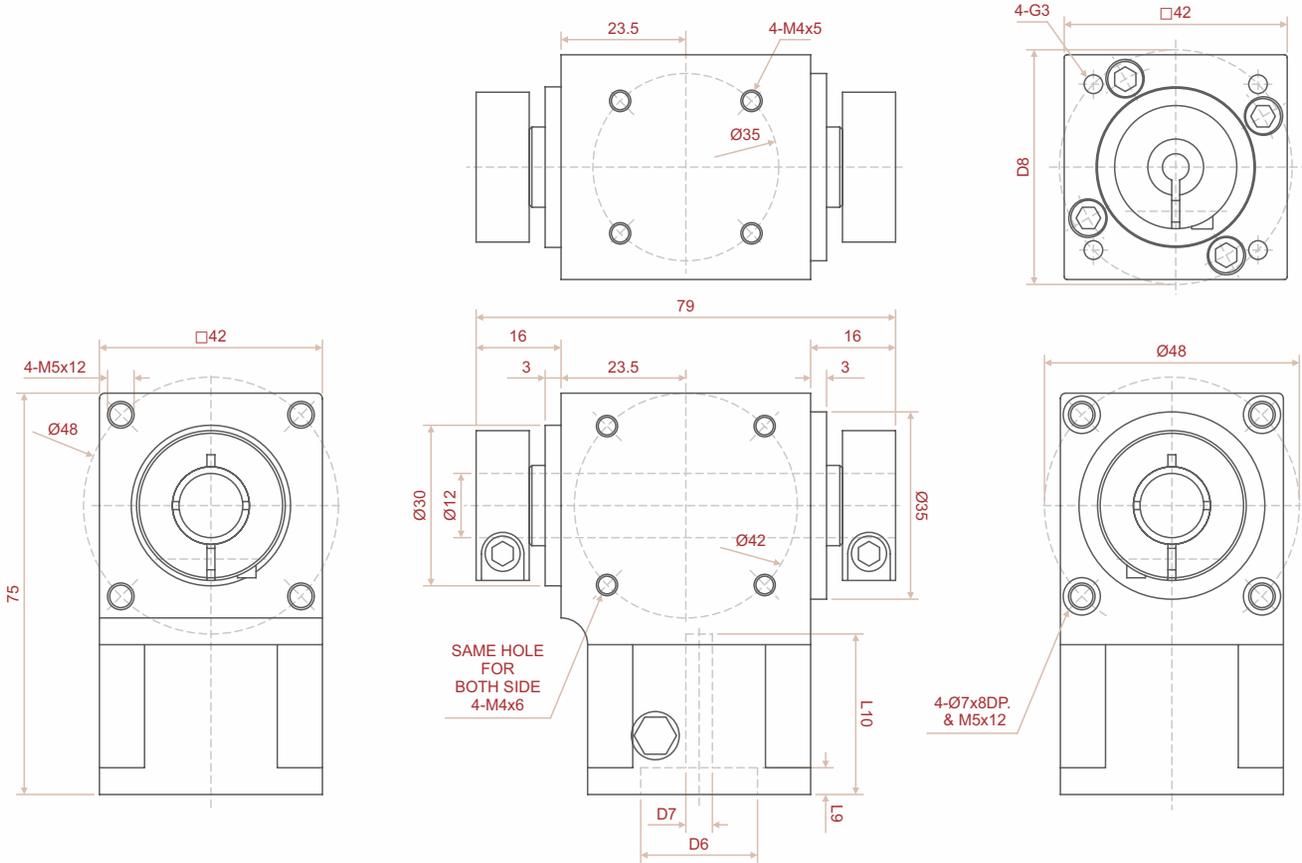
ZAR42-HS



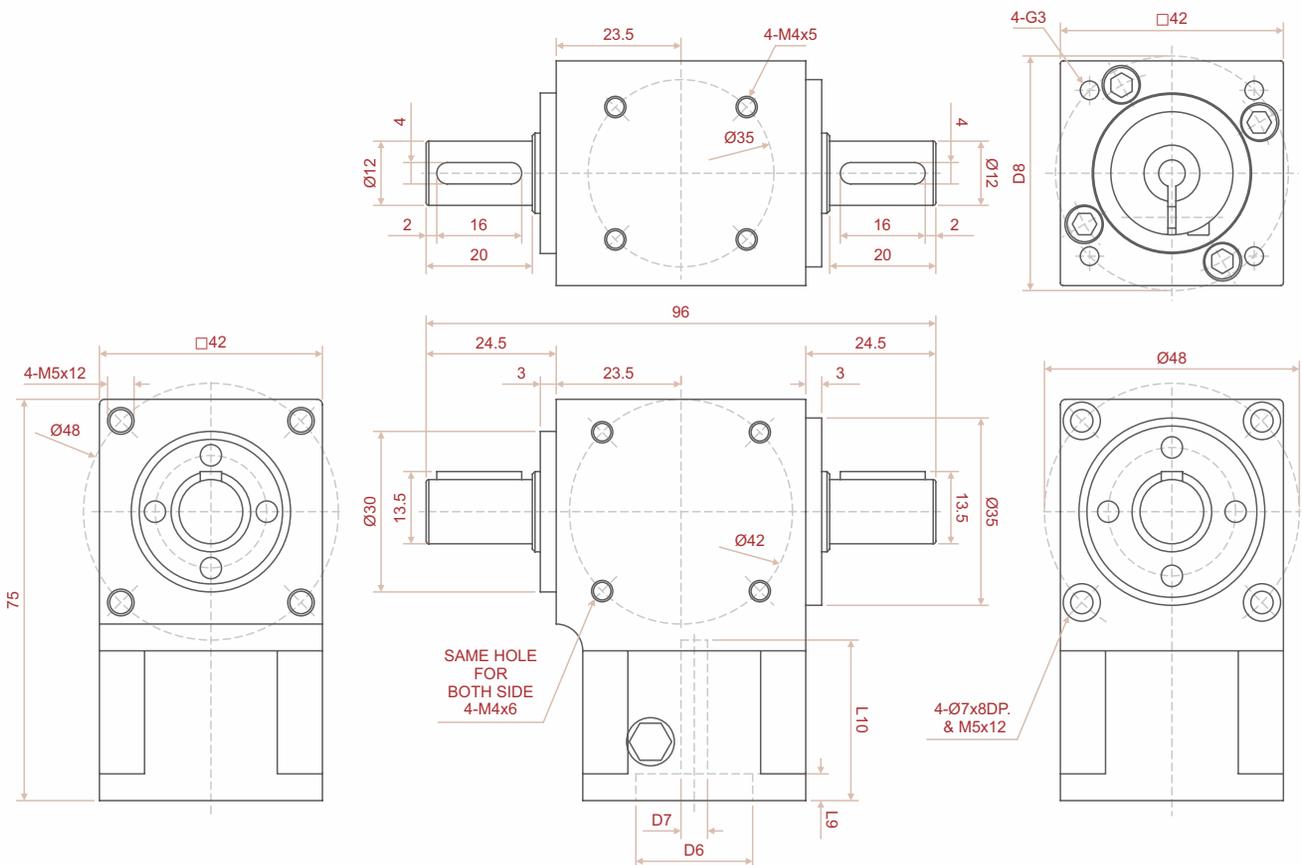


PROFILE DIMENSIONS

ZAR42-PS



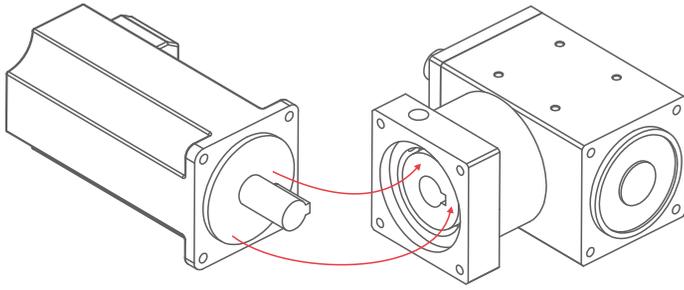
ZAR42-BS



RIGHT ANGLE GEAR REDUCER MOUNTING INSTRUCTION / TORQUE REQUIRED TO SECURE BOLT

RIGHT ANGLE GEARBOX MOUNTING INSTRUCTION

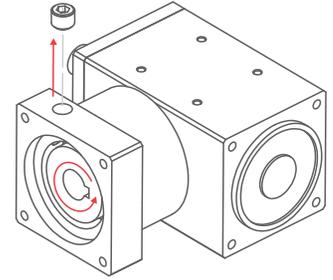
STEP 1



- A. Verify fit before assembly
- B. Clean both surfaces thoroughly

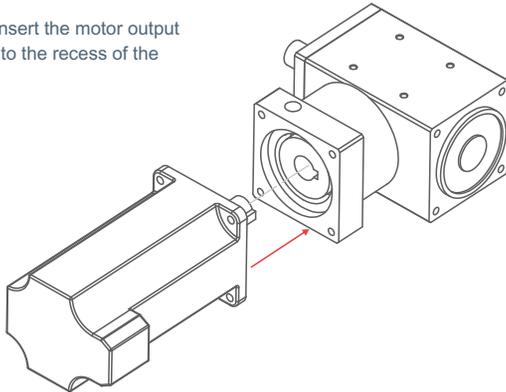
STEP 2

- A. Loosen the plug screw on the side of gearbox input flange.
- B. Rotate the gearbox inlet bushing until the head of the lock bolt is aligned with the access hole.
- C. Loosen the lock bolt on the gearbox inlet bushing.

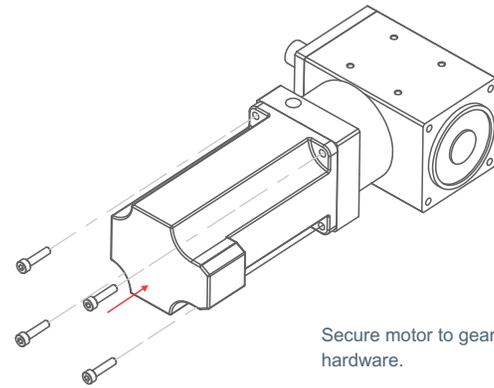


STEP 3

Position and then insert the motor output shaft and flange into the recess of the gearbox.



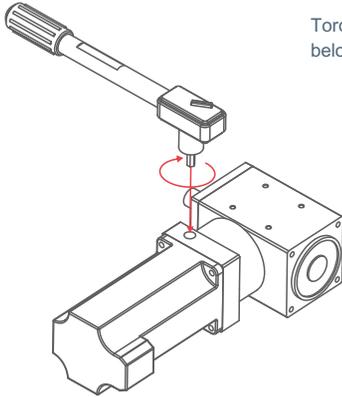
STEP 4



Secure motor to gearbox using specified hardware.

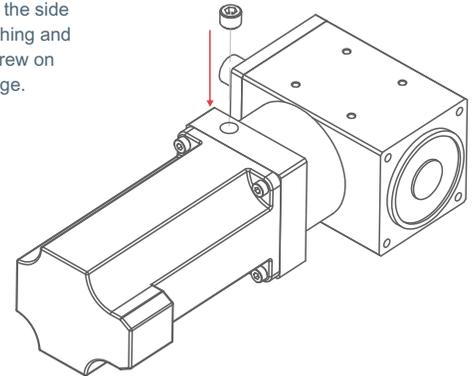
STEP 5

Torque motor coupling according to table below using a calibrated torque wrench.



STEP 6

Tighten the lock bolt on the side of the gearbox inlet bushing and then tighten the plug screw on the side of gearbox flange.



Tightening Torque Recommended For Motor Mounting Bolt & Motor Lock Sleeve Bolt

Bolt Size		M3	M4	M5	M6	M8	M10	M12	M14
Width Across Flats	mm	2.5	3	4	5	6	8	10	14
	Nm	2.1	4.9	9.8	17	41	80	139	343
Strength 12.9 Tightening Torque	In-lbs	19	44	87	151	364	709	1232	3038

Note:

Torques shown above are minimum tightening values. Bolts can be safely tightened up to 25% higher for increasing holding torques. Optionally, Loctite can be applied to the threads of the Lock Bolt. (Use Loctite 242 for screw sizes above M5 and Loctite 222MS for screws sizes M5 and below)

ORDERING INSTRUCTION

ORDERING INSTRUCTION

STEP ONE

Determine the Gear Reducer Ordering

Precision Planetary Gear Reducer Type

- PS = Precision Planetary Gearbox With Square Output Flange
- PN = Precision Planetary Gearbox With Round Output Flange
- ZPS = Spur Gear Planetary Gearbox With Square Output Flange
- ZPN = Spur Gear Planetary Gearbox With Round Output Flange
- ZS = Ultra Precision Planetary Gearbox With Square Housing
- ZN = Ultra Precision Planetary Gearbox With Round Housing
- ZE = Ultra Precision Planetary Gearbox With Flange Output
- ZF = Ultra Precision Planetary Gearbox With Round Flange Output

Gear Ratio				
Single Stage		Two Stages		
3	7	12	30	70
4	9	15	35	100
5	10	20	40	
		25	50	

PS — **060** — **050** — **S**

PS & PN Frame Size	ZPS & ZPN Frame Size	ZS Frame Size
042 = 42mm	060 = 60mm 120 = 120mm	060 = 60mm 142 = 142mm
060 = 60mm	080 = 80mm 160 = 160mm	090 = 90mm 180 = 180mm
090 = 90mm	090 = 90mm	115 = 115mm 220 = 220mm

ZN Frame Size	ZE Frame Size	ZF Frame Size
060 = 60mm 150 = 150mm	060 = 60mm 140 = 140mm	060 = 60mm 140 = 140mm
090 = 90mm 180 = 180mm	090 = 90mm	090 = 90mm 200 = 200mm
120 = 120mm 220 = 220mm	120 = 120mm	110 = 110mm

Backlash Type

- S = Standard Backlash
- L = Low Backlash
- (Not Applicable For Ultra Precision Series)

Economy Gear Reducer Type

EL = Economy Gearbox

EL — **060** — **050** — **S** — **S**

Frame Size

- 022 = 22mm
- 032 = 32mm
- 042 = 42mm
- 060 = 60mm
- 080 = 80mm
- 090 = 90mm

Gear Ratio				
Single Stage		Two Stages		
3	7	12	30	70
4	9	15	35	100
5	10	20	40	
		25	50	

Output Flange Style

- S = Square Flange
- R = Round Flange

Input Flange Style

- S = Square Flange
- R = Round Flange

Precision Right Angle Gear Reducer Type

- RB = Precision Right Angle Gearbox (Ratio 1:1)
- RL = Precision Right Angle Gearbox (Ratio 1:2, 1:3, 1:4, 1:5)
- ZSR = Only available in Single output shaft
- ZFR = Helical Planetary & Right Angle Gearbox

RB — **AS** — **060** — **001**

RB & RL Gear Ratio	ZSR Gear Ratio				
Single Stage	Single Stage	Two Stages			
RB: 1	3	7	12	30	70
RL: 2,3,4,5	4	9	15	35	100
	5	10	20	40	
			25	50	

- AS = Single output shaft
- BS = Double output shaft
(Not applicable for RB series)
- HS = Single hollow shaft
- PS = Double hollow shaft
(Not applicable for RB series)
- FS = Single flange output
- DS = Double flange output
(Not applicable for RB series)
- *ZSR = Only available in Single output shaft

RB & RL Frame Size	ZSR Frame Size	
042 = 42mm	060 = 60mm	142 = 142mm
060 = 60mm	090 = 90mm	180 = 180mm
090 = 90mm	115 = 115mm	220 = 220mm

ZFR Frame Size	
060 = 60mm	140 = 140mm
090 = 90mm	200 = 200mm
110 = 110mm	

STEP TWO

Please fill in the blanks with the Gearbox ordering No. and the motor or Gearbox type No. to be collocated.

Gearbox Ordering Number	— — —
Motor or Gearbox Model Number	

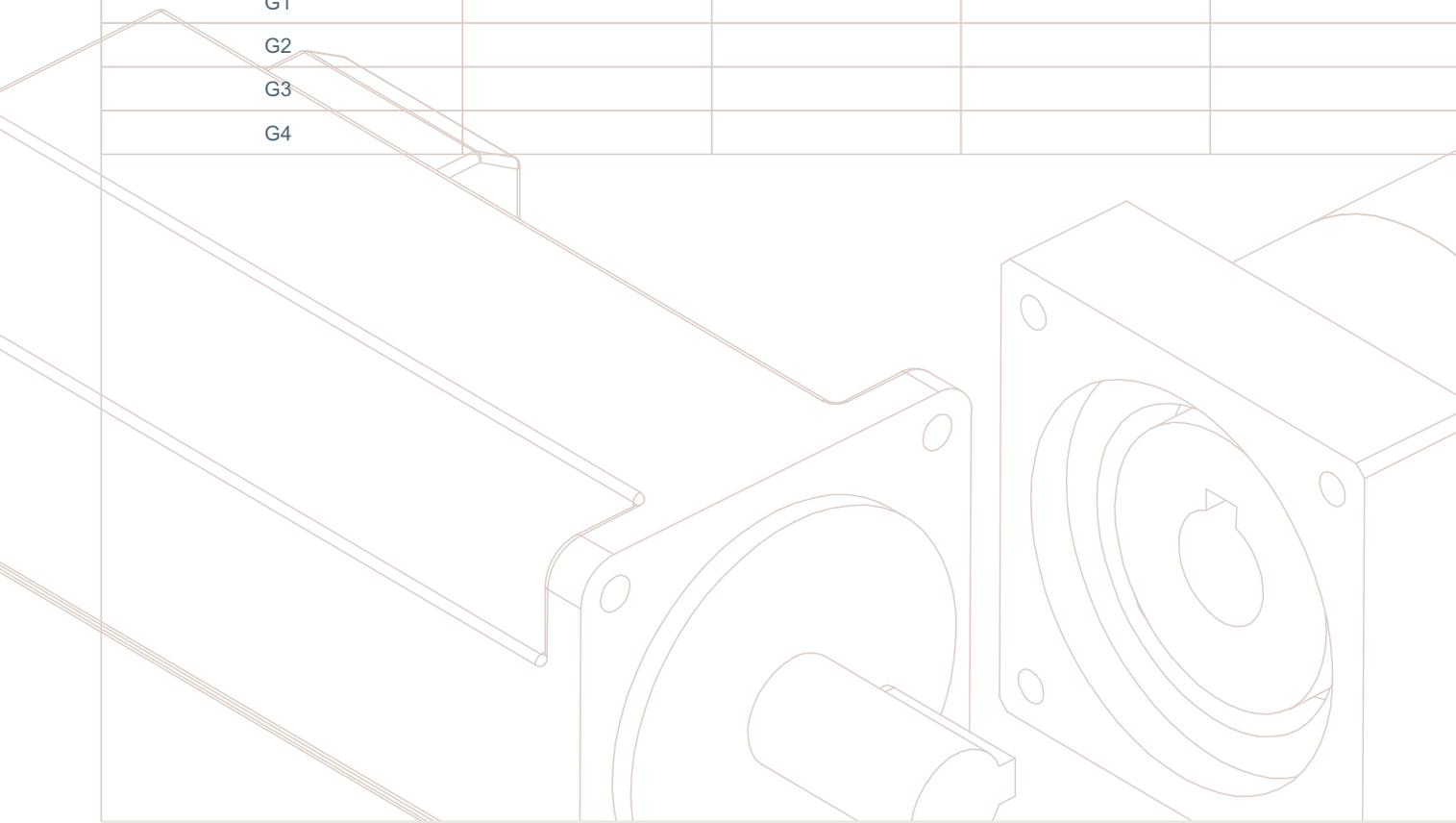
STEP THREE

1. Please fill all relevant dimensions of the motor or Gearbox output end in the chart below for collocating with the Gearbox you selected.
2. Dimension F7 in the chart below to be specified clearly with relevant depth and quantity.

Motor or Gear Reducer Output Dimension (See following page)

mm in

Type of output	AA	AB	AC	AD
Dimension				
F1				
F2				
F3				
F4				
F5				
F6				
F7				
F8				
F9				
F10				
G1				
G2				
G3				
G4				

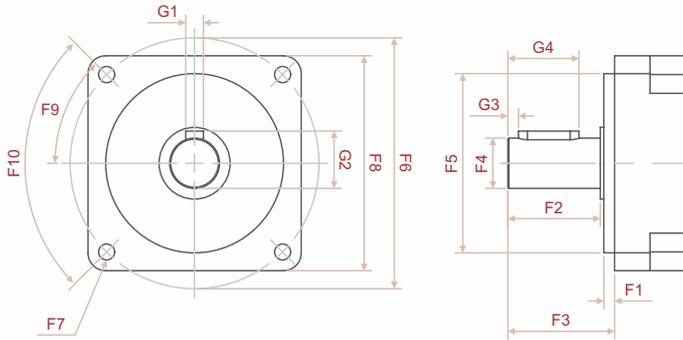


MOTOR OR GEAR REDUCER OUTPUT TYPE / UNIT CONVERSION TABLE

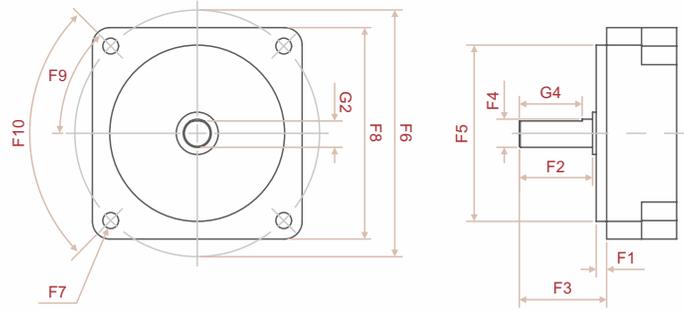
MOTOR OR GEAR REDUCER OUTPUT TYPE

Please fill in the blanks on the previous page with the motor or Gearbox output dimension according to the type or output provided in the chart below.

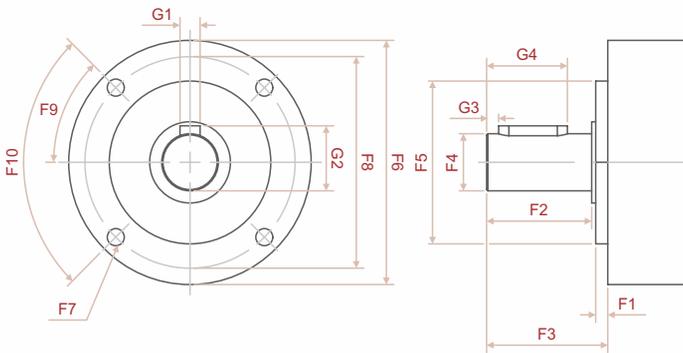
AA (Square flange , keyed shaft)



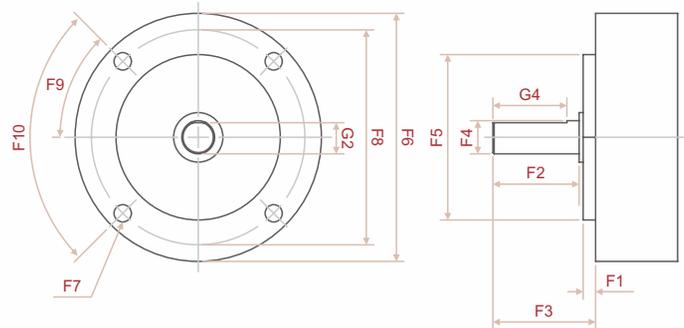
AB (Square flange , round shaft)



AC (Round flange , keyed shaft)



AD (Round flange , round shaft)



UNIT CONVERSION TABLE

TORQUE

MOMENT INERTIA

N.m	kg.m	kg.cm	ft-lb	in-lb	oz-in	lb-in ²	g-cm ²	oz-in ²
1	0.102	10.2	0.738	8.851	141.6	0.00034	1	0.00547
9.807	1	100	7.233	86.77	1389	0.0625	182.9	1
0.098	0.01	1	0.072	0.868	13.89	1	2926.4	16
1.356	0.138	13.83	1	12	192			
0.113	0.0115	1.152	0.083	1	16			
0.007	0.0007	0.072	0.005	0.0625	1			

LENGTH

WEIGHT

mm	cm	m	in	ft	g	kg	lb	oz
1	0.1	0.001	0.0394	0.0033	1	0.001	0.002	0.035
10	1	0.01	0.3937	.0328	1000	1	2.2	35.27
1000	100	1	39.37	3.28	454	0.454	1	16
25.4	2.54	0.0254	1	0.0833	28.35	0.028	0.06	1
304.8	30.48	0.3048	12	1				

SELECTION OF YOUR OPTIMUM GEARBOX

STEP 1

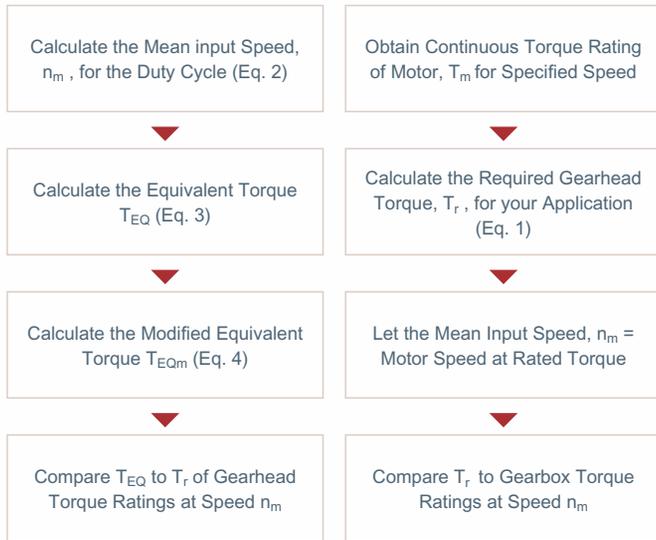
Select the required precision class and gearbox configuration (in-line or right angle).

STEP 2

Select the proper gearbox using exact or general method.

Exact Method

General Method



General Method:

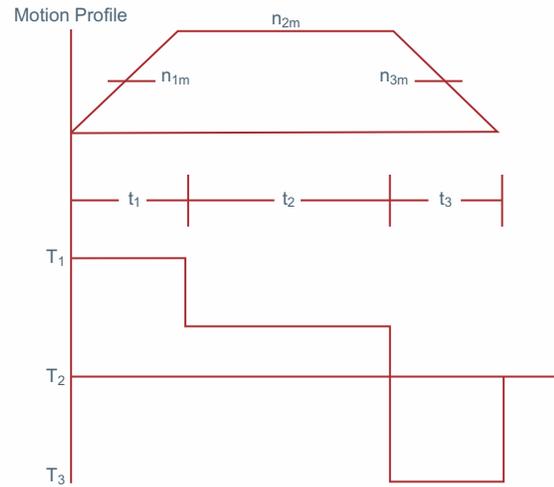
Required Gearbox Torque(T_r)

$$(1) T_r = T_M \cdot i \cdot e$$

Where: T_M = Continuous torque of motor
 i = Gearbox ratio
 e = Efficiency of Gearbox

*Since many motors are capable of exceeding their continuous torque rating for extended lengths of time, the value for T_M will only provide a starting point for Gearbox selection. Only use the general method if the continuous motor rating is not exceeded in the application.

Exact Method:



t_n = time period n
 n_{nm} = mean speed during time period
 $t_n T_n$ = torque during time period t_n

Mean input speed (n_m)

$$(2) n_m = \frac{n_{1m}t_1 + n_{2m}t_2 + n_{3m}t_3 + \dots + n_{nm}t_n}{t_t}$$

where $t_t = t_1 + t_2 + t_3 + \dots + t_n$

Equivalent torque (T_{EC})

$$(3) T_{EC} = 8.7 T_1 \frac{n_{1m}t_1}{n_m t_t} + T_2 \frac{n_{2m}t_2}{n_m t_t} + T_3 \frac{n_{3m}t_3}{n_m t_t} + \dots + T_n \frac{n_{nm}t_n}{n_m t_t}$$

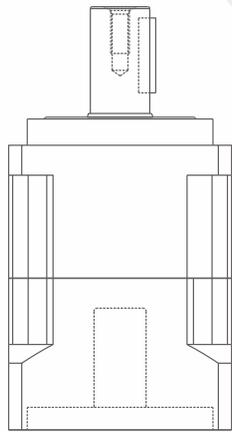
Modified equivalent torque (T_{ECm})

$$(4) T_{ECm} = (T_{EC})/C$$

where C is:

C	Numer of cycles/hr
1.0	>0
0.9	>1000
0.7	>2500
0.5	>5000

For applications > 10,000 cycles/hour or for continuous duty operation, please contact our engineer consultant.



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