



For stepper / servo motor

Planetary Gearbox

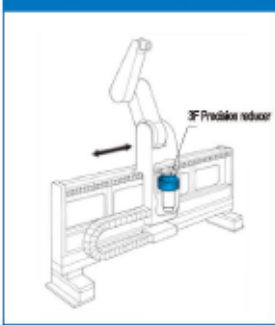
Production workshop



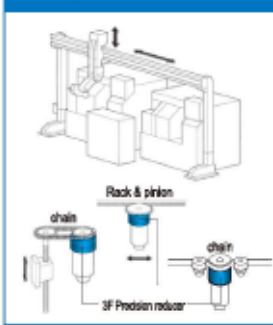
Product Application Industry

Semiconductor liquid crystal manufacturing equipment, robots, machine tools, and other frontier areas requiring precision motion control are widely used.

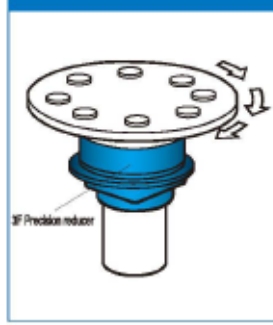
The walking shaft of a robot (rack and pinion)



Gantry robot of machine tool



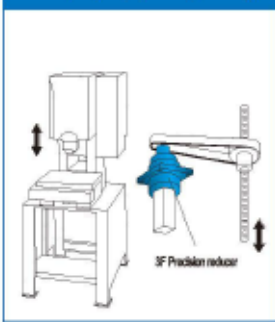
Angle (positioning) control



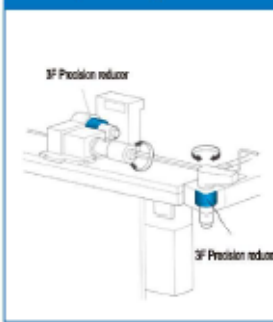
Wafer handling robot



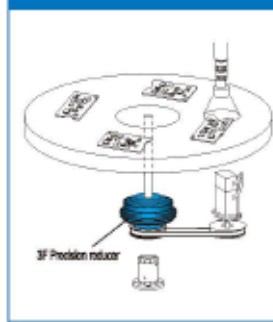
Stamping equipment (riveting)



Pipe bending machine



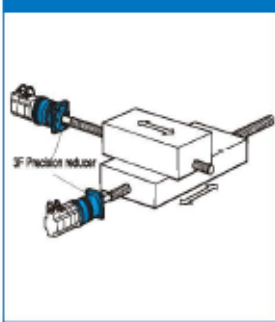
Printed circuit board inspection device



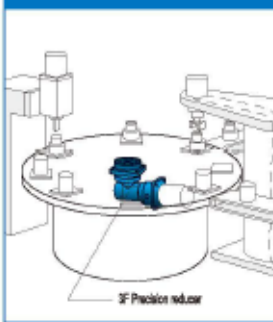
Rotate



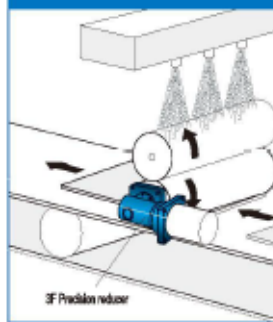
Two axis control (XY workbench)



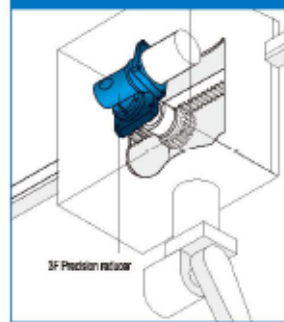
Indexing table drive



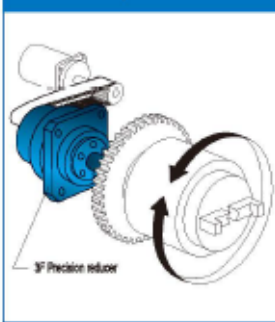
Roller drive for daubing use



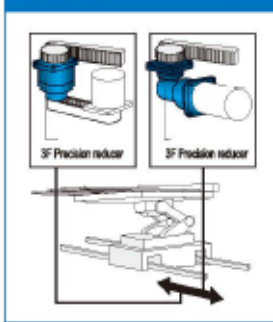
Pulley for loader use



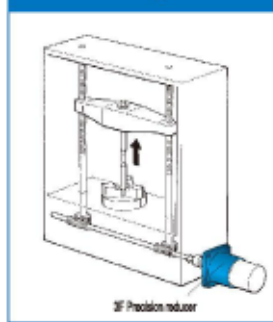
Shaft input belt drive



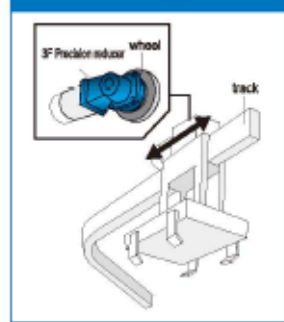
Liquid crystal glass substrate handling robot



Tensile testing machine



Roof walking van

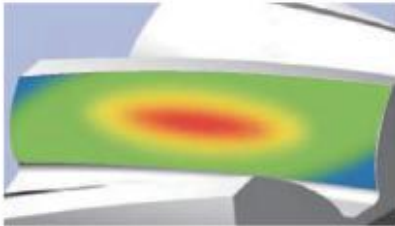


Product Technology

The 3F series planetary gearbox has two multi-national patent lubricating structure, which is used in the internal spiral gear structure to ensure the highest efficient output.

Patent 1: Reducing the axial thrust of the planetary gear operation.

Patent 2: Increase the lubrication, reduce the frictional resistance and noise.



Finite element analysis of gear strength is carried out by using ANSYS technology. Tooth profile and lead trimming of tooth surface are also made to reduce the impact and noise of gear meshing, and increase the service life of gear system.



Carbon-nitriding heat-treated high quality alloy steel is adopted in gear materials to obtain the best wear resistance and impact toughness.

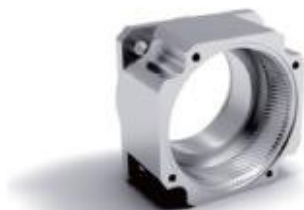


The output planet carrier adopts integral (double support) structure design. The large span of the front and rear bearings is distributed inside the box body, forming a stable integrated structure to ensure high torsion rigidity and accuracy.

PAB series
Take the PAB series as an example



An integrated design of the tooth ring and the output shell is adopted, and high quality steel is used to get high material density by hot forging. The integrated design can ensure that all geometric dimensions are finished in one time and have higher precision and strength compared with other embedded and clamped structures.



The input shaft and locking device are designed in an integrated way. The two bolts are symmetrically distributed to achieve dynamic balance. At the same time, through the strong locking of double bolts, the motor shaft transmission is effectively prevented from slipping and the high-precision zero backlash power transmission is achieved.



Standard Type Planetary Gearbox

PLF



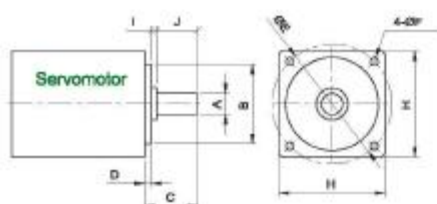
- **1. Quiet operation**
Helical gears are used to achieve smooth and quiet operation.
- **2. High rigidity & torque**
The use of integral ball bearings greatly improves the rigidity and torque.
- **3. Methods of flange and connector**
It can be installed on any motor in the world.
- **4. No grease leakage**
The use of grease with high viscosity which is not easy to separate effectively prevents the grease leakage.
- **5. Convenient maintenance**
No need to replace the grease in the product life period, and the installation is more convenient.

Model Selection of Speed Reducers

PLF Type

PLF080	—	10	—	S1	—	P1	/	Motor
Reducer Model PLF040, PLF060, PLF080, PLF090 PLF120, PLF160			Output Shaft Keyway S1: Solid Output Shaft No Keyway S2: Standard (Keyway) S3: Output for holes			Motor Model Motor Manufacturer & Model		
Ratio 1-stage: 3, 4, 5, 6, 7, 8, 9, 10 2-stage: 12, 15, 16, 20, 25, 28, 30, 35, 40, 50, 70, 80, 100 3-stage: 60, 64, 72, 80, 90, 100, 120, 144, 150, 160, 180, 200 240, 258, 288, 320, 384, 512, 600, 800, 1000			Backlash Grade P0: High precision backlash P1: Precision backlash P2: Standard backlash					

The gearbox matching motor needs to be confirmed with following dimensions:



A	B	C	D	E	F	H	I	J

Naming Scheme:

Type	Model	Ratio	Output Shaft Keyway	Backlash Class	MOTOR NO.	

PLF Reducer Specifications

Specs	Unit	Stage	Ratio	PLF040	PLF060	PLF080	PLF090	PLF120	PLF160
Rated Output Torque / T _{2N}	Nm	1	3	14	28	105	113	120	323
			4	15	38	108	115	215	364
			5	17	40	112	118	230	423
			7	13	35	105	110	160	358
			10	10	15	50	56	110	293
		2	15	14	28	105	113	120	323
			20	15	38	108	120	240	364
			25	17	40	112	118	250	423
			30	13	28	105	113	120	323
			35	17	35	112	118	240	358
			40	12	38	110	115	236	364
			50	15	40	108	118	230	423
			70	13	35	105	110	210	358
			100	12	31	50	56	210	293
Max.Output Torque / T _{2N} ¹	Nm	1,2	3~100	3Times of Nominal Output Torque					
Rated Input Speed / n _{1N}	rpm	1,2	3~100	3000	3000	3000	3000	3000	2500
Max.Input Speed / n _{1H}	rpm	1,2	3~100	5000	5000	5000	5000	5000	3600
Precision Backlash P1	arcmin	1	3~10	≤6	≤6	≤6	≤6	≤6	≤6
		2	12~100	≤8	≤8	≤8	≤8	≤8	≤8
Standard Backlash P2	arcmin	1	3~10	≤7	≤7	≤7	≤7	≤7	≤7
		2	12~100	≤10	≤10	≤10	≤10	≤10	≤10
Torsional Rigidity	Nm/arcmin	1,2	3~100	3	6	12	12	22	50
Max.Radial Force / F _{2R} ³	N	1,2	3~100	320	460	1300	1300	3200	6520
Max.Axial Force / F _{2A} ³	N	1,2	3~100	160	230	660	660	1600	3260
Service Life	hr	1,2	3~100	20000 h					
Efficiency / η	%	1	3~10	≥97%					
		2	15~100	≥94%					
Weight	kg	1	3~10	0.73	0.99	2.1	2.5	4.98	18.2
		2	15~100	1.05	1.46	3.2	3.5	6.92	24.9
Operating Temperature	℃	1,2	3~100	-25℃~+90℃					
Lubrication		1,2	3~100	Synthetic Grease					
Protection Class		1,2	3~100	IP65					
Mounting Position		1,2	3~100	Any Direction					
Noise Level (n1=3000rpm, No load)	dB(A)	1,2	3~100	≤62	≤63	≤65	≤65	≤67	≤68

Reducer Rotary Inertia

Specs	Unit	Stage	Ratio	PLF040	PLF060	PLF080	PLF090	PLF120	PLF160
Moment of Inertia	kg.cm ²	1	3	0.03	0.16	0.61	0.61	3.25	9.21
			4	0.03	0.14	0.48	0.48	2.74	7.54
			5	0.03	0.13	0.47	0.47	2.71	7.42
			7	0.03	0.13	0.45	0.45	2.65	7.25
			10	0.03	0.13	0.45	0.45	2.62	7.14
		2	12~40	0.03	0.13	0.44	0.44	2.58	7.07
			50~100	0.03	0.13	0.44	0.44	2.57	7.04

1. Ratio (i=N_{in}/N_{out}) 2. Output revolutions 100rpm, acting on the output shaft center position.
3. *Continuous operation, service life is 10000hrs.

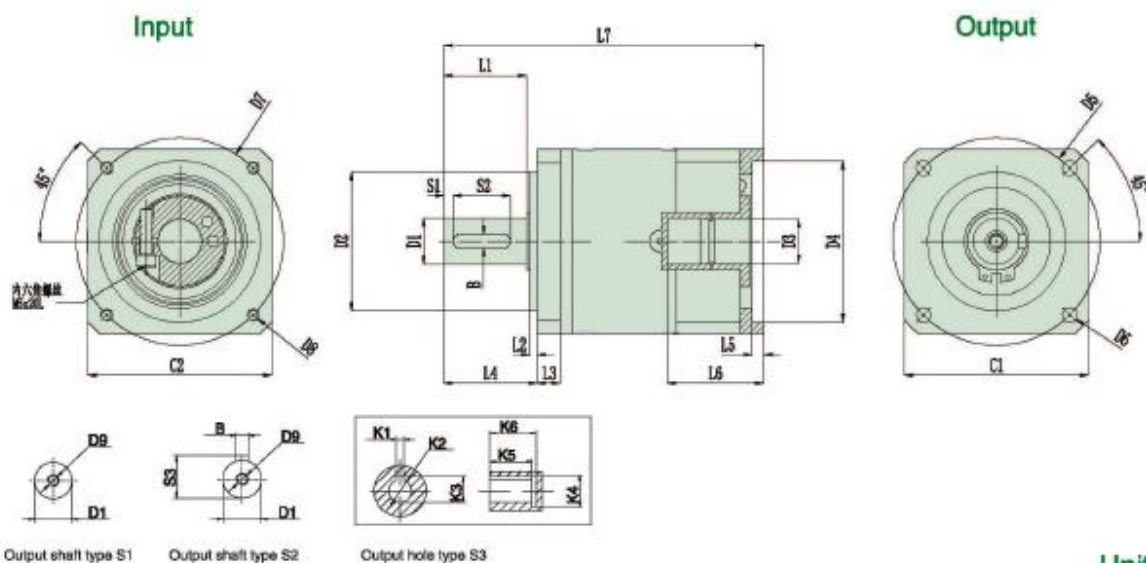
MODEL: PLF

1-Stage

Ratio: 3, 4, 5, 6, 7, 8, 9, 10



Dimensions:



Unit:mm

Size	PLF040-L1	PLF060-L1	PLF080-L1	PLF090-L1	PLF120-L1	PLF160-L1
D1	φ 10	φ 14	φ 20	φ 20	φ 25	φ 40
D2	φ 35	φ 50	φ 80	φ 80	φ 110	φ 130
D3	φ 8 (≤ 8)	φ 14 (≤ 19)	φ 19 (≤ 19)	φ 19 (≤ 22)	φ 22 (≤ 24)	φ 35 (≤ 35)
D4	φ 30 (30-50)	φ 50 (50-70)	φ 70 (50-110)	φ 70 (50-110)	φ 110 (70-130)	φ 114.3 (110-150)
D5	φ 50	φ 70	φ 100	φ 100	φ 130	φ 185
D6	4-φ 3.5	4-φ 5.5	4-φ 6.5	4-φ 6.5	4-φ 8.5	4-φ 11
D7	φ 46 (45-70)	φ 70 (70-130)	φ 90 (70-145)	φ 90 (70-145)	φ 145 (90-165)	φ 200 (145-220)
D8	(4-M4*12L)	(4-M4*8L)	(4-M6*10L)	(4-M6*10L)	(4-M8*16L)	(4-M12*20L)
D9	M3*9L	M5*18L	M6*18L	M6*18L	M10*25L	M16*36L
L1	23	30	36	36	50	80
L2	2	3	3	3	4	5
L3	5	11	10	10	18	20
L4	26	35	40.5	40.5	55.5	87
L5	(3.5)	(4)	(5)	(6)	(10)	(10)
L6	(27)	(31)	(42)	(47)	(62.5)	(81)
L7	(88)	(115)	(139)	(150)	(210)	(276)
C1	□42	□60	□90	□90	□120	□165
C2	(□42)	(□60)	(□80)	(□90)	(□120)	(□176)
S1	2	3	3	3	5	5
S2	16	20	25	25	40	65
S3	11.2	16	22.5	22.5	28	43
B	3	5	6	6	8	12
K1	-	3	5	5	6	10
K2	-	φ 10	φ 15	φ 15	φ 20	φ 35
K3	-	11.4	17.3	17.3	22.8	38.3
K4	-	20	30	30	38	58
K5	-	15	20	20	27	35
K6	-	18	24	24	32	40

Note 1: Inside of () is the optional range of sizes, outside of () is the standard sizes.

Note 2: The reducer output shaft size and length can be customized for customers.

Note 3: The input size can be changed according to the servomotor or stepper motor of each brand.

MODEL: PLF

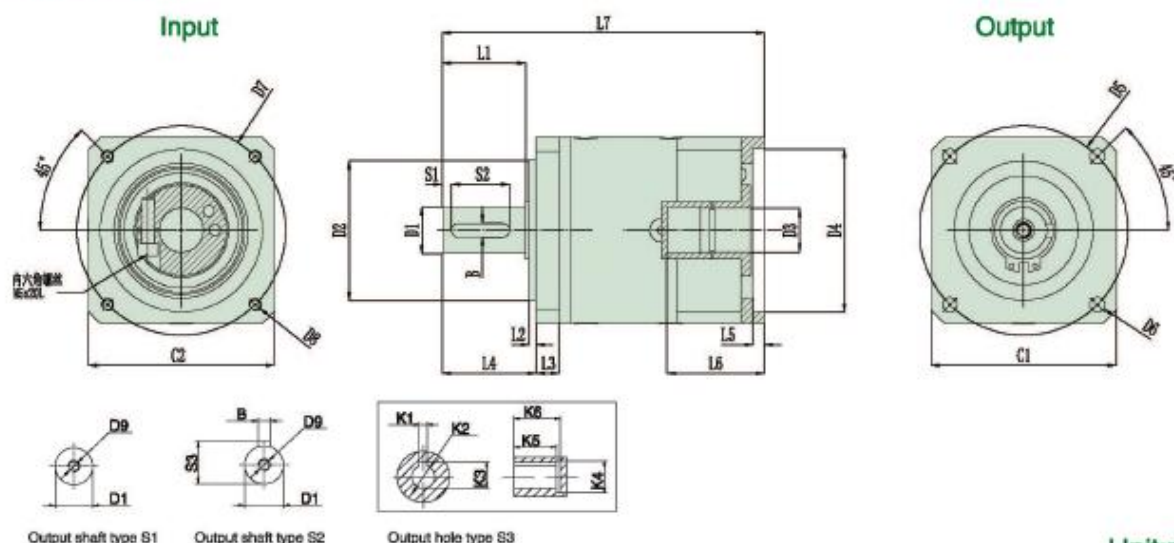
2-Stage

Ratio: 12, 15, 16, 20, 25, 28, 30, 35

40, 50, 70, 80, 100



Dimensions:



Unit:mm

Size	PLF040-L2	PLF060-L2	PLF080-L2	PLF090-L2	PLF120-L2	PLF160-L2
D1	φ 10	φ 14	φ 20	φ 20	φ 25	φ 40
D2	φ 35	φ 50	φ 80	φ 80	φ 110	φ 130
D3	φ 8 (≤8)	φ 14 (≤19)	φ 19 (≤19)	φ 19 (≤22)	φ 22 (≤24)	φ 35 (≤35)
D4	φ 30 (30-50)	φ 50 (50-70)	φ 70 (50-110)	φ 70 (50-110)	φ 110 (70-130)	φ 114.3 (110-150)
D5	φ 50	φ 70	φ 100	φ 100	φ 130	φ 185
D6	4-φ 3.5	4-φ 5.5	4-φ 6.5	4-φ 6.5	4-φ 6.5	4-φ 11
D7	φ 46 (45-70)	φ 70 (70-130)	φ 90 (70-145)	φ 90 (70-145)	φ 145 (90-165)	φ 200 (145-220)
D8	(4-M4*12L)	(4-M4*8L)	(4-M6*10L)	(4-M6*10L)	(4-M8*16L)	(4-M12*20L)
D9	M3*9L	M5*18L	M6*18L	M6*18L	M10*25L	M16*36L
L1	23	30	36	36	50	80
L2	2	3	3	3	4	5
L3	5	11	10	10	18	20
L4	26	35	40.5	40.5	55.5	87
L5	(3.5)	(4)	(5)	(6)	(10)	(10)
L6	(27)	(31)	(42)	(47)	(62.5)	(81)
L7	(103)	(133)	(159)	(170)	(240)	(317)
C1	□42	□60	□90	□90	□120	□165
C2	(□42)	(□60)	(□80)	(□90)	(□120)	(□176)
S1	2	3	3	3	5	5
S2	16	20	25	25	40	65
S3	11.2	16	22.5	22.5	28	43
B	3	5	6	6	8	12
K1	-	3	5	5	6	10
K2	-	φ 10	φ 15	φ 15	φ 20	φ 35
K3	-	11.4	17.3	17.3	22.8	38.3
K4	-	20	30	30	38	58
K5	-	15	20	20	27	35
K6	-	18	24	24	32	40

Note 1: Inside of () is the optional range of sizes, outside of () is the standard sizes.

Note 2: The reducer output shaft size and length can be customized for customers.

Note 3: The input size can be changed according to the servomotor or stepper motor of each brand.

Standard Type Planetary Gearbox

PLE



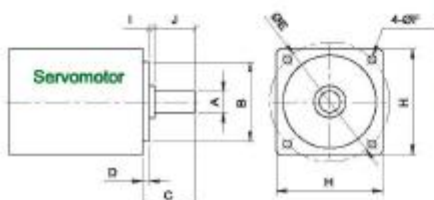
- 1. Quiet operation
Helical gears are used to achieve smooth and quiet operation.
- 2. High rigidity & torque
The use of integral ball bearings greatly improves the rigidity and torque.
- 3. Methods of flange and connector
It can be installed on any motor in the world.
- 4. No grease leakage
The use of grease with high viscosity which is not easy to separate effectively prevents the grease leakage.
- 5. Convenient maintenance
No need to replace the grease in the product life period, and the installation is more convenient.

Model Selection of Speed Reducers

PLE Type

PLE080	—	10	—	S1	—	P1	/	Motor
Reducer Model PLE040, PLE060, PLE080, PLE090 PLE120, PLE160			Output Shaft Keyway S1: Solid Output Shaft No Keyway S2: Standard (Keyway) S3: Output for holes			Motor Model Motor Manufacturer & Model		
Ratio 1-stage: 3, 4, 5, 6, 7, 8, 9, 10 2-stage: 12, 15, 16, 20, 25, 28, 30, 35, 40, 50, 70, 80, 100 3-stage: 60, 64, 72, 80, 90, 100, 120, 144, 150, 160, 180, 200 240, 258, 288, 320, 384, 512, 600, 800, 1000			Backlash Grade P0: High precision backlash P1: Precision backlash P2: Standard backlash					

The gearbox matching motor needs to be confirmed with following dimensions:



A	B	C	D	E	F	H	I	J

Naming Scheme:

Type	Model	Ratio	Output Shaft Keyway	Backlash Class	MOTOR NO.

PLE Reducer Specifications

Specs	Unit	Stage	Ratio	PLE040	PLE060	PLE080	PLE090	PLE120	PLE160
Rated Output Torque / T _{2N}	Nm	1	3	14	28	105	113	120	323
			4	15	38	108	115	215	364
			5	17	40	112	118	230	423
			7	13	35	105	110	160	358
			10	10	15	50	56	110	293
		2	15	14	28	105	113	120	323
			20	15	38	108	120	240	364
			25	17	40	112	118	250	423
			30	13	28	105	113	120	323
			35	17	35	112	118	240	358
			40	12	38	110	115	236	364
			50	15	40	108	118	230	423
			70	13	35	105	110	210	358
			100	12	31	50	56	210	293
Max.Output Torque / T _{2N} ¹	Nm	1,2	3~100	3Times of Nominal Output Torque					
Rated Input Speed / n _{in}	rpm	1,2	3~100	3000	3000	3000	3000	3000	2500
Max.Input Speed / n _{in}	rpm	1,2	3~100	5000	5000	5000	5000	5000	3600
Precision Backlash P1	arcmin	1	3~10	≤6	≤6	≤6	≤6	≤6	≤6
		2	12~100	≤8	≤8	≤8	≤8	≤8	≤8
Standard Backlash P2	arcmin	1	3~10	≤8	≤8	≤8	≤8	≤8	≤8
		2	12~100	≤10	≤10	≤10	≤10	≤10	≤10
Torsional Rigidity	Nm/arcmin	1,2	3~100	3	6	12	12	22	50
Max.Radial Force / F _{rad} ²	N	1,2	3~100	320	460	1300	1300	3200	6520
Max.Axial Force / F _{ax} ²	N	1,2	3~100	160	230	660	660	1600	3260
Service Life	hr	1,2	3~100	20000 h					
Efficiency / η	%	1	3~10	≥ 97%					
		2	15~100	≥ 94%					
Weight	kg	1	3~10	0.73	0.99	2.1	2.4	4.98	18.2
		2	15~100	1.05	1.46	3.2	3.6	6.92	24.9
Operating Temperature	°C	1,2	3~100	-25°C~+90°C					
Lubrication		1,2	3~100	Synthetic Grease					
Protection Class		1,2	3~100	IP65					
Mounting Position		1,2	3~100	Any Direction					
Noise Level (n1=3000rpm, No load)	dB(A)	1,2	3~100	≤62	≤63	≤65	≤65	≤67	≤68

Reducer Rotary Inertia

Specs	Unit	Stage	Ratio	PLE040	PLE060	PLE080	PLE090	PLE120	PLE160
Moment of Inertia	kg.cm ²	1	3	0.03	0.16	0.61	0.61	3.25	9.21
			4	0.03	0.14	0.48	0.48	2.74	7.54
			5	0.03	0.13	0.47	0.47	2.71	7.42
			7	0.03	0.13	0.45	0.45	2.65	7.25
		2	10	0.03	0.13	0.45	0.45	2.62	7.14
			12~40	0.03	0.13	0.44	0.44	2.58	7.07
			50~100	0.03	0.13	0.44	0.44	2.57	7.04

1. Ratio (i=N_{in}/N_{out})

2. Output revolutions 100rpm, acting on the output shaft center position.

3. *Continuous operation, service life is 10000hrs.

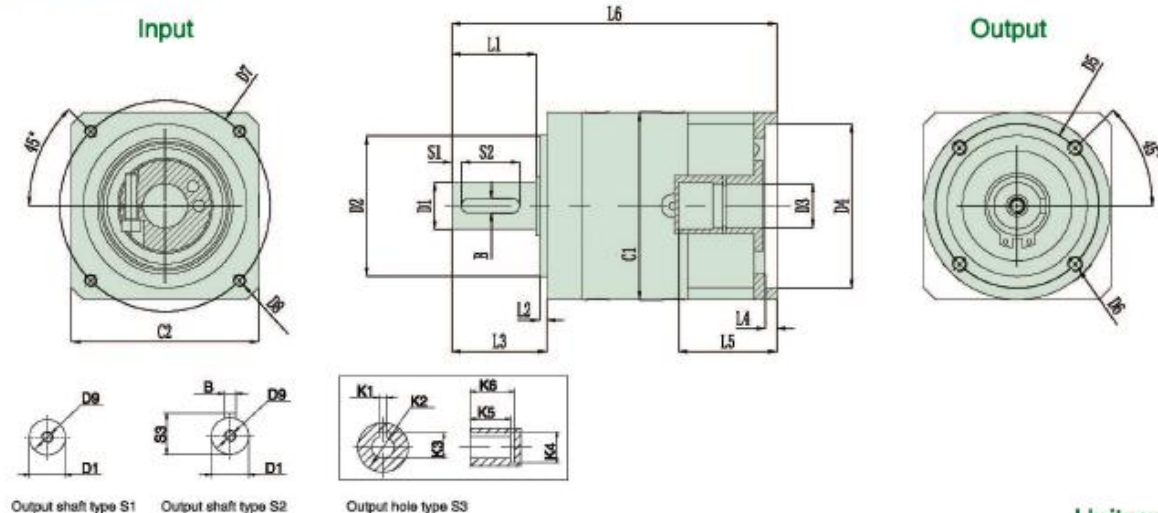
MODEL: PLE

1-Stage

Ratio: 3, 4, 5, 6, 7, 8, 9, 10



Dimensions:



Unit:mm

Size	PLE040-L1	PLE060-L1	PLE080-L1	PLE090-L1	PLE120-L1	PLE160-L1
D1	φ 10	φ 14	φ 20	φ 20	φ 25	φ 40
D2	φ 26	φ 40	φ 60	φ 60	φ 80	φ 130
D3	φ 8 (≤ 8)	φ 14 (≤ 14)	φ 19 (≤ 19)	φ 19 (≤ 24)	φ 22 (≤ 24)	φ 35 (≤ 35)
D4	φ 30 (30-50)	φ 50 (50-70)	φ 70 (50-110)	φ 70 (50-110)	φ 110 (70-130)	φ 114.3 (110-150)
D5	φ 34	φ 52	φ 70	φ 70	φ 100	φ 145
D6	(4-M4*8L)	(4-M5*15L)	(4-M6*12L)	(4-M6*20L)	(4-M10*18L)	(4-M12*24L)
D7	φ 46 (45-70)	φ 70 (70-130)	φ 90 (70-145)	φ 90 (70-145)	φ 145 (90-165)	φ 200 (145-220)
D8	(4-M4*12L)	(4-M5*10L)	(4-M6*15L)	(4-M6*15L)	(4-M8*16L)	(4-M12*20L)
D9	M3*9L	M5*16L	M6*18L	M6*18L	M10*25L	M16*30L
L1	23	30	36	36	50	80
L2	2	3	3	3	4	5
L3	26	35	40.5	40.5	55.5	87
L4	(3.5)	(4)	(5)	(6)	(10)	(10)
L5	(27)	(31)	(42)	(47)	(62.5)	(81)
L6	(88)	(115)	(139.0)	(150)	(210)	(276)
C1	φ 42	φ 60	φ 80	φ 80	φ 120	φ 165
C2	(□ 42)	(□ 60)	(□ 80)	(□ 90)	(□ 120)	(□ 176)
S1	2	3	4	3	5	5
S2	16	20	25	25	40	65
S3	11.2	16	22.5	22.5	28	43
B	3	5	6	6	8	12
K1	-	3	5	5	6	10
K2	-	φ 10	φ 15	φ 15	φ 20	φ 35
K3	-	11.4	17.3	17.3	22.8	38.3
K4	-	20	30	30	38	58
K5	-	15	20	20	27	35
K6	-	18	24	24	32	40

Note 1: Inside of () is the optional range of sizes, outside of () is the standard sizes.

Note 2: The reducer output shaft size and length can be customized for customers.

Note 3: The input size can be changed according to the servomotor or stepper motor of each brand.

MODEL: PLE

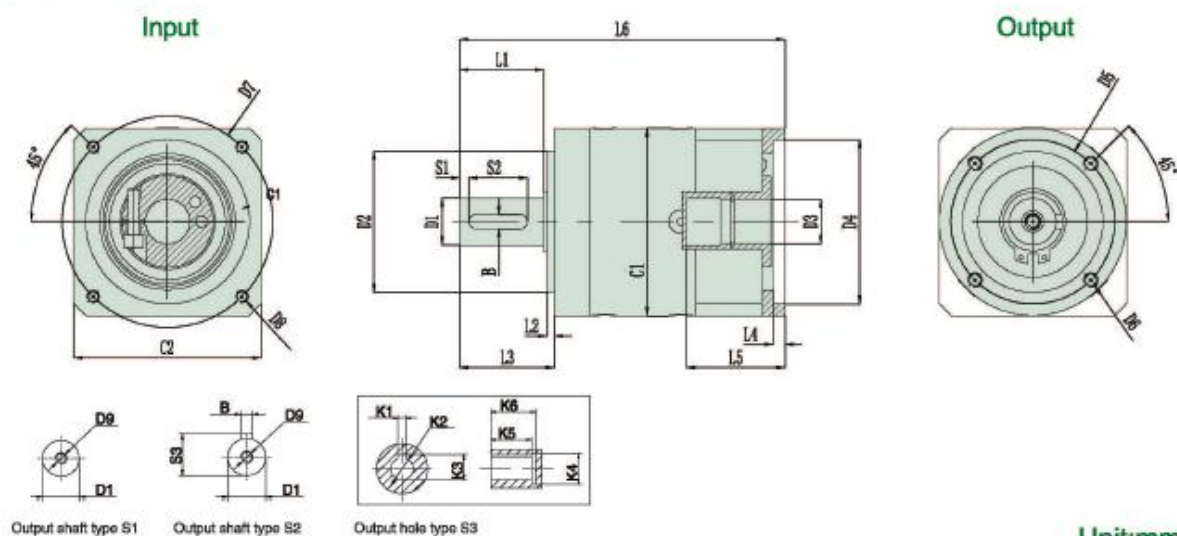
2-Stage

Ratio: 12, 15, 16, 20, 25, 28, 30, 35

40, 50, 70, 80, 100



Dimensions:



Unit:mm

Size	PLE040-L2	PLE060-L2	PLE080-L2	PLE090-L2	PLE120-L2	PLE160-L2
D1	φ 10	φ 14	φ 20	φ 20	φ 25	φ 40
D2	φ 26	φ 40	φ 60	φ 60	φ 80	φ 130
D3	φ 8 (≤ 8)	φ 14 (≤ 14)	φ 19 (≤ 19)	φ 19 (≤ 24)	φ 22 (≤ 24)	φ 35 (≤ 35)
D4	φ 30 (30-50)	φ 50 (50-70)	φ 70 (50-110)	φ 70 (50-110)	φ 110 (70-130)	φ 114.3 (110-150)
D5	φ 34	φ 52	φ 70	φ 70	φ 100	φ 145
D6	(4-M4*8L)	(4-M5*15L)	(4-M6*12L)	(4-M6*20L)	(4-M10*18L)	(4-M12*24L)
D7	φ 46 (45-70)	φ 70 (70-130)	φ 90 (70-145)	φ 90 (70-145)	φ 145 (90-165)	φ 200 (145-220)
D8	(4-M4*12L)	(4-M5*10L)	(4-M6*15L)	(4-M6*15L)	(4-M8*16L)	(4-M12*20L)
D9	M3*9L	M5*16L	M6*18L	M6*18L	M10*25L	M16*30L
L1	23	30	36	36	50	80
L2	2	3	3	3	4	5
L3	26	35	40.5	40.5	55.5	87
L4	(3.5)	(4)	(5)	(6)	(10)	(10)
L5	(27)	(31)	(42)	(47)	(62.5)	(81)
L6	(103)	(133)	(159.0)	(170)	(239.5)	(317)
C1	φ 42	φ 60	φ 80		φ 120	φ 165
C2	(□ 42)	(□ 60)	(□ 80)	(□ 90)	(□ 120)	(□ 176)
S1	2	3	4	3	5	5
S2	16	20	25	25	40	65
S3	11.2	16	22.5	22.5	28	43
B	3	5	6	6	8	12
K1	-	3	5	5	6	10
K2	-	φ 10	φ 15	φ 15	φ 20	φ 35
K3	-	11.4	17.3	17.3	22.8	38.3
K4	-	20	30	30	38	58
K5	-	15	20	20	27	35
K6	-	18	24	24	32	40

Note 1: Inside of () is the optional range of sizes, outside of () is the standard sizes.

Note 2: The reducer output shaft size and length can be customized for customers.

Note 3: The input size can be changed according to the servomotor or stepper motor of each brand.

PRECISION PLANETARY GEARBOX

VRB



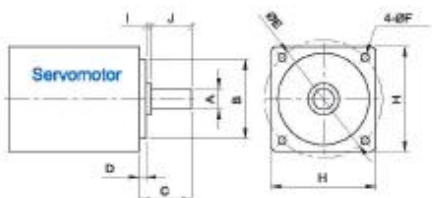
- 1. Quiet operation
Helical gears are used to achieve smooth and quiet operation.
- 2. High precision
The backlash is less than 3 arcmin and the positioning is accurate.
- 3. High rigidity & torque
The use of integral ball bearings greatly improves the rigidity and torque.
- 4. Methods of flange and connector
It can be installed on any motor in the world.
- 5. No grease leakage
The use of grease with high viscosity which is not easy to separate effectively prevents the grease leakage.
- 6. Convenient maintenance
No need to replace the grease in the product life period, and the installation is more convenient.

Model Selection of Speed Reducers

VRB Type

VRB090	–	10	–	S1	–	P1	/	Motor
Reducer Model		Output Shaft Keyway		Motor Model				
VRB042, VRB060, VRB090, VRB115 VRB142, VRB180, VRB220		S1: (Solid Output Shaft No Keyway) S2: Standard (Keyway) S3: Output for holes		Motor Manufacturer & Model				
Ratio		Backlash Grade						
1-stage: 3, 4, 5, 6, 7, 8, 9, 10 2-stage: 15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 80, 90, 100		P0: High precision backlash P1: Precision backlash P2: Standard backlash						

The gearbox matching motor needs to be confirmed with following dimensions:



A	B	C	D	E	F	H	I	J

Naming Scheme:

Type	Model	Ratio	Output Shaft Keyway	Backlash Class	MOTOR NO.

VRB Reducer Specifications

Specs	Unit	Stage	Ratio	VRB042	VRB060	VRB090	VRB115	VRB142	VRB180	VRB220
Rated Output Torque / T _{2N}	Nm	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	130	208	342	588	1140
			20	19	50	140	290	542	1050	1700
			25	22	60	160	330	650	1200	2000
			30	22	55	130	208	342	588	1140
			35	22	60	160	330	650	1200	2000
			40	22	50	140	298	542	1050	1700
			45	14	40	100	230	450	900	1500
			50	22	60	160	330	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
Max. Output Torque / T _{2NOT} ¹	Nm	1,2	3~100	3Times of Nominal Output Torque						
Rated Input Speed / Ω_{IN}	rpm	1,2	3~100	5000	5000	4000	4000	3000	3000	2000
Max. Input Speed / Ω_{IN}	rpm	1,2	3~100	10000	10000	8000	8000	6000	6000	4000
Micro Backlash P0	arcmin	1	3~10	≤1	≤1	≤1	≤1	≤1	≤1	≤1
		2	12~100	≤3	≤3	≤3	≤3	≤3	≤3	≤3
Precision Backlash P1	arcmin	1	3~10	≤3	≤3	≤3	≤3	≤3	≤3	≤3
		2	12~100	≤5	≤5	≤5	≤5	≤5	≤5	≤5
Precision Backlash P2	arcmin	1	3~10	≤5	≤5	≤5	≤5	≤5	≤5	≤5
		2	12~100	≤7	≤7	≤7	≤7	≤7	≤7	≤7
Torsional Rigidity	Nm/arcmin	1,2	3~100	3	7	14	25	50	145	225
Max. Radial Force / F _{rad} ²	N	1,2	3~100	780	1530	3250	6700	9400	14500	50000
Max. Axial Force / F _{axial} ²	N	1,2	3~100	390	765	1625	3350	4700	7250	25000
Service Life	hr	1,2	3~100	20000h						
Efficiency / η	%	1	3~10	≥97%						
		2	15~100	≥94%						
Weight	kg	1	3~10	0.5	1.3	3.3	7.8	15	28	52
		2	15~100	0.8	1.48	3.9	9.6	18.9	33	66
Operating Temperature	°C	1,2	3~100	(-15°C ~ +90°C)						
Lubrication		1,2	3~100	(Synthetic Grease)						
Protection Class		1,2	3~100	IP65						
Mounting Position		1,2	3~100	(Any Direction)						
Noise Level (n1=3000rpm, No load)	dB(A)	1,2	3~100	≤56	≤58	≤60	≤63	≤65	≤67	≤70

Reducer Rotary Inertia

Specs	Unit	Stage	Ratio	VRB042	VRB060	VRB090	VRB115	VRB142	VRB180	VRB220
Rotary Inertia	kg.cm ²	1	3	0.03	0.16	0.61	3.25	9.21	28.98	69.61
			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	12~40	0.03	0.03	0.13	0.47	2.71	7.42	23.29
			50~100	0.03	0.03	0.13	0.44	2.57	7.03	22.51

1. Ratio (i=N_{in}/N_{out}) 2. When output speed is 100rpm, acting on the output shaft center position

3. The Max. acceleration torque T_{2B}=60% of T_{2NOT}, continuous operation, service life is 10000hrs

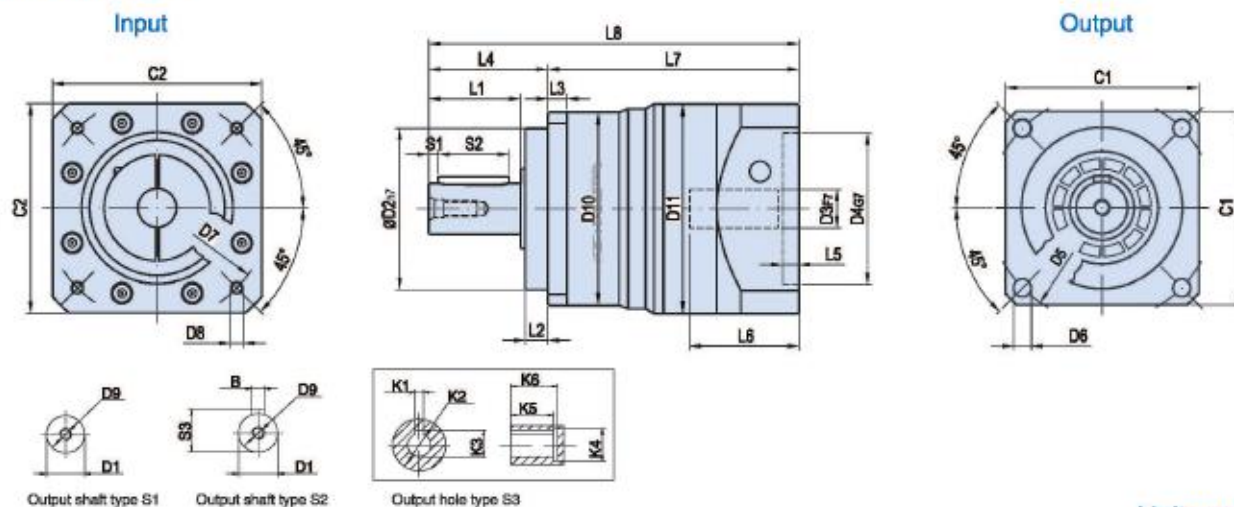
MODEL: VRB

1-Stage

Ratio: 3, 4, 5, 6, 7, 8, 9, 10



Dimensions:



Unit:mm

Size	VRB042-L1	VRB060-L1	VRB090-L1	VRB115-L1	VRB142-L1	VRB180-L1	VRB220-L1
D1	φ 13	φ 16	φ 22	φ 32	φ 40	φ 55	φ 75
D2	φ 35	φ 50	φ 80	φ 110	φ 130	φ 160	φ 180
D3	φ 8 (φ 6.35-11)	φ 14 (φ 11-19)	φ 19 (φ 16-24)	φ 22 (φ 19-35)	φ 24 (φ 22-35)	φ 35 (φ 35-42)	φ 42 (φ 35-55)
D4	φ 30 (φ 30-50)	φ 50 (φ 50-70)	φ 70 (φ 70-110)	φ 110 (φ 114.3)	φ 110 (φ 114.3)	φ 114.3 (φ 114.3-200)	φ 180 (φ 114.3-200)
D5	φ 50	φ 70	φ 100	φ 130	φ 165	φ 215	φ 250
D6	4- φ 3.4	4- φ 5.5	4- φ 7	4- φ 9	4- φ 11	4- φ 13	4- φ 17
D7	φ 46 (φ 45-70)	φ 70 (φ 70-90)	φ 90 (φ 90-145)	φ 145 (φ 145-200)	φ 145 (φ 145-200)	φ 200 (φ 200-235)	φ 215 (φ 200-235)
D8	4-M4(M3-M5)	4-M5 (M4-M6)	4-M6 (M5-M8)	4-M8 (M8-M12)	4-M8 (M8-M12)	4-M12	4-M12
D9	M4X0.7P	M5X0.8P	M8X1.25P	M12X1.75P	M16X2P	M20X2.5P	M20X2.5P
D10	φ 42	φ 60	φ 87	φ 114.5	φ 142	φ 180	φ 218
D11	φ 46	φ 65	φ 90	φ 118	φ 150	φ 184	φ 225.5
L1	19.5	28.5	36.5	51	79	82	105
L2	5.5	7	10	12	15	20	30
L3	4	6	8	10	12	15	20
L4	26	37	48	65	97	105	138
L5	5	5	7 (7-8)	6 (6-11)	8 (8-11)	7 (7-10)	8 (8-15)
L6	27.5 (≤32)	34 (≤44)	44 (≤60)	64.5 (≤81.5)	72.5 (≤82)	85 (≤120)	109 (≤119)
L7	65.5 (65.5-70)	78 (78-88)	98 (98-114)	135 (135-153)	154.5 (154.5-164)	179 (179-214)	220 (220-230)
L8	91.5 (91.5-96)	115 (115-125)	146 (146-162)	201 (201-218)	251.5 (251.5-261)	284 (284-319)	358 (358-368)
C1	42	60	90	115	142	180	220
C2	46(46-60)	65(65-80)	90 (90-130)	130 (130-180)	130 (130-180)	180 (180-220)	200 (200-220)
S1	3	3	4	5	5	6	7
S2	14	22	28	40	65	70	90
S3	15	18	24.5	35	43	59	79.5
B	5	5	6	10	12	16	20
K1	-	4	6	8	10	14	18
K2	-	φ 11	φ 22	φ 28	φ 38	φ 50	φ 60
K3	-	12.8	24.5	31.3	41.3	53.8	64.4
K4	-	φ 16	φ 32	φ 38	φ 48	φ 60	φ 72
K5	-	15	20	27	35	43	60
K6	-	18	24	32	40	50	65

Note 1: Inside of () is the optional range of sizes, outside of () is the standard sizes.

Note 2: The reducer output shaft size and length can be customized for customers.

Note 3: The input size can be changed according to the servomotor or stepper motor of each brand.

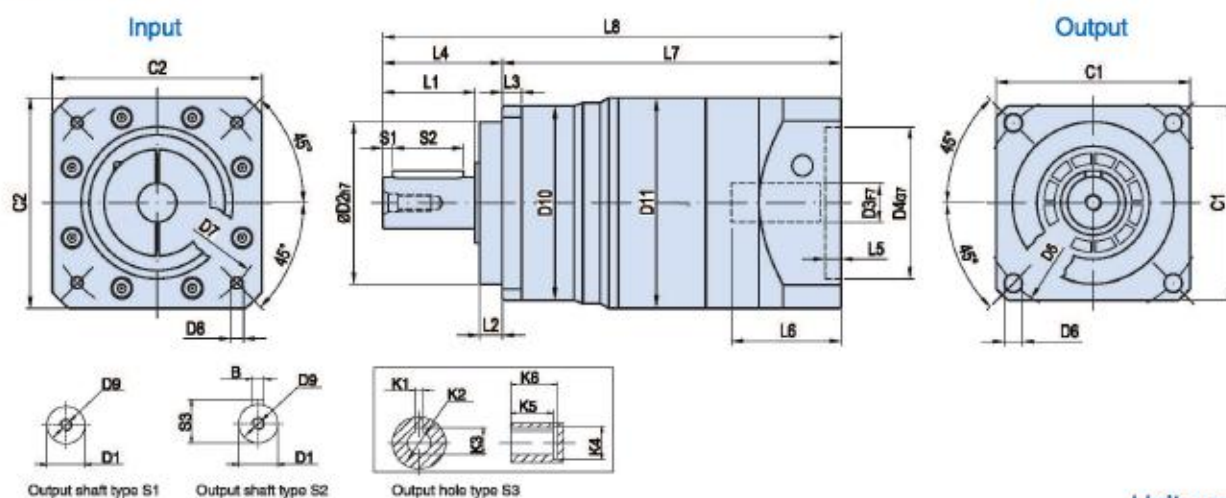
MODEL: VRB

2-Stage

Ratio: 15, 20, 25, 30, 35, 40, 45, 50, 60
70, 80, 90, 100



Dimensions:



Unit:mm

Size	VRB042-L2	VRB060-L2	VRB090-L2	VRB115-L2	VRB142-L2	VRB180-L2	VRB220-L2
D1	φ13	φ16	φ22	φ32	φ40	φ55	φ75
D2	φ35	φ50	φ80	φ110	φ130	φ160	φ180
D3	φ8 (φ6.35-8)	φ14 (φ11-14)	φ19 (φ11-19)	φ22 (φ16-24)	φ24 (φ19-35)	φ35 (φ22-35)	φ42 (φ35-42)
D4	φ30 (φ30-38.1)	φ50	φ70 (φ50-φ80)	φ110 (φ70-110)	φ110 (φ114.3)	φ114.3 (φ110-114.3)	φ180 (φ114.3-200)
D5	φ50	φ70	φ100	φ130	φ165	φ215	φ250
D6	4-φ3.4	4-φ5.5	4-φ7	4-φ9	4-φ11	4-φ13	4-φ17
D7	φ46 (φ45-66.67)	φ70	φ90 (φ70-100)	φ145 (φ90-145)	φ145 (φ145-200)	φ200 (φ145-200)	φ215 (φ200-235)
D8	4 M10(M3)	4 M6 (M4)	4 M6 (M4-M6)	4 M8 (M6-M8)	4-M8 (M8-M12)	4-M12 (M8-M12)	4-M12
D9	M4X0.7P	M5X0.8P	M8X1.25P	M12X1.75P	M16X2P	M20X2.5P	M20X2.5P
D10	φ42	φ60	φ87	φ114.5	φ142	φ180	φ218
D11	φ46	φ65	φ90	φ118	φ150	φ184	φ225.5
L1	19.5	28.5	36.5	51	79	82	105
L2	5.5	7	10	12	15	20	30
L3	4	6	8	10	12	15	20
L4	26	37	48	65	97	105	138
L5	5	5	5	8 (7-8)	11 (8-11)	8 (8-11)	8 (7-10)
L6	27.5	34	34 (≤44)	44 (≤60)	64.5 (≤81.5)	72.5 (≤82)	85 (≤120)
L7	86	105	124.5 (114.5-124.5)	165.5 (149.5-165.5)	206 (189-206)	235 (225.5-235)	269 (264-299)
L8	112	142	172.5 (162.5-172.5)	230.5 (214.5-230.5)	303 (286-303)	340 (330.5-340)	407 (402-437)
C1	42	60	90	115	142	180	220
C2	46 (46-57)	65	65 (65-86)	90 (90-130)	130 (130-180)	150 (150-180)	200 (180-220)
S1	3	3	4	5	5	6	7
S2	14	22	26	40	65	70	90
S3	15	18	24.5	35	43	59	79.5
B	5	5	5	10	12	16	20
K1	-	4	6	8	10	14	18
K2	-	φ11	φ22	φ28	φ38	φ50	φ60
K3	-	12.8	24.5	31.3	41.3	53.8	64.4
K4	-	φ16	φ32	φ38	φ48	φ60	φ72
K5	-	15	20	27	35	43	60
K6	-	18	24	32	40	50	65

Note 1: Inside of () is the optional range of sizes, outside of () is the standard sizes.

Note 2: The reducer output shaft size and length can be customized for customers.

Note 3: The input size can be changed according to the servomotor or stepper motor of each brand.

PLF

Standard Type Planetary Gearbox

PLF series



PFR

Standard Type Right Angle Planetary Gearbox

PFR series



PLE

Standard Type Planetary Gearbox

PLE series



PER

Standard Type Right Angle Planetary Gearbox

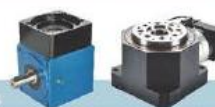
PER series



ZR/RM

Precision Right Angle Gearbox

ZR/RT series



ZK/DG

Precision Hollow Rotary Actuator

ZK/DG series



DK

DK Series Heavy duty rotating platform

DK series

