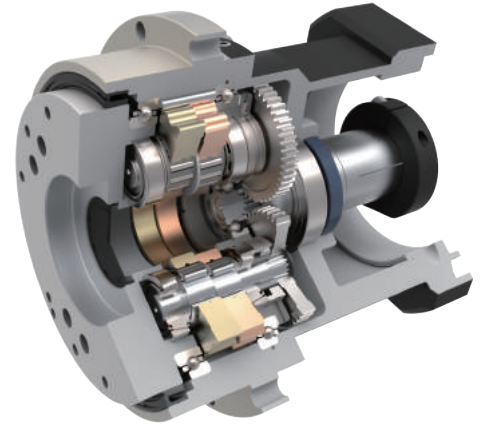


# Quality First & Customer's Satisfaction / Önce Kalite & Müşteri Memnuniyeti



LI MING Machinery CO., LTD. is specialist in design, R&D and manufacturing of a wide range of high-tech gear motor and helical gear reducers, worm gear reducers, planetary gear reducers. In recent years, to meet customers' requirements of quality and price, we have been dedicated to constantly upgrade the performance of gear reducer, maximize efficiency, and provide the most comprehensive technical supports. Under the company's policy of " Quality First; Customer Satisfaction and Intelligence; Sincerity; Honesty " , we have invited many highly experienced talents. At LI MING, we have a team with outstanding background in high-tech field. LI MING's outstanding enterprise culture results from its practicality, constantly learning the advanced management system and a commitment to excellence.

LI MING Machinery CO., LTD., yüksek teknoloji redüktörlü motorlar, helisel dişli redüktörler, sonsuz dişli redüktörler, planet dişli redüktörler gibi endüstriyel ürünlerin dizaynında, AR-GE çalışmalarında ve üretiminde uzmandır. Kuruluşundan günümüze kadar, fiyat - kalite ihtiyaçlarının karşılanması adına, kendisini ürünlerinin performansını, verimini arttırmaya ve en kapsamlı teknik desteği sunmaya adanmıştır. Başarısı; kalite, müşteri memnuniyeti, ileri teknoloji, dürüstlük ve iyi niyet politikalarının ışığında ileri teknolojilerde yüksek tecrübeye sahip ekibine, sürekli gelişen yönetim sistemine ve mükemmeliyete bağlılığına dayanmaktadır.



## High Accuracy & Efficiency Profit / Yüksek Doğruluk & Verim

Among the wide range of speed reducers, the planetary gear reducer features compact construction, high-torque resistance, high transmission efficiency, wide range of speed reduction and high accuracy.

The planetary gear reducers are widely applied in servo, stepping and DC transmission system. With its outstanding feature of high precision transmission, the planetary gear reducer is excellent for reducing speed, increasing torque and reducing torsional inertia ratio. High torque, low backlash and low noise are three key features of LIMING's gear reducers, and these are the reasons why LIMING gear reducers are in the leading position in the industry.

Planet redüktörler kompakt yapı, yüksek tork dayanımı, verim ve çok çeşitli tahvil oranı ile diğer redüktörlerden ayrılırken, genellikle servo motor, step motor ve doğru akım (DC) iletim sistemlerinde kullanılırlar. Hassas iletim özelliğiyle birlikte planet redüktörler, hızın istenilen oranda indirgenmesinde ve torkun artırılmasında en iyi çözümü sunmaktadır. Yüksek tork, düşük boşluk oranı ve düşük ses seviyesi gibi özellikler LIMING'in tercih edilen redüktör olmasının başlıca sebepleridir.

# High Precision Machining Equipment / Yüksek Hassasiyetli İşleme Ekipmanları



Based on our acknowledgement of the unique processing characteristics of speed reducers on all parts, we have developed and designed a series of high-efficiency automatic machining equipment to work with high-performance processing machines. Our well-experienced technicians take good control of precision in our parts, and stringent quality control to ensure the best precision and performance of all parts and components. To enhance technical improvement, LI MING Machinery Company has placed a huge investment in the purchase of a whole set of the latest generation of Computer Numerically-Controlled (CNC) machines and equipments, in combination with distinguished engineering personnel, to upgrade the precision of parts and ensure stable quality.

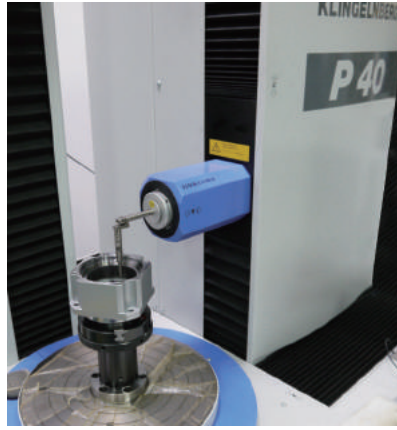
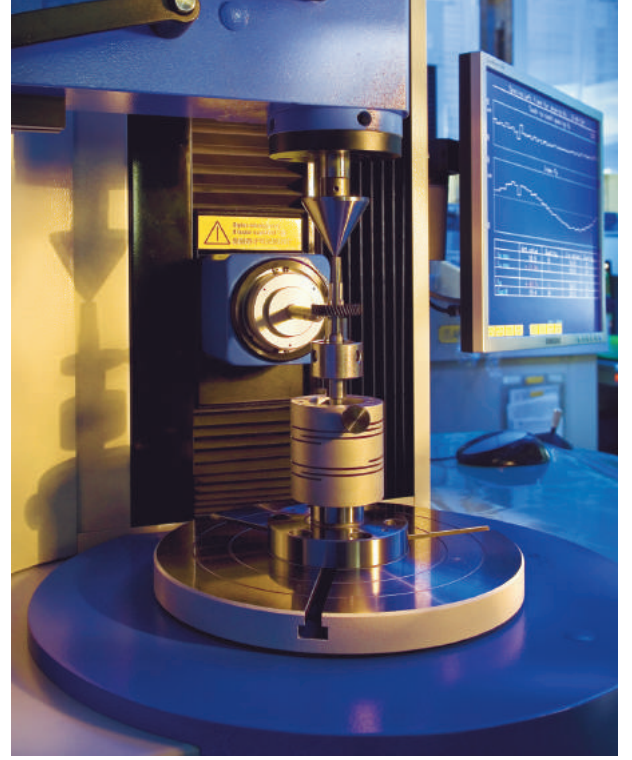
Redüktör parçalarının üretiminde kullanılacak yüksek hassasiyetli ekipmanlar, ihtiyaçlarımız doğrultusunda tasarlanıp, geliştirilmiştir. Tüm parçaların kalite kontrol süreçleri uzman ekibimizce en iyi şekilde yönetilir. Teknik gelişimi ve parçaların hassasiyetini artırıp kalite istikrarını devam ettirmek amacıyla yüksek hassasiyetli CNC işleme merkezleriyle üretim yapılmaktadır.



# Total Quality Management / Kapsamlı Kalite Kontrol

Total Quality Management (TQM) is never a mere slogan of LI MING Company. We adhere to our quality policy. To each quality requirement, we have to set up rigorous quality standards for prompt and accurate quality control every single part is subjected to comprehensive inspection and tests, from initial receipt of material to assembly of finished products and regular operation, to completely satisfy your requirement. Our quality control department has the most advanced inspection equipment conducting precision measurement. A good tool is the master of all good works, our precision inspection equipments are the best assurance of our reliable quality.

Kapsamlı kalite kontrol, LIMING için asla sadece bir slogan değildir. Üretimde ve kalitede istikrarı sağlamak her bir ürün bileşenlerin üretiminden, bitmiş ürünün montajına ve normal çalışma aşamasına kadar geniş kapsamlı inceleme ve teste tabi tutulur. Son kullanıcıyı bilgilendirmek amacıyla, yapılan testlerin özet formunda bir dökümanı kullanıcıya teslim edilir.







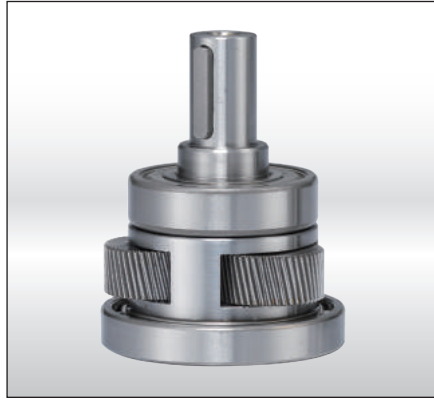
## SERVOBOX Series / Serileri



### Helical Gear / Helis Dişli

The speed reduction mechanism employs helical gears, which provides two times meshing rate of teeth when comparing with regular spur gears. In addition, it also features extremely smooth running, low noise, high torque output and low backlash.

Redüksiyon mekanizmasında helis dişli kullanımı, düz dişli ile kıyaslandığında iki kat daha fazla temas noktası, pürüzsüz çalışma, düşük gürültü, yüksek tork ve düşük boşluk oranı sağlamaktadır.



### Synthetic Lubrication Grease / Sentetik Gres

The protective class IP65 seals design avoids leakage problem. It features no maintenance.

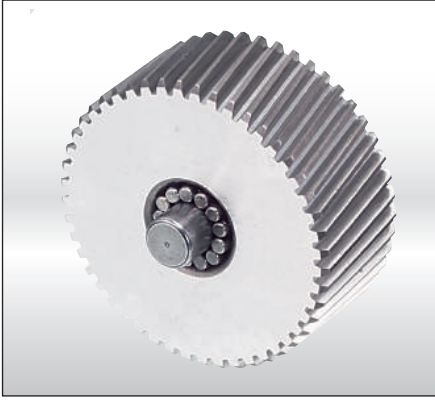
IP65 sınıfı koruyucu keçe bakım gerektirmeden sızıntı problemini engeller.



### Collet Locking Mechanism / Kovan Kilitleme Mekanizması

The input-end and the motor are coupled through a collet locking mechanism. It has passed dynamical balance analysis to assure concentricity and balance on the connection and no backlash for power transmission while running at high speed.

Redüktörün giriş mili ve motorun çıkış mili, kovan kilitleme mekanizmasıyla bağlanır. Bu sayede yüksek hızlarda hassas merkezleme ve bağlantı dengesi sağlanıp, güç iletimi esnasında boşluk engellenmiş olur.



### Full Needle Roller Bearings Design / İğneli Rulmanlı Tasarım

The planetary gear transmission employs full needle roller bearings without retainer to increase the contact surface, which greatly upgrades structural rigidity and service life.

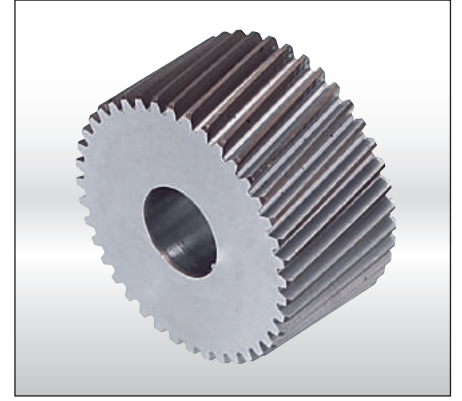
Planet dişlilerde temas yüzeyini artırmak amacıyla iğneli rulmanlı yataklar kullanılır. Bu sayede yapısal sağlamlık ve hizmet ömrü büyük ölçüde artırılmış olur.



### Integrated Planetary Arm Bracket / Tek Parça Planet Kolu

The planetary arm bracket and the output shaft are one-piece constructed to increase torsional rigidity and accuracy. The entire structure is one-time machined for controlling accuracy in the specified tolerance.

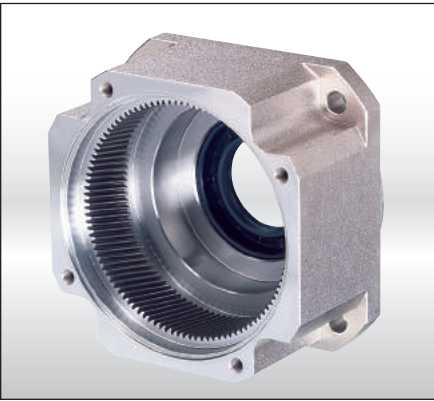
Planet kolu ve çıkış mili, burulma direncini ve hassasiyeti arttırmak amacıyla tek parçadan üretilmiştir. Tüm yapı hassasiyeti ve toleransı sağlamak için tek seferde işlenmiştir.



### High Precision Gear Machining / Yüksek Hassasiyetli Dişli İşleme

The planetary gear and sun gear are made by high quality Ni-Cr-Mo alloy steel (SNM220), precision machined and carburized to hardness 57-60 HRC. Precision teeth grinding assures gear accuracy reaches DIN6 class. It provides better wear resistance, impact resistance and longer service life than gears with only surface nitrided.

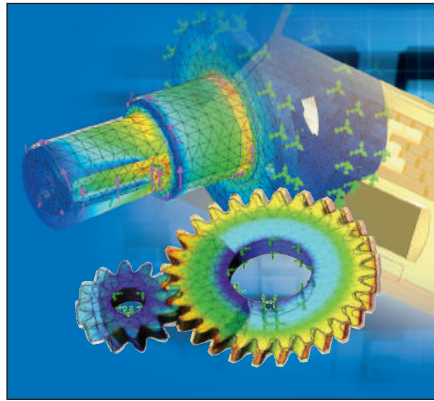
Planet dişli ve güneş dişli yüksek kalite Ni-Cr-Mo alaşımli çelikten üretilmiş, hassas şekilde işlenmiş ve 57-60 HRC sertliğe kadar karbürleşmiştir. Hassas diş taşlama DIN6 sınıfındadır. Bu sayede yalnızca yüzeyi nitrülenmiş dişlilere göre daha uzun hizmet ömrü, daha yüksek aşınma direnci ve darbe direnci sağlanır.



### One-piece Gear Box & Advanced Surface Treatment / Tek Parça Gövde & Gelişmiş Yüzey İşleme

The gear box and internal gear ring are one-piece constructed, which is made by Cr-Mo alloy steel (SCM440), and tempered for high torque output. High gear accuracy meets DIN6 class standard. Gearbox surface is anti-corrosive treated for upgrading environmental-resistant and corrosion-resistant capability.

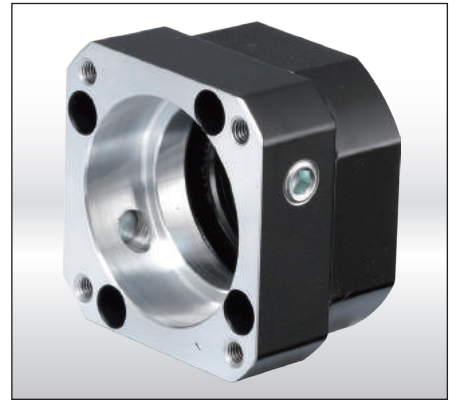
Gövde ve iç dişli bileziği Cr-Mo alaşımli çelikten tek parça olarak üretilmiştir. Yüksek dişli hassasiyeti DIN6 sınıfındadır. Gövde yüzeyi anti-korozif işleme tabi tutulmuştur.



### CAE Design and Analysis / CAE Dizayn ve Analiz

Employs 3D-CAE software for analysis and design, the software allows for analyzing the strength of the entire gear reducer and modifying the helical teeth profile and lead. This reduces the impact and noise during teeth engage and disengage, while increasing the service life of gears and the gear reducer.

Analiz ve tasarım için 3D-CAE yazılımı kullanılır. Yazılım redüktörün mukavemetini analiz etmeye, helis dişli profilini düzenlemeye imkan verir. Bu durum dişliler ve redüktörün hizmet ömrünü artırırken dişlilerin birbirini kavraması ve ayrılması sırasında darbe ve gürültüyü azaltır.



### Modular Design of Motor Connection Plate / Modüler Motor Bağlantı Flanşı

The special modular design of motor connection plate is suitable for any brand and any type of servomotor. It is made by aluminum alloy. Its surface is anti-oxidant treated for upgrading environmental-resistant and corrosion-resistant capability.

Motor bağlantı flanşı modüler tasarımı sayesinde her marka motor modeli ve tipine uygundur. Motor flanşları alüminyum alaşımdan üretilmiştir, yüzeyi anti-korozif işleme tabi tutulmuştur.

# SERVOBOX

## Planetary Reducers/Planet Redüktörler

SERVOBOX series high precision planetary gear reducer employs helical gears. All gears are high precision machined by CNC gear hobbing machine, providing high accuracy gear engagement, smooth running and minimum noise.

LIMING gear box is one-piece fabricated. When comparing with the competitive gear reducer, LIMING gear reducer features smaller construction (saves over 1/4 of size and weight), higher output torque and higher transmission efficiency.

SERVOBOX serilerinde yüksek hassasiyetli helis dişliler kullanılmaktadır. Tüm dişliler, pürüzsüz hareket, düşük gürültü seviyesi, yüksek kavrama doğruluğunun yakalanması adına hassasiyetle CNC'lerde işlenmiştir.

Tek parça olarak üretilen LIMING redüktörler diğer redüktörlerle karşılaştırıldığında, daha küçük yapıya (1/4 oranında boyut ve ağırlıktan tasarruf), yüksek torka ve yüksek aktarım verimliliğine sahiptir.

## Characteristic of SERVOBOX Series / SERVOBOX Serilerinin Özellikleri

### Low Noise

Under 65dB.

### Low Backlash

Backlash for 1-stage model is under 7 arcmin. Available to select specification with 1 arcmin of backlash. Backlash for 2-stage model is under 9 arcmin.

### High Efficiency

Efficiency for 1-stage model exceeds 97%; 2-stage model exceeds 94%.

### High Input Speed

Input speed allows for 5,000 RPM.

### High Torque

Higher output torque is in comparison with spur gear planetary gear reducers.

### High Stability

Employs high tensile strength alloy steel. Gear hardening is made for the entire gear instead of only surface hardening, which extends gear service life and maintain high accuracy after a long period of operation.

### High Speed Reduction Ratio

The gear reducer is a modular design. The planetary gear box can be connected. Speed reduction ratio can reach over than 1/10000.

### Düşük Ses Seviyesi

65dB altı.

### Düşük Boşluk Oranı

1 kademe redüktörlerde 1,3,5,7 arcmin olmak üzere 4 farklı boşluk seçeneği mevcuttur. 2 kademelerde ise 3,5,7,9 arcmin olmak üzere 4 farklı boşluk seçeneği mevcuttur.

### Yüksek Verim

1 kademe için verim %97 seviyelerinde; 2 kademe için verim %94 seviyelerindedir.

### Yüksek Giriş Devri

5,000 RPM

### Yüksek Tork

Düz dişli planet redüktörler ile karşılaştırıldığında daha yüksek tork elde edilir.

### Yüksek İstikrar

Yüksek mukavemetli çelik alaşımı kullanılmıştır. Dişli ömrünü uzatmak, uzun çalışma periyodundan hassasiyeti korumak amacıyla sertleştirme sadece yüzeye değil tüm dişliye uygulanmıştır.

### Çok Çeşitli Çevrim Oranı

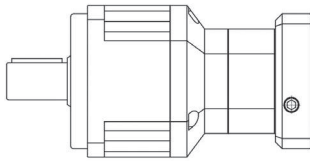
Dişliler modüler olduğundan 1/10000'e kadar çevrim oranı sağlanabilmektedir.

# Indication of Model Numbers / Model Seçimi

SB	90	10		P1	MOTOR
Type	Model	Ratio / Çevrim	Output Shaft Çıkış Mili	Backlash Class Boşluk Sınıfı	Motor Type / Tipi
SB	44	1-Stage/Kademe	Keyway / Kamalı	Ps	Motor Brand & Model No. / Motor Markası & Modeli
SE	62	3, 4, 5, 6, 7, 8, 9, 10		P0	
SB-A	90			P1	
SE-A	120	2-Stage/Kademe	No Keyway / Kamasız	P2	
SBL	142	15 ~ 100			
SEL	180	3-Stage/Kademe			
	220	125 ~ 1000			
	270				
	330				

## Description of Standard and A-Type

The features of 2-stage or 3-stage gearbox are high gear ratio and large output torque. The standard type of 2-stage or 3-stage gearbox are combined by big and small gearboxes to have a limit to input power and then to meet rated output torque. A-Type has a combination of 2 gearboxes with same frame.



SB-Type

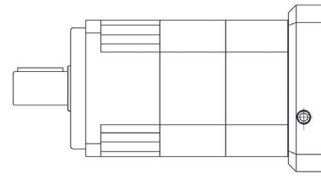
Example:

Servo motor 0.5 kW, rated output torque 2.39 Nm, motor shaft Ø24 mm.

- Suppose the speed reduction ratio is 1/50:  
Output torque is 2.39 Nm x 50 x 94% (efficiency) = 112 Nm.
  - You can select SB-120-50 with rated output torque of 294 Nm and S.F. = 2.6
  - You can select SB-90A-50 with rated output torque of 141 Nm and S.F. = 1.25
- Suppose the speed reduction ratio is 1/100:  
Output torque is 2.39 x 100 x 94% (efficiency) = 224 Nm.  
You can select SB-120-100 and S.F. = 1.3. You are not suggested to choose SB-90A-100 because of low S.F. = 0.62.

## Standart SB ve SBA-Tipi

2 ve 3 kademe redüktörler yüksek torka ve çok çeşitli çevrim oranlarına sahiptirler. Standart SB 2 ve 3 kademe redüktörler biri diğerinden daha büyük olmak üzere 2 farklı dişli grubundan oluşurken, SBA 2 ve 3 kademe redüktörler aynı ölçüde dişli gruplarından oluşur.



SBA-Type

Örnek:

Servo motor 0.5 kW, nominal çıkış torku 2.39 Nm, motor mil çapı Ø24 mm.

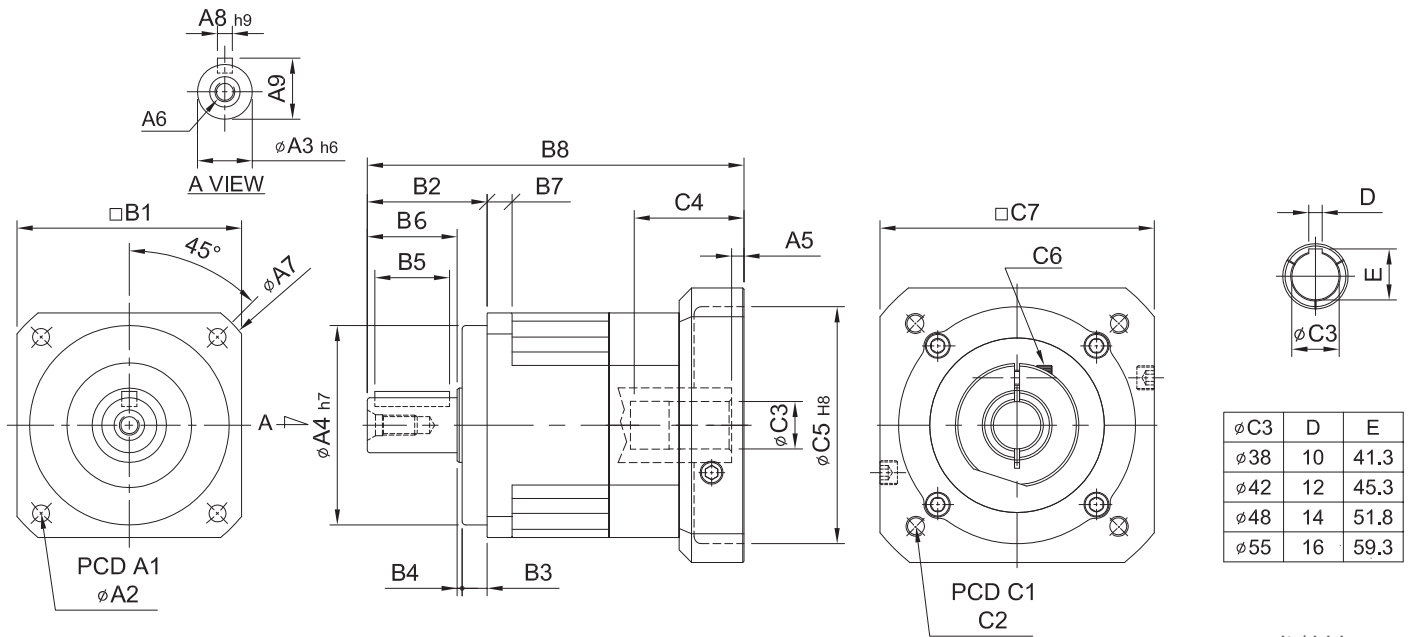
- Çevrim oranının 1/50 olduğu varsayılırsa:  
Çıkış torku 2.39 Nm x 50 x 94% (verim) = 112 Nm.
  - Çıkış torku 294 Nm ve S.F. = 2.6 olan SB-120-50 seçilebilir.
  - Çıkış torku 141 Nm ve S.F. = 1.25 olan SB-90A-50 seçilebilir.
- Çevrim oranının 1/100 olduğu varsayılırsa:  
Çıkış torku 2.39 x 100 x 94% (verim) = 224 Nm. S.F. = 1.3. olduğundan SB-120-100 seçilmesi önerilir. S.F. = 0.62. olan SB-90A-100 önerilmez.

# SERVOBOX

## MODEL : SB

1-Stage / Kademe

RATIO / ÇEVİRİM : 3, 4, 5, 6, 7, 8, 9, 10



$\phi$ C3	D	E
$\phi$ 38	10	41.3
$\phi$ 42	12	45.3
$\phi$ 48	14	51.8
$\phi$ 55	16	59.3

unit / birim: mm

Model Code	44	62	90	120	142	180	220
<b>A</b> A1	50	70	100	130	165	215	250
A2	4.5	5.5	6.8	9	11	13	17
A3	13	16	22	32	40	55	75
A4	35	50	80	110	130	160	180
A5	5	6	9 · 23.5	10 · 20	10	11.5 · 13.5	12.5 · 14.5
A6	M4 x P0.7	M5 x P0.8	M8 x P1.25	M10 x P1.5	M12 x P1.75	M14 x P2.0	M16 x P2.0
A7	58	80	116	148	186	238	288
A8	5	5	6	10	12	16	20
A9	15	18	24.5	35	43	59	79.5
<b>B</b> B1	44	62	90	120	142	180	220
B2	26	36	48	65	92	106	139
B3	5	7	10	12	15	20	30
B4	1	1	2	3	3	4	5
B5	15	20	30	40	65	70	90
B6	20	28	36	50	74	82	104
B7	5	8	10	12	15	16	20
B8	95	115 · 123	164.5 · 179	205 · 215	260.5	323.5	367.5
<b>C</b> C1	46 · 60 · 63	70 · 75 · 90	90 · 100 · 115 · 145	115 · 145 · 165	145 · 165 · 200	200 · 215 · 265	200 · 265 · 300
C2	M3 · M4 · M5	M4 · M5 · M6	M5 · M6 · M8	M6 · M8 · M10	M8 · M10 · M12	M10 · M12 · M16	M12 · M16
C3	8 · 9 · 11	14 · 19	19 · 22 · 24	24 · 28 · 32	28 · 32 · 35	38 · 42 · 48 · 55	42 · 48 · 55
C4	26	33.5 · 41.5	59 · 73.5	67 · 77	84.5	114.5 · 116.5	117.5 · 119.5
C5	30 · 40 · 50	50 · 60 · 70	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180	114.3 · 180 · 230	114.3 · 230 · 250
C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5	M10 x P1.5
C7	46 · 55	64 · 70 · 80	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190	182 · 200 · 250	222 · 250 · 265



Model No.		Unit/Birim	Ratio Çevrim	44	62	90	120	142	180	220
Nominal output torque / Nominal Çıkış Torku	$T_{2N}$	Nm	3	19	59	165	335	625	1,206	2,030
			4	16	51	146	300	555	1,069	1,804
			5	16	48	160	333	618	1,189	2,010
			6	15	45	151	311	583	1,118	1,911
			7	15	45	149	309	573	1,108	1,870
			8	14	43	143	298	553	1,070	1,824
			9	13	44	145	278	516	993	1,694
			10	14	43	141	294	549	1,059	1,779
Max. Acceleration Torque / Max.İvmelenme Torku	$T_{2B}$	Nm	3 ~ 10	1.8 Times of Rated Output Torque / 1,8 x Nominal Çıkış Torku						
Max. Output Torque / Max.Çıkış Torku	$T_{2NOT}$	Nm	3 ~ 10	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku						
Rated Input Speed / Nominal Giriş Devri	$n_{1N}$	rpm	3 ~ 10	3,000	3,000	3,000	3,000	3,000	3,000	2,000
Max. Input Speed / Max.Giriş Devri	$n_{1B}$	rpm	3 ~ 10	6,000	6,000	6,000	5,000	5,000	4,000	3,000
Backlash P <sub>s</sub> / Min.Boşluk Oranı		arcmin	3 ~ 10	-	-	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1
Backlash P <sub>0</sub> / Düşük Boşluk Oranı		arcmin	3 ~ 10	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3
Backlash P <sub>1</sub> / Azaltılmış Boşluk Oranı		arcmin	3 ~ 10	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5
Backlash P <sub>2</sub> / Standart Boşluk Oranı		arcmin	3 ~ 10	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
Torsional Rigidity / Burulma Direnci		Nm/arcmin	3 ~ 10	3	6	14	27	60	140	240
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	3 ~ 10	380	1,180	3,200	6,800	9,300	15,600	51,000
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	3 ~ 10	190	590	1,600	3,400	4,650	7,800	25,500
Service Life / Hizmet Ömrü	$L_H$	hr	3 ~ 10	S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)						
Efficiency / Verim	$\eta$	%	3 ~ 10	≥ 97						
Operating Temperature / Çalışma Sıcaklığı		°C	3 ~ 10	- 25° C ~ + 90° C						
Lubrication / Yağlama			3 ~ 10	Synthetic Grease / Sentetik Gres						
Protection Class / Koruma Sınıfı			3 ~ 10	IP65						
Mounting Position / Montaj Pozisyonu			3 ~ 10	Any / Her Yönde						
Noise Level / Ses Seviyesi		dB	3 ~ 10	≤ 56	≤ 58	≤ 60	≤ 63	≤ 65	≤ 67	≤ 70
Weight / Ağırlık ±3%		Kg	3 ~ 10	0.6	1.28	3.6	8	14.3	28.3	42.5

#### ■ Mass Moments of Inertia / Atalet Ağırlık Momenti (kg.cm<sup>2</sup>)

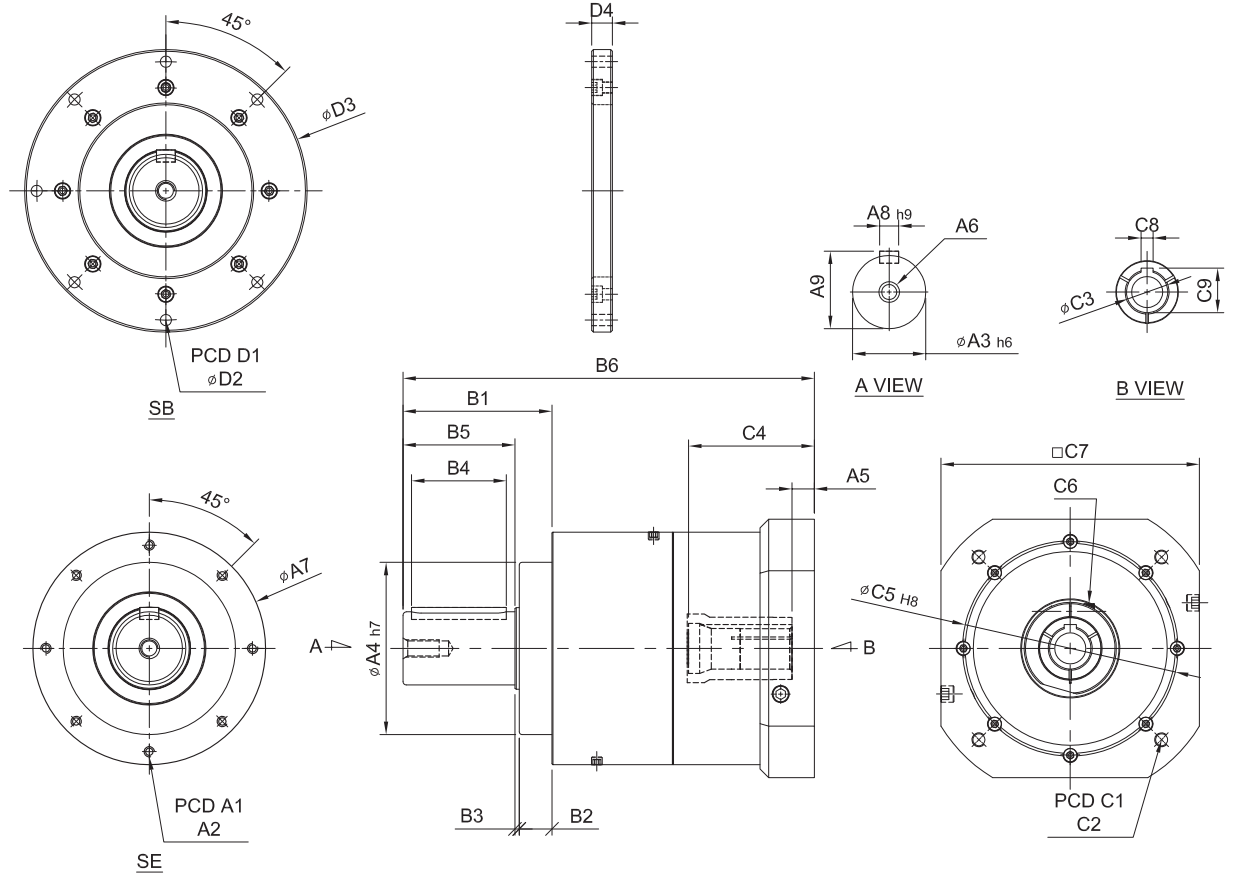
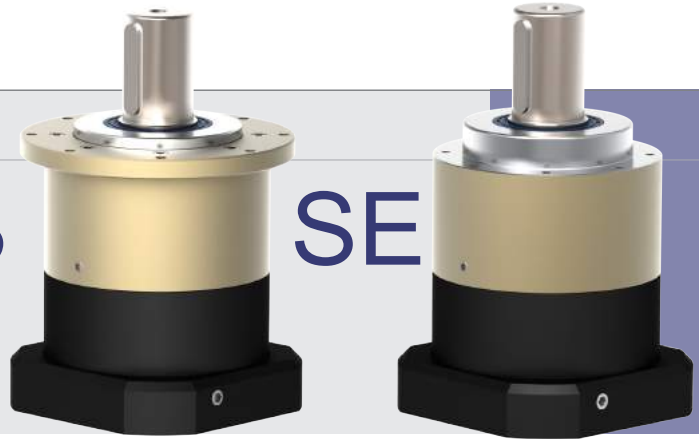
Ratio / Çevrim	44	62	90	120	142	180	220
3	0.03	0.16	0.61	3.25	9.21	28.98	59.61
4	0.03	0.14	0.48	2.74	7.54	23.67	54.37
5	0.03	0.13	0.47	2.71	7.42	23.29	53.27
6	0.03	0.13	0.45	2.65	7.25	22.75	51.72
7	0.03	0.13	0.45	2.62	7.14	22.48	50.97
8	0.03	0.13	0.44	2.58	7.07	22.59	50.84
9	0.03	0.13	0.44	2.57	7.04	22.53	50.63
10	0.03	0.13	0.44	2.57	7.03	22.51	50.56

# SERVOBOX

## MODEL : SB SE

1-Stage / Kademe

RATIO / ÇEVİRİM : 3, 4, 5, 7, 10



unit / birim: mm

Model Code	270	330	
<b>A</b>	A1	240	300
	A2	M12 x P1.75	M16 x P2.0
	A3	85	100
	A4	200	250
	A5	26 · 23	26 · 23
	A6	M20 x P2.5	M24 x P3.0
	A7	270	336
	A8	22	28
	A9	90	106
<b>B</b>	B1	173	187
	B2	38	42
	B3	5	5
	B4	110	120
	B5	130	140
	B6	474.5 · 477.5 · 485	512 · 515

unit / birim: mm

Model Code	270	330	
<b>C</b>	C1	265 · 300 · 350	265 · 300 · 350
	C2	M12 · M16 · M18	M12 · M16 · M18
	C3	48 · 55 · 60 · 70	55 · 60 · 75
	C4	143 · 146	143 · 146
	C5	230 · 250 · 300	230 · 250 · 300
	C6	M12 x P1.75	M12 x P1.75
	C7	280 · 300 · 330	280 · 300 · 330
	C8	14 · 16 · 18 · 20	16 · 18 · 20
	C9	51.8 · 59.3 · 64.4 · 74.8	59.3 · 64.4 · 80
<b>D</b>	D1	300	380
	D2	13	17
	D3	328	416
	D4	24	28



Model No.		Unit/Birim	Ratio Çevrim	270	330
Nominal output torque / Nominal Çıkış Torqu	$T_{2N}$	Nm	3	4,770	8,790
			4	4,730	8,730
			5	4,680	8,660
			7	4,570	8,520
			10	4,420	8,310
Max. Acceleration Torque / Max.İvmelenme Torqu		Nm	3 ~ 10	1.8 Times of Rated Output Torque / 1,8 x Nominal Çıkış Torqu	
Max. Output Torque / Max.Çıkış Torqu	$T_{2NOT}$	Nm	3 ~ 10	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torqu	
Rated Input Speed / Nominal Giriş Devri	$n_{1N}$	rpm	3 ~ 10	2,000	2,000
Max. Input Speed / Max. Giriş Devri	$n_{1B}$	rpm	3 ~ 10	3,000	3,000
Backlash P <sub>s</sub> / Min.Boşluk Oranı		arcmin	3 ~ 10	≤ 1	≤ 1
Backlash P <sub>0</sub> / Düşük Boşluk Oranı		arcmin	3 ~ 10	≤ 3	≤ 3
Backlash P <sub>1</sub> / Azaltılmış Boşluk Oranı		arcmin	3 ~ 10	≤ 5	≤ 5
Backlash P <sub>2</sub> / Standart Boşluk Oranı		arcmin	3 ~ 10	≤ 7	≤ 7
Torsional Rigidity / Burulma Direnci		Nm/arcmin	3 ~ 10	510	980
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	3 ~ 10	107,100	224,910
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	3 ~ 10	53,550	112,455
Service Life / Hizmet Ömrü	$L_H$	hr	3 ~ 10	S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)	
Efficiency / Verim	$\eta$	%	3 ~ 10	≥ 97	
Operating Temperature / Çalışma Sıcaklığı		°C	3 ~ 10	- 25° C ~ + 90° C	
Lubrication / Yağlama			3 ~ 10	Synthetic Grease / Sentetik Gres	
Protection Class / Koruma Sınıfı			3 ~ 10	IP65	
Mounting Position / Montaj Pozisyonu			3 ~ 10	Any / Her Yönde	
Noise Level / Ses Seviyesi		dB	3 ~ 10	≤ 72	≤ 74
Weight / Ağırlık ±3%		Kg	3 ~ 10	SB : 97 · SE : 87.5	SB : 190 · SE : 172

#### ■ Mass Moments of Inertia / Atalet Ağırlık Momenti (kg.cm<sup>2</sup>)

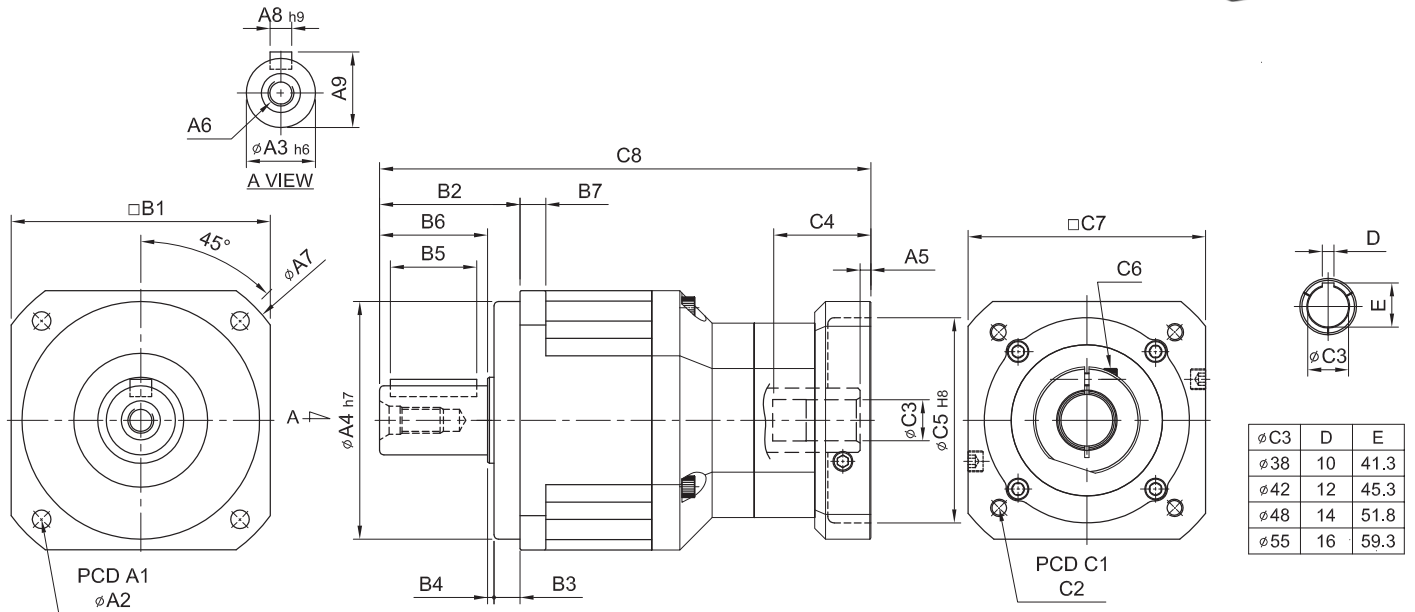
Ratio / Çevrim	270	330
3	122.20	252.96
4	111.46	230.72
5	109.20	226.05
7	104.49	216.29
10	103.65	214.55

# SERVOBOX

## MODEL : SB

2-Stage / Kademe

RATIO / ÇEVİRİM : 15, 20, 25, 30, 35, 40, 50, 60, 70, 80, 90, 100



unit / birim: mm

Model Code	62	90	120	142	180	220
<b>A</b> A1	70	100	130	165	215	250
A2	5.5	6.8	9	11	13	17
A3	16	22	32	40	55	75
A4	50	80	110	130	160	180
A5	5	6	9 · 23.5	10 · 20	10	11.5 · 13.5
A6	M5 x P0.8	M8 x P1.25	M10 x P1.5	M12 x P1.75	M14 x P2.0	M16 x P2.0
A7	80	116	148	186	238	288
A8	5	6	10	12	16	20
A9	18	24.5	35	43	59	79.5
<b>B</b> B1	62	90	120	142	180	220
B2	36	48	65	92	106	139
B3	7	10	12	15	20	30
B4	1	2	3	3	4	5
B5	20	30	40	65	70	90
B6	28	36	50	74	82	104
B7	8	10	12	15	16	20
<b>C</b> C1	46 · 60 · 63	70 · 75 · 90	90 · 100 · 115 · 145	115 · 145 · 165	145 · 165 · 200	200 · 215 · 265
C2	M3 · M4 · M5	M4 · M5 · M6	M5 · M6 · M8 · M10	M6 · M8 · M10	M8 · M10 · M12	M10 · M12
C3	8 · 9 · 11	14 · 19	19 · 22 · 24	24 · 28 · 32	28 · 32 · 35	38 · 42 · 48 · 55
C4	26	33.5 · 41.5	59 · 73.5	67 · 77	84.5	114.5 · 116.5
C5	30 · 40 · 50	50 · 60 · 70	70 · 80 · 95 · 110	70 · 95 · 110 · 130	110 · 130 · 180	114.3 · 180 · 230
C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5
C7	46 · 55	64 · 70 · 80	92 · 110 · 130	122 · 130 · 150	146 · 180 · 190	182 · 200 · 250
C8	139.5	172.5 · 180.5	241 · 255.5	298.5 · 308.5	358.5	446.5



Model No.		Unit/Birim	Ratio Çevrim	62	90	120	142	180	220
Nominal output torque / Nominal Çıkış Torqu	$T_{2N}$	Nm	15	59	165	335	625	1,206	2,030
			20	51	146	300	555	1,069	1,804
			25	48	160	333	618	1,189	2,010
			30	45	151	311	583	1,118	1,911
			35	45	149	309	573	1,108	1,870
			40	43	143	298	553	1,070	1,824
			50	48	160	333	618	1,189	2,010
			60	45	151	311	583	1,118	1,911
			70	45	149	309	573	1,108	1,870
			80	43	143	298	553	1,070	1,824
			90	44	145	278	516	993	1,694
100	43	141	294	549	1,059	1,779			
Max. Acceleration Torque / Max. İvmelenme Torqu	$T_{2B}$	Nm	15 ~ 100	1.8 Times of Rated Output Torque / 1,8 x Nominal Çıkış Torqu					
Max. Output Torque / Max. Çıkış Torqu	$T_{2NOT}$	Nm	15 ~ 100	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torqu					
Rated Input Speed / Nominal Giriş Devri	$n_{1N}$	rpm	15 ~ 100	3,000	3,000	3,000	3,000	3,000	2,000
Max. Input Speed / Max. Giriş Devri	$n_{1B}$	rpm	15 ~ 100	6,000	6,000	5,000	5,000	4,000	3,000
Backlash Ps / Min. Boşluk Oranı		arcmin	15 ~ 100	-	-	≤ 3	≤ 3	≤ 3	≤ 3
Backlash P0 / Düşük Boşluk Oranı		arcmin	15 ~ 100	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5
Backlash P1 / Azaltılmış Boşluk Oranı		arcmin	15 ~ 100	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
Backlash P2 / Standart Boşluk Oranı		arcmin	15 ~ 100	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9
Torsional Rigidity / Burulma Direnci		Nm/arcmin	15 ~ 100	6	14	27	60	140	240
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	15 ~ 100	1,180	3,200	6,800	9,300	15,600	51,000
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	15 ~ 100	590	1,600	3,400	4,650	7,800	25,500
Service Life / Hizmet Ömrü	$L_H$	hr	15 ~ 100	S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)					
Efficiency / Verim	$\eta$	%	15 ~ 100	≥ 94					
Operating Temperature / Çalışma Sıcaklığı		°C	15 ~ 100	- 25° C ~ + 90° C					
Lubrication / Yağlama			15 ~ 100	Synthetic Grease / Sentetik Gres					
Protection Class / Koruma Sınıfı			15 ~ 100	IP65					
Mounting Position / Montaj Pozisyonu			15 ~ 100	Any / Her Yönde					
Noise Level / Ses Seviyesi		dB	15 ~ 100	≤ 58	≤ 60	≤ 63	≤ 65	≤ 67	≤ 70
Weight / Ağırlık ±3%		Kg	15 ~ 100	1.73	4.6	9.42	17.2	34.1	57.3

#### ■ Mass Moments of Inertia / Atalet Ağırlık Momenti (kg.cm<sup>2</sup>)

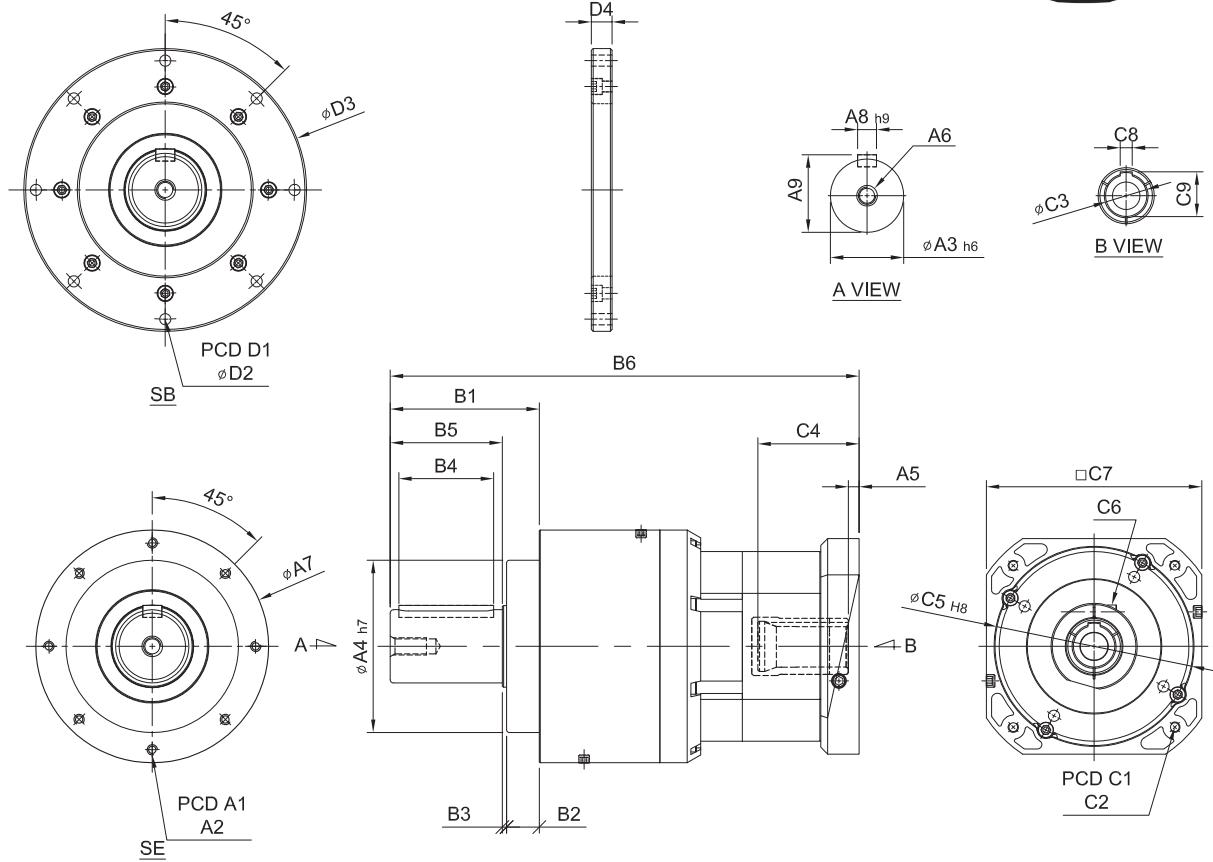
Ratio / Çevrim	62	90	120	142	180	220
15	0.03	0.14	0.46	2.63	7.3	22.79
20	0.03	0.14	0.46	2.63	7.3	22.79
25	0.03	0.14	0.46	2.63	7.1	22.79
30	0.03	0.14	0.46	2.43	7.1	22.59
35	0.03	0.14	0.44	2.43	7.1	22.59
40	0.03	0.14	0.44	2.43	6.92	22.59
50	0.03	0.14	0.44	2.43	6.92	22.59
60	0.03	0.14	0.43	2.39	6.72	21.83
70	0.03	0.14	0.43	2.39	6.72	21.83
80	0.03	0.14	0.43	2.39	6.72	21.83
90	0.03	0.14	0.40	2.39	6.72	21.60
100	0.03	0.14	0.40	2.39	6.72	21.60

# SERVOBOX

## MODEL : SB SE

2-Stage / Kademe

RATIO / ÇEVİRİM: 15,20,25,30,35,40,50,70,100



unit / birim: mm

Model Code	270	330
A1	240	300
A2	M12 x P1.75	M16 x P2.0
A3	85	100
A4	200	250
A5	12.5	26 · 23
A6	M20 x P2.5	M24 x P3.0
A7	270	336
A8	22	28
A9	90	106
B1	173	187
B2	38	42
B3	5	5
B4	110	120
B5	130	140
B6	544 · 547	625 · 632.5 · 635.5

unit / birim: mm

Model Code	270	330
C1	200 · 265 · 300	265 · 300 · 350
C2	M12 · M16	M12 · M16 · M18
C3	42 · 48 · 55	48 · 55 · 60 · 70
C4	117.5 · 120.5	146 · 149
C5	114.3 · 230 · 250	230 · 250 · 300
C6	M10 x P1.5	M12 x P1.75
C7	222 · 250 · 265	280 · 300 · 330
C8	12 · 14 · 16	14 · 16 · 18 · 20
C9	45.3 · 51.8 · 59.3	51.8 · 59.3 · 64.4 · 74.8
D1	300	380
D2	13	17
D3	328	416
D4	24	28



Model No.		Unit/Birim	Ratio Çevrim	270	330
Nominal output torque / Nominal Çıkış Torku	$T_{2N}$	Nm	15	4,770	8,790
			20	4,730	8,730
			25	4,680	8,660
			30	4,620	8,610
			35	4,570	8,520
			40	4,520	8,440
			50	4,680	8,660
			70	4,570	8,520
			100	4,420	8,310
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	15 ~ 100	1.8 Times of Rated Output Torque / 1,8 x Nominal Çıkış Torku	
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	15 ~ 100	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku	
Rated Input Speed / Nominal Giriş Devri	$n_{IN}$	rpm	15 ~ 100	2,000	2,000
Max. Input Speed / Max. Giriş Devri	$n_{IB}$	rpm	15 ~ 100	3,000	3,000
Backlash Ps / Min. Boşluk Oranı		arcmin	15 ~ 100	≤ 3	≤ 3
Backlash P0 / Düşük Boşluk Oranı		arcmin	15 ~ 100	≤ 5	≤ 5
Backlash P1 / Azaltılmış Boşluk Oranı		arcmin	15 ~ 100	≤ 7	≤ 7
Backlash P2 / Standart Boşluk Oranı		arcmin	15 ~ 100	≤ 9	≤ 9
Torsional Rigidity / Burulma Direnci		Nm/arcmin	15 ~ 100	510	980
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	15 ~ 100	107,100	224,910
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	15 ~ 100	53,550	112,455
Service Life / Hizmet Ömrü	$L_H$	hr	15 ~ 100	S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)	
Efficiency / Verim	$\eta$	%	15 ~ 100	≥ 94	
Operating Temperature / Çalışma Sıcaklığı		°C	15 ~ 100	- 25° C ~ + 90° C	
Lubrication / Yağlama			15 ~ 100	Synthetic Grease / Sentetik Gres	
Protection Class / Koruma Sınıfı			15 ~ 100	IP65	
Mounting Position / Montaj Pozisyonu			15 ~ 100	Any / Her Yönde	
Noise Level / Ses Seviyesi		dB	15 ~ 100	≤ 72	≤ 74
Weight / Ağırlık ±3%		Kg	15 ~ 100	SB : 137 · SE : 127.5	

#### ■ Mass Moments of Inertia / Atalet Ağırlık Momenti (kg.cm<sup>2</sup>)

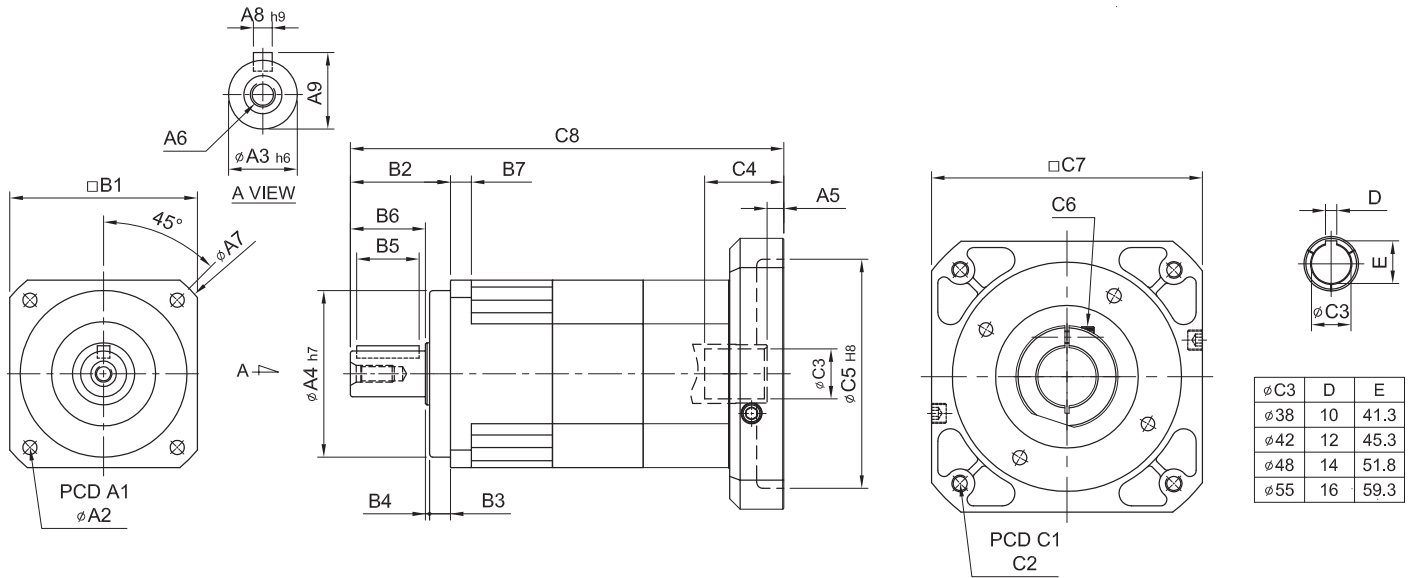
Ratio / Çevrim	270	330
15	63.81	185.05
20	63.81	185.05
25	63.81	185.05
30	63.25	183.43
35	63.25	183.43
40	63.25	183.43
50	63.25	183.43
70	61.12	177.26
100	60.48	175.39

# SERVOBOX

## MODEL : SB-A

2-Stage / Kademe

RATIO / ÇEVİRİM : 15, 20, 25, 30, 35, 40, 50, 60, 70, 80, 90, 100



øC3	D	E
ø38	10	41.3
ø42	12	45.3
ø48	14	51.8
ø55	16	59.3

unit / birim: mm

Model Code	44A	62A	90A	120A	142A	180A	220A
<b>A</b>							
A1	50	70	100	130	165	215	250
A2	4.5	5.5	6.8	9	11	13	17
A3	13	16	22	32	40	55	75
A4	35	50	80	110	130	160	180
A5	5	6	9 · 23.5	10 · 20	10	11.5 · 13.5	12.5 · 14.5
A6	M4 x P0.7	M5 x P0.8	M8 x P1.25	M10 x P1.5	M12 x P1.75	M14 x P2.0	M16 x P2.0
A7	58	80	116	148	186	238	288
A8	5	5	6	10	12	16	20
A9	15	18	24.5	35	43	59	79.5
<b>B</b>							
B1	44	62	90	120	142	180	220
B2	26	36	48	65	92	106	139
B3	5	7	10	12	15	20	30
B4	1	1	2	3	3	4	5
B5	15	20	30	40	65	70	90
B6	20	28	36	50	74	82	104
B7	5	8	10	12	15	16	20
<b>C</b>							
C1	46 · 60 · 63	70 · 75 · 90	90 · 100 · 115 · 145	115 · 145 · 165	145 · 165 · 200	200 · 215 · 265	200 · 265 · 300
C2	M3 · M4 · M5	M4 · M5 · M6	M5 · M6 · M8	M6 · M8 · M10	M8 · M10 · M12	M10 · M12	M12 · M16
C3	8 · 9 · 11	14 · 19	19 · 22 · 24	24 · 28 · 32	28 · 32 · 35	38 · 42 · 48 · 55	42 · 48 · 55
C4	26	33.5 · 41.5	59 · 73.5	67 · 77	84.5	114.5 · 116.5	117.5 · 119.5
C5	30 · 40 · 50	50 · 60 · 70	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180	114.3 · 180 · 230	114.3 · 230 · 250
C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.5	M10 x P1.5	M10 x P1.5	M10 x P1.5
C7	46 · 55	64 · 70 · 80	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190	182 · 200 · 250	222 · 250 · 265
C8	121	148.8 · 156.8	208 · 222.5	261 · 271	327	404.5	460.5



Model No.		Unit/Birim	Ratio Çevrim	44A	62A	90A	120A	142A	180A	220A
Nominal output torque / Nominal Çıkış Torku	$T_{2N}$	Nm	15	19	59	165	335	625	1,206	2,030
			20	16	51	146	300	555	1,069	1,804
			25	16	48	160	333	618	1,189	2,010
			30	15	45	151	311	583	1,118	1,911
			35	15	45	149	309	573	1,108	1,870
			40	14	43	143	298	553	1,070	1,824
			50	16	48	160	333	618	1,189	2,010
			60	15	45	151	311	583	1,118	1,911
			70	15	45	149	309	573	1,108	1,870
			80	14	43	143	298	553	1,070	1,824
			90	13	44	145	278	516	993	1,694
100	14	43	141	294	549	1,059	1,779			
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	15 ~ 100	1.8 Times of Rated Output Torque / 1,8 x Nominal Çıkış Torku						
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	15 ~ 100	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku						
Rated Input Speed / Nominal Giriş Devri	$n_{1N}$	rpm	15 ~ 100	3,000	3,000	3,000	3,000	3,000	3,000	2,000
Max. Input Speed / Max. Giriş Devri	$n_{1B}$	rpm	15 ~ 100	6,000	6,000	6,000	5,000	5,000	4,000	3,000
Backlash Ps / Min. Boşluk Oranı		arcmin	15 ~ 100	-	-	-	≤ 3	≤ 3	≤ 3	≤ 3
Backlash P0 / Düşük Boşluk Oranı		arcmin	15 ~ 100	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5
Backlash P1 / Azaltılmış Boşluk Oranı		arcmin	15 ~ 100	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
Backlash P2 / Standart Boşluk Oranı		arcmin	15 ~ 100	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9
Torsional Rigidity / Burulma Direnci		Nm/arcmin	15 ~ 100	3	6	14	27	60	140	240
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	15 ~ 100	380	1,180	3,200	6,800	9,300	15,600	51,000
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	15 ~ 100	190	590	1,600	3,400	4,650	7,800	25,500
Service Life / Hizmet Ömrü	$L_H$	hr	15 ~ 100	S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)						
Efficiency / Verim	$\eta$	%	15 ~ 100	≥ 94						
Operating Temperature / Çalışma Sıcaklığı		°C	15 ~ 100	- 25° C ~ + 90° C						
Lubrication / Yağlama			15 ~ 100	Synthetic Grease / Sentetik Gres						
Protection Class / Koruma Sınıfı			15 ~ 100	IP65						
Mounting Position / Montaj Pozisyonu			15 ~ 100	Any / Her Yönde						
Noise Level / Ses Seviyesi		dB	15 ~ 100	≤ 56	≤ 58	≤ 60	≤ 63	≤ 65	≤ 67	≤ 70
Weight / Ağırlık ±3%		Kg	15 ~ 100	0.6	2	5.5	11	21	42	59

#### ■ Mass Moments of Inertia / Atalet Ağırlık Momenti (kg.cm<sup>2</sup>)

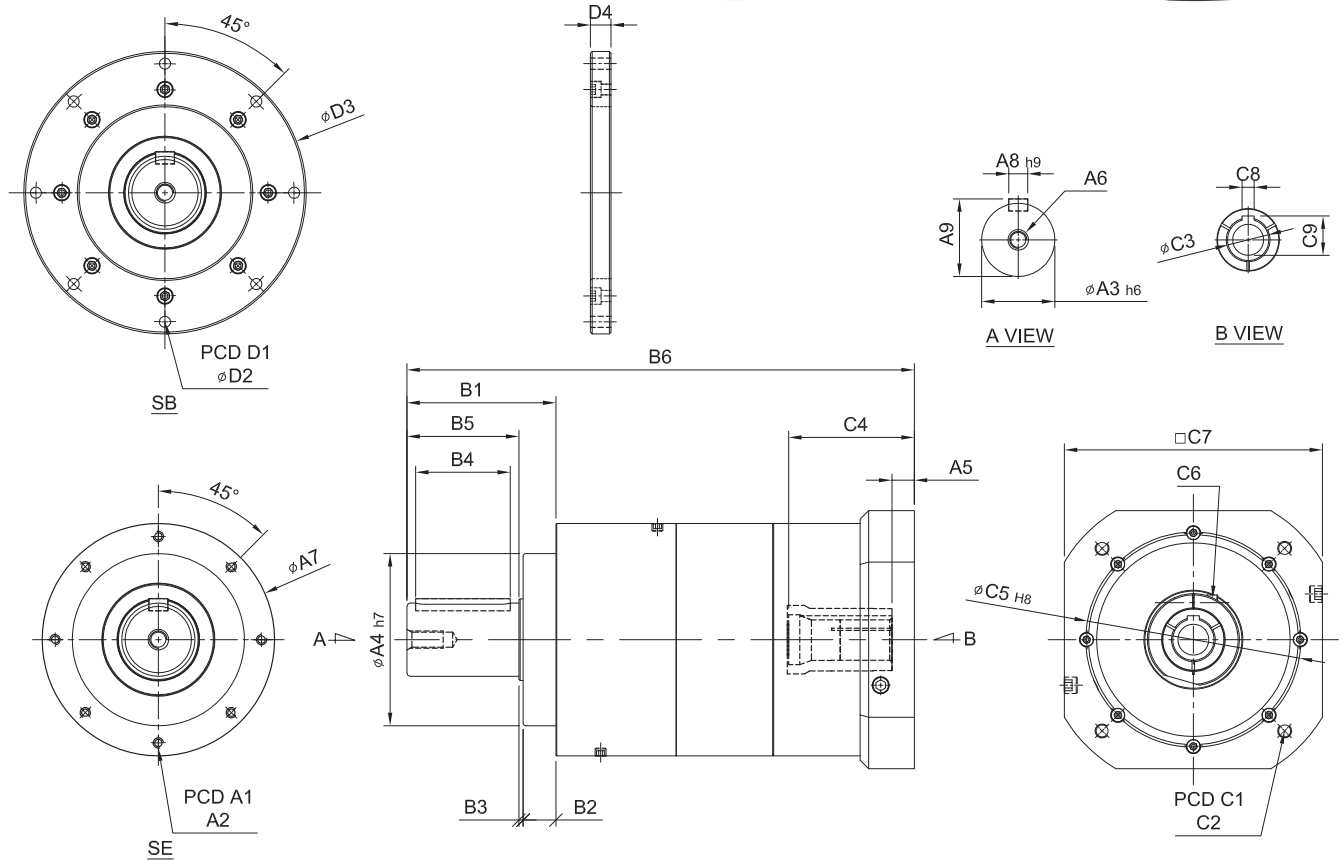
Ratio / Çevrim	44A	62A	90A	120A	142A	180A	220A
15	0.03	0.14	0.46	2.63	7.30	22.79	56.98
20	0.03	0.14	0.46	2.63	7.30	22.79	56.98
25	0.03	0.14	0.46	2.63	7.10	22.79	56.98
30	0.03	0.14	0.46	2.43	7.10	22.59	56.48
35	0.03	0.14	0.44	2.43	7.10	22.59	56.48
40	0.03	0.14	0.44	2.43	6.92	22.59	56.48
50	0.03	0.14	0.44	2.43	6.92	22.59	56.48
60	0.03	0.14	0.43	2.39	6.72	21.83	54.58
70	0.03	0.14	0.43	2.39	6.72	21.83	54.58
80	0.03	0.14	0.43	2.39	6.72	21.83	54.58
90	0.03	0.14	0.40	2.39	6.72	21.60	54.00
100	0.03	0.14	0.43	2.39	6.72	21.83	54.58

# SERVOBOX

## MODEL: SB-A SE-A

2-Stage / Kademe

RATIO / ÇEVİRİM : 15,20,25,30,35,40,50,70,100



unit / birim: mm

Model Code	270A
A1	240
A2	M12 x P1.75
A3	85
A4	200
A5	26 · 23
A6	M20 x P2.5
A7	270
A8	22
A9	90
B1	173
B2	38
B3	5
B4	110
B5	130
B6	586.5 · 589.5

unit / birim: mm

Model Code	270A
C1	265 · 300 · 350
C2	M12 · M16 · M18
C3	48 · 55 · 60
C4	143 · 146 · 149
C5	230 · 250 · 300
C6	M12 x P1.75
C7	280 · 300 · 330
C8	14 · 16 · 18
C9	51.8 · 59.3 · 64.4
D1	300
D2	13
D3	328
D4	24



Model No.	Unit/Birim	Ratio Çevrim	270A	
Nominal output torque / Nominal Çıkış Torqu	$T_{2N}$	Nm	15	4,770
			20	4,730
			25	4,680
			30	4,770
			35	4,570
			40	4,770
			50	4,680
			70	4,570
100	4,220			
Max. Acceleration Torque / Max. İvmelenme Torqu	Nm	15 ~ 100	1.8 Times of Rated Output Torque / 1,8 x Nominal Çıkış Torqu	
Max. Output Torque / Max. Çıkış Torqu	$T_{2NOT}$	Nm	15 ~ 100	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torqu
Rated Input Speed / Nominal Giriş Devri	$n_{IN}$	rpm	15 ~ 100	2,000
Max. Input Speed / Max. Giriş Devri	$n_{IB}$	rpm	15 ~ 100	3,000
Backlash P <sub>s</sub> / Min. Boşluk Oranı		arcmin	15 ~ 100	≤ 3
Backlash P <sub>0</sub> / Düşük Boşluk Oranı		arcmin	15 ~ 100	≤ 5
Backlash P <sub>1</sub> / Azaltılmış Boşluk Oranı		arcmin	15 ~ 100	≤ 7
Backlash P <sub>2</sub> / Standart Boşluk Oranı		arcmin	15 ~ 100	≤ 9
Torsional Rigidity / Burulma Direnci		Nm/arcmin	15 ~ 100	510
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	15 ~ 100	107,100
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	15 ~ 100	53,550
Service Life / Hizmet Ömrü	$L_H$	hr	15 ~ 100	S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)
Efficiency / Verim	$\eta$	%	15 ~ 100	≥ 94
Operating Temperature / Çalışma Sıcaklığı		°C	15 ~ 100	- 25° C ~ + 90° C
Lubrication / Yağlama			15 ~ 100	Synthetic Grease / Sentetik Gres
Protection Class / Koruma Sınıfı			15 ~ 100	IP65
Mounting Position / Montaj Pozisyonu			15 ~ 100	Any / Her Yönde
Noise Level / Ses Seviyesi		dB	15 ~ 100	≤ 72
Weight / Ağırlık ±3%		Kg	15 ~ 100	

#### ■ Mass Moments of Inertia / Atalet Ağırlık Momenti (kg.cm<sup>2</sup>)

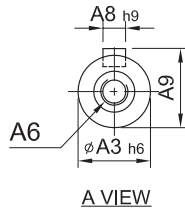
Ratio / Çevrim	270A
15	65.74
20	65.74
25	65.74
30	64.86
35	64.86
40	64.86
50	64.86
70	62.62
100	61.17

# SERVOBOX

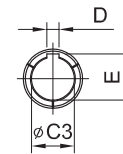
## MODEL : SB

3-Stage / Kademe

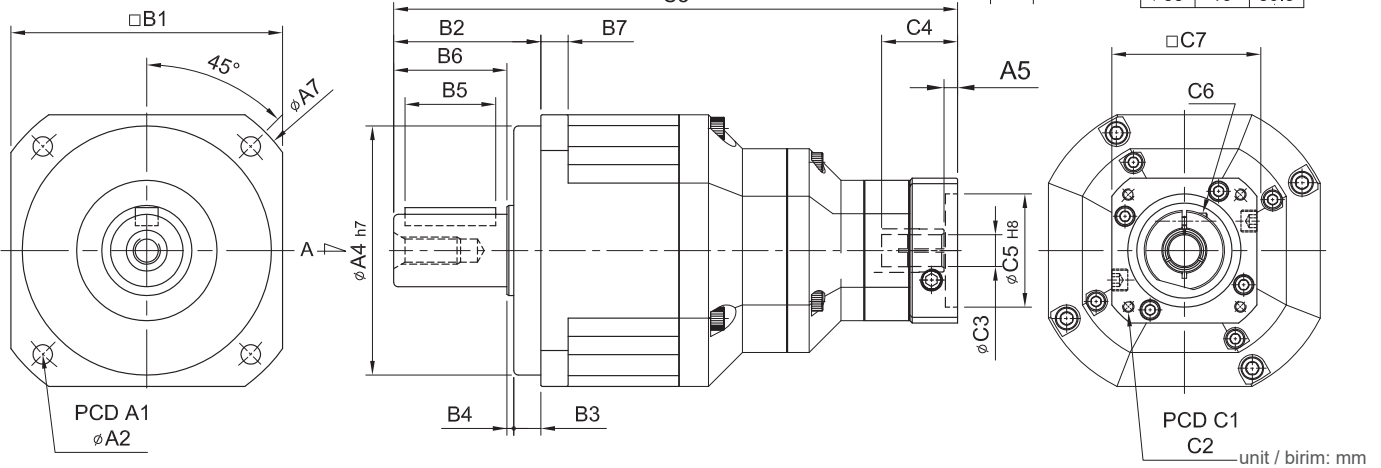
RATIO / ÇEVİRİM : 125,150,175,200,250,300,350,400,  
450,500,600,700,800,900,1000



A VIEW



øC3	D	E
ø38	10	41.3
ø42	12	45.3
ø48	14	51.8
ø55	16	59.3



unit / birim: mm

Model Code	90	120	142	180	220
<b>A</b> A1	100	130	165	215	250
A2	6.8	9	11	13	17
A3	22	32	40	55	75
A4	80	110	130	160	180
A5	5	6	9 · 23.5	10 · 20	10
A6	M8 x P1.25	M10 x P1.5	M12 x P1.75	M14 x P2.0	M16 x P2.0
A7	116	148	186	238	288
A8	6	10	12	16	20
A9	24.5	35	43	59	79.5
<b>B</b> B1	90	120	142	180	220
B2	48	65	92	106	139
B3	10	12	15	20	30
B4	2	3	3	4	5
B5	30	40	65	70	90
B6	36	50	74	82	104
B7	10	12	15	16	20
<b>C</b> C1	46 · 60 · 63	70 · 75 · 90	90 · 100 · 115 · 145	115 · 145 · 165	145 · 165 · 200
C2	M3 · M4 · M5	M4 · M5 · M6	M5 · M6 · M8	M6 · M8 · M10	M8 · M10 · M12
C3	8 · 9 · 11	14 · 19	19 · 22 · 24	24 · 28 · 32	28 · 32 · 35
C4	26	33.5 · 41.5	59 · 73.5	67 · 77	84.5
C5	30 · 40 · 50	50 · 60 · 70	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180
C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5
C7	46 · 55	64 · 70 · 80	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190
C8	197	249 · 257	334.5 · 349	396.5 · 406.5	481.5



Model No.		Unit/Birim	Ratio Çevrim	90	120	142	180	220
Nominal output torque / Nominal Çıkış Torku	$T_{2N}$	Nm	125	160	333	618	1,189	2,010
			150	165	335	625	1,206	2,030
			175	149	309	573	1,108	1,870
			200	146	300	555	1,069	1,804
			250	160	333	618	1,189	2,010
			300	151	311	583	1,118	1,911
			350	149	309	573	1,108	1,870
			400	143	298	553	1,070	1,824
			450	145	278	516	993	1,694
			500	160	333	618	1,189	2,010
			600	151	311	583	1,118	1,911
			700	149	309	573	1,108	1,870
			800	143	298	553	1,070	1,824
900	145	278	516	993	1,694			
1000	141	294	549	1,059	1,779			
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	125 ~ 1000	1.8 Times of Rated Output Torque / 1,8 x Nominal Çıkış Torku				
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	125 ~ 1000	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku				
Rated Input Speed / Nominal Giriş Devri	$n_{1N}$	rpm	125 ~ 1000	3,000	3,000	3,000	3,000	2,000
Max. Input Speed / Max. Giriş Devri	$n_{1B}$	rpm	125 ~ 1000	6,000	5,000	5,000	4,000	3,000
Backlash Ps / Min. Boşluk Oranı		arcmin	125 ~ 1000	-	≤ 5	≤ 5	≤ 5	≤ 5
Backlash P0 / Düşük Boşluk Oranı		arcmin	125 ~ 1000	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
Backlash P1 / Azaltılmış Boşluk Oranı		arcmin	125 ~ 1000	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9
Backlash P2 / Standart Boşluk Oranı		arcmin	125 ~ 1000	≤ 11	≤ 11	≤ 11	≤ 11	≤ 11
Torsional Rigidity / Burulma Direnci		Nm/arcmin	125 ~ 1000	14	27	60	140	240
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	125 ~ 1000	3,200	6,800	9,300	15,600	51,000
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	125 ~ 1000	1,600	3,400	4,650	7,800	25,500
Service Life / Hizmet Ömrü	$L_H$	hr	125 ~ 1000	S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)				
Efficiency / Verim	$\eta$	%	125 ~ 1000	≥ 90				
Operating Temperature / Çalışma Sıcaklığı		°C	125 ~ 1000	- 25° C ~ + 90° C				
Lubrication / Yağlama			125 ~ 1000	Synthetic Grease / Sentetik Gres				
Protection Class / Koruma Sınıfı			125 ~ 1000	IP65				
Mounting Position / Montaj Pozisyonu			125 ~ 1000	Any / Her Yönde				
Noise Level / Ses Seviyesi		dB	125 ~ 1000	≤ 60	≤ 63	≤ 65	≤ 67	≤ 70
Weight / Ağırlık ±3%		Kg	125 ~ 1000	5.2	10	18.1	35	63.7

#### ■ Mass Moments of Inertia / Atalet Ağırlık Momenti (kg.cm<sup>2</sup>)

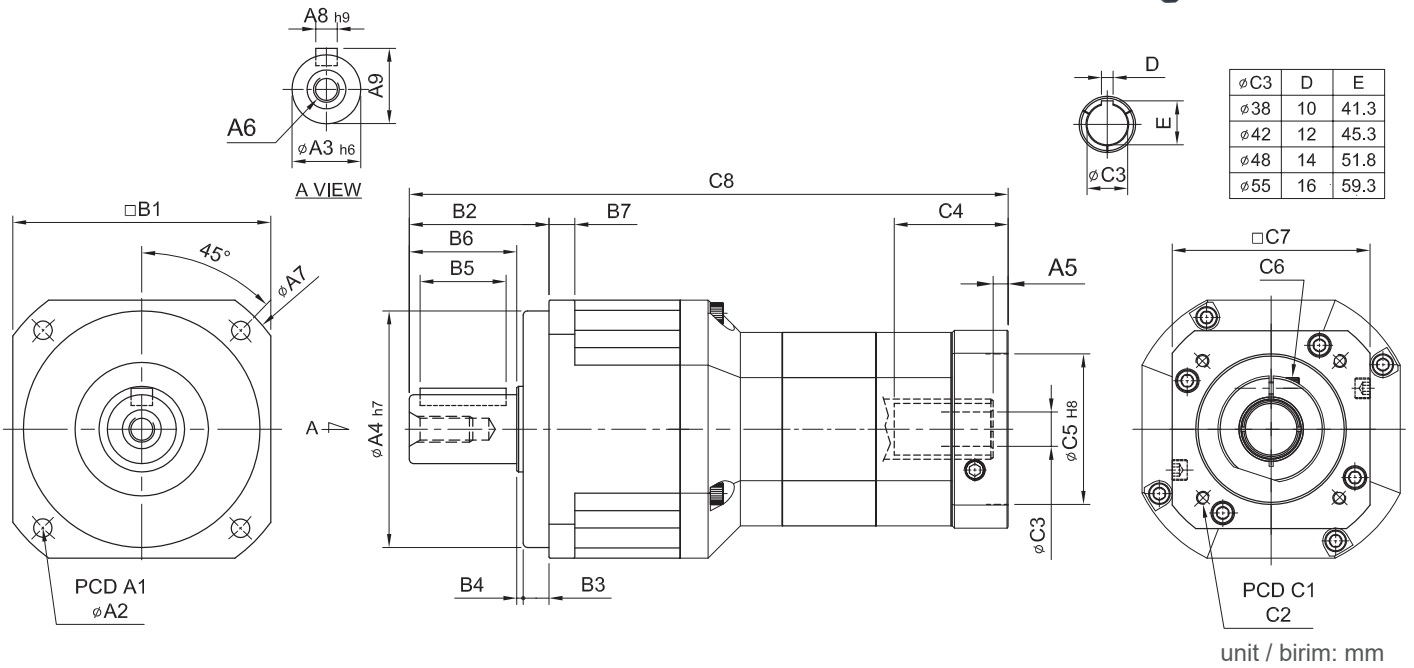
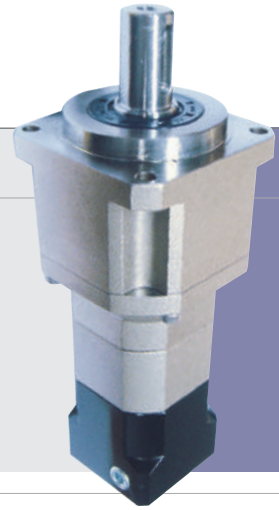
Ratio / Çevrim	90	120	142	180	220
125	0.01	0.04	0.71	1.42	3.29
150	0.01	0.04	0.51	0.92	2.15
175	0.01	0.04	0.40	0.83	1.26
200	0.01	0.04	0.21	0.65	0.98
250	0.01	0.04	0.11	0.52	0.82
300	0.01	0.04	0.09	0.21	0.82
350	0.01	0.04	0.09	0.21	0.82
400	0.01	0.04	0.09	0.21	0.82
450	0.01	0.04	0.09	0.21	0.51
500	0.01	0.04	0.08	0.12	0.51
600	0.01	0.04	0.08	0.12	0.25
700	0.01	0.04	0.08	0.12	0.25
800	0.01	0.04	0.08	0.12	0.25
900	0.01	0.04	0.08	0.12	0.25
1000	0.01	0.04	0.08	0.12	0.25

# SERVOBOX

## MODEL : SB-A

3-Stage / Kademe

RATIO / ÇEVİRİM : 125,150,175,200,250,300,350,400,  
450,500,600,700,800,900,1000



unit / birim: mm

Model Code	62A	90A	120A	142A	180A	220A
<b>A</b>						
A1	70	100	130	165	215	250
A2	5.5	6.8	9	11	13	17
A3	16	22	32	40	55	75
A4	50	80	110	130	160	180
A5	5	6	9 · 23.5	10 · 20	10	11.5 · 13.5
A6	M5 x P0.8	M8 x P1.25	M10 x P1.5	M12 x P1.75	M14 x P2.0	M16 x P2.0
A7	80	116	148	186	238	288
A8	5	6	10	12	16	20
A9	18	24.5	35	43	59	79.5
<b>B</b>						
B1	62	90	120	142	180	220
B2	36	48	65	92	106	139
B3	7	10	12	15	20	30
B4	1	2	3	3	4	5
B5	20	30	40	65	70	90
B6	28	36	50	74	82	104
B7	8	10	12	15	16	20
<b>C</b>						
C1	46 · 63 · 60	70 · 75 · 90	90 · 100 · 115 · 145	115 · 145 · 165	145 · 165 · 200	200 · 215 · 265
C2	M3 · M4 · M5	M4 · M5 · M6	M5 · M6 · M8	M6 · M8 · M10	M8 · M10 · M12	M10 · M12
C3	8 · 9 · 11	14 · 19	19 · 22 · 24	24 · 28 · 32	28 · 32 · 35	38 · 42 · 48 · 55
C4	26	33.5 · 41.5	59 · 73.5	67 · 77	84.5	114.5 · 116.5
C5	30 · 40 · 50	50 · 60 · 70	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180	114.3 · 180 · 230
C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5
C7	46 · 55	64 · 70 · 80	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190	182 · 200 · 250
C8	165.5	206.3 · 214.3	284.5 · 299	354.5 · 364.5	425	527.5



Model No.		Unit/Birim	Ratio Çevrim	62A	90A	120A	142A	180A	220A
Nominal output torque / Nominal Çıkış Torku	$T_{2N}$	Nm	125	48	160	333	618	1,189	2,010
			150	59	165	335	625	1,206	2,030
			175	45	149	309	573	1,108	1,870
			200	51	146	300	555	1,069	1,804
			250	48	160	333	618	1,189	2,010
			300	45	151	311	583	1,118	1,911
			350	45	149	309	573	1,108	1,870
			400	43	143	298	553	1,070	1,824
			450	44	145	278	516	993	1,694
			500	48	160	333	618	1,189	2,010
			600	45	151	311	583	1,118	1,911
			700	45	149	309	573	1,108	1,870
800	43	143	298	553	1,070	1,824			
900	44	145	278	516	993	1,694			
1000	43	141	294	549	1,059	1,779			
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	125 ~ 1000	1.8 Times of Rated Output Torque / 1,8 x Nominal Çıkış Torku					
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	125 ~ 1000	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku					
Rated Input Speed / Nominal Giriş Devri	$n_{IN}$	rpm	125 ~ 1000	3,000	3,000	3,000	3,000	3,000	2,000
Max. Input Speed / Max. Giriş Devri	$n_{IB}$	rpm	125 ~ 1000	6,000	6,000	5,000	5,000	4,000	3,000
Backlash Ps / Min. Boşluk Oranı		arcmin	125 ~ 1000	-	-	≤ 5	≤ 5	≤ 5	≤ 5
Backlash P0 / Düşük Boşluk Oranı		arcmin	125 ~ 1000	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
Backlash P1 / Azaltılmış Boşluk Oranı		arcmin	125 ~ 1000	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9
Backlash P2 / Standart Boşluk Oranı		arcmin	125 ~ 1000	≤ 11	≤ 11	≤ 11	≤ 11	≤ 11	≤ 11
Torsional Rigidity / Burulma Direnci		Nm/arcmin	125 ~ 1000	6	14	27	60	140	240
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	125 ~ 1000	1,180	3,200	6,800	9,300	15,600	51,000
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	125 ~ 1000	590	1,600	3,400	4,650	7,800	25,500
Service Life / Hizmet Ömrü	$L_H$	hr	125 ~ 1000	S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)					
Efficiency / Verim	$\eta$	%	125 ~ 1000	≥ 90					
Operating Temperature / Çalışma Sıcaklığı		°C	125 ~ 1000	- 25° C ~ + 90° C					
Lubrication / Yağlama			125 ~ 1000	Synthetic Grease / Sentetik Gres					
Protection Class / Koruma Sınıfı			125 ~ 1000	IP65					
Mounting Position / Montaj Pozisyonu			125 ~ 1000	Any / Her Yönde					
Noise Level / Ses Seviyesi		dB	125 ~ 1000	≤ 58	≤ 60	≤ 63	≤ 65	≤ 67	≤ 70
Weight / Ağırlık ±3%		Kg	125 ~ 1000	4	6.5	13	30	57	87

#### ■ Mass Moments of Inertia / Atalet Ağırlık Momenti (kg.cm<sup>2</sup>)

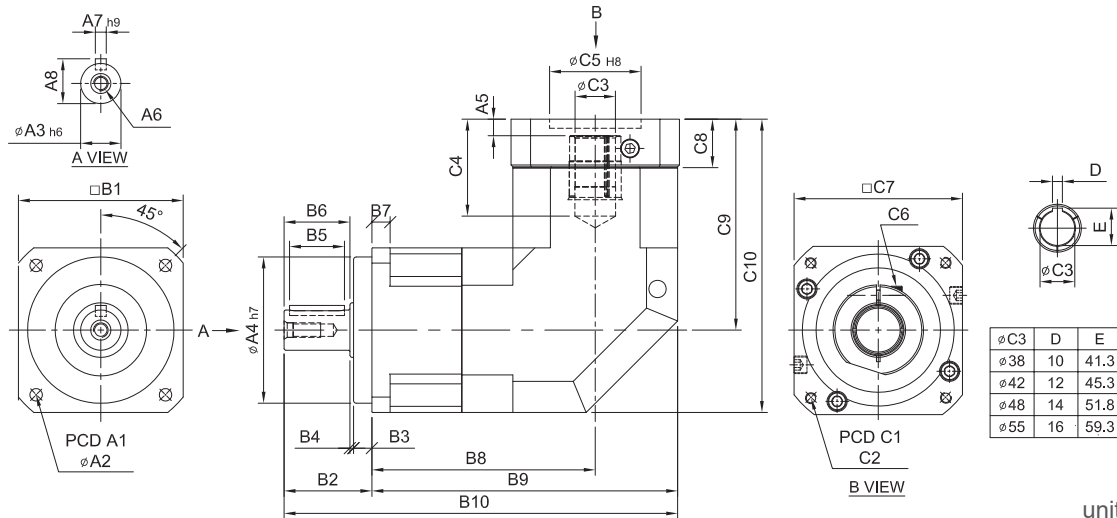
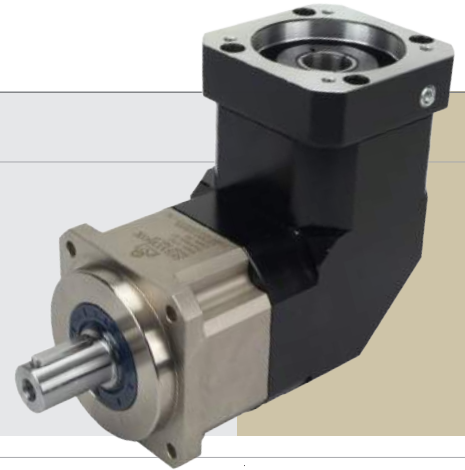
Ratio / Çevrim	62A	90A	120A	142A	180A	220A
125	0.01	0.01	0.04	0.71	1.42	3.29
150	0.01	0.01	0.04	0.51	0.92	2.15
175	0.01	0.01	0.04	0.40	0.83	1.26
200	0.01	0.01	0.04	0.21	0.65	0.98
250	0.01	0.01	0.04	0.11	0.52	0.82
300	0.01	0.01	0.04	0.09	0.21	0.82
350	0.01	0.01	0.04	0.09	0.21	0.82
400	0.01	0.01	0.04	0.09	0.21	0.82
450	0.01	0.01	0.04	0.09	0.21	0.51
500	0.01	0.01	0.04	0.08	0.12	0.51
600	0.01	0.01	0.04	0.08	0.12	0.25
700	0.01	0.01	0.04	0.08	0.12	0.25
800	0.01	0.01	0.04	0.08	0.12	0.25
900	0.01	0.01	0.04	0.08	0.12	0.25
1000	0.01	0.01	0.04	0.08	0.12	0.25

# SERVOBOX

## MODEL : SBL

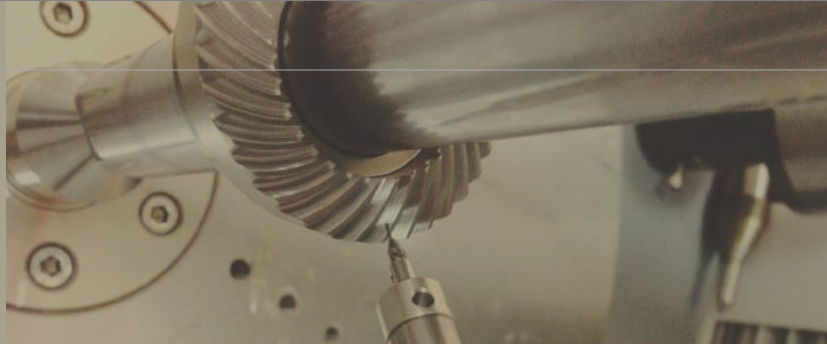
1-Stage / Kademe

RATIO / ÇEVİRİM : 3, 4, 5, 6, 7, 8, 9, 10, 12, 14, 16, 18, 20



unit / birim: mm

Model Code	44	62	90	120	142	180	220
<b>A</b>							
A1	50	70	100	130	165	215	250
A2	4.5	5.5	6.8	9	11	13	17
A3	13	16	22	32	40	55	75
A4	35	50	80	110	130	160	180
A5	6	6	9 · 23.5	10 · 20	10	12.5 · 14.5	12.5 · 14.5
A6	M4 x P0.7	M5 x P0.8	M8 x P1.25	M10 x P1.5	M12 x P1.75	M14 x P2.0	M16 x P2.0
A7	5	5	6	10	12	16	20
A8	15	18	24.5	35	43	59	79.5
<b>B</b>							
B1	44	62	90	120	142	180	220
B2	26	36	48	65	92	106	139
B3	5	7	10	12	15	20	30
B4	1	1	2	3	3	4	5
B5	15	20	30	40	65	70	90
B6	20	28	36	50	74	82	104
B7	5	8	10	12	15	16	20
B8	76	84.5	122.1	148	165.5	223.6	231.6
B9	98	115.5	167.1	208	236.5	313.6	341.6
B10	124	151.5	215	273	328.5	419.6	480.6
<b>C</b>							
C1	46 · 60 · 63	70 · 75 · 90	90 · 110 · 115 · 145	115 · 145 · 165	145 · 165 · 200	200 · 215 · 265	200 · 265 · 300
C2	M3 · M4 · M5	M4 · M5 · M6	M5 · M6 · M8	M6 · M8 · M10	M8 · M10 · M12	M10 · M12 · M16	M12 · M16
C3	8 · 9 · 11	14 · 19	19 · 22 · 24	24 · 28 · 32	28 · 32 · 35	38 · 42 · 48 · 55	42 · 48 · 55
C4	27	33.5 · 41.5	53 · 67.5	67 · 77	85	117 · 119	117 · 119
C5	30 · 40 · 50	50 · 60 · 70	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180	114.3 · 180 · 230	114.3 · 230 · 250
C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5	M10 x P1.5
C7	46 · 55	64 · 70 · 80	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190	182 · 200 · 250	222 · 250 · 265
C8	16	21.5	26.5 · 41	35.5 · 45.5	35.5	45.5 · 47.5	45.5 · 47.5
C9	61	77 · 85	115.3 · 129.8	141 · 151	174	235 · 237	235
C10	83	108 · 116	160.3 · 174.8	201 · 211	245	325 · 327	345



Model No.		Unit/Birim	Ratio Çevrim	44	62	90	120	142	180	220
Nominal output torque / Nominal Çıkış Torku	$T_{2N}$	Nm	3	19	59	165	335	625	1,206	2,030
			4	16	51	146	300	555	1,069	1,804
			5	16	48	160	333	618	1,189	2,010
			6	15	45	151	311	583	1,118	1,911
			7	15	45	149	309	573	1,108	1,870
			8	14	43	143	298	553	1,070	1,824
			9	13	44	145	278	516	993	1,694
			10	14	43	141	294	549	1,059	1,179
			12	15	45	151	311	583	1,118	1,911
			14	15	45	149	309	573	1,108	1,870
			16	14	43	143	298	553	1,070	1,824
18	13	44	145	278	516	993	1,694			
20	14	43	141	294	549	1,059	1,179			
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	3 ~ 20	1.8 Times of Rated Output Torque / 1,8 x Nominal Çıkış Torku						
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	3 ~ 20	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku						
Rated Input Speed / Nominal Giriş Devri	$n_{IN}$	rpm	3 ~ 20	3,000	3,000	3,000	3,000	3,000	3,000	2,000
Max. Input Speed / Max. Giriş Devri	$n_{IB}$	rpm	3 ~ 20	6,000	6,000	6,000	5,000	5,000	4,000	3,000
Backlash Ps / Min. Boşluk Oranı		arcmin	3 ~ 20	-	-	≤ 2	≤ 2	≤ 2	≤ 2	≤ 2
Backlash P0 / Düşük Boşluk Oranı		arcmin	3 ~ 20	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4
Backlash P1 / Azaltılmış Boşluk Oranı		arcmin	3 ~ 20	≤ 6	≤ 6	≤ 6	≤ 6	≤ 6	≤ 6	≤ 6
Backlash P2 / Standart Boşluk Oranı		arcmin	3 ~ 20	≤ 8	≤ 8	≤ 8	≤ 8	≤ 8	≤ 8	≤ 8
Torsional Rigidity / Burulma Direnci		Nm/arcmin	3 ~ 20	3	6	14	27	60	140	240
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	3 ~ 20	380	1,180	3,200	6,800	9,300	15,600	51,000
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	3 ~ 20	190	590	1,600	3,400	4,650	7,800	25,500
Service Life / Hizmet Ömrü	$L_H$	hr	3 ~ 20	S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)						
Efficiency / Verim	$\eta$	%	3 ~ 20	≥ 95						
Operating Temperature / Çalışma Sıcaklığı		°C	3 ~ 20	- 25° C ~ + 90° C						
Lubrication / Yağlama			3 ~ 20	Synthetic Grease / Sentetik Gres						
Protection Class / Koruma Sınıfı			3 ~ 20	IP65						
Mounting Position / Montaj Pozisyonu			3 ~ 20	Any / Her Yönde						
Noise Level / Ses Seviyesi		dB	3 ~ 20	≤ 65	≤ 68	≤ 70	≤ 72	≤ 74	≤ 76	≤ 78
Weight / Ağırlık ±3%		Kg	3 ~ 20	1	2.3	6.6	13.2	22.3	50	75.2

#### ■ Mass Moments of Inertia / Atalet Ağırlık Momenti (kg.cm<sup>2</sup>)

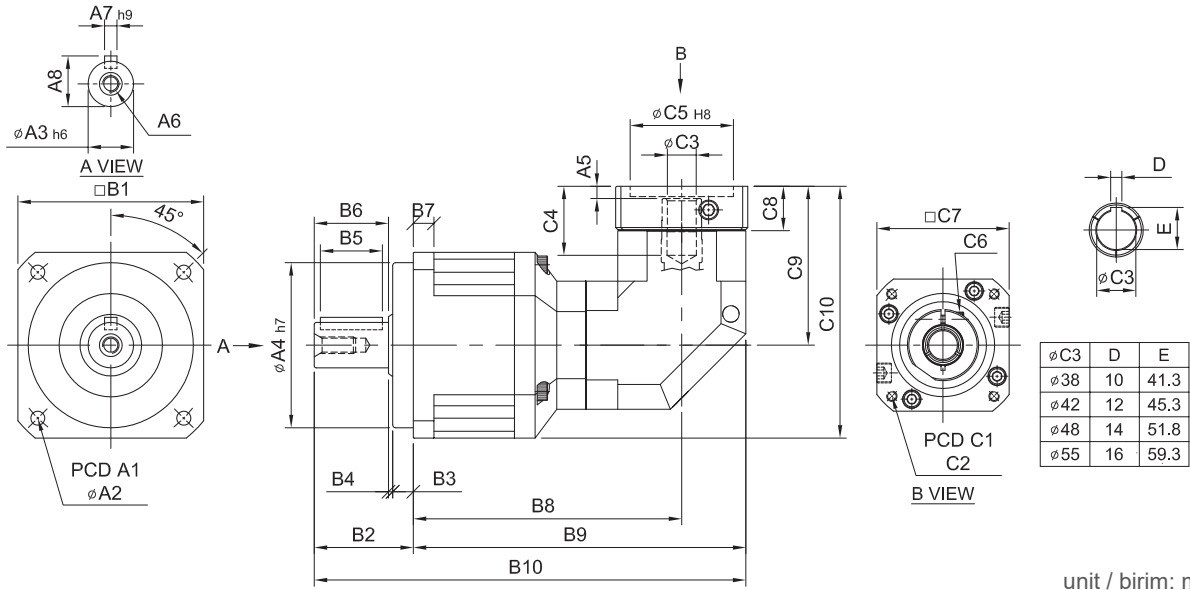
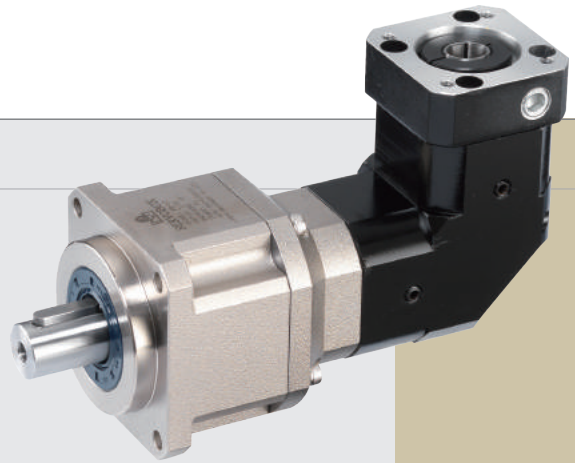
Ratio / Çevrim	44	62	90	120	142	180	220
3	0.09	0.36	2.28	6.85	23.5	68.2	135
4	0.09	0.36	2.28	6.85	23.5	68.2	135
5	0.09	0.36	2.28	6.85	23.5	68.2	135
6	0.09	0.36	2.28	6.85	23.5	68.2	135
7	0.09	0.36	2.28	6.85	23.5	68.2	135
8	0.09	0.36	2.28	6.85	23.5	68.2	135
9	0.09	0.36	2.28	6.85	23.5	68.2	135
10	0.09	0.36	2.28	6.85	23.5	68.2	135
12	0.03	0.08	1.88	6.2	21.8	65.5	119.2
14	0.03	0.08	1.88	6.2	21.8	65.5	119.2
16	0.03	0.08	1.88	6.2	21.8	65.5	119.2
18	0.03	0.08	1.88	6.2	21.8	65.5	119.2
20	0.03	0.08	1.88	6.2	21.8	65.5	119.2

# SERVOBOX

## MODEL : SBL

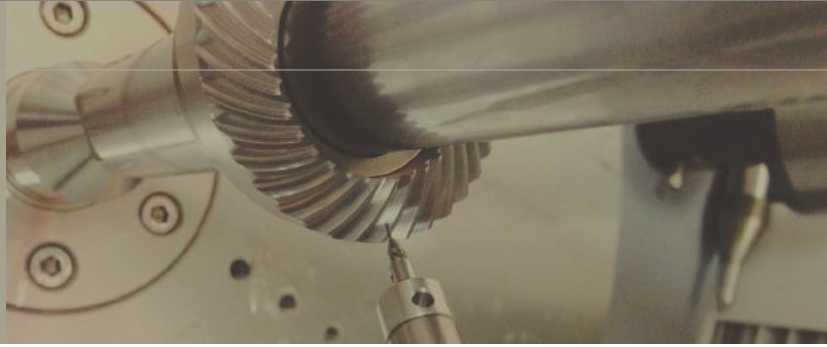
2-Stage / Kademe

RATIO / ÇEVİRİM : 15, 20, 25, 30, 35, 40, 50, 60, 70, 80, 90, 100, 120, 140, 160, 180, 200



unit / birim: mm

Model Code	62	90	120	142	180	220
<b>A</b>						
A1	70	100	130	165	215	250
A2	5.5	6.8	9	11	13	17
A3	16	22	32	40	55	75
A4	50	80	110	130	160	180
A5	6	6	9 · 23.5	10 · 20	10	12.5 · 14.5
A6	M5 x P0.8	M8 x P1.25	M10 x P1.5	M12 x P1.75	M14 x P2.0	M16 x P2.0
A7	5	6	10	12	16	20
A8	18	24.5	35	43	59	79.5
<b>B</b>						
B1	62	90	120	142	180	220
B2	36	48	65	92	106	139
B3	7	10	12	15	20	30
B4	1	2	3	3	4	5
B5	20	30	40	65	70	90
B6	28	36	50	74	82	104
B7	8	10	12	15	16	20
B8	110.5	130	181.6	214.5	249.5	313.6
B9	132.5	161	266.6	274.5	320.5	403.6
B10	168.5	209	291.6	366.5	426.5	542.6
<b>C</b>						
C1	46 · 60 · 63	70 · 75 · 90	90 · 110 · 115 · 145	115 · 145 · 165	145 · 165 · 200	200 · 215 · 265
C2	M3 · M4 · M5	M4 · M5 · M6	M5 · M6 · M8 · M10	M6 · M8 · M10	M8 · M10 · M12	M10 · M12 · M16
C3	8 · 9 · 11	14 · 19	19 · 22 · 24	24 · 82 · 32	32 · 35 · 38	38 · 42 · 48 · 55
C4	27	33.5 · 41.5	53 · 67.5	67 · 77	85	117 · 119
C5	30 · 40 · 50	50 · 60 · 70	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180	114.3 · 180 · 230
C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5
C7	46 · 55	64 · 70 · 80	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190	182 · 200 · 250
C8	16	21.5	26.5 · 41	35.5 · 45.5	35.5	45.5 · 47.5
C9	61	77 · 85	115.3 · 129.8	141 · 151	174	235 · 237
C10	92	122 · 130	175.3 · 189.8	212 · 222	264	345 · 347



Model No.		Unit/Birim	Ratio Çevrim	62	90	120	142	180	220
Nominal output torque / Nominal Çıkış Torku	$T_{2N}$	Nm	15	59	165	335	625	1,206	2,030
			20	51	146	300	555	1,069	1,804
			25	48	160	333	618	1,189	2,010
			30	45	151	311	583	1,118	1,911
			35	45	149	309	573	1,108	1,870
			40	43	143	298	553	1,070	1,824
			50	48	160	333	618	1,189	2,010
			60	45	151	311	583	1,118	1,911
			70	45	149	309	573	1,108	1,870
			80	43	143	298	553	1,070	1,824
			90	44	145	278	516	993	1,694
			100	43	141	294	549	1,059	1,779
			120	45	151	311	583	1,118	1,911
			140	45	149	309	573	1,108	1,870
			160	43	143	298	553	1,070	1,824
180	44	145	278	516	993	1,694			
200	43	141	294	549	1,059	1,779			
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	15 ~ 200	1.8 Times of Rated Output Torque / 1,8 x Nominal Çıkış Torku					
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	15 ~ 200	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku					
Rated Input Speed / Nominal Giriş Devri	$n_{IN}$	rpm	15 ~ 200	3,000	3,000	3,000	3,000	3,000	2,000
Max. Input Speed / Max. Giriş Devri	$n_{IB}$	rpm	15 ~ 200	6,000	6,000	5,000	5,000	4,000	4,000
Backlash Ps / Min. Boşluk Oranı		arcmin	15 ~ 200	-	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4
Backlash P0 / Düşük Boşluk Oranı		arcmin	15 ~ 200	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
Backlash P1 / Azaltılmış Boşluk Oranı		arcmin	15 ~ 200	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9
Backlash P2 / Standart Boşluk Oranı		arcmin	15 ~ 200	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12
Torsional Rigidity / Burulma Direnci		Nm/arcmin	15 ~ 200	6	14	27	60	140	240
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	15 ~ 200	1,180	3,200	6,800	9,300	15,600	51,000
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	15 ~ 200	590	1,600	3,400	4,650	7,800	25,500
Service Life / Hizmet Ömrü	$L_H$	hr	15 ~ 200	S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)					
Efficiency / Verim	$\eta$	%	15 ~ 200	≥ 92					
Operating Temperature / Çalışma Sıcaklığı		°C	15 ~ 200	- 25° C ~ + 90° C					
Lubrication / Yağlama			15 ~ 200	Synthetic Grease / Sentetik Gres					
Protection Class / Koruma Sınıfı			15 ~ 200	IP65					
Mounting Position / Montaj Pozisyonu			15 ~ 200	Any / Her Yönde					
Noise Level / Ses Seviyesi		dB	15 ~ 200	≤ 68	≤ 70	≤ 72	≤ 74	≤ 76	≤ 78
Weight / Ağırlık ±3%		Kg	15 ~ 200	2	5.5	12.5	23.2	44.4	79.5

#### ■ Mass Moments of Inertia / Atalet Ağırlık Momenti (kg.cm<sup>2</sup>)

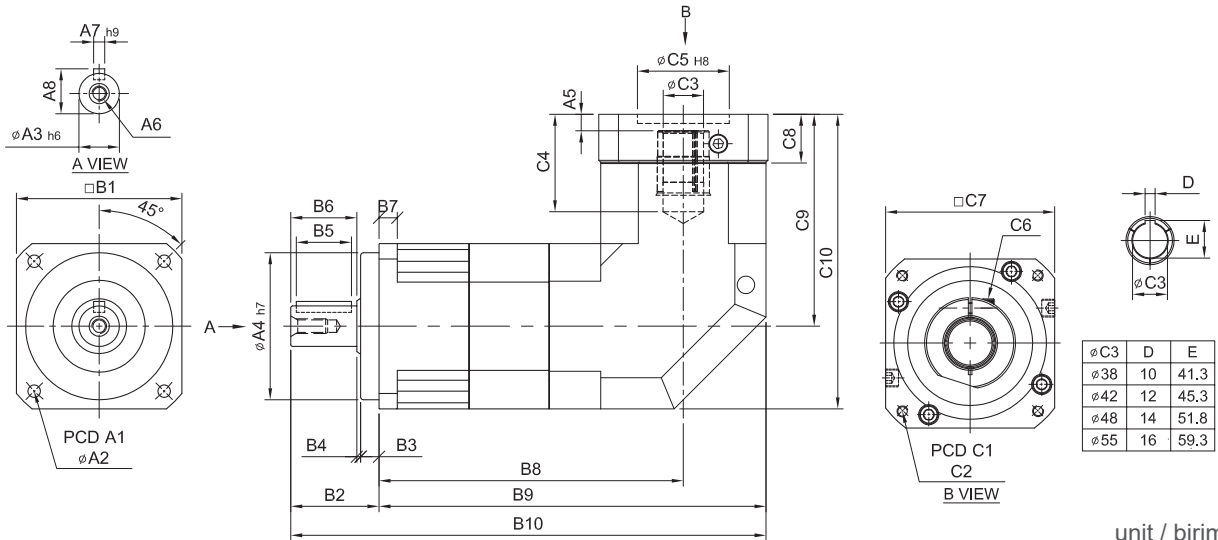
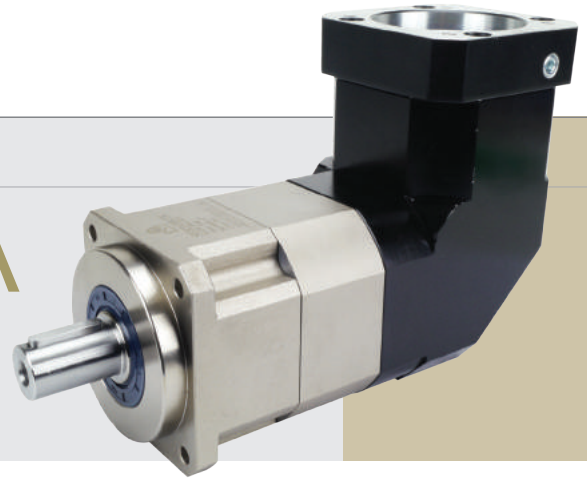
Ratio / Çevrim	62	90	120	142	180	220
15	0.09	0.36	2.28	6.85	26.2	70.1
20	0.09	0.36	2.28	6.85	26.2	70.1
25	0.09	0.36	2.28	6.85	23.1	68.2
30	0.09	0.36	2.28	6.85	23.1	68.2
35	0.09	0.36	2.28	6.85	23.1	68.2
40	0.09	0.36	2.28	6.85	23.1	68.2
50	0.09	0.36	2.28	6.85	23.1	68.2
60	0.09	0.36	2.28	6.85	23.1	68.2
70	0.09	0.36	2.28	6.85	23.1	68.2
80	0.09	0.36	2.28	6.85	23.1	68.2
90	0.09	0.36	2.28	6.85	23.1	68.2
100	0.09	0.36	2.28	6.85	23.1	68.2
120	0.03	0.10	1.88	6.20	21.2	65.1
140	0.03	0.10	1.88	6.20	21.2	65.1
160	0.03	0.10	1.88	6.20	21.2	65.1
180	0.03	0.10	1.88	6.20	21.2	65.1
200	0.03	0.10	1.88	6.20	21.2	65.1

# SERVOBOX

## MODEL : SBL-A

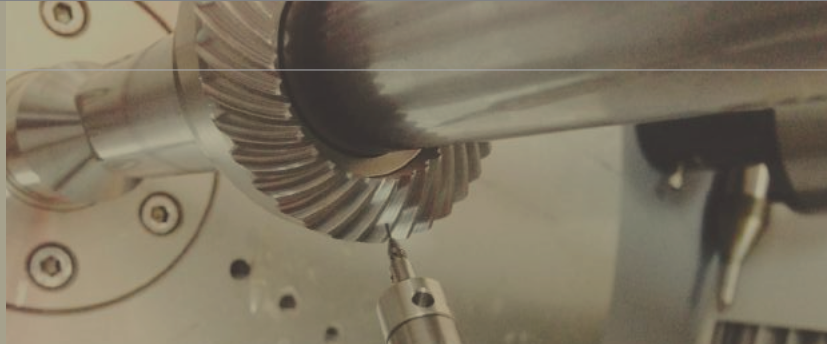
2-Stage / Kademe

RATIO / ÇEVİRİM : 15,20,25,30,35,40,50,60,70,80  
90,100,120,140,160,180,200



unit / birim: mm

Model Code	44A	62A	90A	120A	142A	180A	220A
<b>A</b>	A1	50	70	100	130	165	215
	A2	4.5	5.5	6.8	9	11	13
	A3	13	16	22	32	40	55
	A4	35	50	80	110	130	160
	A5	6	6	9 · 23.5	10 · 20	10	12.5 · 14.5
	A6	M4 x P0.7	M5 x P0.8	M8 x P1.25	M10 x P1.5	M12 x P1.75	M14 x P2.0
	A7	5	5	6	10	12	16
	A8	15	18	24.5	35	43	59
<b>B</b>	B1	44	62	90	120	142	180
	B2	26	36	48	65	92	106
	B3	5	7	10	12	15	20
	B4	1	1	2	3	3	4
	B5	15	20	30	40	65	70
	B6	20	28	36	50	74	82
	B7	5	8	10	12	15	16
	B8	102	118.3	165.6	204	232	304.6
	B9	124	149.3	210.6	264	303	394.6
	B10	150	185.3	258.6	329	395	500.6
<b>C</b>	C1	46 · 60 · 63	70 · 75 · 90	90 · 110 · 115 · 145	115 · 145 · 165	145 · 165 · 200	200 · 215 · 265
	C2	M3 · M4 · M5	M4 · M5 · M6	M5 · M6 · M8	M6 · M8 · M10	M8 · M10 · M12	M10 · M12 · M16
	C3	8 · 9 · 11	14 · 19	19 · 22 · 24	24 · 28 · 32	28 · 32 · 35	38 · 42 · 48 · 55
	C4	27	33.5 · 41.5	53 · 67.5	67 · 77	85	117 · 119
	C5	30 · 40 · 50	50 · 60 · 70	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180	114.3 · 180 · 230
	C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5
	C7	46 · 55	64 · 70 · 80	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190	182 · 200 · 250
	C8	16	21.5	26.5 · 41	35.5 · 45.5	35.5	45.5 · 47.5
	C9	61	77 · 85	115.3 · 129.8	141 · 151	174	235 · 237
	C10	83	108 · 116	160.3 · 174.8	201 · 211	245	325 · 327



Model No.		Unit/Birim	Ratio Çevrim	44A	62A	90A	120A	142A	180A	220A
Nominal output torque / Nominal Çıkış Torku	$T_{2N}$	Nm	15	19	59	165	335	625	1,206	2,030
			20	16	51	146	300	555	1,069	1,804
			25	16	48	160	333	618	1,189	2,010
			30	15	45	151	311	583	1,118	1,911
			35	15	45	149	309	573	1,108	1,870
			40	14	43	143	298	553	1,070	1,824
			50	16	48	160	333	618	1,189	2,010
			60	15	45	151	311	583	1,118	1,911
			70	15	45	149	309	573	1,108	1,870
			80	14	43	143	298	553	1,070	1,824
			90	13	44	145	278	516	993	1,694
			100	14	43	141	294	549	1,059	1,779
			120	15	45	151	311	583	1,118	1,911
			140	15	45	149	309	573	1,108	1,870
			160	14	43	143	298	553	1,070	1,824
180	13	44	145	278	516	993	1,694			
200	14	43	141	294	549	1,059	1,779			
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	15 ~ 200	1.8 Times of Rated Output Torque / 1,8 x Nominal Çıkış Torku						
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	15 ~ 200	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku						
Rated Input Speed / Nominal Giriş Devri	$n_{1N}$	rpm	15 ~ 200	3,000	3,000	3,000	3,000	3,000	3,000	2,000
Max. Input Speed / Max. Giriş Devri	$n_{1B}$	rpm	15 ~ 200	6,000	6,000	6,000	5,000	5,000	4,000	3,000
Backlash Ps / Min. Boşluk Oranı		arcmin	15 ~ 200	-	-	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4
Backlash P0 / Düşük Boşluk Oranı		arcmin	15 ~ 200	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
Backlash P1 / Azaltılmış Boşluk Oranı		arcmin	15 ~ 200	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9
Backlash P2 / Standart Boşluk Oranı		arcmin	15 ~ 200	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12
Torsional Rigidity / Burulma Direnci		Nm/arcmin	15 ~ 200	3	6	14	27	60	140	240
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	15 ~ 200	380	1,180	3,200	6,800	9,300	15,600	51,000
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	15 ~ 200	190	590	1,600	3,400	4,650	7,800	25,500
Service Life / Hizmet Ömrü	$L_H$	hr	15 ~ 200	S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)						
Efficiency / Verim	$\eta$	%	15 ~ 200	≥ 92						
Operating Temperature / Çalışma Sıcaklığı		°C	15 ~ 200	- 25° C ~ + 90° C						
Lubrication / Yağlama			15 ~ 200	Synthetic Grease / Sentetik Gres						
Protection Class / Koruma Sınıfı			15 ~ 200	IP65						
Mounting Position / Montaj Pozisyonu			15 ~ 200	Any / Her Yönde						
Noise Level / Ses Seviyesi		dB	15 ~ 200	≤ 65	≤ 68	≤ 70	≤ 72	≤ 74	≤ 76	≤ 78
Weight / Ağırlık ±3%		Kg	15 ~ 200		3	8.2	12.5	23.2	52.4	94.5

#### ■ Mass Moments of Inertia / Atalet Ağırlık Momenti (kg.cm<sup>2</sup>)

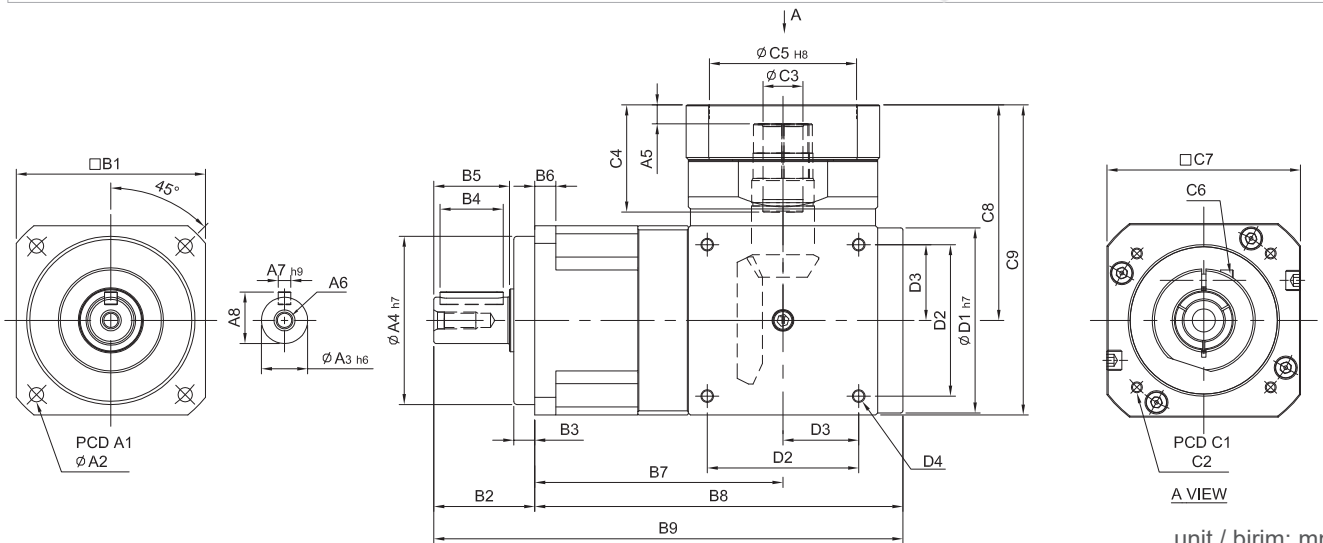
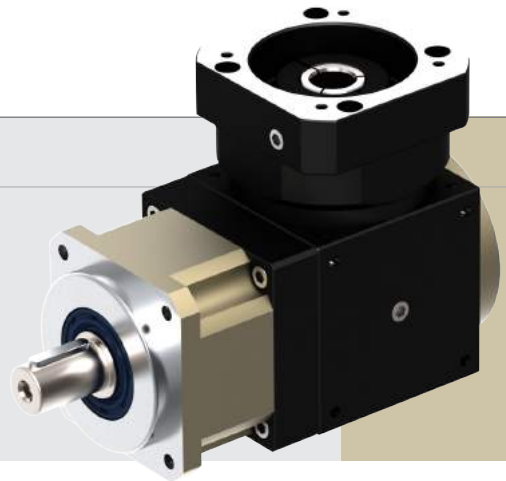
Ratio / Çevrim	44A	62A	90A	120A	142A	180A	220A
15	0.09	0.36	2.28	6.85	23.45	55.2	80.2
20	0.09	0.36	2.28	6.85	23.45	55.2	80.2
25	0.09	0.36	2.28	6.85	23.45	50.4	76.5
30	0.09	0.36	2.28	6.85	23.5	50.4	76.5
35	0.09	0.36	2.28	6.85	23.5	50.4	76.5
40	0.09	0.36	2.28	6.85	23.5	50.4	76.5
50	0.09	0.36	2.28	6.85	23.5	50.4	76.5
60	0.09	0.36	2.28	6.85	23.5	50.4	76.5
70	0.09	0.36	2.28	6.85	23.5	50.4	76.5
80	0.09	0.36	2.28	6.85	23.5	50.4	76.5
90	0.09	0.36	2.28	6.85	23.5	50.4	76.5
100	0.09	0.36	2.28	6.85	23.5	50.4	76.5
120	0.03	0.08	1.88	6.2	21.8	48.7	74.2
140	0.03	0.08	1.88	6.2	21.8	48.7	74.2
160	0.03	0.08	1.88	6.2	21.8	48.7	74.2
180	0.03	0.08	1.88	6.2	21.8	48.7	74.2
200	0.03	0.08	1.88	6.2	21.8	48.7	74.2

# SERVOBOX

## MODEL : SBT

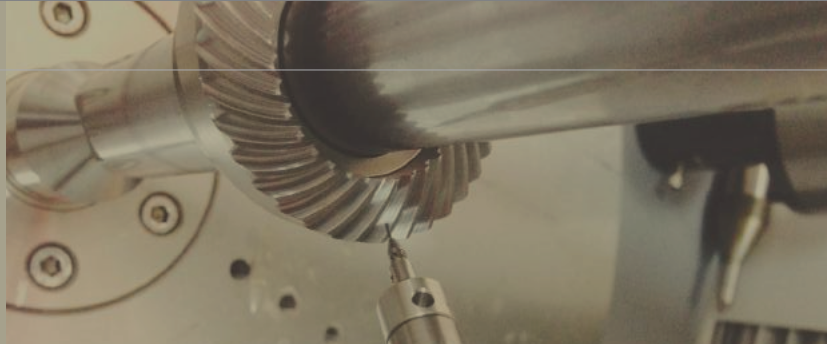
2-Stage / Kademe

RATIO / ÇEVİRİM : 3, 4, 5, 6, 7, 8, 9, 10, 15, 20, 25, 30  
35, 40, 45, 50



unit / birim: mm

Model Code	44	62	90	120	142	180
<b>A</b>						
A1	50	70	100	130	165	215
A2	4.5	5.5	6.8	9	11	13
A3	13	16	22	32	40	55
A4	35	50	80	110	130	160
A5	5	7	9 · 23.5	9 · 23.5	10	9.5
A6	M4 x P0.7	M5 x P0.8	M8 x P1.25	M10 x P1.5	M12 x P1.75	M14 x P2.0
A7	5	5	6	10	12	16
A8	15	18	24.5	35	43	59
<b>B</b>						
B1	44	62	90	120	142	180
B2	26	36	48	65	92	106
B3	5	7	10	12	15	20
B4	15	20	30	40	65	70
B5	20	28	36	50	74	82
B6	5	8	10	12	15	16
B7	67.5	87.5	118	145	160	207
B8	99.5	128	175	215	245	307
B9	125.5	164	223	280	352	413
<b>C</b>						
C1	46 · 60 · 63	70 · 75 · 90	90 · 100 · 115 · 145	90 · 100 · 115 · 145	115 · 145 · 165	145 · 165 · 200
C2	M3 · M4 · M5	M4 · M5 · M6	M5 · M6 · M8	M5 · M6 · M8	M6 · M8 · M10	M8 · M10 · M12
C3	8 · 11	14	19 · 24	22 · 24	28 · 32	35 · 38
C4	25	36	51 · 65.5	51 · 65.5	68	84.5
C5	30 · 40 · 50	50 · 60 · 70	70 · 80 · 95 · 110	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180
C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M6 x P1.0	M8 x P1.25	M10 x P1.5
C7	42	64 · 70 · 80	92 · 110 · 130	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190
C8	53	77	103 · 117	122 · 136	154	189
C9	78	110	148 · 162	177 · 191	225	279
<b>D</b>						
D1	48	62	88	106	135	164
D2	-	52	72	88	110	134
D3	-	26	36	44	55	67
D4	-	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M12 x P1.75



Model No.		Unit/Birim	Ratio Çevrim	44	62	90	120	142	180
Nominal output torque / Nominal Çıkış Torku	$T_{2N}$	Nm	3	19	59	165	335	625	1,206
			4	16	51	146	300	555	1,069
			5	16	48	160	333	618	1,189
			6	15	45	151	311	583	1,118
			7	15	45	149	309	573	1,108
			8	14	43	143	298	553	1,070
			9	13	44	145	278	516	993
			10	16	48	160	333	618	1,189
			15	16	48	160	333	618	1,189
			20	16	48	160	333	618	1,189
			25	16	48	160	333	618	1,189
			30	15	45	151	311	583	1,118
			35	15	45	149	309	573	1,108
			40	14	43	143	298	553	1,070
			45	13	44	145	278	516	993
50	14	43	141	294	549	1,059			
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	3 ~ 50	1.8 Times of Rated Output Torque / 1,8 x Nominal Çıkış Torku					
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	3 ~ 50	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku					
Rated Input Speed / Nominal Giriş Devri	$n_{IN}$	rpm	3 ~ 50	3,000	3,000	3,000	3,000	3,000	3,000
Max. Input Speed / Max. Giriş Devri	$n_{IB}$	rpm	3 ~ 50	6,000	6,000	6,000	5,000	5,000	4,000
Backlash Ps / Min. Boşluk Oranı		arcmin	3 ~ 50	-	-	≤ 2	≤ 2	≤ 2	≤ 2
Backlash P0 / Düşük Boşluk Oranı		arcmin	3 ~ 50	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4
Backlash P1 / Azaltılmış Boşluk Oranı		arcmin	3 ~ 50	≤ 6	≤ 6	≤ 6	≤ 6	≤ 6	≤ 6
Backlash P2 / Standart Boşluk Oranı		arcmin	3 ~ 50	≤ 8	≤ 8	≤ 8	≤ 8	≤ 8	≤ 8
Torsional Rigidity / Burulma Direnci		Nm/arcmin	3 ~ 50	3	6	14	27	60	140
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	3 ~ 50	380	1,180	3,200	6,800	9,300	15,600
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	3 ~ 50	190	590	1,600	3,400	4,650	7,800
Service Life / Hizmet Ömrü	$L_H$	hr	3 ~ 50	S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)					
Efficiency / Verim	$\eta$	%	3 ~ 50	≥ 95					
Operating Temperature / Çalışma Sıcaklığı		°C	3 ~ 50	-25° C ~ + 90° C					
Lubrication / Yağlama			3 ~ 50	Synthetic Grease / Sentetik Gres					
Protection Class / Koruma Sınıfı			3 ~ 50	IP65					
Mounting Position / Montaj Pozisyonu			3 ~ 50	Any / Her Yönde					
Noise Level / Ses Seviyesi		dB	3 ~ 50	≤ 65	≤ 67	≤ 71	≤ 73	≤ 74	≤ 75
Weight / Ağırlık ±3%		Kg	3 ~ 50		2.2	7.1	13	24	48

#### ■ Mass Moments of Inertia / Atalet Ağırlık Momenti (kg.cm<sup>2</sup>)

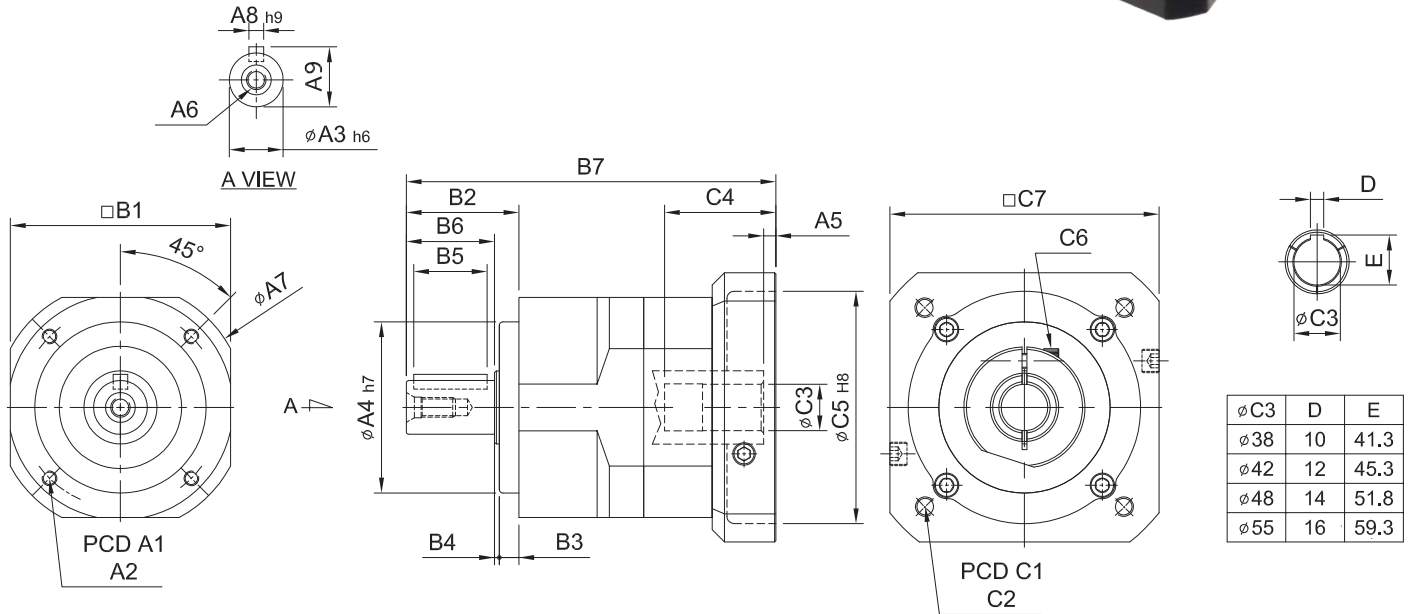
Ratio / Çevrim	44	62	90	120	142	180
3	0.09	0.36	2.28	6.85	23.5	68.2
4	0.09	0.36	2.28	6.85	23.5	68.2
5	0.09	0.36	2.28	6.85	23.5	68.2
6	0.09	0.36	2.28	6.85	23.5	68.2
7	0.09	0.36	2.28	6.85	23.5	68.2
8	0.09	0.36	2.28	6.85	23.5	68.2
9	0.09	0.36	2.28	6.85	23.5	68.2
10	0.09	0.36	2.28	6.85	23.5	68.2
15	0.06	0.22	2.05	6.21	21.2	61.3
20	0.06	0.22	2.05	6.21	21.2	61.3
25	0.06	0.22	2.05	6.21	21.2	61.3
30	0.06	0.22	2.05	6.21	21.2	61.3
35	0.06	0.22	2.05	6.21	21.2	61.3
40	0.06	0.22	2.05	6.21	21.2	61.3
45	0.06	0.22	2.05	6.21	21.2	61.3
50	0.06	0.22	2.05	6.21	21.2	61.3

# SERVOBOX

## MODEL : SE

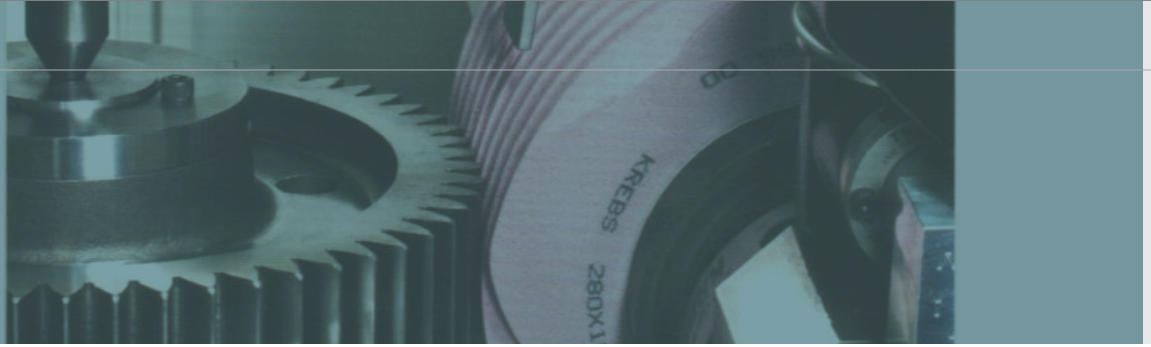
1-Stage / Kademe

RATIO / ÇEVİRİM : 3, 4, 5, 6, 7, 8, 9, 10



unit / birim: mm

Model Code	44	62	90	120	142	180	220
<b>A</b>							
A1	44	62	82	110	140	184	218
A2	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M12 x P1.75	M16 x P2.0
A3	13	16	22	32	40	55	75
A4	35	50	70	90	120	160	180
A5	5	6	9 · 23.5	10 · 20	10	11.5 · 13.5	12.5 · 14.5
A6	M4 x P0.7	M5 x P0.8	M8 x P1.25	M10 x P1.5	M12 x P1.75	M14 x P2.0	M16 x P2.0
A7	50	70	102	134	166	215	252
A8	5	5	6	10	12	16	20
A9	15	18	24.5	35	43	59	79.5
<b>B</b>							
B1	44	62	90	120	142	180	220
B2	26	36	46	65	92	106	139
B3	5	7	8	12	15	20	30
B4	1	1	2	3	3	4	5
B5	15	20	30	40	65	70	90
B6	20	28	36	50	74	82	104
B7	95	115 · 123	164.5 · 179	205 · 215	260.5	323.5	367.5
<b>C</b>							
C1	46 · 60 · 63 · 90	70 · 75 · 90	90 · 100 · 115 · 145	115 · 145 · 165	145 · 165 · 200	200 · 215 · 265	200 · 265 · 300
C2	M3 · M4 · M5	M4 · M5 · M6	M5 · M6 · M8	M6 · M8 · M10	M8 · M10 · M12	M10 · M12	M12 · M16
C3	8 · 9 · 11	14 · 19	19 · 22 · 24	24 · 28 · 32	28 · 32 · 35	38 · 42 · 48 · 55	42 · 48 · 55
C4	26	33.5 · 41.5	59 · 73.5	67 · 77	84.5	114.5 · 116.5	117.5 · 119.5
C5	30 · 40 · 50	50 · 60 · 70	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180	114.3 · 180 · 230	114.3 · 230 · 250
C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5	M10 x P1.5
C7	46 · 55	64 · 70 · 80	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190	182 · 200 · 250	222 · 250 · 265



Model No.		Unit/Birim	Ratio Çevrim	44	62	90	120	142	180	220
Nominal output torque / Nominal Çıkış Torku	$T_{2N}$	Nm	3	19	59	165	335	625	1,206	2,030
			4	16	51	146	300	555	1,069	1,804
			5	16	48	160	333	618	1,189	2,010
			6	15	45	151	311	583	1,118	1,911
			7	15	45	149	309	573	1,108	1,870
			8	14	43	143	298	553	1,070	1,824
			9	13	44	145	278	516	993	1,694
			10	14	43	141	294	549	1,059	1,779
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	3 ~ 10	1.8 Times of Rated Output Torque / 1,8 x Nominal Çıkış Torku						
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	3 ~ 10	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku						
Rated Input Speed / Nominal Giriş Devri	$n_{IN}$	rpm	3 ~ 10	3,000	3,000	3,000	3,000	3,000	3,000	2,000
Max. Input Speed / Max. Giriş Devri	$n_{IB}$	rpm	3 ~ 10	6,000	6,000	6,000	5,000	5,000	4,000	3,000
Backlash Ps / Min. Boşluk Oranı		arcmin	3 ~ 10	-	-	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1
Backlash P0 / Düşük Boşluk Oranı		arcmin	3 ~ 10	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3
Backlash P1 / Azaltılmış Boşluk Oranı		arcmin	3 ~ 10	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5
Backlash P2 / Standart Boşluk Oranı		arcmin	3 ~ 10	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
Torsional Rigidity / Burulma Direnci		Nm/arcmin	3 ~ 10	3	6	14	27	60	140	240
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	3 ~ 10	380	1,180	3,200	6,800	9,300	15,600	51,000
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	3 ~ 10	190	590	1,600	3,400	4,650	7,800	25,500
Service Life / Hizmet Ömrü	$L_H$	hr	3 ~ 10	S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)						
Efficiency / Verim	$\eta$	%	3 ~ 10	≥ 97						
Operating Temperature / Çalışma Sıcaklığı		°C	3 ~ 10	- 25° C ~ + 90° C						
Lubrication / Yağlama			3 ~ 10	Synthetic Grease / Sentetik Gres						
Protection Class / Koruma Sınıfı			3 ~ 10	IP65						
Mounting Position / Montaj Pozisyonu			3 ~ 10	Any / Her Yönde						
Noise Level / Ses Seviyesi		dB	3 ~ 10	≤ 56	≤ 58	≤ 60	≤ 63	≤ 65	≤ 67	≤ 70
Weight / Ağırlık ±3%		Kg	3 ~ 10	0.58	1.32	3.4	7.88	14	29.16	39

#### ■ Mass Moments of Inertia / Atalet Ağırlık Momenti (kg.cm<sup>2</sup>)

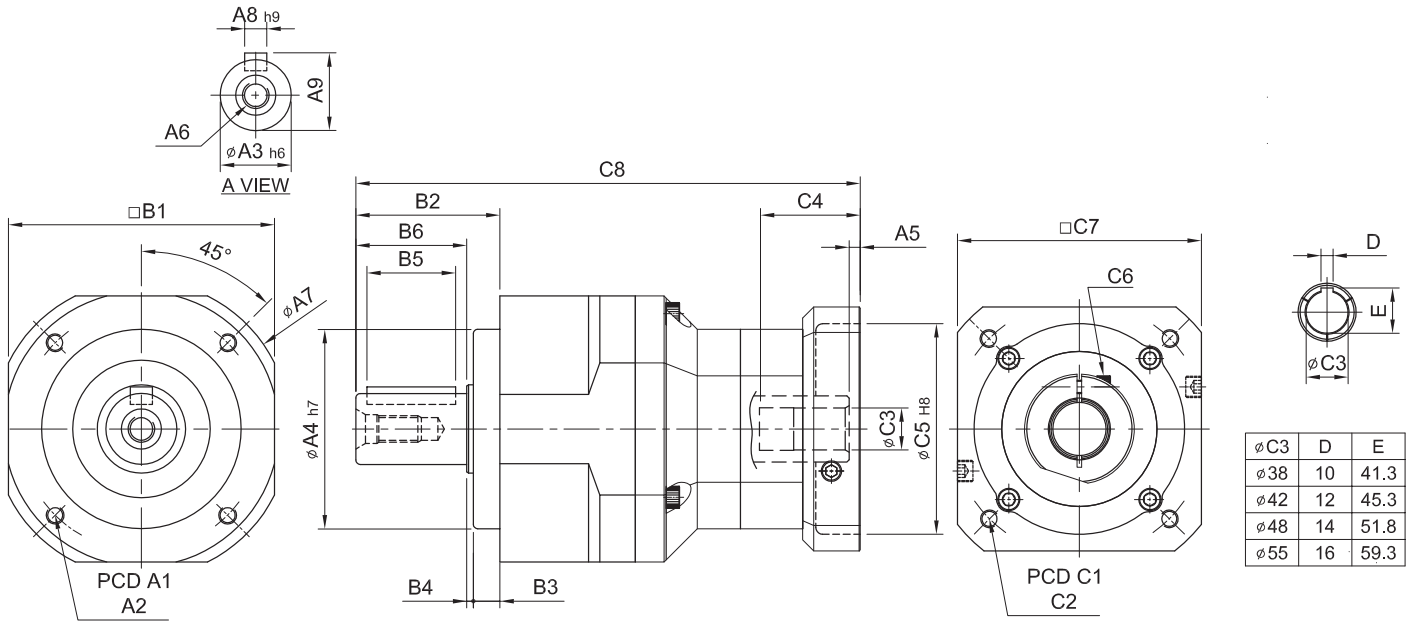
Ratio / Çevrim	44	62	90	120	142	180	220
3	0.03	0.16	0.61	3.25	9.21	28.98	69.61
4	0.03	0.14	0.48	2.74	7.54	23.67	54.37
5	0.03	0.13	0.47	2.71	7.42	23.29	53.27
6	0.03	0.13	0.45	2.65	7.25	22.75	51.72
7	0.03	0.13	0.45	2.62	7.14	22.48	50.97
8	0.03	0.13	0.44	2.58	7.07	22.59	50.84
9	0.03	0.13	0.44	2.57	7.04	22.53	50.63
10	0.03	0.13	0.44	2.57	7.03	22.51	50.56

# SERVOBOX

## MODEL : SE

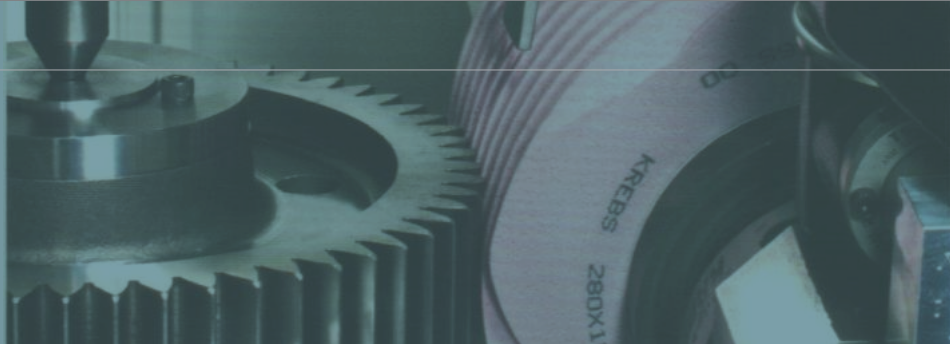
2-Stage / Kademe

RATIO / ÇEVİRİM : 15, 20, 25, 30, 35, 40, 50, 60, 70,  
80, 90, 100



unit / birim: mm

Model Code	62	90	120	142	180	220
<b>A</b> A1	62	82	110	140	184	218
A2	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M12 x P1.75	M16 x P2.0
A3	16	22	32	40	55	75
A4	50	70	90	120	160	180
A5	5	6	9 · 23.5	10 · 20	10	11.5 · 13.5
A6	M5 x P0.8	M8 x P1.25	M10 x P1.5	M12 x P1.75	M14 x P2.0	M16 x P2.0
A7	70	102	134	166	215	252
A8	5	6	10	12	16	20
A9	18	24.5	35	43	59	79.5
<b>B</b> B1	62	90	120	142	180	220
B2	36	46	65	92	106	139
B3	7	8	12	15	20	30
B4	1	2	3	3	4	5
B5	20	30	40	65	70	90
B6	28	36	50	74	82	104
<b>C</b> C1	46 · 60 · 63	70 · 75 · 90	90 · 100 · 115 · 145	115 · 145 · 165	145 · 165 · 200	200 · 215 · 265
C2	M3 · M4 · M5	M4 · M5 · M6	M5 · M6 · M8	M6 · M8 · M10	M8 · M10 · M12	M10 · M12
C3	8 · 9 · 11	14 · 19	19 · 22 · 24	24 · 28 · 32	28 · 32 · 35	38 · 42 · 48 · 55
C4	26	33.5 · 41.5	59 · 73.5	67 · 77	84.5	114.5 · 116.5
C5	30 · 40 · 50	50 · 60 · 70	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180	114.3 · 180 · 230
C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5
C7	46 · 55	64 · 70 · 80	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190	182 · 200 · 250
C8	139.5	172.5 · 180.5	241 · 255.5	298.5 · 308.5	358.5	446.5



Model No.		Unit/Birim	Ratio Çevrim	62	90	120	142	180	220
Nominal output torque / Nominal Çıkış Torku	$T_{2N}$	Nm	15	59	165	335	625	1,206	2,030
			20	51	146	300	555	1,069	1,804
			25	48	160	333	618	1,189	2,010
			30	45	151	311	583	1,118	1,911
			35	45	149	309	573	1,108	1,870
			40	43	143	298	553	1,070	1,824
			50	48	160	333	618	1,189	2,010
			60	45	151	311	583	1,118	1,911
			70	45	149	309	573	1,108	1,870
			80	43	143	298	553	1,070	1,824
			90	44	145	278	516	993	1,694
			100	43	141	294	549	1,059	1,779
Max. Acceleration Torque / Max.İvmelenme Torku	$T_{2B}$	Nm	15 ~ 100	1.8 Times of Rated Output Torque / 1,8 x Nominal Çıkış Torku					
Max. Output Torque / Max.Çıkış Torku	$T_{2NOT}$	Nm	15 ~ 100	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku					
Rated Input Speed / Nominal Giriş Devri	$n_{IN}$	rpm	15 ~ 100	3,000	3,000	3,000	3,000	3,000	2,000
Max. Input Speed / Max.Giriş Devri	$n_{IB}$	rpm	15 ~ 100	6,000	6,000	5,000	5,000	4,000	4,000
Backlash Ps / Min.Boşluk Oranı		arcmin	15 ~ 100	-	-	≤ 3	≤ 3	≤ 3	≤ 3
Backlash P0 / Düşük Boşluk Oranı		arcmin	15 ~ 100	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5
Backlash P1 / Azaltılmış Boşluk Oranı		arcmin	15 ~ 100	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
Backlash P2 / Standart Boşluk Oranı		arcmin	15 ~ 100	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9
Torsional Rigidity / Burulma Direnci		Nm/arcmin	15 ~ 100	6	14	27	60	140	240
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	15 ~ 100	1,180	3,200	6,800	9,300	15,600	51,000
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	15 ~ 100	590	1,600	3,400	4,650	7,800	25,500
Service Life / Hizmet Ömrü	$L_H$	hr	15 ~ 100	S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)					
Efficiency / Verim	$\eta$	%	15 ~ 100	≥ 94					
Operating Temperature / Çalışma Sıcaklığı		°C	15 ~ 100	- 25° C ~ + 90° C					
Lubrication / Yağlama			15 ~ 100	Synthetic Grease / Sentetik Gres					
Protection Class / Koruma Sınıfı			15 ~ 100	IP65					
Mounting Position / Montaj Pozisyonu			15 ~ 100	Any / Her Yönde					
Noise Level / Ses Seviyesi		dB	15 ~ 100	≤ 58	≤ 60	≤ 63	≤ 65	≤ 67	≤ 70
Weight / Ağırlık ±3%		Kg	15 ~ 100	1.68	4.4	9.3	15.5	34.8	56.5

#### ■ Mass Moments of Inertia / Atalet Ağırlık Momenti (kg.cm<sup>2</sup>)

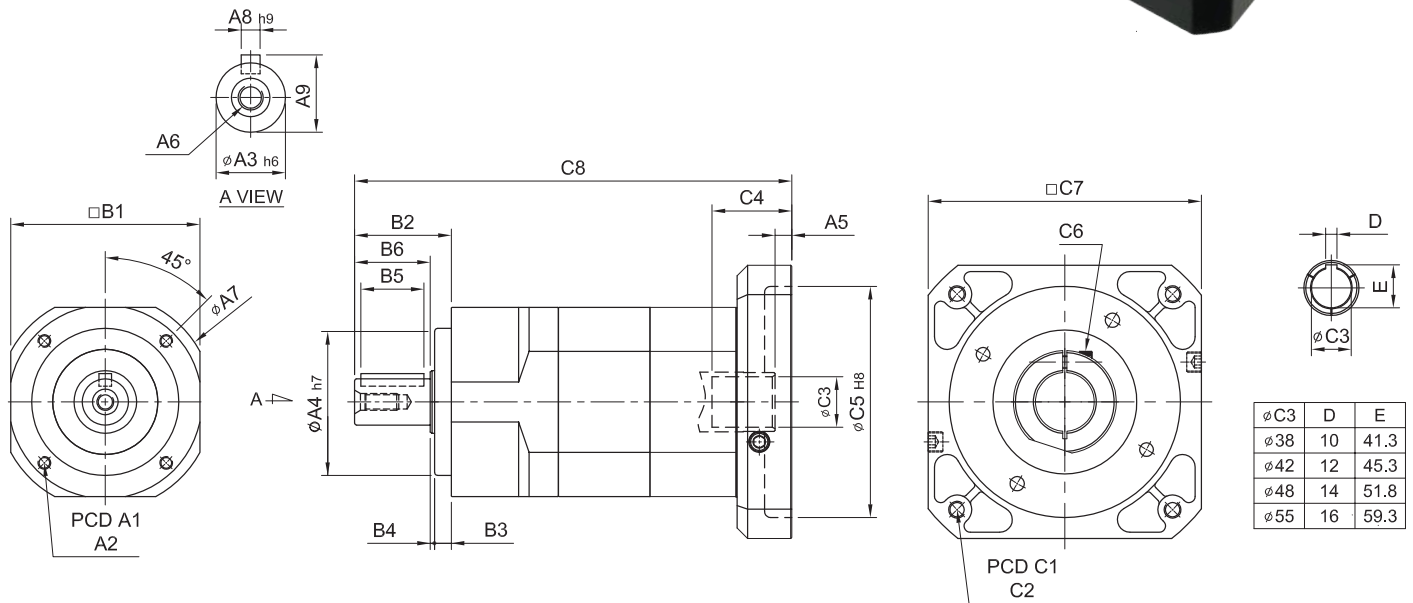
Ratio / Çevrim	62	90	120	142	180	220
15	0.03	0.14	0.46	2.63	7.3	22.79
20	0.03	0.14	0.46	2.63	7.3	22.79
25	0.03	0.14	0.46	2.63	7.1	22.79
30	0.03	0.14	0.46	2.43	7.1	22.59
35	0.03	0.14	0.44	2.43	7.1	22.59
40	0.03	0.14	0.44	2.43	6.92	22.59
50	0.03	0.14	0.44	2.43	6.92	22.59
60	0.03	0.14	0.43	2.39	6.72	21.83
70	0.03	0.14	0.43	2.39	6.72	21.83
80	0.03	0.14	0.43	2.39	6.72	21.83
90	0.03	0.14	0.40	2.39	6.72	21.60
100	0.03	0.14	0.40	2.39	6.72	21.60

# SERVOBOX

## MODEL : SE-A

2-Stage / Kademe

RATIO / ÇEVİRİM : 15, 20, 25, 30, 35, 40, 50, 60, 70  
80, 90, 100



$\phi$ C3	D	E
$\phi$ 38	10	41.3
$\phi$ 42	12	45.3
$\phi$ 48	14	51.8
$\phi$ 55	16	59.3

unit / birim: mm

Model Code	44A	62A	90A	120A	142A	180A	220A
<b>A</b>							
A1	44	62	82	110	140	184	218
A2	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M12 x P1.75	M16 x P2.0
A3	13	16	22	32	40	55	75
A4	35	50	70	90	120	160	180
A5	5	6	9 · 23.5	10 · 20	10	11.5 · 13.5	12.5 · 14.5
A6	M4 x P0.7	M5 x P0.8	M8 x P1.25	M10 x P1.5	M12 x P1.75	M14 x P2.0	M16 x P2.0
A7	50	70	102	134	166	215	252
A8	5	5	6	10	12	16	20
A9	15	18	24.5	35	43	59	79.5
<b>B</b>							
B1	44	62	90	120	142	180	220
B2	26	36	46	65	92	106	139
B3	5	7	8	12	15	20	30
B4	1	1	2	3	3	4	5
B5	15	20	30	40	65	70	90
B6	20	28	36	50	74	82	104
<b>C</b>							
C1	46 · 60 · 63	70 · 75 · 90	90 · 100 · 115 · 145	115 · 145 · 165	145 · 165 · 200	200 · 215 · 265	200 · 265 · 300
C2	M3 · M4 · M5	M4 · M5 · M6	M5 · M6 · M8	M6 · M8 · M10	M8 · M10 · M12	M10 · M12	M12 · M16
C3	8 · 9 · 11	14 · 19	19 · 22 · 24	24 · 28 · 32	28 · 32 · 35	38 · 42 · 48 · 55	42 · 48 · 55
C4	26	33.5 · 41.5	59 · 73.5	67 · 77	84.5	114.5 · 116.5	117.5 · 119.5
C5	30 · 40 · 50	50 · 60 · 70	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180	114.3 · 180 · 230	114.3 · 230 · 250
C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5	M10 x P1.5
C7	46 · 55	64 · 70 · 80	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190	182 · 200 · 250	222 · 250 · 265
C8	121	148.8 · 156.8	208 · 222.5	261 · 271	327	404.5	460.5



Model No.		Unit/Birim	Ratio Çevrim	44A	62A	90A	120A	142A	180A	220A
Nominal output torque / Nominal Çıkış Torku	$T_{2N}$	Nm	15	19	59	165	335	625	1,206	2,030
			20	16	51	146	300	555	1,069	1,804
			25	16	48	160	333	618	1,189	2,010
			30	15	45	151	311	583	1,118	1,911
			35	15	45	149	309	573	1,108	1,870
			40	14	43	143	298	553	1,070	1,824
			50	16	48	160	333	618	1,189	2,010
			60	15	45	151	311	583	1,118	1,911
			70	15	45	149	309	573	1,108	1,870
			80	14	43	143	298	553	1,070	1,824
			90	13	44	145	278	516	993	1,694
			100	14	43	141	294	549	1,059	1,779
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	15 ~ 100	1.8 Times of Rated Output Torque / 1,8 x Nominal Çıkış Torku						
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	15 ~ 100	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku						
Rated Input Speed / Nominal Giriş Devri	$n_{IN}$	rpm	15 ~ 100	3,000	3,000	3,000	3,000	3,000	3,000	2,000
Max. Input Speed / Max. Giriş Devri	$n_{IB}$	rpm	15 ~ 100	6,000	6,000	6,000	5,000	5,000	4,000	3,000
Backlash Ps / Min. Boşluk Oranı		arcmin	15 ~ 100	-	-	-	≤ 3	≤ 3	≤ 3	≤ 3
Backlash P0 / Düşük Boşluk Oranı		arcmin	15 ~ 100	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5
Backlash P1 / Azaltılmış Boşluk Oranı		arcmin	15 ~ 100	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
Backlash P2 / Standart Boşluk Oranı		arcmin	15 ~ 100	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9
Torsional Rigidity / Burulma Direnci		Nm/arcmin	15 ~ 100	3	6	14	27	60	140	240
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	15 ~ 100	380	1,180	3,200	6,800	9,300	15,600	51,000
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	15 ~ 100	190	590	1,600	3,400	4,650	7,800	25,500
Service Life / Hizmet Ömrü	$L_H$	hr	15 ~ 100	S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)						
Efficiency / Verim	$\eta$	%	15 ~ 100	≥ 94						
Operating Temperature / Çalışma Sıcaklığı		°C	15 ~ 100	- 25° C ~ + 90° C						
Lubrication / Yağlama			15 ~ 100	Synthetic Grease / Sentetik Gres						
Protection Class / Koruma Sınıfı			15 ~ 100	IP65						
Mounting Position / Montaj Pozisyonu			15 ~ 100	Any / Her Yönde						
Noise Level / Ses Seviyesi		dB	15 ~ 100	≤ 56	≤ 58	≤ 60	≤ 63	≤ 65	≤ 67	≤ 70
Weight / Ağırlık ±3%		Kg	15 ~ 100	0.9	2	6	10.2	22.5	42	59

#### ■ Mass Moments of Inertia / Atalet Ağırlık Momenti (kg.cm<sup>2</sup>)

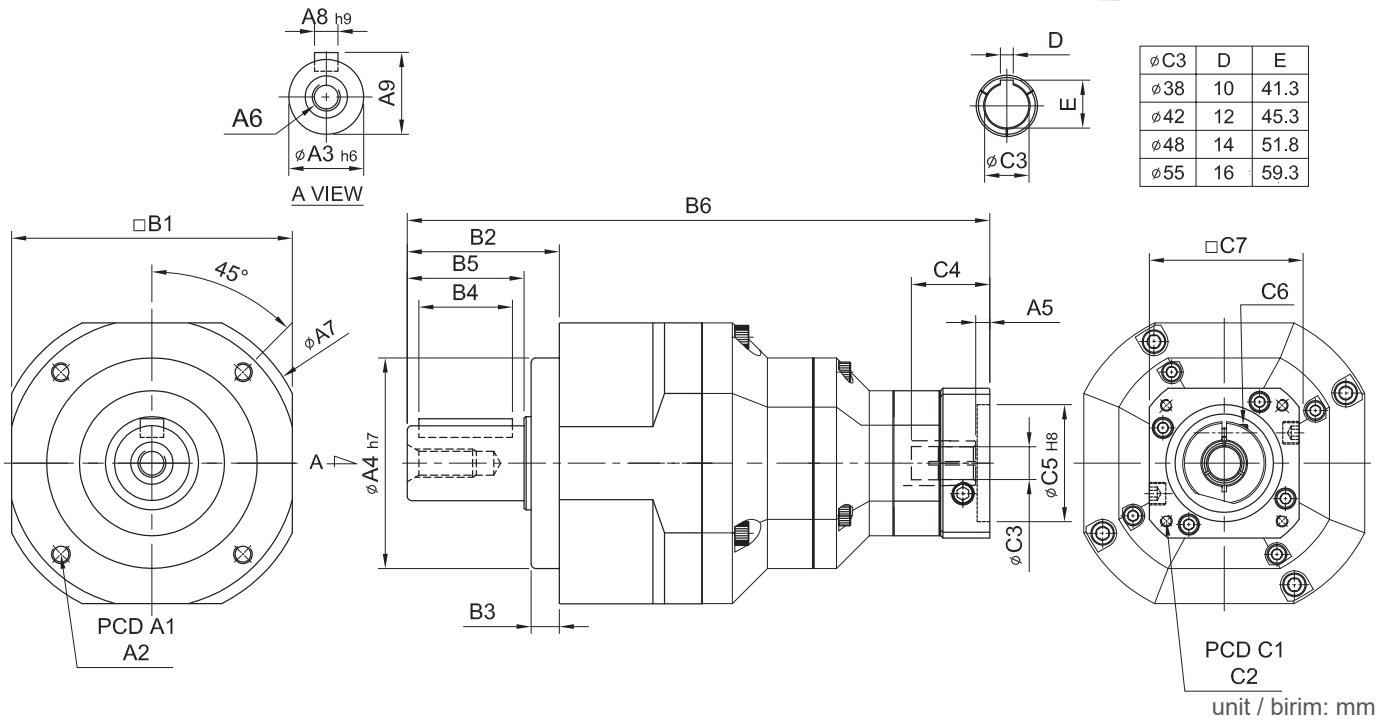
Ratio / Çevrim	44A	62A	90A	120A	142A	180A	220A
15	0.03	0.14	0.46	2.63	7.30	22.79	56.98
20	0.03	0.14	0.46	2.63	7.30	22.79	56.98
25	0.03	0.14	0.46	2.63	7.10	22.79	56.98
30	0.03	0.14	0.46	2.43	7.10	22.59	56.48
35	0.03	0.14	0.44	2.43	7.10	22.59	56.48
40	0.03	0.14	0.44	2.43	6.92	22.59	56.48
50	0.03	0.14	0.44	2.39	6.92	22.59	56.48
60	0.03	0.14	0.43	2.39	6.72	21.83	54.58
70	0.03	0.14	0.43	2.39	6.72	21.83	54.58
80	0.03	0.14	0.43	2.39	6.72	21.83	54.58
90	0.03	0.14	0.40	2.39	6.72	21.60	54.00
100	0.03	0.14	0.40	2.39	6.72	21.60	54.00

# SERVOBOX

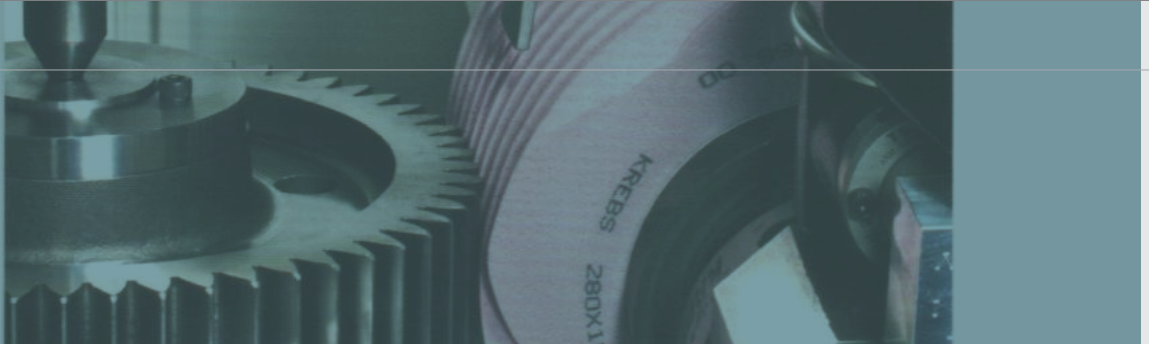
## MODEL : SE

3-Stage / Kademe

RATIO / ÇEVİRİM : 125, 150, 175, 200, 250, 300, 350, 400  
450, 500, 600, 700, 800, 900, 1000



Model Code	90	120	142	180	220
<b>A</b> A1	82	110	140	184	218
A2	M6 x P1.0	M8 x P1.25	M10 x P1.5	M12 x P1.75	M16 x P2.0
A3	22	32	40	55	75
A4	70	90	120	160	180
A5	5	6	9 · 23.5	10 · 20	10
A6	M8 x P1.25	M10 x P1.5	M12 x P1.75	M14 x P2.0	M16 x P2.0
A7	102	134	166	215	252
A8	6	10	12	16	20
A9	24.5	35	43	59	79.5
<b>B</b> B1	90	120	142	180	220
B2	46	65	92	106	139
B3	8	12	15	20	30
B4	30	40	65	70	90
B5	36	50	74	82	104
B6	195	249 · 257	334.5 · 349	396.5 · 406.5	481.5
<b>C</b> C1	46 · 60 · 63	70 · 75 · 90	90 · 100 · 115 · 145	115 · 145 · 165	145 · 165 · 200
C2	M3 · M4 · M5	M4 · M5 · M6	M5 · M6 · M8	M6 · M8 · M10	M8 · M10 · M12
C3	8 · 9 · 11	14 · 19	19 · 22 · 24	24 · 28 · 32	35 · 38
C4	26	33.5 · 41.5	59 · 73.5	67 · 77	84.5
C5	30 · 40 · 50	50 · 60 · 70	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180
C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5
C7	46 · 55	64 · 70 · 80	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190



Model No.		Unit/Birim	Ratio Çevrim	90	120	142	180	220
Nominal output torque / Nominal Çıkış Torku	$T_{2N}$	Nm	125	160	333	618	1,189	2,010
			150	165	335	625	1,206	2,030
			175	149	309	573	1,108	1,870
			200	146	300	555	1,069	1,804
			250	160	333	618	1,189	2,010
			300	151	311	583	1,118	1,911
			350	149	309	573	1,108	1,870
			400	143	298	553	1,070	1,824
			450	145	278	516	993	1,694
			500	160	333	618	1,189	2,010
			600	151	311	583	1,118	1,911
			700	149	309	573	1,108	1,870
800	143	298	553	1,070	1,824			
900	145	278	516	993	1,694			
1000	141	294	549	1,059	1,779			
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	125 ~ 1000	1.8 Times of Rated Output Torque / 1,8 x Nominal Çıkış Torku				
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	125 ~ 1000	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku				
Rated Input Speed / Nominal Giriş Devri	$n_{IN}$	rpm	125 ~ 1000	3,000	3,000	3,000	3,000	2,000
Max. Input Speed / Max. Giriş Devri	$n_{IB}$	rpm	125 ~ 1000	6,000	5,000	5,000	4,000	3,000
Backlash Ps / Min. Boşluk Oranı		arcmin	125 ~ 1000	-	≤ 5	≤ 5	≤ 5	≤ 5
Backlash P0 / Düşük Boşluk Oranı		arcmin	125 ~ 1000	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
Backlash P1 / Azaltılmış Boşluk Oranı		arcmin	125 ~ 1000	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9
Backlash P2 / Standart Boşluk Oranı		arcmin	125 ~ 1000	≤ 11	≤ 11	≤ 11	≤ 11	≤ 11
Torsional Rigidity / Burulma Direnci		Nm/arcmin	125 ~ 1000	14	27	60	140	240
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	125 ~ 1000	3,200	6,800	9,300	15,600	51,000
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	125 ~ 1000	1,600	3,400	4,650	7,800	25,500
Service Life / Hizmet Ömrü	$L_H$	hr	125 ~ 1000	S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)				
Efficiency / Verim	$\eta$	%	125 ~ 1000	≥ 90				
Operating Temperature / Çalışma Sıcaklığı		°C	125 ~ 1000	- 25° C ~ + 90° C				
Lubrication / Yağlama			125 ~ 1000	Synthetic Grease / Sentetik Gres				
Protection Class / Koruma Sınıfı			125 ~ 1000	IP65				
Mounting Position / Montaj Pozisyonu			125 ~ 1000	Any / Her Yönde				
Noise Level / Ses Seviyesi		dB	125 ~ 1000	≤ 60	≤ 63	≤ 65	≤ 67	≤ 70
Weight / Ağırlık ±3%		Kg	125 ~ 1000	4.9	10	23	47	70

#### ■ Mass Moments of Inertia / Atalet Ağırlık Momenti (kg.cm<sup>2</sup>)

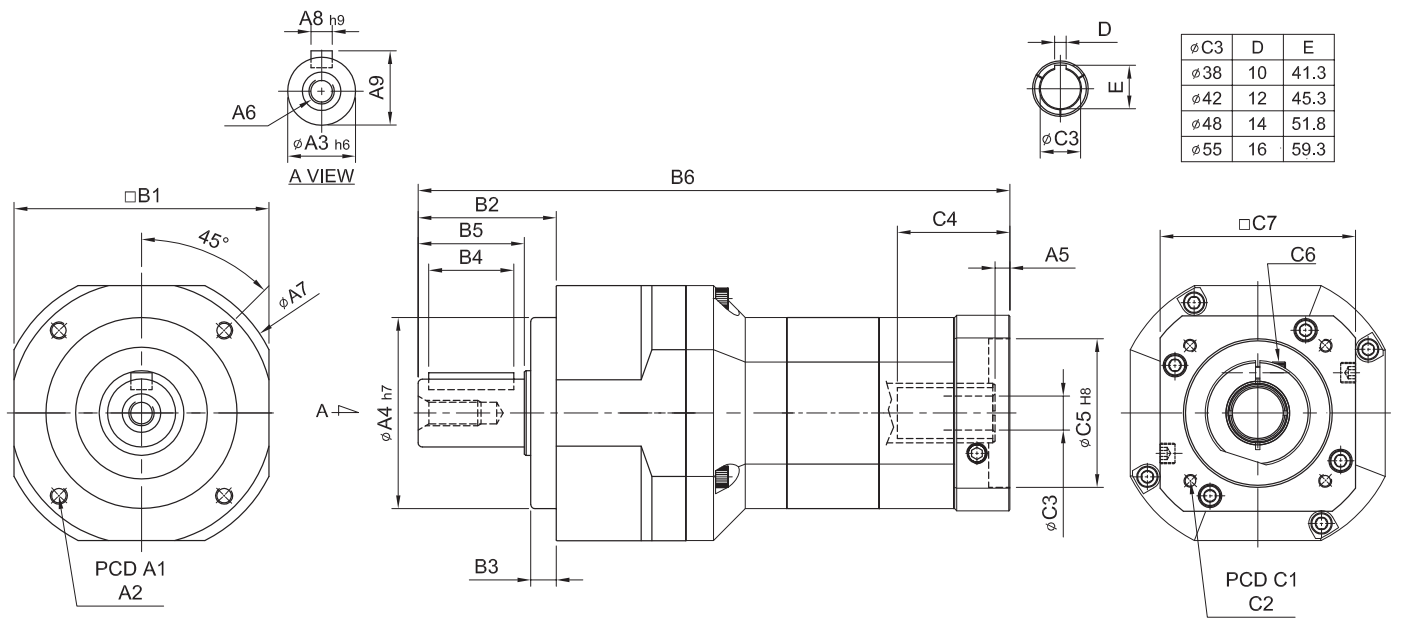
Ratio / Çevrim	90	120	142	180	220
125	0.01	0.04	0.71	1.42	3.29
150	0.01	0.04	0.51	0.92	2.15
175	0.01	0.04	0.40	0.83	1.26
200	0.01	0.04	0.21	0.65	0.98
250	0.01	0.04	0.11	0.52	0.82
300	0.01	0.04	0.09	0.21	0.82
350	0.01	0.04	0.09	0.21	0.82
400	0.01	0.04	0.09	0.21	0.82
450	0.01	0.04	0.09	0.21	0.51
500	0.01	0.04	0.08	0.12	0.51
600	0.01	0.04	0.08	0.12	0.25
700	0.01	0.04	0.08	0.12	0.25
800	0.01	0.04	0.08	0.12	0.25
900	0.01	0.04	0.08	0.12	0.25
1000	0.01	0.04	0.08	0.12	0.25

# SERVOBOX

## MODEL : SE-A

3-Stage / Kademe

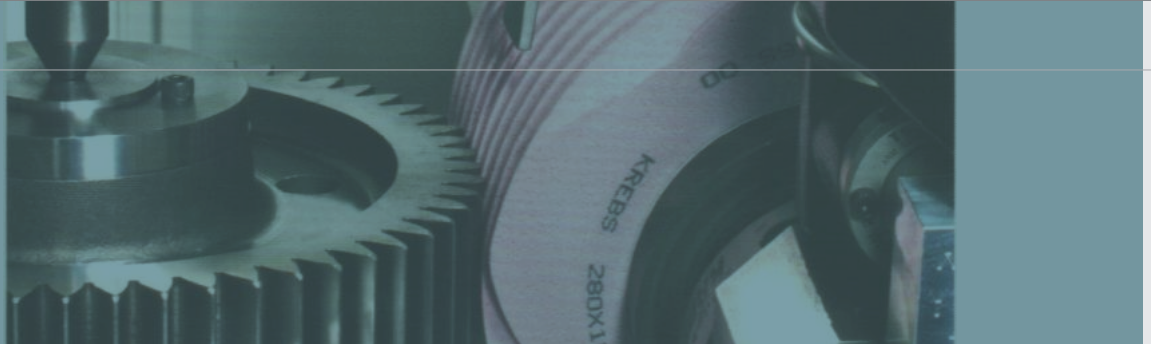
RATIO / ÇEVİRİM : 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600, 700, 800, 900, 1000



øC3	D	E
ø38	10	41.3
ø42	12	45.3
ø48	14	51.8
ø55	16	59.3

unit / birim: mm

Model Code	62A	90A	120A	142A	180A	220A
<b>A</b>						
A1	62	82	110	140	184	218
A2	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M12 x P1.75	M16 x P2.0
A3	16	22	32	40	55	75
A4	50	70	90	120	160	180
A5	6.5	6	9 · 23.5	10 · 20	10	11.5 · 13.5
A6	M5 x P0.8	M8 x P1.25	M10 x P1.5	M12 x P1.75	M14 x P2.0	M16 x P2.0
A7	70	102	134	166	215	252
A8	5	6	10	12	16	20
A9	18	24.5	35	43	59	79.5
<b>B</b>						
B1	62	90	120	142	180	220
B2	36	46	65	92	106	139
B3	7	8	12	15	20	30
B4	20	30	40	65	70	90
B5	28	36	50	74	82	104
B6	165.5	204.5 · 212.5	284.5	354.5	425	527.5
<b>C</b>						
C1	46 · 60 · 63	70 · 75 · 90	90 · 100 · 115 · 145	115 · 145 · 165	145 · 165 · 200	200 · 215 · 265
C2	M3 · M4 · M5	M4 · M5 · M6	M5 · M6 · M8	M6 · M8 · M10	M8 · M10 · M12	M10 · M12
C3	8 · 9 · 11	14 · 19	19 · 22 · 24	24 · 28 · 32	28 · 32 · 35	38 · 42 · 48 · 55
C4	26	33.5 · 41.5	59 · 73.5	67 · 77	84.5	114.5 · 116.5
C5	30 · 40 · 50	50 · 60 · 70	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180	114.3 · 180 · 230
C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5
C7	46 · 55	64 · 70 · 80	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190	182 · 200 · 250



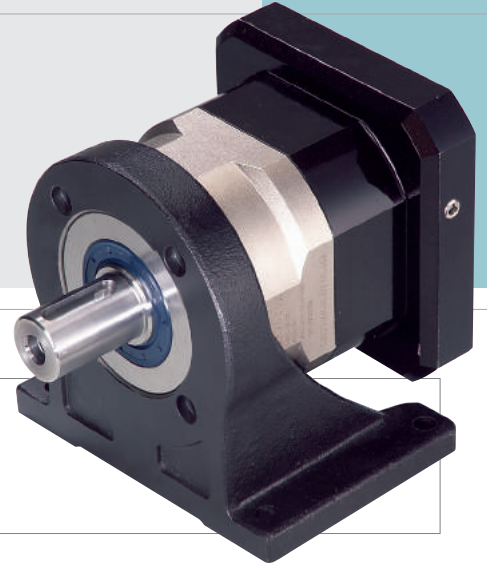
Model No.		Unit/Birim	Ratio Çevrim	62A	90A	120A	142A	180A	220A
Nominal output torque / Nominal Çıkış Torku	$T_{2N}$	Nm	125	48	160	333	618	1,189	2,010
			150	59	165	335	625	1,206	2,030
			175	45	149	309	573	1,108	1,870
			200	51	146	300	555	1,069	1,804
			250	48	160	333	618	1,189	2,010
			300	45	151	311	583	1,118	1,911
			350	45	149	309	573	1,108	1,870
			400	43	143	298	553	1,070	1,824
			450	44	145	278	516	993	1,694
			500	48	160	333	618	1,189	2,010
			600	45	151	311	583	1,118	1,911
			700	45	149	309	573	1,108	1,870
800	43	143	298	553	1,070	1,824			
900	44	145	278	516	993	1,694			
1000	43	141	294	549	1,059	1,779			
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	125 ~ 1000	1.8 Times of Rated Output Torque / 1,8 x Nominal Çıkış Torku					
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	125 ~ 1000	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku					
Rated Input Speed / Nominal Giriş Devri	$n_{IN}$	rpm	125 ~ 1000	3,000	3,000	3,000	3,000	3,000	2,000
Max. Input Speed / Max. Giriş Devri	$n_{IB}$	rpm	125 ~ 1000	6,000	6,000	5,000	5,000	4,000	3,000
Backlash P <sub>s</sub> / Min. Boşluk Oranı		arcmin	125 ~ 1000	-	-	≤ 5	≤ 5	≤ 5	≤ 5
Backlash P <sub>0</sub> / Düşük Boşluk Oranı		arcmin	125 ~ 1000	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
Backlash P <sub>1</sub> / Azaltılmış Boşluk Oranı		arcmin	125 ~ 1000	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9
Backlash P <sub>2</sub> / Standart Boşluk Oranı		arcmin	125 ~ 1000	≤ 11	≤ 11	≤ 11	≤ 11	≤ 11	≤ 11
Torsional Rigidity / Burulma Direnci		Nm/arcmin	125 ~ 1000	6	14	27	60	140	240
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	125 ~ 1000	1,180	3,200	6,800	9,300	15,600	51,000
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	125 ~ 1000	590	1,600	3,400	4,650	7,800	25,500
Service Life / Hizmet Ömrü	$L_H$	hr	125 ~ 1000	S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)					
Efficiency / Verim	$\eta$	%	125 ~ 1000	≥ 90					
Operating Temperature / Çalışma Sıcaklığı		°C	125 ~ 1000	- 25° C ~ + 90° C					
Lubrication / Yağlama			125 ~ 1000	Synthetic Grease / Sentetik Gres					
Protection Class / Koruma Sınıfı			125 ~ 1000	IP65					
Mounting Position / Montaj Pozisyonu			125 ~ 1000	Any / Her Yönde					
Noise Level / Ses Seviyesi		dB	125 ~ 1000	≤ 58	≤ 60	≤ 63	≤ 65	≤ 67	≤ 70
Weight / Ağırlık ±3%		Kg	125 ~ 1000	2.5	6.5	13	26	56.5	86

#### ■ Mass Moments of Inertia / Atalet Ağırlık Momenti (kg.cm<sup>2</sup>)

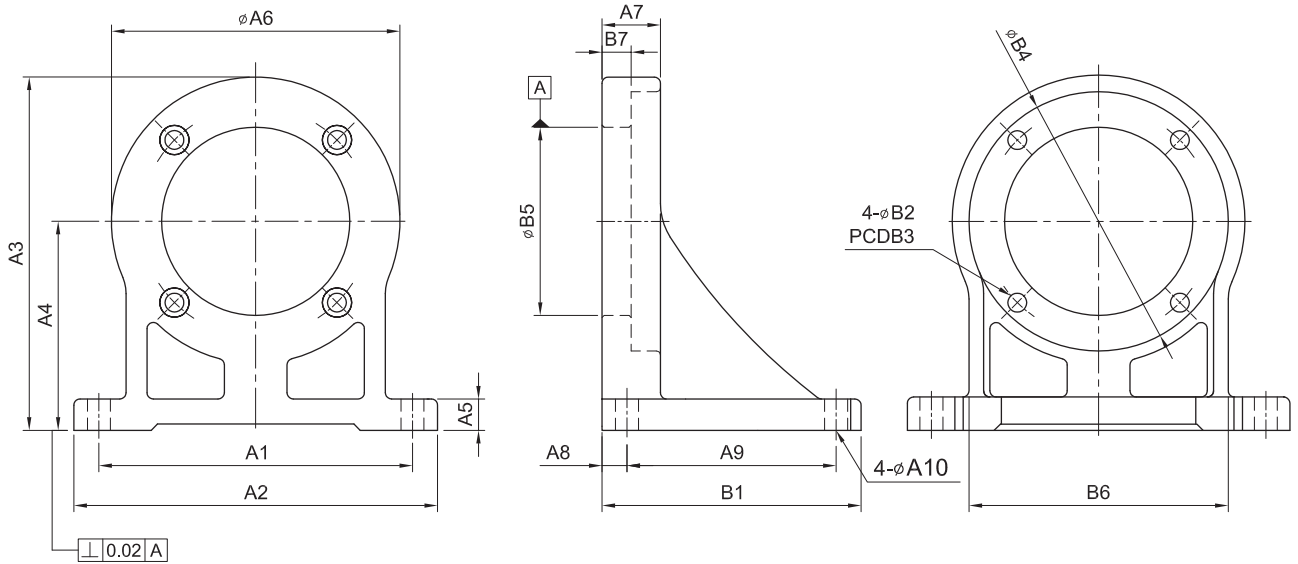
Ratio / Çevrim	62A	90A	120A	142A	180A	220A
125	0.01	0.01	0.04	0.71	1.42	3.29
150	0.01	0.01	0.04	0.51	0.92	2.15
175	0.01	0.01	0.04	0.4	0.83	1.26
200	0.01	0.01	0.04	0.21	0.65	0.98
250	0.01	0.01	0.04	0.11	0.52	0.82
300	0.01	0.01	0.04	0.09	0.21	0.82
350	0.01	0.01	0.04	0.09	0.21	0.82
400	0.01	0.01	0.04	0.09	0.21	0.82
450	0.01	0.01	0.04	0.09	0.21	0.51
500	0.01	0.01	0.04	0.08	0.12	0.51
600	0.01	0.01	0.04	0.08	0.12	0.25
700	0.01	0.01	0.04	0.08	0.12	0.25
800	0.01	0.01	0.04	0.08	0.12	0.25
900	0.01	0.01	0.04	0.08	0.12	0.25
1000	0.01	0.01	0.04	0.08	0.12	0.25

# SERVOBOX

## Accessories / Aksesuarlar



## L Type Base Kits / L Tipi Bağlantı

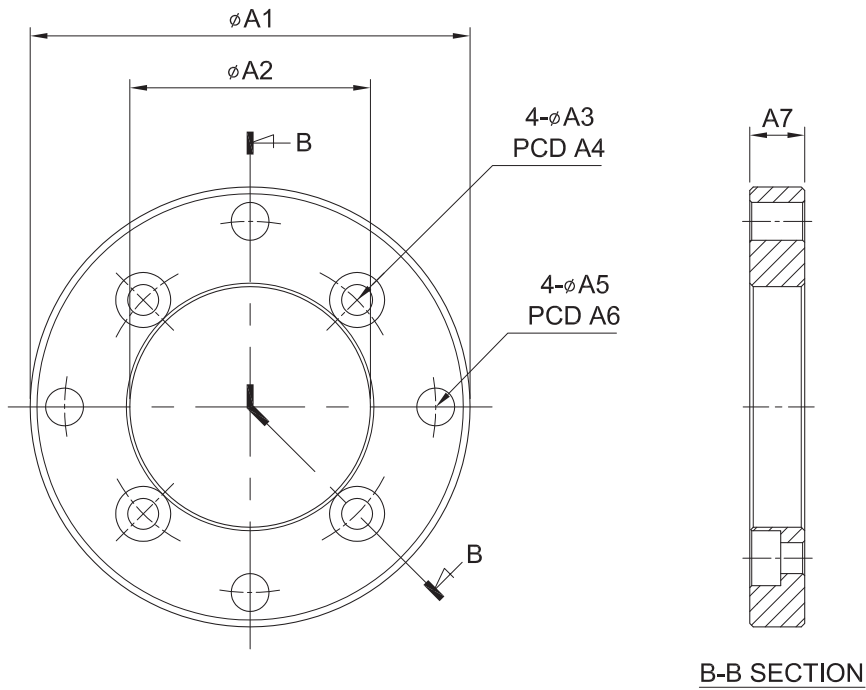
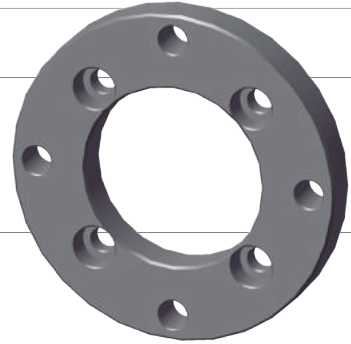


unit / birim: mm

Model Code	44	62	90	120	142	180	220
A	A1	70	90	110	150	190	280
	A2	88	108	130	176	220	330
	A3	75.5	95.5	127	170	207.5	334
	A4	45	55	75	100	120	200
	A5	8	9	11	16	19	30
	A6	60	81	104	140	175	268
	A7	13	16	21	28	35	60
	A8	10	10	11	14	16	26
	A9	40	50	75	100	120	200
	A10	Ø7	Ø7	Ø9	Ø11	Ø13	Ø17
B	B1	60	70	97	128	152	252
	B2	Ø4.5	Ø5.5	Ø6.8	Ø9	Ø11	Ø17
	B3	44	62	82	110	140	218
	B4	50	70	92	124	155	242
	B5	35	50	70	90	120	180
	B6	50	70	90	125	156	230
	B7	6	8	9	14	16	30
C	Kg	0.71	1.57	3.86	6.41	13.44	27.73



## Connecting Plate / Bağlantı Plakası



unit / birim: mm

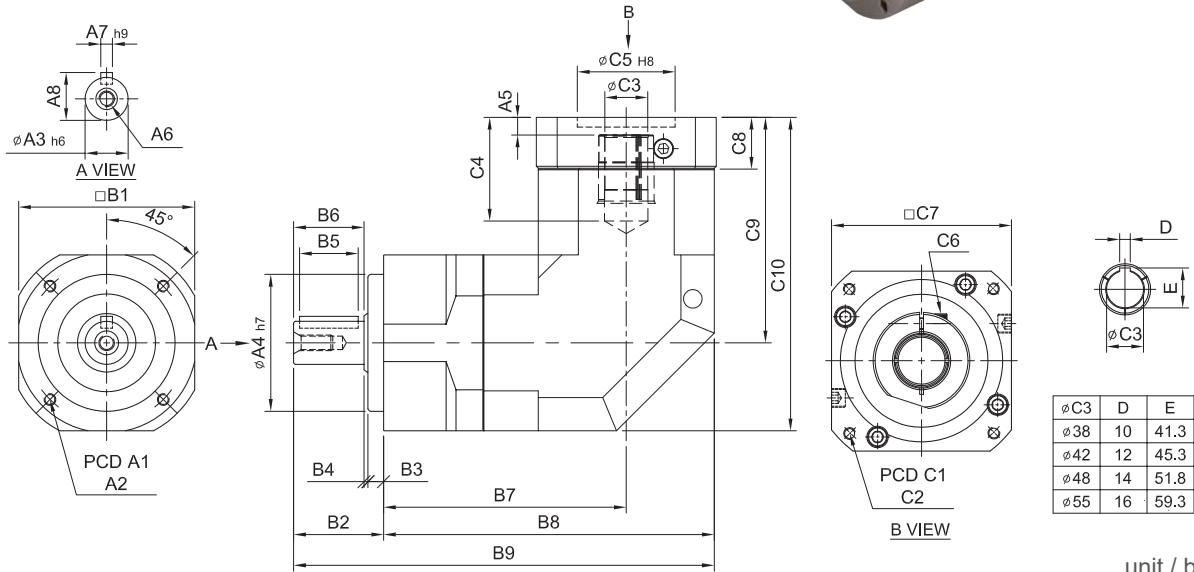
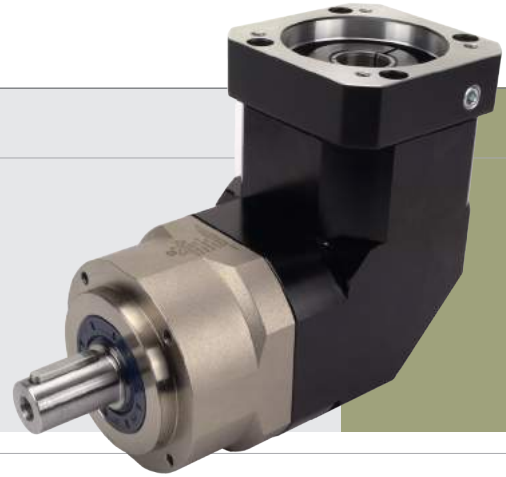
A	Model Code	44	62	90	120	142	180	220
	A1	64	88	123	158	188	238	298
A2	35	50	70	90	120	160	180	
A3	4.5	5.5	6.8	9	11	13	17	
A4	44	62	82	110	140	184	218	
A5	5.5	6.8	9	11	13	15	17	
A6	54	75	106	140	165	210	260	
A7	8	9	11	14	17	22	30	

# SERVOBOX

## MODEL : SEL

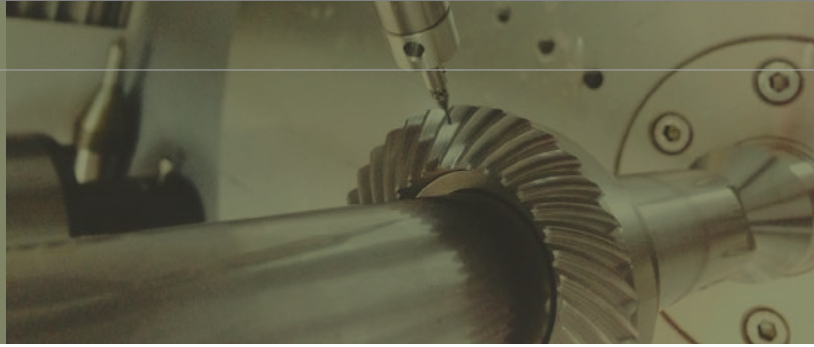
1-Stage / Kademe

RATIO / ÇEVİRİM : 3, 4, 5, 6, 7, 8, 9, 10, 12  
14, 16, 18, 20



unit / birim: mm

Model Code	44	62	90	120	142	180	220
<b>A</b>							
A1	44	62	82	110	140	184	218
A2	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M12 x P1.75	M16 x P2.0
A3	13	16	22	32	40	55	75
A4	35	50	70	90	120	160	180
A5	6	6	9 · 23.5	10 · 20	10	12.5 · 14.5	12.5 · 14.5
A6	M4 x P0.7	M5 x P0.8	M8 x P1.25	M10 x P1.5	M12 x P1.75	M14 x P2.0	M16 x P2.0
A7	5	5	6	10	12	16	20
A8	15	18	24.5	35	43	59	79.5
<b>B</b>							
B1	44	62	90	120	142	180	220
B2	26	36	46	65	92	106	139
B3	5	7	8	12	15	20	30
B4	1	1	2	3	3	4	5
B5	15	20	30	40	65	70	90
B6	20	28	36	50	74	82	104
B7	76	84.5	122.1	148	165.5	223.6	231.6
B8	98	115.5	167.1	208	236.5	313.6	341.6
B9	124	151.5	215.1	273	328.5	419.6	480.6
<b>C</b>							
C1	46 · 60 · 63	70 · 75 · 90	90 · 110 · 115 · 145	115 · 145 · 165	145 · 165 · 200	200 · 215 · 265	200 · 265 · 300
C2	M3 · M4 · M5	M4 · M5 · M6	M5 · M6 · M8	M6 · M8 · M10	M8 · M10 · M12	M10 · M12 · M16	M12 · M16
C3	8 · 9 · 11	14 · 19	19 · 22 · 24	24 · 28 · 32	28 · 32 · 35	38 · 42 · 48 · 55	42 · 48 · 55
C4	27	33.5 · 41.5	53 · 67.5	67 · 77	85	117 · 119	117 · 119
C5	30 · 40 · 50	50 · 60 · 70	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180	114.3 · 180 · 230	114.3 · 230 · 250
C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5	M10 x P1.5
C7	46 · 55	64 · 70 · 80	92 · 110 · 130	122 · 130 · 150	146 · 180 · 190	182 · 200 · 250	222 · 250 · 265
C8	16	21.5	26.5 · 41	35.5 · 45.5	35.5	45.5 · 47.5	45.5 · 47.5
C9	61	77 · 85	115.3 · 129.8	141 · 151	174	235 · 237	235 · 237
C10	83	108 · 116	160.3 · 174.8	201 · 211	245	325 · 327	345 · 347



Model No.		Unit/Birim	Ratio Çevrim	44	62	90	120	142	180	220
Nominal output torque / Nominal Çıkış Torku	$T_{2N}$	Nm	3	19	59	165	335	625	1,206	2,030
			4	16	51	146	300	555	1,069	1,804
			5	16	48	160	333	618	1,189	2,010
			6	15	45	151	311	583	1,118	1,911
			7	15	45	149	309	573	1,108	1,870
			8	14	43	143	298	553	1,070	1,824
			9	13	44	145	278	516	993	1,694
			10	14	43	141	294	549	1,059	1,779
			12	15	45	151	311	583	1,118	1,911
			14	15	45	149	309	573	1,108	1,870
			16	14	43	143	298	553	1,070	1,824
			18	13	44	145	278	516	993	1,694
20	14	43	141	294	549	1,059	1,779			
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	3 ~ 20	1.8 Times of Rated Output Torque / 1,8 x Nominal Çıkış Torku						
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	3 ~ 20	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku						
Rated Input Speed / Nominal Giriş Devri	$n_{1N}$	rpm	3 ~ 20	3,000	3,000	3,000	3,000	3,000	3,000	2,000
Max. Input Speed / Max. Giriş Devri	$n_{1B}$	rpm	3 ~ 20	6,000	6,000	6,000	5,000	5,000	4,000	3,000
Backlash Ps / Min. Boşluk Oranı		arcmin	3 ~ 20	-	-	≤ 2	≤ 2	≤ 2	≤ 2	≤ 2
Backlash P0 / Düşük Boşluk Oranı		arcmin	3 ~ 20	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4
Backlash P1 / Azaltılmış Boşluk Oranı		arcmin	3 ~ 20	≤ 6	≤ 6	≤ 6	≤ 6	≤ 6	≤ 6	≤ 6
Backlash P2 / Standart Boşluk Oranı		arcmin	3 ~ 20	≤ 8	≤ 8	≤ 8	≤ 8	≤ 8	≤ 8	≤ 8
Torsional Rigidity / Burulma Direnci		Nm/arcmin	3 ~ 20	3	6	14	27	60	140	240
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	3 ~ 20	380	1,180	3,200	6,800	9,300	15,600	51,000
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	3 ~ 20	190	590	1,600	3,400	4,650	7,800	25,500
Service Life / Hizmet Ömrü	$L_H$	hr	3 ~ 20	S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)						
Efficiency / Verim	$\eta$	%	3 ~ 20	≥ 95						
Operating Temperature / Çalışma Sıcaklığı		°C	3 ~ 20	- 25° C ~ + 90° C						
Lubrication / Yağlama			3 ~ 20	Synthetic Grease / Sentetik Gres						
Protection Class / Koruma Sınıfı			3 ~ 20	IP65						
Mounting Position / Montaj Pozisyonu			3 ~ 20	Any / Her Yönde						
Noise Level / Ses Seviyesi		dB	3 ~ 20	≤ 65	≤ 68	≤ 70	≤ 72	≤ 74	≤ 76	≤ 78
Weight / Ağırlık ±3%		Kg	3 ~ 20	0.8	2.8	6.3	9.2	22.5	52.3	75

#### ■ Mass Moments of Inertia / Atalet Ağırlık Momenti (kg.cm<sup>2</sup>)

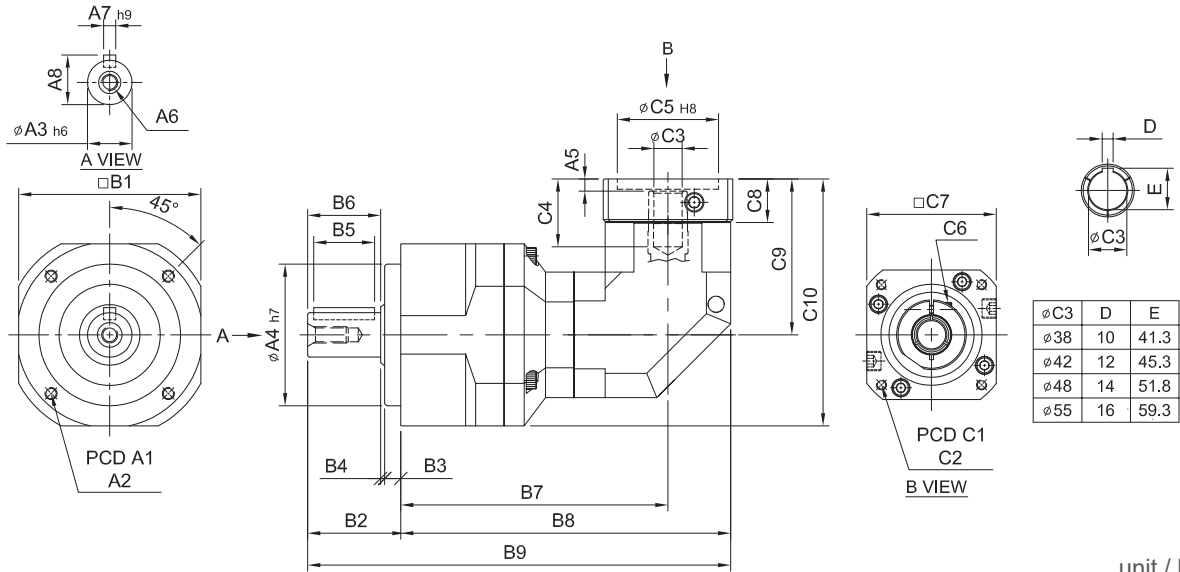
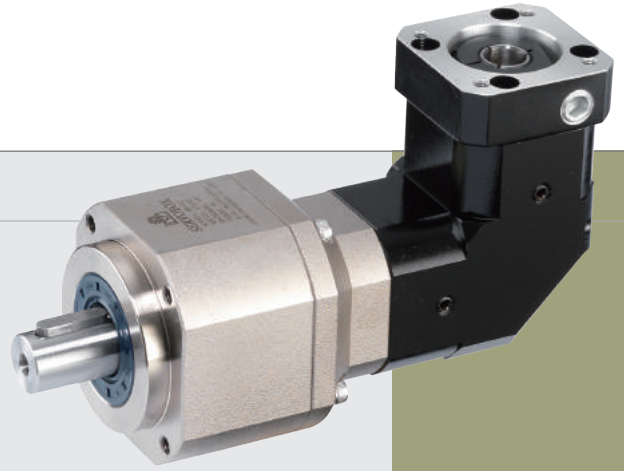
Ratio / Çevrim	44	62	90	120	142	180	220
3	0.09	0.36	2.28	6.85	23.5	68.2	135
4	0.09	0.36	2.28	6.85	23.5	68.2	135
5	0.09	0.36	2.28	6.85	23.5	68.2	135
6	0.09	0.36	2.28	6.85	23.5	68.2	135
7	0.09	0.36	2.28	6.85	23.5	68.2	135
8	0.09	0.36	2.28	6.85	23.5	68.2	135
9	0.09	0.36	2.28	6.85	23.5	68.2	135
10	0.09	0.36	2.28	6.85	23.5	68.2	135
12	0.03	0.08	1.88	6.2	21.8	65.5	119.2
14	0.03	0.08	1.88	6.2	21.8	65.5	119.2
16	0.03	0.08	1.88	6.2	21.8	65.5	119.2
18	0.03	0.08	1.88	6.2	21.8	65.5	119.2
20	0.03	0.08	1.88	6.2	21.8	65.5	119.2

# SERVOBOX

## MODEL : SEL

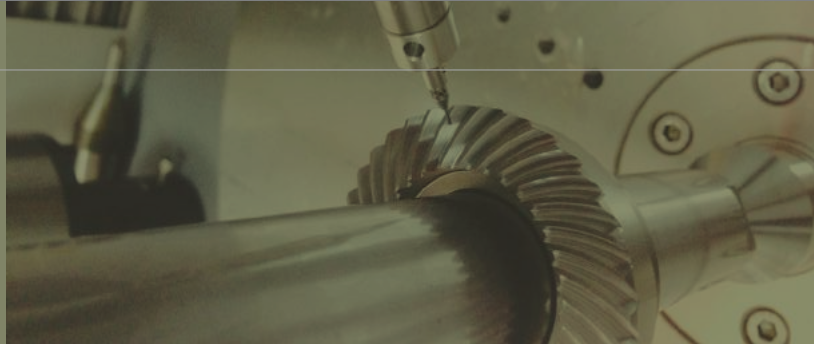
2-Stage / Kademe

RATIO / ÇEVİRİM : 15, 20, 25, 30, 35, 40, 50, 60, 70, 80  
90, 100, 120, 140, 160, 180, 200



unit / birim: mm

Model Code	62	90	120	142	180	220
<b>A</b>						
A1	62	82	110	140	184	218
A2	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M12 x P1.75	M16 x P2.0
A3	16	22	32	40	55	75
A4	50	70	90	120	160	180
A5	6	6	9 · 23.5	10 · 20	10	12.5 · 14.5
A6	M5 x P0.8	M8 x P1.25	M10 x P1.5	M12 x P1.75	M14 x P2.0	M16 x P2.0
A7	5	6	10	12	16	20
A8	18	24.5	35	43	59	79.5
<b>B</b>						
B1	62	90	120	142	180	220
B2	36	46	65	92	106	139
B3	7	8	12	15	20	30
B4	1	2	3	3	4	5
B5	20	30	40	65	70	90
B6	28	36	50	74	82	104
B7	110.5	132	181.6	214.5	249.5	313.6
B8	132.5	163	226.6	274.5	320.5	403.6
B9	168.5	209	291.6	366.5	426.5	542.6
<b>C</b>						
C1	46 · 60 · 63	70 · 75 · 90	90 · 110 · 115 · 145	115 · 145 · 165	145 · 165 · 200	200 · 215 · 265
C2	M3 · M4 · M5	M4 · M5 · M6	M5 · M6 · M8	M6 · M8 · M10	M8 · M10 · M12	M12 · M16
C3	8 · 9 · 11	14 · 19	19 · 22 · 24	24 · 28 · 32	28 · 32 · 35	38 · 42 · 48 · 55
C4	27	33.5 · 41.5	53 · 67.5	67 · 77	85	117 · 119
C5	30 · 40 · 50	50 · 60 · 70	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180	114.3 · 180 · 200 · 230 · 250
C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5
C7	46 · 55	64 · 70 · 80	92 · 110 · 130	122 · 130 · 150	146 · 180 · 190	182 · 200 · 220 · 250 · 265
C8	16	21.5	26.5 · 41	35.5 · 45.5	35.5	45.5 · 47.5
C9	61	77 · 85	115.3 · 129.8	141 · 151	174	235 · 237
C10	92	122 · 130	175.3 · 189.8	212 · 222	264	345 · 347



Model No.		Unit/Birim	Ratio Çevrim	62	90	120	142	180	220
Nominal output torque / Nominal Çıkış Torku	$T_{2N}$	Nm	15	59	165	335	625	1,206	2,030
			20	51	146	300	555	1,069	1,804
			25	48	160	333	618	1,189	2,010
			30	45	151	311	583	1,118	1,911
			35	45	149	309	573	1,108	1,870
			40	43	143	298	553	1,070	1,824
			50	48	160	333	618	1,189	2,010
			60	45	151	311	583	1,118	1,911
			70	45	149	309	573	1,108	1,870
			80	43	143	298	553	1,070	1,824
			90	44	145	278	516	993	1,694
			100	43	141	294	549	1,059	1,779
			120	45	151	311	583	1,118	1,911
			140	45	149	309	573	1,108	1,870
			160	43	143	298	553	1,070	1,824
180	44	145	278	516	993	1,694			
200	43	141	294	549	1,059	1,779			
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	15 ~ 200	1.8 Times of Rated Output Torque / 1,8 x Nominal Çıkış Torku					
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	15 ~ 200	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku					
Rated Input Speed / Nominal Giriş Devri	$n_{1N}$	rpm	15 ~ 200	3,000	3,000	3,000	3,000	3,000	2,000
Max. Input Speed / Max. Giriş Devri	$n_{1B}$	rpm	15 ~ 200	6,000	6,000	5,000	5,000	4,000	4,000
Backlash P <sub>s</sub> / Min. Boşluk Oranı		arcmin	15 ~ 200	-	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4
Backlash P <sub>0</sub> / Düşük Boşluk Oranı		arcmin	15 ~ 200	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
Backlash P <sub>1</sub> / Azaltılmış Boşluk Oranı		arcmin	15 ~ 200	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9
Backlash P <sub>2</sub> / Standart Boşluk Oranı		arcmin	15 ~ 200	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12
Torsional Rigidity / Burulma Direnci		Nm/arcmin	15 ~ 200	6	14	27	60	140	240
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	15 ~ 200	1,180	3,200	6,800	9,300	15,600	51,000
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	15 ~ 200	590	1,600	3,400	4,650	7,800	25,500
Service Life / Hizmet Ömrü	$L_{H}$	hr	15 ~ 200	S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)					
Efficiency / Verim	$\eta$	%	15 ~ 200	≥ 92					
Operating Temperature / Çalışma Sıcaklığı		°C	15 ~ 200	- 25° C ~ + 90° C					
Lubrication / Yağlama			15 ~ 200	Synthetic Grease / Sentetik Gres					
Protection Class / Koruma Sınıfı			15 ~ 200	IP65					
Mounting Position / Montaj Pozisyonu			15 ~ 200	Any / Her Yönde					
Noise Level / Ses Seviyesi		dB	15 ~ 200	≤ 68	≤ 70	≤ 72	≤ 74	≤ 76	≤ 78
Weight / Ağırlık ±3%		Kg	15 ~ 200	1.8	5.8	12	22.8	43.9	78.5

#### ■ Mass Moments of Inertia / Atalet Ağırlık Momenti (kg.cm<sup>2</sup>)

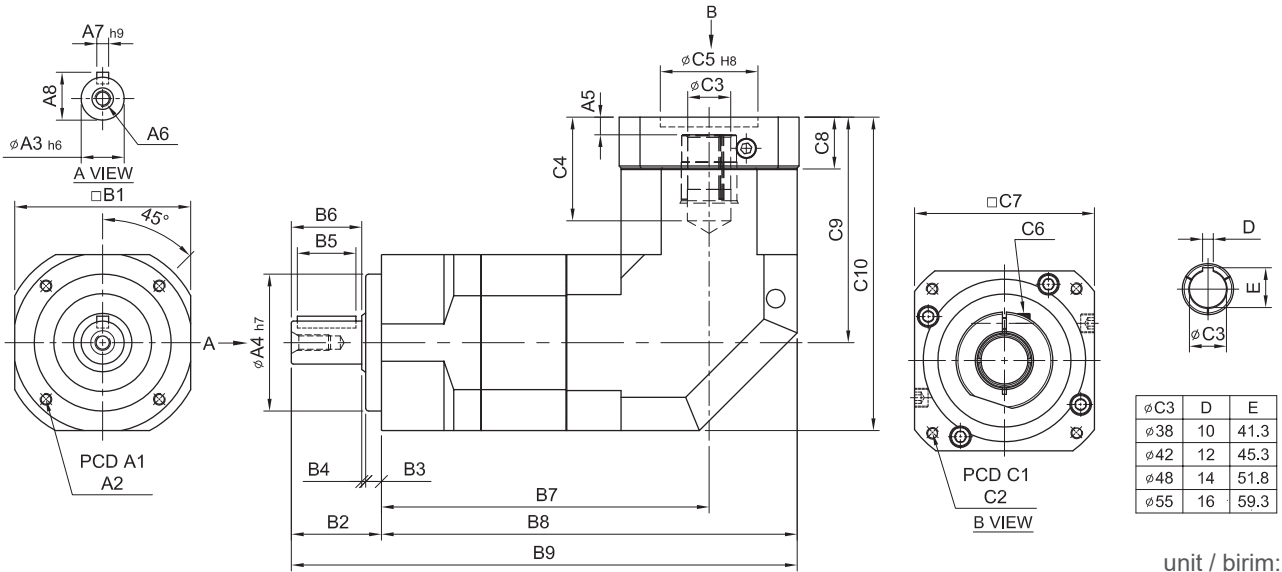
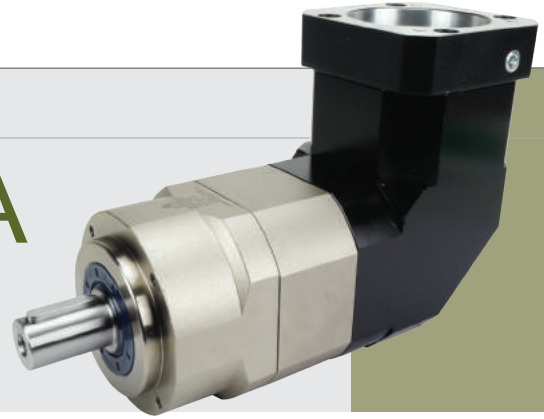
Ratio / Çevrim	62	90	120	142	180	220
15	0.09	0.36	6.28	6.85	26.2	70.1
20	0.09	0.36	6.28	6.85	26.2	70.1
25	0.09	0.36	2.28	6.85	23.1	68.2
30	0.09	0.36	2.28	6.85	23.1	68.2
35	0.09	0.36	2.28	6.85	23.1	68.2
40	0.09	0.36	2.28	6.85	23.1	68.2
50	0.09	0.36	2.28	6.85	23.1	68.2
60	0.09	0.36	2.28	6.85	23.1	68.2
70	0.09	0.36	2.28	6.85	23.1	68.2
80	0.09	0.36	2.28	6.85	23.1	68.2
90	0.09	0.36	2.28	6.85	23.1	68.2
100	0.09	0.36	2.28	6.85	23.1	68.2
120	0.03	0.1	1.88	6.2	21.2	65.1
140	0.03	0.1	1.88	6.2	21.2	65.1
160	0.03	0.1	1.88	6.2	21.2	65.1
180	0.03	0.1	1.88	6.2	21.2	65.1
200	0.03	0.1	1.88	6.2	21.2	65.1

# SERVOBOX

## MODEL : SEL-A

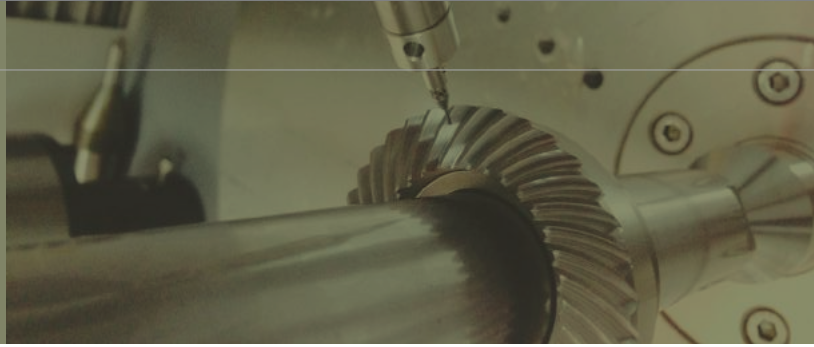
2-Stage / Kademe

RATIO / ÇEVİRİM : 15, 20, 25, 30, 35, 40, 50, 60, 70, 80  
90, 100, 120, 140, 160, 180, 200



unit / birim: mm

Model Code	44A	62A	90A	120A	142A	180A	220A
A1	44	62	82	110	140	184	218
A2	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M12 x P1.75	M16 x P2.0
A3	13	16	22	32	40	55	75
A4	35	50	70	90	120	160	180
A5	6	6	9 · 23.5	10 · 20	10	12.5 · 14.5	12.5 · 14.5
A6	M4 x P0.7	M5 x P0.8	M8 x P1.25	M10 x P1.5	M12 x P1.75	M14 x P2.0	M16 x P2.0
A7	5	5	6	10	12	16	20
A8	15	18	24.5	35	43	59	79.5
B1	44	62	90	120	142	180	220
B2	26	36	46	65	92	106	139
B3	5	7	8	12	15	20	30
B4	1	1	2	3	3	4	5
B5	15	20	30	40	65	70	90
B6	20	28	36	50	74	82	104
B7	102	118.3	167.6	204	232	304.6	324.6
B8	124	149.3	212.6	264	303	394.6	434.6
B9	150	185.3	258.6	329	395	500.6	573.6
C1	46 · 60 · 63	70 · 75 · 90	90 · 100 · 115 · 145	115 · 145 · 165	145 · 165 · 200	200 · 215 · 265	200 · 265 · 300
C2	M3 · M4 · M5	M4 · M5 · M6	M5 · M6 · M8	M6 · M8 · M10	M8 · M10 · M12	M10 · M12 · M16	M12 · M16
C3	8 · 9 · 11	14 · 19	19 · 22 · 24	24 · 28 · 32	28 · 32 · 35	38 · 42 · 48 · 55	42 · 48 · 55
C4	27	33.5 · 41.5	53 · 67.5	67 · 77	85	117 · 119	117 · 119
C5	30 · 40 · 50	50 · 60 · 70	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180	114.3 · 180 · 230	114.3 · 230 · 250
C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5	M10 x P1.5
C7	46 · 55	64 · 70 · 80	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190	182 · 200 · 250	220 · 250 · 265
C8	16	21.5	26.5 · 41	35.5 · 45.5	35.5	45.5 · 47.5	45.5 · 47.5
C9	61	77 · 85	115.3 · 129.8	141 · 151	174	235 · 237	235 · 237
C10	83	108 · 116	160.3 · 174.8	201 · 211	245	325 · 327	345 · 347



Model No.		Unit/Birim	Ratio Çevrim	44A	62A	90A	120A	142A	180A	220A
Nominal output torque / Nominal Çıkış Torku	$T_{2N}$	Nm	15	19	59	165	335	625	1,206	2,030
			20	16	51	146	300	555	1,069	1,804
			25	16	48	160	333	618	1,189	2,010
			30	15	45	151	311	583	1,118	1,911
			35	15	45	149	309	573	1,108	1,870
			40	14	43	143	298	553	1,070	1,824
			50	16	48	160	333	618	1,189	2,010
			60	15	45	151	311	583	1,118	1,911
			70	15	45	149	309	573	1,108	1,870
			80	14	43	143	298	553	1,070	1,824
			90	13	44	145	278	516	993	1,694
			100	14	43	141	294	549	1,059	1,779
			120	15	45	151	311	583	1,118	1,911
			140	15	45	149	309	573	1,108	1,870
			160	14	43	143	298	553	1,070	1,824
			180	13	44	145	278	516	993	1,694
200	14	43	141	294	549	1,059	1,779			
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	15 ~ 200	1.8 Times of Rated Output Torque / 1,8 x Nominal Çıkış Torku						
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	15 ~ 200	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku						
Rated Input Speed / Nominal Giriş Devri	$n_{1N}$	rpm	15 ~ 200	3,000	3,000	3,000	3,000	3,000	3,000	2,000
Max. Input Speed / Max. Giriş Devri	$n_{1B}$	rpm	15 ~ 200	6,000	6,000	6,000	5,000	5,000	4,000	3,000
Backlash Ps / Min. Boşluk Oranı		arcmin	15 ~ 200	-	-	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4
Backlash P0 / Düşük Boşluk Oranı		arcmin	15 ~ 200	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
Backlash P1 / Azaltılmış Boşluk Oranı		arcmin	15 ~ 200	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9
Backlash P2 / Standart Boşluk Oranı		arcmin	15 ~ 200	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12
Torsional Rigidity / Burulma Direnci		Nm/arcmin	15 ~ 200	3	6	14	27	60	140	240
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	15 ~ 200	380	1,180	3,200	6,800	9,300	15,600	51,000
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	15 ~ 200	190	590	1,600	3,400	4,650	7,800	25,500
Service Life / Hizmet Ömrü	$L_{H1}$	hr	15 ~ 200	S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)						
Efficiency / Verim	$\eta$	%	15 ~ 200	≥ 92						
Operating Temperature / Çalışma Sıcaklığı		°C	15 ~ 200	- 25° C ~ + 90° C						
Lubrication / Yağlama			15 ~ 200	Synthetic Grease / Sentetik Gres						
Protection Class / Koruma Sınıfı			15 ~ 200	IP65						
Mounting Position / Montaj Pozisyonu			15 ~ 200	Any / Her Yönde						
Noise Level / Ses Seviyesi		dB	15 ~ 200	≤ 65	≤ 68	≤ 70	≤ 72	≤ 74	≤ 76	≤ 78
Weight / Ağırlık ±3%		Kg	15 ~ 200		2.9	8	12	22.6	51.7	94.5

#### ■ Mass Moments of Inertia / Atalet Ağırlık Momenti (kg.cm<sup>2</sup>)

Ratio / Çevrim	44A	62A	90A	120A	142A	180A	220A
15	0.09	0.36	2.28	6.85	23.45	55.2	80.2
20	0.09	0.36	2.28	6.85	23.45	55.2	80.2
25	0.09	0.36	2.28	6.85	23.45	50.4	76.5
30	0.09	0.36	2.28	6.85	23.5	50.4	76.5
35	0.09	0.36	2.28	6.85	23.5	50.4	76.5
40	0.09	0.36	2.28	6.85	23.5	50.4	76.5
50	0.09	0.36	2.28	6.85	23.5	50.4	76.5
60	0.09	0.36	2.28	6.85	23.5	50.4	76.5
70	0.09	0.36	2.28	6.85	23.5	50.4	76.5
80	0.09	0.36	2.28	6.85	23.5	50.4	76.5
90	0.09	0.36	2.28	6.85	23.5	50.4	76.5
100	0.09	0.36	2.28	6.85	23.5	50.4	76.5
120	0.03	0.08	1.88	6.2	21.8	48.7	74.2
140	0.03	0.08	1.88	6.2	21.8	48.7	74.2
160	0.03	0.08	1.88	6.2	21.8	48.7	74.2
180	0.03	0.08	1.88	6.2	21.8	48.7	74.2
200	0.03	0.08	1.88	6.2	21.8	48.7	74.2

# SERVOBOX

## Characteristic of SD Series / SD Serilerinin Özellikleri

### Quiet operation / Sessiz çalışma

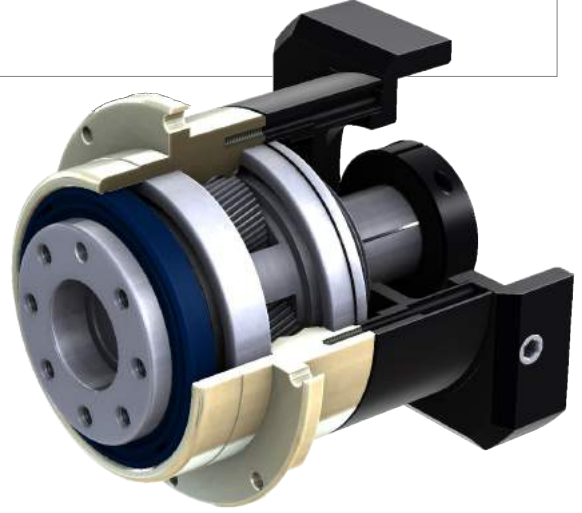
Helical gears contribute to reduce vibration and noise.  
Helis dişliler titreşimin ve sesin engellenmesini sağlar

### High precision / Yüksek hassasiyet

Backlash  $\leq 1$  arc-min reaches precision alignment.  
 $\leq 1$  arc-min boşluk oranıyla yüksek hassasiyet sağlanır.

### High rigidity & torque / Sağlamlık & Yüksek tork

High rigidity & high torque are achieved by integrant needle roller bearings and one-piece constructed.  
Sağlamlık ve yüksek tork tek parça yapı ve iğneli rulmanlar sayesinde elde edilir.



## Indication of Model Numbers / Model Seçimi

SD	90	10		P1	MOTOR
Type	Model	Ratio / Çevrim	Output Bearing / Rulman	Backlash Class / Boşluk Sınıfı	Motor Type
SD	47	1-Stage/Kademe	Ball Bearing / Bilyalı Rulman	Ps	Motor Brand & Model No. / Motor Marka & Modeli
SDL	64	4, 5, 7, 10		P0	
SDD	90	2-Stage/Kademe	Taper Bearing / Masuralı Rulman	P1	
	110	20, 25, 35, 40,		P2	
	140	50, 70, 100			
	200				
	255				

## Features of SD Series / SD Serilerinin Özellikleri



### One-piece Gearbox Housing / Tek Parça Gövde

The gearbox and internal ring gear are one-piece constructed. High gear accuracy meets DIN6 class.

Dişli kutusu ve gövde üzerindeki dişliler tek parça olarak üretilmiştir ve DIN6 sınıfındadır.



### Full Needle Roller Bearings Design / İğneli Rulmanlı Tasarım

The planetary gear transmission employs full needle roller bearings without retainer to increase the contact surface, which greatly upgrades structural rigidity and service life.

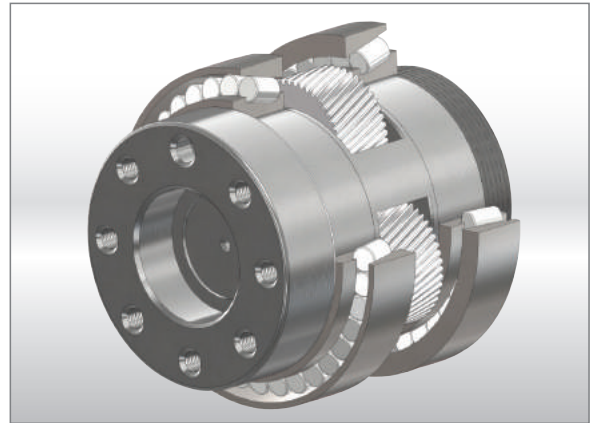
Planet dişlilerde temas yüzeyini arttırmak amacıyla iğneli rulmanlı yataklar kullanılır. Bu sayede yapısal sağlamlık ve hizmet ömrü büyük ölçüde artırılmış olur.



### Collet Locking Mechanism / Kovan Kilitleme Mekanizması

The input-end and the motor are coupled through a collet locking mechanism. It has passed dynamical balance analysis to assure concentricity and balance on the connection and no backlash for power transmission while running at high speed.

Redüktörün giriş mili ve motorun çıkış mili, kovan kilitleme mekanizmasıyla bağlanır. Bu sayede yüksek hızlarda hassas merkezleme ve bağlantı dengesi sağlanıp, güç iletimi esnasında boşluk engellenmiş olur.



### Integrated Planetary Arm Bracket / Tek Parça Planet Kolu

The planetary arm bracket and the output shaft are one-piece constructed to increase torsional rigidity and accuracy. The entire structure is one-time machined for controlling accuracy in the specified tolerance.

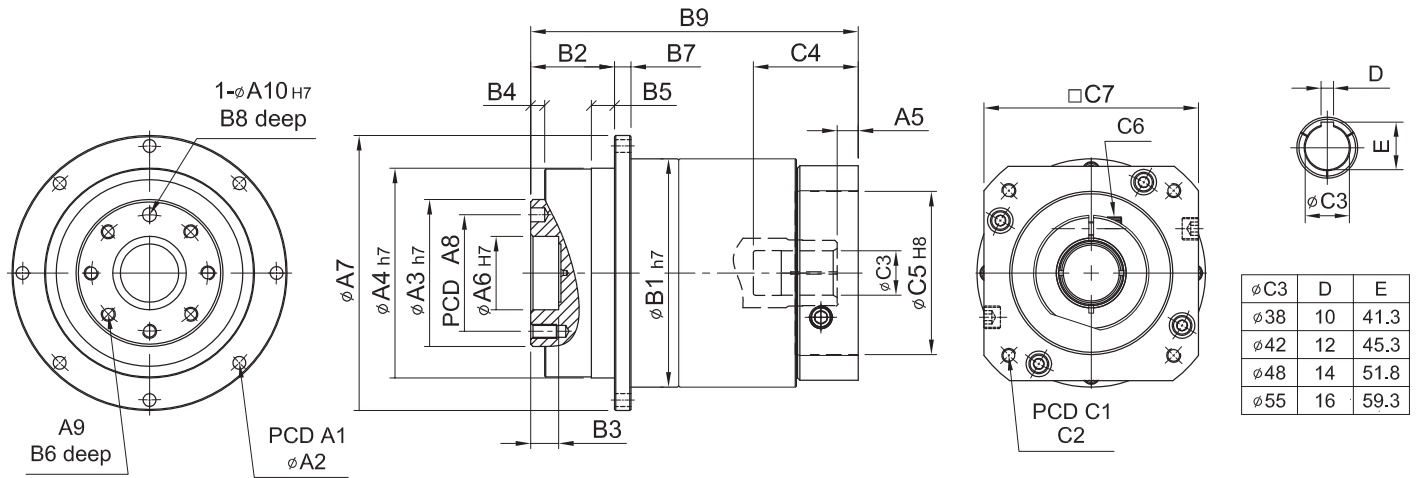
Planet kolu ve çıkış mili, burulma direncini ve hassasiyeti arttırmak amacıyla tek parçadan üretilmiştir. Tüm yapı hassasiyeti ve toleransı sağlamak için tek seferde işlenmiştir.

# SERVOBOX

## MODEL : SD

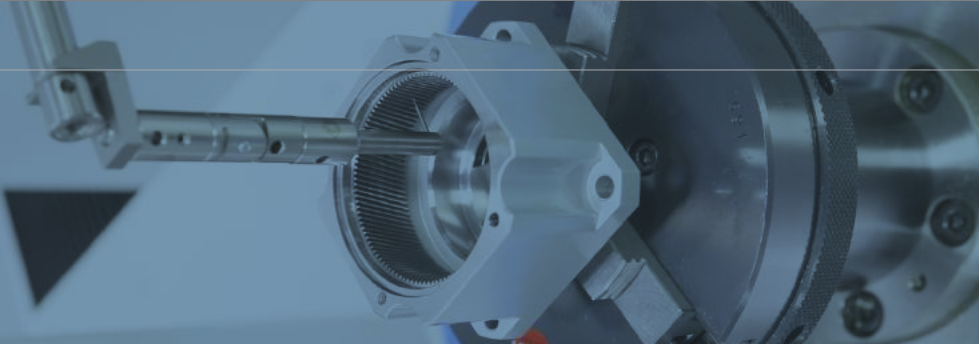
1-Stage / Kademe

RATIO / ÇEVİRİM : 4, 5, 7, 10



unit / birim: mm

Model Code	47	64	90	110	140	200	255
<b>A</b> A1	67	79	109	135	168	233	280
A2	8-3.4	8-4.5	8-5.5	8-5.5	12-6.6	12-9.0	16-13.5
A3	28	40	63	80	100	160	180
A4	47	64	90	110	140	200	255
A5	6	6	9-23.5	10-20	10	11.5-13.5	10.5-12.5
A6	12	20	31.5	40	50	80	100
A7	72	86	118	146	179	248	300
A8	20	31.5	50	63	80	125	140
A9	4 - M3 x P0.5	7 - M5 x P0.8	7 - M6 x P1.0	11 - M6 x P1.0	11 - M8 x P1.25	11 - M10 x P1.5	12 - M16 x P2.0
A10	3	5	6	6	8	10	12
<b>B</b> B1	59	70	98	125	156	212	255
B2	19.5	19.5	30	29	38	50	66
B3	5	7	12	12	12	16	20
B4	1.5	4	6	6	6	8	12
B5	5	6	10	10	15	15	20
B6	6.5	8	12	12	16	22	32
B7	4	5	7	8	10	12	18
B8	4	6	6	7	7	10	10
B9	74.7	84.5	133-147.5	153-163	186.5	250.5-252.5	263-265
<b>C</b> C1	46-60-63	70-75-90	90-100-115-145	115-145-165	145-165-200	200-215-265	200-265-300
C2	M3-M4-M5	M4-M5-M6	M5-M6-M8	M6-M8-M10	M8-M10-M12	M10-M12-M16	M12-M16
C3	8-9-11	14-19	19-22-24	24-28-32	32-35-38	38-42-48-55	42-48-55
C4	33	34	58.5-73	67-77	84.5	114.5-116.5	115.5-117.5
C5	30-40-50	50-60-70	70-80-95-110	95-110-130	110-130-180	114.3-180-230	114.3-230-250
C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5	M10 x P1.5
C7	46-55	64-70-80	92-110-130	122-130-150	146-150-190	182-200-250	222-250-265



Model No.		Unit/Birim	Ratio Çevrim	47	64	90	110	140	200	255
Nominal output torque / Nominal Çıkış Torku	$T_{2N}$	Nm	4	22	60	160	335	650	1,200	2,020
			5	20	50	155	333	618	1,189	2,010
			7	19	47	142	309	573	1,108	1,870
			10	16	43	136	294	549	1,059	1,779
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	4 ~ 10	1.8 Times of Rated Output Torque / 1,8 x Nominal Çıkış Torku						
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	4 ~ 10	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku						
Rated Input Speed / Nominal Giriş Devri	$n_{1N}$	rpm	4 ~ 10	3,000	3,000	3,000	3,000	3,000	3,000	2,000
Max. Input Speed / Max. Giriş Devri	$n_{1B}$	rpm	4 ~ 10	6,000	6,000	6,000	6,000	5,000	4,000	3,000
Backlash Ps / Min. Boşluk Oranı		arcmin	4 ~ 10	-	-	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1
Backlash P0 / Düşük Boşluk Oranı		arcmin	4 ~ 10	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3
Backlash P1 / Azaltılmış Boşluk Oranı		arcmin	4 ~ 10	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5
Backlash P2 / Standart Boşluk Oranı		arcmin	4 ~ 10	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
Torsional Rigidity / Burulma Direnci		Nm/arcmin	4 ~ 10	6	14	30	86	155	450	1126
Max. Axial Force Taper Bearing / Max. Aksiyel Yük Bilyalı Rulman	$F_{2rB}$	N	4 ~ 10	1,020	1,260	4,230	6,360	7,035	17,600	19,800
Max. Axial Force Taper Bearing / Max. Aksiyel Yük Masuralı Rulman	$F_{2aB}$	N	4 ~ 10	-	-	7,330	11,500	18,600	36,800	53,600
Service Life / Hizmet Ömrü	$L_H$	hr	4 ~ 10	S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)						
Efficiency / Verim	$\eta$	%	4 ~ 10	≥ 97						
Operating Temperature / Çalışma Sıcaklığı		°C	4 ~ 10	- 25° C ~ + 90° C						
Lubrication / Yağlama			4 ~ 10	Synthetic Grease / Sentetik Gres						
Protection Class / Koruma Sınıfı			4 ~ 10	IP65						
Mounting Position / Montaj Pozisyonu			4 ~ 10	Any / Her Yönde						
Noise Level / Ses Seviyesi		dB	4 ~ 10	≤ 56	≤ 58	≤ 60	≤ 63	≤ 65	≤ 67	≤ 70
Weight / Ağırlık ±3%		Kg	4 ~ 10	0.7	1.4	4.2	7.4	13.9	32.4	55

#### ■ Mass Moments of Inertia / Atalet Ağırlık Momenti (kg.cm<sup>2</sup>)

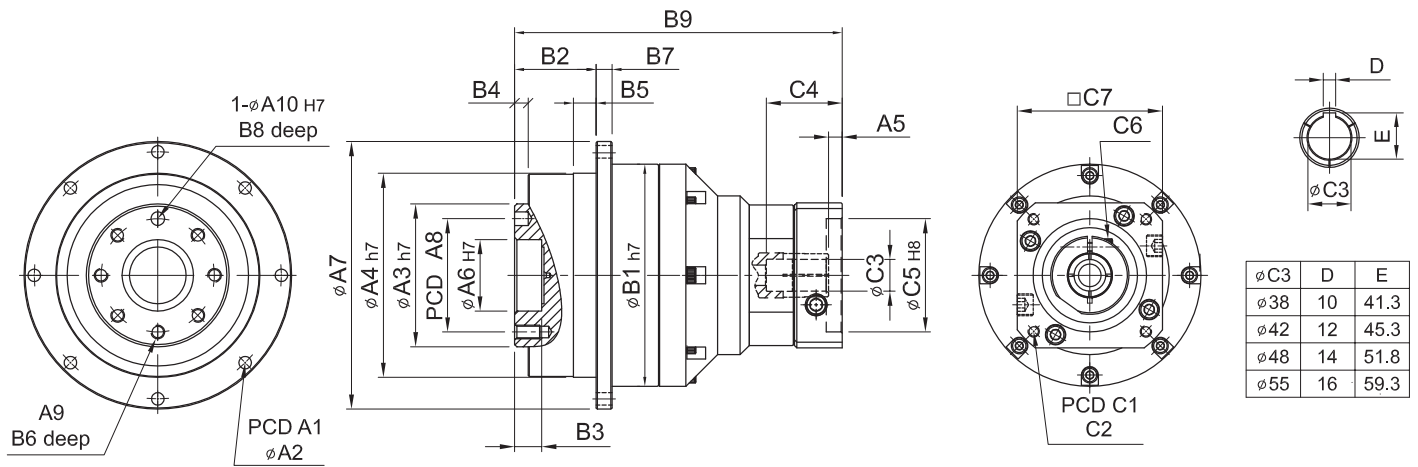
Ratio / Çevrim	47	64	90	110	140	200	255
4	0.03	0.13	0.47	2.75	7.46	24.00	55
5	0.03	0.12	0.45	2.70	7.41	23.23	53.19
7	0.03	0.12	0.45	2.64	7.12	22.11	50.78
10	0.03	0.12	0.43	2.56	7.01	22.21	50.50

# SERVOBOX

## MODEL : SD

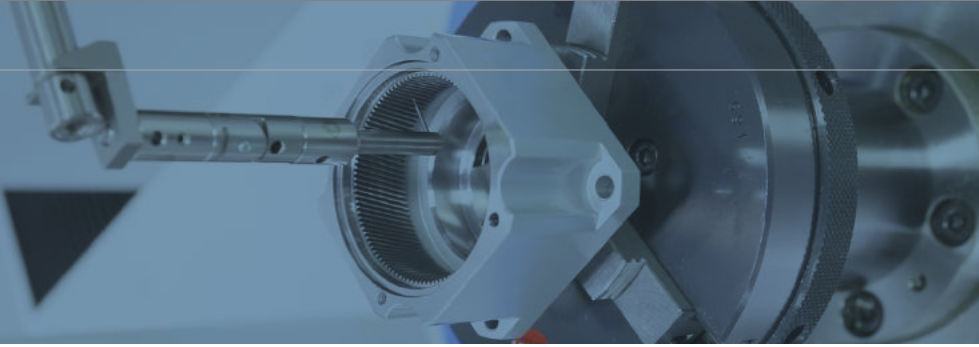
2-Stage / Kademe

RATIO / ÇEVİRİM : 20, 25, 35, 40, 50, 70, 100



unit / birim: mm

Model Code	47	64	90	110	140	200	255
<b>A</b>							
A1	67	79	109	135	168	233	280
A2	8-3.4	8-4.5	8-5.5	8-5.5	12-6.6	12-9.0	16-13.5
A3	28	40	63	80	100	160	180
A4	47	64	90	110	140	200	255
A5	5	6.5	6	9-23	10-20	10	11.5-13.5
A6	12	20	31.5	40	50	80	100
A7	72	86	118	146	179	248	300
A8	20	31.5	50	63	80	125	140
A9	4 - M3 x P0.5	7 - M5 x P0.8	7 - M6 x P1.0	11 - M6 x P1.0	11 - M8 x P1.25	11 - M10 x P1.5	12 - M16 x P2.0
A10	3	5	6	6	8	10	12
<b>B</b>							
B1	59	70	98	125	156	212	255
B2	19.5	19.5	30	29	38	50	66
B3	5	7	12	12	12	16	20
B4	1.5	4	6	6	6	8	12
B5	5	6	10	10	15	15	20
B6	6.5	8	12	12	16	22	30.5
B7	4	5	7	8	10	12	16
B8	4	6	6	7	7	10	10
B9	100.7	109	144.5	189-203.5	224.5-234.5	290.5	349-351
<b>C</b>							
C1	46-60-63	46-60-63	70-75-90	90-100-115-145	115-145-165	145-165-215	200-215-265
C2	M3-M4-M5	M3-M4-M5	M4-M5-M6	M5-M6-M8	M6-M8-M10	M8-M10-M12	M10-M12-M16
C3	8-9-11	8-9-11-14	14-19	19-22-24	24-28-32	28-32-35	38-42-48-55
C4	26	32	33.5	59-73.5	67-77	84.5	114.5-116.5
C5	30-40-50	30-40-50	50-60-70	70-80-95-110	95-110-130	110-130-180	114.3-180-230
C6	M4 x P0.7	M4 x P0.7	M5 x P1.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5
C7	46-55	46-55	64-70-80	92-110-130	122-130-150	146-150-190	182-200-250



Model No.		Unit/Birim	Ratio Çevrim	47	64	90	110	140	200	255
Nominal output torque / Nominal Çıkış Torku	$T_{2N}$	Nm	20	22	60	160	335	650	1,200	2,020
			25	20	50	155	333	618	1,189	2,010
			35	19	47	142	309	573	1,108	1,870
			40	22	60	160	335	650	1,200	2,020
			50	20	50	155	333	618	1,189	2,010
			70	19	47	142	309	573	1,108	1,870
			100	16	43	136	294	549	1,059	1,779
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	20 ~ 100	1.8 Times of Rated Output Torque / 1,8 x Nominal Çıkış Torku						
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	20 ~ 100	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku						
Rated Input Speed / Nominal Giriş Devri	$n_{1N}$	rpm	20 ~ 100	3,000	3,000	3,000	3,000	3,000	3,000	2,000
Max. Input Speed / Max. Giriş Devri	$n_{1B}$	rpm	20 ~ 100	6,000	6,000	6,000	6,000	5,000	4,000	3,000
Backlash P <sub>s</sub> / Min. Boşluk Oranı		arcmin	20 ~ 100	-	-	-	≤ 3	≤ 3	≤ 3	≤ 3
Backlash P <sub>0</sub> / Düşük Boşluk Oranı		arcmin	20 ~ 100	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5
Backlash P <sub>1</sub> / Azaltılmış Boşluk Oranı		arcmin	20 ~ 100	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
Backlash P <sub>2</sub> / Standart Boşluk Oranı		arcmin	20 ~ 100	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9
Torsional Rigidity / Burulma Direnci		Nm/arcmin	20 ~ 100	6	14	30	86	155	450	1,126
Max. Axial Force Ball Bearing / Max. Aksiyel Yük Bilyalı Rulman	$F_{2rB}$	N	20 ~ 100	1,020	1,260	4,230	6,360	7,035	17,600	19,800
Max. Axial Force Taper Bearing / Max. Aksiyel Yük Masuralı Rulman	$F_{2aB}$	N	20 ~ 100	-	-	7,330	11,500	18,600	36,800	53,600
Service Life / Hizmet Ömrü	$L_{H1}$	hr	20 ~ 100	S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)						
Efficiency / Verim	$\eta$	%	20 ~ 100	≥ 94						
Operating Temperature / Çalışma Sıcaklığı		°C	20 ~ 100	- 25° C ~ + 90° C						
Lubrication / Yağlama			20 ~ 100	Synthetic Grease / Sentetik Gres						
Protection Class / Koruma Sınıfı			20 ~ 100	IP65						
Mounting Position / Montaj Pozisyonu			20 ~ 100	Any / Her Yönde						
Noise Level / Ses Seviyesi		dB	20 ~ 100	≤ 56	≤ 58	≤ 60	≤ 63	≤ 65	≤ 67	≤ 70
Weight / Ağırlık ±3%		Kg	20 ~ 100	1	1.9	4.8	9.4	16.7	40.12	64

#### ■ Mass Moments of Inertia / Atalet Ağırlık Momenti (kg.cm<sup>2</sup>)

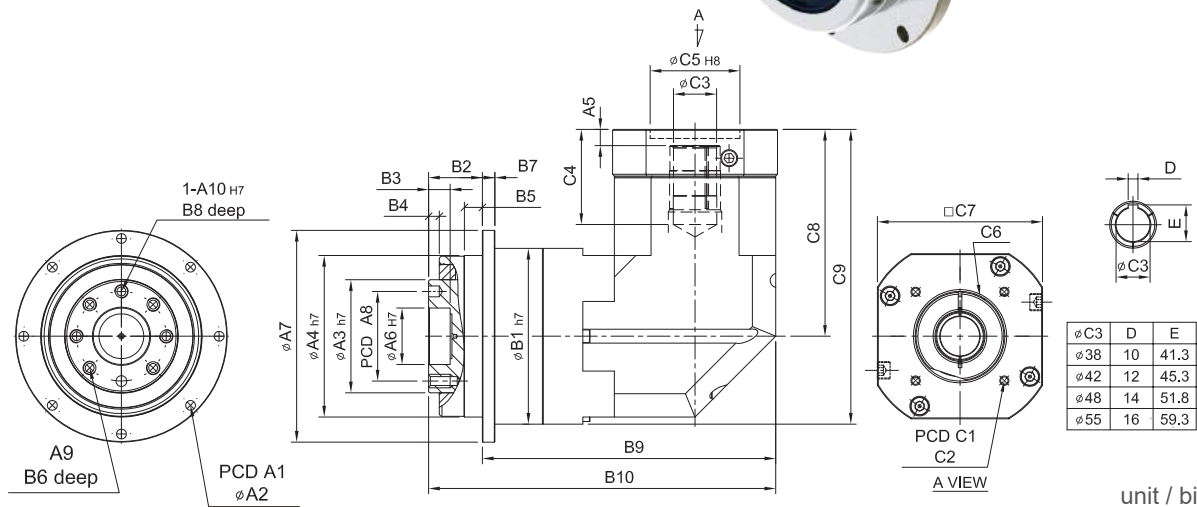
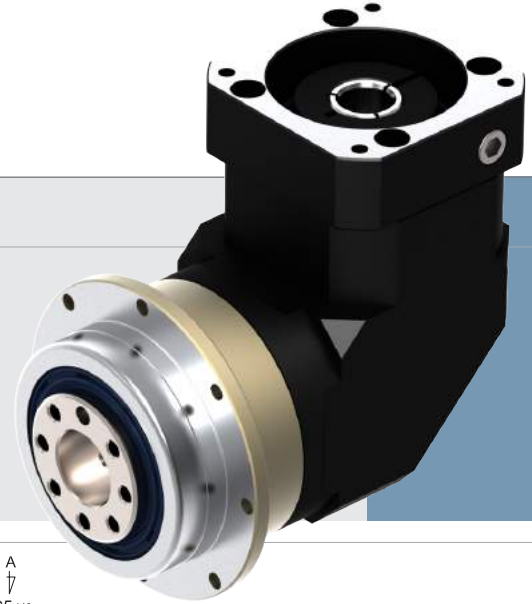
Ratio / Çevrim	47	64	90	110	140	200	255
20	0.03	0.03	0.15	0.45	2.7	7.22	23.22
25	0.03	0.03	0.15	0.45	2.7	7.22	23.22
35	0.03	0.03	0.15	0.45	2.7	7.22	23.22
40	0.03	0.03	0.15	0.45	2.7	7.22	23.22
50	0.03	0.03	0.14	0.4	2.6	7.05	23.07
70	0.03	0.03	0.14	0.4	2.6	7.05	23.07
100	0.03	0.03	0.14	0.4	2.6	7.01	22.67

# SERVOBOX

## MODEL : SDL

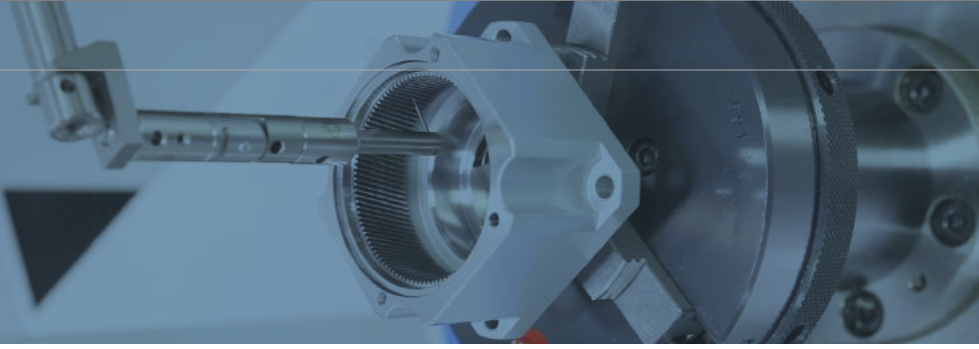
1-Stage / Kademe

RATIO / ÇEVİRİM : 4, 5, 7, 10, 14, 20



unit / birim: mm

Model Code	47	64	90	110	140	200	255
<b>A</b>							
A1	67	79	109	135	168	233	280
A2	8-3.4	8-4.5	8-5.5	8-5.5	12-6.6	12-9.0	16-13.5
A3	28	40	63	80	100	160	180
A4	47	64	90	110	140	200	255
A5	6	6	9-23.5	10-20	10	12.5-14.5	12.5-14.5
A6	12	20	31.5	40	50	80	100
A7	72	86	118	146	179	248	300
A8	20	31.5	50	63	80	125	140
A9	4 - M3 x P0.5	7 - M5 x P0.8	7 - M6 x P1.0	11 - M6 x P1.0	11 - M8 x P1.25	11 - M10 x P1.5	12 - M16 x P2.0
A10	3	5	6	6	8	10	12
<b>B</b>							
B1	59	70	98	125	156	212	255
B2	19.5	19.5	30	29	38	50	66
B3	5	7	12	12	12	16	20
B4	1.5	4	6	6	6	8	12
B5	5	6	10	10	15	15	20
B6	6.5	8	12	12	16	22	32
B7	4	5	7	8	10	12	18
B8	4	6	6	7	7	10	10
B9	84.2	105.5	163.6	203	227.5	313	332.5
B10	103.7	125	193.6	232	265.5	363	398.5
<b>C</b>							
C1	46-60-63	70-75-90	90-110-115-145	115-145-165	145-165-200	200-215-265	200-265-300
C2	M3-M4-M5	M4-M5-M6	M5-M6-M8	M6-M8-M10	M8-M10-M12	M10-M12-M16	M12-M16
C3	8-9-11	14-19	19-22-24	24-28-32	32-35-38	38-42-48-55	42-48-55
C4	27	33.5-41.5	53-67.5	67-77	85	132-134	132-134
C5	30-40-50	50-60-70	70-80-95-110	95-110-130	110-130-180	114.3-180-230	220-250-265
C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5	M10 x P1.5
C7	46-55	64-70-80	92-110-130	122-130-150	146-150-190	182-200-250	222-250-265
C8	61	77-85	115.3-129.8	141-151	165.7	235-237	235-273
C9	90.5	112-120	164.3-178.8	203.5-213.5	243.7	341-343	362-364



Model No.		Unit/Birim	Ratio Çevrim	47	64	90	110	140	200	255
Nominal output torque / Nominal Çıkış Torku	$T_{2N}$	Nm	4	22	60	160	335	650	1,200	2,020
			5	20	50	155	333	618	1,189	2,010
			7	19	47	142	309	573	1,108	1,870
			10	20	50	136	294	549	1,059	1,779
			14	19	47	142	309	573	1,108	1,870
			20	16	43	136	294	549	1,059	1,779
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	4 ~ 20	1.8 Times of Rated Output Torque / 1,8 x Nominal Çıkış Torku						
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	4 ~ 20	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku						
Rated Input Speed / Nominal Giriş Devri	$n_{IN}$	rpm	4 ~ 20	3,000	3,000	3,000	3,000	3,000	3,000	2,000
Max. Input Speed / Max. Giriş Devri	$n_{IB}$	rpm	4 ~ 20	6,000	6,000	6,000	6,000	5,000	4,000	3,000
Backlash P <sub>s</sub> / Min. Boşluk Oranı		arcmin	4 ~ 20	-	-	≤ 2	≤ 2	≤ 2	≤ 2	≤ 2
Backlash P <sub>0</sub> / Düşük Boşluk Oranı		arcmin	4 ~ 20	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4
Backlash P <sub>1</sub> / Azaltılmış Boşluk Oranı		arcmin	4 ~ 20	≤ 6	≤ 6	≤ 6	≤ 6	≤ 6	≤ 6	≤ 6
Backlash P <sub>2</sub> / Standart Boşluk Oranı		arcmin	4 ~ 20	≤ 8	≤ 8	≤ 8	≤ 8	≤ 8	≤ 8	≤ 8
Torsional Rigidity / Burulma Direnci		Nm/arcmin	4 ~ 20	6	14	30	86	155	450	1,126
Max. Axial Force Ball Bearing / Max. Aksiyel Yük bilyalı Rulman	$F_{2rB}$	N	4 ~ 20	1,020	1,260	4,230	6,360	7,035	17,600	19,800
Max. Axial Force Taper Bearing / Max. Aksiyel Yük Masuralı Rulman	$F_{2aB}$	N	4 ~ 20	-	-	7,330	11,500	18,600	36,800	53,600
Service Life / Hizmet Ömrü	$L_H$	hr	4 ~ 20	S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)						
Efficiency / Verim	$\eta$	%	4 ~ 20	≥ 95						
Operating Temperature / Çalışma Sıcaklığı		°C	4 ~ 20	- 25° C ~ + 90° C						
Lubrication / Yağlama			4 ~ 20	Synthetic Grease / Sentetik Gres						
Protection Class / Koruma Sınıfı			4 ~ 20	IP65						
Mounting Position / Montaj Pozisyonu			4 ~ 20	Any / Her Yönde						
Noise Level / Ses Seviyesi		dB	4 ~ 20	≤ 61	≤ 63	≤ 65	≤ 68	≤ 70	≤ 72	≤ 74
Weight / Ağırlık ±3%		Kg	4 ~ 20	1.1	2.3	6.9	13.4	23		

#### ■ Mass Moments of Inertia / Atalet Ağırlık Momenti (kg.cm<sup>2</sup>)

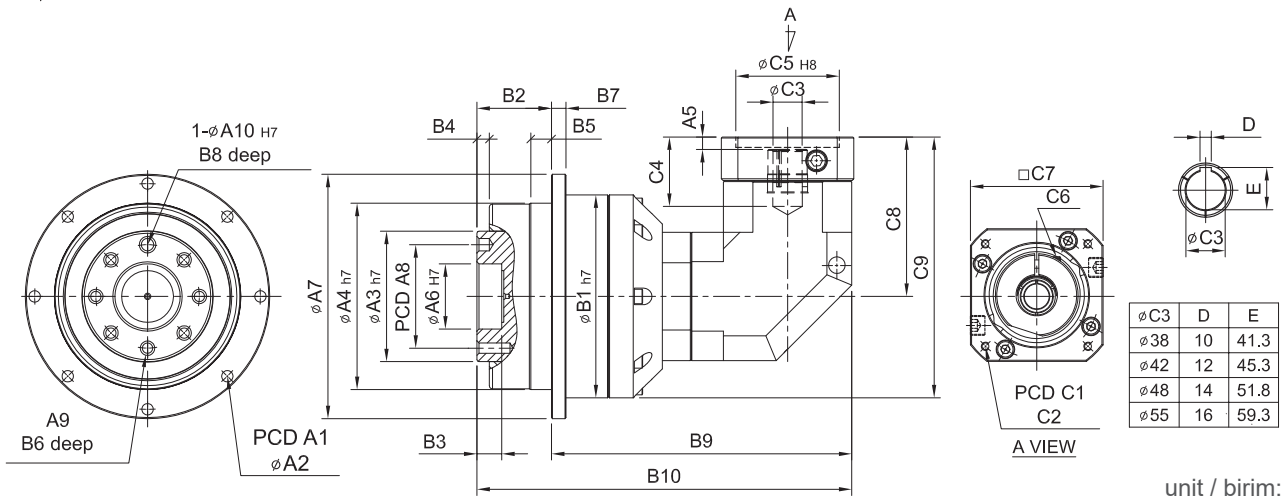
Ratio / Çevrim	47	64	90	110	140	200	255
4	0.09	0.36	2.28	6.85	23.5	68.1	134.8
5	0.09	0.36	2.28	6.85	23.5	68.1	134.8
7	0.09	0.36	2.28	6.85	23.5	68.1	134.8
10	0.09	0.36	2.28	6.85	23.5	68.1	134.8
14	0.03	0.08	1.88	6.2	21.8	66.5	120.2
20	0.03	0.08	1.88	6.2	21.8	66.3	118.8

# SERVOBOX

## MODEL : SDL

2-Stage / Kademe

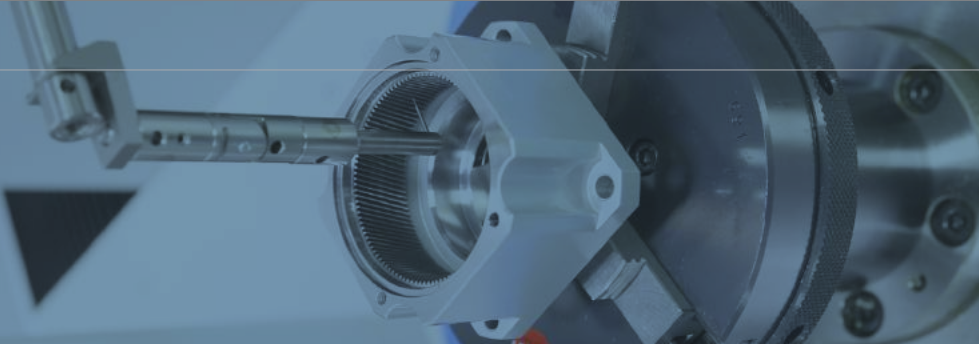
RATIO / ÇEVİRİM : 20, 25, 35, 40, 50, 70, 100, 140, 200



$\phi$ C3	D	E
$\phi$ 38	10	41.3
$\phi$ 42	12	45.3
$\phi$ 48	14	51.8
$\phi$ 55	16	59.3

unit / birim: mm

Model Code	47	64	90	110	140	200	255
A1	67	79	109	135	168	233	280
A2	8-3.4	8-4.5	8-5.5	8-5.5	12-6.6	12-9.0	16-13.5
A3	28	40	63	80	100	160	180
A4	47	64	90	110	140	200	255
A5	6	6	9-23	9-23.5	10	12.5	12.5-14.5
A6	12	20	31.5	40	50	80	100
A7	72	86	118	146	179	248	300
A8	20	31.5	50	63	80	125	140
A9	4 - M3 x P0.5	7 - M5 x P0.8	7 - M6 x P1.0	11 - M6 x P1.0	11 - M8 x P1.25	11 - M10 x P1.5	12 - M16 x P2.0
A10	3	5	6	6	8	10	12
B1	59	70	98	125	156	212	255
B2	19.5	19.5	30	29	38	50	66
B3	5	7	12	12	12	16	20
B4	1.5	4	6	6	6	8	12
B5	5	6	10	10	15	15	20
B6	6.5	8	12	12	16	22	32
B7	4	5	7	8	10	12	16
B8	4	6	6	7	7	10	10
B9	110.2	118.5	151	210.6	254.5	308.5	379.1
B10	129.7	138	181	239.6	292.5	358.5	445.1
C1	46-60-63	46-60-63	70-75-90	90-110-115-145	115-145-165	145-165-200	200-215-265
C2	M3-M4-M5	M3-M4-M5	M4-M5-M6	M5-M6-M8-M10	M6-M8-M10	M8-M10-M12	M10-M12-M16
C3	8-9-11	8-9-11	14-19	19-22-24	24-28-32	32-35-38	38-42-48-55
C4	27	27	33.5-41.5	53-67.5	67-77	85	117-119
C5	30-40-50	30-40-50	50-60-70	70-80-95-110	95-110-130	110-130-180	114.3-180-230
C6	M4 x P0.7	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5
C7	46-55	46-55	64-70-80	92-110-130	122-130-150	146-150-190	182-200-250
C8	61	61	77-85	115.3-129.8	141-151	165.7	235-237
C9	90.5	96	126-134	177.8-192.3	219-229	271.7	362.5-364.5



Model No.		Unit/Birim	Ratio Çevrim	47	64	90	110	140	200	255
Nominal output torque / Nominal Çıkış Torku	$T_{2N}$	Nm	20	22	60	160	335	650	1,200	2,020
			25	20	50	155	333	618	1,189	2,010
			35	19	47	142	309	573	1,108	1,870
			40	22	60	160	335	650	1,200	2,020
			50	20	50	155	333	618	1,189	2,010
			70	19	47	142	309	573	1,108	1,870
			100	16	43	136	294	549	1,059	1,779
			140	19	47	142	309	573	1,108	1,870
200	16	43	136	294	549	1,059	1,779			
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	20 ~ 200	1.8 Times of Rated Output Torque / 1,8 x Nominal Çıkış Torku						
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	20 ~ 200	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku						
Rated Input Speed / Nominal Giriş Devri	$n_{1N}$	rpm	20 ~ 200	3,000	3,000	3,000	3,000	3,000	3,000	2,000
Max. Input Speed / Max. Giriş Devri	$n_{1B}$	rpm	20 ~ 200	6,000	6,000	6,000	6,000	6,000	4,000	3,000
Backlash P <sub>s</sub> / Min. Boşluk Oranı		arcmin	20 ~ 200	-	-	-	≤ 4	≤ 4	≤ 4	≤ 4
Backlash P <sub>0</sub> / Düşük Boşluk Oranı		arcmin	20 ~ 200	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
Backlash P <sub>1</sub> / Azaltılmış Boşluk Oranı		arcmin	20 ~ 200	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9
Backlash P <sub>2</sub> / Standart Boşluk Oranı		arcmin	20 ~ 200	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12
Torsional Rigidity / Burulma Direnci		Nm/arcmin	20 ~ 200	6	14	30	86	155	450	1,126
Max. Axial Force Ball Bearing / Max. Aksiyel Yük Biyalı Rulman	$F_{2tB}$	N	20 ~ 200	1,020	1,260	4,230	6,360	7,035	17,600	19,800
Max. Axial Force Taper Bearing / Max. Aksiyel Yük Masuralı Rulman	$F_{2tAB}$	N	20 ~ 200	-	-	7,330	11,500	18,600	36,800	53,600
Service Life / Hizmet Ömrü	$L_H$	hr	20 ~ 200	S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)						
Efficiency / Verim	$\eta$	%	20 ~ 200	≥ 92						
Operating Temperature / Çalışma Sıcaklığı		°C	20 ~ 200	- 25° C ~ + 90° C						
Lubrication / Yağlama			20 ~ 200	Synthetic Grease / Sentetik Gres						
Protection Class / Koruma Sınıfı			20 ~ 200	IP65						
Mounting Position / Montaj Pozisyonu			20 ~ 200	Any / Her Yönde						
Noise Level / Ses Seviyesi		dB	20 ~ 200	≤ 56	≤ 58	≤ 60	≤ 63	≤ 65	≤ 67	≤ 70
Weight / Ağırlık ±3%		Kg	20 ~ 200		2	6	11.8	22.3	48.5	

#### ■ Mass Moments of Inertia / Atalet Ağırlık Momenti (kg.cm<sup>2</sup>)

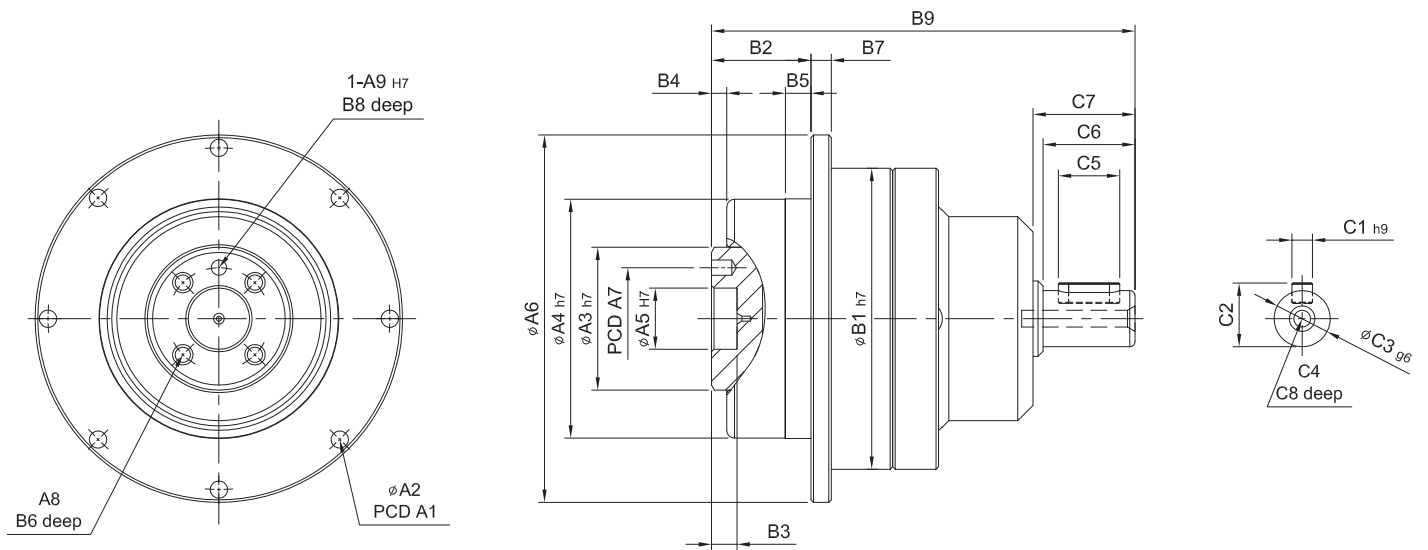
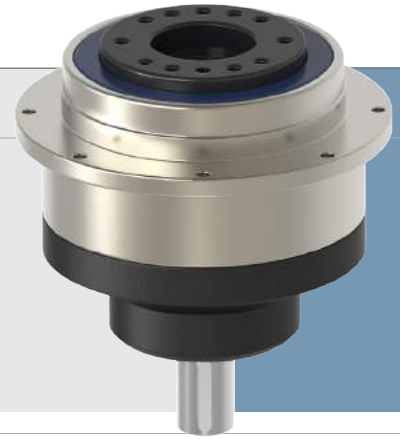
Ratio / Çevrim	47	64	90	110	140	200	255
20	0.09	0.36	2.28	6.85	23.5	22.8	68.2
25	0.09	0.36	2.28	6.85	23.5	22.8	68.2
35	0.09	0.36	2.28	6.85	23.5	22.8	68.2
40	0.09	0.36	2.28	6.85	23.5	22.8	68.2
50	0.09	0.36	2.28	6.85	23.5	22.8	68.2
70	0.09	0.36	2.28	6.85	23.5	22.8	68.2
100	0.09	0.36	2.28	6.85	23.5	22.8	68.2
140	0.03	0.08	1.88	6.2	21.8	21.1	64.9
200	0.03	0.08	1.88	6.2	21.8	21.1	64.9

# SERVOBOX

## MODEL : SDD

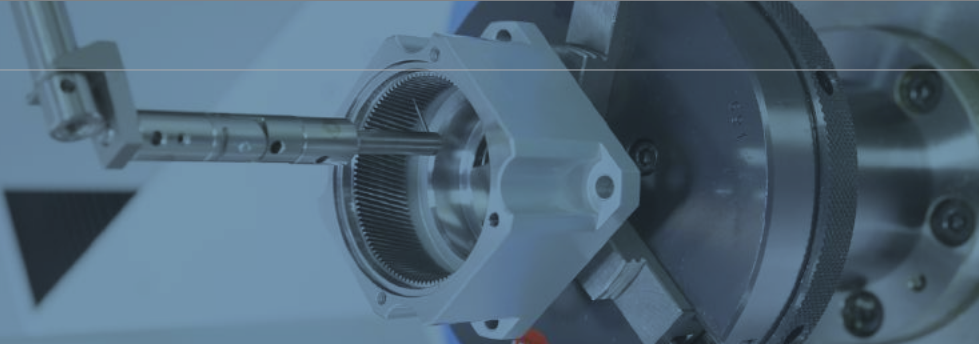
1-Stage / Kademe

RATIO / ÇEVİRİM : 4, 5, 7, 10



unit / birim: mm

Model Code	47	64	90	110	140	200	255
A1	67	79	109	135	168	233	280
A2	8-3.4	8-4.5	8-5.5	8-5.5	12-6.6	12-9.0	16-13.5
A3	28	40	63	80	100	160	180
A4	47	64	90	110	140	200	255
A5	12	20	31.5	40	50	80	100
A6	72	86	118	146	179	248	300
A7	20	31.5	50	63	80	125	140
A8	4 - M3 x P0.5	7 - M5 x P0.8	7 - M6 x P1.0	11 - M6 x P1.0	11 - M8 x P1.25	11 - M10 x P1.5	12 - M16 x 2.0
A9	3	5	6	6	8	10	12
B1	59	70	98	125	156	212	255
B2	19.5	19.5	30	29	38	50	66
B3	5	7	12	12	12	16	20
B4	1.5	4	6	6	6	8	12
B5	5	6	10	10	15	15	20
B6	6.5	8	12	12	16	22	32
B7	4	5	7	8	10	12	18
B8	4	6	6	7	7	10	10
B9	83	99	134	160	195	252	322.5
C1	4	5	5	6	10	12	16
C2	12.5	16	18	24.5	35	43	59
C3	11	14	16	22	32	40	55
C4	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M12 x P1.75	M14 x P2.0	M16 x P2.0
C5	12	20	20	30	40	50	75
C6	18	24	28	36	50	60	85
C7	20	26.3	31.5	40	54	65	90
C8	8	10	12	16	24	28	32



Model No.		Unit/Birim	Ratio Çevrim	47	64	90	110	140	200	255
Nominal output torque / Nominal Çıkış Torku	$T_{2N}$	Nm	4	22	60	160	335	650	1,200	2,020
			5	20	50	155	333	618	1,189	2,010
			7	19	47	142	309	573	1,108	1,870
			10	16	43	136	294	549	1,059	1,779
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	4 ~ 10	1.8 Times of Rated Output Torque / 1,8 x Nominal Çıkış Torku						
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	4 ~ 10	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku						
Rated Input Speed / Nominal Giriş Devri	$n_{1N}$	rpm	4 ~ 10	3,000	3,000	3,000	3,000	3,000	3,000	2,000
Max. Input Speed / Max. Giriş Devri	$n_{1B}$	rpm	4 ~ 10	6,000	6,000	6,000	6,000	5,000	4,000	3,000
Backlash Ps / Min. Boşluk Oranı		arcmin	4 ~ 10	-	-	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1
Backlash P0 / Düşük Boşluk Oranı		arcmin	4 ~ 10	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3
Backlash P1 / Azaltılmış Boşluk Oranı		arcmin	4 ~ 10	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5
Backlash P2 / Standart Boşluk Oranı		arcmin	4 ~ 10	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
Torsional Rigidity / Burulma Direnci		Nm/arcmin	4 ~ 10	6	14	30	86	155	450	1,126
Max. Axial Force Ball Bearing / Max. Aksiyel Yük bilyalı Rulman	$F_{2rB}$	N	4 ~ 10	1,020	1,260	4,230	6,360	7,035	17,600	19,800
Max. Axial Force Taper Bearing / Max. Aksiyel Yük Masuralı Rulman	$F_{2aB}$	N	4 ~ 10	-	-	7,330	11,500	18,600	36,800	53,600
Service Life / Hizmet Ömrü	$L_H$	hr	4 ~ 10	S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)						
Efficiency / Verim	$\eta$	%	4 ~ 10	≥ 97						
Operating Temperature / Çalışma Sıcaklığı		°C	4 ~ 10	- 25° C ~ + 90° C						
Lubrication / Yağlama			4 ~ 10	Synthetic Grease / Sentetik Gres						
Protection Class / Koruma Sınıfı			4 ~ 10	IP65						
Mounting Position / Montaj Pozisyonu			4 ~ 10	Any / Her Yönde						
Noise Level / Ses Seviyesi		dB	4 ~ 10	≤ 56	≤ 58	≤ 60	≤ 63	≤ 65	≤ 67	≤ 70
Weight / Ağırlık ±3%		Kg	4 ~ 10		1.3	4.2	8.5	15.2	42.3	71.5

#### ■ Mass Moments of Inertia / Atalet Ağırlık Momenti (kg.cm<sup>2</sup>)

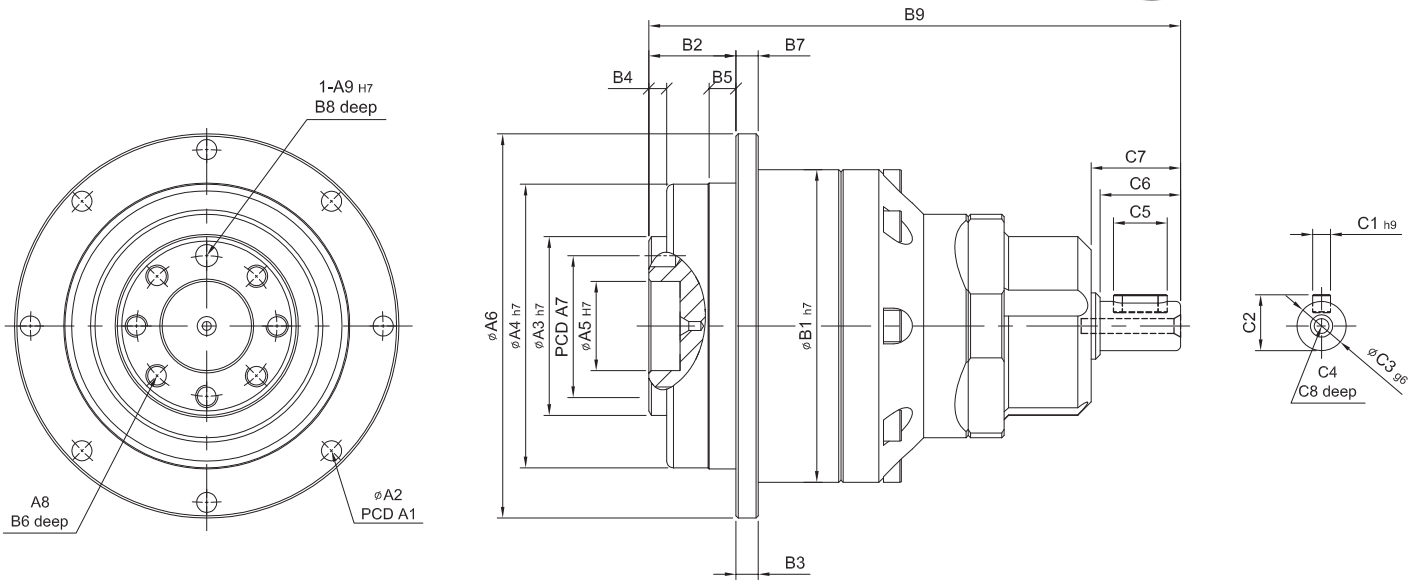
Ratio / Çevrim	47	64	90	110	140	200	255
4	0.03	0.13	0.47	2.75	7.46	24.00	55
5	0.03	0.12	0.45	2.70	7.41	23.23	53.19
7	0.03	0.12	0.45	2.64	7.12	22.11	50.78
10	0.03	0.12	0.43	2.56	7.01	22.21	50.50

# SERVOBOX

## MODEL : SDD

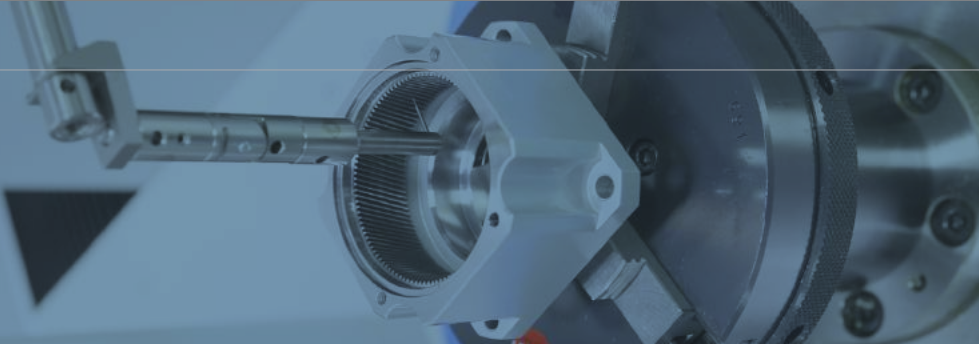
2-Stage / Kademe

RATIO / ÇEVİRİM : 20, 25, 35, 40, 50, 70, 100



unit / birim: mm

Model Code	47	64	90	110	140	200	255	
<b>A</b>	A1	67	79	109	135	168	233	280
	A2	8-3.4	8-4.5	8-5.5	8-5.5	12-6.6	12-9.0	16-13.5
	A3	28	40	63	80	100	160	180
	A4	47	64	90	110	140	200	255
	A5	12	20	31.5	40	50	80	100
	A6	72	86	118	146	179	248	300
	A7	20	31.5	50	63	80	125	140
	A8	4 - M3 x P0.5	7 - M5 x P0.8	7 - M6 x P1.0	11 - M6 x P1.0	11 - M8 x P1.25	11 - M10 x P1.5	12 - M16 x P2.0
	A9	3	5	6	6	8	10	12
<b>B</b>	B1	59	70	98	125	156	212	255
	B2	19.5	19.5	30	29	38	50	66
	B3	5	7	12	12	12	16	20
	B4	1.5	4	6	6	6	8	12
	B5	5	6	10	10	15	15	20
	B6	6.5	8	12	12	16	22	32
	B7	4	5	7	8	10	12	18
	B8	4	6	6	7	7	10	10
	B9	109	119	159	190	231.5	299	350.5
<b>C</b>	C1	4	4	5	5	6	10	12
	C2	12.5	12.5	16	18	24.5	35	43
	C3	11	11	14	16	22	32	40
	C4	M4 x P0.7	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M12 x P1.75	M14 x P2.0
	C5	12	12	20	20	30	40	50
	C6	18	18	24	28	36	50	60
	C7	20	20	26	31.5	40	54	65
	C8	8	8	10	12	16	24	28



Model No.		Unit/Birim	Ratio Çevrim	47	64	90	110	140	200	255
Nominal output torque / Nominal Çıkış Torku	$T_{2N}$	Nm	20	22	60	160	335	650	1,200	2,020
			25	20	50	155	333	618	1,189	2,010
			35	19	47	142	309	573	1,108	1,870
			40	22	60	160	335	650	1,200	2,020
			50	20	50	155	333	618	1,189	2,010
			70	19	47	142	309	573	1,108	1,870
			100	16	43	136	294	549	1,059	1,779
Max. Acceleration Torque / Max.İvmelenme Torku	$T_{2B}$	Nm	20 ~ 100	1.8 Times of Rated Output Torque / 1,8 x Nominal Çıkış Torku						
Max. Output Torque / Max.Çıkış Torku	$T_{2NOT}$	Nm	20 ~ 100	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku						
Rated Input Speed / Nominal Giriş Devri	$n_{IN}$	rpm	20 ~ 100	3,000	3,000	3,000	3,000	3,000	3,000	2,000
Max. Input Speed / Max.Giriş Devri	$n_{IB}$	rpm	20 ~ 100	6,000	6,000	6,000	6,000	5,000	4,000	3,000
Backlash P <sub>s</sub> / Min.Boşluk Oranı		arcmin	20 ~ 100	-	-	-	≤ 3	≤ 3	≤ 3	≤ 3
Backlash P <sub>0</sub> / Düşük Boşluk Oranı		arcmin	20 ~ 100	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5
Backlash P <sub>1</sub> / Azaltılmış Boşluk Oranı		arcmin	20 ~ 100	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
Backlash P <sub>2</sub> / Standart Boşluk Oranı		arcmin	20 ~ 100	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9
Torsional Rigidity / Burulma Direnci		Nm/arcmin	20 ~ 100	6	14	30	86	155	450	1,126
Max. Axial Force Ball Bearing / Max. Aksiyel Yük bilyalı Rulman	$F_{2FB}$	N	20 ~ 100	1,020	1,260	4,230	6,360	7,035	17,600	19,800
Max. Axial Force Taper Bearing / Max. Aksiyel Yük Masuralı Rulman	$F_{2aB}$	N	20 ~ 100	-	-	7,330	11,500	18,600	36,800	53,600
Service Life / Hizmet Ömrü	$L_H$	hr	20 ~ 100	S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)						
Efficiency / Verim	$\eta$	%	20 ~ 100	≥ 94						
Operating Temperature / Çalışma Sıcaklığı		°C	20 ~ 100	- 25° C ~ + 90° C						
Lubrication / Yağlama			20 ~ 100	Synthetic Grease / Sentetik Gres						
Protection Class / Koruma Sınıfı			20 ~ 100	IP65						
Mounting Position / Montaj Pozisyonu			20 ~ 100	Any / Her Yönde						
Noise Level / Ses Seviyesi		dB	20 ~ 100	≤ 56	≤ 58	≤ 60	≤ 63	≤ 65	≤ 67	≤ 70
Weight / Ağırlık ±3%		Kg	20 ~ 100							

#### ■ Mass Moments of Inertia / Atalet Ağırlık Momenti (kg.cm<sup>2</sup>)

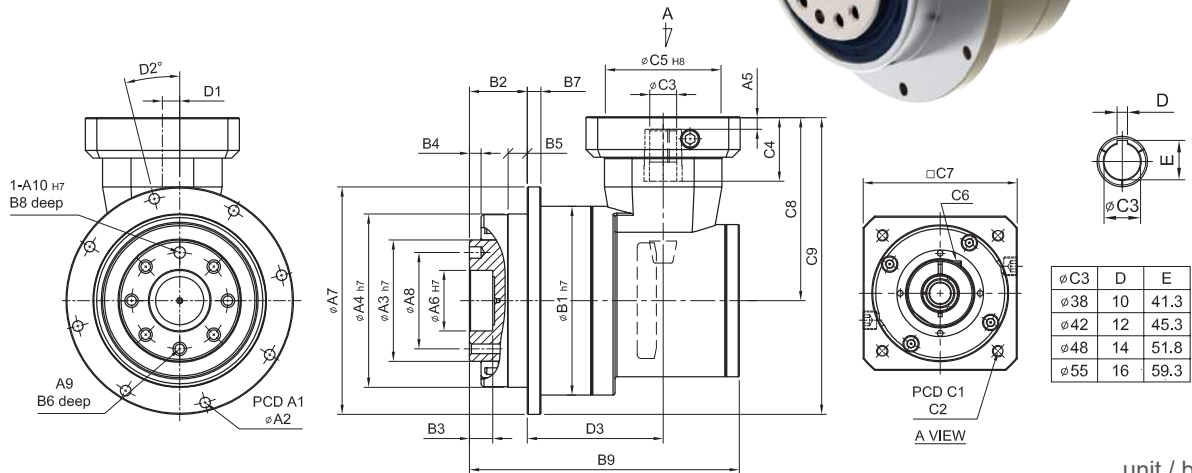
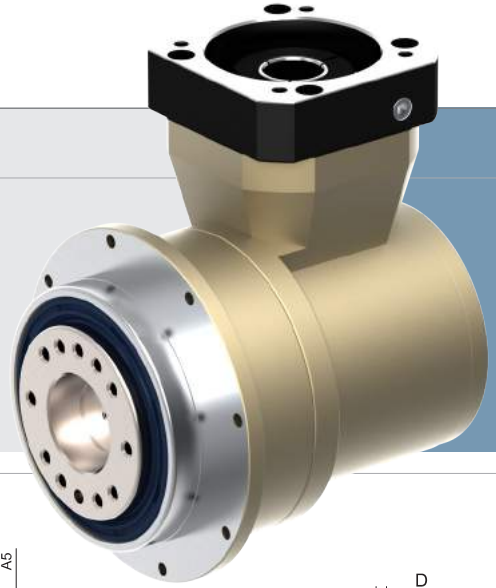
Ratio / Çevrim	47	64	90	110	140	200	255
20	0.03	0.03	0.15	0.45	2.7	7.22	23.22
25	0.03	0.03	0.15	0.45	2.7	7.22	23.22
35	0.03	0.03	0.15	0.45	2.7	7.22	23.22
40	0.03	0.03	0.15	0.45	2.7	7.22	23.22
50	0.03	0.03	0.14	0.4	2.6	7.05	23.07
70	0.03	0.03	0.14	0.4	2.6	7.05	23.07
100	0.03	0.03	0.14	0.4	2.6	7.01	22.67

# SERVOBOX

## MODEL : SDH

2-Stage / Kademe

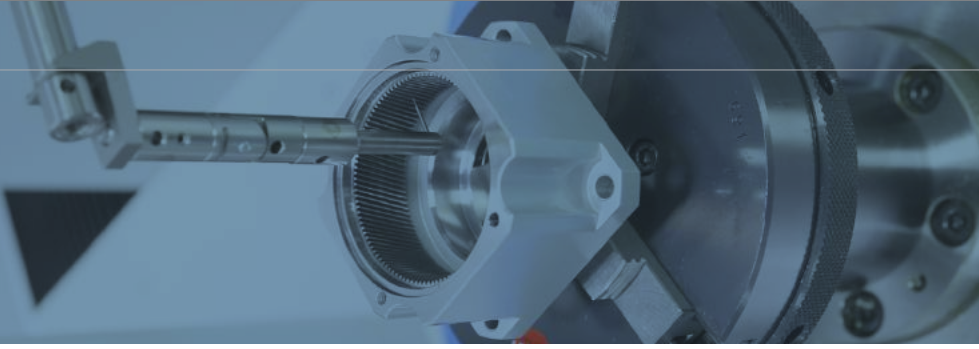
RATIO / ÇEVİRİM : 15, 25, 35, 50, 70, 100, 150



ØC3	D	E
Ø38	10	41.3
Ø42	12	45.3
Ø48	14	51.8
Ø55	16	59.3

unit / birim: mm

Model Code	64	90	110	140	200	255
<b>A</b>						
A1	79	109	135	168	233	280
A2	8-4.5	8-5.5	8-5.5	12-6.6	12-9.0	16-13.5
A3	40	63	80	100	160	180
A4	64	90	110	140	200	255
A5	5	6	9	10	10	13
A6	20	31.5	40	50	80	100
A7	86	118	146	179	248	300
A8	31.5	50	63	80	125	140
A9	7 - M5 x P0.8	7 - M6 x P1.0	11 - M6 x P1.0	11 - M8 x P1.25	11 - M10 x P1.5	12 - M16 x P2.0
A10	5	6	6	8	10	12
<b>B</b>						
B1	70	98	125	156	212	255
B2	19.5	30	29	38	50	66
B3	7	12	12	12	16	20
B4	4	6	6	6	8	12
B5	6	10	10	15	15	20
B6	10	12	12	16	22	30.5
B7	5	7	8	10	12	18
B8	6	6	7	7	10	10
B9	96	140	168	202	273	303.5
<b>C</b>						
C1	46 · 60 · 63	70 · 75 · 90	90 · 110 · 115 · 145	115 · 145 · 165	145 · 165 · 200	200 · 215 · 265
C2	M3 · M4 · M5	M4 · M5 · M6	M5 · M6 · M8	M6 · M8 · M10	M8 · M10 · M12	M10 · M12 · M16
C3	8 · 9 · 11	14	19 · 22 · 24	24 · 28 · 32	28 · 32 · 38	38 · 42 · 48 · 55
C4	26	33	59	67	85	116
C5	30 · 40 · 50	50 · 60 · 70	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180	114.3 · 180 · 230
C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5
C7	46 · 55	64 · 70 · 80	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190	182 · 200 · 250
C8	69	95.5	126.5	149	203	259.5
C9	112	154.5	199.5	238.5	327	409.5
C10	1/8"PT	1/8"PT	1/8"PT	1/4"PT	1/4"PT	3/8"PT
<b>D</b>						
D1	9	9	14	18	27	32
D2	19	14	14	0	0	18
D3	76.5	110	139	164	223	238.5



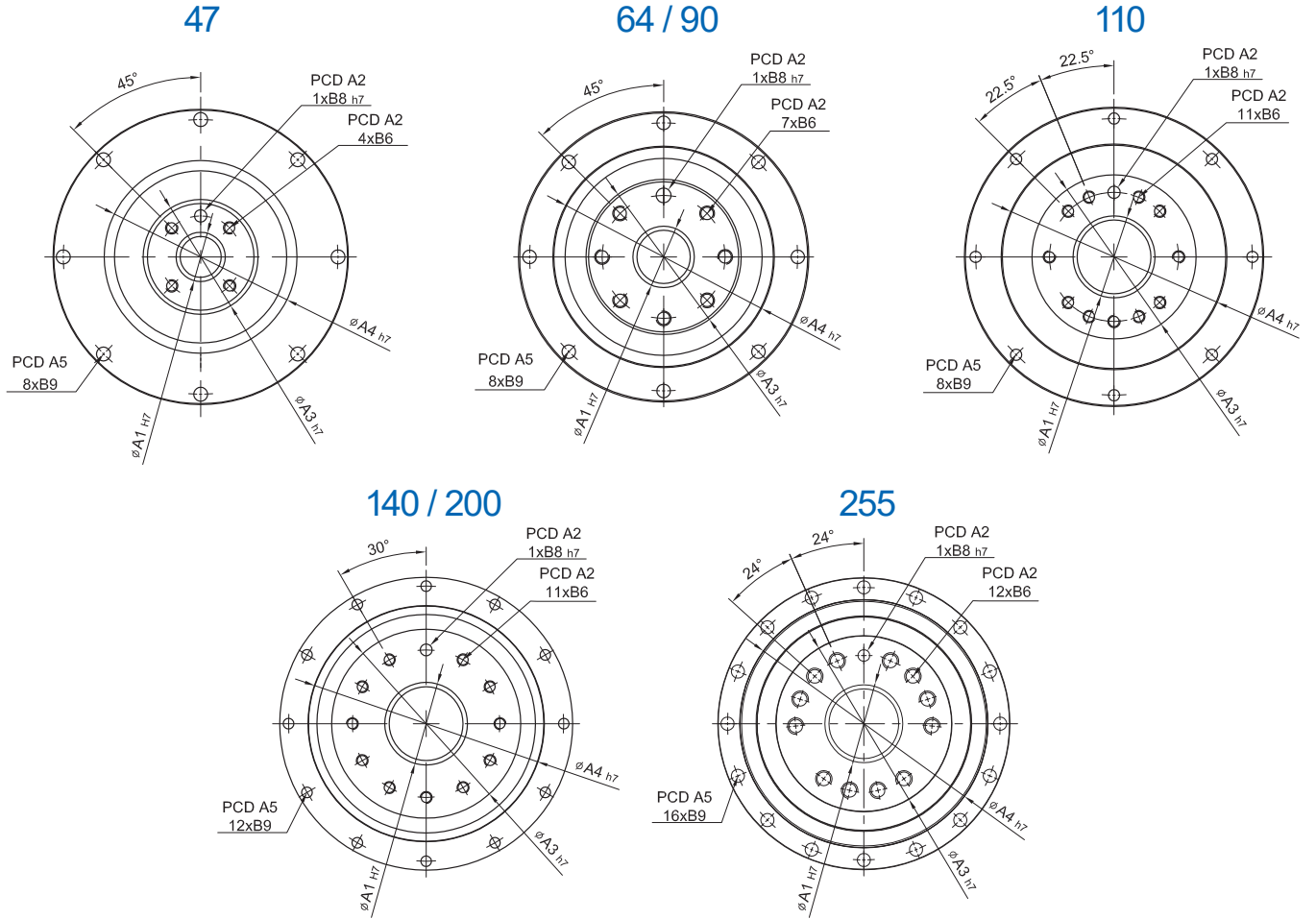
Model No.		Unit/Birim	Ratio Çevrim	64	90	110	140	200	255
Nominal output torque / Nominal Çıkış Torku	$T_{2N}$	Nm	15	60	160	335	650	1,200	2,020
			25	50	155	333	618	1,189	2,010
			35	47	142	309	573	1,108	1,870
			50	50	155	333	618	1,189	2,010
			70	47	142	309	573	1,108	1,870
			100	43	136	294	549	1,059	1,779
			150	43	136	294	549	1,059	1,779
Max. Acceleration Torque / Max.İvmelenme Torku	$T_{2B}$	Nm	15 ~ 150	1.8 Times of Rated Output Torque / 1,8 x Nominal Çıkış Tork					
Max. Output Torque / Max.Çıkış Torku	$T_{2NOT}$	Nm	15 ~ 150	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku					
Rated Input Speed / Nominal Giriş Devri	$n_{IN}$	rpm	15 ~ 150	3,000	3,000	3,000	3,000	2,000	2,000
Max. Input Speed / Max.Giriş Devri	$n_{IB}$	rpm	15 ~ 150	6,000	6,000	5,000	5,000	4,000	4,000
Backlash Ps / Min.Boşluk Oranı		arcmin	15 ~ 150	≤ 2	≤ 2	≤ 2	≤ 2	≤ 2	≤ 2
Backlash P0 / Düşük Boşluk Oranı		arcmin	15 ~ 150	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4
Backlash P1 / Azaltılmış Boşluk Oranı		arcmin	15 ~ 150	≤ 6	≤ 6	≤ 6	≤ 6	≤ 6	≤ 6
Backlash P2 / Standart Boşluk Oranı		arcmin	15 ~ 150	≤ 8	≤ 8	≤ 8	≤ 8	≤ 8	≤ 8
Torsional Rigidity / Burulma Direnci		Nm/arcmin	15 ~ 150	14	30	86	155	450	1,126
Max. Axial Force Ball Bearing / Max. Aksiyel Yük bilyalı Rulman	$F_{2rB}$	N	15 ~ 150	1,260	4,230	6,360	7,035	17,600	19,800
Max. Axial Force Taper Bearing / Max. Aksiyel Yük Masuralı Rulman	$F_{2aB}$	N	15 ~ 150	-	7,330	11,500	18,600	36,800	53,600
Service Life / Hizmet Ömrü	$L_H$	hr	15 ~ 150	S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)					
Efficiency / Verim	$\eta$	%	15 ~ 150	≥ 95					
Operating Temperature / Çalışma Sıcaklığı		°C	15 ~ 150	- 25° C ~ + 90° C					
Lubrication / Yağlama			15 ~ 150	Synthetic Grease / Sentetik Gres					
Protection Class / Koruma Sınıfı			15 ~ 150	IP65					
Mounting Position / Montaj Pozisyonu			15 ~ 150	Any / Her Yönde					
Noise Level / Ses Seviyesi		dB	15 ~ 150	≤ 68	≤ 70	≤ 72	≤ 74	≤ 76	≤ 78
Weight / Ağırlık ±3%		Kg	15 ~ 150	1.7	4.7	9.2	17.4		

#### ■ Mass Moments of Inertia / Atalet Ağırlık Momenti (kg.cm<sup>2</sup>)

Ratio / Çevrim	64	90	110	140	200	255
15	0.03	0.15	0.45	2.7	7.22	23.22
25	0.22	1.37	4.11	14.1	40.8	80.8
35	0.22	1.37	4.11	14.1	40.8	80.8
50	0.18	1.14	3.43	11.7	34.0	67.4
70	0.03	0.14	0.4	2.6	7.05	23.07
100	0.03	0.14	0.4	2.6	7.01	22.67
150	0.03	0.14	0.4	2.6	7.01	22.67



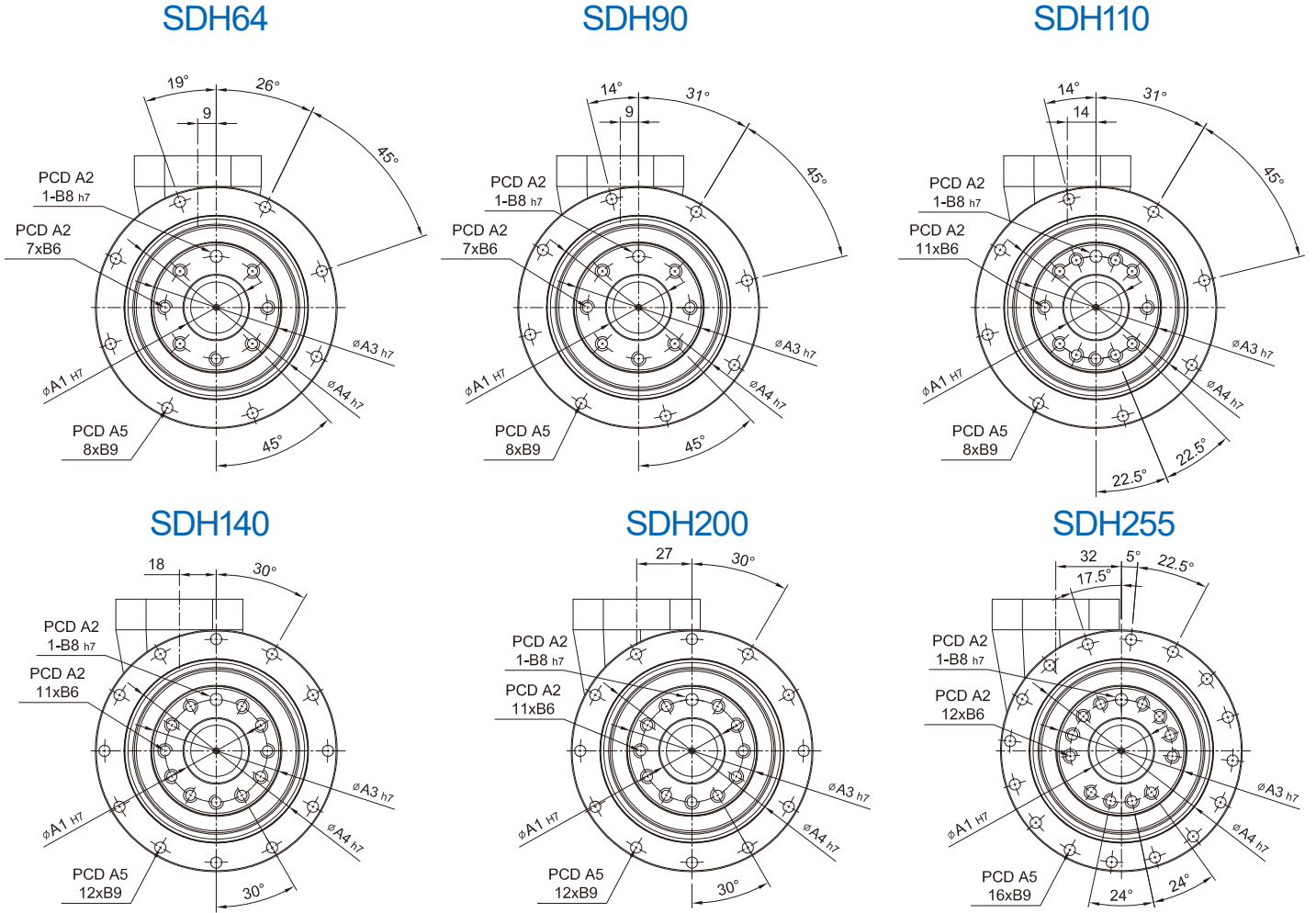
## Output Frame Dimension of SD, SDL, SDD / SD, SDL, SDD Serileri Çıkış Flanş Ölçüleri



unit / birim: mm

Model Code	47	64	90	110	140	200	255	
	<b>A</b>	A1	12	20	31.5	40	50	80
A2		20	31.5	50	63	80	80	140
A3		28	40	63	80	100	160	180
A4		47	64	90	110	140	200	255
A5		67	79	109	135	168	233	280
<b>B</b>	B6	M3 x P0.5	M5 x P0.8	M6 x P1	M6 x P1	M8 x P1.25	M10 x P1.5	M16 x P2
	B8	3	5	6	6	8	10	12
	B9	3.4	4.5	5.5	5.5	6.6	9	13.5

# Output Frame Dimension of SDH Series / SDH Serileri Çıkış Flanş Ölçüleri

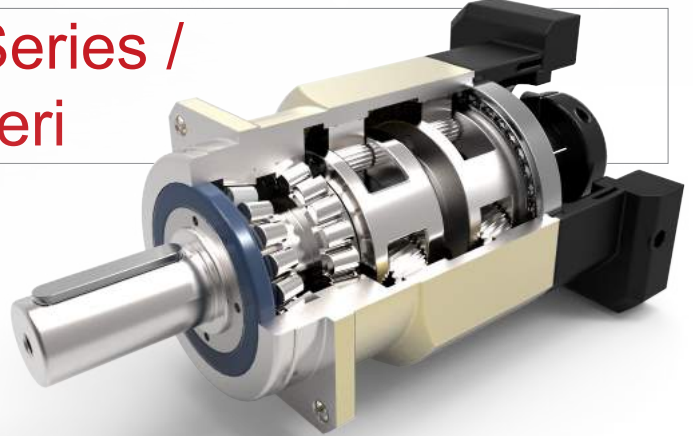


unit / birim: mm

Model Code	64	90	110	140	200	255	
	<b>A</b>	A1	20	31.5	40	50	80
A2		31.5	50	63	80	80	140
A3		40	63	80	100	160	180
A4		64	90	110	140	200	255
A5		79	109	135	168	233	280
<b>B</b>	B6	M5 x P0.8	M6 x P1	M6 x P1	M8 x P1.25	M10 x P1.5	M16 x P2
	B8	5	6	6	8	10	12
	B9	4.5	5.5	5.5	6.6	9	13.5

# SERVOBOX

## Characteristic of SF Series / SF Serilerinin Özellikleri



### Quiet operation / Sessiz çalışma

Helical gears contribute to reduce vibration and noise.  
Helis dişliler titreşimin ve sesin engellenmesini sağlar.

### High precision / Yüksek hassasiyet

Backlash  $\leq 1$  arc-min reaches precision alignment.  
 $\leq 1$  arc-min boşluk oranıyla yüksek hassasiyet sağlanır.

### High rigidity & torque / Sağlamlık & tork

High rigidity & high torque are achieved by integrant needle roller bearings and one-piece constructed.  
Sağlamlık ve yüksek tork tek parça yapı ve iğneli rulmanlar sayesinde elde edilir.

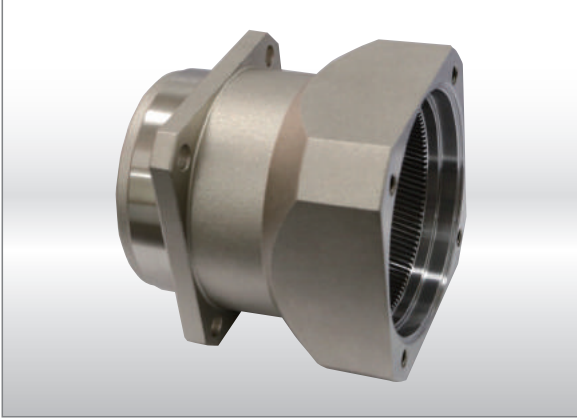
### High Load-Bearing Capacity / Yüksek Rulman Yüğü Kapasitesi

High load-bearing capacity are achieved by dual taper bearing.  
Çift sıra masuralı rulman sayesinde yüksek yük kapasitesine ulaşılır.

## Indication of Model Numbers / Model Seçimi

SF	142	10		P1	MOTOR
Type	Model	Ratio / Çevrim	Keyway / Anahtar	Backlash Class / Boşluk Sınıfı	Motor Type
SF	62	1-Stage/Kademe	Keyway / Anahtar	Ps	Motor Brand &
SF-A	75	3, 4, 5, 6, 7, 8,	No Keyway / Anahtar	P0	Model No. /
SFL	100	9, 10		P1	Motor Marka &
SFL-A	142	2-Stage/Kademe		P2	Modeli
	180	15 ~ 100			

# Features of SF Series / SF Serilerinin Özellikleri



## One-piece Helical Gear Box / Tek Parça Helis Dişli Kutusu

The gear box and internal ring gear are one-piece constructed. The speed reduction mechanism employs helical gears, which provides two times meshing rate of teeth when comparing with regular spur gears. In addition, it also has features of extremely smooth running, low noise, high output torque and low backlash.

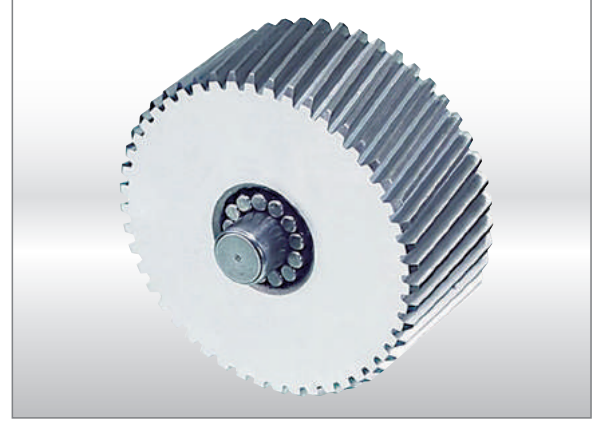
Dişli kutusu ve gövde üzerindeki dişliler tek parça olarak üretilmiştir. Helis dişliler sayesinde düz dişlilere göre 2 kat fazla temas yüzeyi sağlanmaktadır. Bu sayede pürüzsüz hareket, düşük ses, yüksek çıkış torku ve hassasiyet elde edilir.



## Collet Locking Mechanism / Kovan Kilitleme Mekanizması

The input-end and the motor are coupled through a collet locking mechanism. It has passed dynamical balance analysis to assure concentricity and balance on the connection and no backlash for power transmission while running at high speed.

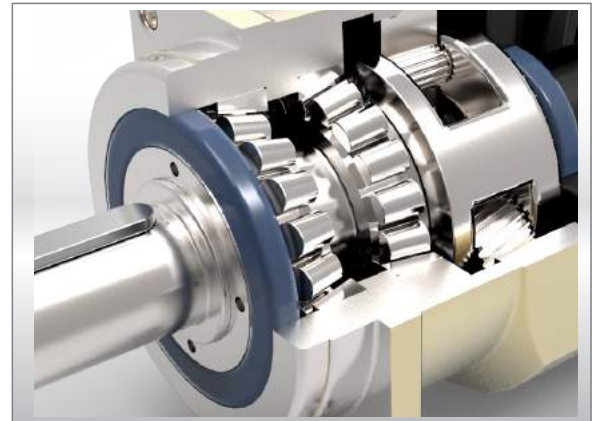
Redüktörün giriş mili ve motorun çıkış mili, kovan kilitleme mekanizmasıyla bağlanır. Bu sayede yüksek hızlarda hassas merkezleme ve bağlantı dengesi sağlanıp, güç iletimi esnasında boşluk engellenmiş olur.



## Full Needle Roller Bearings Design / İğneli Rulmanlı Tasarım

The planetary gear transmission employs full needle roller bearings without retainer to increase the contact surface, which greatly upgrades structural rigidity and service life.

Planet dişlilerde temas yüzeyini arttırmak amacıyla iğneli rulmanlı yataklar kullanılır. Bu sayede yapısal sağlamlık ve hizmet ömrü büyük ölçüde artırılmış olur.



## Integrated Planetary Arm Bracket / Tek Parça Planet Kolu

The planetary arm bracket and the output shaft are one-piece constructed to increase torsional rigidity.

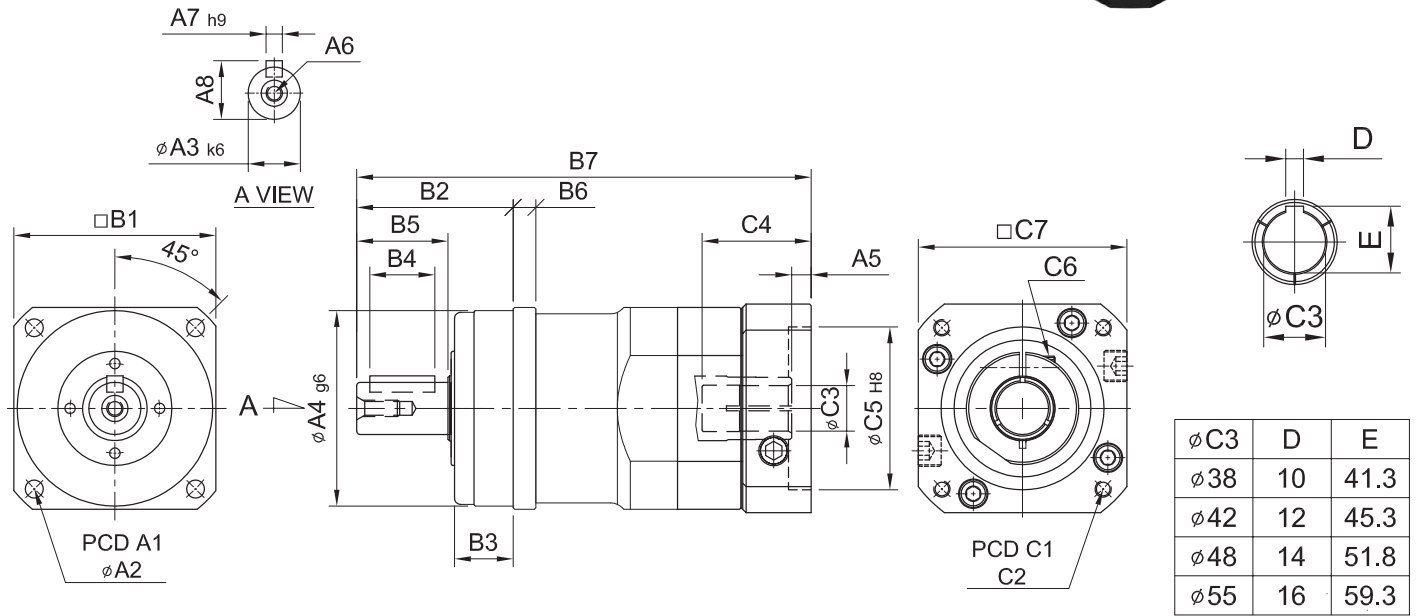
Burulma direncini arttırmak amacıyla planet destek kolu ve çıkış mili tek parça olarak üretilmiştir.

# SERVOBOX

## MODEL : SF

1-Stage / Kademe

RATIO / ÇEVİRİM : 3, 4, 5, 6, 7, 8, 9, 10



unit / birim: mm

Model Code	62	75	100	142	180
<b>A</b> A1	68	85	120	165	215
A2	5.5	6.8	9	11	13
A3	16	22	32	40	55
A4	60	70	90	130	160
A5	6	9.2	10.5	10	11.5 · 13.5
A6	M5 x P0.8	M8 x P1.25	M10 x P1.5	M12 x P1.75	M14 x P2.0
A7	5	6	10	12	16
A8	18	24.5	35	43	59
<b>B</b> B1	62	76	106	142	180
B2	48	56	88	112	112
B3	18	18	27	27	26
B4	20	32	50	70	70
B5	28	36	58	82	82
B6	6	7	10	12	15
B7	139.5 · 147.5	191	242.5	306	360 · 362
<b>C</b> C1	70 · 75 · 90	90 · 110 · 115 · 145	115 · 145 · 165	145 · 165 · 200	200 · 215 · 265
C2	M4 · M5 · M6	M5 · M6 · M8	M6 · M8 · M10	M8 · M10 · M12	M10 · M12 · M16
C3	14 · (16) · 19	19 · 22 · 24	24 · 28 · 32	35 · 38	38 · 42 · 48 · 55
C4	33.5	59.2	67.5	84.5	114.5 · 116.5
C5	50 · 60 · 70	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180	114.3 · 180 · 230
C6	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5
C7	64 · 70 · 80	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190	182 · 200 · 250



Model No.		Unit/Birim	Ratio Çevrim	62	75	100	142	180
Nominal output torque / Nominal Çıkış Torku	$T_{2N}$	Nm	3	59	165	216	625	1,206
			4	51	146	208	555	1,069
			5	48	155	333	618	1,189
			6	45	150	315	583	1,118
			7	45	142	309	573	1,108
			8	44	141	305	553	1,070
			9	44	140	293	551	1,060
	10	43	136	294	549	1,059		
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	3 ~ 10	1.8 Times of Rated Output Torque / 1,8 x Nominal Çıkış Torku				
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	3 ~ 10	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku				
Rated Input Speed / Nominal Giriş Devri	$n_{1N}$	rpm	3 ~ 10	3,000	3,000	3,000	3,000	3,000
Max. Input Speed / Max. Giriş Devri	$n_{1B}$	rpm	3 ~ 10	6,000	6,000	6,000	5,000	4,000
Backlash P <sub>s</sub> / Min. Boşluk Oranı		arcmin	3 ~ 10	-	≤ 1	≤ 1	≤ 1	≤ 1
Backlash P <sub>0</sub> / Düşük Boşluk Oranı		arcmin	3 ~ 10	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3
Backlash P <sub>1</sub> / Azaltılmış Boşluk Oranı		arcmin	3 ~ 10	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5
Backlash P <sub>2</sub> / Standart Boşluk Oranı		arcmin	3 ~ 10	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
Torsional Rigidity / Burulma Direnci		Nm/arcmin	3 ~ 10	8	15	27	60	150
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	3 ~ 10	2,240	4,150	8,760	12,750	17,860
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	3 ~ 10	1,920	3,780	7,500	10,840	15,180
Service Life / Hizmet Ömrü	$L_H$	hr	3 ~ 10	S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)				
Efficiency / Verim	$\eta$	%	3 ~ 10	≥ 97				
Operating Temperature / Çalışma Sıcaklığı		°C	3 ~ 10	- 25° C ~ + 90° C				
Lubrication / Yağlama			3 ~ 10	Synthetic Grease / Sentetik Gres				
Protection Class / Koruma Sınıfı			3 ~ 10	IP65				
Mounting Position / Montaj Pozisyonu			3 ~ 10	Any / Her Yönde				
Noise Level / Ses Seviyesi		dB	3 ~ 10	≤ 58	≤ 60	≤ 63	≤ 65	≤ 67
Weight / Ağırlık ±3%		Kg	3 ~ 10	1.7	4.5	8.3	16.7	34.3

#### ■ Mass Moments of Inertia / Atalet Ağırlık Momenti (kg.cm<sup>2</sup>)

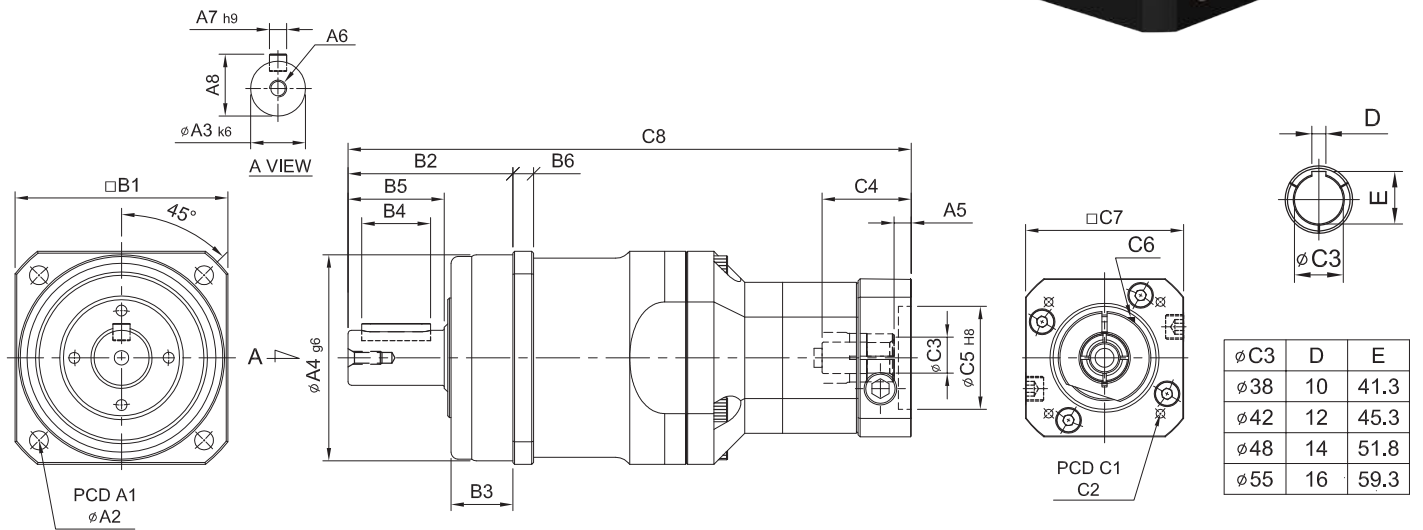
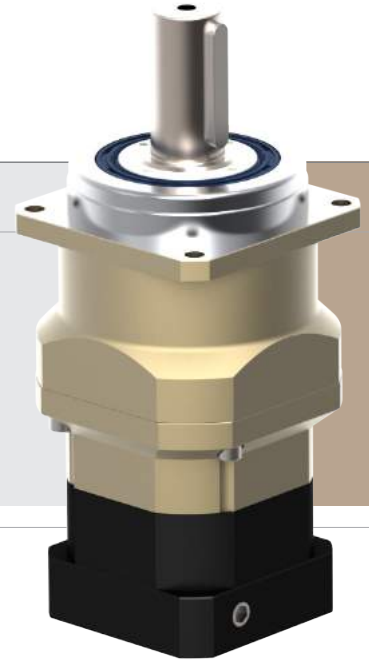
Ratio / Çevrim	62	75	100	142	180
3	0.15	0.60	3.21	9.18	28.82
4	0.14	0.51	2.80	7.51	23.56
5	0.13	0.45	2.71	7.40	23.74
6	0.13	0.45	2.65	7.15	22.65
7	0.12	0.42	2.54	7.15	22.40
8	0.12	0.42	2.51	7.01	22.35
9	0.12	0.42	2.51	7.01	22.35
10	0.12	0.42	2.51	7.01	22.35

# SERVOBOX

## MODEL : SF

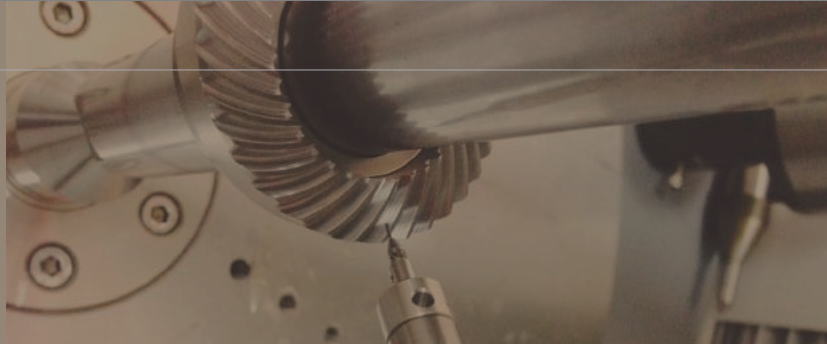
2-Stage / Kademe

RATIO / ÇEVİRİM : 15, 20, 25, 30, 35, 40, 50, 60, 70, 80, 90, 100



unit / birim: mm

Model Code	62	75	100	142	180	
<b>A</b>	A1	68	85	120	165	215
	A2	5.5	6.8	9	11	13
	A3	16	22	32	40	55
	A4	60	70	90	130	160
	A5	5	6	9	10	10
	A6	M5 x P0.8	M8 x P1.25	M10 x P1.5	M12 x P1.75	M14 x P2.0
	A7	5	6	10	12	16
	A8	18	24.5	35	43	59
<b>B</b>	B1	62	76	106	142	180
	B2	48	56	88	112	112
	B3	18	18	27	27	26
	B4	20	32	50	70	70
	B5	28	36	58	82	82
	B6	6	7	10	12	15
<b>C</b>	C1	46 · 60 · 63	70 · 75 · 90	90 · 110 · 115 · 145	115 · 145 · 165	145 · 165 · 200
	C2	M3 · M4 · M5	M4 · M5 · M6	M5 · M6 · M8	M6 · M8 · M10	M8 · M10 · M12
	C3	8 · 9 · 11	14 · (16) · 19	19 · 22 · 24	24 · 28 · 32	35 · 38
	C4	26	33.5	59	67	84.5
	C5	30 · 40 · 50	50 · 60 · 70	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180
	C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5
	C7	46 · 55	64 · 70 · 80	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190
	C8	164	198.8 · 206.8	278	344	395



Model No.		Unit/Birim	Ratio Çevrim	62	75	100	142	180
Nominal output torque / Nominal Çıkış Torku	$T_{2N}$	Nm	15	59	142	298	625	1,206
			20	51	126	267	555	1,069
			25	48	158	296	618	1,189
			30	45	130	278	583	1,118
			35	45	128	275	573	1,108
			40	43	123	265	553	1,070
			50	48	138	296	618	1,189
			60	45	130	277	583	1,118
			70	45	128	275	573	1,108
			80	43	123	265	553	1,070
			90	44	125	247	516	993
100	43	121	262	549	1,059			
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	15 ~ 100	1.8 Times of Rated Output Torque / 1,8 x Nominal Çıkış Torku				
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	15 ~ 100	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku				
Rated Input Speed / Nominal Giriş Devri	$n_{1N}$	rpm	15 ~ 100	3,000	3,000	3,000	3,000	3,000
Max. Input Speed / Max. Giriş Devri	$n_{1B}$	rpm	15 ~ 100	6,000	6,000	5,000	5,000	4,000
Backlash P <sub>s</sub> / Min. Boşluk Oranı		arcmin	15 ~ 100	-	-	≤ 3	≤ 3	≤ 3
Backlash P <sub>0</sub> / Düşük Boşluk Oranı		arcmin	15 ~ 100	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5
Backlash P <sub>1</sub> / Azaltılmış Boşluk Oranı		arcmin	15 ~ 100	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
Backlash P <sub>2</sub> / Standart Boşluk Oranı		arcmin	15 ~ 100	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9
Torsional Rigidity / Burulma Direnci		Nm/arcmin	15 ~ 100	8	15	27	60	140
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	15 ~ 100	2,240	4,150	8,760	12,750	17,860
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	15 ~ 100	1,920	3,780	7,500	10,840	15,180
Service Life / Hizmet Ömrü	$L_H$	hr	15 ~ 100	S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)				
Efficiency / Verim	$\eta$	%	15 ~ 100	≥ 94				
Operating Temperature / Çalışma Sıcaklığı		°C	15 ~ 100	- 25° C ~ + 90° C				
Lubrication / Yağlama			15 ~ 100	Synthetic Grease / Sentetik Gres				
Protection Class / Koruma Sınıfı			15 ~ 100	IP65				
Mounting Position / Montaj Pozisyonu			15 ~ 100	Any / Her Yönde				
Noise Level / Ses Seviyesi		dB	15 ~ 100	≤ 58	≤ 60	≤ 63	≤ 65	≤ 67
Weight / Ağırlık ±3%		Kg	15 ~ 100		4.8			37.3

#### ■ Mass Moments of Inertia / Atalet Ağırlık Momenti (kg.cm<sup>2</sup>)

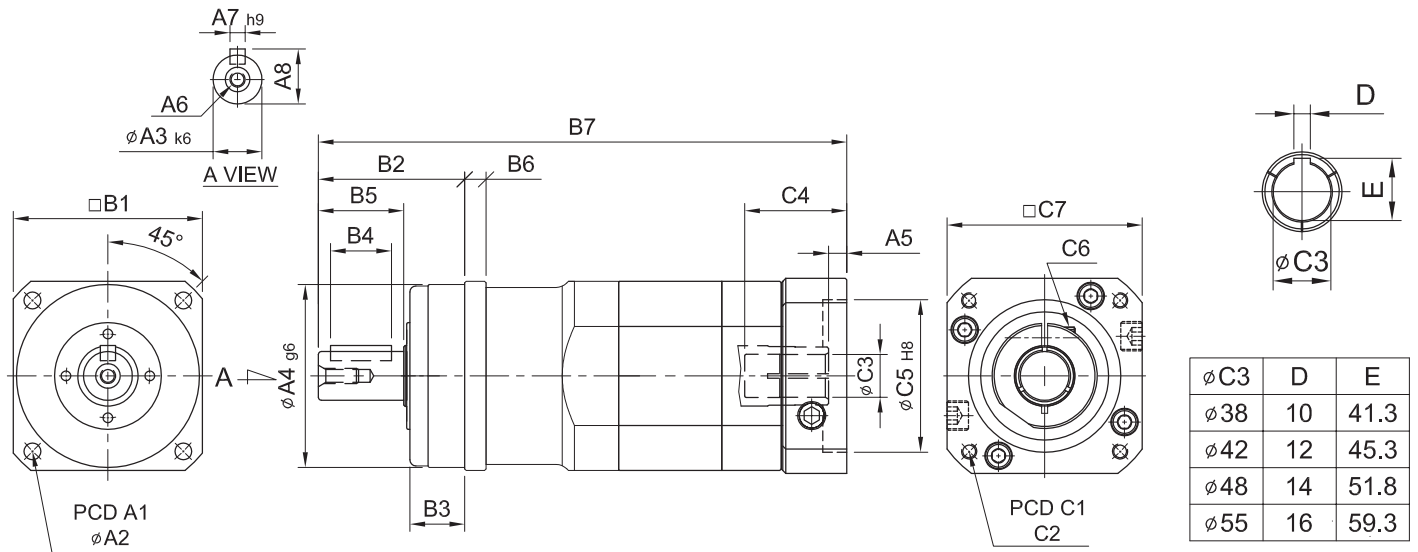
Ratio / Çevrim	62	75	100	142	180
15	0.03	0.13	0.47	2.63	7.30
20	0.03	0.13	0.47	2.63	7.30
25	0.03	0.13	0.47	2.63	7.10
30	0.03	0.13	0.47	2.43	7.10
35	0.03	0.13	0.47	2.43	7.10
40	0.03	0.13	0.47	2.43	6.92
50	0.03	0.13	0.44	2.43	6.92
60	0.03	0.13	0.44	2.39	6.72
70	0.03	0.13	0.44	2.39	6.72
80	0.03	0.13	0.44	2.39	6.72
90	0.03	0.13	0.44	2.39	6.72
100	0.03	0.13	0.44	2.39	6.72

# SERVOBOX

## MODEL : SF-A

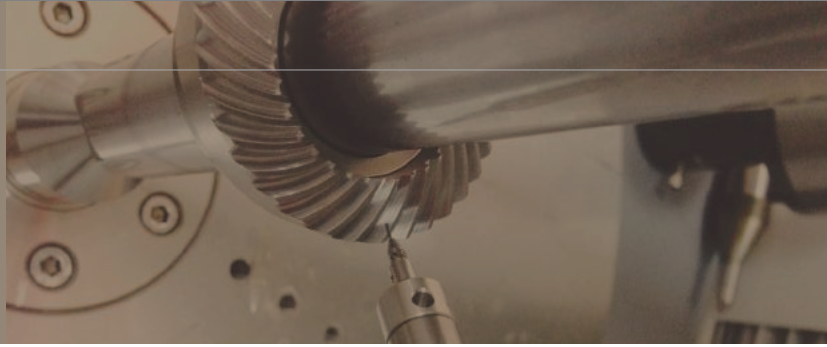
2-Stage / Kademe

RATIO / ÇEVİRİM : 15, 20, 25, 30, 35, 40, 50, 70, 100



unit / birim: mm

Model Code	62A	75A	100A	142A	180A	
<b>A</b>	A1	68	85	120	215	
	A2	5.5	6.8	9	11	13
	A3	16	22	32	40	55
	A4	60	70	90	130	160
	A5	6	8	10.5	10	11.5 · 13.5
	A6	M5 x P0.8	M8 x P1.25	M10 x P1.5	M12 x P1.75	M14 x P2.0
	A7	5	6	10	12	16
	A8	18	24.5	35	43	59
<b>B</b>	B1	62	76	106	142	180
	B2	48	56	88	112	112
	B3	18	18	27	27	26
	B4	20	32	50	70	70
	B5	28	36	58	82	82
	B6	6	7	10	12	15
	B7	173.3 · 181.3	214	282.5	373	441 · 443
<b>C</b>	C1	70 · 75 · 90	90 · 110 · 115 · 145	115 · 145 · 165	145 · 165 · 200	200 · 215 · 265
	C2	M4 · M5 · M6	M5 · M6 · M8	M6 · M8 · M10	M8 · M10 · M12	M10 · M12 · M16
	C3	14 · (16) · 19	19 · 22 · 24	24 · 28 · 32	35 · 38	38 · 42 · 48 · 55
	C4	33.5	51	67.5	84.5	114.5 · 116.5
	C5	50 · 60 · 70	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180	114.3 · 180 · 230
	C6	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5
	C7	64 · 70 · 80	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190	182 · 200 · 250



Model No.		Unit/Birim	Ratio Çevrim	62A	75A	100A	142A	180A
Nominal output torque / Nominal Çıkış Torku	$T_{2N}$	Nm	15	59	165	216	625	1,206
			20	51	146	208	555	1,069
			25	48	155	333	618	1,189
			30	45	150	315	583	1,118
			35	45	142	309	573	1,108
			40	51	146	208	555	1,069
			50	48	155	333	618	1,189
			70	45	142	309	573	1,108
100	43	136	291	549	1,059			
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	15 ~ 100	1.8 Times of Rated Output Torque / 1,8 x Nominal Çıkış Torku				
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	15 ~ 100	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku				
Rated Input Speed / Nominal Giriş Devri	$n_{1N}$	rpm	15 ~ 100	3,000	3,000	3,000	3,000	3,000
Max. Input Speed / Max. Giriş Devri	$n_{1B}$	rpm	15 ~ 100	6,000	6,000	5,000	5,000	4,000
Backlash Ps / Min. Boşluk Oranı		arcmin	15 ~ 100	-	≤ 3	≤ 3	≤ 3	≤ 3
Backlash P0 / Düşük Boşluk Oranı		arcmin	15 ~ 100	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5
Backlash P1 / Azaltılmış Boşluk Oranı		arcmin	15 ~ 100	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
Backlash P2 / Standart Boşluk Oranı		arcmin	15 ~ 100	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9
Torsional Rigidity / Burulma Direnci		Nm/arcmin	15 ~ 100	8	15	27	60	140
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	15 ~ 100	2,240	4,150	8,760	12,750	17,860
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	15 ~ 100	1,920	3,780	7,500	10,840	15,180
Service Life / Hizmet Ömrü	$L_H$	hr	15 ~ 100	S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)				
Efficiency / Verim	$\eta$	%	15 ~ 100	≥ 94				
Operating Temperature / Çalışma Sıcaklığı		°C	15 ~ 100	- 25° C ~ + 90° C				
Lubrication / Yağlama			15 ~ 100	Synthetic Grease / Sentetik Gres				
Protection Class / Koruma Sınıfı			15 ~ 100	IP65				
Mounting Position / Montaj Pozisyonu			15 ~ 100	Any / Her Yönde				
Noise Level / Ses Seviyesi		dB	15 ~ 100	≤ 58	≤ 60	≤ 63	≤ 65	≤ 67
Weight / Ağırlık ±3%		Kg	15 ~ 100	2.6	8.2	11.5	25.6	43

#### ■ Mass Moments of Inertia / Atalet Ağırlık Momenti (kg.cm<sup>2</sup>)

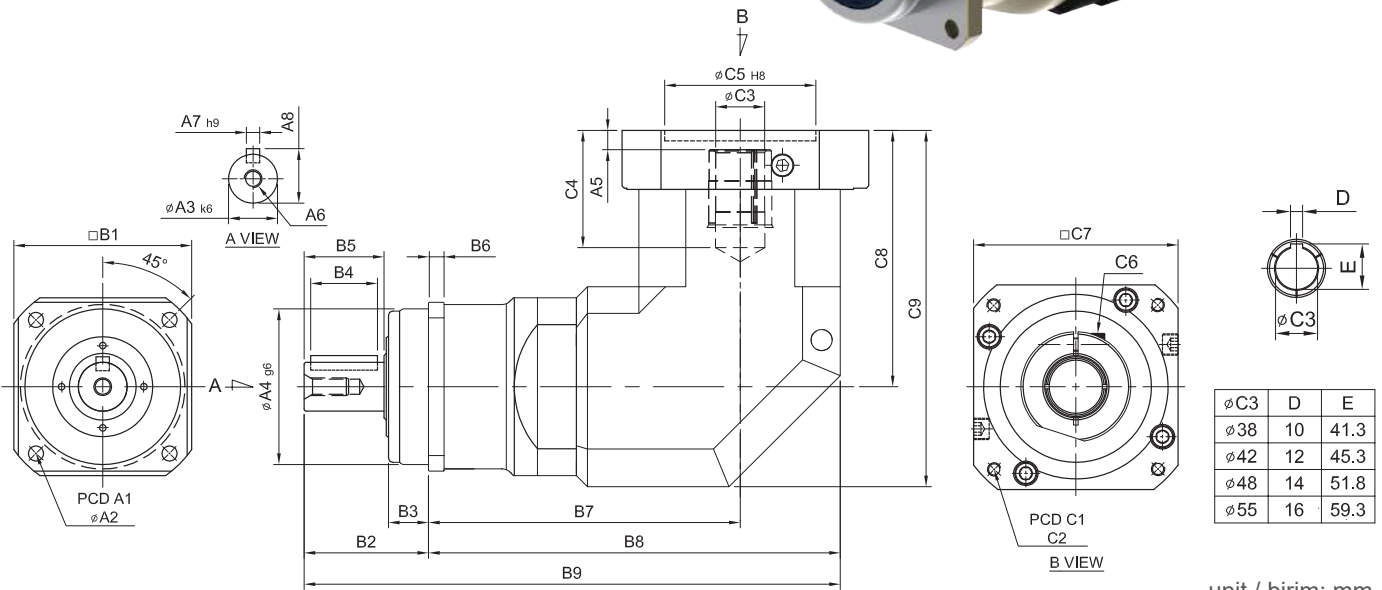
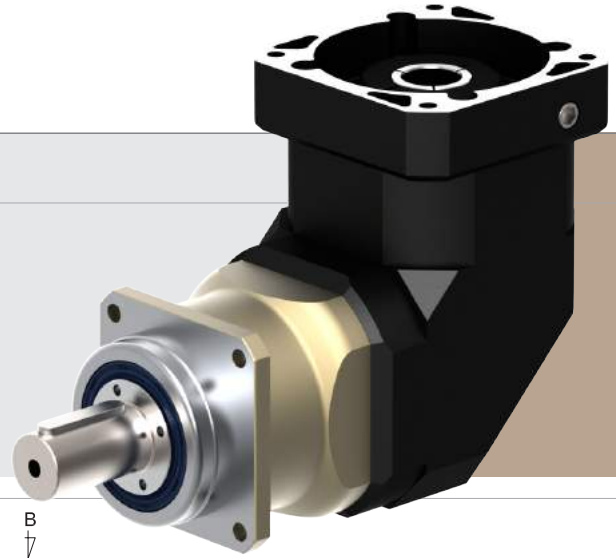
Ratio / Çevrim	62A	75A	100A	142A	180A
15	0.15	0.60	3.21	9.18	28.82
20	0.14	0.51	2.80	7.51	23.56
25	0.13	0.45	2.71	7.40	23.24
30	0.15	0.60	3.21	9.18	28.82
35	0.12	0.42	2.54	7.15	22.40
40	0.14	0.51	2.80	7.51	23.56
50	0.13	0.45	2.71	7.40	23.24
70	0.12	0.42	2.54	7.15	22.40
100	0.12	0.42	2.51	7.01	22.35

# SERVOBOX

## MODEL : SFL

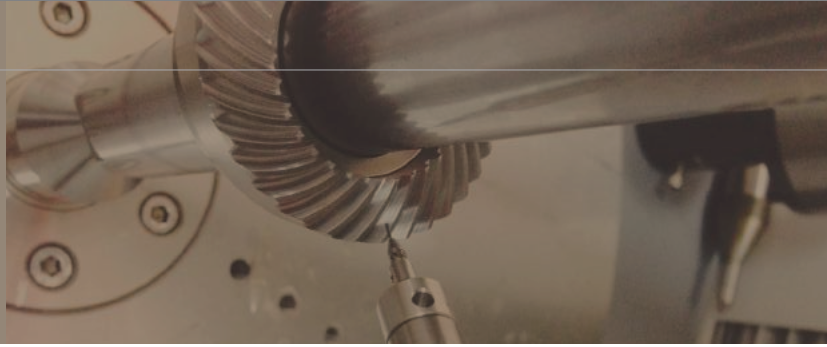
1-Stage / Kademe

RATIO / ÇEVİRİM : 3, 4, 5, 6, 7, 8, 9, 10,  
12, 14, 16, 18, 20



unit / birim: mm

Model Code	62	75	100	142	180
<b>A</b>					
A1	68	85	120	165	215
A2	5.5	6.8	9	11	13
A3	16	22	32	40	55
A4	60	70	90	130	160
A5	6	9	10	10	12.5 · 14.5
A6	M5 x P0.8	M8 x P1.25	M10 x P1.5	M12 x P1.75	M14 x P2.0
A7	5	6	10	12	16
A8	18	24.5	35	43	59
<b>B</b>					
B1	62	76	106	142	180
B2	48	56	88	112	112
B3	18	18	27	27	26
B4	20	32	50	70	70
B5	28	36	58	82	82
B6	6	7	10	12	15
B7	97	142.9	162	191	254.1
B8	128	187.9	222	262	344.1
B9	176	243.9	310	374	456.1
<b>C</b>					
C1	70 · 75 · 90	90 · 110 · 115 · 145	115 · 145 · 165	145 · 165 · 200	200 · 215 · 265
C2	M4 · M5 · M6	M5 · M6 · M8	M6 · M8 · M10	M8 · M10 · M12	M10 · M12 · M16
C3	14 · 19	19 · 22 · 24	24 · 28 · 32	28 · 32 · 35	38 · 42 · 48 · 55
C4	33.5 · 41.5	53 · 67.5	67 · 77	85	117 · 119
C5	50 · 60 · 70	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180	114.3 · 180 · 230
C6	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5
C7	64 · 70 · 80	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190	182 · 200 · 250
C8	77 · 85	115.3	141	165.7	235 · 237
C9	108 · 116	160.3	201	236.7	325 · 327



Model No.		Unit/Birim	Ratio Çevrim	62	75	100	142	180
Nominal output torque / Nominal Çıkış Torku	$T_{2N}$	Nm	3	59	165	216	625	1,206
			4	51	146	208	555	1,069
			5	48	155	333	618	1,189
			6	45	150	315	583	1,118
			7	45	142	309	573	1,108
			8	44	141	305	553	1,070
			9	44	140	293	551	1,060
			10	43	138	291	549	1,059
			12	45	150	315	583	1,118
			14	45	142	309	573	1,108
			16	44	141	305	553	1,070
			18	44	140	293	551	1,060
20	43	138	291	549	1,059			
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	3 ~ 20	1.8 Times of Rated Output Torque / 1,8 x Nominal Çıkış Torku				
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	3 ~ 20	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku				
Rated Input Speed / Nominal Giriş Devri	$n_{1N}$	rpm	3 ~ 20	3,000	3,000	3,000	3,000	3,000
Max. Input Speed / Max. Giriş Devri	$n_{1B}$	rpm	3 ~ 20	6,000	6,000	6,000	5,000	4,000
Backlash Ps / Min. Boşluk Oranı		arcmin	3 ~ 20	-	≤ 2	≤ 2	≤ 2	≤ 2
Backlash P0 / Düşük Boşluk Oranı		arcmin	3 ~ 20	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4
Backlash P1 / Azaltılmış Boşluk Oranı		arcmin	3 ~ 20	≤ 6	≤ 6	≤ 6	≤ 6	≤ 6
Backlash P2 / Standart Boşluk Oranı		arcmin	3 ~ 20	≤ 8	≤ 8	≤ 8	≤ 8	≤ 8
Torsional Rigidity / Burulma Direnci		Nm/arcmin	3 ~ 20	8	15	27	60	150
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	3 ~ 20	2,240	4,150	8,760	12,750	17,860
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	3 ~ 20	1,920	3,780	7,500	10,840	15,180
Service Life / Hizmet Ömrü	$L_H$	hr	3 ~ 20	S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)				
Efficiency / Verim	$\eta$	%	3 ~ 20	≥ 95				
Operating Temperature / Çalışma Sıcaklığı		°C	3 ~ 20	- 25° C ~ + 90° C				
Lubrication / Yağlama			3 ~ 20	Synthetic Grease / Sentetik Gres				
Protection Class / Koruma Sınıfı			3 ~ 20	IP65				
Mounting Position / Montaj Pozisyonu			3 ~ 20	Any / Her Yönde				
Noise Level / Ses Seviyesi		dB	3 ~ 20	≤ 63	≤ 65	≤ 68	≤ 70	≤ 72
Weight / Ağırlık ±3%		Kg	3 ~ 20	2.7	7.5	10.9	25.6	57.9

#### ■ Mass Moments of Inertia / Atalet Ağırlık Momenti (kg.cm<sup>2</sup>)

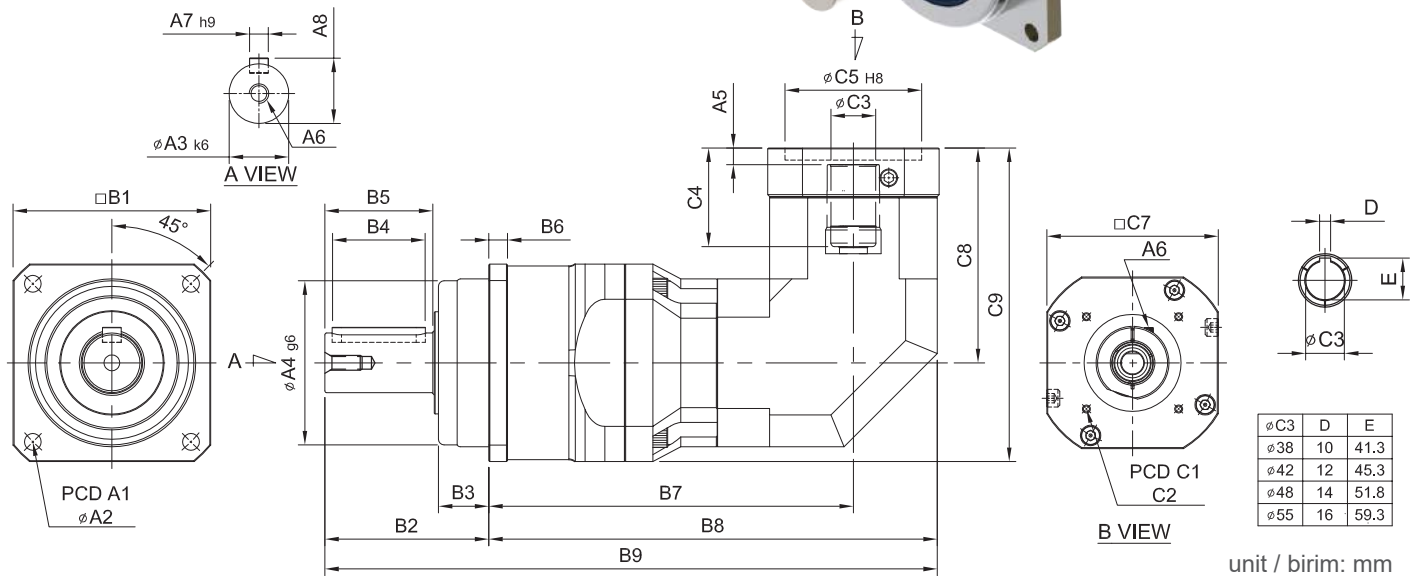
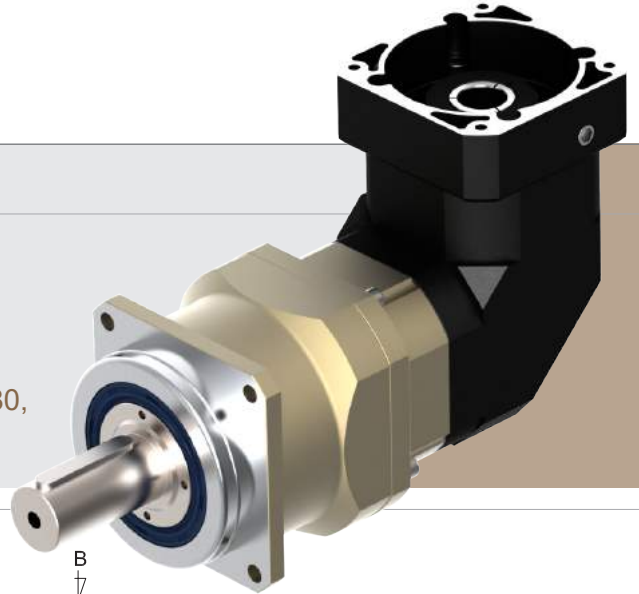
Ratio / Çevrim	62	75	100	142	180
3	0.30	2.11	6.42	18.36	57.65
4	0.28	2.02	5.61	18.02	56.17
5	0.26	2.01	5.42	17.21	55.05
6	0.24	2.00	5.33	16.50	53.44
7	0.24	1.97	5.09	15.85	51.10
8	0.24	1.94	5.06	14.94	49.03
9	0.24	1.94	5.04	14.61	48.08
10	0.24	1.94	5.02	14.02	41.33
12	0.22	1.94	4.98	13.86	41.12
14	0.22	1.94	4.95	13.53	40.50
16	0.21	1.92	4.91	13.03	40.11
18	0.21	1.91	4.87	12.57	39.73
20	0.20	1.88	4.75	12.11	38.65

# SERVOBOX

## MODEL : SFL

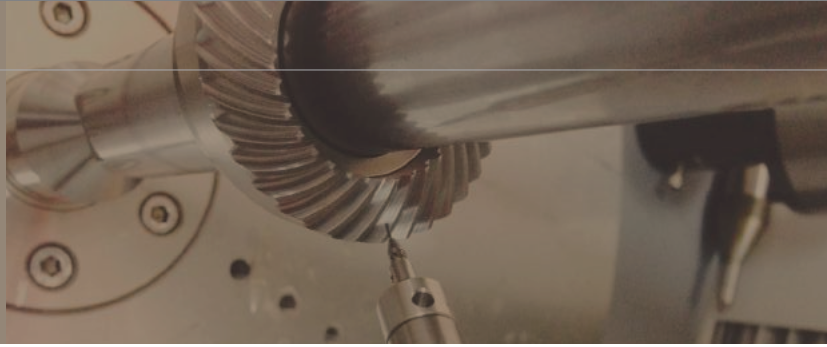
2-Stage / Kademe

RATIO / ÇEVİRİM : 15, 20, 25, 30, 35, 40, 50, 60, 70, 80,  
90, 100, 120, 140, 160, 180, 200



unit / birim: mm

Model Code	62	75	100	142	180
A1	68	85	120	165	215
A2	5.5	6.8	9	11	13
A3	16	22	32	40	55
A4	60	70	90	130	160
A5	6	6	9	10	10
A6	M5 x P0.8	M8 x P1.25	M10 x P1.5	M12 x P1.75	M14 x P2.0
A7	5	6	10	12	16
A8	18	24.5	35	43	59
B1	62	76	106	142	180
B2	48	56	88	112	112
B3	18	18	27	27	26
B4	20	32	50	70	70
B5	28	36	58	82	82
B6	6	7	10	12	15
B7	123	148.3	195.6	240	280
B8	145	179.3	240.6	300	351
B9	193	235.3	328.6	412	463
C1	46 · 60 · 63	70 · 75 · 90	90 · 110 · 115 · 145	115 · 145 · 165	145 · 165 · 200
C2	M3 · M4 · M5	M4 · M5 · M6	M5 · M6 · M8 · M10	M6 · M8 · M10	M8 · M10 · M12
C3	8 · 9 · 11	14 · 19	19 · 22 · 24	24 · 28 · 32	28 · 32 · 35
C4	27	33.5 · 41.5	53	67	85
C5	30 · 40 · 50	50 · 60 · 70	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180
C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5
C7	46 · 55	64 · 70 · 80	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190
C8	61	77 · 85	115.3	141	165.7
C9	92	117 · 125	168.3	212	255.7



Model No.		Unit/Birim	Ratio Çevrim	62	75	100	142	180
Nominal output torque / Nominal Çıkış Torku	$T_{2N}$	Nm	15	59	142	298	625	1,206
			20	51	126	267	555	1,069
			25	48	158	296	618	1,189
			30	45	130	278	583	1,118
			35	45	128	275	573	1,108
			40	43	123	265	553	1,070
			50	48	138	296	618	1,189
			60	45	130	277	583	1,118
			70	45	128	275	573	1,108
			80	43	123	265	553	1,070
			90	44	125	247	516	993
			100	43	121	262	549	1,059
			120	45	130	277	583	1,118
			140	45	128	275	573	1,108
			160	43	123	265	553	1,070
			180	44	125	247	516	993
200	43	121	262	549	1,059			
Max. Acceleration Torque / Max.İvmelenme Torku	$T_{2B}$	Nm	15 ~ 200	1.8 Times of Rated Output Torque / 1,8 x Nominal Çıkış Torku				
Max. Output Torque / Max.Çıkış Torku	$T_{2NOT}$	Nm	15 ~ 200	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku				
Rated Input Speed / Nominal Giriş Devri	$n_{1N}$	rpm	15 ~ 200	3,000	3,000	3,000	3,000	3,000
Max. Input Speed / Max.Giriş Devri	$n_{1B}$	rpm	15 ~ 200	6,000	6,000	5,000	5,000	4,000
Backlash Ps / Min.Boşluk Oranı		arcmin	15 ~ 200	-	-	≤ 4	≤ 4	≤ 4
Backlash P0 / Düşük Boşluk Oranı		arcmin	15 ~ 200	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
Backlash P1 / Azaltılmış Boşluk Oranı		arcmin	15 ~ 200	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9
Backlash P2 / Standart Boşluk Oranı		arcmin	15 ~ 200	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12
Torsional Rigidity / Burulma Direnci		Nm/arcmin	15 ~ 200	8	15	27	60	150
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	15 ~ 200	2,240	4,150	8,760	12,750	17,860
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	15 ~ 200	1,920	3,780	7,500	10,840	15,180
Service Life / Hizmet Ömrü	$L_H$	hr	15 ~ 200	S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)				
Efficiency / Verim	$\eta$	%	15 ~ 200	≥ 92				
Operating Temperature / Çalışma Sıcaklığı		°C	15 ~ 200	- 25° C ~ + 90° C				
Lubrication / Yağlama			15 ~ 200	Synthetic Grease / Sentetik Gres				
Protection Class / Koruma Sınıfı			15 ~ 200	IP65				
Mounting Position / Montaj Pozisyonu			15 ~ 200	Any / Her Yönde				
Noise Level / Ses Seviyesi		dB	15 ~ 200	≤ 63	≤ 65	≤ 68	≤ 70	≤ 72
Weight / Ağırlık ±3%		Kg	15 ~ 200	11.38				

#### ■ Mass Moments of Inertia / Atalet ğırlık Momenti (kg.cm<sup>2</sup>)

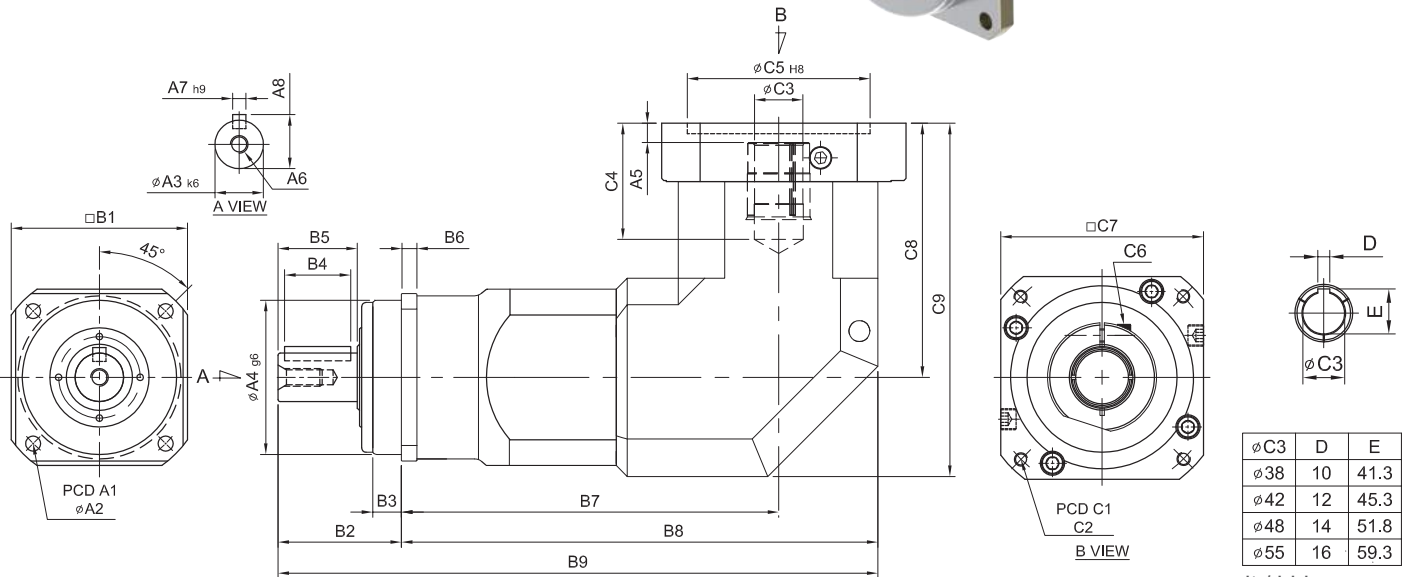
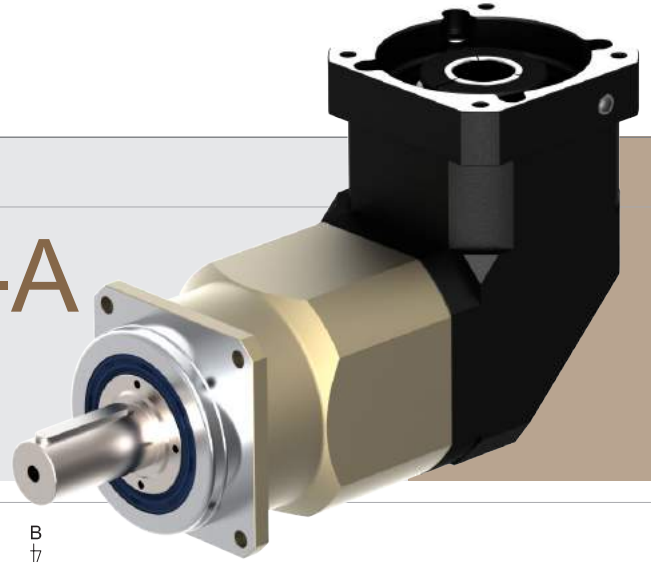
Ratio / Çevrim	62	75	100	142	180
15	0.09	0.34	2.20	6.85	26.2
20	0.09	0.34	2.20	6.85	26.2
25	0.09	0.34	2.20	6.85	23.1
30	0.09	0.34	2.20	6.85	23.1
35	0.09	0.34	2.20	6.85	23.1
40	0.09	0.34	2.20	6.85	23.1
50	0.09	0.34	2.20	6.85	23.1
60	0.09	0.34	2.20	6.85	23.1
70	0.09	0.34	2.20	6.85	23.1
80	0.09	0.34	2.20	6.85	23.1
90	0.09	0.34	2.20	6.85	23.1
100	0.09	0.34	2.20	6.85	23.1
120	0.03	0.30	1.86	6.20	21.2
140	0.03	0.30	1.86	6.20	21.2
160	0.03	0.30	1.86	6.20	21.2
180	0.03	0.30	1.86	6.20	21.2
200	0.03	0.30	1.86	6.20	21.2

# SERVOBOX

## MODEL : SFL-A

2-Stage / Kademe

RATIO / KADEME : 15, 20, 25, 30, 35, 40, 50,  
60, 70, 80, 100, 140, 200



unit / birim: mm

Model Code	62A	75A	100A	142A	180A
A1	68	85	120	165	215
A2	5.5	6.8	9	11	13
A3	16	22	32	40	55
A4	60	70	90	130	160
A5	6	9	10	10	12.5 · 14.5
A6	M5 x P0.8	M8 x P1.25	M10 x P1.5	M12 x P1.75	M14 x P2.0
A7	5	6	10	12	16
A8	18	24.5	35	43	59
B1	62	76	106	142	180
B2	48	56	88	112	112
B3	18	18	27	27	26
B4	20	32	50	70	70
B5	28	36	58	82	82
B6	6	7	10	12	15
B7	130.8	173.9	206	258	335.1
B8	161.8	218.9	266	329	425.1
B9	209.8	274.9	354	441	537.1
C1	70 · 75 · 90	90 · 110 · 115 · 145	115 · 145 · 165	145 · 165 · 200	200 · 215 · 265
C2	M4 · M5 · M6	M5 · M6 · M8	M6 · M8 · M10	M8 · M10 · M12	M10 · M12 · M16
C3	14 · 19	19 · 22 · 24	24 · 28 · 32	28 · 32 · 35	38 · 42 · 48 · 55
C4	33.5 · 41.5	53 · 67.5	67 · 77	85	117 · 119
C5	50 · 60 · 70	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180	114.3 · 180 · 230
C6	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5
C7	64 · 70 · 80	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190	182 · 200 · 250
C8	77 · 85	115.3	141	165.7	235 · 237
C9	108 · 116	160.3	201	236.7	325 · 327



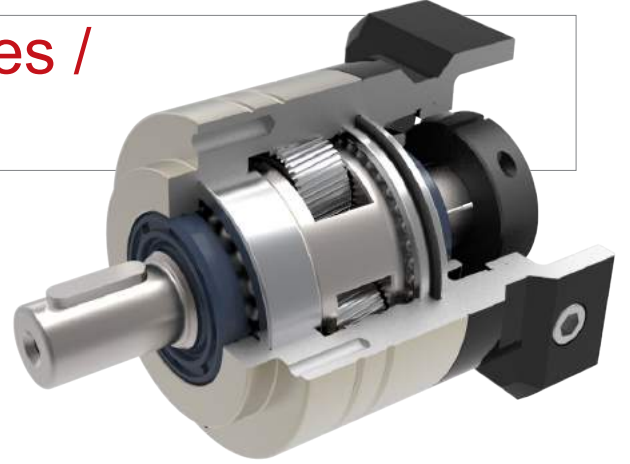
Model No.		Unit/Birim	Ratio Çevrim	62A	75A	100A	142A	180A
Nominal output torque / Nominal Çıkış Torku	$T_{2N}$	Nm	15	59	165	216	625	1,206
			20	51	146	208	555	1,069
			25	48	155	333	618	1,189
			30	45	150	315	583	1,118
			35	45	142	309	573	1,108
			40	51	122	208	555	1,069
			50	48	155	333	618	1,189
			60	45	150	315	583	1,118
			70	45	142	309	573	1,108
			80	51	146	208	555	1,069
			100	48	155	333	618	1,189
			140	45	142	309	573	1,108
200	43	138	291	549	1,059			
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	15 ~ 200	1.8 Times of Rated Output Torque / 1,8 x Nominal Çıkış Torku				
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	15 ~ 200	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku				
Rated Input Speed / Nominal Giriş Devri	$n_{1N}$	rpm	15 ~ 200	3,000	3,000	3,000	3,000	3,000
Max. Input Speed / Max. Giriş Devri	$n_{1B}$	rpm	15 ~ 200	6,000	6,000	5,000	5,000	4,000
Backlash Ps / Min. Boşluk Oranı		arcmin	15 ~ 200	-	≤ 4	≤ 4	≤ 4	≤ 4
Backlash P0 / Düşük Boşluk Oranı		arcmin	15 ~ 200	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
Backlash P1 / Azaltılmış Boşluk Oranı		arcmin	15 ~ 200	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9
Backlash P2 / Standart Boşluk Oranı		arcmin	15 ~ 200	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12
Torsional Rigidity / Burulma Direnci		Nm/arcmin	15 ~ 200	8	15	27	60	150
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	15 ~ 200	2,240	4,150	8,760	12,750	17,860
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	15 ~ 200	1,920	3,780	7,500	10,840	15,180
Service Life / Hizmet Ömrü	$L_H$	hr	15 ~ 200	S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)				
Efficiency / Verim	$\eta$	%	15 ~ 200	≥ 92				
Operating Temperature / Çalışma Sıcaklığı		°C	15 ~ 200	- 25° C ~ + 90° C				
Lubrication / Yağlama			15 ~ 200	Synthetic Grease / Sentetik Gres				
Protection Class / Koruma Sınıfı			15 ~ 200	IP65				
Mounting Position / Montaj Pozisyonu			15 ~ 200	Any / Her Yönde				
Noise Level / Ses Seviyesi		dB	15 ~ 200	≤ 63	≤ 65	≤ 68	≤ 70	≤ 72
Weight / Ağırlık ±3%		Kg	15 ~ 200	3.5	11.1	16.8	29.9	66.1

#### ■ Mass Moments of Inertia / Atalet Ağırlık Momenti (kg.cm<sup>2</sup>)

Ratio / Çevrim	62A	75A	100A	142A	180A
15	0.15	0.60	3.21	9.18	28.82
20	0.14	0.51	2.80	7.51	23.56
25	0.13	0.45	2.71	7.40	23.24
30	0.12	0.43	2.66	7.32	22.91
35	0.12	0.42	2.54	7.15	22.40
40	0.14	0.51	2.80	7.51	23.56
50	0.13	0.45	2.71	7.40	23.24
60	0.12	0.43	2.66	7.32	22.91
70	0.12	0.42	2.54	7.15	22.40
80	0.14	0.51	2.80	7.51	23.56
100	0.13	0.45	2.71	7.40	23.24
140	0.12	0.42	2.54	7.15	22.40
200	0.11	0.41	2.48	7.02	22.14

# SERVOBOX

## Characteristic of SA Series / SA Serilerinin Özellikleri



### Quiet Operation / Sessiz Çalışma

Grinding spiral bevel gear & Helical gears contribute to reduce vibration and noise.  
Taşlanmış konik dişliler ve helis dişliler titreşimin ve sesin engellenmesini sağlar.

### High Rigidity & High Torque / Sağlamlık & Yüksek Tork

High rigidity & high torque are achieved by integrant needle roller bearings and one-piece constructed.  
Sağlamlık ve yüksek tork tek parça yapı ve iğneli rulmanlar sayesinde elde edilir.

### High Efficiency / Yüksek Verim

Efficiency for 1-stage model exceeds 95%; 2-stage model exceeds 92%.  
1 kademe için verim %95, 2 kademe için verim %92'dir.

## Indication of Model Numbers / Model Seçimi

SA	90	10		P1	MOTOR
Type	Model	Ratio / Çevrim	Output Shaft / Çıkış Mili	Backlash Class / Boşluk Sınıfı	Motor Type
SA	50 70 90 120 160	1-Stage 3, 4, 5, 7, 10  2-Stage 15, 20, 25, 30, 35, 40, 50, 70, 100	Keyway / Kamalı  No Keyway / Kamasız	1-Stage/Kademe $P_s \leq 1$ $P_0 \leq 3$ $P_1 \leq 5$ $P_2 \leq 7$ 2-Stage/Kademe $P_s \leq 3$ $P_0 \leq 5$ $P_1 \leq 7$ $P_2 \leq 9$	Motor Brand & Model No. / Motor Marka & Modeli

# Features of SA Series / SA Serilerinin Özellikleri



## Helical Gear Design

The speed reduction mechanism employs helical gears, which provides two times meshing rate of teeth when comparing with regular spur gears. In addition, it also features extremely smooth running, low noise, high torque output and low backlash.

Helis dişliler sayesinde düz dişlilere göre 2 kat fazla temas yüzeyi sağlanmaktadır. Bu sayede pürüzsüz hareket, düşük ses, yüksek çıkış torku ve hassasiyet elde edilir.

## High Precision Gear Machining

Manufactured from high quality Ni-Cr-Mo alloy steel (SNCM220), precision achined and carbunzed to hardness 57-60 HRC. Precision teeth grinding sure gear accuracy reaches DIN6 class.

Yüksek kaliteli Ni-Cr-Mo alaşımli çelikten (SNCM220) üretilmiştir. Sertlik derecesi 57-60 HRC'dir. Dişli taşlama hassasiyeti DIN6 sınıfındadır.



## Integrated Planetary Arm Bracket / Tek Parça Planet Kolu

The planetary arm bracket and the output shaft are one-piece constructed to increase torsional rigidity and accuracy.

Burulma direncini arttırmak amacıyla planet destek kolu ve çıkış mili tek parça olarak üretilmiştir.



## Collet Locking Mechanism

The input-end and the motor are coupled through a collet locking mechanism. It has passed dynamical balance analysis to assure concentricity and balance on the connection and no backlash for power transmission while running at high speed.

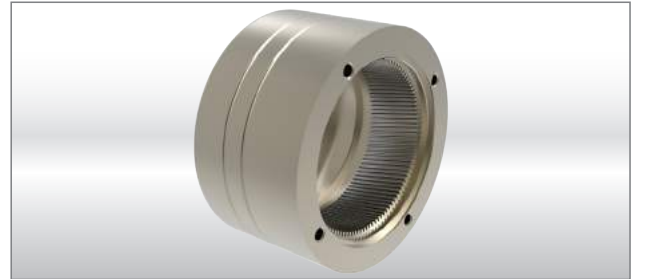
Redüktörün giriş mili ve motorun çıkış mili, kovan kilitleme mekanizmasıyla bağlanır. Bu sayede yüksek hızlarda hassas merkezleme ve bağlantı dengesi sağlanıp, güç iletimi esnasında boşluk engellenmiş olur.



## Full Needle Roller Bearings Design

The planetary gear transmission employs full needle roller bearings without retainer to increase the contact surface, which greatly upgrades structural rigidity and service life.

Planet dişlilerde temas yüzeyini attırmak amacıyla iğneli rulmanlı yataklar kullanılır. Bu sayede yapısal sağlamlık ve hizmet ömrü büyük ölçüde artırılmış olur.



## One-piece Gear Box & Advanced Surface Treatment

The gear box and internal ring gear are one-piece constructed to achieve high rigidity and high torque.

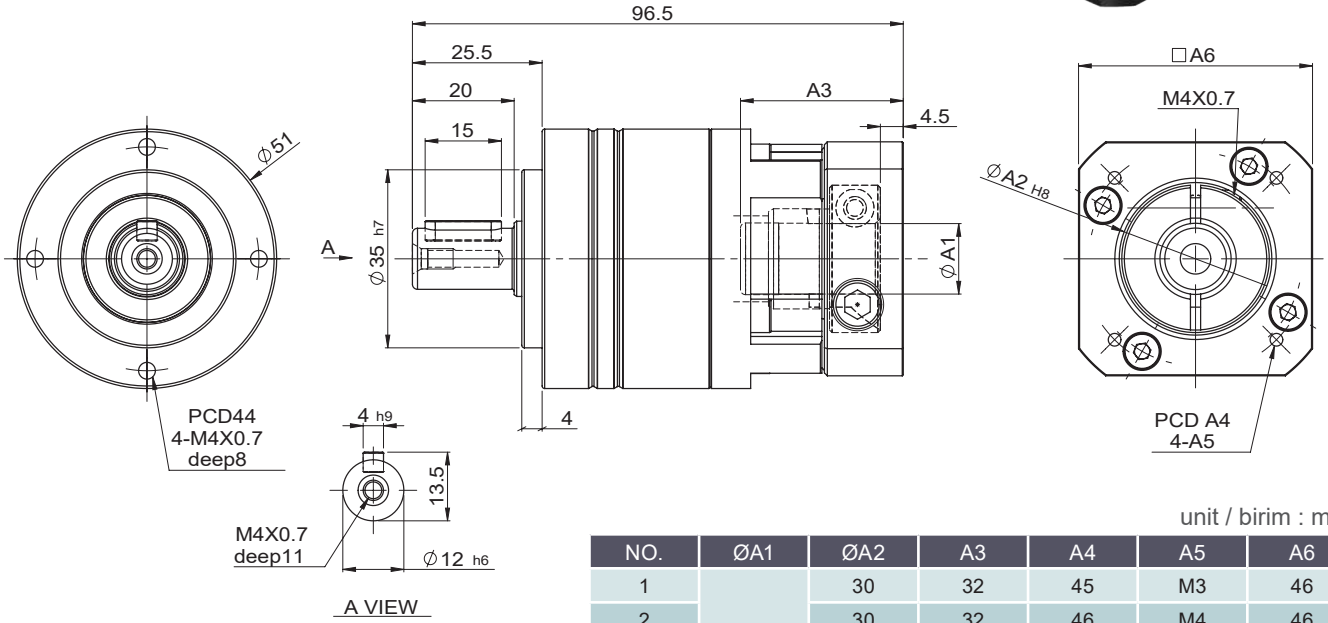
Sağlamlık ve torkun artırılması için dişli kutusu ve gövde üzerindeki dişliler tek parça olarak işlenmiştir.

# SERVOBOX

## MODEL : SA50

1-Stage / Kademe

RATIO / ÇEVİRİM : 3, 4, 5, 7, 10

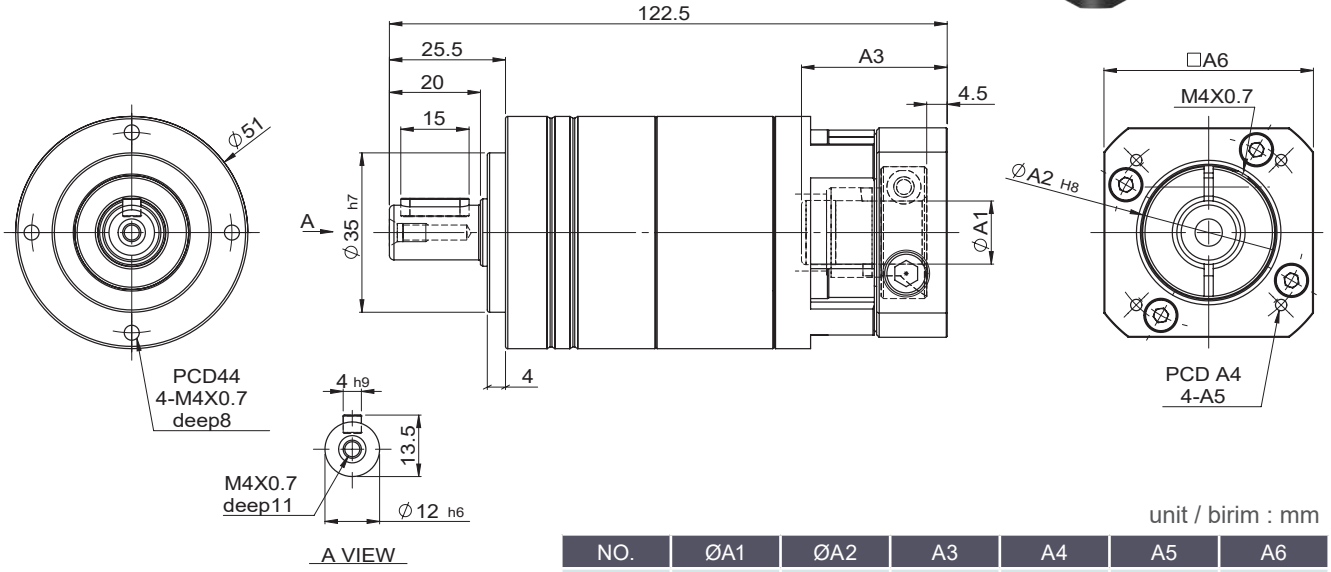


Model No.		Unit/Birim	3	4	5	7	10
Nominal output torque / Nominal Çıkış Torku	$T_{2N}$	Nm	17	15	14	13	12
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	31	27	25	23	22
Mass Moment of Inertia / Atalet Ağırlık Momenti		kg.cm <sup>2</sup>	0.03	0.03	0.03	0.03	0.03
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku				
Rated Input Speed / Nominal Giriş Devri	$n_{IN}$	rpm	3,000				
Max. Input Speed / Max. Giriş Devri	$n_{IB}$	rpm	5,000				
Torsional Rigidity / Burulma Direnci		Nm/arcmin	3				
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	320				
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	160				
Service Life / Hizmet Ömrü	$L_H$	hr	S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)				
Efficiency / Verim	$\eta$	%	$\geq 97\%$				
Operating Temperature / Çalışma Sıcaklığı		°C	- 25° C ~ + 90° C				
Lubrication / Yağlama			Synthetic Grease / Sentetik Gres				
Protection Class / Koruma Sınıfı			IP65				
Mounting Position / Montaj Pozisyonu			Any / Her Yönde				
Noise Level / Ses Seviyesi		dB	$\leq 58$ dB				
Weight / Ağırlık $\pm 3\%$		Kg					

# MODEL : SA50

2-Stage / Kademe

RATIO / ÇEVİRİM : 15, 20, 25, 30, 35, 40, 50, 70, 100



NO.	ØA1	ØA2	A3	A4	A5	A6
1	11 · 14	30	32	45	M3	46
2		30	32	46	M4	46
3		30	32	48.5	M3	55
4		40	32	63	M5	55
5		50	32	70	M5	60

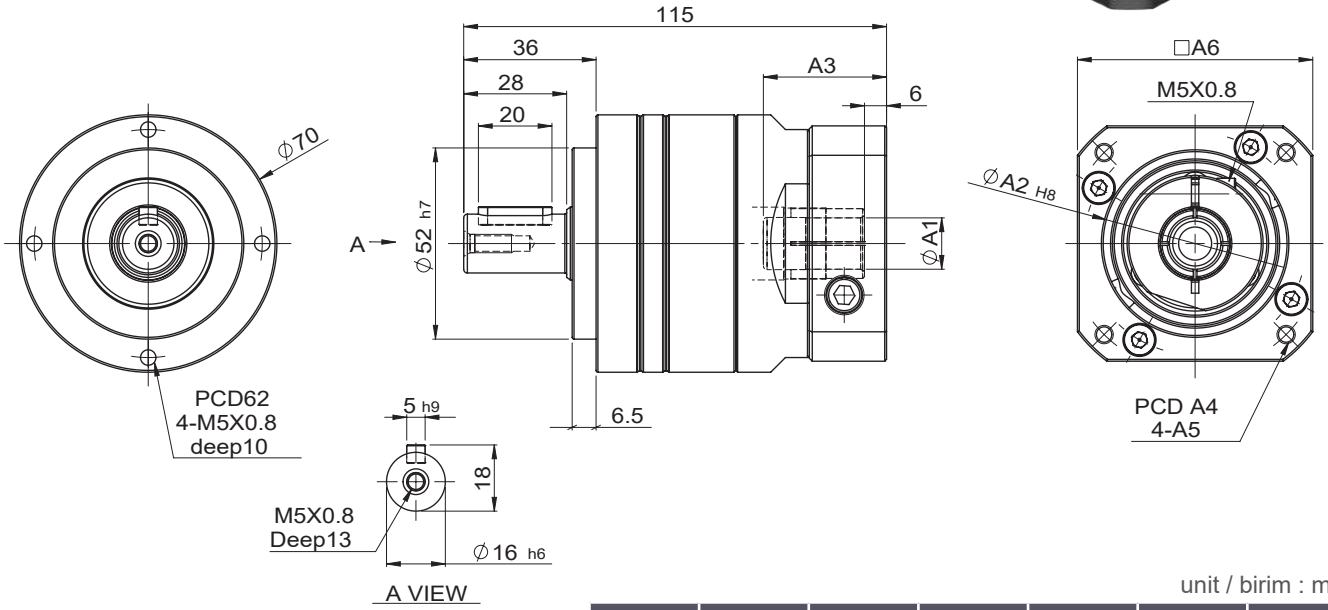
Model No.		Unit/Birim	15	20	25	30	35	40	50	70	100
Nominal output torque / Nominal Çıkış Torku	$T_{2N}$	Nm	17	15	14	13	13	12	14	13	12
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	31	27	25	23	23	22	25	23	22
Mass Moment of Inertia / Aalet Ağırlık Momenti		kg.cm <sup>2</sup>	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku								
Rated Input Speed / Nominal Giriş Devri	$n_{IN}$	rpm	3,000								
Max. Input Speed / Max. Giriş Devri	$n_{IB}$	rpm	5,000								
Torsional Rigidity / Burulma Direnci		Nm/arcmin	3								
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	320								
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	160								
Service Life / Hizmet Ömrü	$L_H$	hr	S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)								
Efficiency / Verim	$\eta$	%	$\geq 95\%$								
Operating Temperature / Çalışma Sıcaklığı		°C	- 25° C ~ + 90° C								
Lubrication / Yağlama			Synthetic Grease / Sentetik Gres								
Protection Class / Koruma Sınıfı			IP65								
Mounting Position / Montaj Pozisyonu			Any / Her Yönde								
Noise Level / Ses Seviyesi		dB	$\leq 60$ dB								
Weight / Ağırlık $\pm 3\%$		Kg									

# SERVOBOX

## MODEL : SA70

1-Stage / Kademe

RATIO / ÇEVİRİM : 3, 4, 5, 7, 10



unit / birim : mm

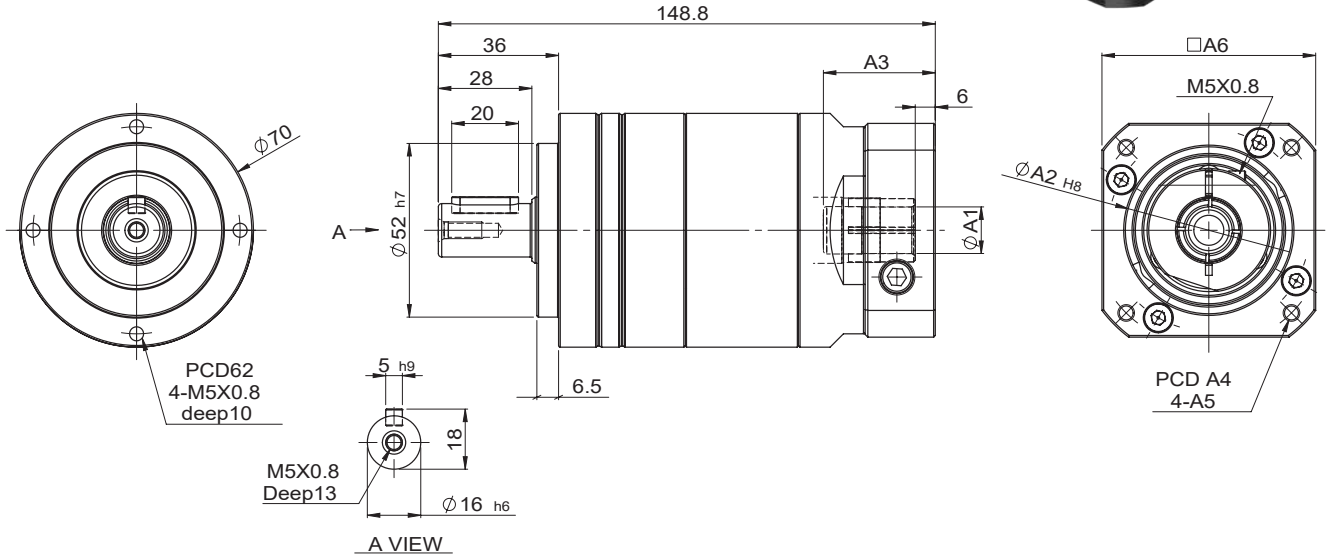
NO.	ØA1	ØA2	A3	A4	A5	A6
1	14 · 19	50	33.5	70	M5	70
2		60	33.5	75	M6	75
3		70	33.5 · 41	90	M6	80

Model No.		Unit/Birim	3	4	5	7	10
Nominal output torque / Nominal Çıkış Torku	$T_{2N}$	Nm	54	48	45	41	40
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	97	86	81	74	72
Mass Moment of Inertia / Aalet Ağırlık Momenti		kg.cm <sup>2</sup>	0.15	0.15	0.13	0.13	0.13
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku				
Rated Input Speed / Nominal Giriş Devri	$n_{1N}$	rpm	3,000				
Max. Input Speed / Max. Giriş Devri	$n_{1B}$	rpm	5,000				
Torsional Rigidity / Burulma Direnci		Nm/arcmin	3				
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	800				
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	400				
Service Life / Hizmet Ömrü	$L_H$	hr	S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)				
Efficiency / Verim	$\eta$	%	$\geq 97\%$				
Operating Temperature / Çalışma Sıcaklığı		°C	- 25° C ~ + 90° C				
Lubrication / Yağlama			Synthetic Grease / Sentetik Gres				
Protection Class / Koruma Sınıfı			IP65				
Mounting Position / Montaj Pozisyonu			Any / Her Yönde				
Noise Level / Ses Seviyesi		dB	$\leq 58$ dB				
Weight / Ağırlık $\pm 3\%$		Kg					

# MODEL : SA70

2-Stage / Kademe

RATIO / ÇEVİRİM : 15, 20, 25, 30, 35, 40, 50, 70, 100



unit / birim : mm

NO.	ØA1	ØA2	A3	A4	A5	A6
1	14 · 19	50	33.5	70	M5	70
2		60	33.5	75	M6	75
3		70	33.5 · 41	90	M6	80

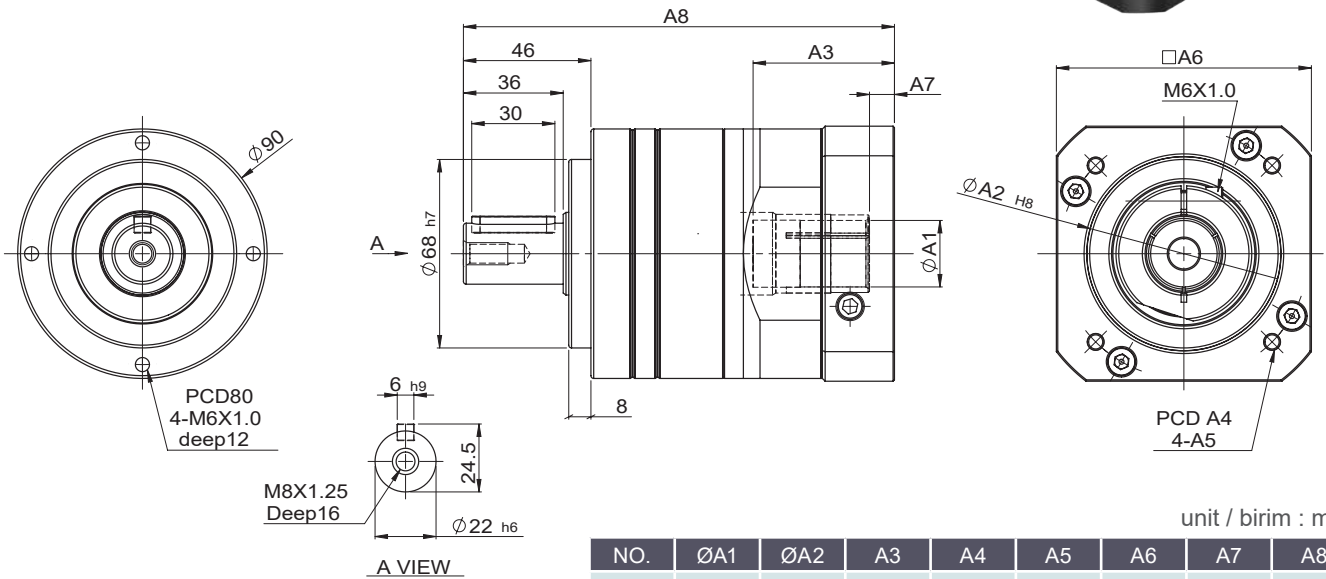
Model No.		Unit/Birim	15	20	25	30	35	40	50	70	100
Nominal output torque / Nominal Çıkış Torqu	$T_{2N}$	Nm	54	48	45	41	41	39	45	41	40
Max. Acceleration Torque / Max. İvmelenme Torqu	$T_{2B}$	Nm	97	86	81	74	74	70	81	74	72
Mass Moment of Inertia / Atalet Ağırlık Momenti		kg.cm <sup>2</sup>	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
Max. Output Torque / Max. Çıkış Torqu	$T_{2NOT}$	Nm	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torqu								
Rated Input Speed / Nominal Giriş Devri	$n_{1N}$	rpm	3,000								
Max. Input Speed / Max. Giriş Devri	$n_{1B}$	rpm	5,000								
Torsional Rigidity / Burulma Direnci		Nm/arcmin	3								
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	800								
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	400								
Service Life / Hizmet Ömrü	$L_H$	hr	S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)								
Efficiency / Verim	$\eta$	%	$\geq 95\%$								
Operating Temperature / Çalışma Sıcaklığı		°C	- 25° C ~ + 90° C								
Lubrication / Yağlama			Synthetic Grease / Sentetik Gres								
Protection Class / Koruma Sınıfı			IP65								
Mounting Position / Montaj Pozisyonu			Any / Her Yönde								
Noise Level / Ses Seviyesi		dB	$\leq 60$ dB								
Weight / Ağırlık $\pm 3\%$		Kg									

# SERVOBOX

## MODEL : SA90

1-Stage / Kademe

RATIO / ÇEVİRİM : 4, 5, 7, 10



unit / birim : mm

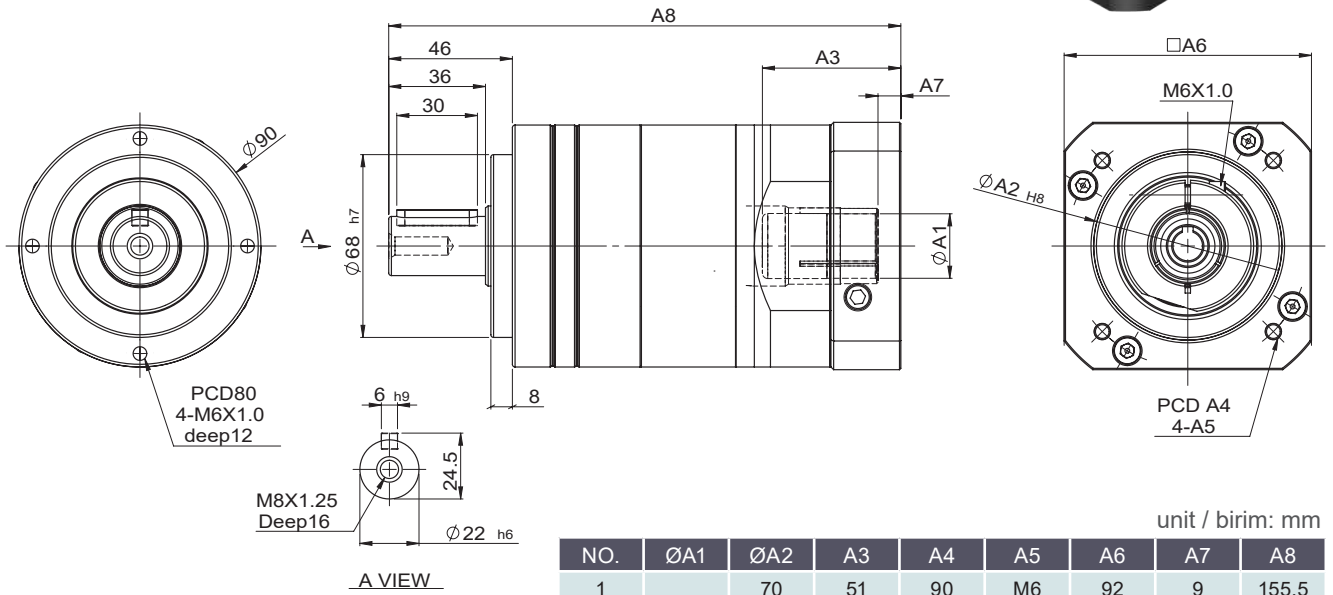
NO.	ØA1	ØA2	A3	A4	A5	A6	A7	A8
1	19-24	70	51	90	M6	92	9	155.5
2		80	51	100	M6	92	9	155.5
3		95	51	115	M6	110	9	155.5
4		95	51	115	M8	110	9	155.5
5		110	51	145	M8	130	9	155.5
6		110	65.5	145	M8	130	23.5	170

Model No.	Unit/Birim	4	5	7	10	
Nominal output torque / Nominal Çıkış Torku	$T_{2N}$	Nm	146	155	142	136
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	1.8 Times of Rated Output Torque / 1,8 x Nominal Çıkış Torku			
Mass Moment of Inertia / Aalet Ağırlık Momenti		kg.cm <sup>2</sup>	0.51	0.45	0.42	0.42
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku			
Rated Input Speed / Nominal Giriş Devri	$n_{1N}$	rpm	3,000			
Max. Input Speed / Max. Giriş Devri	$n_{1B}$	rpm	5,000			
Torsional Rigidity / Burulma Direnci		Nm/arcmin	15			
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	4,150			
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	3,780			
Service Life / Hizmet Ömrü	$L_H$	hr	S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)			
Efficiency / Verim	$\eta$	%	$\geq 97\%$			
Operating Temperature / Çalışma Sıcaklığı		°C	- 25° C ~ + 90° C			
Lubrication / Yağlama			Synthetic Grease / Sentetik Gres			
Protection Class / Koruma Sınıfı			IP65			
Mounting Position / Montaj Pozisyonu			Any / Her Yönde			
Noise Level / Ses Seviyesi		dB	$\leq 60$ dB			
Weight / Ağırlık $\pm 3\%$		Kg				

# MODEL : SA90

2-Stage / Kademe

RATIO / ÇEVİRİM : 20, 25, 35, 40, 50, 70, 100



NO.	ØA1	ØA2	A3	A4	A5	A6	A7	A8
1	19 - 24	70	51	90	M6	92	9	155.5
2		80	51	100	M6	92	9	155.5
3		95	51	115	M6	110	9	155.5
4		95	51	115	M8	110	9	155.5
5		110	51	145	M8	130	9	155.5
6		110	65.5	145	M8	130	23.5	170

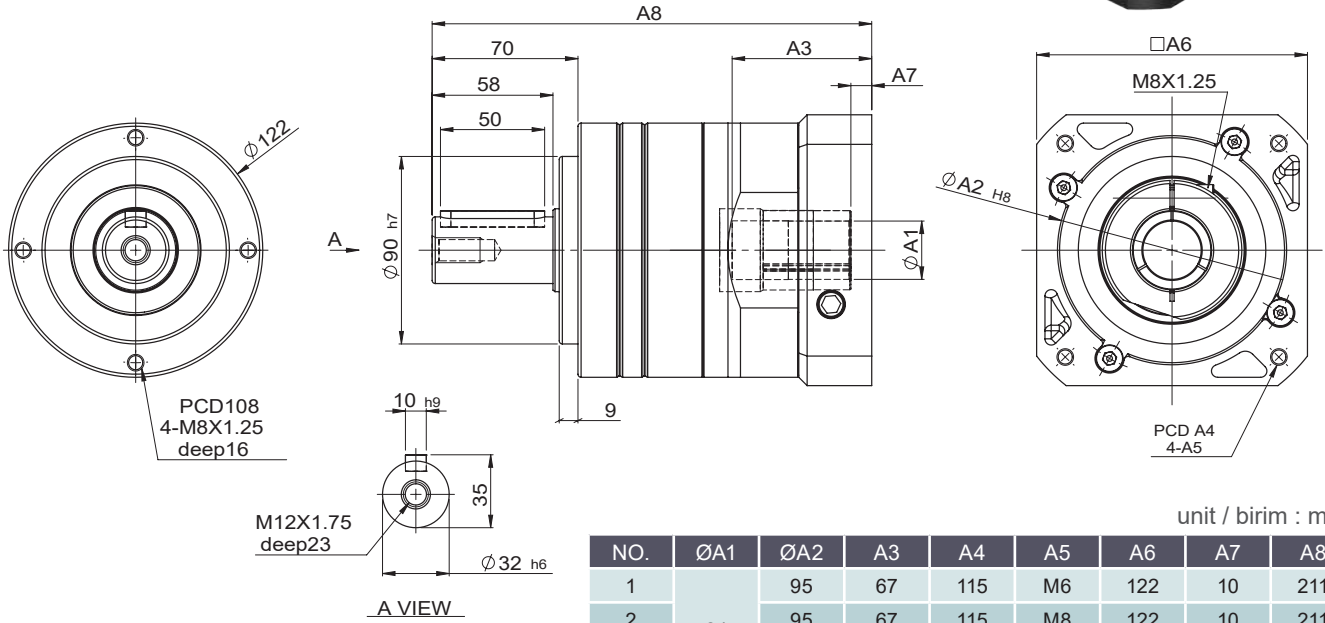
Model No.		Unit/Birim	20	25	35	40	50	70	100
Nominal output torque / Nominal Çıkış Torku	$T_{2N}$	Nm	126	158	128	123	138	128	121
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	1.8 Times of Rated Output Torque / 1,8 x Nominal Çıkış Torku						
Mass Moment of Inertia / Atalet Ağırlık Momenti		kg.cm <sup>2</sup>	0.13	0.13	0.13	0.13	0.13	0.13	0.13
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku						
Rated Input Speed / Nominal Giriş Devri	$n_{1N}$	rpm	3,000						
Max. Input Speed / Max. Giriş Devri	$n_{1B}$	rpm	6,000						
Torsional Rigidity / Burulma Direnci		Nm/arcmin	15						
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	4,150						
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	3,780						
Service Life / Hizmet Ömrü	$L_H$	hr	S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)						
Efficiency / Verim	$\eta$	%	$\geq 94\%$						
Operating Temperature / Çalışma Sıcaklığı		°C	- 25° C ~ + 90° C						
Lubrication / Yağlama			Synthetic Grease / Sentetik Gres						
Protection Class / Koruma Sınıfı			IP65						
Mounting Position / Montaj Pozisyonu			Any / Her Yönde						
Noise Level / Ses Seviyesi		dB	$\leq 63$ dB						
Weight / Ağırlık $\pm 3\%$		Kg							

# SERVOBOX

## MODEL : SA120

1-Stage / Kademe

RATIO / ÇEVİRİM : 4, 5, 7, 10



unit / birim : mm

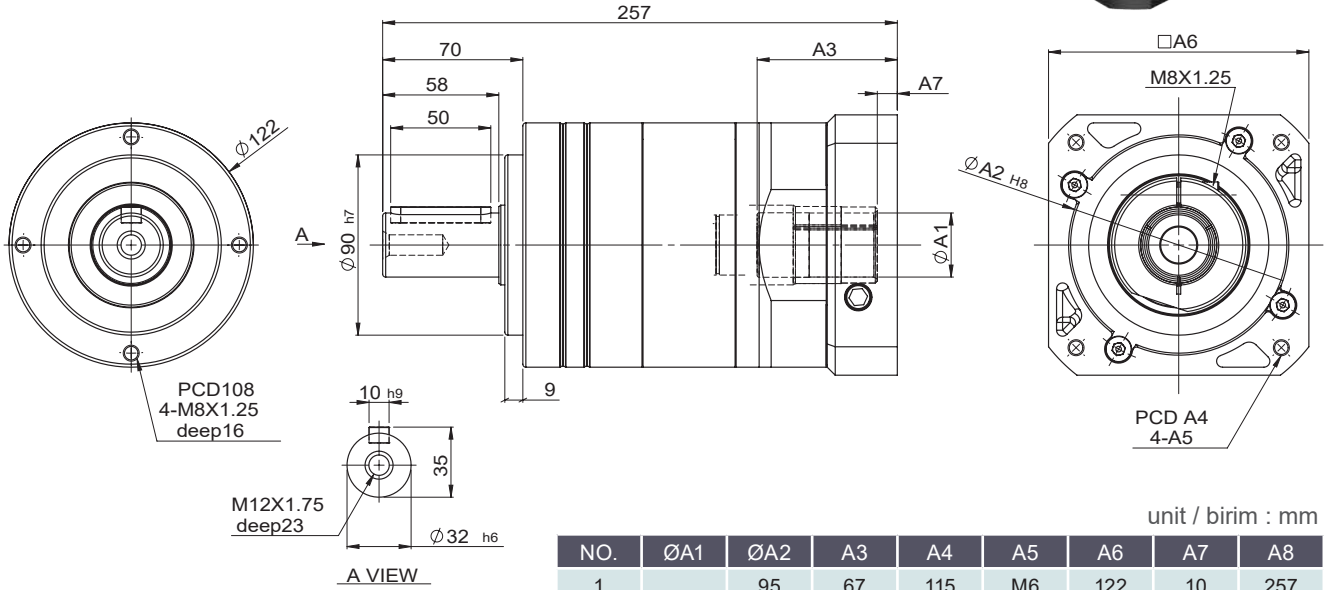
NO.	ØA1	ØA2	A3	A4	A5	A6	A7	A8
1	24 28 32	95	67	115	M6	122	10	211
2		95	67	115	M8	122	10	211
3		110	67	145	M8	130	10	211
4		110	77	145	M8	130	20	221
5		130	67	165	M10	150	10	211

Model No.		Unit/Birim	4	5	7	10
Nominal output torque / Nominal Çıkış Torku	$T_{2N}$	Nm	208	333	309	294
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	1.8 Times of Rated Output Torque / 1,8 x Nominal Çıkış Torku			
Mass Moment of Inertia / Aalet Ağırlık Momenti		kg.cm <sup>2</sup>	2.8	2.71	2.54	2.51
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku			
Rated Input Speed / Nominal Giriş Devri	$n_{1N}$	rpm	3,000			
Max. Input Speed / Max. Giriş Devri	$n_{1B}$	rpm	6,000			
Torsional Rigidity / Burulma Direnci		Nm/arcmin	27			
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	8,760			
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	7,500			
Service Life / Hizmet Ömrü	$L_H$	hr	S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)			
Efficiency / Verim	$\eta$	%	$\geq 97\%$			
Operating Temperature / Çalışma Sıcaklığı		°C	- 25° C ~ + 90° C			
Lubrication / Yağlama			Synthetic Grease / Sentetik Gres			
Protection Class / Koruma Sınıfı			IP65			
Mounting Position / Montaj Pozisyonu			Any / Her Yönde			
Noise Level / Ses Seviyesi		dB	$\leq 63$ dB			
Weight / Ağırlık $\pm 3\%$		Kg				

# MODEL : SA120

2-Stage / Kademe

RATIO / ÇEVİRİM : 20, 25, 35, 40, 50, 70, 100



unit / birim : mm

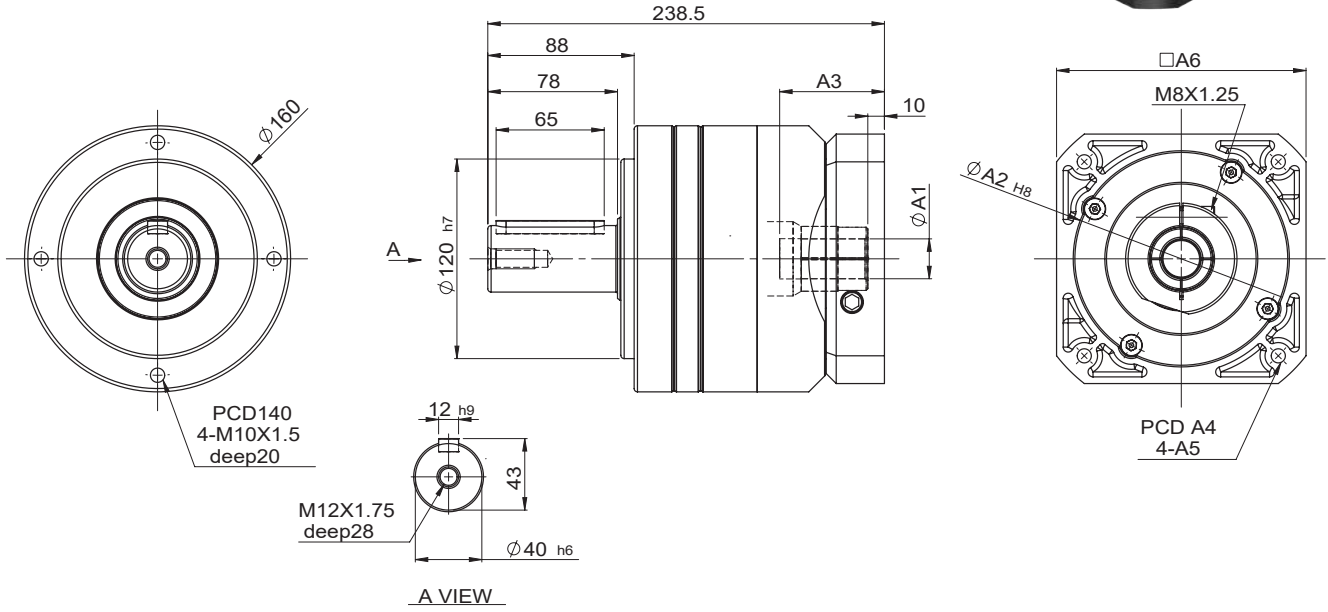
Model No.		Unit/Birim	20	25	35	40	50	70	100
Nominal output torque / Nominal Çıkış Torku	$T_{2N}$	Nm	267	296	275	265	296	275	262
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	1.8 Times of Rated Output Torque / 1,8 x Nominal Çıkış Torku						
Mass Moment of Inertia / Atalet Ağırlık Momenti		kg.cm <sup>2</sup>	0.47	0.47	0.47	0.47	0.44	0.44	0.44
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku						
Rated Input Speed / Nominal Giriş Devri	$n_{1N}$	rpm	3,000						
Max. Input Speed / Max. Giriş Devri	$n_{1B}$	rpm	5,000						
Torsional Rigidity / Burulma Direnci		Nm/arcmin	27						
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	8,760						
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	7,500						
Service Life / Hizmet Ömrü	$L_H$	hr	S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)						
Efficiency / Verim	$\eta$	%	$\geq 94\%$						
Operating Temperature / Çalışma Sıcaklığı		°C	- 25° C ~ + 90° C						
Lubrication / Yağlama			Synthetic Grease / Sentetik Gres						
Protection Class / Koruma Sınıfı			IP65						
Mounting Position / Montaj Pozisyonu			Any / Her Yönde						
Noise Level / Ses Seviyesi		dB	$\leq 63$ dB						
Weight / Ağırlık $\pm 3\%$		Kg							

# SERVOBOX

## MODEL : SA160

1-Stage / Kademe

RATIO / ÇEVİRİM : 3, 4, 5, 7, 10



unit / birim : mm

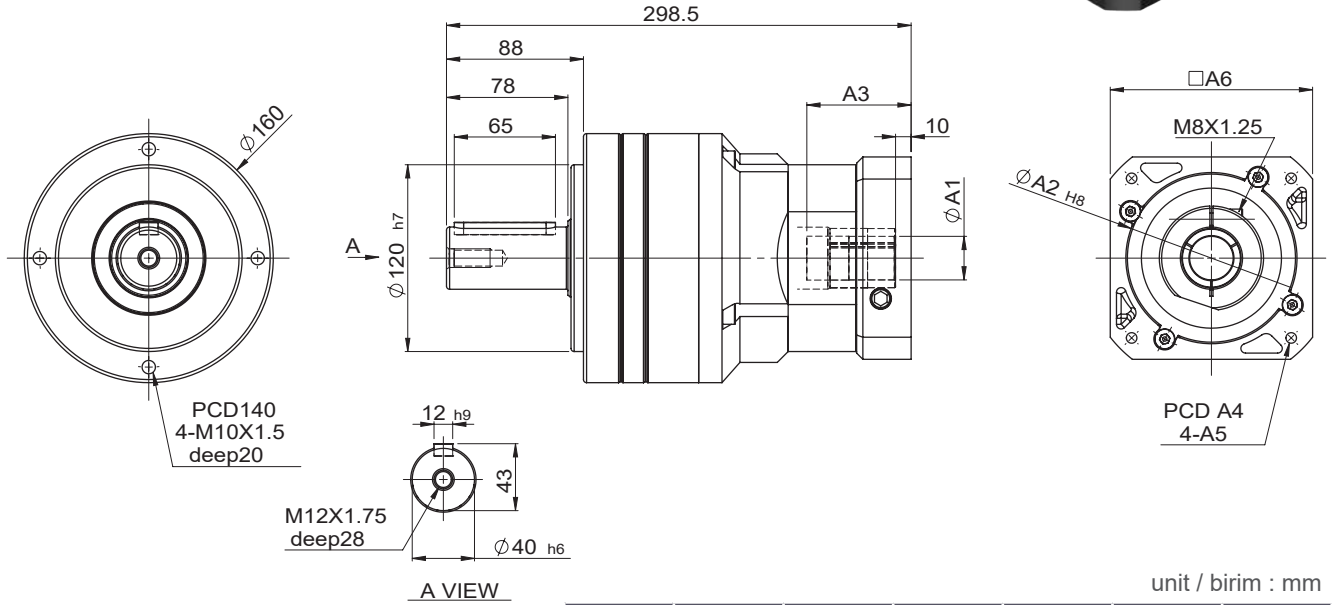
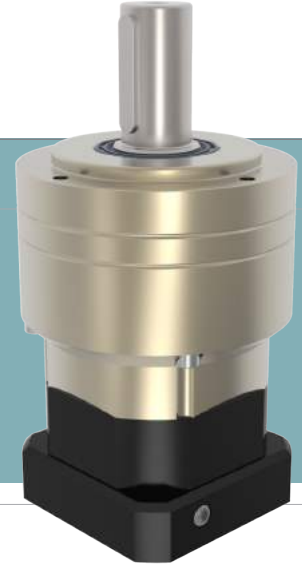
NO.	ØA1	ØA2	A3	A4	A5	A6
1	35	130	63	165	M10	150

Model No.		Unit/Birim	3	4	5	7	10
Nominal output torque / Nominal Çıkış Torku	$T_{2N}$	Nm	625	555	618	573	549
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	1.8 Times of Rated Output Torque / 1,8 x Nominal Çıkış Torku				
Mass Moment of Inertia / Atalet Ağırlık Momenti		kg.cm <sup>2</sup>	9.21	7.54	7.42	7.14	7.03
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku				
Rated Input Speed / Nominal Giriş Devri	$n_{1N}$	rpm	3,000				
Max. Input Speed / Max. Giriş Devri	$n_{1B}$	rpm	5,000				
Torsional Rigidity / Burulma Direnci		Nm/arcmin	60				
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	9,300				
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	4,650				
Service Life / Hizmet Ömrü	$L_H$	hr	S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)				
Efficiency / Verim	$\eta$	%	$\geq 97\%$				
Operating Temperature / Çalışma Sıcaklığı		°C	- 25° C ~ + 90° C				
Lubrication / Yağlama			Synthetic Grease / Sentetik Gres				
Protection Class / Koruma Sınıfı			IP65				
Mounting Position / Montaj Pozisyonu			Any / Her Yönde				
Noise Level / Ses Seviyesi		dB	$\leq 65$ dB				
Weight / Ağırlık $\pm 3\%$		Kg					

# MODEL : SA160

2-Stage / Kademe

RATIO / ÇEVİRİM : 15, 20, 25, 30, 35, 40, 50, 70, 100

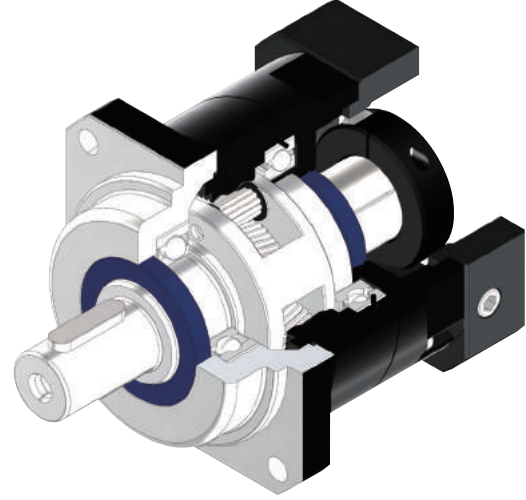


NO.	ØA1	ØA2	A3	A4	A5	A6
1	35	95	67	115	M6	122
2		110	67	145	M8	130
3		130	67	165	M10	150

Model No.		Unit/Birim	15	20	25	30	35	40	50	70	100
Nominal output torque / Nominal Çıkış Torku	$T_{2N}$	Nm	625	555	618	583	573	553	618	573	549
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	1.8 Times of Rated Output Torque / 1,8 x Nominal Çıkış Torku								
Mass Moment of Inertia / Atalet Ağırlık Momenti		kg.cm <sup>2</sup>	2.63	2.63	2.63	2.43	2.43	2.43	2.43	2.39	2.39
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku								
Rated Input Speed / Nominal Giriş Devri	$n_{1N}$	rpm	3,000								
Max. Input Speed / Max. Giriş Devri	$n_{1B}$	rpm	5,000								
Torsional Rigidity / Burulma Direnci		Nm/arcmin	60								
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	9,300								
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	4,650								
Service Life / Hizmet Ömrü	$L_H$	hr	S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)								
Efficiency / Verim	$\eta$	%	$\geq 94\%$								
Operating Temperature / Çalışma Sıcaklığı		°C	- 25° C ~ + 90° C								
Lubrication / Yağlama			Synthetic Grease / Sentetik Gres								
Protection Class / Koruma Sınıfı			IP65								
Mounting Position / Montaj Pozisyonu			Any / Her Yönde								
Noise Level / Ses Seviyesi		dB	$\leq 65$ dB								
Weight / Ağırlık $\pm 3\%$		Kg									

# FA series / serileri

- 1-Stage Backlash  $\leq 8$  arcmin  
1 Kademe Boşluk Oranı  $\leq 8$  arcmin
- 2-Stage Backlash  $\leq 12$  arcmin  
2 Kademe Boşluk Oranı  $\leq 12$  arcmin



## Indication of Model Numbers / Model Seçimi

FA	80	10		MOTOR
Type	Model	Ratio/Çevrim	Output Shaft / Çıkış Mili	Motor Type
FA	50 70 80 90 100 120	1-Stage/Kademe 3, 4, 5, 7, 10  2-Stage/Kademe 15, 20, 25, 30, 35, 40, 50, 70, 100	Keyway/Kamalı  No Keyway/Kamasız	Motor Brand & Model No. / Motor Marka & Modeli

### Quiet operation

Grinding spiral bevel gear & Helical gears contribute to reduce vibration and noise.  
Taşlanmış konik dişliler ve helis dişliler titreşimin ve sesin engellenmesini sağlar.

### High Rigidity & High Torque

High rigidity & high torque are achieved by integrant needle roller bearings and one-piece constructed.  
Sağlamlık ve yüksek tork tek parça yapı ve iğneli rulmanlar sayesinde elde edilir.

### High Efficiency

Efficiency for 1-stage model exceeds 95%; 2-stage model exceeds 92%.  
1 kademe için verim %95, 2 kademe için verim %92'dir.

# Features of FA Series / FA Serilerinin Özellikleri



## Helical Gear Design

The speed reduction mechanism employs helical gears, which provides two times meshing rate of teeth when comparing with regular spur gears. In addition, it also features extremely smooth running, low noise, high torque output and low backlash.

Helis dişliler sayesinde düz dişlilere göre 2 kat fazla temas yüzeyi sağlanmaktadır. Bu sayede pürüzsüz hareket, düşük ses, yüksek çıkış torku ve hassasiyet elde edilir.

## High Precision Gear Machining

Manufactured from high quality Ni-Cr-Mo alloy steel (SNM220), precision achined and carburized to hardness 57-60 HRC. Precision teeth grinding sure gear accuracy reaches DIN6 class.

Yüksek kaliteli Ni-Cr-Mo alaşımlı çelikten (SNM220) üretilmiştir. Sertlik derecesi 57-60 HRC'dir. Dişli taşlama hassasiyeti DIN6 sınıfındadır.



## Full Needle Roller Bearings Design

The planetary gear transmission employs full needle roller bearings without retainer to increase the contact surface, which greatly upgrades structural rigidity and service life.

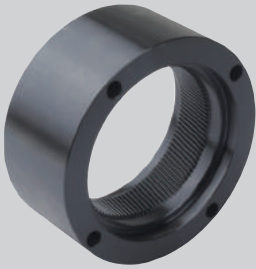
Planet dişlilerde temas yüzeyini artırmak amacıyla iğneli rulmanlı yataklar kullanılır. Bu sayede yapısal sağlamlık ve hizmet ömrü büyük ölçüde artırılmış olur.



## Integrated Planetary Arm Bracket

The planetary arm bracket and the output shaft are one-piece constructed to increase torsional rigidity.

Burulma direncini arttırmak amacıyla planet destek kolu ve çıkış mili tek parça olarak üretilmiştir.



## One-piece Gear Box & Advanced Surface Treatment

The gear box and internal ring gear are one-piece constructed to achieve high rigidity and high torque.

Sağlamlık ve torkun artırılması için dişli kutusu ve gövde üzerindeki dişliler tek parça olarak işlenmiştir.



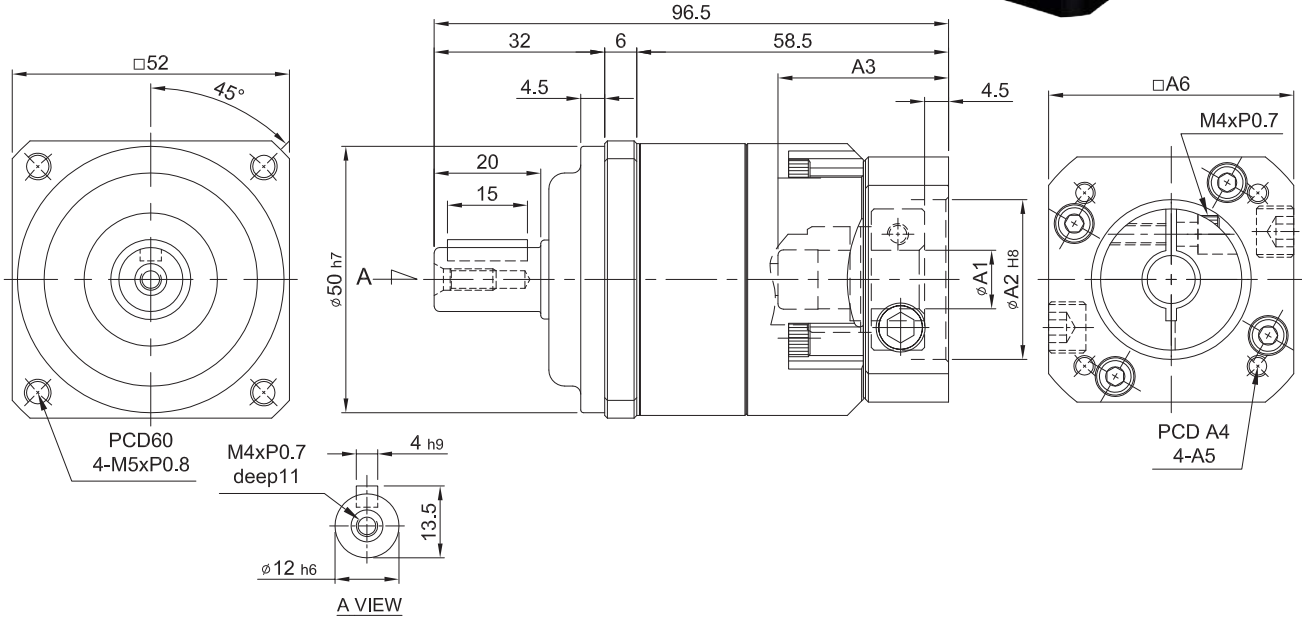
## Collet Locking Mechanism

The input-end and the motor are coupled through a collet locking mechanism. It has passed dynamical balance analysis to assure concentricity and balance on the connection and no backlash for power transmission while running at high speed.

Redüktörün giriş mili ve motorun çıkış mili, kovan kilitleme mekanizmasıyla bağlanır. Bu sayede yüksek hızlarda hassas merkezleme ve bağlantı dengesi sağlanıp, güç iletimi esnasında boşluk engellenmiş olur.

# MODEL : FA50

RATIO / ÇEVİRİM : 3, 4, 5, 7, 10 (1-Stage / Kademe)



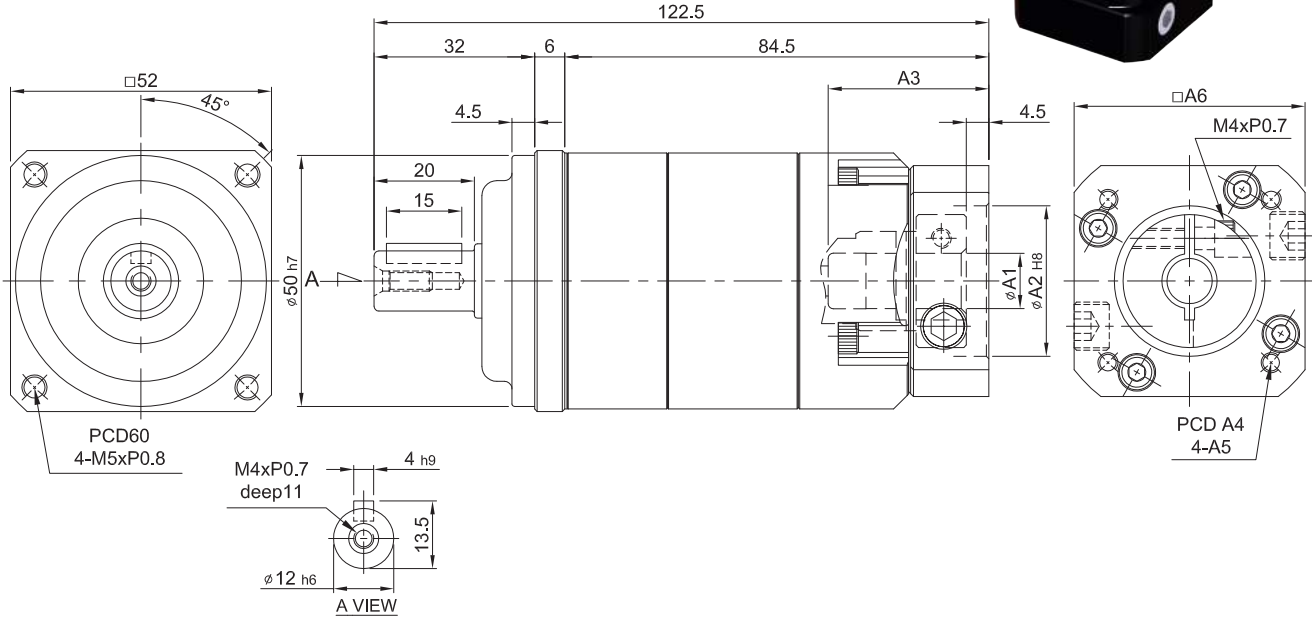
unit / birim : mm

NO.	ØA1	ØA2	A3	A4	A5	A6
1	8 · 10 · 11 · 14	30	32	45	M3	46
2		30	32	46	M4	46
3		30	32	48.5	M3	55
4		40	32	63	M5	55
5		50	32	70	M5	60

Ratio / Çevrim		Unit / Birim	3	4	5	7	10
Nominal Output Torque / Nominal Çıkış Torku	$T_{2N}$	Nm	19	16	16	15	14
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	34	29	29	27	25
Mass Moments of Inertia / Atalet Ağırlık Momenti		kg.cm <sup>2</sup>	0.03	0.03	0.03	0.03	0.03
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku				
Rated Input Speed / Nominal Giriş Devri	$n_{1N}$	rpm	3,000				
Max. Input Speed / Max. Giriş Devri	$n_{1B}$	rpm	5,000				
Torsional Rigidity / Burulma Direnci		Nm/arcmin	3				
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	350				
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	180				
Service Life / Hizmet Ömrü	$L_H$	hr	S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs) S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat)				
Efficiency / Verim	$\eta$	%	≥ 97%				
Operating Temperature / Çalışma Sıcaklığı		°C	-25°C ~+90°C				
Lubrication / Yağlama			Synthetic Grease / Sentetik Gres				
Protection Class / Koruma Sınıfı			IP 65				
Mounting Position / Montaj Pozisyonu			Any / Her Yönde				
Noise Level / Ses Seviyesi		dB	≤ 58 dB				
Weight ±2% / Ağırlık		Kg	0.64				

# MODEL : FA50

RATIO / ÇEVİRİM : 15, 20, 25, 30, 35, 40, 50, 70, 100 (2-Stage / Kademe)



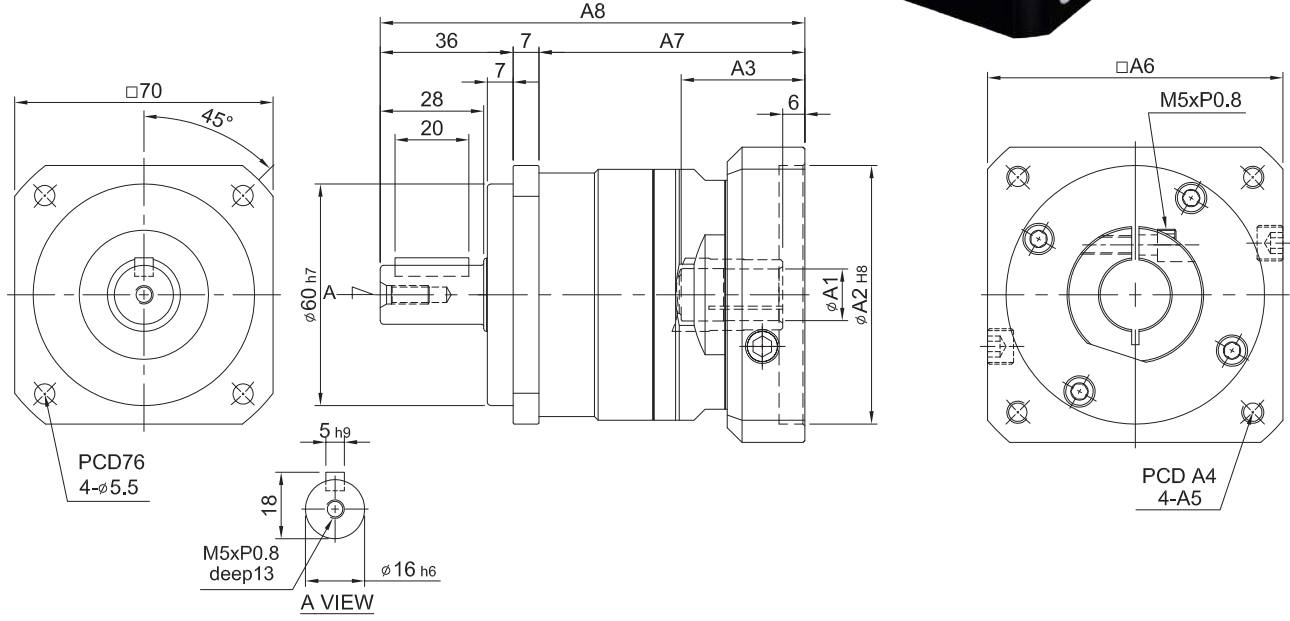
unit / birim : mm

NO.	ØA1	ØA2	A3	A4	A5	A6
1	8 · 10 · 11 · 14	30	32	45	M3	46
2		30	32	46	M4	46
3		30	32	48.5	M3	55
4		40	32	63	M5	55
5		50	32	70	M5	60

Ratio / Çevrim		Unit / Birim	15	20	25	30	35	40	50	70	100
Nominal Output Torque / Nominal Çıkış Torku	$T_{2N}$	Nm	19	16	16	19	15	16	16	15	14
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	34	29	29	34	27	29	29	27	25
Mass Moments of Inertia / Atalet Ağırlık Momenti		kg.cm <sup>2</sup>	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku								
Rated Input Speed / Nominal Giriş Devri	$n_{IN}$	rpm	3,000								
Max. Input Speed / Max. Giriş Devri	$n_{IB}$	rpm	5,000								
Torsional Rigidity / Burulma Direnci		Nm/arcmin	3								
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	350								
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	180								
Service Life / Hizmet Ömrü	$L_H$	hr	S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs) S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat)								
Efficiency / Verim	$\eta$	%	$\geq 95\%$								
Operating Temperature / Çalışma Sıcaklığı		°C	-25°C ~ +90°C								
Lubrication / Yağlama			Synthetic Grease / Sentetik Gres								
Protection Class / Koruma Sınıfı			IP 65								
Mounting Position / Montaj Pozisyonu			Any / Her Yönde								
Noise Level / Ses Seviyesi		dB	$\leq 60$ dB								
Weight $\pm 2\%$ / Ağırlık		Kg	0.96								

# MODEL : FA70

RATIO / ÇEVİRİM: 3, 4, 5, 7, 10 (1-Stage / Kademe)



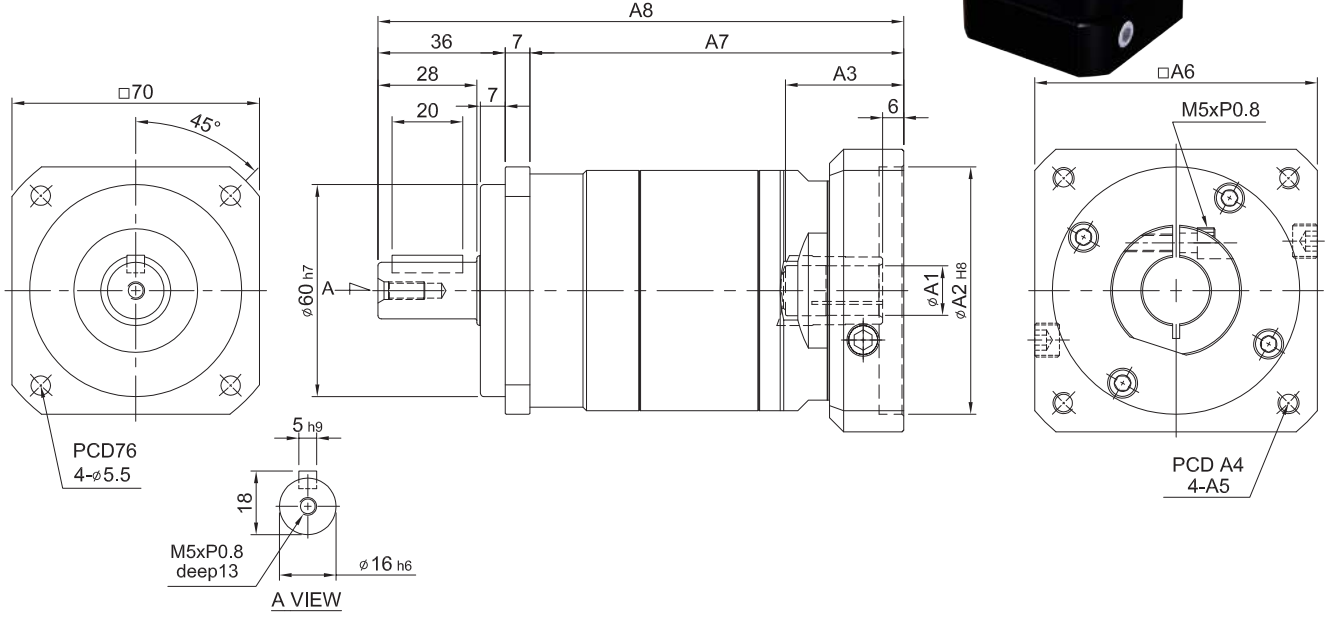
unit / birim : mm

NO.	ØA1	ØA2	A3	A4	A5	A6	A7	A8
1	14	50	33.5	70	M5	64	72	115
2	14	60	33.5	75	M6	70	72	115
3	14	70	33.5	85	M6	80	72	115
4	19	50	41.5	70	M5	64	80	123
5	19	60	41.5	75	M6	70	80	123
6	19	70	41.5	85	M6	80	80	123

Ratio / Çevrim	Unit / Birim	3	4	5	7	10	
Nominal Output Torque / Nominal Çıkış Torku	$T_{2N}$	Nm	54	48	45	41	40
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	97	86	81	74	72
Mass Moments of Inertia / Atalet Ağırlık Momenti		kg.cm <sup>2</sup>	0.16	0.14	0.13	0.13	0.13
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku				
Rated Input Speed / Nominal Giriş Devri	$n_{IN}$	rpm	3,000				
Max. Input Speed / Max. Giriş Devri	$n_{IB}$	rpm	5,000				
Torsional Rigidity / Burulma Direnci		Nm/arcmin	5				
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	800				
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	400				
Service Life / Hizmet Ömrü	$L_H$	hr	S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs) S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat)				
Efficiency / Verim	$\eta$	%	$\geq 97\%$				
Operating Temperature / Çalışma Sıcaklığı		°C	-25°C ~+90°C				
Lubrication / Yağlama			Synthetic Grease / Sentetik Gres				
Protection Class / Koruma Sınıfı			IP 65				
Mounting Position / Montaj Pozisyonu			Any / Her Yönde				
Noise Level / Ses Seviyesi		dB	$\leq 58$ dB				
Weight $\pm 2\%$ / Ağırlık		Kg	1				

# MODEL : FA70

RATIO / ÇEVİRİM : 15, 20, 25, 30, 35, 40, 50, 70, 100 (2-Stage / Kademe)



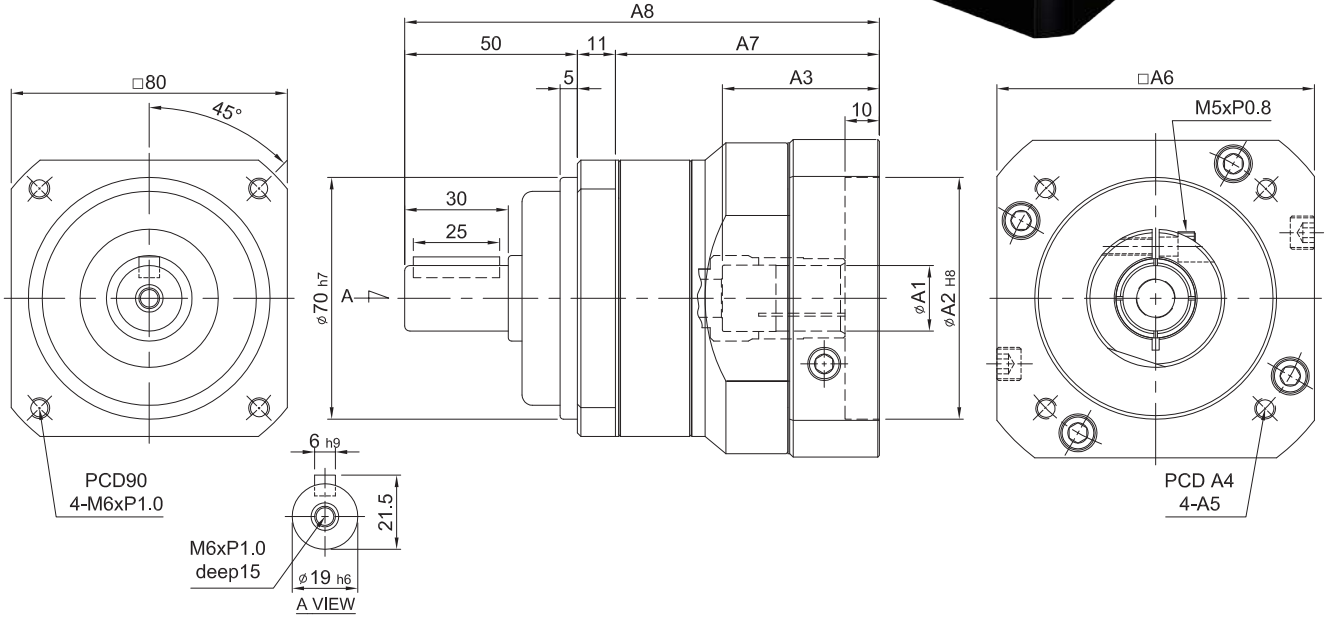
unit / birim: mm

NO.	ØA1	ØA2	A3	A4	A5	A6	A7	A8
1	14	50	33.5	70	M5	64	105.8	148.8
2	14	60	33.5	75	M6	70	105.8	148.8
3	14	70	33.5	85	M6	80	105.8	148.8
4	19	50	41.5	70	M5	64	113.8	156.8
5	19	60	41.5	75	M6	70	113.8	156.8
6	19	70	41.5	85	M6	80	113.8	156.8

Ratio / Çevrim		Unit / Birim	15	20	25	30	35	40	50	70	100
Nominal Output Torque / Nominal Çıkış Torku	$T_{2N}$	Nm	54	48	45	41	41	39	45	41	40
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	97	86	81	74	74	70	81	74	72
Mass Moments of Inertia / Atalet Ağırlık Momenti		kg.cm <sup>2</sup>	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku								
Rated Input Speed / Nominal Giriş Devri	$n_{IN}$	rpm	3,000								
Max. Input Speed / Max. Giriş Devri	$n_{IB}$	rpm	5,000								
Torsional Rigidity / Burulma Direnci		Nm/arcmin	5								
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	800								
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	400								
Service Life / Hizmet Ömrü	$L_H$	hr	S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs) S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat)								
Efficiency / Verim	$\eta$	%	$\geq 95\%$								
Operating Temperature / Çalışma Sıcaklığı		°C	-25°C ~ +90°C								
Lubrication / Yağlama			Synthetic Grease / Sentetik Gres								
Protection Class / Koruma Sınıfı			IP 65								
Mounting Position / Montaj Pozisyonu			Any / Her Yönde								
Noise Level / Ses Seviyesi		dB	$\leq 60$ dB								
Weight $\pm 2\%$ / Ağırlık		Kg	2.1								

# MODEL : FA80

RATIO / ÇEVİRİM : 3, 4, 5, 7, 10 (1-Stage / Kademe)



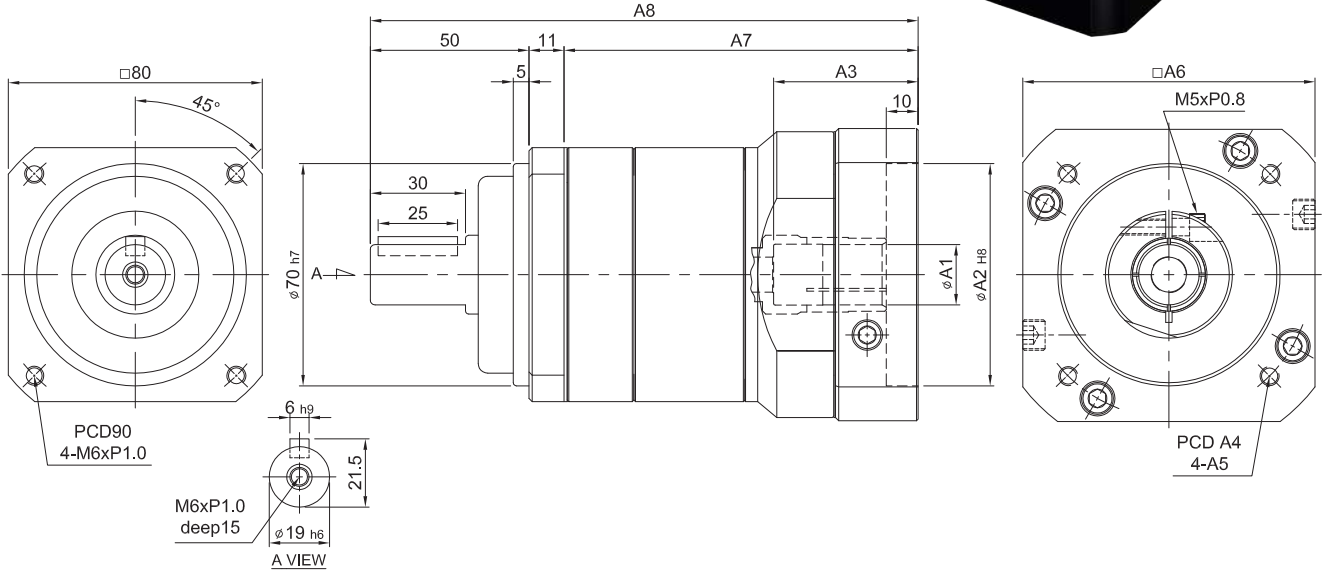
unit / birim : mm

NO.	ØA1	ØA2	A3	A4	A5	A6	A7	A8
1	14 · 19	50	33.5	70	M5	80	64.5	125.5
2		70	45.5	90	M6	92	76.5	137.5
3		80	45.5	100	M6	92	76.5	137.5
4		95	45.5	115	M6	110	76.5	137.5

Ratio / Çevrim		Unit / Birim	3	4	5	7	10	
Nominal Output Torque / Nominal Çıkış Torku	$T_{2N}$	Nm	112	110	108	105	100	
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	202	198	194	189	180	
Mass Moments of Inertia / Atalet Ağırlık Momenti		kg.cm <sup>2</sup>	0.48	0.38	0.38	0.38	0.35	
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku					
Rated Input Speed / Nominal Giriş Devri	$n_{IN}$	rpm	3,000					
Max. Input Speed / Max. Giriş Devri	$n_{IB}$	rpm	5,000					
Torsional Rigidity / Burulma Direnci		Nm/arcmin	12					
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	1,200					
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	600					
Service Life / Hizmet Ömrü	$L_H$	hr	S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs) S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat)					
Efficiency / Verim	$\eta$	%	$\geq 97\%$					
Operating Temperature / Çalışma Sıcaklığı		°C	-25°C ~ +90°C					
Lubrication / Yağlama			Synthetic Grease / Sentetik Gres					
Protection Class / Koruma Sınıfı			IP 65					
Mounting Position / Montaj Pozisyonu			Any / Her Yönde					
Noise Level / Ses Seviyesi		dB	$\leq 60$ dB					
Weight $\pm 2\%$ / Ağırlık		Kg	1.6					

# MODEL : FA80

RATIO / ÇEVİRİM : 15, 20, 25, 30, 35, 40, 50, 70, 100 (2-Stage / Kademe)



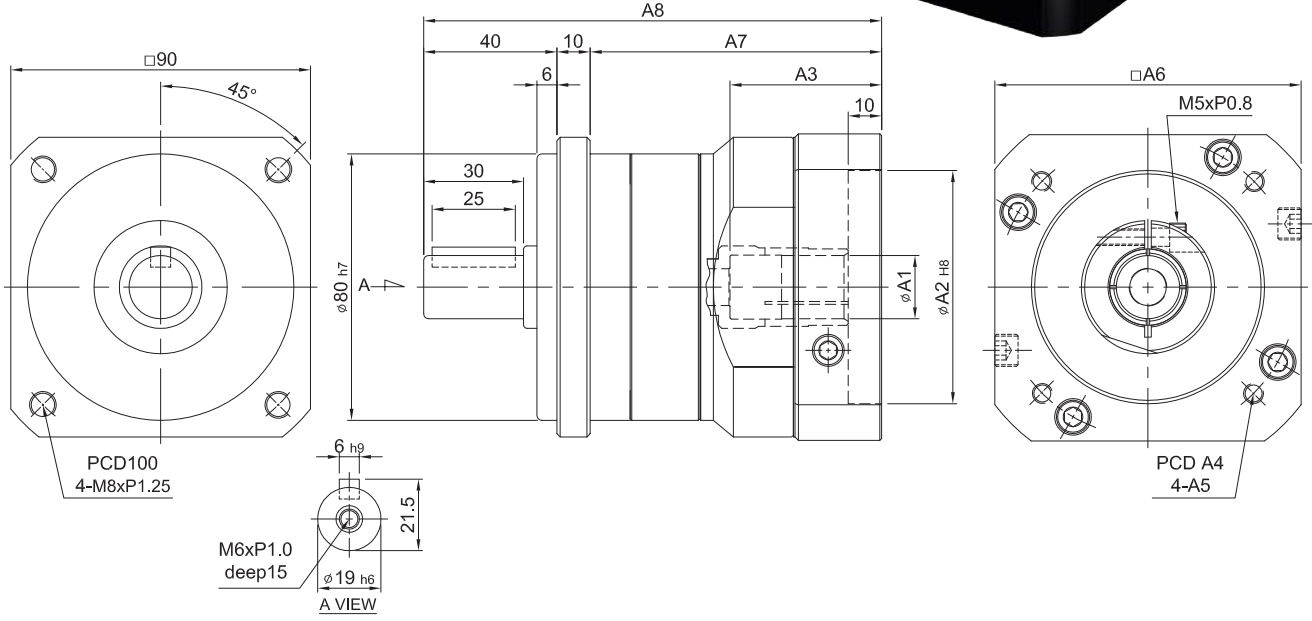
unit / birim : mm

NO.	ØA1	ØA2	A3	A4	A5	A6	A7	A8
1	14 · 19	50	33.5	70	M5	80	99.5	160.5
2		70	45.5	90	M6	92	111.5	172.5
3		80	45.5	100	M6	92	111.5	172.5
4		95	45.5	115	M6	110	111.5	172.5

Ratio / Çevrim		Unit / Birim	15	20	25	30	35	40	50	70	100
Nominal Output Torque / Nominal Çıkış Torku	$T_{2N}$	Nm	112	110	108	112	105	110	108	105	100
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	202	198	194	202	189	198	194	189	180
Mass Moments of Inertia / Atalet Ağırlık Momenti		kg.cm <sup>2</sup>	0.41	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku								
Rated Input Speed / Nominal Giriş Devri	$n_{IN}$	rpm	3,000								
Max. Input Speed / Max. Giriş Devri	$n_{IB}$	rpm	5,000								
Torsional Rigidity / Burulma Direnci		Nm/arcmin	12								
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	1,200								
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	600								
Service Life / Hizmet Ömrü	$L_H$	hr	S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs) S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat)								
Efficiency / Verim	$\eta$	%	$\geq 95\%$								
Operating Temperature / Çalışma Sıcaklığı		°C	-25°C ~ +90°C								
Lubrication / Yağlama			Synthetic Grease / Sentetik Gres								
Protection Class / Koruma Sınıfı			IP 65								
Mounting Position / Montaj Pozisyonu			Any / Her Yönde								
Noise Level / Ses Seviyesi		dB	$\leq 62$ dB								
Weight $\pm 2\%$ / Ağırlık		Kg	2.8								

# MODEL : FA90

RATIO / ÇEVİRİM : 3, 4, 5, 7, 10 (1-Stage / Kademe)



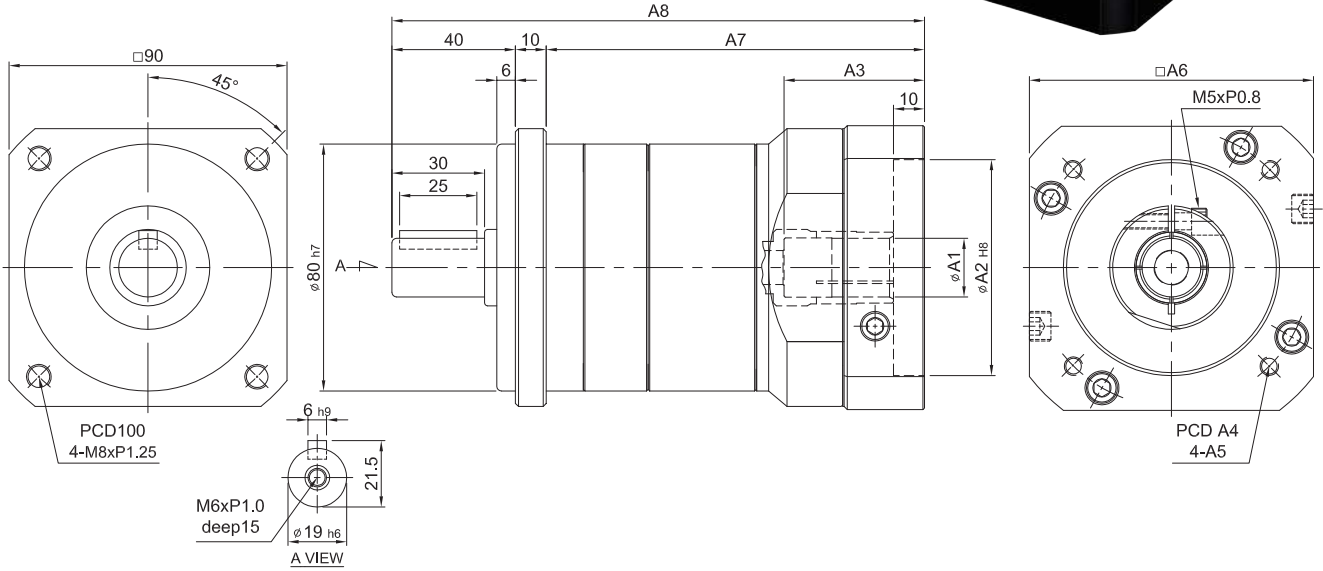
unit / birim : mm

NO.	ØA1	ØA2	A3	A4	A5	A6	A7	A8
1	14 · 19	70	45.5	90	M6	92	87.5	137.5
2		80	45.5	100	M6	92	87.5	137.5
3		95	45.5	115	M6	110	87.5	137.5
4		110	45.5	145	M8	130	87.5	137.5

Ratio / Çevrim		Unit / Birim	3	4	5	7	10	
Nominal Output Torque / Nominal Çıkış Torku	$T_{2N}$	Nm	112	110	108	105	100	
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	202	198	194	189	180	
Mass Moments of Inertia / Atalet Ağırlık Momenti		kg.cm <sup>2</sup>	0.48	0.38	0.38	0.38	0.35	
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku					
Rated Input Speed / Nominal Giriş Devri	$n_{1N}$	rpm	3,000					
Max. Input Speed / Max. Giriş Devri	$n_{1B}$	rpm	5,000					
Torsional Rigidity / Burulma Direnci		Nm/arcmin	12					
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	1,200					
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	600					
Service Life / Hizmet Ömrü	$L_H$	hr	S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs) S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat)					
Efficiency / Verim	$\eta$	%	$\geq 97\%$					
Operating Temperature / Çalışma Sıcaklığı		°C	-25°C ~+90°C					
Lubrication / Yağlama			Synthetic Grease / Sentetik Gres					
Protection Class / Koruma Sınıfı			IP 65					
Mounting Position / Montaj Pozisyonu			Any / Her Yönde					
Noise Level / Ses Seviyesi		dB	$\leq 60$ dB					
Weight $\pm 2\%$ / Ağırlık		Kg	1.96					

# MODEL : FA90

RATIO / ÇEVİRİM : 15, 20, 25, 30, 35, 40, 50, 70, 100 (2-Stage / Kademe)



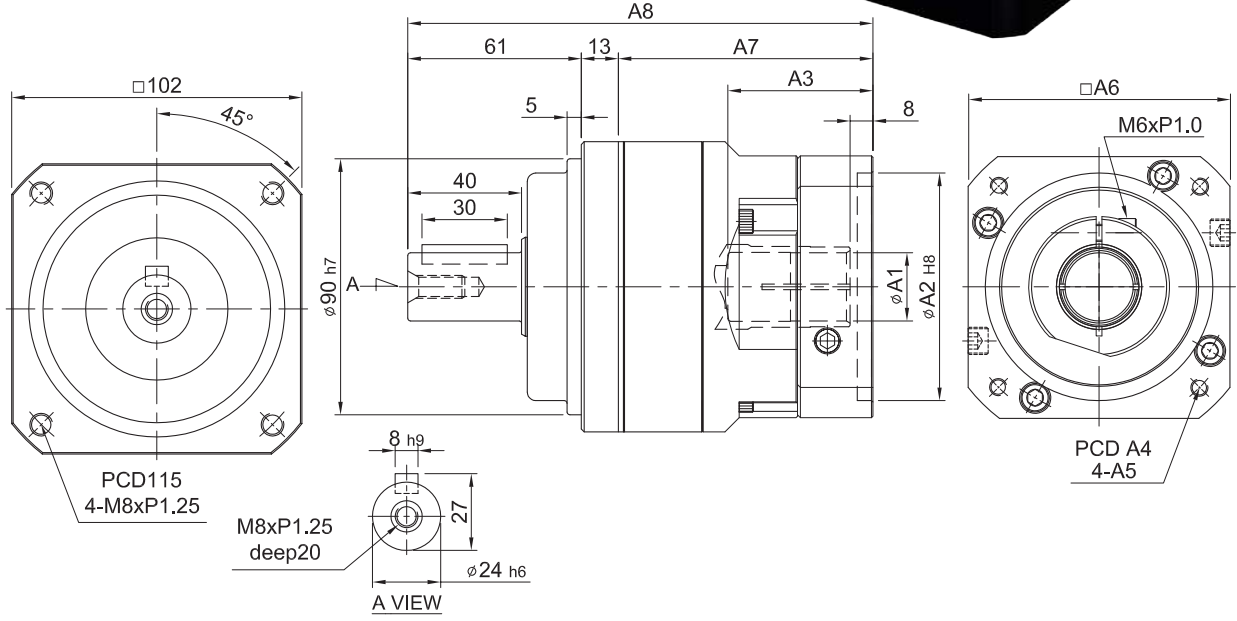
unit / birim : mm

NO.	ØA1	ØA2	A3	A4	A5	A6	A7	A8
1	14 · 19	70	45.5	90	M6	92	122.5	172.5
2		80	45.5	100	M6	92	122.5	172.5
3		95	45.5	115	M6	110	122.5	172.5
4		110	45.5	145	M8	130	122.5	172.5

Ratio / Çevrim		Unit / Birim	15	20	25	30	35	40	50	70	100
Nominal Output Torque / Nominal Çıkış Torku	$T_{2N}$	Nm	112	110	108	112	105	110	108	105	100
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	202	198	194	202	189	198	194	189	180
Mass Moments of Inertia / Atalet Ağırlık Momenti		kg.cm <sup>2</sup>	0.41	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku								
Rated Input Speed / Nominal Giriş Devri	$n_{IN}$	rpm	3,000								
Max. Input Speed / Max. Giriş Devri	$n_{IB}$	rpm	5,000								
Torsional Rigidity / Burulma Direnci		Nm/arcmin	12								
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	1,200								
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	600								
Service Life / Hizmet Ömrü	$L_H$	hr	S5 Cycle Operation: 30,000 (S1 Continuous Operation: 15,000 hrs) S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat)								
Efficiency / Verim	$\eta$	%	$\geq 95\%$								
Operating Temperature / Çalışma Sıcaklığı		°C	-25°C ~+90°C								
Lubrication / Yağlama			Synthetic Grease / Sentetik Gres								
Protection Class / Koruma Sınıfı			IP 65								
Mounting Position / Montaj Pozisyonu			Any / Her Yönde								
Noise Level / Ses Seviyesi		dB	$\leq 62$ dB								
Weight $\pm 2\%$ / Ağırlık		Kg	3.06								

# MODEL : FA100

RATIO / ÇEVİRİM : 3, 4, 5, 7, 10 (1-Stage / Kademe)



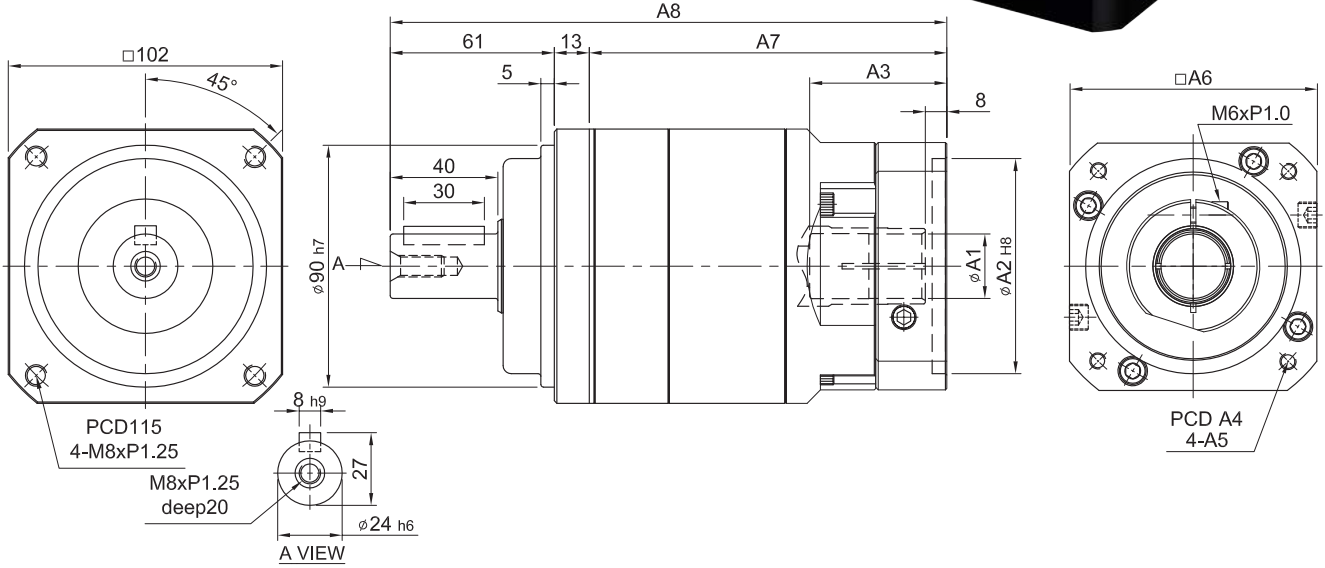
unit / birim : mm

NO.	ØA1	ØA2	A3	A4	A5	A6	A7	A8
1	19 · 22 · 24	70	51	90	M6	92	89.5	163.5
2		80	51	100	M6	92	89.5	163.5
3		95	51	115	M6	110	89.5	163.5
4		95	51	115	M8	110	89.5	163.5
5		110	51	145	M8	130	89.5	163.5
6		110	65.5	145	M8	130	104	178

Ratio / Çevrim		Unit / Birim	3	4	5	7	10
Nominal Output Torque / Nominal Çıkış Torku	$T_{2N}$	Nm	165	146	160	149	141
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	297	263	288	268	254
Mass Moments of Inertia / Atalet Ağırlık Momenti		kg.cm <sup>2</sup>	0.6	0.45	0.45	0.45	0.41
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku				
Rated Input Speed / Nominal Giriş Devri	$n_{IN}$	rpm	3,000				
Max. Input Speed / Max. Giriş Devri	$n_{IB}$	rpm	5,000				
Torsional Rigidity / Burulma Direnci		Nm/arcmin	14				
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	3,200				
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	1,600				
Service Life / Hizmet Ömrü	$L_H$	hr	S5 Cycle Operation: 30,000 (S1 Continuous Operation: 15,000 hrs) S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat)				
Efficiency / Verim	$\eta$	%	$\geq 97\%$				
Operating Temperature / Çalışma Sıcaklığı		°C	-25°C ~ +90°C				
Lubrication / Yağlama			Synthetic Grease / Sentetik Gres				
Protection Class / Koruma Sınıfı			IP 65				
Mounting Position / Montaj Pozisyonu			Any / Her Yönde				
Noise Level / Ses Seviyesi		dB	$\leq 65$ dB				
Weight $\pm 2\%$ / Ağırlık		Kg	3.76				

# MODEL : FA100

RATIO / ÇEVİRİM : 15, 20, 25, 30, 35, 40, 50, 70, 100 (2-Stage / Kademe)



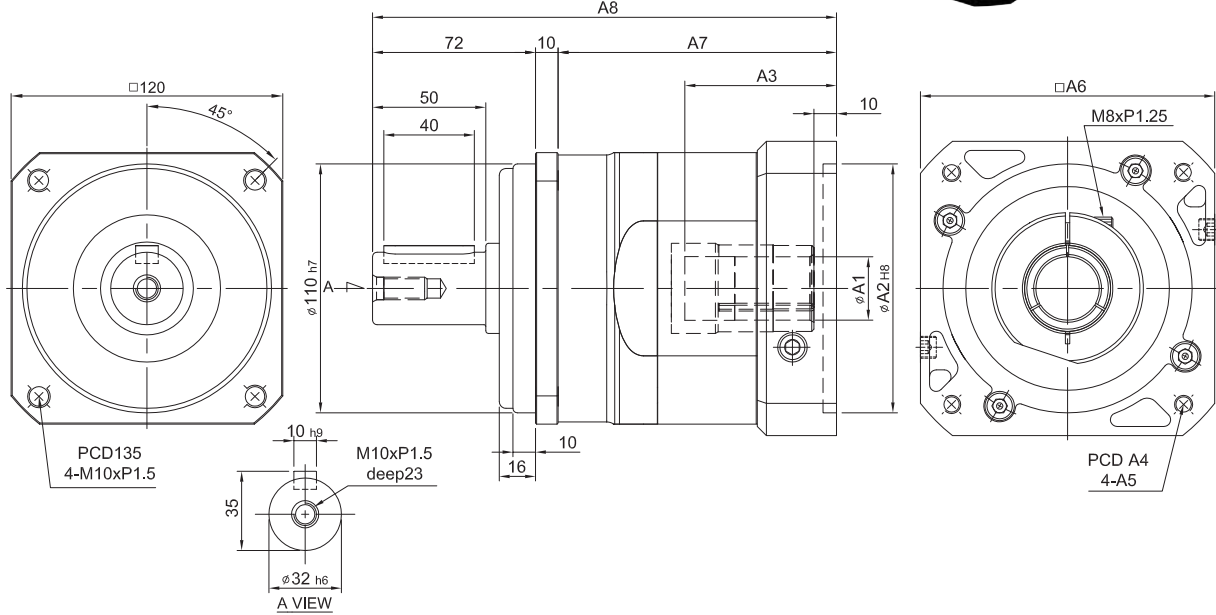
unit / birim : mm

NO.	ØA1	ØA2	A3	A4	A5	A6	A7	A8
1	19 · 22 · 24	70	51	90	M6	92	133	207
2		80	51	100	M6	92	133	207
3		95	51	115	M6	110	133	207
4		95	51	115	M8	110	133	207
5		110	51	145	M8	130	133	207
6		110	65.5	145	M8	130	147.5	221.5

Ratio / Çevrim		Unit / Birim	15	20	25	30	35	40	50	70	100
Nominal Output Torque / Nominal Çıkış Torku	$T_{2N}$	Nm	165	146	160	165	149	146	160	149	141
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	297	263	288	297	268	263	288	268	254
Mass Moments of Inertia / Atalet Ağırlık Momenti		kg.cm <sup>2</sup>	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku								
Rated Input Speed / Nominal Giriş Devri	$n_{IN}$	rpm	3,000								
Max. Input Speed / Max. Giriş Devri	$n_{IB}$	rpm	5,000								
Torsional Rigidity / Burulma Direnci		Nm/arcmin	14								
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	3,200								
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	1,600								
Service Life / Hizmet Ömrü	$L_H$	hr	S5 Cycle Operation: 30,000 (S1 Continuous Operation: 15,000 hrs) S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat)								
Efficiency / Verim	$\eta$	%	$\geq 95\%$								
Operating Temperature / Çalışma Sıcaklığı		°C	-25°C ~+90°C								
Lubrication / Yağlama			Synthetic Grease / Sentetik Gres								
Protection Class / Koruma Sınıfı			IP 65								
Mounting Position / Montaj Pozisyonu			Any / Her Yönde								
Noise Level / Ses Seviyesi		dB	$\leq 67$ dB								
Weight $\pm 2\%$ / Ağırlık		Kg	5.92								

# MODEL : FA120

RATIO / ÇEVİRİM : 3, 4, 5, 7, 10 (1-Stage / Kademe)



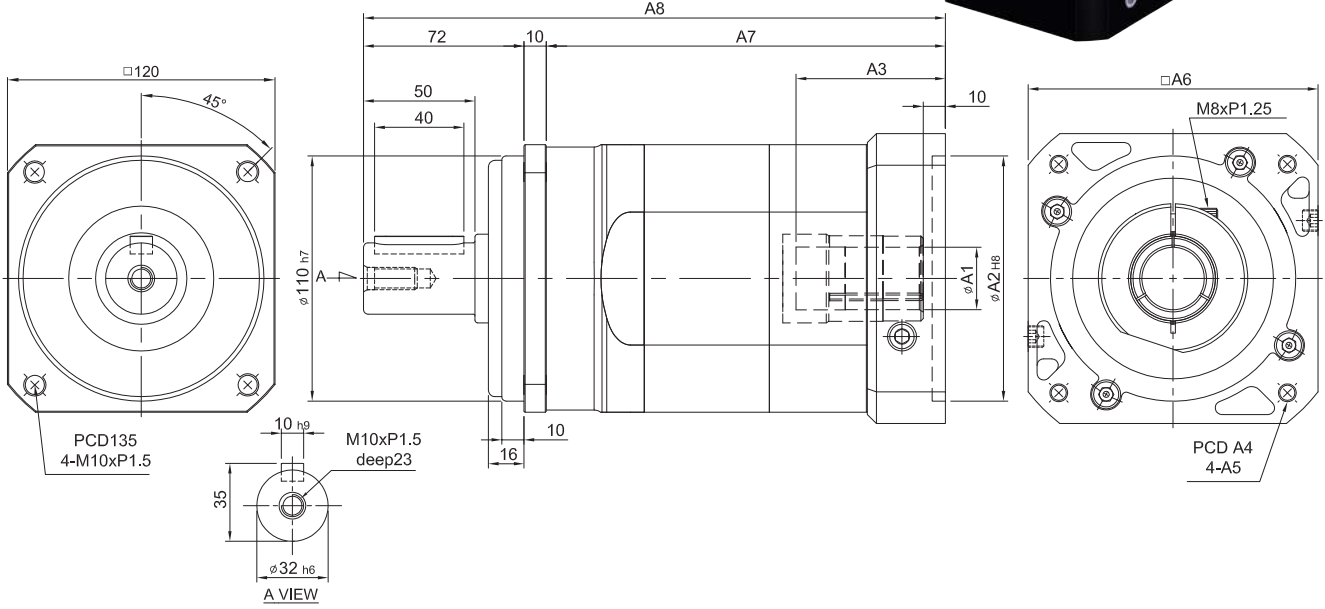
unit / birim : mm

NO.	ØA1	ØA2	A3	A4	A5	A6	A7	A8
1	24 · 28 · 32	95	67	115	M6	122	123	205
2		95	67	115	M8	122	123	205
3		110	67	145	M8	130	123	205
4		110	77	145	M8	130	133	215
5		130	67	165	M10	150	123	205

Ratio / Çevrim	Unit / Birim	3	4	5	7	10	
Nominal Output Torque / Nominal Çıkış Torku	$T_{2N}$	Nm	286	255	264	245	234
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	515	459	475	441	421
Mass Moments of Inertia / Atalet Ağırlık Momenti		kg.cm <sup>2</sup>	3.21	2.64	2.64	2.62	2.51
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku				
Rated Input Speed / Nominal Giriş Devri	$n_{IN}$	rpm	3,000				
Max. Input Speed / Max. Giriş Devri	$n_{IB}$	rpm	5,000				
Torsional Rigidity / Burulma Direnci		Nm/arcmin	23				
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	5,220				
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	2,600				
Service Life / Hizmet Ömrü	$L_H$	hr	S5 Cycle Operation: 30,000 (S1 Continuous Operation: 15,000 hrs) S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat)				
Efficiency / Verim	$\eta$	%	$\geq 97\%$				
Operating Temperature / Çalışma Sıcaklığı		°C	-25°C ~+90°C				
Lubrication / Yağlama			Synthetic Grease / Sentetik Gres				
Protection Class / Koruma Sınıfı			IP 65				
Mounting Position / Montaj Pozisyonu			Any / Her Yönde				
Noise Level / Ses Seviyesi		dB	$\leq 67$ dB				
Weight ±2% / Ağırlık		Kg	7.43				

# MODEL : FA120

RATIO / ÇEVİRİM : 15, 35, 50, 70, 100 (2-Stage / Kademe)



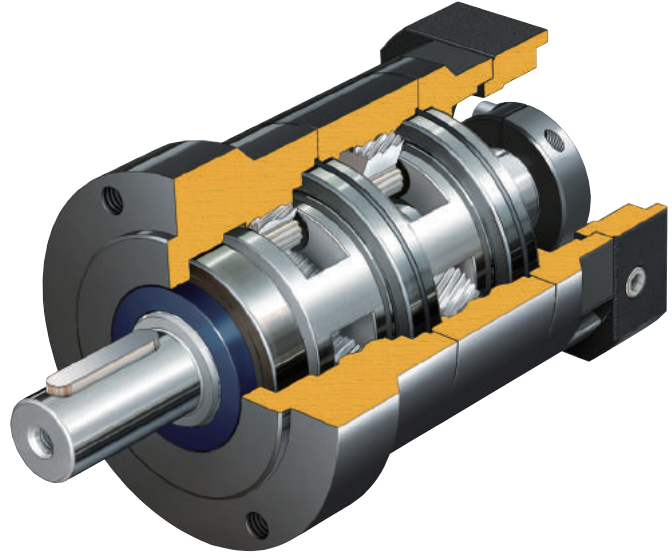
unit / birim : mm

NO.	$\phi A1$	$\phi A2$	A3	A4	A5	A6	A7	A8
1	24 · 28 · 32	95	67	115	M6	122	179	261
2		95	67	115	M8	122	179	261
3		110	67	145	M8	130	179	261
4		110	77	145	M8	130	189	271
5		130	67	165	M10	150	179	261

Ratio / Çevrim		Unit / Birim	15	20	25	30	35	40	50	70	100
Nominal Output Torque / Nominal Çıkış Torku	$T_{2N}$	Nm	286	255	264	286	245	255	264	245	234
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	518	459	475	514	441	459	475	441	421
Mass Moments of Inertia / Atalet Ağırlık Momenti		kg.cm <sup>2</sup>	2.64	2.64	2.64	2.64	2.64	2.64	2.51	2.51	2.51
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku								
Rated Input Speed / Nominal Giriş Devri	$n_{IN}$	rpm	3,000								
Max. Input Speed / Max. Giriş Devri	$n_{IB}$	rpm	5,000								
Torsional Rigidity / Burulma Direnci		Nm/arcmin	23								
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	5,220								
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	2,600								
Service Life / Hizmet Ömrü	$L_H$	hr	S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs) S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat)								
Efficiency / Verim	$\eta$	%	$\geq 95\%$								
Operating Temperature / Çalışma Sıcaklığı		°C	-25°C ~+90°C								
Lubrication / Yağlama			Synthetic Grease / Sentetik Gres								
Protection Class / Koruma Sınıfı			IP 65								
Mounting Position / Montaj Pozisyonu			Any / Her Yönde								
Noise Level / Ses Seviyesi		dB	$\leq 69$ dB								
Weight $\pm 2\%$ / Ağırlık		Kg	10.3								

# SN series / serileri

- 1-Stage Backlash  $\leq 8$  arcmin  
1 Kademe Boşluk Oranı  $\leq 8$  arcmin
- 2-Stage Backlash  $\leq 12$  arcmin  
2 Kademe Boşluk Oranı  $\leq 12$  arcmin



## Indication of Model Numbers / Model Seçimi

SN	80	10		MOTOR
Type	Model	Ratio/Çevrim	Output Shaft / Çıkış Mili	Motor Type
SN	50 60 70 80 115	1-Stage/Kademe 3, 4, 5, 7, 10  2-Stage/Kademe 15, 20, 25, 30, 35, 40, 50, 70, 100	Keyway/Kamalı  No Keyway/Kamasız	Motor Brand & Model No. / Motor Marka & Modeli

### Quiet operation

Grinding spiral bevel gear & Helical gears contribute to reduce vibration and noise.  
Taşlanmış konik dişliler ve helis dişliler titreşimin ve sesin engellenmesini sağlar.

### High Rigidity & High Torque

High rigidity & high torque are achieved by integrant needle roller bearings and one-piece constructed.  
Sağlamlık ve yüksek tork tek parça yapı ve iğneli rulmanlar sayesinde elde edilir.

### High Efficiency

Efficiency for 1-stage model exceeds 95%; 2-stage model exceeds 92%.  
1 kademe için verim %95, 2 kademe için verim %92'dir.

# Features of SN Series / SN Serilerinin Özellikleri



## Helical Gear Design

The speed reduction mechanism employs helical gears, which provides two times meshing rate of teeth when comparing with regular spur gears. In addition, it also features extremely smooth running, low noise, high torque output and low backlash.

Helis dişliler sayesinde düz dişlilere göre 2 kat fazla temas yüzeyi sağlanmaktadır. Bu sayede pürüzsüz hareket, düşük ses, yüksek çıkış torku ve hassasiyet elde edilir.

## High Precision Gear Machining

Manufactured from high quality Ni-Cr-Mo alloy steel (SNCM220), precision achined and carburized to hardness 57-60 HRC. Precision teeth grinding sure gear accuracy reaches DIN6 class.

Yüksek kaliteli Ni-Cr-Mo alaşımlı çelikten (SNCM220) üretilmiştir. Sertlik derecesi 57-60 HRC'dir. Dişli taşlama hassasiyeti DIN6 sınıfındadır.



## Integrated Planetary Arm Bracket

The planetary arm bracket and the output shaft are one-piece constructed to increase torsional rigidity.

Burulma direncini arttırmak amacıyla planet destek kolu ve çıkış mili tek parça olarak üretilmiştir.



## Full Needle Roller Bearings Design

The planetary gear transmission employs full needle roller bearings without retainer to increase the contact surface, which greatly upgrades structural rigidity and service life.

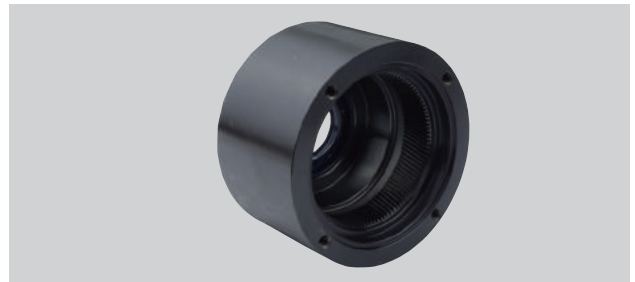
Planet dişlilerde temas yüzeyini arttırmak amacıyla iğneli rulmanlı yataklar kullanılır. Bu sayede yapısal sağlamlık ve hizmet ömrü büyük ölçüde artırılmış olur.



## Collet Locking Mechanism

The input-end and the motor are coupled through a collet locking mechanism. It has passed dynamical balance analysis to assure concentricity and balance on the connection and no backlash for power transmission while running at high speed.

Redüktörün giriş mili ve motorun çıkış mili, kovan kilitleme mekanizmasıyla bağlanır. Bu sayede yüksek hızlarda hassas merkezleme ve bağlantı dengesi sağlanıp, güç iletimi esnasında boşluk engellenmiş olur.



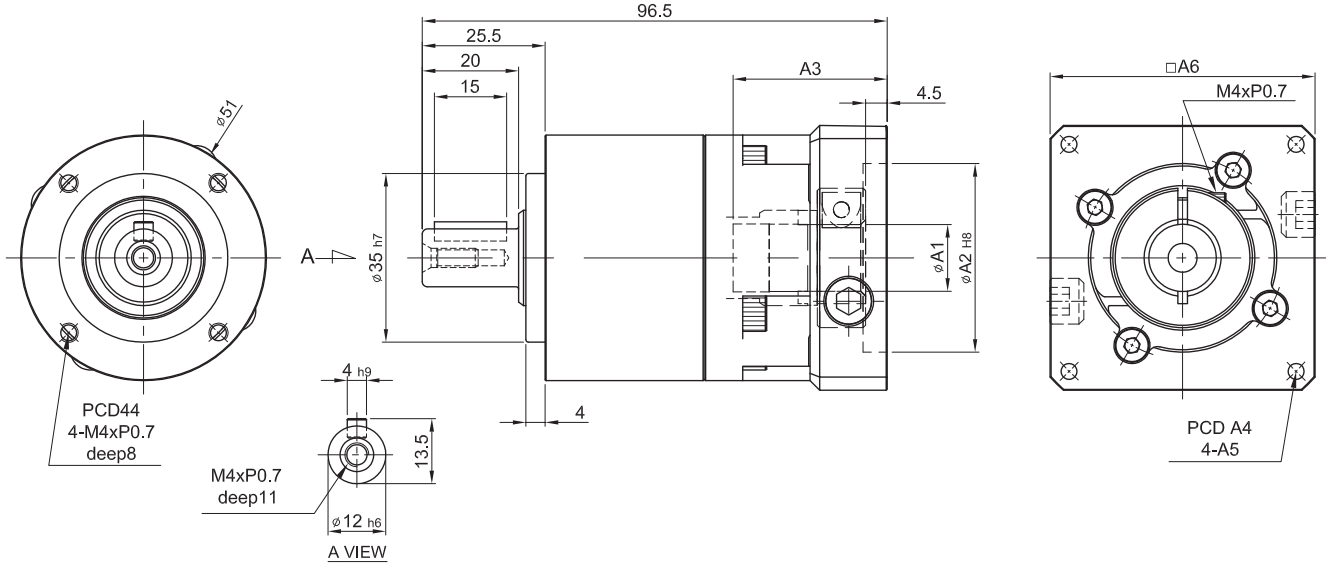
## One-piece Gear Box & Advanced Surface Treatment

The gear box and internal ring gear are one-piece constructed to achieve high rigidity and high torque.

Sağlamlık ve torkun artırılması için dişli kutusu ve gövde üzerindeki dişliler tek parça olarak işlenmiştir.

# MODEL : SN50

RATIO / ÇEVİRİM : 3, 4, 5, 7, 10 (1-Stage / Kademe)



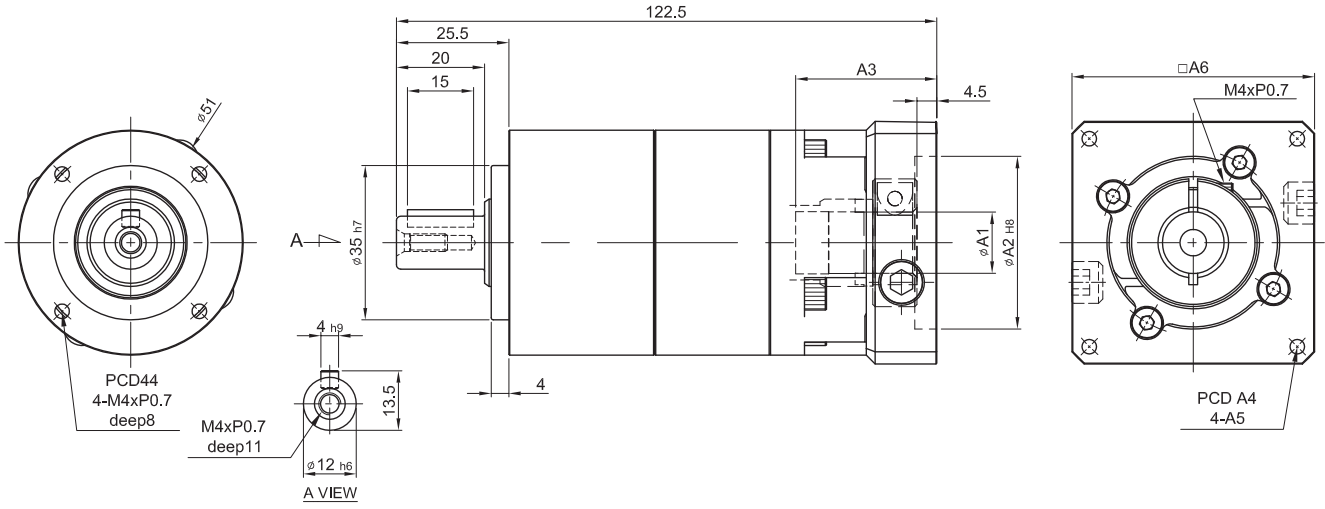
unit / birim: mm

NO.	ØA1	ØA2	A3	A4	A5	A6
1	8 · 10 · 11 · 14	30	32	45	M3	46
2		30	32	46	M4	46
3		30	32	48.5	M3	55
4		40	32	63	M5	55
5		50	32	70	M5	60

Ratio / Çevrim		Unit / Birim	3	4	5	7	10
Nominal Output Torque / Nominal Çıkış Torku	$T_{2N}$	Nm	17	15	14	13	12
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	31	27	25	23	22
Mass Moments of Inertia / Aalet Ağırlık Momenti		kg.cm <sup>2</sup>	0.03	0.03	0.03	0.03	0.03
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku				
Rated Input Speed / Nominal Giriş Devri	$n_{IN}$	rpm	3,000				
Max. Input Speed / Max. Giriş Devri	$n_{1B}$	rpm	5,000				
Torsional Rigidity / Burulma Direnci		Nm/arcmin	3				
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	320				
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	160				
Service Life / Hizmet Ömrü	$L_H$	hr	S5 Cycle Operation: 30,000 (S1 Continuous Operation: 15,000 hrs) S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat)				
Efficiency / Verim	$\eta$	%	$\geq 97\%$				
Operating Temperature / Çalışma Sıcaklığı		°C	-25°C ~ +90°C				
Lubrication / Yağlama			Synthetic Grease / Sentetik Gres				
Protection Class / Koruma Sınıfı			IP 65				
Mounting Position / Montaj Pozisyonu			Any / Her Yönde				
Noise Level / Ses Seviyesi		dB	$\leq 58$ dB				
Weight $\pm 2\%$ / Ağırlık		Kg	0.73				

# MODEL : SN50

RATIO / ÇEVİRİM : 15, 20, 25, 30, 35, 40, 50, 70, 100 (2-Stage / Kademe)



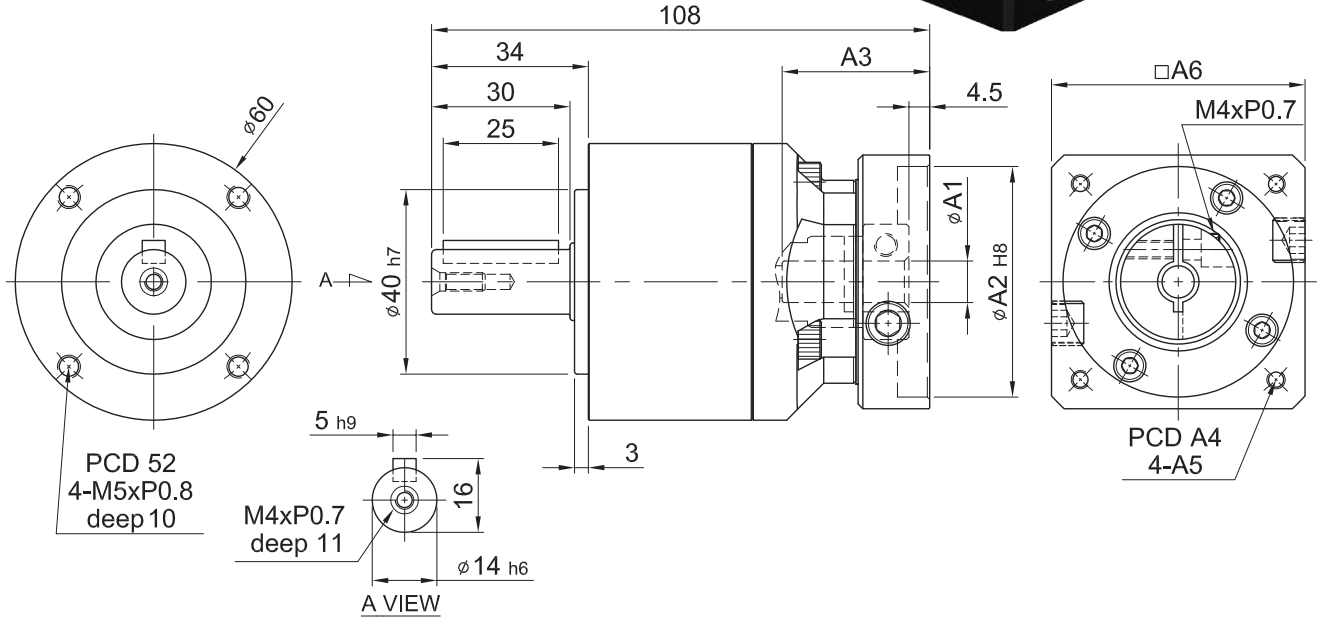
unit / birim : mm

NO.	ØA1	ØA2	A3	A4	A5	A6
1	8 · 10 · 11 · 14	30	32	45	M3	46
2		30	32	46	M4	46
3		30	32	48.5	M3	55
4		40	32	63	M5	55
5		50	32	70	M5	60

Ratio / Çevrim		Unit / Birim	15	20	25	30	35	40	50	70	100
Nominal Output Torque / Nominal Çıkış Torku	$T_{2N}$	Nm	17	15	14	13	13	12	14	13	12
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	31	27	25	23	23	22	25	23	22
Mass Moments of Inertia / Atalet Ağırlık Momenti		kg.cm <sup>2</sup>	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku								
Rated Input Speed / Nominal Giriş Devri	$n_{IN}$	rpm	3,000								
Max. Input Speed / Max. Giriş Devri	$n_{IB}$	rpm	5,000								
Torsional Rigidity / Burulma Direnci		Nm/arcmin	3								
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	320								
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	160								
Service Life / Hizmet Ömrü	$L_H$	hr	S5 Cycle Operation: 30,000 (S1 Continuous Operation: 15,000 hrs) S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat)								
Efficiency / Verim	$\eta$	%	$\geq 95\%$								
Operating Temperature / Çalışma Sıcaklığı		°C	-25°C ~+90°C								
Lubrication / Yağlama			Synthetic Grease / Sentetik Gres								
Protection Class / Koruma Sınıfı			IP 65								
Mounting Position / Montaj Pozisyonu			Any / Her Yönde								
Noise Level / Ses Seviyesi		dB	$\leq 60$ dB								
Weight $\pm 2\%$ / Ağırlık		Kg	1.05								

# MODEL : SN60

RATIO / ÇEVİRİM : 3, 4, 5, 7, 10 (1-Stage / Kademe)



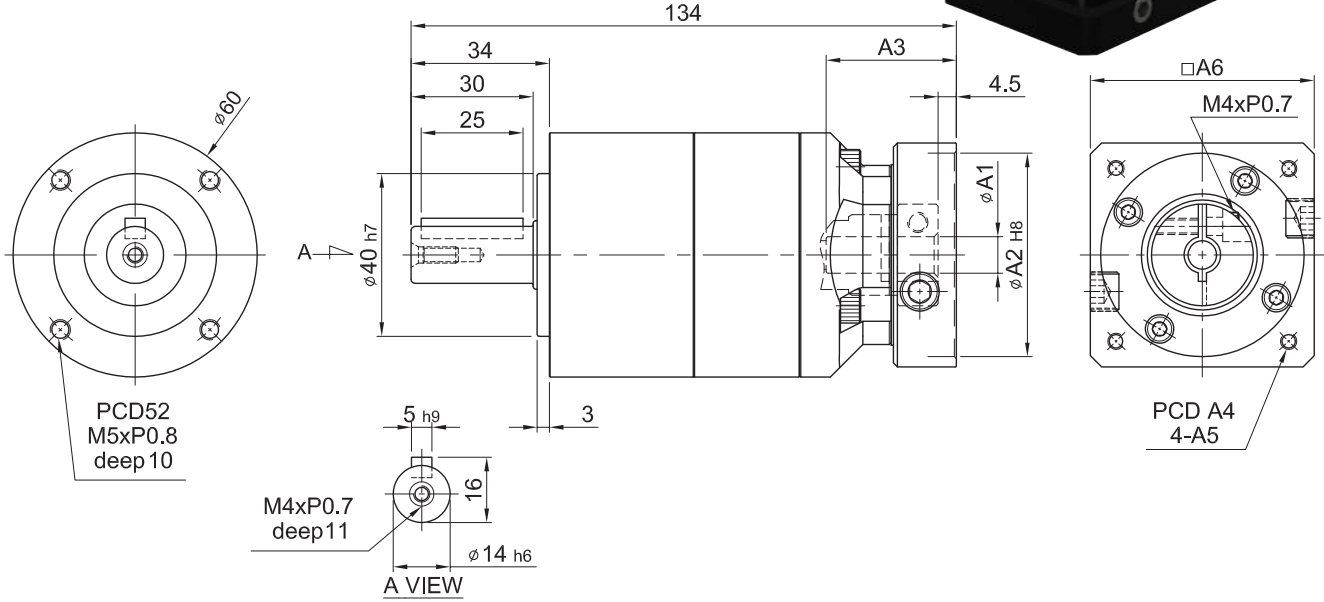
unit / birim : mm

NO.	ØA1	ØA2	A3	A4	A5	A6
1		30	32	45	M3	46
2		30	32	46	M4	46
3	8 · 9 · 10 · 12.7 · 14	30	32	48.5	M3	55
4		40	32	63	M5	55
5		50	32	70	M5	60

Ratio / Çevrim		Unit / Birim	3	4	5	7	10
Nominal Output Torque / Nominal Çıkış Torku	$T_{2N}$	Nm	28	38	40	35	25
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	50	68	72	63	45
Mass Moments of Inertia / Atalet Ağırlık Momenti		kg.cm <sup>2</sup>	0.06	0.06	0.06	0.06	0.06
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku				
Rated Input Speed / Nominal Giriş Devri	$n_{IN}$	rpm	3,000				
Max. Input Speed / Max. Giriş Devri	$n_{IB}$	rpm	5,000				
Torsional Rigidity / Burulma Direnci		Nm/arcmin	4				
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	460				
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	230				
Service Life / Hizmet Ömrü	$L_H$	hr	S5 Cycle Operation: 30,000 (S1 Continuous Operation: 15,000 hrs) S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat)				
Efficiency / Verim	$\eta$	%	$\geq 97\%$				
Operating Temperature / Çalışma Sıcaklığı		°C	-25°C ~+90°C				
Lubrication / Yağlama			Synthetic Grease / Sentetik Gres				
Protection Class / Koruma Sınıfı			IP 65				
Mounting Position / Montaj Pozisyonu			Any / Her Yönde				
Noise Level / Ses Seviyesi		dB	$\leq 58$ dB				
Weight $\pm 2\%$ / Ağırlık		Kg	0.99				

# MODEL : SN60

RATIO / ÇEVİRİM : 15, 20, 25, 30, 35, 40, 50, 70, 100 (2-Stage / Kademe)



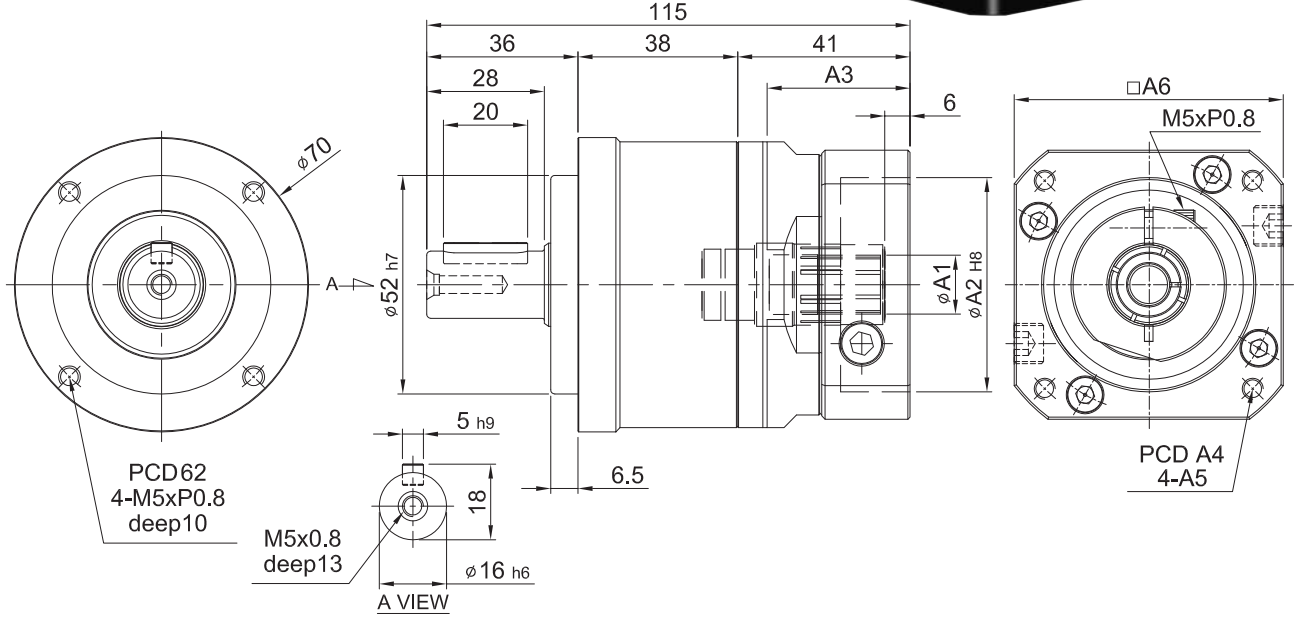
unit / birim : mm

NO.	ØA1	ØA2	A3	A4	A5	A6
1		30	32	45	M3	46
2		30	32	46	M4	46
3	8 · 9 · 10 · 12.7 · 14	30	32	48.5	M3	55
4		40	32	63	M5	55
5		50	32	70	M5	60

Ratio / Çevrim		Unit / Birim	15	20	25	30	35	40	50	70	100
Nominal Output Torque / Nominal Çıkış Torku	$T_{2N}$	Nm	28	38	40	28	35	38	40	35	25
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	50	68	72	50	63	68	72	63	45
Mass Moments of Inertia / Atalet Ağırlık Momenti		kg.cm <sup>2</sup>	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku								
Rated Input Speed / Nominal Giriş Devri	$n_{IN}$	rpm	3,000								
Max. Input Speed / Max. Giriş Devri	$n_{IB}$	rpm	5,000								
Torsional Rigidity / Burulma Direnci		Nm/arcmin	4								
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	460								
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	230								
Service Life / Hizmet Ömrü	$L_H$	hr	S5 Cycle Operation: 30,000 (S1 Continuous Operation: 15,000 hrs) S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat)								
Efficiency / Verim	$\eta$	%	$\geq 95\%$								
Operating Temperature / Çalışma Sıcaklığı		°C	-25°C ~ +90°C								
Lubrication / Yağlama			Synthetic Grease / Sentetik Gres								
Protection Class / Koruma Sınıfı			IP 65								
Mounting Position / Montaj Pozisyonu			Any / Her Yönde								
Noise Level / Ses Seviyesi		dB	$\leq 60$ dB								
Weight $\pm 2\%$ / Ağırlık		Kg	1.46								

# MODEL : SN70

RATIO / ÇEVİRİM : 3, 4, 5, 7, 10 (1-Stage / Kademe)



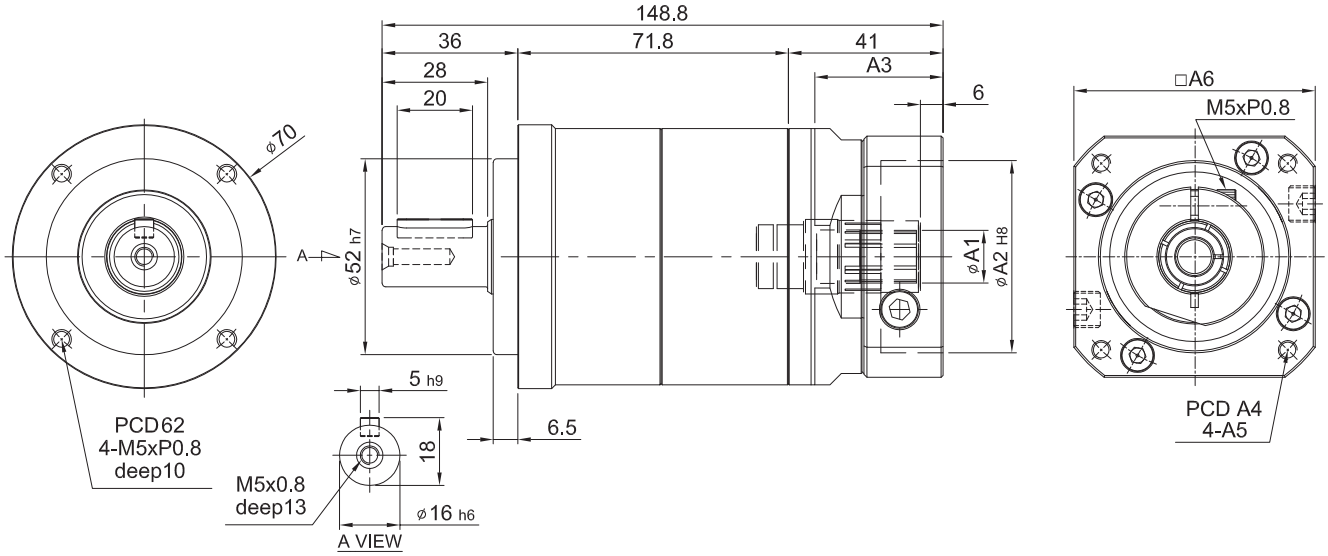
unit / birim : mm

NO.	ØA1	ØA2	A3	A4	A5	A6
1		50	33.5	70	5	70
2	14 - 19	60	33.5	75	6	75
3		70	33.5	90	6	80

Ratio / Çevrim		Unit / Birim	3	4	5	7	10
Nominal Output Torque / Nominal Çıkış Torku	$T_{2N}$	Nm	54	48	45	41	40
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	97	86	81	74	72
Mass Moments of Inertia / Atalet Ağırlık Momenti		kg.cm <sup>2</sup>	0.15	0.15	0.13	0.13	0.13
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku				
Rated Input Speed / Nominal Giriş Devri	$n_{1N}$	rpm	3,000				
Max. Input Speed / Max. Giriş Devri	$n_{1B}$	rpm	5,000				
Torsional Rigidity / Burulma Direnci		Nm/arcmin	5				
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	800				
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	400				
Service Life / Hizmet Ömrü	$L_H$	hr	S5 Cycle Operation: 30,000 (S1 Continuous Operation: 15,000 hrs) S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat)				
Efficiency / Verim	$\eta$	%	$\geq 97\%$				
Operating Temperature / Çalışma Sıcaklığı		°C	-25°C ~+90°C				
Lubrication / Yağlama			Synthetic Grease / Sentetik Gres				
Protection Class / Koruma Sınıfı			IP 65				
Mounting Position / Montaj Pozisyonu			Any / Her Yönde				
Noise Level / Ses Seviyesi		dB	$\leq 58$ dB				
Weight $\pm 2\%$ / Ağırlık		Kg	1.25				

# MODEL : SN70

RATIO / ÇEVİRİM : 15, 20, 25, 30, 35, 40, 50, 70, 100 (2-Stage / Kademe)



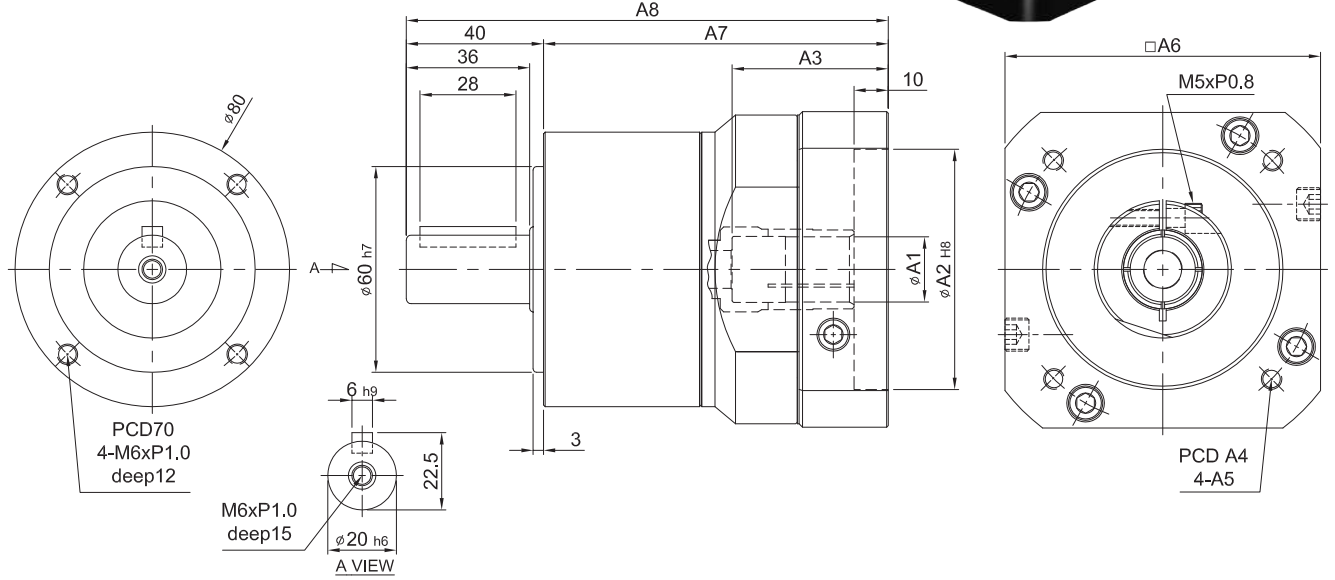
unit / birim : mm

NO.	ØA1	ØA2	A3	A4	A5	A6
1	14 · 19	50	33.5	70	5	70
2		60	33.5	75	6	75
3		70	33.5	90	6	80

Ratio / Çevrim		Unit / Birim	15	20	25	30	35	40	50	70	100
Nominal Output Torque / Nominal Çıkış Torku	$T_{2N}$	Nm	54	48	45	41	41	39	45	41	40
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	97	86	81	74	74	70	81	74	72
Mass Moments of Inertia / Aalet Ağırlık Momenti		kg.cm <sup>2</sup>	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku								
Rated Input Speed / Nominal Giriş Devri	$n_{IN}$	rpm	3,000								
Max. Input Speed / Max. Giriş Devri	$n_{IB}$	rpm	5,000								
Torsional Rigidity / Burulma Direnci		Nm/arcmin	5								
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	800								
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	400								
Service Life / Hizmet Ömrü	$L_H$	hr	S5 Cycle Operation: 30,000 (S1 Continuous Operation: 15,000 hrs) S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat)								
Efficiency / Verim	$\eta$	%	$\geq 95\%$								
Operating Temperature / Çalışma Sıcaklığı		°C	-25°C ~ +90°C								
Lubrication / Yağlama			Synthetic Grease / Sentetik Gres								
Protection Class / Koruma Sınıfı			IP 65								
Mounting Position / Montaj Pozisyonu			Any / Her Yönde								
Noise Level / Ses Seviyesi		dB	$\leq 60$ dB								
Weight $\pm 2\%$ / Ağırlık		Kg	1.9								

# MODEL : SN80

RATIO / ÇEVİRİM : 3, 4, 5, 7, 10 (1-Stage / Kademe)



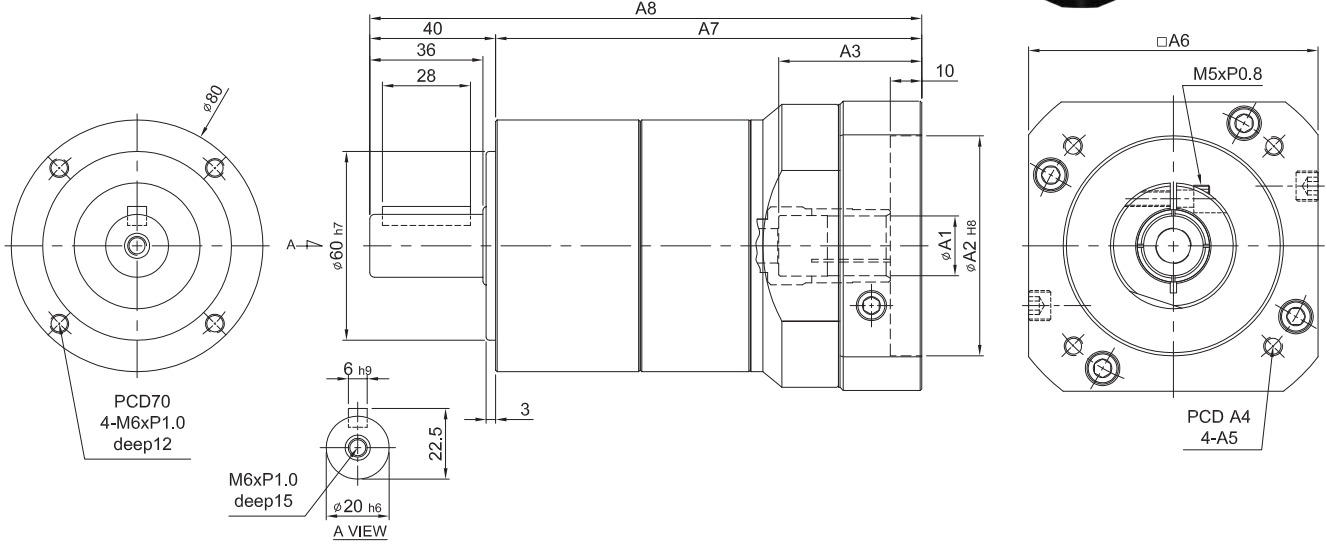
unit / birim : mm

NO.	ØA1	ØA2	A3	A4	A5	A6	A7	A8
1	14 · 19	70	45.5	90	M6	92	100.5	140.5
2		80	45.5	100	M6	92	100.5	140.5
3		95	45.5	115	M6	110	100.5	140.5
4		110	45.5	145	M8	130	100.5	140.5

Ratio / Çevrim		Unit / Birim	3	4	5	7	10	
Nominal Output Torque / Nominal Çıkış Torku	$T_{2N}$	Nm	112	110	108	105	100	
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	202	198	194	189	180	
Mass Moments of Inertia / Atalet Ağırlık Momenti		kg.cm <sup>2</sup>	0.48	0.38	0.38	0.38	0.35	
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku					
Rated Input Speed / Nominal Giriş Devri	$n_{1N}$	rpm	3,000					
Max. Input Speed / Max. Giriş Devri	$n_{1B}$	rpm	5,000					
Torsional Rigidity / Burulma Direnci		Nm/arcmin	12					
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	1,300					
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	660					
Service Life / Hizmet Ömrü	$L_H$	hr	S5 Cycle Operation: 30,000 (S1 Continuous Operation: 15,000 hrs) S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat)					
Efficiency / Verim	$\eta$	%	$\geq 97\%$					
Operating Temperature / Çalışma Sıcaklığı		°C	-25°C ~+90°C					
Lubrication / Yağlama			Synthetic Grease / Sentetik Gres					
Protection Class / Koruma Sınıfı			IP 65					
Mounting Position / Montaj Pozisyonu			Any / Her Yönde					
Noise Level / Ses Seviyesi		dB	$\leq 60$ dB					
Weight $\pm 2\%$ / Ağırlık		Kg	2.1					

# MODEL : SN80

RATIO / ÇEVİRİM : 15, 20, 25, 30, 35, 40, 50, 70, 100 (2-Stage / Kademe)



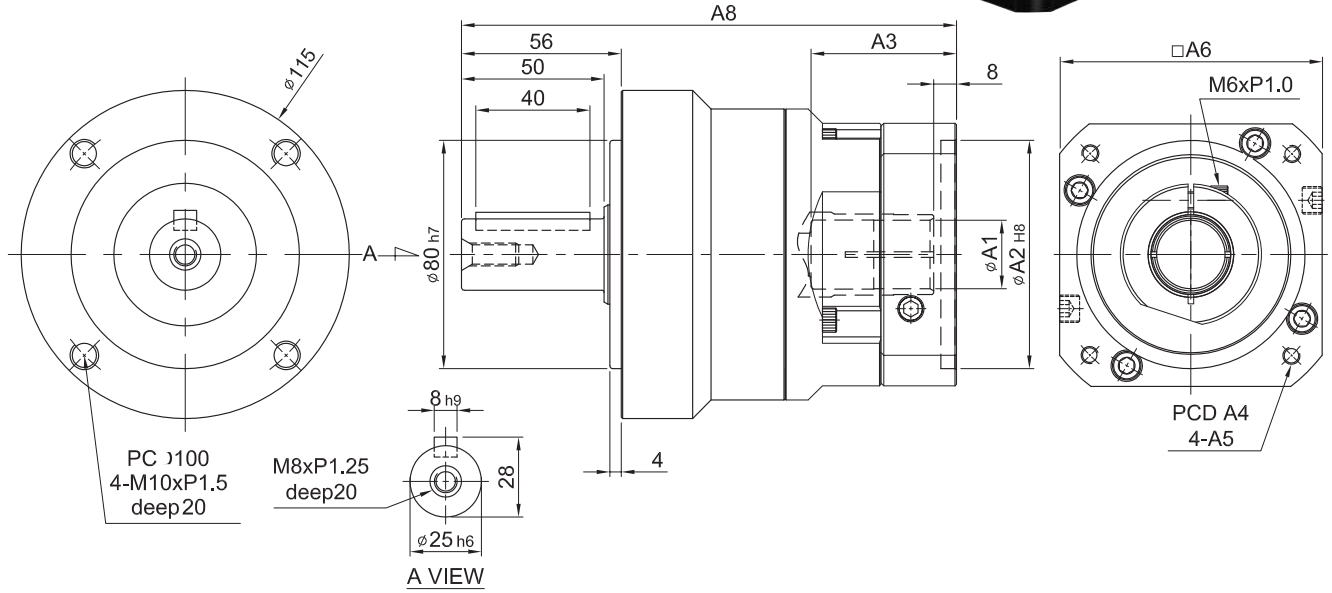
unit / birim : mm

NO.	ØA1	ØA2	A3	A4	A5	A6	A7	A8
1	14 · 19	70	45.5	90	M6	92	135.5	175.5
2		80	45.5	100	M6	92	135.5	175.5
3		95	45.5	115	M6	110	135.5	175.5
4		110	45.5	145	M8	130	135.5	175.5

Ratio / Çevrim		Unit / Birim	15	20	25	30	35	40	50	70	100
Nominal Output Torque / Nominal Çıkış Torku	$T_{2N}$	Nm	112	110	108	112	105	110	108	105	100
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	202	198	194	202	189	198	194	189	180
Mass Moments of Inertia / Aalet Ağırlık Momenti		kg.cm <sup>2</sup>	0.41	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku								
Rated Input Speed / Nominal Giriş Devri	$n_{IN}$	rpm	3,000								
Max. Input Speed / Max. Giriş Devri	$n_{IB}$	rpm	5,000								
Torsional Rigidity / Burulma Direnci		Nm/arcmin	12								
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	1,300								
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	660								
Service Life / Hizmet Ömrü	$L_H$	hr	S5 Cycle Operation: 30,000 (S1 Continuous Operation: 15,000 hrs) S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat)								
Efficiency / Verim	$\eta$	%	$\geq 95\%$								
Operating Temperature / Çalışma Sıcaklığı		°C	-25°C ~ +90°C								
Lubrication / Yağlama			Synthetic Grease / Sentetik Gres								
Protection Class / Koruma Sınıfı			IP 65								
Mounting Position / Montaj Pozisyonu			Any / Her Yönde								
Noise Level / Ses Seviyesi		dB	$\leq 62$ dB								
Weight $\pm 2\%$ / Ağırlık		Kg	3.2								

# MODEL : SN115

RATIO / ÇEVİRİM : 3, 4, 5, 7, 10 (1-Stage / Kademe)



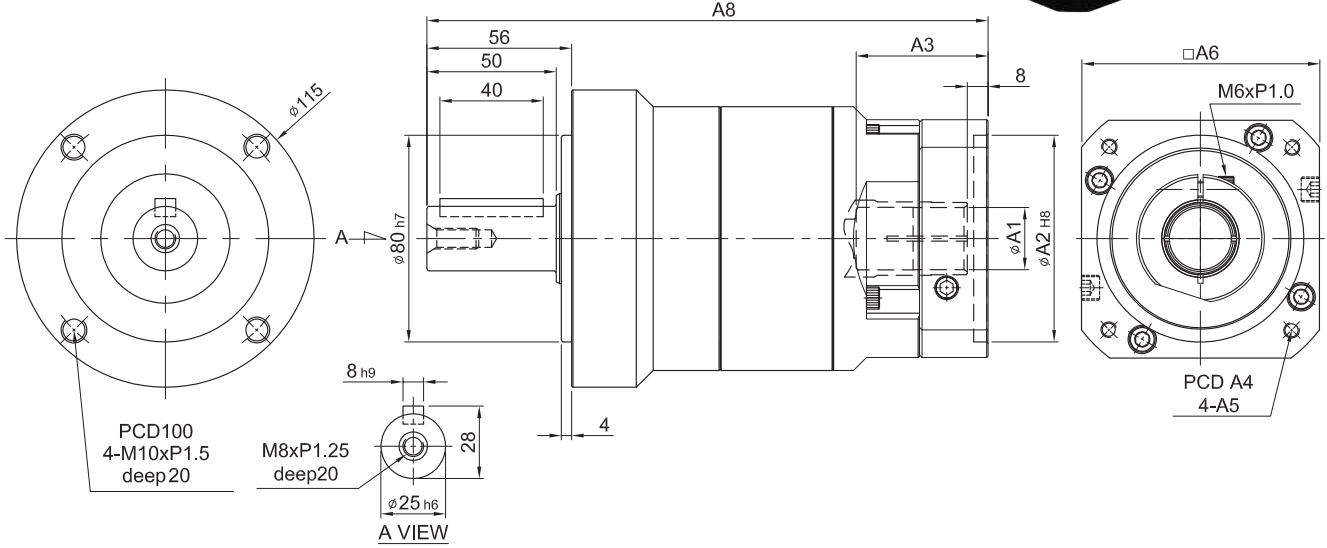
unit / birim : mm

NO.	ØA1	ØA2	A3	A4	A5	A6	A7	A8
1	19 · 22 · 24	70	51	90	M6	92	60	173.5
2		80	51	100	M6	92	60	173.5
3		95	51	115	M6	110	60	173.5
4		95	51	115	M8	110	60	173.5
5		110	51	145	M8	130	60	173.5
6		110	65.5	145	M8	130	74.5	188

Ratio / Çevrim	Unit / Birim	3	4	5	7	10	
Nominal Output Torque / Nominal Çıkış Torku	$T_{2N}$	Nm	165	146	160	149	141
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	297	263	288	268	254
Mass Moments of Inertia / Atalet Ağırlık Momenti		kg.cm <sup>2</sup>	0.6	0.45	0.45	0.45	0.41
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku				
Rated Input Speed / Nominal Giriş Devri	$n_{1N}$	rpm	3,000				
Max. Input Speed / Max. Giriş Devri	$n_{1B}$	rpm	5,000				
Torsional Rigidity / Burulma Direnci		Nm/arcmin	14				
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	3,200				
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	1,600				
Service Life / Hizmet Ömrü	$L_{H1}$	hr	S5 Cycle Operation: 30,000 (S1 Continuous Operation: 15,000 hrs) S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat)				
Efficiency / Verim	$\eta$	%	$\geq 97\%$				
Operating Temperature / Çalışma Sıcaklığı		°C	-25°C ~+90°C				
Lubrication / Yağlama			Synthetic Grease / Sentetik Gres				
Protection Class / Koruma Sınıfı			IP 65				
Mounting Position / Montaj Pozisyonu			Any / Her Yönde				
Noise Level / Ses Seviyesi		dB	$\leq 65$ dB				
Weight $\pm 2\%$ / Ağırlık		Kg	4.98				

# MODEL : SN115

RATIO / ÇEVİRİM : 15, 20, 25, 30, 35, 40, 50, 70, 100 (2-Stage / Kademe)



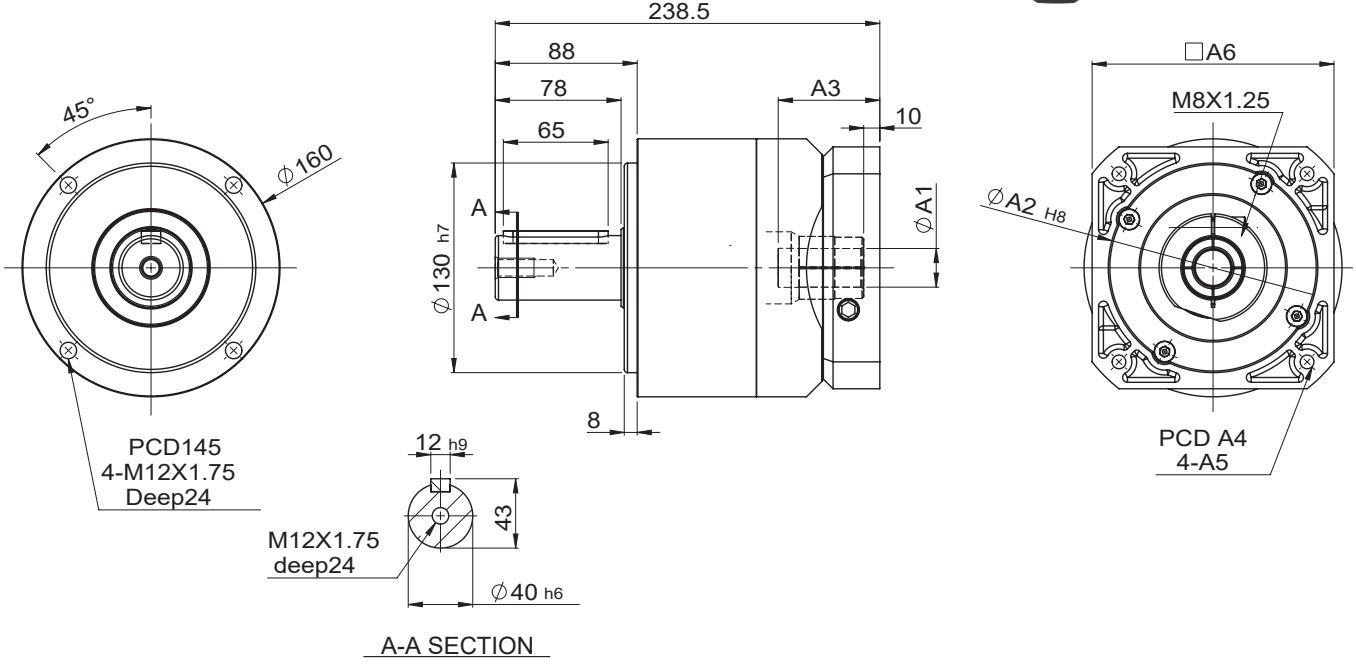
unit / birim : mm

NO.	ØA1	ØA2	A3	A4	A5	A6	A7	A8
1	19 · 22 · 24	70	51	90	M6	92	103.5	217
2		80	51	100	M6	92	103.5	217
3		95	51	115	M6	110	103.5	217
4		95	51	115	M8	110	103.5	217
5		110	51	145	M8	130	103.5	217
6		110	65.5	145	M8	130	118	231.5

Ratio / Çevrim		Unit / Birim	15	20	25	30	35	40	50	70	100
Nominal Output Torque / Nominal Çıkış Torku	$T_{2N}$	Nm	165	146	160	165	149	146	160	149	141
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	297	263	288	297	268	263	288	268	254
Mass Moments of Inertia / Atalet Ağırlık Momenti		kg.cm <sup>2</sup>	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku								
Rated Input Speed / Nominal Giriş Devri	$n_{IN}$	rpm	3,000								
Max. Input Speed / Max. Giriş Devri	$n_{IB}$	rpm	5,000								
Torsional Rigidity / Burulma Direnci		Nm/arcmin	14								
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	3,200								
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	1,600								
Service Life / Hizmet Ömrü	$L_H$	hr	S5 Cycle Operation: 30,000 (S1 Continuous Operation: 15,000 hrs) S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat)								
Efficiency / Verim	$\eta$	%	≥ 95%								
Operating Temperature / Çalışma Sıcaklığı		°C	-25°C ~+90°C								
Lubrication / Yağlama			Synthetic Grease / Sentetik Gres								
Protection Class / Koruma Sınıfı			IP 65								
Mounting Position / Montaj Pozisyonu			Any / Her Yönde								
Noise Level / Ses Seviyesi		dB	≤ 67 dB								
Weight ±2% / Ağırlık		Kg	6.92								

# MODEL : SN160

RATIO / ÇEVİRİM : 3, 4, 5, 6, 7, 8, 9, 10 (1-Stage / Kademe)



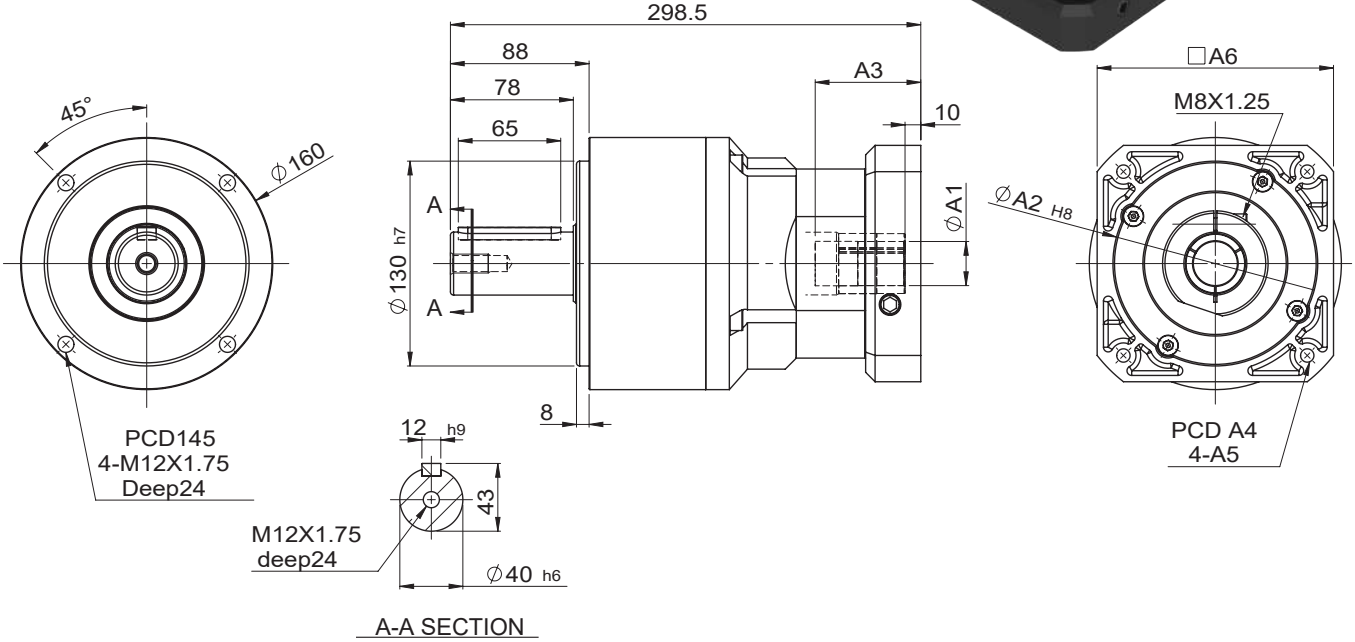
unit / birim : mm

NO.	ØA1	ØA2	A3	A4	A5	A6
1	24 · 28 · 32	130	63	165	M10	150

Ratio / Çevrim		Unit / Birim	3	4	5	6	7	8	9	10
Nominal Output Torque / Nominal Çıkış Torku	$T_{2N}$	Nm	625	555	618	583	573	553	516	549
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	1.8 Times of Rated Output Torque / 1,8 x Nominal Çıkış Torku							
Mass Moments of Inertia / Atalet Ağırlık Momenti		kg.cm <sup>2</sup>	9.21	7.54	7.42	7.25	7.14	7.07	7.04	7.03
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku							
Rated Input Speed / Nominal Giriş Devri	$n_{1N}$	rpm	3,000							
Max. Input Speed / Max. Giriş Devri	$n_{1B}$	rpm	5,000							
Torsional Rigidity / Burulma Direnci		Nm/arcmin	60							
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	9,300							
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	4,650							
Service Life / Hizmet Ömrü	$L_{H1}$	hr	S5 Cycle Operation: 30,000 (S1 Continuous Operation: 15,000 hrs) S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat)							
Efficiency / Verim	$\eta$	%	$\geq 97\%$							
Operating Temperature / Çalışma Sıcaklığı		°C	- 25 °C ~ + 90°C							
Lubrication / Yağlama			Synthetic Grease / Sentetik Gres							
Protection Class / Koruma Sınıfı			IP 65							
Mounting Position / Montaj Pozisyonu			Any / Her Yönde							
Noise Level / Ses Seviyesi		dB	$\leq 65$ dB							
Weight $\pm 2\%$ / Ağırlık		Kg								

# MODEL : SN160

RATIO / ÇEVİRİM : 15, 20, 25, 30, 35, 40, 50, 70, 100 (2-Stage / Kademe)

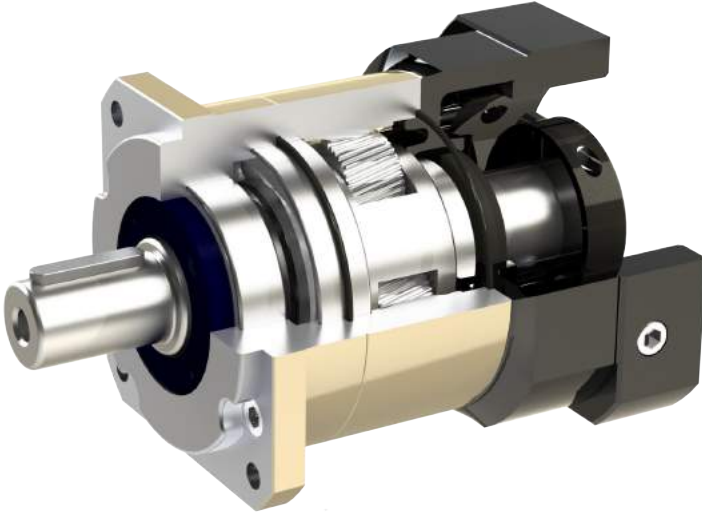


unit / birim : mm

NO.	ØA1	ØA2	A3	A4	A5	A6
1	24 · 28 · 32	95	67	115	M6	122
2		110	67	145	M8	130
3		130	67	165	M10	150


Ratio / Çevrim		Unit / Birim	15	20	25	30	35	40	50	60	70	80	90	100
Nominal Output Torque / Nominal Çıkış Torku	$T_{2N}$	Nm	625	555	618	583	573	553	618	583	573	553	516	549
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	1.8 Times of Rated Output Torque / 1,8 x Nominal Çıkış Torku											
Mass Moments of Inertia / Atalet Ağırlık Momenti		kg.cm <sup>2</sup>	2.63	2.63	2.63	2.43	2.43	2.43	2.43	2.39	2.39	2.39	2.39	2.39
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku											
Rated Input Speed / Nominal Giriş Devri	$n_{IN}$	rpm	3,000											
Max. Input Speed / Max. Giriş Devri	$n_{IB}$	rpm	5,000											
Torsional Rigidity / Burulma Direnci		Nm/arcmin	60											
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	9,300											
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	4,650											
Service Life / Hizmet Ömrü	$L_H$	hr	S5 Cycle Operation: 30,000 (S1 Continuous Operation: 15,000 hrs) S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat)											
Efficiency / Verim	$\eta$	%	≥ 94%											
Operating Temperature / Çalışma Sıcaklığı		°C	- 25°C ~ + 90°C											
Lubrication / Yağlama			Synthetic Grease / Sentetik Gres											
Protection Class / Koruma Sınıfı			IP 65											
Mounting Position / Montaj Pozisyonu			Any / Her Yönde											
Noise Level / Ses Seviyesi		dB	≤ 65 dB											
Weight ±2% / Ağırlık		Kg												

# FB series / serileri



- 1-Stage Backlash  $\leq 8$  arcmin  
1 Kademe Boşluk Oranı  $\leq 8$  arcmin
- 2-Stage Backlash  $\leq 12$  arcmin  
2 Kademe Boşluk Oranı  $\leq 12$  arcmin

## Indication of Model Numbers / Model Seçimi

FB	90	10		MOTOR
Type FB FE	Model 50 70 90 120 145 180 220	Ratio/Çevrim 1-Stage/Kademe 3, 4, 5, 7, 10 2-Stage/Kademe 15, 20, 25, 30, 35, 40, 50, 70, 100	Output Shaft / Çıkış Mili Keyway/Kamalı No Keyway/Kamasız	Motor Type Motor Brand & Model No. / Motor Marka & Modeli

# Features of FB Series / FB Serilerinin Özellikleri



## Integrated Planetary Arm Bracket

The planetary arm bracket and the output shaft are one-piece constructed to increase torsional rigidity and accuracy. The entire structure is integrated machined for controlling accuracy in the specified tolerance.

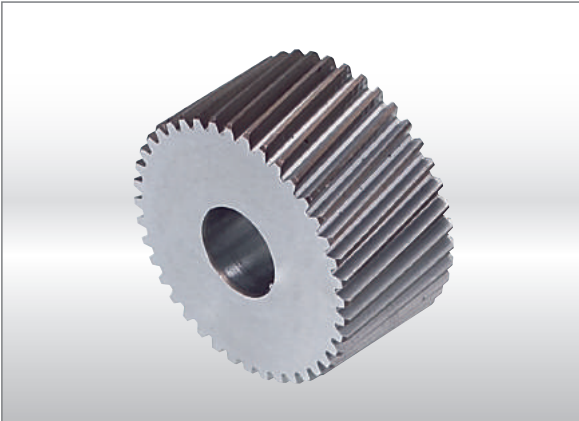
Planet kolu ve çıkış mili, burulma direncini ve hassasiyeti arttırmak amacıyla tek parçadan üretilmiştir. Tüm yapı hassasiyeti ve toleransı sağlamak için tek seferde işlenmiştir.



## Full Needle Roller Bearings Design

The planetary gear transmission employs full needle roller bearings without retainer to increase the contact surface, which greatly upgrades structural rigidity and service life.

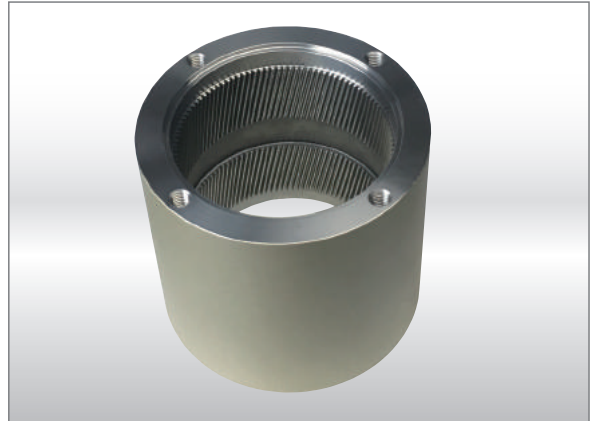
Planet dişlilerde temas yüzeyini arttırmak amacıyla iğneli rulmanlı yataklar kullanılır. Bu sayede yapısal sağlamlık ve hizmet ömrü büyük ölçüde artırılmış olur.



## High Precision Gear Machining

The planetary gear and sun gear are manufactured from high quality Ni-Cr-Mo alloy steel (SNCM220), precision machined and carburizing heat treatment to hardness 57-60 HRC. Precision teeth grinding or skiving assures gear accuracy reaches DIN6 class.

Yüksek kaliteli Ni-Cr-Mo alaşımlı çelikten (SNCM220) üretilmiştir. Sertlik derecesi 57-60 HRC'dir. Dişli taşlama hassasiyeti DIN6 sınıfındadır.



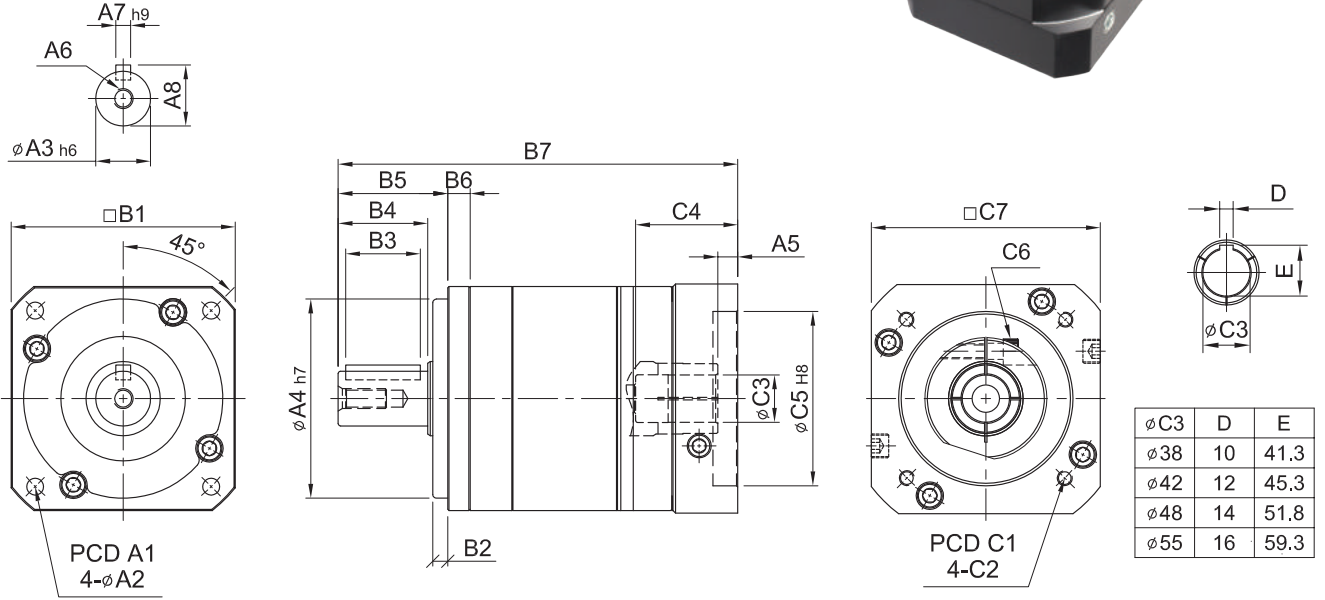
## One-piece Gearbox Housing

The gearbox and internal ring gear are one-piece constructed. High gear accuracy meets DIN6 class.

Dişli kutusu ve gövde üzerindeki dişliler tek parça olarak üretilmiştir ve DIN6 sınıfındadır.

# MODEL : FB

RATIO / ÇEVİRİM : 3, 4, 5, 7, 10 (1-Stage / Kademe)



unit / birim : mm

Model Code	50	70	90	120	145	180	220	
A	A1	50	70	100	130	165	215	250
	A2	4.5	6	6.8	9	11	13	17
	A3	13	16	22	32	40	55	75
	A4	35	50	80	110	130	160	180
	A5	5	6	9 · 23.5	10 · 20	10	13 · 15	13.5 · 15.5
	A6	M4 x P0.7	M5 x P0.8	M8 x P1.25	M10 x P1.5	M12 x P1.75	M14 x P2.0	M16 x P2.0
	A7	5	5	6	10	12	16	20
	A8	15	18	24.5	35	43	59	81
B	B1	50	70	90	120	145	180	220
	B2	4	5	8	8	10	20	20
	B3	15	20	30	40	65	70	90
	B4	20	28	36	50	74	82	104
	B5	25	34	44	60	87	106	129
	B6	6	8	9	12	15	16	24
	B7	100.5	132.5	170.5 · 185	227.5	291	325 · 327	377 · 379
C	C1	46 · 60 · 63	70 · 75 · 90	90 · 100 · 115 · 145	115 · 145 · 165	145 · 165 · 200	200 · 215 · 265	200 · 265 · 300
	C2	M3 M4 M5	M4 M5 M6	M5 M6 M8	M6 M8 M10	M8 M10 M12	M10 M12	M12 M16
	C3	8 · 9 · 11	14 · 19	19 · 22 · 24	24 · 28 · 32	35 · 38	38 · 42 · 48	42 · 48 · 55
	C4	26	33.5	51 · 65.5	63 · 73	81.5	115 · 117	118 · 120
	C5	30 · 40 · 50	40 · 50 · 60	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180	114.3 · 180 · 230	114.3 · 230 · 250
	C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5	M10 x P1.5
	C7	46 · 55	64 · 70 · 80	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190	182 · 200 · 250	222 · 250 · 265

# FB 1-Stage / Kademe

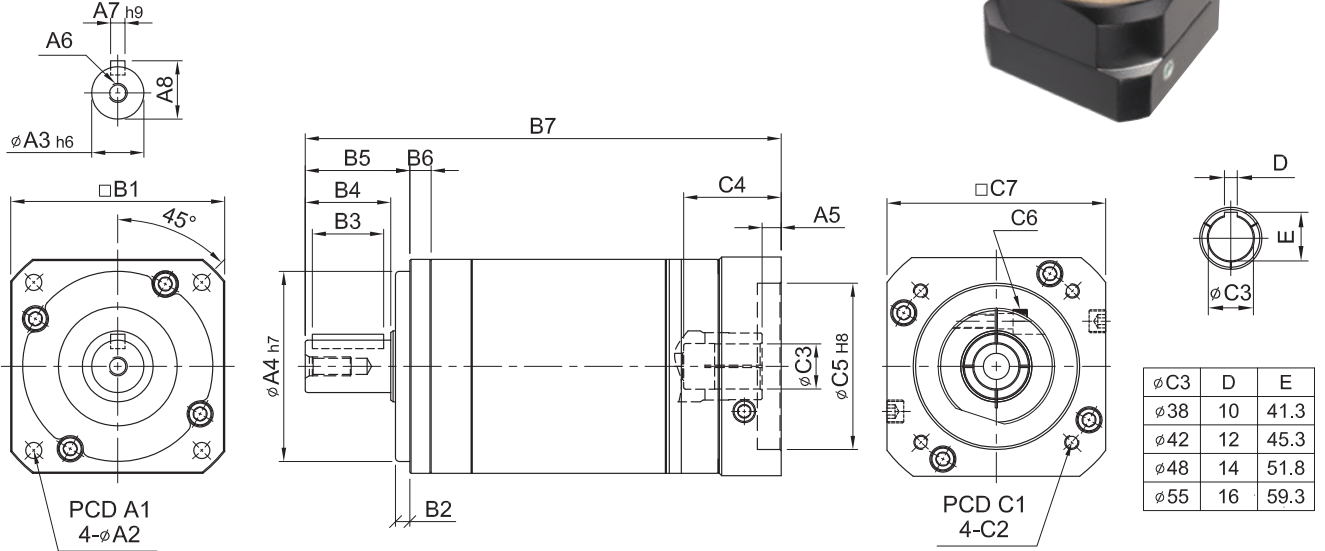
Model No.		Unit/Birim	Ratio Çevrim	50	70	90	120	145	180	220
Nominal output torque / Nominal Çıkış Torku	$T_{2N}$	Nm	3	17	50	125	268	482	940	1,420
			4	15	45	111	238	426	860	1,300
			5	14	42	104	223	401	835	1,270
			7	13	39	98	208	373	790	1,180
			10	12	37	92	198	356	760	1,140
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	3~10	1.8 Times of Rated Output Torque / 1,8 x Nominal Çıkış Torku						
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	3~10	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku						
Rated Input Speed / Nominal Giriş Devri	$n_{1N}$	rpm	3~10	3,000	3,000	3,000	3,000	3,000	2,000	2,000
Max. Input Speed / Max. Giriş Devri	$n_{1B}$	rpm	3~10	5,000	5,000	5,000	5,000	5,000	3,000	3,000
Backlash / Boşluk Oranı		arcmin	3~10	≤ 8	≤ 8	≤ 8	≤ 8	≤ 8	≤ 8	≤ 8
Torsional Rigidity / Burulma Direnci		Nm/arcmin	3~10	2.3	5	15	45	69	140	220
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	3~10	750	1,180	3,000	6,500	9,100	11,150	35,000
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	3~10	325	590	1,500	3,250	4,550	5,575	17,500
Service Life / Hizmet Ömrü	$L_{H1}$	hr	3~10	S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)						
Efficiency / Verim	$\eta$	%	3~10	≥ 97%						
Operating Temperature / Çalışma Sıcaklığı		°C	3~10	-25° C ~ +90° C						
Lubrication / Yağlama			3~10	Synthetic Grease / Sentetik Gres						
Protection Class / Koruma Sınıfı			3~10	IP65						
Mounting Position / Montaj Pozisyonu			3~10	Any / Her Yönde						
Noise Level / Ses Seviyesi		dB	3~10	≤ 62	≤ 62	≤ 65	≤ 68	≤ 70	≤ 70	≤ 70
Weight / Ağırlık ±3%		Kg	3~10	0.63	1.57	3.22	8	16	33	54

## Mass Moments of Inertia / Atalet Ağırlık Momenti (kg.cm<sup>2</sup>)

Ratio / Çevrim	50	70	90	120	145	180	220
3	0.04	0.14	0.61	3.25	8.75	24.63	50.67
4	0.04	0.13	0.48	2.74	7.16	20.12	46.21
5	0.04	0.11	0.47	2.74	6.84	19.80	45.28
7	0.04	0.11	0.44	2.58	6.78	19.21	43.32
10	0.04	0.11	0.44	2.57	6.68	19.13	42.98

# MODEL : FB

RATIO / ÇEVİRİM : 15, 20, 25, 30, 35, 40, 50, 70, 100 (2-Stage / Kademe)



unit / birim : mm

Model Code	50	70	90	120	145	180	220	
A	A1	50	70	100	130	165	215	250
	A2	4.5	6	6.8	9	11	13	17
	A3	13	16	22	32	40	55	75
	A4	35	50	80	110	130	160	180
	A5	5	6	9 · 23.5	10 · 20	10	13 · 15	13.5 · 15.5
	A6	M4 x P0.7	M5 x P0.8	M8 x P1.25	M10 x P1.5	M12 x P1.75	M14 x P2.0	M16 x P2.0
	A7	5	5	6	10	12	16	20
	A8	15	18	24.5	35	43	59	81
B	B1	50	70	90	120	145	180	220
	B2	4	5	6	8	10	20	20
	B3	15	20	30	40	65	70	90
	B4	20	28	36	50	74	82	104
	B5	25	34	44	60	87	106	129
	B6	6	8	9	12	15	16	24
	B7	126.7	166.5	210.2 · 224.7	281.5 · 291.5	354.7	394.5 · 396.5	464
C	C1	46 · 60 · 63	70 · 75 · 90	90 · 100 · 115 · 145	115 · 145 · 165	145 · 165 · 200	200 · 215 · 265	200 · 265 · 300
	C2	M3 M4 M5	M4 M5 M6	M5 M6 M8	M6 M8 M10	M8 M10 M12	M10 M12	M12 M16
	C3	8 · 9 · 11	14 · 19	19 · 22 · 24	24 · 28 · 32	35 · 38	38 · 42 · 48	42 · 48 · 55
	C4	26	33.5	51 · 65.5	63 · 73	81.5	115 · 117	118 · 120
	C5	30 · 40 · 50	40 · 50 · 60	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180	114.3 · 180 · 230	114.3 · 230 · 250
	C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5	M10 x P1.5
	C7	46 · 55	64 · 70 · 80	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190	182 · 200 · 250	222 · 250 · 265

# FB 2-Stage / Kademe

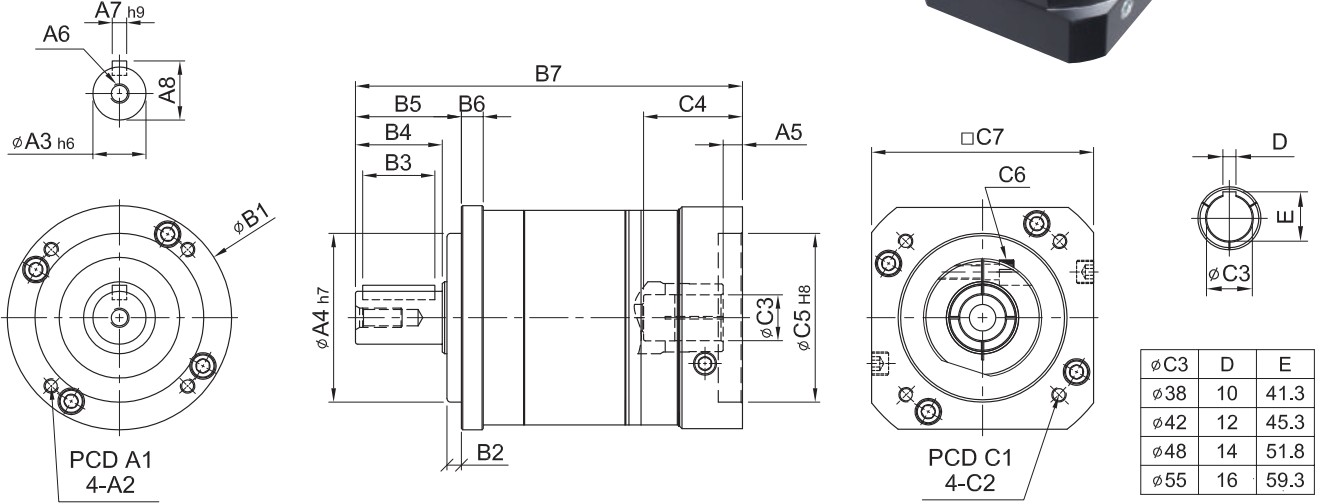
Model No.		Unit/Birim	Ratio Çevrim	50	70	90	120	145	180	220
Nominal output torque / Nominal Çıkış Torqu	$T_{2N}$	Nm	15	17	50	125	268	482	940	1,420
			20	15	45	111	238	426	860	1,300
			25	14	42	104	223	401	835	1,270
			30	17	50	125	268	482	940	1,420
			35	13	39	98	208	373	790	1,180
			40	15	45	111	238	427	860	1,300
			50	14	42	104	223	402	835	1,270
			70	13	40	98	208	373	790	1,180
			100	12	37	92	198	357	760	1,100
Max. Acceleration Torque / Max. İvmelenme Torqu	$T_{2B}$	Nm	15~100	1.8 Times of Rated Output Torque / 1,8 x Nominal Çıkış Torqu						
Max. Output Torque / Max. Çıkış Torqu	$T_{2NOT}$	Nm	15~100	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torqu						
Rated Input Speed / Nominal Giriş Devri	$n_{1N}$	rpm	15~100	3,000	3,000	3,000	3,000	3,000	2,000	2,000
Max. Input Speed / Max. Giriş Devri	$n_{1B}$	rpm	15~100	5,000	5,000	5,000	5,000	5,000	3,000	3,000
Backlash / Boşluk Oranı		arcmin	15~100	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12
Torsional Rigidity / Burulma Direnci		Nm/arcmin	15~100	2.3	5	15	45	69	140	220
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	15~100	750	1,180	3,000	6,500	9,100	11,150	35,000
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	15~100	325	590	1,500	3,250	4,550	5,575	17,500
Service Life / Hizmet Ömrü	$L_H$	hr	15~100	S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)						
Efficiency / Verim	$\eta$	%	15~100	≥ 94%						
Operating Temperature / Çalışma Sıcaklığı		°C	15~100	-25° C ~ +90° C						
Lubrication / Yağlama			15~100	Synthetic Grease / Sentetik Gres						
Protection Class / Koruma Sınıfı			15~100	IP65						
Mounting Position / Montaj Pozisyonu			15~100	Any / Her Yönde						
Noise Level / Ses Seviyesi		dB	15~100	≤ 65	≤ 65	≤ 68	≤ 70	≤ 72	≤ 72	≤ 72
Weight / Ağırlık ±3%		Kg	15~100	0.9	2.24	4.59	11.22	22.5	46.4	75

## Mass Moments of Inertia / Atalet Ağırlık Momenti (kg.cm<sup>2</sup>)

Ratio / Çevrim	50	70	90	120	145	180	220
15	0.04	0.14	0.61	3.25	8.75	24.63	50.67
20	0.04	0.13	0.48	2.74	7.16	20.12	46.21
25	0.04	0.11	0.47	2.74	6.84	19.80	45.28
30	0.04	0.14	0.61	3.25	8.75	24.63	50.67
35	0.04	0.11	0.44	2.58	6.78	19.21	43.32
40	0.04	0.11	0.48	2.74	7.16	20.12	46.21
50	0.04	0.11	0.47	2.74	6.84	19.80	45.28
70	0.04	0.11	0.44	2.58	6.78	19.21	43.32
100	0.04	0.11	0.44	2.57	6.68	19.13	42.98

# MODEL : FE

RATIO / ÇEVİRİM : 3, 4, 5, 7, 10 (1-Stage / Kademe)



unit / birim : mm

Model Code	50	70	90	120	145	180	220	
A	A1	42	60	80	105	130	184	218
	A2	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M12 x P1.75	M16 x P2.0
	A3	13	16	22	32	40	55	75
	A4	35	50	70	90	110	160	180
	A5	5	6	9 · 23.5	10 · 20	10	13 · 15	13.5 · 15.5
	A6	M4 x P0.7	M5 x P0.8	M8 x P1.25	M10 x P1.5	M12 x P1.75	M14 x P2.0	M16 x P2.0
	A7	5	5	6	10	12	16	20
	A8	15	18	24.5	35	43	59	79.5
B	B1	$\phi 50$	$\phi 70$	$\phi 93$	$\phi 122$	$\phi 148$	$\phi 205$	$\phi 242$
	B2	4	5	6	8	10	20	20
	B3	15	20	30	40	65	70	90
	B4	20	28	36	50	74	82	104
	B5	25	34	44	60	87	106	129
	B6	6	8	9	12	15	21.5	30
	B7	100.5	132.5 · 140.5	170.5 · 185	227.5 · 237.5	291	325 · 327	376.5 · 378.5
C	C1	46 · 60 · 63	70 · 75 · 90	90 · 100 · 115 · 145	115 · 145 · 165	145 · 165 · 200	200 · 215 · 265	200 · 265 · 300
	C2	M3 M4 M5	M4 M5 M6	M5 M6 M8	M6 M8 M10	M8 M10 M12	M10 M12	M12 M16
	C3	8 · 9 · 11	14 · 19	19 · 22 · 24	24 · 28 · 32	35 · 38	38 · 42 · 48	42 · 48 · 55
	C4	26	33.5	51 · 65.5	63 · 73	81.5	115 · 117	118 · 120
	C5	30 · 40 · 50	40 · 50 · 60	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180	114.3 · 180 · 230	114.3 · 230 · 250
	C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5	M10 x P1.5
	C7	46 · 55	64 · 70 · 80	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190	182 · 200 · 250	222 · 250 · 265

# FE 1-Stage / Kademe

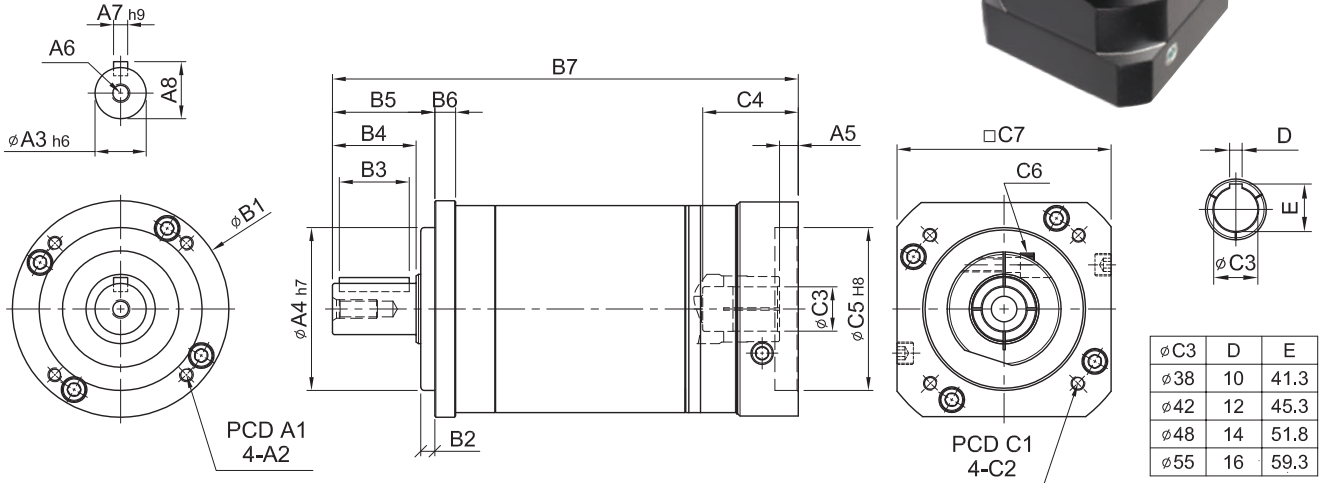
Model No.		Unit/Birim	Ratio Çevrim	50	70	90	120	145	180	220
Nominal output torque / Nominal Çıkış Torku	$T_{2N}$	Nm	3	17	50	125	268	482	940	1,420
			4	15	45	111	238	426	860	1,300
			5	14	42	104	223	401	835	1,270
			7	13	39	98	208	373	790	1,180
			10	12	37	92	198	356	760	1,140
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	3~10	1.8 Times of Rated Output Torque / 1,8 x Nominal Çıkış Torku						
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	3~10	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku						
Rated Input Speed / Nominal Giriş Devri	$n_{1N}$	rpm	3~10	3,000	3,000	3,000	3,000	3,000	2,000	2,000
Max. Input Speed / Max. Giriş Devri	$n_{1B}$	rpm	3~10	5,000	5,000	5,000	5,000	5,000	3,000	3,000
Backlash / Boşluk Oranı		arcmin	3~10	≤ 8	≤ 8	≤ 8	≤ 8	≤ 8	≤ 8	≤ 8
Torsional Rigidity / Burulma Direnci		Nm/arcmin	3~10	2.3	5	15	45	69	140	220
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	3~10	750	1,180	3,000	6,500	9,100	11,150	35,000
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	3~10	325	590	1,500	3,250	4,550	5,575	17,500
Service Life / Hizmet Ömrü	$L_H$	hr	3~10	S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)						
Efficiency / Verim	$\eta$	%	3~10	≥ 97%						
Operating Temperature / Çalışma Sıcaklığı		°C	3~10	-25° C ~ +90° C						
Lubrication / Yağlama			3~10	Synthetic Grease / Sentetik Gres						
Protection Class / Koruma Sınıfı			3~10	IP65						
Mounting Position / Montaj Pozisyonu			3~10	Any / Her Yönde						
Noise Level / Ses Seviyesi		dB	3~10	≤ 62	≤ 62	≤ 65	≤ 68	≤ 70	≤ 70	≤ 70
Weight / Ağırlık ±3%		Kg	3~10	0.63	1.57	3.22	8	16	33	54

## Mass Moments of Inertia / Atalet Ağırlık Momenti (kg.cm<sup>2</sup>)

Ratio / Çevrim	50	70	90	120	145	180	220
3	0.04	0.14	0.61	3.25	8.75	24.63	50.67
4	0.04	0.13	0.48	2.74	7.16	20.12	46.21
5	0.04	0.11	0.47	2.74	6.84	19.80	45.28
7	0.04	0.11	0.44	2.58	6.78	19.21	43.32
10	0.04	0.11	0.44	2.57	6.68	19.13	42.98

# MODEL : FE

RATIO / ÇEVİRİM : 15, 20, 25, 30, 35, 40, 50, 70, 100 (2-Stage / Kademe)



unit / birim : mm

Model Code	50	70	90	120	145	180	220	
A	A1	42	60	80	105	130	184	218
	A2	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M12 x P1.75	M16 x P2.0
	A3	13	16	22	32	40	55	75
	A4	35	50	70	90	110	160	180
	A5	5	6	9 · 23.5	10 · 20	10	13 · 15	13.5 · 15.5
	A6	M4 x P0.7	M5 x P0.8	M8 x P1.25	M10 x P1.5	M12 x P1.75	M14 x P2.0	M16 x P2.0
	A7	5	5	6	10	12	16	20
	A8	15	18	24.5	35	43	59	79.5
B	B1	Ø50	Ø70	Ø93	Ø122	Ø148	Ø205	Ø242
	B2	4	5	6	8	10	20	20
	B3	15	20	30	40	65	70	90
	B4	20	28	36	50	74	82	104
	B5	25	34	44	60	87	106	129
	B6	6	8	9	12	15	21.5	30
	B7	126.7	166.5	210.2 · 224.7	281.5 · 291.5	354.7	394.5 · 396.5	463.5 · 465.5
C	C1	46 · 60 · 63	70 · 75 · 90	90 · 100 · 115 · 145	115 · 145 · 165	145 · 165 · 200	200 · 215 · 265	200 · 265 · 300
	C2	M3 M4 M5	M4 M5 M6	M5 M6 M8	M6 M8 M10	M8 M10 M12	M10 M12	M12 M16
	C3	8 · 9 · 11	14 · 19	19 · 22 · 24	24 · 28 · 32	35 · 38	38 · 42 · 48	42 · 48 · 55
	C4	26	33.5	51 · 65.5	63 · 73	81.5	115 · 117	118 · 120
	C5	30 · 40 · 50	40 · 50 · 60	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180	114.3 · 180 · 230	114.3 · 230 · 250
	C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5	M10 x P1.5
	C7	46 · 55	64 · 70 · 80	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190	182 · 200 · 250	222 · 250 · 265

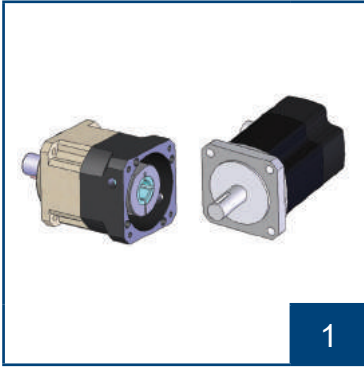
# FE 2-Stage / Kademe

Model No.		Unit/Birim	Ratio Çevrim	50	70	90	120	145	180	220
Nominal output torque / Nominal Çıkış Torku	$T_{2N}$	Nm	15	17	50	125	268	482	940	1,420
			20	15	45	111	238	426	860	1,300
			25	14	42	104	223	401	835	1,270
			30	17	50	125	268	482	940	1,420
			35	13	39	98	208	373	790	1,180
			40	15	45	111	238	427	860	1,300
			50	14	42	104	223	402	835	1,270
			70	13	40	98	208	373	790	1,180
			100	12	37	92	198	357	760	1,100
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	15~100	1.8 Times of Rated Output Torque / 1,8 x Nominal Çıkış Torku						
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	15~100	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku						
Rated Input Speed / Nominal Giriş Devri	$n_{IN}$	rpm	15~100	3,000	3,000	3,000	3,000	3,000	2,000	2,000
Max. Input Speed / Max. Giriş Devri	$n_{IB}$	rpm	15~100	5,000	5,000	5,000	5,000	5,000	3,000	3,000
Backlash / Boşluk Oranı		arcmin	15~100	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12
Torsional Rigidity / Burulma Direnci		Nm/arcmin	15~100	2.3	5	15	45	69	140	220
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	15~100	750	1,180	3,000	6,500	9,100	11,150	35,000
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	15~100	325	590	1,500	3,250	4,550	5,575	17,500
Service Life / Hizmet Ömrü	$L_{H1}$	hr	15~100	S5 Döngüsel Çalışma: >30,000 (S1 Sürekli Çalışma: >15,000 saat) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)						
Efficiency / Verim	$\eta$	%	15~100	≥ 94%						
Operating Temperature / Çalışma Sıcaklığı		°C	15~100	-25° C ~ +90° C						
Lubrication / Yağlama			15~100	Synthetic Grease / Sentetik Gres						
Protection Class / Koruma Sınıfı			15~100	IP65						
Mounting Position / Montaj Pozisyonu			15~100	Any / Her Yönde						
Noise Level / Ses Seviyesi		dB	15~100	≤ 65	≤ 65	≤ 68	≤ 70	≤ 72	≤ 72	≤ 72
Weight / Ağırlık ±3%		Kg	15~100	0.9	2.24	4.59	11.22	22.5	46.4	75

## Mass Moments of Inertia / Atalet Ağırlık Momenti (kg.cm<sup>2</sup>)

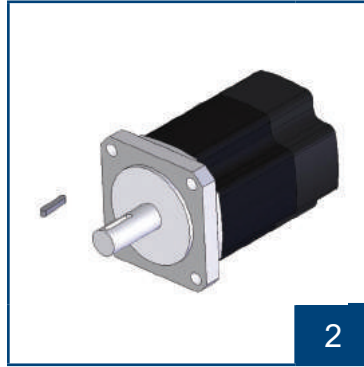
Ratio / Çevrim	50	70	90	120	142	180	220
15	0.04	0.14	0.61	3.25	8.75	24.63	50.67
20	0.04	0.13	0.48	2.74	7.16	20.12	46.21
25	0.04	0.11	0.47	2.74	6.84	19.80	45.28
30	0.04	0.14	0.61	3.25	8.75	24.63	50.67
35	0.04	0.11	0.44	2.58	6.78	19.21	43.32
40	0.04	0.11	0.48	2.74	7.16	20.12	46.21
50	0.04	0.11	0.47	2.74	6.84	19.80	45.28
70	0.04	0.11	0.44	2.58	6.78	19.21	43.32
100	0.04	0.11	0.44	2.57	6.68	19.13	42.98

# Planetary Gearbox and Motor Mounting Instructions / Motor Bağlantı Bilgileri



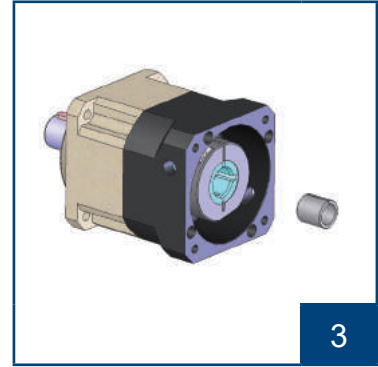
Confirm the motor, and gearbox size.  
Clean up the mounting surface.

Motor ve redüktör ölçüleri kontrol edilir,  
bağlantı yüzeyleri temizlenir.



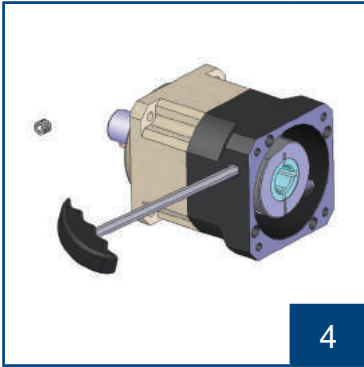
Remove the motor key if the diameter  
of motor shaft is under  $\varphi 35$ .

Motor mil çapı 35 mm'den küçükse  
kama çıkartılır.



Check motor shaft size and insert  
bushing into input bore if necessary.

Motor mil çapı kontrol edilir,  
gerekliyse burç kullanılır.



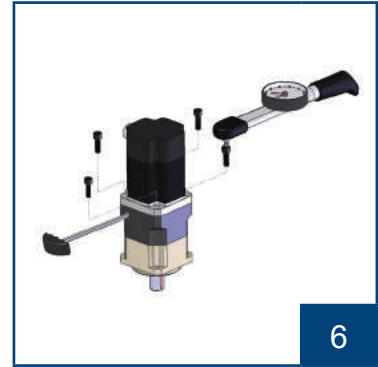
Remove the plug on the adapter plate.  
Rotate the set collar till the bolt is line  
up.

Tapa çıkarılır, sıkma bileziği vida  
görününceye kadar çevrilir.



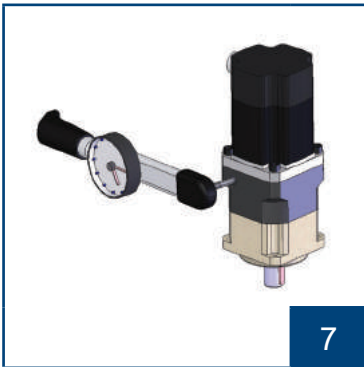
Put the motor into the gearbox  
vertically.

Motor dikey olarak yerleştirilir.



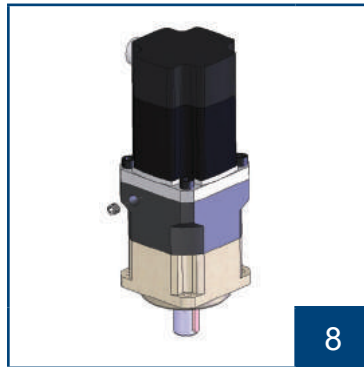
Tighten the mounting bolt in 1~4 order  
with torque wrench.

Motor bağlantı vidaları sıkılır.



Tighten the set collar bolt with torque  
wrench.

Sıkma bileziği sıkılır.



Tighten back the screw plug.

Tapa yerine takılır.

1. To be sure to tighten motor first and  
then to tighten the set collar on  
motor shaft.

Motor bağlantı vidaları sıkıldıktan  
sonra , bileziğin sıkılmasına dikkat  
edilmelidir.

2. Please assembly in order according  
to above steps, especially for step 6  
and step 7.

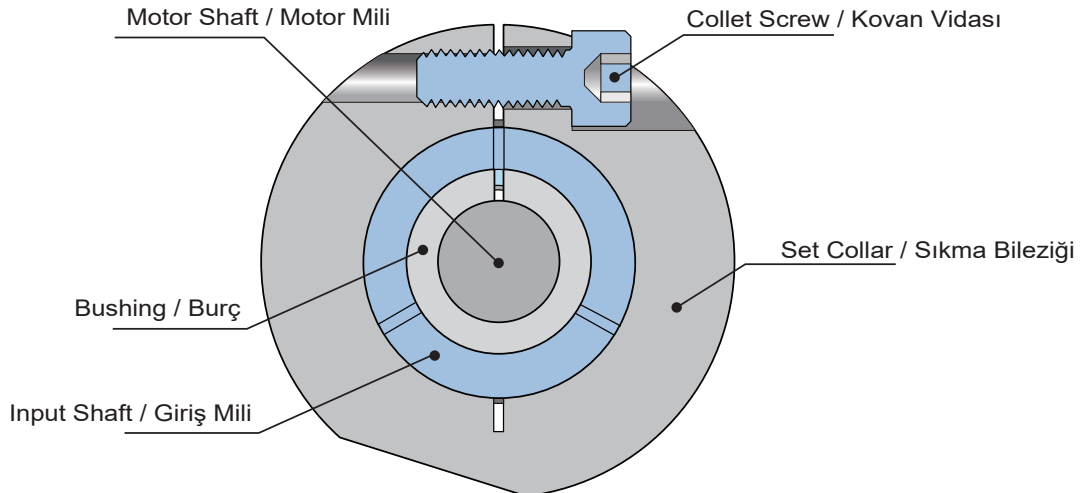
Lütfen montaj sırasında yukarıdaki  
talimatlara uyunuz.

# Collet Locking Mechanism / Kovan Kilitleme Mekanizması

Collet Screw & Set Collar Torque Table / Kovan Vidası & Sıkma Bileziği Tork Tablosu

MODEL									Spec. of Collet Screw / Kovan Vidası	Screw Grade / Vida Cinsi	Tighten Torque / Sıkma Torku (Nm)	Clench Torque (Nm)	Key / Kama
SB SE	SBT PBT	SD	SDH	SF	PB	FA	SN	FB					
44	44	47	64	-	44	50	50 60	50	M4 x P 0.7	12.9	4.83	87	
62	62	64	90	62	62	70 80 90	70 80	70	M5 x P 0.8	12.9	10	164	
90	90 120	90	110	75	90	100	115	90	M6 x P 1.0	12.9	16.3	233	
120	142	110	140	100	120	120	-	120	M8 x P 1.25	12.9	41	423	
142	180	140	200	142	142	-	-	145	M10 x P 1.5	12.9	81	678	
180 220	-	200 255	255	180	180 220	-	-	180 220	M10 x P 1.5	12.9	81	678	●
270 330	-	-	-	-	-	-	-	-	M12 x P 1.75	12.9	110	813	●

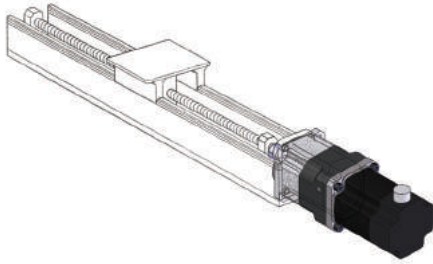
Input Bore / Giriş Mili	Ø38	Ø42	Ø48	Ø55	Ø60	Ø75
Key / Kama	10 x 8	12 x 8	14 x 9	16 x 10	18 x 11	20 x 12



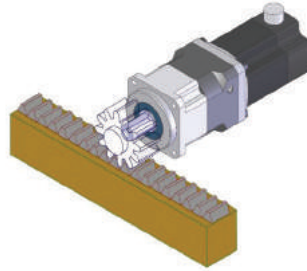
# Applications / Örnek Uygulamalar

## Linear Action / Lineer Hareket

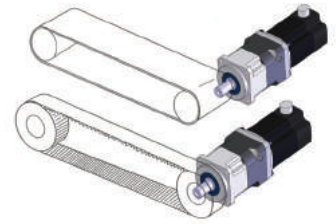
Ball Screw / Vidalı Mil



Rack / Kremayer

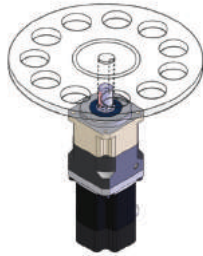


Roller / Belt / Kayış / Kasnak

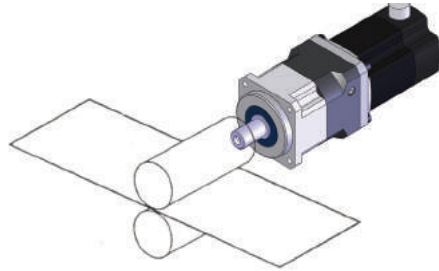


## Rotary Action / Dairesel Hareket

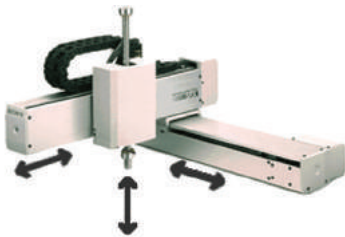
Index / İndeks



## Others / Diğer



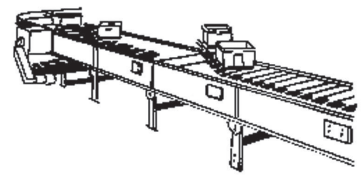
Robot



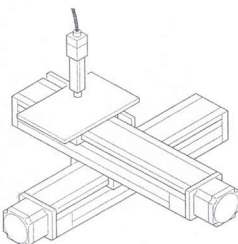
Printing Machine/Baskı Makinesi



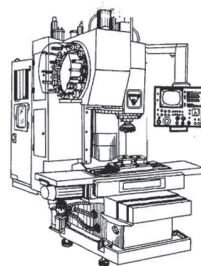
Conveyor / Konveyör



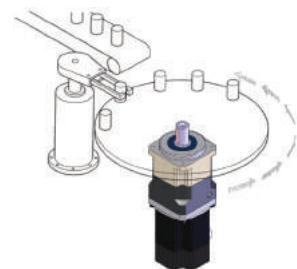
Working Table / Modül



CNC Spindle / CNC

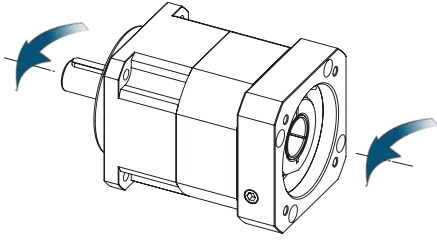


Index / İndeks

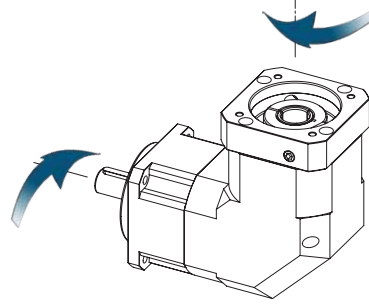


## Rotation Directions / Millerin Dönüş Yönleri

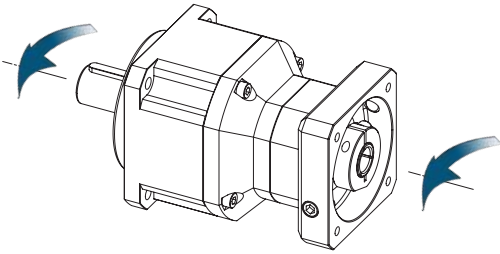
1-Stage Planetary Reducer /  
1 Kademe Planet Redüktör



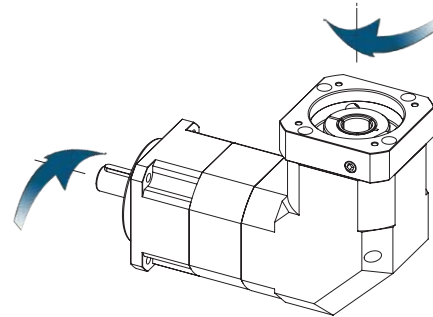
1-Stage Spiral Bevel Gear & Planetary Reducer /  
1 Kademe Konik Dişli Planet Redüktör



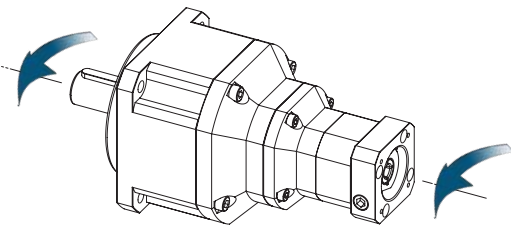
2-Stage Planetary Reducer /  
2 Kademe Planet Redüktör



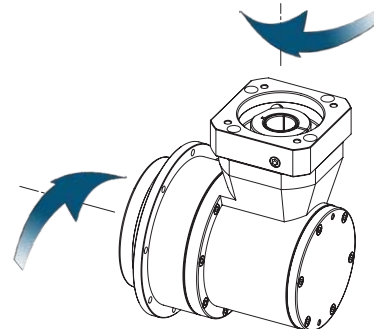
2-Stage Spiral Bevel Gear & Planetary Reducer /  
2 Kademe Konik Dişli Planet Redüktör



3-Stage Planetary Reducer /  
3 Kademe Planet Redüktör




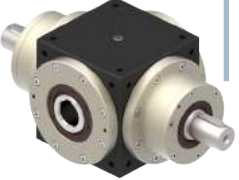







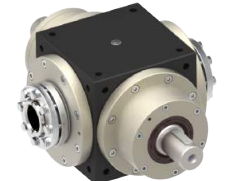



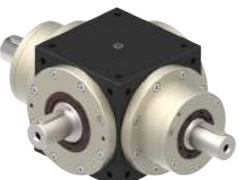



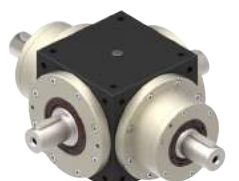






1-Stage Hypoid Gear & Planetary Reducer /  
1 Kademe Hypoid Dişli Planet Redüktör



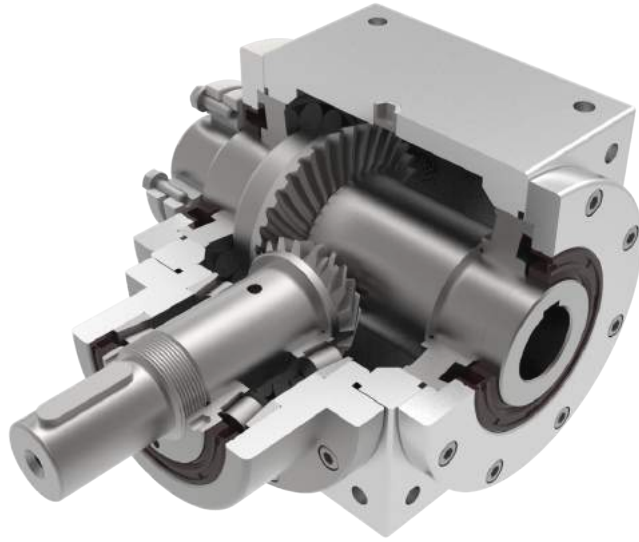
# ST Series / Serileri

Input Shaft / Giriş Mili

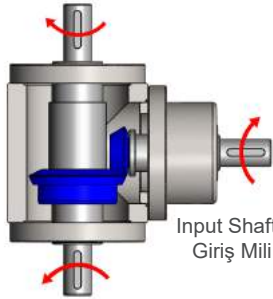
	F	R	D	Y
O Hollow Output Shaft / Delik Millî				
	FO	RO	DO	YO
N Single Clamping / Tek Konik Sıkma				
	FN	RN	DN	YN
M Double Clamping / Çift Konik Sıkma				
	FM	RM	DM	YM
S Single Output Shaft / Tek Çıkış Mili				
	FS	RS	DS	YS
V Double Output Shaft / Çift Çıkış Mili				
	FV	RV	DV	YV
P Flange / Flanş				
	FP	RP	DP	YP

Output Shaft / Çıkış Mili

# Rotating Direction / Milin Dönüş Yönü

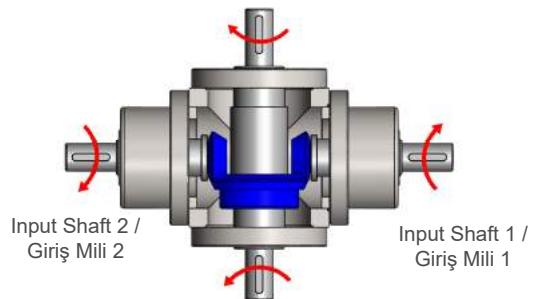


Output Shaft 2 / Çıkış Mil 2



Output Shaft 1 / Giriş Mil 1

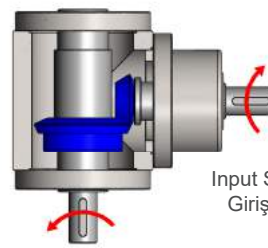
Output Shaft 2 / Çıkış Mil 2



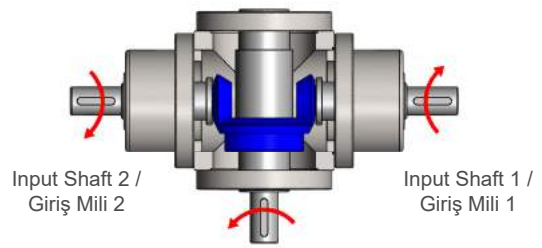
Output Shaft 1 / Çıkış Mil 1

L  
Shaft Direction /  
Mil Yönü

L  
Shaft Direction /  
Mil Yönü

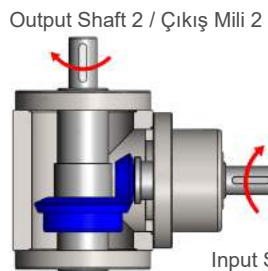


Output Shaft 1 / Çıkış Mil 1

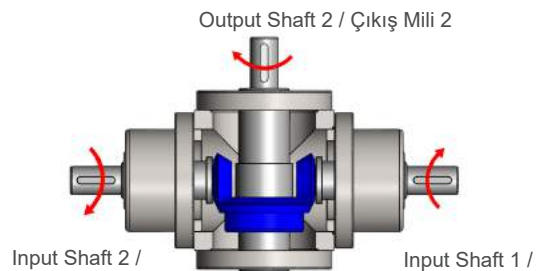


Output Shaft 1 / Çıkış Mil 1

R 軸向  
Shaft Direction



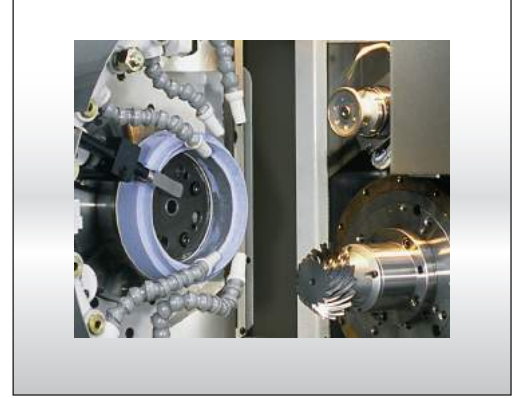
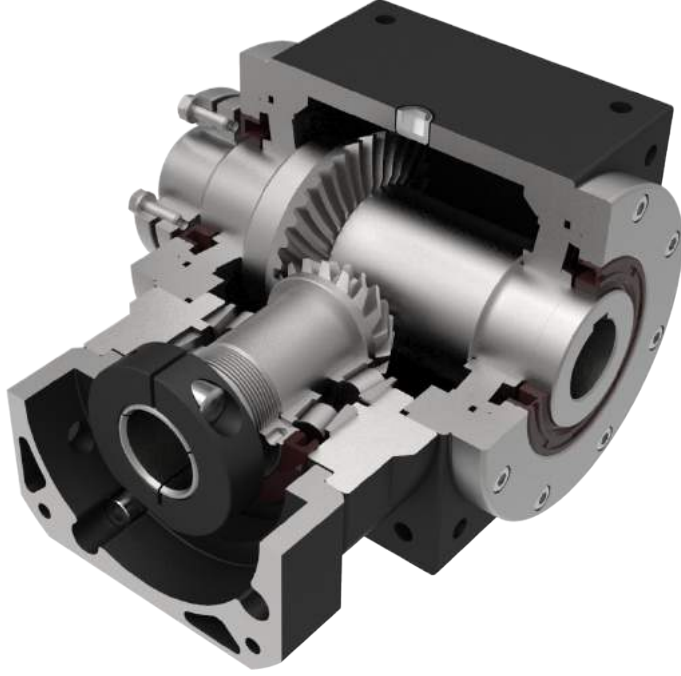
Input Shaft 1 /  
Giriş Mil 1



Input Shaft 2 /  
Giriş Mil 2

Input Shaft 1 /  
Giriş Mil 1

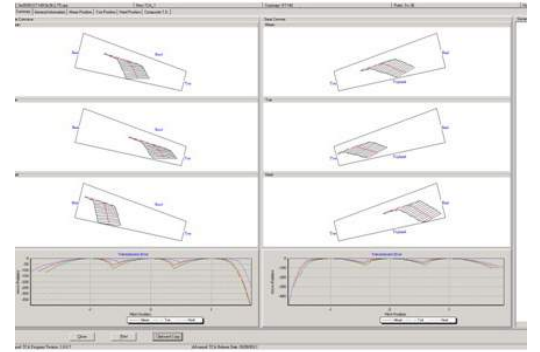
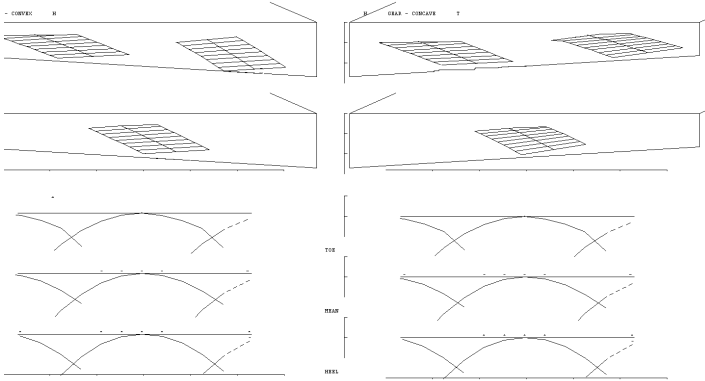
# Features of ST Series / ST Serilerinin Özellikleri



High precision grinded and carburized spiral bevel gears /  
Yüksek hassasiyetle taşlanmış ve karbürlenmiş konik dişliler

High precision grinded and carburized spiral bevel gears to meet standard AGMA12.

AGMA12 standardına ulaşmak amacıyla konik dişliler yüksek hassasiyetle taşlanıp, karbürlenmiştir.



## Optimized Design and CAE Analysis / Optimize Edilmiş Dizayn ve CAE Analizi

Use Gleason's design software to design new spiral bevel gears. Through the ideal gear contact pattern for application, achieve high permissible output torque. Employs 3D-CAE software for analysis and design, the software allows for analyzing the strength of the entire gear reducer and helical teeth. Increasing the service life of gears and the gear reducer.

Konik dişlilerin dizaynında Gleason yazılımı kullanılmıştır. En uygun temas modellemesiyle, yüksek çıkış torkuna ulaşılır. Analiz ve dizayn için 3D-CAE yazılımı kullanılmıştır. Bu sayede redüktör ve helis dişlilerin mukavemeti ve hizmet ömrü test edilmiş olur.

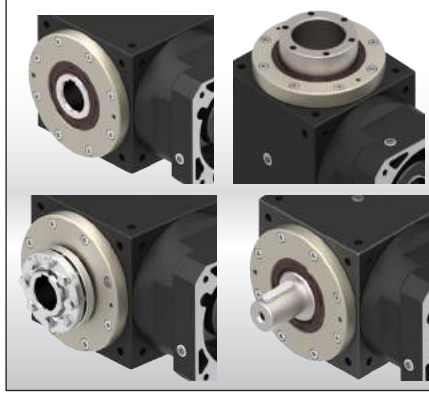
# Features of ST Series / ST Serilerinin Özellikleri



## Low Backlash / Düşük Boşluk Oranı

Using Gleason high precision CNC grinding machine to grinding the spiral bevel gears. Torsional backlash depending on design up to <2 arcmin.

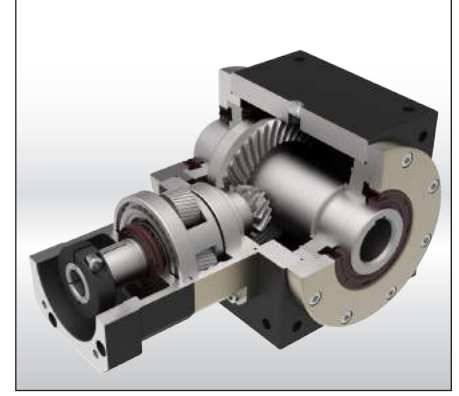
Konik dişlileri taşlamak için yüksek hassasiyetli Gleason CNC kullanılmıştır. Bu sayede <2 arcmin'e kadar burulma boşluğu elde edilir.



## Mounting Position / Montaj Pozisyonu

Multiple precision machined surface is easy for assembly, suitable for any optional mounting orientation. Output shaft and input shaft are designed to suit for various industries applications.

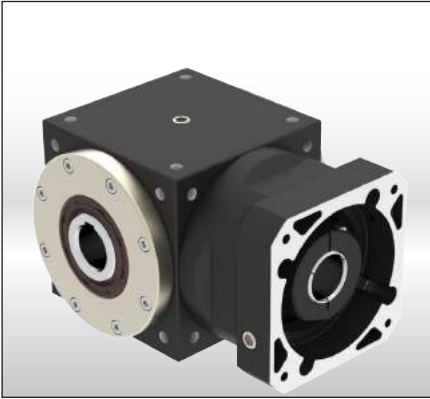
Çok hassas işlenen yüzeyler montajda kolaylık ve çeşitlilik sağlar. Çıkış ve giriş milleri birçok uygulama için tasarlanmıştır.



## More High Gear Ratio / Çok Çeşitli Çevrim Oranı

High precision grinded and carburized spiral bevel gears with optimal designed planetary gear can do ratio 500: 1.

Yüksek hassasiyetle taşlanmış ve karbürlenmiş konik dişliler ve planet dişliler sayesinde 1/500'e kadar tahvil oranına ulaşılır.



## No Maintenance / Bakım Gerektirmez

It features no maintenance and long service life.

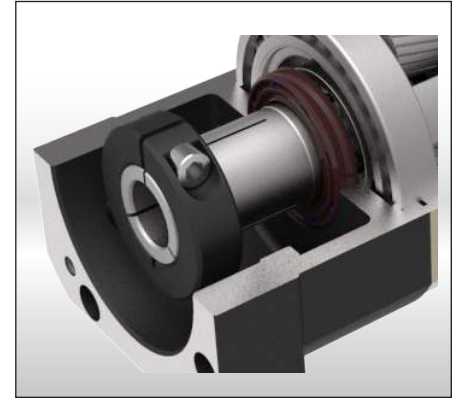
Bakım gerektirmeyen uzun hizmet ömrü.



## High Output Torque / Yüksek Çıkış Torku

The gear box is one-piece constructed to ensure the high rigidity and corrosion-resistant capability.

Redüktör sağlamlık ve paslanmaya karşı dayanıklı olması için tek parça olarak üretilmiştir.



## Collet Locking Mechanism / Kovan Kilitleme Mekanizması

The input-end and the motor are coupled through a collet locking mechanism. It has passed dynamical balance analysis to assure concentricity and balance on the connection and no backlash for power transmission while running at high speed.

Giriş mili ve motor mili kovan kilitleme mekanizmasıyla birbirine bağlanır. Yüksek devirlerde çalışırken güç iletiminde boşluk olmaması ve bağlantı dengesinin sağlanması amacıyla dinamik denge analizi yapılır.

# ST Series / Serileri

## 1-Stage / Kademe

Model No.		Unit Birim	Ratio Çevrim	65	75	90	110	140	170	210
Nominal output torque / Nominal Çıkış Torku	$T_{2N}$	Nm	1	25	45	78	150	360	585	1,300
			2	24	42	68	150	330	544	1,220
			3	18	33	54	120	270	450	1,020
			4	13	28	52	100	224	376	860
			5	12	25	40	85	196	320	740
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	1~5	1.5 Times of Rated Output Torque / 1,5 x Nominal Çıkış Torku						
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	1~5	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku						
Rated Input Speed / Nominal Giriş Devri	$n_{1N}$	rpm	1~5	3,000	3,000	3,000	2,500	2,500	2,000	2,000
Max. Input Speed / Max. Giriş Devri	$n_{1B}$	rpm	1~5	7,500	6,500	5,500	4,500	3,500	3,000	3,000
Backlash / Boşluk Oranı		arcmin	P0	-	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3
			P1	≤ 6	≤ 6	≤ 6	≤ 6	≤ 6	≤ 6	≤ 6
			P2	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9
Max. Radial Force Ball Bearing / Max. Radyal Yük Bilyalı Rulman	$F_{2rB}$	N	1~5	700	1,050	1,500	2,360	3,080	4,800	6,400
Max. Axial Force Ball Bearing / Max. Aksiyel Yük Bilyalı Rulman	$F_{2aB}$	N	1~5	350	525	750	1,180	1,540	2,400	3,200
Max. Radial Force Taper Bearing / Max. Radyal Yük Masuralı Rulman	$F_{2rB}$	N	1~5	-	2,400	3,200	5,000	6,500	9,100	13,000
Max. Axial Force Taper Bearing / Max. Aksiyel Yük Masuralı Rulman	$F_{2aB}$	N	1~5	-	1,200	1,600	2,500	3,250	4,550	6,500
Service Life / Hizmet Ömrü	$L_H$	hr	1~5	S5 Döngüsel Çalışma : >30,000 (S1 Sürekli Çalışma : >15,000 hrs) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)						
Efficiency / Verim	$\eta$	%	1~5	94% ~ 98%						
Operating Temperature / Çalışma Sıcaklığı		°C	1~5	-30°C ~ +100°C						
Lubrication / Yağlama			1~5	Synthetic Oil / Sentetik Yağ						
Noise Level / Ses Seviyesi		dB	1~5	≤ 65	≤ 67	≤ 71	≤ 73	≤ 74	≤ 75	≤ 77

### Mass Moments of Inertia / Atalet Ağırlık Momenti (kgcm<sup>2</sup>)

Ratio / Çevrim	65	75	90	110	140	170	210
1	0.51	1.79	4.93	12.5	36.8	85.9	287
2	0.44	0.95	2.78	7.41	15.6	39.3	123
3	0.43	0.78	2.34	6.18	10.9	28.5	84.1
4	0.43	0.72	2.18	5.71	9.19	24.5	69.9
5	0.43	0.69	2.10	5.48	8.32	22.6	62.7

# ST Series / Serileri

## 2-Stage / Kademe

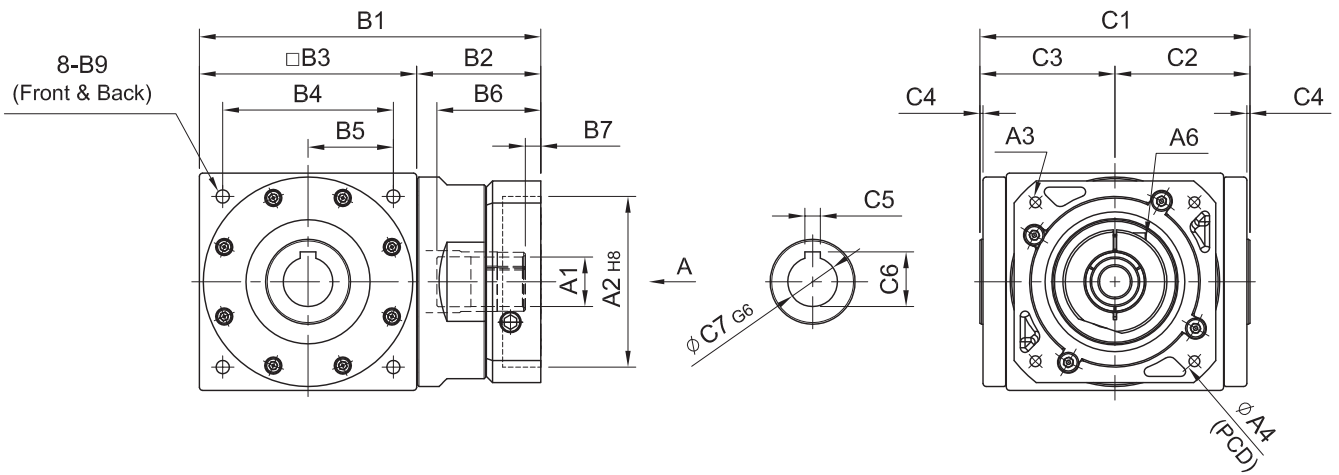
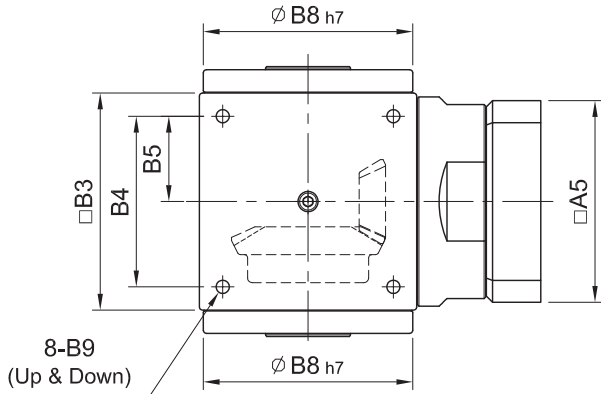
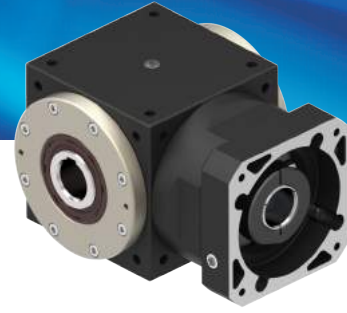
Model No.		Unit Birim	Ratio Çevrim	65	75	90	110	140	170	210
Nominal output torque / Nominal Çıkış Torqu	$T_{2N}$	Nm	10	24	42	68	150	330	544	1,220
			15	18	33	54	120	270	450	1,020
			20	13	28	48	100	224	376	860
			25	12	25	40	85	196	320	740
			30	18	33	54	120	270	450	1,020
			40	13	28	52	100	224	376	860
			50	12	25	40	85	196	320	740
Max. Acceleration Torque / Max. İvmelenme Torqu	$T_{2B}$	Nm	10~50	1.5 Times of Rated Output Torque / 1,5 x Nominal Çıkış Torqu						
Max. Output Torque / Max. Çıkış Torqu	$T_{2NOT}$	Nm	10~50	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torqu						
Rated Input Speed / Nominal Giriş Devri	$n_{1N}$	rpm	10~50	3,000	3,000	3,000	3,000	3,000	3,000	3,000
Max. Input Speed / Max. Giriş Devri	$n_{1B}$	rpm	10~50	8,000	8,000	6,000	6,000	6,000	5,000	5,000
Backlash / Boşluk Oranı		arcmin	P0	-	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4	≤ 4
			P1	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
			P2	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10
Max. Radial Force Ball Bearing / Max. Radyal Yük Bilyalı Rulman	$F_{2rB}$	N	1~5	700	1,050	1,500	2,360	3,080	4,800	6,400
Max. Axial Force Ball Bearing / Max. Aksiyel Yük Bilyalı Rulman	$F_{2aB}$	N	1~5	350	525	750	1,180	1,540	2,400	3,200
Max. Radial Force Taper Bearing / Max. Radyal Yük Masuralı Rulman	$F_{2rB}$	N	1~5	-	2,400	3,200	5,000	6,500	9,100	13,000
Max. Axial Force Taper Bearing / Max. Aksiyel Yük Masuralı Rulman	$F_{2aB}$	N	1~5	-	1,200	1,600	2,500	3,250	4,550	6,500
Service Life / Hizmet Ömrü	$L_H$	hr	10~50	S5 Döngüsel Çalışma : >30,000 (S1 Sürekli Çalışma : >15,000 hrs) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)						
Efficiency / Verim	$\eta$	%	10~50	90% ~ 94%						
Operating Temperature / Çalışma Sıcaklığı		°C	10~50	-30°C ~ +100°C						
Lubrication / Yağlama			10~50	Synthetic Oil / Sentetik Yağ						
Noise Level / Ses Seviyesi		dB	10~50	≤ 68	≤ 69	≤ 73	≤ 74	≤ 75	≤ 76	≤ 78

### Mass Moments of Inertia / Atalet Ağırlık Momenti (kgcm<sup>2</sup>)

Ratio / Çevrim	65	75	90	110	140	170	210
10	0.05	0.15	0.18	0.41	0.56	3.25	8.9
15	0.05	0.15	0.18	0.41	0.56	3.25	8.9
20	0.05	0.15	0.18	0.41	0.56	3.25	8.9
25	0.05	0.15	0.18	0.41	0.56	3.25	8.9
30	0.05	0.15	0.16	0.38	0.53	3.09	8.4
40	0.05	0.15	0.16	0.38	0.53	3.09	8.4
50	0.05	0.15	0.16	0.38	0.53	3.09	8.4

# ST-FO series / serileri

RATIO / ÇEVİRİM : 1.2.3.4.5 (1-Stage / Kademe)

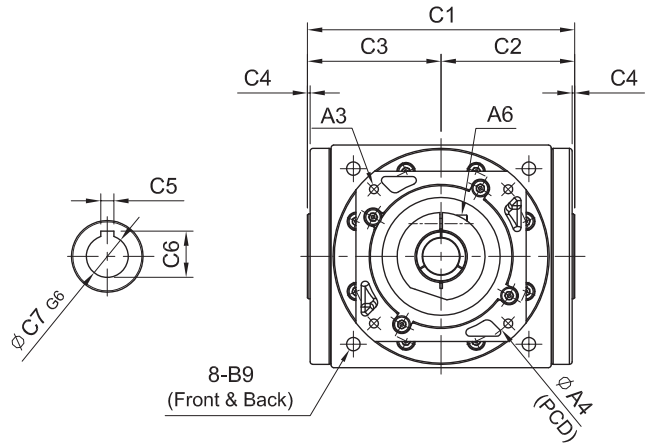
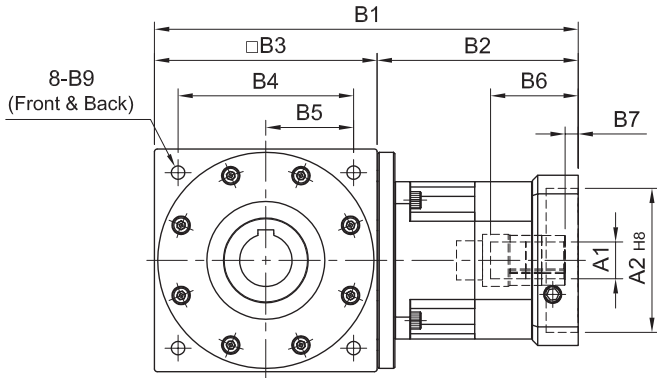
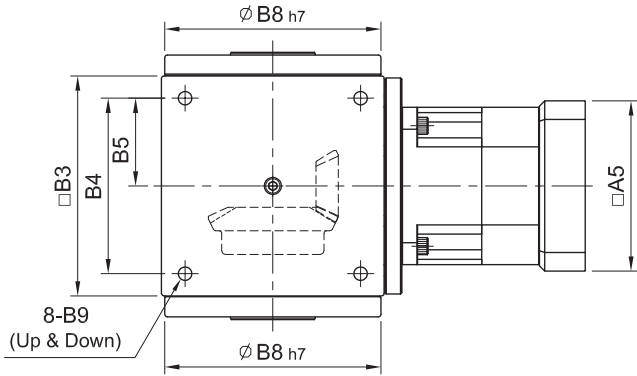
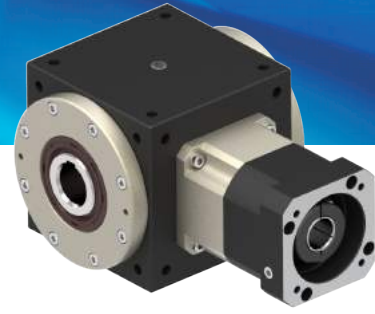


unit / birim: mm

Model Code	65	65(1:1)	75	90	110	140	170	210	
<b>A</b>	A1	14	14	14	19·24	22·24	28·32	35	38·42·48·55
	A2	50·60·70	50·60·70	50·60·70	70·80·95·110	70·80·95·110	95·110·130	110·130·180	114.3·180·230
	A3	M4·M5·M6	M4·M5·M6	M4·M5·M6	M5·M6·M8	M5·M6·M8	M6·M8·M10	M8·M10·M12	M10·M12·M16
	A4	70·75·90	70·75·90	70·75·90	90·100·115·145	90·100·115·145	115·145·165	145·165·200	200·215·265
	A5	64·70·80	64·70·80	64·70·80	92·110·130	92·110·130	122·130·150	146·150·190	182·200·250
	A6	M5 x P0.8	M5 x P0.8	M5 x P0.8	M6 x P1.0	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5
<b>B</b>	B1	110	110	115	148·162	177·191	224	274	357
	B2	45	45	40	58·72	67·81	84	104	147
	B3	65	65	75	90	110	140	170	210
	B4	52	52	60	72	88	110	134	170
	B5	26	26	30	36	44	55	67	85
	B6	36	36	36	51·65.5	51·65.5	68	84.5	117·119
	B7	7	7	7	9·23.5	9·23.5	10	9.5	14
	B8	62	64	73	88	106	135	164	205
B9	M5 x P0.8	M5 x P0.8	M6 x P1.0	M6 x P1.0	M8 x P1.25	M10 x P1.5	M12 x P1.75	M16 x P2.0	
<b>C</b>	C1	84	89	100	118	144	174	204	250
	C2	42	44.5	50	59	72	87	102	125
	C3	42	44.5	50	59	72	87	102	125
	C4	2	2	2	2	2	2	2	2
	C5	5	5	5	6	8	10	12	14
	C6	16.3	16.3	16.3	20.8	25.3	35.3	43.3	53.3
	C7	14	14	14	18	22	32	40	50
Weight / Ağırlık	1.7	1.7	2.4	4.3	7.1	14.9	24.5	46	

# ST-RO series / serileri

RATIO / ÇEVİRİM : 10.15.20.25.30.40.50 (2-Stage / Kademe)



unit / birim: mm

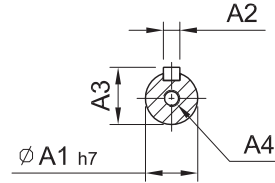
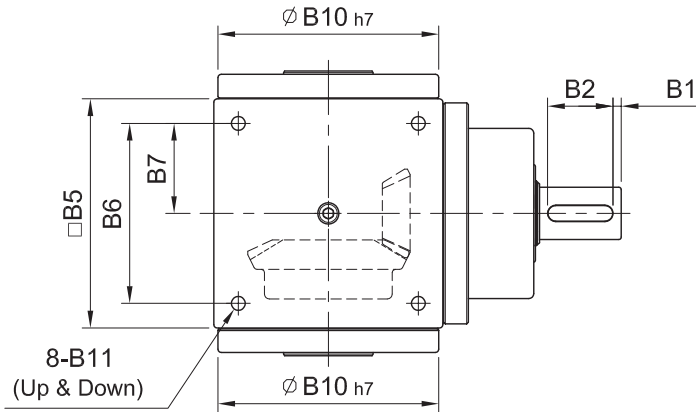
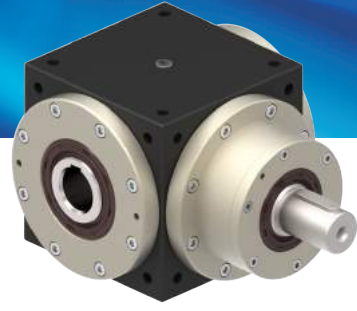
Model Code	65	75	90	110	140	170	210	
	<b>A</b>	A1 8 · 11	8 · 11	14	14	(14) · 19	19 · 24	28 · 32
A2	30 · 40 · 50	30 · 40 · 50	50 · 60 · 70	50 · 60 · 70	50 · 70 · 80 · 95	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180
A3	M3 · M4 · M5	M3 · M4 · M5	M4 · M5 · M6	M4 · M5 · M6	M5 · M6	M5 · M6 · M8	M6 · M8 · M10	M8 · M10 · M12
A4	46 · 60 · 63	46 · 60 · 63	70 · 75 · 90	70 · 75 · 90	70 · 90 · 100 · 115	90 · 100 · 115 · 145	115 · 145 · 165	145 · 165 · 200
A5	46 · 55	46 · 55	64 · 70 · 80	64 · 70 · 80	80 · 92 · 110	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190
A6	M4 x P0.7	M4 x P0.7	M5 x P0.8	M5 x P0.8	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5
<b>B</b>	B1 132	137	149	165	(191) · 203	260	313	394
B2	67	62	74	75	(81) · 93	120	143	184
B3	65	75	75	90	110	140	170	210
B4	52	60	60	72	88	110	134	170
B5	26	30	30	36	44	55	67	85
B6	26	26	33.5	33.5	(33.5) · 45.5	59	67	85
B7	5	5	6	6	(6) · 10	9	10	10
B8	62	73	73	88	106	135	164	205
B9	M5 x P0.8	M6 x P1.0	M6 x P1.0	M6 x P1.0	M8 x P1.25	M10 x P1.5	M12 x P1.75	M16 x P2.0
<b>C</b>	C1 84	100	100	118	144	174	204	250
C2	42	50	50	59	72	87	102	125
C3	42	50	50	59	72	87	102	125
C4	2	2	2	2	2	2	2	2
C5	5	5	5	6	8	10	12	14
C6	16.3	16.3	16.3	20.8	25.3	35.3	43.3	53.3
C7	14	14	14	18	22	32	40	50

Weight / Ağırlık

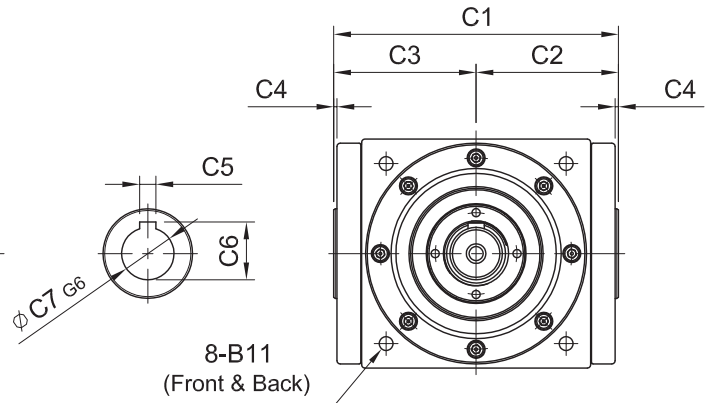
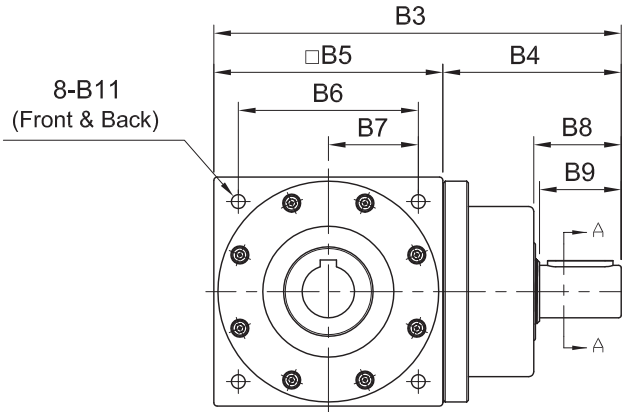
1.9    3.6    3.4    4.8    8.5    14.2    24    52

# ST-DO series / serileri

RATIO / ÇEVİRİM : 1.2.3.4.5 (1-Stage / Kademe)



A-A SECTION

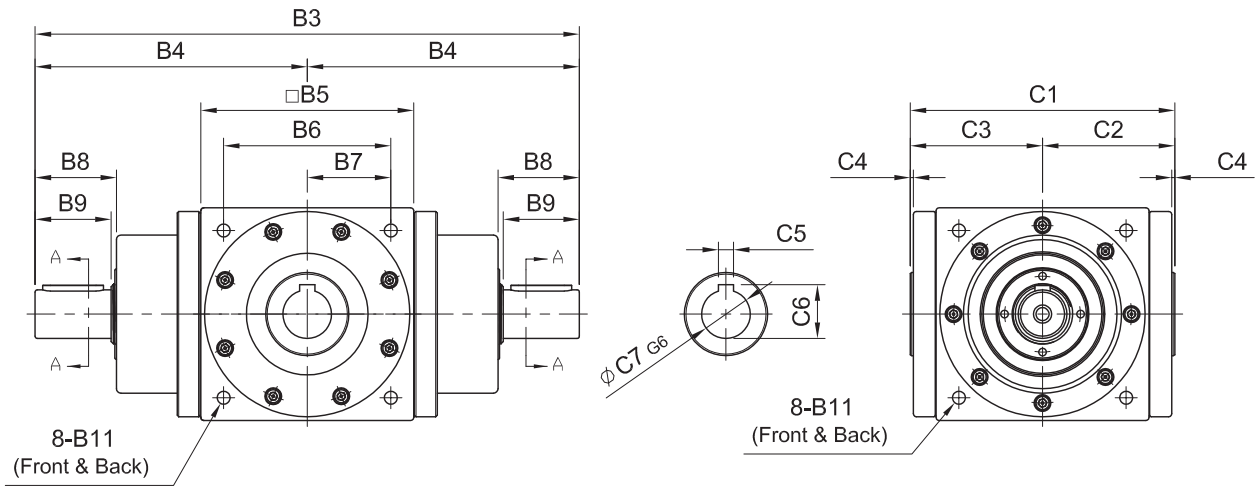
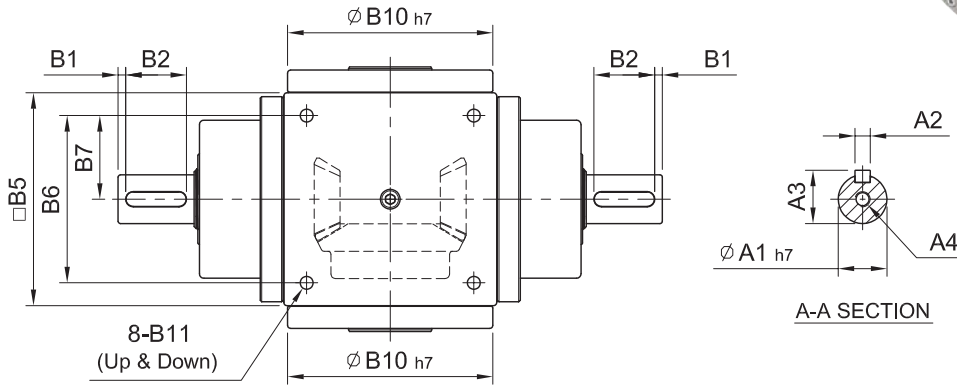
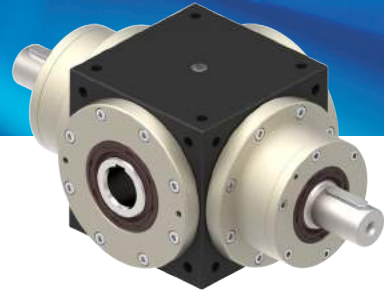


unit / birim: mm

Model Code	65	65(1:1)	75	90	110	140	170	210
	<b>A</b>							
A1	14	14	16	18	22	32	40	50
A2	5	5	5	6	6	10	12	14
A3	16	16	18	20.5	24.5	35	43	53.5
A4	M5 x P0.8	M5 x P0.8	M5 x P0.8	M8 x P1.25	M8 x P1.25	M10 x P1.5	M12 x P1.75	M12 x P1.75
<b>B</b>								
B1	2.5	2.5	2.5	5	5	5	5	5
B2	15	15	25	25	30	40	50	65
B3	127.5	127.5	145.5	168.5	207	250	300	375
B4	62.5	62.5	67.5	78.5	97	110	130	165
B5	65	65	75	90	110	140	170	210
B6	52	52	60	72	88	110	134	170
B7	26	26	30	36	44	55	67	85
B8	22	22	32	38	43	53.5	64	77
B9	20	20	30	35	40	50	60	75
B10	62	64	73	88	106	135	164	205
B11	M5 x P0.8	M5 x P0.8	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M12 x P1.75	M16 x P2.0
<b>C</b>								
C1	84	89	100	118	144	174	204	250
C2	42	44.5	50	59	72	87	102	125
C3	42	44.5	50	59	72	87	102	125
C4	2	2	2	2	2	2	2	2
C5	5	5	5	6	8	10	12	14
C6	16.3	16.3	16.3	20.8	25.3	35.3	43.3	53.3
C7	14	14	14	18	22	32	40	50
Weight / Ağırlık	2.1	2.1	2.8	4.9	9	15.5	25	53

# ST-YO series / serileri

RATIO / ÇEVİRİM : 1.2.3.4.5 (1-Stage / Kademe)

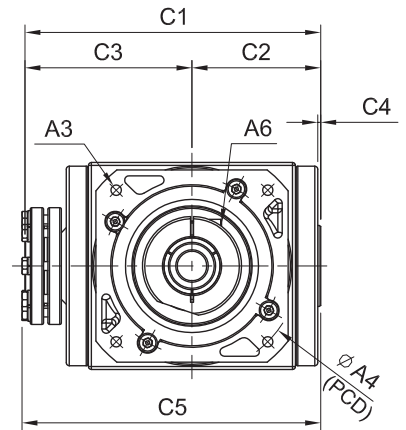
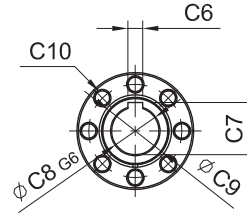
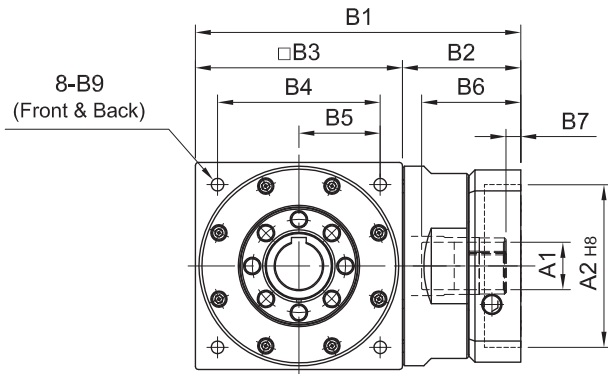
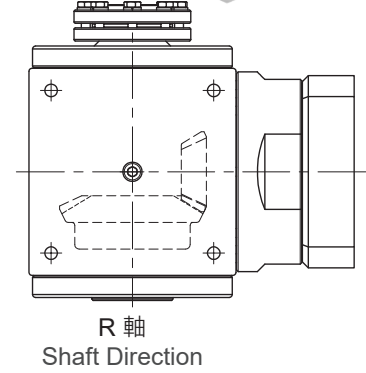
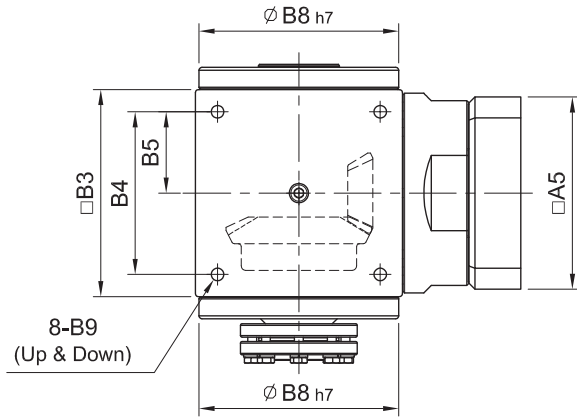
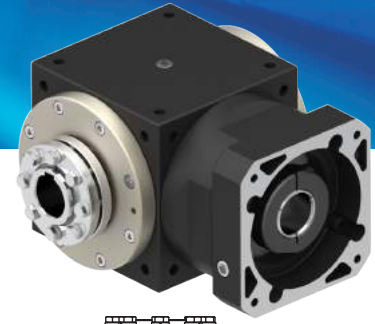


unit / birim: mm

Model Code	65	65(1:1)	75	90	110	140	170	210
	<b>A</b>							
A1	14	14	16	18	22	32	40	50
A2	5	5	5	6	6	10	12	14
A3	16	16	18	20.5	24.5	35	43	53.5
A4	M5 x P0.8	M5 x P0.8	M5 x P0.8	M8 x P1.25	M8 x P1.25	M10 x P1.5	M12 x P1.75	M12 x P1.75
<b>B</b>								
B1	2.5	2.5	2.5	5	5	5	5	5
B2	15	15	25	25	30	40	50	65
B3	190	190	210	247	304	360	430	540
B4	95	95	105	123.5	152	180	215	270
B5	65	65	75	90	110	140	170	210
B6	52	52	60	72	88	110	134	170
B7	26	26	30	36	44	55	67	85
B8	22	22	32	38	43	53.5	64	77
B9	20	20	30	35	40	50	60	75
B10	62	64	73	88	106	135	164	205
B11	M5 x P0.8	M5 x P0.8	M6 x P1.0	M6 x P1.0	M8 x P1.25	M10 x P1.5	M12 x P1.75	M16 x P2.0
<b>C</b>								
C1	84	89	100	118	144	174	204	250
C2	42	44.5	50	59	72	87	102	125
C3	42	44.5	50	59	72	87	102	125
C4	2	2	2	2	2	2	2	2
C5	5	5	5	6	8	10	12	14
C6	16.3	16.3	16.3	20.8	25.3	35.3	43.3	53.3
C7	14	14	14	18	22	32	40	50
Weight / Ağırlık	2.85	2.85	3.6	6.2	11.5	18	28	57

# ST-FN series / serileri

RATIO / ÇEVİRİM : 1.2.3.4.5 (1-Stage / Kademe)

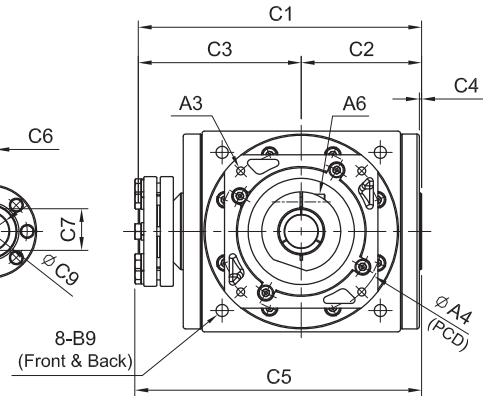
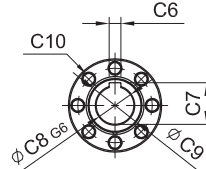
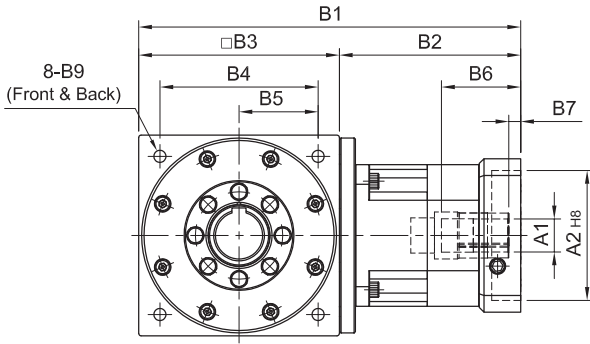
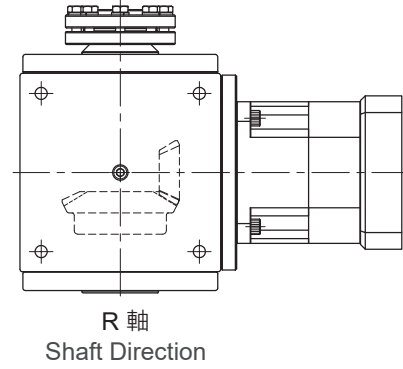
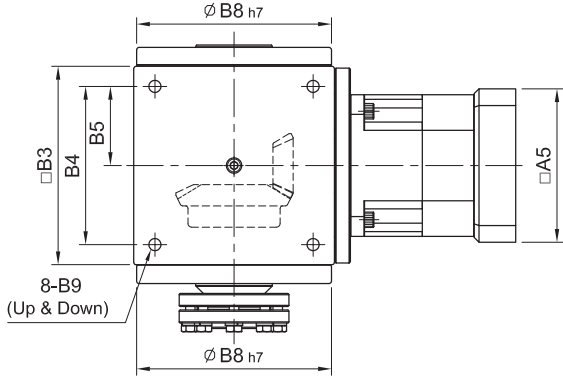
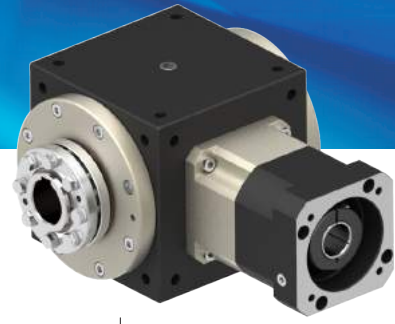


unit / birim: mm

Model Code	65	65(1:1)	75	90	110	140	170	210	
<b>A</b>	A1	14	14	14	19·24	22·24	28·32	35	38·42·48·55
	A2	50·60·70	50·60·70	50·60·70	70·80·95·110	70·80·95·110	95·110·130	110·130·180	114.3·180·230
	A3	M4·M5·M6	M4·M5·M6	M4·M5·M6	M5·M6·M8	M5·M6·M8	M6·M8·M10	M8·M10·M12	M10·M12·M16
	A4	70·75·90	70·75·90	70·75·90	90·100·115·145	90·100·115·145	115·145·165	145·165·200	200·215·265
	A5	64·70·80	64·70·80	64·70·80	92·110·130	92·110·130	122·130·150	146·150·190	182·200·250
	A6	M5 x P0.8	M5 x P0.8	M5 x P0.8	M6 x P1.0	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5
<b>B</b>	B1	110	110	115	148·162	177·191	224	274	357
	B2	45	45	40	58·72	67·81	84	104	147
	B3	65	65	75	90	110	140	170	210
	B4	52	52	60	72	88	110	134	170
	B5	26	26	30	36	44	55	67	85
	B6	36	36	36	51·65.5	51·65.5	68	84.5	117
	B7	7	7	7	9·23.5	9·23.5	10	9.5	14
	B8	62	64	73	88	106	135	164	205
	B9	M5 x P0.8	M5 x P0.8	M6 x P1.0	M6 x P1.0	M8 x P1.25	M10 x P1.5	M12 x P1.75	M16 x P2.0
<b>C</b>	C1	104	109	120	138	169	202	240	285
	C2	42	44.5	50	59	72	87	102	125
	C3	62	64.5	70	79	97	115	138	160
	C4	2	2	2	2	2	2	2	2
	C5	110	113	124	142	171	202	242	288
	C6	5	5	5	6	8	10	12	14
	C7	16.3	16.3	16.3	20.8	25.3	35.3	43.3	53.3
	C8	14	14	14	18	22	32	40	50
	C9	22	22	22	28	34	44	52	65
	C10	6-M6	6-M6	6-M6	6-M6	8-M6	8-M6	8-M8	8-M8
Weight / Ağırlık	1.7	1.7	2.4	4.3	7.1	14.9	24.5	46	

# ST-RN series / serileri

RATIO / ÇEVİRİM : 10.15.20.25.30.40.50 (2-Stage / Kademe)

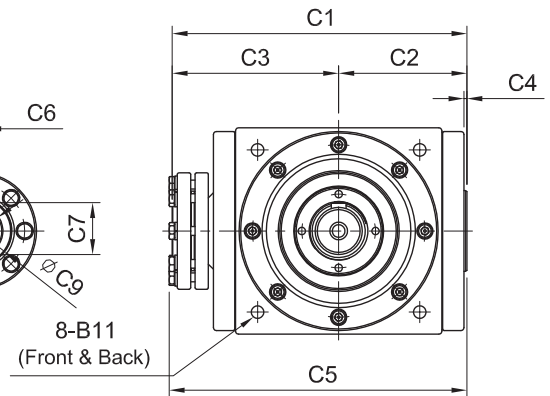
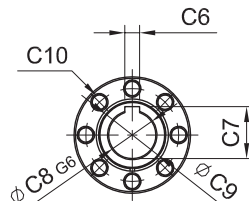
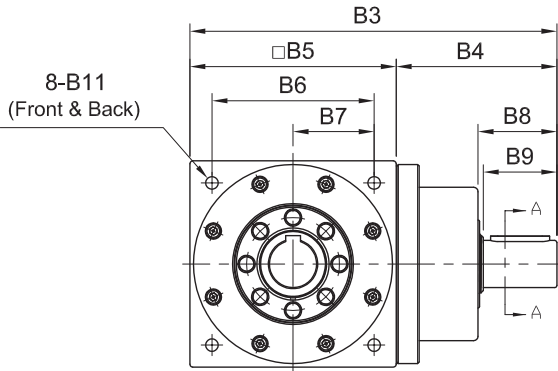
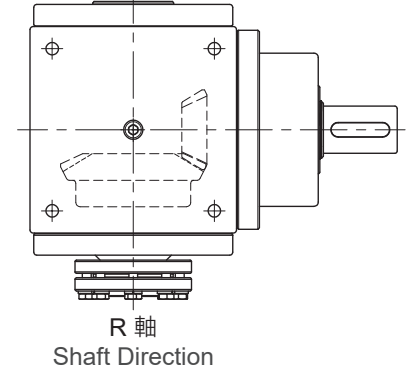
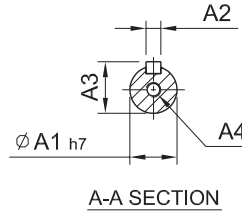
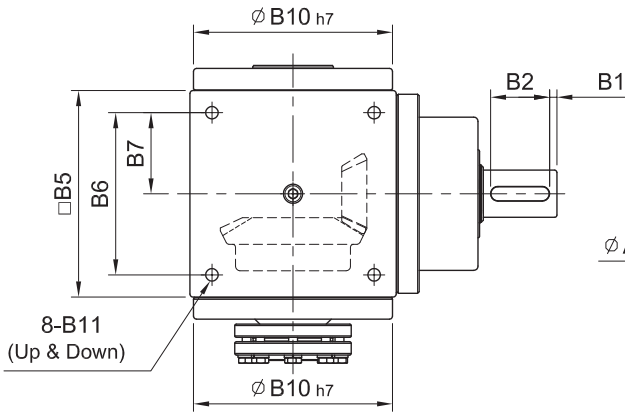
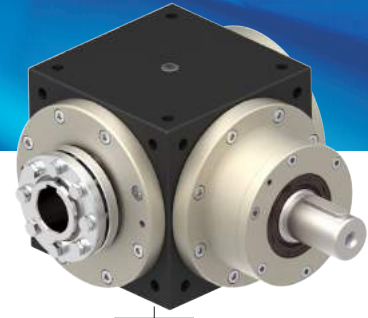


unit / birim: mm

Model Code	65	75	90	110	140	170	210		
<b>A</b>	A1	8 · 11	8 · 11	14	14	(14) · 19	19 · 24	28 · 32	35
	A2	30 · 40 · 50	30 · 40 · 50	50 · 60 · 70	50 · 60 · 70	50 · 70 · 80 · 95	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180
	A3	M3 · M4 · M5	M3 · M4 · M5	M4 · M5 · M6	M4 · M5 · M6	M5 · M6	M5 · M6 · M8	M6 · M8 · M10	M8 · M10 · M12
	A4	46 · 60 · 63	46 · 60 · 63	70 · 75 · 90	70 · 75 · 90	70 · 90 · 100 · 115	90 · 100 · 115 · 145	115 · 145 · 165	145 · 165 · 200
	A5	46 · 55	46 · 55	64 · 70 · 80	64 · 70 · 80	80 · 92 · 110	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190
	A6	M4 x P0.7	M4 x P0.7	M5 x P0.8	M5 x P0.8	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5
<b>B</b>	B1	132	137	149	165	(191) · 203	260	313	394
	B2	67	62	74	75	(81) · 93	120	143	184
	B3	65	75	75	90	110	140	170	210
	B4	52	60	60	72	88	110	134	170
	B5	26	30	30	36	44	55	67	85
	B6	26	26	33.5	33.5	(33.5) · 45.5	59	67	85
	B7	5	5	6	6	(6) · 10	9	10	10
	B8	62	73	73	88	106	135	164	205
	B9	M5 x P0.8	M6 x P1.0	M6 x P1.0	M6 x P1.0	M8 x P1.25	M10 x P1.5	M12 x P1.75	M16 x P2.0
<b>C</b>	C1	104	120	120	138	169	200	240	285
	C2	42	50	50	59	72	87	102	125
	C3	62	70	70	79	97	113	138	160
	C4	2	2	2	2	2	2	2	2
	C5	118	124	124	142	171	202	242	288
	C6	5	5	5	6	8	10	12	14
	C7	16.3	16.3	16.3	20.8	25.3	35.3	43.3	53.3
	C8	14	14	14	18	22	32	40	50
	C9	22	22	22	28	34	44	52	65
	C10	6-M6	6-M6	6-M6	6-M6	8-M6	8-M6	8-M8	8-M8
Weight / Ağırlık	1.9	3.6	3.4	4.8	8.5	14.2	24	52	

# ST-DN series / serileri

RATIO / ÇEVİRİM : 1.2.3.4.5 (1-Stage / Kademe)

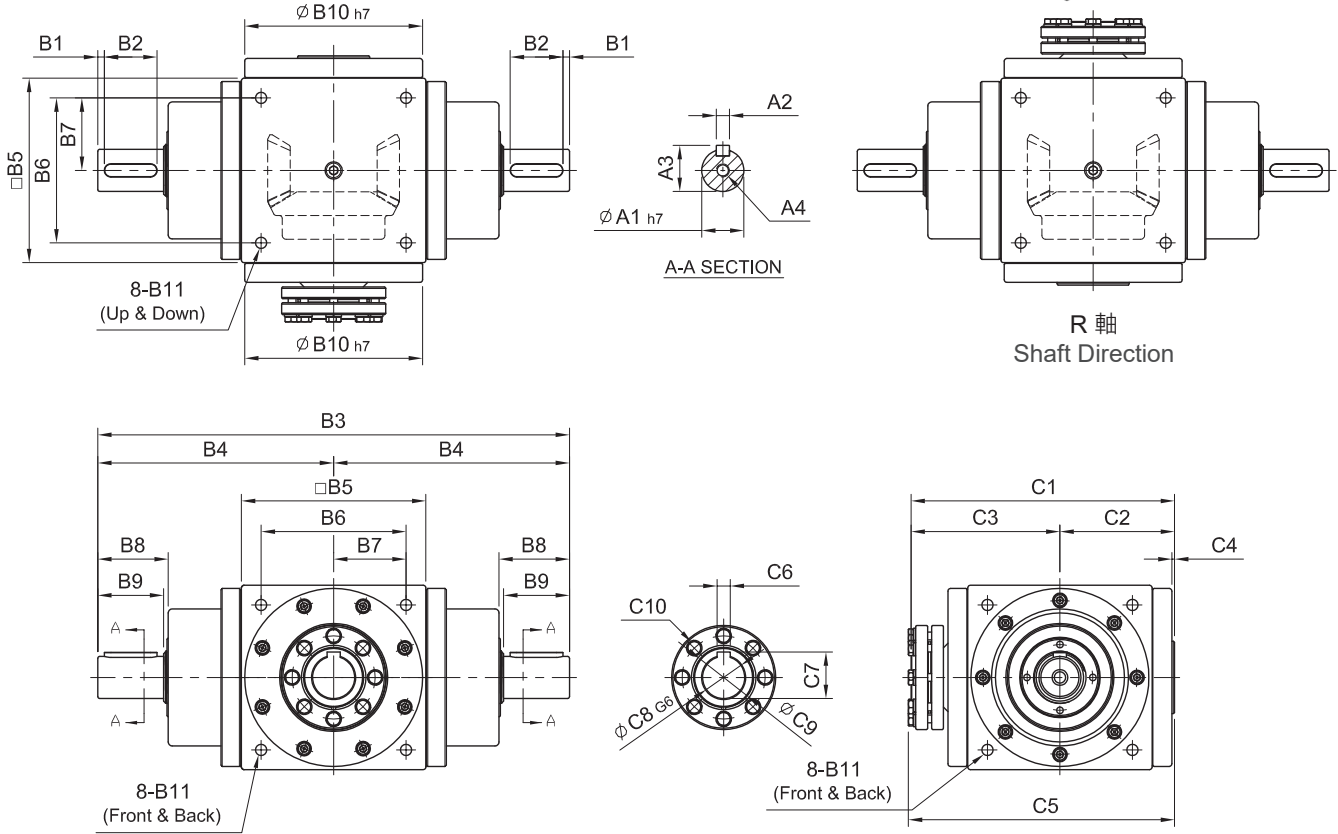
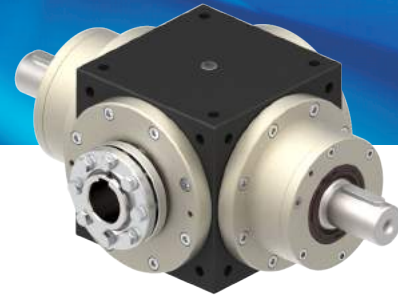


unit / birim: mm

Model Code	65	65(1:1)	75	90	110	140	170	210	
<b>A</b>	A1	14	14	16	18	22	32	40	50
	A2	5	5	5	6	6	10	12	14
	A3	16	16	18	20.5	24.5	35	43	53.5
	A4	M5 x P0.8	M5 x P0.8	M5 x P0.8	M8 x P1.25	M8 x P1.25	M10 x P1.5	M12 x P1.75	M12 x P1.75
<b>B</b>	B1	2.5	2.5	2.5	5	5	5	5	5
	B2	15	15	25	25	30	40	50	65
	B3	127.5	127.5	145.5	168.5	207	250	300	375
	B4	62.5	62.5	67.5	78.5	97	110	130	165
	B5	65	65	75	90	110	140	170	210
	B6	52	52	60	72	88	110	134	170
	B7	26	26	30	36	44	55	67	85
	B8	22	22	32	38	43	53.5	64	77
	B9	20	20	30	35	40	50	60	75
	B10	62	64	73	88	106	135	164	205
B11	M5 x P0.8	M5 x P0.8	M6 x P1.0	M6 x P1.0	M8 x P1.25	M10 x P1.5	M12 x P1.75	M16 x P2.0	
<b>C</b>	C1	104	109	120	138	169	202	240	285
	C2	42	44.5	50	59	72	87	102	125
	C3	62	64.5	70	79	97	115	138	160
	C4	2	2	2	2	2	2	2	2
	C5	110	113	124	142	171	202	242	288
	C6	5	5	5	6	8	10	12	14
	C7	16.3	16.3	16.3	20.8	25.3	35.3	43.3	53.3
	C8	14	14	14	18	22	32	40	50
	C9	22	22	22	28	34	44	52	65
	C10	6-M6	6-M6	6-M6	6-M6	8-M6	8-M6	8-M8	8-M8
Weight / Ağırlık	2.1	2.1	2.8	4.9	8.59	15.5	25	53	

# ST-YN series / serileri

RATIO / ÇEVİRİM : 1.2.3.4.5 (1-Stage / Kademe)

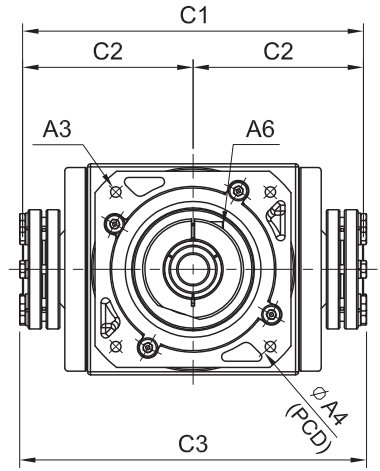
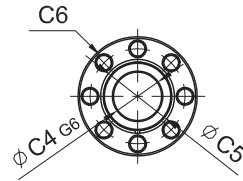
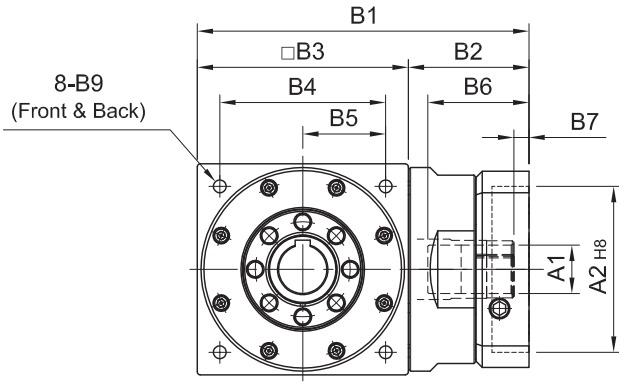
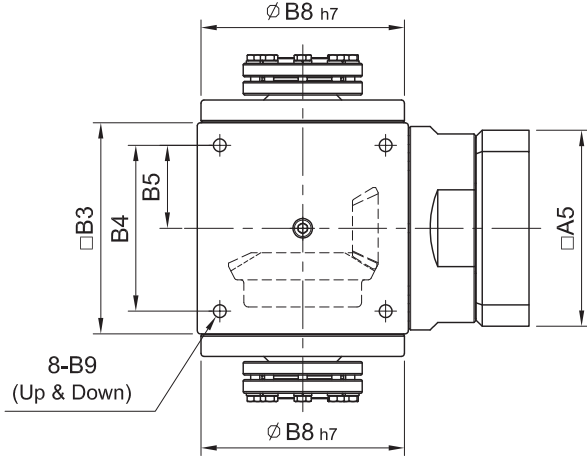


unit / birim: mm

Model Code	65	65(1:1)	75	90	110	140	170	210	
<b>A</b>	A1	14	14	16	18	22	32	40	50
	A2	5	5	5	6	6	10	12	14
	A3	16	16	18	20.5	24.5	35	43	53.5
	A4	M5 x P0.8	M5 x P0.8	M5 x P0.8	M8 x P1.25	M8 x P1.25	M10 x P1.5	M12 x P1.75	M12 x P1.75
<b>B</b>	B1	2.5	2.5	2.5	5	5	5	5	5
	B2	15	15	25	25	30	40	50	65
	B3	190	190	210	247	304	360	430	540
	B4	95	95	105	123.5	152	180	215	270
	B5	65	65	75	90	110	140	170	210
	B6	52	52	60	72	88	110	134	170
	B7	26	26	30	36	44	55	67	85
	B8	22	22	32	38	43	53.5	64	77
	B9	20	20	30	35	40	50	60	75
	B10	62	64	73	88	106	135	164	205
B11	M5 x P0.8	M5 x P0.8	M6 x P1.0	M6 x P1.0	M8 x P1.25	M10 x P1.5	M12 x P1.75	M16 x P2.0	
<b>C</b>	C1	104	109	120	138	169	200	240	285
	C2	42	44.5	50	59	72	87	102	125
	C3	62	64.5	70	79	97	113	138	160
	C4	2	2	2	2	2	2	2	2
	C5	110	113	124	142	171	202	242	288
	C6	5	5	5	6	8	10	12	14
	C7	16.3	16.3	16.3	20.8	25.3	35.3	43.3	53.3
	C8	14	14	14	18	22	32	40	50
	C9	22	22	22	28	34	44	52	65
	C10	6-M6	6-M6	6-M6	6-M6	8-M6	8-M6	8-M8	8-M8
Weight / Ağırlık	2.85	2.85	3.6	6.2	11.5	18	28	57	

# ST-FM series / serileri

RATIO / ÇEVİRİM : 1.2.3.4.5 (1-Stage / Kademe)

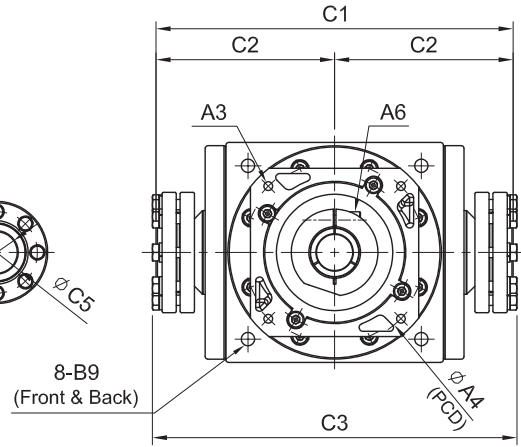
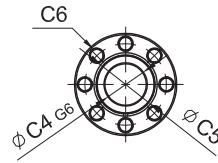
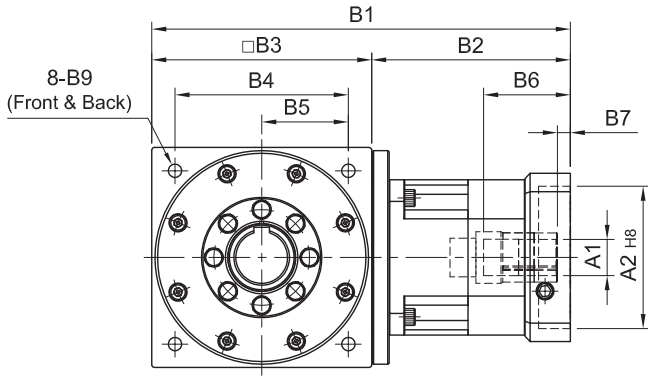
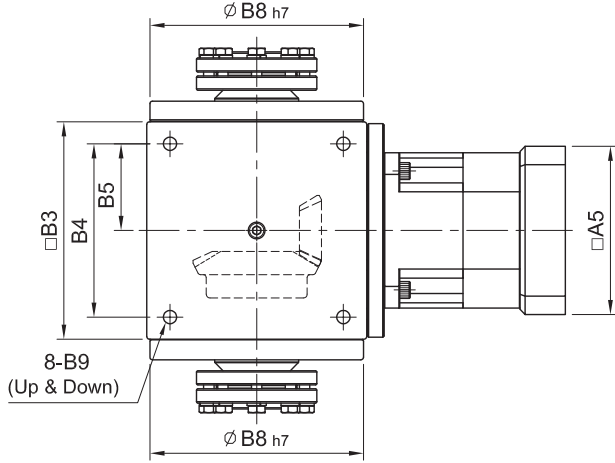


unit / birim: mm

Model Code	65	65(1:1)	75	90	110	140	170	210	
	<b>A</b>	A1	14	14	14	19·24	22·24	28·32	35
	A2	50·60·70	50·60·70	50·60·70	70·80·95·110	70·80·95·110	95·110·130	110·130·180	114.3·180·230
	A3	M4·M5·M6	M4·M5·M6	M4·M5·M6	M5·M6·M8	M5·M6·M8	M6·M8·M10	M8·M10·M12	M10·M12·M16
	A4	70·75·90	70·75·90	70·75·90	90·100·115·145	90·100·115·145	115·145·165	145·165·200	200·215·265
	A5	64·70·80	64·70·80	64·70·80	92·110·130	92·110·130	122·130·150	146·150·190	182·200·250
	A6	M5 x P0.8	M5 x P0.8	M5 x P0.8	M6 x P1.0	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5
<b>B</b>	B1	110	110	115	148·162	177·191	224	274	357
	B2	45	45	40	58·72	67·81	84	104	147
	B3	65	65	75	90	110	140	170	210
	B4	52	52	60	72	88	110	134	170
	B5	26	26	30	36	44	55	67	85
	B6	36	36	37	51·65.5	51·65.5	68	84.5	117
	B7	7	7	7	9·23.5	9·23.5	10	9.5	14
	B8	62	64	73	88	106	135	164	205
	B9	M5 x P0.8	M5 x P0.8	M6 x P1.0	M6 x P1.0	M8 x P1.25	M10 x P1.5	M12 x P1.75	M16 x P2.0
<b>C</b>	C1	124	129	140	158	194	230	276	320
	C2	62	64.5	70	79	97	115	138	160
	C3	136	138	150	166	198	232	280	327
	C4	14	14	14	18	22	32	40	50
	C5	22	22	22	28	34	44	52	65
	C6	6-M6	6-M6	6-M6	6-M6	8-M6	8-M6	8-M8	8-M8
Weight / Ağırlık		1.7	1.7	2.4	4.3	7.1	14.9	24.5	46

# ST-RM series / serileri

RATIO / ÇEVİRİM : 10.15.20.25.30.40.50 (2-Stage / Kademe)

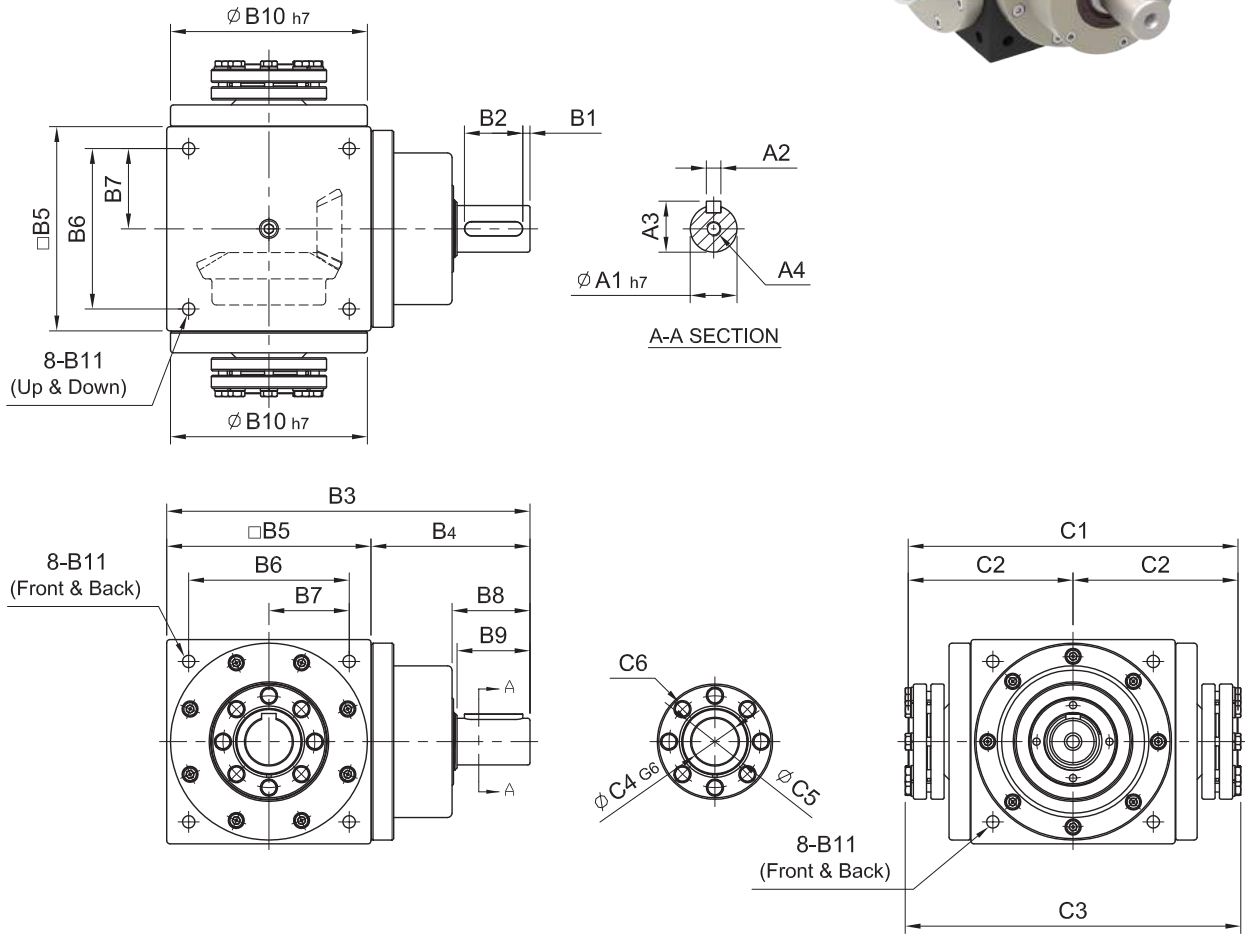


unit / birim: mm

	Model Code	65	75		90	110	140	170	210
	<b>A</b>	A1	8 · 11	8 · 11	14	14	(14) · 19	19 · 24	28 · 32
A2		30 · 40 · 50	30 · 40 · 50	50 · 60 · 70	50 · 60 · 70	50 · 70 · 80 · 95	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180
A3		M3 · M4 · M5	M3 · M4 · M5	M4 · M5 · M6	M4 · M5 · M6	M5 · M6	M5 · M6 · M8	M6 · M8 · M10	M8 · M10 · M12
A4		46 · 60 · 63	46 · 60 · 63	70 · 75 · 90	70 · 75 · 90	70 · 90 · 100 · 115	90 · 100 · 115 · 145	115 · 145 · 165	145 · 165 · 200
A5		46 · 55	46 · 55	64 · 70 · 80	64 · 70 · 80	80 · 92 · 110	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190
A6		M4 x P0.7	M4 x P0.7	M5 x P0.8	M5 x P0.8	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5
<b>B</b>	B1	132	137	137	165	(191) · 203	260	313	394
	B2	67	62	62	75	(81) · 93	120	143	184
	B3	65	75	75	90	110	140	170	210
	B4	52	60	60	72	88	110	134	170
	B5	26	30	30	36	44	55	67	85
	B6	26	26	26	33.5	(33.5) · 45.5	59	67	85
	B7	5	5	5	6	(6) · 10	9	10	10
	B8	62	73	73	88	106	135	164	205
<b>C</b>	B9	M5 x P0.8	M6 x P1.0	M6 x P1.0	M6 x P1.0	M8 x P1.25	M10 x P1.5	M12 x P1.75	M16 x P2.0
	C1	124	140	140	158	194	230	276	320
	C2	62	70	70	79	97	115	138	160
	C3	136	150	150	166	198	232	280	327
	C4	14	14	14	18	22	32	40	50
	C5	22	22	22	28	34	44	52	65
C6	6-M6	6-M6	6-M6	6-M6	8-M6	8-M6	8-M8	8-M8	
Weight / Ağırlık		1.9	3.6	3.4	4.8	8.5	14.2	24	52

# ST-DM series / serileri

RATIO / ÇEVİRİM : 1.2.3.4.5 (1-Stage / Kademe)

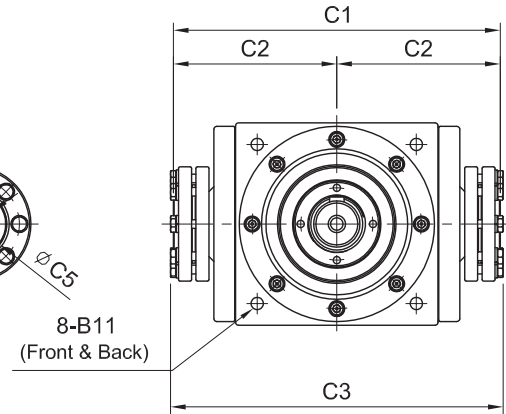
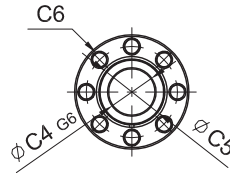
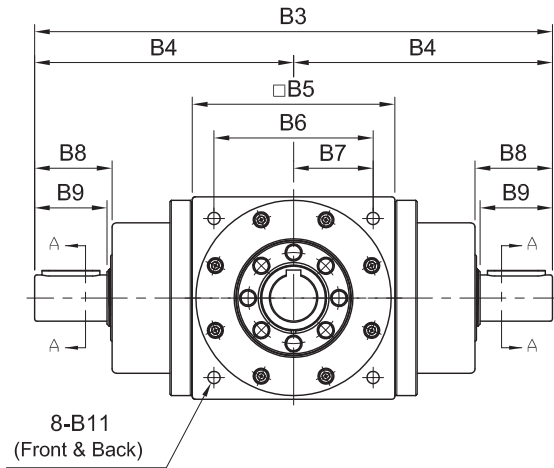
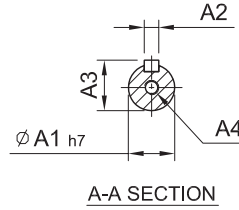
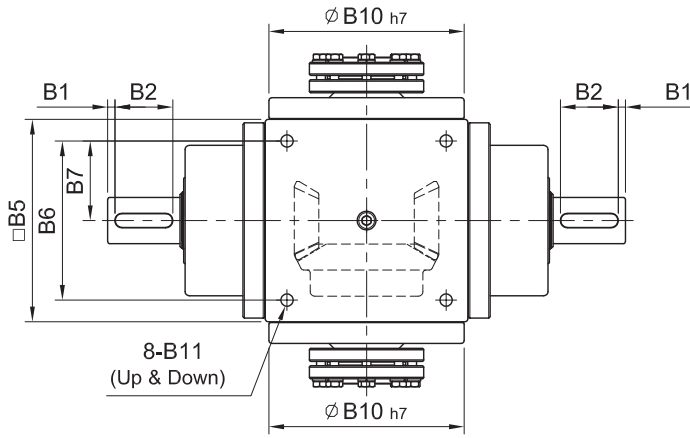


unit / birim: mm

Model Code	65	65(1:1)	75	90	110	140	170	210
	<b>A</b>							
A1	14	14	16	18	22	32	40	50
A2	5	5	5	6	6	10	12	14
A3	16	16	18	20.5	24.5	35	43	53.5
A4	M5 x P0.8	M5 x P0.8	M5 x P0.8	M8 x P1.25	M8 x P1.25	M10 x P1.5	M12 x P1.75	M12 x P1.75
<b>B</b>								
B1	2.5	2.5	2.5	5	5	5	5	5
B2	15	15	25	25	30	40	50	65
B3	127.5	127.5	142.5	168.5	207	250	300	375
B4	62.5	62.5	67.5	78.5	97	110	130	165
B5	65	65	75	90	110	140	170	210
B6	52	52	60	72	88	110	134	170
B7	26	26	30	36	44	55	67	85
B8	22	22	32	38	43	53.5	64	77
B9	20	20	30	35	40	50	60	75
B10	62	64	73	88	106	135	164	205
B11	M5 x P0.8	M5 x P0.8	M6 x P1.0	M6 x P1.0	M8 x P1.25	M10 x P1.5	M12 x P1.75	M16 x P2.0
<b>C</b>								
C1	124	129	140	158	194	230	276	320
C2	62	64.5	70	79	97	115	138	160
C3	136	138	150	166	198	232	280	327
C4	14	14	14	18	22	32	40	50
C5	22	22	22	28	34	44	52	65
C6	6-M6	6-M6	6-M6	6-M6	8-M6	8-M6	8-M8	8-M8
Weight / Ağırlık	2.1	2.1	2.8	4.9	8.59	15.5	25	53

# ST-YM series / serileri

RATIO / ÇEVİRİM : 1.2.3.4.5 (1-Stage / Kademe)

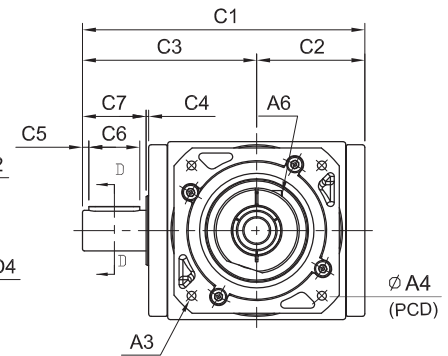
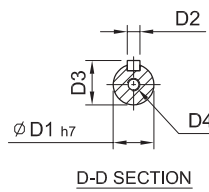
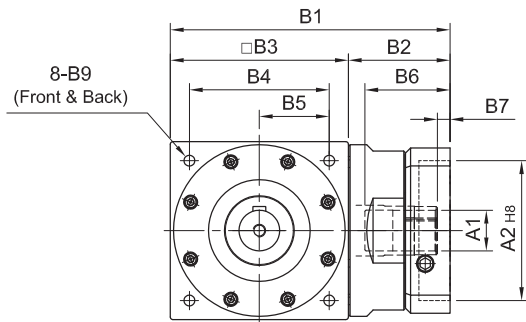
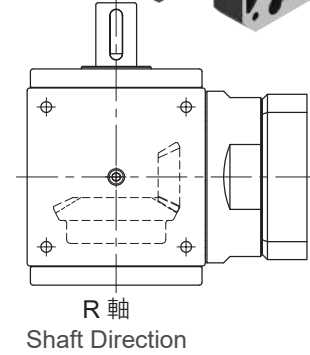
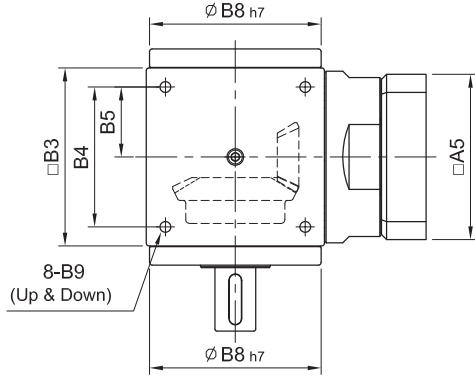
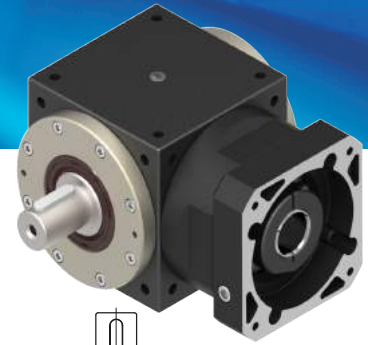


unit / birim: mm

Model Code	65	65(1:1)	75	90	110	140	170	210
	<b>A</b>							
A1	14	14	16	18	22	32	40	50
A2	5	5	5	6	6	10	12	14
A3	16	16	18	20.5	24.5	35	43	53.5
A4	M5 x P0.8	M5 x P0.8	M5 x P0.8	M8 x P1.25	M8 x P1.25	M10 x P1.5	M12 x P1.75	M12 x P1.75
<b>B</b>								
B1	2.5	2.5	2.5	5	5	5	5	5
B2	15	15	25	25	30	40	50	65
B3	190	190	210	247	304	360	430	540
B4	95	95	95	123.5	152	180	215	270
B5	65	65	75	90	110	140	170	210
B6	52	52	60	72	88	110	134	170
B7	26	26	30	36	44	55	67	85
B8	22	22	32	38	43	53.5	64	77
B9	20	20	30	35	40	50	60	75
B10	62	64	73	88	106	135	164	205
B11	M5 x P0.8	M5 x P0.8	M6 x P1.0	M6 x P1.0	M8 x P1.25	M10 x P1.5	M12 x P1.75	M16 x P2.0
<b>C</b>								
C1	124	129	140	158	194	230	276	320
C2	62	64.5	70	79	97	115	138	160
C3	136	138	150	166	198	232	280	327
C4	14	14	14	18	22	32	40	50
C5	22	22	22	28	34	44	52	65
C6	6-M6	6-M6	6-M6	6-M6	8-M6	8-M6	8-M8	8-M8
Weight / Ağırlık	2.85	2.85	3.6	6.2	11.5	18	28	57

# ST-FS series / serileri

RATIO / ÇEVİRİM : 1.2.3.4.5 (1-Stage / Kademe)

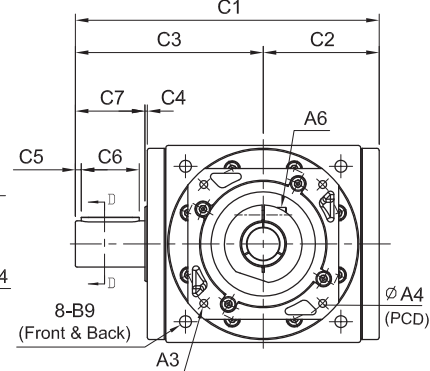
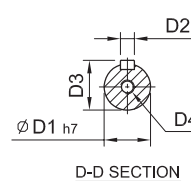
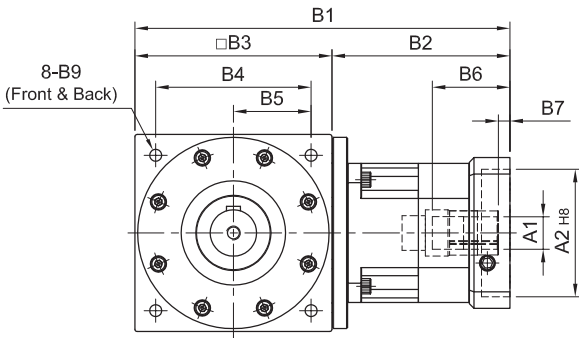
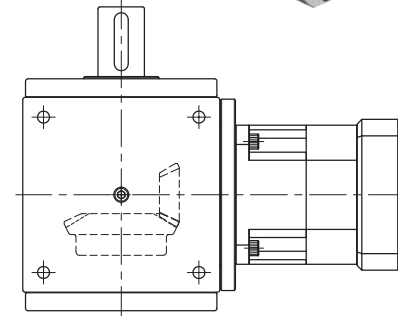
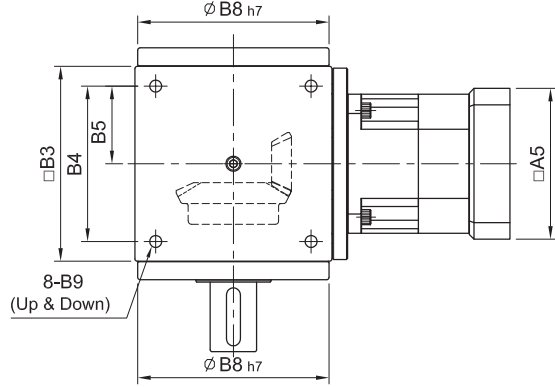
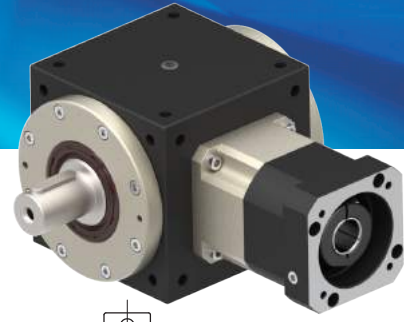


unit / birim: mm

	Model Code	65	65(1:1)	75	90	110	140	170	210
		<b>A</b>	A1	14	14	14	19·24	22·24	28·32
	A2	50·60·70	50·60·70	50·60·70	70·80·95·110	70·80·95·110	95,110,130	110,130,180	114.3·180·230
	A3	M4·M5·M6	M4·M5·M6	M4·M5·M6	M5·M6·M8	M5·M6·M8	M6·M8·M10	M8·M10·M12	M10·M12·M16
	A4	70·75·90	70·75·90	70·75·90	90·100·115·145	90·100·115·145	115·145·165	145·165·200	200·215·265
	A5	64·70·80	64·70·80	64·70·80	92·110·130	92·110·130	122·130·150	146·150·190	182·200·250
	A6	M5 x P0.8	M5 x P0.8	M5 x P0.8	M6 x P1.0	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5
<b>B</b>	B1	110	110	115	148·162	177·191	224	274	357
	B2	45	45	40	58·72	67·81	84	104	147
	B3	65	65	75	90	110	140	170	210
	B4	52	52	60	72	88	110	134	170
	B5	26	26	30	36	44	55	67	85
	B6	36	36	36	51·65.5	51·65.5	67	84.5	117
	B7	7	7	7	9·23.5	9·23.5	10	9.5	14
	B8	62	64	73	88	106	135	164	205
	B9	M5 x P0.8	M5 x P0.8	M6 x P1.0	M6 x P1.0	M8 x P1.25	M10 x P1.5	M12 x P1.75	M16 x P2.0
<b>C</b>	C1	102	107	128	151	182	222	262	323
	C2	40	42.5	48	57	70	85	100	123
	C3	62	64.5	80	94	112	137	162	200
	C4	2	2	2	2	2	2	2	2
	C5	2.5	2.5	2.5	5	5	5	5	5
	C6	15	15	25	25	30	40	50	65
	C7	20	20	32	35	40	50	60	75
<b>D</b>	D1	14	14	16	18	22	32	40	50
	D2	5	5	5	6	6	10	12	14
	D3	16	16	18	20.5	24.5	35	43	53.5
	D4	M5 x P0.8	M5 x P0.8	M5 x P0.8	M8 x P1.25	M8 x P1.25	M10 x P1.5	M12 x P1.75	M12 x P1.75
Weight / Ağırlık		1.7	1.7	2.4	4.3	7.1	14.9	24.5	46

# ST-RS series / serileri

RATIO / ÇEVİRİM : 10.15.20.25.30.40.50 (2-Stage / Kademe)

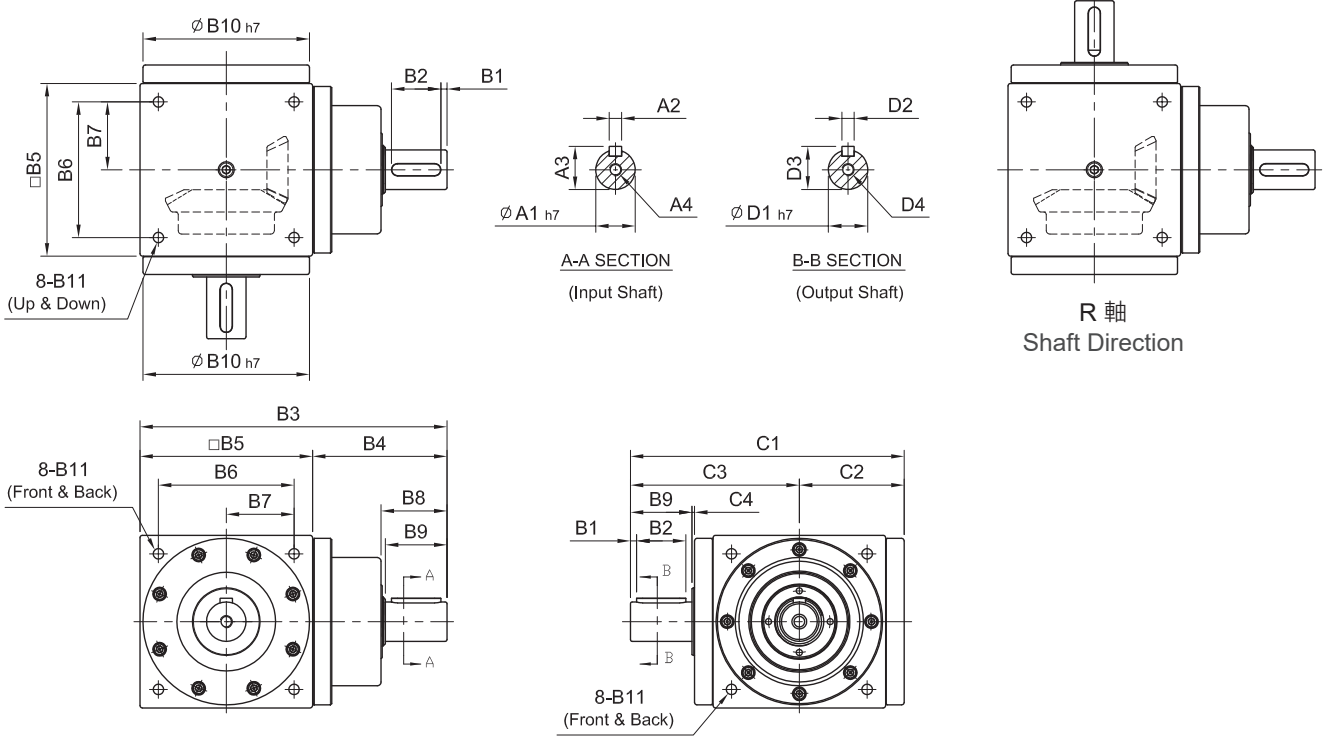
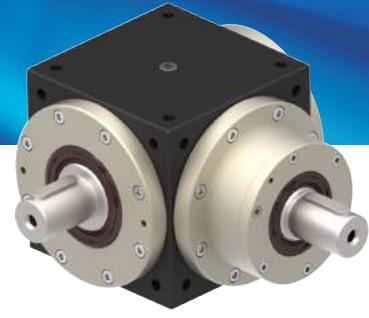


unit / birim: mm

Model Code	65	75	90	110	140	170	210	
	<b>A</b>	A1: 8 · 11 A2: 30 · 40 · 50 A3: M3 · M4 · M5 A4: 46 · 60 · 63 A5: 46 · 55 A6: M4 x P0.7	A1: 8 · 11 A2: 30 · 40 · 50 A3: M3 · M4 · M5 A4: 46 · 60 · 63 A5: 46 · 55 A6: M4 x P0.7	A1: 14 A2: 50 · 60 · 70 A3: M4 · M5 · M6 A4: 70 · 75 · 90 A5: 64 · 70 · 80 A6: M5 x P0.8	A1: 14 A2: 50 · 60 · 70 A3: M4 · M5 · M6 A4: 70 · 75 · 90 A5: 64 · 70 · 80 A6: M5 x P0.8	A1: 14 · 19 A2: 50 · 70 · 80 · 95 A3: M5 · M6 A4: 70 · 90 · 100 · 115 A5: 80 · 92 · 110 A6: M5 x P0.8	A1: 19 · 24 A2: 70 · 80 · 95 · 110 A3: M5 · M6 · M8 A4: 90 · 100 · 115 · 145 A5: 92 · 110 · 130 A6: M6 x P1.0	A1: 28 · 32 A2: 95 · 110 · 130 A3: M6 · M8 · M10 A4: 115 · 145 · 165 A5: 122 · 130 · 150 A6: M8 x P1.25
<b>B</b>	B1: 132 B2: 67 B3: 65 B4: 52 B5: 26 B6: 26 B7: 5 B8: 62 B9: M5 x P0.8	B1: 137 B2: 62 B3: 75 B4: 60 B5: 30 B6: 26 B7: 5 B8: 73 B9: M6 x P1.0	B1: 137 B2: 62 B3: 75 B4: 60 B5: 30 B6: 26 B7: 5 B8: 73 B9: M6 x P1.0	B1: 165 B2: 75 B3: 90 B4: 72 B5: 36 B6: 33.5 B7: 6 B8: 88 B9: M6 x P1.0	B1: 191 B2: 81 B3: 110 B4: 88 B5: 44 B6: 33.5 B7: 6 B8: 106 B9: M8 x P1.25	B1: 260 B2: 120 B3: 140 B4: 110 B5: 55 B6: 59 B7: 9 B8: 135 B9: M10 x P1.5	B1: 313 B2: 143 B3: 170 B4: 134 B5: 67 B6: 67 B7: 10 B8: 164 B9: M12 x P1.75	B1: 394 B2: 184 B3: 210 B4: 170 B5: 85 B6: 85 B7: 10 B8: 205 B9: M16 x P2.0
<b>C</b>	C1: 102 C2: 40 C3: 62 C4: 2 C5: 2.5 C6: 15 C7: 20	C1: 128 C2: 48 C3: 80 C4: 2 C5: 2.5 C6: 25 C7: 32	C1: 128 C2: 48 C3: 80 C4: 2 C5: 2.5 C6: 25 C7: 32	C1: 151 C2: 57 C3: 94 C4: 2 C5: 5 C6: 25 C7: 35	C1: 182 C2: 70 C3: 112 C4: 2 C5: 5 C6: 30 C7: 40	C1: 222 C2: 85 C3: 137 C4: 2 C5: 5 C6: 40 C7: 50	C1: 262 C2: 100 C3: 162 C4: 2 C5: 5 C6: 50 C7: 60	C1: 323 C2: 123 C3: 200 C4: 2 C5: 5 C6: 65 C7: 75
<b>D</b>	D1: 14 D2: 5 D3: 16 D4: M5 x P0.8	D1: 16 D2: 5 D3: 18 D4: M5 x P0.8	D1: 16 D2: 5 D3: 18 D4: M5 x P0.8	D1: 18 D2: 6 D3: 20.5 D4: M8 x P1.25	D1: 22 D2: 6 D3: 24.5 D4: M8 x P1.25	D1: 32 D2: 10 D3: 35 D4: M10 x P1.5	D1: 40 D2: 12 D3: 43 D4: M12 x P1.75	D1: 50 D2: 14 D3: 53.5 D4: M12 x P1.75
Weight / Ağırlık	1.9	3.6	3.4	4.8	8.5	14.2	24	52

# ST-DS series / serileri

RATIO / ÇEVİRİM : 1.2.3.4.5 (1-Stage / Kademe)

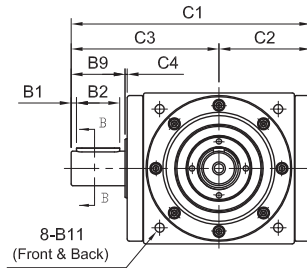
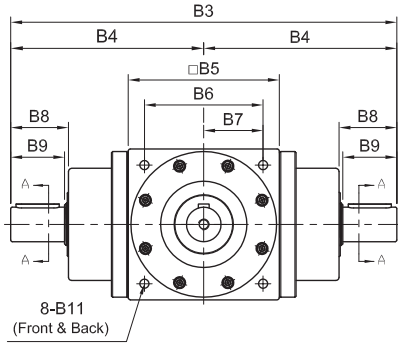
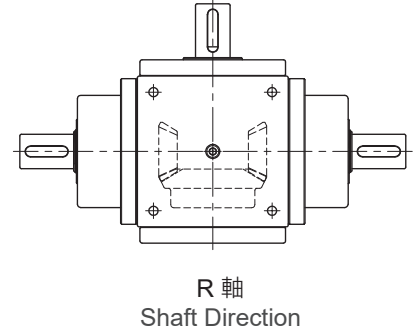
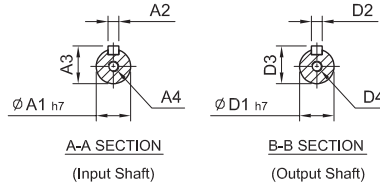
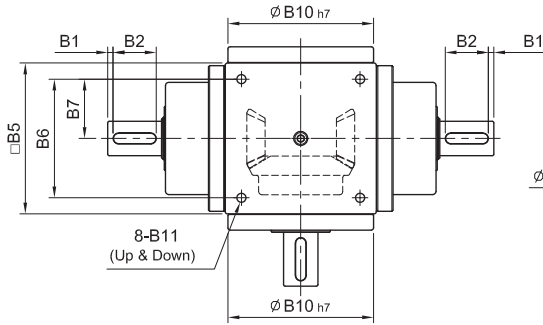
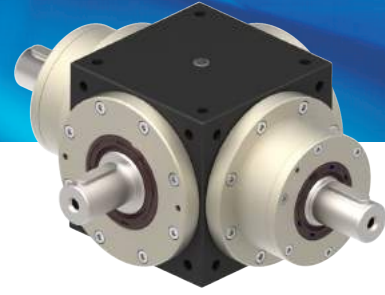


unit / birim: mm

Model Code	65	65(1:1)	75	90	110	140	170	210	
<b>A</b>	A1	14	14	16	18	22	32	40	50
	A2	5	5	5	6	6	10	12	14
	A3	16	16	18	20.5	24.5	35	43	53.5
	A4	M5 x P0.8	M5 x P0.8	M5 x P0.8	M8 x P1.25	M8 x P1.25	M10 x P1.5	M12 x P1.75	M12 x P1.75
<b>B</b>	B1	2.5	2.5	2.5	5	5	5	5	5
	B2	15	15	25	25	30	40	50	65
	B3	127.5	127.5	142.5	168.5	207	250	300	375
	B4	62.5	62.5	67.5	78.5	97	110	130	165
	B5	65	65	75	90	110	140	170	210
	B6	52	52	60	72	88	110	134	170
	B7	26	26	30	36	44	55	67	85
	B8	22	22	32	38	43	53.5	64	77
	B9	20	20	30	35	40	50	60	75
	B10	62	64	73	88	106	135	164	205
	B11	M5 x P0.8	M5 x P0.8	M6 x P1.0	M6 x P1.0	M8 x P1.25	M10 x P1.5	M12 x P1.75	M16 x P2.0
<b>C</b>	C1	102	107	128	151	182	222	262	323
	C2	40	42.5	48	57	70	85	100	123
	C3	62	64.5	80	94	112	137	162	200
	C4	2	2	2	2	2	2	2	2
<b>D</b>	D1	14	14	16	18	22	32	40	50
	D2	5	5	5	6	6	10	12	14
	D3	16	16	18	20.5	24.5	35	43	53.5
	D4	M5 x P0.8	M5 x P0.8	M5 x P0.8	M8 x P1.25	M8 x P1.25	M10 x P1.5	M12 x P1.75	M12 x P1.75
Weight / Ağırlık	2.1	2.1	2.8	4.9	8.59	15.5	25	53	

# ST-YS series / serileri

RATIO / ÇEVİRİM : 1.2.3.4.5 (1-Stage / kademe)

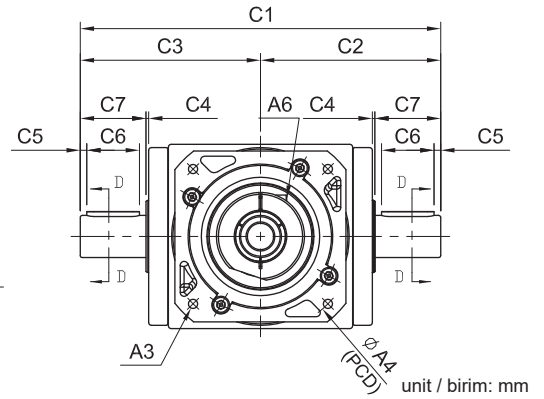
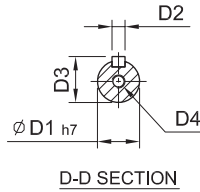
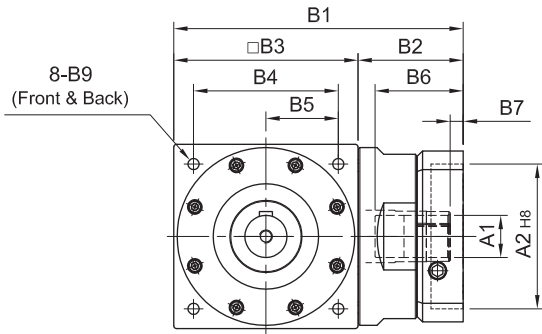
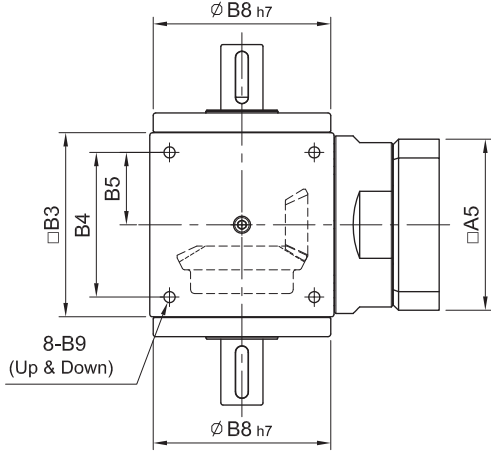
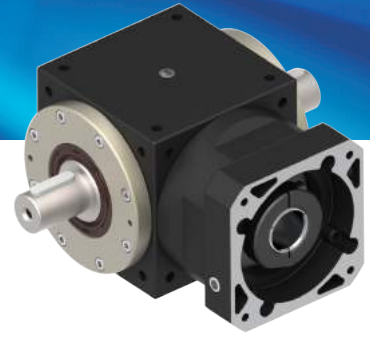


unit / birim: mm

Model Code	65	65(1:1)	75	90	110	140	170	210	
<b>A</b>	A1	14	14	16	18	22	32	50	
	A2	5	5	5	6	6	10	14	
	A3	16	16	18	20.5	24.5	35	53.5	
	A4	M5 x P0.8	M5 x P0.8	M5 x P0.8	M8 x P1.25	M8 x P1.25	M10 x P1.5	M12 x P1.75	M12 x P1.75
<b>B</b>	B1	2.5	2.5	2.5	5	5	5	5	
	B2	15	15	25	25	30	40	65	
	B3	190	190	210	247	304	360	430	540
	B4	95	95	105	123.5	152	180	215	270
	B5	65	65	75	90	110	140	170	210
	B6	52	52	60	72	88	110	134	170
	B7	26	26	30	36	44	55	67	85
	B8	22	22	32	38	43	53.5	64	77
	B9	20	20	30	35	40	50	60	75
	B10	62	64	73	88	106	135	164	205
	B11	M5 x P0.8	M5 x P0.8	M6 x P1.0	M6 x P1.0	M8 x P1.25	M10 x P1.5	M12 x P1.75	M16 x P2.0
<b>C</b>	C1	102	107	128	151	182	222	323	
	C2	40	42.5	48	57	70	85	123	
	C3	62	64.5	80	94	112	137	200	
	C4	2	2	2	2	2	2	2	
<b>D</b>	D1	14	14	16	18	22	32	50	
	D2	5	5	5	6	6	10	14	
	D3	16	16	18	20.5	24.5	35	53.5	
	D4	M5 x P0.8	M5 x P0.8	M5 x P0.8	M8 x P1.25	M8 x P1.25	M10 x P1.5	M12 x P1.75	M12 x P1.75
Weight / Ağırlık	2.85	2.85	3.6	6.2	11.5	18	28	57	

# ST-FV series / serileri

RATIO / ÇEVİRİM : 1.2.3.4.5 (1-Stage / Kademe)

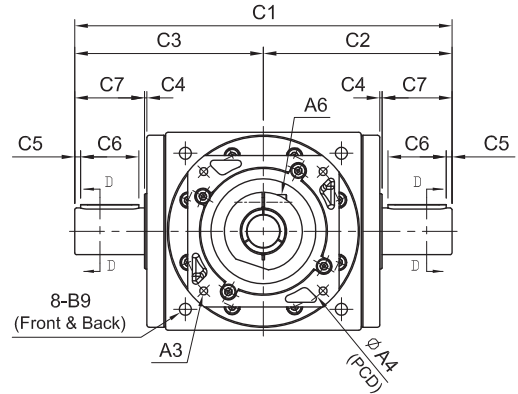
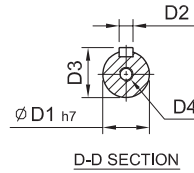
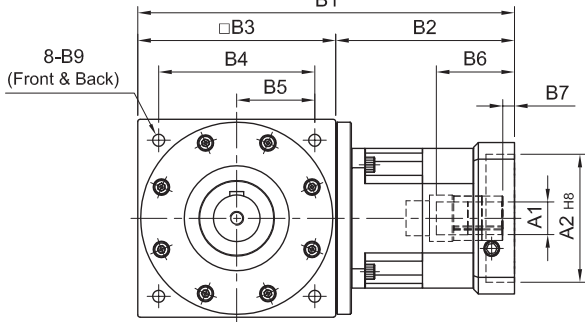
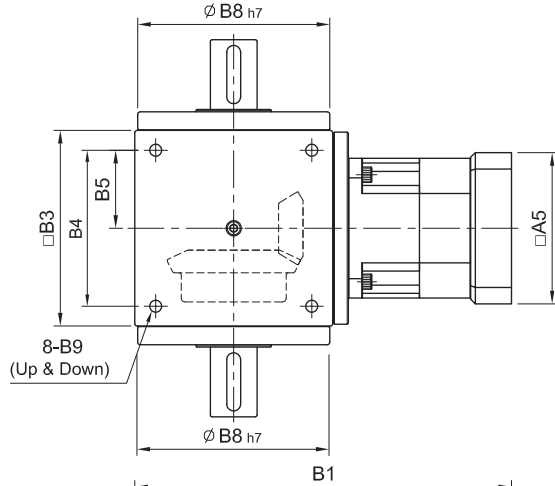
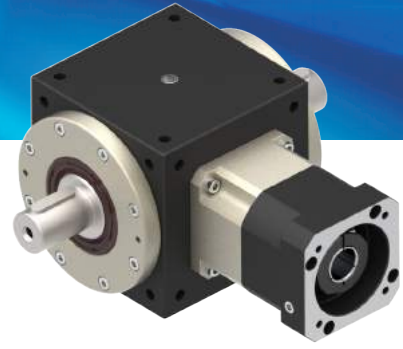


unit / birim: mm

Model Code	65	65(1:1)	75	90	110	140	170	210	
<b>A</b>	A1	14	14	14	19·24	22·24	28·32	35	38·42·48·55
	A2	50·60·70	50·60·70	50·60·70	70·80·95·110	70·80·95·110	95·110·130	110·130·180	114.3·180·230
	A3	M4·M5·M6	M4·M5·M6	M4·M5·M6	M5·M6·M8	M5·M6·M8	M6·M8·M10	M8·M10·M120	M10·M12·M16
	A4	70·75·90	70·75·90	70·75·90	90·100·115·145	90·100·115·145	115·145·165	145·165·200	200·215·265
	A5	64·70·80	64·70·80	64·70·80	92·110·130	92·110·130	122·130·150	146·150·190	182·200·250
	A6	M5 x P0.8	M5 x P0.8	M5 x P0.8	M6 x P1.0	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5
<b>B</b>	B1	110	110	115	148·162	177·191	224	274	357
	B2	45	45	40	58·72	67·81	84	104	147
	B3	65	65	75	90	110	140	170	210
	B4	52	52	60	72	88	110	134	170
	B5	26	26	30	36	44	55	67	85
	B6	36	36	36	51·65.5	51·65.5	67	84.5	117
	B7	7	7	7	9·23.5	9·23.5	10	9.5	14
	B8	62	64	73	88	106	135	164	205
	B9	M5 x P0.8	M5 x P0.8	M6 x P1.0	M6 x P1.0	M8 x P1.25	M10 x P1.5	M12 x P1.75	M16 x P2.0
<b>C</b>	C1	124	129	160	188	224	274	324	400
	C2	62	64.5	80	94	112	137	162	200
	C3	62	64.5	80	94	112	137	162	200
	C4	2	2	2	2	2	2	2	2
	C5	2.5	2.5	2.5	5	5	5	5	5
	C6	15	15	25	25	30	40	50	65
	C7	20	20	32	35	40	50	60	75
<b>D</b>	D1	14	14	16	18	22	32	40	50
	D2	5	5	5	6	6	10	12	14
	D3	16	16	18	20.5	24.5	35	43	53.5
	D4	M5 x P0.8	M5 x P0.8	M5 x P0.8	M8 x P1.25	M8 x P1.25	M10 x P1.5	M12 x P1.75	M12 x P1.75
Weight / Ağırlık	1.7	1.7	2.4	4.3	7.1	14.9	24.5	46	

# ST-RV series / serileri

RATIO / ÇEVİRİM : 10.15.20.25.30.40.50 (2-Stage / Kademe)

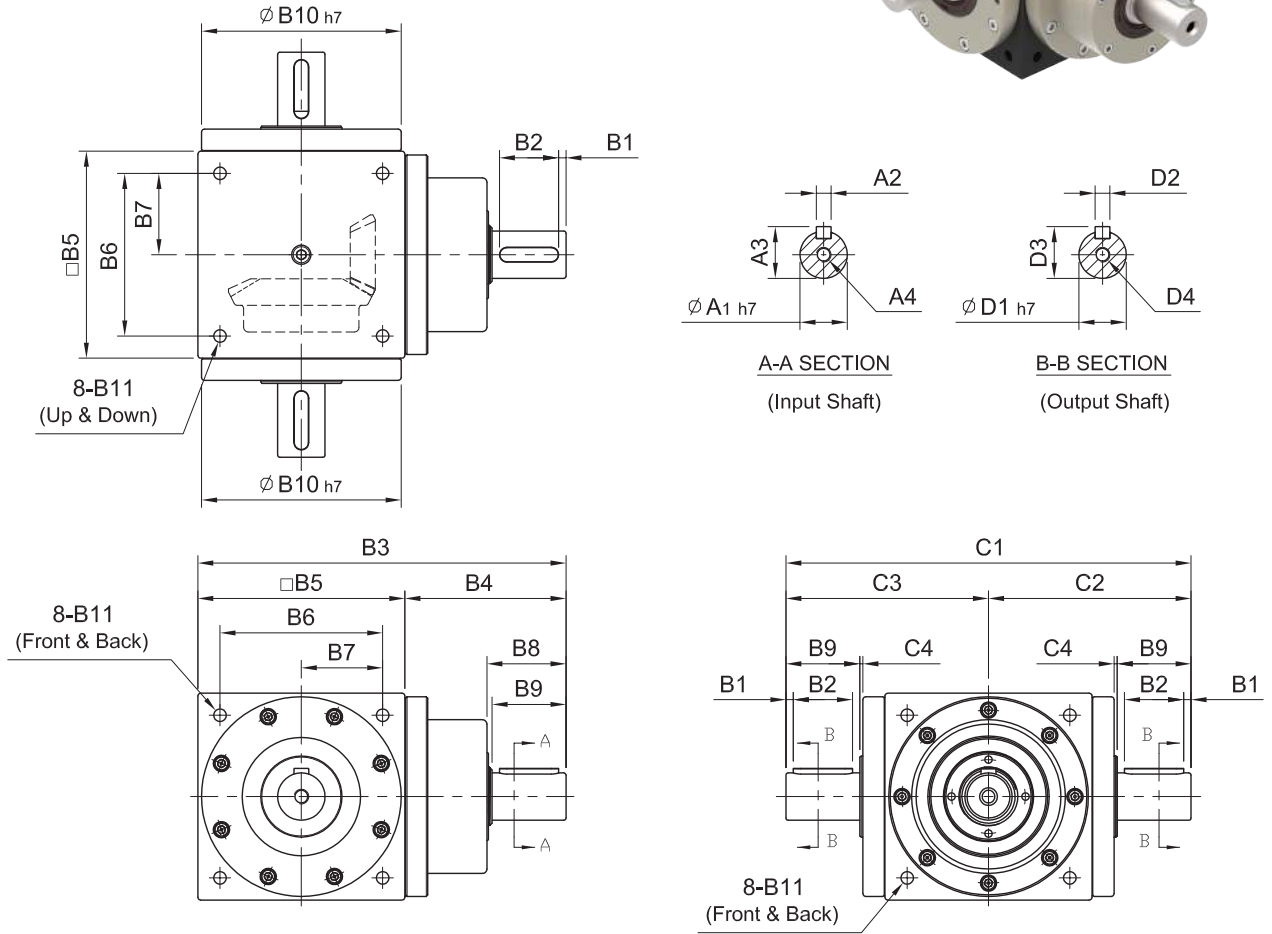
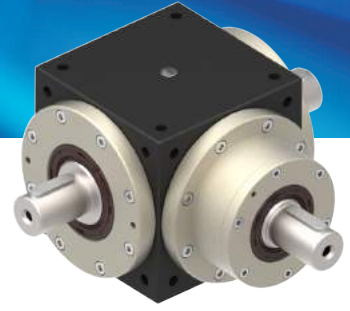


unit / birim: mm

	Model Code	65	75	90	110	140	170	210	
		<b>A</b>	A1	8 · 11	8 · 11	14	14	14 · 19	19 · 24
	A2	30 · 40 · 50	30 · 40 · 50	50 · 60 · 70	50 · 60 · 70	50 · 70 · 80 · 95	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180
	A3	M3 · M4 · M5	M3 · M4 · M5	M4 · M5 · M6	M4 · M5 · M6	M5 · M6	M5 · M6 · M8	M6 · M8 · M10	M8 · M10 · M12
	A4	46 · 60 · 63	46 · 60 · 63	70 · 75 · 90	70 · 75 · 90	70 · 90 · 100 · 115	90 · 100 · 115 · 145	115 · 145 · 165	145 · 165 · 200
	A5	46 · 55	46 · 55	64 · 70 · 80	64 · 70 · 80	80 · 92 · 110	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190
	A6	M4 x P0.7	M4 x P0.7	M5 x P0.8	M5 x P0.8	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5
<b>B</b>	B1	132	137	137	165	191	260	313	394
	B2	67	62	62	75	81	120	143	184
	B3	65	75	75	90	110	140	170	210
	B4	52	60	60	72	88	110	134	170
	B5	26	30	30	36	44	55	67	85
	B6	26	26	26	33.5	33.5	59	67	85
	B7	5	5	5	6	6	9	10	10
	B8	62	73	73	88	106	135	164	205
	B9	M5 x P0.8	M6 x P1.0	M6 x P1.0	M6 x P1.0	M8 x P1.25	M10 x P1.5	M12 x P1.75	M16 x P2.0
<b>C</b>	C1	124	160	160	188	224	274	324	400
	C2	62	80	80	94	112	137	162	200
	C3	62	80	80	94	112	137	162	200
	C4	2	2	2	2	2	2	2	2
	C5	2.5	2.5	2.5	5	5	5	5	5
	C6	15	25	25	25	30	40	50	65
	C7	20	32	32	35	40	50	60	75
<b>D</b>	D1	14	16	16	18	22	32	40	50
	D2	5	5	5	6	6	10	12	14
	D3	16	18	18	20.5	24.5	35	43	53.5
	D4	M5 x P0.8	M5 x P0.8	M5 x P0.8	M8 x P1.25	M8 x P1.25	M10 x P1.5	M12 x P1.75	M12 x P1.75
Weight / Ağırlık		1.9	3.6	3.4	4.8	8.5	14.2	24	52

# ST-DV series / serileri

RATIO / ÇEVİRİM : 1.2.3.4.5 (1-Stage / Kademe)

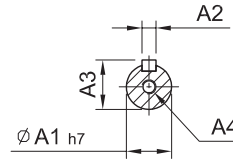
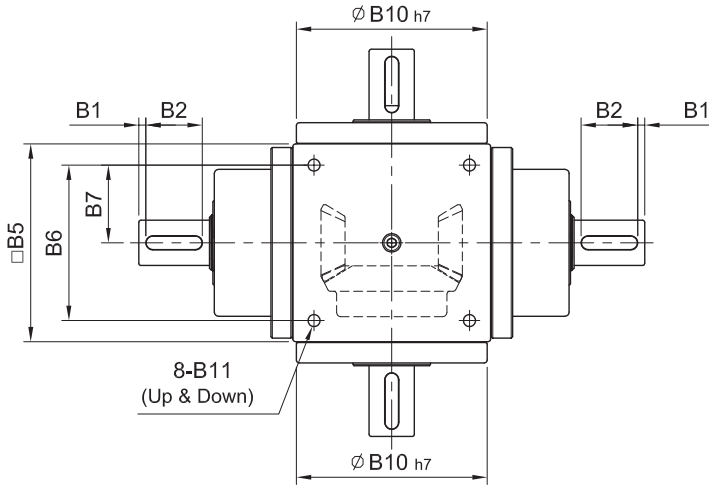
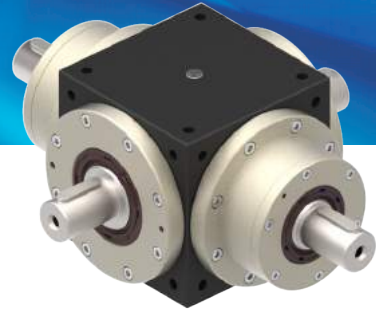


unit / birim: mm

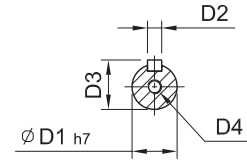
Model Code	65	65(1:1)	75	90	110	140	170	210	
<b>A</b>	A1	14	14	16	18	22	32	40	50
	A2	5	5	5	6	6	10	12	14
	A3	16	16	18	20.5	24.5	35	43	53.5
	A4	M5 x P0.8	M5 x P0.8	M5 x P0.8	M8 x P1.25	M8 x P1.25	M10 x P1.5	M12 x P1.75	M12 x P1.75
<b>B</b>	B1	2.5	2.5	2.5	5	5	5	5	5
	B2	15	15	25	25	30	40	50	65
	B3	127.5	127.5	142.5	168.5	207	250	300	375
	B4	62.5	62.5	67.5	78.5	97	110	130	165
	B5	65	65	75	90	110	140	170	210
	B6	52	52	60	72	88	110	134	170
	B7	26	26	30	36	44	55	67	85
	B8	22	22	32	38	43	53.5	64	77
	B9	20	20	30	35	40	50	60	75
	B10	62	64	73	88	106	135	164	205
B11	M5 x P0.8	M5 x P0.8	M6 x P1.0	M6 x P1.0	M8 x P1.25	M10 x P1.5	M12 x P1.75	M16 x P2.0	
<b>C</b>	C1	124	129	160	188	224	274	324	400
	C2	62	64.5	80	94	112	137	162	200
	C3	62	64.5	80	94	112	137	162	200
	C4	2	2	2	2	2	2	2	2
<b>D</b>	D1	14	14	16	18	22	32	40	50
	D2	5	5	5	6	6	10	12	14
	D3	16	16	18	20.5	24.5	35	43	53.5
	D4	M5 x P0.8	M5 x P0.8	M5 x P0.8	M8 x P1.25	M8 x P1.25	M10 x P1.5	M12 x P1.75	M12 x P1.75
Weight / Ağırlık	2.1	2.1	2.8	4.9	8.59	15.5	25	53	

# ST-YV series / serileri

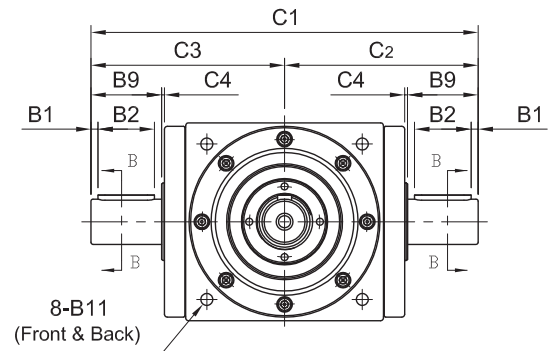
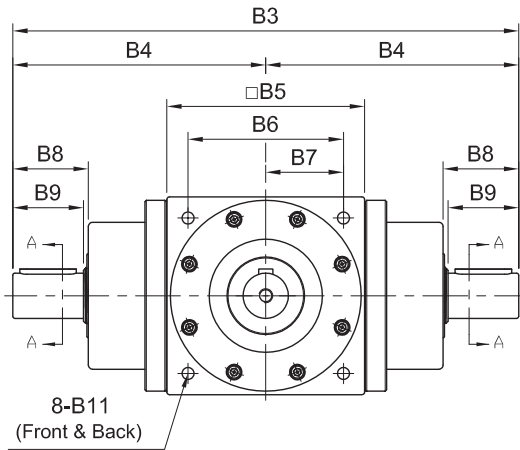
RATIO / ÇEVİRİM : 1.2.3.4.5 (1-Stage / Kademe)



A-A SECTION  
(Input Shaft)



B-B SECTION  
(Output Shaft)

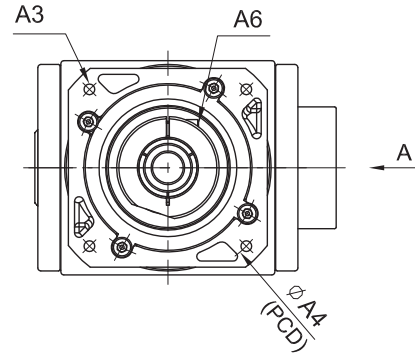
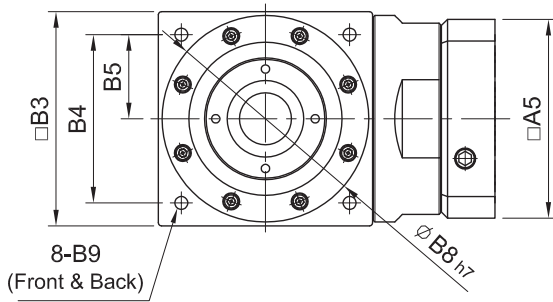
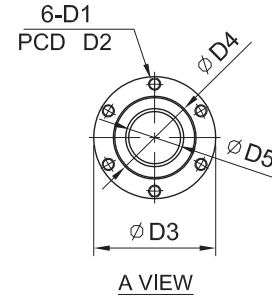
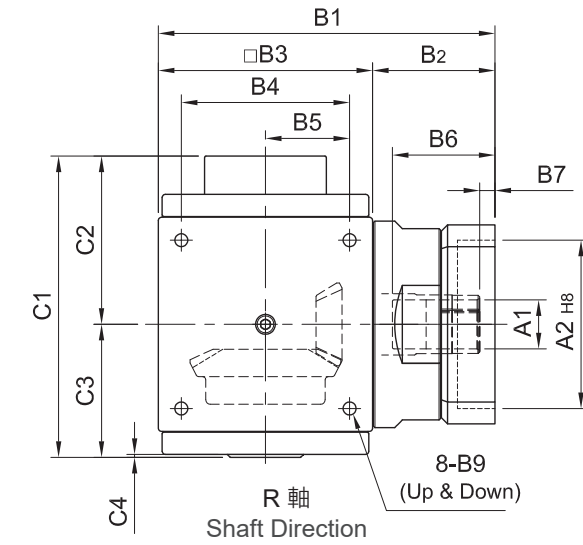
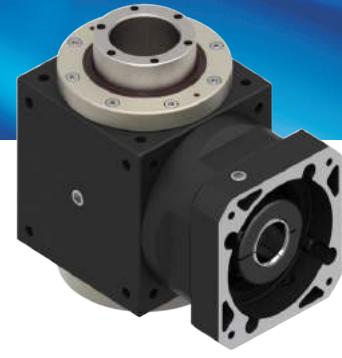


unit / birim: mm

Model Code	65	65(1:1)	75	90	110	140	170	210	
<b>A</b>	A1	14	14	16	18	22	32	40	50
	A2	5	5	5	6	6	10	12	14
	A3	16	16	18	20.5	24.5	35	43	53.5
	A4	M5 x P0.8	M5 x P0.8	M5 x P0.8	M8 x P1.25	M8 x P1.25	M10 x P1.5	M12 x P1.75	M12 x P1.75
<b>B</b>	B1	2.5	2.5	2.5	5	5	5	5	5
	B2	15	15	25	25	30	40	50	65
	B3	190	190	210	247	304	360	430	540
	B4	95	95	105	123.5	152	180	215	270
	B5	65	65	75	90	110	140	170	210
	B6	52	52	60	72	88	110	134	170
	B7	26	26	30	36	44	55	67	85
	B8	22	22	32	38	43	53.5	64	77
	B9	20	20	30	35	40	50	60	75
	B10	62	64	73	88	106	135	164	205
B11	M5 x P0.8	M5 x P0.8	M6 x P1.0	M6 x P1.0	M8 x P1.25	M10 x P1.5	M12 x P1.75	M16 x P2.0	
<b>C</b>	C1	124	129	160	188	224	274	324	400
	C2	62	64.5	80	94	112	137	162	200
	C3	62	64.5	80	94	112	137	162	200
	C4	2	2	2	2	2	2	2	2
<b>D</b>	D1	14	14	16	18	22	32	40	50
	D2	5	5	5	6	6	10	12	14
	D3	16	16	18	20.5	24.5	35	43	53.5
	D4	M5 x P0.8	M5 x P0.8	M5 x P0.8	M8 x P1.25	M8 x P1.25	M10 x P1.5	M12 x P1.75	M12 x P1.75
Weight / Ağırlık	2.85	2.85	3.6	6.2	11.5	18	28	57	

# ST-FP series / serileri

RATIO / ÇEVİRİM : 2.3.4.5 (1-Stage / Kademe)

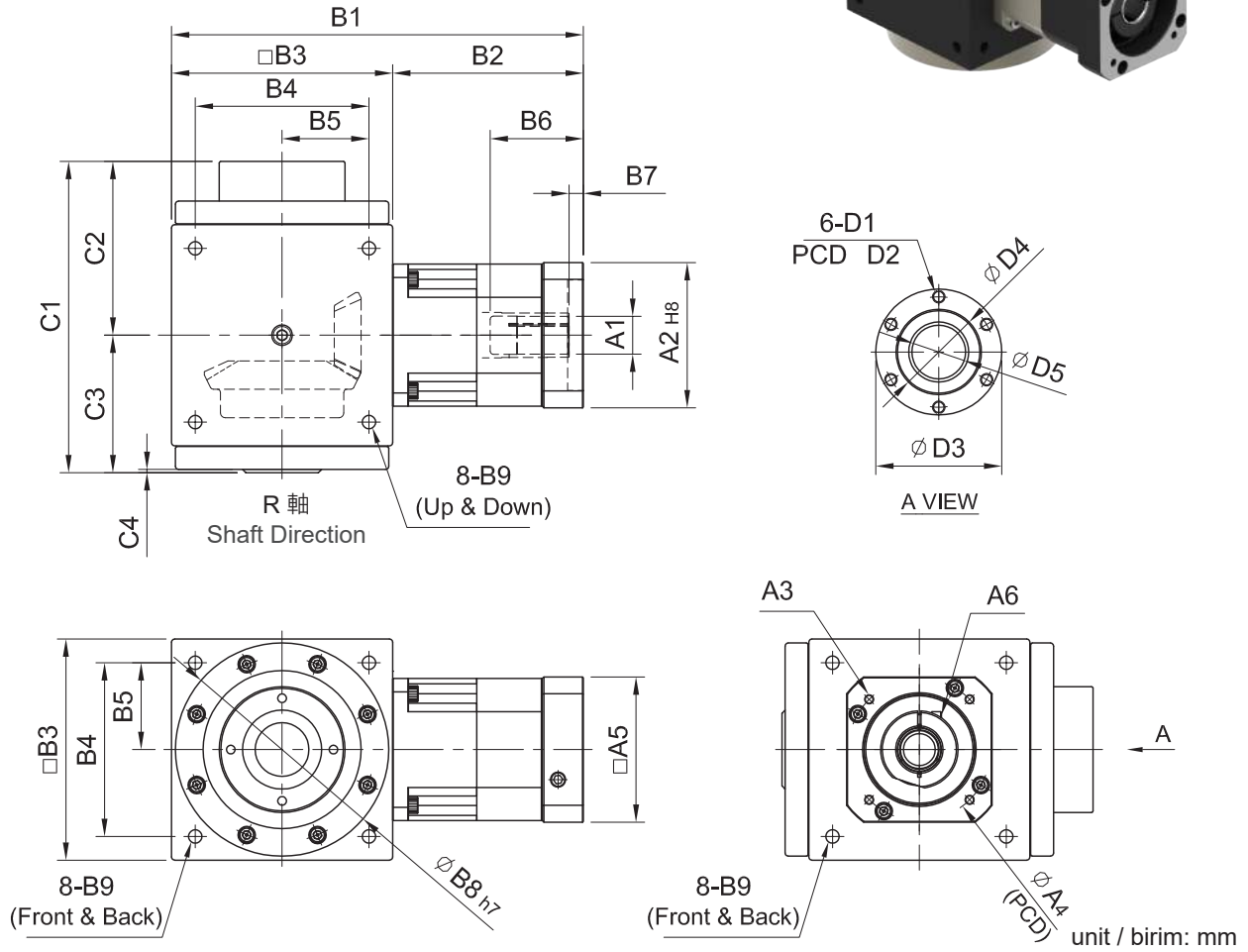


unit / birim: mm

Model Code	75	90	110	140	170	210	
<b>A</b>	A1	14	19 · 24	22 · 24	28 · 32	35	38 · 42 · 48 · 55
	A2	50 · 60 · 70	70 · 80 · 95 · 110	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180	114.3 · 180 · 230
	A3	M4 · M5 · M6	M5 · M6 · M8	M5 · M6 · M8	M6 · M8 · M10	M8 · M10 · M120	M10 · M12 · M16
	A4	70 · 75 · 90	90 · 100 · 115 · 145	90 · 100 · 115 · 145	115 · 145 · 165	145 · 165 · 200	200 · 215 · 265
	A5	64 · 70 · 80	92 · 110 · 130	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190	182 · 200 · 250
	A6	M5 x P0.8	M6 x P1.0	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5
<b>B</b>	B1	115	148 · 162	177 · 191	224	274	357
	B2	40	58 · 72	67 · 81	84	104	147
	B3	75	90	110	140	170	210
	B4	60	72	88	110	134	170
	B5	30	36	44	55	67	85
	B6	36	51 · 65.5	51 · 65.5	67	84.5	117
	B7	7	9 · 23.5	9 · 23.5	10	9.5	14
	B8	73	88	106	135	164	205
	B9	M6 x P1.0	M6 x P1.0	M8 x P1.25	M10 x P1.5	M12 x P1.75	M16 x P2.0
<b>C</b>	C1	106	127	156	197	223	267
	C2	57	68	84	109	121	142
	C3	49	59	72	88	102	125
	C4	1.25	2	2	2	2.25	2.25
<b>D</b>	D1	M4 x P0.7	M5 x P0.8	M5 x P0.8	M8 x P1.25	M10 x P1.5	M10 x P1.5
	D2	36	40	45	70	77	84
	D3	41.7	46.7	57.7	79.7	89.7	99.7
	D4	26	30	36	54	58	64
	D5	15	18	22	34	38	42
Weight / Ağırlık	2.4	4.3	7.1	14.9	24.5	46	

# ST-RP series / serileri

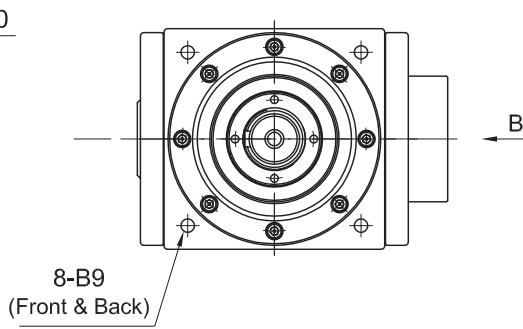
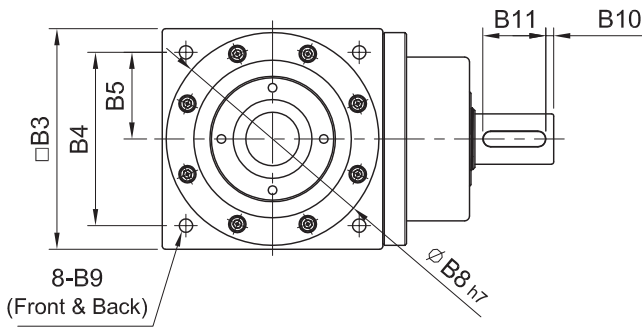
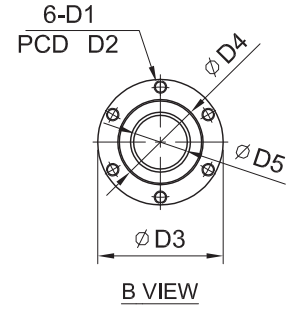
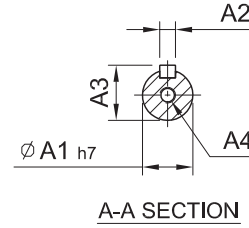
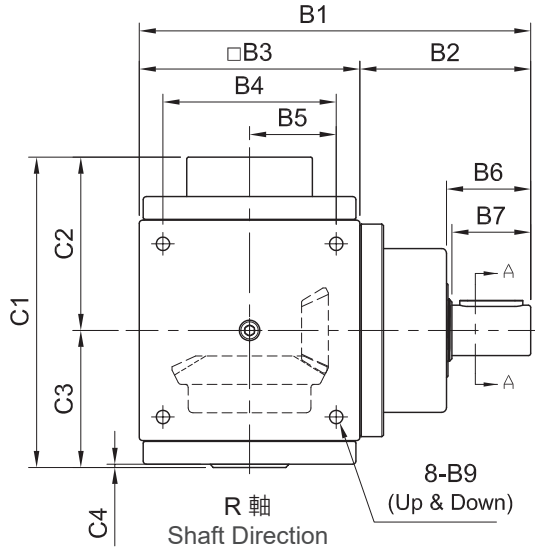
RATIO / ÇEVİRİM : 10.15.20.25.30.40.50 (2-Stage / Kademe)



Model Code	75	90	110	140	170	210	
<b>A</b>	A1	8 · 11	14	14 · 19	19 · 24	28 · 32	35
	A2	30 · 40 · 50	50 · 60 · 70	50 · 70 · 80 · 95	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180
	A3	M3 · M4 · M5	M4 · M5 · M6	M5 · M6	M5 · M6 · M8	M6 · M8 · M10	M8 · M10 · M12
	A4	46 · 60 · 63	70 · 75 · 90	70 · 90 · 100 · 115	90 · 100 · 115 · 145	115 · 145 · 165	145 · 165 · 200
	A5	46 · 55	64 · 70 · 80	80 · 92 · 110	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190
	A6	M4 x P0.7	M5 x P0.8	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5
<b>B</b>	B1	137	165	191	260	313	394
	B2	62	75	81	120	143	184
	B3	75	90	110	140	170	210
	B4	60	72	88	110	134	170
	B5	30	36	44	55	67	85
	B6	26	33.5	33.5	59	67	85
	B7	5	6	6	9	10	10
	B8	73	88	106	135	164	205
	B9	M6 x P1.0	M6 x P1.0	M8 x P1.25	M10 x P1.5	M12 x P1.75	M16 x P2.0
<b>C</b>	C1	106	127	156	197	223	267
	C2	57	68	84	109	121	142
	C3	49	59	72	88	102	125
	C4	1.25	2	2	2	2.25	2.25
<b>D</b>	D1	M4 x P0.7	M5 x P0.8	M5 x P0.8	M8 x P1.25	M10 x P1.5	M10 x P1.5
	D2	36	40	45	70	77	84
	D3	41.7	46.7	57.7	79.7	89.7	99.7
	D4	26	30	36	54	58	64
	D5	15	18	22	34	38	42
Weight / Ağırlık	3.6	4.8	8.5	14.2	24	52	

# ST-DP series / serileri

RATIO / ÇEVİRİM : 2.3.4.5 (1-Stage / Kademe)

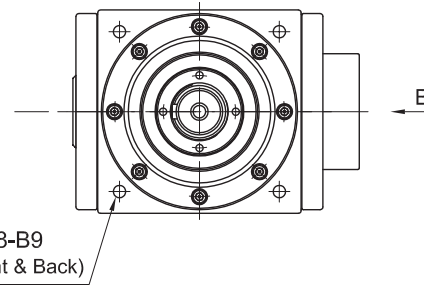
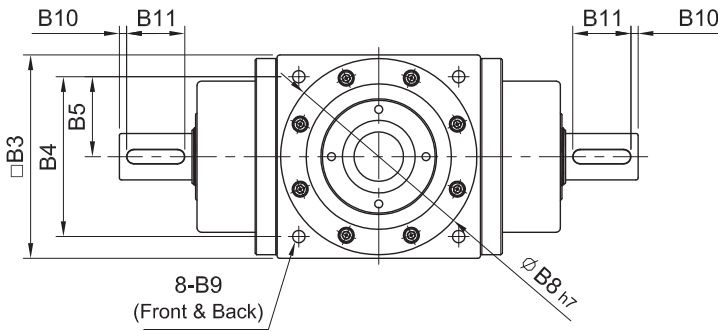
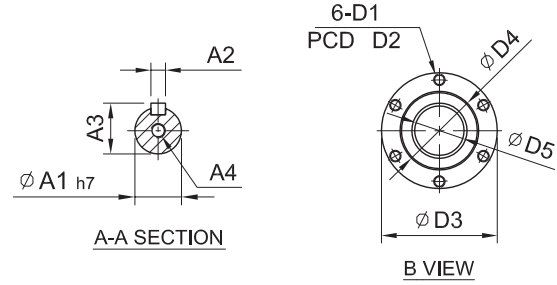
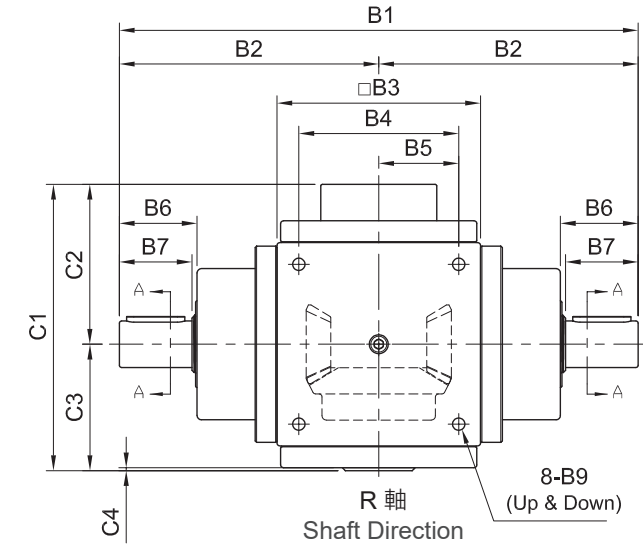


unit / birim: mm

Model Code	75	90	110	140	170	210	
<b>A</b>	A1	16	18	22	32	40	
	A2	5	6	6	10	12	
	A3	18	20.5	24.5	35	43	
	A4	M5 x P0.8	M8 x P1.25	M8 x P1.25	M10 x P1.5	M12 x P1.75	M12 x P1.75
<b>B</b>	B1	142.5	169	207	250	300	
	B2	67.5	79	97	110	130	
	B3	75	90	110	140	170	
	B4	60	72	88	110	134	
	B5	30	36	44	55	67	
	B6	32	38	43	53.5	64	
	B7	30	35	40	50	60	
	B8	73	88	106	135	164	
	B9	M6 x P1.0	M6 x P1.0	M8 x P1.25	M10 x P1.5	M12 x P1.75	M16 x P2.0
	B10	2.5	5	5	5	5	
	B11	25	25	30	40	50	
<b>C</b>	C1	106	127	156	197	223	
	C2	57	68	84	109	121	
	C3	49	59	72	88	102	
	C4	1.25	2	2	2	2.25	
<b>D</b>	D1	M4 x P0.7	M5 x P0.8	M5 x P0.8	M8 x P1.25	M10 x P1.5	
	D2	36	40	45	70	77	
	D3	41.7	46.7	57.7	79.7	89.7	
	D4	26	30	36	54	58	
	D5	15	18	22	34	38	
Weight / Ağırlık	2.8	4.9	8.59	15.5	25	53	

# ST-YP series / serileri

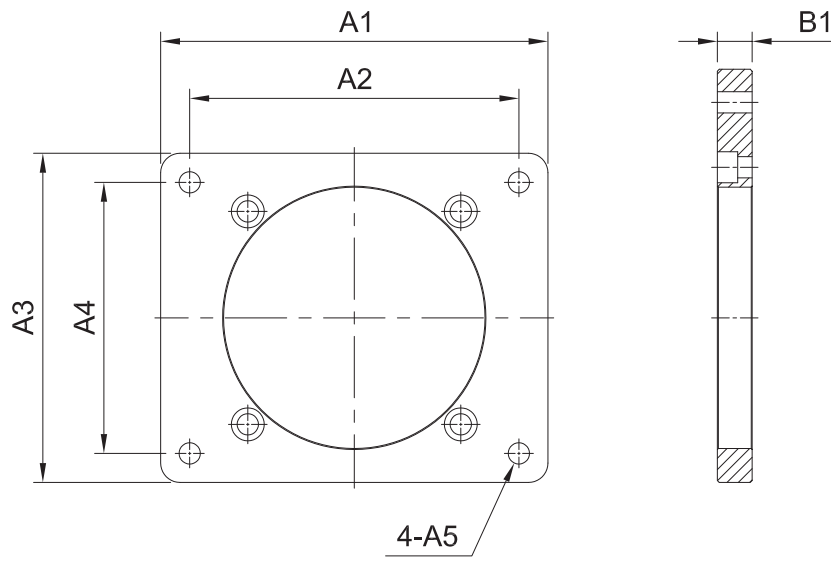
RATIO / ÇEVİRİM : 2.3.4.5 (1-Stage / Kademe)



unit / birim: mm

Model Code	75	90	110	140	170	210	
<b>A</b>	A1	16	18	22	32	40	50
	A2	5	6	6	10	12	14
	A3	18	20.5	24.5	35	43	53.5
	A4	M5 x P0.8	M8 x P1.25	M8 x P1.25	M10 x P1.5	M12 x P1.75	M12 x P1.75
<b>B</b>	B1	210	247	304	360	430	540
	B2	105	123.5	152	180	215	270
	B3	75	90	110	140	170	210
	B4	60	72	88	110	134	170
	B5	30	36	44	55	67	85
	B6	32	38	43	53.5	64	77
	B7	30	35	40	50	60	75
	B8	73	88	106	135	164	205
	B9	M6 x P1.0	M6 x P1.0	M8 x P1.25	M10 x P1.5	M12 x P1.75	M16 x P2.0
	B10	2.5	5	5	5	5	5
	B11	25	25	30	40	50	65
<b>C</b>	C1	106	127	156	197	223	267
	C2	57	68	84	109	121	142
	C3	49	59	72	88	102	125
	C4	1.25	2	2	2	2.25	2.25
<b>D</b>	D1	M4 x P0.7	M5 x P0.8	M5 x P0.8	M8 x P1.25	M10 x P1.5	M10 x P1.5
	D2	36	40	45	70	77	84
	D3	41.7	46.7	57.7	79.7	89.7	99.7
	D4	26	30	36	54	58	64
	D5	15	18	22	34	38	42
Weight / Ağırlık	3.6	6.2	11.5	18	28	57	

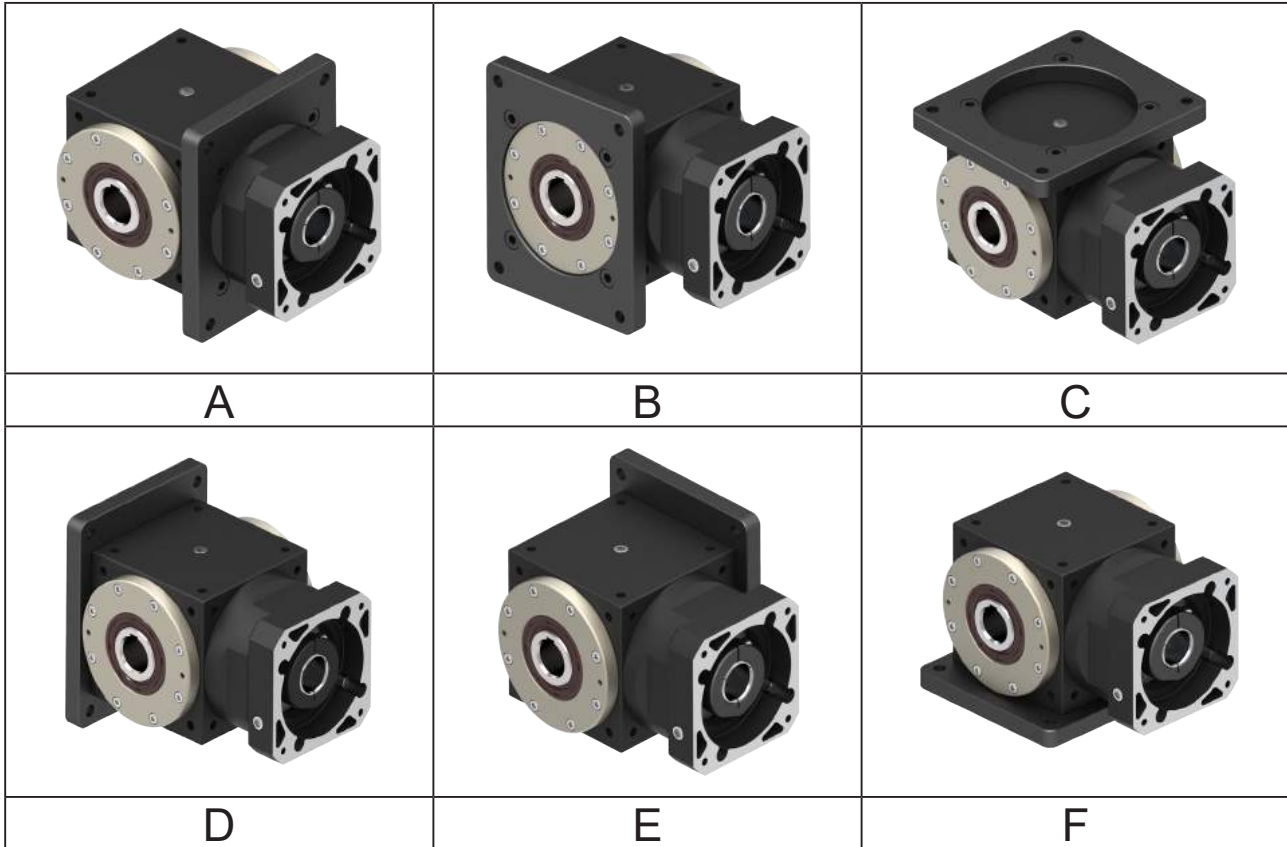
# Fixing Plate / Bağlantı Plakası



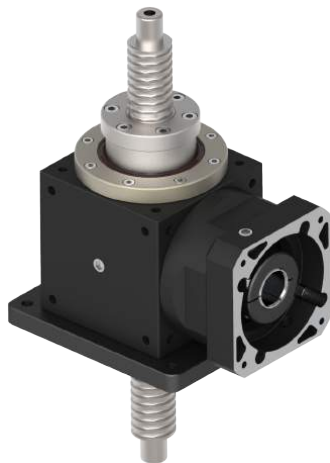
unit / birim:mm

Model Code	65	75	90	110	140	170	210
	<b>A</b>						
A1	100	110	130	160	200	230	280
A2	85	95	110	135	170	200	240
A3	85	90	110	135	170	200	250
A4	70	75	90	110	140	170	210
A5	7	7	7	9	11	13	17
<b>B</b>							
B1	10	12	13	16	18	18	25

# Selection Direction of Fixing Plate / Bağlantı Plakası Seçimi



## Installation Example of Fixing Plate / Bağlantı Plakası Montajı

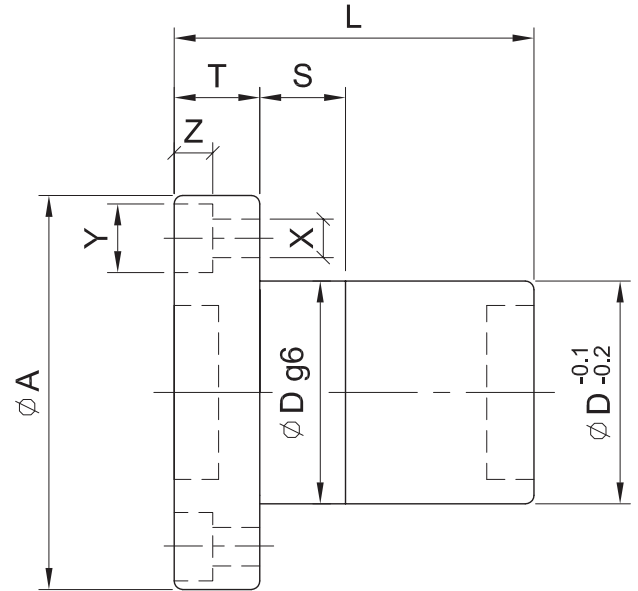
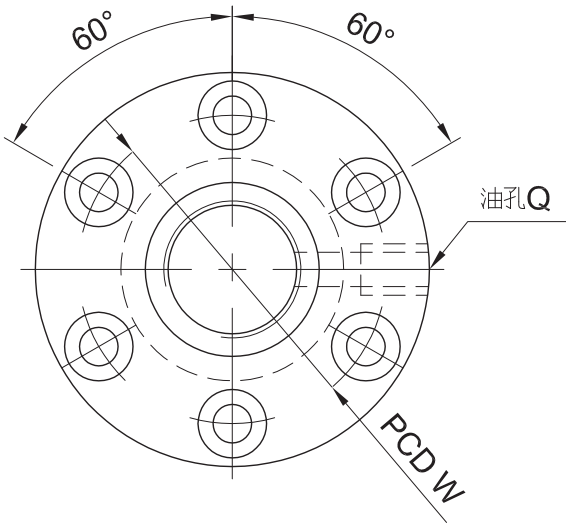
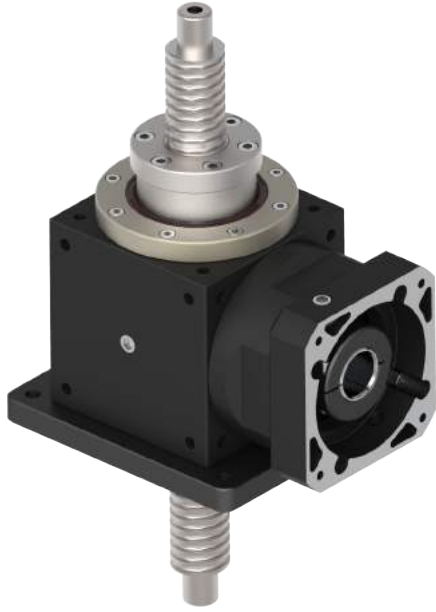


ST140-FPT-5 +  
FP140-F



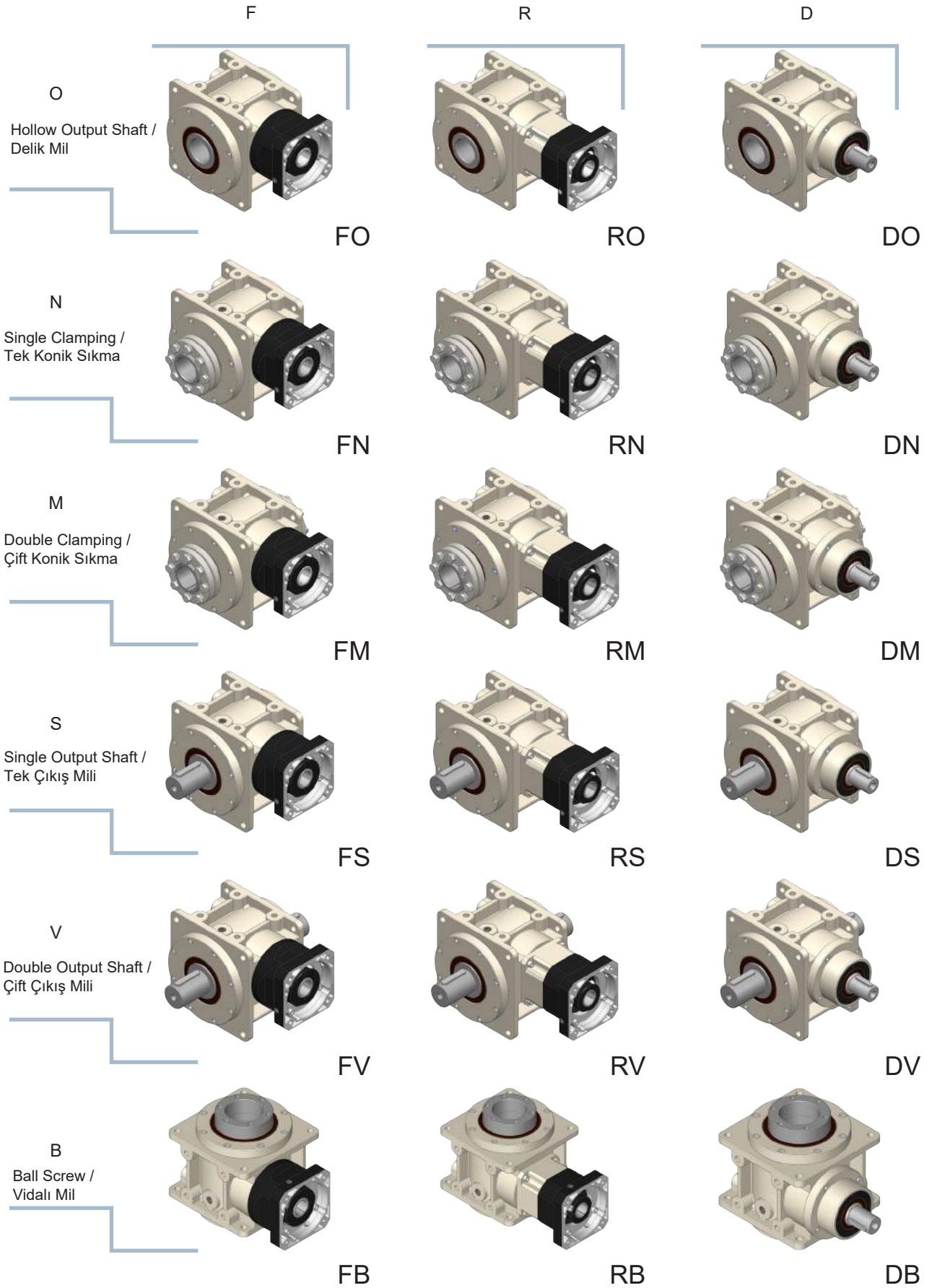
ST110-FSB-5 +  
FP110-A

# Reference Information of Ball Screw / Vidalı Mil Ölçüleri

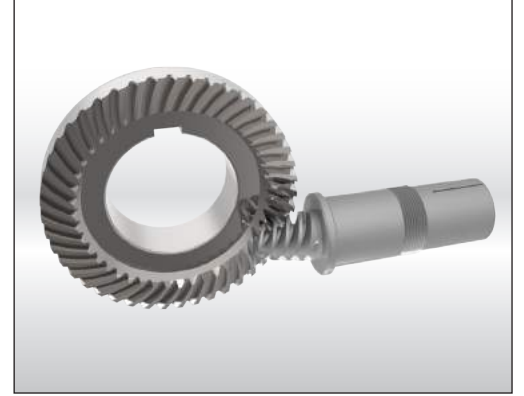
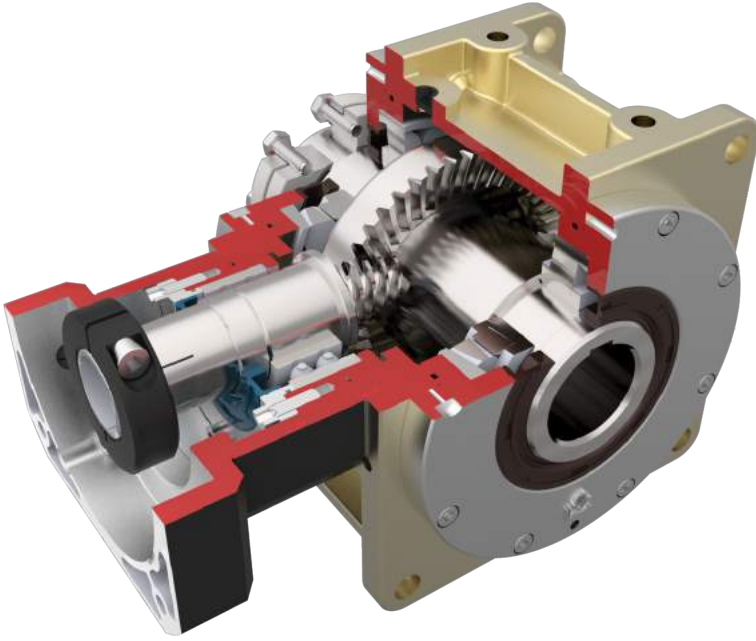


Model	Screw Size / Vidalı Mil Çapı		Basic Rate Load (kgf) / Yük Kapasitesi		Nut / Somun		Flange / Flanş			FIT	Screw Bolt / Vida Ölçüsü			Oil Hole / Yağlama Deliği	Length / Boy
	O.D. / Mil Çapı	Lead / Hatve	Dynamic / Dinamik	Static / Statik	Dg6	L	A	T	W		S	X	Y		
75	14	5	720	1010	26	42	46	10	36	10	4.5	8	4.5	M6 x P1.0	≤ 500
90	16	6	980	1650	30	55	54	12	40	12	5.5	9.5	5.5	M6 x P1.0	≤ 800
110	20	10	860	1710	36	66	57	12	45	12	5.5	9.5	5.5	M6 x P1.0	≤ 1000
140	32	10	3340	7080	54	90	88	16	70	15	9	14	8.5	M8 x P1	≤ 1200
170	36	10	3600	8280	58	89	98	18	77	20	11	17.5	11	M8 x P1	≤ 1500
210	40	10	4670	11830	64	99	106	18	84	20	11	17.5	11	M8 x P1	≤ 1500

# HY series / serileri



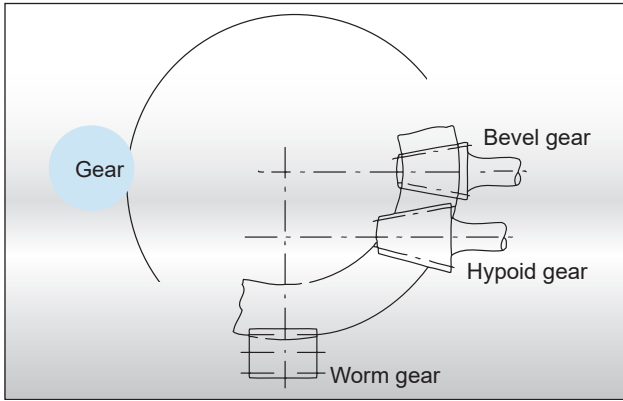
# Features of HY Series / HY Serilerinin Özellikleri



## Super-Reduction-Hypoid Gear / Hypoid Dişli

Gleason super-reduction-hypoid gear tooth system, the max. single stage ratio is 1/15. Single stage ratio 1/20~1/60 is optional.

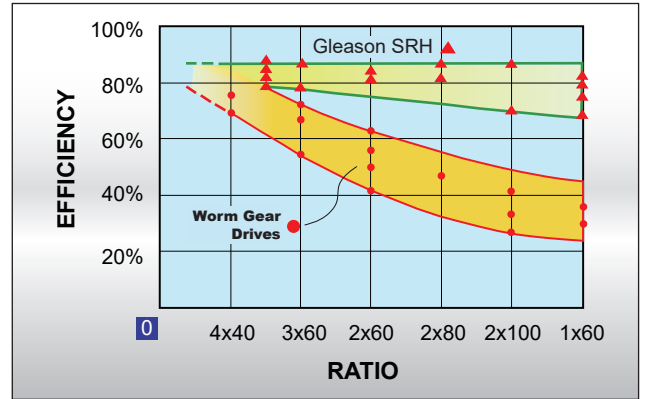
1 kademe için 1/60'a kadar tahvil oranı sağlanabilmektedir.



## High Output Torque / Yüksek Çıkış Torqu

The gear box is one-piece constructed to ensure the high rigidity and corrosion-resistant capability.

Redüktör sağlamlık ve paslanmaya karşı dayanıklı olması için tek parça olarak üretilmiştir.



## High Efficiency

High running efficiency, the efficiency more than 90%.

%90'dan daha fazla verimliliğe ulaşılır.

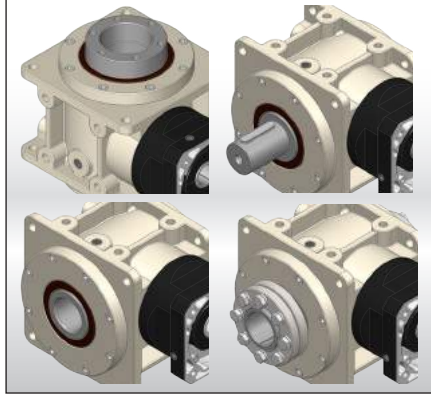
# Features of HY Series / HY Serilerinin Özellikleri



## Low Backlash / Düşük Boşluk Oranı

Using Gleason high precision CNC grinding machine to grinding the spiral bevel gears. Torsional backlash depending on design up to <2 arcmin.

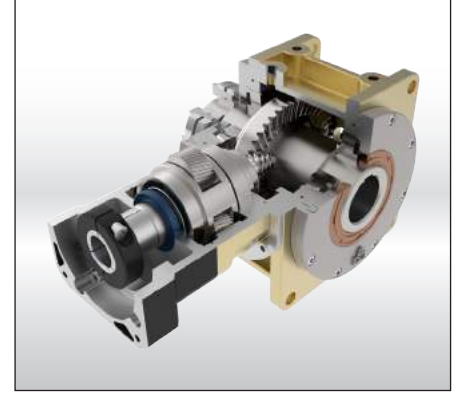
Konik dişlileri taşlamak için yüksek hassasiyetli Gleason CNC kullanılmıştır. Bu sayede <2 arcmin'e kadar burulma boşluğu elde edilir.



## Mounting Position / Montaj Pozisyonu

Multiple precision machined surface is easy for assembly, suitable for any optional mounting orientation. Output shaft and input shaft are designed to suit for various industries applications.

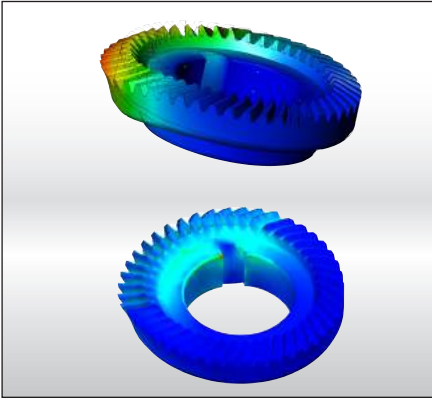
Çok hassas işlenen yüzeyler montajda kolaylık ve çeşitlilik sağlar. Çıkış ve giriş milleri birçok uygulama için tasarlanmıştır.



## More High Gear Ratio / Çok Çeşitli Çevrim Oranı

High precision grinded and carburized spiral bevel gears with optimal designed planetary gear can do ratio 1500: 1.

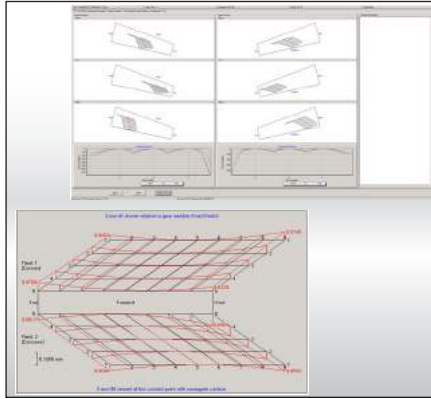
Yüksek hassasiyetle taşlanmış ve karbürlenmiş konik dişliler ve planet dişliler sayesinde 1/1500'e kadar tahvil oranına ulaşılır.



## CAE Design and Analysis / CAE Dizayn ve Analiz

Employs 3D-CAE software for analysis and design, the software allows for analyzing the strength of the entire gear reducer and helical teeth. Increasing the service life of gears and the gear reducer.

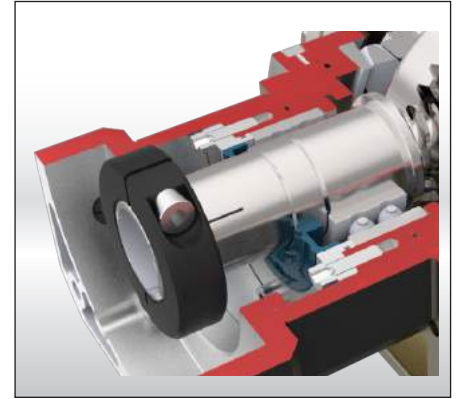
Analiz ve dizayn için 3D-CAE yazılımı kullanılmıştır. Bu sayede redüktör ve helis dişlilerin mukavemeti ve hizmet ömrü test edilmiş olur.



## Optimized Design / Optimize Edilmiş Dizayn

Use Gleason's design software to design new spiral bevel gears. Through the ideal gear contact pattern for application, achieve high permissible output torque.

Konik dişlilerin dizaynında Gleason yazılımı kullanılmıştır. En uygun temas modellemesiyle, yüksek çıkış torkuna ulaşılır.



## Collet Locking Mechanism / Kovan Kilitleme Mekanizması

The input-end and the motor are coupled through a collet locking mechanism. It has passed dynamical balance analysis to assure concentricity and balance on the connection and no backlash for power transmission while running at high speed.

Giriş mili ve motor mili kovan kilitleme mekanizmasıyla birbirine bağlanır. Yüksek devirlerde çalışırken güç iletiminde boşluk olmaması ve bağlantı dengesinin sağlanması amacıyla dinamik denge analizi yapılır.

# HY Series / Serileri

## 1-Stage / Kademe

Model No.		Unit Birim	Ratio Çevrim	55	75	90	115	130	140	160	190
Nominal output torque / Nominal Çıkış Torku	$T_{2N}$	Nm	3,4,5	35	70	140	260	430	720	1,100	1,440
			6,8,10	30	60	117	220	365	615	957	1,230
			12,15	25	50	95	180	300	510	815	1,020
Max. Acceleration Torque / Max.İvmelenme Torku	$T_{2B}$	Nm	3~15	1.5 Times of Rated Output Torque / 1,5 x Nominal Çıkış Torku							
Max. Output Torque / Max.Çıkış Torku	$T_{2NOT}$	Nm	3~15	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku							
Rated Input Speed / Nominal Giriş Devri	$n_{1N}$	rpm	3,4,5	2,100	1,800	1,500	1,150	1,000	700	600	550
			6,8,10	3,200	2,700	2,200	1,800	1,500	1,200	1,100	1,000
			12,15	3,900	3,300	2,800	2,300	2,000	1,600	1,350	1,300
Max. Input Speed / Max.Giriş Devri	$n_{1B}$	rpm	3~15	8,000	8,000	7,000	6,000	5,000	5,000	4,500	4,500
Backlash / Boşluk Oranı	$J_t$	arcmin	P0	-	-	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3
			P1	≤ 6	≤ 6	≤ 6	≤ 6	≤ 6	≤ 6	≤ 6	≤ 6
			P2	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9
Max. Radial Force Ball Bearing / Max. Radyal Yük Bilyalı Rulman	$F_{2rB}$	N	3~15	1,495	2,366	2,691	4,797	5,837	7,020	9,490	12,337
Max. Axial Force Ball Bearing / Max. Aksiyel Yük Bilyalı Rulman	$F_{2aB}$	N	3~15	748	1,183	1,346	2,399	2,919	3,510	4,745	6,169
Max. Radial Force Taper Bearing / Max. Radyal Yük Masuralı Rulman	$F_{2rB}$	N	3~15	-	-	5,523 6,545(B)	9,100	12,320	14,420	18,620	24,080
Max. Axial Force Taper Bearing / Max. Aksiyel Yük Masuralı Rulman	$F_{2aB}$	N	3~15	-	-	2,762 3,273(B)	4,550	6,160	7,210	9,310	12,040
Service Life / Hizmet Ömrü	$L_{Ht}$	hr	3~15	S5 Döngüsel Çalışma : >30,000 (S1 Sürekli Çalışma : >15,000 hrs) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)							
Efficiency / Verim	$\eta$	%	3~8	≥ 96%							
			10~15	≥ 93%							
Operating Temperature / Çalışma Sıcaklığı		°C	3~15	-10°C ~ +90°C							
Lubrication / Yağlama			3~15	Synthetic Oil / Sentetik Yağ							
Noise Level / Ses Seviyesi		dB	3~5	≤ 67	≤ 67	≤ 69	≤ 69	≤ 71	≤ 71	≤ 72	≤ 72

NOTE / NOT: (B) Ball Screw / Vidalı Mil

### Mass Moments of Inertia / Atalet Ağırlık Momenti (kgcm<sup>2</sup>)

Ratio / Çevrim	55	75	90	115	130	140	160	190
3	0.39	0.98	2.42	7.12	14.03	26.96	52.32	91.47
4	0.30	0.73	1.77	5.09	9.17	17.44	32.78	62.43
5	0.23	0.58	1.41	4.00	7.12	13.53	24.76	44.29
6	0.22	0.52	1.41	3.65	6.76	12.25	22.49	39.55
8	0.17	0.43	1.12	2.85	5.09	8.95	15.67	27.07
10	0.15	0.38	1.00	2.46	4.27	7.38	12.47	21.43
12	0.14	0.36	0.88	2.25	3.81	6.47	10.67	18.14
15	0.13	0.34	0.81	2.07	3.45	5.76	9.23	15.53

# HY Series / Serileri

## 2-Stage / Kademe

Model No.		Unit Birim	Ratio Çevrim	55	75	90	115	130	140	160	190
Nominal output torque / Nominal Çıkış Torku	$T_{2N}$	Nm	20,30,40,50	35	70	140	260	430	720	1,100	1,440
			60,80,100	30	60	117	220	365	615	957	1,230
			120,150	25	50	95	180	300	510	815	1,020
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	20~150	1.5 Times of Rated Output Torque / 1,5 x Nominal Çıkış Torku							
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	20~150	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku							
Rated Input Speed / Nominal Giriş Devri	$n_{1N}$	rpm	20~150	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000
Max. Input Speed / Max. Giriş Devri	$n_{1B}$	rpm	20~150	6,000	6,000	6,000	6,000	5,000	5,000	5,000	4,000
Backlash / Boşluk Oranı	$J_t$	arcmin	P0	-	-	$\leq 4$	$\leq 4$	$\leq 4$	$\leq 4$	$\leq 4$	$\leq 4$
			P1	$\leq 7$	$\leq 7$	$\leq 7$	$\leq 7$	$\leq 7$	$\leq 7$	$\leq 7$	$\leq 7$
			P2	$\leq 10$	$\leq 10$	$\leq 10$	$\leq 10$	$\leq 10$	$\leq 10$	$\leq 10$	$\leq 10$
Max. Radial Force Ball Bearing / Max. Radyal Yük Bilyalı Rulman	$F_{2rB}$	N	20~150	1,495	2,366	2,691	4,797	5,837	7,020	9,490	12,337
Max. Axial Force Ball Bearing / Max. Aksiyel Yük Bilyalı Rulman	$F_{2aB}$	N	20~150	748	1,183	1,346	2,399	2,919	3,510	4,745	61,69
Max. Radial Force Taper Bearing / Max. Radyal Yük Masuralı Rulman	$F_{2rB}$	N	20~150	-	-	5,523 6,545(B)	9,100	12,320	14,420	18,620	24,080
Max. Axial Force Taper Bearing / Max. Aksiyel Yük Masuralı Rulman	$F_{2aB}$	N	20~150	-	-	2,762 3,273(B)	4,550	6,160	7,210	9,310	12,040
Service Life / Hizmet Ömrü	$L_H$	hr	20~150	S5 Döngüsel Çalışma : >30,000 (S1 Sürekli Çalışma : >15,000 hrs) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)							
Efficiency / Verim	$\eta$	%	20~80	$\geq 92\%$							
			100~150	$\geq 90\%$							
Operating Temperature / Çalışma Sıcaklığı		°C	20~150	-10°C ~ +90°C							
Lubrication / Yağlama			20~150	Synthetic Oil / Sentetik Yağ							
Noise Level / Ses Seviyesi		dB	20~150	$\leq 67$	$\leq 67$	$\leq 69$	$\leq 69$	$\leq 71$	$\leq 71$	$\leq 72$	$\leq 72$

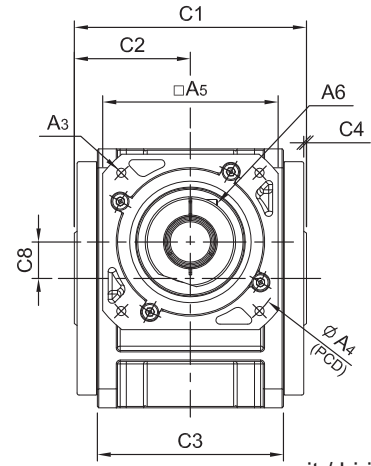
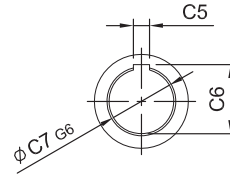
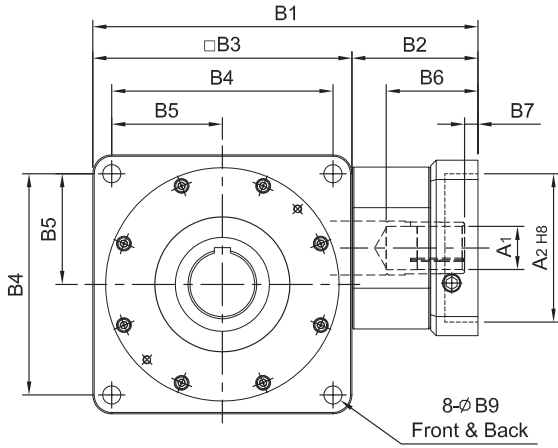
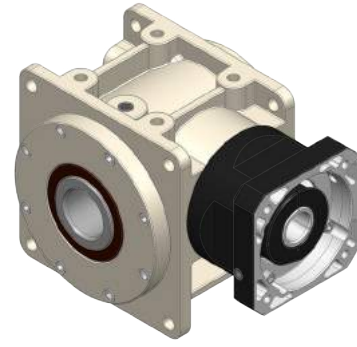
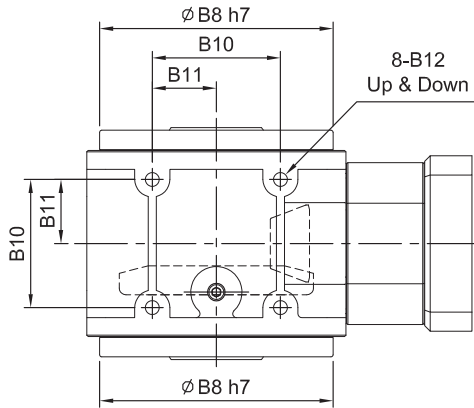
NOTE / NOT: (B) Ball Screw / Vidalı Mil

### Mass Moments of Inertia / Atalet Ağırlık Momenti (kgcm<sup>2</sup>)

Ratio / Çevrim	55	75	90	115	130	140	160	190
20	0.46	1.38	1.41	6.64	6.73	12.57	12.85	13.33
25	0.39	1.15	1.18	4.9	4.99	7.99	8.27	8.75
30	0.37	1.06	1.09	4.15	4.24	6.58	6.86	7.34
40	0.36	1.06	1.07	4.09	4.13	6.38	6.48	6.66
50	0.36	1.05	1.06	4.07	4.09	6.31	6.36	6.45
60	0.35	0.94	0.97	3.2	3.29	4.14	4.42	4.9
75	0.35	0.94	0.96	3.17	3.24	4.04	4.23	4.56
80	0.34	0.94	0.95	3.14	3.18	3.94	4.04	4.22
100	0.34	0.93	0.94	3.12	3.14	3.87	3.92	4.01
120	0.33	0.93	0.94	3.1	3.1	3.8	3.8	3.8
150	0.33	0.92	0.93	3.08	3.06	3.73	3.68	3.59

# HY-FO series / serileri

RATIO / ÇEVİRİM : 3.4.5.6.8.10.12.15 (1-Stage / Kademe)

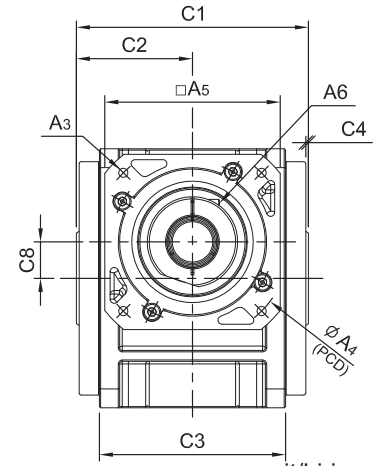
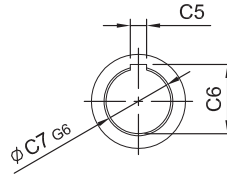
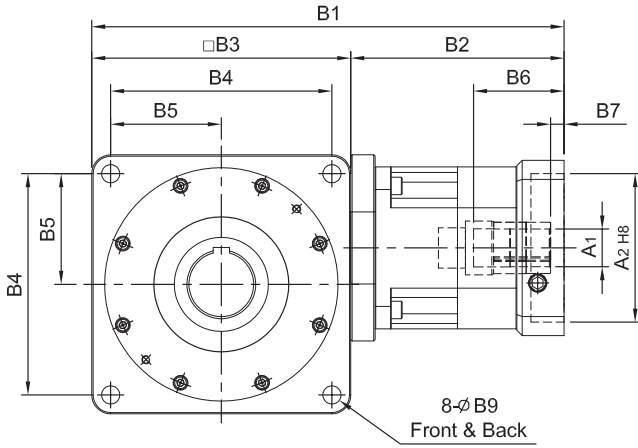
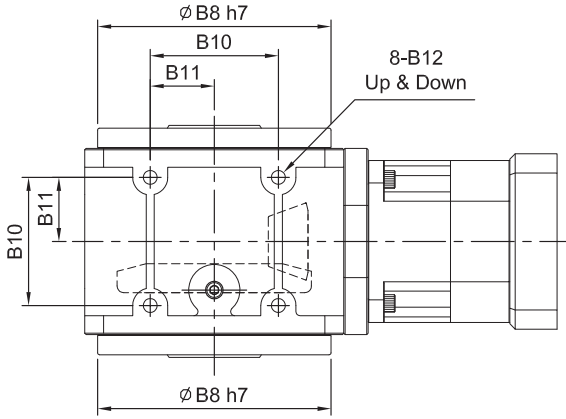
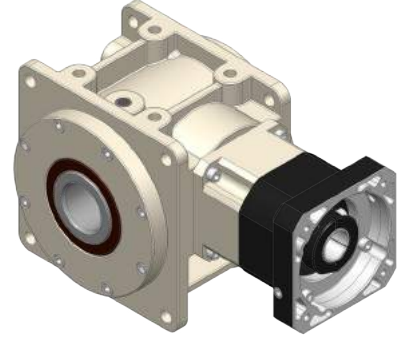


unit / birim: mm

Model Code	55	75	90	115	130	140	160	190
A1	8 · 11	14	14 · 19	19 · 24	28 · 32	35	35 · 38	42 · 48
A2	30 · 40 · 50	50 · 60 · 70	50 · 70 · 80 · 95	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180	110 · 130 · 180	114.3 · 180 · 230 · 250
A3	M3 · M4 · M5	M4 · M5 · M6	M5 · M6	M5 · M6 · M8	M6 · M8 · M10	M8 · M10 · M12	M8 · M10 · M12	M12 · M16
A4	46 · 60 · 63	70 · 75 · 90	70 · 90 · 100 · 115	90 · 100 · 115 · 145	115 · 145 · 165	145 · 165 · 200	145 · 165 · 200	200 · 215 · 265 · 300
A5	46 · 55	64 · 70 · 80	80 · 92 · 110	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190	146 · 150 · 190	182 · 200 · 250 · 265
A6	M3 x P.05	M5 x P0.8	M5 x P0.8	M8 x P1.25	M8 x P1.25	M10 x P1.5	M10 x P1.5	M10 x P1.5
B1	123	158	202	241	286	333	358	417 · 419
B2	33	43	62	71	94	118	118	153 · 155
B3	90	115	140	170	192	215	240	264
B4	78	98	118	144	164	182	206	224
B5	39	49	59	72	82	91	103	112
B6	26	38	49	58	69.5	81.5	81.5	114.5 · 116.5
B7	5	6	9	8	10	10	10	11.5 · 13.5
B8	84	103	128	148	173	200	227	254
B9	6.8	9	11	11	13.5	15	17.5	17.5
B10	44	54	66	80	95	104	120	140
B11	22	27	33	40	47.5	52	60	70
B12	M6 x P1.0	M8 x P1.25	M10 x P1.5	M12 x P1.75	M12 x P1.75	M14 x P2.0	M16 x P2.0	M16 x P2.0
C1	88	108	132	156	172	187	212	242
C2	44	54	66	78	86	93.5	106	121
C3	60	80	100	120	138	146	166	196
C4	2	2	2	2	2	2	2	2
C5	6	7	8	10	12	14	14	18
C6	22.8	28.3	33.3	43.3	51.3	58.8	63.8	74.3
C7	20	25	30	40	48	55	60	70
C8	9	14	18	23	27	32	38	42
Weight / Ağırlık	3.0	4.6	8.3	12.3	18.2	26.6	37.6	59.5

# HY-RO series / serileri

RATIO / ÇEVİRİM : 20.25.30.40.50.60.75.80.100.120.150 (2-Stage / Kademe)

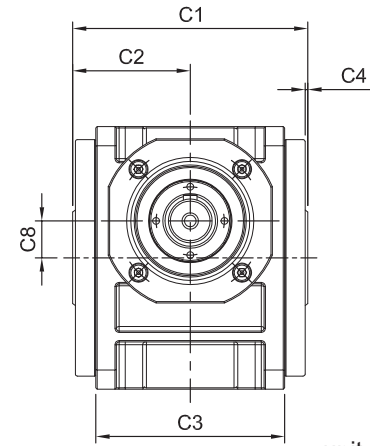
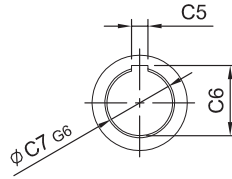
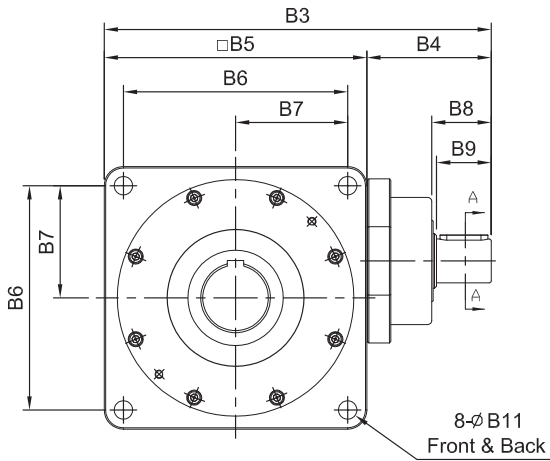
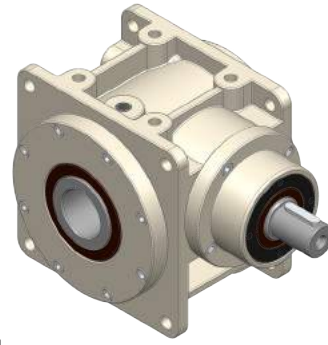
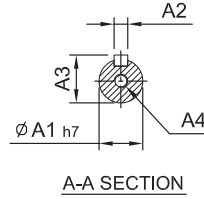
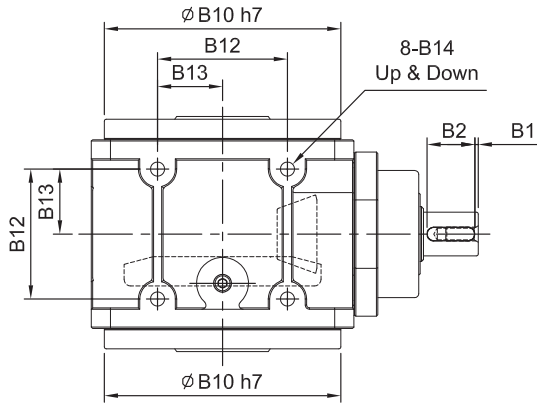


unit/birim: mm

Model Code	55	75	90	115	130	140	160	190	
<b>A</b>	A1	8 · 11	14	(14) · 19	19 · 24	28 · 32	32 · 35	32 · 35	38 · 42 · 48 · 55
	A2	30 · 40 · 50	50 · 60 · 70	50 · 70 · 80 · 95	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180	110 · 130 · 180	114.3 · 180 · 230 · 250
	A3	M3 · M4 · M5	M4 · M5 · M6	M5 · M6	M5 · M6 · M8	M6 · M8 · M10	M8 · M10 · M12	M8 · M10 · M12	M12 · M16
	A4	46 · 60 · 63	70 · 75 · 90	70 · 90 · 100 · 115	90 · 100 · 115 · 145	115 · 145 · 165	145 · 165 · 200	145 · 165 · 200	200 · 215 · 265 · 300
	A5	46 · 55	64 · 70 · 80	80 · 92 · 110	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190	146 · 150 · 190	182 · 200 · 250 · 265
	A6	M3 x P.05	M5 x P0.8	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5	M10 x P1.5
<b>B</b>	B1	157	201	(224.5) · 237	287	340	405	430	508 · 510
	B2	67	86	(84.5) · 97	117	148	190	190	244 · 246
	B3	90	115	140	170	192	215	240	264
	B4	78	98	118	144	164	182	206	224
	B5	39	49	59	72	82	91	103	112
	B6	26	32	(33.5) · 45.5	59	67	84.5	84.5	114.5 · 116.5
	B7	5	6	(6) · 10	9	10	10	10	11.5 · 13.5
	B8	84	103	128	148	173	200	227	254
	B9	6.8	9	11	11	13.5	15	17.5	17.5
	B10	44	54	66	80	95	104	120	140
	B11	22	27	33	40	47.5	52	60	70
	B12	M6 x P1.0	M8 x P1.25	M10 x P1.5	M12 x P1.75	M12 x P1.75	M14 x P2.0	M16 x P2.0	M16 x P2.0
<b>C</b>	C1	88	108	132	156	172	187	212	242
	C2	44	54	66	78	86	93.5	106	121
	C3	60	80	100	120	138	146	166	196
	C4	2	2	2	2	2	2	2	2
	C5	6	7	8	10	12	14	14	18
	C6	22.8	28.3	33.3	43.3	51.3	58.8	63.8	74.3
	C7	20	25	30	40	48	55	60	70
	C8	9	14	18	23	27	32	38	42
Weight / Ağırlık	3.5	5.8	10.0	16.0	26.8	41.2	52.1	86.1	

# HY-DO series / serileri

RATIO / ÇEVİRİM : 3.4.5.6.8.10.12.15 (1-Stage / Kademe)

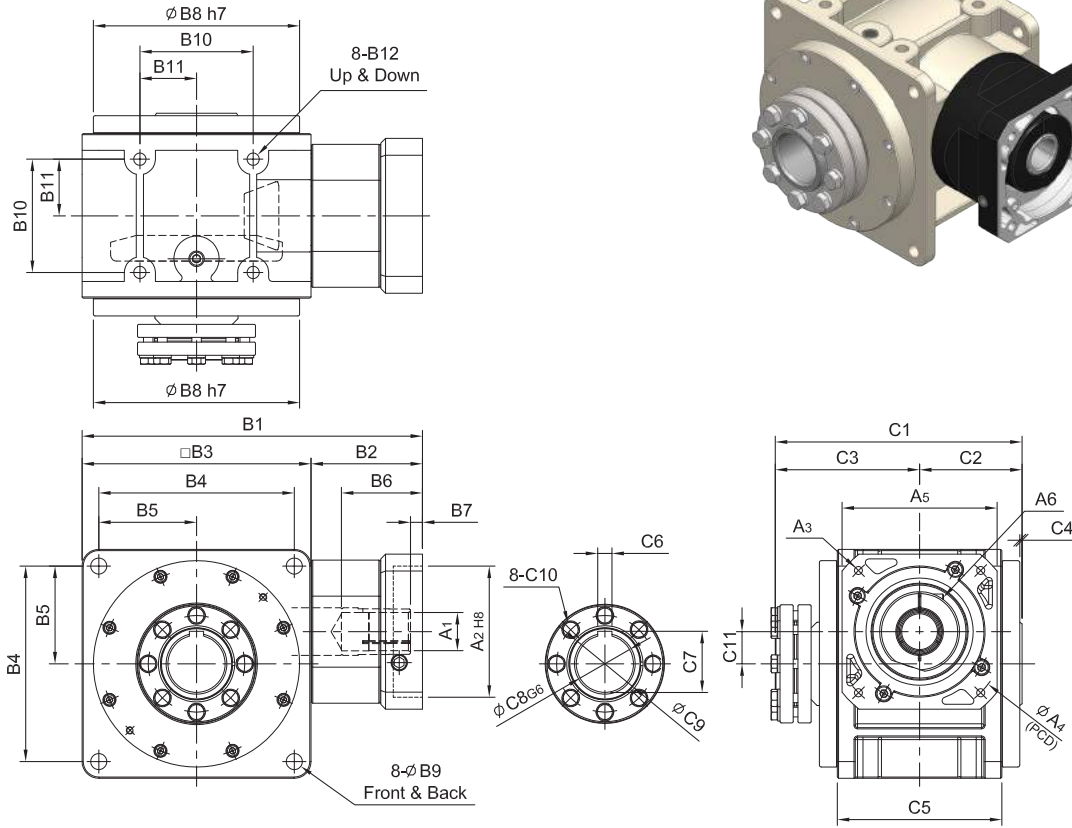


unit / birim: mm

Model Code	55	75	90	115	130	140	160	190
<b>A</b>	A1	14	19	24	28	32	38	40
	A2	5	6	8	8	10	12	12
	A3	16	21.5	27	31	35	41	43
	A4	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5	M10 x P1.5	M12 x P1.75
<b>B</b>	B1	2.5	2.5	2.5	2.5	5	5	5
	B2	20	25	35	35	40	40	50
	B3	147	181	218	260	293	315	367
	B4	57	66	78	90	101	100	127
	B5	90	115	140	170	192	215	240
	B6	78	98	118	144	164	182	206
	B7	39	49	59	72	82	91	103
	B8	27	32	42.5	42.5	52.5	51.5	62
	B9	25	30	40	40	50	50	60
	B10	84	103	128	148	173	200	227
	B11	6.8	9	11	11	13.5	15	17.5
	B12	44	54	66	80	95	104	120
	B13	22	27	33	40	47.5	52	60
	B14	M6 x P1.0	M8 x P1.25	M10 x P1.5	M12 x P1.75	M12 x P1.75	M14 x P2.0	M16 x P2.0
<b>C</b>	C1	88	108	132	156	172	212	242
	C2	44	54	66	78	86	93.5	106
	C3	60	80	100	120	138	146	166
	C4	2	2	2	2	2	2	2
	C5	6	7	8	10	12	14	18
	C6	22.8	28.3	33.3	43.3	51.3	58.8	63.8
	C7	20	25	30	40	48	55	60
	C8	9	14	18	23	27	32	38
Weight / Ağırlık	2.9	4.6	8.1	11.0	18.7	25.9	36.8	56.1

# HY-FN series / serileri

RATIO / ÇEVİRİM : 3.4.5.6.8.10.12.15 (1-Stage / Kademe)

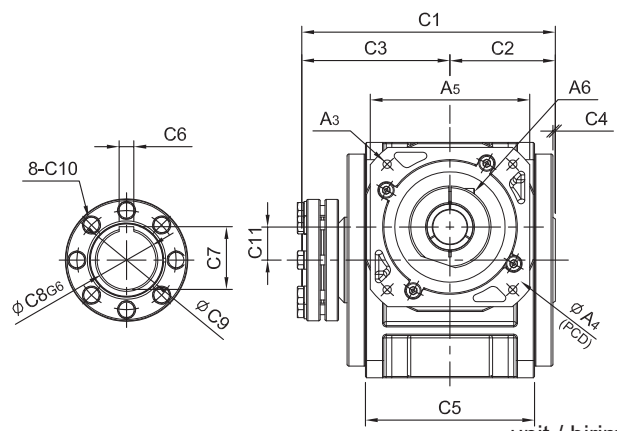
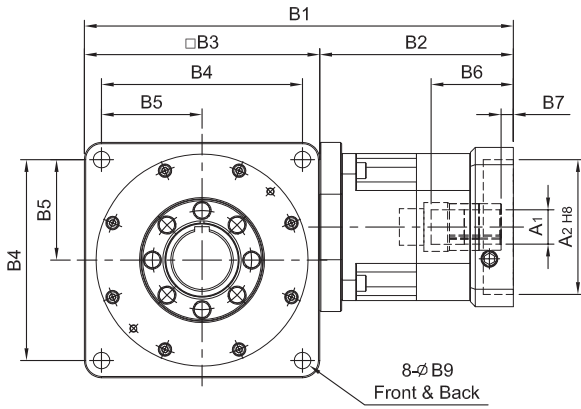
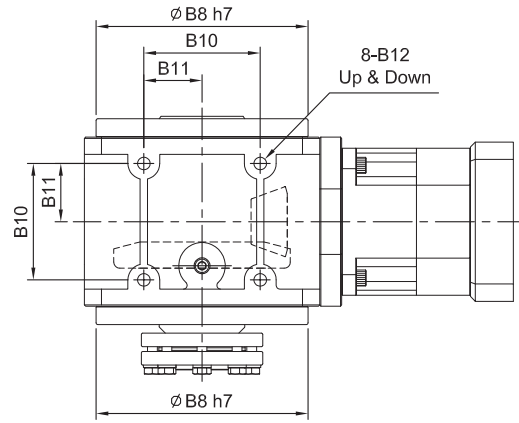


unit / birim: mm

Model Code	55	75	90	115	130	140	160	190	
<b>A</b>	A1	8 · 11	14	14 · 19	19 · 24	28 · 32	35	35 · 38	42 · 48
	A2	30 · 40 · 50	50 · 60 · 70	50 · 70 · 80 · 95	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180	110 · 130 · 180	114.3 · 180 · 230 · 250
	A3	M3 · M4 · M5	M4 · M5 · M6	M5 · M6	M5 · M6 · M8	M6 · M8 · M10	M8 · M10 · M12	M8 · M10 · M12	M12 · M16
	A4	46 · 60 · 63	70 · 75 · 90	70 · 90 · 100 · 115	90 · 100 · 115 · 145	115 · 145 · 165	145 · 165 · 200	145 · 165 · 200	200 · 215 · 265 · 300
	A5	46 · 55	64 · 70 · 80	80 · 92 · 110	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190	146 · 150 · 190	182 · 200 · 250 · 265
	A6	M3 x P.05	M5 x P0.8	M5 x P0.8	M8 x P1.25	M8 x P1.25	M10 x P1.5	M10 x P1.5	M10 x P1.5
<b>B</b>	B1	123	158	202	241	286	333	358	417 · 419
	B2	33	43	62	71	94	118	118	153 · 155
	B3	90	115	140	170	192	215	240	264
	B4	78	98	118	144	164	182	206	224
	B5	39	49	59	72	82	91	103	112
	B6	26	38	49	58	69.5	81.5	81.5	114.5 · 116.5
	B7	5	6	9	8	10	10	10	11.5 · 13.5
	B8	84	103	128	148	173	200	227	254
	B9	6.8	9	11	11	13.5	15	17.5	17.5
	B10	44	54	66	80	95	104	120	140
	B11	22	27	33	40	47.5	52	60	70
	B12	M6 x P1.0	M8 x P1.25	M10 x P1.5	M12 x P1.75	M12 x P1.75	M14 x P2.0	M16 x P2.0	M16 x P2.0
<b>C</b>	C1	109	134	160	189	207	224	249	281
	C2	44	54	66	78	86	93.5	106	121
	C3	65	80	94	111	121	130.5	143	160
	C4	2	2	2	2	2	2	2	2
	C5	60	80	100	120	138	146	166	196
	C6	6	7	8	10	12	14	14	18
	C7	22.8	28.3	33.3	43.3	51.3	58.8	63.8	74.3
	C8	20	25	30	40	48	55	60	70
	C9	28	34	44	52	60	65	73	83
	C10	M6	M6	M6	M8	M8	M8	M8	M10
	C11	9	14	18	23	27	32	38	42
Weight / Ağırlık	3.2	5.0	8.7	13.0	19.3	27.4	39.4	61.7	

# HY-RN series / serileri

RATIO / ÇEVİRİM : 20.25.30.40.50.60.75.80.100.120.150 (2-Stage / Kademe)

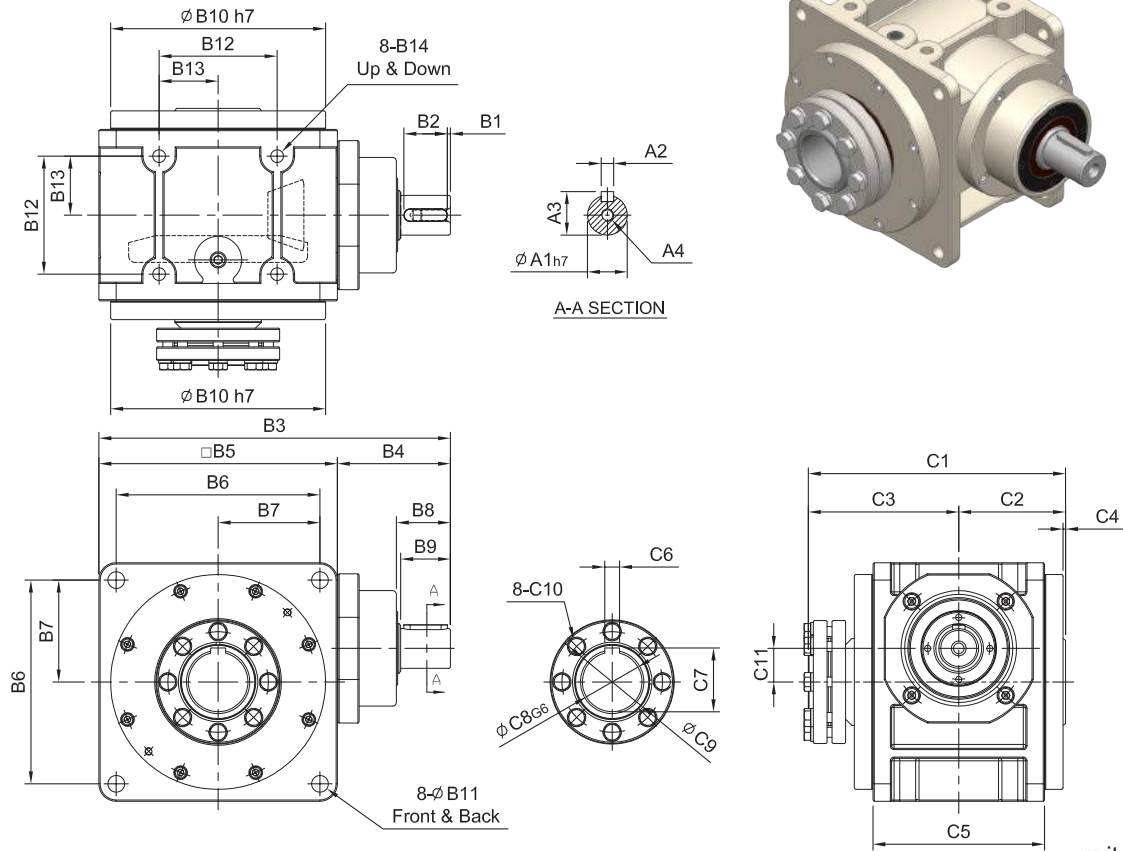


unit / birim: mm

Model Code	55	75	90	115	130	140	160	190	
	<b>A</b>	A1	8 · 11	14	(14) · 19	19 · 24	28 · 32	32 · 35	32 · 35
	A2	30 · 40 · 50	50 · 60 · 70	50 · 70 · 80 · 95	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180	110 · 130 · 180	114.3 · 180 · 230 · 250
	A3	M3 · M4 · M5	M4 · M5 · M6	M5 · M6	M5 · M6 · M8	M6 · M8 · M10	M8 · M10 · M12	M8 · M10 · M12	M12 · M16
	A4	46 · 60 · 63	70 · 75 · 90	70 · 90 · 100 · 115	90 · 100 · 115 · 145	115 · 145 · 165	145 · 165 · 200	145 · 165 · 200	200 · 215 · 265 · 300
	A5	46 · 55	64 · 70 · 80	80 · 92 · 110	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190	146 · 150 · 190	182 · 200 · 250 · 265
	A6	M3 x P.05	M5 x P0.8	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5	M10 x P1.5
<b>B</b>	B1	157	201	(224.5) · 237	287	340	405	430	508 · 510
	B2	67	86	(84.5) · 97	117	148	190	190	244 · 246
	B3	90	115	140	170	192	215	240	264
	B4	78	98	118	144	164	182	206	224
	B5	39	49	59	72	82	91	103	112
	B6	26	32	(33.5) · 45.5	59	67	84.5	84.5	114.5 · 116.5
	B7	5	6	(6) · 10	9	10	10	10	11.5 · 13.5
	B8	84	103	128	148	173	200	227	254
	B9	6.8	9	11	11	13.5	15	17.5	17.5
	B10	44	54	66	80	95	104	120	140
	B11	22	27	33	40	47.5	52	60	70
	B12	M6 x P1.0	M8 x P1.25	M10 x P1.5	M12 x P1.75	M12 x P1.75	M14 x P2.0	M16 x P2.0	M16 x P2.0
<b>C</b>	C1	109	134	160	189	207	224	249	281
	C2	44	54	66	78	86	93.5	106	121
	C3	65	80	94	111	121	130.5	143	160
	C4	2	2	2	2	2	2	2	2
	C5	60	80	100	120	138	146	166	196
	C6	6	7	8	10	12	14	14	18
	C7	22.8	28.3	33.3	43.3	51.3	58.8	63.8	74.3
	C8	20	25	30	40	48	55	60	70
	C9	28	34	44	52	60	65	73	83
	C10	M6	M6	M6	M8	M8	M8	M8	M10
	C11	9	14	18	23	27	32	38	42
Weight / Ağırlık	3.8	6.2	10.5	16.7	28.0	41.9	53.9	88.4	

# HY-DN series / serileri

RATIO / ÇEVİRİM: 3.4.5.6.8.10.12.15 (1-Stage / Kademe)

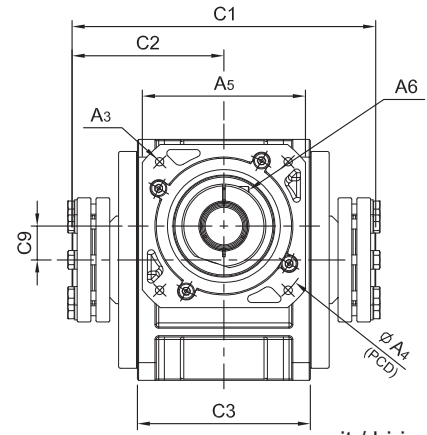
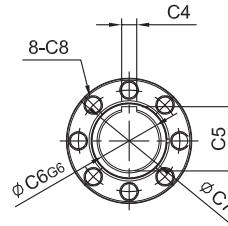
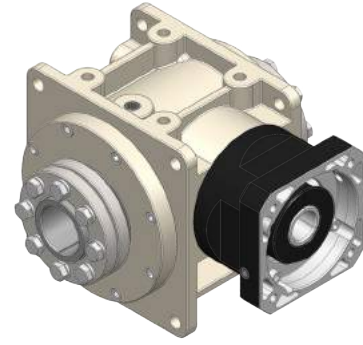
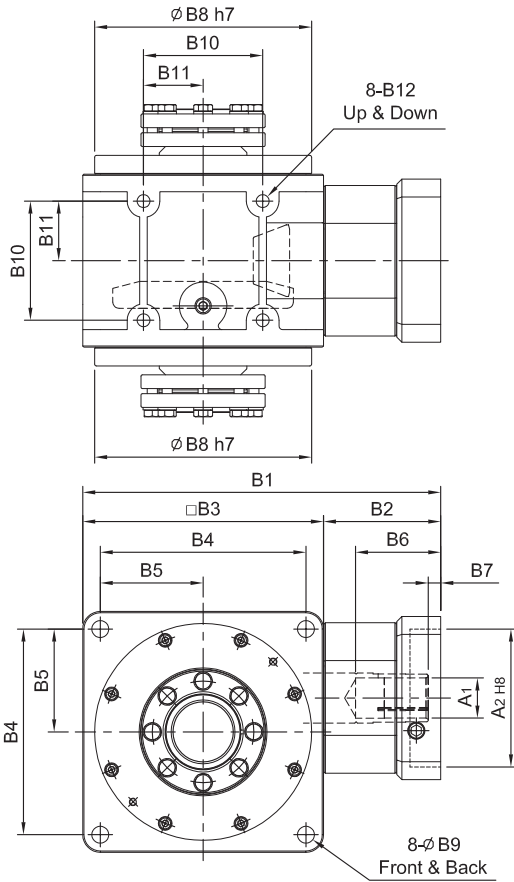


unit / birim: mm

Model Code	55	75	90	115	130	140	160	190
	<b>A</b>							
A1	14	19	24	28	32	32	38	40
A2	5	6	8	8	10	10	12	12
A3	16	21.5	27	31	35	35	41	43
A4	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5	M10 x P1.5	M12 x P1.75	M12 x P1.75
<b>B</b>								
B1	2.5	2.5	2.5	2.5	5	5	5	5
B2	20	25	35	35	40	40	50	50
B3	147	181	218	260	293	315	367	403
B4	57	66	78	90	101	100	127	139
B5	90	115	140	170	192	215	240	264
B6	78	98	118	144	164	182	206	224
B7	39	49	59	72	82	91	103	112
B8	27	32	42.5	42.5	52.5	51.5	62	63.5
B9	25	30	40	40	50	50	60	60
B10	84	103	128	148	173	200	227	254
B11	6.8	9	11	11	13.5	15	17.5	17.5
B12	44	54	66	80	95	104	120	140
B13	22	27	33	40	47.5	52	60	70
B14	M6 x P1.0	M8 x P1.25	M10 x P1.5	M12 x P1.75	M12 x P1.75	M14 x P2.0	M16 x P2.0	M16 x P2.0
<b>C</b>								
C1	109	134	160	189	207	224	249	281
C2	44	54	66	78	86	93.5	106	121
C3	65	80	94	111	121	130.5	143	160
C4	2	2	2	2	2	2	2	2
C5	60	80	100	120	138	146	166	196
C6	6	7	8	10	12	14	14	18
C7	22.8	28.3	33.3	43.3	51.3	58.8	63.8	74.3
C8	20	25	30	40	48	55	60	70
C9	28	34	44	52	60	65	73	83
C10	M6	M6	M6	M8	M8	M8	M8	M10
C11	9	14	18	23	27	32	38	42
Weight / Ağırlık	3.1	5.0	8.6	11.6	19.9	27.8	38.6	58.4

# HY-FM series / serileri

RATIO / ÇEVİRİM : 3.4.5.6.8.10.12.15 (1-Stage / Kademe)

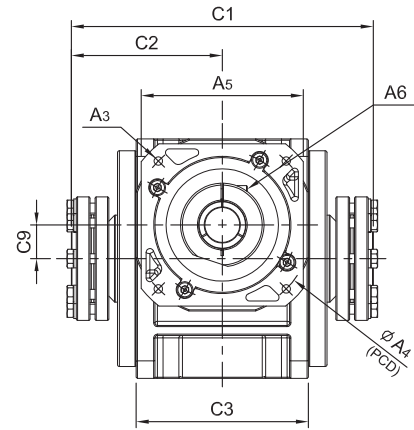
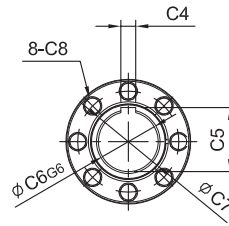
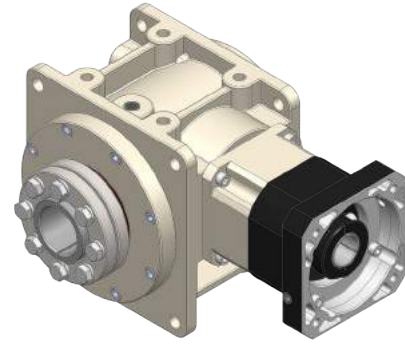
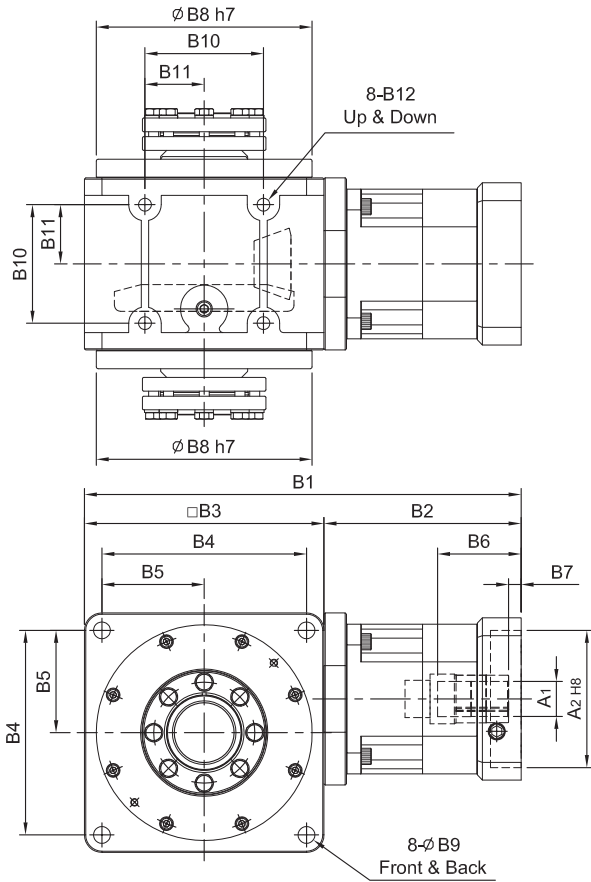


unit / birim: mm

Model Code	55	75	90	115	130	140	160	190	
<b>A</b>	A1	8 · 11	14	14 · 19	19 · 24	28 · 32	35	35 · 38	42 · 48
	A2	30 · 40 · 50	50 · 60 · 70	50 · 70 · 80 · 95	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180	110 · 130 · 180	114.3 · 180 · 230 · 250
	A3	M3 · M4 · M5	M4 · M5 · M6	M5 · M6	M5 · M6 · M8	M6 · M8 · M10	M8 · M10 · M12	M8 · M10 · M12	M12 · M16
	A4	46 · 60 · 63	70 · 75 · 90	70 · 90 · 100 · 115	90 · 100 · 115 · 145	115 · 145 · 165	145 · 165 · 200	145 · 165 · 200	200 · 215 · 265 · 300
	A5	46 · 55	64 · 70 · 80	80 · 92 · 110	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190	146 · 150 · 190	182 · 200 · 250 · 265
	A6	M3 x P.05	M5 x P0.8	M5 x P0.8	M8 x P1.25	M8 x P1.25	M10 x P1.5	M10 x P1.5	M10 x P1.5
<b>B</b>	B1	123	158	202	241	286	333	358	417 · 419
	B2	33	43	62	71	94	118	118	153 · 155
	B3	90	115	140	170	192	215	240	264
	B4	78	98	118	144	164	182	206	224
	B5	39	49	59	72	82	91	103	112
	B6	26	38	49	58	69.5	81.5	81.5	114.5 · 116.5
	B7	5	6	9	8	10	10	10	11.5 · 13.5
	B8	84	103	128	148	173	200	227	254
	B9	6.8	9	11	11	13.5	15	17.5	17.5
	B10	44	54	66	80	95	104	120	140
	B11	22	27	33	40	47.5	52	60	70
	B12	M6 x P1.0	M8 x P1.25	M10 x P1.5	M12 x P1.75	M12 x P1.75	M14 x P2.0	M16 x P2.0	M16 x P2.0
<b>C</b>	C1	130	160	188	222	242	261	286	320
	C2	65	80	94	111	121	130.5	143	160
	C3	60	80	100	120	138	146	166	196
	C4	-	-	-	-	12	14	14	18
	C5	-	-	-	-	51.3	58.8	63.8	74.3
	C6	20	25	30	40	48	55	60	70
	C7	28	34	44	52	60	65	73	83
	C8	M6	M6	M6	M8	M8	M8	M8	M10
	C9	9	14	18	23	27	32	38	42
Weight / Ağırlık		3.5	5.3	9.2	13.7	20.5	28.6	41.0	64.0

# HY-RM series / serileri

RATIO / ÇEVİRİM : 20.25.30.40.50.60.75.80.100.120.150 (2-Stage / Kademe)

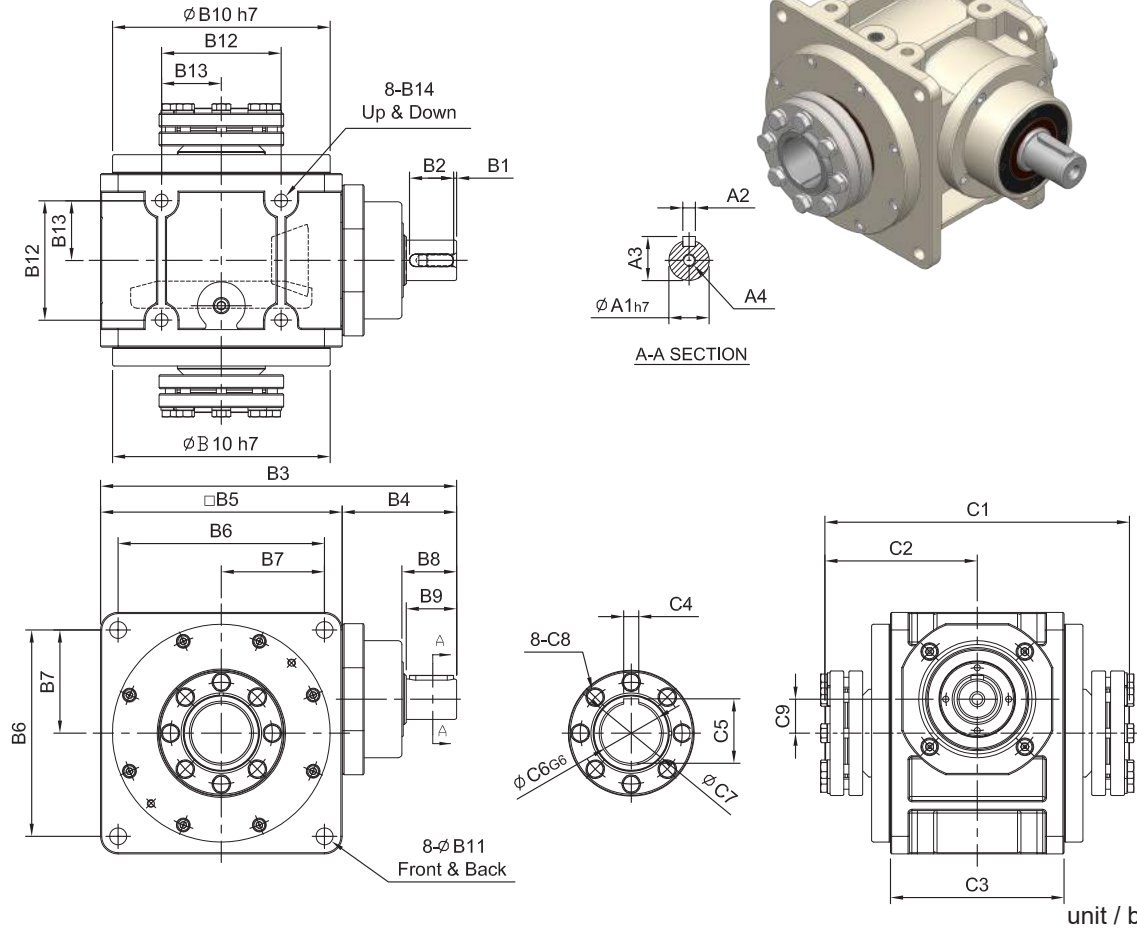


unit / birim: mm

	Model Code	55	75	90	115	130	140	160	190
	<b>A</b>	A1	8 · 11	14	(14) · 19	19 · 24	28 · 32	32 · 35	32 · 35
A2		30 · 40 · 50	50 · 60 · 70	50 · 70 · 80 · 95	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180	110 · 130 · 180	114.3 · 180 · 230 · 250
A3		M3 · M4 · M5	M4 · M5 · M6	M5 · M6	M5 · M6 · M8	M6 · M8 · M10	M8 · M10 · M12	M8 · M10 · M12	M12 · M16
A4		46 · 60 · 63	70 · 75 · 90	70 · 90 · 100 · 115	90 · 100 · 115 · 145	115 · 145 · 165	145 · 165 · 200	145 · 165 · 200	200 · 215 · 265 · 300
A5		46 · 55	64 · 70 · 80	80 · 92 · 110	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190	146 · 150 · 190	182 · 200 · 250 · 265
A6		M3 x P.05	M5 x P.0.8	M5 x P.0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5	M10 x P1.5
<b>B</b>	B1	157	201	(224.5) · 237	287	340	405	430	508 · 510
	B2	67	86	(84.5) · 97	117	148	190	190	244 · 246
	B3	90	115	140	170	192	215	240	264
	B4	78	98	118	144	164	182	206	224
	B5	39	49	59	72	82	91	103	112
	B6	26	32	(33.5) · 45.5	59	67	84.5	84.5	114.5 · 116.5
	B7	5	6	(6) · 10	9	10	10	10	11.5 · 13.5
	B8	84	103	128	148	173	200	227	254
	B9	6.8	9	11	11	13.5	15	17.5	17.5
	B10	44	54	66	80	95	104	120	140
	B11	22	27	33	40	47.5	52	60	70
	B12	M6 x P1.0	M8 x P1.25	M10 x P1.5	M12 x P1.75	M12 x P1.75	M14 x P2.0	M16 x P2.0	M16 x P2.0
<b>C</b>	C1	130	160	188	222	242	261	286	320
	C2	65	80	94	111	121	130.5	143	160
	C3	60	80	100	120	138	146	166	196
	C4	-	-	-	-	12	14	14	18
	C5	-	-	-	-	51.3	58.8	63.8	74.3
	C6	20	25	30	40	48	55	60	70
	C7	28	34	44	52	60	65	73	83
	C8	M6	M6	M6	M8	M8	M8	M8	M10
	C9	9	14	18	23	27	32	38	42
Weight / Ağırlık	4.1	6.6	11.0	17.4	29.1	43.1	55.6	90.7	

# HY-DM series / serileri

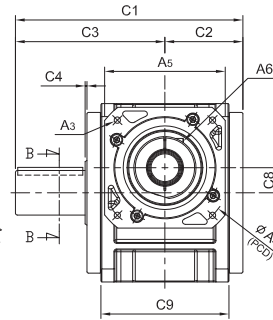
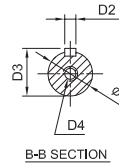
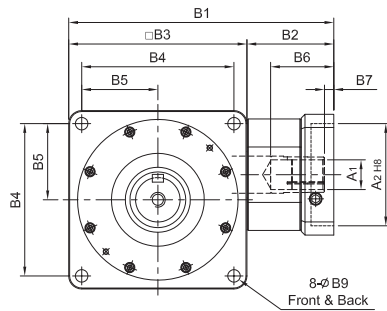
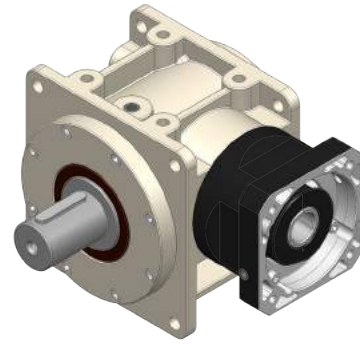
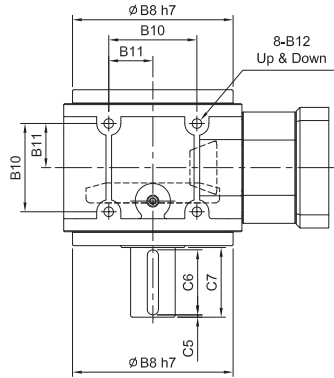
RATIO / ÇEVİRİM : 3.4.5.6.8.10.12.15 (1-Stage / Kademe)



Model Code	55	75	90	115	130	140	160	190
	<b>A</b>							
A1	14	19	24	28	32	32	38	40
A2	5	6	8	8	10	10	12	12
A3	16	21.5	27	31	35	35	41	43
A4	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5	M10 x P1.5	M12 x P1.75	M12 x P1.75
<b>B</b>								
B1	2.5	2.5	2.5	2.5	5	5	5	5
B2	20	25	35	35	40	40	50	50
B3	147	181	218	260	293	315	367	403
B4	57	66	78	90	101	100	127	139
B5	90	115	140	170	192	215	240	264
B6	78	98	118	144	164	182	206	224
B7	39	49	59	72	82	91	103	112
B8	27	32	42.5	42.5	52.5	51.5	62	63.5
B9	25	30	40	40	50	50	60	60
B10	84	103	128	148	173	200	227	254
B11	6.8	9	11	11	13.5	15	17.5	17.5
B12	44	54	66	80	95	104	120	140
B13	22	27	33	40	47.5	52	60	70
B14	M6 x P1.0	M8 x P1.25	M10 x P1.5	M12 x P1.75	M12 x P1.75	M14 x P2.0	M16 x P2.0	M16 x P2.0
<b>C</b>								
C1	130	160	188	222	242	261	286	320
C2	65	80	94	111	121	130.5	143	160
C3	60	80	100	120	138	146	166	196
C4	-	-	-	-	12	14	14	18
C5	-	-	-	-	51.3	58.8	63.8	74.3
C6	20	25	30	40	48	55	60	70
C7	28	34	44	52	60	65	73	83
C8	M6	M6	M6	M8	M8	M8	M8	M10
C9	9	14	18	23	27	32	38	42
Weight / Ağırlık	3.4	5.3	8.9	11.9	20.7	29.7	41	60.7

# HY-FS series / serileri

RATIO / ÇEVİRİM : 3.4.5.6.8.10.12.15 (1-Stage / Kademe)

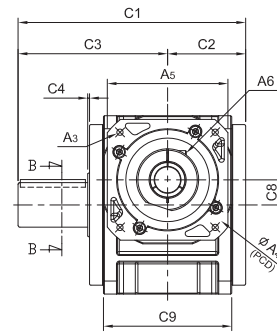
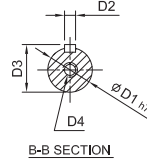
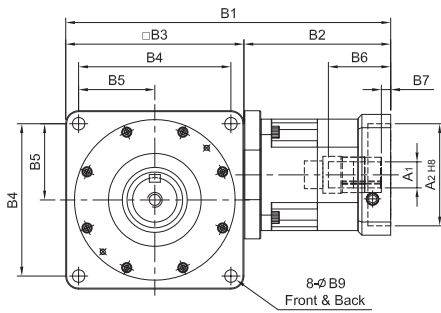
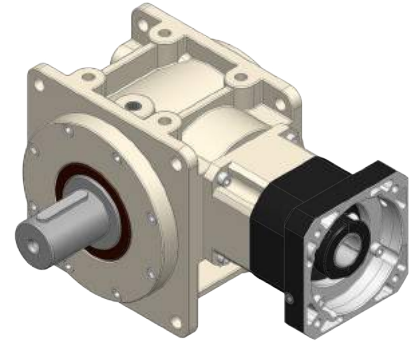
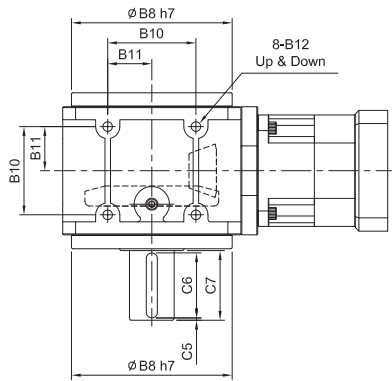


unit / birim: mm

	Model Code	55	75	90	115	130	140	160	190
	<b>A</b>	A1	8 · 11	14	14 · 19	19 · 24	28 · 32	35	35 · 38
A2		30 · 40 · 50	50 · 60 · 70	50 · 70 · 80 · 95	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180	110 · 130 · 180	114.3 · 180 · 230 · 250
A3		M3 · M4 · M5	M4 · M5 · M6	M5 · M6	M5 · M6 · M8	M6 · M8 · M10	M8 · M10 · M12	M8 · M10 · M12	M12 · M16
A4		46 · 60 · 63	70 · 75 · 90	70 · 90 · 100 · 115	90 · 100 · 115 · 145	115 · 145 · 165	145 · 165 · 200	145 · 165 · 200	200 · 215 · 265 · 300
A5		46 · 55	64 · 70 · 80	80 · 92 · 110	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190	146 · 150 · 190	182 · 200 · 250 · 265
A6		M3 x P.05	M5 x P0.8	M5 x P0.8	M8 x P1.25	M8 x P1.25	M10 x P1.5	M10 x P1.5	M10 x P1.5
<b>B</b>	B1	123	158	202	241	286	333	358	417 · 419
	B2	33	43	62	71	94	118	118	153 · 155
	B3	90	115	140	170	192	215	240	264
	B4	78	98	118	144	164	182	206	224
	B5	39	49	59	72	82	91	103	112
	B6	26	38	49	58	69.5	81.5	81.5	114.5 · 116.5
	B7	5	6	9	8	10	10	10	11.5 · 13.5
	B8	84	103	128	148	173	200	227	254
	B9	6.8	9	11	11	13.5	15	17.5	17.5
	B10	44	54	66	80	95	104	120	140
	B11	22	27	33	40	47.5	52	60	70
	B12	M6 x P1.0	M8 x P1.25	M10 x P1.5	M12 x P1.75	M12 x P1.75	M14 x P2.0	M16 x P2.0	M16 x P2.0
<b>C</b>	C1	121	146	180	214	245	275	310	350
	C2	42	52	64	76	84	91.5	103	118
	C3	79	94	120	138	161	183.5	206	231
	C4	2	2	2	2	2	2	2	2
	C5	5	2.5	2.5	2.5	2.5	5	5	5
	C6	25	35	45	55	70	80	90	100
	C7	35	40	50	60	75	90	100	110
	C8	9	14	18	23	27	32	38	42
	C9	60	80	100	120	138	146	166	196
<b>D</b>	D1	20	24	32	40	48	55	60	70
	D2	6	8	10	10	12	14	14	16
	D3	22.5	27	35	51.3	51	58.5	63	74
	D4	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5	M12 x P1.75	M16 x P2.0	M20 x P2.5	M20 x P2.5
Weight / Ağırlık		3.2	5.0	9.1	14.0	21.0	30.6	42.8	67.9

# HY-RS series / serileri

RATIO / ÇEVİRİM : 20.25.30.40.50.60.75.80.100.120.150 (2-Stage / Kademe)

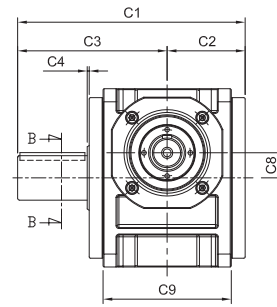
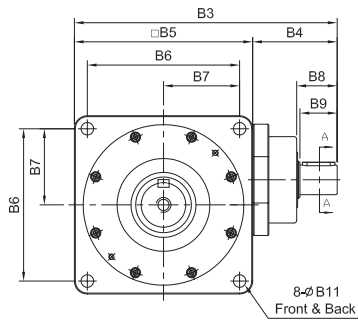
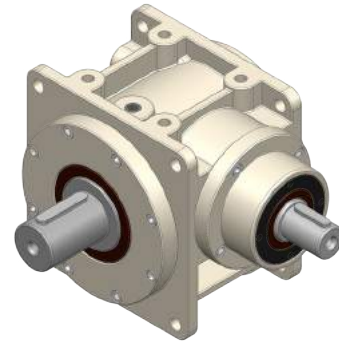
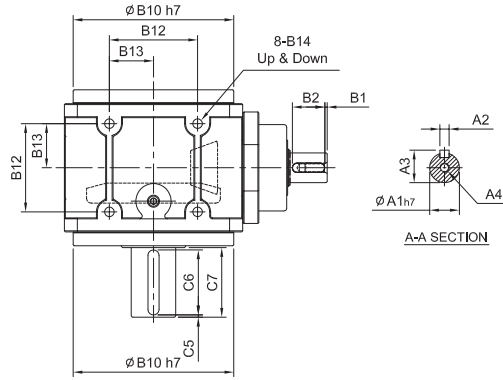


unit / birim: mm

Model Code	55	75	90	115	130	140	160	190	
<b>A</b>	A1	8 · 11	14	(14) · 19	19 · 24	28 · 32	32 · 35	32 · 35	38 · 42 · 48 · 55
	A2	30 · 40 · 50	50 · 60 · 70	50 · 70 · 80 · 95	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180	110 · 130 · 180	114.3 · 180 · 230 · 250
	A3	M3 · M4 · M5	M4 · M5 · M6	M5 · M6	M5 · M6 · M8	M6 · M8 · M10	M8 · M10 · M12	M8 · M10 · M12	M12 · M16
	A4	46 · 60 · 63	70 · 75 · 90	70 · 90 · 100 · 115	90 · 100 · 115 · 145	115 · 145 · 165	145 · 165 · 200	145 · 165 · 200	200 · 215 · 265 · 300
	A5	46 · 55	64 · 70 · 80	80 · 92 · 110	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190	146 · 150 · 190	182 · 200 · 250 · 265
	A6	M3 x P.05	M5 x P0.8	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5	M10 x P1.5
<b>B</b>	B1	157	201	(224.5) · 237	287	340	405	430	508 · 510
	B2	67	86	(84.5) · 97	117	148	190	190	244 · 246
	B3	90	115	140	170	192	215	240	264
	B4	78	98	118	144	164	182	206	224
	B5	39	49	59	72	82	91	103	112
	B6	26	32	(33.5) · 45.5	59	67	84.5	84.5	114.5 · 116.5
	B7	5	6	(6) · 10	9	10	10	10	11.5 · 13.5
	B8	84	103	128	148	173	200	227	254
	B9	6.8	9	11	11	13.5	15	17.5	17.5
	B10	44	54	66	80	95	104	120	140
	B11	22	27	33	40	47.5	52	60	70
	B12	M6 x P1.0	M8 x P1.25	M10 x P1.5	M12 x P1.75	M12 x P1.75	M14 x P2.0	M16 x P2.0	M16 x P2.0
<b>C</b>	C1	121	146	180	214	245	275	310	350
	C2	42	52	64	76	84	91.5	103	118
	C3	79	94	120	138	161	183.5	206	231
	C4	2	2	2	2	2	2	2	2
	C5	5	2.5	2.5	2.5	2.5	5	5	5
	C6	25	35	45	55	70	80	90	100
	C7	35	40	50	60	75	90	100	110
	C8	9	14	18	23	27	32	38	42
	C9	60	80	100	120	138	146	166	196
<b>D</b>	D1	20	24	32	40	48	55	60	70
	D2	6	8	10	10	12	14	14	16
	D3	22.5	27	35	51.3	51	58.5	63	74
	D4	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5	M12 x P1.75	M16 x P2.0	M20 x P2.5	M20 x P2.5
Weight / Ağırlık	3.8	6.3	10.9	17.7	29.6	45.2	57.4	94.6	

# HY-DS series / serileri

RATIO / ÇEVİRİM : 3.4.5.6.8.10.12.15 (1-Stage / Kademe)

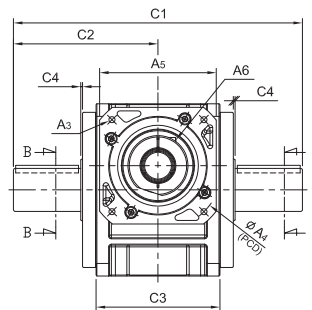
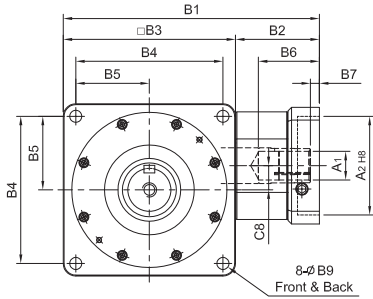
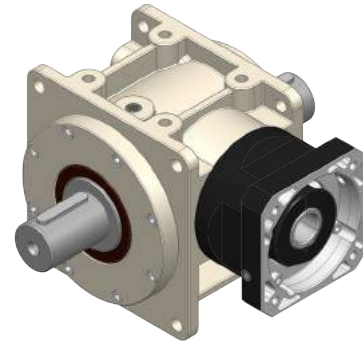
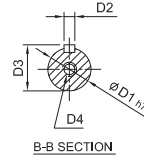
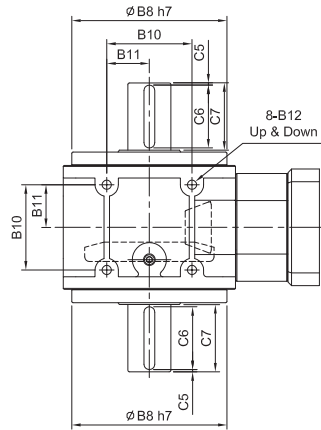


unit / birim: mm

Model Code	55	75	90	115	130	140	160	190
	<b>A</b>							
A1	14	19	24	28	32	32	38	40
A2	5	6	8	8	10	10	12	12
A3	16	21.5	27	31	35	35	41	43
A4	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5	M10 x P1.5	M12 x P1.75	M12 x P1.75
<b>B</b>								
B1	2.5	2.5	2.5	2.5	5	5	5	5
B2	20	25	35	35	40	40	50	50
B3	147	180.5	218	260	293	315	367	402.5
B4	57	65.5	78	90	101	100	127	138.5
B5	90	115	140	170	192	215	240	264
B6	78	98	118	144	164	182	206	224
B7	39	49	59	72	82	91	103	112
B8	27	32	42.5	42.5	52.5	51.5	62	63.5
B9	25	30	40	40	50	50	60	60
B10	84	103	128	148	173	200	227	254
B11	6.8	9	11	11	13.5	15	17.5	17.5
B12	44	54	66	80	95	104	120	140
B13	22	27	33	40	47.5	52	60	70
B14	M6 x P1.0	M8 x P1.25	M10 x P1.5	M12 x P1.75	M12 x P1.75	M14 x P2.0	M16 x P2.0	M16 x P2.0
<b>C</b>								
C1	121	146	180	214	245	275	310	350
C2	42	52	64	76	84	91.5	103	118
C3	79	94	120	138	161	183.5	206	231
C4	2	2	2	2	2	2	2	2
C5	5	2.5	2.5	2.5	2.5	5	5	5
C6	25	35	45	55	70	80	90	100
C7	35	40	50	60	75	90	100	110
C8	9	14	18	23	27	32	38	42
C9	60	80	100	120	138	146	166	196
<b>D</b>								
D1	20	24	32	40	48	55	60	70
D2	6	8	10	10	12	14	14	16
D3	22.5	27	35	51.3	51	58.5	63	74
D4	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5	M12 x P1.75	M16 x P2.0	M20 x P2.5	M20 x P2.5
Weight / Ağırlık	2.9	5.0	8.7	12.0	21.1	32.8	42.0	64.6

# HY-FV series / serileri

RATIO / ÇEVİRİM : 3.4.5.6.8.10.12.15 (1-Stage / Kademe)

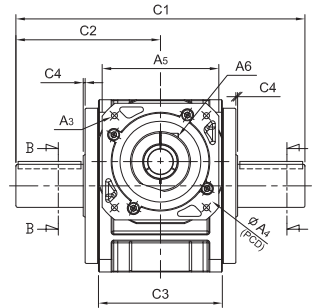
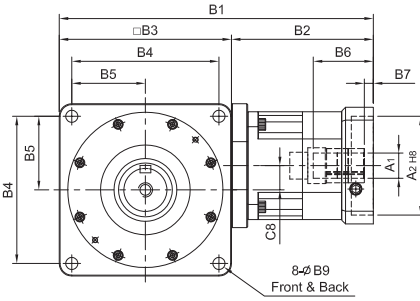
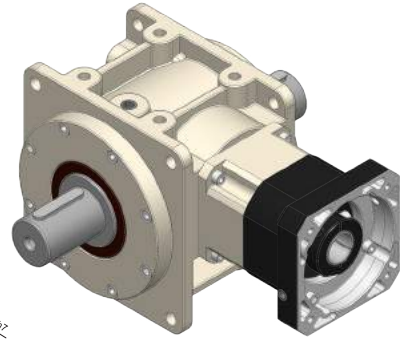
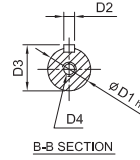
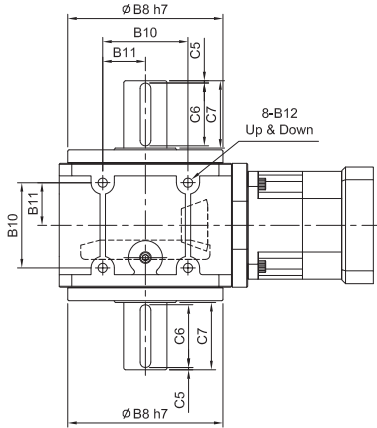


unit / birim: mm

Model Code	55	75	90	115	130	140	160	190
	<b>A</b>	A1: 8 · 11 A2: 30 · 40 · 50 A3: M3 · M4 · M5 A4: 46 · 60 · 63 A5: 46 · 55 A6: M3 x P.05	A1: 14 A2: 50 · 60 · 70 A3: M4 · M5 · M6 A4: 70 · 75 · 90 A5: 64 · 70 · 80 A6: M5 x P0.8	A1: 14 · 19 A2: 50 · 70 · 80 · 95 A3: M5 · M6 A4: 70 · 90 · 100 · 115 A5: 80 · 92 · 110 A6: M5 x P0.8	A1: 19 · 24 A2: 70 · 80 · 95 · 110 A3: M5 · M6 · M8 A4: 90 · 100 · 115 · 145 A5: 92 · 110 · 130 A6: M8 x P1.25	A1: 28 · 32 A2: 95 · 110 · 130 A3: M6 · M8 · M10 A4: 115 · 145 · 165 A5: 122 · 130 · 150 A6: M8 x P1.25	A1: 35 A2: 110 · 130 · 180 A3: M8 · M10 · M12 A4: 145 · 165 · 200 A5: 146 · 150 · 190 A6: M10 x P1.5	A1: 35 · 38 A2: 110 · 130 · 180 A3: M8 · M10 · M12 A4: 145 · 165 · 200 A5: 146 · 150 · 190 A6: M10 x P1.5
<b>B</b>	B1: 123 B2: 33 B3: 90 B4: 78 B5: 39 B6: 26 B7: 5 B8: 84 B9: 6.8 B10: 44 B11: 22 B12: M6 x P1.0	B1: 158 B2: 43 B3: 115 B4: 98 B5: 49 B6: 38 B7: 6 B8: 103 B9: 9 B10: 54 B11: 27 B12: M8 x P1.25	B1: 202 B2: 62 B3: 140 B4: 118 B5: 59 B6: 49 B7: 9 B8: 128 B9: 11 B10: 66 B11: 33 B12: M10 x P1.5	B1: 241 B2: 71 B3: 170 B4: 144 B5: 72 B6: 58 B7: 8 B8: 148 B9: 11 B10: 80 B11: 40 B12: M12 x P1.75	B1: 286 B2: 94 B3: 192 B4: 164 B5: 82 B6: 69.5 B7: 10 B8: 173 B9: 13.5 B10: 95 B11: 47.5 B12: M12 x P1.75	B1: 333 B2: 118 B3: 215 B4: 182 B5: 91 B6: 81.5 B7: 10 B8: 200 B9: 15 B10: 104 B11: 52 B12: M14 x P2.0	B1: 358 B2: 118 B3: 240 B4: 206 B5: 103 B6: 81.5 B7: 10 B8: 227 B9: 17.5 B10: 120 B11: 60 B12: M16 x P2.0	B1: 417 · 419 B2: 153 · 155 B3: 264 B4: 224 B5: 112 B6: 114.5 · 116.5 B7: 11.5 · 13.5 B8: 254 B9: 17.5 B10: 140 B11: 70 B12: M16 x P2.0
<b>C</b>	C1: 158 C2: 79 C3: 60 C4: 2 C5: 5 C6: 25 C7: 35 C8: 9	C1: 188 C2: 94 C3: 80 C4: 2 C5: 2.5 C6: 35 C7: 40 C8: 14	C1: 232 C2: 116 C3: 100 C4: 2 C5: 2.5 C6: 45 C7: 50 C8: 18	C1: 276 C2: 138 C3: 120 C4: 2 C5: 2.5 C6: 55 C7: 60 C8: 23	C1: 322 C2: 161 C3: 138 C4: 2 C5: 2.5 C6: 70 C7: 75 C8: 27	C1: 367 C2: 183.5 C3: 146 C4: 2 C5: 5 C6: 80 C7: 90 C8: 32	C1: 412 C2: 206 C3: 166 C4: 2 C5: 5 C6: 90 C7: 100 C8: 38	C1: 462 C2: 231 C3: 196 C4: 2 C5: 5 C6: 100 C7: 110 C8: 42
<b>D</b>	D1: 20 D2: 6 D3: 22.5 D4: M6 x P1.0	D1: 24 D2: 8 D3: 27 D4: M8 x P1.25	D1: 32 D2: 10 D3: 35 D4: M10 x P1.5	D1: 40 D2: 10 D3: 51.3 D4: M10 x P1.5	D1: 48 D2: 12 D3: 51 D4: M12 x P1.75	D1: 55 D2: 14 D3: 58.5 D4: M16 x P2.0	D1: 60 D2: 14 D3: 63 D4: M20 x P2.5	D1: 70 D2: 16 D3: 74 D4: M20 x P2.5
Weight / Ağırlık	3.4	5.4	9.7	15.3	23.1	34.7	47.1	74.0

# HY-RV series / serileri

RATIO / ÇEVİRİM : 20.25.30.40.50.60.75.80.100.120.150 (2-Stage / Kademe)

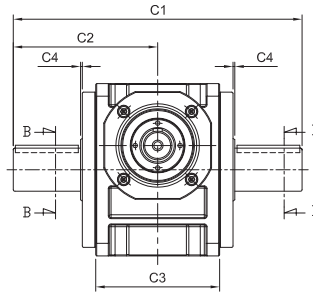
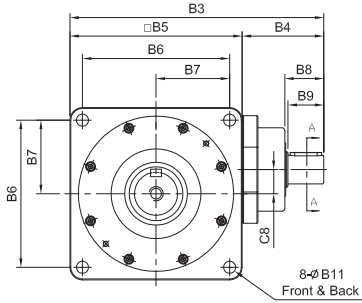
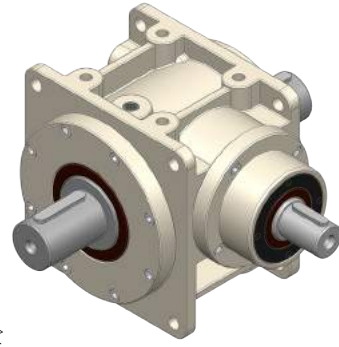
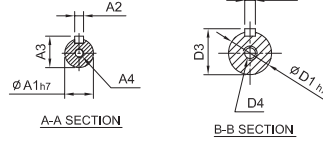
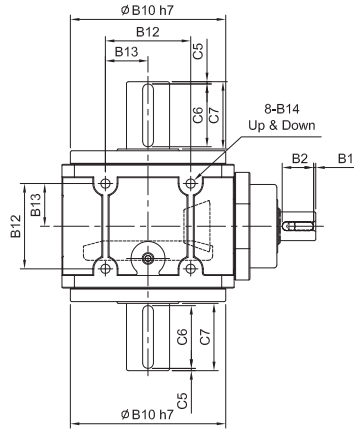


unit / birim: mm

	Model Code	Model							
		55	75	90	115	130	140	160	190
A	A1	8 · 11	14	(14) · 19	19 · 24	28 · 32	32 · 35	32 · 35	38 · 42 · 48 · 55
	A2	30 · 40 · 50	50 · 60 · 70	50 · 70 · 80 · 95	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180	110 · 130 · 180	114.3 · 180 · 230 · 250
	A3	M3 · M4 · M5	M4 · M5 · M6	M5 · M6	M5 · M6 · M8	M6 · M8 · M10	M8 · M10 · M12	M8 · M10 · M12	M12 · M16
	A4	46 · 60 · 63	70 · 75 · 90	70 · 90 · 100 · 115	90 · 100 · 115 · 145	115 · 145 · 165	145 · 165 · 200	145 · 165 · 200	200 · 215 · 265 · 300
	A5	46 · 55	64 · 70 · 80	80 · 92 · 110	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190	146 · 150 · 190	182 · 200 · 250 · 265
	A6	M3 x P.05	M5 x P.0.8	M5 x P.0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5	M10 x P1.5
B	B1	157	201	(224.5) · 237	287	340	405	430	508 · 510
	B2	67	86	(84.5) · 97	117	148	190	190	244 · 246
	B3	90	115	140	170	192	215	240	264
	B4	78	98	118	144	164	182	206	224
	B5	39	49	59	72	82	91	103	112
	B6	26	32	(33.5) · 45.5	59	67	84.5	84.5	114.5 · 116.5
	B7	5	6	(6) · 10	9	10	10	10	11.5 · 13.5
	B8	84	103	128	148	173	200	227	254
	B9	6.8	9	11	11	13.5	15	17.5	17.5
	B10	44	54	66	80	95	104	120	140
	B11	22	27	33	40	47.5	52	60	70
	B12	M6 x P1.0	M8 x P1.25	M10 x P1.5	M12 x P1.75	M12 x P1.75	M14 x P2.0	M16 x P2.0	M16 x P2.0
C	C1	158	188	232	276	322	367	412	462
	C2	79	94	116	138	161	183.5	206	231
	C3	60	80	100	120	138	146	166	196
	C4	2	2	2	2	2	2	2	2
	C5	5	2.5	2.5	2.5	2.5	5	5	5
	C6	25	35	45	55	70	80	90	100
	C7	35	40	50	60	75	90	100	110
	C8	9	14	18	23	27	32	38	42
D	D1	20	24	32	40	48	55	60	70
	D2	6	8	10	10	12	14	14	16
	D3	22.5	27	35	51.3	51	58.5	63	74
	D4	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5	M12 x P1.75	M16 x P2.0	M20 x P2.5	M20 x P2.5
Weight / Ağırlık	4.0	6.6	11.5	18.9	31.7	41.2	61.6	100.6	

# HY-DV series / serileri

RATIO / ÇEVİRİM : 3.4.5.6.8.10.12.15 (1-Stage / Kademe)

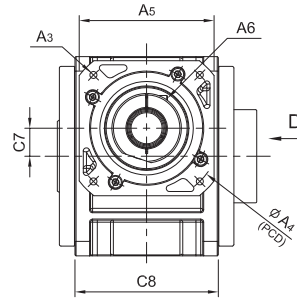
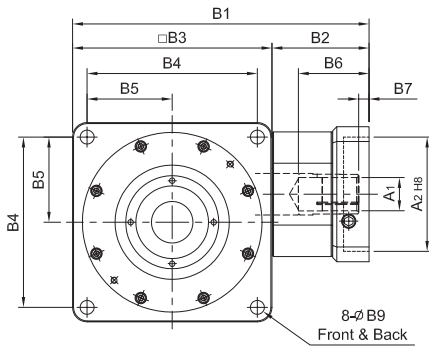
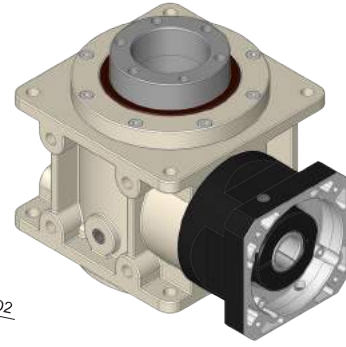
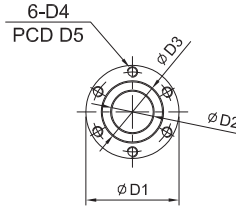
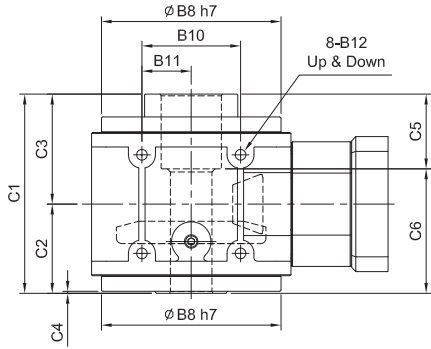


unit / birim: mm

Model Code	55	75	90	115	130	140	160	190	
	<b>A</b>	A1	14	19	24	28	32	32	38
	A2	5	6	8	8	10	10	12	12
	A3	16	21.5	27	31	35	35	41	43
	A4	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5	M10 x P1.5	M12 x P1.75	M12 x P1.75
<b>B</b>	B1	2.5	2.5	2.5	2.5	5	5	5	5
	B2	20	25	35	35	40	40	50	50
	B3	147	181	218	260	293	315	367	403
	B4	57	66	78	90	101	100	127	139
	B5	90	115	140	170	192	215	240	264
	B6	78	98	118	144	164	182	206	224
	B7	39	49	59	72	82	91	103	112
	B8	27	32	42.5	42.5	52.5	51.5	62	63.5
	B9	25	30	40	40	50	50	60	60
	B10	84	103	128	148	173	200	227	254
	B11	6.8	9	11	11	13.5	15	17.5	17.5
	B12	44	54	66	80	95	104	120	140
	B13	22	27	33	40	47.5	52	60	70
	B14	M6 x P1.0	M8 x P1.25	M10 x P1.5	M12 x P1.75	M12 x P1.75	M14 x P2.0	M16 x P2.0	M16 x P2.0
<b>C</b>	C1	158	188	232	276	322	367	412	462
	C2	79	94	116	138	161	183.5	206	231
	C3	60	80	100	120	138	146	166	196
	C4	2	2	2	2	2	2	2	2
	C5	5	2.5	2.5	2.5	2.5	5	5	5
	C6	25	35	45	55	70	80	90	100
	C7	35	40	50	60	75	90	100	110
	C8	9	14	18	23	27	32	38	42
<b>D</b>	D1	20	24	32	40	48	55	60	70
	D2	6	8	10	10	12	14	14	16
	D3	22.5	27	35	51.3	51	58.5	63	74
	D4	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5	M12 x P1.75	M16 x P2.0	M20 x P2.5	M20 x P2.5
Weight / Ağırlık	3.1	5.3	9.2	14.7	23.6	37.7	47.8	70.6	

# HY-FB series / serileri

RATIO / ÇEVİRİM : 3.4.5.6.8.10.12.15 (1-Stage / Kademe)

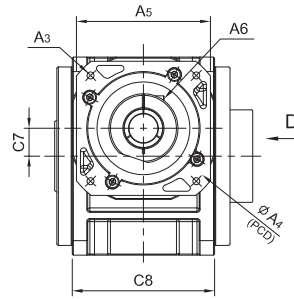
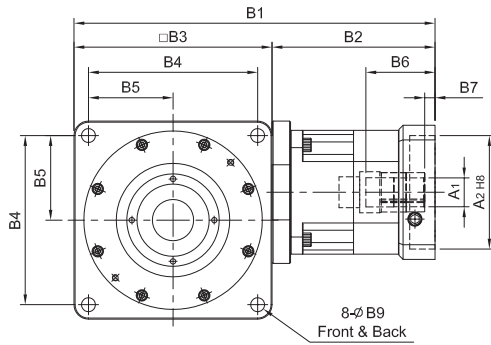
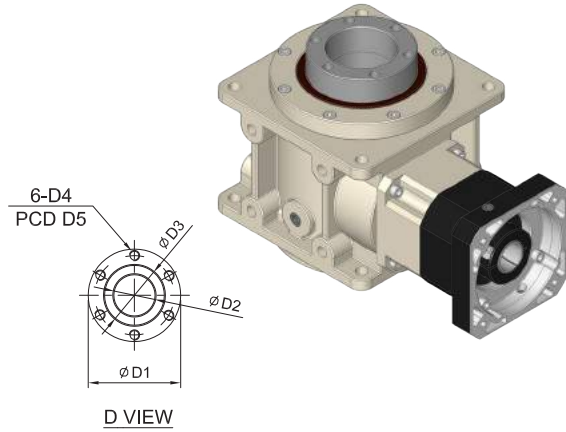
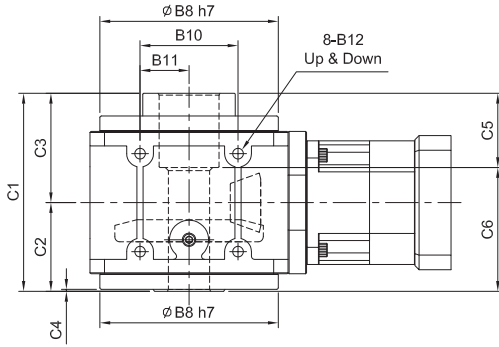


unit / birim: mm

	Model Code	75	90	115	130	140	160	190
	<b>A</b>	A1	14	14 · 19	19 · 24	28 · 32	35	35 · 38
A2		50 · 60 · 70	50 · 70 · 80 · 95	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180	110 · 130 · 180	114.3 · 180 · 230 · 250
A3		M4 · M5 · M6	M5 · M6	M5 · M6 · M8	M6 · M8 · M10	M8 · M10 · M12	M8 · M10 · M12	M12 · M16
A4		70 · 75 · 90	70 · 90 · 100 · 115	90 · 100 · 115 · 145	115 · 145 · 165	145 · 165 · 200	145 · 165 · 200	200 · 215 · 265 · 300
A5		64 · 70 · 80	80 · 92 · 110	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190	146 · 150 · 190	182 · 200 · 250 · 265
A6		M5 x P0.8	M5 x P0.8	M8 x P1.25	M8 x P1.25	M10 x P1.5	M10 x P1.5	M10 x P1.5
<b>B</b>	B1	158	202	241	286	333	358	417 · 419
	B2	43	62	71	94	118	118	153 · 155
	B3	115	140	170	192	215	240	264
	B4	98	118	144	164	182	206	224
	B5	49	59	72	82	91	103	112
	B6	38	49	58	69.5	81.5	81.5	114.5 · 116.5
	B7	6	9	8	10	10	10	11.5 · 13.5
	B8	103	128	148	173	200	227	254
	B9	9	11	11	13.5	15	17.5	17.5
	B10	54	66	80	95	104	120	140
	B11	27	33	40	47.5	52	60	70
	B12	M8 x P1.25	M10 x P1.5	M12 x P1.75	M12 x P1.75	M14 x P2.0	M16 x P2.0	M16 x P2.0
<b>C</b>	C1	125	140	177	193	205	230	260
	C2	58	66	78.5	87	94	107	123
	C3	67	74	98.5	106	111	123	137
	C4	3.25	2	2.5	2	2.5	2.5	3
	C5	50	58	72	72	82	92	117
	C6	75	82	105	121	123	138	143
	C7	14	18	23	27	32	38	42
	C8	80	100	120	138	146	166	196
<b>D</b>	D1	54.7	64.7	89.7	89.7	99.7	117.7	129.7
	D2	22	30	38	40	44	54	65
	D3	34	40	58	58	64	75	90
	D4	M5 x P0.8	M5 x P0.8	M10 x P1.5	M10 x P1.5	M10 x P1.5	M12 x P1.75	M12 x P1.75
	D5	45	51	77	77	84	97	112
Weight / Ağırlık		4.3	8.3	12.7	18.7	26.9	37.9	58.9

# HY-RB series / serileri

RATIO / ÇEVİRİM : 20.25.30.40.50.60.75.80.100.120.150 (2-Stage / Kademe)

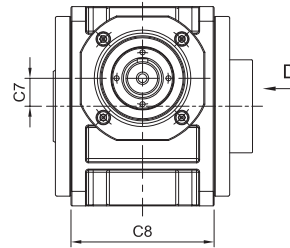
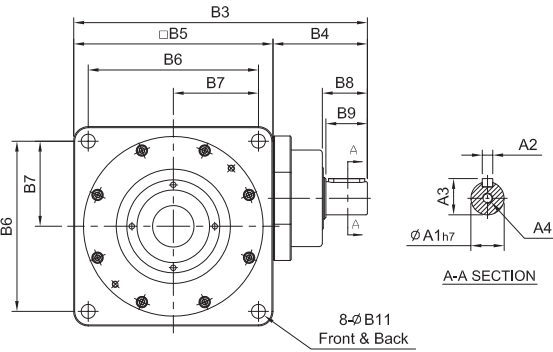
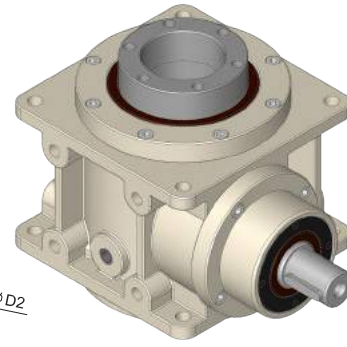
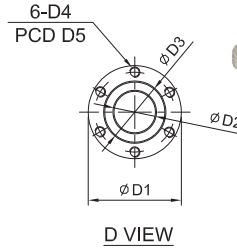
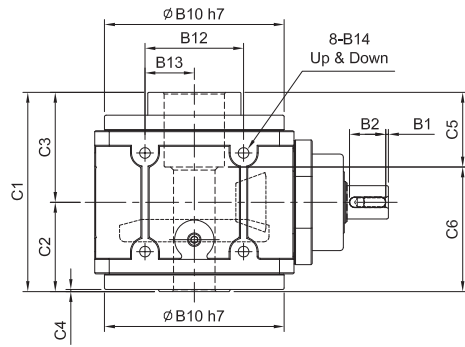


unit / birim: mm

Model Code	75	90	115	130	140	160	190	
<b>A</b>	A1	14	(14) · 19	19 · 24	28 · 32	32 · 35	32 · 35	38 · 42 · 48 · 55
	A2	50 · 60 · 70	50 · 70 · 80 · 95	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180	110 · 130 · 180	114.3 · 180 · 230 · 250
	A3	M4 · M5 · M6	M5 · M6	M5 · M6 · M8	M6 · M8 · M10	M8 · M10 · M12	M8 · M10 · M12	M12 · M16
	A4	70 · 75 · 90	70 · 90 · 100 · 115	90 · 100 · 115 · 145	115 · 145 · 165	145 · 165 · 200	145 · 165 · 200	200 · 215 · 265 · 300
	A5	64 · 70 · 80	80 · 92 · 110	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190	146 · 150 · 190	182 · 200 · 250 · 265
	A6	M5 x P0.8	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5	M10 x P1.5
<b>B</b>	B1	201	(224.5) · 237	287	340	405	430	508 · 510
	B2	86	(84.5) · 97	117	148	190	190	244 · 246
	B3	115	140	170	192	215	240	264
	B4	98	118	144	164	182	206	224
	B5	49	59	72	82	91	103	112
	B6	32	(33.5) · 45.5	59	67	84.5	84.5	114.5 · 116.5
	B7	6	(6) · 10	9	10	10	10	11.5 · 13.5
	B8	103	128	148	173	200	227	254
	B9	9	11	11	13.5	15	17.5	17.5
	B10	54	66	80	95	104	120	140
	B11	27	33	40	47.5	52	60	70
	B12	M8 x P1.25	M10 x P1.5	M12 x P1.75	M12 x P1.75	M14 x P2.0	M16 x P2.0	M16 x P2.0
<b>C</b>	C1	125	140	177	193	205	230	260
	C2	58	66	78.5	87	94	107	123
	C3	67	74	98.5	106	111	123	137
	C4	3.25	2	2.5	2	2.5	2.5	3
	C5	50	58	72	72	82	92	117
	C6	75	82	105	121	123	138	143
	C7	14	18	23	27	32	38	42
	C8	80	100	120	138	146	166	196
<b>D</b>	D1	54.7	64.7	89.7	89.7	99.7	117.7	129.7
	D2	22	30	38	40	44	54	65
	D3	34	40	58	58	64	75	90
	D4	M5 x P0.8	M5 x P0.8	M10 x P1.5	M10 x P1.5	M10 x P1.5	M12 x P1.75	M12 x P1.75
	D5	45	51	77	77	84	97	112
Weight / Ağırlık	5.5	10.1	16.4	27.3	41.5	52.5	85.5	

# HY-DB series / serileri

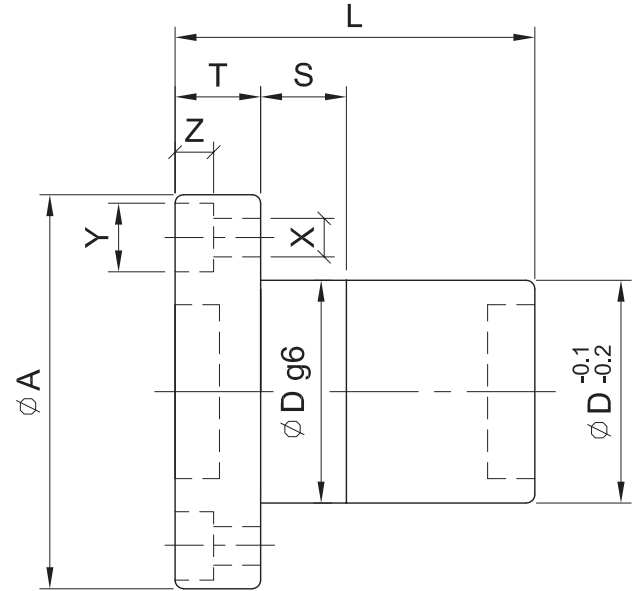
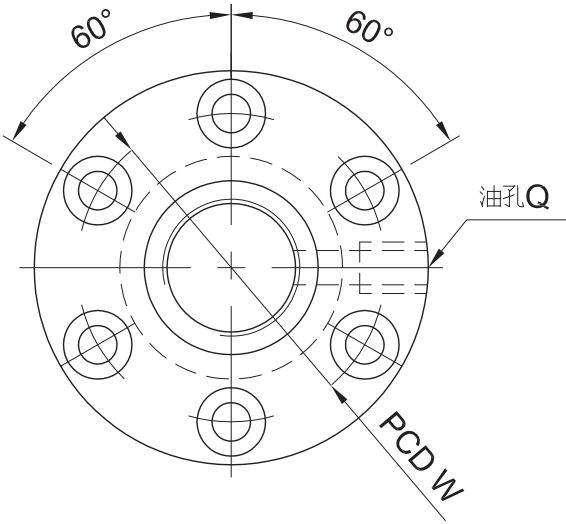
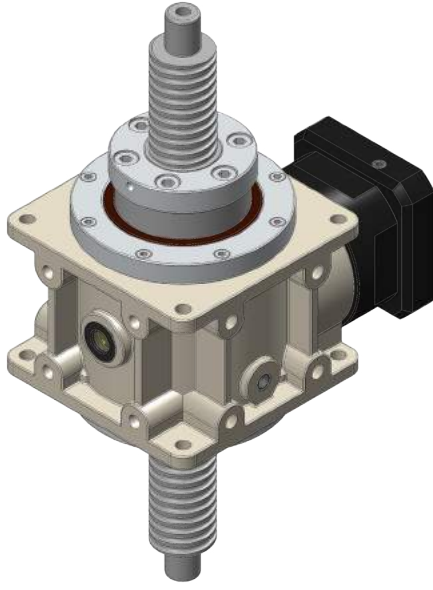
RATIO / ÇEVİRİM : 3.4.5.6.8.10.12.15 (1-Stage / Kademe)



unit / birim: mm

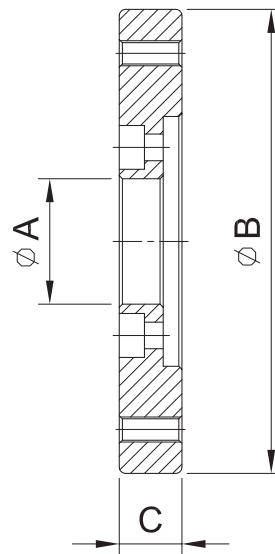
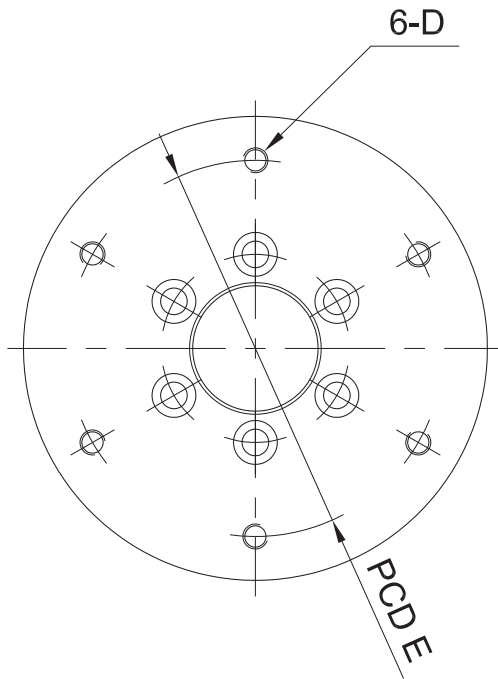
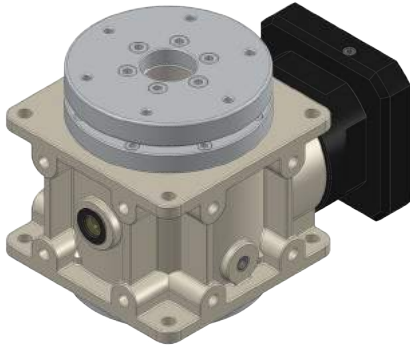
Model Code	75	90	115	130	140	160	190
	<b>A</b>						
A1	19	24	28	32	32	38	40
A2	6	8	8	10	10	12	12
A3	21.5	27	31	35	35	41	43
A4	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5	M10 x P1.5	M12 x P1.75	M12 x P1.75
<b>B</b>							
B1	2.5	2.5	2.5	5	5	5	5
B2	25	35	35	40	40	50	50
B3	181	218	260	293	315	367	403
B4	66	78	90	101	100	127	139
B5	115	140	170	192	215	240	264
B6	98	118	144	164	182	206	224
B7	49	59	72	82	91	103	112
B8	32	42.5	42.5	52.5	51.5	62	63.5
B9	30	40	40	50	50	60	60
B10	103	128	148	173	200	227	254
B11	9	11	11	13.5	15	17.5	17.5
B12	54	66	80	95	104	120	140
B13	27	33	40	47.5	52	60	70
B14	M8 x P1.25	M10 x P1.5	M12 x P1.75	M12 x P1.75	M14 x P2.0	M16 x P2.0	M16 x P2.0
<b>C</b>							
C1	125	140	177	193	205	230	260
C2	58	66	78.5	87	94	107	123
C3	67	74	98.5	106	111	123	137
C4	3.25	2	2.5	2	2.5	2.5	3
C5	50	58	72	72	82	92	117
C6	75	82	105	121	123	138	143
C7	14	18	23	27	32	38	42
C8	80	100	120	138	146	166	196
<b>D</b>							
D1	54.7	64.7	89.7	89.7	99.7	117.7	129.7
D2	22	30	38	40	44	54	65
D3	34	40	58	58	64	75	90
D4	M5 x P0.8	M5 x P0.8	M10 x P1.5	M10 x P1.5	M10 x P1.5	M12 x P1.75	M12 x P1.75
D5	45	51	77	77	84	97	112
Weight / Ağırlık	4.2	7.8	12.2	19.2	29.6	38.7	55.5

# Reference Information of Ball Screw / Vidalı Mil Ölçüleri



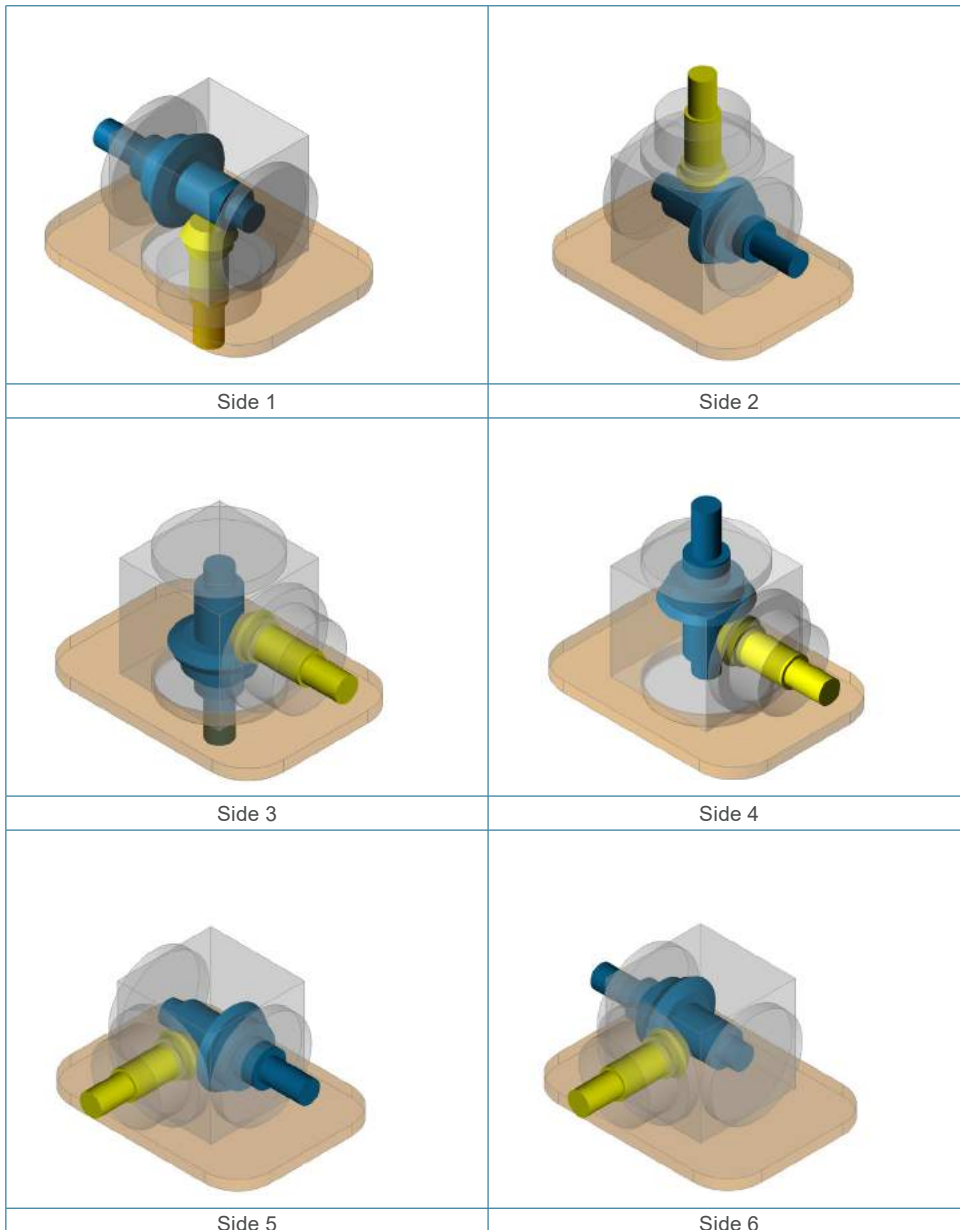
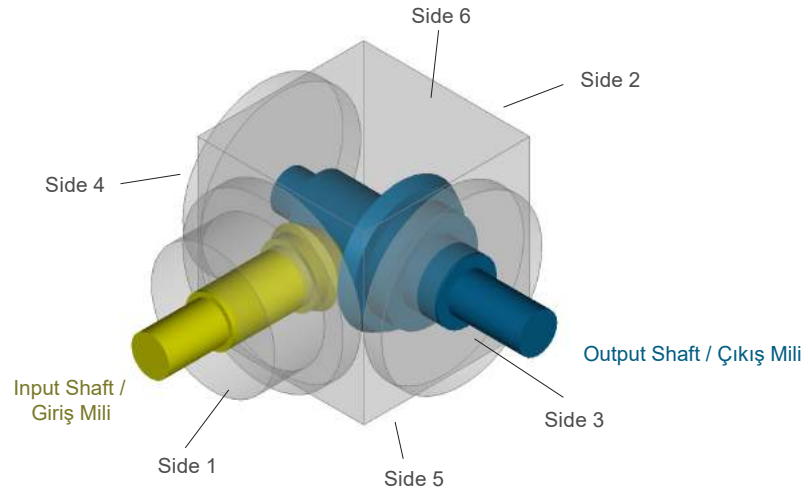
Model	Screw Size / Vidalı Mil Çapı		Basic Rate Load (kgf) /Yük Kapasitesi		Nut / Somun		Flange / Flanş			FIT	Screw Bolt / Vida Ölçüsü			Oil Hole / Yağlama Deliği	Length / Boy
	O.D. / Mil Çapı	Lead / Hatve	Dynamic / Dinamik	Static / Statik	Dg6	L	A	T	W		S	X	Y		
55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
75	20	6	1,380	2,730	34	61	57	12	45	12	5.5	9.5	5.5	M6 x P1	≤ 1500
90	25	8	1,630	3,650	40	69	63.5	12	51	15	5.5	9.5	5.5	M8 x P1	≤ 1500
115	36	10	3,600	8,280	58	89	98	18	77	20	11	17.5	11	M8 x P1	≤ 1500
130	36	10	3,600	8,280	58	89	98	18	77	20	11	17.5	11	M8 x P1	≤ 1500
140	40	10	4,670	11,830	64	99	106	18	84	20	11	17.5	11	M8 x P1	≤ 1500
160	50	12	5,770	14,870	75	111	121	22	97	20	14	20	13	1/8"PT	≤ 1500
190	63	12	9,320	29,150	90	136	136	22	112	20	14	20	13	1/8"PT	≤ 1500

# Flange / Flanş



Model / Code	55	75	90	115	130	140	160	190
A	-	25	30	40	45	50	55	60
B	-	102	128	148	168	198	228	248
C	-	15	16	20	23	24	23	27
D	-	M6 x P1.0	M8 x P1.25	M8 x P1.25	M10 x P1.5	M10 x P1.5	M10 x P1.5	M12 x P1.25
E	-	80	100	120	140	160	180	200

# Selection Direction of Installation / Montaj Yönü Seçimi



# HK series / serileri

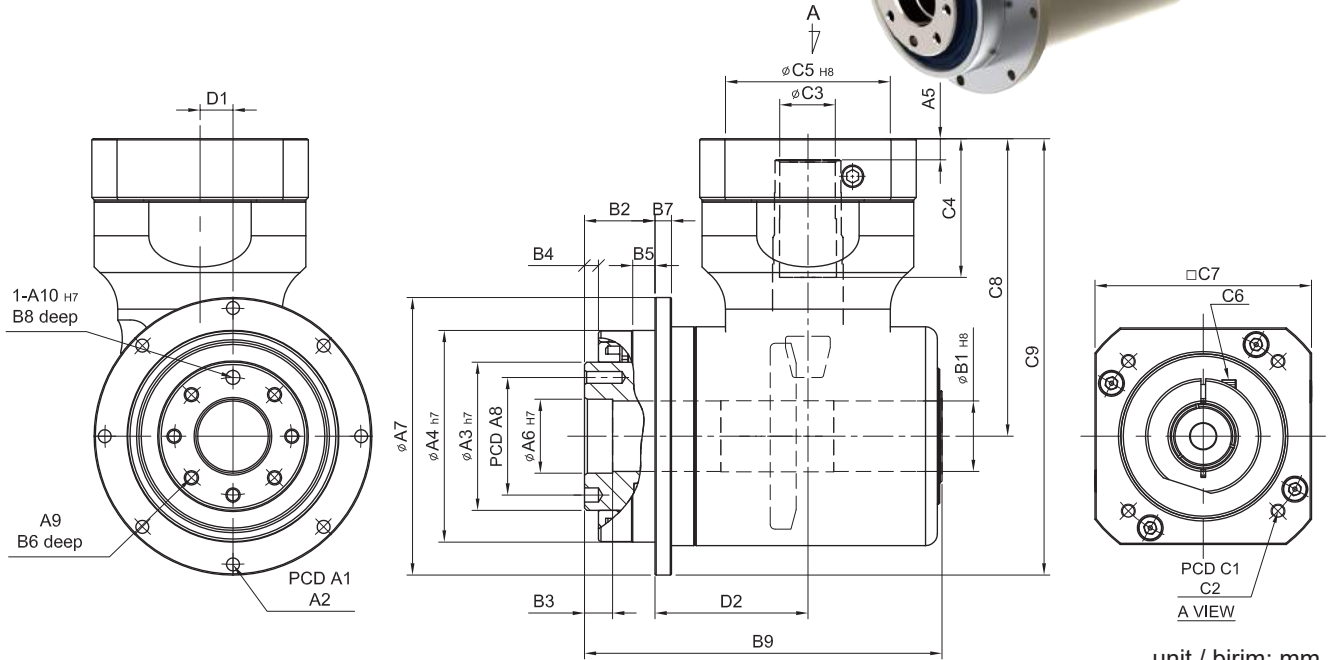
## Indication of Model Numbers / Model Seçimi

HK	64		B	3	P0	
Type	Model	Output / Çıkış	Bearing / Rulman	Ratio / Çevrim	Backlash Class / Boşluk Sınıfı	Motor Type / Tipi
HK	64 90 110 140 200		B:Ball Bearing / Bilyalı Rulman (64#~140#) T:Taper Bearing / Masuralı Rulman (200#)	3 5 8 10 15	$P0 \leq 3$ $P1 \leq 6$ $P2 \leq 9$	Motor Brand & Model No. / Motor Markası & Modeli



# HK series / serileri

RATIO / ÇEVİRİM : 3.5.8.10.15 (1-Stage / Kademe)



unit / birim: mm

Model Code	64	90	110	140	200
<b>A</b>					
A1	79	109	135	168	233
A2	8-4.5	8-5.5	8-5.5	12-6.6	12-9.0
A3 h7	40	63	80	100	160
A4 h7	64	90	110	140	200
A5	5	6	9	10	10
A6 h7	20	31.5	40	50	80
A7	86	118	146	179	248
A8	31.5	50	63	80	125
A9	7-M5 x P0.8	7-M6 x P1.0	11-M6 x P1.0	11-M8 x P1.25	11-M10 x P1.5
A10 H7	5	6	6	8	10
<b>B</b>					
B1 H7	15	30	30	40	55
B2	19.5	30	29	38	50
B3	7	12	12	12	16
B4	4	6	6	6	8
B5	6	10	10	15	15
B6	10	12	12	16	22
B7	5	7	8	10	12
B8	6	6	7	7	10
B9	104.5	152	168	200	260
<b>C</b>					
C1	46 · 60 · 63	90 · 110 · 115 · 145	115 · 145 · 165	115 · 145 · 165	145 · 165 · 200
C2	M3 · M4 · M5	M5 · M6 · M8	M6 · M8 · M10	M6 · M8 · M10	M8 · M10 · M12
C3	11	24	32	35	42
C4	26	59	67	82	84.5
C5 H8	30 · 40 · 50	70 · 80 · 95 · 110	95 · 110 · 130	95 · 110 · 130	110 · 130 · 180
C6	M3 x P0.5	M6 x P1.0	M8 x P1.25	M8 x P1.25	M10 x P1.5
C7	46 · 55	92 · 110 · 130	122 · 130 · 150	122 · 130 · 150	146 · 150 · 190
C8	69	126.5	149	179	228
C9	112	185.5	222.5	269	352.5
C10	1/8"PT	1/8"PT	1/4"PT	1/4"PT	1/4"PT
<b>D</b>					
D1	9	14	18	23	32
D2	43	65	77	90	117

# HK Series / Serileri

## 1-Stage / Kademe

Model No.		Unit Birim	Ratio Çevrim	64	90	110	140	200
Nominal output torque / Nominal Çıkış Torku	$T_{2N}$	Nm	3 ~ 5	30	70	140	260	720
			8 ~ 10	25	60	117	220	615
			15	20	50	95	180	510
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	3~15	1.5 Times of Rated Output Torque / 1,5 x Nominal Çıkış Torku				
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	3~15	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku				
Rated Input Speed / Nominal Giriş Devri	$n_{1N}$	rpm	3 ~ 5	2,200	1,800	1,500	1,150	700
			8 ~ 10	3,300	2,700	2,200	1,800	1,200
			15	4,000	3,300	2,800	2,300	1,600
Max. Input Speed / Max. Giriş Devri	$n_{1B}$	rpm	3~15	6,000	5,000	4,000	3,000	3,000
Backlash / Boşluk Oranı	$J_t$	arcmin	P0	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3
			P1	≤ 6	≤ 6	≤ 6	≤ 6	≤ 6
			P2	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9
Max. Radial Force Ball Bearing / Max. Radyal Yük Bilyalı Rulman	$F_{2rB}$	N	3~15	1,040	2,366	3,900	5,837	-
Max. Axial Force Ball Bearing / Max. Aksiyel Yük Bilyalı Rulman	$F_{2aB}$	N	3~15	520	1183	1950	2919	-
Max. Radial Force Taper Bearing / Max. Radyal Yük Masuralı Rulman	$F_{2rB}$	N	3~15	-	-	-	-	14,420
Max. Axial Force Taper Bearing / Max. Aksiyel Yük Masuralı Rulman	$F_{2aB}$	N	3~15	-	-	-	-	7,210
Service Life / Hizmet Ömrü	$L_{Ht}$	hr	3~15	S5 Döngüsel Çalışma : >30,000 (S1 Sürekli Çalışma : >15,000 hrs) S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)				
Efficiency / Verim	$\eta$	%	3~8	≥ 96%				
			10~15	≥ 93%				
Operating Temperature / Çalışma Sıcaklığı		°C	3~15	-10°C ~ +90°C				
Lubrication / Yağlama			3~15	Synthetic Oil / Sentetik Yağ				
Noise Level / Ses Seviyesi		dB	3~15	≤ 66	≤ 67	≤ 68	≤ 69	≤

### Mass Moments of Inertia / Atalet Ağırlık Momenti (kgcm<sup>2</sup>)

Ratio / Çevrim	64	90	110	140	200
3	0.39	0.98	2.42	7.12	26.96
5	0.23	0.58	1.41	4.00	13.53
8	0.17	0.43	1.12	2.85	8.95
10	0.15	0.38	1.00	2.46	7.38
15	0.13	0.34	0.81	2.07	5.76

# HF series / serileri

## Indication of Model Numbers / Model Seçimi

HF	60	F	O	B	3	P0	
Type	Model	Input / Giriş	Output / Çıkış	Bearing / Rulman	Ratio / Çevrim	Backlash Class / Boşluk Sınıfı	Motor Type/ Motor Tipi
HF	60 75 100 140 180	F: Input Flange / Flanşlı	O: Hollow Output Shaft / Delik Milli  N: Single Clamping (Keyway) / Tek Konik Sıkma (Kamalı)  N1: Single Clamping (No Keyway) / Tek Konik Sıkma (Kamasız)  M: Double Clamping / Çift Konik Sıkma  S: Single Output Shaft (Keyway) / Tek Çıkış Milli (Kamalı)  S1: Single Output Shaft (No Keyway) / Tek Çıkış Milli (Kamasız)	B: Ball Bearing / Bilyalı Rulman	3 5 8 10 15	P0 ≤ 3 P1 ≤ 6 P2 ≤ 9	Motor Brand & Model No. / Motor Markası & Modeli



# HF Series / Serileri

## 1-Stage / Kademe

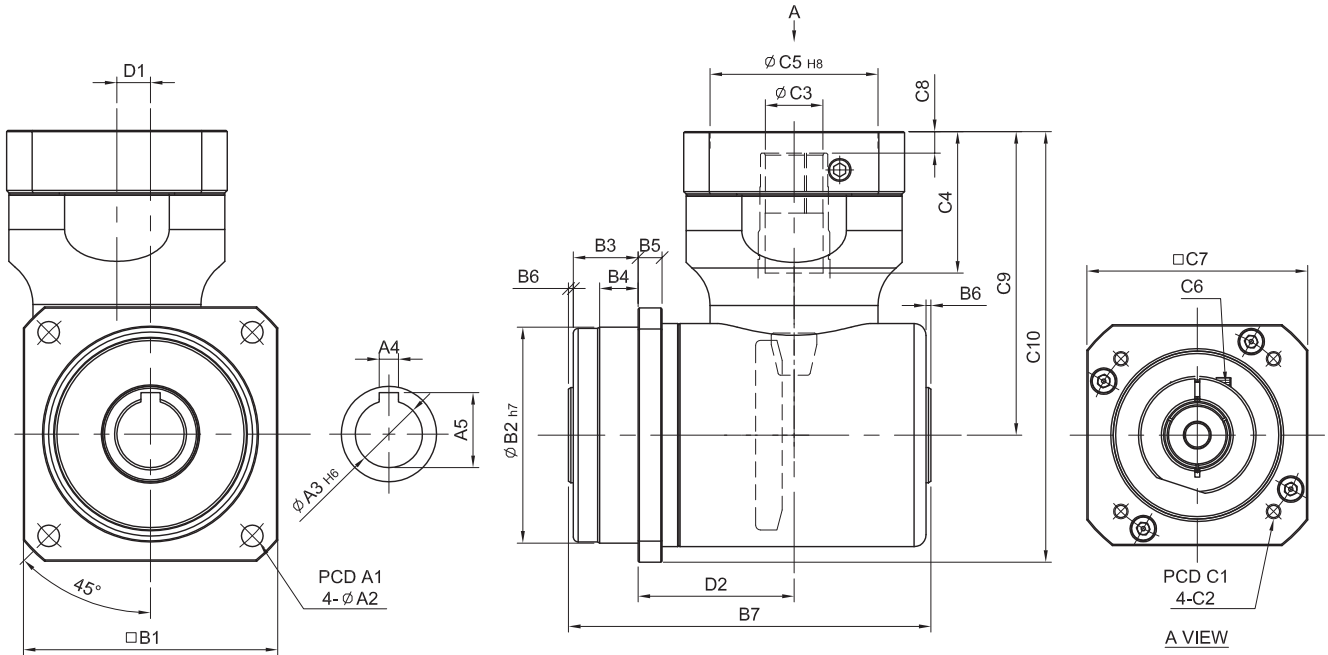
Model No.		Unit Birim	Ratio Çevrim	60	75	100	140	180
Nominal output torque / Nominal Çıkış Torku	$T_{2N}$	Nm	3 · 5	30	35	70	260	720
			8 · 10	25	30	60	220	615
			15	20	25	50	180	510
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	3~15	1.5 Times of Rated Output Torque / 1,5 x Nominal Çıkış Torku				
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	3~15	3 Times of Rated Output Torque / 3 x Nominal Çıkış Torku				
Rated Input Speed / Nominal Giriş Devri	$n_{1N}$	rpm	3 · 5	2,200	2,100	1,800	1,150	700
			8 · 10	3,300	3,200	2,700	1,800	1,200
			15	4,000	3,900	3,300	2,300	1,600
Max. Input Speed / Max. Giriş Devri	$n_{1B}$	rpm	3~15					
Backlash / Boşluk Oranı	$J_t$	arcmin	P0	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3
			P1	≤ 6	≤ 6	≤ 6	≤ 6	≤ 6
			P2	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9
Max. Radial Force Ball Bearing / Max. Radyal Yük Bilyalı Rulman	$F_{2rB}$	N	3~15	1,040	1,495	2,366	5,837	7,020
Max. Axial Force Ball Bearing / Max. Aksiyel Yük Bilyalı Rulman	$F_{2aB}$	N	3~15	520	748	1,183	2,919	3,510
Max. Radial Force Taper Bearing / Max. Radyal Yük Masuralı Rulman	$F_{2rB}$	N	3~15	-	-	-	-	-
Max. Axial Force Taper Bearing / Max. Aksiyel Yük Masuralı Rulman	$F_{2aB}$	N	3~15	-	-	-	-	-
Service Life / Hizmet Ömrü	$L_{Ht}$	hr	3~15					
Efficiency / Verim	$\eta$	%	3~8	≥ 96%				
			10~15	≥ 93%				
Operating Temperature / Çalışma Sıcaklığı		°C	3~15	-10°C ~ +90°C				
Lubrication / Yağlama			3~15	Synthetic Oil / Sentetik Yağ				
Noise Level / Ses Seviyesi		dB	3~15	≤ 66	≤ 66	≤ 66	≤ 68	≤ 70

### Mass Moments of Inertia / Atalet Ağırlık Momenti (kgcm<sup>2</sup>)

Ratio / Çevrim	60	75	100	140	180
3	0.39	0.39	0.98	7.12	26.96
5	0.23	0.23	0.58	4.00	13.53
8	0.17	0.17	0.43	2.85	8.95
10	0.15	0.15	0.38	2.46	7.38
15	0.13	0.13	0.34	2.07	5.76

# HF-FO series / serileri

RATIO / ÇEVİRİM : 3.5.8.10.15 (1-Stage / Kademe)

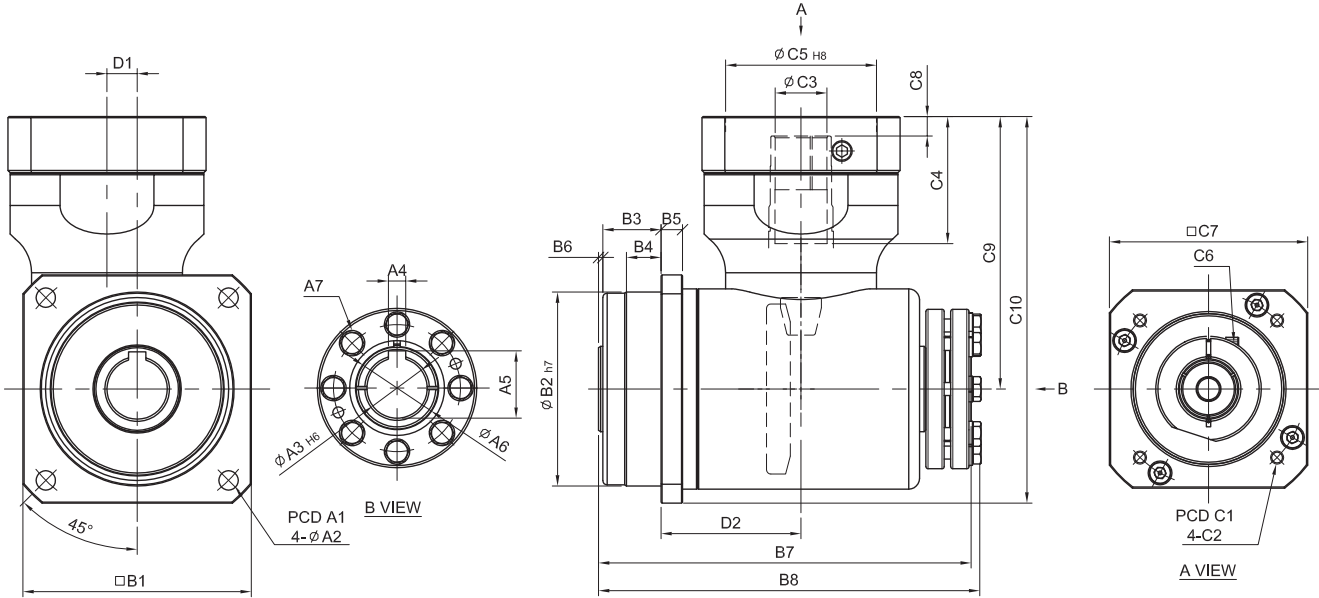


unit / birim: mm

Model Code	60	75	100	140	180
	<b>A</b>				
A1	68	85	120	165	215
A2	5.5	6.5	9	11	13
A3	15	20	28	40	55
A4	4	5	8	12	14
A5	16.7	22.3	31.3	43.3	58.8
<b>B</b>					
B1	62	76	106	142	190
B2	60	70	90	130	160
B3	18	18	27	27	26
B4	11	12	16	15.5	15.5
B5	6	7	10	12	15
B6	2	2	2	3	3
B7	103	113	151	193	247
<b>C</b>					
C1	46 · 60 · 63	70 · 75 · 90	90 · 100 · 115 · 145	115 · 145 · 165	145 · 165 · 200
C2	M3 · M4 · M5	M4 · M5 · M6	M5 · M6 · M8	M6 · M8 · M10	M8 · M10 · M12
C3	11	14	24	35	42
C4	26	33	59	82	84.5
C5	30 · 40 · 50	50 · 60 · 70	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180
C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5
C7	46 · 55	64 · 70 · 80	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190
C8	5	6	9	10	10
<b>D</b>					
D1	9	9	14	23	32
D2	41.5	48	65	90	125

# HF-FN series / serileri

RATIO / ÇEVİRİM : 3.5.8.10.15 (1-Stage / Kademe)

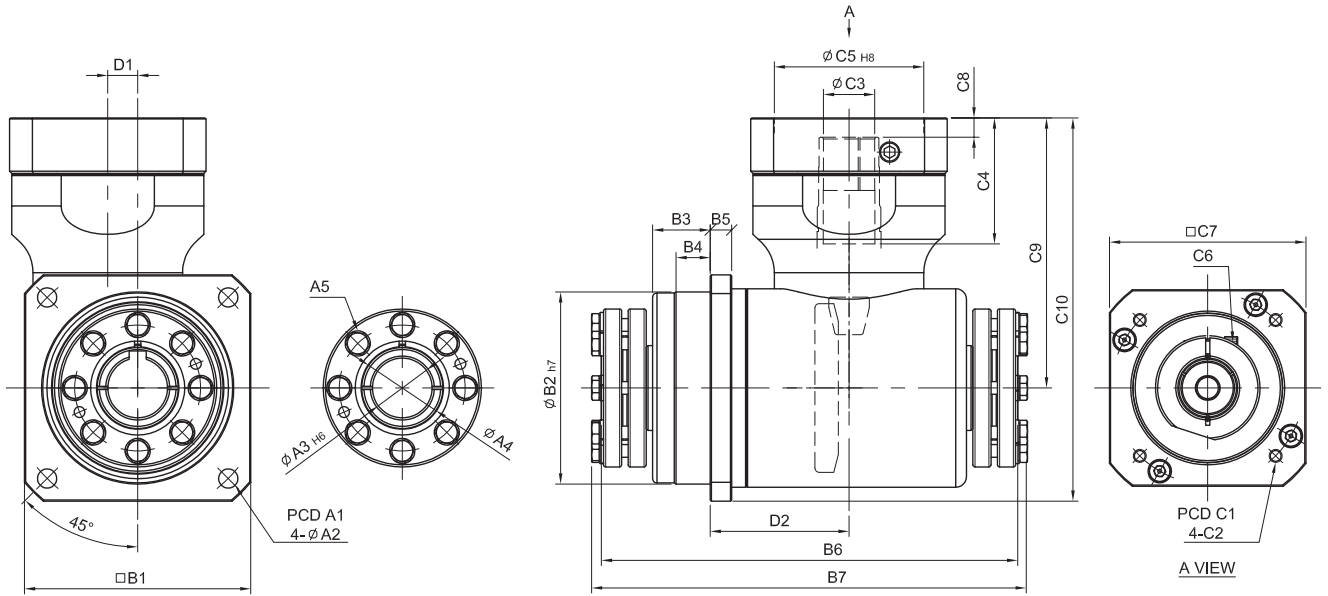


unit / birim: mm

	Model Code	60	75	100	140	180
A	A1	68	85	120	165	215
	A2	5.5	6.5	9	11	13
	A3	15	20	28	40	55
	A4	4	5	8	12	14
	A5	16.7	22.3	31.3	43.3	58.8
	A6	22	28	38	52	73
	A7	6-M6	6-M6	8-M6	8-M6	8-M6
B	B1	62	76	106	142	190
	B2	60	70	90	130	160
	B3	18	18	27	27	26
	B4	11	12	16	15.5	15.5
	B5	6	7	10	12	15
	B6	2	2	2	3	3
	B7	123.5	134	173	223	279
	B8	127.5	138	177	228	283
C	C1	46 · 60 · 63	70 · 75 · 90	90 · 100 · 115 · 145	115 · 145 · 165	145 · 165 · 200
	C2	M3 · M4 · M5	M4 · M5 · M6	M5 · M6 · M8	M6 · M8 · M10	M8 · M10 · M12
	C3	11	14	24	35	42
	C4	26	33	59	82	84.5
	C5	30 · 40 · 50	50 · 60 · 70	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180
	C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5
	C7	46 · 55	64 · 70 · 80	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190
	C8	5	6	9	10	10
D	D1	9	9	14	23	32
	D2	41.5	48	65	90	125

# HF-FM series / serileri

RATIO / ÇEVİRİM : 3.5.8.10.15 (1-Stage / Kademe)

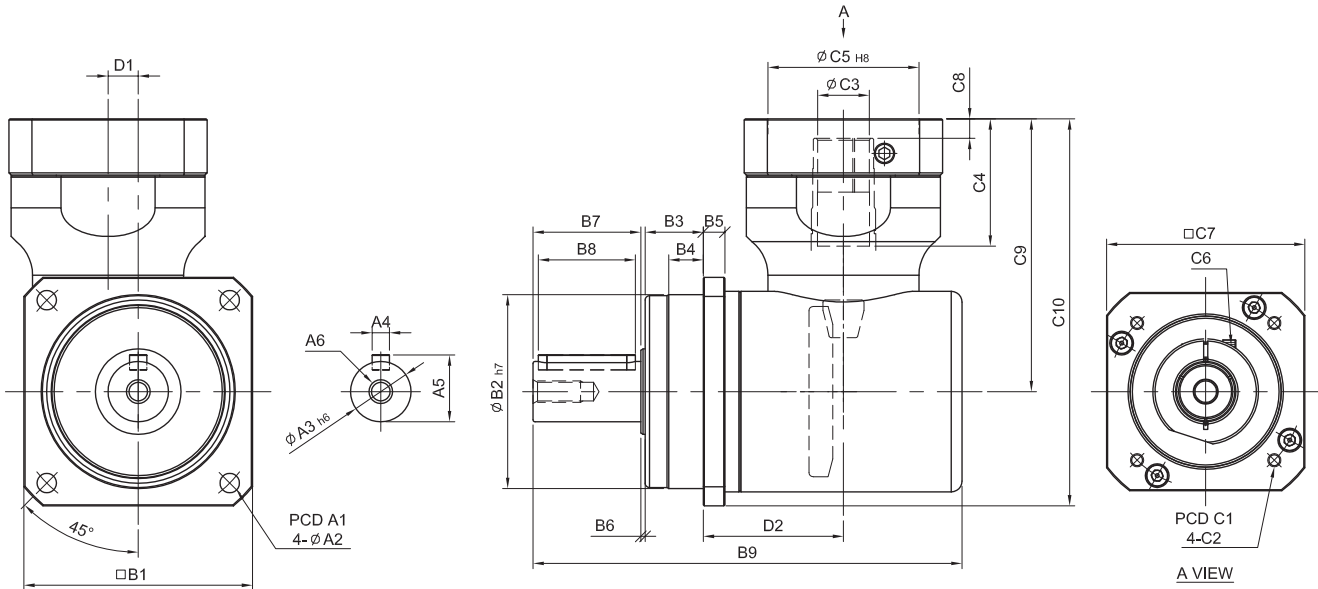


unit / birim: mm

	Model Code	60	75	100	140	180
		<b>A</b>	A1	68	85	120
	A2	5.5	6.5	9	11	13
	A3	15	20	28	40	55
	A4	22	28	38	52	73
	A5	6-M6	6-M6	8-M6	8-M6	8-M6
<b>B</b>	B1	62	76	106	142	190
	B2	60	70	90	130	160
	B3	18	18	27	27	26
	B4	11	12	16	15.5	15.5
	B5	6	7	10	12	15
	B6	144	155	195	253	311
	B7	152	163	203	262	318.5
<b>C</b>	C1	46 · 60 · 63	70 · 75 · 90	90 · 100 · 115 · 145	115 · 145 · 165	145 · 165 · 200
	C2	M3 · M4 · M5	M4 · M5 · M6	M5 · M6 · M8	M6 · M8 · M10	M8 · M10 · M12
	C3	11	14	24	35	42
	C4	26	33	59	82	84.5
	C5	30 · 40 · 50	50 · 60 · 70	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180
	C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5
	C7	46 · 55	64 · 70 · 80	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190
	C8	5	6	9	10	10
<b>D</b>	D1	9	9	14	23	32
	D2	41.5	48	65	90	125

# HF-FS series / serileri

RATIO / ÇEVİRİM : 3.5.8.10.15 (1-Stage / Kademe)



unit / birim: mm

Model Code	60	75	100	140	180	
<b>A</b>	A1	68	85	120	165	215
	A2	5.5	6.5	9	11	13
	A3	16	22	28	40	55
	A4	5	6	8	12	16
	A5	18	24.5	31	43	59
	A6	M5 x P0.8	M8 x P.125	M10 x 1.5	M12 x P1.75	M16 x P20
<b>B</b>	B1	62	76	106	142	190
	B2	60	70	90	130	160
	B3	18	18	27	27	26
	B4	11	12	16	15.5	15.5
	B5	6	7	10	12	15
	B6	2	2	2	3	3
	B7	28	36	50	70	82
	B8	25	32	45	60	70
	B9	129	147	199	260	326
<b>C</b>	C1	46 · 60 · 63	70 · 75 · 90	90 · 100 · 115 · 145	115 · 145 · 165	145 · 165 · 200
	C2	M3 · M4 · M5	M4 · M5 · M6	M5 · M6 · M8	M6 · M8 · M10	M8 · M10 · M12
	C3	11	14	24	35	42
	C4	26	33	59	82	84.5
	C5	30 · 40 · 50	50 · 60 · 70	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180
	C6	M4 x P0.7	M5 x P0.8	M6 x P1.0	M8 x P1.25	M10 x P1.5
	C7	46 · 55	64 · 70 · 80	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190
	C8	5	6	9	10	10
<b>D</b>	D1	9	9	14	23	32
	D2	41.5	48	65	90	125

# WE series / serileri



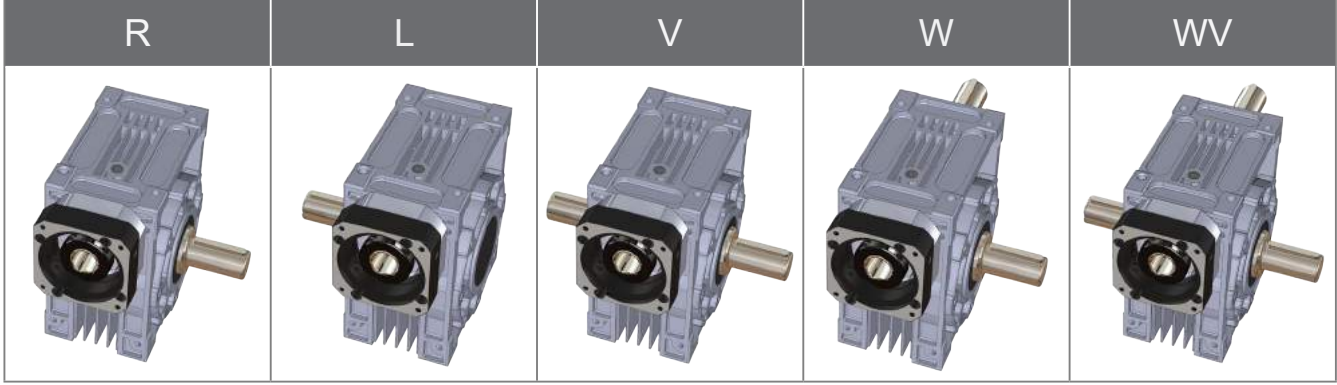
- Backlash  $\leq 8$  arcmin  
Boşluk Oranı  $\leq 8$  arcmin

## Indication of Model Numbers / Model Seçimi

WE	N		60	30	L	MOTOR
Type	Output Shaft / Çıkış Mili	Output Flange / Çıkış Flanşı	Model	Ratio / Çevrim	Shaft Dircetion / Mil Yönü	Motor Type / Motor Tipi
WE	S:Solid / Çıkış Millii	None / Flanşsız	30	1/5	R	Motor Brand & Model No. /
	O:Hollow / Delik Millii	F:Output Flange / Flanşlı	40	1/10	L	Motor Markası & Modeli
	N:Clamping / Konik Sıkmalı		50	1/15		
			60	1/20		
			70	1/30		
				1/40		
				1/50		
				1/60		

# Characteristic of WE Series / WE Serilerinin Özellikleri

## Shaft Direct / Çıkış Mili Yönü



### Shaft Direction

- R : Right Shaft (input shaft to the face; output shaft to the right)  
L : Left Shaft (input shaft to the face; output shaft to the left)  
V : Single Input Shaft & Double Output Shaft  
W : Double Input Shaft & Single Output Shaft  
WV : Double Input Shaft & Double Output Shaft  
S : Special shaft (for any order, please specify your need clearly or attach drawings)

### Çıkış Mili Yönü

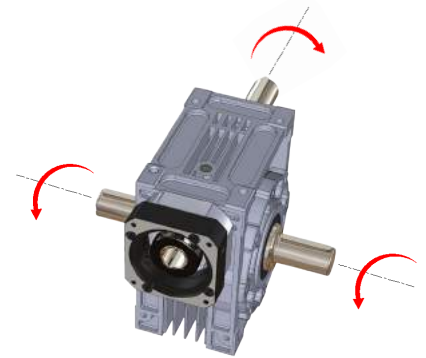
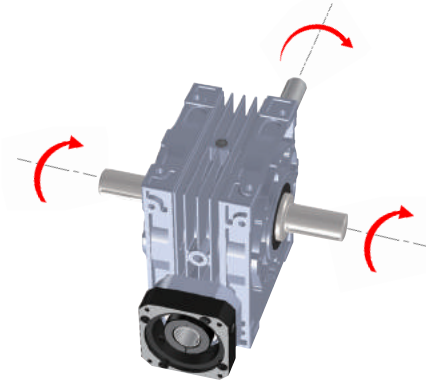
- R : Sağ Çıkış (giriş miline karşıdan bakıldığında)  
L : Sol Çıkış (giriş miline karşıdan bakıldığında)  
V : Tek Giriş Mili & Çift Çıkış Mili  
W : Çift Giriş Mili & Tek Çıkış Mili  
WV : Çift Giriş Mili & Çift Çıkış Mili  
S : Özel Üretim

### Rotary Direction

Upper worm for right-directed thread, so the input shaft is rotating clockwise and the output shaft counterclockwise; for any rotating direction required, be sure to specify it.

### Milin Dönüş Yönü

Giriş milinin saat yönünde hareketinde, çıkış milleri saat yönünün aksine hareket eder.



Rotation Direction /  
Milin Dönüş Yönü

# WE Series / Serileri



WES



WESF



WEO



WEOF



WEN



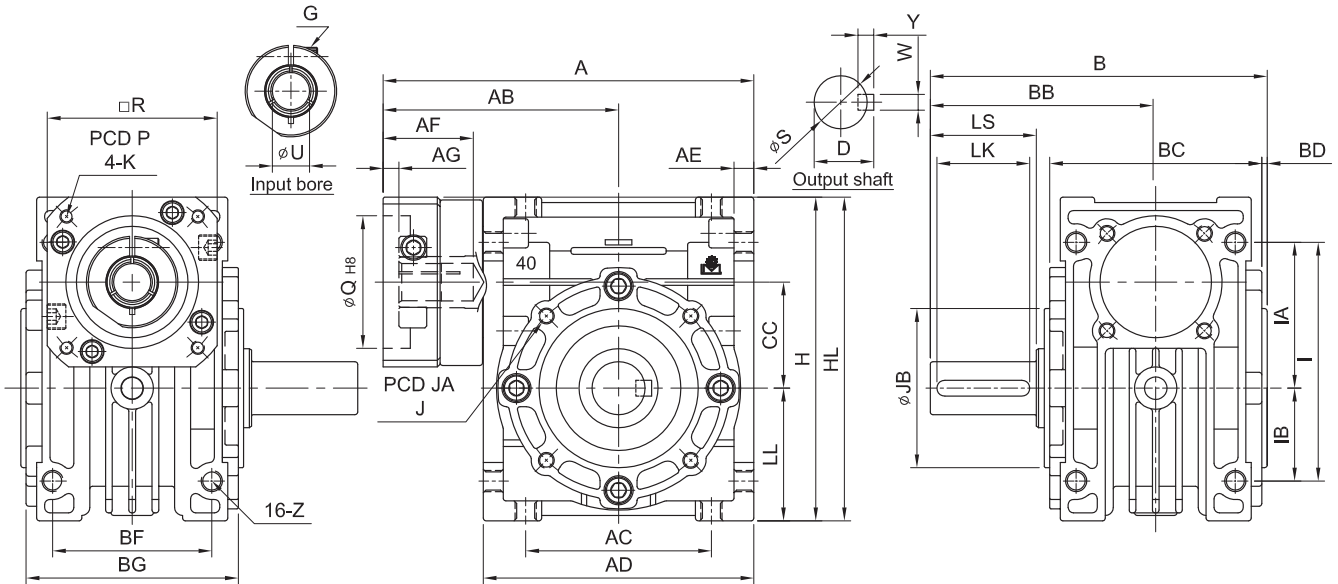
WENF

# WE Series / Serileri

Model No.		Unit Birim	Ratio Çevrim	30	40	50	60	70
Nominal output torque / Nominal Çıkış Torku	$T_{2N}$	Nm	5	8.3	22.3	30.6	41.2	70.6
				90.3	92.3	92.6	92.6	93.6
			10	8.8	20.7	41.9	65.9	92
				83.7	86.6	89.6	90.1	90.5
			15	11.4	26.2	40.9	64.5	90
				81.9	83.7	85.3	86.1	86.6
			20	9.52	22.6	40.7	63.5	106.1
				72.3	76.6	81.7	82.4	85.1
Efficiency / Verim	$\eta$	%	30	12.1	27.4	43.2	67.9	95
				69.6	72.3	74.5	75.9	76.7
			40	9.2	24.3	43.8	69.1	111
				56.8	66.3	69.2	70.3	74.3
			50	10.4	24	43.6	69.2	105.6
				58.7	64.6	67.7	68.9	71.2
			60	9.6	20.5	36.1	58.3	100.5
				54.6	56.8	59.3	61.3	68.8
Max. Output Torque / Max.Çıkış Torku	$T_{2NOT}$	Nm	5~60	2 Times of Rated Output Torque / 2 x Nominal Çıkış Torku				
Rated Input Speed / Nominal Giriş Devri	$n_{1N}$	rpm	5~60	2,000				
Max. Input Speed / Max.Giriş Devri	$n_{1B}$	rpm	5~60	3,000				
Backlash / Boşluk Oranı		arcmin	5~60	$\leq 8$				
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	5~60	1,830	3,490	4,840	6,270	7,380
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	5~60	915	1,745	2,420	3,135	3,690
Service Life / Hizmet Ömrü	$L_H$	hr	5~60	S5 Döngüsel Çalışma : >12,000 (S1 Sürekli Çalışma : >6,000hrs) S5 Cycle Operation: >12,000 (S1 Continuous Operation: >6,000hrs)				
Operating Temperature / Çalışma Sıcaklığı		°C	5~60	-15° C ~ +50 ° C				
Lubrication / Yağlama			5~60	Synthetic Grease / Sentetik Yağ				
Protection Class / Koruma Sınıfı			5~60	IP65				
Mounting Position / Montaj Pozisyonu			5~60	Any / Her Yönde				

# WES series / serileri

RATIO / ÇEVİRİM : 5.10.15.20.30.40.50.60



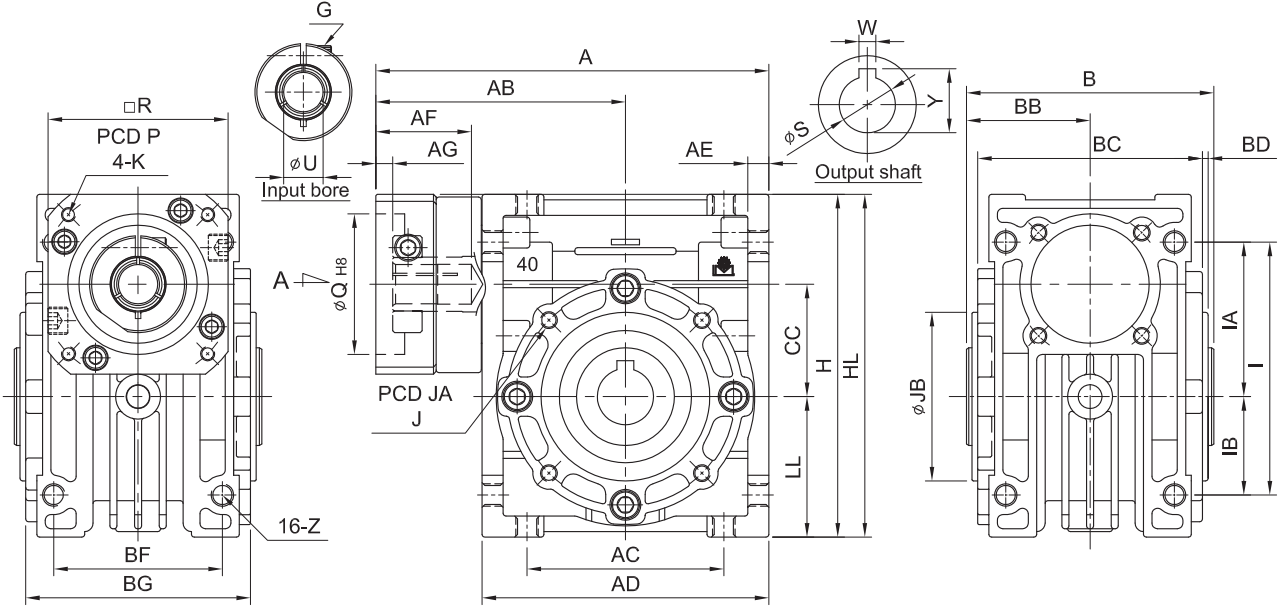
Model Code	A	AB	AC	AD	AE	AF	AG	B	BB	BC	BD	BF	BG	CC	LL	I	IA	IB	Z	H
30	108	68	55	80	6	32	5	99.5	67.5	60	2	45	58	30	40	72	45	27	M6	98
40	140	89	70	102	7.5	34	6	127	85	80	2	60	72	40	50	90	55	35	M8	122
50	158	98	80	120	8.5	34 · 41	6	150	100	94	3	70	85	50	60	105	65	40	M10	145
60	195	122	100	146	10	59	9	159	105	102	3	85	103	60	75	136	83	53	M10	180
70	219	134	120	170	12	54 · 59	9	187	125	118	3	90	110	70	85	150	90	60	M10	200

unit / birim : mm

Model Code	30	40	50	60	70
S	16	20	25	25	30
Y	5	6	7	7	7
W	5	6	8	8	8
D	18	22.5	28	28	33
LS	35	40	50	50	60
LK	30	35	45	45	55
J	8-M6 x P1.0	12-M6 x P1.0	12-M6 x P1.0	12-M8 x P1.25	12-M10 x P1.5
JA	65	77	95	120	140
JB	55	60	70	80	90
P	46 · 60 · 63	70 · 75 · 90	70 · 75 · 90	90 · 100 · 115 · 145	90 · 100 · 115 · 145
K	M3 x P0.5	M4 x P0.7	M4 x P0.7	M5 x P0.8	M5 x P0.8
	M4 x P0.7	M5 x P0.8	M5 x P0.8	M6 x P1.0	M6 x P1.0
	M5 x P0.8	M6 x P1.0	M6 x P1.0	M8 x P1.25	M8 x P1.25
R	46 · 55	64 · 70 · 80	64 · 70 · 80	92 · 110 · 130	92 · 110 · 130
G	M3 x P0.5	M5 x P0.8	M5 x P0.8	M6 x P1.0	M6 x P1.0
Q	30 · 40 · 50	50 · 60 · 70	50 · 60 · 70	70 · 80 · 95 · 110	70 · 80 · 95 · 110
U	8	14	14 · (19)	19 · (24)	19 · 24
HL	100	122 · 125 · 130	145 · 150	181 · 190 · 200	210 · 220

# WEO series / serileri

RATIO / ÇEVİRİM : 5.10.15.20.30.40.50.60



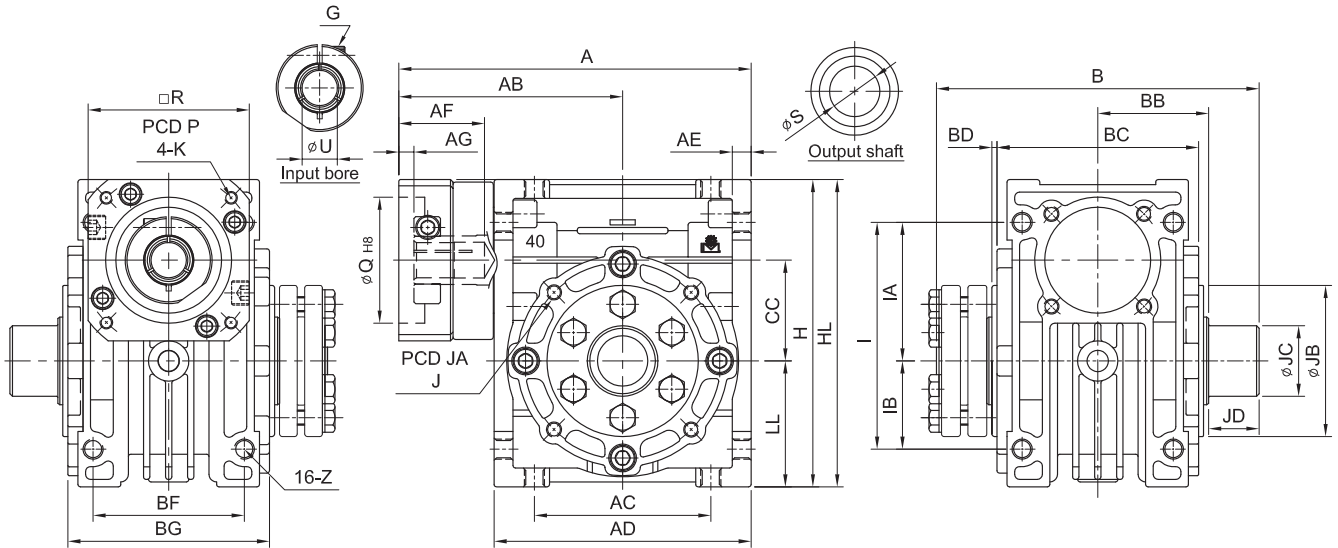
Model Code	A	AB	AC	AD	AE	AF	AG	B	BB	BC	BD	BF	BG	CC	LL	I	IA	IB	Z	H
30	108	68	55	80	6	32	5	65	32.5	60	2	45	58	30	40	72	45	27	M6	98
40	140	89	70	102	7.5	34	6	88	44	80	2	60	72	40	50	90	55	35	M8	122
50	158	98	80	120	8.5	34 - 41	6	98	50	94	3	70	85	50	60	105	65	40	M10	145
60	195	122	100	146	10	59	9	108	54	102	3	85	103	60	75	136	83	53	M10	180
70	219	134	120	170	12	54 - 59	9	128	64	118	3	90	110	70	85	150	90	60	M10	200

unit / birim : mm

Model Code	30	40	50	60	70
S	14	20	25	25	30
Y	16.3	22.8	28.3	28.3	33.3
W	5	6	8	8	8
J	8-M6 x P1.0	12-M6 x P1.0	12-M6 x P1.0	12-M8 x P1.25	12-M10 x P1.5
JA	65	77	95	120	140
JB	55	60	70	80	90
P	46 - 60 - 63	70 - 75 - 90	70 - 75 - 90	90 - 100 - 115 - 145	90 - 100 - 115 - 145
K	M3 x P0.5 M4 x P0.7 M5 x P0.8	M4 x P0.7 M5 x P0.8 M6 x P1.0	M4 x P0.7 M5 x P0.8 M6 x P1.0	M5 x P0.8 M6 x P1.0 M8 x P1.25	M5 x P0.8 M6 x P1.0 M8 x P1.25
R	46 - 55	64 - 70 - 80	64 - 70 - 80	92 - 110 - 130	92 - 110 - 130
G	M3 x P0.5	M5 x P0.8	M5 x P0.8	M6 x P1.0	M6 x P1.0
Q	30 - 40 - 50	50 - 60 - 70	50 - 60 - 70	70 - 80 - 95 - 110	70 - 80 - 95 - 110
U	8	14	14 - (19)	19 - (24)	19 - 24
HL	100	122 - 125 - 130	145 - 150	181 - 190 - 200	210 - 220

# WEN series / serileri

RATIO / ÇEVİRİM : 5.10.15.20.30.40.50.60



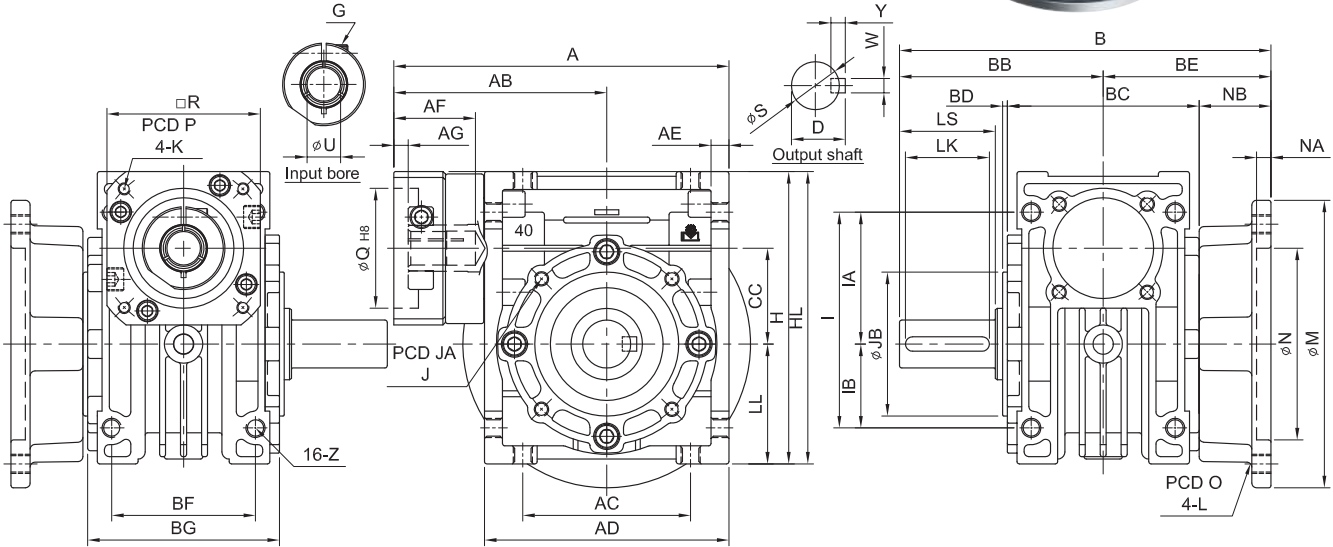
Model Code	A	AB	AC	AD	AE	AF	AG	B	BB	BC	BD	BF	BG	CC	LL	I	IA	IB	Z	H
30	108	68	55	80	6	32	5	108	36	60	2	45	58	30	40	72	45	27	M6	98
40	140	89	70	102	7.5	34	6	128	46	80	2	60	72	40	50	90	55	35	M8	122
50	158	98	80	120	8.5	34 · 41	6	146	53	94	3	70	85	50	60	105	65	40	M10	145
60	195	122	100	146	10	59	9	154	57	102	3	85	103	60	75	136	83	53	M10	180
70	219	134	120	170	12	54 · 59	9	172	65	118	3	90	110	70	85	150	90	60	M10	200

unit / birim : mm

Model Code	30	40	50	60	70
S	14	20	25	25	30
J	8-M6 x P1.0	12-M6 x P1.0	12-M6 x P1.0	12-M8 x P1.25	12-M10 x P1.5
JA	65	77	95	120	140
JB	55	60	70	80	90
JC	22	28	34	35	40
JD	18	18	20	20	21
P	46 · 60 · 63	70 · 75 · 90	70 · 75 · 90	90 · 100 · 115 · 145	90 · 100 · 115 · 145
K	M3 x P0.5 M4 x P0.7 M5 x P0.8	M4 x P0.7 M5 x P0.8 M6 x P1.0	M4 x P0.7 M5 x P0.8 M6 x P1.0	M5 x P0.8 M6 x P1.0 M8 x P1.25	M5 x P0.8 M6 x P1.0 M8 x P1.25
R	46 · 55	64 · 70 · 80	64 · 70 · 80	92 · 110 · 130	92 · 110 · 130
G	M3 x P0.5	M5 x P0.8	M5 x P0.8	M6 x P1.0	M6 x P1.0
Q	30 · 40 · 50	50 · 60 · 70	50 · 60 · 70	70 · 80 · 95 · 110	70 · 80 · 95 · 110
U	8	14	14 · (19)	19 · (24)	19 · 24
HL	100	122 · 125 · 130	145 · 150	181 · 190 · 200	210 · 220

# WESF series / serileri

RATIO / ÇEVİRİM : 5.10.15.20.30.40.50.60



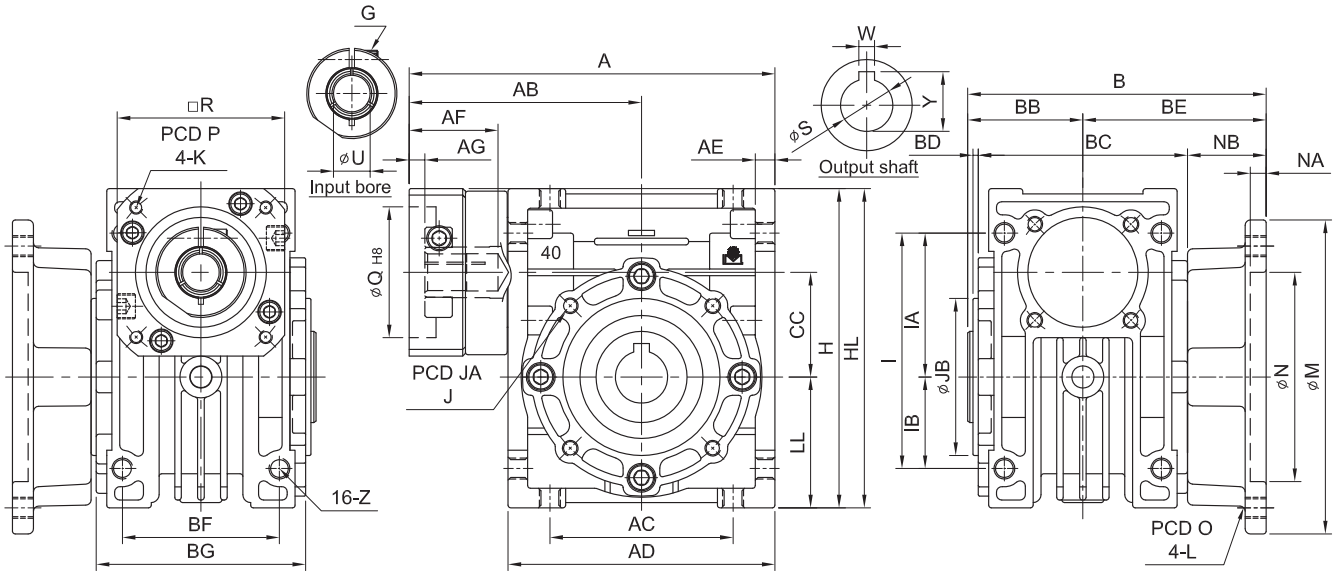
Model Code	A	AB	AC	AD	AE	AF	AG	B	BB	BC	BD	BE	BF	BG	NB	CC	LL	I	IA	IB	Z	H
30	108	68	55	80	6	32	5	127.5	67.5	60	2	60	45	58	30	30	40	72	45	27	M6	98
40	140	89	70	102	7.5	34	6	155	85	80	2	70	60	72	30	40	50	90	55	35	M8	122
50	158	98	80	120	8.5	34 · 41	6	180	100	94	3	80	70	85	33	50	60	105	65	40	M10	145
60	195	122	100	146	10	59	9	205	105	102	3	100	85	103	49	60	75	136	83	53	M10	180
70	219	134	120	170	12	54 · 59	9	225	125	118	3	100	90	110	41	70	85	150	90	60	M10	200

unit / birim : mm

Model Code	30	40	50	60	70
S	16	20	25	25	30
Y	5	6	7	7	7
W	5	6	8	8	8
D	18	22.5	28	28	33
LS	35	40	50	50	60
LK	30	35	45	45	55
J	8-M6 x P1.0	12-M6 x P1.0	12-M6 x P1.0	12-M8 x P1.25	12-M10 x P1.5
JA	65	77	95	120	140
JB	55	60	70	80	90
N	70	80	95	130	150
NA	5	6	6	7	7
O	85	100	120	160	185
L	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5	M12 x P1.75
M	100	120	140	180	210
P	46 · 60 · 63	70 · 75 · 90	70 · 75 · 90	90 · 100 · 115 · 145	90 · 100 · 115 · 145
K	M3 x P0.5 M4 x P0.7 M5 x P0.8	M4 x P0.7 M5 x P0.8 M6 x P1.0	M4 x P0.7 M5 x P0.8 M6 x P1.0	M5 x P0.8 M6 x P1.0 M8 x P1.25	M5 x P0.8 M6 x P1.0 M8 x P1.25
R	46 · 55	64 · 70 · 80	64 · 70 · 80	92 · 110 · 130	92 · 110 · 130
G	M3 x P0.5	M5 x P0.8	M5 x P0.8	M6 x P1.0	M6 x P1.0
Q	30 · 40 · 50	50 · 60 · 70	50 · 60 · 70	70 · 80 · 95 · 110	70 · 80 · 95 · 110
U	8	14	14 · (19)	19 · (24)	19 · 24
HL	100	122 · 125 · 130	145 · 150	181 · 190 · 200	210 · 220

# WEOF series

RATIO / ÇEVİRİM : 5.10.15.20.30.40.50.60



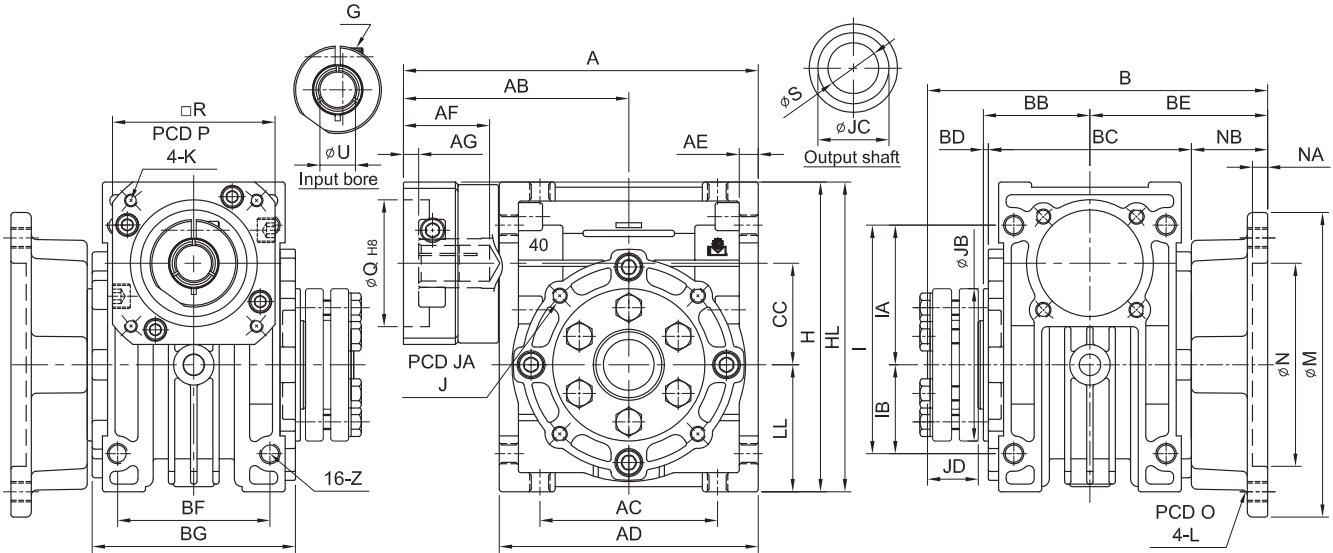
Model Code	A	AB	AC	AD	AE	AF	AG	B	BB	BC	BD	BE	BF	BG	NB	CC	LL	I	IA	IB	Z	H
30	108	68	55	80	6	32	5	92.5	32.5	60	2	60	45	58	30	30	40	72	45	27	M6	98
40	140	89	70	102	7.5	34	6	114	44	80	2	70	60	72	30	40	50	90	55	35	M8	122
50	158	98	80	120	8.5	34 - 41	6	130	49	94	3	80	70	85	33	50	60	105	65	40	M10	145
60	195	122	100	146	10	59	9	154	54	102	3	100	85	103	49	60	75	136	83	53	M10	180
70	219	134	120	170	12	54 - 59	9	164	64	118	3	100	90	110	41	70	85	150	90	60	M10	200

unit / birim : mm

Model Code	30	40	50	60	70
S	14	20	25	25	30
Y	16.3	22.8	28.3	28.3	33.3
W	5	6	8	8	8
J	8-M6 x P1.0	12-M6 x P1.0	12-M6 x P1.0	12-M8 x P1.25	12-M10 x P1.5
JA	65	77	95	120	140
JB	55	60	70	80	90
N	70	80	95	130	150
NA	5	6	6	7	7
O	85	100	120	160	185
L	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5	M12 x P1.75
M	100	120	140	180	210
P	46 - 60 - 63	70 - 75 - 90	70 - 75 - 90	90 - 100 - 115 - 145	90 - 100 - 115 - 145
K	M3 x P0.5 M4 x P0.7 M5 x P0.8	M4 x P0.7 M5 x P0.8 M6 x P1.0	M4 x P0.7 M5 x P0.8 M6 x P1.0	M5 x P0.8 M6 x P1.0 M8 x P1.25	M5 x P0.8 M6 x P1.0 M8 x P1.25
R	46 - 55	64 - 70 - 80	64 - 70 - 80	92 - 110 - 130	92 - 110 - 130
G	M3 x P0.5	M5 x P0.8	M5 x P0.8	M6 x P1.0	M6 x P1.0
Q	30 - 40 - 50	50 - 60 - 70	50 - 60 - 70	70 - 80 - 95 - 110	70 - 80 - 95 - 110
U	8	14	14 - (19)	19 - (24)	19 - 24
HL	100	122 - 125 - 130	145 - 150	181 - 190 - 200	210 - 220

# WENF series / serileri

RATIO / ÇEVİRİM : 5.10.15.20.30.40.50.60



Model Code	A	AB	AC	AD	AE	AF	AG	B	BB	BC	BD	BE	BF	BG	NB	CC	LL	I	IA	IB	Z	H
30	108	68	55	80	6	32	5	114	32.5	60	2	60	45	58	30	30	40	72	45	27	M6	98
40	140	89	70	102	7.5	34	6	134	44	80	2	70	60	72	30	40	50	90	55	35	M8	122
50	158	98	80	120	8.5	34 · 41	6	153	49	94	3	80	70	85	33	50	60	105	65	40	M10	145
60	195	122	100	146	10	59	9	177	54	102	3	100	85	103	49	60	75	136	83	53	M10	180
70	219	134	120	170	12	54 · 59	9	186	64	118	3	100	90	110	41	70	85	150	90	60	M10	200

unit / birim : mm

Model Code	30	40	50	60	70
S	14	20	25	25	30
J	8-M6 x P1.0	12-M6 x P1.0	12-M6 x P1.0	12-M8 x P1.25	12-M10 x P1.5
JA	65	77	95	120	140
JB	55	60	70	80	90
JC	22	28	34	35	40
JD	20	20	21	21	22
N	70	80	95	130	150
NA	5	6	6	7	7
O	85	100	120	160	185
L	M6 x P1.0	M8 x P1.25	M10 x P1.5	M10 x P1.5	M12 x P1.75
M	100	120	140	180	210
P	46 · 60 · 63	70 · 75 · 90	70 · 75 · 90	90 · 100 · 115 · 145	90 · 100 · 115 · 145
K	M3 x P0.5 M4 x P0.7 M5 x P0.8	M4 x P0.7 M5 x P0.8 M6 x P1.0	M4 x P0.7 M5 x P0.8 M6 x P1.0	M5 x P0.8 M6 x P1.0 M8 x P1.25	M5 x P0.8 M6 x P1.0 M8 x P1.25
R	46 · 55	64 · 70 · 80	64 · 70 · 80	92 · 110 · 130	92 · 110 · 130
G	M3 x P0.5	M5 x P0.8	M5 x P0.8	M6 x P1.0	M6 x P1.0
Q	30 · 40 · 50	50 · 60 · 70	50 · 60 · 70	70 · 80 · 95 · 110	70 · 80 · 95 · 110
U	8	14	14 · (19)	19 · (24)	19 · 24
HL	100	122 · 125 · 130	145 · 150	181 · 190 · 200	210 · 220

# ANE series / serileri

## ANE Series Adjustable Backlash Worm Gear Reducer

Characteristic: dual-lead design, high output torque, high rigidity, low noise, low vibration and low backlash ( 0~6 arcmin ).

Easy to adjust backlash for increasing accuracy and service life.

Customerized specifications are available.

Suitable for high-accuracy transmission system, indexing, positioning and sizing applications:

- 4th-axis of machine tables
- Rotary tables and index tables
- Robots
- Positioning and sizing devices of various industrial machinery

## Ayarlanabilir boşluklu, sonsuz dişli ANE serileri

Özellikler: Yüksek çıkış torku, sağlamlık, düşük ses, düşük titreşim ve düşük boşluk oranı ( 0~6 arcmin ).

Hizmet ömrünü ve hassasiyeti arttırmak için boşluk oranı kolayca ayarlanabilir.

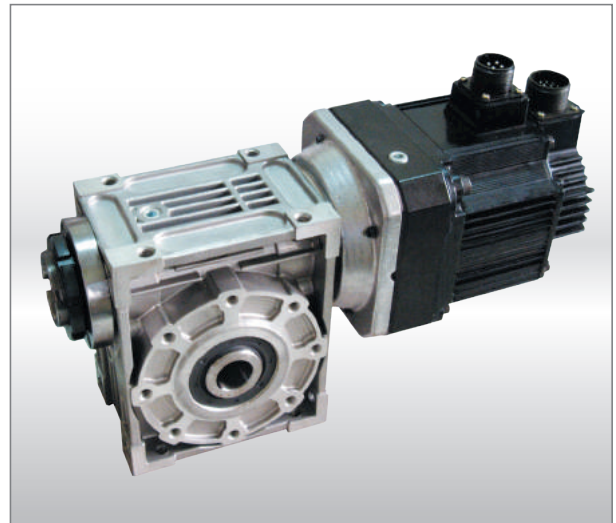
Talebe göre üretim.

Yüksek hassasiyetli iletim sistemleri, indeks, konumlandırma ve boyutlandırma uygulamaları için uygundur.

- Döner tablalar ve indeks tablaları
- Robotlar
- Boyutlandırma ve konumlandırma uygulamaları

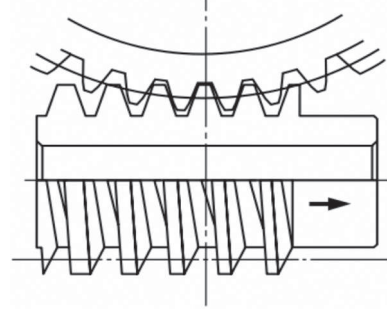


Solid output shaft / Çıkış Millî



Hollow output shaft / Delik Millî

# Characteristic of ANE Series / ANE Serilerinin Özellikleri



## Principle of Dual-lead Worm Transmission and Backlash Adjustment

The backlash adjustment on a conventional worm / worm gear set is made by moving the worm along the worm gear in radial direction, which may result in a change of center distance of the transmission set. Such change of center distance will cause poor contact between teeth, wearing and affection on accuracy of worm / worm gear set.

However, the backlash adjustment on a dual-lead worm is made by moving worm in axial direction, which does not change the distance of the transmission set and avoid above problems. The dual-lead worm features varied teeth thickness. There is a different lead length between the right and left tooth faces, that creates a continuous teeth shapes. To properly engage with the worm, the teeth faces of worm gear are also designed with different right and left tooth faces. This permits backlash adjustment to achieve the best condition.

After a period of operation, if a backlash between worm and worm gear increases due to wear, it can be adjusted by moving the worm in axial direction until a proper backlash is obtained. The dual-lead worm transmission allows for changing side backlash to keep correct teeth-engagement at all times. In addition, it has a compact structure and easy adjustment. Therefore, it is ideally suited for indexing devices that require continuous accuracy by adjusting teeth backlash to the minimum extent.

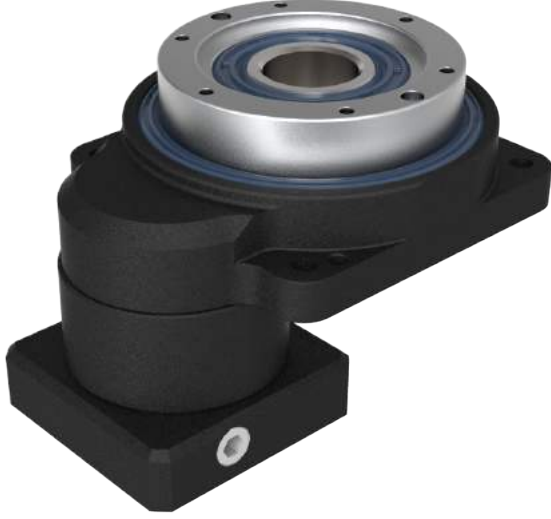
## Çift Yönlü Sonsuz Dişli Prensipleri ve Boşluk Ayarlaması

Geleneksel sonsuz dişli setlerinde boşluk ayarlaması işlemi dişli setinin merkez konumunun değişmesine yol açabilen vida dişlisinin, sonsuz dişlinin radyal yönünde hareket ettirilmesiyle sağlanır. Merkez mesafesinin bu şekilde değişmesi dişliler arasında temasın zayıflamasına, aşınmaya ve hassasiyetin azalmasına sebep olur. Çift yönlü sonsuz dişli setlerinde ise boşluk ayarlaması işlemi merkez mesafeyi değiştirmeden vida dişlisinin aksiyel yönde hareket ettirilmesiyle yapılır.

Çift yönlü vida dişlisi değişken diş kalınlığına sahiptir. Sağ ve sol diş yüzeyi arasında sürekli diş şekilleri oluşturan farklı temas yüzeyleri vardır. Vida dişlisi ile düzgün bir kavrama sağlayabilmek için sonsuz dişli de farklı sağ ve sol diş yüzeyleri ile tasarlanmıştır. Bu durum boşluğun en iyi şekilde ayarlanmasına izin verir. Belli bir çalışma süresinden sonra boşluk aşınma sebebiyle artarsa, istenilen boşluk sağlanana kadar vida dişlisi aksiyel yönde hareket ettirilebilir.

Çift yönlü sonsuz dişli prensibi, dişliler arasındaki kavramanın her zaman düzgün olmasını sağlar. Buna ek olarak, kompakt bir yapıya ve montaj kolaylığına sahiptir.

# GT series / serileri



## Indication of Models / Model Seçimi

<b>GT</b>	—	<b>60</b>		<b>B</b>	—	<b>10</b>	—	<b>MOTOR</b>
Type / Tip		Model		Output Table Supporting Bearing / Dış Tabla Destek Rulmanı		Ratio / Çevrim		Motor Type
GT		60		Ball Bearing / Bilyalı Rulman		5, 10, 18		Motor Brand & Model No. / Motor Markası & Modeli
		85		Crossed Roller Bearing / Masuralı Rulman		25, 50, 100		
		110						
		135						
		200						

### Quiet operation / Sessiz Çalışma

Grinding spiral bevel gear & Helical gears contribute to reduce vibration and noise. / Taşlanmış helis dişliler titreşim ve çalışma sesini azaltmaktadır.

### High Rigidity & High Torque / Yüksek Rijitlik & Yüksek Tork

High rigidity & high torque are achieved by crossed roller bearings. / Masuralı rulmanlar sayesinde yüksek rijitlik ve yüksek tork sağlanır.

### High Efficiency / Yüksek Verim

Efficiency exceeds 98%. / Verim %98'e kadar ulaşmaktadır.

# Characteristic of GT Series / GT Serilerinin Özellikleri

## Flexible Motor Connection / Kolay Motor Bağlantısı

The modular design of motor connection plate is suitable for any brand servomotor and stepmotor. The input-end and the motor are coupled through a collet locking mechanism. It has passed dynamical balance analysis to assure concentricity and balance on the connection and no backlash for power transmission while running at high speed.

Modüler motor bağlantı flanşları her marka servo motor ve step motor için tasarlanmıştır. Motor mili ve redüktörün giriş mili kovan kilitleme mekanizması sayesinde birbirine bağlanır. Bağlantıdaki denge ve iletimde boşluk olmaması adına yüksek devirlerde dinamik denge analizleri yapılır.

## Hollow Structure Design / Delik Milli Tasarım

Make it convenient for electric wiring or piping work.

Delik milli tasarım elektirik ve kablo tesisatı için kolaylık sağlar.

## High Accuracy / Yüksek Hassasiyet

Repetitive Positioning Accuracy  $\pm 10$  sec  
Torsional Backlash  $\leq 1$  arcmin  
Lost Motion 2 arcmin

Tekrarlanabilir pozisyonlama  $\pm 10$  sec Burulma  
Boşluğu  $\leq 1$  arcmin  
Kayıp Hareket 2 arcmin



## Helical Gear Design / Helis Dişli Tasarım

The speed reduction mechanism employs helical gears, which provides two times meshing rate of teeth when comparing with regular spur gears. In addition, it also Specification extremely smooth running, low noise, high torque output and low backlash.

Helis dişliler sayesinde düz dişlilere göre 2 kat fazla temas yüzeyi sağlanmaktadır. Bu sayede pürüzsüz hareket, düşük ses, yüksek çıkış torqu ve hassasiyet elde edilir.

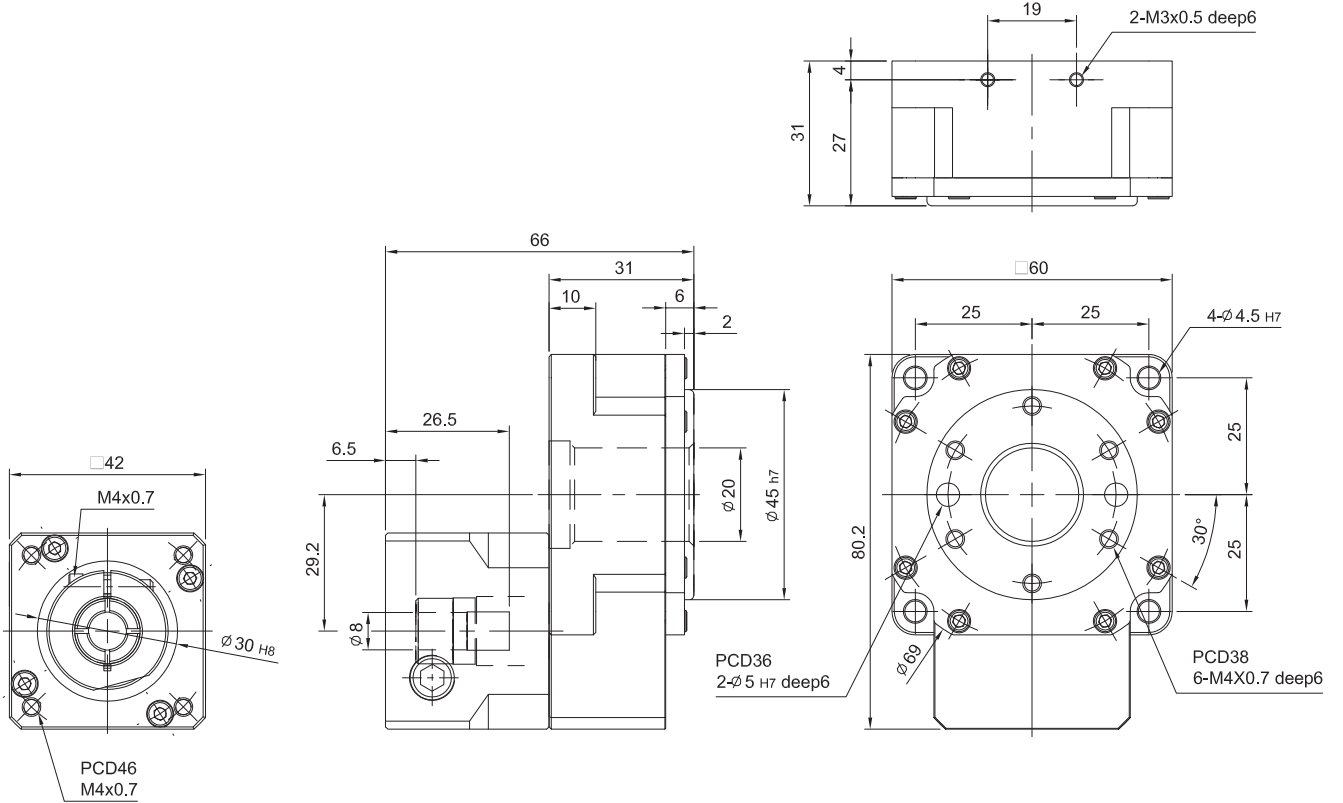
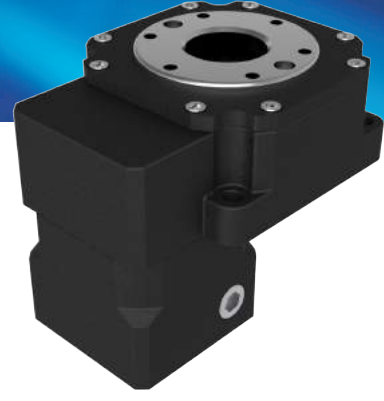
## High Precision Gear Machining / Yüksek Hassasiyetli Dişli İşleme

The housing of reducer is made by aluminum alloy, and precision machining by CNC machine. Precision teeth grinding assures gear accuracy reaches DIN6 class and carburized to hardness 58-60 HRC.

Redüktör gövdesi alüminyum alaşımdan üretilip, yüksek hassasiyetle CNC'lerde işlenir. Hassas dişli taşlama sayesinde DIN6 sınıfına ulaşıp, dişliler 58-60 HRC sertliğe kadar karbürlenmiştir.

# MODEL : GT-60B

RATIO / ÇEVİRİM : 5.10.18 (1-Stage / Kademe)



Characteristic / Özellikler	Unit / Birim	GT-60B
Output Table Supporting Bearing / Dış Tabla Destek Rulmanı		Ball Bearing / Bilyalı Rulman
Rated Output Torque / Nominal Çıkış Torku	N.m	5
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$ N.m	2 Time of Rated Output Torque / 2 x Nominal Çıkış Torku
Inertia Moment / Atalet Momenti	kg.m <sup>2</sup>	$777 \times 10^{-7}$
Output Permissible Speed / Azami Çıkış Devri	rpm	300
Torsional Backlash / Burulma Tepkisi	arcmin	$\leq 1$
Lost Motion / Kayıp Hareket	arcmin	2 (0.033°)
Repetitive Positioning Accuracy / Tekrar Konumlandırma Doğruluğu	arcsec	$\pm 10$ (0.0028°)
Permissible Thrust Load / Azami İtme Yüğü	N	350
Permissible Moment Load / Azami Moment Yüğü	N.m	7
Runout of Output Table Surface / Dış Tabla Yüzey Dağılımı	mm	0.01
Runout of Output Table Inner / Outer Diameter / Dış Tabla İç/Dış Çap Dağılımı	mm	0.01
Parallelism of Output Table / Dış Tabla Paralelliği	mm	0.02
Protection Class / Koruma Sınıfı		IP 65
Weight / Ağırlık	Kg	0.54

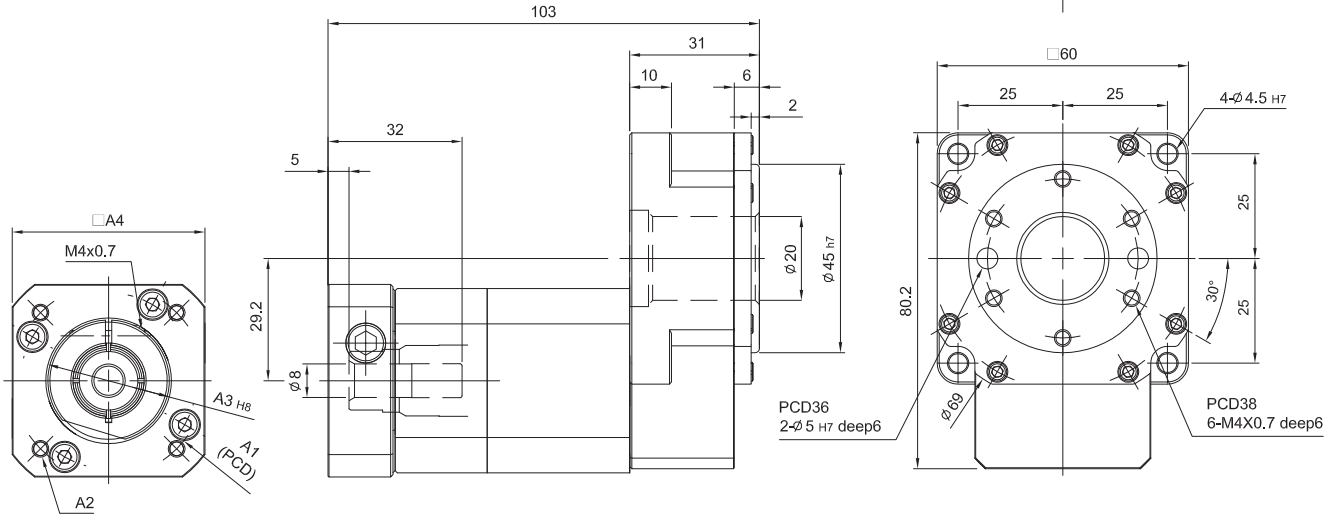
# MODEL : GT-60B

RATIO / ÇEVİRİM : 25.50.100 (2-Stage / Kademe)



Unit / Birim: mm

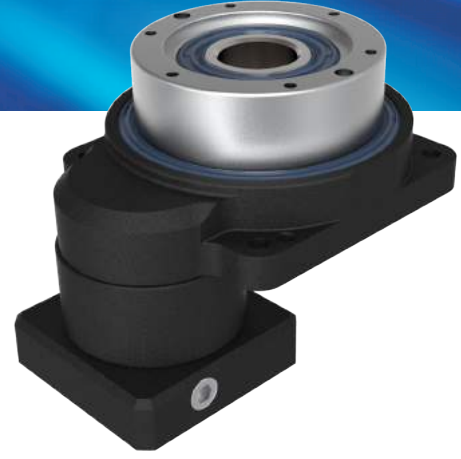
Model Code	60
A1	46 · 63 · 60
A2	M3 · M4 · M5
A3	30 · 40 · 50
A4	46 · 55



Characteristic / Özellikler	Unit / Birim	GT-60B
Output Table Supporting Bearing / Dış Tabla Destek Rulmanı		Ball Bearing / Bilyalı Rulman
Rated Output Torque / Nominal Çıkış Torku	N.m	5
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$ N.m	2 Time of Rated Output Torque / 2 x Nominal Çıkış Torku
Inertia Moment / Atalet Momenti	kg.m <sup>2</sup>	$777 \times 10^{-7}$
Output Permissible Speed / Azami Çıkış Devri	rpm	300
Torsional Backlash / Burulma Tepkisi	arcmin	$\leq 3$
Lost Motion / Kayıp Hareket	arcmin	2 (0.033°)
Repetitive Positioning Accuracy / Tekrar Konumlandırma Doğruluğu	arcsec	$\pm 10$ (0.0028°)
Permissible Thrust Load / Azami İtme Yüğü	N	350
Permissible Moment Load / Azami Moment Yüğü	N.m	7
Runout of Output Table Surface / Dış Tabla Yüzey Dağılımı	mm	0.01
Runout of Output Table Inner / Outer Diameter / Dış Tabla İç/Dış Çap Dağılımı	mm	0.01
Parallelism of Output Table / Dış Tabla Paralelliği	mm	0.02
Protection Class / Koruma Sınıfı		IP 65
Weight / Ağırlık	Kg	1.1

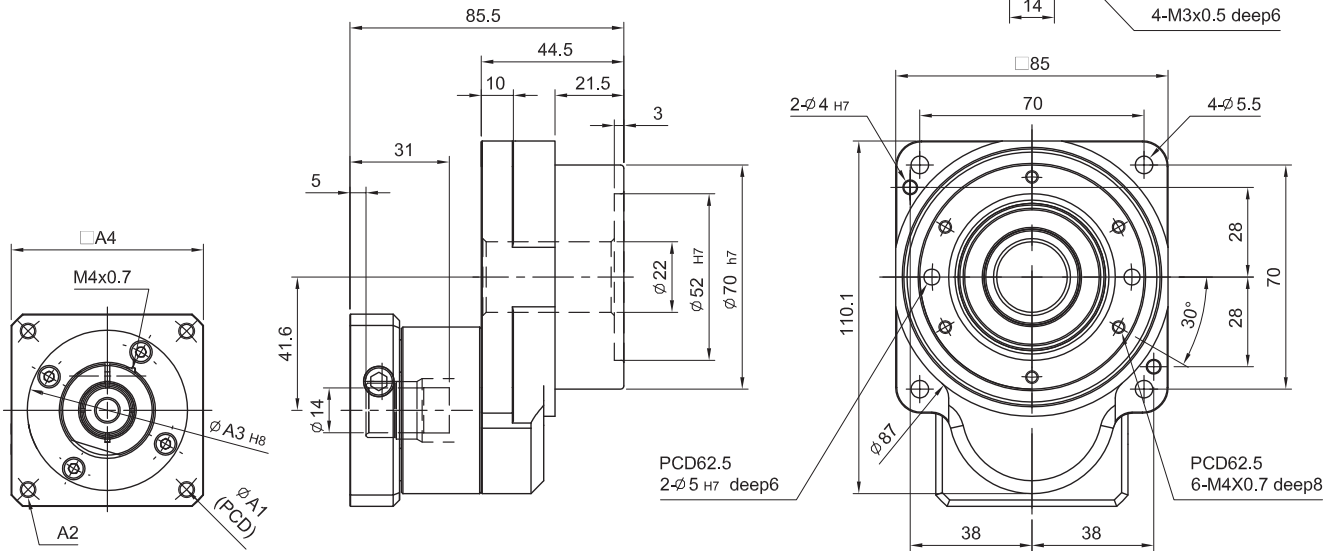
# MODEL : GT-85B

RATIO / ÇEVİRİM : 5.10.18 (1-Stage / Kademe)



Unit / Birim: mm

Model Code	85
A1	46 · 63 · 60
A2	M3 · M4 · M5
A3	30 · 40 · 50
A4	46 · 55



Characteristic / Özellikler	Unit / Birim	GT-85B
Output Table Supporting Bearing / Dış Tabla Destek Rulmanı		Ball Bearing / Bilyalı Rulman
Rated Output Torque / Nominal Çıkış Torku	N.m	18
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$ N.m	2 Time of Rated Output Torque / 2 x Nominal Çıkış Torku
Inertia Moment / Atalet Momenti	kg.m <sup>2</sup>	$1,268 \times 10^{-6}$
Output Permissible Speed / Azami Çıkış Devri	rpm	300
Torsional Backlash / Burulma Tepkisi	arcmin	$\leq 1$
Lost Motion / Kayıp Hareket	arcmin	2 (0.033°)
Repetitive Positioning Accuracy / Tekrar Konumlandırma Doğruluğu	arcsec	$\pm 10$ (0.0028°)
Permissible Thrust Load / Azami İtme Yüğü	N	600
Permissible Moment Load / Azami Moment Yüğü	N.m	12
Runout of Output Table Surface / Dış Tabla Yüzey Dağılımı	mm	0.01
Runout of Output Table Inner / Outer Diameter / Dış Tabla İç/Dış Çap Dağılımı	mm	0.01
Parallelism of Output Table / Dış Tabla Paralelliği	mm	0.02
Protection Class / Koruma Sınıfı		IP 65
Weight / Ağırlık	Kg	1.17

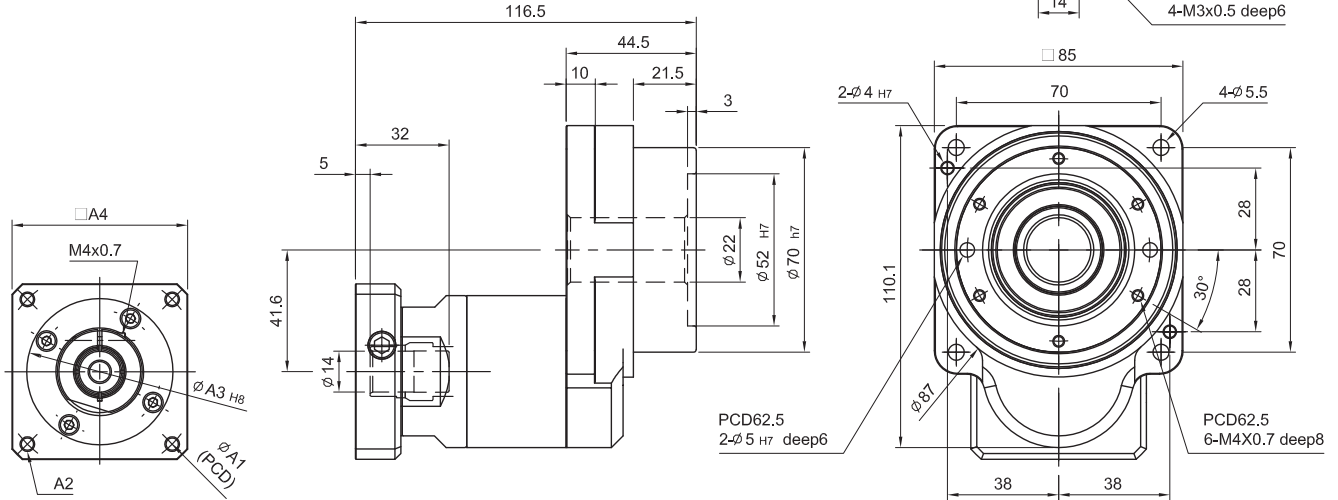
# MODEL : GT-85B

RATIO / ÇEVİRİM : 25.50.100 (2-Stage / Kademe)



Unit / Birim: mm

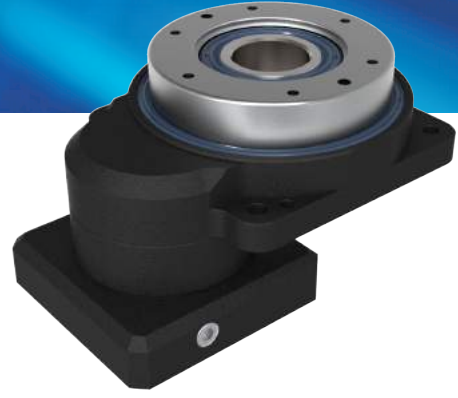
Model Code	85
A1	46 · 63 · 60
A2	M3 · M4 · M5
A3	30 · 40 · 50
A4	46 · 55



Characteristic / Özellikler	Unit / Birim	GT-85B
Output Table Supporting Bearing / Diş Tabla Destek Rulmanı		Ball Bearing / Bilyalı Rulman
Rated Output Torque / Nominal Çıkış Torku	N.m	18
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$ N.m	2 Time of Rated Output Torque / 2 x Nominal Çıkış Torku
Inertia Moment / Alalet Momenti	kg.m <sup>2</sup>	$1,268 \times 10^{-6}$
Output Permissible Speed / Azami Çıkış Devri	rpm	300
Torsional Backlash / Burulma Tepkisi	arcmin	≤ 3
Lost Motion / Kayıp Hareket	arcmin	2 (0.033°)
Repetitive Positioning Accuracy / Tekrar Konumlandırma Doğruluğu	arcsec	±10 (0.0028°)
Permissible Thrust Load / Azami İtme Yüğü	N	600
Permissible Moment Load / Azami Moment Yüğü	N.m	12
Runout of Output Table Surface / Diş Tabla Yüzey Dağılımı	mm	0.01
Runout of Output Table Inner / Outer Diameter / Diş Tabla İç/Diş Çap Dağılımı	mm	0.01
Parallelism of Output Table / Diş Tabla Paralelliği	mm	0.02
Protection Class / Koruma Sınıfı		IP 65
Weight / Ağırlık	Kg	1.95

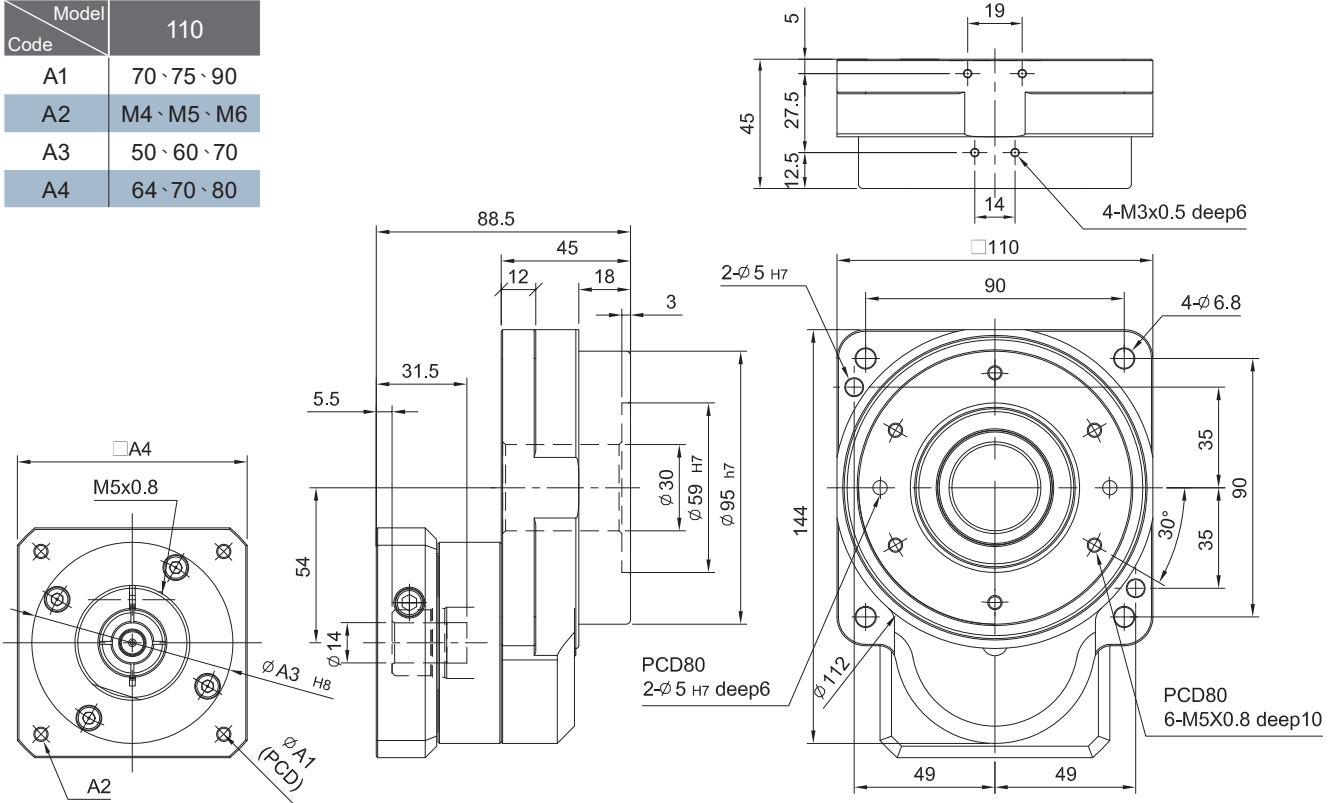
# MODEL : GT-110B

RATIO / ÇEVİRİM : 5.10.18 (1-Stage / Kademe)



Unit / Birim: mm

Model Code	110
A1	70 · 75 · 90
A2	M4 · M5 · M6
A3	50 · 60 · 70
A4	64 · 70 · 80



Characteristic / Özellikler	Unit / Birim	GT-110B
Output Table Supporting Bearing / Dış Tabla Destek Rulmanı		Ball Bearing / Bilyalı Rulman
Rated Output Torque / Nominal Çıkış Torku	N.m	33
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$ N.m	2 Time of Rated Output Torque / 2 x Nominal Çıkış Torku
Inertia Moment / Atalet Momenti	kg.m <sup>2</sup>	$1,562 \times 10^{-6}$
Output Permissible Speed / Azami Çıkış Devri	rpm	300
Torsional Backlash / Burulma Tepkisi	arcmin	$\leq 1$
Lost Motion / Kayıp Hareket	arcmin	2 (0.033°)
Repetitive Positioning Accuracy / Tekrar Konumlandırma Doğruluğu	arcsec	$\pm 10$ (0.0028°)
Permissible Thrust Load / Azami İtme Yüğü	N	800
Permissible Moment Load / Azami Moment Yüğü	N.m	16
Runout of Output Table Surface / Dış Tabla Yüzey Dağılımı	mm	0.015
Runout of Output Table Inner / Outer Diameter / Dış Tabla İç/Dış Çap Dağılımı	mm	0.015
Parallelism of Output Table / Dış Tabla Paralellığı	mm	0.025
Protection Class / Koruma Sınıfı		IP 65
Weight / Ağırlık	Kg	2.54

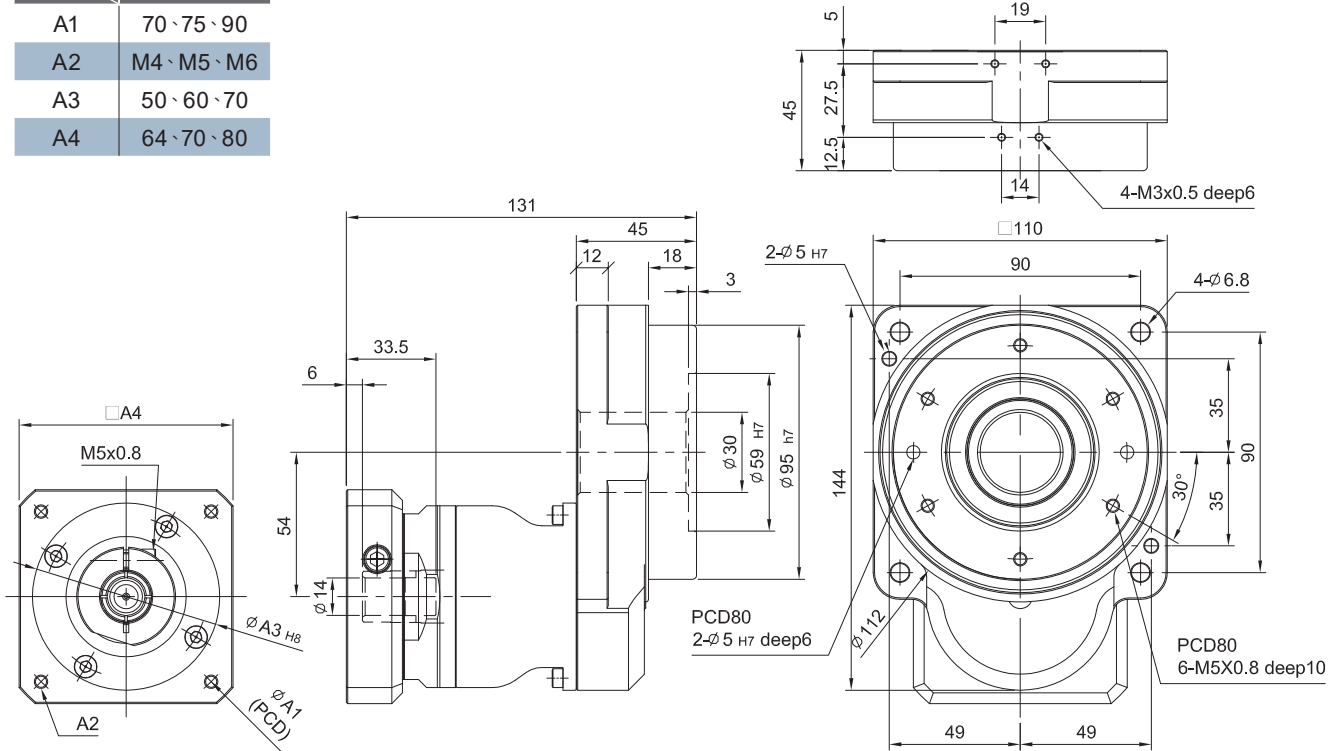
# MODEL : GT-110B

RATIO / ÇEVİRİM : 25.50.100 (2-Stage / Kademe)



Unit / Birim: mm

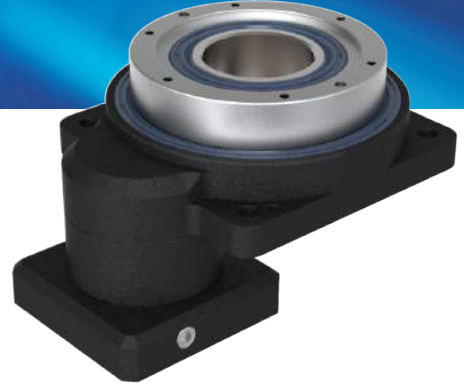
Model Code	110
A1	70 · 75 · 90
A2	M4 · M5 · M6
A3	50 · 60 · 70
A4	64 · 70 · 80



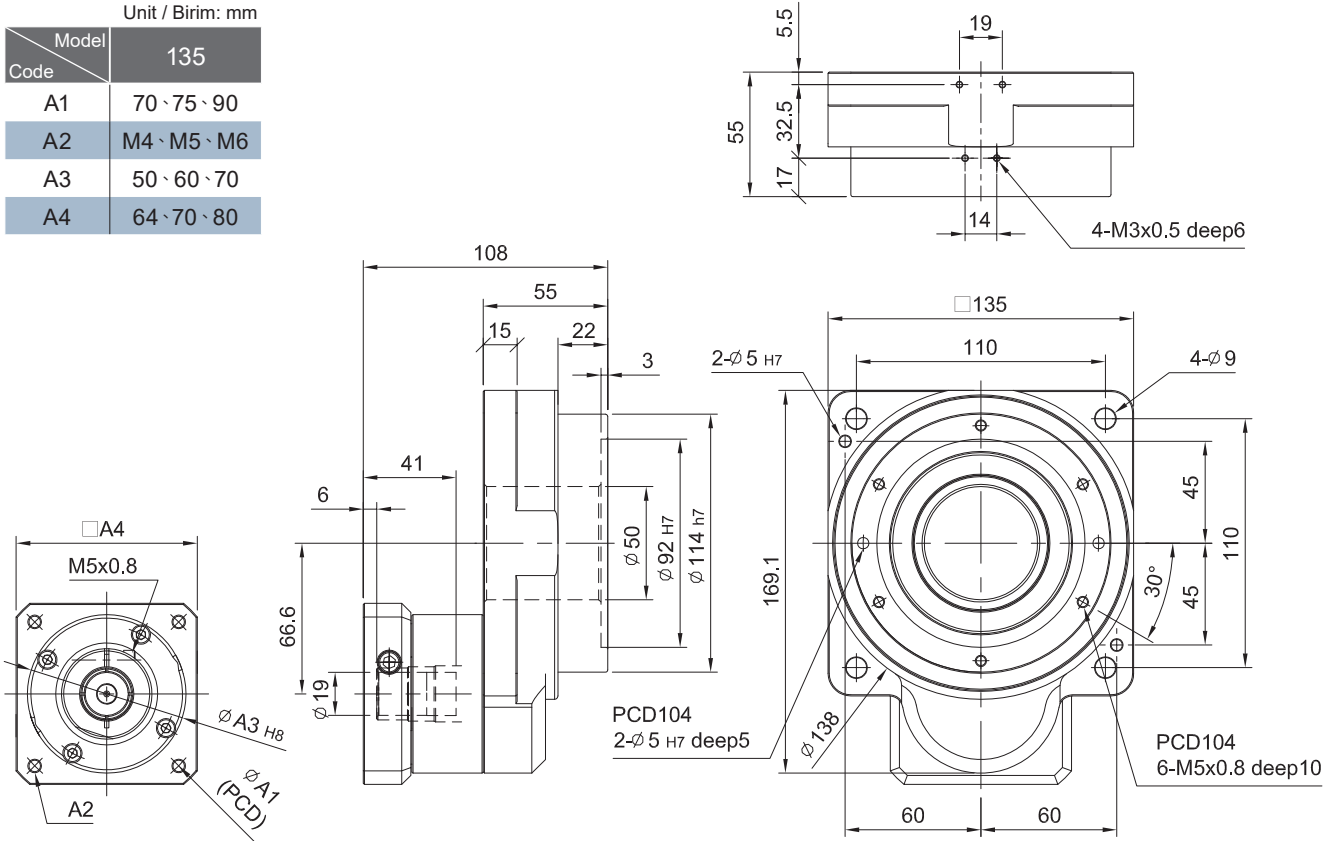
Characteristic / Özellikler	Unit / Birim	GT-110B
Output Table Supporting Bearing / Dış Tabla Destek Rulmanı		Ball Bearing / Bilyalı Rulman
Rated Output Torque / Nominal Çıkış Torku	N.m	33
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$ N.m	2 Time of Rated Output Torque / 2 x Nominal Çıkış Torku
Inertia Moment / Atalet Momenti	kg.m <sup>2</sup>	$1,562 \times 10^{-6}$
Output Permissible Speed / Azami Çıkış Devri	rpm	300
Torsional Backlash / Burulma Tepkisi	arcmin	≤ 3
Lost Motion / Kayıp Hareket	arcmin	2 (0.033°)
Repetitive Positioning Accuracy / Tekrar Konumlandırma Doğruluğu	arcsec	±10 (0.0028°)
Permissible Thrust Load / Azami İtme Yüğü	N	800
Permissible Moment Load / Azami Moment Yüğü	N.m	16
Runout of Output Table Surface / Dış Tabla Yüzey Dağılımı	mm	0.015
Runout of Output Table Inner / Outer Diameter / Dış Tabla İç/Dış Çap Dağılımı	mm	0.015
Parallelism of Output Table / Dış Tabla Paralelliği	mm	0.025
Protection Class / Koruma Sınıfı		IP 65
Weight / Ağırlık	Kg	3.76

# MODEL : GT-135B

RATIO / ÇEVİRİM : 5.10.18 (1-Stage / Kademe)



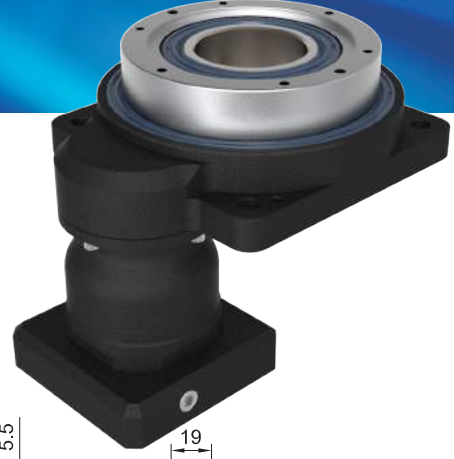
Unit / Birim: mm	
Model Code	135
A1	70 · 75 · 90
A2	M4 · M5 · M6
A3	50 · 60 · 70
A4	64 · 70 · 80



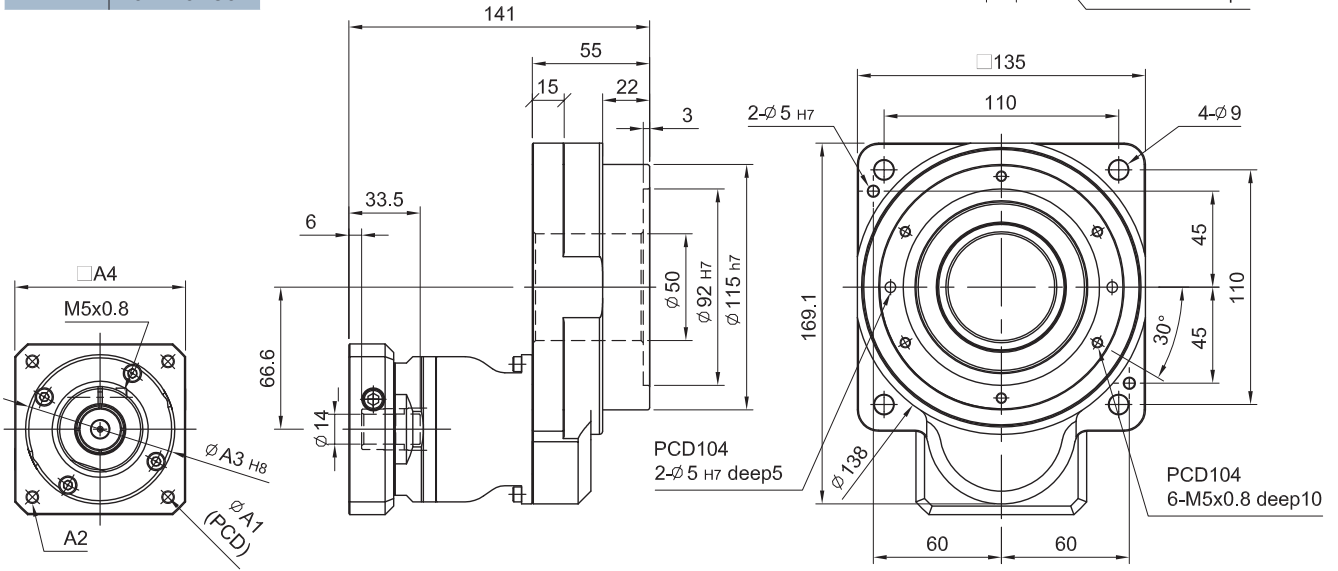
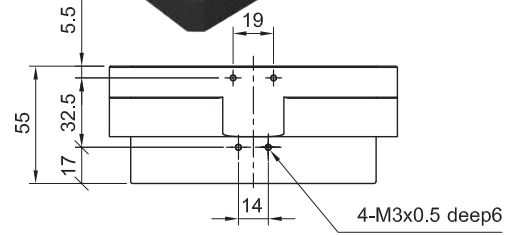
Characteristic / Özellikler	Unit / Birim	GT-135B
Output Table Supporting Bearing / Dış Tabla Destek Rulmanı		Ball Bearing / Bilyalı Rulman
Rated Output Torque / Nominal Çıkış Torku	N.m	43
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$ N.m	2 Time of Rated Output Torque / 2 x Nominal Çıkış Torku
Inertia Moment / Atalet Momenti	kg.m <sup>2</sup>	$2,918 \times 10^{-6}$
Output Permissible Speed / Azami Çıkış Devri	rpm	300
Torsional Backlash / Burulma Tepkisi	arcmin	$\leq 1$
Lost Motion / Kayıp Hareket	arcmin	2 (0.033°)
Repetitive Positioning Accuracy / Tekrar Konumlandırma Doğruluğu	arcsec	$\pm 10$ (0.0028°)
Permissible Thrust Load / Azami İtme Yüğü	N	1,450
Permissible Moment Load / Azami Moment Yüğü	N.m	30
Runout of Output Table Surface / Dış Tabla Yüzey Dağılımı	mm	0.015
Runout of Output Table Inner / Outer Diameter / Dış Tabla İç/Dış Çap Dağılımı	mm	0.015
Parallelism of Output Table / Dış Tabla Paralellığı	mm	0.025
Protection Class / Koruma Sınıfı		IP 65
Weight / Ağırlık	Kg	3.83

# MODEL : GT-135B

RATIO / ÇEVİRİM : 25.50.100 (2-Stage / Kademe)



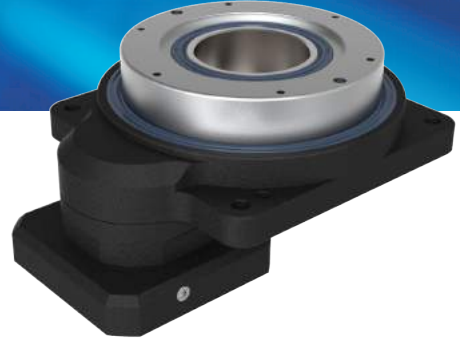
Unit / Birim: mm	
Model Code	135
A1	70 · 75 · 90
A2	M4 · M5 · M6
A3	50 · 60 · 70
A4	64 · 70 · 80



Characteristic / Özellikler	Unit / Birim	GT-135B
Output Table Supporting Bearing / Dış Tabla Destek Rulmanı		Ball Bearing / Bilyalı Rulman
Rated Output Torque / Nominal Çıkış Torku	N.m	43
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$ N.m	2 Time of Rated Output Torque / 2 x Nominal Çıkış Torku
Inertia Moment / Atalet Momenti	kg.m <sup>2</sup>	$2,918 \times 10^{-6}$
Output Permissible Speed / Azami Çıkış Devri	rpm	300
Torsional Backlash / Burulma Tepkisi	arcmin	$\leq 3$
Lost Motion / Kayıp Hareket	arcmin	2 (0.033°)
Repetitive Positioning Accuracy / Tekrar Konumlandırma Doğruluğu	arcsec	$\pm 10$ (0.0028°)
Permissible Thrust Load / Azami İtme Yüğü	N	1,450
Permissible Moment Load / Azami Moment Yüğü	N.m	30
Runout of Output Table Surface / Dış Tabla Yüzeý Dağılımı	mm	0.015
Runout of Output Table Inner / Outer Diameter / Dış Tabla İç/Dış Çap Dağılımı	mm	0.015
Parallelism of Output Table / Dış Tabla Paralelliği	mm	0.025
Protection Class / Koruma Sınıfı		IP 65
Weight / Ağırlık	Kg	4.92

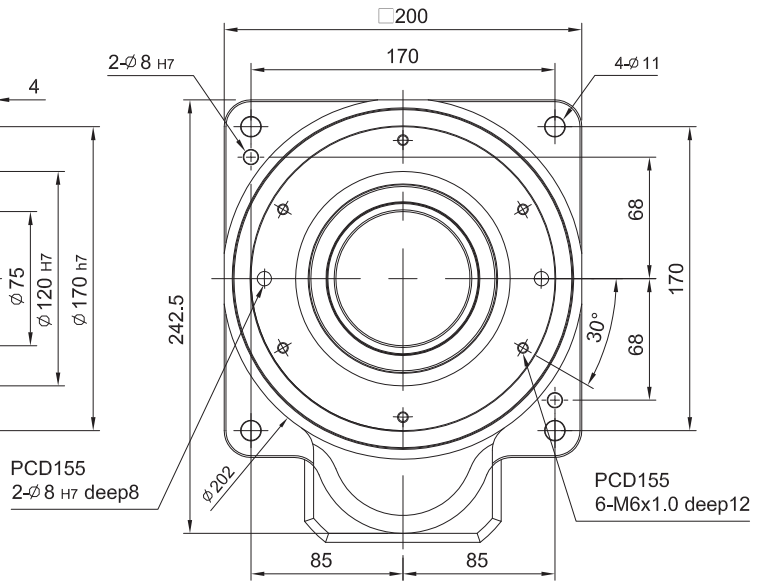
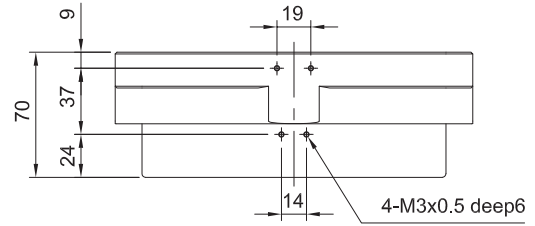
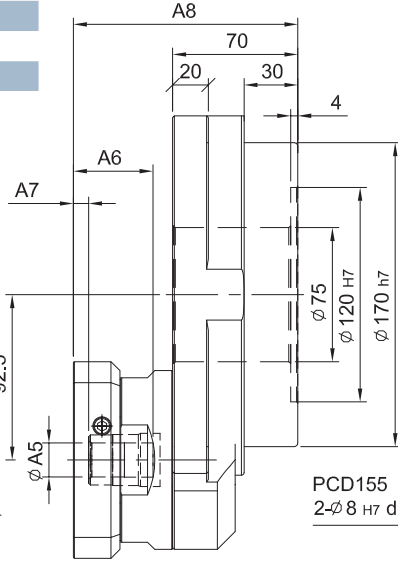
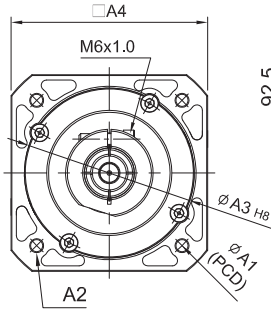
# MODEL : GT-200B

RATIO / ÇEVİRİM : 5.10.18 (1-Stage / Kademe)



Unit / Birim: mm

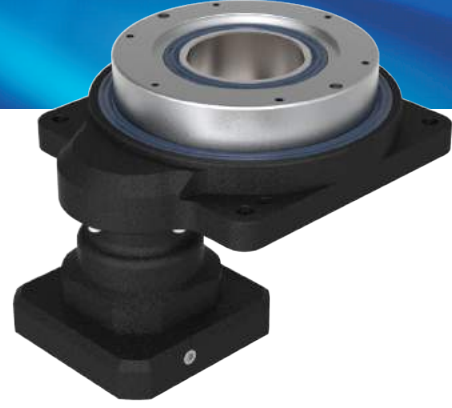
Model Code	200
A1	90 · 100 · 115 · 145
A2	M5 · M6 · M8
A3	70 · 80 · 95 · 110
A4	92 · 110 · 130
A5	19 · 24
A6	44.5 · 57.5
A7	8.5 · 7.5
A8	125.5 · 138.5



Characteristic / Özellikler	Unit / Birim	GT-200B
Output Table Supporting Bearing / Dış Tabla Destek Rulmanı		Ball Bearing / Bilyalı Rulman
Rated Output Torque / Nominal Çıkış Torku	N.m	142
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$ N.m	2 Time of Rated Output Torque / 2 x Nominal Çıkış Torku
Inertia Moment / Atalet Momenti	kg.m <sup>2</sup>	$29,072 \times 10^{-6}$
Output Permissible Speed / Azami Çıkış Devri	rpm	300
Torsional Backlash / Burulma Tepkisi	arcmin	$\leq 1$
Lost Motion / Kayıp Hareket	arcmin	2 (0.033°)
Repetitive Positioning Accuracy / Tekrar Konumlandırma Doğruluğu	arcsec	$\pm 10$ (0.0028°)
Permissible Thrust Load / Azami İtme Yüğü	N	2,500
Permissible Moment Load / Azami Moment Yüğü	N.m	50
Runout of Output Table Surface / Dış Tabla Yüzey Dağılımı	mm	0.02
Runout of Output Table Inner / Outer Diameter / Dış Tabla İç/Dış Çap Dağılımı	mm	0.02
Parallelism of Output Table / Dış Tabla Paralelliği	mm	0.03
Protection Class / Koruma Sınıfı		IP 65
Weight / Ağırlık	Kg	10.09

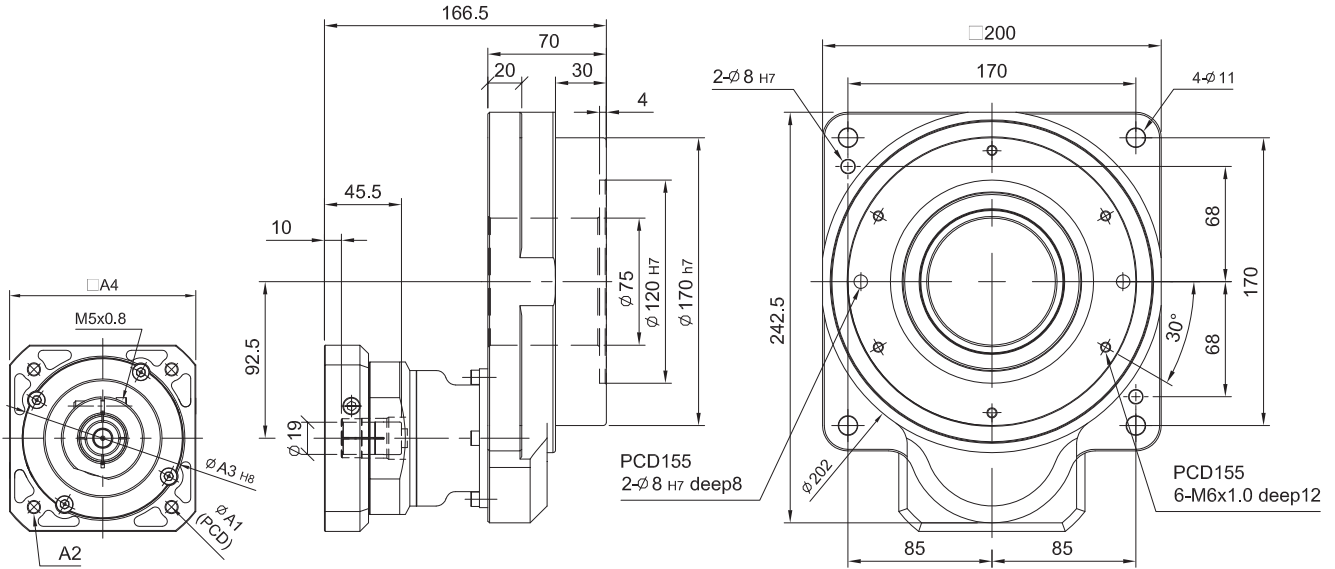
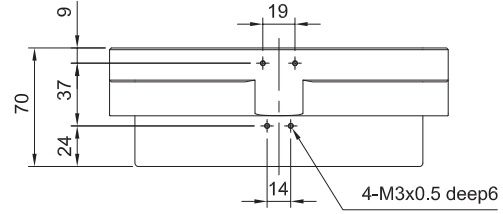
# MODEL : GT-200B

RATIO / ÇEVİRİM : 25.50.100 (2-Stage / Kademe)



Unit / Birim: mm

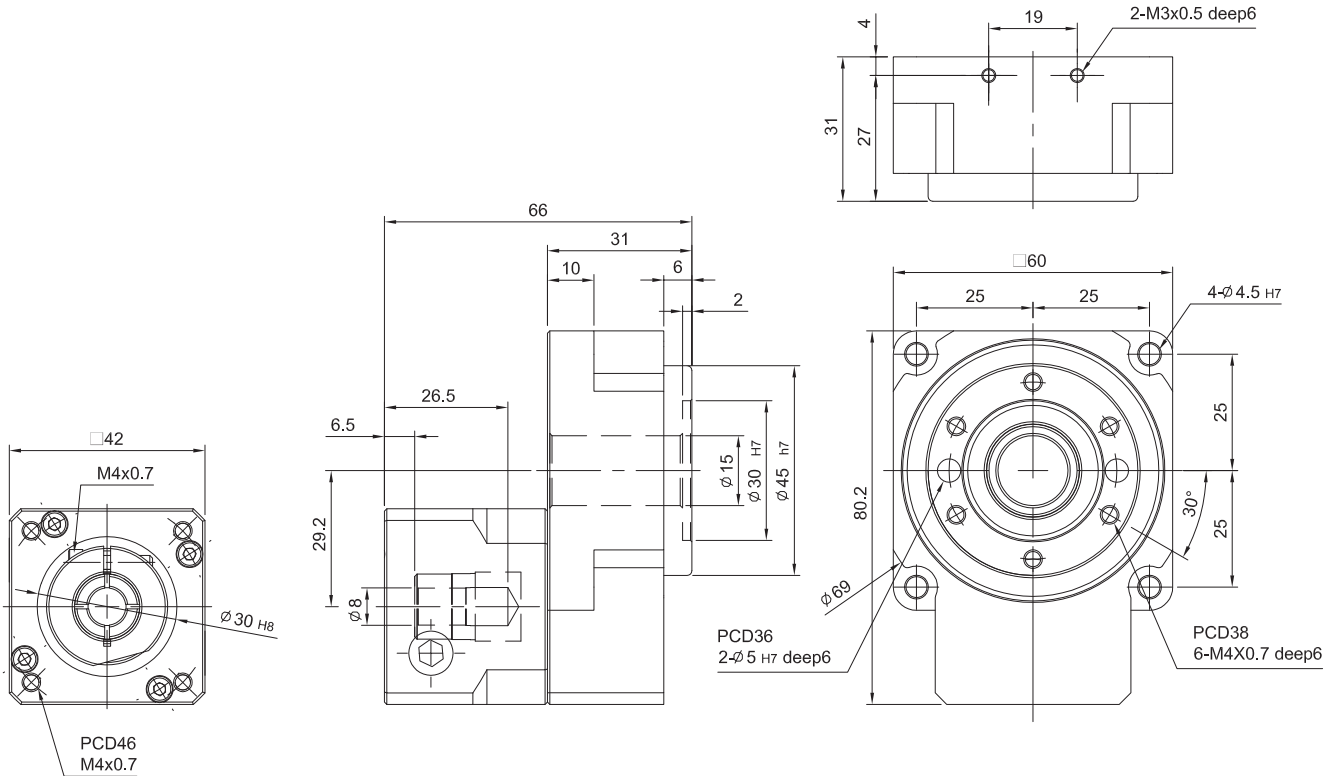
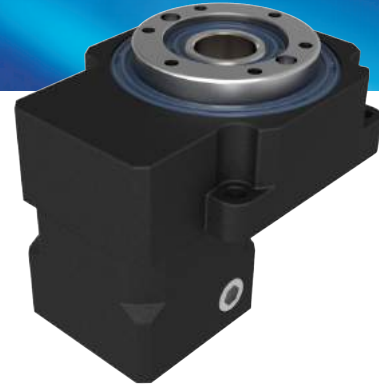
Model Code	200
A1	90 · 100 · 115 · 145
A2	M5 · M6 · M8
A3	70 · 80 · 95 · 110
A4	92 · 110 · 130



Characteristic / Özellikler	Unit / Birim	GT-200B
Output Table Supporting Bearing / Dış Tabla Destek Rulmanı		Ball Bearing / Bilyalı Rulman
Rated Output Torque / Nominal Çıkış Torku	N.m	142
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$ N.m	2 Time of Rated Output Torque / 2 x Nominal Çıkış Torku
Inertia Moment / Atalet Momenti	kg.m <sup>2</sup>	$29,072 \times 10^{-6}$
Output Permissible Speed / Azami Çıkış Devri	rpm	300
Torsional Backlash / Burulma Tepkisi	arcmin	$\leq 3$
Lost Motion / Kayıp Hareket	arcmin	2 (0.033°)
Repetitive Positioning Accuracy / Tekrar Konumlandırma Doğruluğu	arcsec	$\pm 10$ (0.0028°)
Permissible Thrust Load / Azami İtme Yüğü	N	2,500
Permissible Moment Load / Azami Moment Yüğü	N.m	50
Runout of Output Table Surface / Dış Tabla Yüzey Dağılımı	mm	0.02
Runout of Output Table Inner / Outer Diameter / Dış Tabla İç/Dış Çap Dağılımı	mm	0.02
Parallelism of Output Table / Dış Tabla Paralelliği	mm	0.03
Protection Class / Koruma Sınıfı		IP 65
Weight / Ağırlık	Kg	11.8

# MODEL : GT-60C

RATIO / ÇEVİRİM : 5.10.18 (1-Stage / Kademe)



Characteristic / Özellikler	Unit / Birim	GT-60C
Output Table Supporting Bearing / Dış Tabla Destek Rulmanı		Crossed Roller Bearing / Masuralı Rulman
Rated Output Torque / Nominal Çıkış Torku	N.m	5
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$ N.m	2 Time of Rated Output Torque / 2 x Nominal Çıkış Torku
Inertia Moment / Atalet Momenti	kg.m <sup>2</sup>	$735 \times 10^{-7}$
Output Permissible Speed / Azami Çıkış Devri	rpm	200
Torsional Backlash / Burulma Tepkisi	arcmin	$\leq 1$
Lost Motion / Kayıp Hareket	arcmin	2 (0.033°)
Repetitive Positioning Accuracy / Tekrar Konumlandırma Doğruluğu	arcsec	$\pm 10$ (0.0028°)
Permissible Thrust Load / Azami İtme Yüğü	N	500
Permissible Moment Load / Azami Moment Yüğü	N.m	10
Runout of Output Table Surface / Dış Tabla Yüzey Dağılımı	mm	0.01
Runout of Output Table Inner / Outer Diameter / Dış Tabla İç/Dış Çap Dağılımı	mm	0.01
Parallelism of Output Table / Dış Tabla Paralellliği	mm	0.02
Protection Class / Koruma Sınıfı		IP 65
Weight / Ağırlık	Kg	0.62

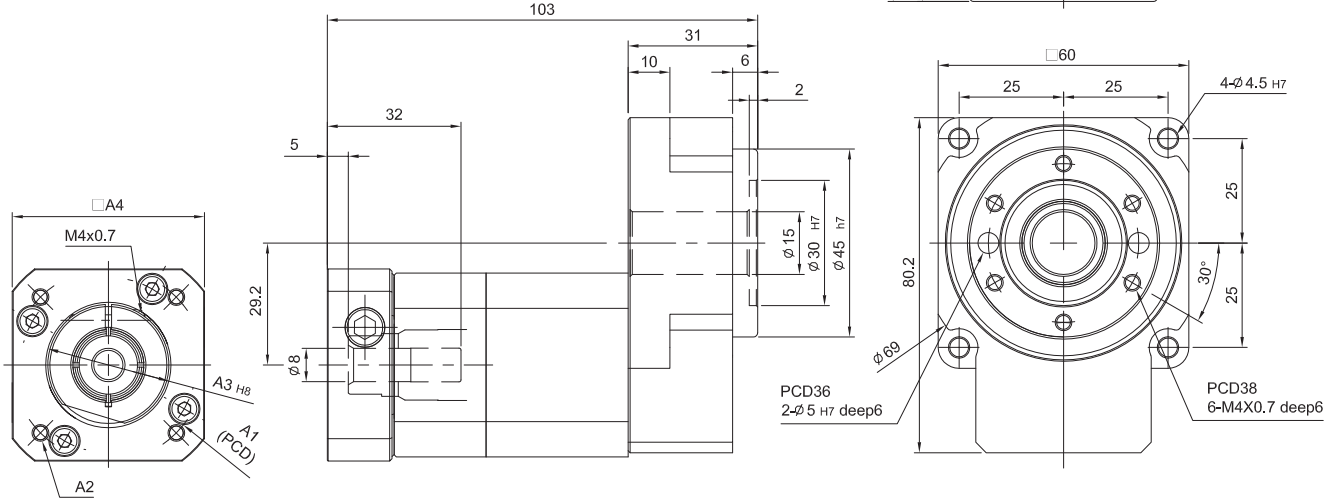
# MODEL : GT-60C

RATIO / ÇEVİRİM : 25.50.100 (2-Stage / Kademe)



Unit / Birim: mm

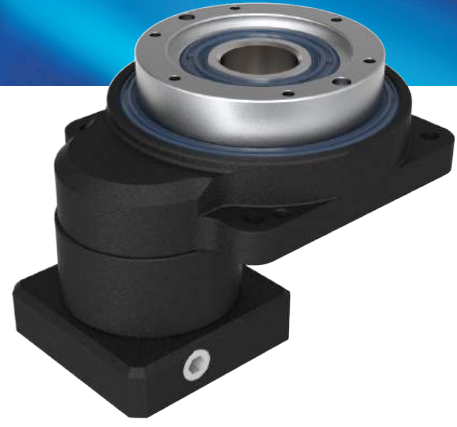
Model Code	60
A1	46 · 63 · 60
A2	M3 · M4 · M5
A3	30 · 40 · 50
A4	46 · 55



Characteristic / Özellikler	Unit / Birim	GT-60C
Output Table Supporting Bearing / Dış Tabla Destek Rulmanı		Crossed Roller Bearing / Masuralı Rulman
Rated Output Torque / Nominal Çıkış Torku	N.m	5
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$ N.m	2 Time of Rated Output Torque / 2 x Nominal Çıkış Torku
Inertia Moment / Atalet Momenti	kg.m <sup>2</sup>	$735 \times 10^{-7}$
Output Permissible Speed / Azami Çıkış Devri	rpm	200
Torsional Backlash / Burulma Tepkisi	arcmin	$\leq 3$
Lost Motion / Kayıp Hareket	arcmin	2 (0.033°)
Repetitive Positioning Accuracy / Tekrar Konumlandırma Doğruluğu	arcsec	$\pm 10$ (0.0028°)
Permissible Thrust Load / Azami İtme Yüğü	N	500
Permissible Moment Load / Azami Moment Yüğü	N.m	10
Runout of Output Table Surface / Dış Tabla Yüzey Dağılımı	mm	0.01
Runout of Output Table Inner / Outer Diameter / Dış Tabla İç/Dış Çap Dağılımı	mm	0.01
Parallelism of Output Table / Dış Tabla Paralelliği	mm	0.02
Protection Class / Koruma Sınıfı		IP 65
Weight / Ağırlık	Kg	1.1

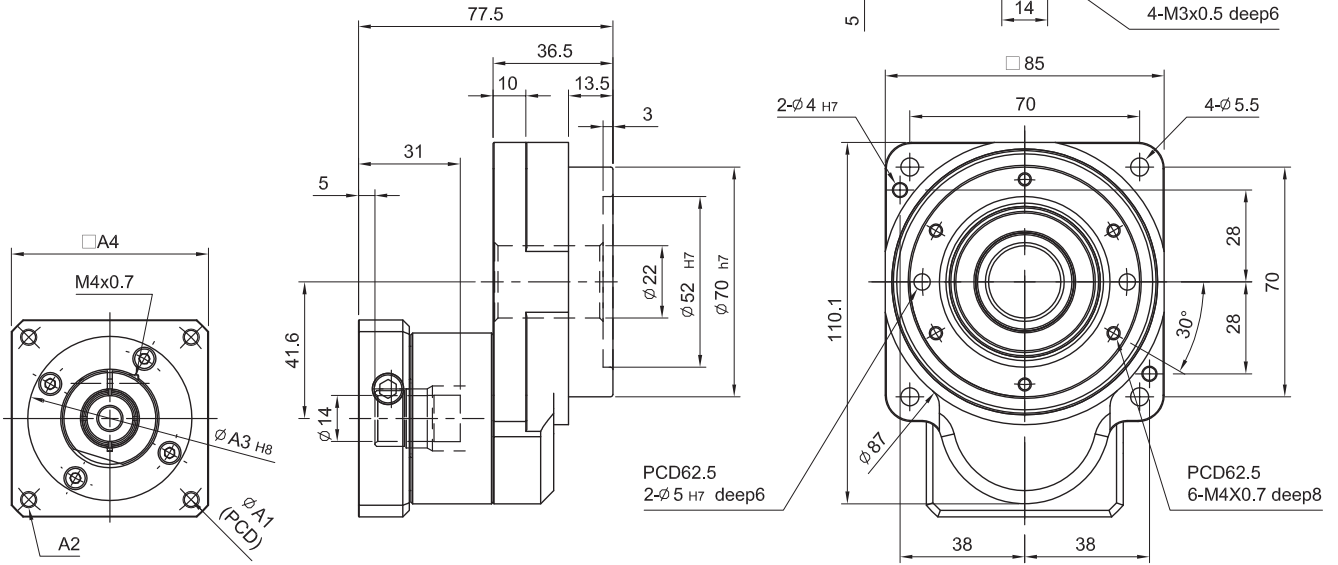
# MODEL : GT-85C

RATIO / ÇEVİRİM : 5.10.18 (1-Stage / Kademe)



Unit / Birim: mm

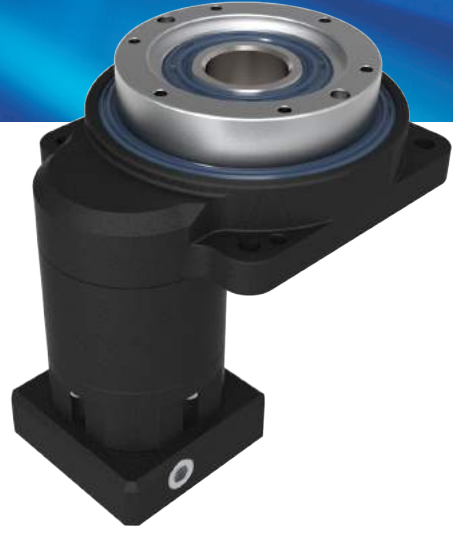
Model Code	85
A1	46 · 63 · 60
A2	M3 · M4 · M5
A3	30 · 40 · 50
A4	46 · 55



Characteristic / Özellikler	Unit / Birim	GT-85C
Output Table Supporting Bearing / Dış Tabla Destek Rulmanı		Crossed Roller Bearing / Masuralı Rulman
Rated Output Torque / Nominal Çıkış Torku	N.m	18
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$ N.m	2 Time of Rated Output Torque / 2 x Nominal Çıkış Torku
Inertia Moment / Atalet Momenti	kg.m <sup>2</sup>	$1,203 \times 10^{-6}$
Output Permissible Speed / Azami Çıkış Devri	rpm	200
Torsional Backlash / Burulma Tepkisi	arcmin	$\leq 1$
Lost Motion / Kayıp Hareket	arcmin	2 (0.033°)
Repetitive Positioning Accuracy / Tekrar Konumlandırma Doğruluğu	arcsec	$\pm 10$ (0.0028°)
Permissible Thrust Load / Azami İtme Yüğü	N	900
Permissible Moment Load / Azami Moment Yüğü	N.m	18
Runout of Output Table Surface / Dış Tabla Yüzey Dağılımı	mm	0.01
Runout of Output Table Inner / Outer Diameter / Dış Tabla İç/Dış Çap Dağılımı	mm	0.01
Parallelism of Output Table / Dış Tabla Paralelliği	mm	0.02
Protection Class / Koruma Sınıfı		IP 65
Weight / Ağırlık	Kg	1.1

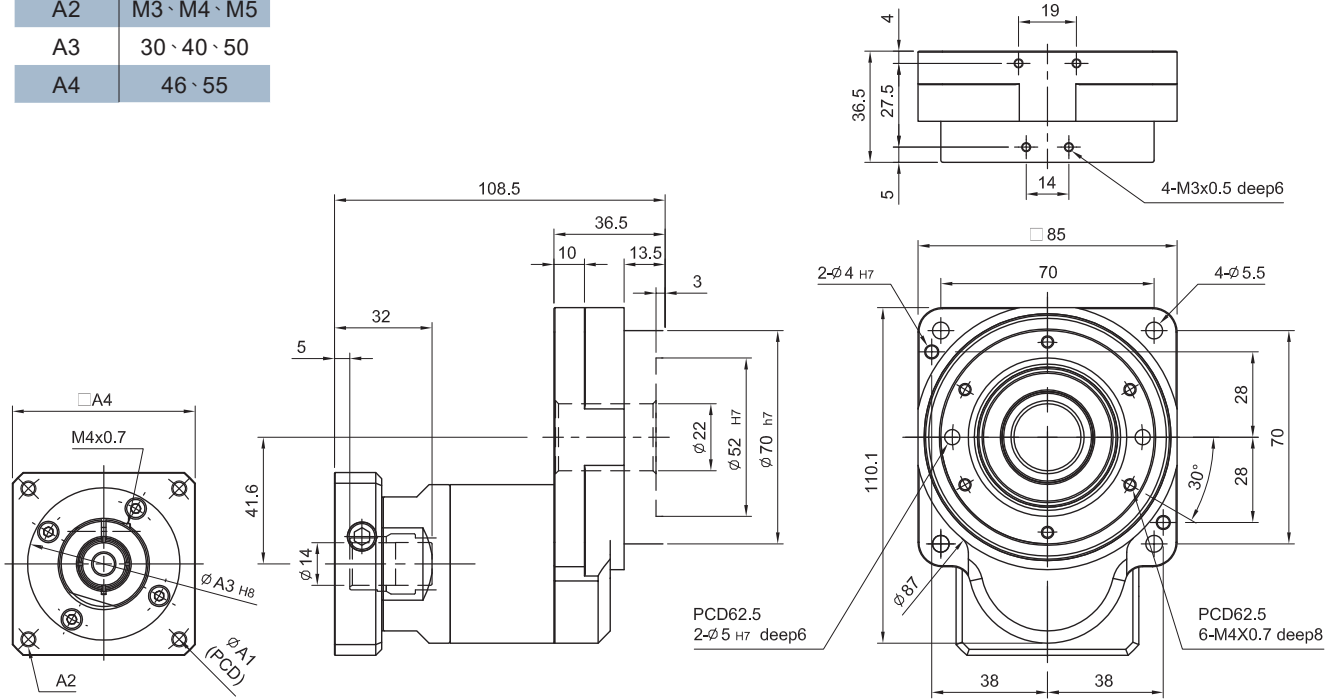
# MODEL : GT-85C

RATIO / ÇEVİRİM : 25.50.100 (2-Stage / Kademe)



Unit / Birim: mm

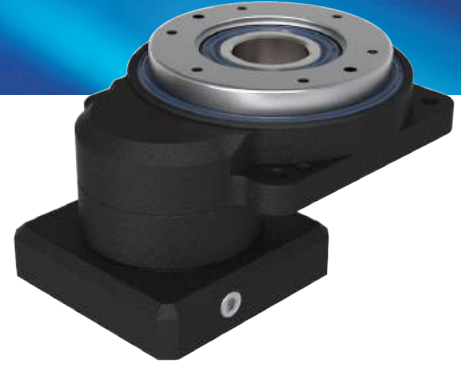
Model Code	85
A1	46 · 63 · 60
A2	M3 · M4 · M5
A3	30 · 40 · 50
A4	46 · 55



Characteristic / Özellikler	Unit / Birim	GT-85C
Output Table Supporting Bearing / Diş Tabla Destek Rulmanı		Crossed Roller Bearing / Masuralı Rulman
Rated Output Torque / Nominal Çıkış Torku	N.m	18
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$ N.m	2 倍額定輸出扭矩 2 Time of Rated Output Torque
Inertia Moment / Atalet Momenti	kg.m <sup>2</sup>	$1,203 \times 10^{-6}$
Output Permissible Speed / Azami Çıkış Devri	rpm	200
Torsional Backlash / Burulma Tepkisi	arcmin	$\leq 3$
Lost Motion / Kayıp Hareket	arcmin	2 (0.033°)
Repetitive Positioning Accuracy / Tekrar Konumlandırma Doğruluğu	arcsec	$\pm 10$ (0.0028°)
Permissible Thrust Load / Azami İtme Yüğü	N	900
Permissible Moment Load / Azami Moment Yüğü	N.m	18
Runout of Output Table Surface / Diş Tabla Yüzey Dağılımı	mm	0.01
Runout of Output Table Inner / Outer Diameter / Diş Tabla İç/Diş Çap Dağılımı	mm	0.01
Parallelism of Output Table / Diş Tabla Paralelliği	mm	0.02
Protection Class / Koruma Sınıfı		IP 65
Weight / Ağırlık	Kg	1.78

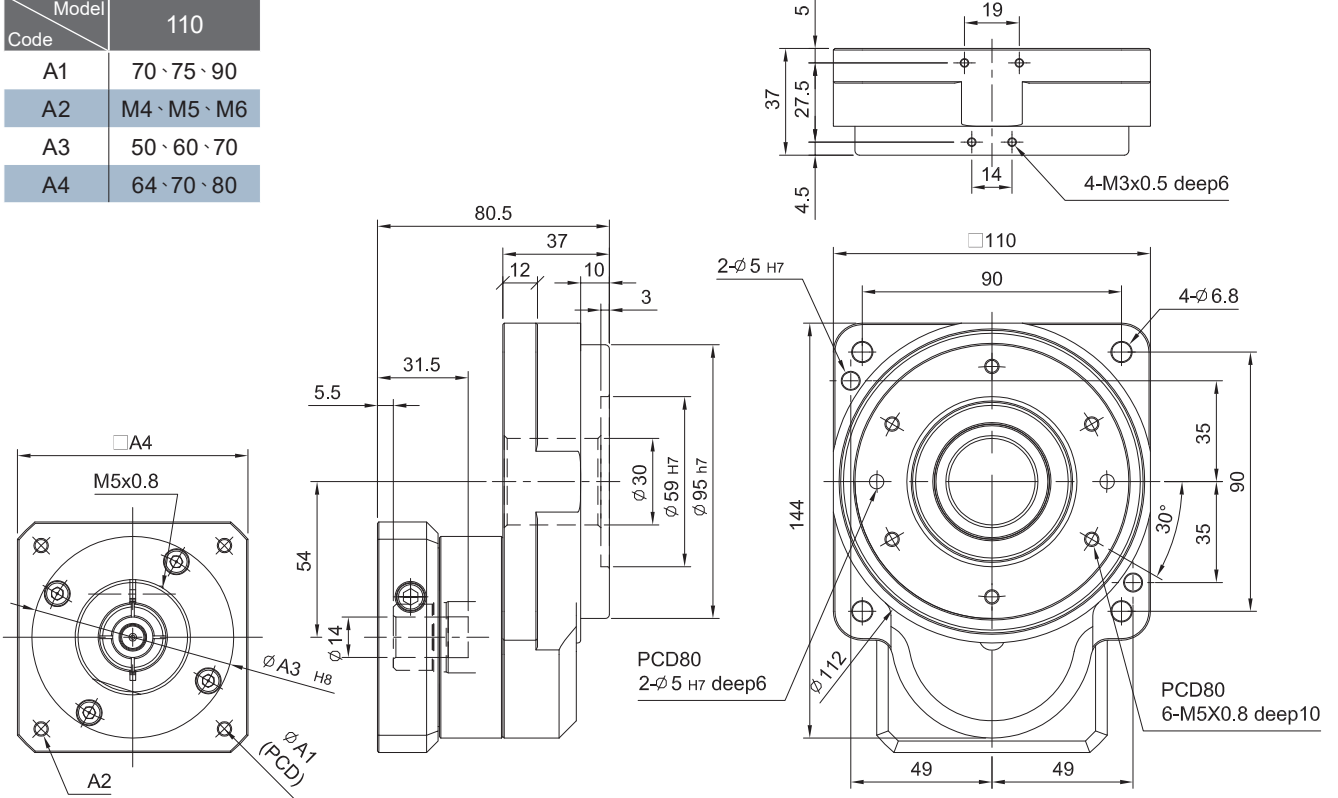
# MODEL : GT-110C

RATIO / ÇEVİRİM : 5.10.18 (1-Stage / Kademe)



Unit / Birim: mm

Model Code	110
A1	70 · 75 · 90
A2	M4 · M5 · M6
A3	50 · 60 · 70
A4	64 · 70 · 80



Characteristic / Özellikler	Unit / Birim	GT-110C
Output Table Supporting Bearing / Dış Tabla Destek Rulmanı		Crossed Roller Bearing / Masuralı Rulman
Rated Output Torque / Nominal Çıkış Torku	N.m	33
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$ N.m	2 Time of Rated Output Torque / 2 x Nominal Çıkış Torku
Inertia Moment / Atalet Momenti	kg.m <sup>2</sup>	$1,483 \times 10^{-6}$
Output Permissible Speed / Azami Çıkış Devri	rpm	200
Torsional Backlash / Burulma Tepkisi	arcmin	$\leq 1$
Lost Motion / Kayıp Hareket	arcmin	2 (0.033°)
Repetitive Positioning Accuracy / Tekrar Konumlandırma Doğruluğu	arcsec	$\pm 10$ (0.0028°)
Permissible Thrust Load / Azami İtme Yüğü	N	1,200
Permissible Moment Load / Azami Moment Yüğü	N.m	24
Runout of Output Table Surface / Dış Tabla Yüzey Dağılımı	mm	0.015
Runout of Output Table Inner / Outer Diameter / Dış Tabla İç/Dış Çap Dağılımı	mm	0.015
Parallelism of Output Table / Dış Tabla Paralellığı	mm	0.025
Protection Class / Koruma Sınıfı		IP 65
Weight / Ağırlık	Kg	2.04

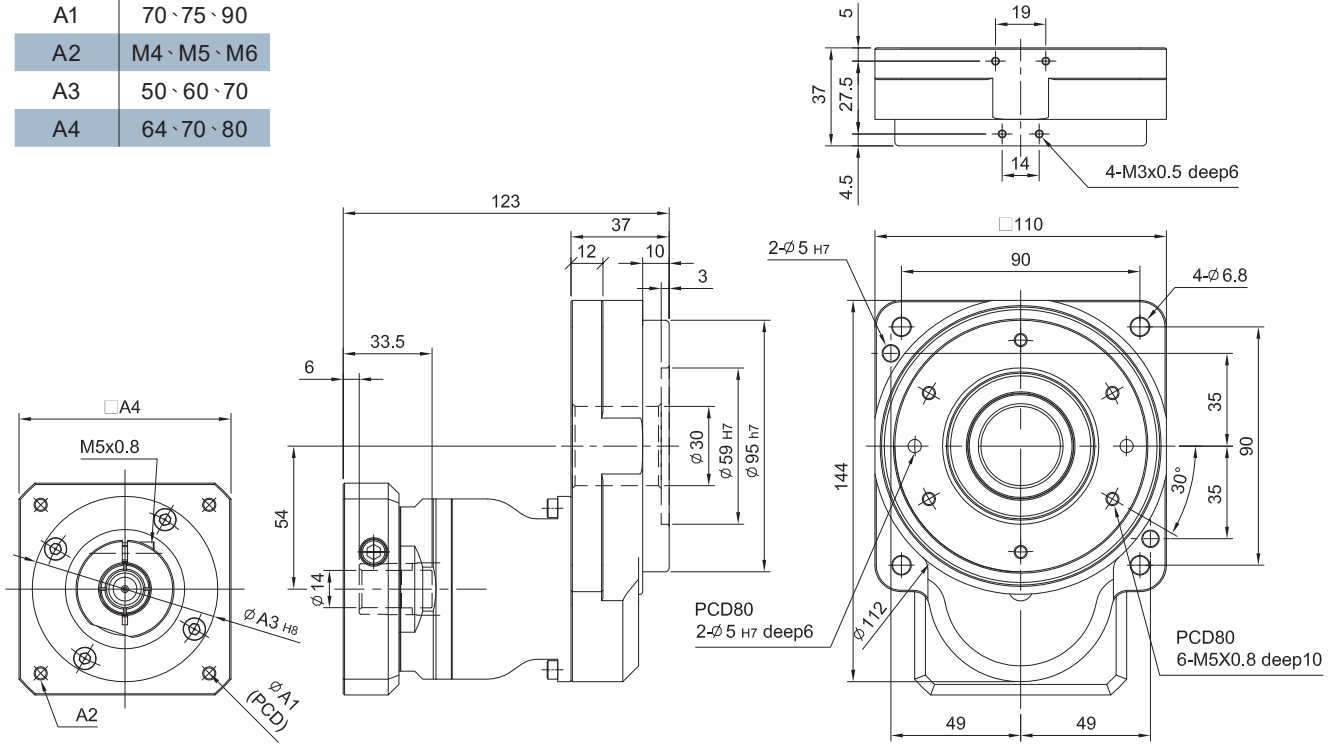
# MODEL : GT-110C

RATIO / ÇEVİRİM : 25.50.100 (2-Stage / Kademe)



Unit / Birim: mm

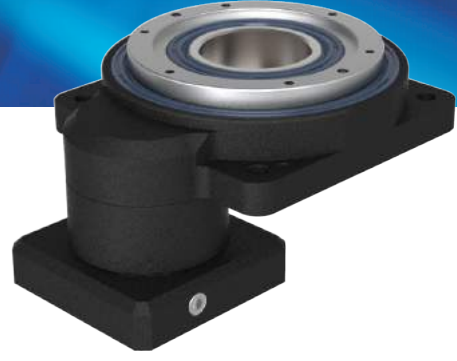
Model Code	110
A1	70 · 75 · 90
A2	M4 · M5 · M6
A3	50 · 60 · 70
A4	64 · 70 · 80



Characteristic / Özellikler	Unit / Birim	GT-110C
Output Table Supporting Bearing / Dış Tabla Destek Rulmanı		Crossed Roller Bearing / Masuralı Rulman
Rated Output Torque / Nominal Çıkış Torku	N.m	33
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$ N.m	2 Time of Rated Output Torque / 2 x Nominal Çıkış Torku
Inertia Moment / Atalet Momenti	kg.m <sup>2</sup>	$1,483 \times 10^{-6}$
Output Permissible Speed / Azami Çıkış Devri	rpm	200
Torsional Backlash / Burulma Tepkisi	arcmin	$\leq 3$
Lost Motion / Kayıp Hareket	arcmin	2 (0.033°)
Repetitive Positioning Accuracy / Tekrar Konumlandırma Doğruluğu	arcsec	$\pm 10$ (0.0028°)
Permissible Thrust Load / Azami İtme Yüğü	N	1,200
Permissible Moment Load / Azami Moment Yüğü	N.m	24
Runout of Output Table Surface / Dış Tabla Yüzey Dağılımı	mm	0.015
Runout of Output Table Inner / Outer Diameter / Dış Tabla İç/Dış Çap Dağılımı	mm	0.015
Parallelism of Output Table / Dış Tabla Paralelliği	mm	0.025
Protection Class / Koruma Sınıfı		IP 65
Weight / Ağırlık	Kg	3.51

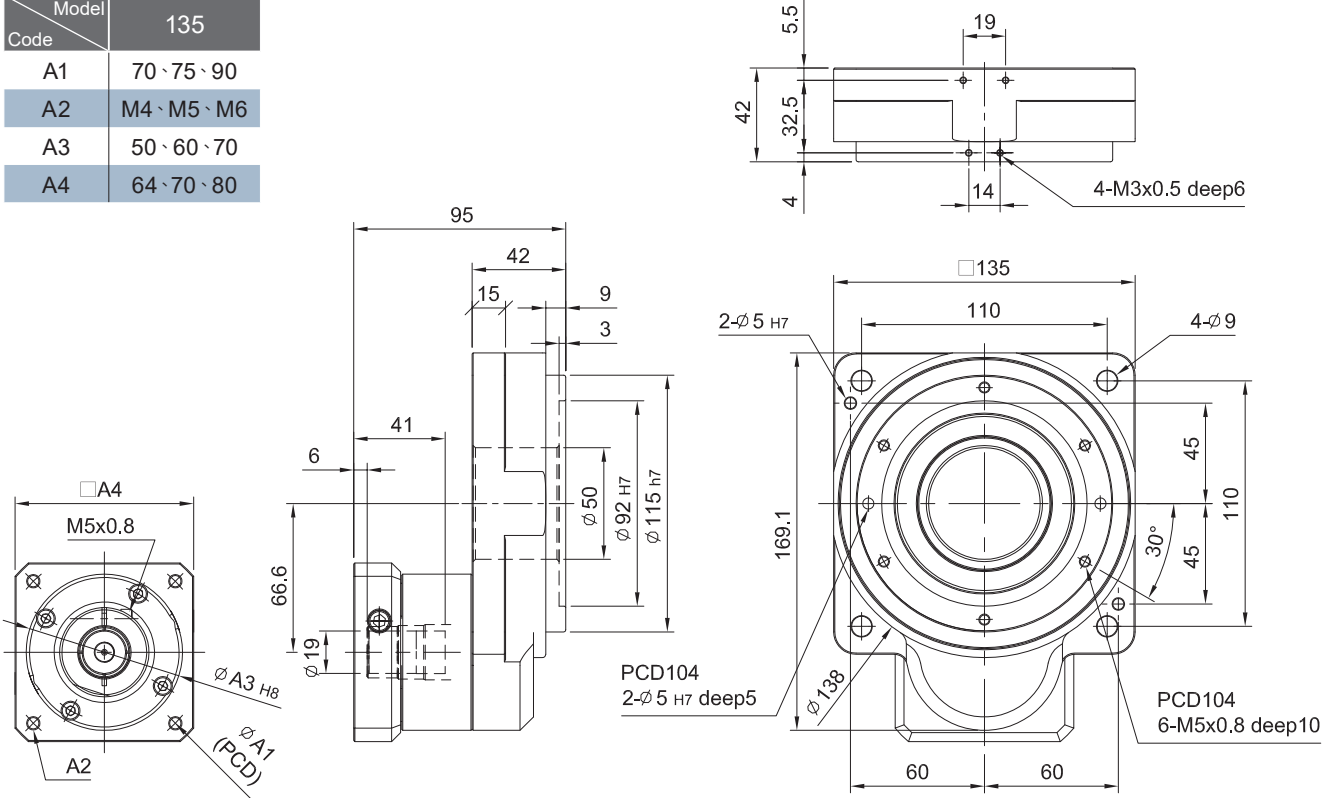
# MODEL : GT-135C

RATIO / ÇEVİRİM : 5.10.18 (1-Stage / Kademe)



Unit / Birim: mm

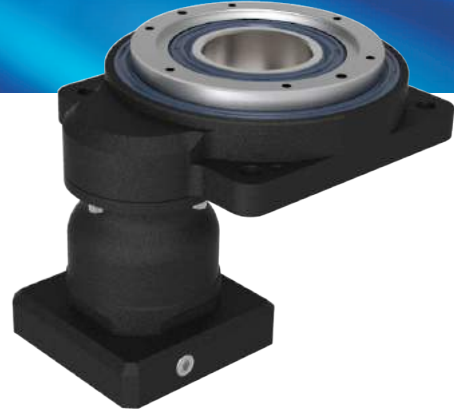
Model Code	135
A1	70 · 75 · 90
A2	M4 · M5 · M6
A3	50 · 60 · 70
A4	64 · 70 · 80



Characteristic / Özellikler	Unit / Birim	GT-135C
Output Table Supporting Bearing / Dış Tabla Destek Rulmanı		Crossed Roller Bearing / Masuralı Rulman
Rated Output Torque / Nominal Çıkış Torku	N.m	43
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$ N.m	2 Time of Rated Output Torque / 2 x Nominal Çıkış Torku
Inertia Moment / Atalet Momenti	kg.m <sup>2</sup>	$2,772 \times 10^{-6}$
Output Permissible Speed / Azami Çıkış Devri	rpm	200
Torsional Backlash / Burulma Tepkisi	arcmin	$\leq 1$
Lost Motion / Kayıp Hareket	arcmin	2 (0.033°)
Repetitive Positioning Accuracy / Tekrar Konumlandırma Doğruluğu	arcsec	$\pm 10$ (0.0028°)
Permissible Thrust Load / Azami İtme Yüğü	N	2,200
Permissible Moment Load / Azami Moment Yüğü	N.m	45
Runout of Output Table Surface / Dış Tabla Yüzey Dağılımı	mm	0.015
Runout of Output Table Inner / Outer Diameter / Dış Tabla İç/Dış Çap Dağılımı	mm	0.015
Parallelism of Output Table / Dış Tabla Paralellliği	mm	0.025
Protection Class / Koruma Sınıfı		IP 65
Weight / Ağırlık	Kg	3.13

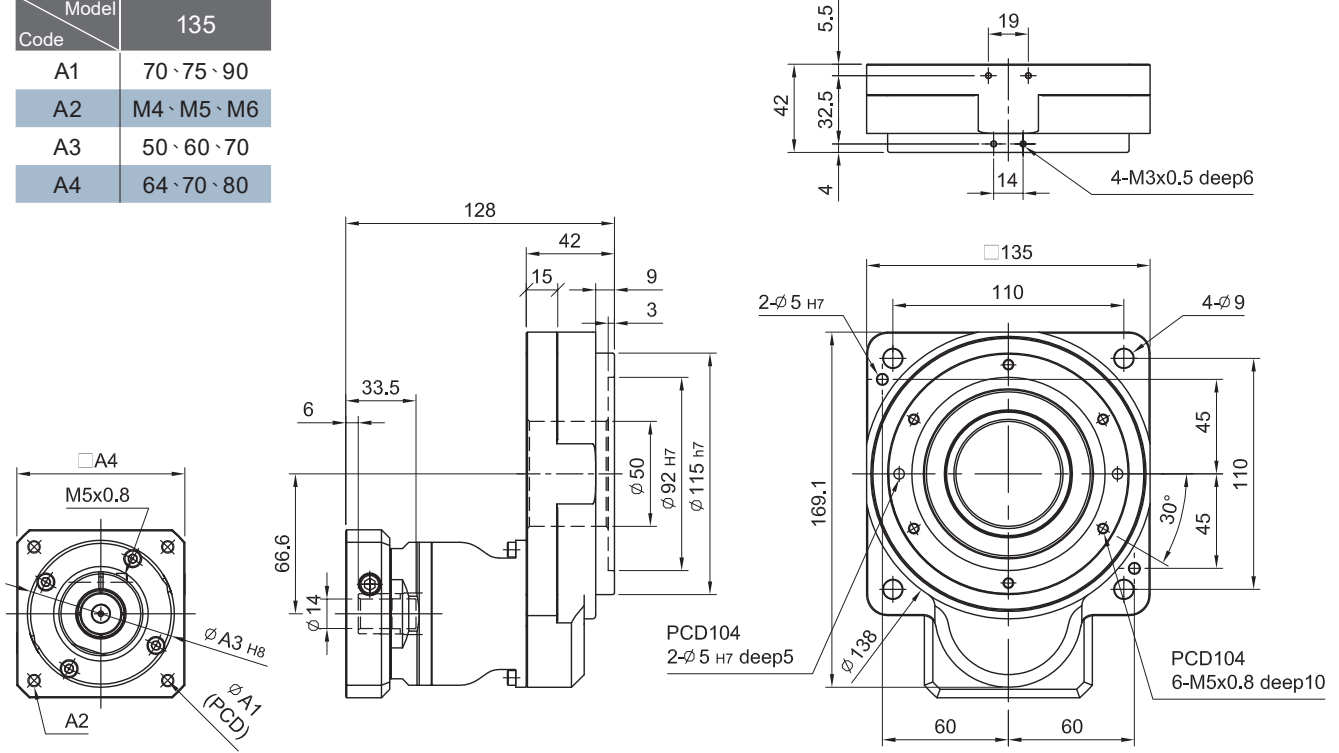
# MODEL : GT-135C

RATIO / ÇEVİRİM : 25.50.100 (2-Stage / Kademe)



Unit / Birim: mm

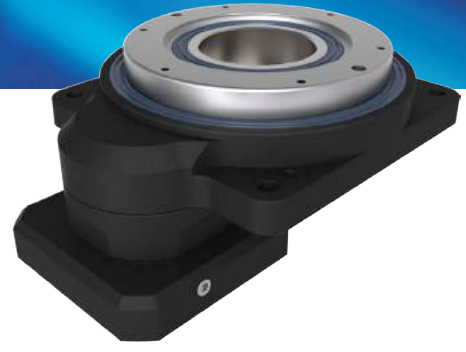
Model Code	135
A1	70 · 75 · 90
A2	M4 · M5 · M6
A3	50 · 60 · 70
A4	64 · 70 · 80



Characteristic / Özellikler	Unit / Birim	GT-135C
Output Table Supporting Bearing / Dış Tabla Destek Rulmanı		Crossed Roller Bearing / Masuralı Rulman
Rated Output Torque / Nominal Çıkış Torku	N.m	43
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$ N.m	2 Time of Rated Output Torque / 2 x Nominal Çıkış Torku
Inertia Moment / Atalet Momenti	kg.m <sup>2</sup>	$2,772 \times 10^{-6}$
Output Permissible Speed / Azami Çıkış Devri	rpm	200
Torsional Backlash / Burulma Tepkisi	arcmin	$\leq 3$
Lost Motion / Kayıp Hareket	arcmin	2 (0.033°)
Repetitive Positioning Accuracy / Tekrar Konumlandırma Doğruluğu	arcsec	$\pm 10$ (0.0028°)
Permissible Thrust Load / Azami İtme Yüğü	N	2,200
Permissible Moment Load / Azami Moment Yüğü	N.m	45
Runout of Output Table Surface / Dış Tabla Yüzye Dağılımı	mm	0.015
Runout of Output Table Inner / Outer Diameter / Dış Tabla İç/Dış Çap Dağılımı	mm	0.015
Parallelism of Output Table / Dış Tabla Paralelliği	mm	0.025
Protection Class / Koruma Sınıfı		IP 65
Weight / Ağırlık	Kg	4.21

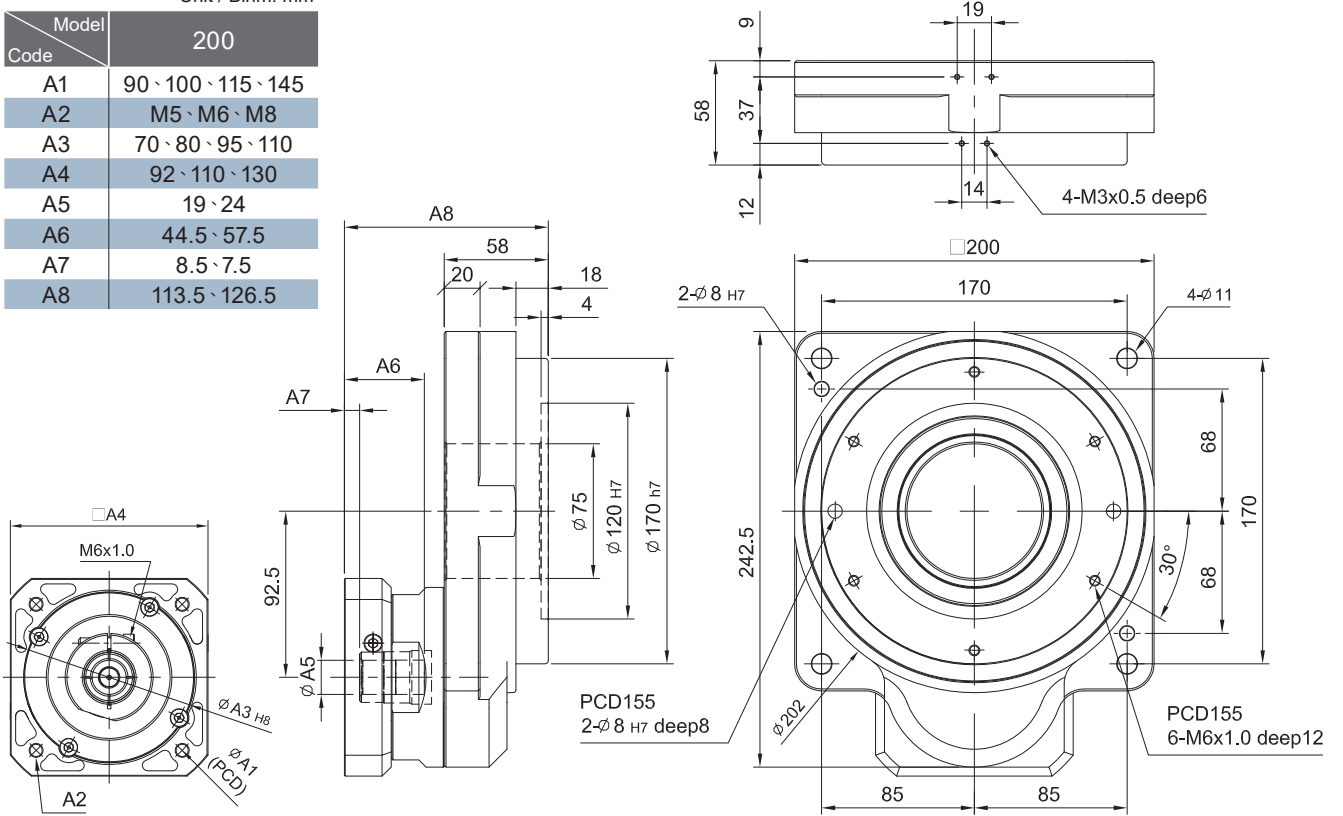
# MODEL : GT-200C

RATIO / ÇEVİRİM : 5.10.18 (1-Stage / Kademe)



Unit / Birim: mm

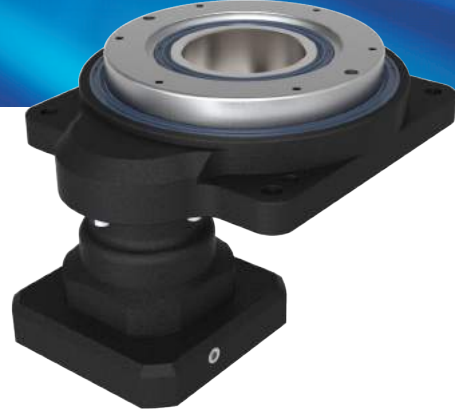
Model Code	200
A1	90 · 100 · 115 · 145
A2	M5 · M6 · M8
A3	70 · 80 · 95 · 110
A4	92 · 110 · 130
A5	19 · 24
A6	44.5 · 57.5
A7	8.5 · 7.5
A8	113.5 · 126.5



Characteristic / Özellikler	Unit / Birim	GT-200C
Output Table Supporting Bearing / Dış Tabla Destek Rulmanı		Crossed Roller Bearing / Masuralı Rulman
Rated Output Torque / Nominal Çıkış Torku	N.m	142
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$ N.m	2 Time of Rated Output Torque / 2 x Nominal Çıkış Torku
Inertia Moment / Atalet Momenti	kg.m <sup>2</sup>	$27,619 \times 10^{-6}$
Output Permissible Speed / Azami Çıkış Devri	rpm	200
Torsional Backlash / Burulma Tepkisi	arcmin	$\leq 1$
Lost Motion / Kayıp Hareket	arcmin	2 (0.033°)
Repetitive Positioning Accuracy / Tekrar Konumlandırma Doğruluğu	arcsec	$\pm 10$ (0.0028°)
Permissible Thrust Load / Azami İtme Yüğü	N	4,000
Permissible Moment Load / Azami Moment Yüğü	N.m	80
Runout of Output Table Surface / Dış Tabla Yüzey Dağılımı	mm	0.02
Runout of Output Table Inner / Outer Diameter / Dış Tabla İç/Dış Çap Dağılımı	mm	0.02
Parallelism of Output Table / Dış Tabla Paralelliği	mm	0.03
Protection Class / Koruma Sınıfı		IP 65
Weight / Ağırlık	Kg	8.66

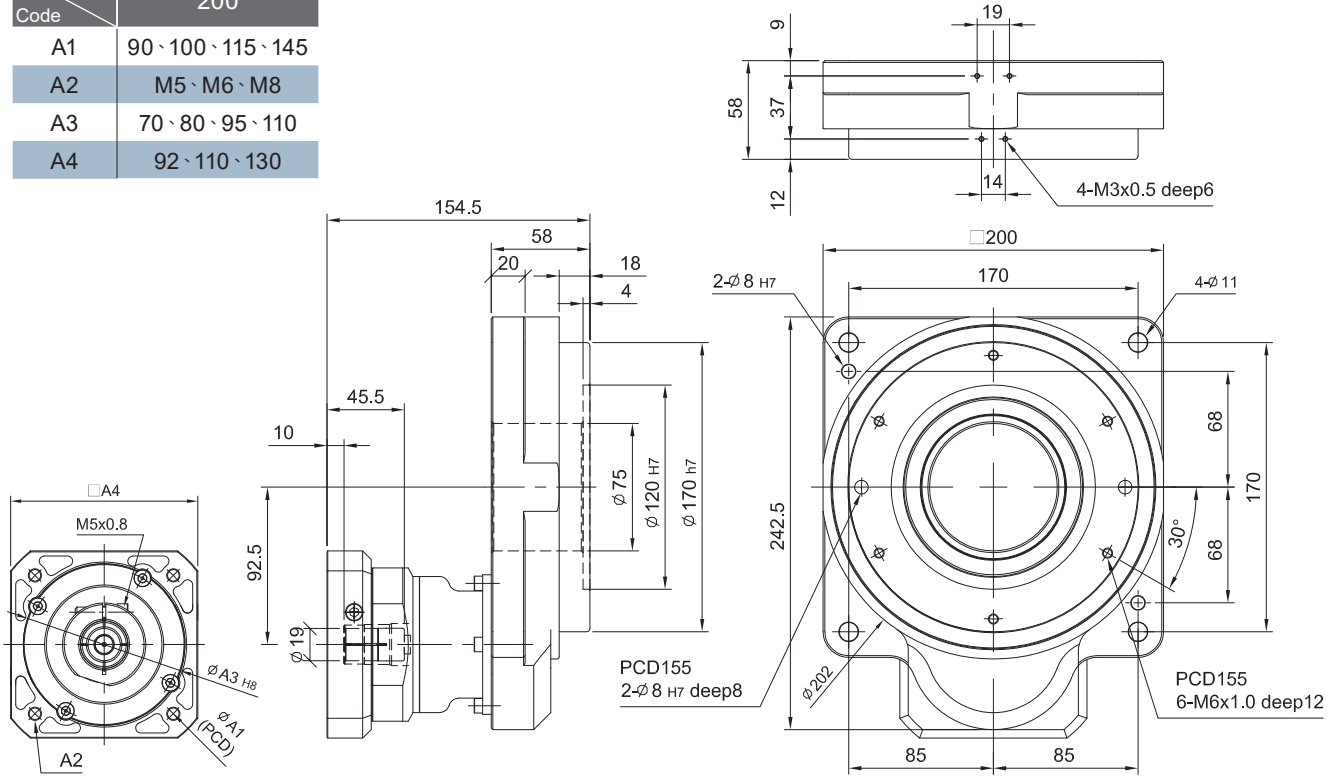
# MODEL : GT-200C

RATIO / ÇEVİRİM : 25.50.100 (2-Stage / Kademe)



Unit / Birim: mm

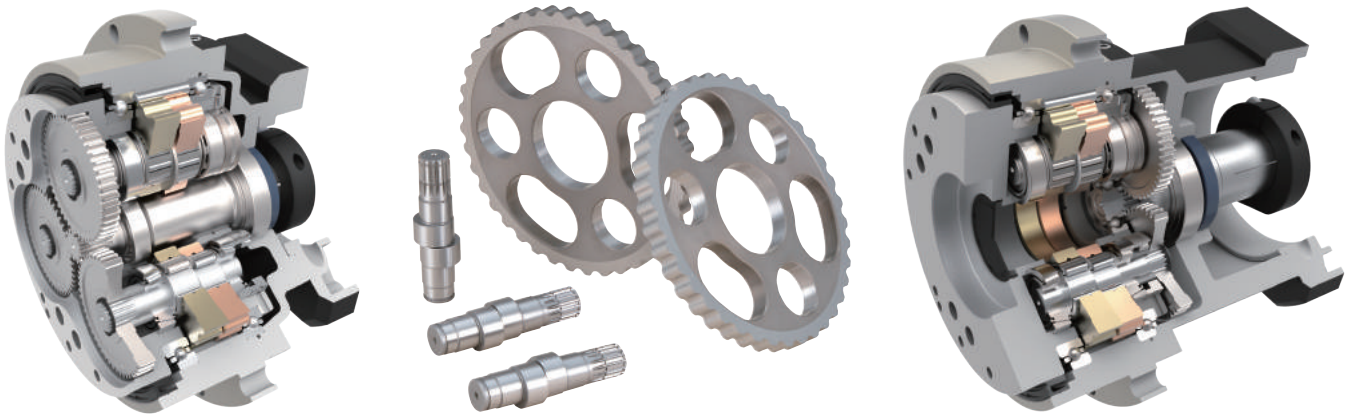
Model Code	200
A1	90 · 100 · 115 · 145
A2	M5 · M6 · M8
A3	70 · 80 · 95 · 110
A4	92 · 110 · 130



Characteristic / Özellikler	Unit / Birim	GT-200C
Output Table Supporting Bearing / Dış Tabla Destek Rulmanı		Crossed Roller Bearing / Masuralı Rulman
Rated Output Torque / Nominal Çıkış Torku	N.m	142
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$ N.m	2 Time of Rated Output Torque / 2 x Nominal Çıkış Torku
Inertia Moment / Atalet Momenti	kg.m <sup>2</sup>	$27,619 \times 10^{-6}$
Output Permissible Speed / Azami Çıkış Devri	rpm	200
Torsional Backlash / Burulma Tepkisi	arcmin	$\leq 3$
Lost Motion / Kayıp Hareket	arcmin	2 (0.033°)
Repetitive Positioning Accuracy / Tekrar Konumlandırma Doğruluğu	arcsec	$\pm 10$ (0.0028°)
Permissible Thrust Load / Azami İtme Yüğü	N	4,000
Permissible Moment Load / Azami Moment Yüğü	N.m	80
Runout of Output Table Surface / Dış Tabla Yüzey Dağılımı	mm	0.02
Runout of Output Table Inner / Outer Diameter / Dış Tabla İç/Dış Çap Dağılımı	mm	0.02
Parallelism of Output Table / Dış Tabla Paralelliği	mm	0.03
Protection Class / Koruma Sınıfı		IP 65
Weight / Ağırlık	Kg	10.3

# CYKODRIVE series / serileri

## Indication of Model Numbers / Model Seçimi



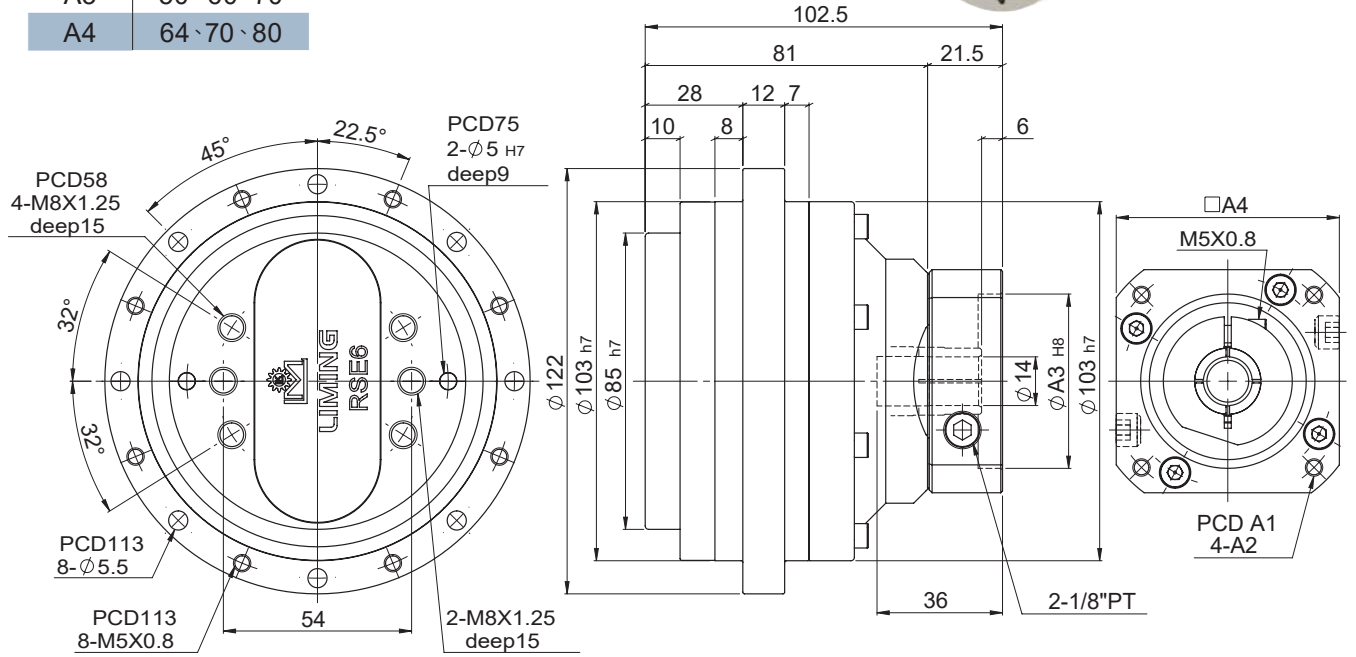
		Input Type / Giriş			
		E	M	S	L
Output Type / Çıkış	RS				
		RSE	RSM	RSS	RSL
	RD				
	RDE	RDM	RDS	RDL	
RC					
	RCE	RCM	RCS	RCL	

# MODEL : RSM6

RATIO / ÇEVİRİM : 41.81.121



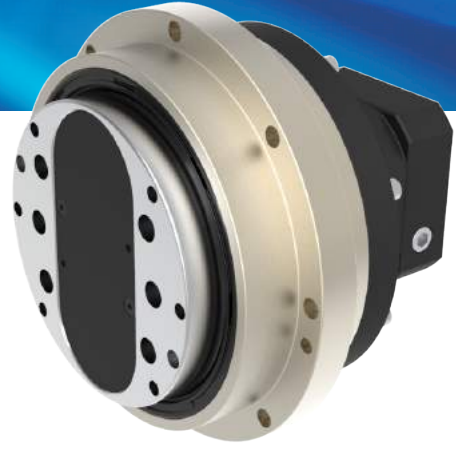
Unit / Birim: mm	
Model Code	RSM6
A1	70 · 75 · 90
A2	M4 · M5 · M6
A3	50 · 60 · 70
A4	64 · 70 · 80



Characteristic / Özellikler		Unit / Birim	RSM6
Output Table Supporting Bearing / Çıkış Tabla Destek Rulmanı			Angular Contact Ball Bearing / Konik Rulman
Rated Output Torque / Nominal Çıkış Torku		Nm	60
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	5 Times of Rated Output Torque / 5 x Nominal Çıkış Torku
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	2 Times of Rated Output Torque / 2 x Nominal Çıkış Torku
Inertia Moment / Atalet Momenti		kg.m <sup>2</sup>	1.15 x 10 <sup>-4</sup>
Rated Output Speed / Nominal Çıkış Devri		rpm	15
Max. Output Speed / Max. Çıkış Devri		rpm	55
Permissible Input Speed / Max. Giriş Devri		rpm	3,000
Backlash Ps / Min. Boşluk Oranı	$J_t$	arcmin	2
Backlash P0 / Azaltılmış Boşluk Oranı	$J_t$	arcmin	4
Backlash P1 / Standart Boşluk Oranı	$J_t$	arcmin	6
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	2,100
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	1,500
Rated Life / Hizmet Ömrü	$L_H$	hr	S5 Cycle Operation: >6,000 (S1 Continuous Operation: >3,000 hrs) S5 Döngüsel Çalışma: >6,000 (S1 Sürekli Çalışma: >3,000 hrs)
Torsional Rigidity / Burulma Direnci		Nm/arcmin	50
Efficiency / Verim	$\eta$	%	≥ 85
Synthetic Grease / Sentetik Gres		g	100
Weight / Ağırlık		Kg	3.5

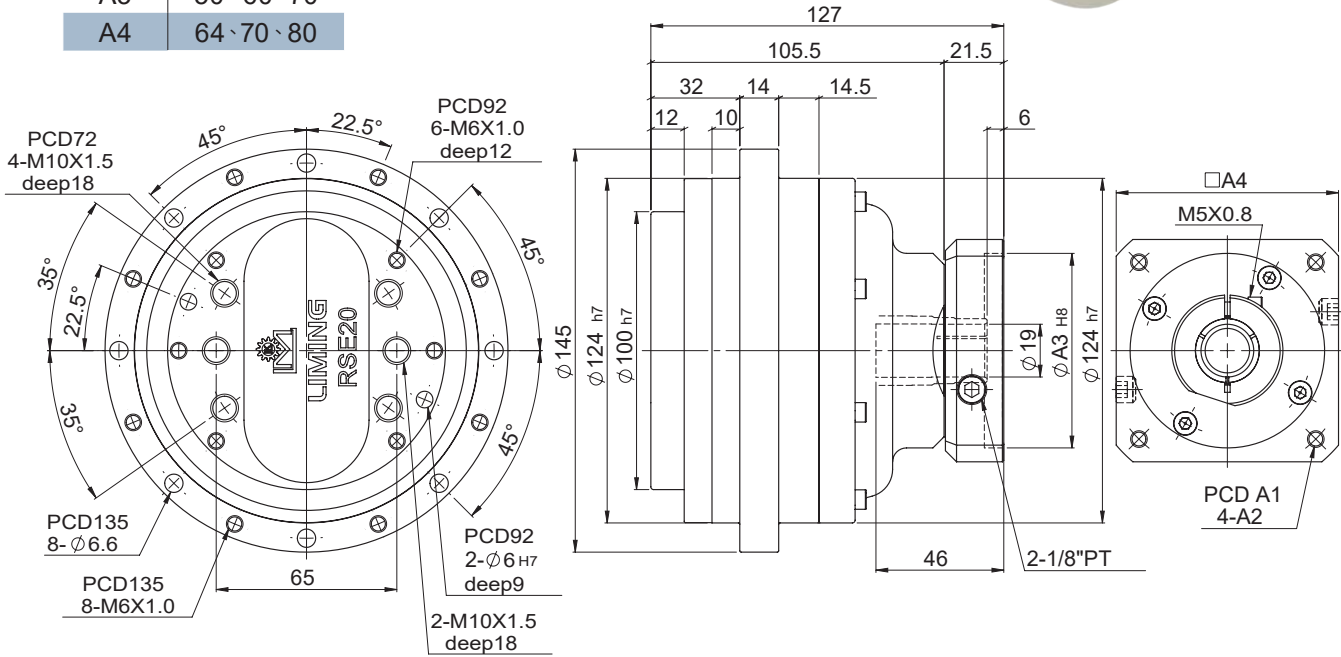
# MODEL : RSM20

RATIO / ÇEVİRİM : 41.81.121.161



Unit / Birim: mm

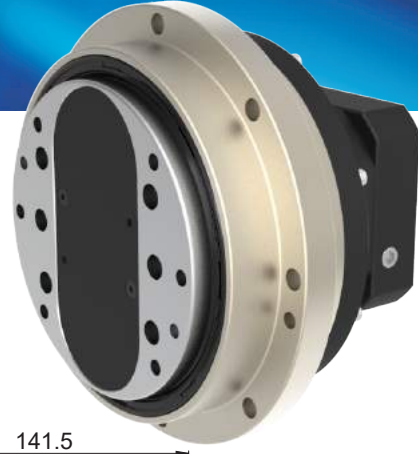
Model Code	RSM20
A1	70 · 75 · 90
A2	M4 · M5 · M6
A3	50 · 60 · 70
A4	64 · 70 · 80



Characteristic / Özellikler	Unit / Birim	RSM20
Output Table Supporting Bearing / Çıkış Tabla Destek Rulmanı		Angular Contact Ball Bearing / Konik Rulman
Rated Output Torque / Nominal Çıkış Torku	Nm	200
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$ Nm	5 Times of Rated Output Torque / 5 x Nominal Çıkış Torku
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$ Nm	2.5 Times of Rated Output Torque / 2,5 x Nominal Çıkış Torku
Inertia Moment / Atalet Momenti	kg.m <sup>2</sup>	$2 \times 10^{-4}$
Rated Output Speed / Nominal Çıkış Devri	rpm	15
Max. Output Speed / Max. Çıkış Devri	rpm	50
Permissible Input Speed / Max. Giriş Devri	rpm	3,000
Backlash Ps / Min. Boşluk Oranı	$J_t$ arcmin	$\leq 1$
Backlash P0 / Azaltılmış Boşluk Oranı	$J_t$ arcmin	$\leq 3$
Backlash P1 / Standart Boşluk Oranı	$J_t$ arcmin	$\leq 5$
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$ N	6,500
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$ N	4,300
Rated Life / Hizmet Ömrü	$L_H$ hr	S5 Cycle Operation: >6,000 (S1 Continuous Operation: >3,000 hrs) S5 Döngüsel Çalışma: >6,000 (S1 Sürekli Çalışma: >3,000 hrs)
Torsional Rigidity / Burulma Direnci	Nm/arcmin	70
Efficiency / Verim	$\eta$ %	$\geq 85$
Synthetic Grease / Sentetik Gres	g	170
Weight / Ağırlık	Kg	6.4

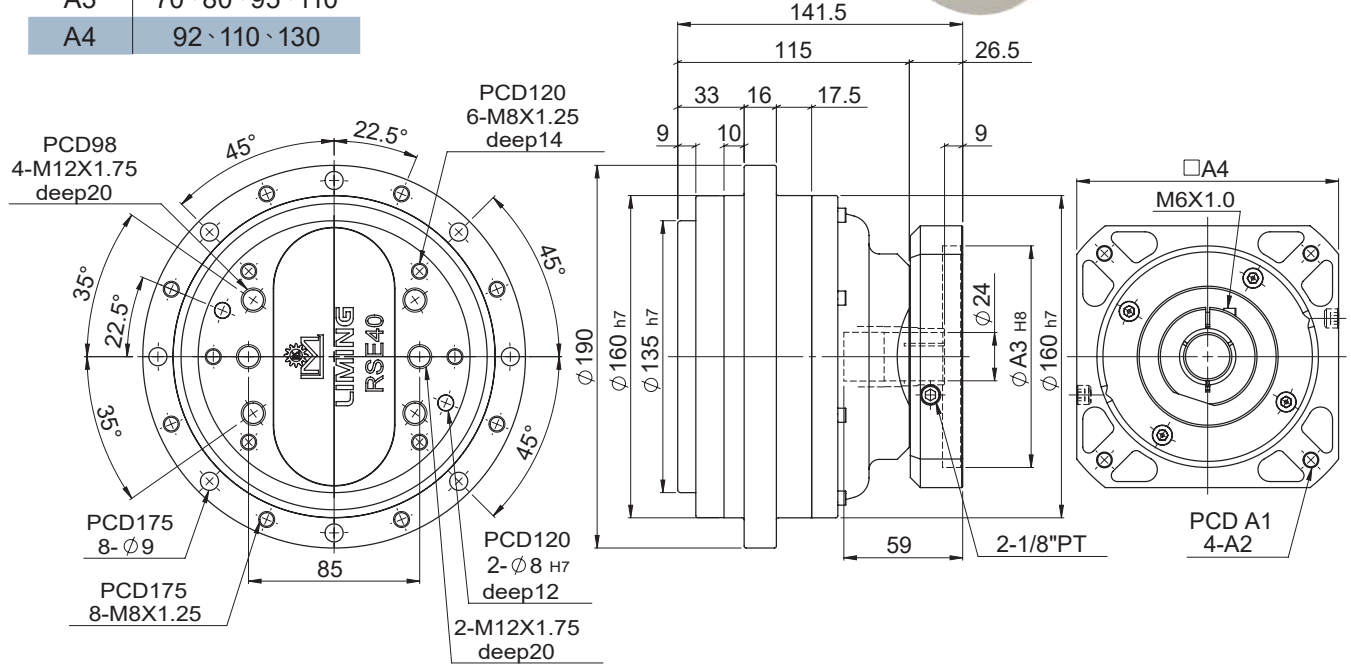
# MODEL : RSM40

RATIO / ÇEVİRİM : 41.81.121.161



Unit / Birim: mm

Model Code	RSM40
A1	90 · 100 · 115 · 145
A2	M5 · M6 · M8
A3	70 · 80 · 95 · 110
A4	92 · 110 · 130



Characteristic / Özellikler		Unit / Birim	RSM40
Output Table Supporting Bearing / Çıkış Tabla Destek Rulmanı			Angular Contact Ball Bearing / Konik Rulman
Rated Output Torque / Nominal Çıkış Torku		Nm	400
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	5 Times of Rated Output Torque / 5 x Nominal Çıkış Torku
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	2.5 Times of Rated Output Torque / 2,5 x Nominal Çıkış Torku
Inertia Moment / Atalet Momenti		kg.m <sup>2</sup>	$5 \times 10^{-4}$
Rated Output Speed / Nominal Çıkış Devri		rpm	15
Max. Output Speed / Max. Çıkış Devri		rpm	45
Permissible Input Speed / Max. Giriş Devri		rpm	3,000
Backlash Ps / Min. Boşluk Oranı	$J_t$	arcmin	$\leq 1$
Backlash P0 / Azaltılmış Boşluk Oranı	$J_t$	arcmin	$\leq 3$
Backlash P1 / Standart Boşluk Oranı	$J_t$	arcmin	$\leq 5$
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	8,600
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	5,700
Rated Life / Hizmet Ömrü	$L_H$	hr	S5 Cycle Operation: >6,000 (S1 Continuous Operation: >3,000 hrs) S5 Döngüsel Çalışma: >6,000 (S1 Sürekli Çalışma: >3,000 hrs)
Torsional Rigidity / Burulma Direnci		Nm/arcmin	100
Efficiency / Verim	$\eta$	%	$\geq 85$
Synthetic Grease / Sentetik Gres		g	290
Weight / Ağırlık		Kg	10



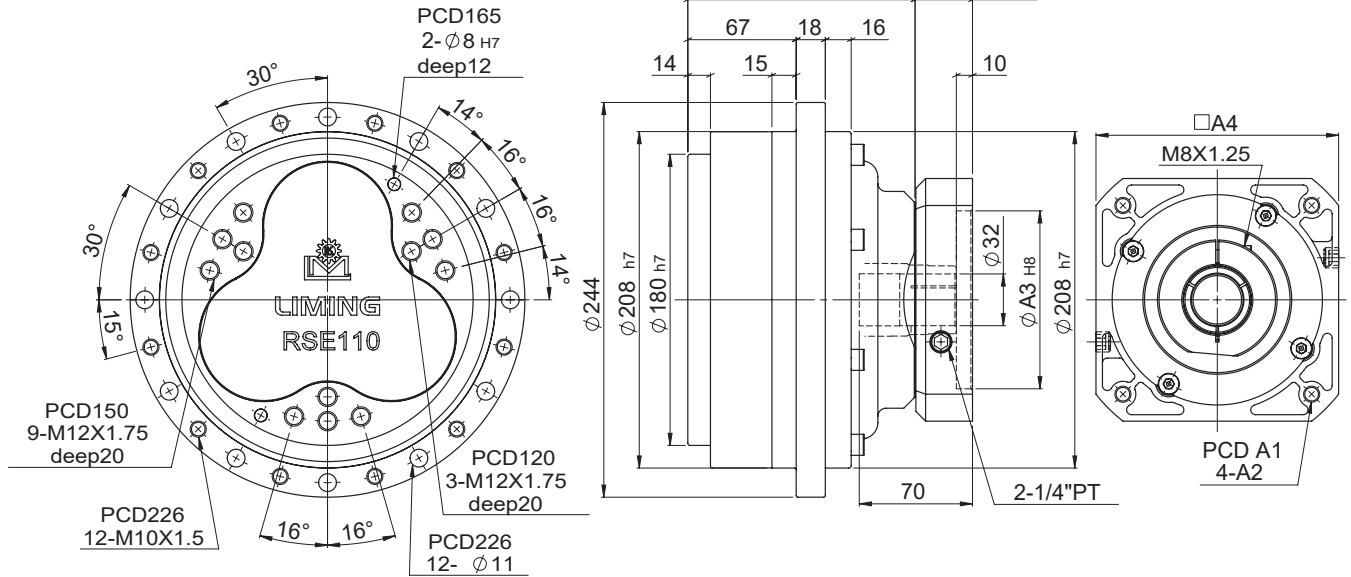
# MODEL : RSM110

RATIO / ÇEVİRİM : 41.81.121.161



Unit / Birim: mm

Model Code	RSM110
A1	115 · 145 · 165
A2	M6 · M8 · M10
A3	95 · 110 · 130
A4	122 · 130 · 150



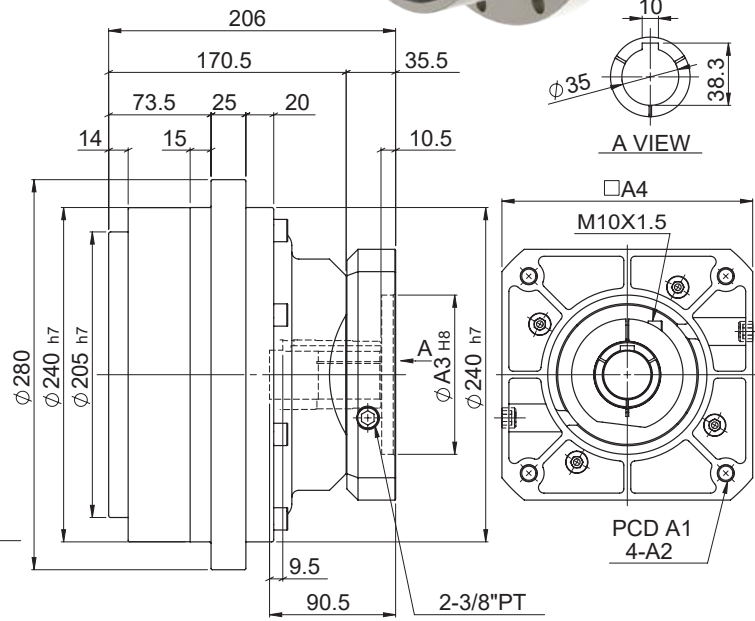
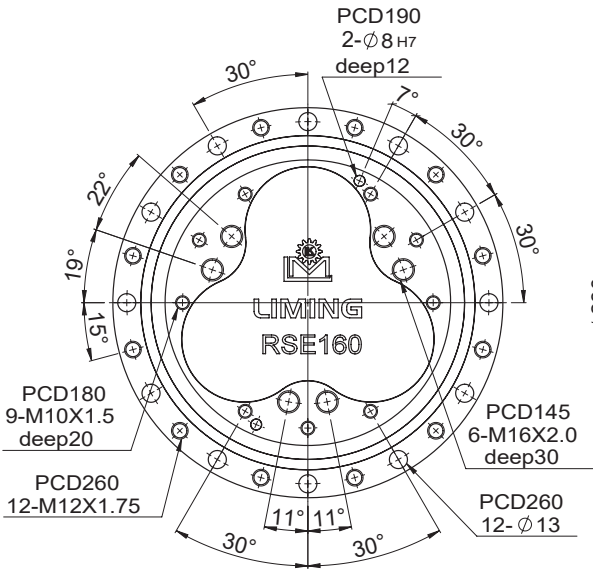
Characteristic / Özellikler	Unit / Birim	RSM110
Output Table Supporting Bearing / Çıkış Tabla Destek Rulmanı		Angular Contact Ball Bearing / Konik Rulman
Rated Output Torque / Nominal Çıkış Torku	Nm	1,100
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$ Nm	5 Times of Rated Output Torque / 5 x Nominal Çıkış Torku
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$ Nm	2.5 Times of Rated Output Torque / 2,5 x Nominal Çıkış Torku
Inertia Moment / Alalet Momenti	kg.m <sup>2</sup>	$15 \times 10^{-4}$
Rated Output Speed / Nominal Çıkış Devri	rpm	15
Max. Output Speed / Max. Çıkış Devri	rpm	35
Permissible Input Speed / Max. Giriş Devri	rpm	3,000
Backlash Ps / Min. Boşluk Oranı	$J_t$ arcmin	$\leq 1$
Backlash P0 / Azaltılmış Boşluk Oranı	$J_t$ arcmin	$\leq 3$
Backlash P1 / Standart Boşluk Oranı	$J_t$ arcmin	$\leq 5$
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$ N	16,000
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$ N	12,000
Rated Life / Hizmet Ömrü	$L_H$ hr	S5 Cycle Operation: >6,000 (S1 Continuous Operation: >3,000 hrs) S5 Döngüsel Çalışma: >6,000 (S1 Sürekli Çalışma: >3,000 hrs)
Torsional Rigidity / Burulma Direnci	Nm/arcmin	210
Efficiency / Verim	$\eta$ %	$\geq 85$
Synthetic Grease / Sentetik Gres	g	710
Weight / Ağırlık	Kg	

# MODEL : RSM160

RATIO / ÇEVİRİM : 41.81.121.161



Unit / Birim: mm	
Model Code	RSM160
A1	145 · 165 · 200
A2	M8 · M10 · M12
A3	110 · 130 · 180
A4	146 · 150 · 190



Characteristic / Özellikler	Unit / Birim	RSM160
Output Table Supporting Bearing / Çıkış Tabla Destek Rulmanı		Angular Contact Ball Bearing / Konik Rulman
Rated Output Torque / Nominal Çıkış Torku	Nm	1,600
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$ Nm	5 Times of Rated Output Torque / 5 x Nominal Çıkış Torku
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$ Nm	2.5 Times of Rated Output Torque / 2,5 x Nominal Çıkış Torku
Inertia Moment / Atalet Momenti	kg.m <sup>2</sup>	25 x 10 <sup>-4</sup>
Rated Output Speed / Nominal Çıkış Devri	rpm	15
Max. Output Speed / Max. Çıkış Devri	rpm	27
Permissible Input Speed / Max. Giriş Devri	rpm	3,000
Backlash Ps / Min. Boşluk Oranı	$J_t$ arcmin	≤ 1
Backlash P0 / Azaltılmış Boşluk Oranı	$J_t$ arcmin	≤ 3
Backlash P1 / Standart Boşluk Oranı	$J_t$ arcmin	≤ 5
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$ N	19,000
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$ N	15,000
Rated Life / Hizmet Ömrü	$L_H$ hr	S5 Cycle Operation: >6,000 (S1 Continuous Operation: >3,000 hrs) S5 Döngüsel Çalışma: >6,000 (S1 Sürekli Çalışma: >3,000 hrs)
Torsional Rigidity / Burulma Direnci	Nm/arcmin	300
Efficiency / Verim	$\eta$ %	≥ 85
Synthetic Grease / Sentetik Gres	g	800
Weight / Ağırlık	Kg	

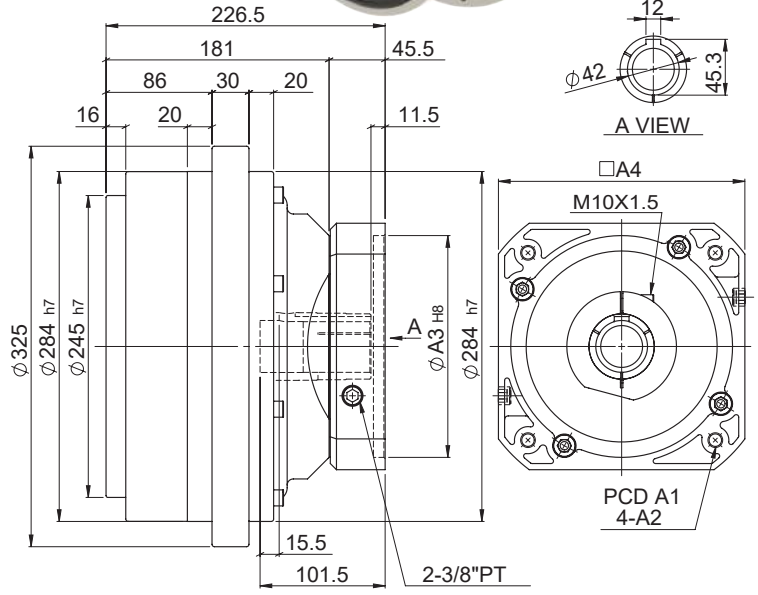
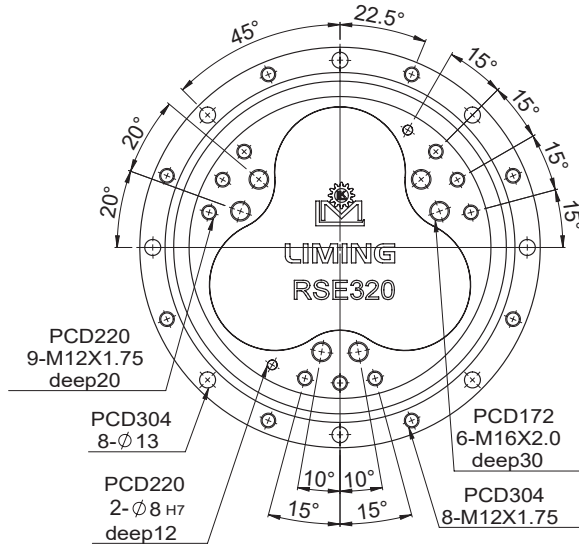
# MODEL : RSM320

RATIO / ÇEVİRİM : 41.81.121.161



Unit / Birim: mm

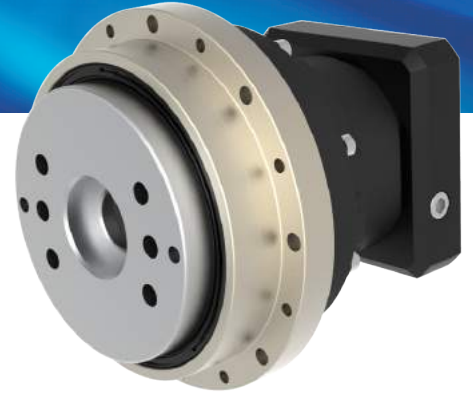
Model Code	RSM320
A1	200 · 215 · 265
A2	M10 · M12 · M16
A3	114.3 · 180 · 230
A4	182 · 200 · 250



Characteristic / Özellikler	Unit / Birim	RSM320
Output Table Supporting Bearing / Çıkış Tabla Destek Rulmanı		Angular Contact Ball Bearing / Konik Rulman
Rated Output Torque / Nominal Çıkış Torku	Nm	3,200
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$ Nm	5 Times of Rated Output Torque / 5 x Nominal Çıkış Torku
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$ Nm	2.5 Times of Rated Output Torque / 2,5 x Nominal Çıkış Torku
Inertia Moment / Atalet Momenti	kg.m <sup>2</sup>	32 x 10 <sup>-4</sup>
Rated Output Speed / Nominal Çıkış Devri	rpm	15
Max. Output Speed / Max. Çıkış Devri	rpm	21
Permissible Input Speed / Max. Giriş Devri	rpm	3,000
Backlash Ps / Min. Boşluk Oranı	$J_t$ arcmin	≤ 1
Backlash P0 / Azaltılmış Boşluk Oranı	$J_t$ arcmin	≤ 3
Backlash P1 / Standart Boşluk Oranı	$J_t$ arcmin	≤ 5
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$ N	25,300
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$ N	20,000
Rated Life / Hizmet Ömrü	$L_H$ hr	S5 Cycle Operation: >6,000 (S1 Continuous Operation: >3,000 hrs) S5 Döngüsel Çalışma: >6,000 (S1 Sürekli Çalışma: >3,000 hrs)
Torsional Rigidity / Burulma Direnci	Nm/arcmin	980
Efficiency / Verim	$\eta$ %	≥ 85
Synthetic Grease / Sentetik Gres	g	1,700
Weight / Ağırlık	Kg	

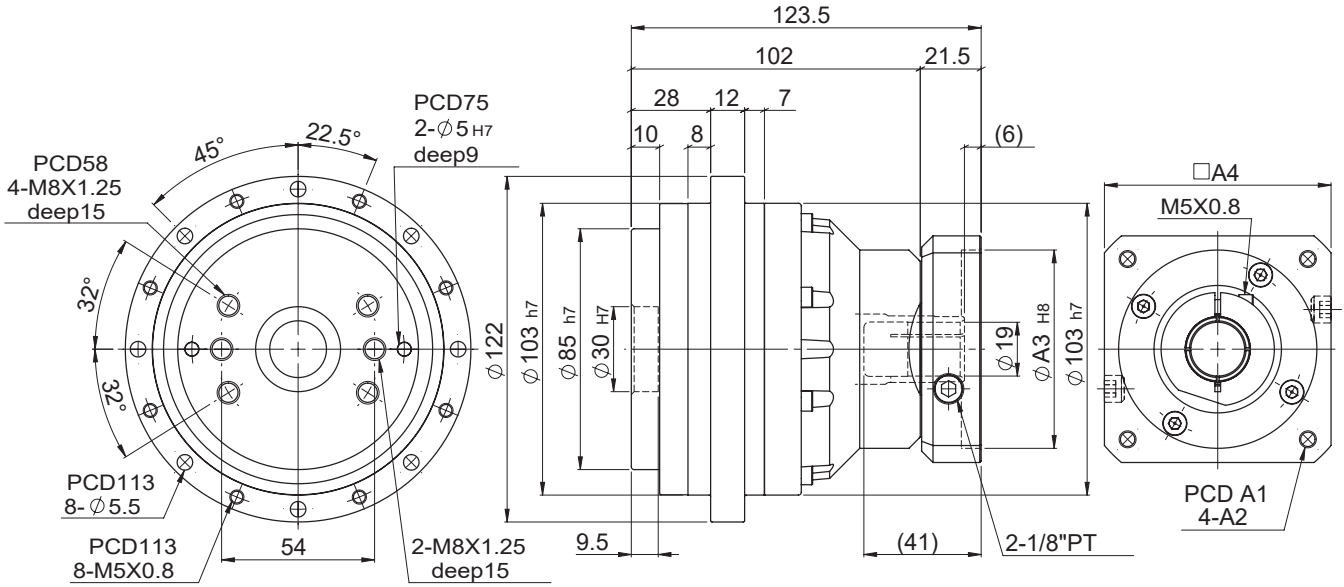
# MODEL : RDM6

RATIO / ÇEVİRİM : 41.81.121.161



Unit / Birim: mm

Model Code	RDM6
A1	70 · 75 · 90
A2	M4 · M5 · M6
A3	50 · 60 · 70
A4	64 · 70 · 80



Characteristic / Özellikler	Unit / Birim	RDM6
Output Table Supporting Bearing / Çıkış Tabla Destek Rulmanı		Angular Contact Ball Bearing / Konik Rulman
Rated Output Torque / Nominal Çıkış Torku	Nm	60
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$ Nm	5 Times of Rated Output Torque / 5 x Nominal Çıkış Torku
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$ Nm	2 Times of Rated Output Torque / 2 x Nominal Çıkış Torku
Inertia Moment / Atalet Momenti	kg.m <sup>2</sup>	$1.15 \times 10^{-4}$
Rated Output Speed / Nominal Çıkış Devri	rpm	15
Max. Output Speed / Max. Çıkış Devri	rpm	55
Permissible Input Speed / Max. Giriş Devri	rpm	3,000
Backlash Ps / Min. Boşluk Oranı	$J_t$ arcmin	2
Backlash P0 / Azaltılmış Boşluk Oranı	$J_t$ arcmin	4
Backlash P1 / Standart Boşluk Oranı	$J_t$ arcmin	6
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$ N	2,100
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$ N	1,500
Rated Life / Hizmet Ömrü	$L_H$ hr	S5 Cycle Operation: >6,000 (S1 Continuous Operation: >3,000 hrs) S5 Döngüsel Çalışma: >6,000 (S1 Sürekli Çalışma: >3,000 hrs)
Torsional Rigidity / Burulma Direnci	Nm/arcmin	50
Efficiency / Verim	$\eta$ %	$\geq 85$
Synthetic Grease / Sentetik Gres	g	100
Weight / Ağırlık	Kg	3.8

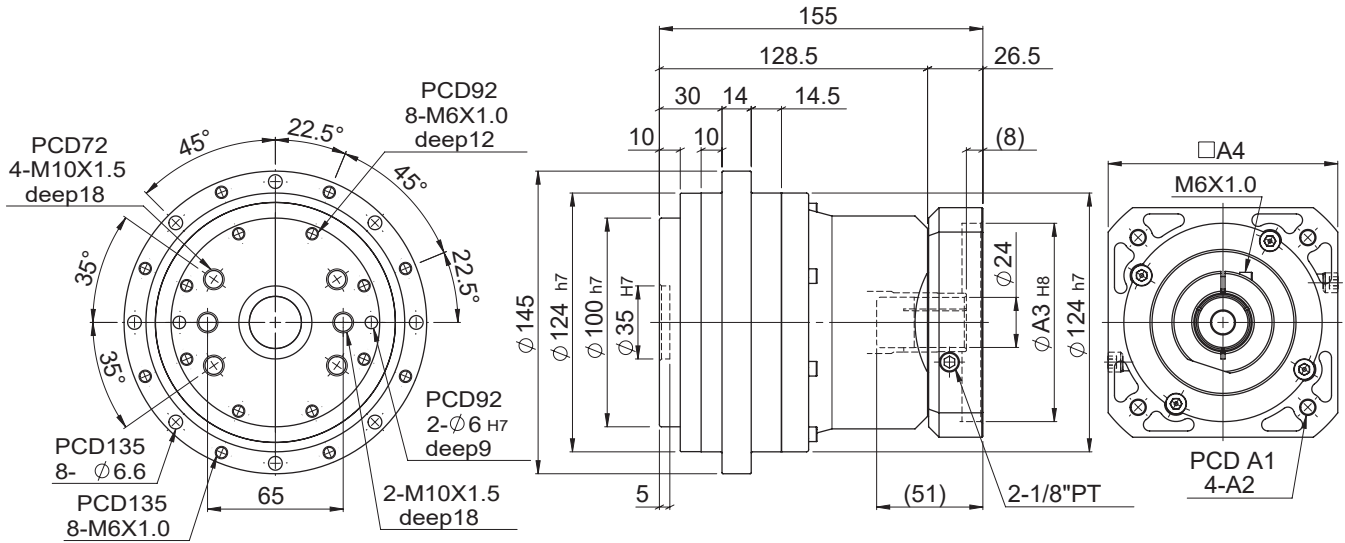
# MODEL : RDM20

RATIO / ÇEVİRİM : 41.81.121.161



Unit / Birim: mm

Model Code	RDM20
A1	90 · 100 · 115 · 145
A2	M5 · M6 · M8
A3	70 · 80 · 95 · 110
A4	92 · 110 · 130



Characteristic / Özellikler	Unit / Birim	RDM20
Output Table Supporting Bearing / Çıkış Tabla Destek Rulmanı		Angular Contact Ball Bearing / Konik Rulman
Rated Output Torque / Nominal Çıkış Torku	Nm	200
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$ Nm	5 Times of Rated Output Torque / 5 x Nominal Çıkış Torku
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$ Nm	2.5 Times of Rated Output Torque / 2,5 x Nominal Çıkış Torku
Inertia Moment / Atalet Momenti	kg.m <sup>2</sup>	$2 \times 10^{-4}$
Rated Output Speed / Nominal Çıkış Devri	rpm	15
Max. Output Speed / Max. Çıkış Devri	rpm	50
Permissible Input Speed / Max. Giriş Devri	rpm	3,000
Backlash Ps / Min. Boşluk Oranı	$J_t$ arcmin	$\leq 1$
Backlash P0 / Azaltılmış Boşluk Oranı	$J_t$ arcmin	$\leq 3$
Backlash P1 / Standart Boşluk Oranı	$J_t$ arcmin	$\leq 5$
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$ N	6,500
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$ N	4,300
Rated Life / Hizmet Ömrü	$L_H$ hr	S5 Cycle Operation: >6,000 (S1 Continuous Operation: >3,000 hrs) S5 Döngüsel Çalışma: >6,000 (S1 Sürekli Çalışma: >3,000 hrs)
Torsional Rigidity / Burulma Direnci	Nm/arcmin	70
Efficiency / Verim	$\eta$ %	$\geq 85$
Synthetic Grease / Sentetik Gres	g	170
Weight / Ağırlık	Kg	

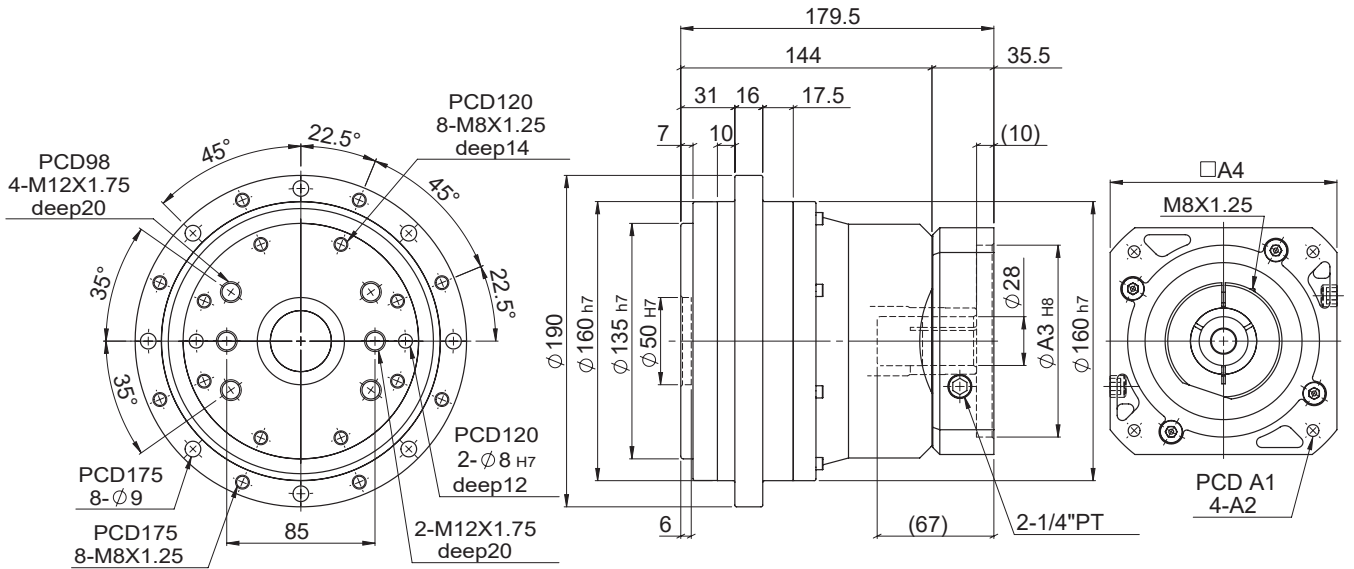
# MODEL : RDM40

RATIO / ÇEVİRİM : 41.81.121.161



Unit / Birim: mm

Model Code	RDM40
A1	115 · 145 · 165
A2	M6 · M8 · M10
A3	95 · 110 · 130
A4	122 · 130 · 150



Characteristic / Özellikler	Unit / Birim	RDM40
Output Table Supporting Bearing / Çıkış Tabla Destek Rulmanı		Angular Contact Ball Bearing / Konik Rulman
Rated Output Torque / Nominal Çıkış Torku	Nm	400
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$ Nm	5 Times of Rated Output Torque / 5 x Nominal Çıkış Torku
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$ Nm	2.5 Times of Rated Output Torque / 2,5 x Nominal Çıkış Torku
Inertia Moment / Atalet Momenti	kg.m <sup>2</sup>	$5 \times 10^{-4}$
Rated Output Speed / Nominal Çıkış Devri	rpm	15
Max. Output Speed / Max. Çıkış Devri	rpm	45
Permissible Input Speed / Max. Giriş Devri	rpm	3,000
Backlash Ps / Min. Boşluk Oranı	$J_t$ arcmin	$\leq 1$
Backlash P0 / Azaltılmış Boşluk Oranı	$J_t$ arcmin	$\leq 3$
Backlash P1 / Standart Boşluk Oranı	$J_t$ arcmin	$\leq 5$
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$ N	8,600
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$ N	5,700
Rated Life / Hizmet Ömrü	$L_H$ hr	S5 Cycle Operation: >6,000 (S1 Continuous Operation: >3,000 hrs) S5 Döngüsel Çalışma: >6,000 (S1 Sürekli Çalışma: >3,000 hrs)
Torsional Rigidity / Burulma Direnci	Nm/arcmin	100
Efficiency / Verim	$\eta$ %	$\geq 85$
Synthetic Grease / Sentetik Gres	g	290
Weight / Ağırlık	Kg	

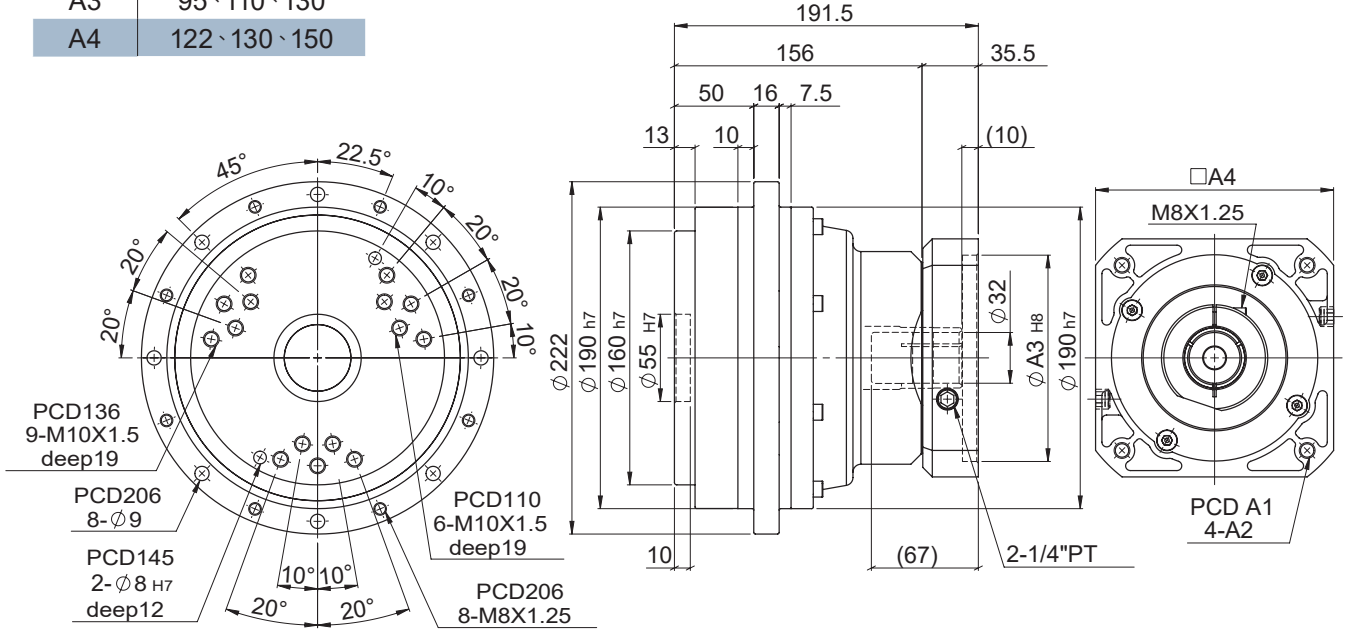
# MODEL : RDM80

RATIO / ÇEVİRİM : 45.81.101.171



Unit / Birim: mm

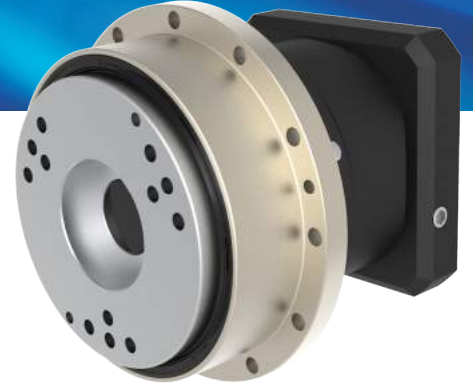
Model Code	RDM80
A1	115 · 145 · 165
A2	M6 · M8 · M10
A3	95 · 110 · 130
A4	122 · 130 · 150



Characteristic / Özellikler		Unit / Birim	RDM80
Output Table Supporting Bearing / Çıkış Tabla Destek Rulmanı			Angular Contact Ball Bearing / Konik Rulman
Rated Output Torque / Nominal Çıkış Torku		Nm	800
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	5 Times of Rated Output Torque / 5 x Nominal Çıkış Torku
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	2.5 Times of Rated Output Torque / 2,5 x Nominal Çıkış Torku
Inertia Moment / Atalet Momenti		kg.m <sup>2</sup>	$9 \times 10^{-4}$
Rated Output Speed / Nominal Çıkış Devri		rpm	15
Max. Output Speed / Max. Çıkış Devri		rpm	42
Permissible Input Speed / Max. Giriş Devri		rpm	3,000
Backlash Ps / Min. Boşluk Oranı	$J_t$	arcmin	$\leq 1$
Backlash P0 / Azaltılmış Boşluk Oranı	$J_t$	arcmin	$\leq 3$
Backlash P1 / Standart Boşluk Oranı	$J_t$	arcmin	$\leq 5$
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	12,500
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	8,200
Rated Life / Hizmet Ömrü	$L_H$	hr	S5 Cycle Operation: >6,000 (S1 Continuous Operation: >3,000 hrs) S5 Döngüsel Çalışma: >6,000 (S1 Sürekli Çalışma: >3,000 hrs)
Torsional Rigidity / Burulma Direnci		Nm/arcmin	150
Efficiency / Verim	$\eta$	%	$\geq 85$
Synthetic Grease / Sentetik Gres		g	480
Weight / Ağırlık		Kg	

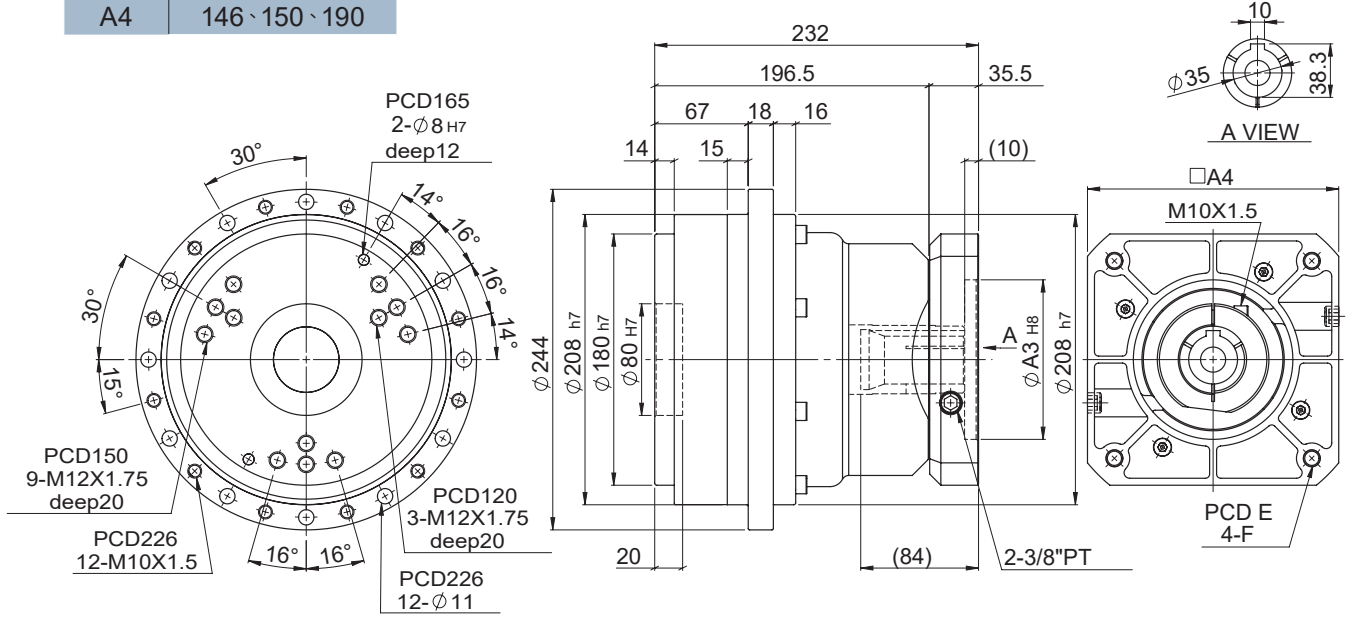
# MODEL : RDM110

RATIO / ÇEVİRİM : 41.81.121.161



Unit / Birim: mm

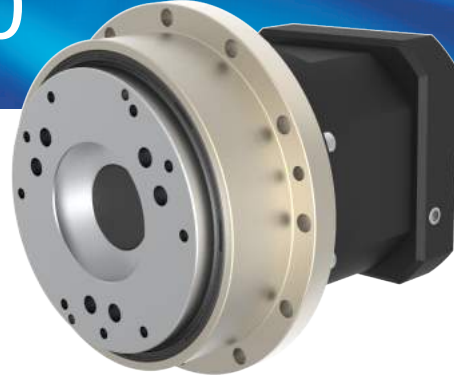
Model Code	RDM110
A1	145 · 165 · 200
A2	M8 · M10 · M12
A3	110 · 130 · 180
A4	146 · 150 · 190



Characteristic / Özellikler	Unit / Birim	RDM110
Output Table Supporting Bearing / Çıkış Tabla Destek Rulmanı		Angular Contact Ball Bearing / Konik Rulman
Rated Output Torque / Nominal Çıkış Torku	Nm	1,100
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$ Nm	5 Times of Rated Output Torque / 5 x Nominal Çıkış Torku
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$ Nm	2.5 Times of Rated Output Torque / 2,5 x Nominal Çıkış Torku
Inertia Moment / Alalet Momenti	kg.m <sup>2</sup>	$15 \times 10^{-4}$
Rated Output Speed / Nominal Çıkış Devri	rpm	15
Max. Output Speed / Max. Çıkış Devri	rpm	35
Permissible Input Speed / Max. Giriş Devri	rpm	3,000
Backlash Ps / Min. Boşluk Oranı	$J_t$ arcmin	$\leq 1$
Backlash P0 / Azaltılmış Boşluk Oranı	$J_t$ arcmin	$\leq 3$
Backlash P1 / Standart Boşluk Oranı	$J_t$ arcmin	$\leq 5$
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$ N	16,000
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$ N	12,000
Rated Life / Hizmet Ömrü	$L_H$ hr	S5 Cycle Operation: >6,000 (S1 Continuous Operation: >3,000 hrs) S5 Döngüsel Çalışma: >6,000 (S1 Sürekli Çalışma: >3,000 hrs)
Torsional Rigidity / Burulma Direnci	Nm/arcmin	210
Efficiency / Verim	$\eta$ %	$\geq 85$
Synthetic Grease / Sentetik Gres	g	710
Weight / Ağırlık	Kg	

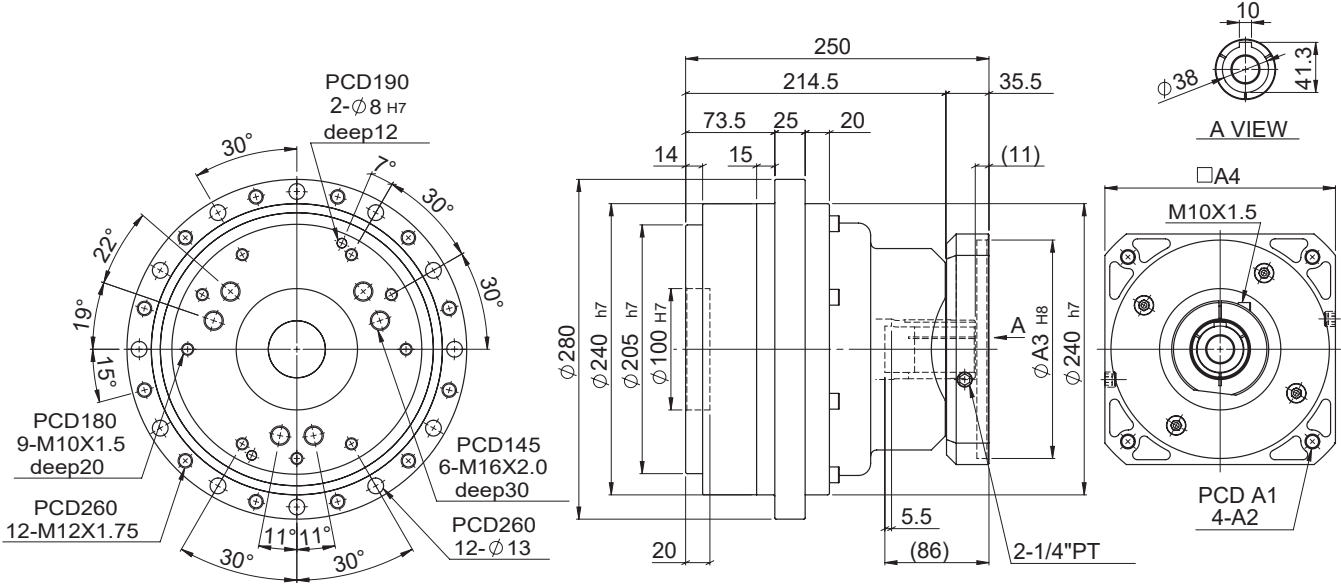
# MODEL : RDM160

RATIO / ÇEVİRİM : 41.81.121.161



Unit / Birim: mm

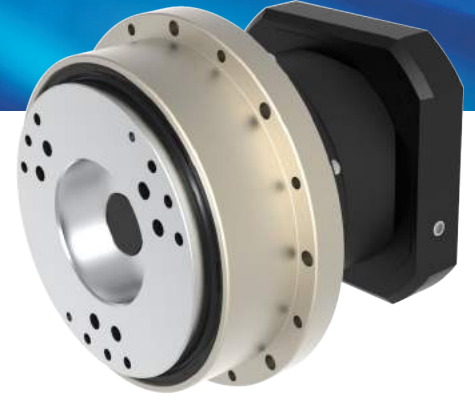
Model Code	RDM160
A1	145 · 165 · 200
A2	M8 · M10 · M12
A3	110 · 130 · 180
A4	146 · 150 · 190



Characteristic / Özellikler		Unit / Birim	RDM160
Output Table Supporting Bearing / Çıkış Tabla Destek Rulmanı			Angular Contact Ball Bearing / Konik Rulman
Rated Output Torque / Nominal Çıkış Torku		Nm	1,600
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$	Nm	5 Times of Rated Output Torque / 5 x Nominal Çıkış Torku
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$	Nm	2.5 Times of Rated Output Torque / 2,5 x Nominal Çıkış Torku
Inertia Moment / Alalet Momenti		kg.m <sup>2</sup>	25 x 10 <sup>-4</sup>
Rated Output Speed / Nominal Çıkış Devri		rpm	15
Max. Output Speed / Max. Çıkış Devri		rpm	27
Permissible Input Speed / Max. Giriş Devri		rpm	3,000
Backlash Ps / Min. Boşluk Oranı	$J_t$	arcmin	≤ 1
Backlash P0 / Azaltılmış Boşluk Oranı	$J_t$	arcmin	≤ 3
Backlash P1 / Standart Boşluk Oranı	$J_t$	arcmin	≤ 5
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$	N	19,000
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$	N	15,000
Rated Life / Hizmet Ömrü	$L_H$	hr	S5 Cycle Operation: >6,000 (S1 Continuous Operation: >3,000 hrs) S5 Döngüsel Çalışma: >6,000 (S1 Sürekli Çalışma: >3,000 hrs)
Torsional Rigidity / Burulma Direnci		Nm/arcmin	300
Efficiency / Verim	$\eta$	%	≥ 85
Synthetic Grease / Sentetik Gres		g	800
Weight / Ağırlık		Kg	

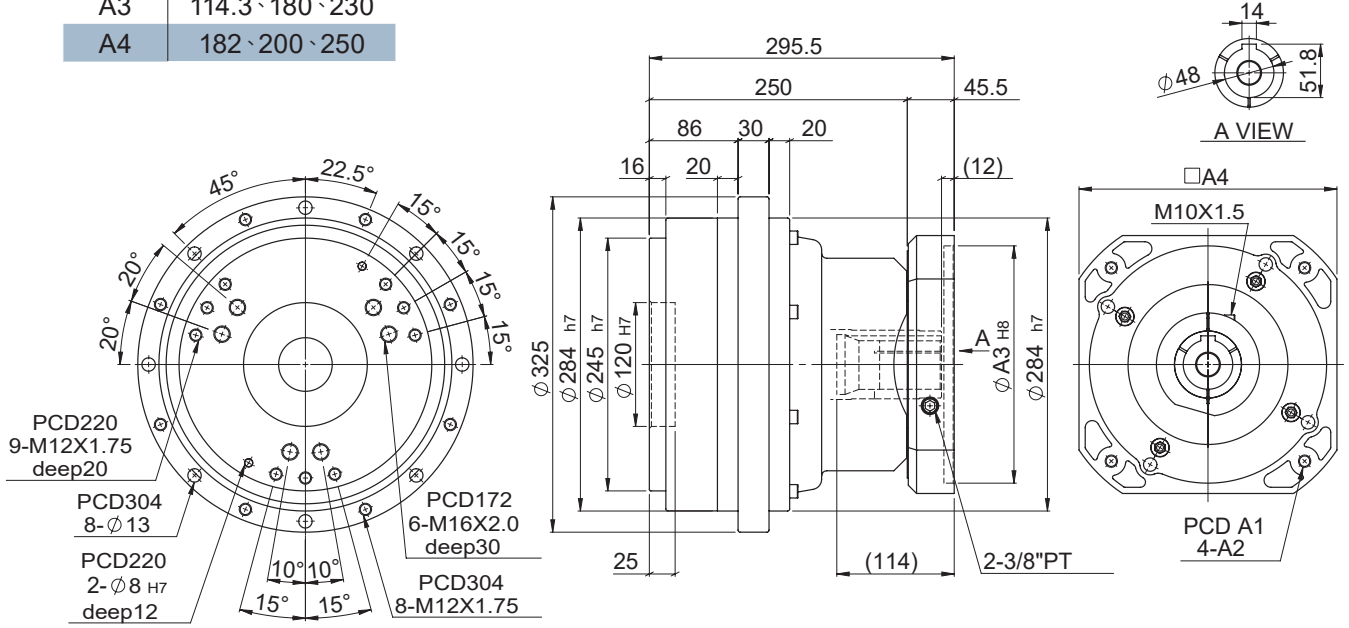
# MODEL : RDM320

RATIO / ÇEVİRİM : 41.81.121.161



Unit / Birim: mm

Model Code	RDM320
A1	200 · 215 · 265
A2	M10 · M12 · M16
A3	114.3 · 180 · 230
A4	182 · 200 · 250



Characteristic / Özellikler	Unit / Birim	RDM320
Output Table Supporting Bearing / Çıkış Tabla Destek Rulmanı		Angular Contact Ball Bearing / Konik Rulman
Rated Output Torque / Nominal Çıkış Torku	Nm	3,200
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$ Nm	5 Times of Rated Output Torque / 5 x Nominal Çıkış Torku
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$ Nm	2.5 Times of Rated Output Torque / 2,5 x Nominal Çıkış Torku
Inertia Moment / Atalet Momenti	kg.m <sup>2</sup>	$32 \times 10^{-4}$
Rated Output Speed / Nominal Çıkış Devri	rpm	15
Max. Output Speed / Max. Çıkış Devri	rpm	21
Permissible Input Speed / Max. Giriş Devri	rpm	3,000
Backlash Ps / Min. Boşluk Oranı	$J_t$ arcmin	$\leq 1$
Backlash P0 / Azaltılmış Boşluk Oranı	$J_t$ arcmin	$\leq 3$
Backlash P1 / Standart Boşluk Oranı	$J_t$ arcmin	$\leq 5$
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$ N	25,300
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$ N	20,000
Rated Life / Hizmet Ömrü	$L_H$ hr	S5 Cycle Operation: >6,000 (S1 Continuous Operation: >3,000 hrs) S5 Döngüsel Çalışma: >6,000 (S1 Sürekli Çalışma: >3,000 hrs)
Torsional Rigidity / Burulma Direnci	Nm/arcmin	980
Efficiency / Verim	$\eta$ %	$\geq 85$
Synthetic Grease / Sentetik Gres	g	1,700
Weight / Ağırlık	Kg	

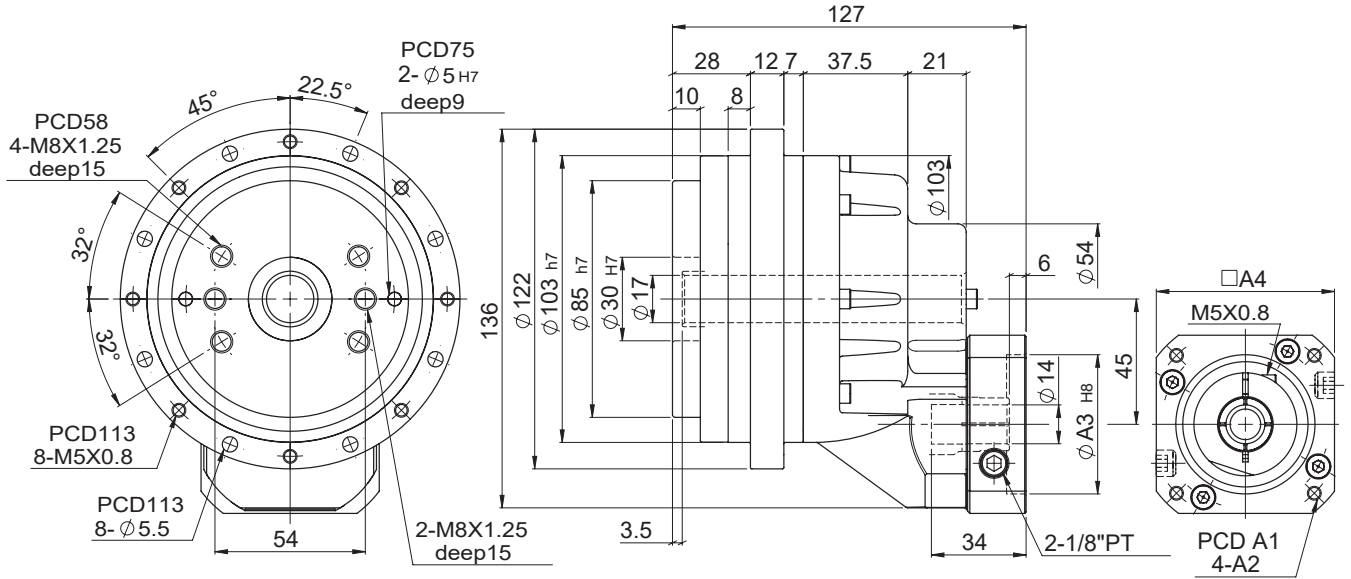
# MODEL : RCM6

RATIO / ÇEVİRİM : 121.145



Unit / Birim: mm

Model Code	RCM6
A1	70 · 75 · 90
A2	M4 · M5 · M6
A3	50 · 60 · 70
A4	64 · 70 · 80



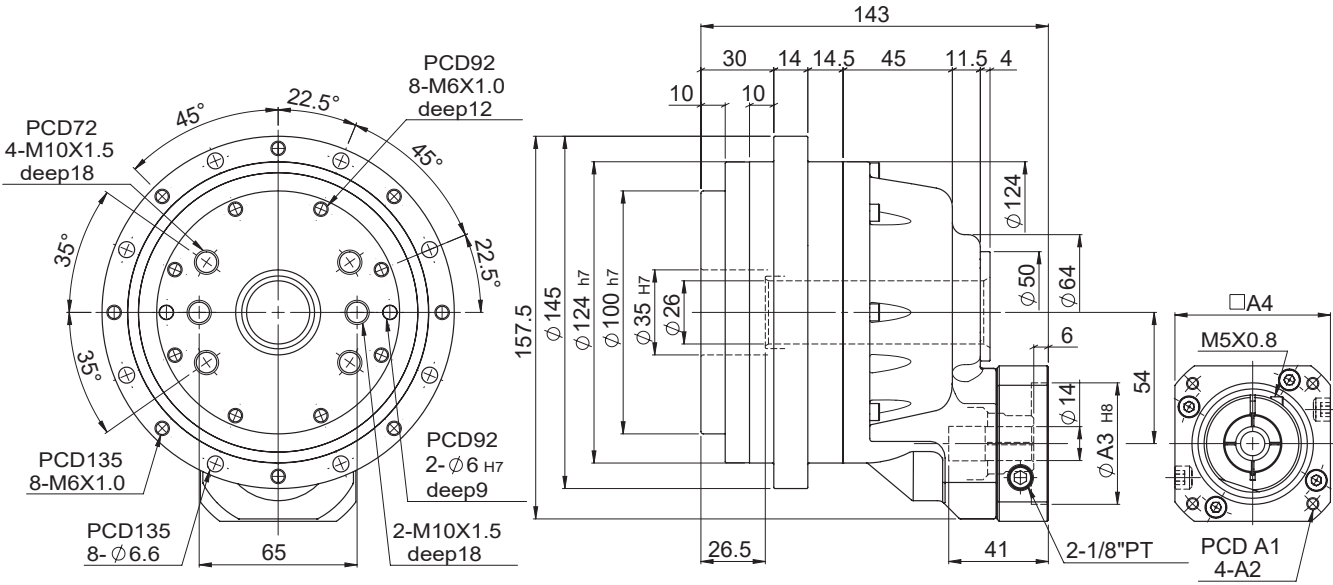
Characteristic / Özellikler	Unit / Birim	RCM6
Output Table Supporting Bearing / Çıkış Tabla Destek Rulmanı		Angular Contact Ball Bearing / Konik Rulman
Rated Output Torque / Nominal Çıkış Torku	Nm	60
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$ Nm	5 Times of Rated Output Torque / 5 x Nominal Çıkış Torku
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$ Nm	2 Times of Rated Output Torque / 2 x Nominal Çıkış Torku
Inertia Moment / Atalet Momenti	kg.m <sup>2</sup>	$1.15 \times 10^{-4}$
Rated Output Speed / Nominal Çıkış Devri	rpm	15
Max. Output Speed / Max. Çıkış Devri	rpm	55
Permissible Input Speed / Max. Giriş Devri	rpm	3,000
Backlash Ps / Min. Boşluk Oranı	$J_t$ arcmin	2
Backlash P0 / Azaltılmış Boşluk Oranı	$J_t$ arcmin	4
Backlash P1 / Standart Boşluk Oranı	$J_t$ arcmin	6
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$ N	2,100
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$ N	1,500
Rated Life / Hizmet Ömrü	$L_H$ hr	S5 Cycle Operation: >6,000 (S1 Continuous Operation: >3,000 hrs) S5 Döngüsel Çalışma: >6,000 (S1 Sürekli Çalışma: >3,000 hrs)
Torsional Rigidity / Burulma Direnci	Nm/arcmin	50
Efficiency / Verim	$\eta$ %	$\geq 85$
Synthetic Grease / Sentetik Gres	g	100
Weight / Ağırlık	Kg	3.8

# MODEL : RCM20

RATIO / ÇEVİRİM : 111



Unit / Birim: mm	
Model Code	RCM20
A1	70 · 75 · 90
A2	M4 · M5 · M6
A3	50 · 60 · 70
A4	64 · 70 · 80



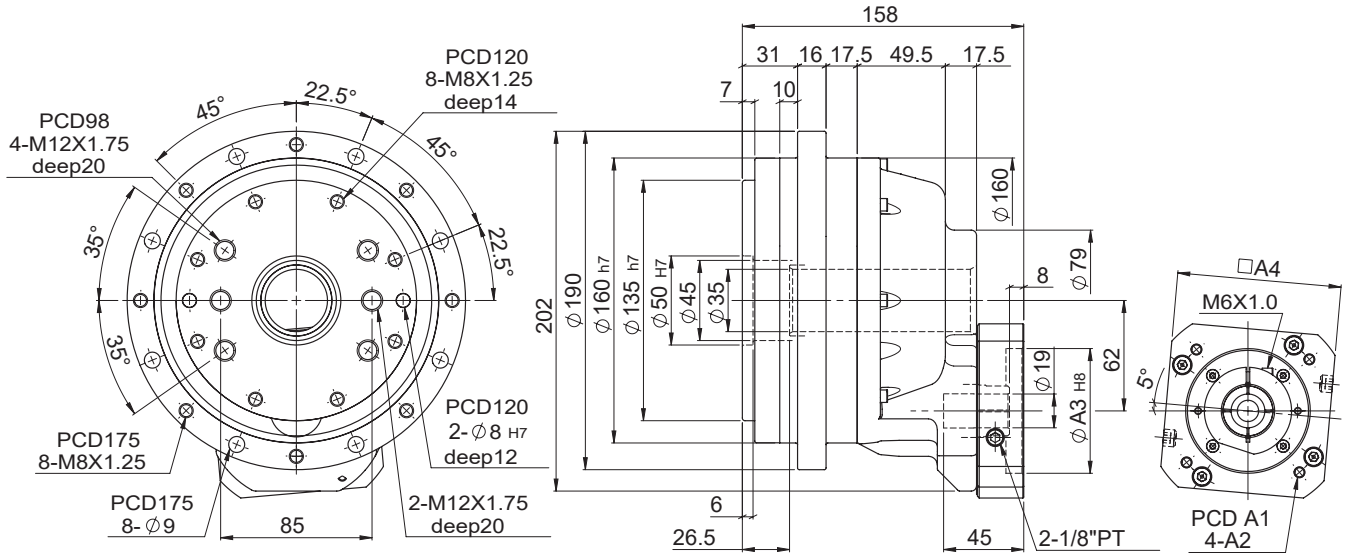
Characteristic / Özellikler	Unit / Birim	RCM20
Output Table Supporting Bearing / Çıkış Tabla Destek Rulmanı		Angular Contact Ball Bearing / Konik Rulman
Rated Output Torque / Nominal Çıkış Torku	Nm	200
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$ Nm	5 Times of Rated Output Torque / 5 x Nominal Çıkış Torku
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$ Nm	2.5 Times of Rated Output Torque / 2,5 x Nominal Çıkış Torku
Inertia Moment / Atalet Momenti	kg.m <sup>2</sup>	$2 \times 10^{-4}$
Rated Output Speed / Nominal Çıkış Devri	rpm	15
Max. Output Speed / Max. Çıkış Devri	rpm	50
Permissible Input Speed / Max. Giriş Devri	rpm	3,000
Backlash Ps / Min. Boşluk Oranı	$J_t$ arcmin	$\leq 1$
Backlash P0 / Azaltılmış Boşluk Oranı	$J_t$ arcmin	$\leq 3$
Backlash P1 / Standart Boşluk Oranı	$J_t$ arcmin	$\leq 5$
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$ N	6,500
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$ N	4,300
Rated Life / Hizmet Ömrü	$L_H$ hr	S5 Cycle Operation: >6,000 (S1 Continuous Operation: >3,000 hrs) S5 Döngüsel Çalışma: >6,000 (S1 Sürekli Çalışma: >3,000 hrs)
Torsional Rigidity / Burulma Direnci	Nm/arcmin	70
Efficiency / Verim	$\eta$ %	$\geq 85$
Synthetic Grease / Sentetik Gres	g	170
Weight / Ağırlık	Kg	6.4

# MODEL : RCM40

RATIO / ÇEVİRİM : 127



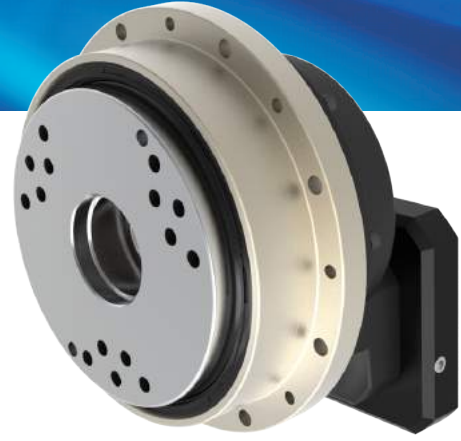
Unit / Birim: mm	
Model Code	RCM40
A1	90 · 100 · 115 · 145
A2	M5 · M6 · M8
A3	70 · 80 · 95 · 110
A4	92 · 110 · 130



Characteristic / Özellikler	Unit / Birim	RCM40
Output Table Supporting Bearing / Çıkış Tabla Destek Rulmanı		Angular Contact Ball Bearing / Konik Rulman
Rated Output Torque / Nominal Çıkış Torku	Nm	400
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$ Nm	5 Times of Rated Output Torque / 5 x Nominal Çıkış Torku
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$ Nm	2.5 Times of Rated Output Torque / 2,5 x Nominal Çıkış Torku
Inertia Moment / Atalet Momenti	kg.m <sup>2</sup>	$5 \times 10^{-4}$
Rated Output Speed / Nominal Çıkış Devri	rpm	15
Max. Output Speed / Max. Çıkış Devri	rpm	45
Permissible Input Speed / Max. Giriş Devri	rpm	3,000
Backlash Ps / Min. Boşluk Oranı	$J_t$ arcmin	$\leq 1$
Backlash P0 / Azaltılmış Boşluk Oranı	$J_t$ arcmin	$\leq 3$
Backlash P1 / Standart Boşluk Oranı	$J_t$ arcmin	$\leq 5$
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$ N	8,600
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$ N	5,700
Rated Life / Hizmet Ömrü	$L_H$ hr	S5 Cycle Operation: >6,000 (S1 Continuous Operation: >3,000 hrs) S5 Döngüsel Çalışma: >6,000 (S1 Sürekli Çalışma: >3,000 hrs)
Torsional Rigidity / Burulma Direnci	Nm/arcmin	100
Efficiency / Verim	$\eta$ %	$\geq 85$
Synthetic Grease / Sentetik Gres	g	290
Weight / Ağırlık	Kg	11.5

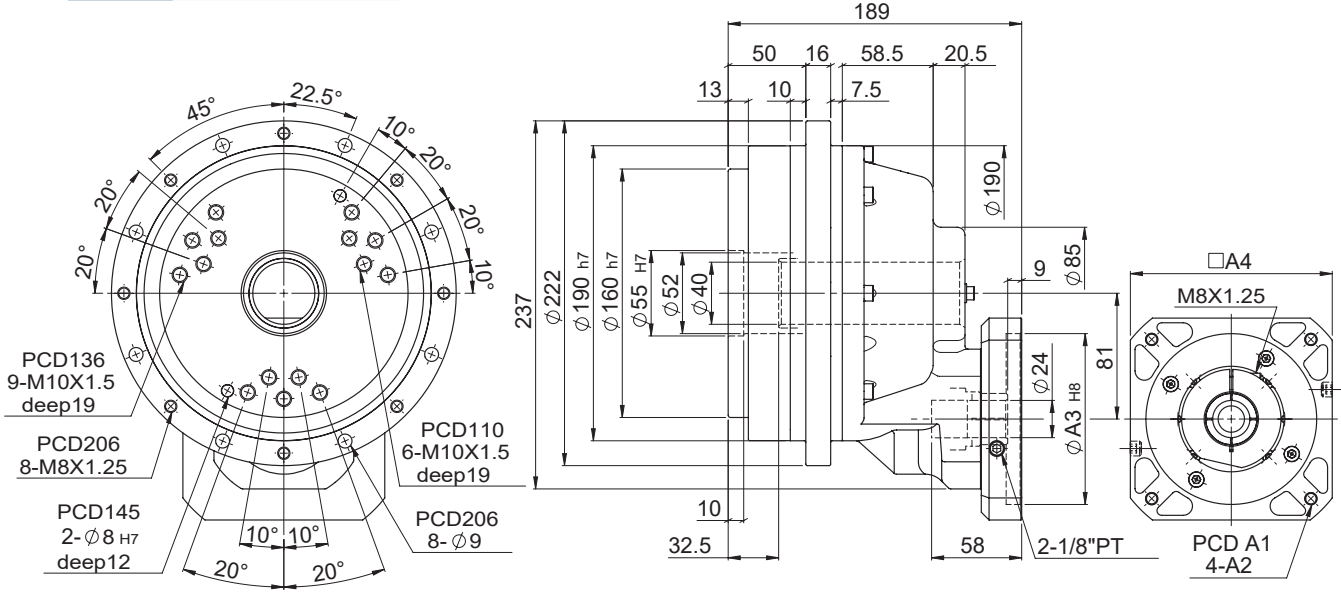
# MODEL : RCM80

RATIO / ÇEVİRİM : 126



Unit / Birim: mm

Model Code	RCM80
A1	90 · 100 · 115 · 145
A2	M5 · M6 · M8
A3	70 · 80 · 95 · 110
A4	92 · 110 · 130



Characteristic / Özellikler	Unit / Birim	RCM80
Output Table Supporting Bearing / Çıkış Tabla Destek Rulmanı		Angular Contact Ball Bearing / Konik Rulman
Rated Output Torque / Nominal Çıkış Torku	Nm	800
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$ Nm	5 Times of Rated Output Torque / 5 x Nominal Çıkış Torku
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$ Nm	2.5 Times of Rated Output Torque / 2,5 x Nominal Çıkış Torku
Inertia Moment / Atalet Momenti	kg.m <sup>2</sup>	$9 \times 10^{-4}$
Rated Output Speed / Nominal Çıkış Devri	rpm	15
Max. Output Speed / Max. Çıkış Devri	rpm	42
Permissible Input Speed / Max. Giriş Devri	rpm	3,000
Backlash Ps / Min. Boşluk Oranı	$J_t$ arcmin	$\leq 1$
Backlash P0 / Azaltılmış Boşluk Oranı	$J_t$ arcmin	$\leq 3$
Backlash P1 / Standart Boşluk Oranı	$J_t$ arcmin	$\leq 5$
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$ N	12,500
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$ N	8,200
Rated Life / Hizmet Ömrü	$L_H$ hr	S5 Cycle Operation: >6,000 (S1 Continuous Operation: >3,000 hrs) S5 Döngüsel Çalışma: >6,000 (S1 Sürekli Çalışma: >3,000 hrs)
Torsional Rigidity / Burulma Direnci	Nm/arcmin	150
Efficiency / Verim	$\eta$ %	$\geq 85$
Synthetic Grease / Sentetik Gres	g	480
Weight / Ağırlık	Kg	19.6

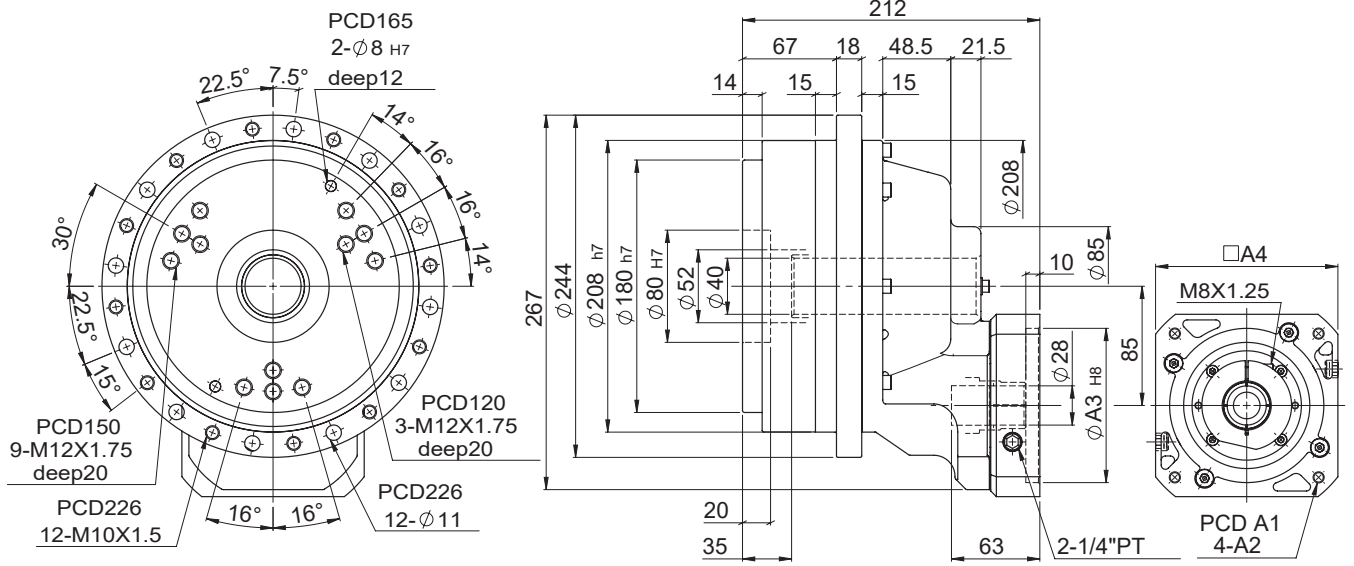
# MODEL : RCM110

RATIO / ÇEVİRİM : 129



Unit / Birim: mm

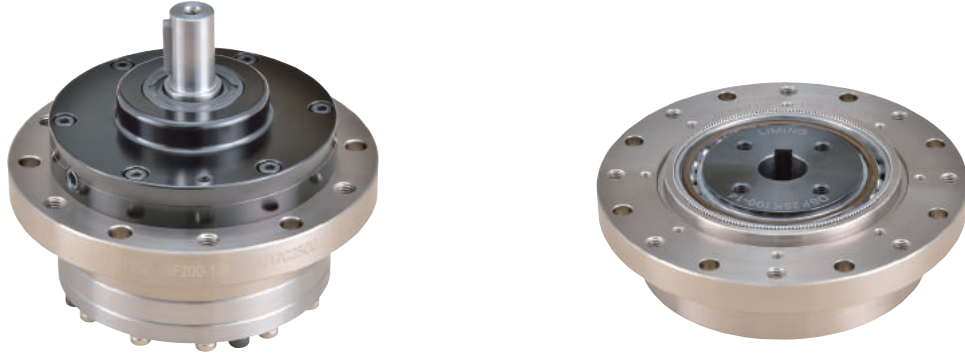
Model Code	RCM110
A1	115 · 145 · 165
A2	M6 · M8 · M10
A3	95 · 110 · 130
A4	122 · 130 · 150



Characteristic / Özellikler	Unit / Birim	RCM110
Output Table Supporting Bearing / Çıkış Tabla Destek Rulmanı		Angular Contact Ball Bearing / Konik Rulman
Rated Output Torque / Nominal Çıkış Torku	Nm	1,100
Max. Output Torque / Max. Çıkış Torku	$T_{2NOT}$ Nm	5 Times of Rated Output Torque / 5 x Nominal Çıkış Torku
Max. Acceleration Torque / Max. İvmelenme Torku	$T_{2B}$ Nm	2.5 Times of Rated Output Torque / 2,5 x Nominal Çıkış Torku
Inertia Moment / Atalet Momenti	kg.m <sup>2</sup>	$15 \times 10^{-4}$
Rated Output Speed / Nominal Çıkış Devri	rpm	15
Max. Output Speed / Max. Çıkış Devri	rpm	35
Permissible Input Speed / Max. Giriş Devri	rpm	3,000
Backlash Ps / Min. Boşluk Oranı	$J_t$ arcmin	$\leq 1$
Backlash P0 / Azaltılmış Boşluk Oranı	$J_t$ arcmin	$\leq 3$
Backlash P1 / Standart Boşluk Oranı	$J_t$ arcmin	$\leq 5$
Max. Radial Force / Max. Radyal Yük	$F_{2rB}$ N	16,000
Max. Axial Force / Max. Aksiyel Yük	$F_{2aB}$ N	12,000
Rated Life / Hizmet Ömrü	$L_H$ hr	S5 Cycle Operation: >6,000 (S1 Continuous Operation: >3,000 hrs) S5 Döngüsel Çalışma: >6,000 (S1 Sürekli Çalışma: >3,000 hrs)
Torsional Rigidity / Burulma Direnci	Nm/arcmin	210
Efficiency / Verim	$\eta$ %	$\geq 85$
Synthetic Grease / Sentetik Gres	g	710
Weight / Ağırlık	Kg	27

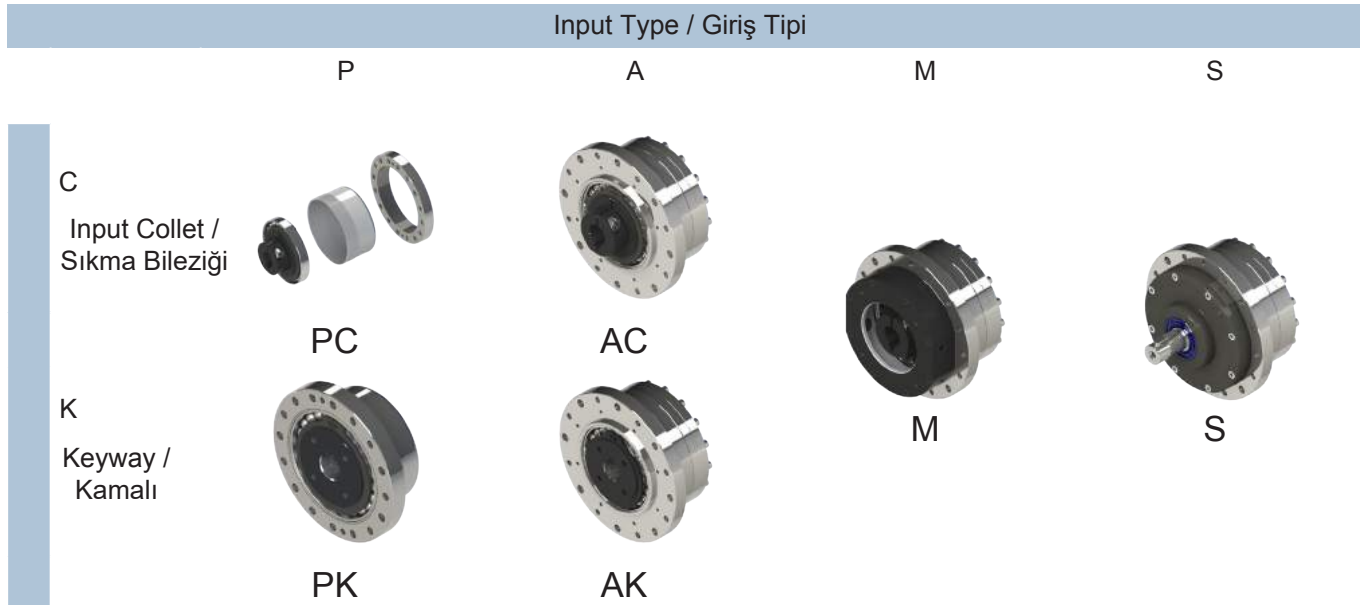


# DSF series / serileri



## Indication of Model Numbers / Model Seçimi

DSF	14	P	C	70	MOTOR
Type	Model	Input / Giriş	Input Style / Motor Bağlantı Şekli	Ratio / Çevrim	Motor Type / Tipi
DSF	14 17 20 25 32	P A M S	C K	1/50 ~ 1/120	Motor Brand & Model No. / Motor Markası & Modeli

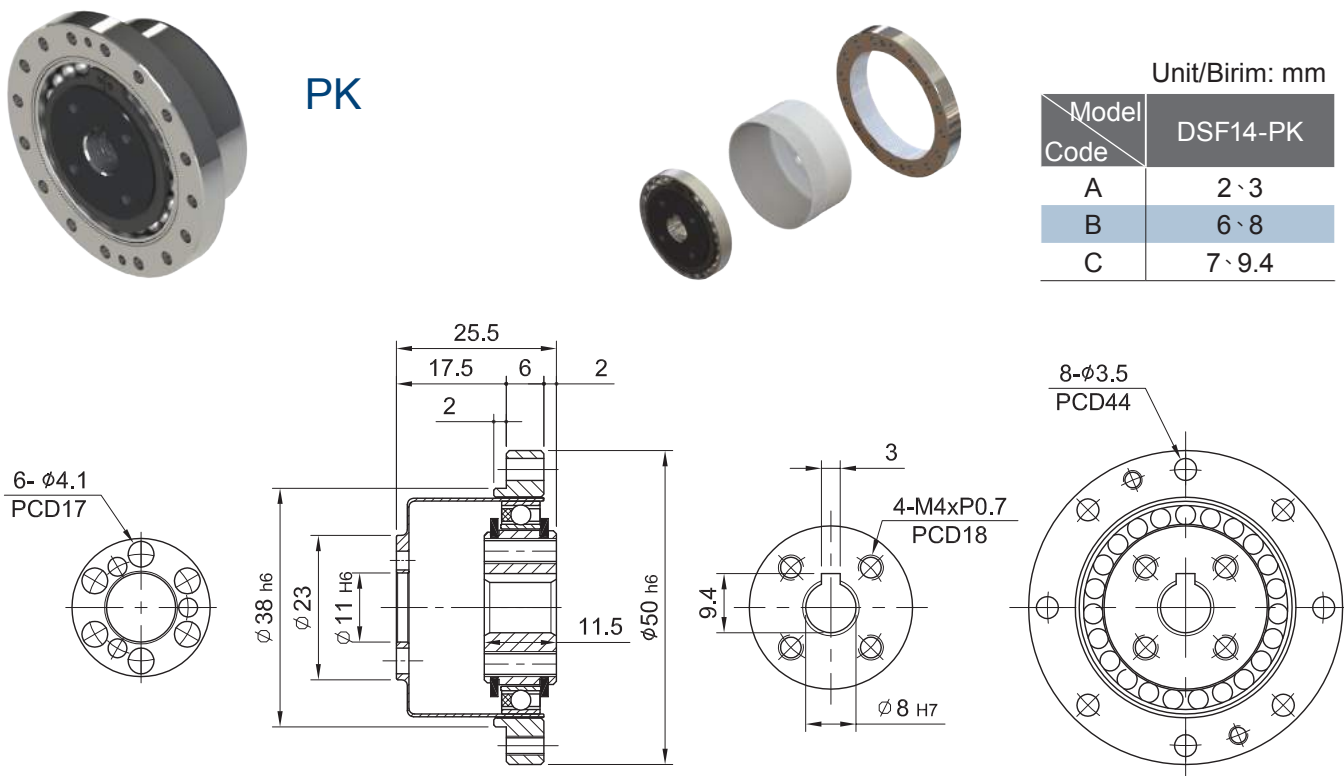
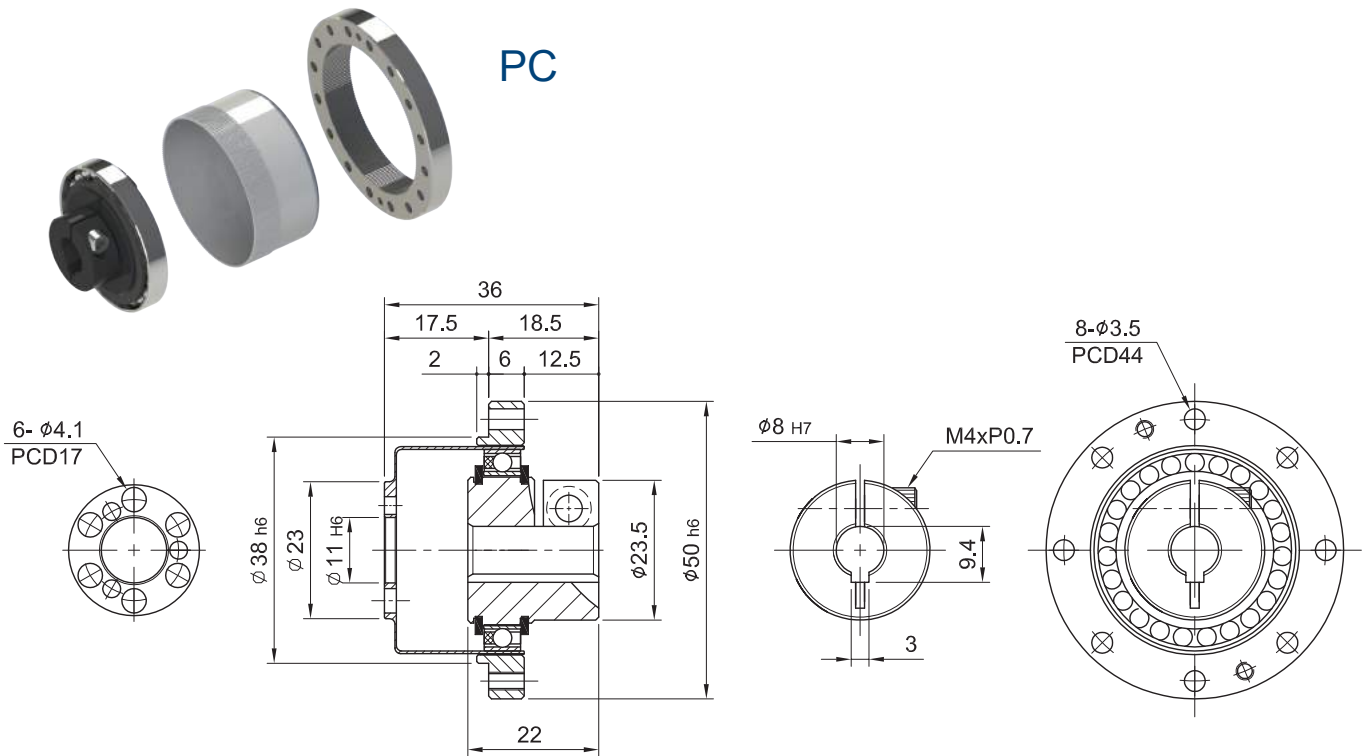


# DSF Series / Serileri

Model No.	Unit / Birim	Ratio / Çevrim	14	17	20	25	32
Nominal Output Torque / Nominal Çıkış Torku	Nm	50	7	21	32	51	98
		80	9	28	44	82	157
		100	9	31	52	87	176
		120	9	31	52	87	176
Max. Output Torque / Max. Çıkış Torku	Nm	50~120	2.5 Times of Rated Output Torque / 2,5 x Nominal çıkış Torku				
Emergency Stop Torque / Acil Durdurma Torku	Nm	50~120	3.5 Times of Rated Output Torque / 3,5 x Nominal Çıkış Torku				
Nominal Input Speed / Nominal Giriş Devri	rpm	50~120	3,000	3,000	3,000	3,000	3,000
Backlash / Boşluk Oranı	arcsec	50~120	≤ 20				
No-Load Torque / Yüksüz Moment	Nm	50~120	0.1	0.1	0.2	0.31	0.56
Reducer Inertia / Atalet	Ix10-4kgm <sup>2</sup>	50~100	0.049	0.079	0.193	0.413	1.69
		Jx10-5kgm <sup>2</sup>	100~120	0.040	0.081	0.197	0.421
Torsional Rigidity / Burulma Direnci	Nm / arcmin	50~120	0.02	0.04	0.067	0.13	0.29
Max. Radial Force / Max. Radyal Yük	N	50~120	1416	2361	2626	4331	6732
Max. Axial Force / Max. Aksiyel Yük	N	50~120	708	1180	1313	2165	3366
Service Life / Hizmet Ömrü	hr	50~120	>10,000				
Operating Temperature / Çalışma Sıcaklığı	°C	50~120	Environment / Çevre -10°C ~ +70°C / Max. Temperature / Sıcaklık 90°C				
Lubrication / Yağlama		50~100	Synthetic Grease / Sentetik Gres No.2				
Noise Level / Ses Seviyesi	dB	50~120	52	52	53	55	60
Weight / Ağırlık	Kg	50~120					

# MODEL : DSF14

RATIO / ÇEVİRİM : 50.80.100.120

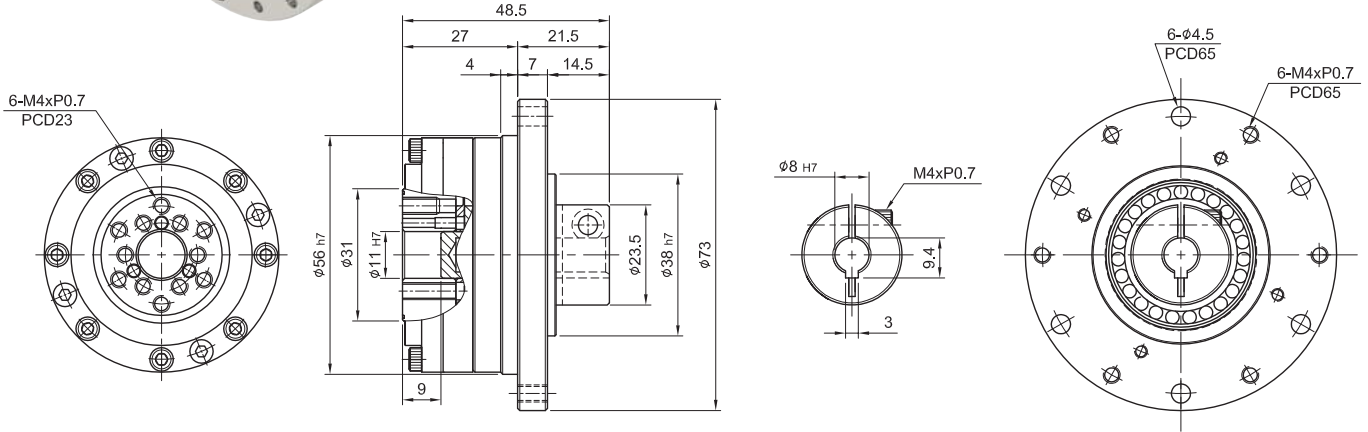


# MODEL : DSF14

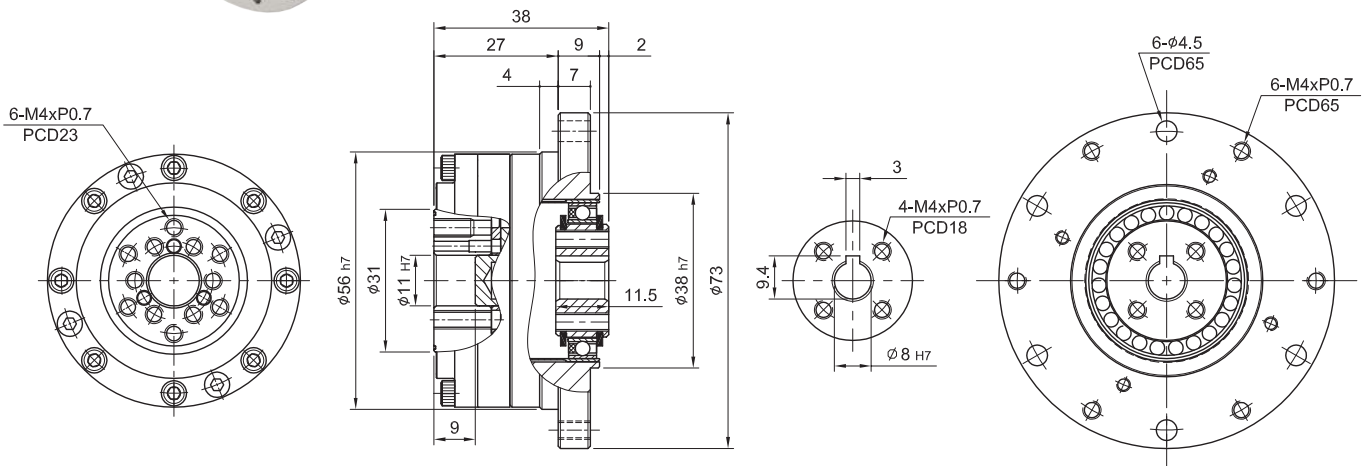
RATIO / ÇEVİRİM : 50.80.100.120



AC



AK



Unit/Birim: mm

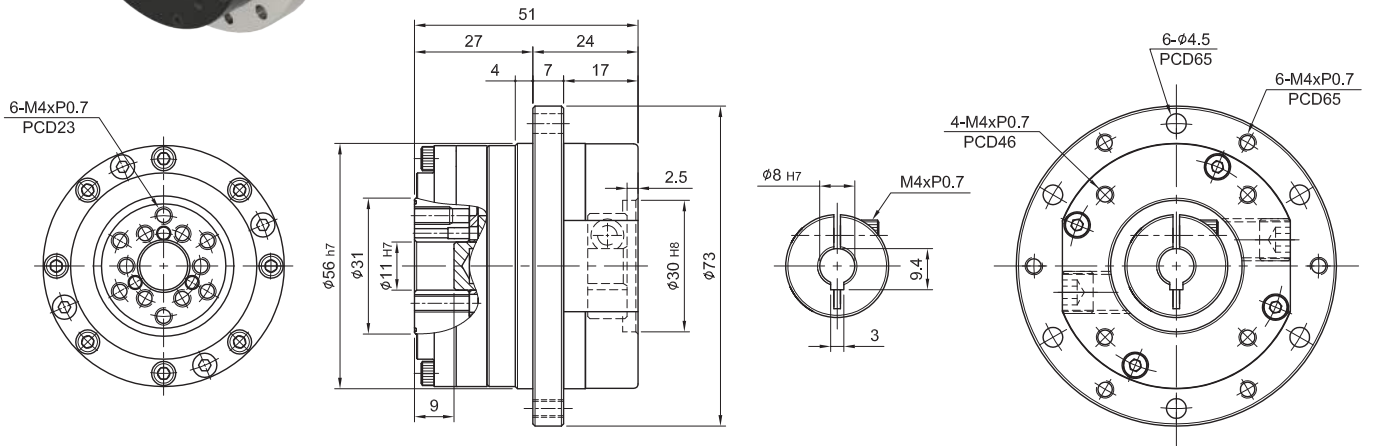
Model Code	DSF14-AK
A	2 - 3
B	6 - 8
C	7 - 9.4

# MODEL : DSF14

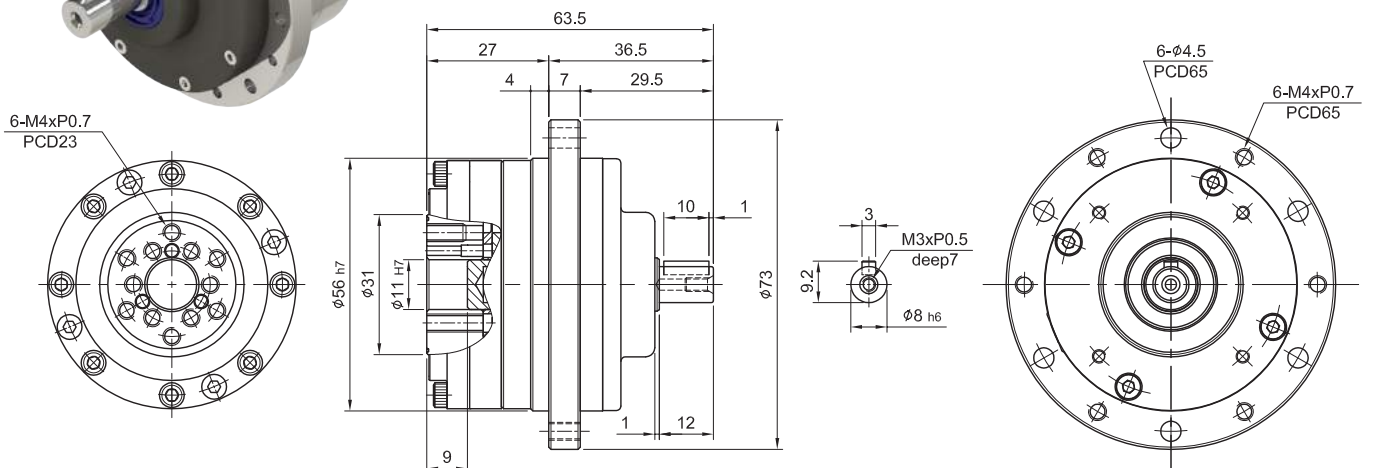
RATIO / ÇEVİRİM : 50.80.100.120



M

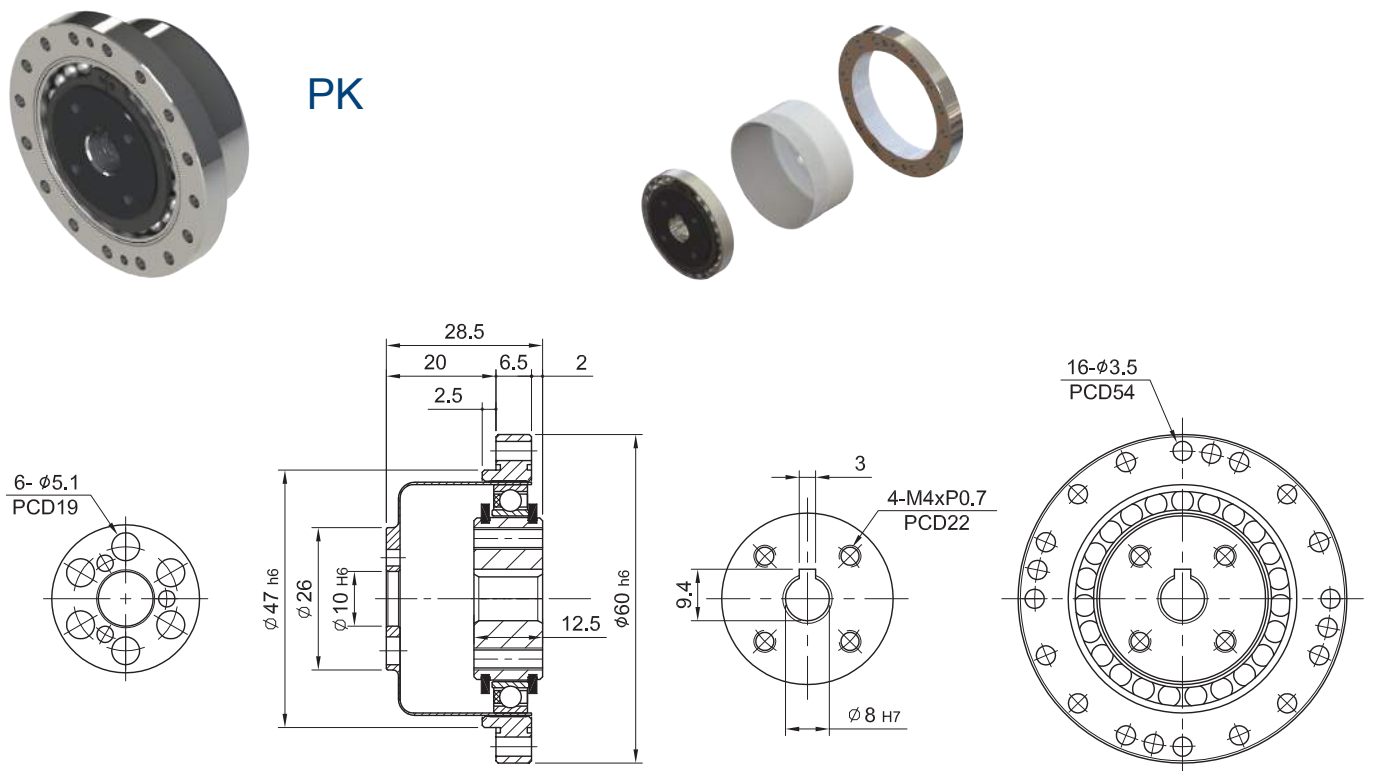
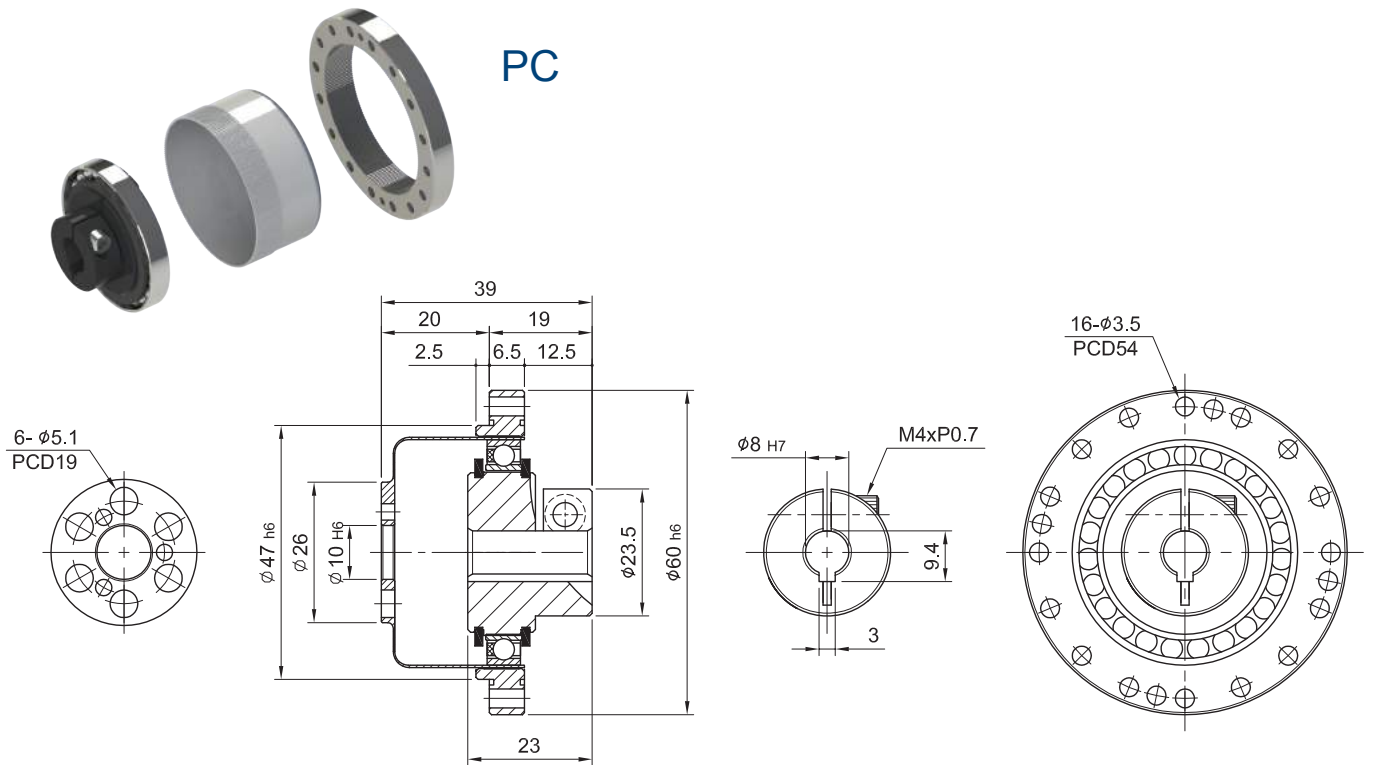


S



# MODEL : DSF17

RATIO / ÇEVİRİM : 50.80.100.120

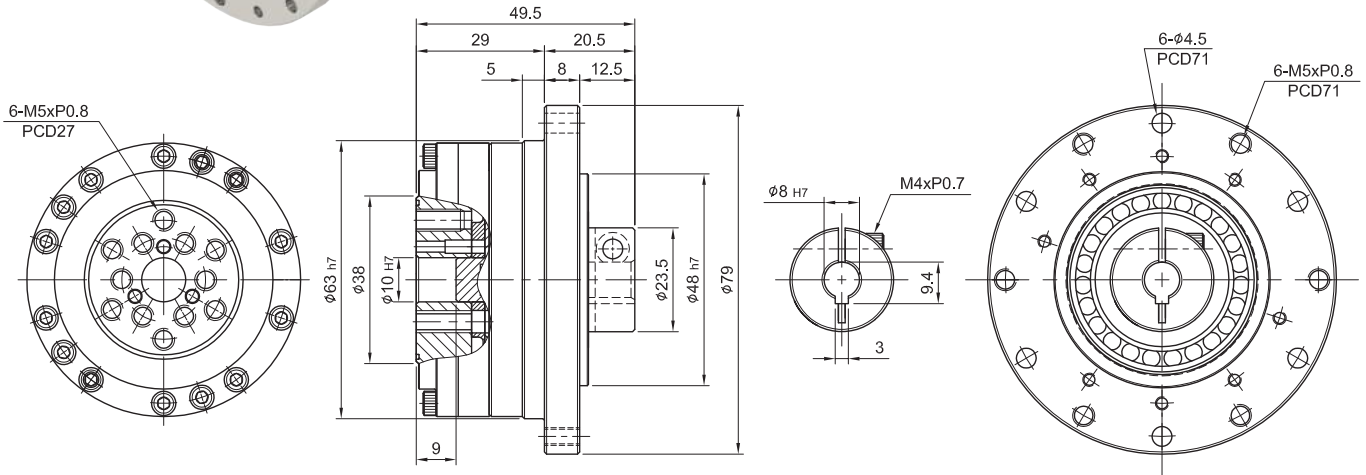


# MODEL : DSF17

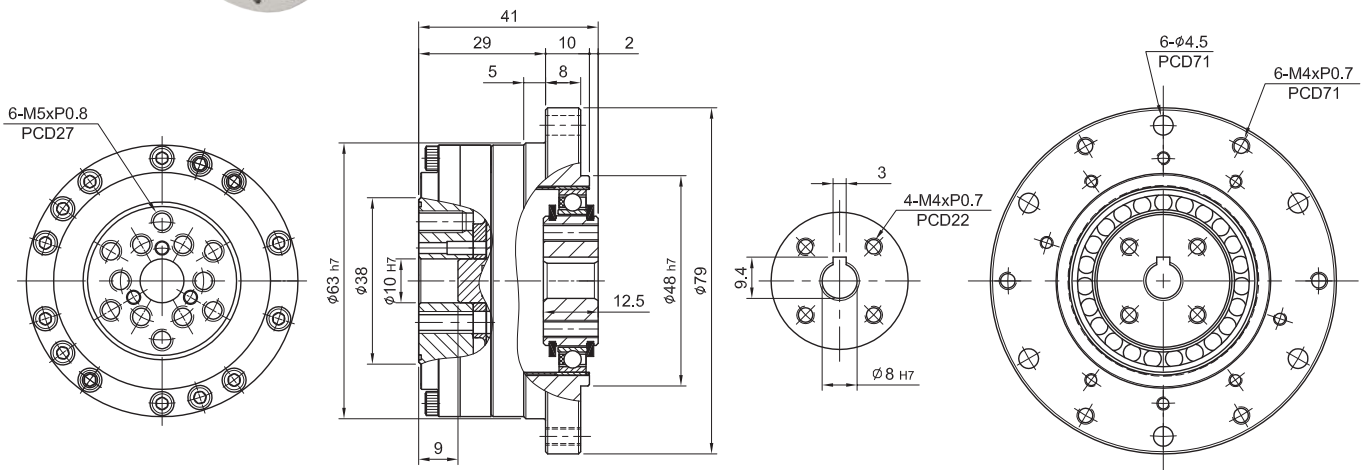
RATIO / ÇEVİRİM : 50.80.100.120



AC



AK

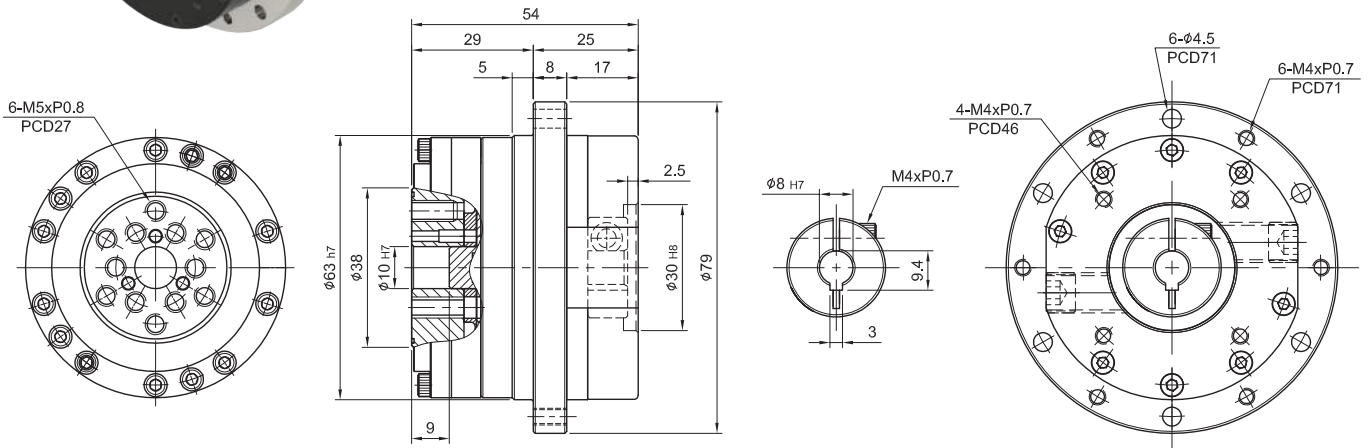


# MODEL : DSF17

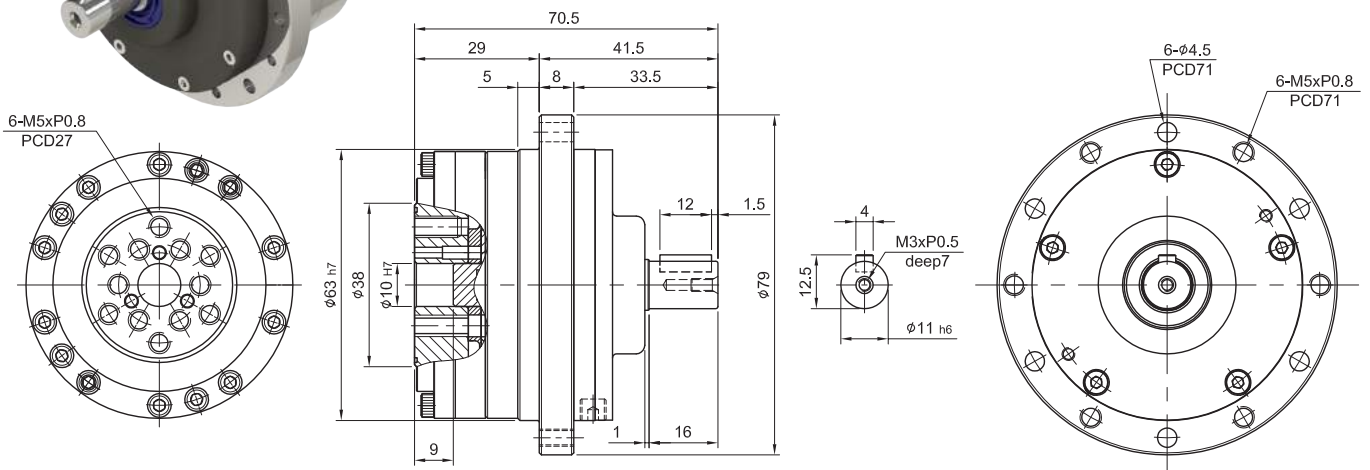
RATIO / ÇEVİRİM : 50.80.100.120



M



S

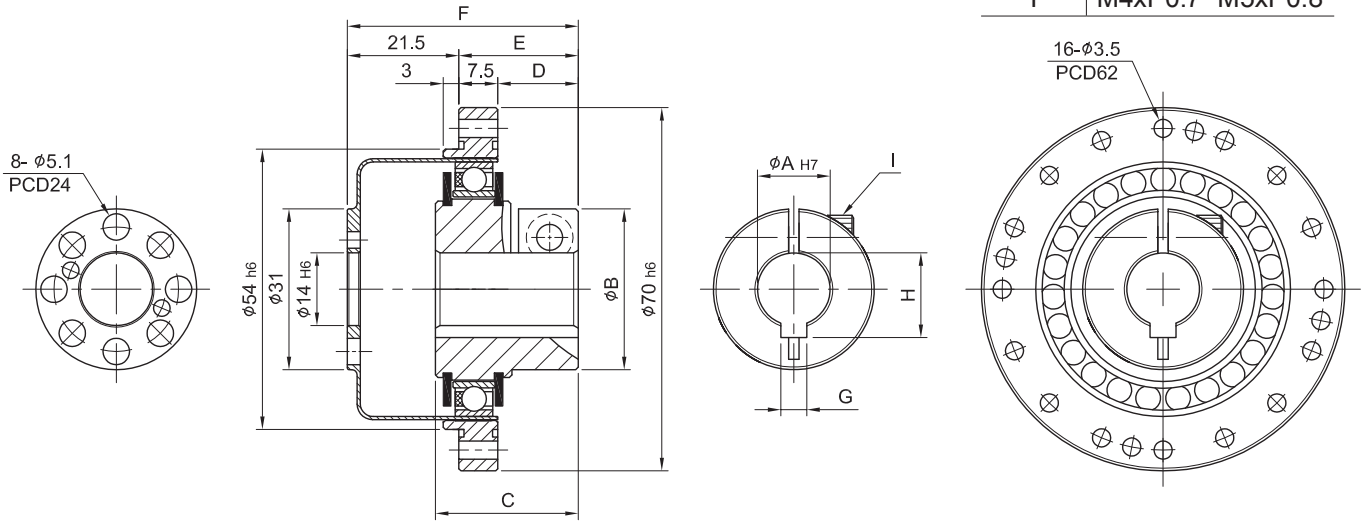


# MODEL : DSF20

RATIO / ÇEVİRİM : 50.80.100.120



PC

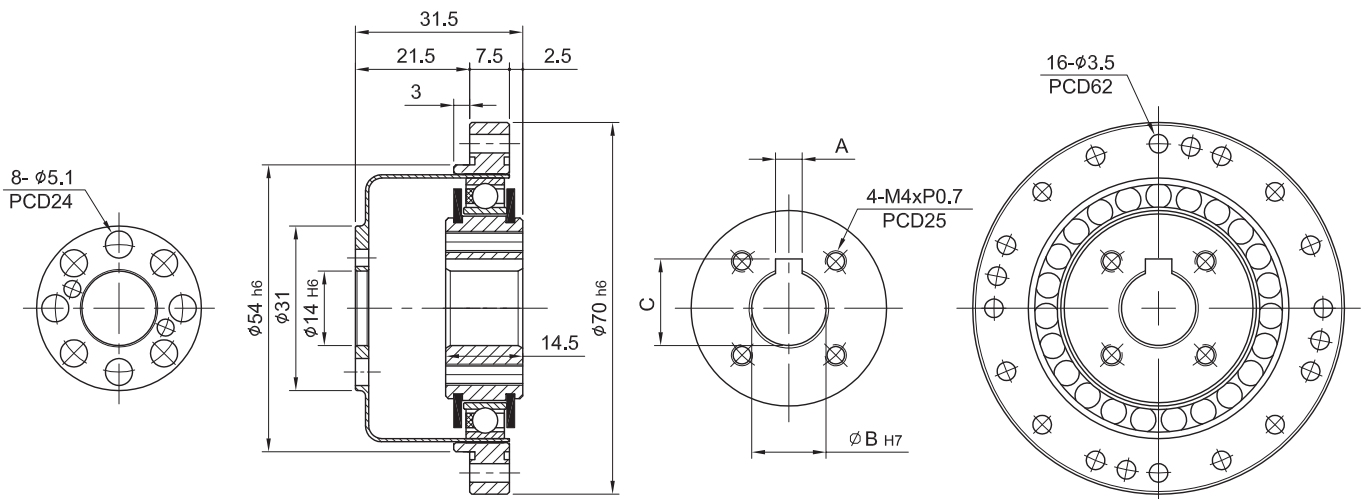


Unit/Birim: mm

Model Code	DSF20-PC
A	8 · 14
B	23.5 · 31
C	23.5 · 27.5
D	13.5 · 15.5
E	21 · 23
F	42.5 · 44.5
G	3 · 5
H	9.4 · 16.3
I	M4xP0.7 · M5xP0.8



PK



Unit/Birim: mm

Model Code	DSF20-PK
A	3 · 5
B	8 · 14
C	9.4 · 16.3

# MODEL : DSF20

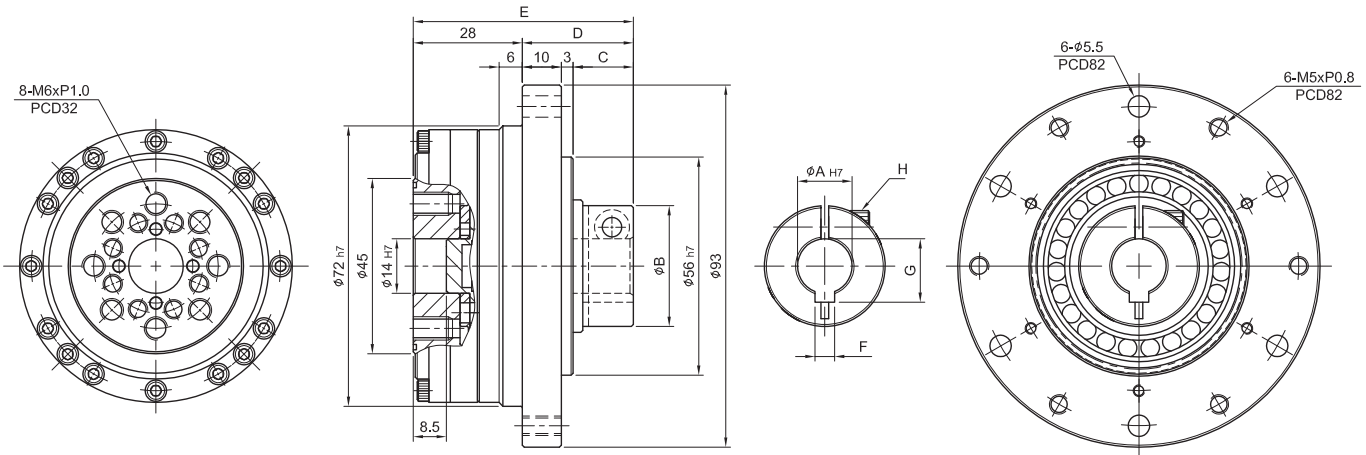
RATIO / ÇEVİRİM : 50.80.100.120



AC

Unit/Birim: mm

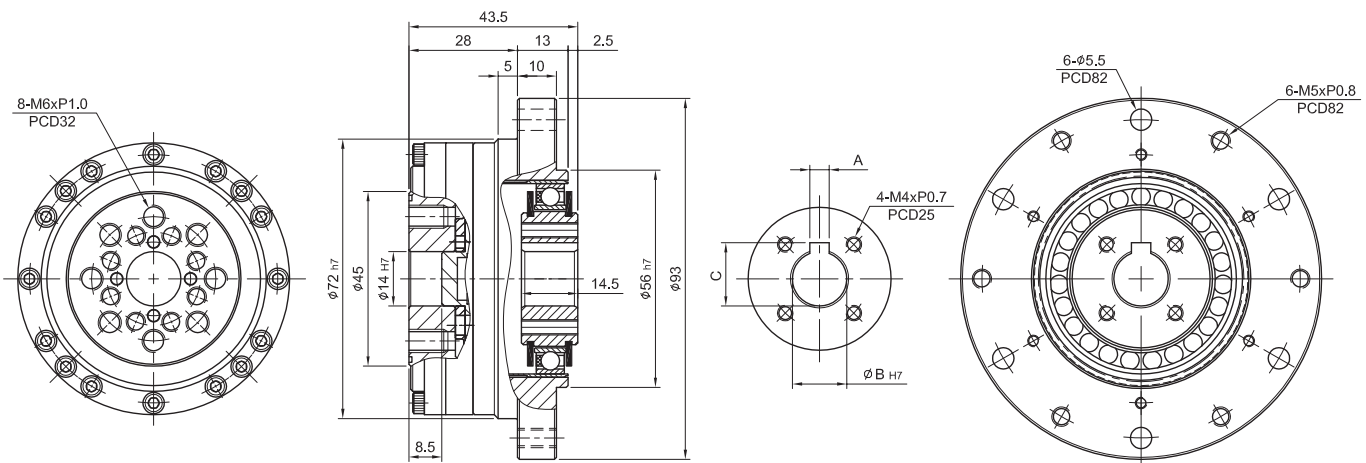
Model Code	DSF20-AC
A	8 · 14
B	23.5 · 31
C	13.5 · 15.5
D	26.5 · 28.5
E	54.5 · 56.5
F	3 · 5
G	9.4 · 16.3
H	M4xP0.7 · M5xP0.8



AK

Unit/Birim: mm

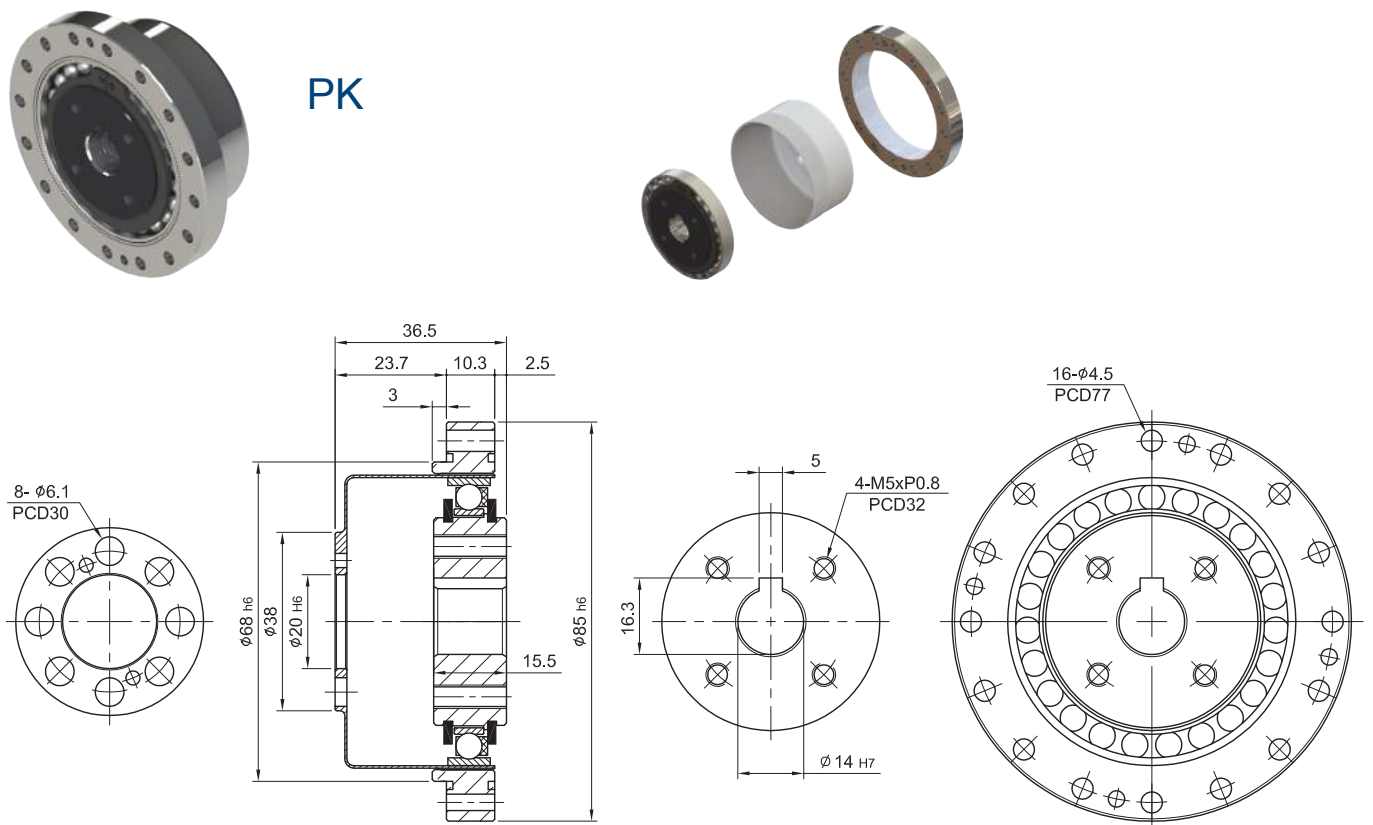
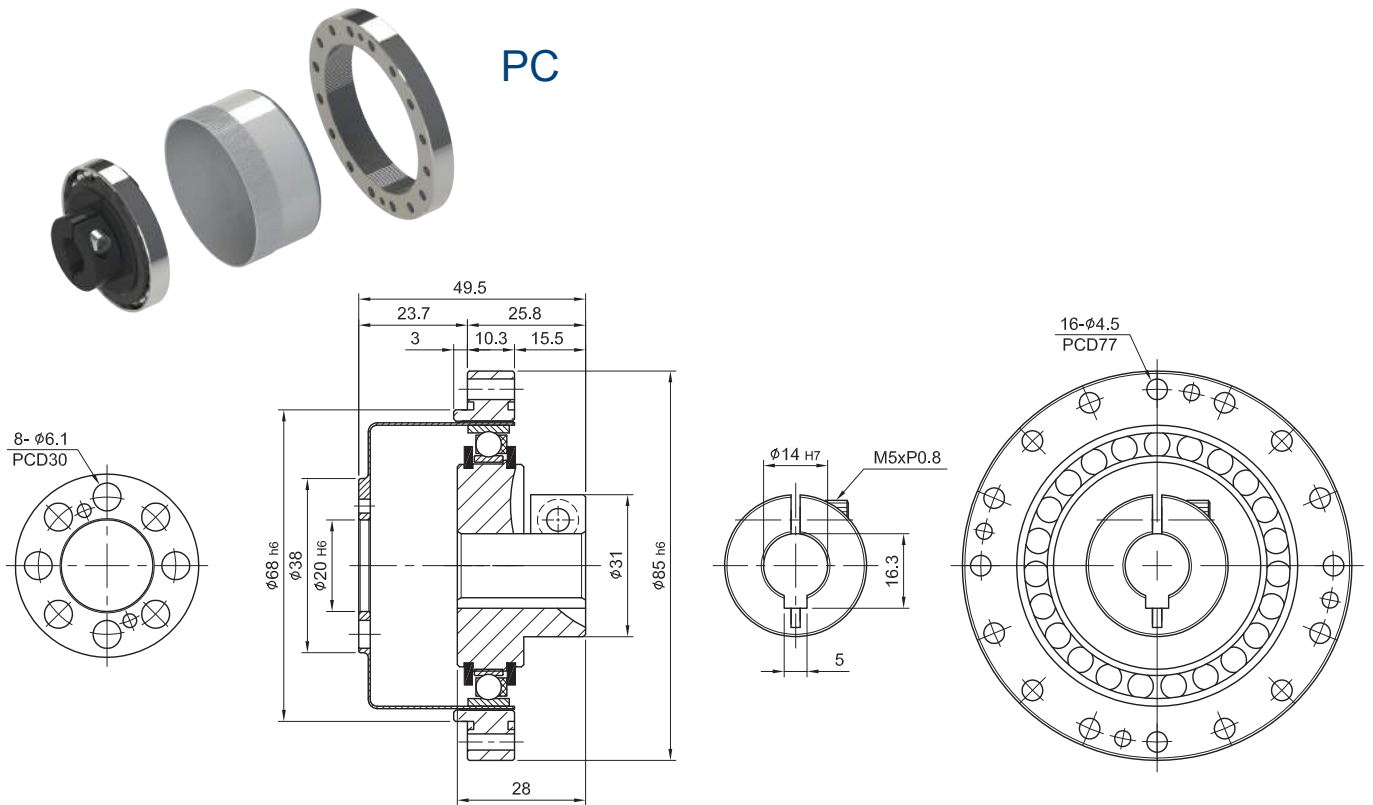
Model Code	DSF20-AK
A	3 · 5
B	8 · 14
C	9.4 · 16.3





# MODEL : DSF25

RATIO / ÇEVİRİM : 50.80.100.120

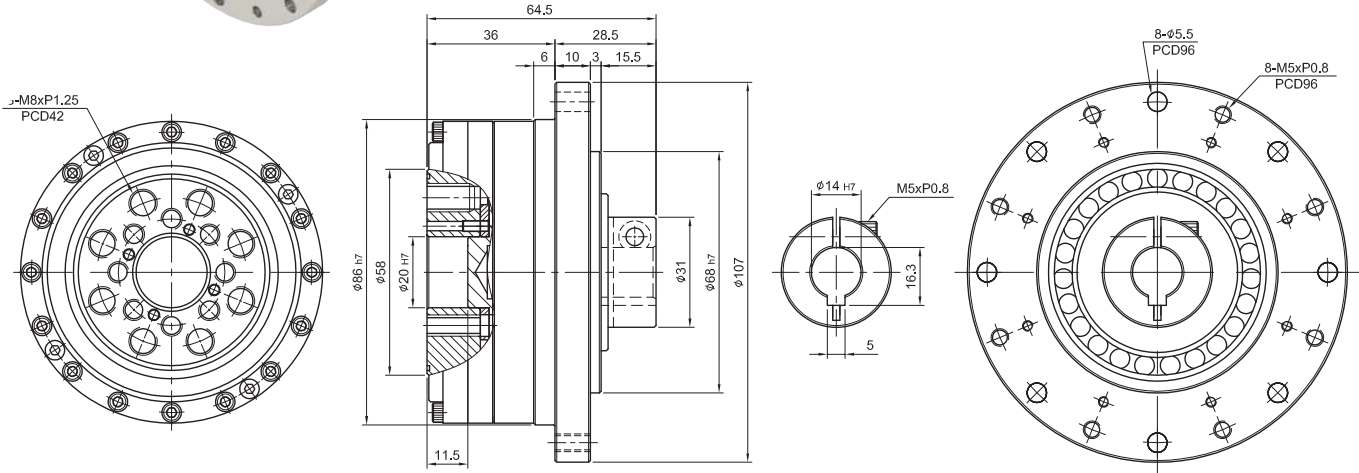


# MODEL : DSF25

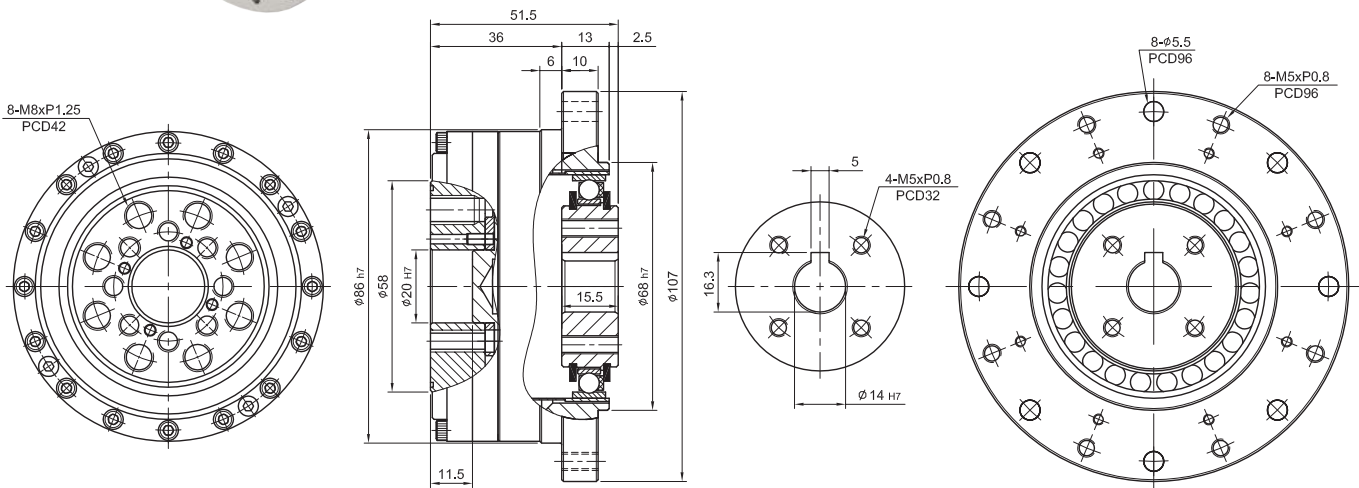
RATIO / ÇEVİRİM : 50.80.100.120



AC



AK

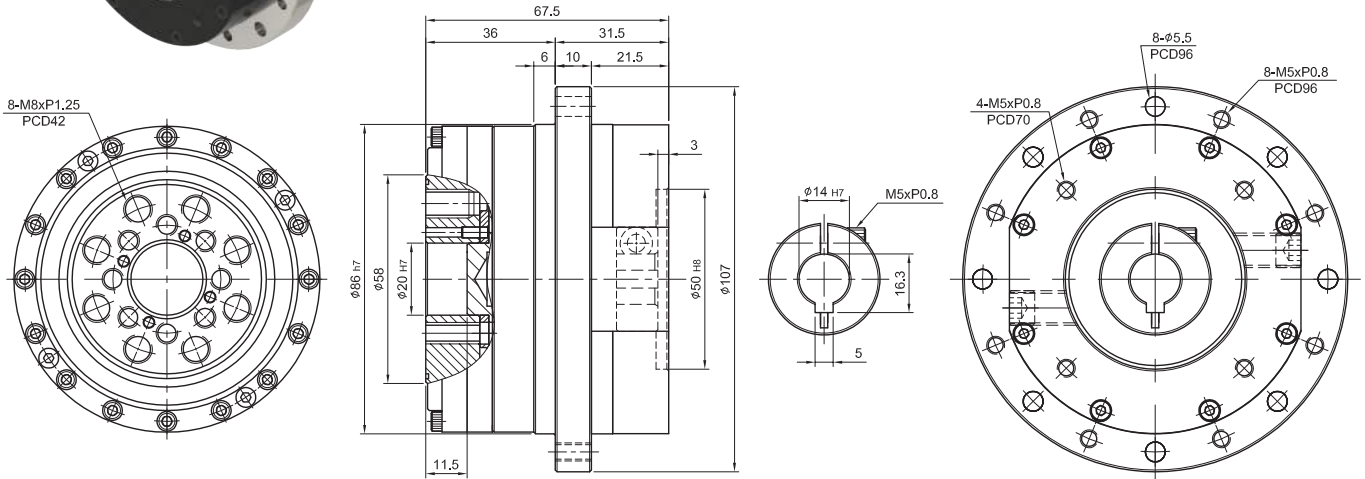


# MODEL : DSF25

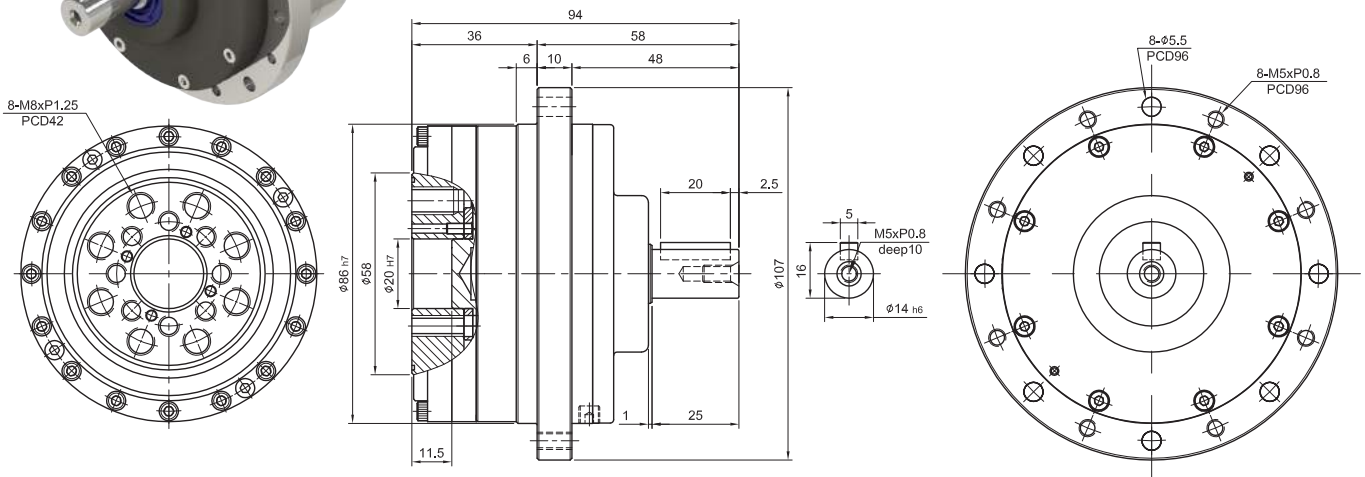
RATIO / ÇEVİRİM : 50.80.100.120



M

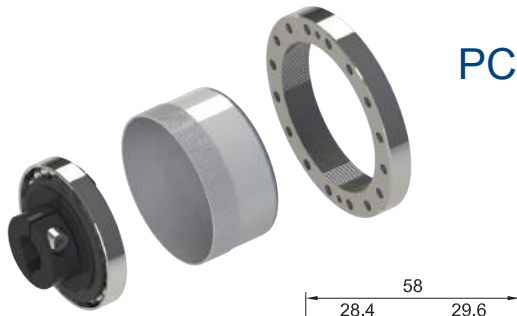


S



# MODEL : DSF32

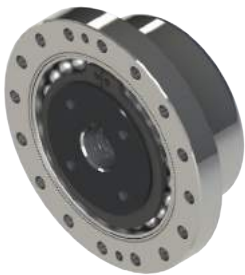
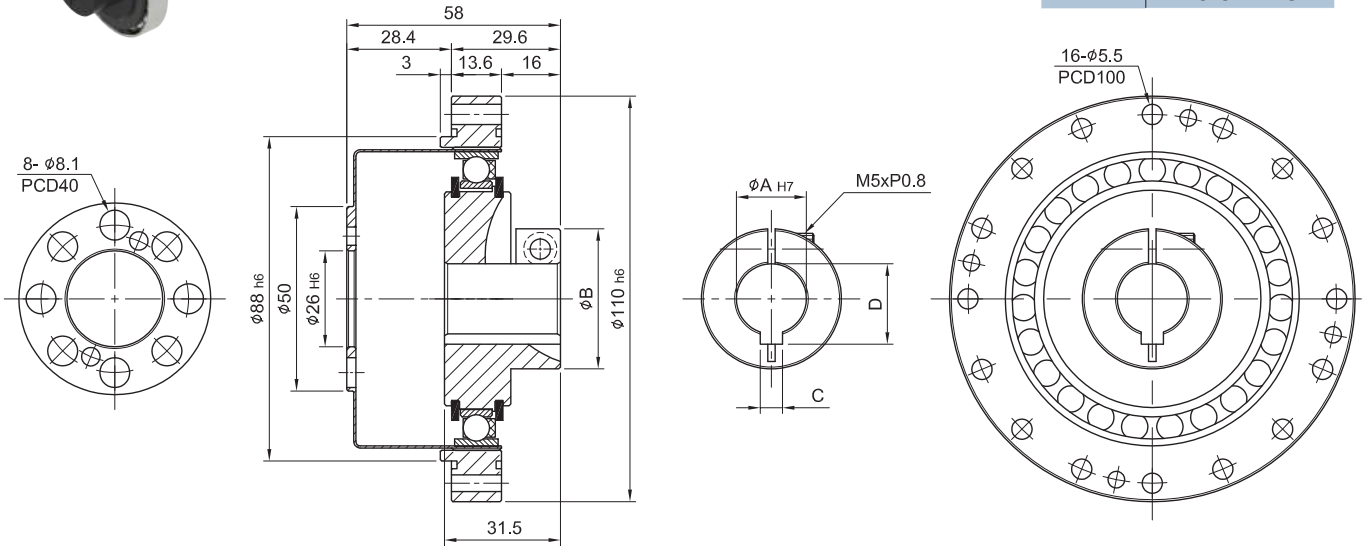
RATIO / ÇEVİRİM : 50.80.100.120



PC

Unit/Birim: mm

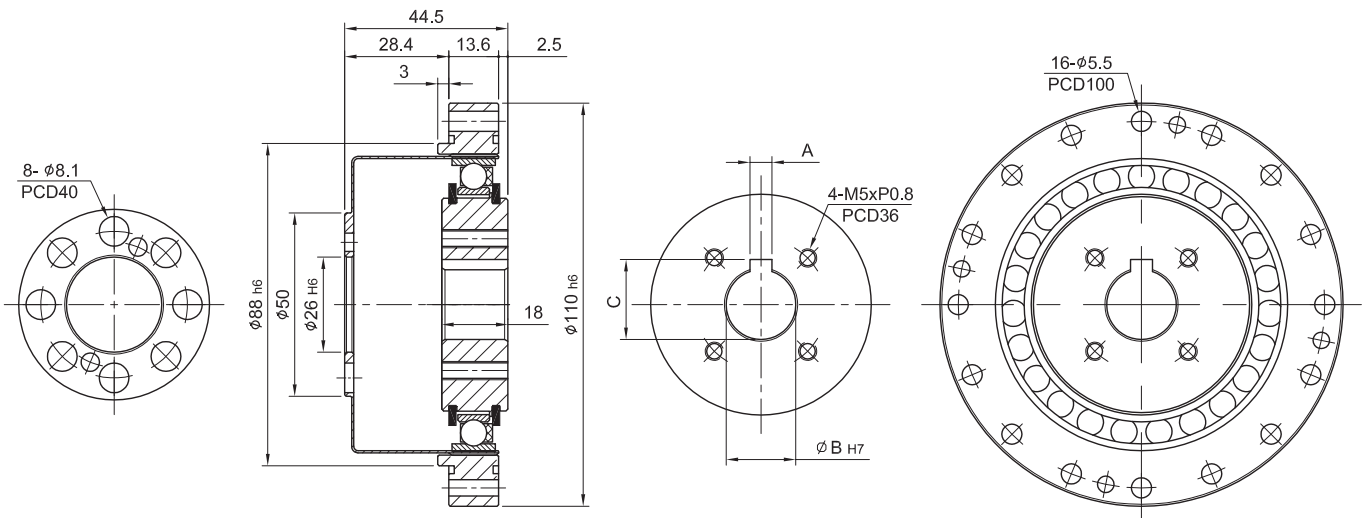
Model Code	DSF32-PC
A	14 · 19
B	34 · 38
C	5 · 6
D	16.3 · 21.8



PK

Unit/Birim: mm

Model Code	DSF32-PK
A	5 · 6
B	14 · 19
C	16.3 · 21.8



# MODEL : DSF32

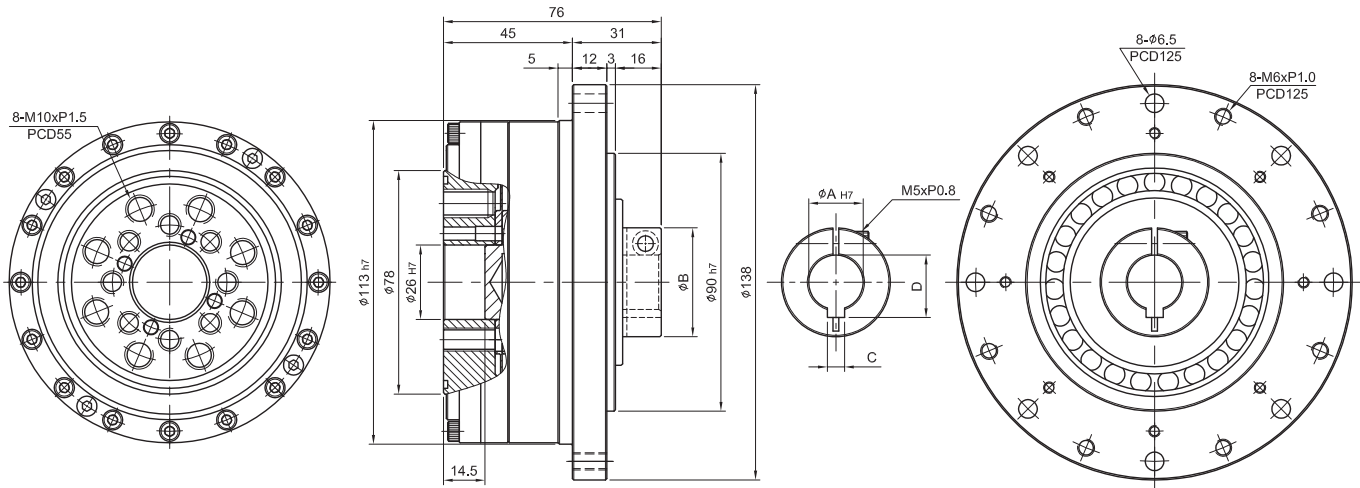
RATIO / ÇEVİRİM : 50.80.100.120



AC

Unit/Birim: mm

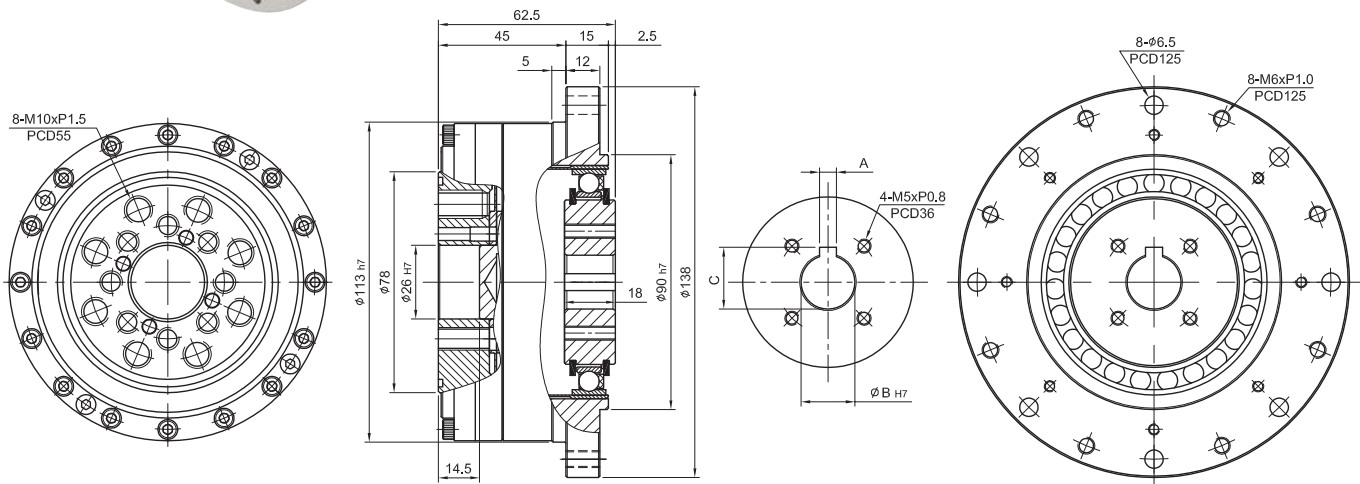
Model Code	DSF32-AC
A	14 · 19
B	34 · 38
C	5 · 6
D	16.3 · 21.8



AK

Unit/Birim: mm

Model Code	DSF32-AK
A	5 · 6
B	14 · 19
C	16.3 · 21.8



# MODEL : DSF32

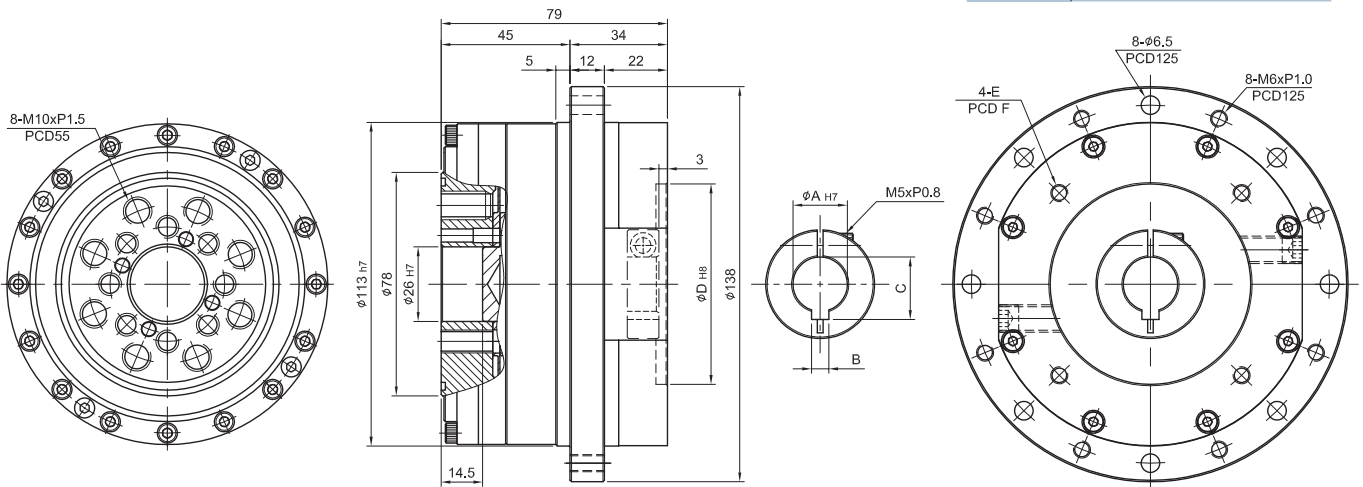
RATIO / ÇEVİRİM : 50.80.100.120



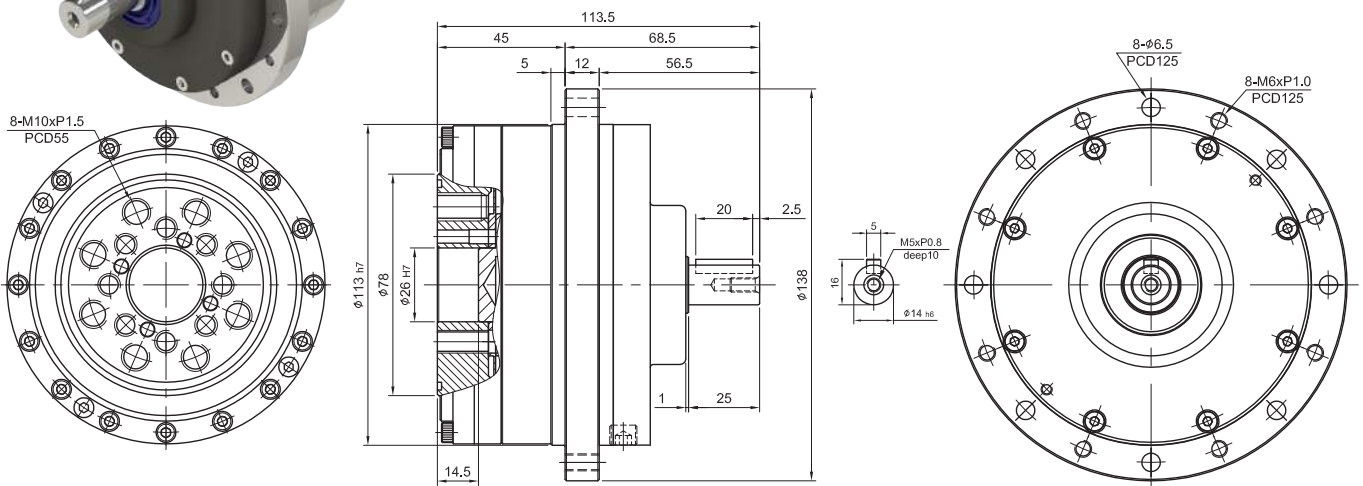
M

Unit/Birim: mm

Model Code	DSF32-M
A	14 · 19
B	5 · 6
C	16.3 · 21.8
D	50 · 70
E	M5xP0.8 · M6xP1.0
F	70 · 90



S



# DHF series / serileri



## Indication of Model Numbers / Model Seçimi

DHF	17	A	C	100	MOTOR
Type	Model	Input / Giriş	Input Style / Motor Bağlantı Şekli	Ratio / Çevrim	Motor Type / Tipi
DHF	17 20 25 32 40 45	A O S	C K O	1/50 ~ 1/120	Motor Brand & Model No. / Motor Markası & Modeli

### Input Type / Giriş

A

O

S

C

Input Collet / Sıkma Bileziği



AC

K

Keyway / Kamalı



AK

O

Hollow Input Shaft / Delik Milli



AO



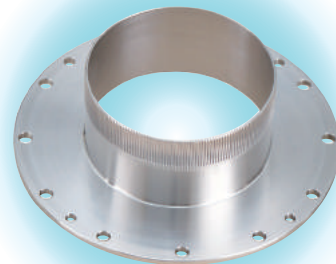
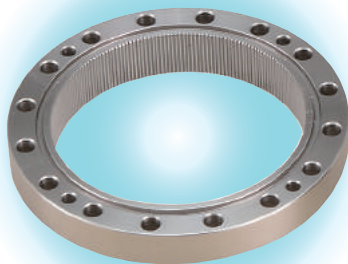
O



S

# DHF series / serileri

Model No.	Unit / Birim	Ratio / Çevrim	17	20	25	32	40
Nominal Output Torque / Nominal Çıkış Torku	Nm	50	21	32	51	98	176
		80	28	44	82	157	265
		100	31	52	87	176	343
		120	31	52	87	176	382
Max. Output Torque / Max. Çıkış Torku	Nm	50~120	2.5 Times of Rated Output Torque / 2,5 x Nominal çıkış Torku				
Emergency Stop Torque / Acil Durdurma Torku	Nm	50~120	3.5 Times of Rated Output Torque / 3,5 x Nominal Çıkış Torku				
Nominal Input Speed / Nominal Giriş Devri	rpm	50~120	3,500	3,500	3,500	3,500	3,000
Backlash / Boşluk Oranı	arcsec	50~120	≤ 20				
No-Load Torque / Yüksüz Moment	Nm	50~120	2.7/0.26	4.7/0.46	8/0.79	16/1.58	32/3.16
Reducer Inertia / Atalet	Ix10-4kgm <sup>2</sup>	50~100	0.054	0.090	0.282	1.09	2.85
		Jx10-5kgm <sup>2</sup>	100~120	0.055	0.092	0.288	1.11
Torsional Rigidity / Burulma Direnci	Nm / arcmin	50~120	0.045	0.067	0.13	0.29	0.53
Max. Radial Force / Max. Radyal Yük	N	50~120	3136	6732	9496	11828	15758
Max. Axial Force / Max. Aksiyel Yük	N	50~120	1568	3366	4748	5914	7879
Service Life / Hizmet Ömrü	hr	50~120	>10,000				
Operating Temperature / Çalışma Sıcaklığı	°C	50~120	Environment / Çevre -10°C ~ +70°C / Max.Temperature / Sıcaklık 90°C				
Lubrication / Yağlama		50~100	Synthetic Grease / Sentetik Gres No.2				
Noise Level / Ses Seviyesi	dB	50~120	52	53	55	60	63
Weight / Ağırlık	Kg	50~120					

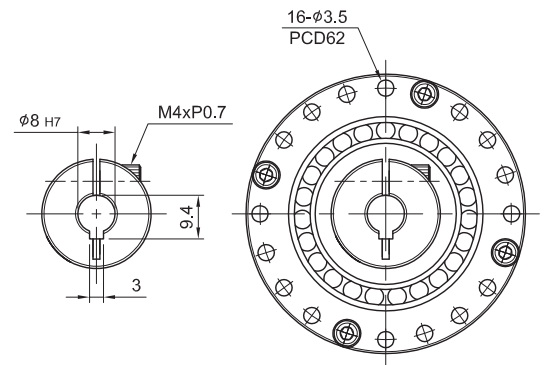
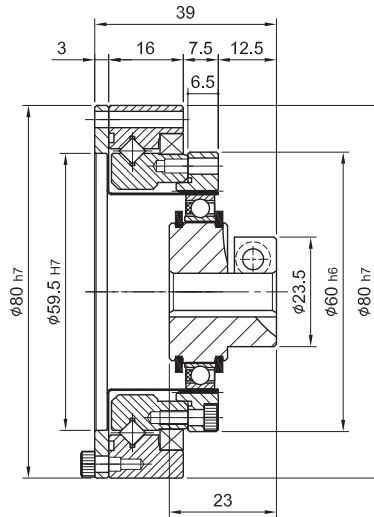
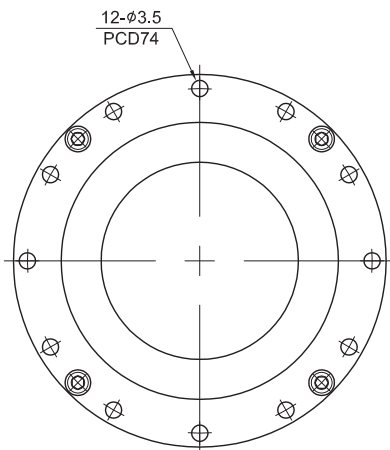
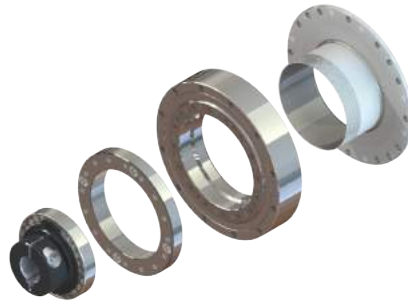


# MODEL : DHF17

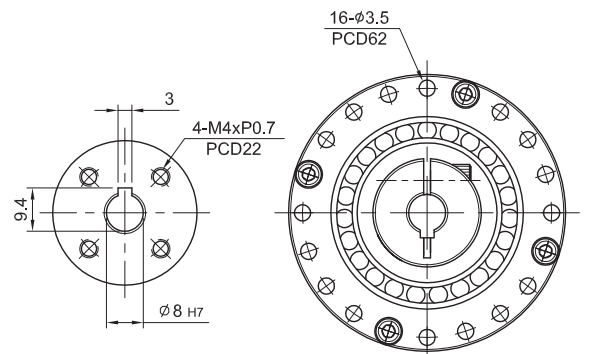
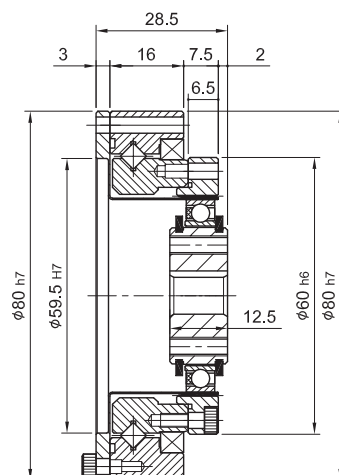
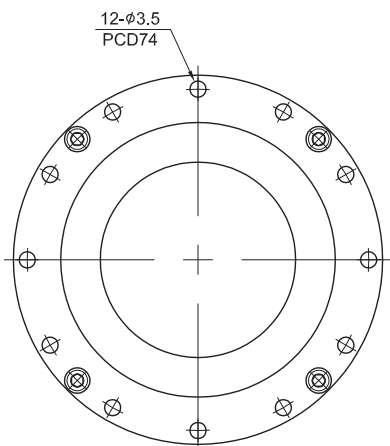
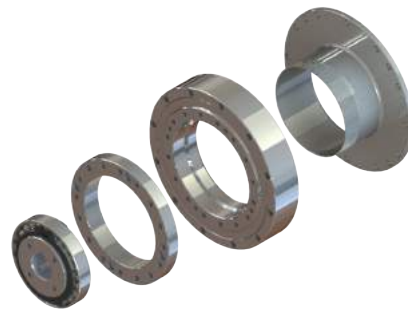
RATIO / ÇEVİRİM : 50.80.100.120



AC



AK

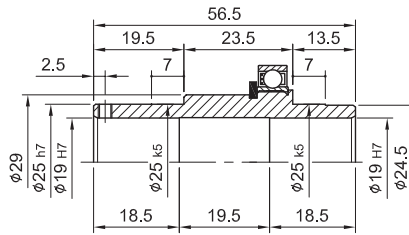
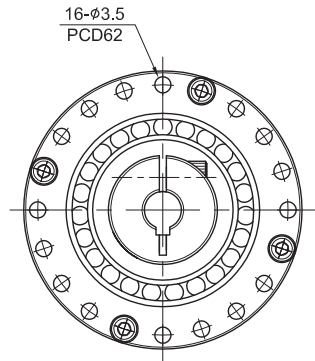
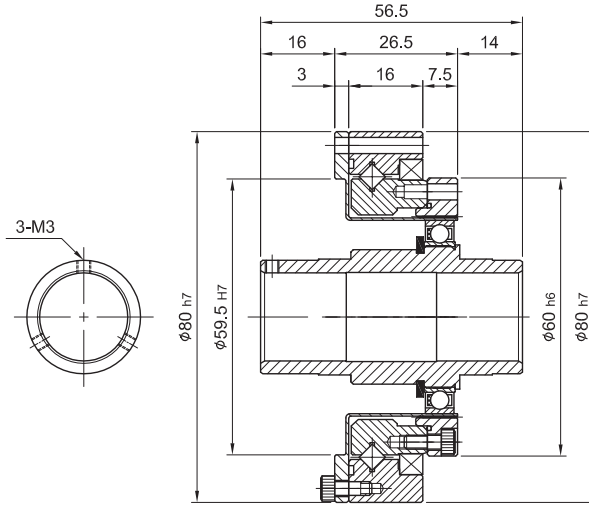
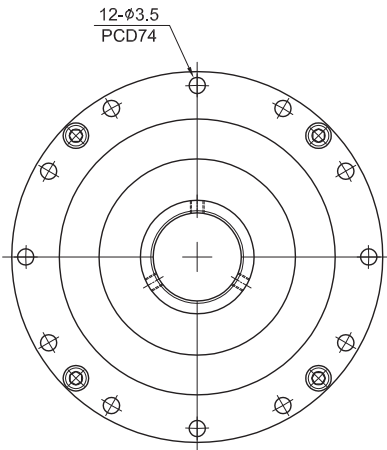


# MODEL : DHF17

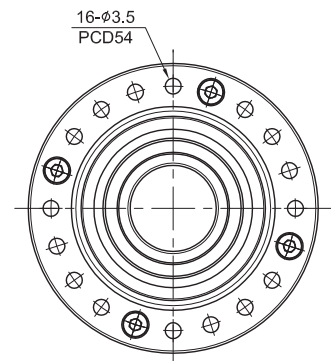
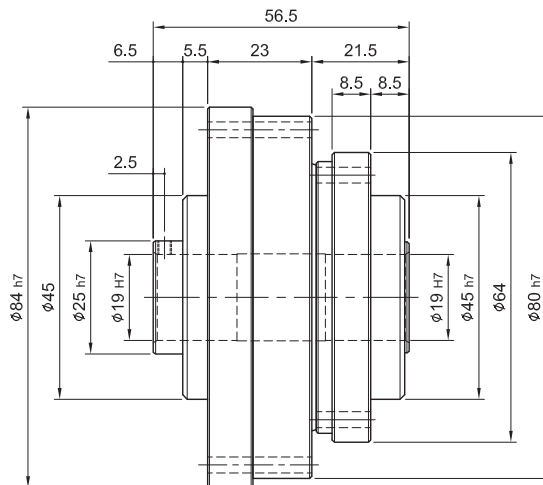
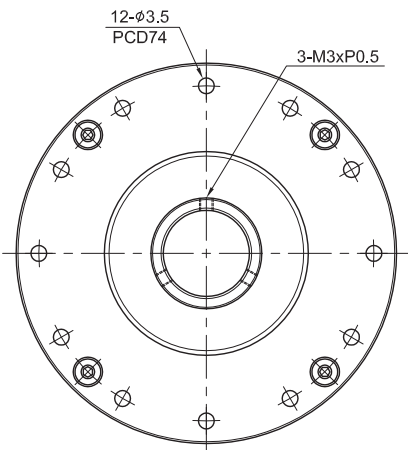
RATIO / ÇEVİRİM : 50.80.100.120



AO



O

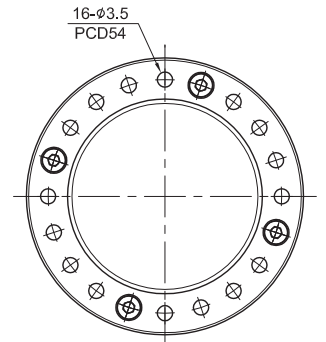
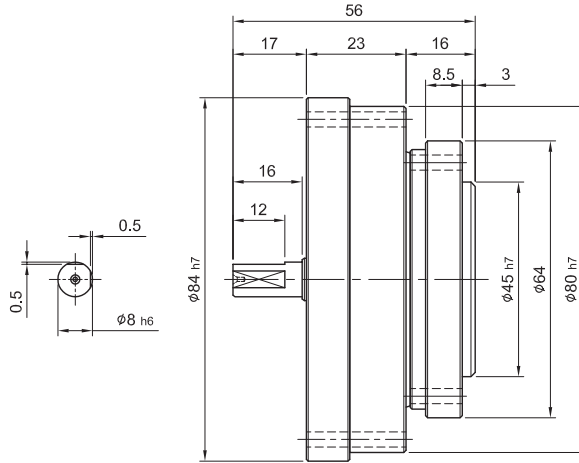
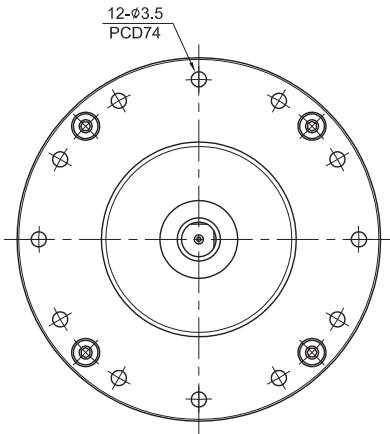


# MODEL : DHF17

RATIO / ÇEVİRİM : 50.80.100.120



S

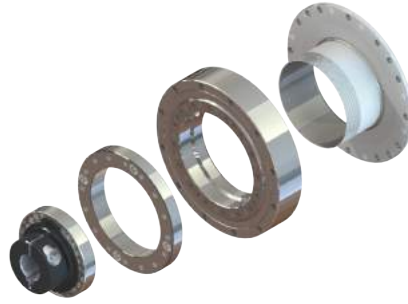


# MODEL : DHF20

RATIO / ÇEVİRİM : 50.80.100.120

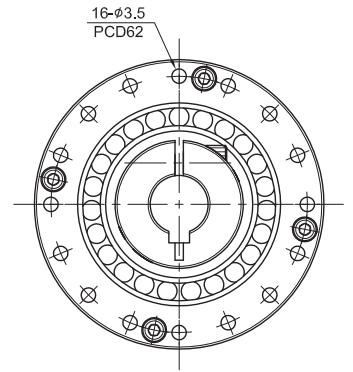
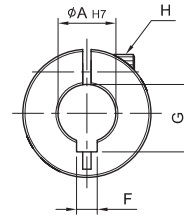
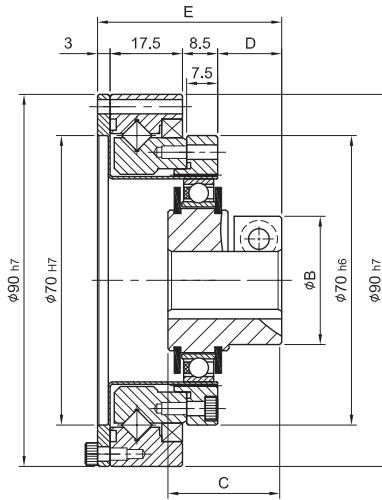
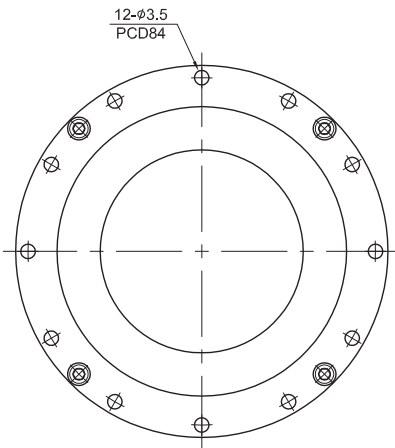


AC



Unit/Birim: mm

Model Code	DHF20-AC
A	8 · 14
B	23.5 · 31
C	25.5 · 27.5
D	13.5 · 15.5
E	42.5 · 44.5
F	3 · 5
G	9.4 · 16.3
H	M4xP0.7 · M5xP0.8

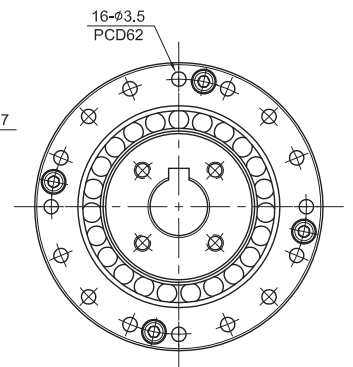
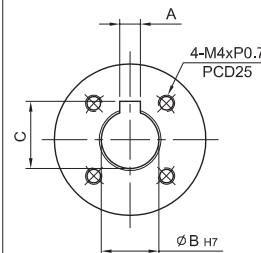
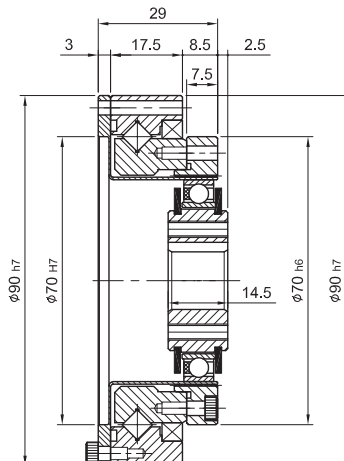
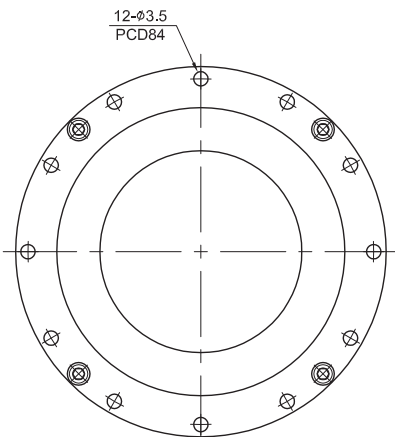


AK



Unit/Birim: mm

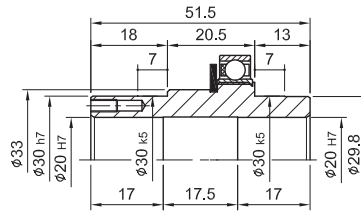
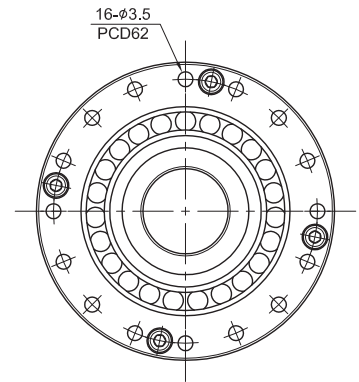
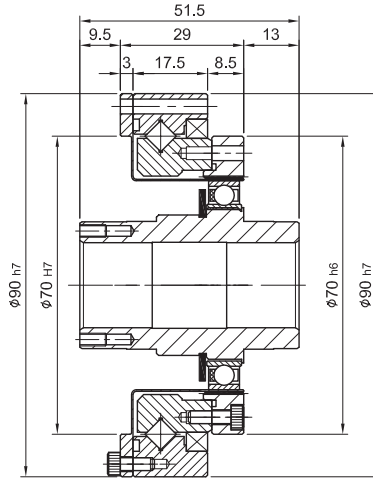
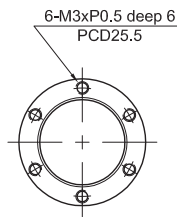
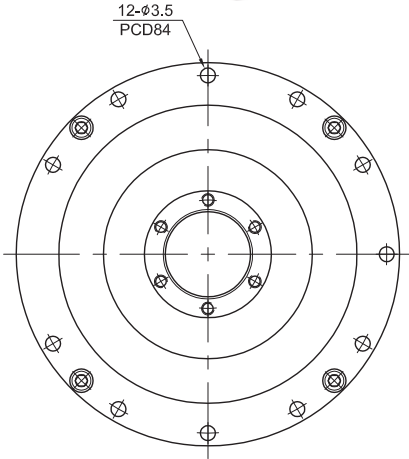
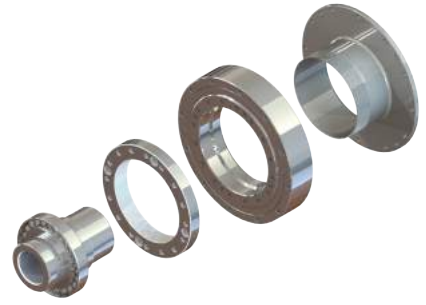
Model Code	DHF20-AK
A	3 · 5
B	8 · 14
C	9.4 · 16.3



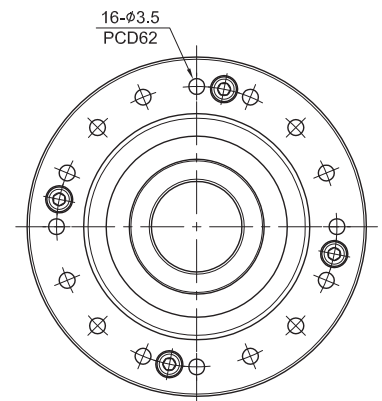
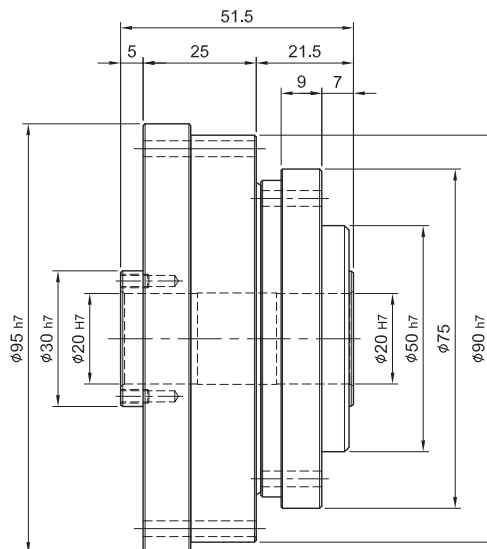
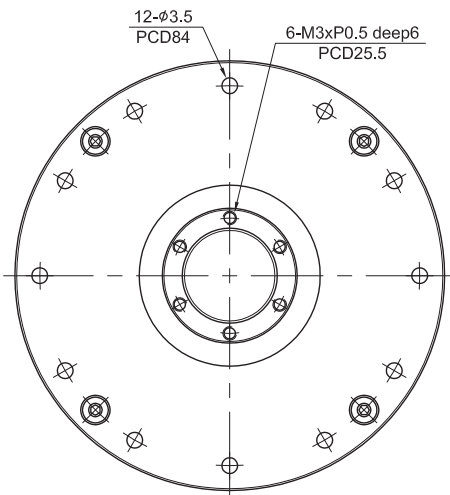
# MODEL : DHF20

RATIO / ÇEVİRİM : 50.80.100.120

AO



O

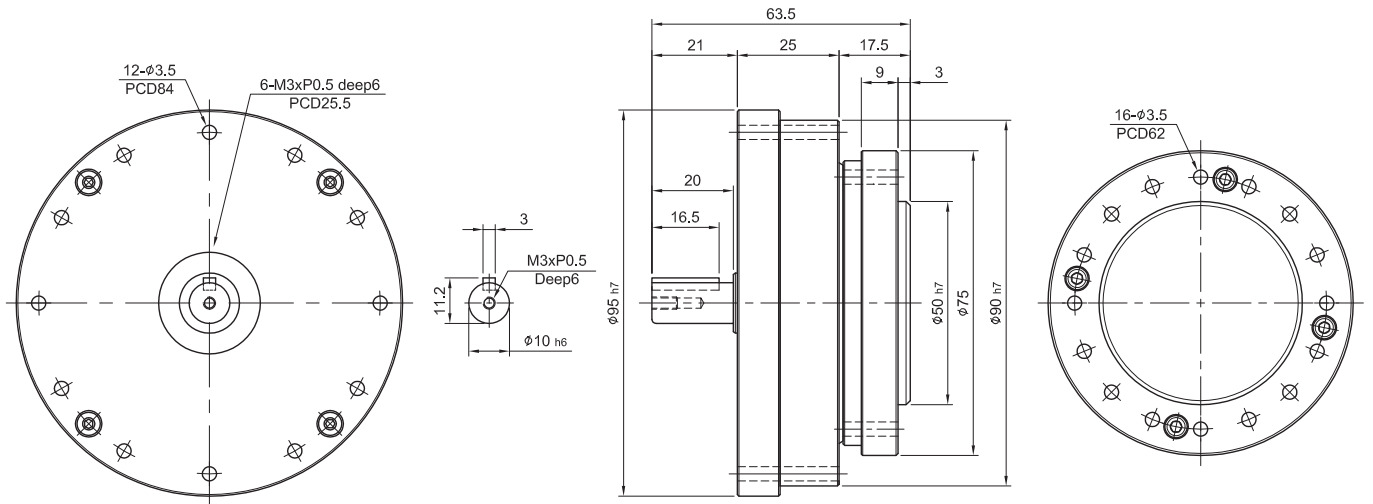


# MODEL : DHF20

RATIO / ÇEVİRİM : 50.80.100.120



S

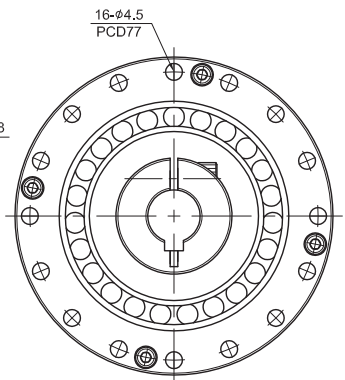
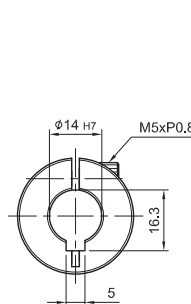
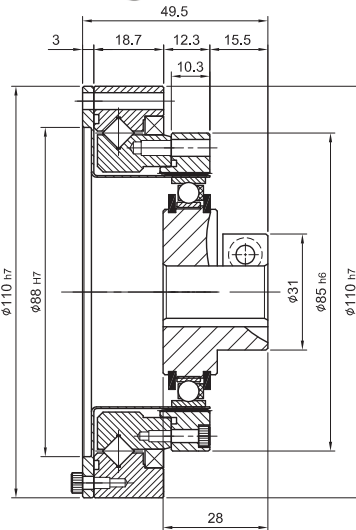
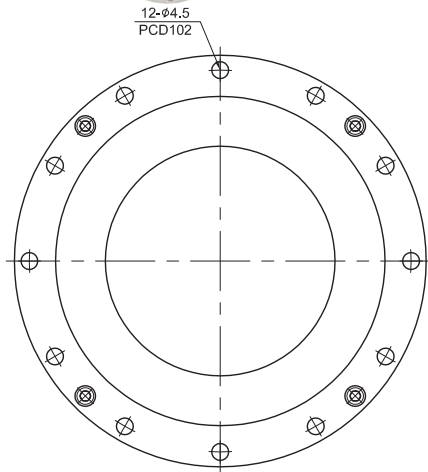
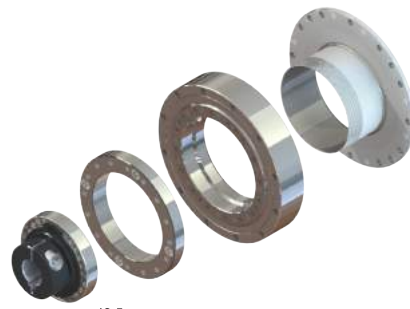


# MODEL : DHF25

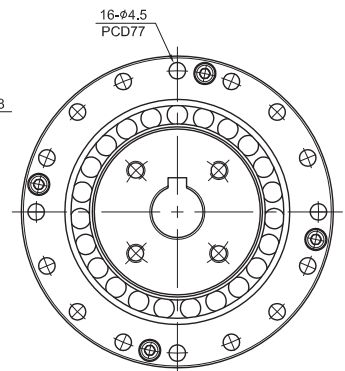
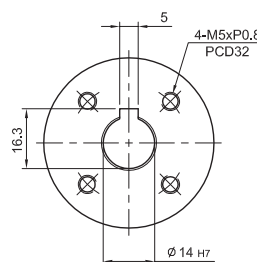
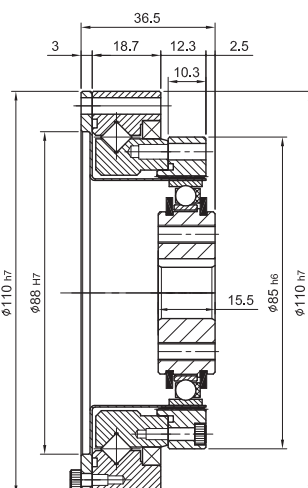
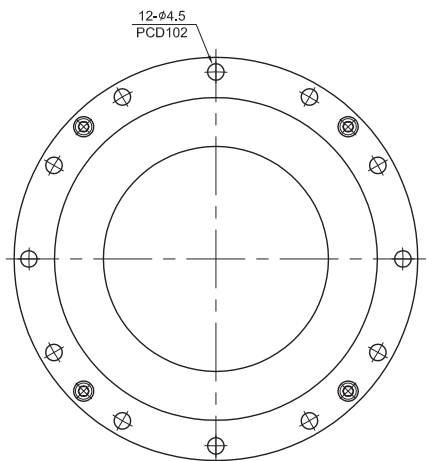
RATIO / ÇEVİRİM : 50.80.100.120



AC



AK

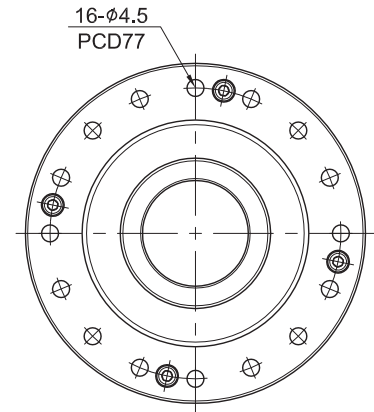
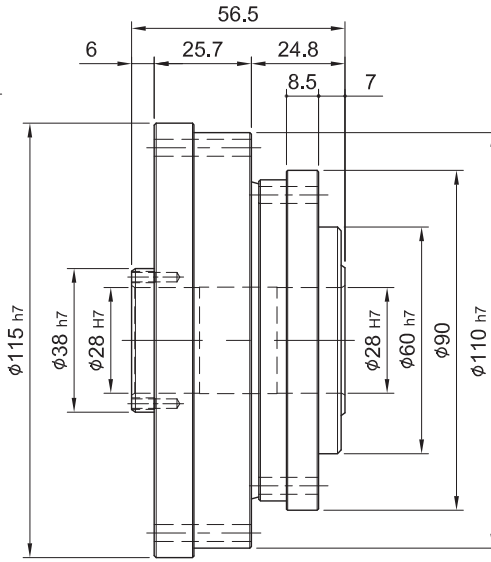
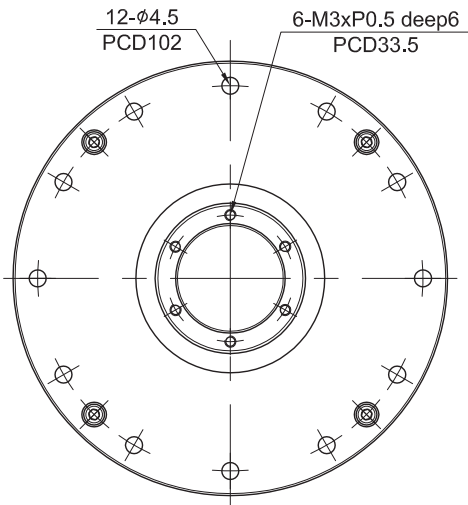


# MODEL : DHF25

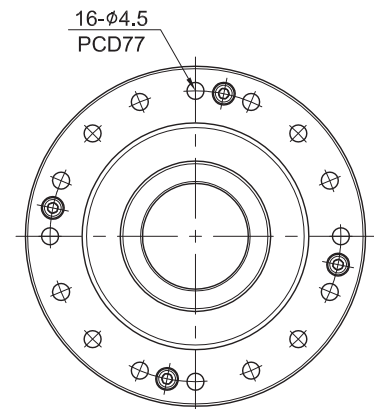
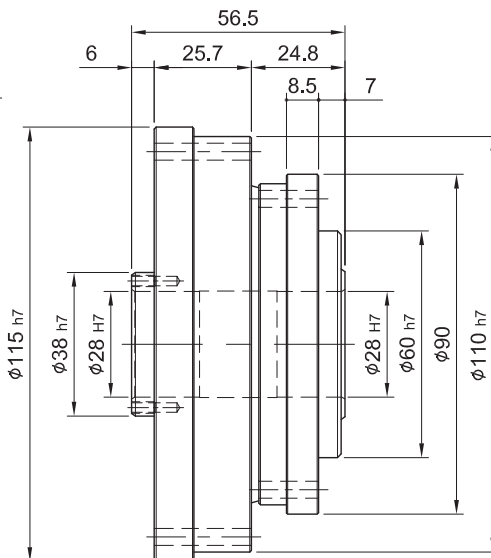
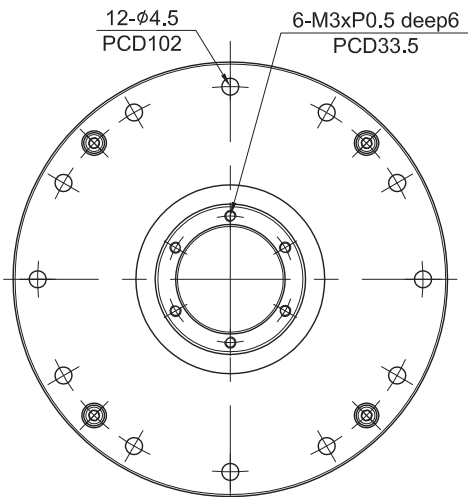
RATIO / ÇEVİRİM : 50.80.100.120



AO



O

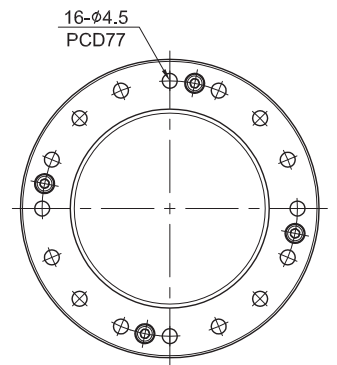
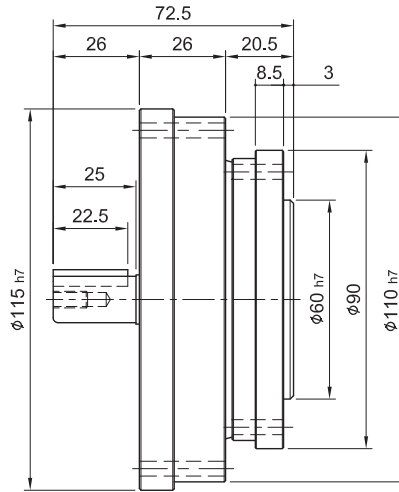
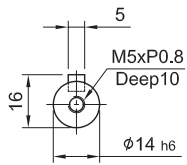
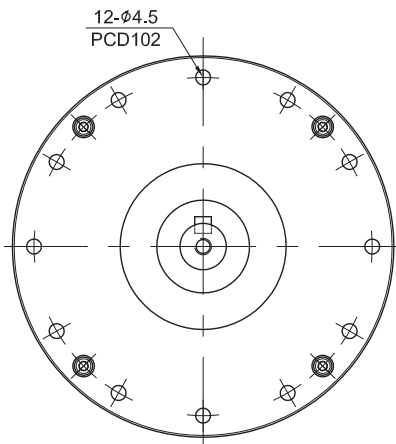


# MODEL : DHF25

RATIO / ÇEVİRİM : 50.80.100.120



S

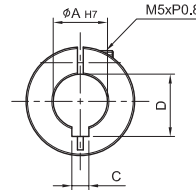
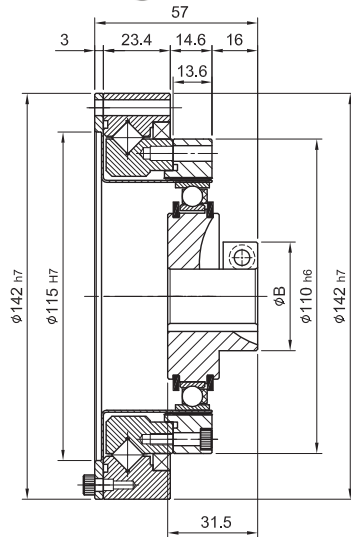
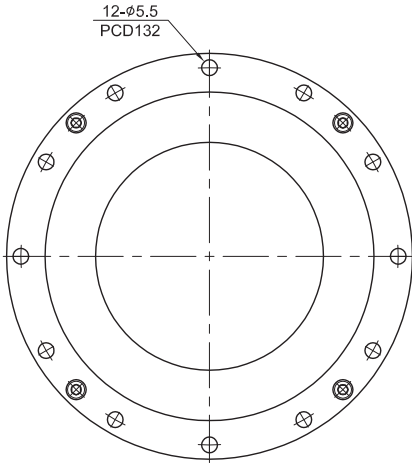


# MODEL : DHF32

RATIO / ÇEVİRİM : 50.80.100.120

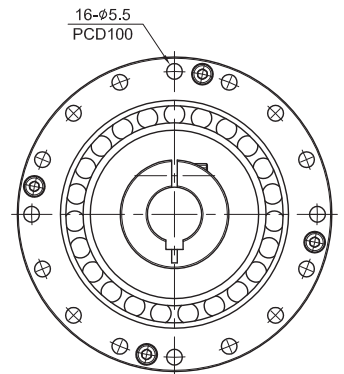


AC

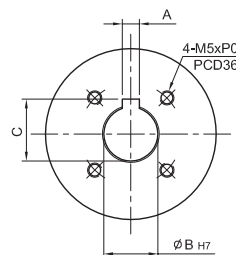
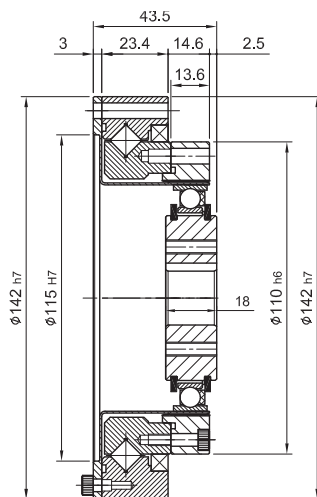
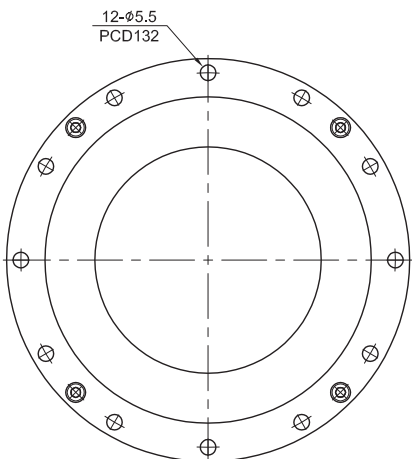


Unit/Birim: mm

Model Code	DHF32-AC
A	14 · 19
B	34 · 38
C	5 · 6
D	16.3 · 21.8

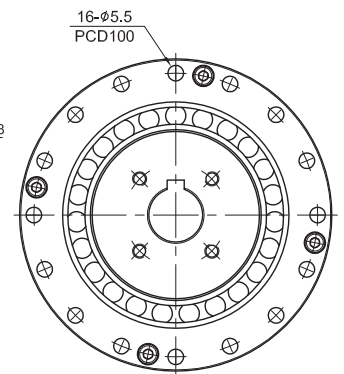


AK



Unit/Birim: mm

Model Code	DHF32-AK
A	5 · 6
B	14 · 19
C	16.3 · 21.8

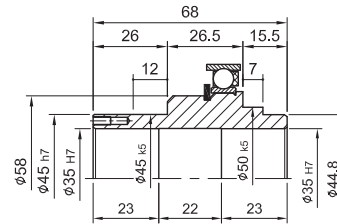
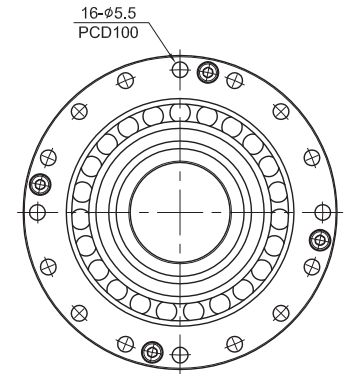
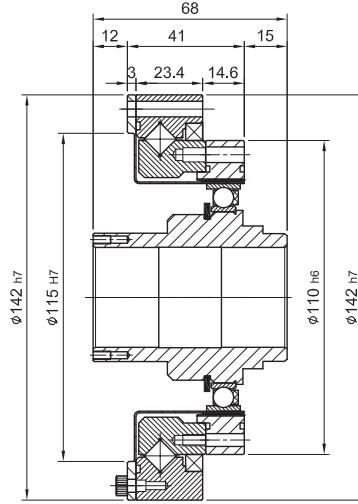
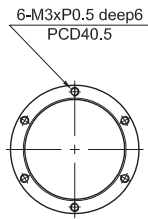
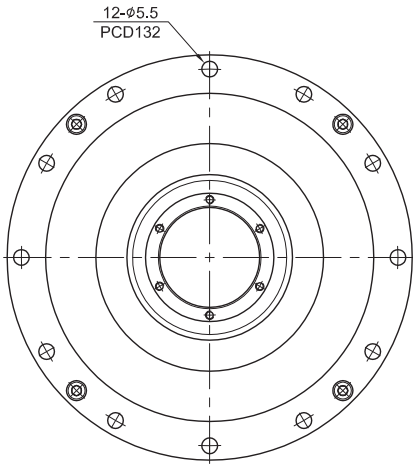
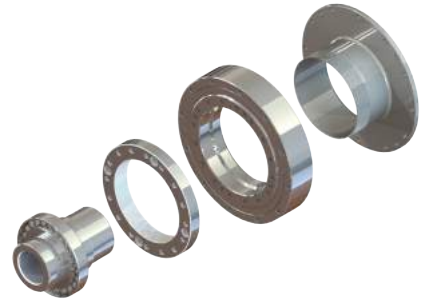


# MODEL : DHF32

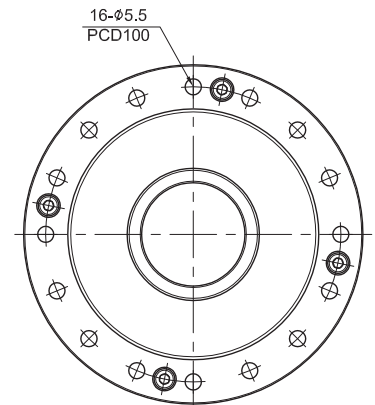
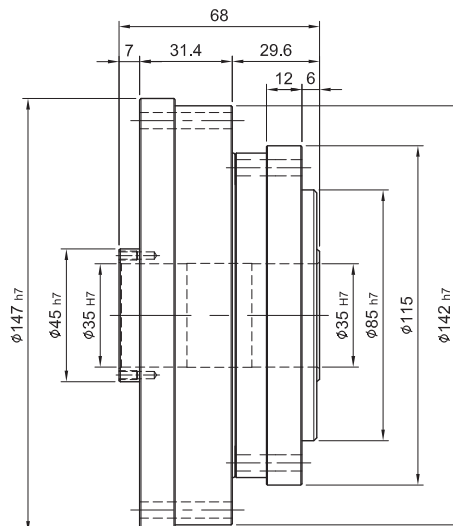
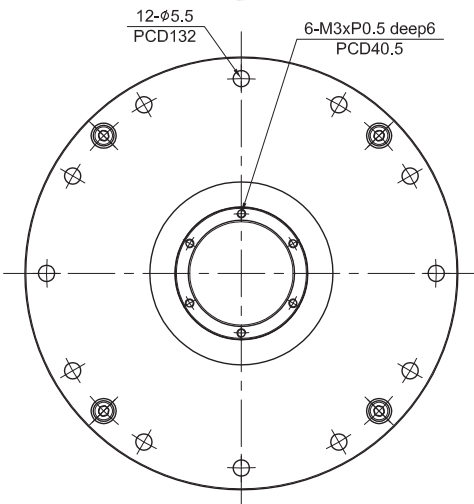
RATIO / ÇEVİRİM : 50.80.100.120



AO



O

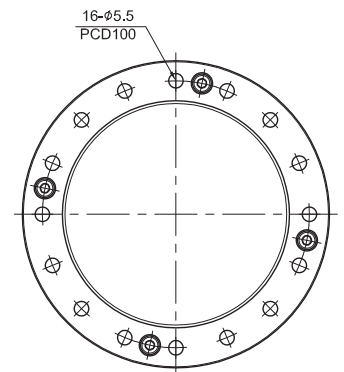
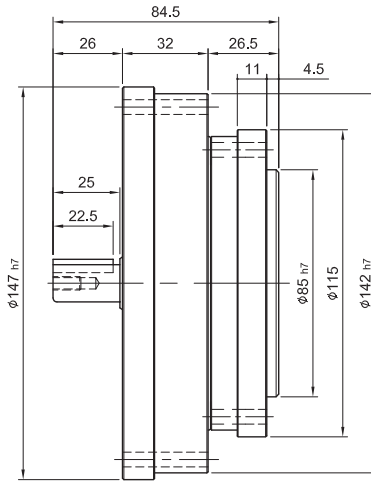
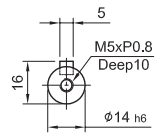
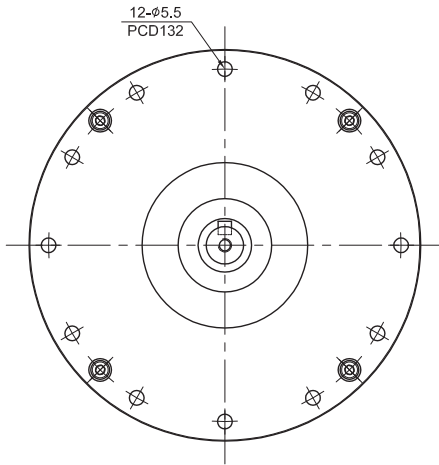


# MODEL : DHF32

RATIO / ÇEVİRİM : 50.80.100.120



S

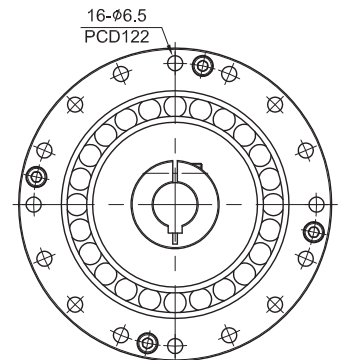
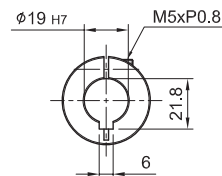
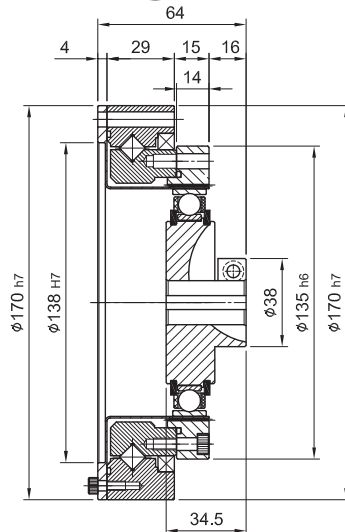
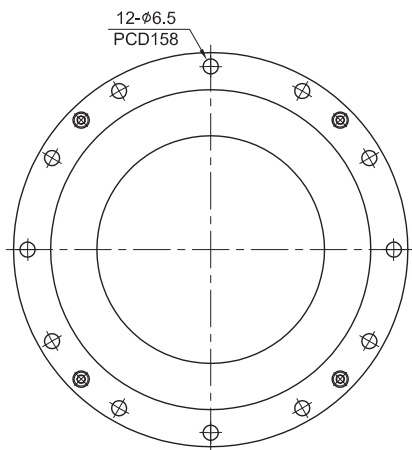
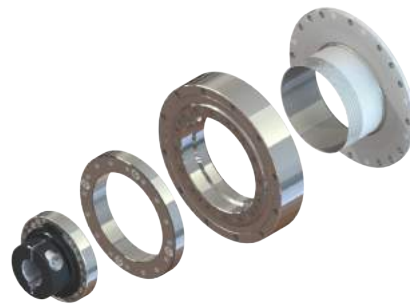


# MODEL : DHF40

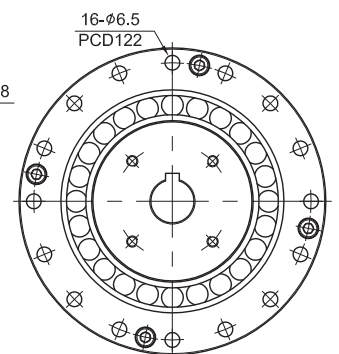
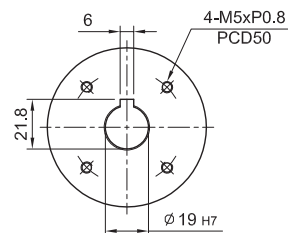
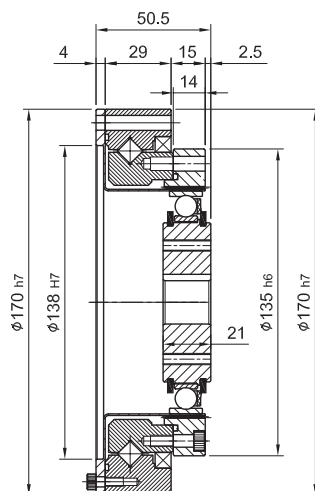
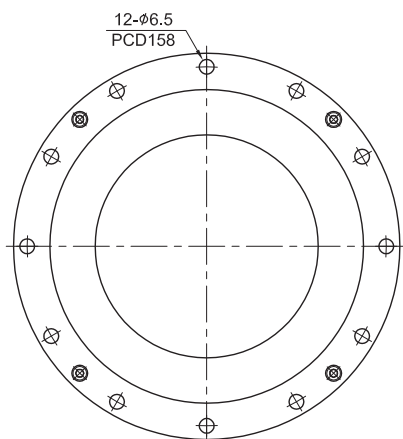
RATIO / ÇEVİRİM : 50.80.100.120



AC



AK

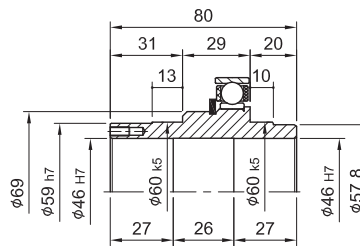
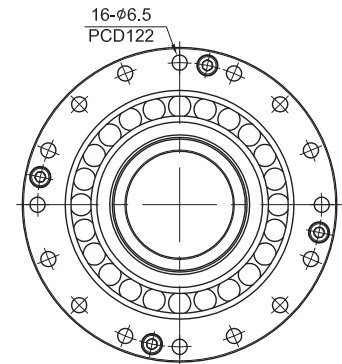
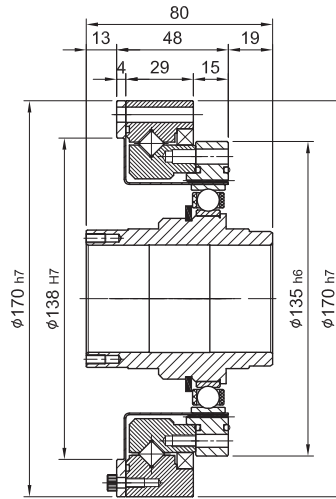
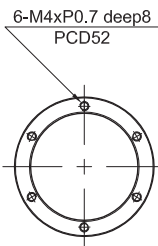
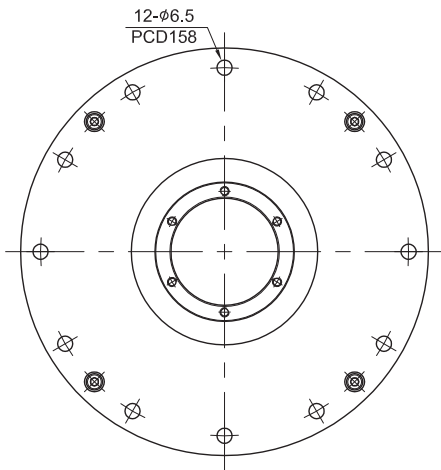


# MODEL : DHF40

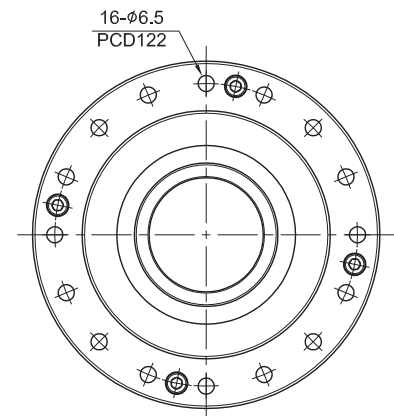
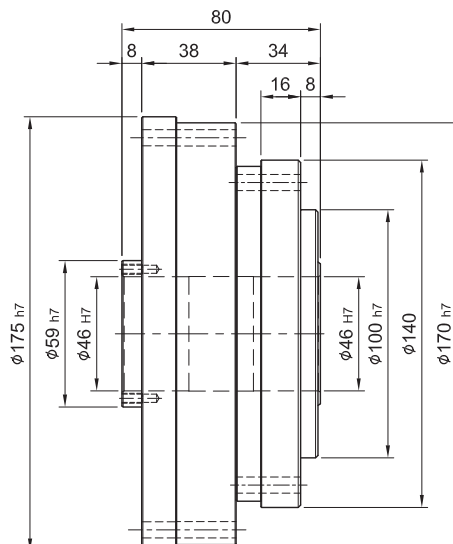
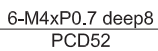
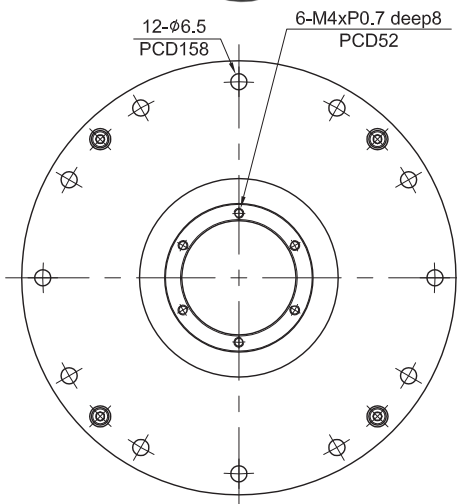
RATIO / ÇEVİRİM : 50.80.100.120



AO



O

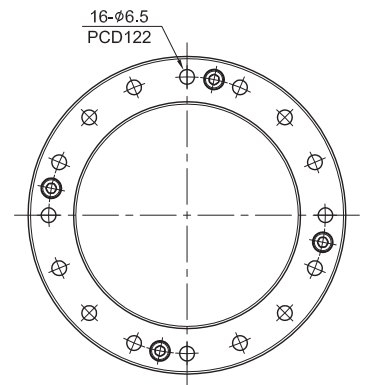
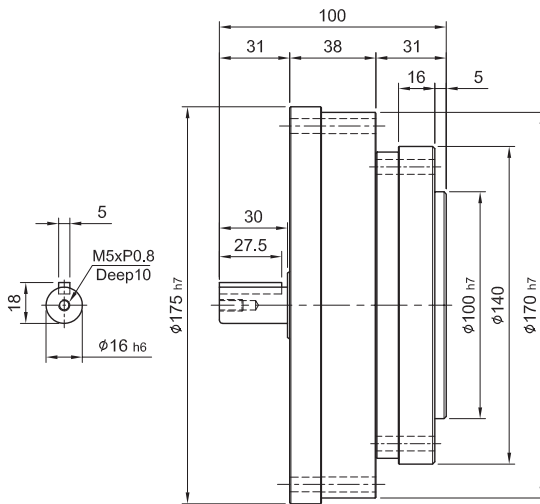
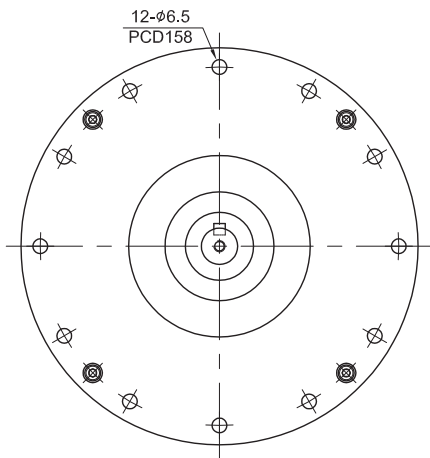


# MODEL : DHF40

RATIO / ÇEVİRİM : 50.80.100.120



S

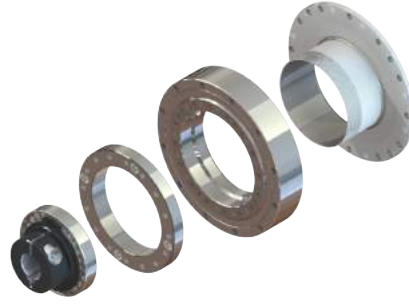


# MODEL : DHF45

RATIO / ÇEVİRİM : 50.80.100.120



AC



AK



AO



O



S

# LIMING REDUCERS / REDÜKTÖRLER

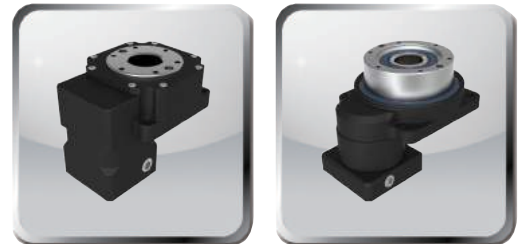
High Precision Planetary Reducers / Yüksek Hassasiyetli Planet Redüktörler



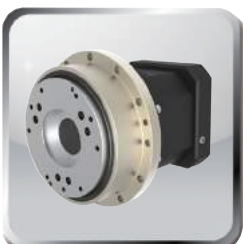
High Precision Right Angle Reducers / Yüksek Hassasiyetli Dik Açılı Redüktörler



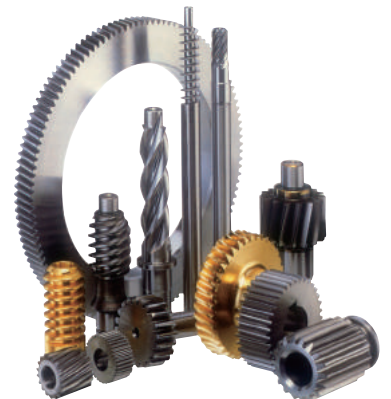
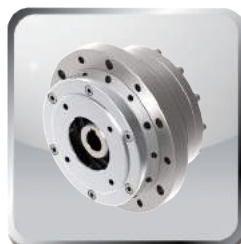
Hollow Rotary Actuator Reducers / Döner Tabla Redüktörleri



High Precision Cycloidal Reducers / Cycloid Redüktörler



Harmonic Reducers / Harmonik Redüktörler



# LIMING REDUCERS / REDÜKTÖRLER

