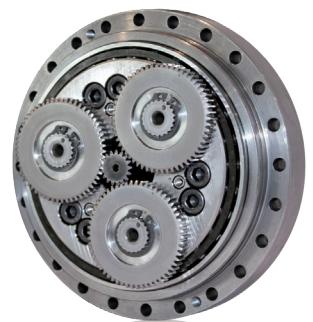




Motion Control





Keeping pace with a high-speed future

Lifestyle in general has always been changing because of the fast development of information technologies. Internet, social media, online shopping, video on demand, smart phones, and a high level of connectivity speed up our lives. Products need to be available everywhere and at any time. This has a strong influence on the development of high-speed logistic systems and infrastructure such as factories, storage, ports and terminals, railroads etc. In the industrial sector, the development of Industry 4.0 has greatly changed machine and plant engineering in recent years.

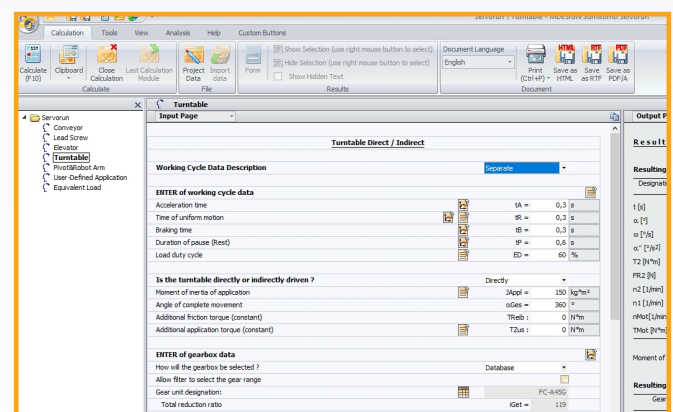
The industrial world is increasingly entering an era of automation and labour savings. Companies that want to remain competitive need to optimize their operational and manufacturing processes. Robots, machine tools, and automated factories must be flexible, fast, and individual. This trend to automate all processes even affects the development of modern health equipment. Speed and precision is key. Most industrial processes need high performance precision drives with low and zero backlash.

Sumitomo Drive Technologies understands these growing challenges and offers a comprehensive range of products for high performance tasks. We support our customers with the creation of tailor-made differentiating solutions.

Servorun sizing software

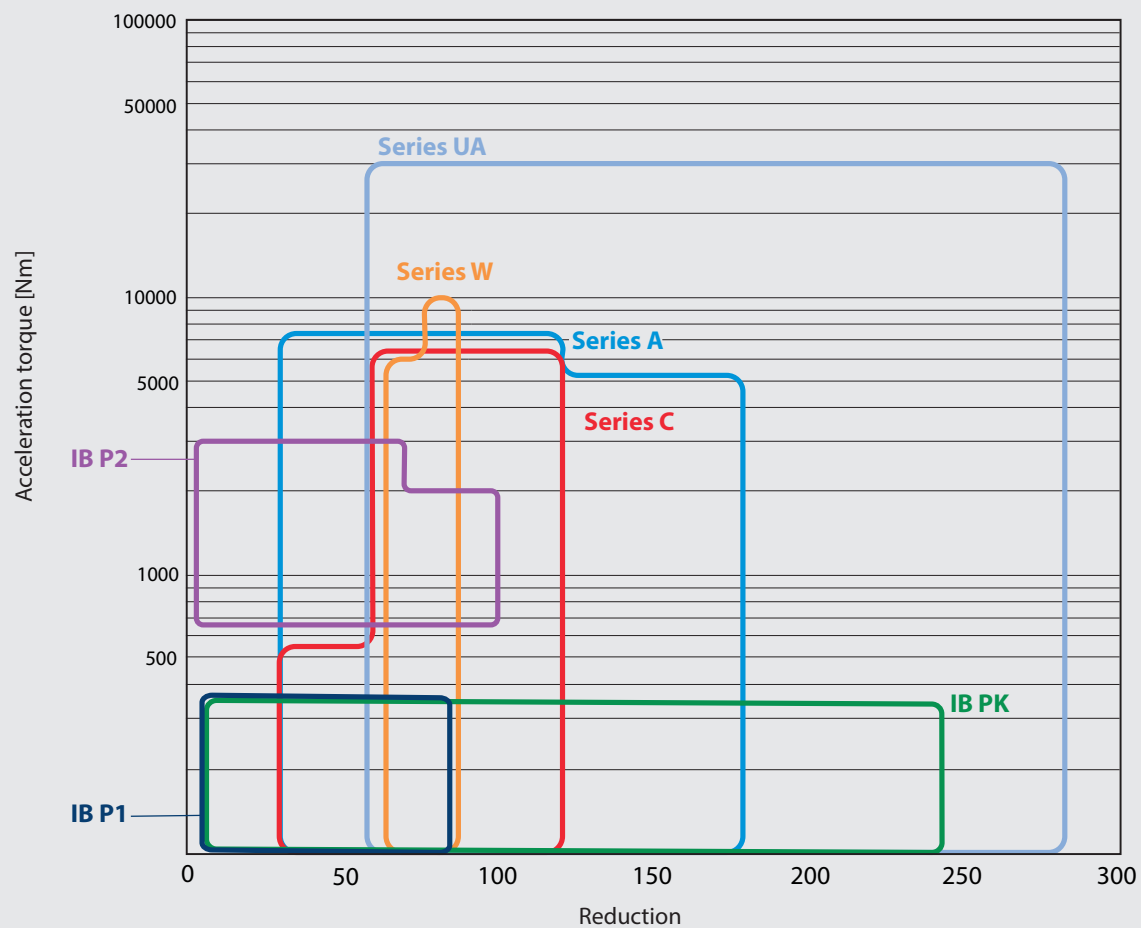
As part of our support in the design phase of new applications, we provide a detailed calculation of the gearbox.

Starting from the basic details of the application, our sizing software 'Servorun' verifies the gearbox selection as well as motor suitability for the application. In fact, in addition to gearbox specifications our Servorun database also includes a wide range of the most commonly used motors.



Selection chart

To preselect the right series for your application, please define needed ratio and acceleration torque.



Zero Backlash Precision Gearboxes

The Sumitomo Fine Cyclo® product series are high precision cycloidal gearboxes. These single and double stage gearboxes are highly compact in design, provide long product life, and can be optimally integrated into the customer's application. The Fine Cyclo® product series have high torsional stiffness. This combined with their low moments of inertia create ideal solutions for highly dynamic tasks.

A Series – High Precision Point to Point Movement

- FC – Highly customizable and cost efficient. This gearbox is comprised of the principal reduction components without bearing support. This allows for the best product integration into customer designs with bearing support.
- F1C – Integrated bearing support. Fully sealed. Very high acceleration torque and bearing capacity for larger sizes.
- F2C – Jack of all Trades. Fully sealed. Extremely compact design with fully integrated output bearing.

The A Series is a single stage gearbox most commonly used in the machine tool, medical, food, and packaging industries.

C Series – Large Hollow Shaft with High Precision Point to Point Movement

The C Series is a fully sealed, single stage gearbox, and used when a large hollow center shaft is required. Ideal for allowing cables to pass through the center of the gearbox for high level integration. Typically found in machine tools, medical applications, and robotics.

UA Series – Highly Efficient Traverse Movement

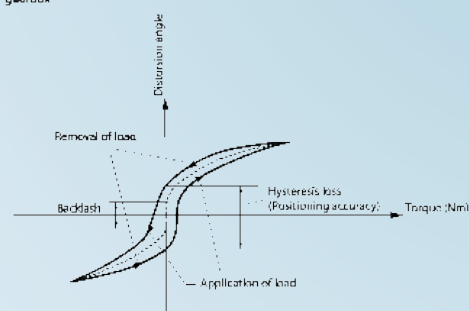
The UA Series is a double stage gearbox with a planetary gear mechanism first stage and cycloidal disc second stage. This series is ideal for efficient movement and very high stiffness. The UA series is typically found in welding robotics, pallet changer drives, and antenna drives.

Zero Backlash vs. Lost Motion

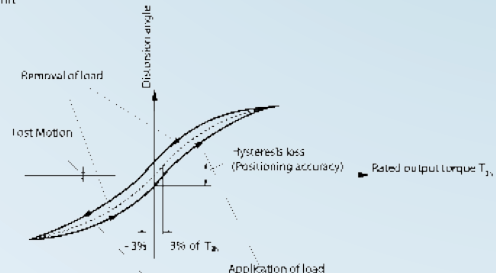
Mechanical Backlash is the “play” in a mechanism caused by gaps between parts. Lost motion is an umbrella term that covers any difference between the input motion and the output motion. Sumitomo Fine Cyclo® Gearboxes are all Zero Backlash. This makes Sumitomo Fine Cyclo® Gearboxes the most accurate in the industry. There is no mechanical play between internal parts.

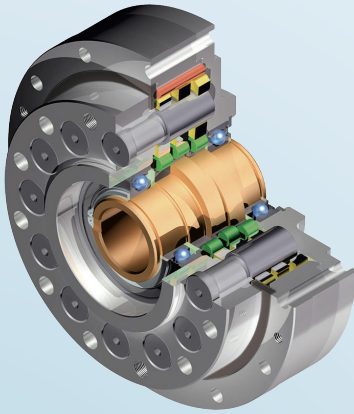
The Hysteresis curve to the right shows the lost motion and distortion angle of a zero backlash gearbox. Lost motion is the low stiffness present in the lower torque range of the curve.

Typical Hysteresis curve for a conventional gearbox



Typical Hysteresis curve for a FINE CYCLO unit





FINE CYCLO® SERIES FC TYPE A

FC-A

Features & Benefits

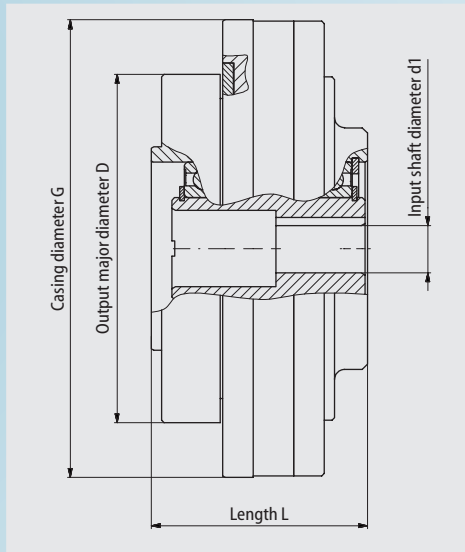
Cost effective high precision reduction kit

For use in combination with customers own output bearing.

Relevant characteristics

- Zero mechanical backlash / 1 arcmin Lost Motion
- 6 sizes
- Reduction ratios 1:29, 1:59, 1:89, 1:119, 1:179 (availability depending on size)
- Acceleration torque up to 7610 Nm
- Input speed up to 6150 rpm
- Torsional stiffness up to 1100 Nm/arcmin
- Maintenance free for life
- Motor connection with keyway or clamping system / coupling on request
- Motor adapter on request

Main dimensions and mass



Size	Length L [mm]	Diameter G [mm]	Diameter D [mm]	Diameter d1 (1) [mm]	Mass [kg]
A15	57	115	87	11	2.7
A25	73	145	112	14	5.2
A35	85	180	137	19	9.6
A45	97.5	220	172	24	18
A65	117	270	212	28	30
A75	131	310	237	28	46

(1) Please contact us for alternative diameters.

Torque & Speed main data

Size	Nominal output torque (1) [Nm]		Accel. / decel torque [Nm]	Mean input speed (2) [rpm]	Max input speed [rpm]
A15	(i 59, 89)	149	335	5600	6150
A25	(i 29)	283	721	3100	4350
	(i 59...119)	349		4200	5050
A35	(i 29)	499	1390	2500	3500
	(i 59...119)	668		3300	3950
A45	(i 29)	1060	2910	1900	2700
	(i 59...179)	1390		2600	3150
A65	(i 29)	1870	5130	1500	2200
	(i 59...179)	2570		2000	2350
A75	(i 29)	3580	7610	1200	1950
	(i 59...119)	3900		1750	2000

(1) at input speed n1=1500 rpm; for A75 (i 29) at input speed n1=1000 rpm

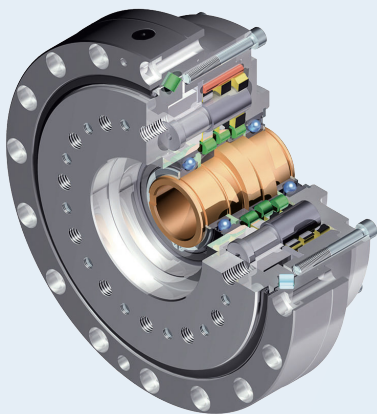
(2) at 50% ED

Output bearing capacity

Gearbox without output side bearing

Available ratios

Size	Ratios
A15	59 / 89
A25	29 / 59 / 89 / 119
A35	29 / 59 / 89 / 119
A45	29 / 59 / 89 / 119 / 179
A65	29 / 59 / 89 / 119 / 179
A75	29 / 59 / 89 / 119



FINE CYCLO® SERIES F1 A

F1C-A

Features & Benefits

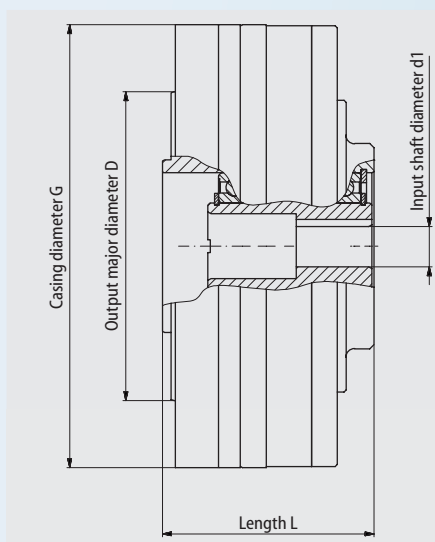
Unit with high capacity cross roller bearing on output shaft

Combination of zero backlash gearbox and precision cross roller bearing.
 Sizes 45, 65 and 75 provide extremely high support capacity at output shaft.

Relevant characteristics

- Zero mechanical backlash / 1 arcmin Lost Motion
- 3 sizes
- Reduction ratios 1:29, 1:59, 1:89, 1:119, 1:179 (availability depending on size)
- Acceleration torque up to 7610 Nm
- Input speed up to 6150 rpm
- Torsional stiffness up to 1100 Nm/arcmin
- Maintenance free for life (cross roller bearing regreasing requested on sizes 45, 65 and 75)
- Motor connection with keyway or clamping system / coupling on request
- Motor adapter on request

Main dimensions and mass



Size	Length L [mm]	Diameter G [mm]	Diameter D [mm]	Diameter d1 (1) [mm]	Mass [kg]
A45	112.5	265	198	24	30
A65	150	350	269	28	64
A75	164	430	313	28	107

(1) Please contact us for alternative diameters.

Torque & Speed main data

Size	Nominal output torque (1) [Nm]	Accel. / decel torque [Nm]	Mean input speed (2) [rpm]	Max input speed [rpm]
A45	(i 29) 1060	2910	1900	2700
	(i 59...179) 1390		2600	3150
A65	(i 29) 1870	5130	1500	2200
	(i 59...179) 2570		2000	2350
A75	(i 29) 3580	7610	1200	1950
	(i 59...119) 3900		1750	2000

(1) at input speed n1=1500 rpm; for A75 (i 29) at input speed n1=1000 rpm

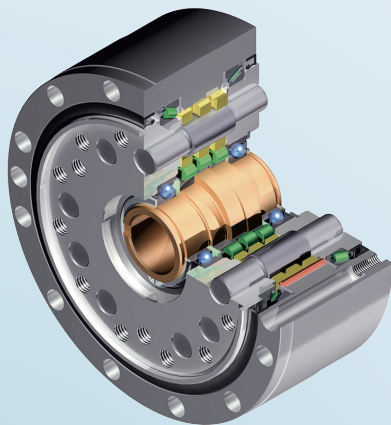
(2) at 50% ED

Output bearing capacity

Size	Max permissible bending moment [Nm]
A45	3350
A65	6700
A75	14400

Available ratios

Size	Ratios
A45	29 / 59 / 89 / 119 / 179
A65	29 / 59 / 89 / 119 / 179
A75	29 / 59 / 89 / 119



FINE CYCLO® SERIES F2 A

F2C-A

Features & Benefits

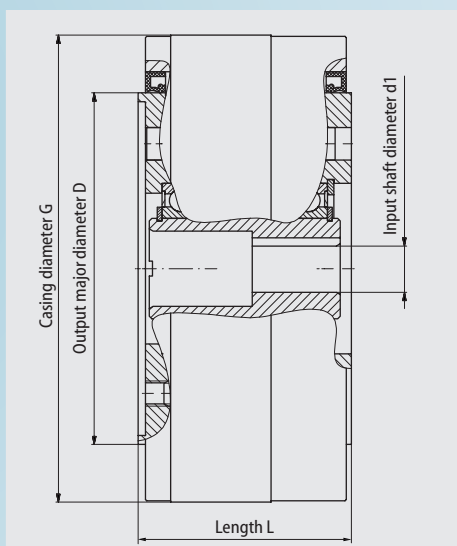
Extremely compact and fully sealed high precision gearbox

Taper roller bearings for output shaft directly integrated in the gearbox housing.
Maximum compactness and power density.

Relevant characteristics

- Zero mechanical backlash / 1 arcmin Lost Motion
- 4 sizes
- Reduction ratios 1:29, 1:59, 1:89, 1:119, 1:179 (availability depending on size)
- Acceleration torque up to 2910 Nm
- Input speed up to 6150 rpm
- Torsional stiffness up to 445 Nm/arcmin
- Maintenance free for life
- Motor connection with keyway or clamping system / coupling on request
- Motor adapter on request

Main dimensions and mass



Size	Length L [mm]	Diameter G [mm]	Diameter D [mm]	Diameter d1 (1) [mm]	Mass [kg]
A15	65.5	126	90	14	5
A25	70	156	114	14	7.3
A35	85	186	140	19	13
A45	101	231	174	24	24

(1) Please contact us for alternative diameters.

Torque & Speed main data

Size	Nominal output torque (1) [Nm]		Accel. / decel. torque [Nm]	Mean input speed (2) [rpm]	Max input speed [rpm]
A15	(i 59, 89)	149	335	5600	6150
A25	(i 29)	283	721	3100	4350
	(i 59...119)	349		4200	5050
A35	(i 29)	499	1390	2500	3500
	(i 59...119)	668		3300	3950
A45	(i 29)	1060	2910	1900	2700
	(i 59...179)	1390		2600	3150

(1) at input speed $n_1=1500$ rpm

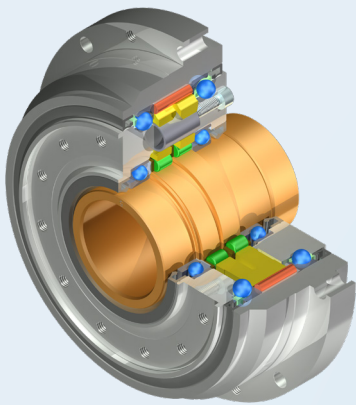
(2) at 50% ED

Output bearing capacity

Size	Max permissible bending moment [Nm]	Max permissible axial load push / pull [N]
A15	608	3920 / 2450
A25	1030	5400 / 3920
A35	1620	7850 / 5400
A45	2550	11800 / 6870

Available ratios

Size	Ratios
A15	59 / 89
A25	29 / 59 / 89 / 119
A35	29 / 59 / 89 / 119
A45	29 / 59 / 89 / 119 / 179



FINE CYCLO® SERIES C

C-Series

Features & Benefits

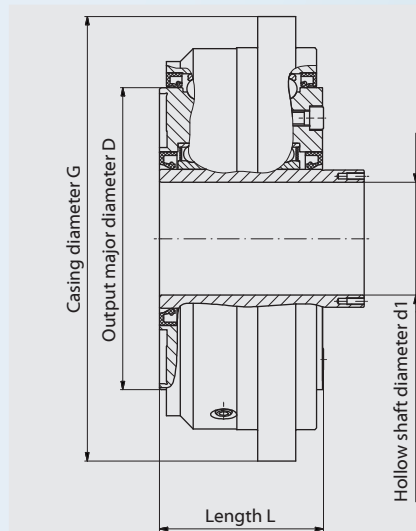
High precision gearbox with large hollow bore

Angular contact ball bearings or taper roller bearings directly integrated in the gearbox housing.

Relevant characteristics

- Zero mechanical backlash / 1 arcmin Lost Motion
- 6 sizes
- Reduction ratios 1:29; 1:59; 1:89; 1:119
- Acceleration torque up to 6278 Nm
- Input speed up to 4000 rpm
- Torsional stiffness up to 1030 Nm/arcmin
- Maintenance free for life
- Motor connection with belt transmission or spur gear

Main dimensions and mass



Size	Length L [mm]	Diameter G [mm]	Diameter D [mm]	Diameter d1 [mm]	Mass [kg]
C15	67.5	160	114	40	6
C25	80.5	186	140	49	12.5
C35	94.5	256	174	65	21
C45	109	292	200	79	32
C55	121	325	230	92	45
C65	131	362	260	99	62

Torque & Speed main data

Size	Nominal output torque (1) [Nm]	Accel. / decel. torque [Nm]	Mean input speed (2) [rpm]	Max input speed [rpm]
C15	225	540	3200	4000
C25	432	1030	2900	3500
C35	822	1962	2100	2500
C45	1336	3188	1800	2100
C55	2055	4316	1500	1800
C65	3713	6278	1400	1700

(1) at input speed $n_1=1500$ rpm; for C65 at input speed $n_1=1000$ rpm

(2) at 50% ED

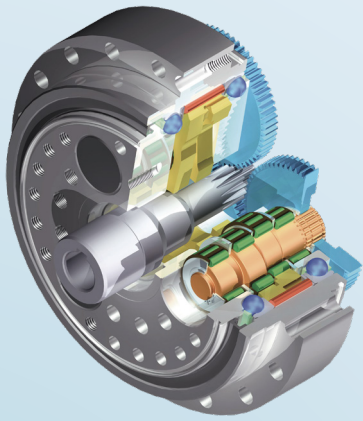
Output bearing capacity

Size	Max permissible bending moment [Nm]	Max permissible axial load [N]
C15	1069	3924
C25	1850	7848
C35	2850	10791
C45	3924	8339
C55	6082	10791
C65	8829	13734

Available ratios

Size	Ratios
C15	29 / 59 / 89 / 119
C25	59 / 89 / 119
C35	59 / 89 / 119
C45	59 / 89 / 119
C55	59 / 89 / 119
C65	59 / 89 / 119

Above technical specifications are intended for rough preselection only.



FINE CYCLO® SERIES UA

UA-Series

Features & Benefits

Double stage high precision gearbox with advanced bearing design and higher torque
 Angular contact ball bearings or taper roller bearings for output shaft directly integrated in the gearbox housing.

Planetary prestage and three to four (UA115) eccentrics providing highest transmission accuracy, minimum speed ripples and minimum vibration.

Relevant characteristics

- Zero mechanical backlash / 0.5 arcmin Lost Motion
- 8 sizes
- Reduction ratios 1:30 to 1:283 (availability depending on size)
- Acceleration torque up to 30000 Nm
- Output speed up to 50 rpm
- Torsional stiffness up to 6000 Nm/arcmin
- Comes with motor adapter and connection by kewway or clamping system.

Main dimensions and mass

	Size	Length L (1) [mm]	Diameter G [mm]	Diameter D [mm]	Diameter d1 max [mm]	Mass (1) [kg]
	UA15	104	133	90	28	8.5
	UA25	109	165	110	28	13
	UA35	140	189	130	38	20
	UA45	138	224	155	38	30
	UA55	158.5	244	174	42	43
	UA65	170	295	210	42	55
	UA80	194	325	238	42	90
	UA115	272	570	400	on request	260

(1) dependent upon the input design

Torque & Speed main data

Size	Nominal output torque (1) [Nm]	Max Accel. / decel. torque [Nm]	Max output speed [rpm]
UA15	250	625	60
UA25	500	1250	50
UA35	900	2250	40
UA45	1320	3300	30
UA55	2000	5000	30
UA65	3430	8575	30
UA80	5000	12500	25
UA115	12000	30000	20

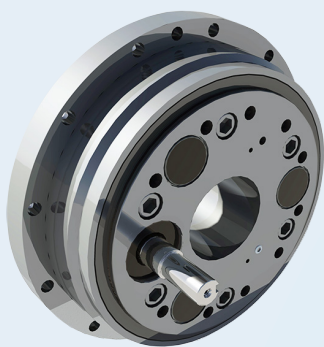
(1) at output speed n2=15 rpm

Output bearing capacity

Size	Max permissible bending moment [Nm]	Max permissible axial load [N]
UA15	883	3924
UA25	1666	5194
UA35	2156	7840
UA45	3430	8820
UA55	4000	10780
UA65	7056	11000
UA80	10000	13734
UA115	44000	29000

Available ratios

Size	Ratios
UA15	60 / 78 / 116 / 139 / 154 / 171
UA25	78 / 88 / 115 / 124 / 145 / 173
UA35	82 / 87 / 121 / 152 / 166
UA45	62 / 82 / 99 / 121 / 130 / 152 / 166
UA55	81 / 97 / 126 / 145 / 169 / 241
UA65	89 / 121 / 136 / 144 / 163 / 171 / 199 / 249
UA80	93 / 103 / 122 / 155 / 166 / 190 / 239 / 283
UA115	dependent on prestage



FINE CYCLO® SERIES W

W-Series

Features & Benefits

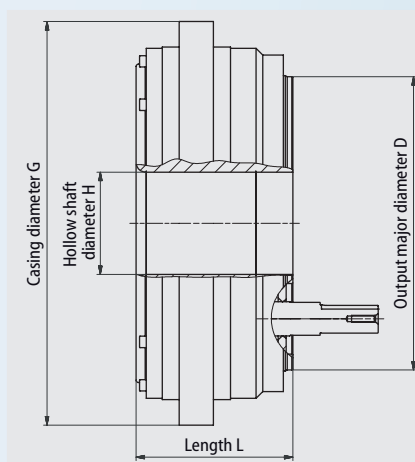
Multi stage high precision gearbox with extremely large hollow shaft

Angular contact ball bearings or taper roller bearings for output shaft directly integrated in the gearbox housing.

Relevant characteristics

- Zero mechanical backlash / 1 arcmin Lost Motion
- 2 sizes
- Reduction ratios 1:64 (size W55) and 1:87 (size W70)
- Acceleration torque up to 10000 Nm
- Output speed up to 30 rpm
- Torsional stiffness up to 1960 Nm/arcmin
- Motor connection with coupling on request
- Motor adapter on request

Main dimensions and mass



Size	Length L [mm]	Diameter G [mm]	Diameter D [mm]	Diameter H [mm]	Mass [kg]
W55	129.5	355	258	90	68
W70	175.5	470	390	138	95

Design of input stage on customer request

Torque & Speed main data

Size	Nominal output torque (1) [Nm]	Max Accel. / decel. torque [Nm]	Max output speed [rpm]
W55	2453	6130	30
W70	4000	10000	25

(1) at output speed $n_2=15$ rpm

Output bearing capacity

Size	Max permissible bending moment [Nm]	Max permissible axial load [N]
W55	9565	13734
W70	22000	29400

Available ratios

Size	Ratios
W55	64
W70	87.3

Additional ratios depending on prestage

Above technical specifications are intended for rough preselection only.

IB Series Low Backlash Planetary Gearboxes

Sumitomo Low Backlash Planetary Gearboxes are precision gearboxes with backlash between 3 and 15 arcmin. These incredibly compact and quiet gearboxes have a large torque range and can allow maximum input speeds up to 6000 RPM. Quick installation, IB series are ready for immediate attachment to servo motors for continuous running.

IB P1 Series – Lower Torque Range

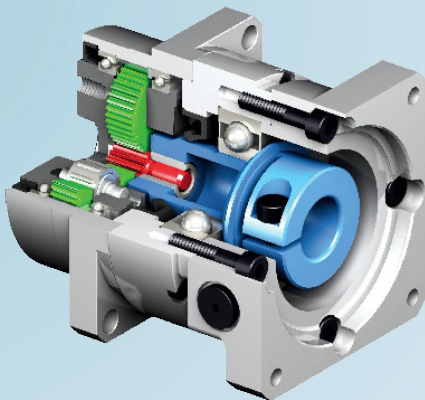
The IB P1 Series come as a 3 or 15 arcmin backlash options. The IB P1 works best for peripheral robotic equipment, machine tools, and general automation.

IB P2 Series – Higher Torque Range

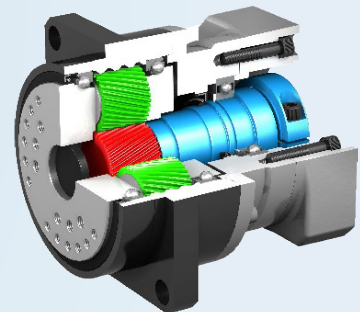
The IB P2 Series gearbox is a larger planetary gearbox meant for higher torque applications. The IB P2 series is available as a 3 arcmin backlash gearbox with torque ranges up to 3000 N·m and a max input speed of 6000 RPM. This gearbox is ideal for machine tools, press machines, bending machines, and packaging machines.

IB PK1 Series – Right Angle Lower Torque Range

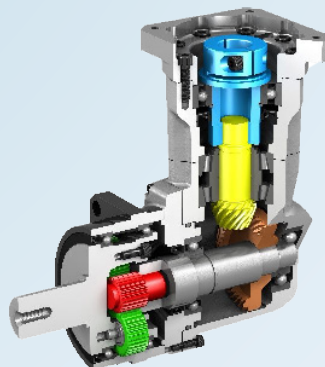
The IB PK1 Series is a compact gearbox with an input shaft perpendicular to the output shaft. It is modeled after the P1 Series, and is best utilized when space is critical.



IB P1 Series – Lower Torque Range



IB P2 Series – Higher Torque Range



IB PK1 Series – Right Angle Lower Torque Range

IB P1 TYPE

Features & Benefits

The smallest gearbox for precise applications

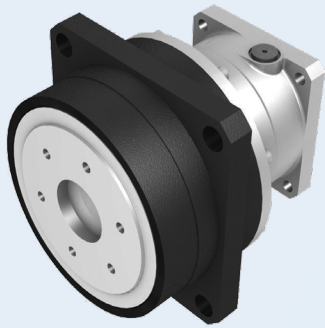
High torque density unit with angular ball bearings for high load capacity.

Adaptable servo motor connection.

Relevant characteristics

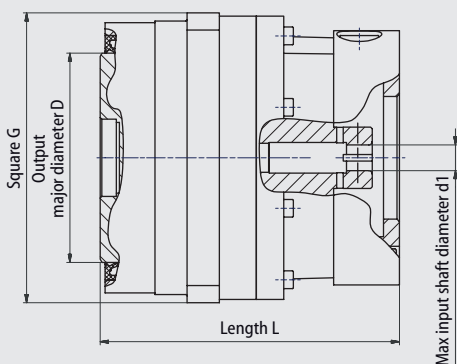
- Mechanical backlash 3 arcmin or 15 arcmin
- 3 sizes
- Simple motor assembly with clamp ring
- Reduction ratios from 3.7 up to 81
- Acceleration torque from 35 Nm up to 380 Nm
- Input speed up to 6000 rpm
- Axial / radial load up to 4500 N / 9400 N
- Maintenance free for life

Servo planetary gear IB P1 Type



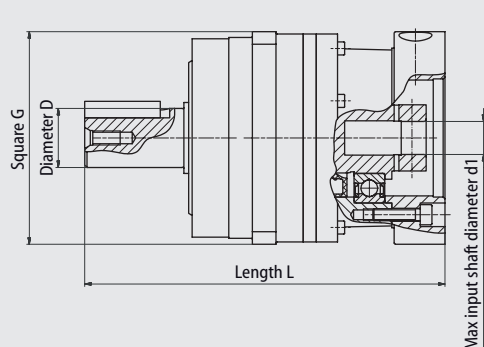
Main dimensions and mass

ANFX F TYPE



Size	Max length L (1) (2) [mm]	Square G [mm]	Output major diameter D [mm]	Max input shaft diameter d1 [mm]	Mass max value (2) [kg]
P110	82 / 124.5	□ 60	42	16	1.26 / 1.36
P120	145.5 / 165	□ 90	65	24	3 / 3.5
P130	179.5 / 150	□ 120	90	35	6.6 / 7.5

ANFX N/W TYPE



Size	Max length L (1) (2) [mm]	Square G [mm]	Diameter D [mm]	Max input shaft diameter d1 [mm]	Mass max value (2) [kg]
P110	107.5 / 125.5	□ 60	16	16	1.3 / 1.4
P120	189.5 / 203	□ 90	25	24	3.3 / 3.7
P130	220 / 236	□ 120	40	35	6.8 / 7.9

- (1) depending on motor flange
(2) single stage / double stage

Torque & Speed main data

Size	Max nominal output torque (1) [Nm]	Max accel. / decel. torque [Nm]	Max output speed [rpm]
P110	22.5	45	6000
P120	69	190	6000
P130	153	380	5000

- (1) depending on reduction ratio
Please contact us for detailed data

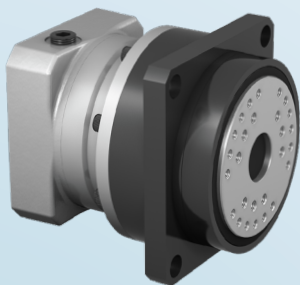
Output bearing capacity

Size	Max bending moment [Nm]	Max radial load / axial load (2) [N]
P110	70	2160 / 1050
P120	300	4800 / 2900
P130	620	9400 / 4500

- (2) at input speed $n_1 = 1000$ rpm

Available ratios

Size	Ratios
P110	3.7 / 5 / 9 / 11 / 15 / 21 / 33 / 45 / 81
P120	
P130	



Servo planetary gear IB P2 Type

IB P2 TYPE

Features & Benefits

The precise drive for high torque demands

Compact gearbox with angular ball bearings for high load capacity.
Helical gear concept for the best torque transmission and lowest vibration and noise.

Relevant characteristics

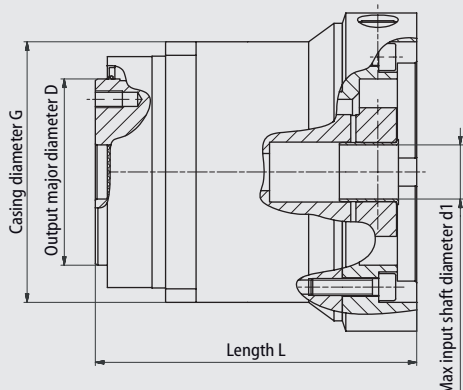
- Mechanical backlash 3 arcmin
- 2 sizes
- Simple motor assembly with clamp ring
- Reduction ratios from 4 up to 100
- Acceleration torque from 900 Nm up to 3000 Nm
- Input speed up to 6000 rpm
- Axial / radial load up to 8100 N / 18385 N
- Maintenance free for life

Main dimensions and mass

ANFX F TYPE					
Size	Max length L (1) (2) [mm]	Square G [mm]	Output major diameter D	Max input shaft diameter d1 (2) [mm]	Mass approx. value (2) [kg]
P240	237 / 238	□ 154	110	55	20 / 21
P250	258 / 337	□ 212	155	55	36 / 49

(1) depending on motor flange
(2) single stage / double stage

Alternative version available with cylindrical output shaft.



Torque & Speed main data

Size	Max nominal output torque (1) (2) [Nm]	Max accel. / decel. torque [Nm]	Max input speed [rpm]
P240	500	900	6000
P250	1500	3000	5000

- (1) depending on reduction ratio
Please contact us for detailed datas
(2) at input speed $n_1 = 1500$ rpm

Output bearing capacity

Size	Max bending moment [Nm]	Max radial / axial load [N]
P240	1177	10245 / 5200
P250	2000	18385 / 8100

Above technical specifications are intended

Available ratios

Size	Ratios
P240	4 / 5 / 7 / 10 /
P250	16 / 20 / 25 / 28 / 35 / 40 / 50 / 70 / 100

Above technical specifications are intended for rough preselection only.



Servo planetary gear IB PK Type

IB PK TYPE

Features & Benefits

Right angle version of the smallest gearbox for precise application

Angular contact output ball bearings for high load capacity.

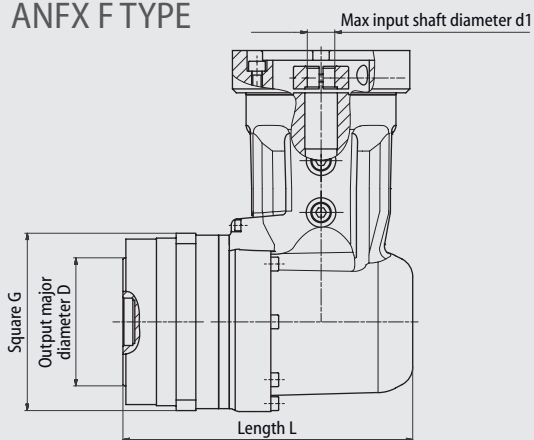
Extensive range of servomotor connections available.

Relevant characteristics

- Mechanical backlash 6 arcmin or 15 arcmin
- 3 sizes with double or triple reduction system
- Simple motor assembly with clamp ring
- Reduction ratios from 6 up to 243
- Acceleration torque from 35 Nm up to 380 Nm
- Input speed up to 6000 rpm
- Axial / radial load up to 9400 N / 4500 N
- Maintenance free for life

Main dimensions and mass

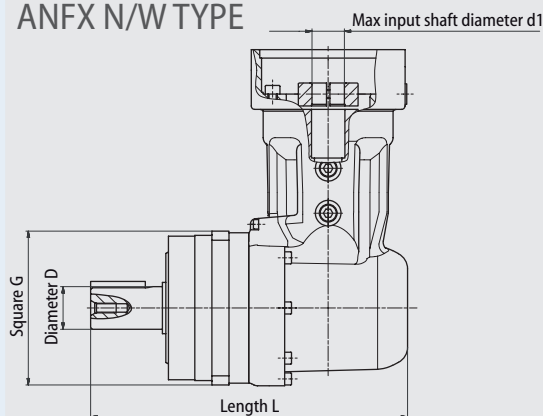
ANFX F TYPE



Size	Max length L (1) (2) [mm]	Square G [mm]	Output major diameter D [mm]	Max input shaft diameter d1 (2) [mm]	Mass (2) [kg]
PK110	100 / 111	□ 60	42	16	2 / 2.2
PK120	141.5 / 147	□ 90	65	24	5.8 / 6
PK130	176.5 / 183.5	□ 120	90	35	12.2 / 12.3

- 1) depending on motor flange
2) single stage / double stage

ANFX N/W TYPE



Size	Max length L (1) (2) [mm]	Square G [mm]	Diameter D [mm]	Max input shaft diameter d1 (2) [mm]	Max mass (2) [kg]
PK110	130 / 141	□ 60	16	16	2.2 / 2.2
PK120	185.5 / 191	□ 90	25	24	5.8 / 6.2
PK130	262.5 / 269.5	□ 120	40	35	12.3 / 13.1

- 1) depending on motor flange
2) single stage / double stage

Torque & Speed main data

Size	Max nominal output torque (1) (2) [Nm]	Max accel. / decel. torque (1) [Nm]	Max input speed [rpm]
PK110	22.5	45	6000
PK120	69	190	6000
PK130	153	380	5000

- (1) depending on reduction ratio
Please contact us for detailed datas
(2) at input speed n1= 1000 rpm

Output bearing capacity

Size	Max bending moment [Nm]	Max radial / axial load [N]
PK110	70	1050 / 3140
PK120	300	2900 / 4800
PK130	620	4500 / 9400

Available ratios

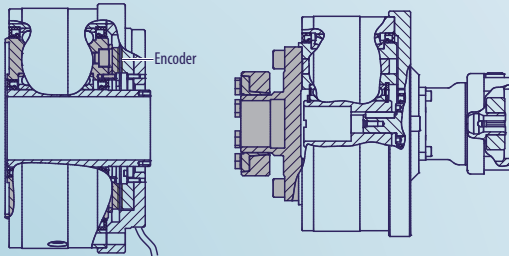
Size	Ratios
PK110	5.55 / 7.5 / 11.1 / 15 / 22.5
PK120	27 / 33 / 45 / 49.5 / 63
PK130	67.5 / 99 / 121.5 / 135

Customizations

Sumitomo design and production possibilities allow standard gearboxes to be turned into deeply tailored solutions. Customizations may include non-standard motor adaptations, combinations of different gearboxes, integration of brakes and feedback devices, realization of specific interfaces with the machine, fine performance tuning and many others. Especially at project startup, we offer a side by side co-engineering of the application where we can combine our extensive experience with yours.

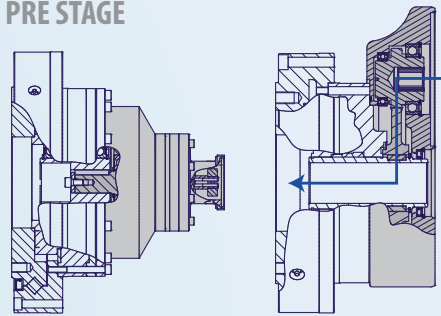
Our highly skilled sales force and engineers are ready to visit you to find the most competitive solution to your application demand together. After sales service is also available for quick reaction in case of gearbox maintenance, repair, or modification thanks to the worldwide network of Sumitomo production facilities and sales offices.

OUTPUT



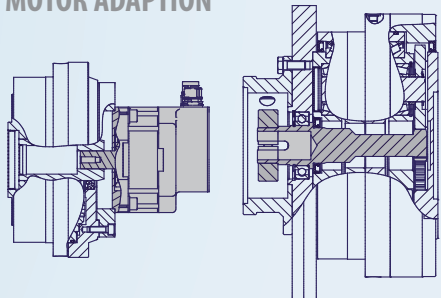
The ideal output geometries of a gearbox are as diverse as your applications.
We adjust to your needs, not the other way round!

PRE STAGE



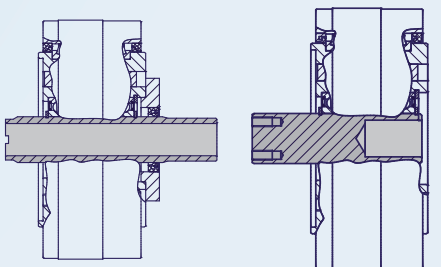
Are you in need of extreme ratios?
Input speed not high enough?
Pairing the right gearbox stages is our business.

MOTOR ADAPTION



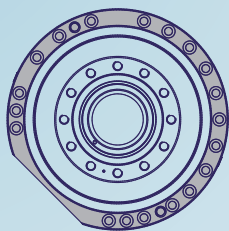
Do you have a favorite motor brand?
We have the gearbox which can be directly coupled to it.
No matter whether it is for 1000 units or just 1!

INPUT SHAFT



No matter which input you prefer, we can provide a solution!

HOUSING



Do you have space restrictions?
Does your machine design demand a unique drive train?
We have the solution.



For further selection options, visit our configurator.