

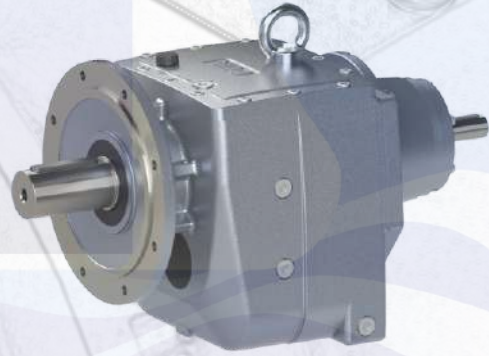
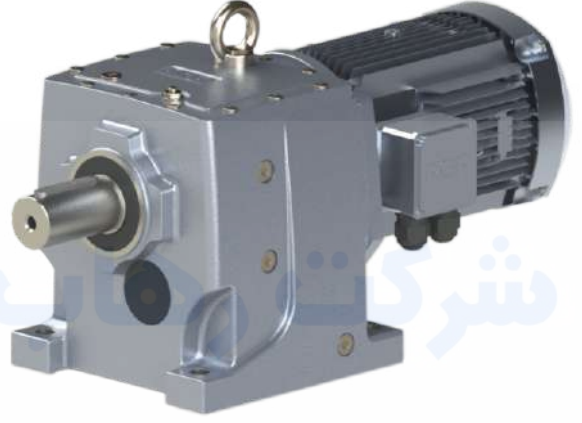
PGR®

DRIVE TECHNOLOGIES

Helisel Dişlili Redüktör

Helical Gear Units

PA/PF SERIES



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TR

SERVİS FAKTÖRÜ

Diyagram 1, günlük çalışma zamanına bağlı gerekli minimum servis faktörü f_B min, 'Z' saatteki çevrimleri ve uygulama yükü sınıflandırması 'U', 'M', 'H' gösterir. Çalışma düzgünlüğüne ve kütle hız faktörüne bağlı olarak, üç yük sınıflandırması belirlenmiştir. Hareket ettiren makineden gelen etkiler çalışma düzgünlüğü sınıflandırmasında tanımlanırken, kütle hız faktörü en fazla olan yük üzerinde etkili olur.

Not : Elde edilen servis faktörü f_B kullanılan sürücü (tahrik) tipine göre "k" katsayısı ile çarpılır.

k = 1 ; elektrik motoru veya hidromotor,
k = 1.25 ; çok silindirli içten yanmalı motor,
k = 1.50 ; tek silindirli içten yanmalı motor

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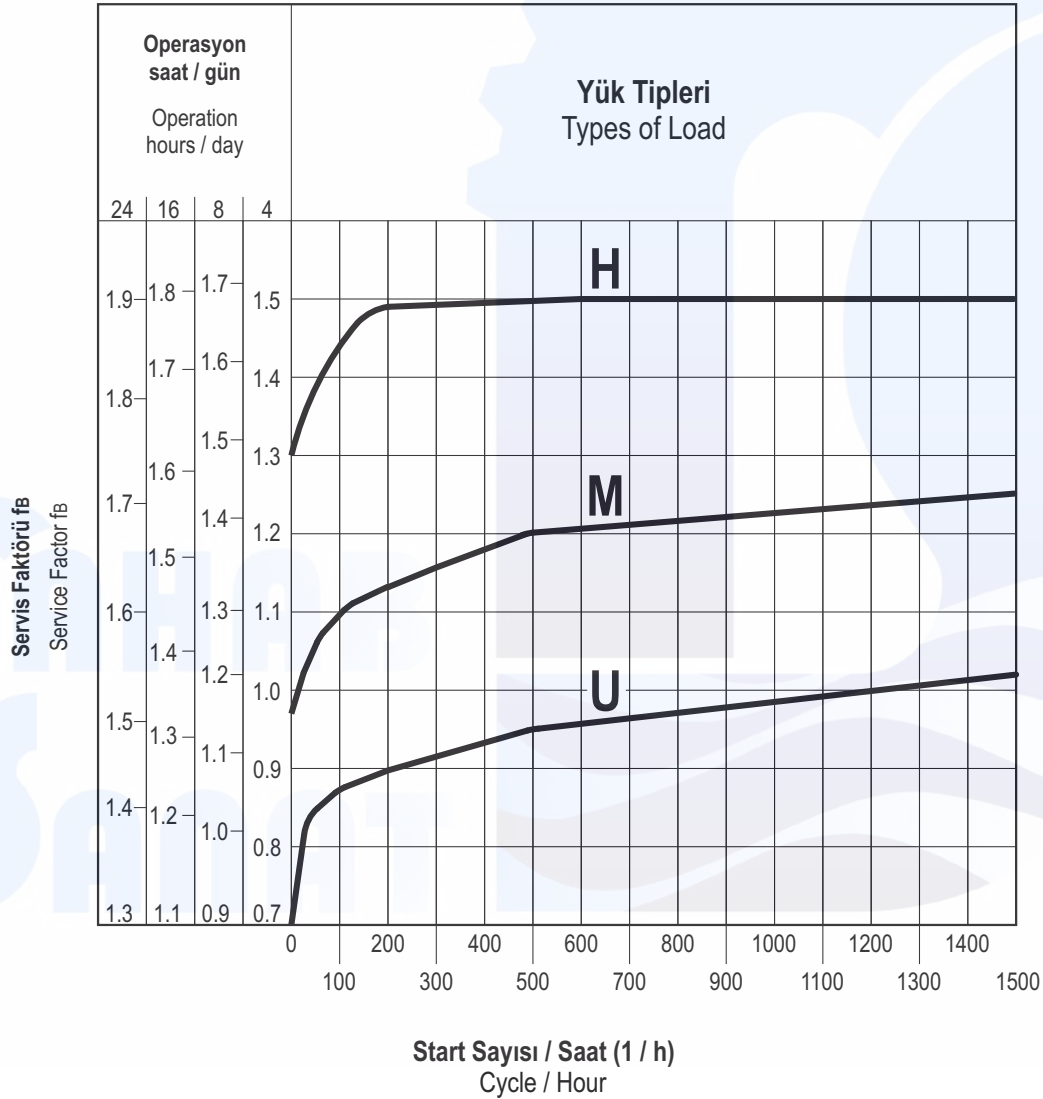
SERVICE FACTOR

Diagram 1 shows requiring minimum service factor depend on revolution per hours 'Z' and types of load 'U', 'M' or 'H'. In the following section the information regarding mass acceleration factor how it effects and the relation between load classification will be explained. Forces or loads which are applied from driven machin to gear unit while determine load classification, mass acceleration factor is played important role on the high load classification which is designated with 'H' sign.

Note : Service factor f_B which is acquired from diagram should be modified with factor "k" that, depends on driver type.

k = 1 ; hydraulic motor and electrical motor
k = 1.25 ; multi-cylinder engine
k = 1.50 ; single-cylinder engine

Diyagram - 1



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TEKNİK BİLGİLER

Dişli Ünitesini Seçme

Bir çalışmanın sınıflandırılması :

a) Düzgün çalışma (U)

Küçük karıştırıcılar, asansörler, konveyörler, montaj bantları, doldurma makineleri, bantlı konveyörler, temizleme makineleri, fanlar, test makineleri.

b) Yumuşak şoklar, düzgün olmayan çalışma (M)

Ağır konveyör bantları, değirmenler, ahır gübre makineleri, vinç hareketli mekanizmalar, bükme makineleri, çimento karıştırıcılar, dişli makineleri, ahşap işleme makineleri için sürücüler, vinçler, kayar kapılar, dengeleme makineleri.

c) Ağır şoklar, aşırı düzgün olmayan çalışma (H)

Taş kırıcılar, eksantrik presler, doğrayıcılar, presler, taşlama milleri, çekiçli kırıcılar, kağıt öğütücüler, ağır karıştırıcılar, delme makineleri, katlama makineleri, dönen tezgahlar, yatay karıştırıcılar, kesiciler, vibratörler, santrifüj makineleri, döner tablalar.

Yük sınıflandırması, çalışma düzgünlüğünden ve aşağıdaki tabloya göre kütle hız faktörü 'maf' den belirlenir. Burada, çalışma veya kütle hız faktöründen gelen daha yüksek sınıf yük sınıflandırmasında geçerlidir. (Örnek: aşırı düzgün olmayan çalışma ve maf = 2,8 gibi durumda yük sınıfı 'M' olarak belirlenir.

Yük Sınıfı	Çalışma	Kütle hız faktörü
U	Düzgün çalışma	$maf \leq 0.25$
M	Düzgün olmayan çalışma	$0.25 < maf \leq 3$
H	Aşırı düzgün olmayan çalışma	$3 < maf \leq 10$

$$m_{af} = \frac{J_{ex.red}}{J_{mot}} = \frac{J_{ex}}{J_{mot}} \times \left(\frac{1}{i_{ges}} \right)^2$$

i_{ges} = Toplam dişli ünitesi oranı

$J_{ex.red}$ = Hareket motoru üzerindeki azaltılmış tüm dış kütle atalet momenti

J_{ex} = Tüm dış kütle atalet momenti

J_{mot} = Motorun kütle atalet momenti

Kütle hız faktörü maf, çıkış tarafındaki dış kütleler ile giriş tarafındaki yüksek hız kütlelerin arasındaki ilişkiyi gösterir. Kütle hız faktörü, başlatma ve frenleme işlemlerine ve titreşime göre dişli ünitesindeki tork tesir seviyesini önemli derecede etkiler. Örneğin; bantlı konveyör sistemlerinde dış kütle atalet momenti taşıyan ürün kadar yük uygular. maf > 10 ise, transfer elemanlarında büyük bir oynama, yük sınıflamasında belirsizlik varsa veya şüphedeyseniz, PGR'e danışınız.

Servis faktörü fB, maksimum dişli ünitesi çıkış momenti Mamax ile montajlanmış motor gücü P1, çıkış hızı n2 ve dişli ünitesi verimi (η) sonucu ortaya çıkan momenti Ma arasındaki ilişkidir.

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EXPLANATORY NOTES

Selecting a Gear Unit

Operation classification;

a) Uniform application (U)

Small agitators, elevators, conveyors, assembly belts, filling machines, conveyor belts, cleaning machines, fans, testing machines.

b) Moderate shocks, non-uniform application (M)

Heavy conveyors belts, mills, stall dinging machines, crane traveling mechanisms, bending machines, cement mixers, gear pumps, decoilers, tapping units, packaging machines, feed drives for wood processing machines, hoists, winches sliding doors, balancing machines.

c) Heavy shocks, extreme non-uniform application (H)

Stone crusher, eccentric presses, choppers, presses, spindle grinding mills, hammer mills, shredders, heavy mixers, punching machines, folding machines, rolling stands, tumbling barrels, shears, vibrators, centrifuges, roller tables.

Load classification is obtained from operation class and mass acceleration factor (maf). For this reason in any situation you must use the greater factor for calculation. (Eg; heavy - shock and maf = 2,8 load classification must be 'M')

Load Classification	Operation	Mass Acceleration Factor
U	Uniform application	$maf \leq 0.25$
M	Non-uniform application	$0.25 < maf \leq 3$
H	Extreme non-uniform application	$3 < maf \leq 10$

i_{ges} = Total gear unit ratio

$J_{ex.red}$ = All external mass moment of inertia on the drive motor, reduced

J_{ex} = All external mass moment of inertia

J_{mot} = Mass moment of inertia of the motors

Technically mass acceleration factor maf mass different between external output-side and high speed input-side. maf plays more important role at the level of torque propulsive than in the gear unit. It is mostly effected at start-up, braking operation and vibration. Please contact PGR where maf is greater than 10 and if there be large fluctuations in transfer elements and vibration in the system.

Calculation of service factor is illuminated below. It depends on maximum output moment of gear unit and the output moment which is calculated from motor power, rotation speed and efficiency.

TR

TEKNİK BİLGİLER

EN

EXPLANATORY NOTES

$$P_1 = \frac{M_2 \cdot n_2}{\eta_{9550}} \quad [kW], \quad M_2 \quad [Nm], \quad n_2 \quad [min^{-1}]$$

Dişli ünitesini doğru şekilde seçtiğinizde, çıkış ve hız genel açıklamalarından alınan servis faktörü f_B , diyagram 1'e göre minimum servis faktörü f_{Bmin} 'den büyük veya eşittir.

If selection of gear unit is correctly done, service factor which is taken from selection of gear motors table, must be greater than minimum service factor f_{Bmin} which is taken from diagram-1 (see page 4) according to types of load.

$$f_B \geq f_{Bmin}$$

Helisel, paralel mil ve helisel konik dişli ünitelerinde her bir kademe için çok yüksek bir seviyede verimlilik vardır (her bir kademe için yaklaşık %98 veya $\eta = 0,98$). Bu yüzden hesaplamalarda verim $\eta = 1,0$ alınması yeterli doğru sonuçlara ulaşılmasına yardımcı olur. Helisel sonsuz dişliler ile ilgili dişli ünitesi verimliliği, her bir çıkış hızı n_2 'ye ait çıkış ve diş oran tablolarında listelenmiştir. W kovanı montajlı (serbest hareket mili) redüktörde çıkış gücü aşağıdaki formülden hesaplanır.

Efficiency is approximately 98% at helical, helical bevel parallel shaft gear units. For that reason efficiency could be taken $\eta = 1$ it shows that efficiency does not affect the calculation. But, for helical worm gear efficiency is given at table which depends on output speed and gear ratio.
With W cylinder (free drive shafts) ;

$$P_1 = \frac{M_{amax} \cdot n_2}{9550 \cdot f_{Bmin} \cdot \eta} \quad [kW], \quad M_{amax} \quad [Nm], \quad n_2 \quad [min^{-1}]$$

Burada, azami hareket gücü P_{1max} aşılamaz.

Value which calculated from formula P_1 , must be less than P_{1max} which is taken from the selection of W cylinder selection tables.

$$P_1 \leq P_{1max}$$

W ve IEC tipi redüktörler için performans tablosunda her bir çıkış devri n_2 , maksimum çıkış momenti M_{amax} , maksimum motor gücü P_{1max} listelenmiştir.

P_{1max} is shown at performance table for W cylinder (with free input shaft) and IEC adapter.

Hareketli tarafa fren bağlandığında, (frenli motorlar gibi) fren momenti de bir dişli ünitesini seçmede göz önüne alınmalıdır. Gezinti hareketleri, çember dişliler, döner tablalar, kapı hareketleri, karıştırıcılar ve yüzey havalandırıcı ile ilgili uygulamalarda sıkça karşılaşılan yüksek dış kütle atalet momenti ($m_{af} > 2$) kullanımlarda frenleme momentinin, seçilen anma momentinin 1,2 katını aşmamasını öneririz. Daha yüksek frenleme torkları kullanılacaksa, bu durum dişli ünitesini seçerken göz önünde bulundurulmalıdır. Lütfen PGR'e danışınız.

In selecting gear units brake can be optionally equipped which it is attached to the shaft or solid. It must be considered because of break torque. Application which have high external mass moment of inertia such as $m_{af} > 2$. We suggest break torque does not overrun 1,2 times motor torque.

Radial ve Eksenel Kuvvetler

Çıkış momenti ve hız genel açıklamalarındaki tablolarda, çıkış mili üzerine izin verilen radyal kuvvetler F_R ve eksenel kuvvetler F_A listelenmiştir. Tercihen güçlendirilmiş çıkış mili yatakları bir çok dişli ünitesi tipi için geçerlidir. Güçlendirilmiş yataklardaki radyal ve eksenel kuvvetler tablolarda F_{RGR} ve F_{AGR} olarak belirtilmiştir. Listelenen radyal ve eksenel kuvvetler, mil çıkışlı ayak ve flanş bağlantılı dişli üniteleri için uygulanır. Radyal ve eksenel kuvvetler, bu kuvvetlerden biri 0 (sıfır)'a eşit iken hesaplanmıştır.

Ayrıca, radyal ve eksenel kuvvetlere ait bir servis faktörü $f_B = 1$ çıkış gücü ve devir açıklaması genel tablolarda verilen kuvvetlerin temeline dayanır. Darbeli tipli kuvvetlerin olduğu ve aşırı çalışmalı (>8 saat/gün) uygulamalarda uygun servis faktörü $f_B > 1$ radyal ve eksenel kuvvetler için de göz önünde bulundurulmalıdır. İzin verilen kuvvetler F_A ve F_R belirli oranda azaltılır.

Axial and Radial Forces

Permissible forces on the output shaft are given at the selection of gear motor. F_R represents radial load and F_A represents axial load. F_{RGR} and F_{AGR} represents permissible load with reinforced bearings. This values are calculated when one of them is equal to zero.

In selecting gear motor tables service factor is given with permissible axial and radial load but it must be considered when operating times is greater than 8 hours and service factor must be greater than 1 for that reason permissible radial and axial loads are reduced.

TR

TEKNİK BİLGİLER

Listelenen radyal kuvvetler, milin ucunun orta kısmında etki eden bir kuvvete karşılık gelir. İzin verilen kuvvetleri saptarken, uygulanan kuvvetin hiç istenmeyen yönü ve dönme yönü varsayıldı. Tam bir hesaplama için, daha yüksek radyal ve eksenel kuvvetler muhtemeldir bu yüzden lütfen bize istenen servis süresinin yanı sıra gerçek güç ve dönme yönünün detaylarını da belirtiniz.

Transfer elemanları, çıkış miline eklenirse, ilgili faktör f_z radyal kuvveti saptamada göz önüne alınmalıdır.

fz için Tablo

Transfer Elemanları	Faktör fz	Açıklama
Dişliler	1.1	$z \leq 17$ diş
Zincir Dişliler	1.4	$z \leq 13$ diş
Zincir Dişliler	1.2	$z \leq 20$ diş
Dar V-Kayış Makaralar	1.7	ön gerilim kuvveti
Düz kayış Makaralar	2.5	

Mil üzerinde ortaya çıkan radyal kuvvet, aşağıdaki formül kullanılarak hesaplanmıştır.

$$F_{rorth} = \frac{2 \cdot M_2}{d_0} f_z \leq F_R$$

M_2 : Dişli ünitesi çıkış momenti [Nm]

f_z : Tablodan alınan katsayı

d_0 : Etkili daire çapı [mm]

F_R : Devir ve çıkış gücü tablolarından alınan müsaade edilebilir radyal kuvvet [kN]

F_{Rorth} : Mil üzerindeki radyal kuvvet [kN]

Kuvvet mil ortasına uygulanmazsa, herhangi bir 'X' noktasında izin verilen radyal kuvvet **formül I ve II** kullanılarak hesaplanır.

Formül / Formula - I

$$F_{RXL} = F_R \cdot \frac{z}{y + x}$$

Formül / Formula - II

$$F_{RXW} = \frac{C}{(f + x) \cdot 1000}$$

X : mil bileziğinden kuvvet uygulama noktasına olan uzaklık [mm]
X noktası - mil kararlılığı

F_{RXW} : izin verilen radyal yük [kN]

F_R : hız ve çıkış tabloları ve milin ortasına uygulanan kuvvetten alınan radyal kuvvet [kN]
X Noktası - yatak servis ömrü

F_{RXL} : izin verilen radyal yük [kN]

C	
C_{GR}	
f	9 - 11
y	
z	

Belirtilmidir ki, hesaplamalarda **formül I** yatak servis ömrünü, **formül II** ise mil kararlılığını hesaplamada kullanılır. Hesaplamalar sonucunda küçük değer dikkate alınmalıdır.

EN

EXPLANATORY NOTES

Axial and radial forces are calculated where force acting on the middle of the shaft end see page 34-36. Direction of rotation is played important role in calculation. For that reason these forces are calculated and the value of the result is found from forces to the shaft worse. Hence, please explain details in your orders.

For belt-pulley operations or any other motion transfer applications f_z factor must be considered while calculating radial and axial load.

fz values are shown at table.

Transfer Elements	Factor fz	Notice
Gears	1.1	$z \leq 17$ teeth
Chain Sprockets	1.4	$z \leq 13$ teeth
Chain Sprockets	1.2	$z \leq 20$ teeth
Narrow V-belt pulleys	1.7	by
Flat belt pulleys	2.5	Pre-Tensioning

Radial load is determined with following formula;

M_2 : Output torque of gear unit [Nm]

f_z : Factor which is taken from table

d_0 : Effective circular diameter [mm]

F_R : Permitted radial force which is taken from the speed and output moment tables. [kN]

F_{Rorth} : Radial force on the gear unit shaft [kN]

The formula which is mentioned above is used when force is not acting on the middle of shaft. In other situations the following formula is applied

X : distance from the shaft collar to the point of force application [mm]
point X - shaft stability

F_{RXW} : permitted overhung force [kN]

F_R : overhung force from the speed and output tables, force applied at the middle of the shaft [kN]
point X - bearing service life

F_{RXL} : permitted overhung load [kN]

[Nmm]

[mm]

[mm]

[mm]

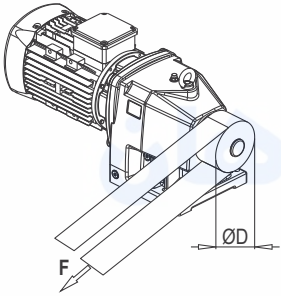
Notify that, **formula I** and **formula II** are applied for calculating radial load where **formula I** is used for service life and **formula II** is used for shaft stability. After the calculations were done some points should be taken into consideration.

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RADYAL YÜK HESABI

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CALCULATION OF RADIAL LOADS

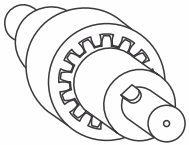


RADYAL YÜKLERİN HESABI

Radial yük F(N)'nin hesaplanmasında gerekli tahrik momenti M (Nm), kasnak veya dişli çapı D (mm) olmak üzere aşağıdaki formüller kullanılır.

CALCULATION OF OVERHUNG LOADS

Radial load F (N) is calculated with the following formulas where required moment M (Nm) and hoop or gear diameter D (mm) is used.

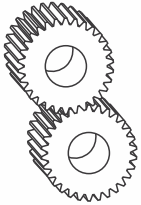


1 - Elastik Kaplin

Çalışma sırasında oluşan sapmalar kaplinin güvenlik sınırları içerisinde ise kuvvetler ihmal edilebilir.

1 - Elastik Coupling

If elastic coupling is working in its reliable working area, the overhung loads can be neglected.



2 - Düz Dişli (20° kavrama açılı)

$$F_R = \frac{2100 \times M_2}{D}$$

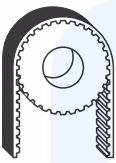
2 - For Spur Gear (Pressure angle 20°)



3 - Küçük Hızlarda Zincir Dişli (Z < 17)

$$F_R = \frac{2100 \times M_2}{D}$$

3 - For Chain Drive With Low Speed (Z < 17)



4 - Triger Kayış

$$F_R = \frac{2500 \times M_2}{D}$$

4 - For Trigger Belt



5 - V Kayış

$$F_R = \frac{5000 \times M_2}{D}$$

5 - For V Belt



6 - Gerdirme Makaralı Kayış

$$F_R = \frac{5000 \times M_2}{D}$$

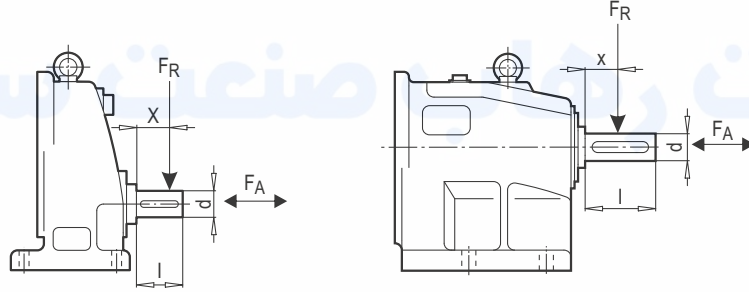
6 - Flat Belt With Spanning Puley

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RADYAL YÜK HESABI

EN

CALCULATION OF RADIAL LOADS



ÇIKIŞ ŞAFTINDAKİ RADYAL VE EKSENEL YÜK HESAPLAMALARI İÇİN DEĞERLER
VALUE TABLE FOR RADIAL AND AXIAL LOADS AT OUTPUT SHAFT

Helisel dişlili redüktör Helical gearboxes	y (mm)	z (mm)	c Normal Normal (Nmm)	c Güçlendirilmiş Reinforced (Nmm)	f (mm)	d (mm)	l (mm)
PA\PF 11	65.0	85.0	#	-	39.0	20	40
PA\PF 21	77.0	102.0	#	-	50.0	25	50
PA\PF 31	104.5	134.5	#	-	69.5	30	60
PA\PF 41	111.5	146.5	#	-	67.0	35	70
PA\PF 51	125.0	165.0	#	-	74.0	40	80
PA\PF 02 - PA\PF 03	63.8	83.8	0.06 x 10 ⁶	0.10 x 10 ⁶	11.8	20	40
PA\PF 12 - PA\PF 13	73.5	98.5	0.12 x 10 ⁶	0.18 x 10 ⁶	14.0	25	50
PA\PF 22 - PA\PF 23	86.0	116.0	0.19 x 10 ⁶	0.30 x 10 ⁶	14.0	30	60
PA\PF 32- PA\PF 33	112.5	152.5	0.39 x 10 ⁶	0.60 x 10 ⁶	30.0	40	80
PA\PF 42 - PA\PF 43	123.0	168.0	0.42 x 10 ⁶	0.73 x 10 ⁶	30.0	45	90
PA\PF 52 - PA\PF 53	149.5	204.5	0.92 x 10 ⁶	1.56 x 10 ⁶	35.0	55	110
PA\PF 62 - PA\PF 63	191.0	256.0	1.46 x 10 ⁶	2.46 x 10 ⁶	35.0	65	130
PA\PF 72 - PA\PF 73	212.0	282.0	2.13 x 10 ⁶	4.45 x 10 ⁶	37.0	75	140
PA\PF 82 - PA\PF 83	248.5	333.5	4.24 x 10 ⁶	6.89 x 10 ⁶	38.0	90	170
PA\PF 92- PA\PF 93	278.0	383.0	8.07 x 10 ⁶	12.50 x 10 ⁶	41.0	110	210
PA\PF 102 - PA\PF 103	323.5	448.5	14.86 x 10 ⁶	22.84 x 10 ⁶	46.0	130	250

İstediginde hesaplanacaktır.

It will be calculated when you demand.

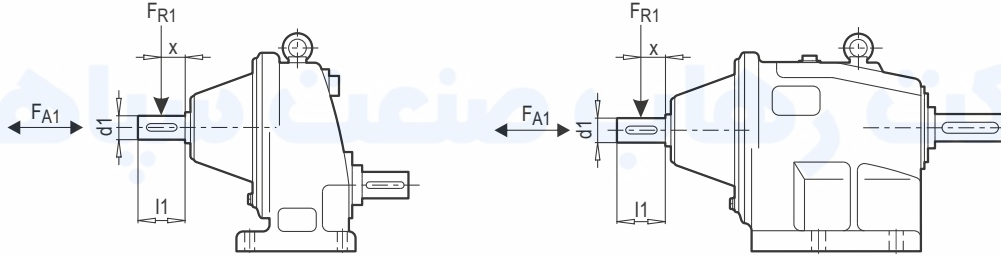
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RADYAL YÜK HESABI

EN

CALCULATION OF RADIAL LOADS

W



GİRİŞ ŞAFTINDAKİ RADYAL VE EKSENEL YÜK HESAPLAMALARI İÇİN DEĞERLER

VALUE TABLE FOR RADIAL AND AXIAL LOADS AT INPUT SHAFT $f=0$

Helisel dişlilü redüktör Helical gearboxes	y (mm)	z (mm)	c (Nmm)	d1 (mm)	l1 (mm)
PA\PF 03 PA\PF 11 PA\PF 02 PA\PF 12 PA\PF 13 PA\PF 23 PA\PF 33	70.0	90.0	3.64×10^4	16	40
PA\PF 21 PA\PF 31 PA\PF 22 PA\PF 32 PA\PF 43 PA\PF 53	96.5	121.5	1.07×10^5	24	50
PA\PF 41 PA\PF 51 PA\PF 42 PA\PF 52 PA\PF 63	110.5	150.5	4.70×10^5	38	80
PA\PF 62 PA\PF 63* PA\PF 72 PA\PF 73 PA\PF 83 PA\PF 93	149.5	204.5	4.60×10^5	42	110
PA\PF 82 PA\PF 83* PA\PF 92 PA\PF 93* PA\PF 103	207.5	277.5	1.82×10^6	65	140
PA\PF 102	224.5	294.5	1.66×10^6	65	140

* W Adaptörlerde Güçlendirilmiş Rulman Kullanılmıştır. / * Reinforced bearing is used at W Adapters.

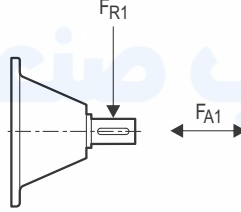
TR

RADYAL YÜK HESABI

EN

CALCULATION OF RADIAL LOADS

W



Tip Type	PA\PF 11 PA\PF 02 PA\PF 12 PA\PF 03 PA\PF 13 PA\PF 23 PA\PF 33		PA\PF 21 PA\PF 31 PA\PF 22 PA\PF 32 PA\PF 43 PA\PF 53		PA\PF 41 PA\PF 51 PA\PF 42 PA\PF 52 PA\PF 63		PA\PF 62 PA\PF 72 PA\PF 63* PA\PF 73 PA\PF 83 PA\PF 93		PA\PF 82 PA\PF 92 PA\PF 102 PA\PF 83* PA\PF 93* PA\PF 103		
	P ₁ (kW)	F _{A1}	F _{R1}	F _{A1}	F _{R1}	F _{A1}	F _{R1}	F _{A1}	F _{R1}	F _{A1}	F _{R1}
0.12	1.2	0.85	2.9	2.1	-	-	-	-	-	-	-
0.18	1.1	0.82	2.9	2.1	-	-	-	-	-	-	-
0.25	1.0	0.78	2.8	2.1	-	-	-	-	-	-	-
0.37	0.89	0.75	2.6	2.1	4.1	2.1	-	-	-	-	-
0.55	0.77	0.72	2.5	2.0	3.9	2.8	-	-	-	-	-
0.75	0.58	0.70	2.3	1.9	3.8	2.4	6.1	4.4	-	-	-
1.10	0.35	0.61	2.1	1.8	3.5	2.7	5.9	4.3	-	-	-
1.50	0.29	0.43	2.0	1.8	3.3	2.6	5.8	4.2	-	-	-
2.20	0.20	0.42	1.7	1.7	2.7	2.4	5.5	4.1	-	-	-
3.00	0.15	0.23	1.5	1.6	2.5	2.3	5.2	3.9	4.3	11.0	
4.00	-	-	0.98	1.1	2.3	2.1	4.9	3.7	4.2	10.9	
5.50	-	-	0.65	1.0	1.6	1.8	4.4	3.4	4.1	10.8	
7.50	-	-	0.27	1.0	1.4	1.3	4.3	3.4	3.8	10.4	
9.20	-	-	-	-	1.0	0.98	3.9	3.1	3.6	10.1	
11.0	-	-	-	-	0.59	0.47	3.3	2.7	3.4	9.9	
15.0	-	-	-	-	-	-	3.3	2.7	3.1	9.5	
18.5	-	-	-	-	-	-	2.7	2.3	3.0	9.3	
22.0	-	-	-	-	-	-	2.2	1.8	2.9	9.3	
30.0	-	-	-	-	-	-	1.1	1.2	2.3	8.4	
37.0	-	-	-	-	-	-	0.74	0.87	2.0	8.1	
45.0	-	-	-	-	-	-	-	-	2.2	8.3	
55.0	-	-	-	-	-	-	-	-	1.5	7.4	
75.0	-	-	-	-	-	-	-	-	0.78	4.6	
90.0	-	-	-	-	-	-	-	-	0.24	5.2	

* W Adaptörlerde Güçlendirilmiş Rulman Kullanılmıştır.

* Reinforced bearing is used at W Adapters.

$$\begin{aligned} F_{A1} &\Rightarrow F_{r1} = 0 \\ F_{R1} &\Rightarrow F_{a1} = 0 \end{aligned}$$



7

TR KISALTMALAR

EN ABBREVIATIONS

f_B	= Servis Faktörü (Mamax / Ma)	f_B	= Service factor (Mamax / Ma)
F_A	= Çıkış tarafındaki müsaade edilebilir eksenel yük [kN]	F_A	= Permissible thrust load at the output side [kN]
F_R	= Çıkış tarafındaki, milin orta noktasına etkiyen müsaade edilebilir radyal yük [kN]	F_R	= Permissible overhung load at the output side, force acting at the shaft's midpoint [kN]
F_D	= Reaksiyon yükü [kN]	F_D	= Reaction [kN]
i_{toplam}	= Dişli ünitesindeki toplam tahvil oranı	i_{total}	= Gear units total ratio
i_{ges}	= Tahvil oranı	i_{ges}	= Reduction ratio
M₂	= Çıkış momenti [Nm]	M₂	= Output torque [Nm]
Mamax	= Müsaade edilebilir maksimum çıkış momenti [Nm]	Mamax	= Max. permissible output torque [Nm]
n₂	= Çıkış hızı [d/dk]	n₂	= Output speed [min ⁻¹]
P_e	= Mamax referans alınarak hesaplanan güç [kW]	P_e	= Calculated power [kW] with reference to Mamax
P_n	= Motor güç oranı [kW]	P_n	= Rated power of motor [kW]
η	= Verim [%]	η	= Efficiency [%]
kg	= Redüktörün ağırlığı	kg	= Weight of the geared motor

1) 4 ve 5 kademeli redüktörlerin 0,75 kW' a kadar 4 kutuplu olan motorlarında kayıp yaklaşık 40 W olarak hesaplanmıştır. Kayıp, motor hızına bağlı olarak o oranda değişir.

1) Gear units or gear motors which have 4 and 5 stage reduction 4 pole motor up to 0,75 kW losses are calculated nearly 40W, losses are dependent motor speed.

RAHAB
SANAT

TR

PA/PF TANITIMI

POLAT HELİSEL DİŞLİLİ REDÜKTÖR (PA/PF)

2 ve 3 kademeli helisel tip redüktörle (PA/PF 62-63'den PA/PF 102-103'e) motor ve çıkış miline eşmerkezli olarak montaj edilmiştir. PA/PF 02'den 52'ye kadar 2 kademeli redüktörlerimiz mevcuttur. PA/PF 02'den PA/PF 52'ye kadar olan 2 kademeli redüktörlerimiz daha yüksek tahvil oranlarında gövde dayanımını arttırarak 3 kademeli olarak üretilmektedir.

Bu 3 kademeli redüktörler PA/PF 03 - PA/PF 53 adı altında dizayn edilmiştir. PA/PF 62/63 ve üzeri boyutlardaki helisel dişlili redüktörler aynı gövde içerisinde 2 veya 3 kademeli redüktörler haline getirilebilirler. Yüksek tahvil oranları için 4, 5 ve 6 kademeli helisel dişlili redüktörlerimiz de mevcuttur. Helisel dişlili redüktörlerin ayaklı ve flanşlı versiyonları bulunmaktadır. Flanşlı helisel tip redüktörlerde flanş gövdeyle bir döküm olduğundan dolayı flanş ile gövde arasında herhangi bir bağlantı civatası mevcut değildir. 0,12 - 160 Kw'dan 26000 Nm'ye kadar çıkış oranı 11 farklı boyuttaki redüktörlerimizle elde edebiliyoruz.

Helisel Dişli Redüktör:

0.12 kW dan 160 kW' ya kadar
26000 Nm 'ye kadar çıkış momenti bulunur.

EN

DESCRIPTION OF PA/PF

POLAT HELICAL GEARED MOTOR (PA/PF)

High quality Polat helical gears can be supplied foot or flange mounted products. Foot mounted is designated by 'PA' which is Polat foot mounted helical gear and flange mounted is designated by 'PF' which is Polat flange mounted helical gear.

There are available 2,3 or multistage designs. From PA/PF 02 to PA/PF 52 helical gear units are available in two stage reduction. These designs could be produced in three stage reduction at high ratio with increasing strength of unit case which are designated from PA/PF 03 to PA/PF 53.

Greater cases which are designated from PA/PF 62-63 to PA/PF 102-103 to and three stage helical gear units are designed input and output shaft concentrically. Polat multistage helical gear units are designed for high reduction ratios. At flange mounted helical gears, flange is intended on case for strength mounted or installation. Approximately 26000 Nm moment could be obtained with eleven different sizes of Polat helical gear unit altering from 0,12 kW to 160 kW.

Helical Gear Reducer :

Approx. 26000 Nm output moment
altering power from 0,12 kW to 160 kW.

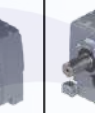
MAX. MÜSAADE EDİLEBİLİR ÇIKIŞ MOMENTİ M_{max} .

MAX. PERMISSIBLE OUTPUT TORQUES M_{max} .

147 - 169

Bir, İki ve Üç kademeli helisel dişlili redüktör

Helical gear boxes single, double and triple reduction

									
Tip / Type	Ma max. (Nm)	Tip / Type	Ma max. (Nm)	Tip / Type	Ma max. (Nm)	Tip / Type	Ma max. (Nm)	Tip / Type	Ma max. (Nm)
PA/PF 11	60	PA/PF 02	100	PA/PF 03	110	PA/PF 62	3120	PA/PF 63	3700
PA/PF 21	80	PA/PF 12	180	PA/PF 13	200	PA/PF 72	4710	PA/PF 73	5650
PA/PF 31	190	PA/PF 22	370	PA/PF 23	340	PA/PF 82	7250	PA/PF 83	9180
PA/PF 41	290	PA/PF 32	710	PA/PF 33	670	PA/PF 92	10780	PA/PF 93	14000
PA/PF 51	490	PA/PF 42	1240	PA/PF 43	1290	PA/PF 102	17370	PA/PF 103	23160
		PA/PF 52	2020	PA/PF 53	2230				

TR

W ve IEC ADAPTÖR KULLANIMI

W ve IEC Adaptör

W kovanlı redüktörlerin max. tahrik gücü geçerli olan çıkış devri ve tahvil oranına göre tablolarda verilmiştir. (Bknz 147-169) IEC adaptörlü dişli ünitelerinde, her gövde büyüklüğünün standart gücü DIN EN 50347'ye göre verilir. P1 değeri W ve IEC seçim sayfalarında listelenmiştir. Bu listedeki değerlerden fazla bir güç istenirse özel hesaplamalar gerekmektedir. Lütfen danışınız.

W kovanlı redüktörlerin giriş mili rulmanları düzenli olarak yağlanmalıdır. 2 kademeli redüktörlerden PA/PF 62, PD/PM 62 ve üst gövdeler, 3 kademeli redüktörlerden PA/PF 73, PD/PM 73, PKD 6390 ve üst gövdeler için her 4000 çalışma saatinde yaklaşık 20-25 gr gres içeren otomatik yağlayıcı kullanılarak giriş şaftı rulmanı yağlamasını öneririz. Kullanılan yağlayıcı Petamo GHY 133 N'dir. Ayrıca W kovanlı redüktörlerde bu yağlayıcıdan ayrı opsiyon olarak dişli ünitesinin soğumasını sağlamak için dış fan da mevcuttur. Lütfen danışınız.

Otomatik yağlayıcı üniteleri IEC 160 motor büyüklüğünden başlayarak en düşük 2 kademeli redüktörlerden PA/PF 62, PD/PM 62, 3 kademeli redüktörlerden de PA/PF 73, PD/PM 73, PKD 6390 gövdelerine bağlanmaktadır. Bu otomatik yağlayıcı rulmanlara kalıcı bir yağlama sağlar. Redüktörü çalıştırmadan önce devreye sokulmalıdır. Günlük ortalama 8 saat çalışıyorsa yılda 1 kez, bunun dışındaki çalışma saatlerinde 6 ayda bir değiştirilmelidir. Otomatik yağlayıcı içindeki gres dış ortam sıcaklığı 0° C - 40° C arasındaki çalışmalara uygundur. Çok uzun süreli çalışmalarda ve belirtilen dış ortam sıcaklığı değişimlerinde daha özel yağlayıcı kullanılmalıdır. Lütfen danışınız.

Otomatik yağlayıcı IEC'ler belirtilen çalışma şartları içerisinde dikey montaj pozisyonunda (M2 ve M4) önerilmez. Bu gibi durumlarda direkt motor montajı önerilir. Eğer motor boyutu 160 ve daha büyük IEC'ler dikey montaj pozisyonunda kullanılacaksa, kullanım şartları göz önünde bulundurularak tarafımızdan kontrol edilmeli ve onaylanmalıdır. Lütfen buna dikkat ediniz. Dikey montaj pozisyonu çalışmalarında (M2) sızdırmazlık elemanlarının ömrü azalabilmektedir. Bu gibi durumlarda daha kısa aralıklarla bakım yapılmalıdır. 2 kademeli redüktörlerden PA/PF 52, PD/PM 52'ye kadar ve 3 kademeli redüktörlerden PA/PF 63, PD/PM 63, PKD 5390'a kadar olan IEC adaptörlü dişli üniteleri çalışma ömürleri süresince sızdırmazlığa sahip yağlanmış rulman içerir. Bunlar için bakım süreleri kullanım kılavuzunda önerilen bakım süreleri geçerlidir.

Motor boyutu 63'ten 180'e kadar olan IEC adaptörün kaplini arızaya karşı emniyetli değildir. Fakat otomatik yağlayıcı kullanılan IEC 160-180 ve daha büyük boyutlu adaptörlerdeki kaplinler arızaya karşı emniyetlidir. Kaldırma, asansör ve bu gibi insan yaralanmalarına neden olabilecek çalışmalar için özel hesaplamalar gerekmektedir. Lütfen PGR'ye danışınız. Direk motor montajlı redüktörle karşılaştırmak gerekirse IEC ilave mil kaplinine ve extra rulman yataklanmasına sahiptir. Direk motor montajına göre IEC bağlantılı redüktörlerde güç kayıpları daha fazladır. PGR olarak biz direk motor montajını öneririz. Bu size sadece teknik avantaj değil finansal olarak da avantaj sağlar.

EN

USING OF W AND IEC ADAPTER

W and IEC Adapter for Gear Units

Selection of W cylinder (with free input shaft) and IEC adapter are listed on page 147-169. Maximum power are given according to gear reduction ratio and output speed. Gear units with IEC adapter standard power is specified according to DIN EN 50347. For other power values which are not shown on table, special calculation for operating safety limits is required. For these cases, please contact PGR.

Polat gear unit series such as PA/PF 62, PD/PM 62 and greater case which are 2 stage reducers, PA/PF 73, PD/PM 73, PKD 6390 and greater case which are 3 stage reducers with W adapter (with free input shaft) input solid shaft bearings must be lubricated orderly. Automatic lubricator could be used for increasing service life of bearings. This unit includes approximately 20-25g grease and it supplies fresh grease at every 4000 running hours. PGR recommends using Petamo GHY 133 N type of lubrication. At the same time, fan option is available for cool gear unit to safe operation. For this option contact PGR

Automatic lubricator design is used from IEC160 motor size and greater motor size to small gear units which are for 2 stage reducers PA/PF 62, PD/PM 62 and for 3 stage reducers PA/PF 73, PD/PM 73 and PKD 6390. This unit provides permanent lubrication to bearings. Automatic lubricator must be changed once a year for where gear unit is run 8 hours or less at daily operation for other running hours it must be changed every 6 months. Automatic lubricator must be actuated before starting the reducers. Grease is acceptable between 0 °C - 40 °C operation conditions. At long - term running and exception from specified ambient temperature special lubricate must be used. Please, consult us.

Under determined operating conditions, IEC with automatic lubricator is not suggested for vertical mounting positions (M2 and M4 mounting positions). For these cases direct motor mounting should be applied. If IEC 160 and greater size will be used at vertical mounting positions, it must be controlled by PGR for suitable and safe operations with considering actual operating conditions. For mounting position M2 (vertical alignment) life cycle of seals are effected badly for that reason maintenance of these reducer must be at shorter times from which maintenance time is determined at manual. 2 stage reducers up to PA/PF 52, PD/PM 52 and 3 stage reducer up to PA/PF 63, PD/PM 63, PKD 5390 gear units are included seals for bearings as long as their service life. For these gear units maintenance time is valid as the time is specified at manual.

Coupling is used for installing motor to IEC adapter. At from IEC 63 to IEC 180, coupling is not safe for important application since human injuries could occur. But IEC 160 - IEC 180 with automatic lubricator and greater size of IEC adapter is safe for application but on the other hand for operations where accident could be caused personnel damage special calculation is required, please consult us. Direct motor mounting has a lot of advantage according to mounting of IEC adapter. At gear units with IEC adapter has additional solid shaft coupling and bearing seats for that reason power losses are greater than direct motor mounting. Last but not least direct motor coupling not only has technical advantages but also financial advantages.

TR	KULLANIM ALANLARI	EN	APPLICATION AREAS
UYGULAMALAR		APPLICATIONS	
<u>KARIŞTIRICILAR</u>		<u>AGITATORS (MIXERS)</u>	
* Saf Sıvılar * Sıvılar ve Katılar * Değişken Yoğunluklu Sıvılar		* Pure Liquids * Liquids and Solids * Liquids - Variable Density	
<u>HAVALANDIRMA TERTİBATLARI</u>		<u>BLOWERS</u>	
* Santrifüj * Lob * Pervane		* Centrifugal * Lobe * Vane	
<u>MAYALAMA VE DAMITMA</u>		<u>BREWING AND DISTILLING</u>	
* Şişeleme Mekanizması * Mayalama Kazanları - Kesintisiz İş * Fırınlr, Ocaklar - Kesintisiz İş * Ezme, Karışım Kazanları - Kesintisiz İş * Ölçü Haznesi - Sık Sık Başlama		* Bottling Machinery * Brew Kettles - Continuous Duty * Cookers - Continuous Duty * Mash Tubs - Continuous Duty * Scale Hopper - Frequent Starts	
<u>TOPRAK İŞLEME MAKİNELERİ</u>		<u>CLAY WORKING MACHINERY</u>	
* Tuğla Presi * Briket Makinesi * Çamur Karma Makinesi		* Brick Press * Briquette Machine * Pug Mill	
<u>KOMPRESÖRLER</u>		<u>COMPRESSORS</u>	
* Santrifüj * Lob * Çok Pistonlu * Tek Pistonlu		* Centrifugal * Lobe * Reciprocating, Multi-Cylinder * Reciprocating, Single-Cylinder	
<u>KONVEYÖRLER - GENEL MAKSATLI</u>		<u>CONVEYORS - GENERAL PURPOSE</u>	
* Üniform Yüklü * Üniform Yüklü Olmayan * Pistonlu veya Karıştırıcı		* Uniformly Loaded or Fed * Not Uniformly fed * Reciprocating Or Shaker	
<u>VİNÇLER</u>		<u>CRANES</u>	
* Kuru Havuz - Ana Kaldırma vinci - Yardımcı Vinç - Direkli Vinç - Döndürme İş - Çekme İş * Endüstriyel İş - Ana Kaldırma Vinci		* Dry Dock - Main Hoist - Auxiliary Hoist - Boom Hoist - Slewing Drive - Traction Drive * Industrial Duty - Main Hoist	
<u>ASANSÖRLER</u>		<u>ELEVATORS</u>	
* Kova * Santrifuj Boşaltma * Yürüyen Merdiven * Taşıma, Nakliye * Yerçekimi Boşaltım		* Bucket * Centrifugal Discharge * Escalators * Freight * Gravity Discharge	
<u>KIRMA MAKİNELERİ</u>		<u>CRUSHER</u>	
* Taş ya da Maden		* Stone or Ore	

TR	KULLANIM ALANLARI	EN	APPLICATION AREAS
UYGULAMALAR		APPLICATIONS	
<u>TARAMA MAKİNELERİ</u>		<u>DREDGES</u>	
* Kablo Bobinleri * Konveyörler * Pompalar * İstifleme Makineleri * Vinçler		* Cable Reels * Conveyors * Pumps * Stackers * Winches	
<u>EKSTRUDERLER</u>		<u>EXTRUDERS</u>	
* Genel * Plastikler - Değişken Hızlı Tahrir - Sabit Hızlı Tahrir * Kauçuk, Lastik - Kesintisiz Vida İşlemleri - Kesintili Vida İşlemleri		* General * Plastics - Variable Speed Drive - Fixed Speed Drive * Rubber - Continuous Screw Operation - Intermittent Screw Operation	
<u>FANLAR</u>		<u>FANS</u>	
* Santrifüj * Yüksek Emişli * İndüklenmiş Çekiş * Endüstriyel ve Maden Ocağı		* Centrifugal * Forced Draft * Induced Draft * Industrial and Mine	
<u>BESLEME ÜNİTELERİ</u>		<u>FEEDERS</u>	
* Palet * Bant * Disk * Pistonlu * Vida		* Apron * Belt * Disc * Reciprocating * Screw	
<u>GIDA ENDÜSTRİSİ</u>		<u>FOOD INDUSTRY</u>	
* Hububat Fırını * Hamur Karıştırıcı * Kıyma Makinesi * Dilimleyici		* Cereal Cooker * Dough Mixer * Meat Grinder * Slicer	
<u>METAL İŞLEMELERİ</u>		<u>METAL MILLS</u>	
* Çekme Makinesi Taşıma ve Ana Tahrir * Hammadde İtici * Makaslar * Tel Çekme * Tel Sargı Makinesi * Salgı Tezgahı - Geri Dönmesiz - Tek Tahrir - Grup Tahrir		* Draw Bench Carriage and Main Drive * Slab Pushers * Shears * Wire Drawing * Wire Winding Machine * Runout Table - Non-Reversing - Individual Drives - Group Drives	
<u>DÖNER İŞLEMELER</u>		<u>MILLS (ROTARY TYPE)</u>	
* Küresel ve Çubuk - Düz Halka Dişli - Helisel Halka Dişli - Doğrudan Bağlı * Çimento Fırını * Kurutucular ve Soğutucular		* Ball and Rod - Spur Ring Gear - Helical Ring Gear - Direct Connected * Cement Kilns * Dryers and Coolers	

TR

KULLANIM ALANLARI

EN

APPLICATION AREAS

UYGULAMALAR

KERESTE ENDÜSTRİSİ

- * Kabuk Soyucular
Besleme Tamburu
Ana Tahrir
- * Konveyörler
Brülör
Ana Yük veya Ağır Yük
Ana Kütük
Hızır ve Taşıma Bandı
Kalın Dilim
Taşıma
- * Kesme Testereleeri
Zincir
Sürükleme
- * İndirme Boşaltma Tamburları
- * Uzun Deste
- * Tomruk Çekme-Eğme
- * Kütük Döndürme Aygıtları
- * Sıralama Tablası
- * Taşıma
Zincir
Kreynyolu
- * Tabla Tahriki

KAĞIT İŞLEMELERİ

- * Karıştırıcı
- * Saf çözeltiler için Karıştırıcı
- * Kabuk Soyma Tromelleri
- * Mekanik Kabuk Soyucu
- * Dövücü - Öğütücü
- * Düzleştirme Makinesi
- * Kalenderleme
- * Yüzey Pürüzlendirici
- * Çentik Besleyici
- * Kaplama Merdanesi
- * Konveyörler
Çentik, Kabuk, Kimyasal
Kalın Dilimler İçeren Kütükler
- * Kesici
- * Silindir Kalıpları
- * Kurutucu
Kağıt Makinesi
Konveyör Tip
- * Kabartmalı Basıcı
- * Ekstruder
- * Kağıt Merdaneleri
- * Presler
- * Hamurlaştırıcı
- * Pompalar

FİLTRELER

- * Havalı Yıkama
- * Döner - Taş veya Çakıl
- * Hareketli Su Girişi

APPLICATIONS

LUMBER INDUSTRY

- * Barkers
Spindle Feed
Main Drive
- * Conveyors
Burner
Main or Heavy Duty
Main Log
Re-saw, Merry-Go-Round
Slab
Transfer
- * Cut-Off Saws
Chain
Drag
- * Debarking Drums
- * Long Deck
- * Log Hauls - Incline
- * Log Turning Devices
- * Sorting Table
- * Transfers
Chain
Causeway
- * Tray Drives

PAPER MILLS

- * Agitator (Mixer)
- * Agitator for Pure Liquors
- * Barking Drums
- * Mechanical Barkers
- * Beater
- * Breaker Stack
- * Calender
- * Chipper
- * Chip Feeder
- * Coating Rolls
- * Conveyors
Chip, Bark, Chemical
Log (including Slab)
- * Cutter
- * Cylinder Molds
- * Dryer
Paper Machine
Conveyor Type
- * Embosser
- * Extruder
- * Paper Rolls
- * Presses
- * Pulper
- * Pumps

SCREENS

- * Air Washing
- * Rotary - Stone or Gravel
- * Traveling Water Intake

TR	KULLANIM ALANLARI	EN	APPLICATION AREAS
UYGULAMALAR PLASTİK ENDÜSTRİSİ İLK İŞLEMLER		APPLICATIONS PLASTIC INDUSTRY PRIMARY PROCESSING	
* Yoğun İç Karıştırıcılar Harmanlayıcı Kesintisiz Karıştırıcı		* Intensive Internal Mixers Batch Mixers Continuous Mixers	
PLASTİK ENDÜSTRİSİ İKİNCİL İŞLEMLER		PLASTIC INDUSTRY SECONDARY PROCESSING	
* Hacim Kalıpcıları * Kaplama * Tabaka * Boru * Ön Plastikleştirme * Rot * Saç, Plaka * Borular		* Blow Molders * Coating * Film * Pipe * Pre-Plasticizers * Rods * Sheet * Tubing	
POMPALAR		PUMPS	
* Santrifüj * Oranlama * Pistonlu Tek Tesirli - 3 veya daha fazla Silindir Çift Tesirli - 2 veya daha fazla Silindir * Döner Şanzuman Tipi Lob Pervane		* Centrifugal * Proportioning * Reciprocating Single Acting - 3 or more cylinders Double Acting - 2 or more cylinders * Rotary Gear Type Lobe Vane	
KAUÇUK - LASTİK ENDÜSTRİSİ		RUBBER INDUSTRY	
* Yoğun İç Karıştırıcılar Harmanlayıcılar Kesintisiz Karıştırıcılar * Karıştırma İşlemi 2 Yumuşak Merdane 1 veya 2 Oluklu Merdane * Toplu İşleme - 2 Yumuşak Silindir * Kırıcı ve Isıtıcı - 2 Merdane, 1 Oluklu Merdane * Kırıcı - 2 Oluklu Merdane * Tutma, Besleme, Karıştırma İşlemi - 2 Merdane * Artıcı - 2 Merdane * Kalenderler		* Intensive Internal Mixers Batch Mixers Continuous Mixers * Mixing Mill 2 Smooth Rolls 1 or 2 corrugated Rolls * Batch Drop Mill - 2 Smooth Rolls * Cracker Warmer-2 Rolls, 1 Corr. Roll * Cracker - 2 Corrugated Rolls * Holding, Feed and Blend Mill - 2 Rolls * Refiner - 2 Rolls * Calenders	
ATIK SU BOŞALTIM EKİPMANLARI		SEWAGE DISPOSAL EQUIPMENT	
* Çubuklu Elek * Kimyasal Besleme Üniteleri * Su Boşaltma Eleği * Köpük Kesici * Yavaş veya Hızlı Karıştırıcılar * Tortu Toplayıcı * Koyulaştırıcı * Vakumlu Filtre		* Bar Screens * Chemical Feeders * Dewatering Screen * Scum Breaker * Slow or Rapid Mixers * Sludge Collector * Thickener * Vacuum Filter	
KOMPAKTÖRLER		COMPACTORS	
ÇEKTİRMELER - YAVAŞ VE KUVVETLİ		PULLERS - BARGE HAUL	

TR	KULLANIM ALANLARI	EN	APPLICATION AREAS
	UYGULAMALAR		APPLICATIONS
	ŞEKER ENDÜSTRİSİ		SUGAR INDUSTRY
	* Pancar Dilimleme Aleti * Kamış Bıçakları * Kırma Makineleri		* Beet Slicer * Cane Knives * Crushers
	TEKSTİL ENDÜSTRİSİ		TEXTILE INDUSTRY
	* Harman Ölçer * Kalenderler * Şablonlar * Kuru Konserveler * Boyama Makinesi * Dokuma Tezgahları * Çamaşır Sıkma Makinesi - Merdane * Kaplama * Doldurma Makinesi * Haşıl Makinesi * Halat Yıkama Makinesi * Eğirme Makinesi * Germe Kurutma Makineleri * Yıkama Makineleri * Masura Sarıcısı		* Batcher * Calenders * Cards * Dry Cans * Dyeing Machinery * Looms * Mangle * Napper * Pads * Siashers * Soapers * Spinners * Tenter Frames * Washers * Winders
	DAMPERLİ ARAÇLAR		CAR DUMPERS
	ÇEKİCİ ARAÇLAR		CAR PULLERS
	ARITICILAR		CLARIFIERS
	KONSERVE DOLUM MAKİNELERİ		CAN FILLING MACHINES

TR

KULLANILAN TERİMLER

EN

NOMENCLATURE

REDÜKTÖR TİPİ / GEAR TYPE

Ayak Montajlı
Foot Mounted

PA 11...PA 51 = **Tek kademeli, Ayak montajlı, Helisel dişlili redüktör**
Single reduction, Foot mounted, Helical gearboxes

PA 02...PA 102 = **İki kademeli, Ayak montajlı, Helisel dişlili redüktör**
Double reduction, Foot mounted, Helical gearboxes

PA 03...PA 103 = **Üç kademeli, Ayak montajlı, Helisel dişlili redüktör**
Triple reduction, Foot mounted, Helical gearboxes

PA 02/12...PA 52/12 = **Dört kademeli, Ayak montajlı, Helisel dişlili redüktör**
Quadruple reduction, Foot mounted, Helical gearboxes

PA 63/22...PA 103/52 = **Beş kademeli, Ayak montajlı, Helisel dişlili redüktör**
Quintuple reduction, Foot mounted, Helical gearboxes

PA 63/23...PA 103/53 = **Altı kademeli, Ayak montajlı, Helisel dişlili redüktör**
Sixtuple reduction, Foot mounted, Helical gearboxes

Flanş Montajlı
Flange Mounted

PF 11...PF 51 = **Tek kademeli, Flanş montajlı, Helisel dişlili redüktör**
Single reduction, Flange mounted, Helical gearboxes

PF 02...PF 102 = **İki kademeli, Flanş montajlı, Helisel dişlili redüktör**
Double reduction, Flange mounted, Helical gearboxes

PF 03...PF 103 = **Üç kademeli, Flanş montajlı, Helisel dişlili redüktör**
Triple reduction, Flange mounted, Helical gearboxes

PF 02/12...PF 52/12 = **Dört kademeli, Flanş montajlı, Helisel dişlili redüktör**
Quadruple reduction, Flange mounted, Helical gearboxes

PF 63/22...PF 103/52 = **Beş kademeli, Flanş montajlı, Helisel dişlili redüktör**
Quintuple reduction, Flange mounted, Helical gearboxes

PF 63/23...PF 103/53 = **Altı kademeli, Flanş montajlı, Helisel dişlili redüktör**
Sixtuple reduction, Flange mounted, Helical gearboxes

24

25

TR

KULLANILAN TERİMLER

EN

NOMENCLATURE

Giriş Aksamları Input Options	Motor Motor	Kutup Numarası Number of Poles	Motor Seçenekleri Motor Options
W = Motorsuz girişli redüktörler için aksam = With free input shaft IEC = DIN 42677' ye göre standart motorlar için aksam = For assembly with IEC standard motors acc. to DIN 42677 T = Turbo kaplin = Turbo coupling	Üç fazlı motor Motor boyutu 63 - 315 Three phase motor Motor size 63 - 315 EExell = Patlamaya karşı güvenliği arttırılmış üç fazlı motor = Explosion proof three phase motor increased safety	2 = 2 Kutuplu = 2 - Poles 4 = 4 Kutuplu = 4 - Poles 6 = 6 Kutuplu = 6 - Poles 4 - 2 = 1:2 oranında hız değiştirici dahlander bağlantısı = Pole changing 1:2 Dahlander connection 8 - 2 = 1:4 oranında hız değiştirici ayrılmış sarmal dizilişli = Pole changing 1:4 Separate windings Diğer kutup kombinasyonları istendiğinde karşılanacaktır Other pole combinations on request	BRE = Frenli = With brake EF = Tek fazlı, fanlı = Separate fan, single phase ZF = Çift fazlı, fanlı = Separate fan, double phase DF = Üç fazlı, fanlı = Separate fan, three phase IG = Enkoderli = With encoder KK/FK = Debriyajlı = With clutches SR = Toza karşı korumalı fren = Brake dust - proof TF = Termistörlü = Thermistor RG = Korozyon korumalı frenli = Brake corrosion - protected WU = Yumuşak kalkışlı rotor = Soft start rotor RLS = Geri dönmeye karşı kilitli = Backstop TW = Isıya duyarlı = Thermal trip HL = Manuel frenli motor = Brake motor with hand release F = Extra Fan = Auxiliary Fan



PA MODÜLER SİSTEMİ

EN

MODULAR SYSTEM OF PA



Elektrik Motoru (Frenli)
Electric Motor (With Brake)



Elektrik Motoru (Frensiz)
Electric Motor (without brake)



Helisel Dişlili İndirgeç
Helical Reduction Gearcase



Helisel Dişlili, Flanşlı Redüktör
Helical Gearbox, Flange Mounted



IEC Adaptörü
IEC Adapter



W Kovani
Free Input Shaft



Elektrik Motoru (Frenli)
Electric Motor (With Brake)



Elektrik Motoru (Frensiz)
Electric Motor (None Brake)



W Kovani
Free Input Shaft



IEC Adaptörü
IEC Adapter



Elektrik Motoru (Frenli)
Electric Motor (With Brake)



Elektrik Motoru (Frensiz)
Electric Motor (None Brake)



**Helisel Dişlili, Ayaklı,
Tek Kademeli Redüktör**
Helical Gear, Foot Mounted,
Single Reduction



**Helisel Dişlili, Ayaklı,
Monoblok Redüktör**
Helical Gear, Foot Mounted,
Monoblock Case



**Helisel Dişlili, Ayaklı,
Blok Redüktör**
Helical Gear, Foot Mounted,
Block Case,



TR

ÜRÜNLERİMİZ

EN

PRODUCTS

1) PA 11...PA 51

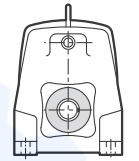
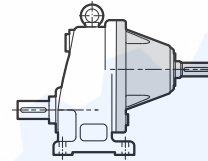
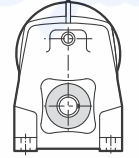
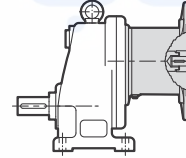
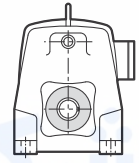
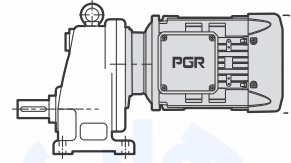
Ayak montajlı, Tek kademeli,
Helisel dişlili, Motorlu redüktör
Helical geared motor, Foot mounted,
Single reduction

PA 11...PA 51

Ayak montajlı, Tek kademeli,
Helisel dişlili, IEC adaptörlü redüktör
Helical gear unit, Foot mounted,
Single reduction, With IEC adapter

PA 11...PA 51

Ayak montajlı, Tek kademeli,
Helisel dişlili, W kovanlı redüktör
Helical gear unit, Foot mounted,
Single reduction, With free input shaft



2) PA 02...PA 52

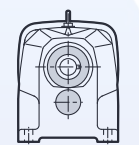
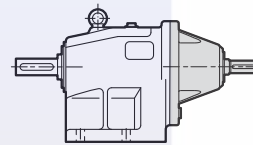
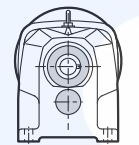
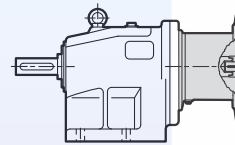
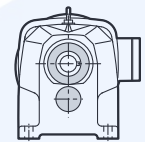
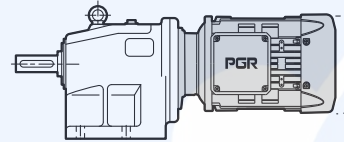
Ayak montajlı, İki kademeli,
Helisel dişlili, Motorlu redüktör
Helical geared motor, Foot mounted,
Double reduction

PA 02...PA 52

Ayak montajlı, İki kademeli,
Helisel dişlili, IEC adaptörlü redüktör
Helical gear unit, Foot mounted,
Double reduction, With IEC adapter

PA 02...PA 52

Ayak montajlı, İki kademeli,
Helisel dişlili, W kovanlı redüktör
Helical gear unit, Foot mounted,
Double reduction, With free input shaft



3) PA 62...102 - PA 63...103

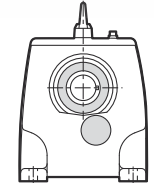
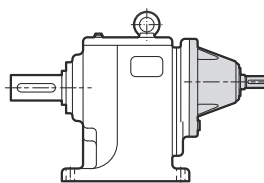
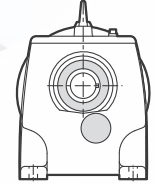
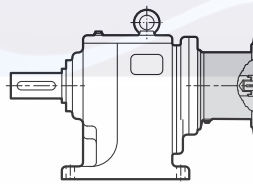
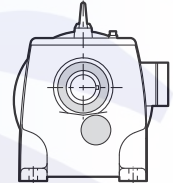
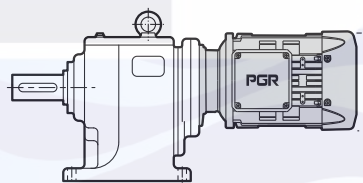
Ayak montajlı, İki kademeli - Üç kademeli,
Helisel dişlili, Motorlu redüktör
Helical geared motor, Foot mounted,
Double reduction - Triple reduction

PA 62...102 - PA 63...103

Ayak montajlı, İki kademeli - Üç kademeli,
Helisel dişlili, IEC adaptörlü redüktör
Helical gear unit, Foot mounted,
Double reduction - Triple reduction,
With IEC adapter

PA 62...102 - PA 63...103

Ayak montajlı, İki kademeli - Üç kademeli,
Helisel dişlili, W kovanlı redüktör
Helical gear unit, Foot mounted,
Double reduction - Triple reduction,
With free input shaft



TR

ÜRÜNLERİMİZ

EN

PRODUCTS

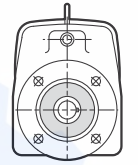
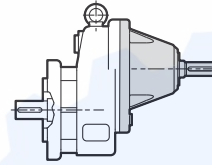
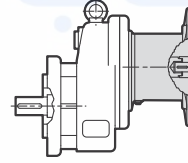
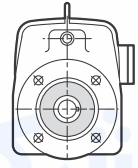
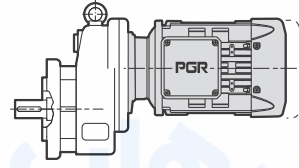
1) PF 11...PF 51

**Flanş montajlı, Tek kademeli,
Helisel dişlili, Motorlu redüktör**Helical geared motor, Flange mounted,
Single reduction

PF 11...PF 51

**Flanş montajlı, Tek kademeli,
Helisel dişlili, IEC adaptörlü redüktör**Helical gear unit, Flange mounted,
Single reduction, With IEC adapter

PF 11...PF 51

**Flanş montajlı, Tek kademeli,
Helisel dişlili, W kovanlı redüktör**Helical gear unit, Flange mounted,
Single reduction, With free input shaft

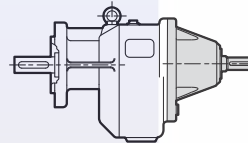
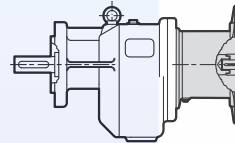
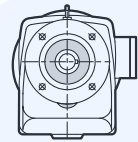
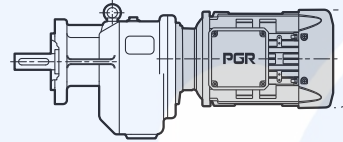
2) PF 02...PF 52

**Flanş montajlı, İki kademeli,
Helisel dişlili, Motorlu redüktör**Helical geared motor, Flange mounted,
Double reduction

PF 02...PF 52

**Flanş montajlı, İki kademeli,
Helisel dişlili, IEC adaptörlü redüktör**Helical gear unit, Flange mounted,
Double reduction, With IEC adapter

PF 02...PF 52

**Flanş montajlı, İki kademeli,
Helisel dişlili, W kovanlı redüktör**Helical gear unit, Flange mounted,
Double reduction, With free input shaft

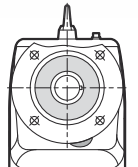
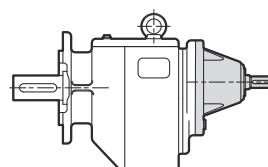
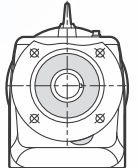
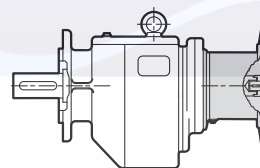
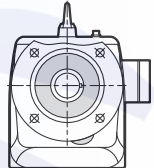
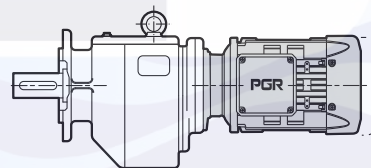
3) PF 62...102 - PA 63...103

**Flanş montajlı, İki kademeli - Üç kademeli,
Helisel dişlili, Motorlu redüktör**Helical geared motor, Flange mounted,
Double reduction - Triple reduction

PF 62...102 - PA 63...103

**Flanş montajlı, İki kademeli - Üç kademeli,
Helisel dişlili, IEC adaptörlü redüktör**Helical gear unit, Flange mounted,
Double reduction - Triple reduction,
With IEC adapter

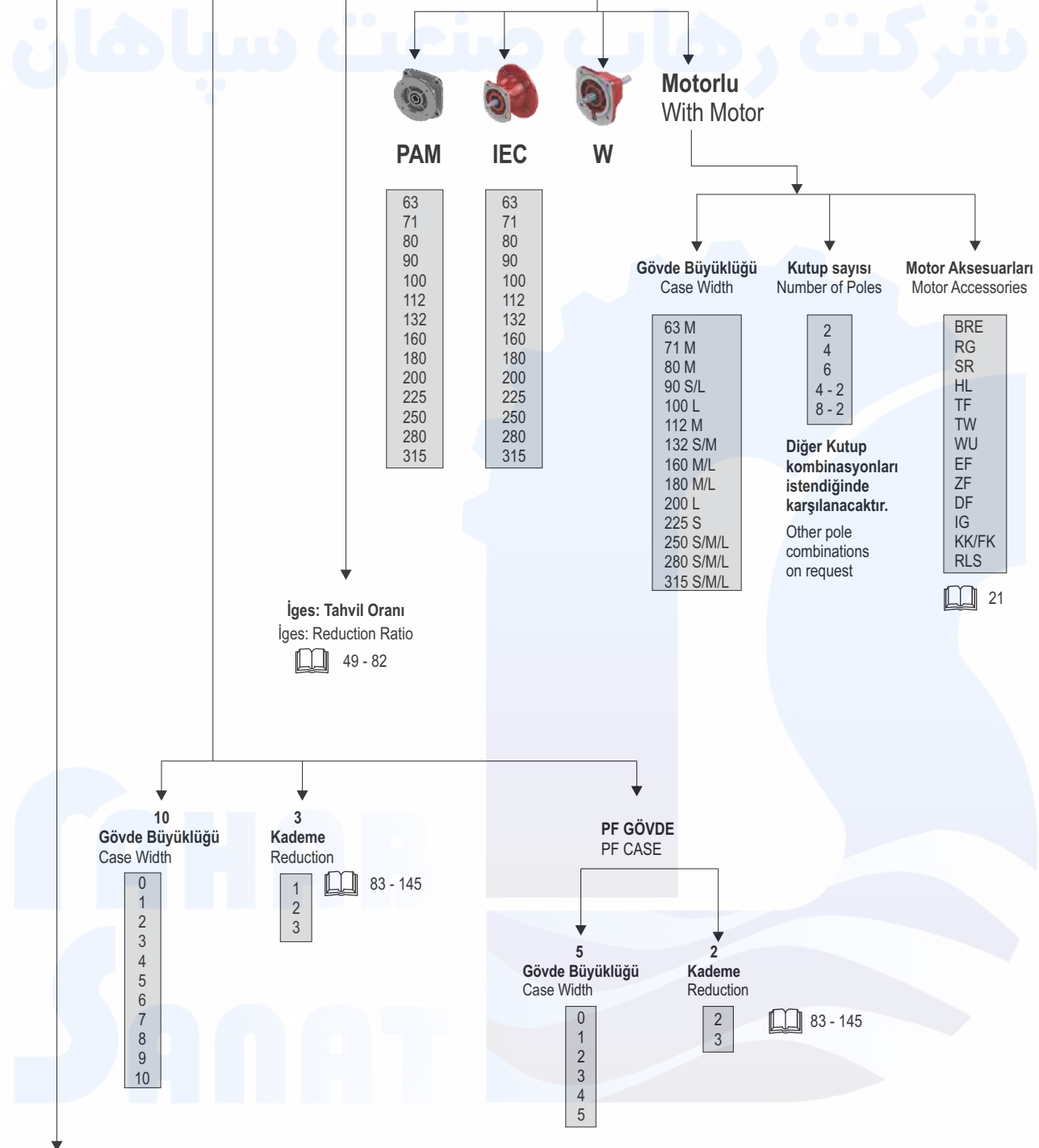
PF 62...102 - PA 63...103

**Flanş montajlı, İki kademeli - Üç kademeli,
Helisel dişlili, W kovanlı redüktör**Helical gear unit, Flange mounted,
Double reduction - Triple reduction,
With free input shaft

TR SİPARİŞ ÖRNEĞİ

EN EXAMPLE FOR ORDERING

PA (PF) 103/52 817.82 - 132M / 4 BRE



Tip :POLAT Ayaklı Redüktör (POLAT Flanşlı Redüktör)

Type : POLAT Helical Foot Mounted Geared Motor (POLAT Helical Flange Mounted Geared Motor)

TR

MONTAJ POZİSYONLARI

M4 montaj pozisyonunda ilave yağlama ünitesi kullanılır.

Tabloda gösterilen bu montaj pozisyonları helisel dişli redüktörlerin W kovani ve IEC adaptör olanlar için de geçerlidir.

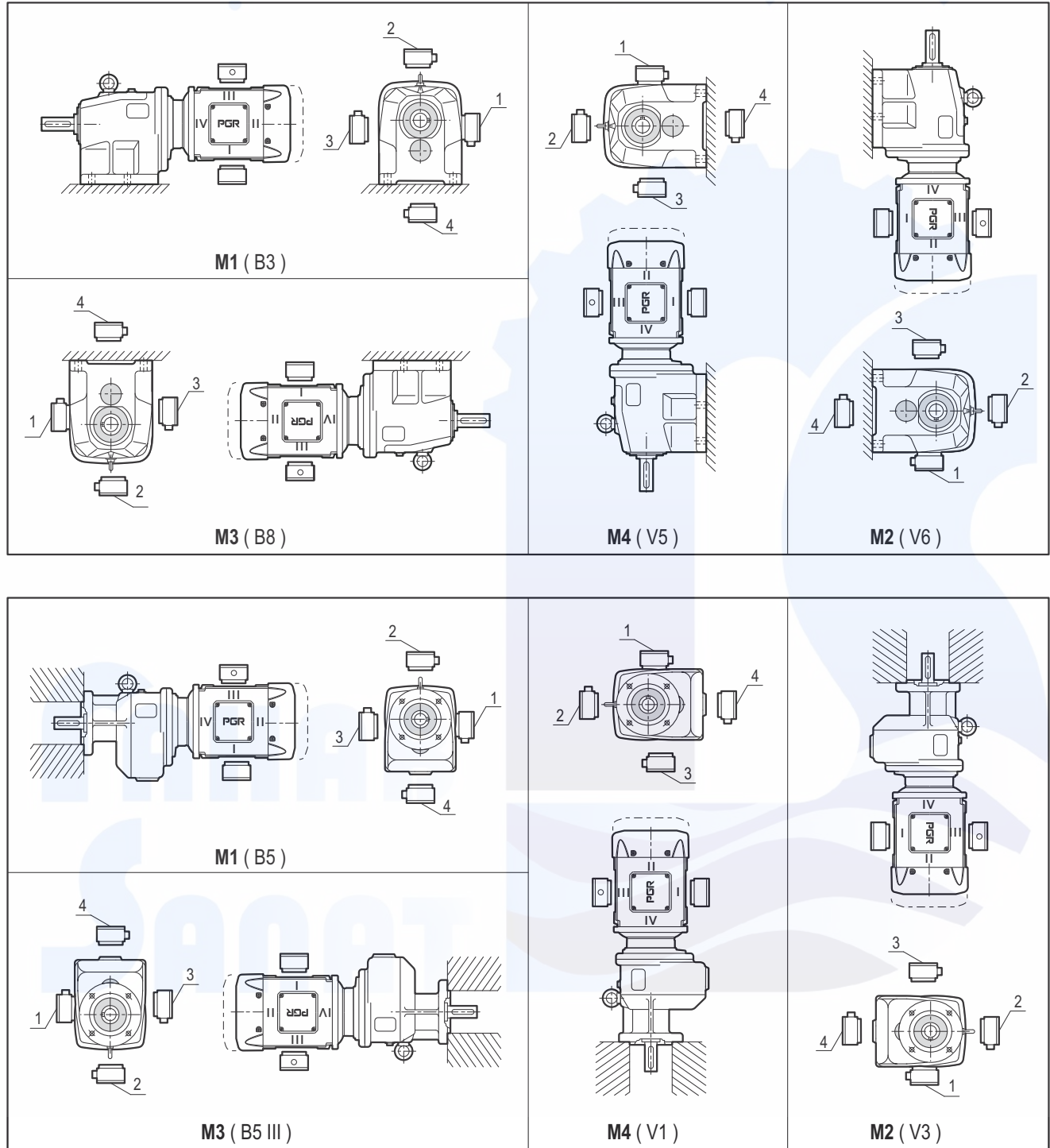
EN

MOUNTING POSITIONS

Mounting position M4 with additional lubricant volume

Mounting positions which are shown below are used for all types of helical gear units. (Type W cylinder, IEC adapter and geared motor)

32 - 33



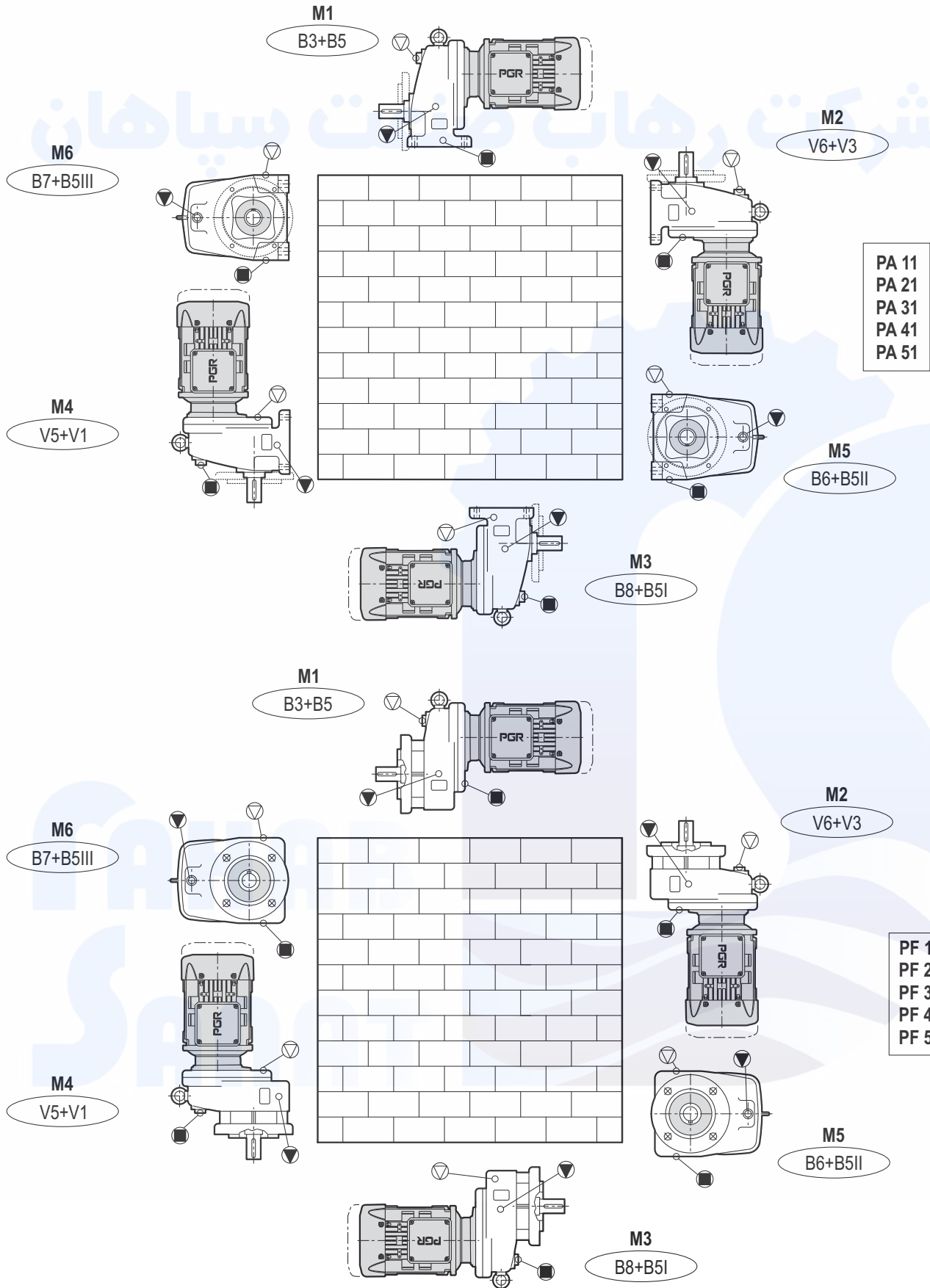
Montaj yüzeyi / Mounting surface

TR

MONTAJ POZİSYONLARI

EN

MOUNTING POSITIONS



▽ Havalandırma tapası / Vent plug

■ Boşaltma tapası / Drain plug

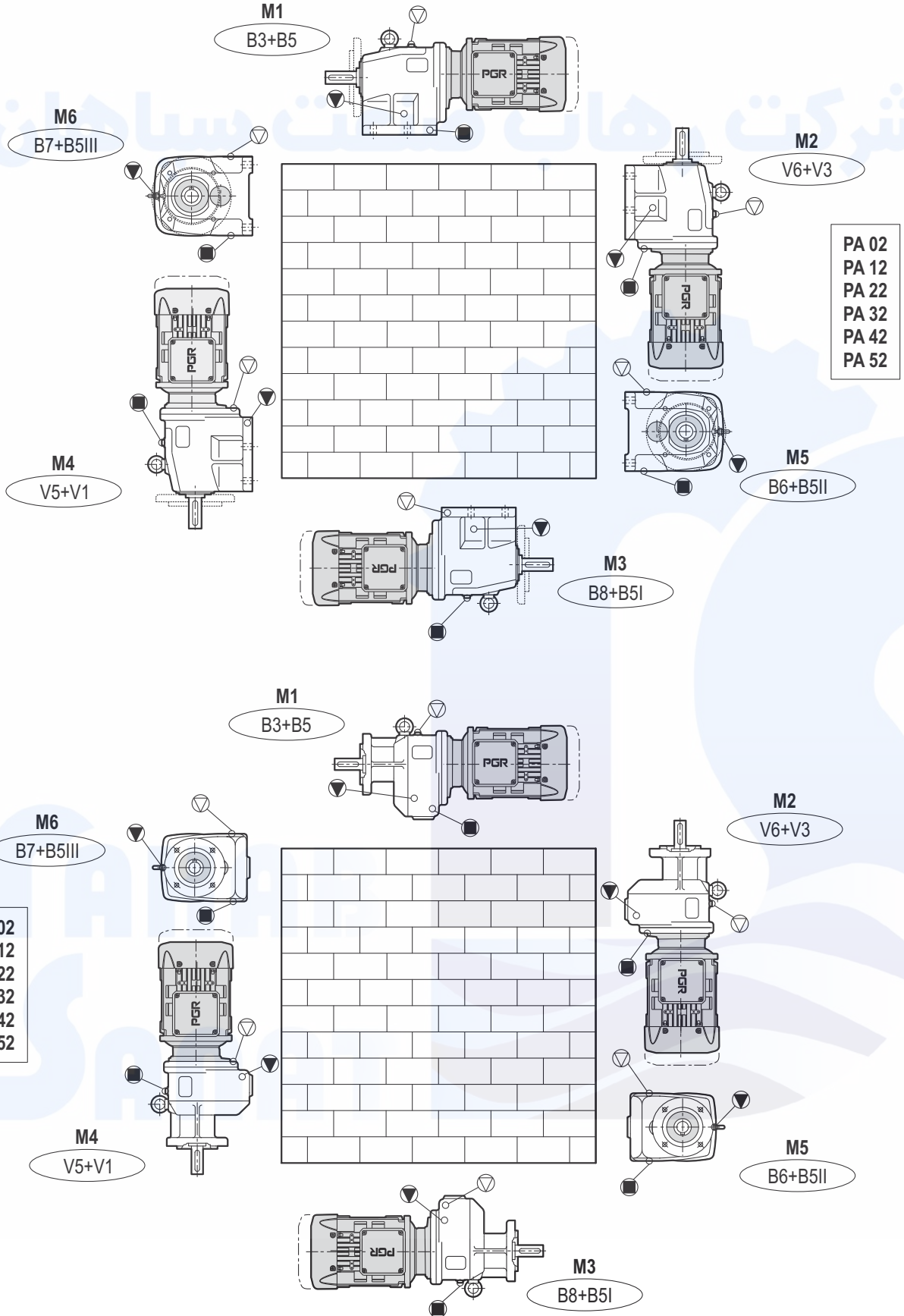
▽ Yağ Seviye tapası / Oil level

TR

MONTAJ POZİSYONLARI

EN

MOUNTING POSITIONS



▽ Havalandırma tapası / Vent plug

● Boşaltma tapası / Drain plug

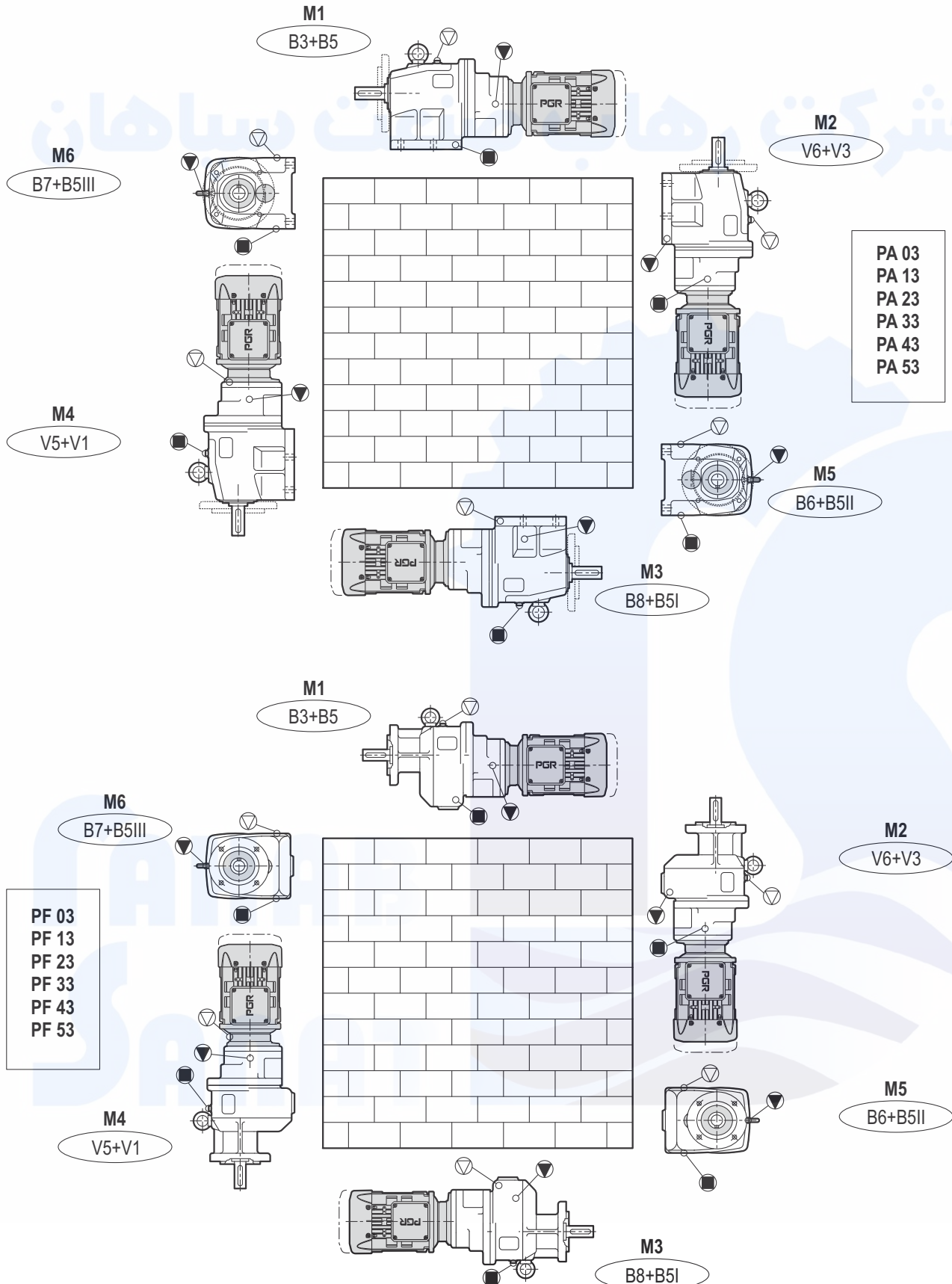
▽ Yağ Seviye tapası / Oil level

TR

MONTAJ POZİSYONLARI

EN

MOUNTING POSITIONS



○ Havalandırma tapası / Vent plug

● Boşaltma tapası / Drain plug

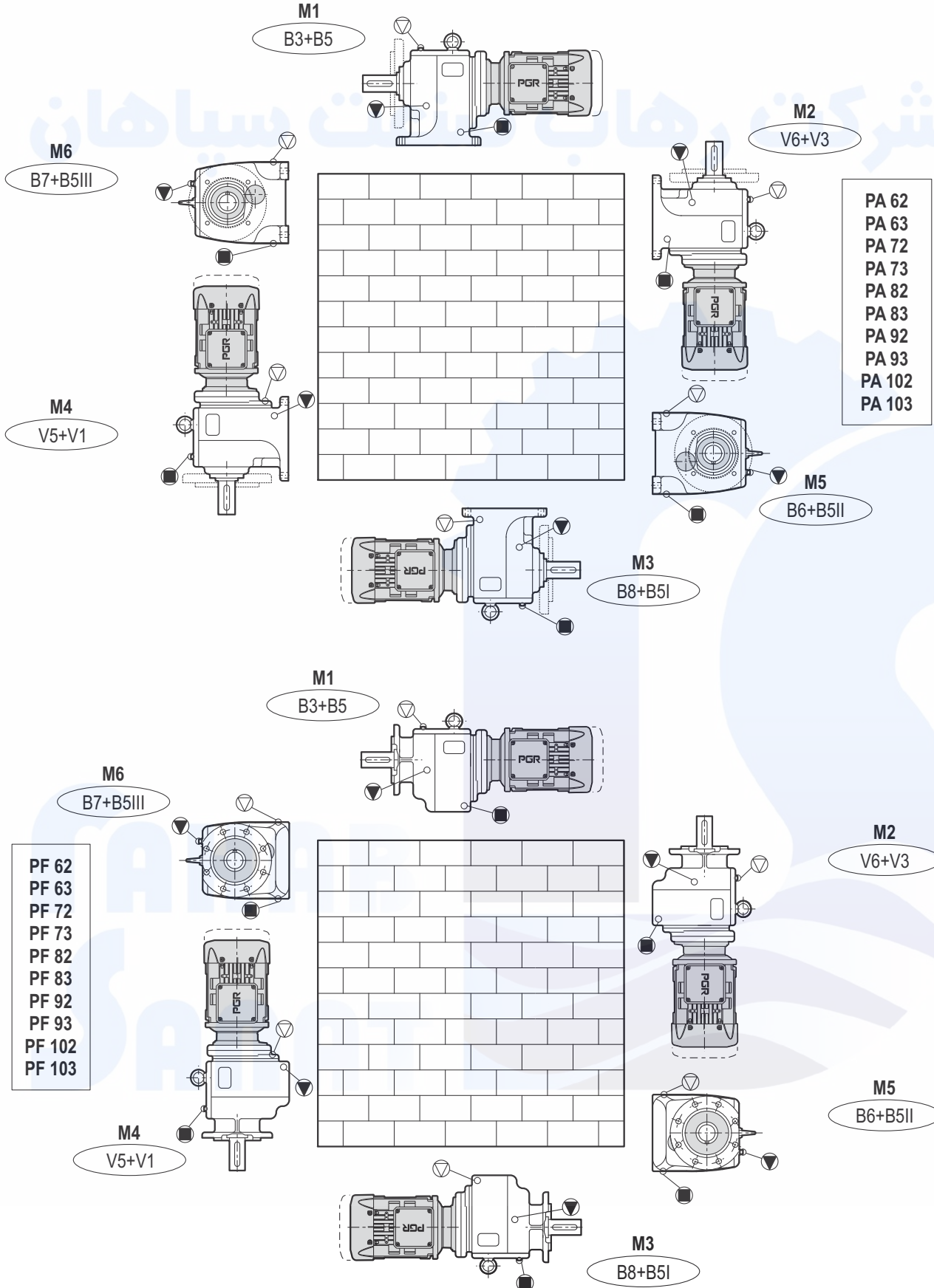
▼ Yağ Seviye tapası / Oil level

TR

MONTAJ POZİSYONLARI

EN

MOUNTING POSITIONS



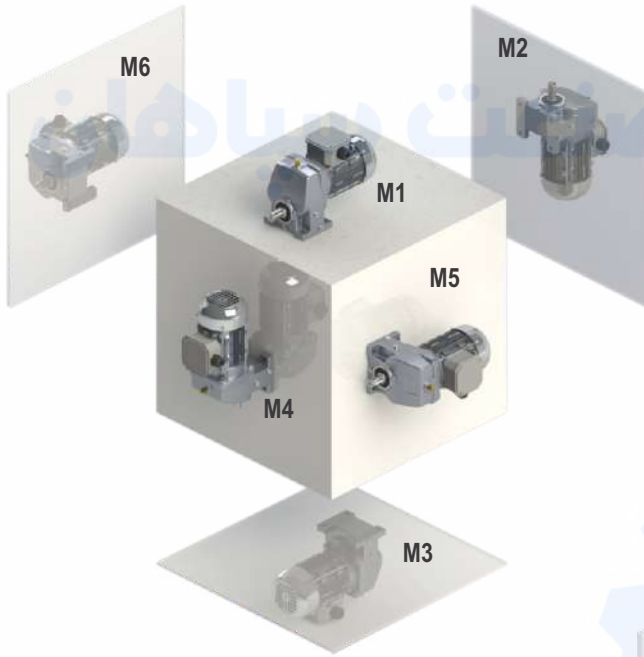
○ Havalandırma tapası / Vent plug

● Boşaltma tapası / Drain plug

▼ Yağ Seviye tapası / Oil level

TR

PA MONTAJ POZİSYONLARI

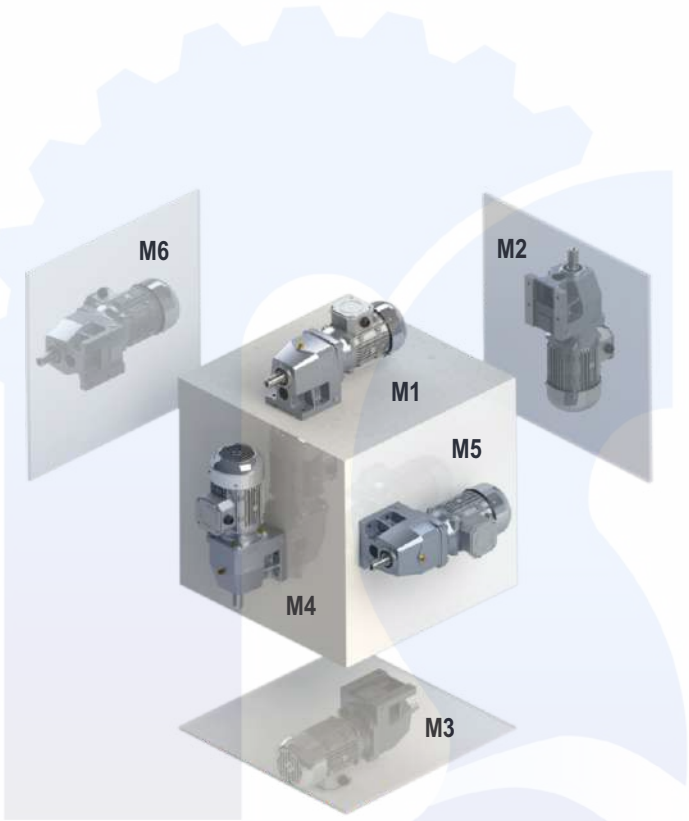


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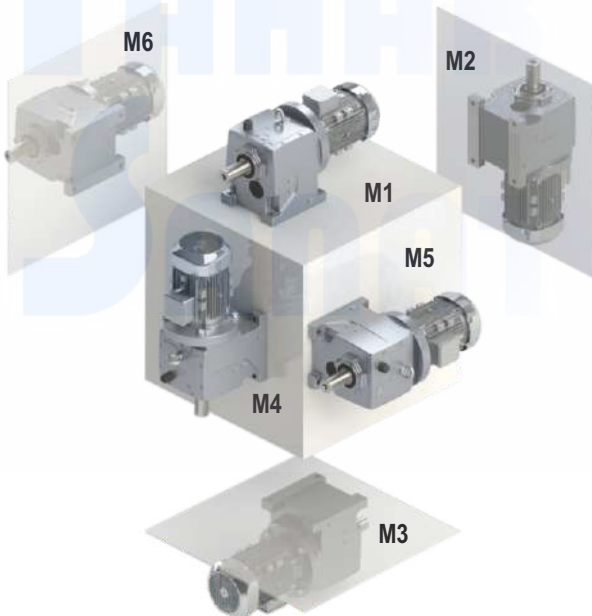
PA MOUNTING POSITIONS

PA TEK KADEME
PA SINGLE REDUCTION

**PA İKİ VE ÜÇ KADEME
(MONOBLOK)**
PA DOUBLE AND TRIPLE
REDUCTION (MONOBLOC)



**PA İKİ VE ÜÇ KADEME
(BLOK)**
PA DOUBLE AND TRIPLE
REDUCTION (BLOC)



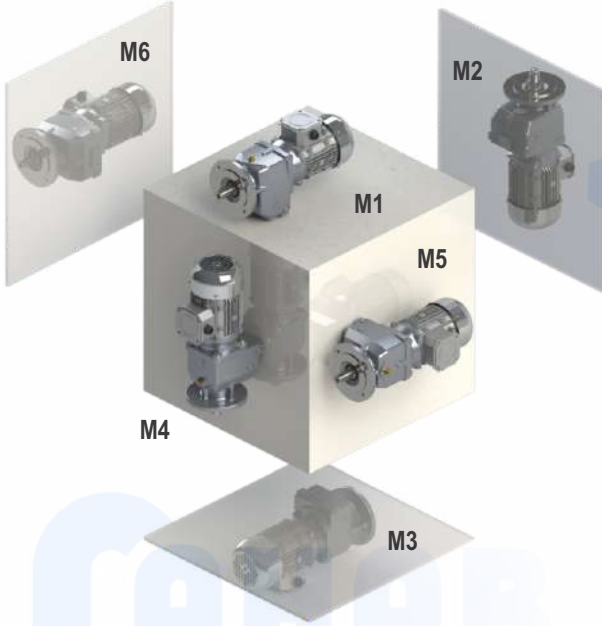
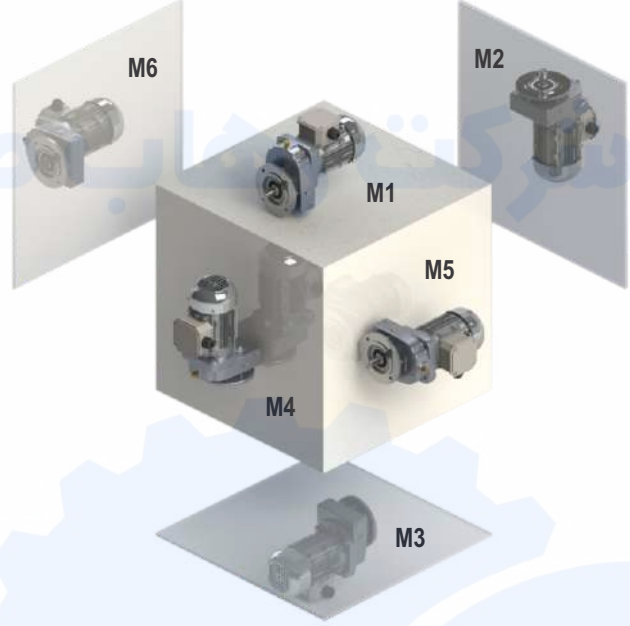
TR

PF MONTAJ POZİSYONLARI

EN

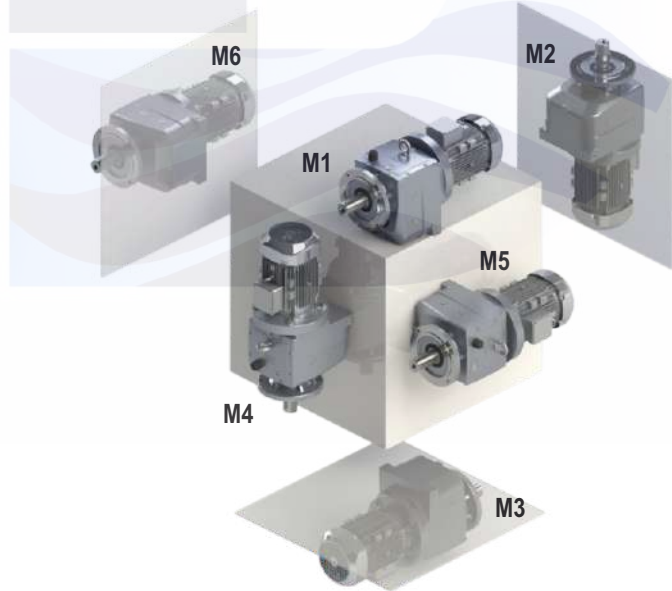
PF MOUNTING POSITIONS

PF TEK KADEME
PF SINGLE REDUCTION



PF İKİ VE ÜÇ KADEME
(MONOBLOK)
PF DOUBLE AND TRIPLE
REDUCTION (MONOBLOCK)

PF İKİ VE ÜÇ KADEME
(BLOK)
PF DOUBLE AND TRIPLE
REDUCTION (BLOCK)



TR

YAĞLAMA

Çalıştırmadan veya uzun süreli olarak depoya kaldırmadan önce ventildeki tapa sökülüp, havalandırma tapası takılarak aşırı basınç ve yağ sızıntısı önlenmelidir.

Redüktörler fabrikadan çalışmaya hazır ve mineral yağ doldurulmuş olarak gönderilirler. Bütün dişli üniteler aşağıdaki tablonun ortam sıcaklığı sütununda listesi verilen yağlayıcı (normal) ile dolu olarak sevk edilirler. Diğer ortam sıcaklıkları için listede verilen yağlayıcılar ek ücret karşılığında temin edilebilir.

Yağlayıcı her 10 000 çalışma saatinde veya 2 yıl sonra değiştirilmelidir. Sentetik yağlar için yağ değişikliği her 20000 çalışma saatinde veya 4 yıl sonra yapılmalıdır. Zorlu çalışma koşullarında örneğin yüksek rutubet ve büyük sıcaklık değişimleri ve kötü çevre şartları gibi durumlarda daha kısa aralıklarla yağ değişimi yapılması tavsiye edilir. Yağ değişiminin üniteyi komple temizleme işlemi ile birleştirilmesi önerilir. Rulman içerisindeki gres her 10000 çalışma saatinde değiştirilmeli ve yeni gres ile doldurulmalıdır. Bu işlem yapılırken rulmanın 1/3 ünün gresle dolu olması sağlanmalıdır.

Not: Sentetik ve mineral yağlayıcılar birbirine karıştırılmamalıdır.

Note: Consider that different kinds of oil (synthetic and mineral oil) should not be mixed.

EN

LUBRICATION

Lubricating oil properties and selection of oil must be done correctly for the reducers to have long life and to run with good performance. In order to prevent oil leakage during long period storage due to inner pressure, top plug should be removed according to assembly type and venting plug should be mounted.

Reducers are delivered as being filled with mineral oil. Properties of oils depending on ambient temperature are presented at the following table. Gear units which is W or IEC adapter type and gear motors are charged with lubricant. Ambient temperature plays an important role for choosing lubricant. Relation between ambient temperature and properties of oils are shown in table.

Lubricants must be changed every 10000 hour or after two years, but this time changes when synthetic oil is used. Lubricants must be changed every 20000 hours or after four years where synthetic oil is used. However, operating conditions should be considered for changing oil time eg. in aggressive environment severe temperature changing, oil must be changed frequently. For bearings grease should be changed every 10000 running time and it should be done with fresh grease and least 1/3 of bearing must be covered.

Redüktör Tipi Type of gearbox	Yağ Tipi Type of Lubricant	Ortam Sıcaklığı Ambient Temp. °C	ISO vizkozite sınıfı ISO viscosity class	SHELL	MOBİL	BP	ESSO	DEA	ARAL	CASTROL	TRIBOL	KLÜBER
Helisel Dişli Redüktör	Mineral yağ	- 5...40 Normal	ISO VG 220	Shell Omala Oel 220	Mobilgear 600 XP 220	Energol GR-XP 220	Spartan EP 220	Deagear DX SAE 85W-90 Falcon CLP 220	Degol BG 220	Alpha SP 220 Alpha MW 220 Alpha MAX 220	Tribol 1100/220	Klüberoil GEM 1-220
	Mineral oil	-15...25	ISO VG 100	Shell omala Oel 100	Mobilgear 600 XP 150	Energol GR-XP 100	Spartan EP 100	Deagear DX SAE 80W Falcon CLP 150	Degol BG 100	Alpha SP 100 Alpha MW 100 Alpha MAX 220	Tribol 1100/100	Klüberoil GEM 1-100
		# - 50...-15	ISO VG 15	Shell Tellus Oel T 15	Mobil DTE 10 Excel 15	Bartran HV 15	Univis J 13	Alkraft Hydraulic Oil 15	Vitolon 1010	Hyspin SP 15 Hyspin ZZ 15	Tribol 770	Isotex MT 30 rot
	Sentetik yağ Synthetic oil	- 25...80	ISO VG 220	Shell Tivela Oel WB	Mobil Glygoyle 30	Energol SG-XP 220	ESSO Glycolube 220	Polydea PGLP 220	Degol GS 220	Alphasyn PG 220	Tribol 800/220	Klübersynth GH 6 - 220
Helical Gearboxes	Biyolojik Sentetik yağ Biodegradable oil	- 25...80	ISO VG 220					Plantogear 220 S	Bio-Degol S 220	Carelube GES 220	Tribol Bio Top1418/220	Klüber - Bio GM 2 - 220
	Gıda yağları Food - grade oil	- 25...80	ISO VG 220	Cassida 220	Mobil SHC Cibus 220		GEAR OIL FM 220	Renolin 220	Degol FG 220	OPTIMOL optileb GE 220	Tribol Food Proof 1810/220	Klüberoil 4UH1 - 220
	Akışkan sentetik gres Synthetic fluid grease	- 35...60		Shell Tivela compound A	Mobil SHC Polyrex 005	Energol GSF	Fliessfett S 420	Glissando 6833 EP 00	Aralub SKA 00	Alpha Gel 00	Tribol 800/1000	Klübersynth GE 46 -1200
Rulmanlar Anti Friction Bearings	Mineral yağlı gres	- 30...60 Normal		Alvania Fett R 3 oder Alvania Fett RL 3	Mobilux 3 Mobilux 2	Energol LS 3	Beacon 3	Glissando 30 Glissando 20	Aralub HL 3 Aralub HL 2	Spheerol AP 3 Spheerol AP 2 LZV - EP	Tribol 3030/100-2 Tribol 4020/220-2 Tribol 3785	Centoplex 3 Centoplex 2
	Mineral oil grease	# - 50...110				Energol LS 2	Beacon 2	Glissando FT 3	Aralub BAB EP 2	Spheerol EPL 2		
	Sentetik gres Synthetic grease	# - 50...110		Aero Shell Grease 16 oder 7	Mobiltemp SHC 32		Beacon 325	Discor 8 - EP 2	Aralub SKL 2	Product 783/46	Tribol 3499	Isotex Topas NB52

-30°C altında ve 60°C üzerindeki ortam sıcaklıklarında şafttaki sızdırmazlık elemanı için özel kalitedeki malzeme kullanılmalıdır.

Different materials should be used for sealing rings at operation temperature where temperature is below -30 °C and above 60 °C.

TR

YAĞ MİKTAR TABLOSU

(Litre) (L)						
	M1	M2	M3	M4	M5	M6
 32 - 33						
 28 - 31	B3	V6	B8	V5	B6	B7
PA 11	0.25	0.50	0.55	0.40	0.40	0.40
PA 21	0.60	1.20	1.20	1.00	1.00	1.00
PA 31	1.00	1.80	2.20	2.00	1.60	1.60
PA 41	1.30	2.60	3.10	2.50	2.60	2.60
PA 51	2.00	3.50	4.40	4.00	3.40	3.40

EN

LUBRICATION LEVELS

(Litre) (L)						
	M1	M2	M3	M4	M5	M6
 32 - 33						
 28 - 31	B3	V6	B8	V5	B6	B7
PA 62	6.50	15.00	13.00	18.00	13.00	13.00
PA 72	9.00	23.00	18.00	26.50	18.00	18.00
PA 82	14.00	35.00	27.00	40.00	28.00	28.00
PA 92	25.00	73.00	47.00	74.00	50.00	50.00
PA 102	36.00	79.00	66.00	102.00	71.00	71.00

(Litre) (L)						
	M1	M2	M3	M4	M5	M6
 32 - 33						
 28 - 31	B3	V6	B8	V5	B6	B7
PA 02	0.15	0.60	0.75	0.60	0.45	0.45
PA 12	0.25	0.75	0.85	0.75	0.50	0.50
PA 22	0.50	1.80	2.00	1.80	1.35	1.35
PA 32	0.90	3.00	2.90	2.90	2.00	2.00
PA 42	1.20	4.50	4.20	4.30	3.20	3.20
PA 52	2.50	7.20	6.80	6.80	5.10	5.10

(Litre) (L)						
	M1	M2	M3	M4	M5	M6
 32 - 33						
 28 - 31	B3	V6	B8	V5	B6	B7
PA 63	13.00	14.50	13.50	17.00	13.00	13.00
PA 73	19.00	20.00	19.00	25.00	19.20	19.20
PA 83	27.00	31.00	29.00	37.00	30.50	30.50
PA 93	51.50	56.00	51.00	72.00	53.50	53.50
PA 103	69.00	71.00	69.00	92.50	67.00	67.00

(Litre) (L)						
	M1	M2	M3	M4	M5	M6
 32 - 33						
 28 - 31	B3	V6	B8	V5	B6	B7
PA 03	0.50	1.10	0.85	1.05	0.60	0.60
PA 13	0.70	1.30	1.10	1.20	0.70	0.70
PA 23	1.40	2.40	1.90	2.40	1.40	1.40
PA 33	1.60	2.90	2.90	3.70	2.00	2.00
PA 43	3.00	5.60	4.40	5.70	3.20	3.20
PA 53	4.50	8.70	6.80	9.20	5.00	5.00

TR

YAĞ MİKTAR TABLOSU

(Litre) (L)						
 32 - 33	M1	M2	M3	M4	M5	M6
 28 - 31	B5	V3	B5I	VI	B5II	B5III
PF 11	0.25	0.50	0.45	0.30	0.35	0.35
PF 21	0.50	1.30	1.20	0.80	1.00	1.00
PF 31	0.80	1.60	1.65	1.30	1.20	1.20
PF 41	1.00	2.60	2.80	1.90	2.40	2.40
PF 51	1.80	3.50	3.90	3.30	3.40	3.40

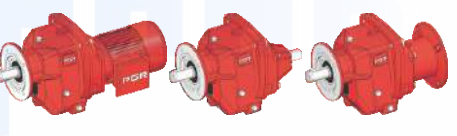
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LUBRICATION LEVELS

(Litre) (L)						
 32 - 33	M1	M2	M3	M4	M5	M6
 28 - 31	B5	V3	B5I	VI	B5II	B5III
PF 62	7.00	15.00	14.00	18.70	13.50	13.50
PF 72	10.00	23.00	20.50	31.00	21.00	21.00
PF 82	15.00	37.00	30.00	45.50	30.00	30.00
PF 92	26.00	73.00	48.00	76.00	50.00	50.00
PF 102	40.00	81.00	66.00	104.00	72.00	72.00

(Litre) (L)						
 32 - 33	M1	M2	M3	M4	M5	M6
 28 - 31	B5	V3	B5I	VI	B5II	B5III
PF 02	0.25	0.65	0.70	0.70	0.50	0.50
PF 12	0.35	0.85	0.90	0.90	0.60	0.60
PF 22	0.70	2.00	2.00	2.15	1.55	1.55
PF 32	1.30	3.50	3.00	3.10	2.15	2.15
PF 42	1.80	5.00	4.00	4.50	3.20	3.20
PF 52	3.00	7.70	6.20	7.40	5.10	5.10

(Litre) (L)						
 32 - 33	M1	M2	M3	M4	M5	M6
 28 - 31	B5	V3	B5I	VI	B5II	B5III
PF 63	13.50	14.70	14.00	18.00	14.00	14.00
PF 73	21.50	22.50	22.00	29.00	22.00	22.00
PF 83	31.00	34.00	32.50	40.00	34.00	34.00
PF 93	53.00	70.00	53.00	74.00	54.50	54.50
PF 103	69.00	78.00	78.00	99.00	67.00	67.00

(Litre) (L)						
 32 - 33	M1	M2	M3	M4	M5	M6
 28 - 31	B5	V3	B5I	VI	B5II	B5III
PF 03	0.50	1.10	0.90	1.10	0.65	0.65
PF 13	0.85	1.40	1.10	1.35	0.80	0.80
PF 23	1.80	2.90	2.10	2.90	1.50	1.50
PF 33	1.90	3.40	2.90	4.00	2.20	2.20
PF 43	3.50	6.10	4.20	6.10	3.00	3.00
PF 53	5.20	8.80	6.50	9.20	5.00	5.00

TR

KİLİT

Opsiyonel olarak kilitlerimiz mevcuttur. Bu kilitler tek yöne dönmeye izin verirken, diğer yöne dönmeyi engeller. 80 gövde ve üzeri üç fazlı motorlar, W kovanları ve IEC adaptörleri yağlanması yapılmış kilit ile donatılabilir. Bu kilitler çıkartılabilir, merkezkaç kuvveti tarafından kontrol edilir ve yaklaşık olarak 900 d/dk üzerine çıktıktan sonra aşınmaya maruz kalır.

Kilit mekanizmalı redüktörler için çıkış şaftının veya milinin dönme yönünün verilmesi gerekir. Dönme yönü çıkış şaftına veya çıkış miline göre düzenlenir.

Kararlaştırılan dönme yönü için, tarif edilen dönme yönü her zaman çıkış şaftına veya miline göre düzenlenir. Delik millî redüktörler için konik sıkırma tarafından belirlenir.

DİKKAT: Motoru ve sistemi çalıştırmadan önce redüktörün dönme yönünü kontrol ediniz. Redüktör üzerindeki oklar dönme yönünü gösterir.

Bloke edilen yön **CCW** ise Dönme Yönü **CW**
Bloke edilen yön **CW** ise Dönme Yönü **CCW**

CW : Saat yönü

CCW : Saat yönü tersi

EN

BACKSTOP

Backstop system is available for all types of helical gear unit. Lubricated backstop system could be used optionally for using motor size 80 and greater, W cylinder and IEC adapters. Backstop system permits just one direction rotation it resists, another direction rotation. Rotation speed is important for tear. Nearly 900 min⁻¹ and greater rotation speed influence abration.

Please, determine direction of rotation when you offer. Direction of rotation should be determined according to output shaft.

Arrows which is designated by 'CW' or 'CCW' shows locking direction when you have a view of the face of output shaft end

Precaution: When you receive gear units, please check direction of rotation before running or installation to avoid damage.

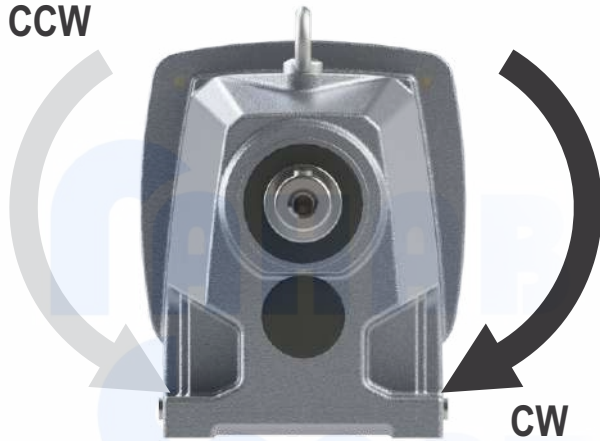
If Locking direction is **CCW**, Rotational direction is **CW**

If Locking direction is **CW**, Rotational direction is **CCW**

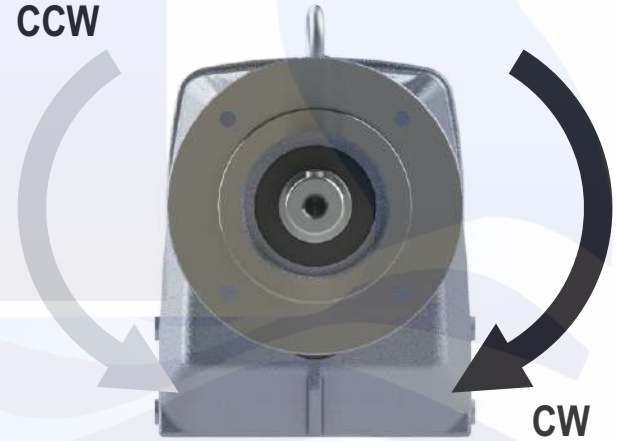
CW : Clockwise rotation

CCW : Counterclockwise rotation

PA



PF



TR

TOLERANSLAR

MOTOR VE REDÜKTÖRLERDE BOYUT - ÇİZİM BİLGİLERİ

Motor ölçüleri istenen opsiyona göre ölçüleri değişebilir.

DELİK MİLLİLER

Delik mil çapı toleransı için (DIN 748) ISO H7.
Müşteri mili çap toleransı ISO h6. "H" yükleme tipi bulunursa ISO k6

IEC - ADAPTÖR

Flanş merkezi çap toleransı için ISO H7

GİRİŞ VE ÇIKIŞ ŞAFTLARI

Mil çapı toleransı (DIN 748) :

ø 14 ile ø 50 mm arası için ISO k6,
ø 50 mm üzeri için ISO m6

Şaftta dış çekilmiş delikler için DIN 332/2 ye göre;

= ø 13 - ø 16	M5	
> ø 16 - ø 21	M6	
> ø 21 - ø 24	M8	
> ø 24 - ø 30	M10	
> ø 30 - ø 38	M12	
> ø 38 - ø 50	M16	
> ø 50 - ø 85	M20	
> ø 85 - ø 130	M24	



83 - 145

Kama yatakları DIN 6885

Şaft boyu "h" DIN 747

FLANŞLAR

Flanş merkezi çap toleransı (DIN 42948);

< ø 230 mm' ye kadar ISO j6,
> ø 230 mm üzeri için ISO h6

EN

TOLERANCES

DIMENSIONS OF GEARED MOTORS AND GEARBOXES - DRAWING INFORMATION

Motor dimension could be changed according to customer purchase.

HOLLOW SHAFTS

Tolerance of hollow shaft (DIN 748) ISO H7.
Tolerance of customer's solid shaft which is used for hollow shaft ISO h6, with type of load classification 'H' which is heavy-shock operation ISO k6.

IEC - ADAPTER

Diameter tolerance of flange centering is machined according to ISO H7.

INPUT AND OUTPUT SHAFT

Tolerances of solid shaft (DIN 748) :

between ø 14 - ø 50 mm to ISO k6,
greater than ø 50 mm to ISO m6.

Tapped center hole is machined according to DIN 332, sheet 2 ;

= ø 13 - ø 16	M5	
> ø 16 - ø 21	M6	
> ø 21 - ø 24	M8	
> ø 24 - ø 30	M10	
> ø 30 - ø 38	M12	
> ø 38 - ø 50	M16	
> ø 50 - ø 85	M20	
> ø 85 - ø 130	M24	



83 - 145

Keyways are machined according to DIN 6885, sheet 1

Shaft heights are machined according to "h" to DIN 747

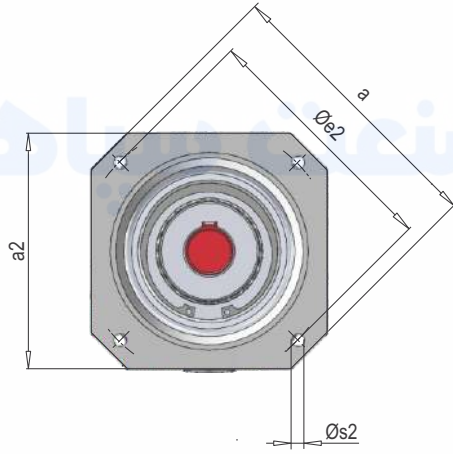
FLANGES

Diameter tolerance of flange centering is machined according to (DIN 42948);

< ø 230 mm to ISO j6,
> ø 230 mm to ISO h6

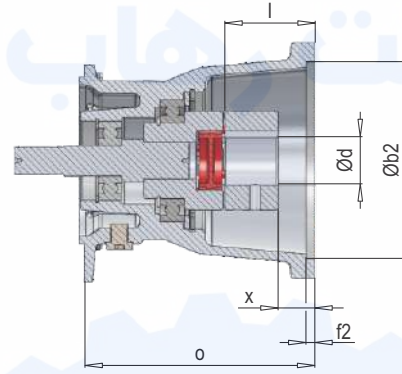
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SERVOMOTOR ADAPTÖRÜ



EN

SERVOMOTOR ADAPTERS



Redüktör Tipi Gear Unit Type	Motor Büyüklüğü / Motor Size							Şaft Ebatı Shaft Size		Silindir Cylinder	M _{knom} [Nm]	Adaptör tipi Adapter type
	a	a2	b2	e2	f2	s2	x	d	l			
PA/PF 02 , PA/PF 12	120	96	80	100	4	M6	15	19	40	124	10	Servo 100 / 160 S
PA/PF 02 , PA/PF 12	165	126	110	130	4	M8	20	24	50	136	35	Servo 130 / 160 S
PA/PF 22 , PA/PF 32	155	126	110	130	4	M8	20	24	50	150	35	Servo 130 / 250 S
PA/PF 02 , PA/PF 12	186	155	130	165	5	M10	23	32	58	151	95	Servo 165 / 160 S
PA/PF 22 , PA/PF 32	186	155	130	165	5	M10	23	32	58	166	95	Servo 165 / 250 S
PA/PF 22 , PA/PF 32	240	192	180	215	5	M12	45	38	80	187	95	Servo 215/ 250 S
PA/PF 42 , PA/PF 52	240	192	180	215	5	M12	24	38	80	229	310	Servo 215/ 300 S
PA/PF 42 , PA/PF 52	350	260	250	300	5	M16	26	48	82	231	310	Servo 300/ 300 S
PA/PF 62 , PA/PF 72 PA/PF 82 , PA/PF 92	350	260	250	300	5	M16	26	48	82	249	310	Servo 300/ 350 S

SEP tipi servo motor bağlantı adaptörünün bağlantısı kamalı olarak yapılmaktadır. SEK tiplerinde ise servo motor adaptörünün bağlantısı setuskur civata sıkırtması ile yapılmaktadır. Servo motor bağlantı adaptörünün bağlantı flanşının farklı olması durumunda yüksek adetli siparişler üretime alınır.

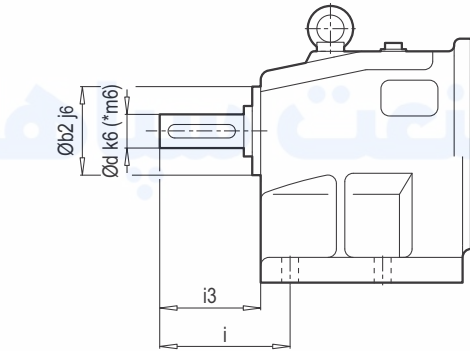
For connecting SEP adapter which is shown above on this page, servo motor's output shaft is designed with locking key. For connecting SEK type adapter, connecting is supplied with a clamp coupling sleeve. An intermediate flange is required when other servo motor types are used with IEC adapter. Offers are manufactured gladly by PGR.

TR

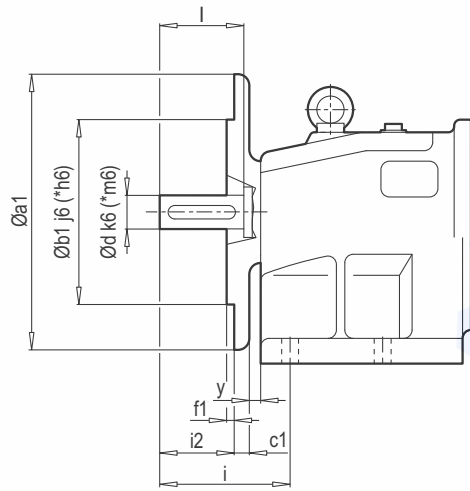
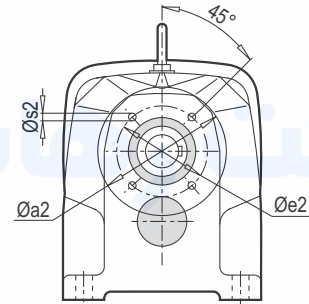
PA / B14 - B5

EN

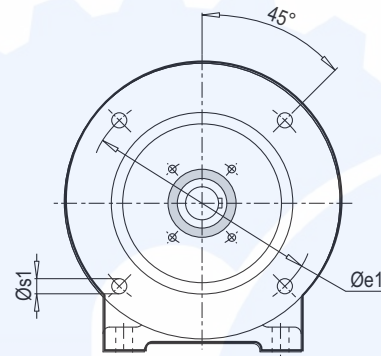
PA / B14 - B5



B 14



B5



94 - 117



PA 02-12-22

NOT : PA 02-12-22 Gövdelerde tek feder,
PA 32-42-52 Gövdelerde çift feder bulunmaktadır.

NOTE : PA 02-12-22 Cases have single support,
PA 32-42-52 Cases have double support.



PA 32-42-52

Tip / Type	a2	b2	e2	f2	s2	i	i3	a1	b1	c1	e1	f1	s1	i2	y	d	l	x
PA 02 PA 03	90	55	72	8	M 8x13	52	42	160	110	11	130	3,5	9	27	5	20	40	3
PA 12 PA 13	95	60	80	9	M 8x13	78	60	200	130	14	165	3,5	11	43	5	25	50	4
PA 22 PA 23	130	72	100	10	M 12x20	74	59	250	180	16	215	4,0	14	38	5	30	60	5
PA 32 PA 33	150	90	120	11	M 16x25	96	79	300	230	20	265	4,0	14	54	5	40	80	6
PA 42 PA 43	165	105	135	14	M 16x25	130	106	300	230	20	265	4,0	14	81	5	45	90	6
PA 52 PA 53	200	134	165	19	M 16x25	140	120	350	250	20	300	5,0	18	95	5	55*	110	6

TR M4 MONTAJ POZİSYONU İÇİN İLAVE YAĞ HACMİ

EN ADDITIONAL LUBRICANT VOLUME FOR MOUNTING POSITION M4

Tip Type	Boyut Size	ø D [mm]	H [mm]	[kg]
PF 42 - PF 43	I	100	180	6
PF 52 - PF 53				
PF 63				
PF 62	II	150	300	7
PF 72 - PF 73				
PF 82 - PF 83	III	180	300	8
PF 92 - PF 93				
PF 102 - PF 103				

Bu ilave yağ hacim ünitesinin kullanılması, dikey montaj pozisyonlarında (M4) ve kötü çalışma şartları altında bile havalandırma tapasından yağ sızmasını önler. Dikey çalışma ortamlarında redüktör içindeki yağ köpüklenme yapabilir ve bu ünite ilave bir hacim sağlar.

İlave yağ hacim ünitesi, tahvil oranı 20' den küçük helisel dişli üniteleri PA/PF42 ve daha üst gövdelerin dikey montaj pozisyonu uygulamalarında kullanımı önerilir.



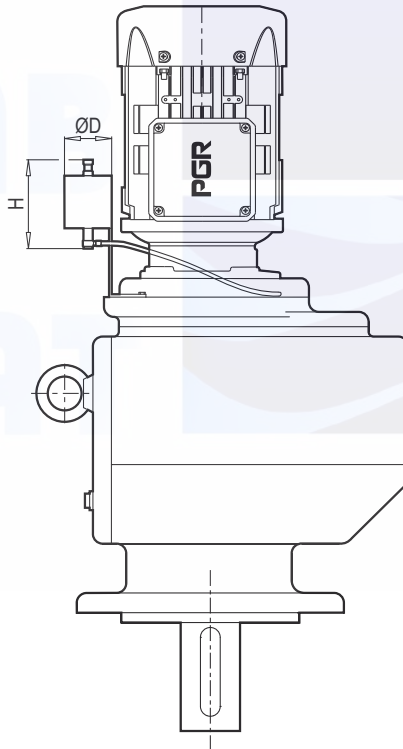
34

Additional lubricant volume unit is used for preventing oil leakage from venting plug when gear unit is mounted with M4 mounting position. It is important because at vertical mounting position oil could be foamed.

PGR suggest that additional lubrication volume units should be used where gear reduction is less than 20 and for polat helical gear unit series such as PA/PF 42 and bigger cases when M4 vertical mounting position is applied.

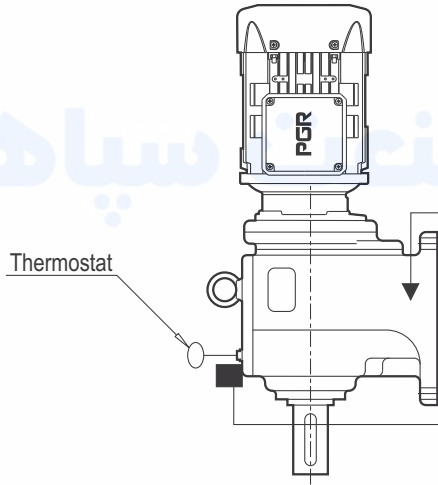


34



TR

YAĞ SOĞUTMALI



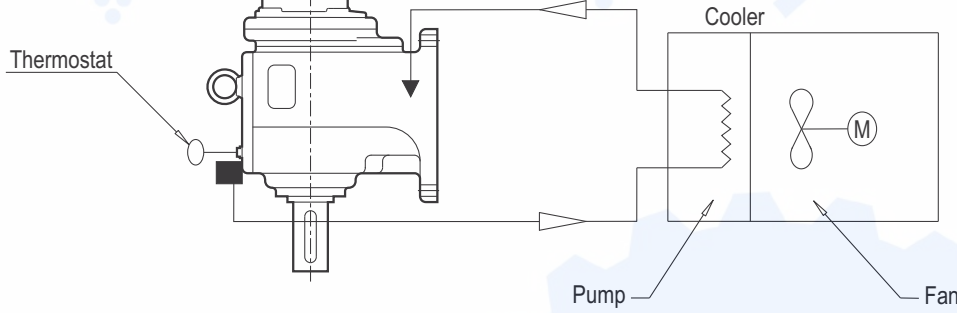
■ Çıkış = Emme hattı

▼ Yağ seviyesi = Basınç hattı

Dışlı ünitesi yağı, bir pompa tarafından çekilir ve bir ısı dönüştürücüsü boyunca akar. Yağ, bir fan tarafından yaratılan bir hava akımı ile soğutulur. Yağ, ısı dönüştürücünün dışına taşınır ve tekrar haznesine geri gönderilir. Sıcaklık bir termostat tarafından kontrol edilir. PGR, sıcaklığın izlenmesini önerir.

EN

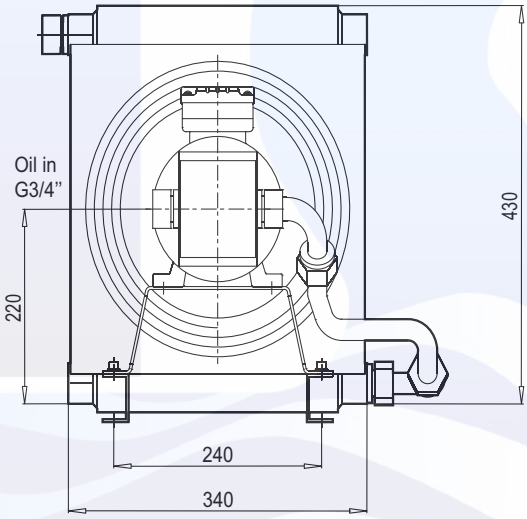
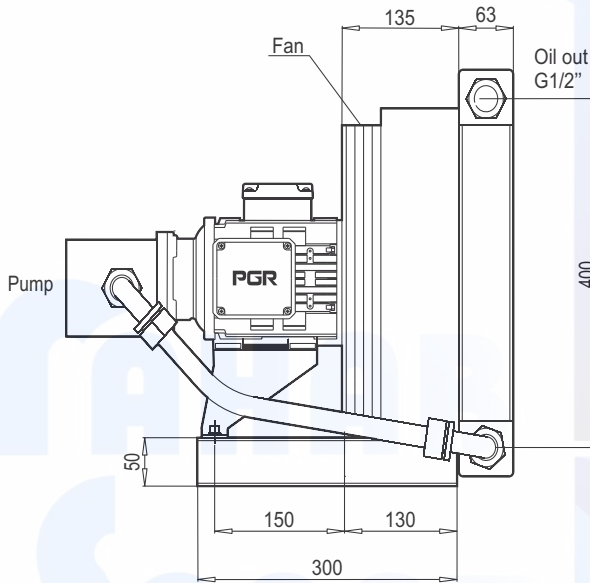
OIL COOLING



■ Output = Suction line

▼ Oil level = Pressure line

Picture which is above on this page shows cycle of the cooling unit. There is a thermostat on the gear unit for checking oil temperature. Oil flows from suction line to pressure line which is provided by a pump. In this way, oil temperature is cooled down by a fan which is supplying air flow of oil. Then, oil flows to the house of gear unit.



* Potansiyel patlayıcı atmosferli alanlar için uygun değildir.

Dizayn

Soğutucu : TFS/A 8,5-400-F-03-11
Düşürme : Dış 1/2" iç 3/4"
Motorlar : Spannung 3x400 V
Çıkış gücü : 0.55 kW
Hız : 1350 minimum
Koruma sınıfı : IP 55
Yalıtım sınıfı : F
Sıcaklık sınıfı : B

Aşağıdaki özelliklerde mevcuttur:
- Özel voltaj 60 HZ - Özel motor

Ağırlık : 32 kg

* Not suited for areas with potentially explosive atmospheres

Design

Cooler : TFS/A 8,5-400-F-03-11
Reduction : Out 1/2" in 3/4"
Motors : Spannung 3x400 V
Output : 0.55 kW
Speed : 1350 minimum
Protection Class : IP 55
Insulation Class : F
Temperature Class : B

Available with:
- Special voltage 60 HZ - Special motor

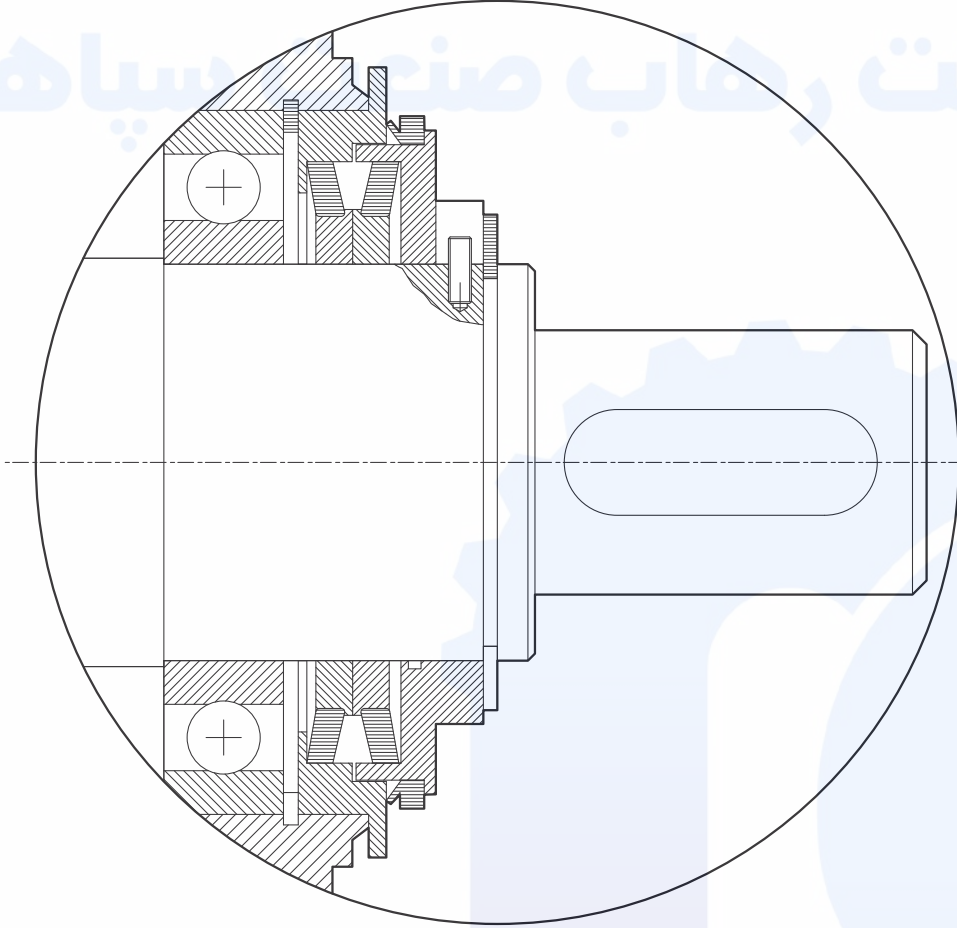
Weight : 32 kg

TR

MEKANİK KEÇE

EN

MECHANICAL SEAL



Özellikle aşırı çalışmalarda ve çok kötü çalışma koşullarında uygundur. Daldırmalı veya sulu çalışma ortamlarından etkilenmemektedir. Bu keçe tipi dış çevre koşullarından kesin koruma sağlar.

Seals are important to prevent oil leakage and for protection in bad environments. In hazardous environment and extreme operation conditions sealing must be considered. For that reason mechanical seals are applicable for using at hazardous environment, submerged operation.

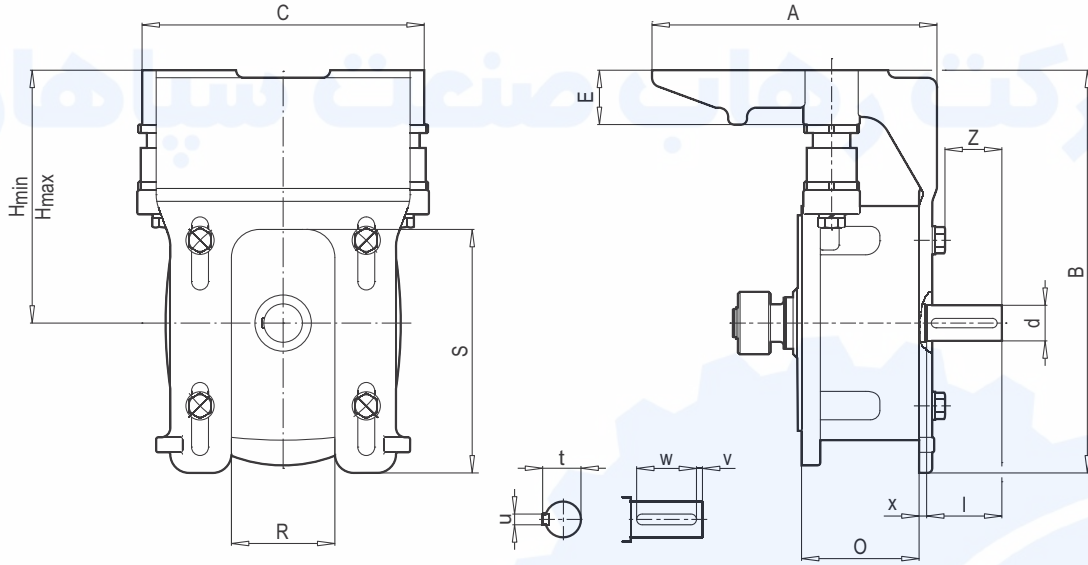
TR

MOTOR PLATFORMU

EN

MOTOR PLATFORM INSTALLATION

Motor Platformu Ölçüleri
Motor Platform Dimensions



Tip Type	Bağlantı boyutları ve platform ölçüleri Connection and platform dimensions										Mil Ölçüleri Shaft size				Flanş Flange
	A	B	C	E	R	S	H min	H max	Z	O	d l	t u	v w	x	
MK I 63 M - 100 L	224	253	206	45	60	140	153	173	41	121.5	24 50	27 8	5 40	8	160 S
MK II 80 M - 112 M	238	320	252	50	66	145	199	224	48	115.5	28 60	31 8	5 50	9	250 S
MK III-A 90 S - 132 M	305	430	302	58	110	260	254	286	61	127	38 80	41 10	5 70	8	300 S
MK III-B 90 S - 132 M	305	430	302	58	110	260	254	286	91	172	42 110	45 12	10 90	8	Ø250
MK IV 112 M - 200 L	478	530	402	75	130	315	315	355	116	254	65 140	69 18	15 110	8	Ø350
MK V 200 L - 250 M	664	690	572	105	382	369	465	515	119	247	65 140	69 18	15 110	12	Ø450

Motor Platform Montajı

Motor platform tasarımı PGR monoblok dişli ünitesi serilerinin tüm montaj pozisyonlarında kullanılabilir. 5 motor platformu boyutu tüm motor-redüktör kombinasyonlarını kapsar. Çok kademeli redüktörler de karşılayan ayrı ayrı redüktörler için seçim tablolarından motor platformları bakılabilir. (Sayfa 45-46 bakınız)

- * Her montaj pozisyonu için kullanılabilir.
- * Optimum kayış gerilimi için kolayca yönlendirilebilen yükseklik ayarlaması yapılabilir.
- * Sabitleme elemanlarında dahil olmak üzere korozyona karşı dirençlidir.
- * Hafif, vibrasyonu absorbe eden alüminyum yapı mevcuttur.
- * Birçok motor boyutu için kullanım kolaylığı sağlar.
- * Tabloya göre "l" oranının 1'e eşit olduğu durumlar için önerilir.
- * Her yöne 90°'ye kadar eksen etrafında dönebilme özelliğine sahiptir.

Assembling Motor Platform

Motor platform design could be used at all PGR monoblock gear unit series for all mounting positions. There are 5 motor platform designs. These platforms are provided with the possibility of using all motorgear unit series. Motor platform type, dimension and suitable belt type could be followed from table which is shown on page 45-46, on the other hand this table is valid for multi stage gear units.

- * It could be used for all mounting positions.
- * It could be adjusted for optimum belt-tension and height easily.
- * It has high corrosion resistance even fixing elements have this property.
- * Alumium structure provide vibration absorbing and light weight.
- * It could be used with all motor type.
- * It is recommended to be used when "l" ratio equals to one.
- * It could be adjusted to all directions up to 90°

TR

MOTOR PLATFORMU

EN

MOTOR PLATFORM INSTALLATION

Tip Type	PA/PF 11 PA/PF 12	PA/PF 21 PA/PF 31 PA/PF 22 PA/PF 32	PA/PF 41 PA/PF 51 PA/PF 42 PA/PF 52 PA/PF 63	PA/PF 62 PA/PF 72 PA/PF 73 PA/PF 83	PA/PF 93	PA/PF 82 PA/PF 92 PA/PF 103	PA/PF 102
Motor	W III	W II	W III	W III W IV	W V W IV	W V W IV	W IV
63 M	MK I						
71 M	MK I						
80 M	MK I	MK II					
90 S 90 L	MK I	MK II	MK III - A	MK III - B			
100 L	MK I	MK II	MK III - A	MK III - B			
112 M		MK II	MK III - A	MK III - B	MK IV	MK IV	
132 S 132 M			MK III - A	MK III - B	MK IV	MK IV	
160 M 160 L				MK IV	MK IV	MK IV	
180 M 180 L				MK IV	MK IV	MK IV **	
200 L				MK IV	MK IV	MK IV **	MK V
225 S 225 M					MK V	MK V	MK V
250 M					MK V	MK V	MK V

** Ayarlanabilir mesafe (sınırlı)

Seçim Örneği:

Çıkış gücü ve hızına göre gerekli olan dişli ünitesinin temel tipini ve gerekli çıkış gücü veya çıkış dönüş hızına dayanan çıkış gücü ve dişli oranını saptayınız.

Örnek :

0.25 kW , 19.4 d/dk = 72.60
PA 12 - 71 M

Bu esas dişli ünitesi tipi için, motor platformu MK I tayin edildiğini tablodan (yukarıya bakınız) saptayınız. Bu nedenle, tam tip tanımı PA 12-MK I - 71'dir.

MK I tablodan (sayfa 46) bant makarası ve bant tipi ile ilgili daha fazla bilgi alırsınız.

Esas boyutlar, tabloda gösterilmiştir (sayfa 44)

** Distance adjustment (Limited)

Example:

Motor platform assignment could be explained in one example hence, according to selecting gear unit reduction ratio, output speed and motor power is determined.

For instance ;

0.25 kW , 19.4 min⁻¹ , i = 72.60
PA 12 - 71 M

According to the above table type of gear unit (column) and motor type (row) are intersected. Hence, from this motor bracket MK I dimension should be used. Full designation is PA 12 - MK I - 71.

The following page shows more detail about belt pulley and type of belt (see page 46).

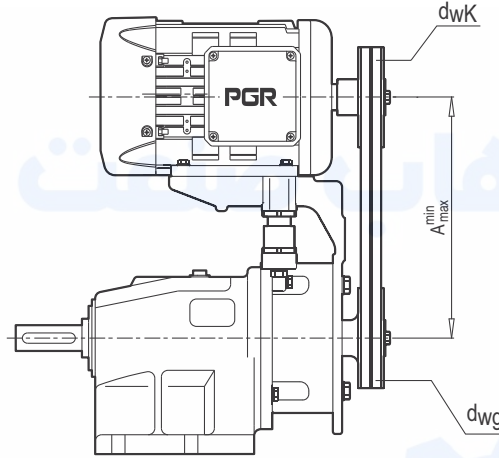
You can see dimension of belt length with motor platform assignment. (Page 44)

TR

MOTOR PLATFORMU

EN

MOTOR PLATFORM INSTALLATION



	Motor	Çıkış Output (kW)	Ayar aralığı Adjustment range		Kayış uzunluğu Belt length	Mil merkezi uzaklığı Shaft centre distance A	Kayış sayısı Number of belts
			Amin	Amax			
MK I Kayış Tipi SPZ Belt type SPZ	63 M/4A	0.12	216	236	(dwg =80) (i = 1) Lw 697	223	1
	63 M/4B	0.18	216	236	697	223	1
	71 M/4A	0.25	224	244	710	229	1
	71 M/4B	0.37	224	244	710	229	1
	80 M/4A	0.55	233	253	737	243	1
	80 M/4B	0.75	233	253	737	243	1
	90 S/4A	1.10	243	263	750	249	1
	90 L/4A	1.50	243	263	750	249	2
	100 L/4A	2.20	253	273	772	260	2
	100 L/4B	3.00	253	273	772	260	3
MK II Kayış Tipi XPZ Belt type XPZ	80 M/4A	0.55	279	304	(dwg =112) (i = 1) Lw 930	289	1
	80 M/4B	0.75	279	304	930	289	1
	90 S/4A	1.10	289	314	950	299	1
	90 L/4A	1.50	289	314	950	299	1
	100 L/4A	2.20	299	324	980	314	1
	100 L/4B	3.00	299	324	980	314	2
	112 M/4B	4.00	311	336	1000	324	2
MK III Kayış Tipi SPZ Belt type SPZ	90 S/4A	1.10	344	376	(dwg =160) (i = 1) Lw 1222	360	1
	90 L/4B	1.50	344	376	1222	360	1
	100 L/4A	2.20	354	386	1250	374	1
	100 L/4B	3.00	354	386	1250	374	1
	112 M/4B	4.00	366	398	1262	380	2
	132 S/4C	5.50	386	418	1312	405	2
	132 M/4B	7.50	386	418	1312	405	3
	132 M/4	9.20	386	418	1312	405	3
MK IV Kayış Tipi XPA Belt type XPA	112 M/4B	4.00	427	467	(dwg =200) (i = 1) Lw 1500	436	1
	132 S/4C	5.50	447	487	1550	461	1
	132 M/4B	7.50	447	487	1550	461	2
	132 M/4	9.20	447	487	1550	461	2
	160 M/4B	11.0	475	515	1600	486	2
	160 L/4A	15.0	475	515	1600	486	3
	180 M/4B	18.5	495	535	1650	511	3
	180 L/4B	22.0	495	535	1650	511	4
	200 L/4C	30.0	515	555	1700	536	4
MK V Kayış Tipi SPA Belt type SPA	200 L/4C	30.0	665	715	(dwg =250) (i = 1) Lw 2182	698	4
	225 S/4A	37.0	690	740	2207	710	4
	225 M/4C	45.0	690	740	2207	710	5

Motorlu Seçim Sayfaları
Selection Of Gearmotors



PA 11 ... 51



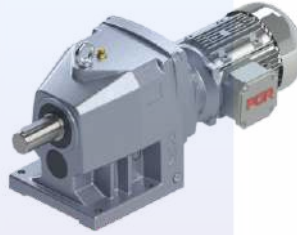
PF 11 ... 51



PA 02 ... 52



PF 02 ... 52



PA 03 ... 53



PF 03 ... 53



PA 62 ... 102
63 ... 103



PF 62 ... 102
63 ... 103

PA / PF

TR

TEKNİK AÇIKLAMALAR

EN

TECHNICAL EXPLANATIONS

Motorlu redüktör performans tablolarının yapısı.

Notify about performance tables for Geared motor.

0.12 kW

Redüktör motor gücü
Gear unit motor power

Motor gücü
Motor power

Çıkış devri
Output speed

Çıkış momenti
Output torque

Servis faktörü
Service factor

Tahvil oranı
Reduction ratio

Redüktör tipi
Gear unit motor type

Ağırlık
Weight

Ölçü sayfaları
Drawing page

P ₁ [kW]	n ₂ [Min ⁻¹]	M ₂ [Nm]	f _B	i _{ges}	F _R [kN]	F _A [kN]	F _{R GR} [kN]	F _{A GR} [kN]	Tip / Type	Kg	Sayfa Page mm
0.12	3.1	* 207	0.8	420.39	3.0	4.0	5.0	15.0	PA 13 - 63M/4A PF 13 - 63M/4A	21	99
	3.6	* 216	0.8	369.18	3.0	4.0	5.0	15.0			
	4.2	* 204	0.8	313.35	3.0	4.0	5.0	15.0			

Servis Faktörü 0.8'e göre

Max. moment

Maximum output
torque with f_B = 0.8

Müsaade edilebilir radyal yükler

Normal rulmanlarda

F_R için listelenmiş değerlerde

F_A = 0 (N) olarak hesaplanmıştır

Permissible radial force or load on
output shaft while normal bearings
are used. For this load F_A is assumed
equal zero. F_A = 0 (N)

Müsaade edilebilir eksenel yükler

Normal rulmanlarda

F_A için listelenmiş değerlerde

F_R = 0 (N) olarak hesaplanmıştır

Permissible axial force or load on output
shaft while normal bearings are used. For
this load F_R is assumed equal zero.
F_R = 0 (N)

Müsaade edilebilir eksenel yükler
Güçlendirilmiş rulmanlarda
F_A için listelenmiş değerlerde
F_R = 0 (N) olarak hesaplanmıştır

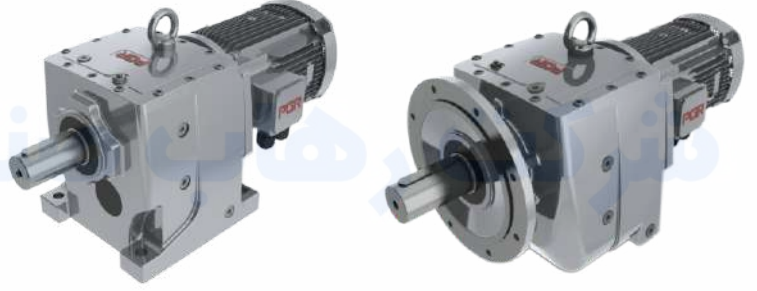
Permissible axial force on output
shaft while reinforced bearings are
used. For this load F_R is assumed
equal to zero. F_R = 0 (N)

Müsaade edilebilir radyal yükler
Güçlendirilmiş rulmanlarda
F_R için listelenmiş değerlerde
F_A = 0 (N) olarak hesaplanmıştır

Permissible radial force or load on
output shaft while reinforced bearings
are used. For this load F_A is assumed
equal to zero. F_A = 0 (N)

Ölçü Tabloları

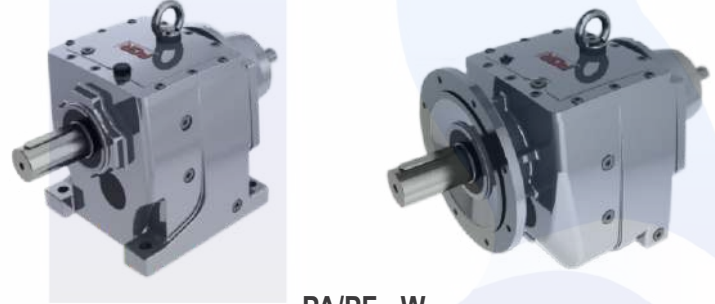
Dimension Tables



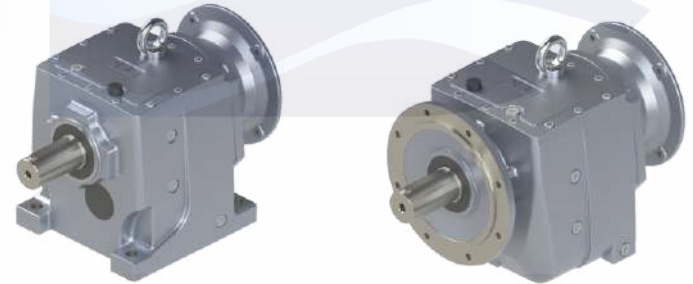
PA/PF - MOTOR



PA/PF - IEC



PA/PF - W

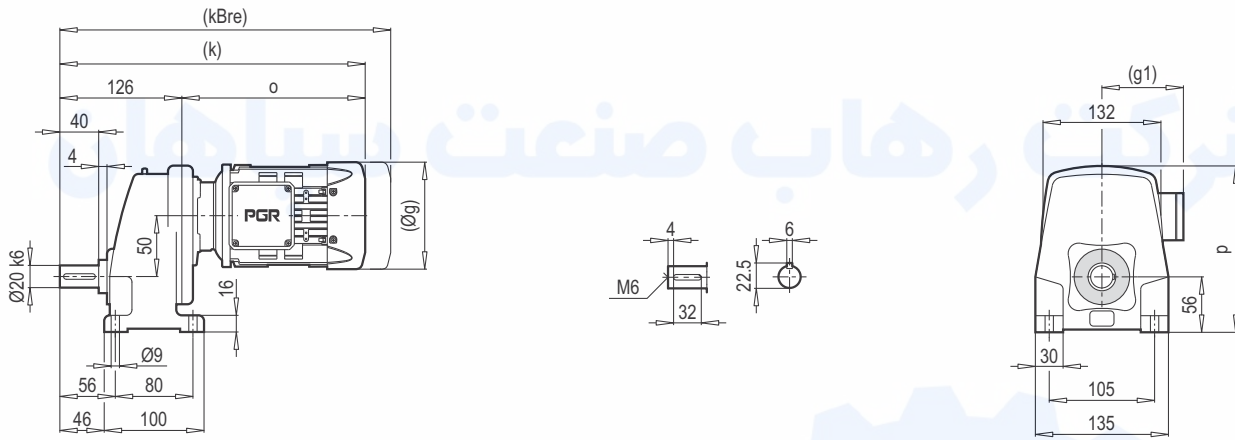


PA/PF - PAM

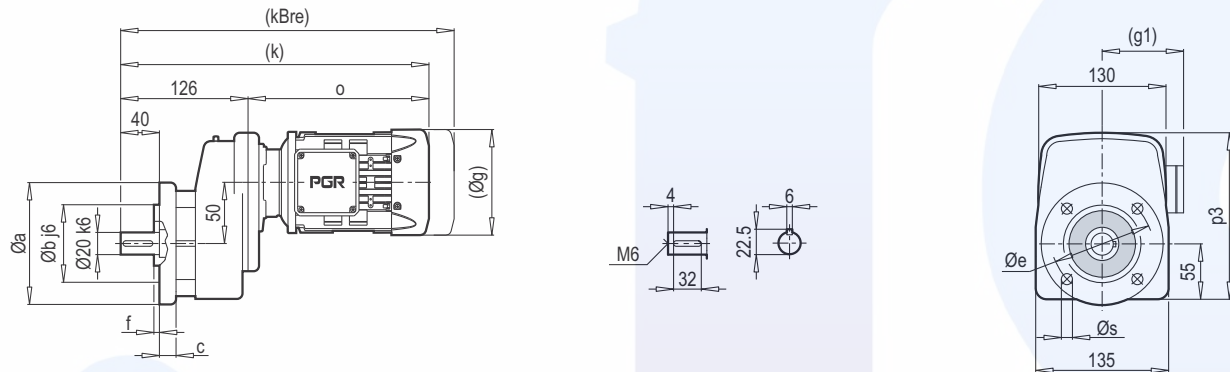
PA / PF

PA/PF 11

PA 11



PF 11

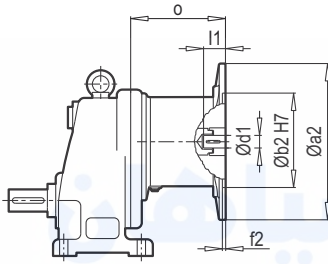


a	b	c	e	f	s
120	80	10	100	3.0	7
140	95	10	115	3.0	9

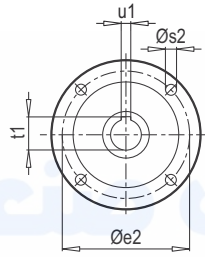
	63 M	71 M	80 M	90 S/L	100 L	112 M		
g	124	140	159	193	217	232		
g1	111	119	127	151	160	168		
k	324	366	393	416/436	464	509		
kBre	376	426	455	489/509	545	589		
o	198	240	267	290/310	338	383		
p	171	179	189	199	208	220		
p3	171	179	189	199	208	220		

Not : (...) İşaretli olan ölçüler Motor markasına göre farklılık gösterir.
Note : The dimensions which have (...) sign vary depending on the motor brand.

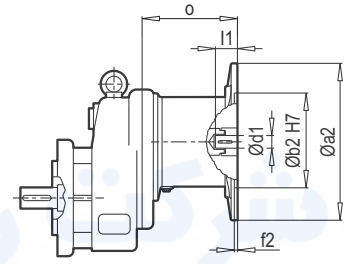
PA 11



IEC



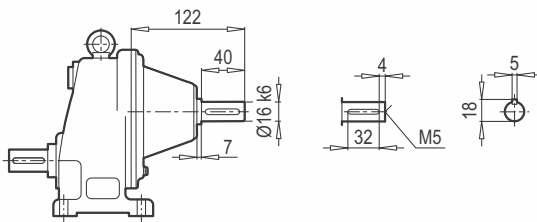
PF 11



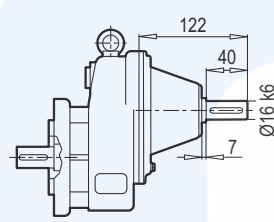
Tip / Type	IEC	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	o
PA/PF 11	63	140	95	115	3.5	M8	11	23	12.8	4	85
	71	160	110	130	4.0	M8	14	30	16.3	5	89
	80	200	130	165	4.0	M10	19	40	21.8	6	105
	90	200	130	165	4.0	M10	24	50	27.3	8	105
	100	250	180	215	5.0	M12	28	60	31.3	8	130
	112	250	180	215	5.0	M12	28	60	31.3	8	130

~ Kg	
IEC	PA/PF 11
63	11
71	12
80	16
90	16
100	23
112	23

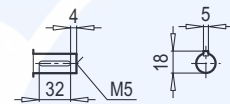
PA 11



W

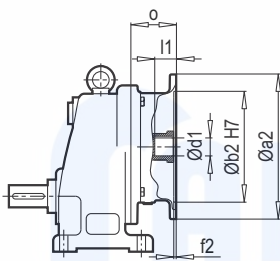


PF 11

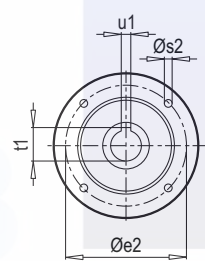


W ~ Kg	
PA/PF 11	10

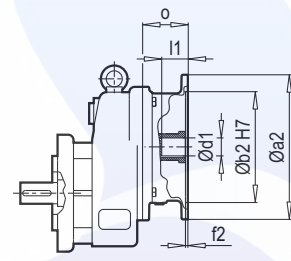
PA 11



PAM B5/B14



PF 11



Tip / Type	PAM B5	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	o
PA/PF 11	63	140	95	115	3.5	M8	11	23	12.8	4	85
	71	160	110	130	4.0	M8	14	30	16.3	5	55
	80	200	130	165	4.0	M10	19	40	21.8	6	74
	90	200	130	165	4.0	M10	24	50	27.3	8	74
	100	250	180	215	5.0	M12	28	60	31.3	8	75
	112	250	180	215	5.0	M12	28	60	31.3	8	75

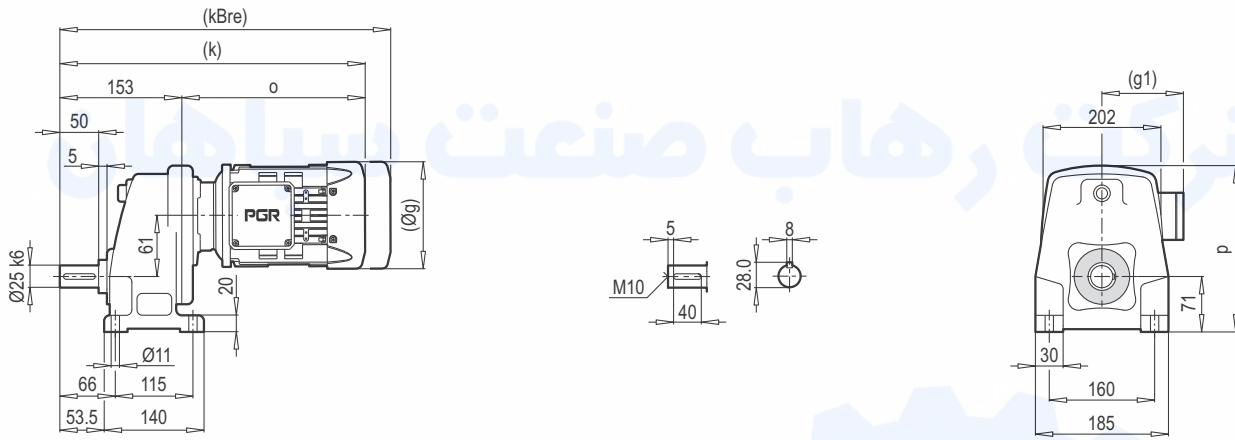
~ Kg	
PAM B5	PA/PF 11
63	10
71	10
80	11
90	11
100	18
112	18

Tip / Type	PAM B14	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	o
PA/PF 11	63	90	60	75	4	6	11	23	12.8	4	60
	71	105	70	85	4	7	14	30	16.3	5	55
	80	120	80	100	4	7	19	40	21.8	6	74
	90	140	95	115	4	9	24	50	27.3	8	74
	100	160	110	130	5	9	28	60	31.3	8	75
	112	160	110	130	5	9	28	60	31.3	8	75

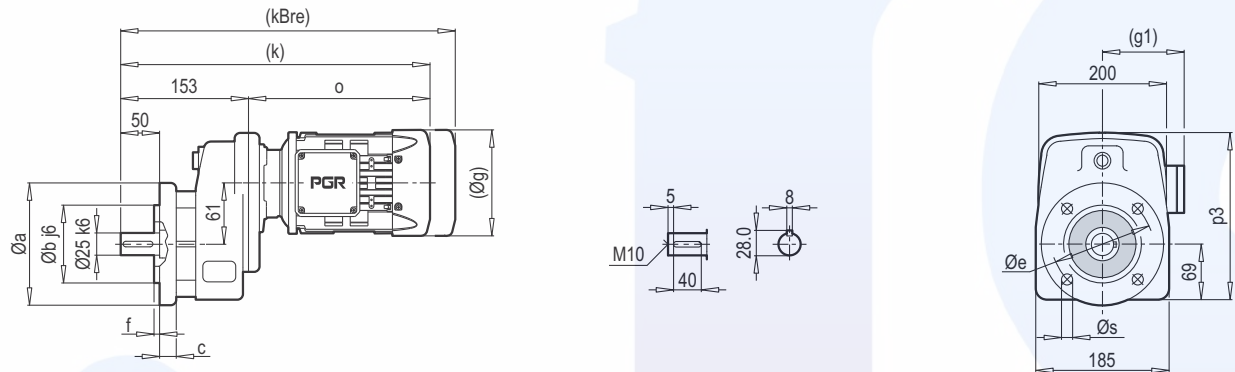
~ Kg	
PAM B14	PA/PF 11
63	9
71	9
80	10
90	10
100	11
112	11

PA/PF 21

PA 21



PF 21

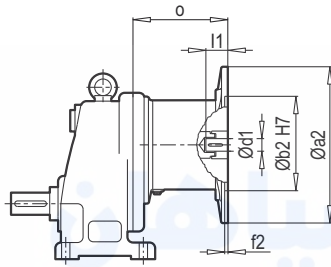


a	b	c	e	f	s
140	95	10	115	3.0	9
160	110	10	130	3.5	9

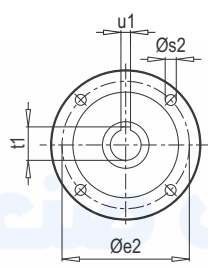
	90 L	100 L	112 M					
g	193	217	232					
g1	151	160	168					
k	458	486	531					
kBre	531	567	611					
o	305	333	378					
p	232	234	246					
p3	227	229	241					

Not : (...) İşaretli olan ölçüler Motor markasına göre farklılık gösterir.
Note : The dimensions which have (...) sign vary depending on the motor brand.

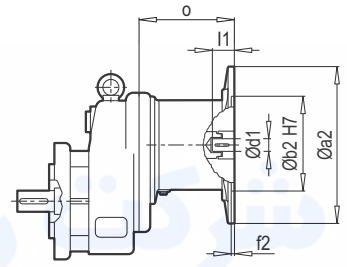
PA 21



IEC



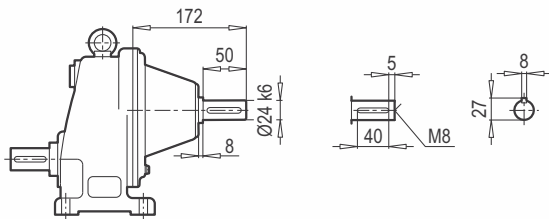
PF 21



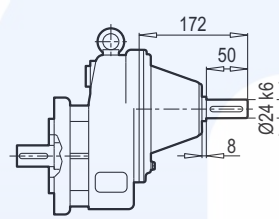
Tip / Type	IEC	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	o
PA/PF 21	71	160	110	130	4.0	M8	14	30	16.3	5	88
	80	200	130	165	4.0	M10	19	40	21.8	6	107
	90	200	130	165	4.0	M10	24	50	27.3	8	107
	100	250	180	215	5.0	M12	28	60	31.3	8	124
	112	250	180	215	5.0	M12	28	60	31.3	8	124

~ Kg	
IEC	PA/PF 21
71	21
80	25
90	25
100	29
112	29

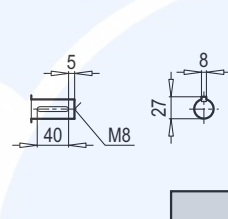
PA 21



W

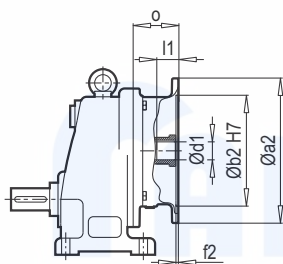


PF 21

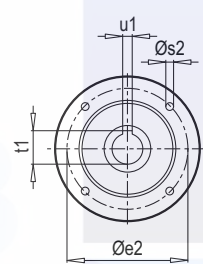


W ~ Kg	
PA/PF 21	23

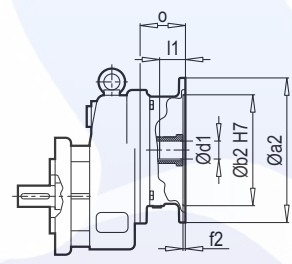
PA 21



PAM B5/B14



PF 21



Tip / Type	PAM B5	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	o
PA/PF 21	71	160	110	130	4.0	M8	14	30	16.3	5	88
	80	200	130	165	4.0	M10	19	40	21.8	6	72
	90	200	130	165	4.0	M10	24	50	27.3	8	72
	100	250	180	215	5.0	M12	28	60	31.3	8	75
	112	250	180	215	5.0	M12	28	60	31.3	8	75

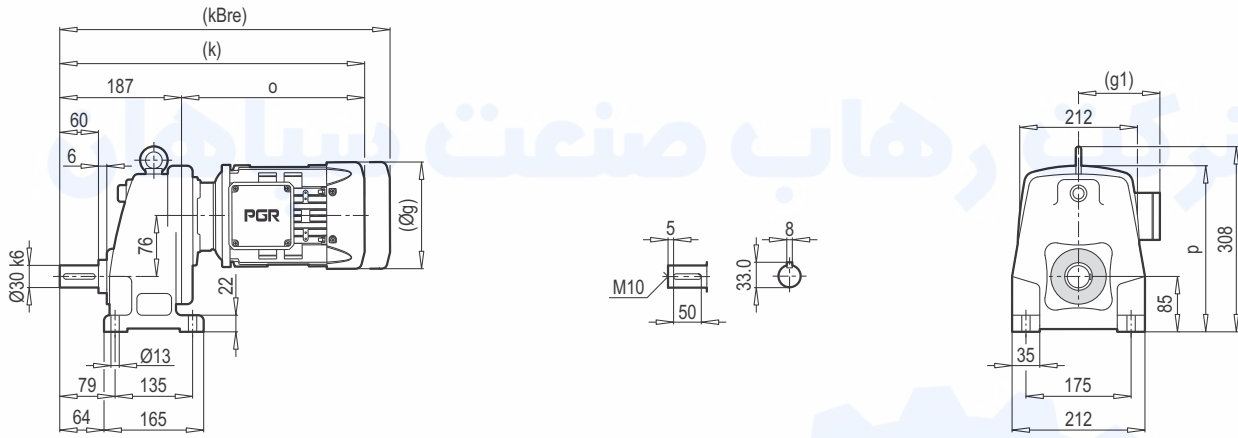
~ Kg	
PAM B5	PA/PF 21
71	19
80	20
90	20
100	21
112	21

Tip / Type	PAM B14	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	o
PA/PF 21	71	105	70	85	4.0	7	14	30	16.3	5	88
	80	120	80	100	4.0	7	19	40	21.8	6	72
	90	140	95	115	4.0	9	24	50	27.3	8	72
	100	160	110	130	5.0	9	28	60	31.3	8	75
	112	160	110	130	5.0	9	28	60	31.3	8	75

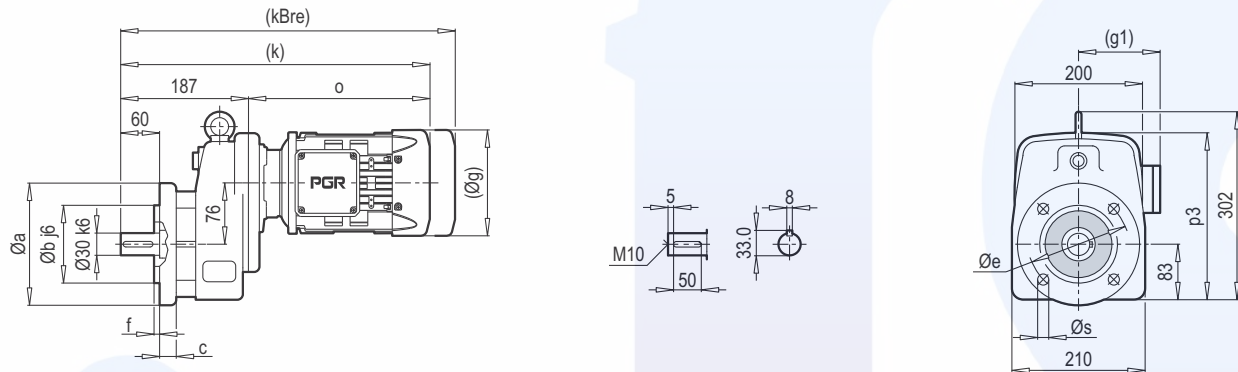
~ Kg	
PAM B14	PA/PF 21
71	17
80	18
90	18
100	20
112	20

PA/PF 31

PA 31



PF 31

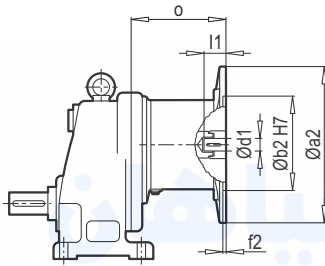


a	b	c	e	f	s
200	130	12	165	3.5	11

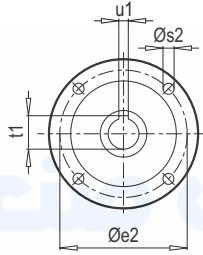
	100 L	112 M	132 S/M					
g	217	232	279					
g1	160	168	182					
k	520	565	572/607					
kBre	601	645	680/748					
o	333	378	385/420					
p	263	275	294					
p3	260	272	291					

Not : (...) İşaretli olan ölçüler Motor markasına göre farklılık gösterir.
Note : The dimensions which have (...) sign vary depending on the motor brand.

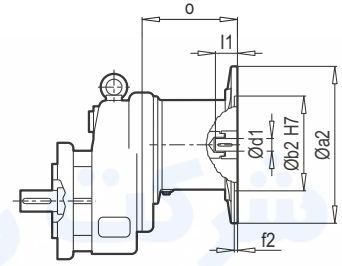
PA 31



IEC



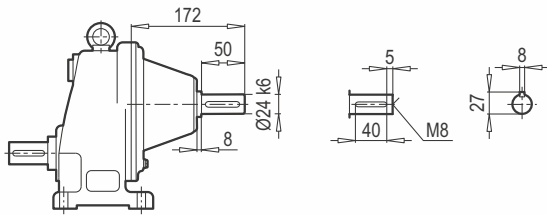
PF 31



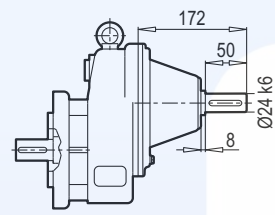
Tip / Type	IEC	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	o
PA/PF 31	71	160	110	130	4.0	M8	14	30	16.3	5	88
	80	200	130	165	4.0	M10	19	40	21.8	6	107
	90	200	130	165	4.0	M10	24	50	27.3	8	107
	100	250	180	215	5.0	M12	28	60	31.3	8	124
	112	250	180	215	5.0	M12	28	60	31.3	8	124
	132	300	230	265	5.0	M12	38	80	41.3	10	156

~ Kg	
IEC	PA/PF 31
71	26
80	30
90	30
100	34
112	34
132	44

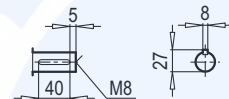
PA 31



W

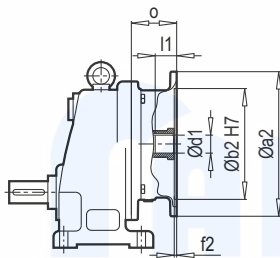


PF 31

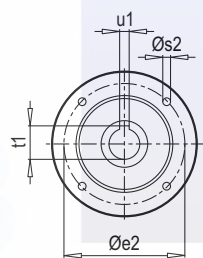


W ~ Kg	
PA/PF 31	28

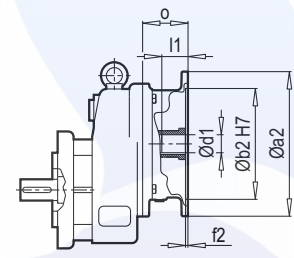
PA 31



PAM B5/B14



PF 31



Tip / Type	PAM B5	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	o
PA/PF 31	71	160	110	130	4.0	M8	14	30	16.3	5	88
	80	200	130	165	4.0	M10	19	40	21.8	6	72
	90	200	130	165	4.0	M10	24	50	27.3	8	72
	100	250	180	215	5.0	M12	28	60	31.3	8	75
	112	250	180	215	5.0	M12	28	60	31.3	8	75
	132	300	230	265	5.0	M12	38	80	41.3	10	94

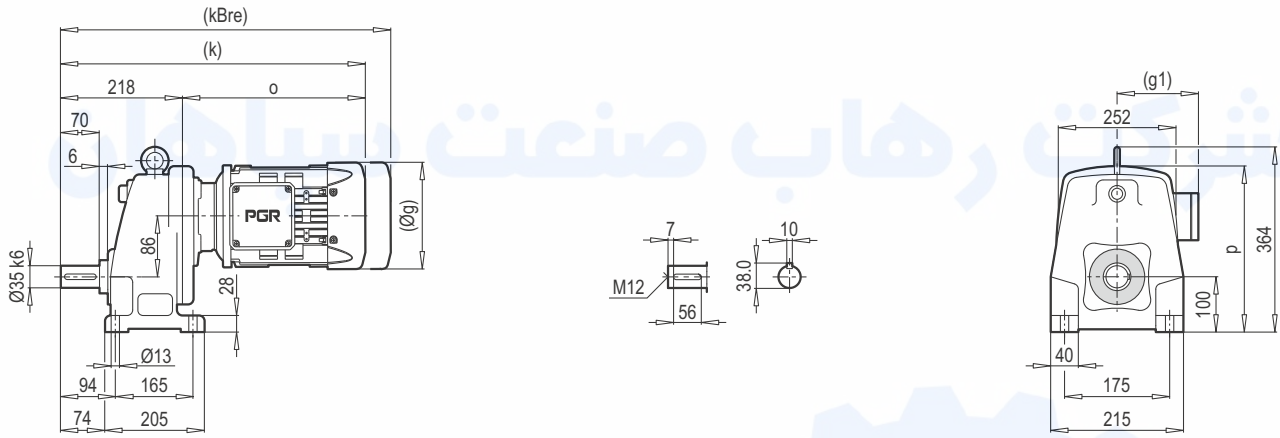
~ Kg	
PAM B5	PA/PF 31
71	24
80	25
90	25
100	26
112	26
132	36

Tip / Type	PAM B14	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	o
PA/PF 31	71	105	70	85	4.0	7	14	30	16.3	5	88
	80	120	80	100	4.0	7	19	40	21.8	6	72
	90	140	95	115	4.0	9	24	50	27.3	8	72
	100	160	110	130	5.0	9	28	60	31.3	8	75
	112	160	110	130	5.0	9	28	60	31.3	8	75
	132	200	130	165	5.0	11	38	80	41.3	10	94

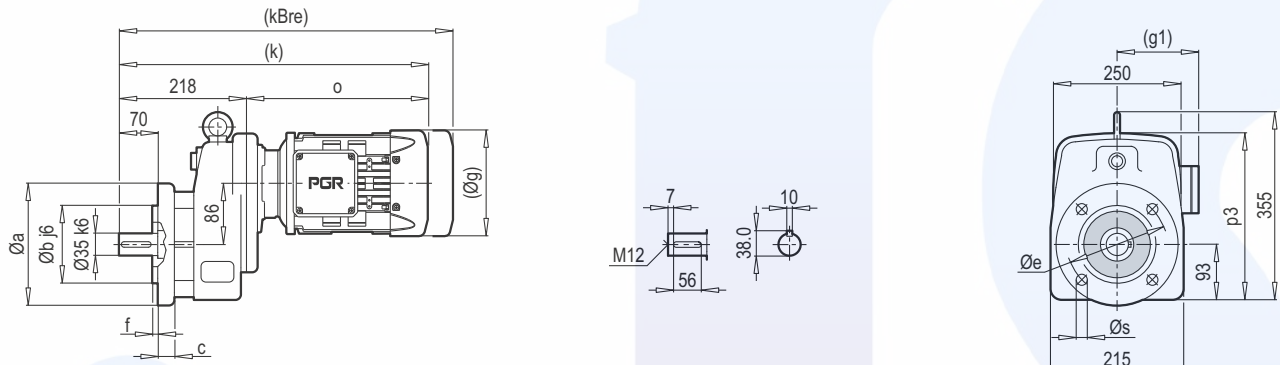
~ Kg	
PAM B14	PA/PF 31
71	22
80	23
90	23
100	25
112	25
132	29

PA/PF 41

PA 41



PF 41

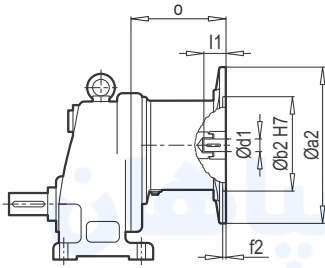


a	b	c	e	f	s
200	130	16	165	3.5	11
250	180	16	215	4.0	14

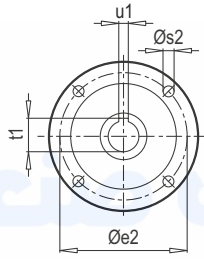
	112 M	132 S/M	160 M/L					
g	232	279	323					
g1	168	182	200					
k	576	583/618	723					
kBre	656	691/759	875					
o	358	365/400	505					
p	311	319	346					
p3	302	310	337					

Not : (...) İşaretli olan ölçüler Motor markasına göre farklılık gösterir.
Note : The dimensions which have (...) sign vary depending on the motor brand.

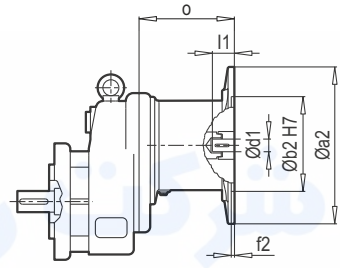
PA 41



IEC



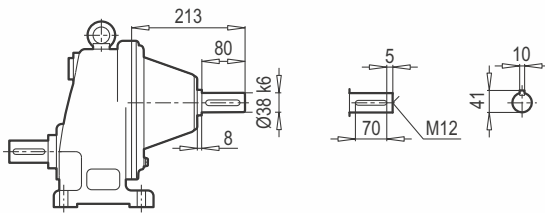
PF 41



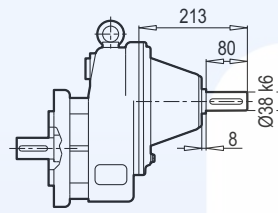
Tip / Type	IEC	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	o
PA/PF 41	90	200	130	165	4.0	M10	24	50	27.3	8	109
	100	250	180	215	5.0	M12	28	60	31.3	8	133
	112	250	180	215	5.0	M12	28	60	31.3	8	133
	132	300	230	265	5.0	M12	38	80	41.3	10	190
	160	350	250	300	6.0	M16	42	110	45.3	12	194

~ Kg	
IEC	PA/PF 41
90	43
100	50
112	50
132	64
160	75

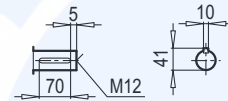
PA 41



W

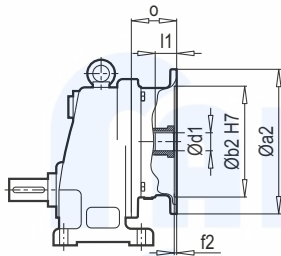


PF 41

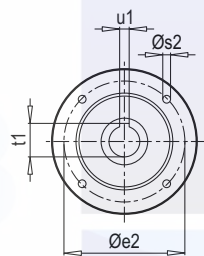


W ~ Kg	
PA/PF 41	
	48

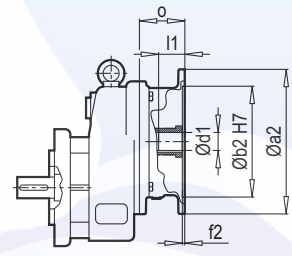
PA 41



PAM B5/B14



PF 41



Tip / Type	PAM B5	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	o
PA/PF 41	90	200	130	165	4.0	M10	24	50	27.3	8	72
	100	250	180	215	5.0	M12	28	60	31.3	8	75
	112	250	180	215	5.0	M12	28	60	31.3	8	75
	132	300	230	265	5.0	M12	38	80	41.3	10	94
	160	350	250	300	6.0	M16	42	110	45.3	12	120

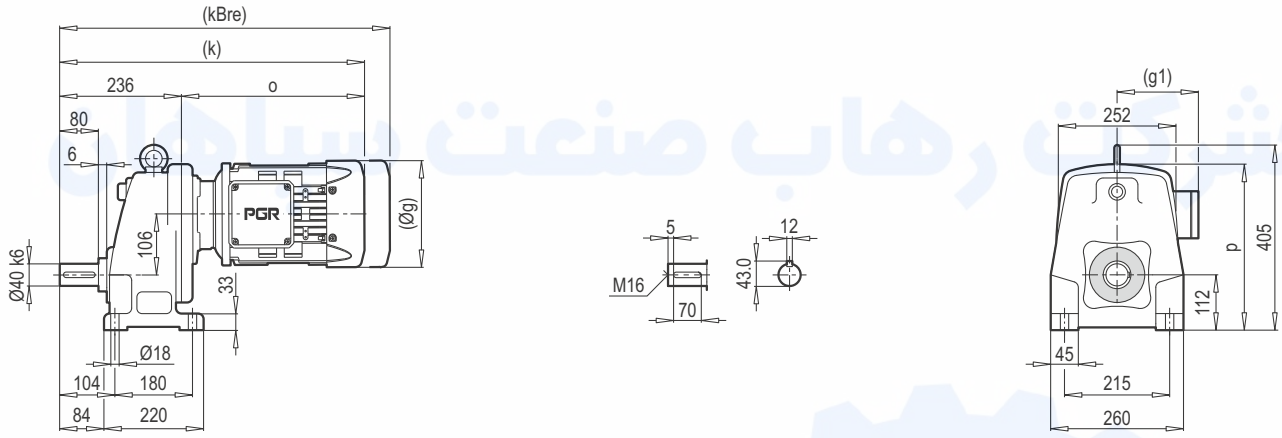
~ Kg	
PAM B5	PA/PF 41
90	37
100	38
112	38
132	47
160	55

Tip / Type	PAM B14	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	o
PA/PF 41	90	140	95	115	4.0	9	24	50	27.3	8	72
	100	160	110	130	5.0	9	28	60	31.3	8	75
	112	160	110	130	5.0	9	28	60	31.3	8	75
	132	200	130	165	5.0	11	38	80	41.3	10	94

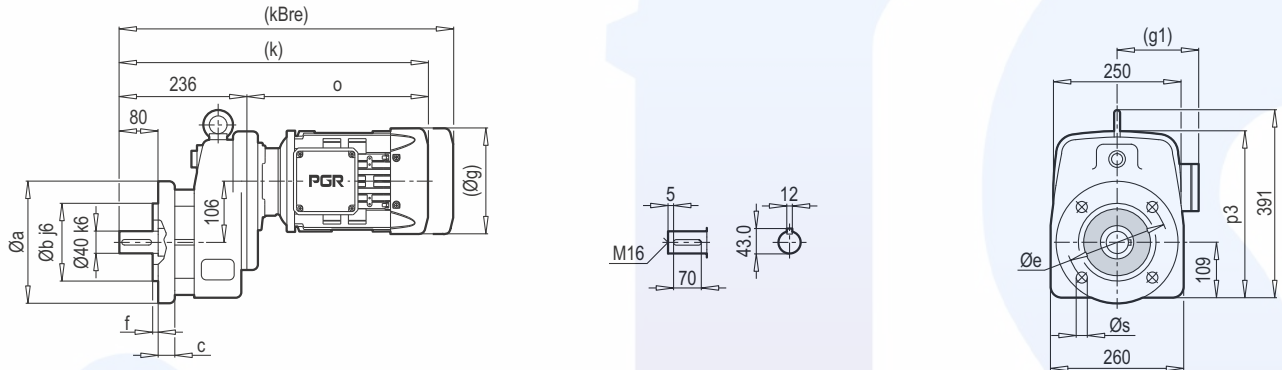
~ Kg	
PAM B14	PA/PF 41
90	36
100	37
112	37
132	42

PA/PF 51

PA 51



PF 51

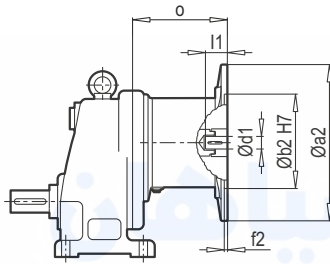


a	b	c	e	f	s
250	180	20	215	4.0	14
300	230	20	265	4.0	14

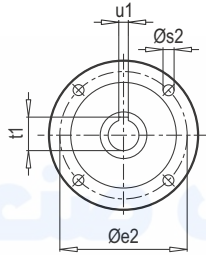
	112 M	132 S/M	160 M/L	180 M/L				
g	232	279	323	370				
g1	168	182	200	248				
k	594	601/636	741	815				
kBre	674	709/777	893	977				
o	358	365/400	505	579				
p	343	351	378	378				
p3	341	349	376	376				

Not : (...) İşaretli olan ölçüler Motor markasına göre farklılık gösterir.
Note : The dimensions which have (...) sign vary depending on the motor brand.

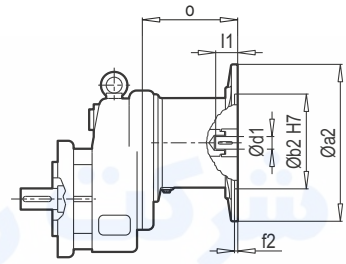
PA 51



IEC



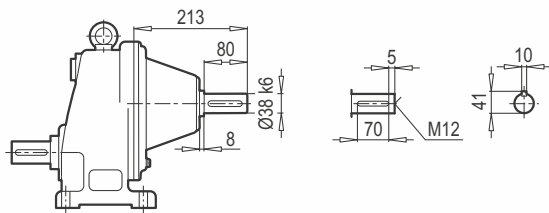
PF 51



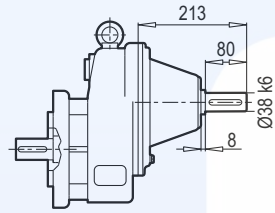
Tip / Type	IEC	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	o
PA/PF 51	90	200	130	165	4.0	M10	24	50	27.3	8	109
	100	250	180	215	5.0	M12	28	60	31.3	8	133
	112	250	180	215	5.0	M12	28	60	31.3	8	133
	132	300	230	265	5.0	M12	38	80	41.3	10	190
	160	350	250	300	6.0	M16	42	110	45.3	12	194
	180	350	250	300	6.0	M16	48	110	51.8	14	194

~ Kg	
IEC	PA/PF 51
90	53
100	60
112	60
132	75
160	85
180	85

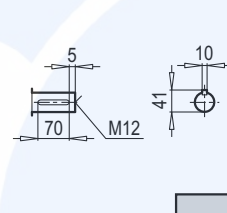
PA 51



W

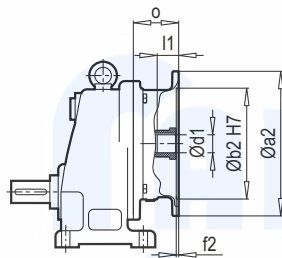


PF 51

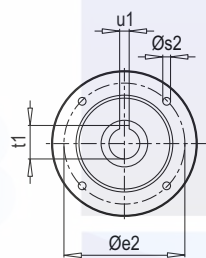


W ~ Kg	
PA/PF 51	58

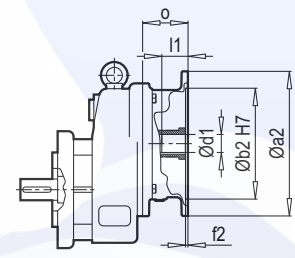
PA 51



PAM B5/B14



PF 51



Tip / Type	PAM B5	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	o
PA/PF 51	90	200	130	165	4.0	M10	24	50	27.3	8	72
	100	250	180	215	5.0	M12	28	60	31.3	8	75
	112	250	180	215	5.0	M12	28	60	31.3	8	75
	132	300	230	265	5.0	M12	38	80	41.3	10	94
	160	350	250	300	6.0	M16	42	110	45.3	12	120
	180	350	250	300	6.0	M16	48	110	51.8	14	120

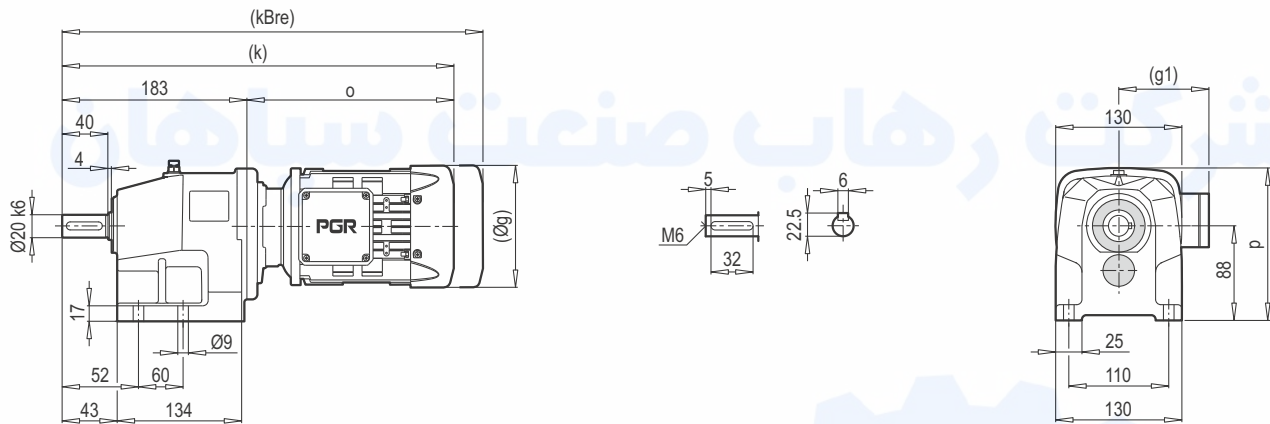
~ Kg	
PAM B5	PA/PF 51
90	46
100	47
112	47
132	56
160	64
180	64

Tip / Type	PAM B14	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	o
PA/PF 51	90	140	95	115	4.0	9	24	50	27.3	8	72
	100	160	110	130	5.0	9	28	60	31.3	8	75
	112	160	110	130	5.0	9	28	60	31.3	8	75
	132	200	130	165	5.0	11	38	80	41.3	10	94

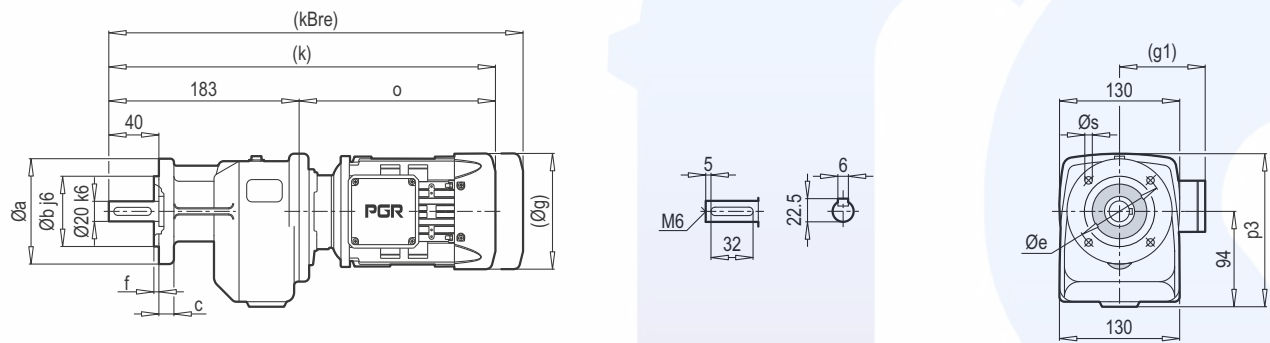
~ Kg	
PAM B14	PA/PF 51
90	45
100	46
112	46
132	51

PA/PF 02

PA 02



PF 02

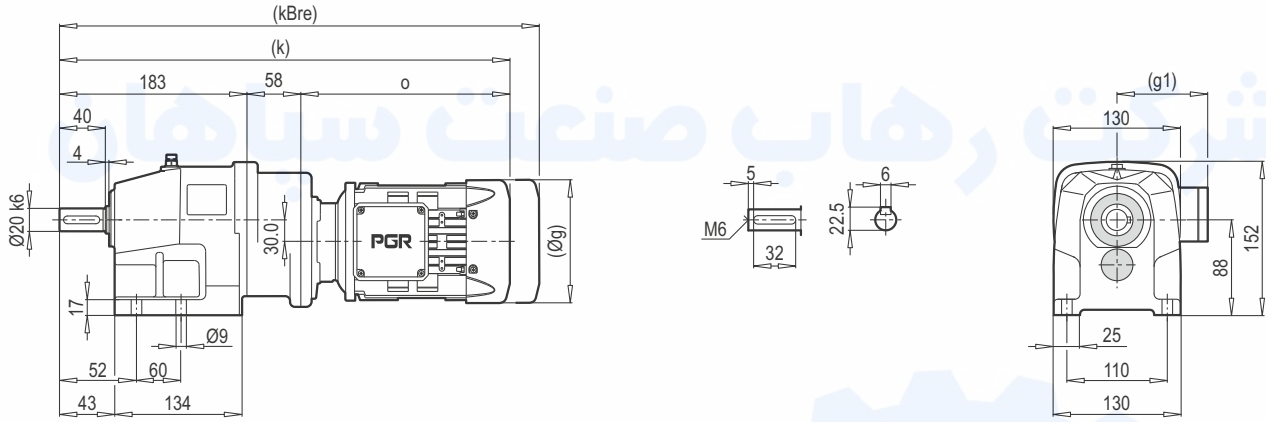


a	b	c	e	f	s
120	80	11	100	3.0	7
140	95	11	115	3.0	9
160	110	11	130	3.5	9

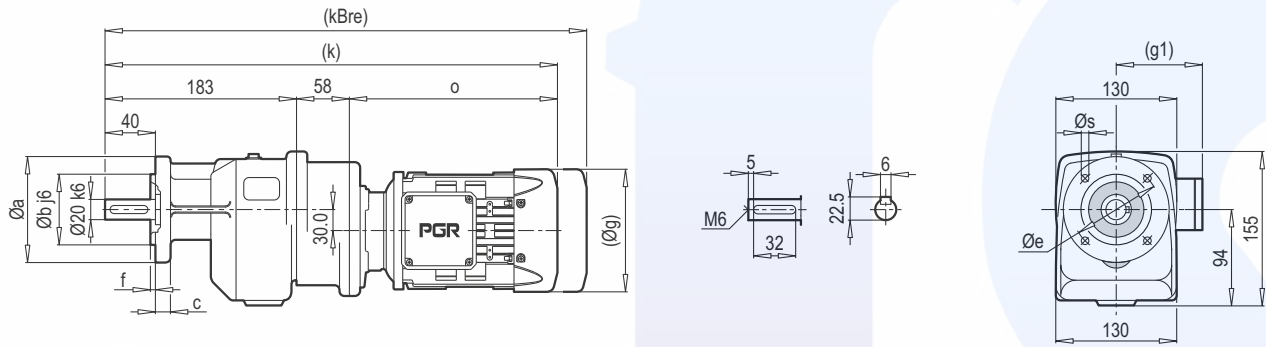
	63 M	71 M	80 M	90 S/L				
g	124	140	159	193				
g1	111	119	127	151				
k	381	423	450	473/493				
kBre	433	483	512	546/566				
o	198	240	267	290/310				
p	152	160	170	180				
p3	155	163	173	183				

Not : (...) İşaretli olan ölçüler Motor markasına göre farklılık gösterir.
Note : The dimensions which have (...) sign vary depending on the motor brand.

PA 03



PF 03



a	b	c	e	f	s
120	80	11	100	3.0	7
140	95	11	115	3.0	9
160	110	11	130	3.5	9

	63 M	71 M						
g	124	140						
g1	111	119						
k	439	481						
kBre	491	541						
o	198	240						
p								
p3								

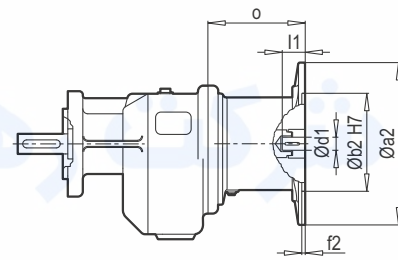
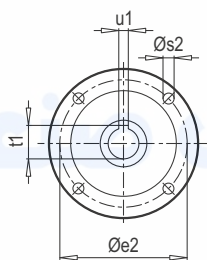
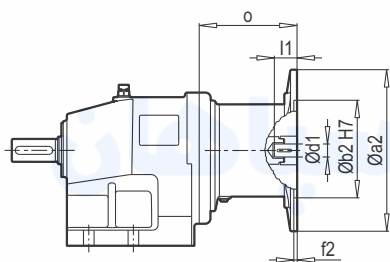
Not : (...) İşaretli olan ölçüler Motor markasına göre farklılık gösterir.

Note : The dimensions which have (...) sign vary depending on the motor brand.

PA 02
PA 03

IEC

PF 02
PF 03



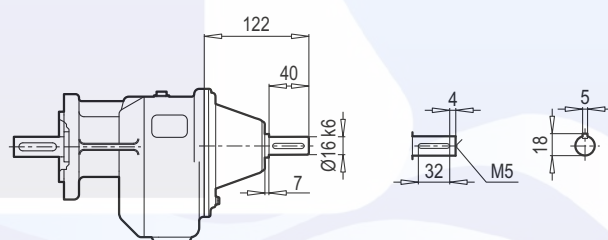
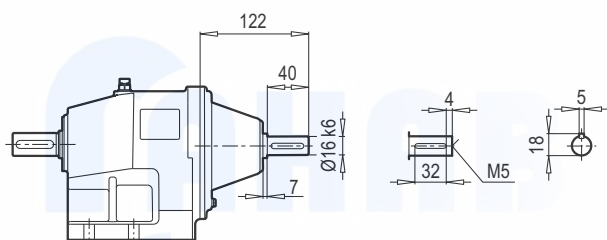
Tip / Type	IEC	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	o
PA/PF 02-03	63	140	95	115	3.5	M8	11	23	12.8	4	85
PA/PF 02-03	71	160	110	130	4.0	M8	14	30	16.3	5	89
PA/PF 02	80	200	130	165	4.0	M10	19	40	21.8	6	105
PA/PF 02	90	200	130	165	4.0	M10	24	50	27.3	8	105

~ Kg		
IEC	PA/PF 02	PA/PF 03
63	14	18
71	15	19
80	18	-
90	18	-

PA 02
PA 03

W

PF 02
PF 03

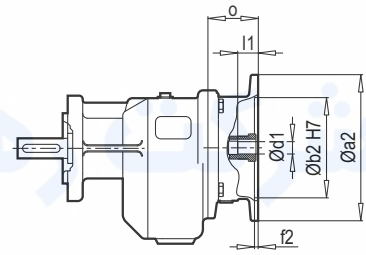
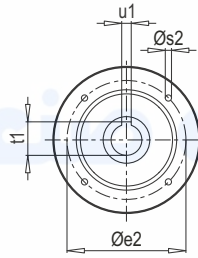
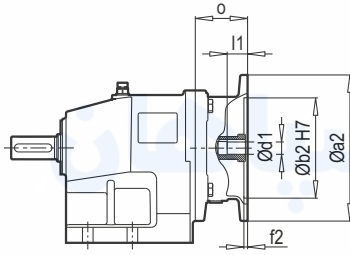


W ~ Kg	
PA/PF 02	12
PA/PF 03	17

PA 02
PA 03

PAM B5/B14

PF 02
PF 03



Tip / Type	PAM B5	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	PA/PF 02 PA/PF 03 o
PA/PF 02-03	63	140	95	115	3.5	M8	11	23	12.8	4	85
PA/PF 02-03	71	160	110	130	4.0	M8	14	30	16.3	5	55
PA/PF 02	80	200	130	165	4.0	M10	19	40	21.8	6	74
PA/PF 02	90	200	130	165	4.0	M10	24	50	27.3	8	74

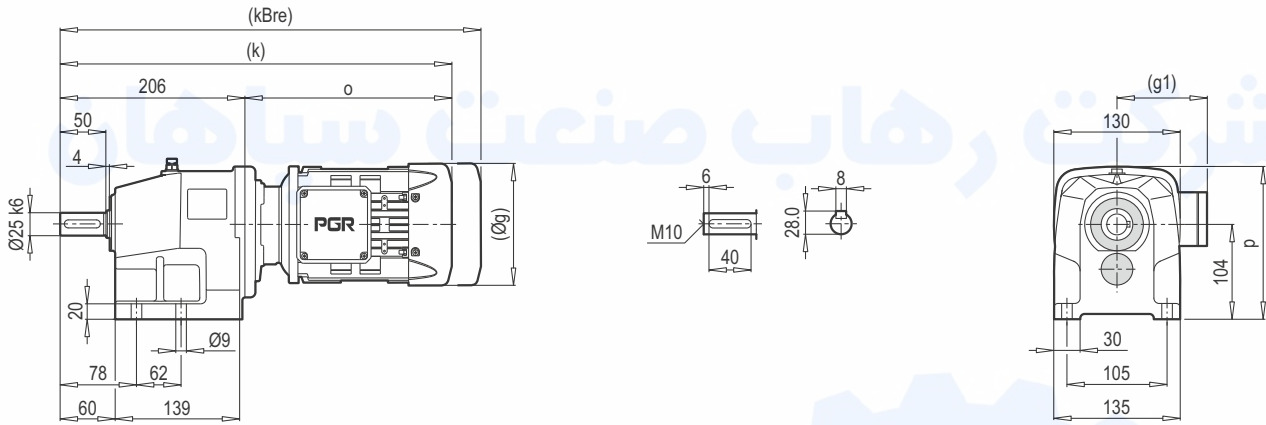
~ Kg		
PAM B5	PA/PF 02	PA/PF 03
63	12	16
71	12	16
80	13	-
90	13	-

Tip / Type	PAM B14	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	PA/PF 02 PA/PF 03 o
PA/PF 02-03	63	90	60	75	4.0	6	11	23	12.8	4	60
PA/PF 02-03	71	105	70	85	4.0	7	14	30	16.3	5	55
PA/PF 02	80	120	80	100	4.0	7	19	40	21.8	6	74
PA/PF 02	90	140	95	115	4.0	9	24	50	27.3	8	74

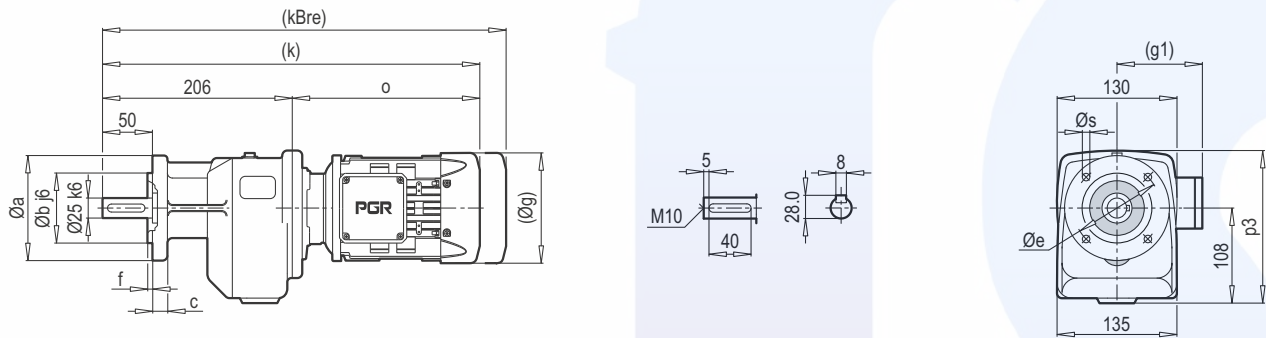
~ Kg		
PAM B14	PA/PF 02	PA/PF 03
63	11	15
71	11	15
80	12	-
90	12	-

PA/PF 12

PA 12



PF 12

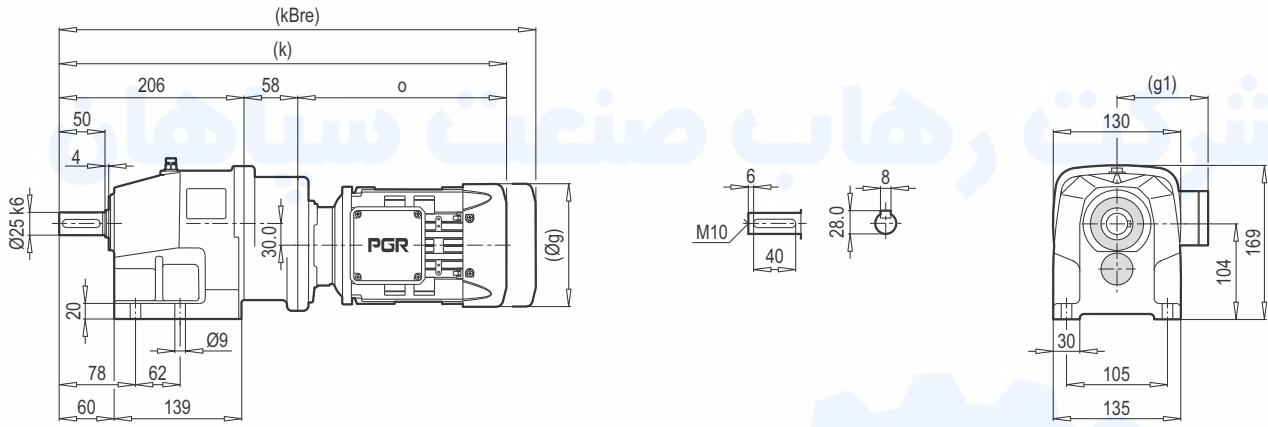


a	b	c	e	f	s
120	80	13	100	3.0	7
140	95	13	115	3.0	9
160	110	13	130	3.5	9

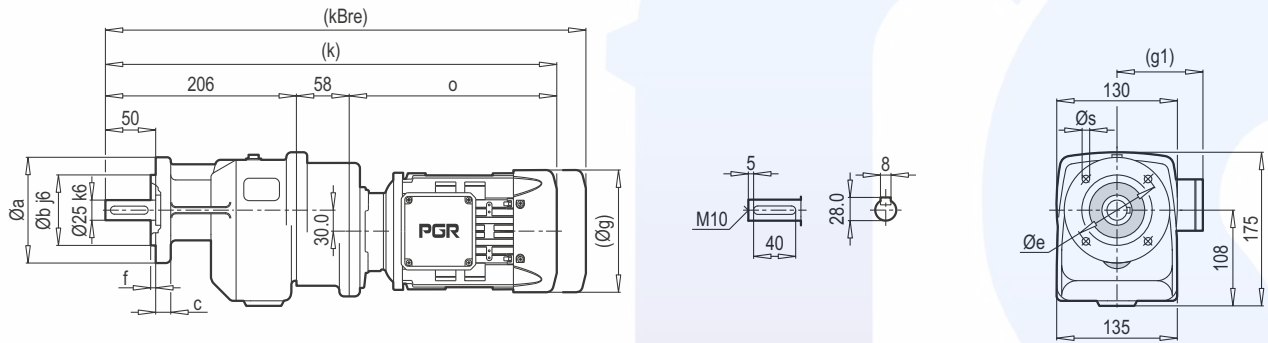
	63 M	71 M	80 M	90 S/L	100 L	112 M		
g	124	140	159	193	217	232		
g1	111	119	127	151	160	168		
k	404	446	473	496/516	544	589		
kBre	456	506	535	569/589	625	669		
o	198	240	267	290/310	338	383		
p	169	176	186	196	205	216		
p3	175	180	190	200	209	220		

Not : (...) İşaretili olan ölçüler Motor markasına göre farklılık gösterir.
Note : The dimensions which have (...) sign vary depending on the motor brand.

PA 13



PF 13



a	b	c	e	f	s
120	80	13	100	3.0	7
140	95	13	115	3.0	9
160	110	13	130	3.5	9

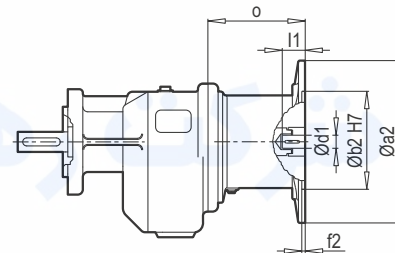
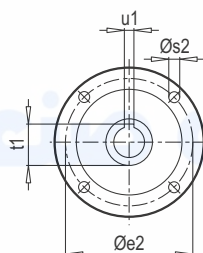
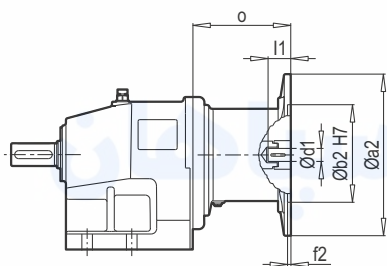
	63 M	71 M						
g	124	140						
g1	111	119						
k	462	504						
kBre	514	564						
o	198	240						

Not : (...) İşaretili olan ölçüler Motor markasına göre farklılık gösterir.
Note : The dimensions which have (...) sign vary depending on the motor brand.

PA 12
PA 13

IEC

PF 12
PF 13



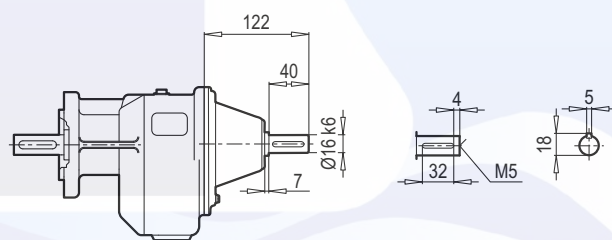
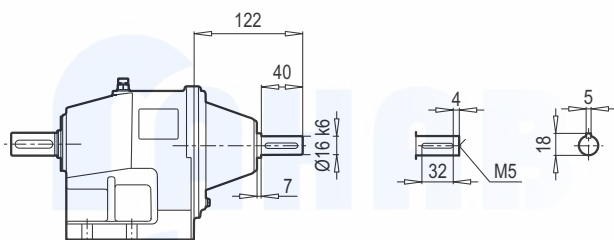
Tip / Type	IEC	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	o
PA/PF 12-13	63	140	95	115	3.5	M8	11	23	12.8	4	85
PA/PF 12-13	71	160	110	130	4.0	M8	14	30	16.3	5	89
PA/PF 12	80	200	130	165	4.0	M10	19	40	21.8	6	105
PA/PF 12	90	200	130	165	4.0	M10	24	50	27.3	8	105
PA/PF 12	100	250	180	215	5.0	M12	28	60	31.3	8	130
PA/PF 12	112	250	180	215	5.0	M12	28	60	31.3	8	130

~ Kg		
IEC	PA/PF 12	PA/PF 13
63	16	21
71	17	22
80	20	-
90	20	-
100	27	-
112	27	-

PA 12
PA 13

W

PF 12
PF 13

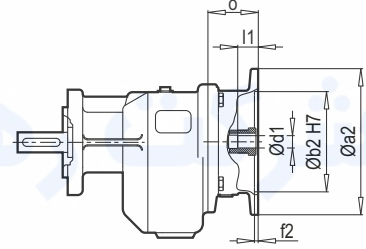
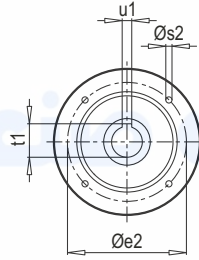
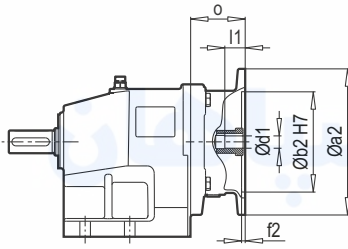


W ~ Kg	
PA/PF 12	15
PA/PF 13	20

PA 12
PA 13

PAM B5/B14

PF 12
PF 13



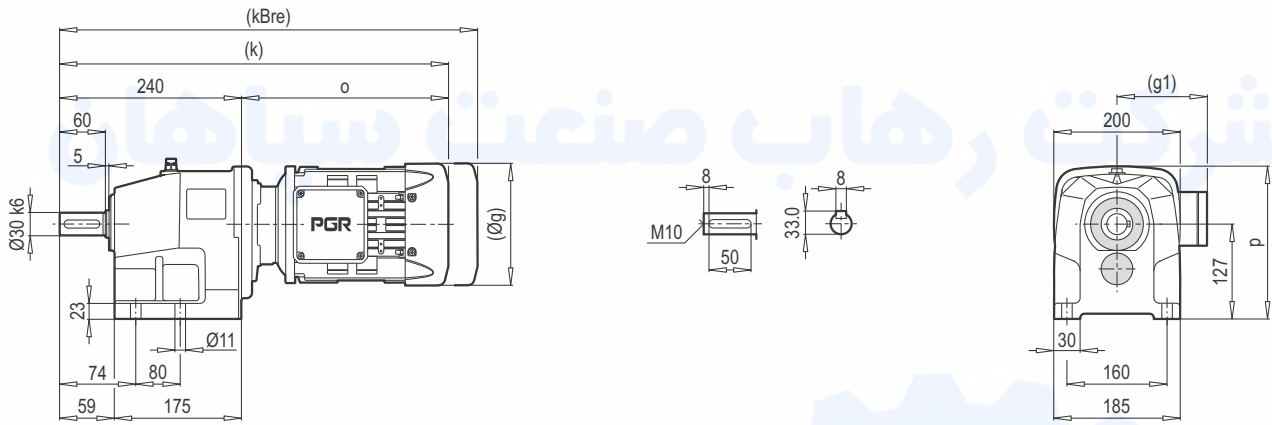
Tip / Type	PAM B5	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	o
PA/PF 12-13	63	140	95	115	3.5	M8	11	23	12.8	4	85
PA/PF 12-13	71	160	110	130	4.0	M8	14	30	16.3	5	55
PA/PF 12	80	200	130	165	4.0	M10	19	40	21.8	6	74
PA/PF 12	90	200	130	165	4.0	M10	24	50	27.3	8	74
PA/PF 12	100	250	180	215	5.0	M12	28	60	31.3	8	75
PA/PF 12	112	250	180	215	5.0	M12	28	60	31.3	8	75

Tip / Type	PAM B14	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	o
PA/PF 12-13	63	90	60	75	4.0	6	11	23	12.8	4	60
PA/PF 12-13	71	105	70	85	4.0	7	14	30	16.3	5	55
PA/PF 12	80	120	80	100	4.0	7	19	40	21.8	6	74
PA/PF 12	90	140	95	115	4.0	9	24	50	27.3	8	74
PA/PF 12	100	160	110	130	5.0	9	28	60	31.3	8	75
PA/PF 12	112	160	110	130	5.0	9	28	60	31.3	8	75

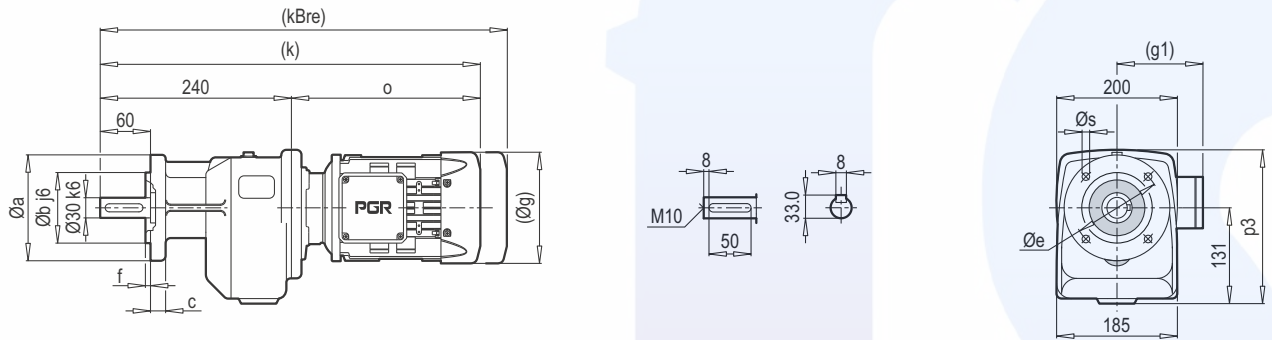
~ Kg		
PAM B5	PA/PF 12	PA/PF 13
63	14	19
71	14	19
80	15	-
90	15	-
100	22	-
112	22	-

~ Kg		
PAM B14	PA/PF 12	PA/PF 13
63	13	18
71	13	18
80	14	-
90	14	-
100	15	-
112	15	-

PA 22



PF 22

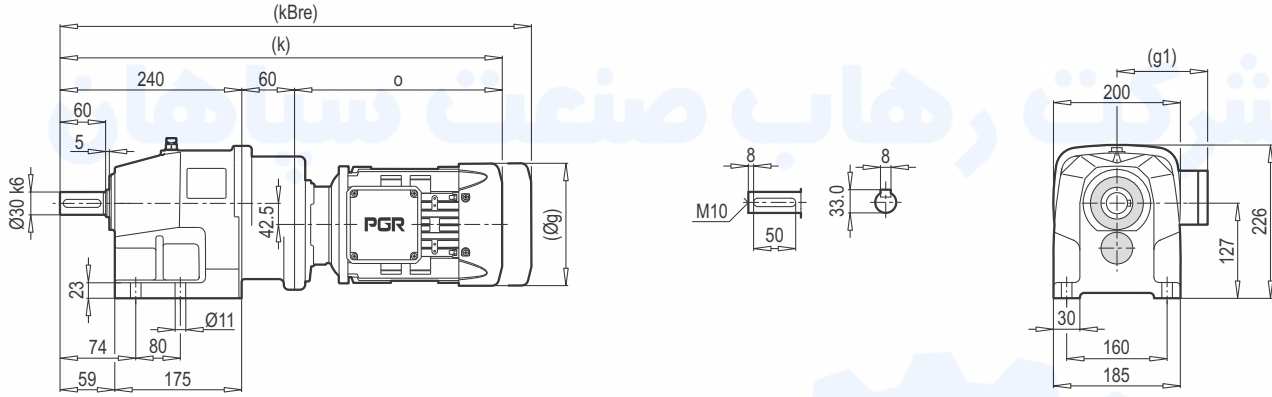


a	b	c	e	f	s
160	110	14	130	3.5	9
200	130	14	165	3.5	11

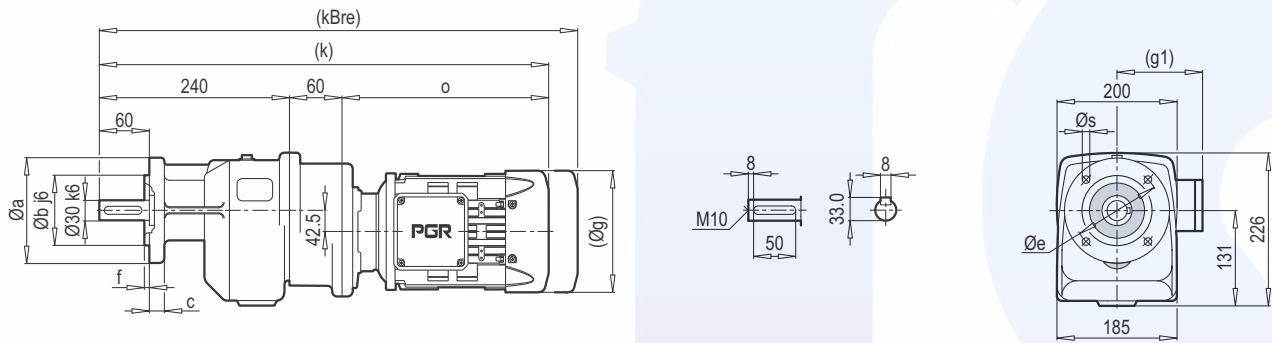
	71 M	80 M	90 S/L	100 L	112 M			
g	140	159	193	217	232			
g1	119	127	151	160	168			
k	476	502	525/545	573	618			
kBre	536	564	598/618	654	698			
o	236	262	285/305	333	378			
p	226	226	226	228	240			
p3	226	226	226	228	240			

Not : (...) İşaretili olan ölçüler Motor markasına göre farklılık gösterir.
Note : The dimensions which have (...) sign vary depending on the motor brand.

PA 23



PF 23



a	b	c	e	f	s
160	110	14	130	3.5	9
200	130	14	165	3.5	11

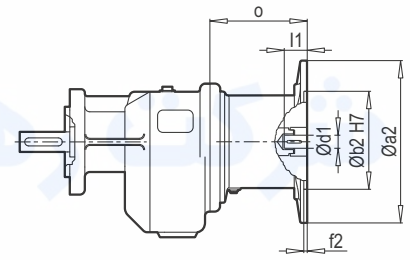
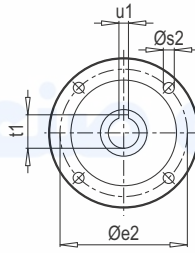
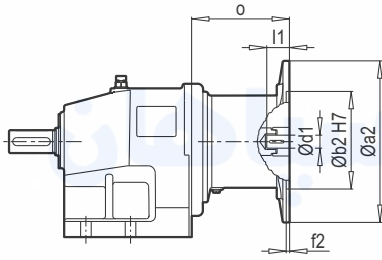
	63 M	71 M	80 M					
g	124	140	159					
g1	111	119	127					
k	498	540	567					
kBre	550	600	629					
o	198	240	267					

Not : (...) İşaretli olan ölçüler Motor markasına göre farklılık gösterir.
Note : The dimensions which have (...) sign vary depending on the motor brand.

PA 22
PA 23

IEC

PF 22
PF 23



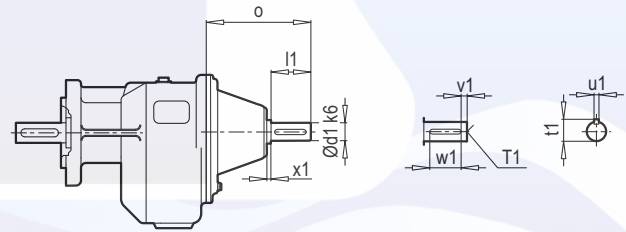
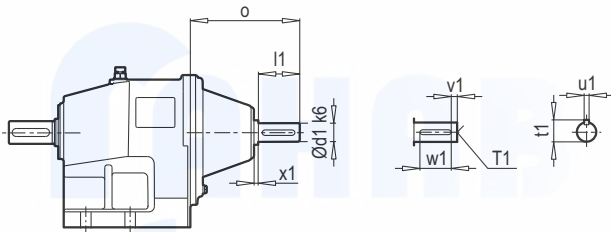
Tip / Type	IEC	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	PA/PF 22 o	PA/PF 23 o
PA/PF 23	63	140	95	115	3.5	M8	11	23	12.8	4	-	85
PA/PF 22-23	71	160	110	130	4.0	M8	14	30	16.3	5	88	89
PA/PF 22-23	80	200	130	165	4.0	M10	19	40	21.8	6	107	105
PA/PF 22-23	90	200	130	165	4.0	M10	24	50	27.3	8	107	105
PA/PF 22	100	250	180	215	5.0	M12	28	60	31.3	8	124	-
PA/PF 22	112	250	180	215	5.0	M12	28	60	31.3	8	124	-

~ Kg		
IEC	PA/PF 22	PA/PF 23
63	-	33
71	28	34
80	32	37
90	32	37
100	36	-
112	36	-

PA 22
PA 23

W

PF 22
PF 23



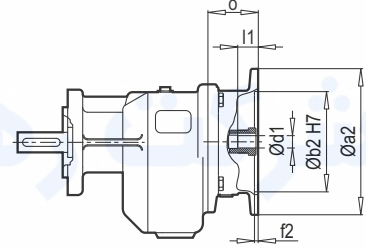
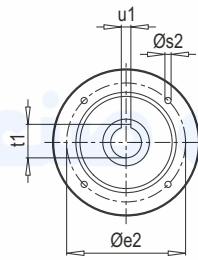
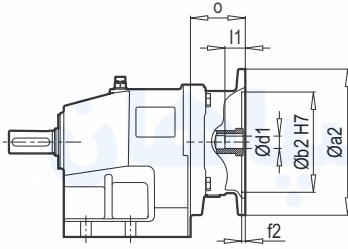
Tip / Type	Ød1	x1	l1	o	T1	t1	u1	v1	w1
PA/PF 22	24	8	50	172	M8	27	8	5	40
PA/PF 23	16	7	40	122	M5	18	5	4	32

W ~ Kg	
PA/PF 22	30
PA/PF 23	32

PA 22
PA 23

PAM B5/B14

PF 22
PF 23



Tip / Type	PAM B5	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	PA/PF 22 o	PA/PF 23 o
PA/PF 23	63	140	95	115	3.5	M8	11	23	12.8	4	-	85
PA/PF 22-23	71	160	110	130	4.0	M8	14	30	16.3	5	88	55
PA/PF 22-23	80	200	130	165	4.0	M10	19	40	21.8	6	72	74
PA/PF 22-23	90	200	130	165	4.0	M10	24	50	27.3	8	72	74
PA/PF 22	100	250	180	215	5.0	M12	28	60	31.3	8	75	-
PA/PF 22	112	250	180	215	5.0	M12	28	60	31.3	8	75	-

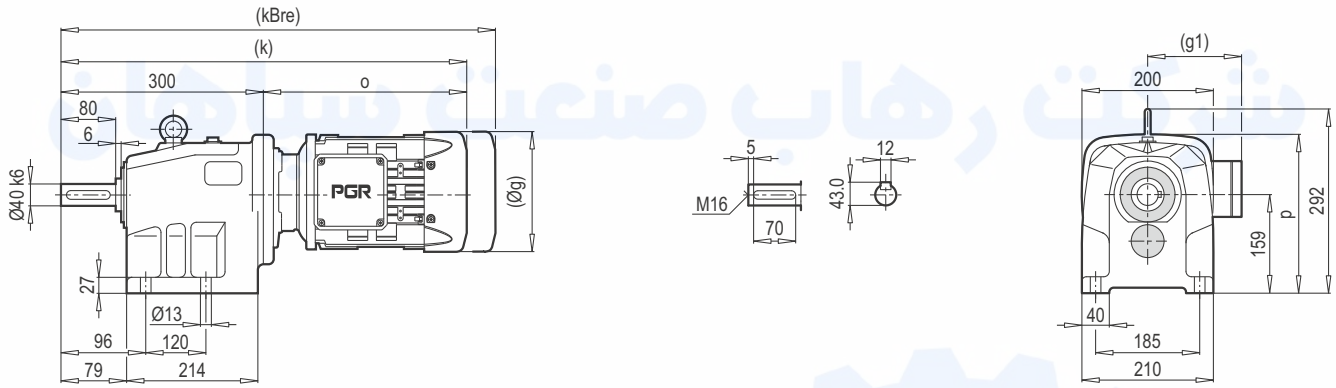
Tip / Type	PAM B14	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	PA/PF 22 o	PA/PF 23 o
PA/PF 23	63	90	60	75	4.0	6	11	23	12.8	4	-	60
PA/PF 22-23	71	105	70	85	4.0	7	14	30	16.3	5	88	55
PA/PF 22-23	80	120	80	100	4.0	7	19	40	21.8	6	72	74
PA/PF 22-23	90	140	95	115	4.0	9	24	50	27.3	8	72	74
PA/PF 22	100	160	110	130	5.0	9	28	60	31.3	8	75	-
PA/PF 22	112	160	110	130	5.0	9	28	60	31.3	8	75	-

~ Kg		
PAM B5	PA/PF 22	PA/PF 23
63	-	31
71	26	31
80	27	32
90	27	32
100	28	-
112	28	-

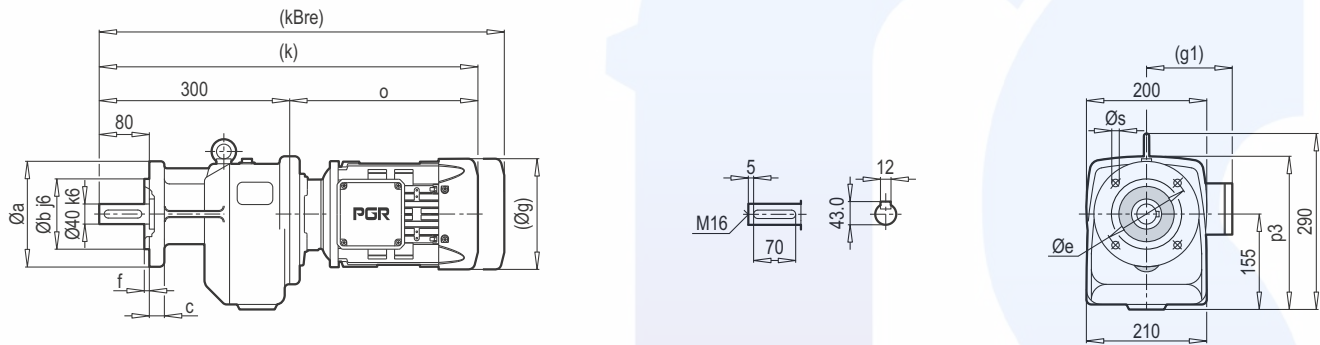
~ Kg		
PAM B14	PA/PF 22	PA/PF 23
63	-	30
71	24	30
80	25	31
90	25	31
100	27	-
112	27	-

PA/PF 32

PA 32



PF 32

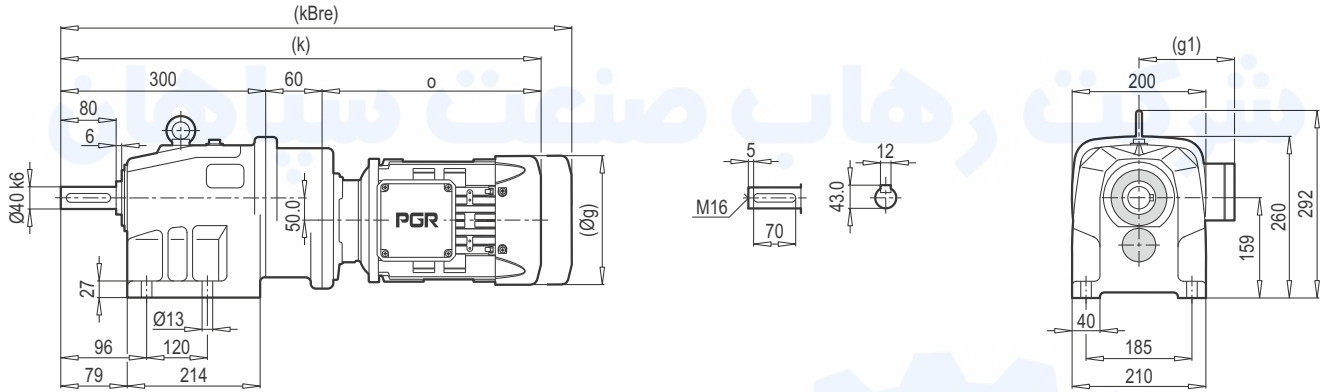


a	b	c	e	f	s
200	130	16	165	3.5	11
250	180	16	215	4.0	14

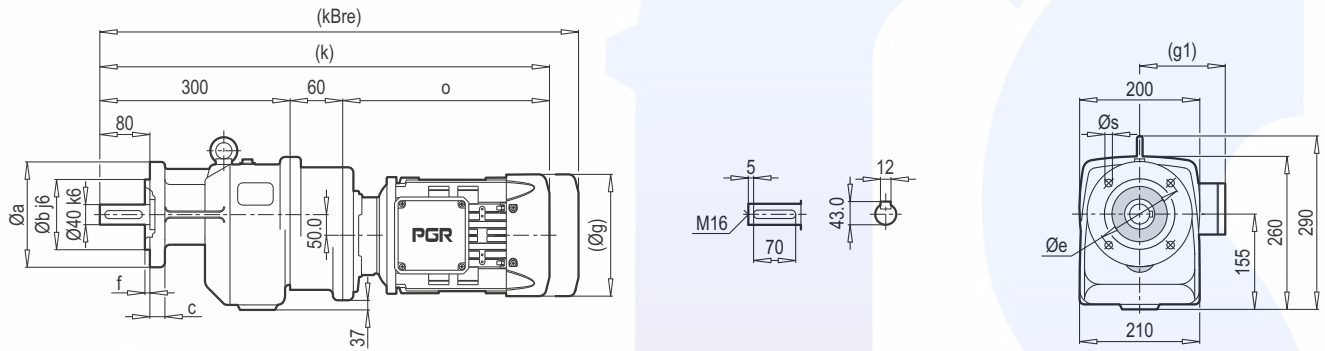
	71 M	80 M	90 S/L	100 L	112 M	132 S/M		
g	140	159	193	217	232	279		
g1	119	127	151	160	168	182		
k	536	562	585/605	633	678	685/720		
kBre	596	624	658/678	714	758	793/861		
o	236	262	285/305	333	378	385/420		
p	260	260	260	260	271	290		
p3	260	260	260	260	271	290		

Not : (...) İşaretli olan ölçüler Motor markasına göre farklılık gösterir.
Note : The dimensions which have (...) sign vary depending on the motor brand.

PA 33



PF 33



a	b	c	e	f	s
200	130	16	165	3.5	11
250	180	16	215	4.0	14

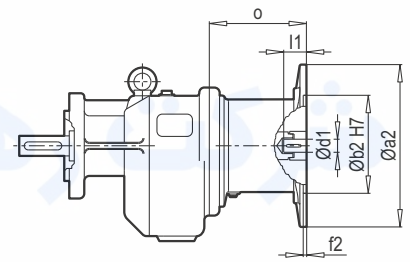
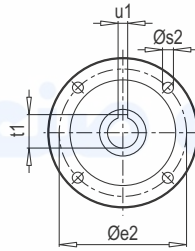
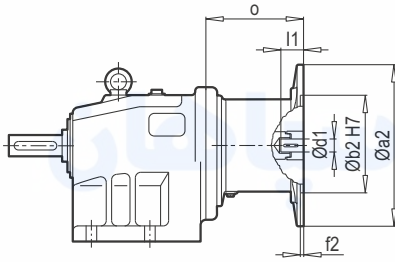
	63 M	71 M	80 M					
g	124	140	159					
g1	111	119	127					
k	558	600	627					
kBre	610	660	689					
o	198	240	267					

Not : (...) İşaretli olan ölçüler Motor markasına göre farklılık gösterir.
Note : The dimensions which have (...) sign vary depending on the motor brand.

PA 32
PA 33

IEC

PF 32
PF 33



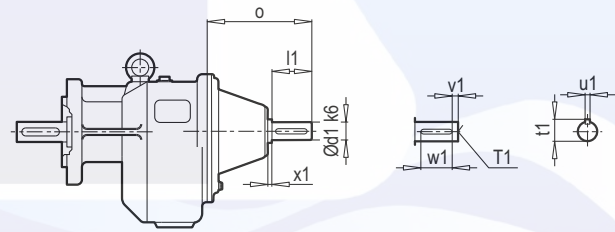
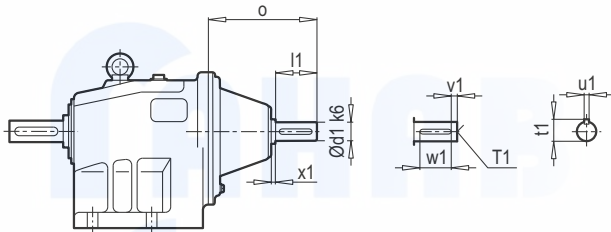
Tip / Type	IEC	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	PA/PF 32 o	PA/PF 33 o
PA/PF 33	63	140	95	115	3.5	M8	11	23	12.8	4	-	85
PA/PF 32-33	71	160	110	130	4.0	M8	14	30	16.3	5	88	89
PA/PF 32-33	80	200	130	165	4.0	M10	19	40	21.8	6	107	105
PA/PF 32-33	90	200	130	165	4.0	M10	24	50	27.3	8	107	105
PA/PF 32-33	100	250	180	215	5.0	M12	28	60	31.3	8	124	130
PA/PF 32-33	112	250	180	215	5.0	M12	28	60	31.3	8	124	130
PA/PF 32	132	300	230	265	5.0	M12	38	80	41.3	10	156	-

~ Kg		
IEC	PA/PF 32	PA/PF 33
63	-	46
71	40	47
80	44	50
90	44	50
100	48	57
112	48	57
132	57	-

PA 32
PA 33

W

PF 32
PF 33



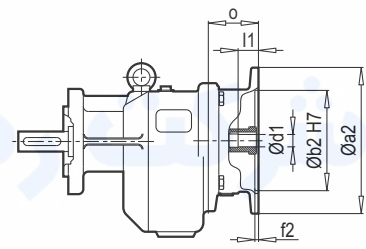
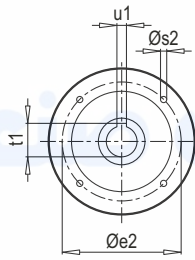
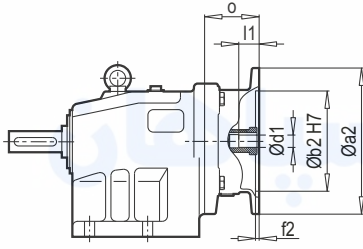
Tip / Type	Ød1	x1	l1	o	T1	t1	u1	v1	w1
PA/PF 32	24	8	50	172	M8	27	8	5	40
PA/PF 33	16	7	40	122	M5	18	5	4	32

W ~ Kg	
PA/PF 32	42
PA/PF 33	45

PA 32
PA 33

PAM B5/B14

PF 32
PF 33



Tip / Type	PAM B5	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	PA/PF 32 o	PA/PF 33 o
PA/PF 33	63	140	95	115	3.5	M8	11	23	12.8	4	-	85
PA/PF 32-33	71	160	110	130	4.0	M8	14	30	16.3	5	88	55
PA/PF 32-33	80	200	130	165	4.0	M10	19	40	21.8	6	72	74
PA/PF 32-33	90	200	130	165	4.0	M10	24	50	27.3	8	72	74
PA/PF 32-33	100	250	180	215	5.0	M12	28	60	31.3	8	75	132
PA/PF 32-33	112	250	180	215	5.0	M12	28	60	31.3	8	75	132
PA/PF 32	132	300	230	265	5.0	M12	38	80	41.3	10	94	-

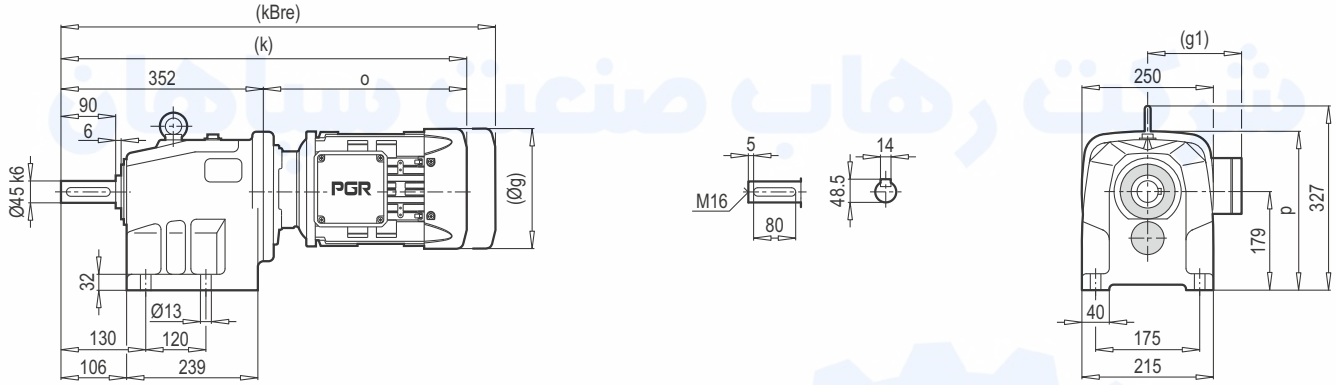
~ Kg		
PAM B5	PA/PF 32	PA/PF 33
63	-	43
71	37	43
80	38	44
90	38	44
100	39	51
112	39	51
132	49	-

Tip / Type	PAM B14	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	PA/PF 32 o	PA/PF 33 o
PA/PF 33	63	90	60	75	4.0	6	11	23	12.8	4	-	60
PA/PF 32-33	71	105	70	85	4.0	7	14	30	16.3	5	88	55
PA/PF 32-33	80	120	80	100	4.0	7	19	40	21.8	6	72	74
PA/PF 32-33	90	140	95	115	4.0	9	24	50	27.3	8	72	74
PA/PF 32-33	100	160	110	130	5.0	9	28	60	31.3	8	75	75
PA/PF 32-33	112	160	110	130	5.0	9	28	60	31.3	8	75	75
PA/PF 32	132	200	130	165	5.0	11	38	80	41.3	10	94	-

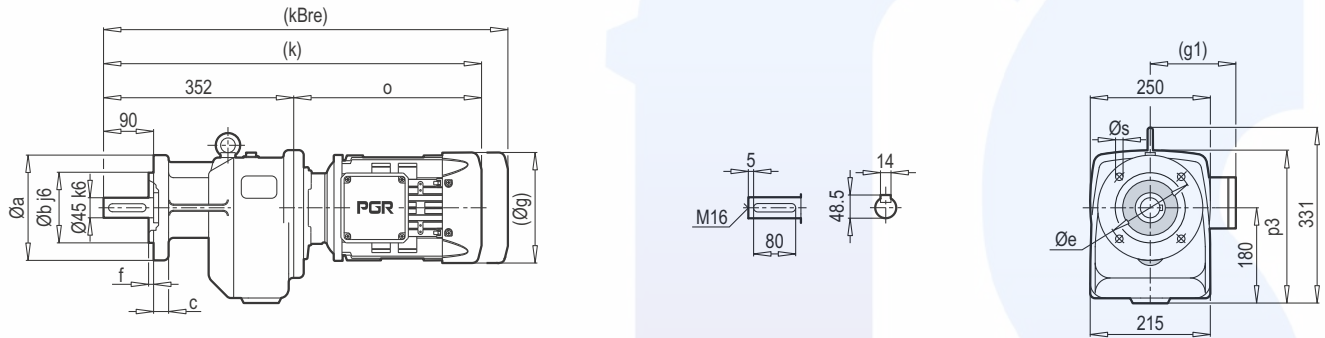
~ Kg		
PAM B14	PA/PF 32	PA/PF 33
63	-	42
71	35	42
80	36	43
90	36	43
100	38	44
112	38	44
132	42	-

PA/PF 42

PA 42



PF 42



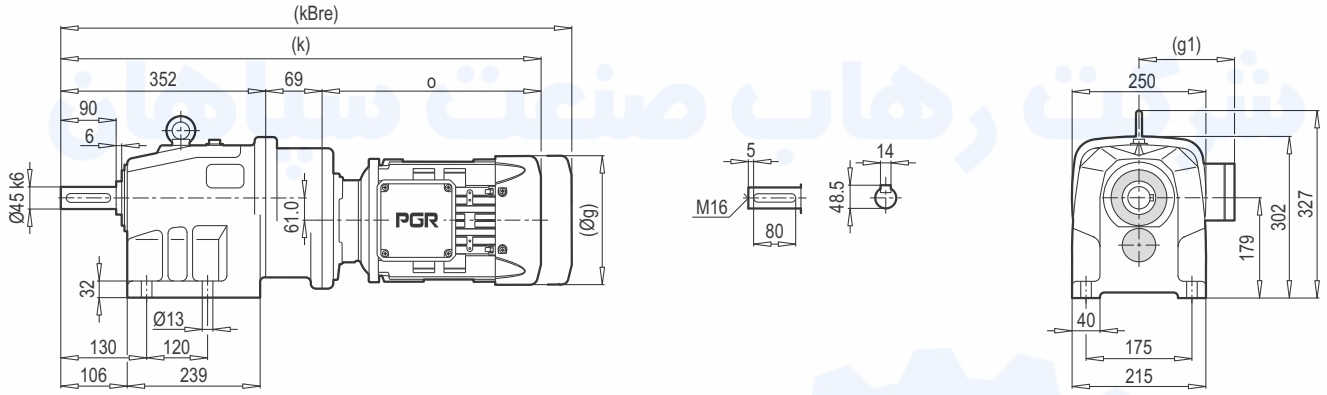
a	b	c	e	f	s
200	130	16	165	3.5	11
250	180	16	215	4.0	14

	90 S/L	100 L	112 M	132 S/M	160 M/L			
g	193	217	232	279	323			
g1	151	160	168	182	200			
k	617/637	665	710	717/752	857			
kBre	690/710	746	790	825/893	1009			
o	265/285	313	358	365/400	505			
p	302	302	302	310	337			
p3	302	302	302	310	337			

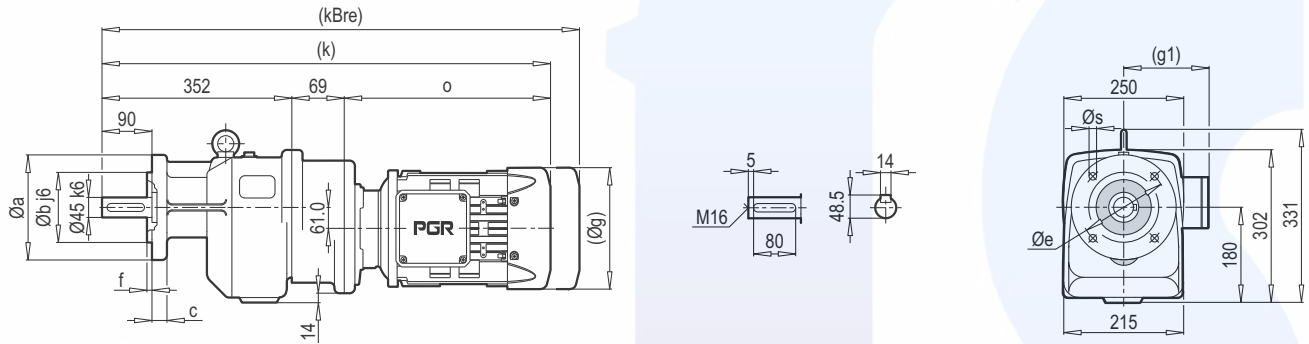
Not : (...) İşaretli olan ölçüler Motor markasına göre farklılık gösterir.

Note : The dimensions which have (...) sign vary depending on the motor brand.

PA 43



PF 43



a	b	c	e	f	s
200	130	16	165	3.5	11
250	180	16	215	4.0	14

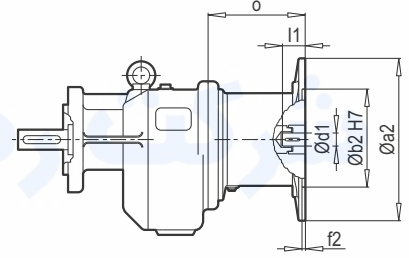
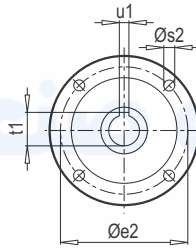
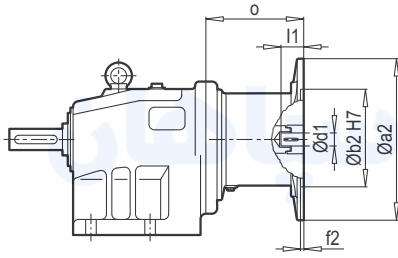
	71 M	80 M	90 S/L	100 L	112 M			
g	140	159	193	217	232			
g1	119	127	151	160	168			
k	657	683	706/726	754	799			
kBre	717	745	779/799	835	879			
o	236	262	285/305	333	378			

Not : (...) İşaretili olan ölçüler Motor markasına göre farklılık gösterir.
Note : The dimensions which have (...) sign vary depending on the motor brand.

PA 42
PA 43

IEC

PF 42
PF 43



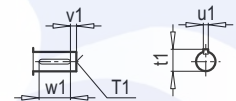
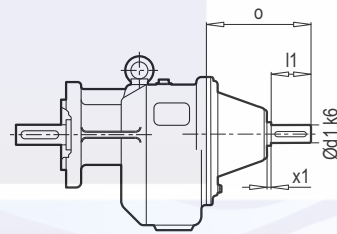
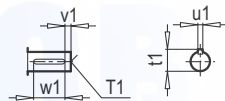
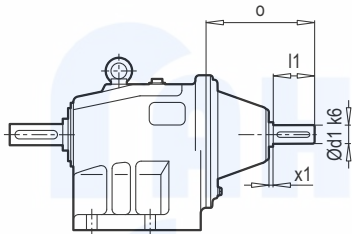
Tip / Type	IEC	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	PA/PF 42 o	PA/PF 43 o
PA/PF 43	71	160	110	130	4.0	M8	14	30	16.3	5	-	88
PA/PF 43	80	200	130	165	4.0	M10	19	40	21.8	6	-	107
PA/PF 42-43	90	200	130	165	4.0	M10	24	50	27.3	8	109	107
PA/PF 42-43	100	250	180	215	5.0	M12	28	60	31.3	8	133	124
PA/PF 42-43	112	250	180	215	5.0	M12	28	60	31.3	8	133	124
PA/PF 42	132	300	230	265	5.0	M12	38	80	41.3	10	190	-
PA/PF 42	160	350	250	300	6.0	M16	42	110	45.3	12	194	-

~ Kg		
IEC	PA/PF 42	PA/PF 43
71	-	71
80	-	75
90	62	75
100	70	79
112	70	79
132	84	-
160	95	-

PA 42
PA 43

W

PF 42
PF 43



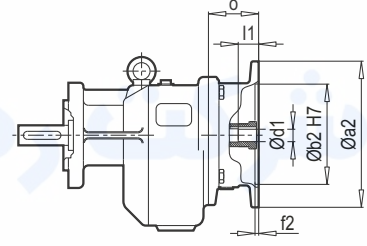
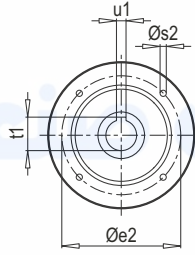
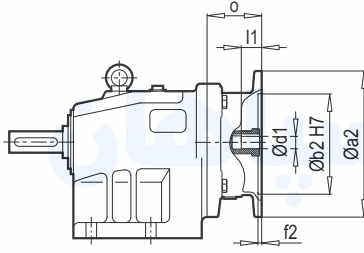
Tip / Type	Ød1	x1	l1	o	T1	t1	u1	v1	w1
PA/PF 42	38	8	80	213	M12	41	10	5	70
PA/PF 43	24	8	50	172	M8	27	8	5	40

W ~ Kg	
PA/PF 42	68
PA/PF 43	73

PA 42
PA 43

PAM B5/B14

PF 42
PF 43



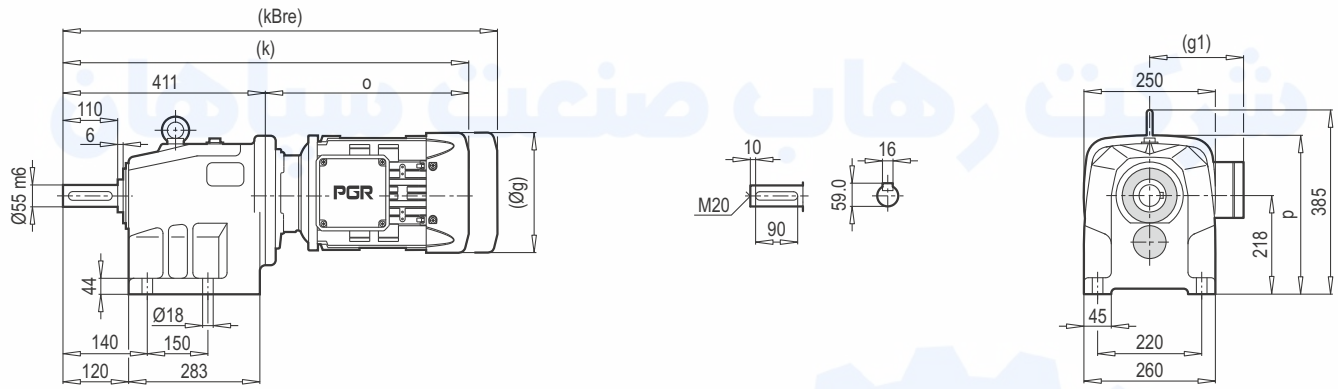
Tip / Type	PAM B5	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	PA/PF 42 o	PA/PF 43 o
PA/PF 43	71	160	110	130	4.0	M8	14	30	16.3	5	-	88
PA/PF 43	80	200	130	165	4.0	M10	19	40	21.8	6	-	72
PA/PF 42-43	90	200	130	165	4.0	M10	24	50	27.3	8	72	72
PA/PF 42-43	100	250	180	215	5.0	M12	28	60	31.3	8	75	75
PA/PF 42-43	112	250	180	215	5.0	M12	28	60	31.3	8	75	75
PA/PF 42	132	300	230	265	5.0	M12	38	80	41.3	10	94	-
PA/PF 42	160	350	250	300	6.0	M16	42	110	45.3	12	120	-

~ Kg		
PAM B5	PA/PF 42	PA/PF 43
71	-	67
80	-	68
90	56	68
100	57	69
112	57	69
132	66	-
160	74	-

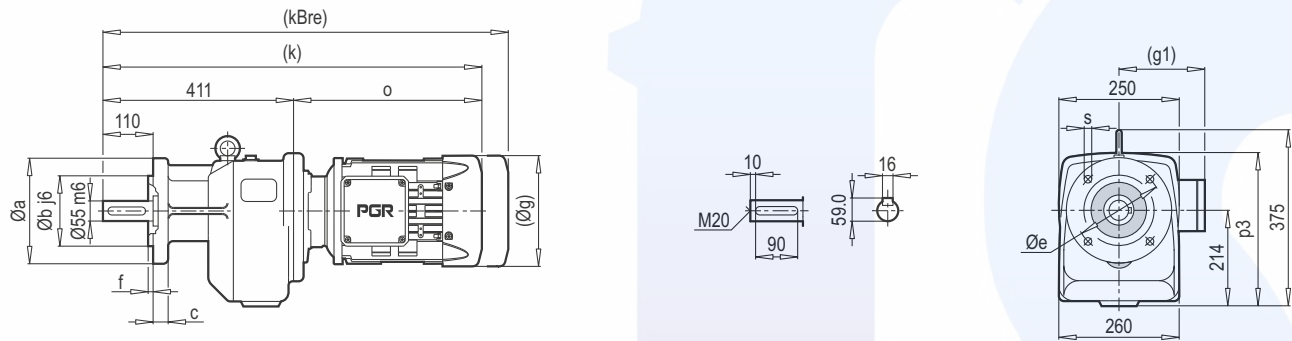
Tip / Type	PAM B14	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	PA/PF 42 o	PA/PF 43 o
PA/PF 43	71	105	70	85	4.0	7	14	30	16.3	5	-	55
PA/PF 43	80	120	80	100	4.0	7	19	40	21.8	6	-	74
PA/PF 42-43	90	140	95	115	4.0	9	24	50	27.3	8	72	74
PA/PF 42-43	100	160	110	130	5.0	9	28	60	31.3	8	75	75
PA/PF 42-43	112	160	110	130	5.0	9	28	60	31.3	8	75	-
PA/PF 42	132	200	130	165	5.0	11	38	80	41.3	10	94	-

~ Kg		
PAM B14	PA/PF 42	PA/PF 43
71	-	65
80	-	66
90	55	66
100	56	68
112	56	-
132	61	-

PA 52



PF 52

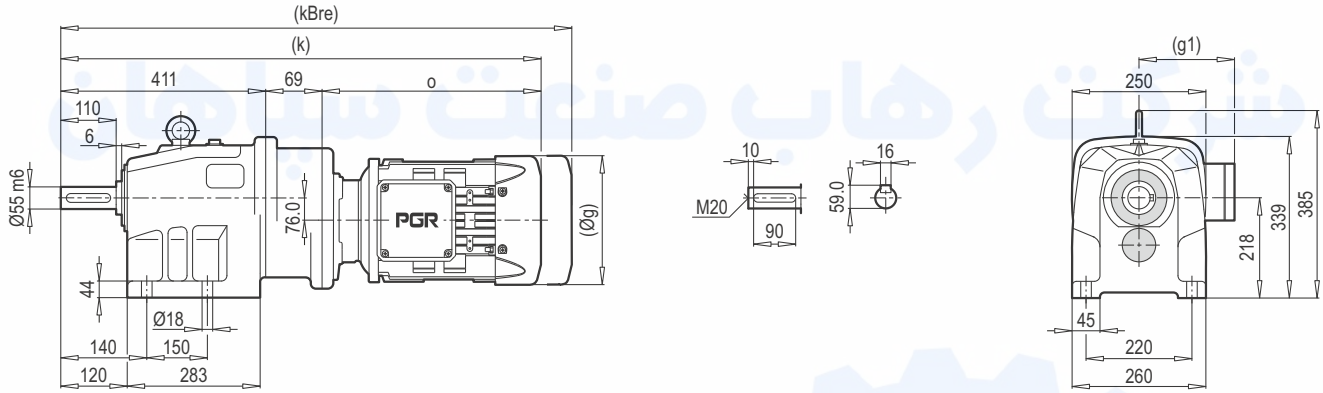


a	b	c	e	f	s
250	180	20	215	4.0	14
300	230	20	265	4.0	14

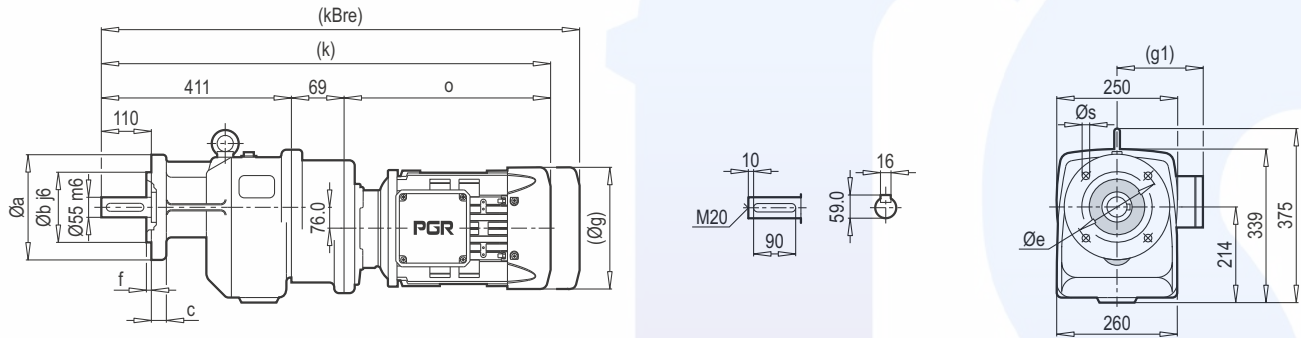
	90 S/L	100 L	112 M	132 S/M	160 M/L	180 M/L		
g	193	217	232	279	323	370		
g1	151	160	168	182	200	248		
k	676/696	724	769	776/811	916	990		
kBre	749/769	805	849	884/952	1068	1152		
o	265/285	313	358	365/400	505	579		
p	339	339	339	347	374	374		
p3	339	339	339	347	374	374		

Not : (...) İşaretili olan ölçüler Motor markasına göre farklılık gösterir.
Note : The dimensions which have (...) sign vary depending on the motor brand.

PA 53



PF 53



a	b	c	e	f	s
250	180	20	215	4.0	14
300	230	20	265	4.0	14

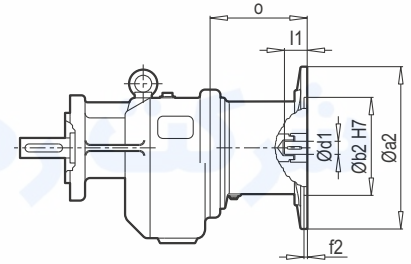
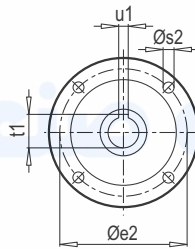
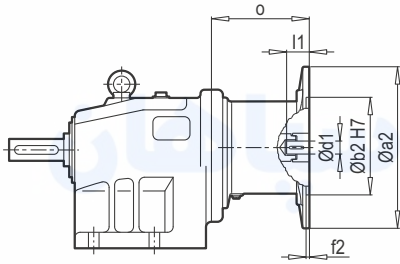
	71 M	80 M	90 S/L	100 L	112 M			
g	140	159	193	217	232			
g1	119	127	151	160	168			
k	716	742	765/785	813	858			
kBre	776	804	838/858	894	938			
o	236	262	285/305	333	378			

Not : (...) İşaretli olan ölçüler Motor markasına göre farklılık gösterir.
Note : The dimensions which have (...) sign vary depending on the motor brand.

PA 52
PA 53

IEC

PF 52
PF 53



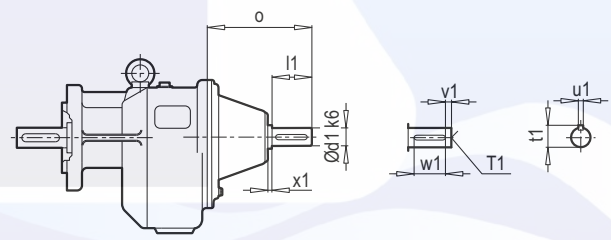
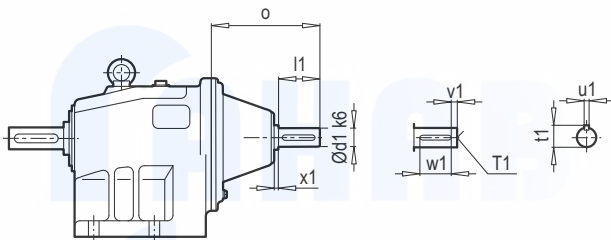
Tip / Type	IEC	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	PA/PF 52 o	PA/PF 53 o
PA/PF 53	71	160	110	130	4.0	M8	14	30	16.3	5	-	88
PA/PF 53	80	200	130	165	4.0	M10	19	40	21.8	6	-	107
PA/PF 52-53	90	200	130	165	4.0	M10	24	50	27.3	8	109	107
PA/PF 52-53	100	250	180	215	5.0	M12	28	60	31.3	8	133	124
PA/PF 52-53	112	250	180	215	5.0	M12	28	60	31.3	8	133	124
PA/PF 52	132	300	230	265	5.0	M12	38	80	41.3	10	190	-
PA/PF 52	160	350	250	300	6.0	M16	42	110	45.3	12	194	-
PA/PF 52	180	350	250	300	6.0	M16	48	110	51.8	14	194	-

~ Kg		
IEC	PA/PF 52	PA/PF 53
71	-	106
80	-	110
90	93	110
100	101	114
112	101	114
132	116	-
160	126	-
180	126	-

PA 52
PA 53

W

PF 52
PF 53



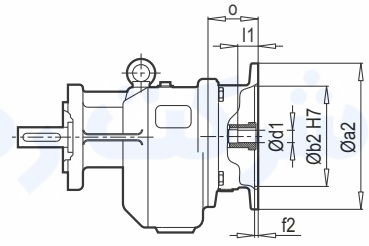
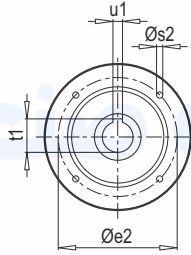
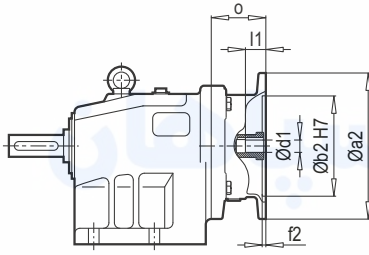
Tip / Type	Ød1	x1	l1	o	T1	t1	u1	v1	w1
PA/PF 52	38	8	80	213	M12	41	10	5	70
PA/PF 53	24	8	50	172	M8	27	8	5	40

W ~ Kg	
PA/PF 52	99
PA/PF 53	108

PA 52
PA 53

PAM B5/B14

PF 52
PF 53



Tip / Type	PAM B5	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	PA/PF 52 o	PA/PF 53 o
PA/PF 53	71	160	110	130	4.0	M8	14	30	16.3	5	-	88
PA/PF 53	80	200	130	165	4.0	M10	19	40	21.8	6	-	72
PA/PF 52-53	90	200	130	165	4.0	M10	24	50	27.3	8	72	72
PA/PF 52-53	100	250	180	215	5.0	M12	28	60	31.3	8	75	75
PA/PF 52-53	112	250	180	215	5.0	M12	28	60	31.3	8	75	75
PA/PF 52	132	300	230	265	5.0	M12	38	80	41.3	10	94	-
PA/PF 52	160	350	250	300	6.0	M16	42	110	45.3	12	120	-
PA/PF 52	180	350	250	300	6.0	M16	48	110	51.8	14	120	-

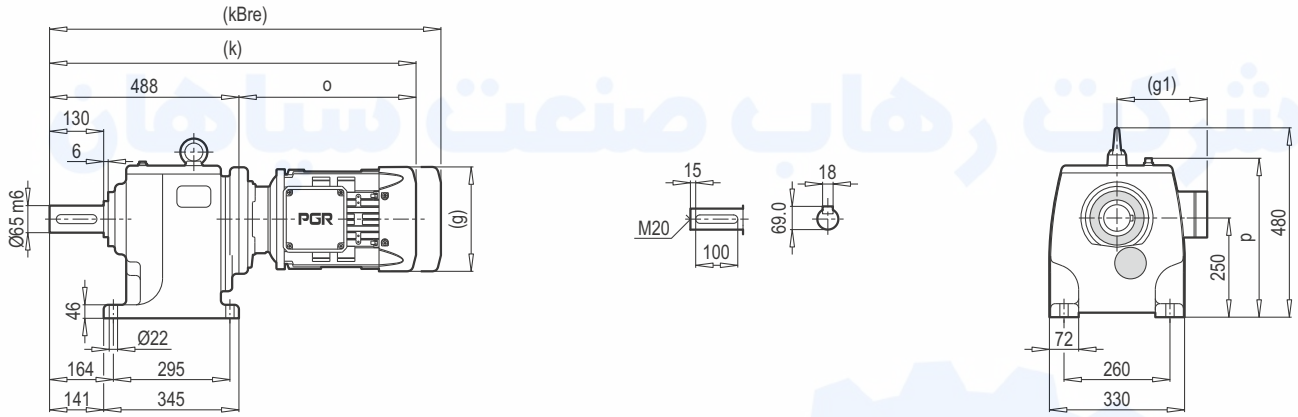
~ Kg		
PAM B5	PA/PF 52	PA/PF 53
71	-	100
80	-	101
90	85	101
100	86	102
112	86	102
132	95	-
160	103	-
180	103	-

Tip / Type	PAM B14	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	PA/PF 52 o	PA/PF 53 o
PA/PF 53	71	105	70	85	4.0	7	14	30	16.3	5	-	55
PA/PF 53	80	120	80	100	4.0	7	19	40	21.8	6	-	74
PA/PF 52-53	90	140	95	115	4.0	9	24	50	27.3	8	72	74
PA/PF 52-53	100	160	110	130	5.0	9	28	60	31.3	8	75	75
PA/PF 52-53	112	160	110	130	5.0	9	28	60	31.3	8	75	75
PA/PF 52	132	200	130	165	5.0	11	38	80	41.3	10	94	-

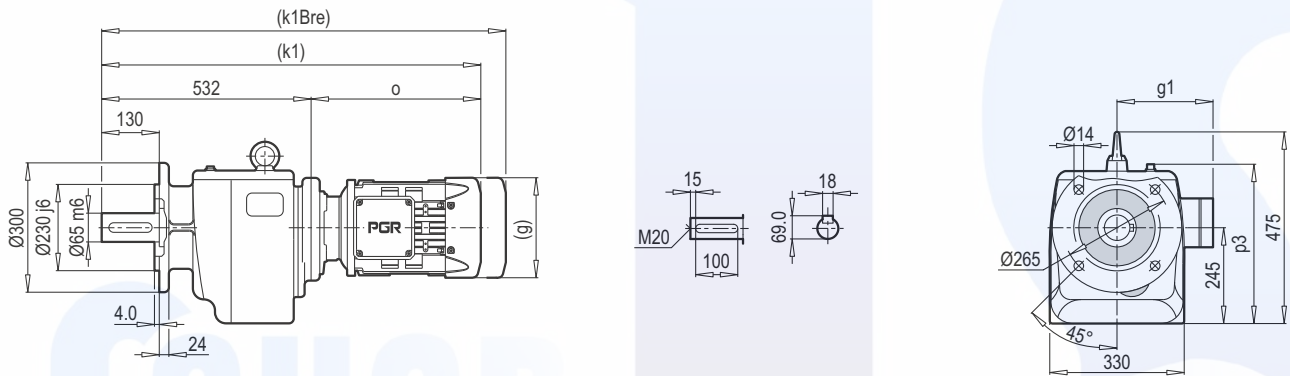
~ Kg		
PAM B14	PA/PF 52	PA/PF 53
71	-	98
80	-	99
90	84	99
100	85	101
112	85	101
132	89	-

PA/PF 62

PA 62



PF 62

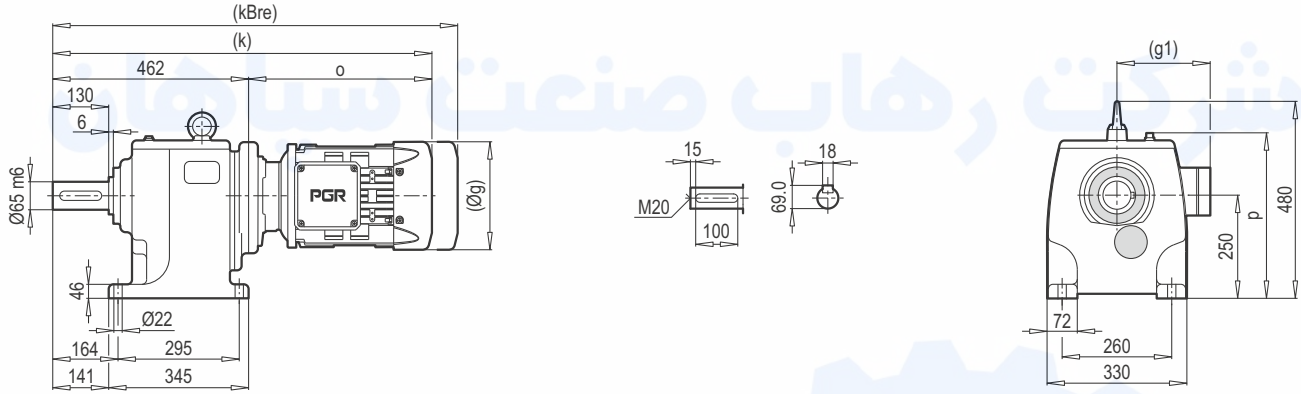


	112 M	132 S	132 M	160 M/L	180 M/L	200 L	225 S/M	
g	232	279	279	323	370	415	456	
g1	168	182	182	200	248	260	260	
k	848	851	886	952	1011	1106	1188	
kBre	928	959	1027	1104	1173	1253	1360	
k1	892	895	930	996	1055	1150	1232	
k1Bre	972	1003	1071	1148	1217	1297	1404	
o	360	363	398	464	523	618	700	
p	400	400	400	425	425	449	485	
p3	395	395	395	420	420	449	485	

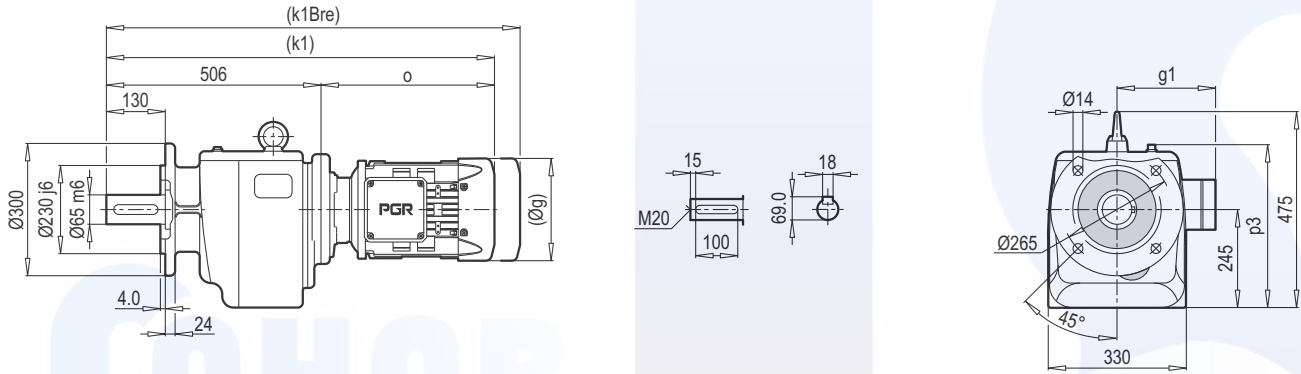
Not : (...) İşaretli olan ölçüler Motor markasına göre farklılık gösterir.

Note : The dimensions which have (...) sign vary depending on the motor brand.

PA 63



PF 63



	90 S/L	100 L	112 M	132 S/M	160 M/L	180 M/L		
g	193	217	232	279	323	370		
g1	151	160	168	182	200	248		
k	727/747	775	820	827/862	967	1041		
kBre	800/820	856	900	935/1003	1119	1203		
k1	771/791	819	864	871/906	1011	1085		
k1Bre	844/864	900	944	979/1047	1163	1247		
o	265/285	313	358	365/400	505	579		
p	400	400	400	400	410	410		
p3	395	395	395	395	405	405		

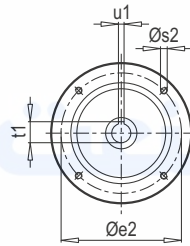
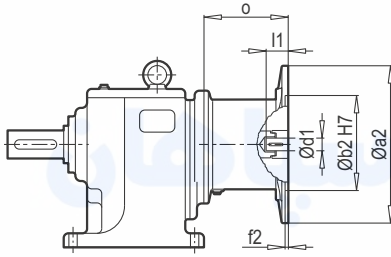
Not : (...) İşaretli olan ölçüler Motor markasına göre farklılık gösterir.

Note : The dimensions which have (...) sign vary depending on the motor brand.

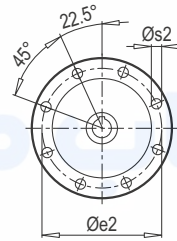
PA 62
PA 63

IEC

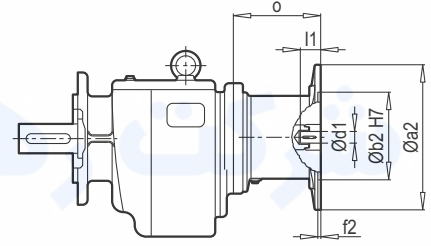
PF 62
PF 63



IEC 90...200



IEC 225



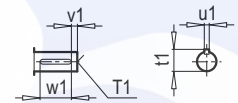
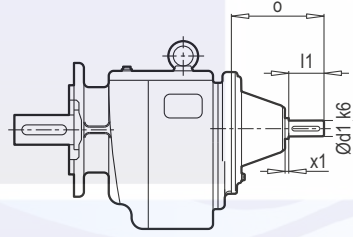
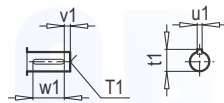
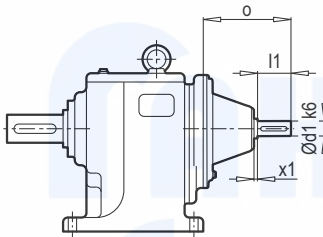
Tip / Type	IEC	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	PA/PF 62 o	PA/PF 63 o
PA/PF 63	90	200	130	165	4.0	M10	24	50	27.3	8	-	109
PA/PF 62-63	100	250	180	215	5.0	M12	28	60	31.3	8	127	133
PA/PF 62-63	112	250	180	215	5.0	M12	28	60	31.3	8	127	133
PA/PF 62-63	132	300	230	265	5.0	M12	38	80	41.3	10	177	190
PA/PF 62-63	160	350	250	300	6.0	M16	42	110	45.3	12	266	194
PA/PF 62-63	180	350	250	300	6.0	M16	48	110	51.8	14	266	194
PA/PF 62	200	400	300	350	6.0	M16	55	110	59.3	16	229	-
PA/PF 62	225	450	350	400	6.0	M16	60	140	64.4	18	303	-

~ Kg		
IEC	PA/PF 62	PA/PF 63
90	-	151
100	167	159
112	167	159
132	181	173
160	207	184
180	207	184
200	222	-
225	237	-

PA 62
PA 63

W

PF 62
PF 63



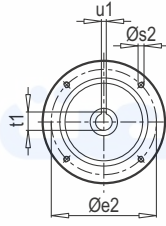
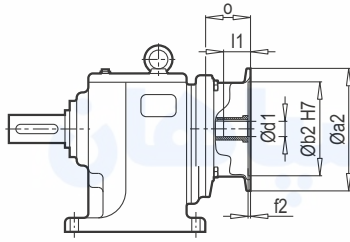
Tip / Type	Ød1	x1	l1	o	T1	t1	u1	v1	w1
PA/PF 62	42	8	110	288	M16	45	12	10	90
PA/PF 63	38	8	80	213	M12	41	10	5	70

W ~ Kg	
PA/PF 62	180
PA/PF 63	156

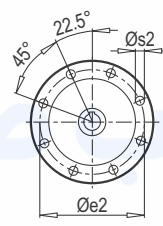
PA 62
PA 63

PAM B5/B14

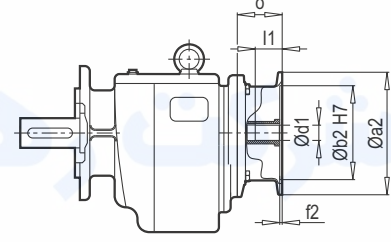
PF 62
PF 63



PAM 90...200



PAM 225



Tip / Type	PAM B5	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	PA/PF 62 o	PA/PF 63 o
PA/PF 63	90	200	130	165	4.0	M10	24	50	27.3	8	-	72
PA/PF 62-63	100	250	180	215	5.0	M12	28	60	31.3	8	75	75
PA/PF 62-63	112	250	180	215	5.0	M12	28	60	31.3	8	75	75
PA/PF 62-63	132	300	230	265	5.0	M12	38	80	41.3	10	110	94
PA/PF 62-63	160	350	250	300	6.0	M16	42	110	45.3	12	145	120
PA/PF 62-63	180	350	250	300	6.0	M16	48	110	51.8	14	145	120
PA/PF 62	200	400	300	350	6.0	M16	55	110	59.3	16	157	-
PA/PF 62	225	450	350	400	6.0	M16	60	140	64.4	18	183	-

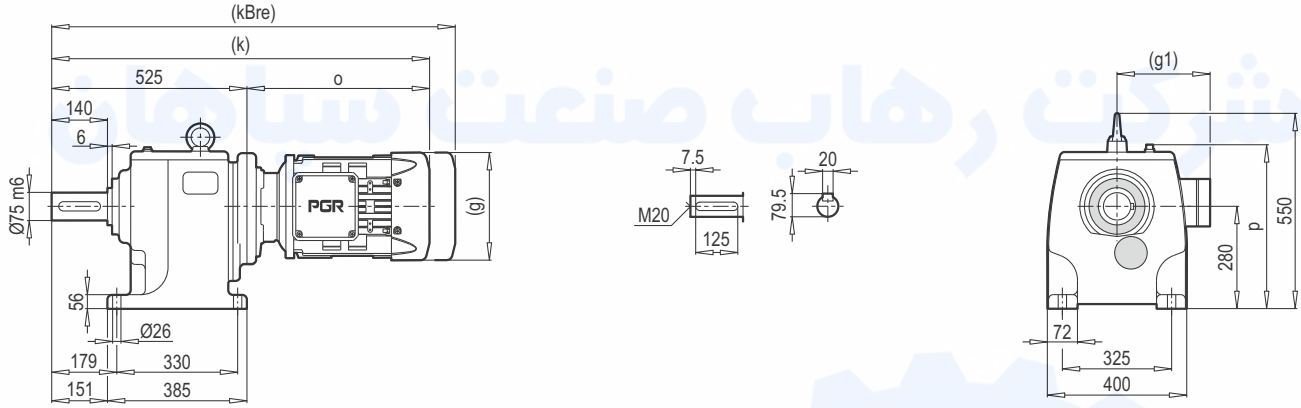
~ Kg		
PAM B5	PA/PF 62	PA/PF 63
90	-	140
100	146	141
112	146	141
132	157	150
160	174	158
180	174	158
200	181	-
225	191	-

Tip / Type	PAM B14	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	PA/PF 62 o	PA/PF 63 o
PA/PF 63	90	140	95	115	4.0	9	24	50	27.3	8	-	72
PA/PF 62-63	100	160	110	130	5.0	9	28	60	31.3	8	75	75
PA/PF 62-63	112	160	110	130	5.0	9	28	60	31.3	8	75	75
PA/PF 62-63	132	200	130	165	5.0	11	38	80	41.3	10	110	94

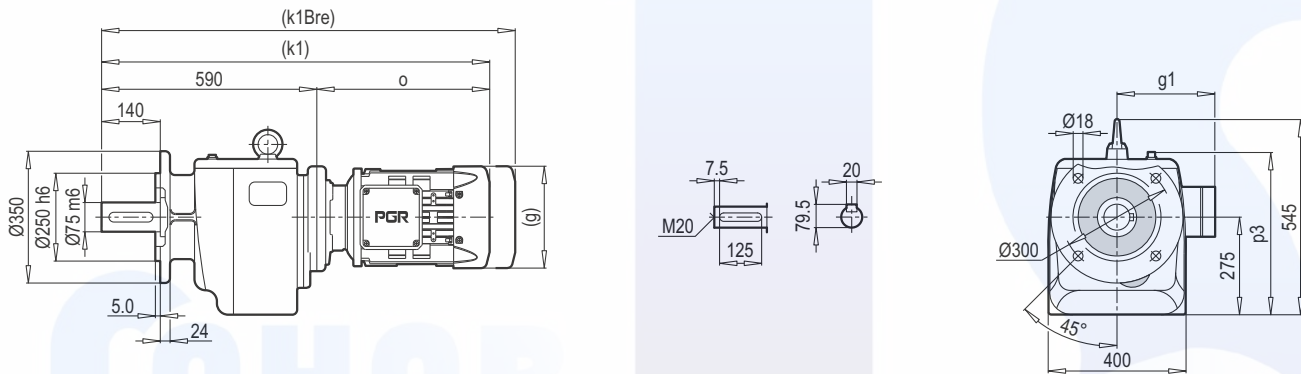
~ Kg		
PAM B14	PA/PF 62	PA/PF 63
90	-	139
100	145	140
112	145	140
132	152	145

PA/PF 72

PA 72



PF 72

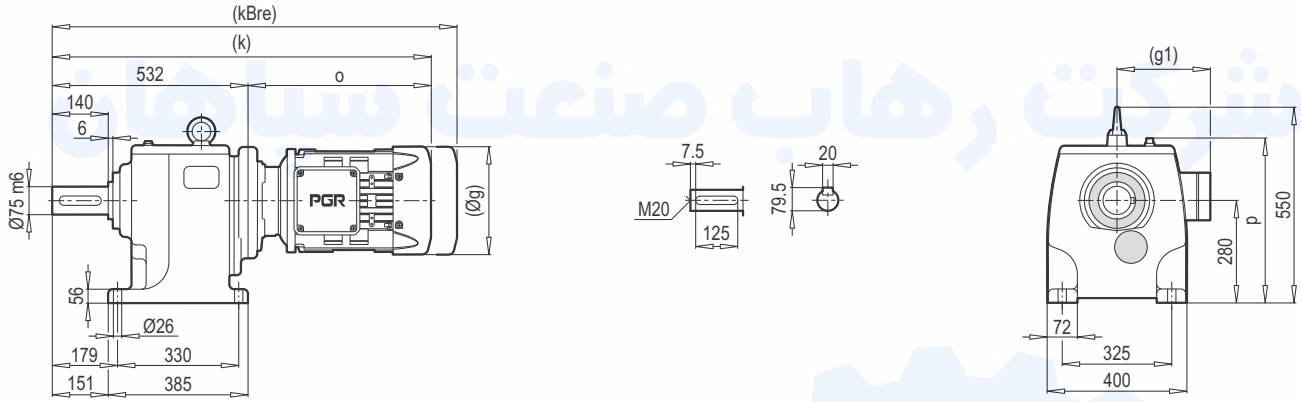


	132 M	160 M/L	180 M/L	200 L	225 S/M			
g	279	323	370	415	456			
g1	182	200	248	260	260			
k	923	989	1048	1143	1225			
kBre	1064	1141	1210	1290	1397			
k1	988	1054	1113	1208	1290			
k1Bre	1129	1206	1275	1355	1462			
o	398	464	523	618	700			
p	447	455	459	479	479			
p3	442	450	450	479	479			

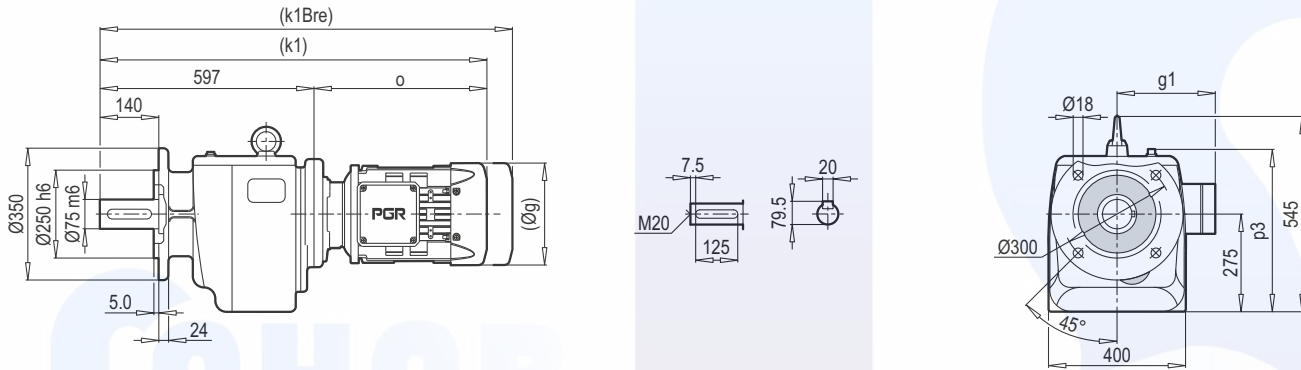
Not : (...) İşaretli olan ölçüler Motor markasına göre farklılık gösterir.

Note : The dimensions which have (...) sign vary depending on the motor brand.

PA 73



PF 73



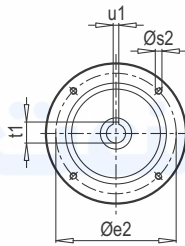
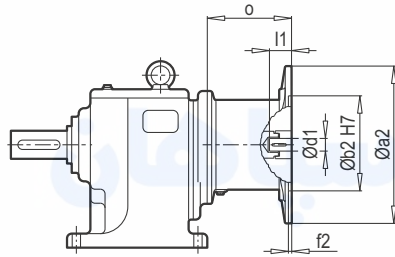
	100 L	112 M	132 S	132 M	160 M/L	180 M/L	200 L	225 S/M
g	217	232	279	279	323	370	415	456
g1	160	168	182	182	200	248	260	260
k	844	892	895	930	996	1055	1150	1232
kBre	925	972	1003	1071	1148	1217	1297	1404
k1	909	957	960	995	1061	1120	1215	1297
k1Bre	990	1037	1068	1136	1213	1282	1362	1469
o	312	360	363	398	464	523	618	700
p	447	447	447	447	455	455	479	479
p3	442	442	442	442	450	450	474	474

Not : (...) İşaretli olan ölçüler Motor markasına göre farklılık gösterir.
Note : The dimensions which have (...) sign vary depending on the motor brand.

PA 72
PA 73

IEC

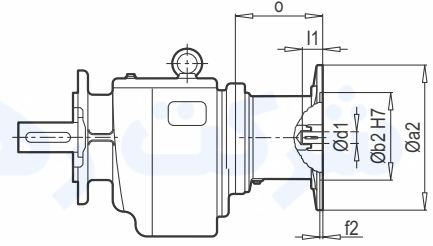
PF 72
PF 73



IEC 100...200



IEC 225



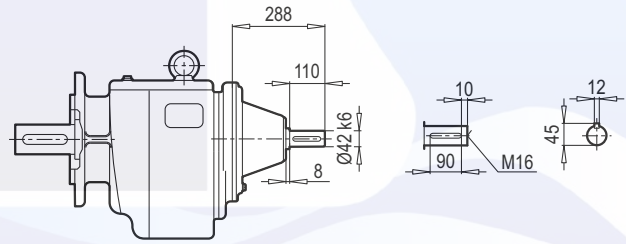
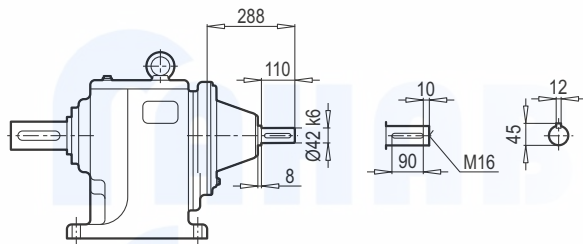
Tip / Type	IEC	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	o
PA/PF 73	100	250	180	215	5.0	M12	28	60	31.3	8	127
PA/PF 73	112	250	180	215	5.0	M12	28	60	31.3	8	127
PA/PF 72-73	132	300	230	265	5.0	M12	38	80	41.3	10	177
PA/PF 72-73	160	350	250	300	6.0	M16	42	110	45.3	12	266
PA/PF 72-73	180	350	250	300	6.0	M16	48	110	51.8	14	266
PA/PF 72-73	200	400	300	350	6.0	M16	55	110	59.3	16	229
PA/PF 72-73	225	450	350	400	6.0	M16	60	140	64.4	18	303

~ Kg		
IEC	PA/PF 72	PA/PF 73
100	-	250
112	-	250
132	253	264
160	279	290
180	279	290
200	294	305
225	310	320

PA 72
PA 73

W

PF 72
PF 73

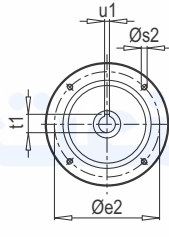
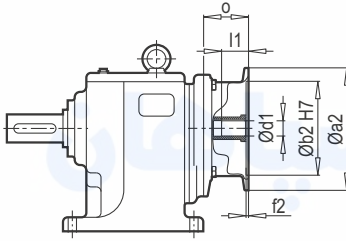


W ~ Kg	
PA/PF 72	252
PA/PF 73	263

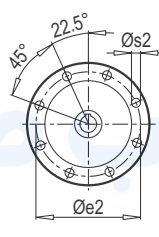
PA 72
PA 73

PAM B5/B14

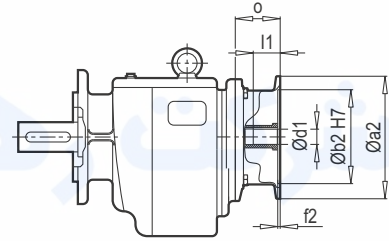
PF 72
PF 73



PAM 100...200



PAM 225



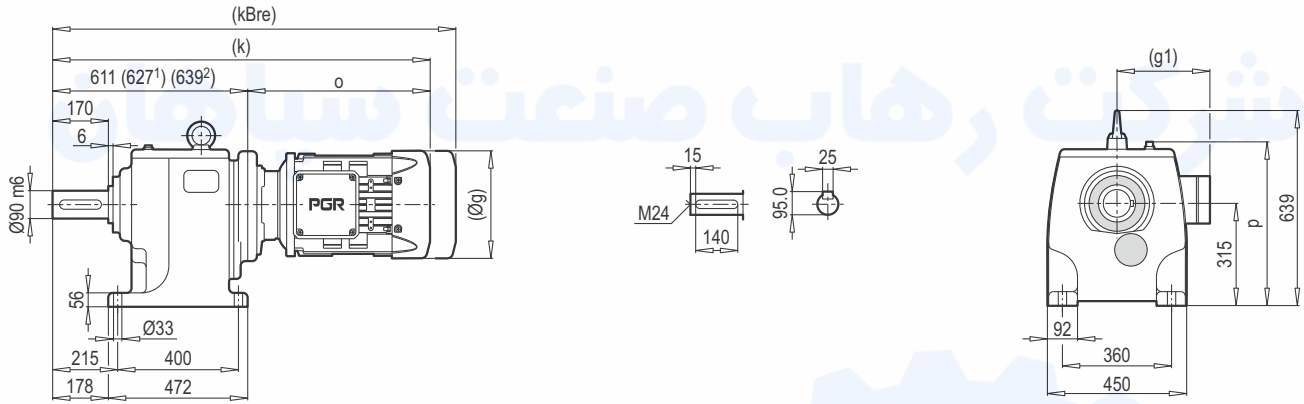
Tip / Type	PAM B5	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	o
PA/PF 73	100	250	180	215	5.0	M12	28	60	31.3	8	75
PA/PF 73	112	250	180	215	5.0	M12	28	60	31.3	8	75
PA/PF 72-73	132	300	230	265	5.0	M12	38	80	41.3	10	110
PA/PF 72-73	160	350	250	300	6.0	M16	42	110	45.3	12	145
PA/PF 72-73	180	350	250	300	6.0	M16	48	110	51.8	14	145
PA/PF 72-73	200	400	300	350	6.0	M16	55	110	59.3	16	157
PA/PF 72-73	225	450	350	400	6.0	M16	60	140	64.4	18	183

Tip / Type	PAM B14	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	o
PA/PF 73	100	160	110	130	5.0	9	28	60	31.3	8	75
PA/PF 73	112	160	110	130	5.0	9	28	60	31.3	8	75
PA/PF 72-73	132	200	130	165	5.0	11	38	80	41.3	10	110

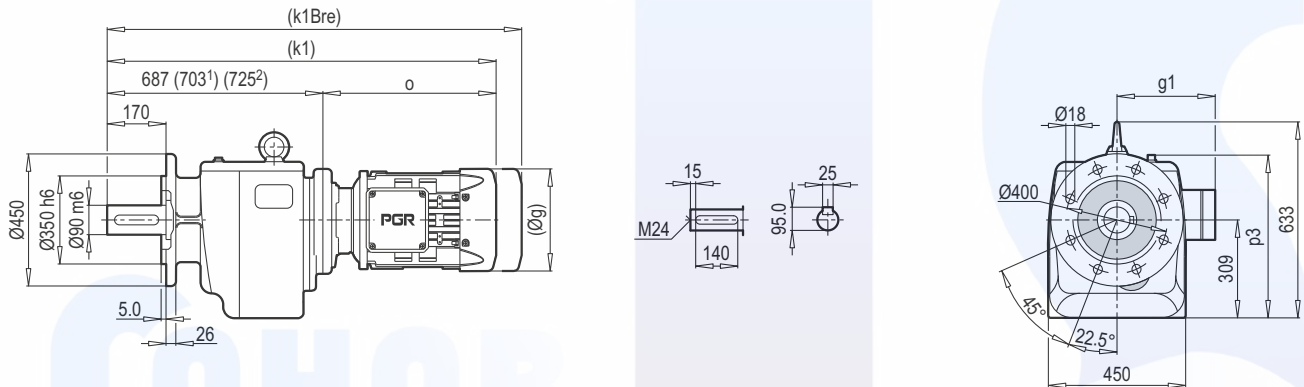
~ Kg		
PAM B5	PA/PF 72	PA/PF 73
100	-	225
112	-	225
132	226	236
160	243	253
180	243	253
200	250	260
225	260	270

~ Kg		
PAM B14	PA/PF 72	PA/PF 73
100	-	224
112	-	224
132	221	231

PA 82



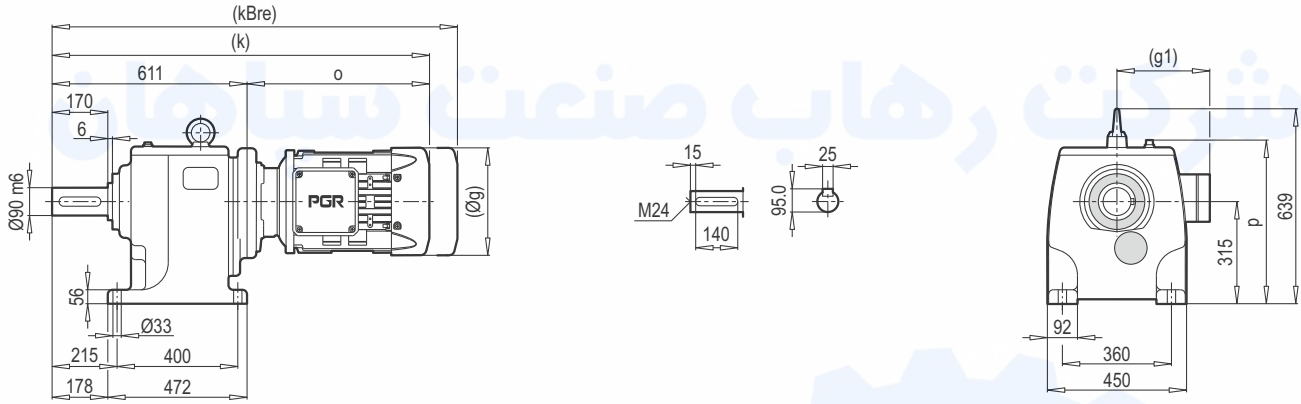
PF 82



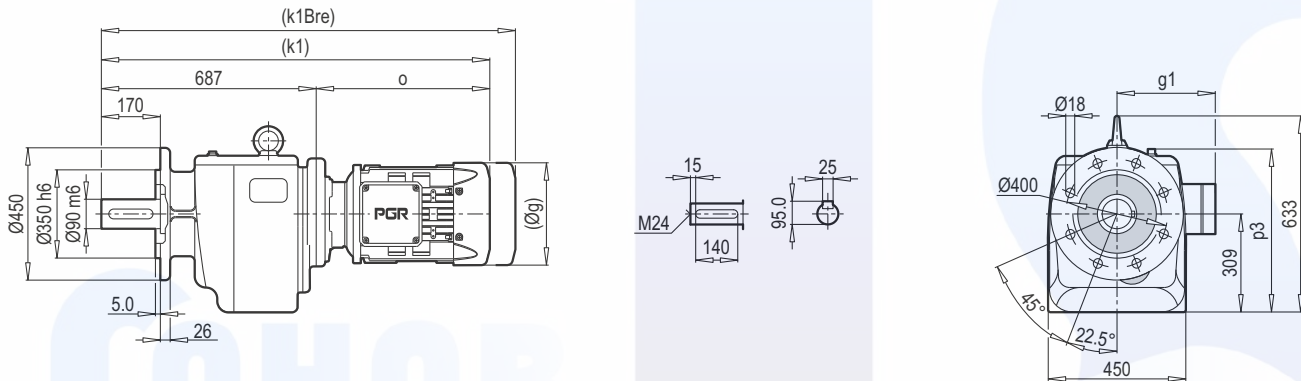
	132 M	160 M/L	180 M/L	200 L	225 S/M	250 M ¹⁾	280 M ²⁾	
g	279	323	370	415	456	495	510	
g1	182	200	248	260	260	392	372	
k	1009	1075	1134	1229	1311	1271	1527	
kBre	1150	1227	1296	1376	1483	1401	-	
k1	1085	1151	1210	1305	1387	1347	1613	
k1Bre	1226	1303	1372	1452	1559	1477	-	
o	398	464	523	618	700	644	888	
p	512	512	512	514	514	575	564	
p3	506	506	506	508	508	569	561	

Not : (...) İşaretli olan ölçüler Motor markasına göre farklılık gösterir.
Note : The dimensions which have (...) sign vary depending on the motor brand.

PA 83



PF 83



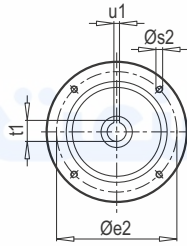
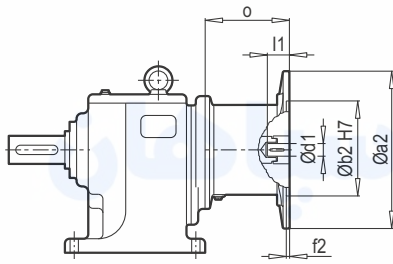
	100 L	112 M	132 S	132 M	160 M/L	180 M/L	200 L	225 S/M
g	217	232	279	279	323	370	415	456
g1	160	168	182	182	200	248	260	260
k	923	971	974	1009	1075	1134	1229	1311
kBre	1004	1051	1082	1150	1227	1296	1376	1483
k1	999	1047	1050	1085	1151	1210	1305	1387
k1Bre	1080	1127	1158	1226	1303	1372	1452	1559
o	312	360	363	398	464	523	618	700
p	512	512	512	512	512	512	514	514
p3	506	506	506	506	506	506	508	508

Not : (...) İşaretli olan ölçüler Motor markasına göre farklılık gösterir.
Note : The dimensions which have (...) sign vary depending on the motor brand.

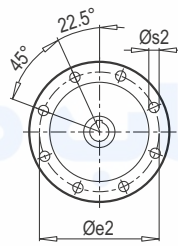
PA 82
PA 83

IEC

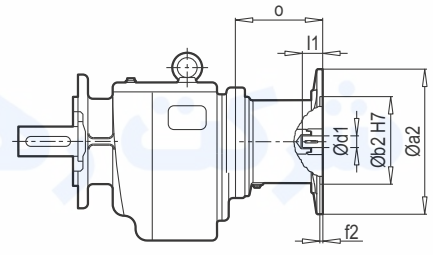
PF 82
PF 83



IEC 100...200



IEC 225...280



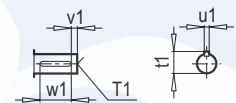
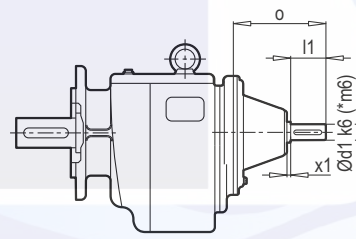
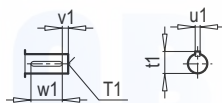
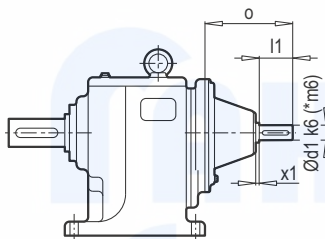
Tip / Type	IEC	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	o
PA/PF 83	100	250	180	215	5.0	M12	28	60	31.3	8	127
PA/PF 83	112	250	180	215	5.0	M12	28	60	31.3	8	127
PA/PF 82-83	132	300	230	265	5.0	M12	38	80	41.3	10	177
PA/PF 82-83	160	350	250	300	6.0	M16	42	110	45.3	12	266
PA/PF 82-83	180	350	250	300	6.0	M16	48	110	51.8	14	266
PA/PF 82-83	200	400	300	350	6.0	M16	55	110	59.3	16	229
PA/PF 82-83	225	450	350	400	6.0	M16	60	140	64.4	18	303
PA/PF 82	250	550	450	500	6.0	M16	65	140	69.4	18	304
PA/PF 82	280	550	450	500	6.0	M16	75	140	79.9	20	304

~ Kg		
IEC	PA/PF 82	PA/PF 83
100	-	366
112	-	366
132	371	379
160	398	406
180	398	406
200	412	421
225	428	437
250	487	-
280	487	-

PA 82
PA 83

W

PF 82
PF 83



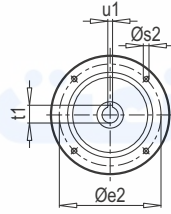
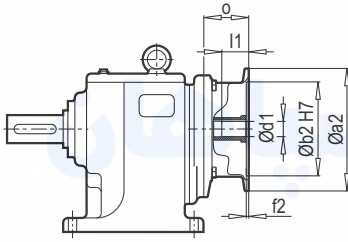
Tip / Type	Ød1	x1	l1	o	T1	t1	u1	v1	w1
PA/PF 82	65*	12	140	397	M20	69	18	15	110
PA/PF 83	42	8	110	288	M16	45	12	10	90

W ~ Kg	
PA/PF 82	449
PA/PF 83	378

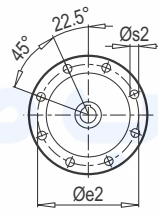
PA 82
PA 83

PAM B5/B14

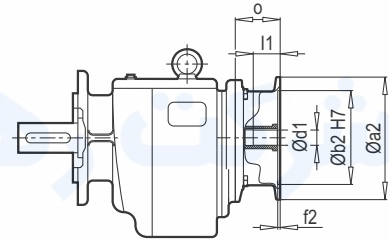
PF 82
PF 83



PAM 100...200



PAM 225...280



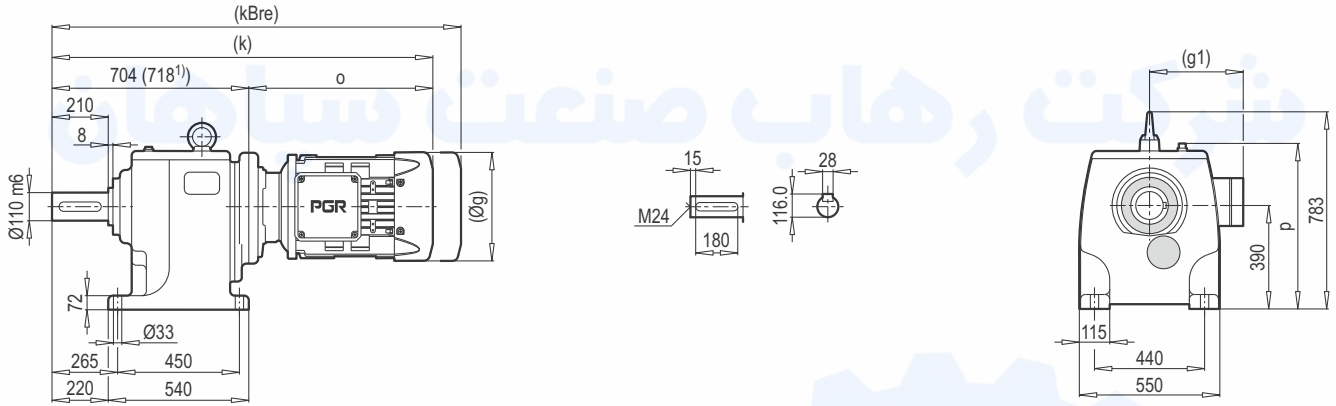
Tip / Type	PAM B5	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	o
PA/PF 83	100	250	180	215	5.0	M12	28	60	31.3	8	75
PA/PF 83	112	250	180	215	5.0	M12	28	60	31.3	8	75
PA/PF 82-83	132	300	230	265	5.0	M12	38	80	41.3	10	110
PA/PF 82-83	160	350	250	300	6.0	M16	42	110	45.3	12	145
PA/PF 82-83	180	350	250	300	6.0	M16	48	110	51.8	14	145
PA/PF 82-83	200	400	300	350	6.0	M16	55	110	59.3	16	157
PA/PF 82-83	225	450	350	400	6.0	M16	60	140	64.4	18	183
PA/PF 82	250	550	450	500	6.0	M16	65	140	69.4	18	202
PA/PF 82	280	550	450	500	6.0	M16	75	140	79.9	20	202

Tip / Type	PAM B14	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	o
PA/PF 83	100	160	110	130	5.0	9	28	60	31.3	8	75
PA/PF 83	112	160	110	130	5.0	9	28	60	31.3	8	75
PA/PF 82-83	132	200	130	165	5.0	11	38	80	41.3	10	110

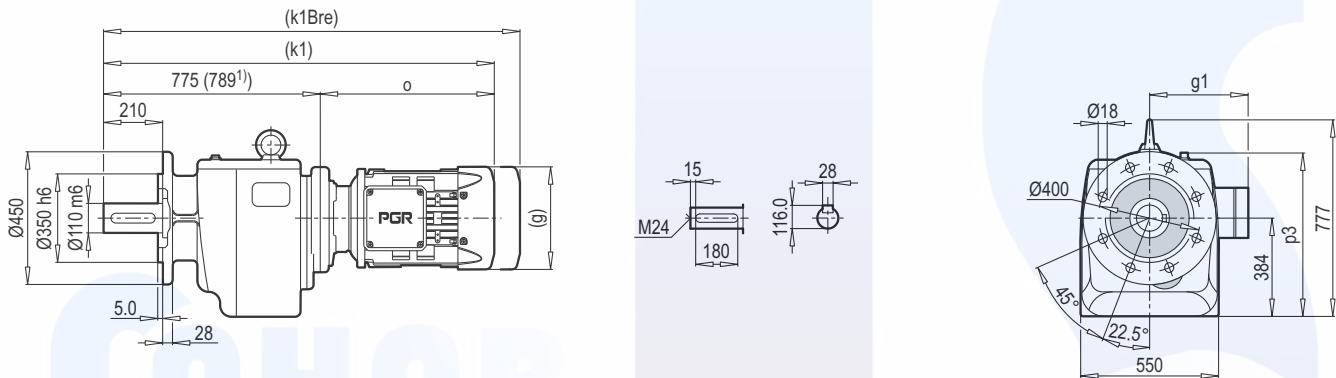
~Kg		
PAM B5	PA/PF 82	PA/PF 83
100	-	332
112	-	332
132	335	343
160	352	360
180	352	360
200	359	367
225	369	377
250	429	-
280	429	-

~Kg		
PAM B14	PA/PF 82	PA/PF 83
100	-	331
112	-	331
132	330	338

PA 92



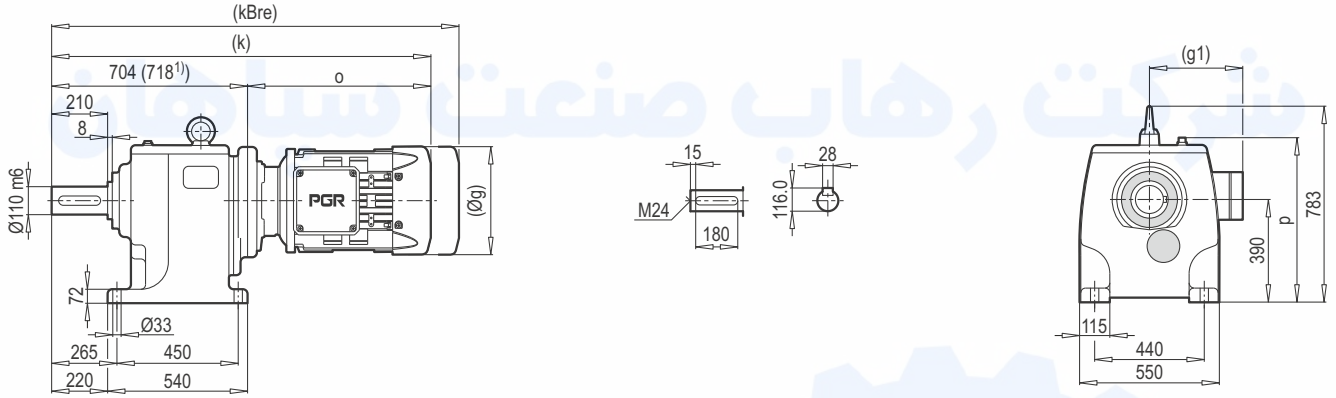
PF 92



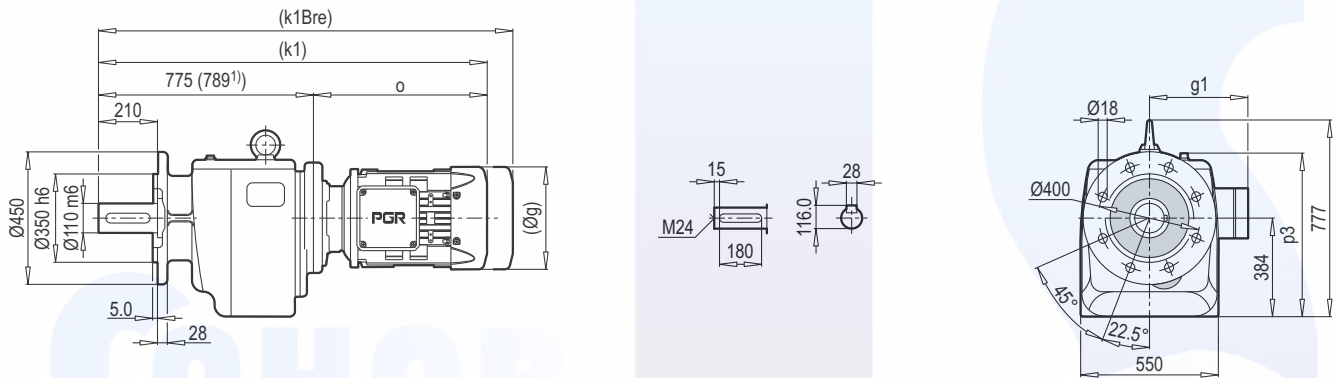
	180 M/L	200 L	225 S/M	250 M ¹⁾	280 M ¹⁾	315 S ¹⁾	315 M ¹⁾	
g	370	415	456	495	510	-	-	
g1	248	260	260	392	372	-	-	
k	1227	1322	1404	1362	1606	-	-	
kBre	1389	1469	1576	1492	-	-	-	
k1	1298	1393	1475	1433	1677	-	-	
k1Bre	1460	1540	1647	1563	-	-	-	
o	523	618	700	644	888	-	-	
p	622	622	622	650	682	-	-	
p3	616	616	616	644	676	-	-	

Not : (...) İşaretili olan ölçüler Motor markasına göre farklılık gösterir.
Note : The dimensions which have (...) sign vary depending on the motor brand.

PA 93



PF 93



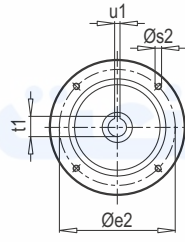
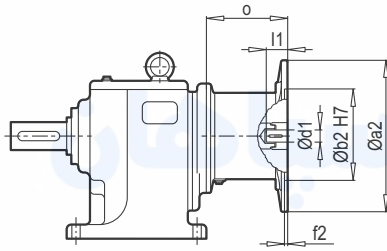
	132 S	132 M	160 M/L	180 M/L	200 L	225 S/M	250 M ¹⁾	280 M ¹⁾
g	279	279	323	370	415	456	495	510
g1	182	182	200	248	260	260	392	372
k	1067	1102	1168	1227	1322	1404	1362	1606
kBre	1175	1243	1320	1389	1469	1576	1492	-
k1	1138	1173	1239	1298	1393	1475	1433	1677
k1Bre	1246	1303	1391	1460	1540	1647	1563	-
o	363	398	464	523	618	700	644	888
p	622	622	622	622	622	622	650	682
p3	616	616	616	616	616	616	644	676

Not : (...) İşareti olan ölçüler Motor markasına göre farklılık gösterir.
Note : The dimensions which have (...) sign vary depending on the motor brand.

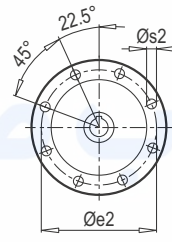
PA 92
PA 93

IEC

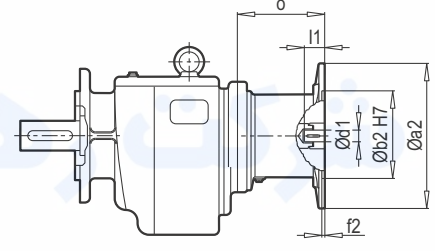
PF 92
PF 93



IEC 132...200



IEC 225...315



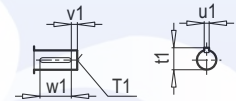
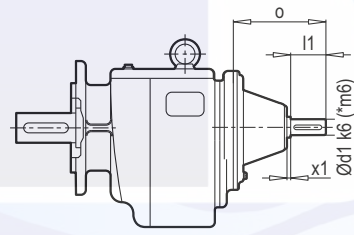
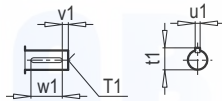
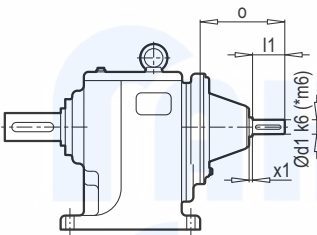
Tip / Type	IEC	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	o
PA/PF 93	132	300	230	265	5.0	M12	38	80	41.3	10	177
PA/PF 92-93	160	350	250	300	6.0	M16	42	110	45.3	12	266
PA/PF 92-93	180	350	250	300	6.0	M16	48	110	51.8	14	266
PA/PF 92-93	200	400	300	350	6.0	M16	55	110	59.3	16	229
PA/PF 92-93	225	450	350	400	6.0	M16	60	140	64.4	18	303
PA/PF 92-93	250	550	450	500	6.0	M16	65	140	69.4	18	304
PA/PF 92-93	280	550	450	500	6.0	M16	75	140	79.9	20	304
PA/PF 92	315	660	550	600	7.0	M20	80	170	85.4	22	382

~ Kg		
IEC	PA/PF 92	PA/PF 93
132	-	569
160	584	596
180	584	596
200	599	611
225	615	626
250	673	685
280	673	685
315	758	-

PA 92
PA 93

W

PF 92
PF 93



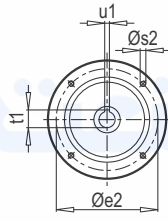
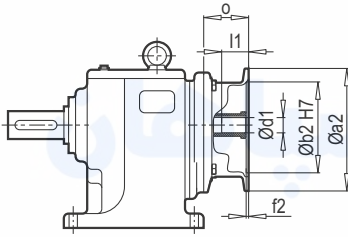
Tip / Type	Ød1	x1	l1	o	T1	t1	u1	v1	w1
PA/PF 92	65*	12	140	397	M20	69	18	15	110
PA/PF 93	42	8	110	288	M16	45	12	10	90

W ~ Kg	
PA/PF 92	610
PA/PF 93	568

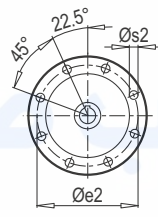
PA 92
PA 93

PAM B5/B14

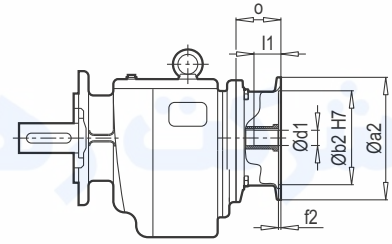
PF 92
PF 93



PAM 132...200



PAM 225...315



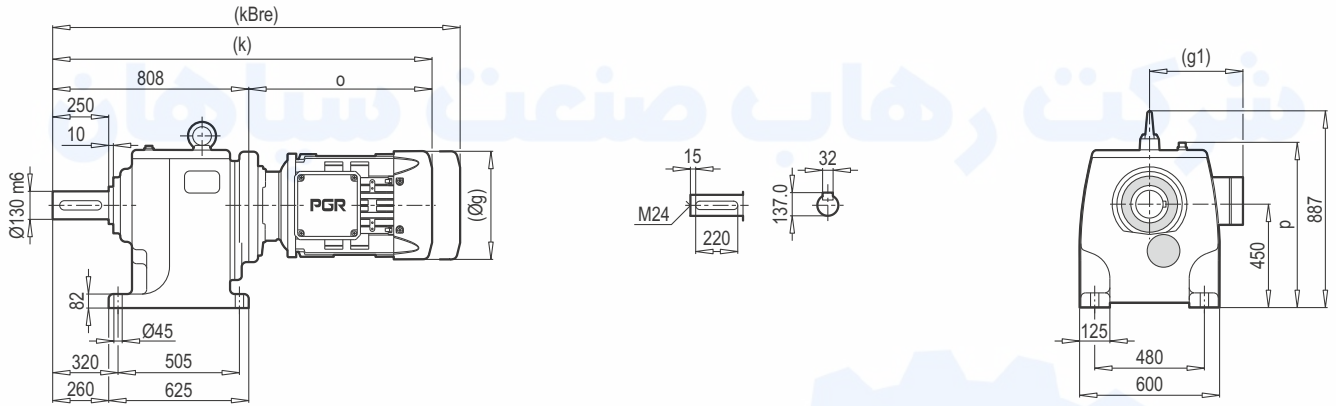
Tip / Type	PAM B5	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	o
PA/PF 93	132	300	230	265	5.0	M12	38	80	41.3	10	110
PA/PF 92-93	160	350	250	300	6.0	M16	42	110	45.3	12	145
PA/PF 92-93	180	350	250	300	6.0	M16	48	110	51.8	14	145
PA/PF 92-93	200	400	300	350	6.0	M16	55	110	59.3	16	157
PA/PF 92-93	225	450	350	400	6.0	M16	60	140	64.4	18	183
PA/PF 92-93	250	550	450	500	6.0	M16	65	140	69.4	18	202
PA/PF 92-93	280	550	450	500	6.0	M16	75	140	79.9	20	202
PA/PF 92	315	660	550	600	7.0	M20	80	170	85.4	22	-

Tip / Type	PAM B14	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	o
PA/PF 93	132	200	130	165	5.0	11	38	80	41.3	10	110

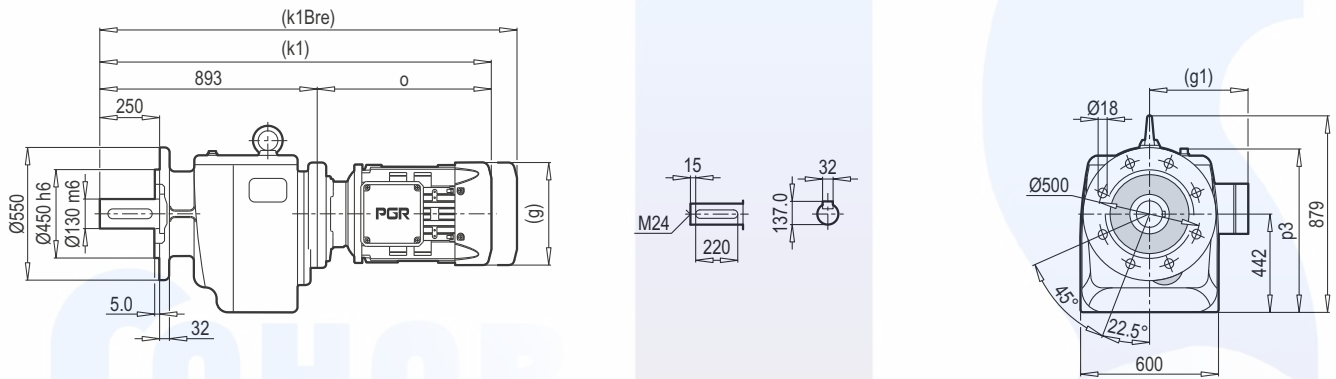
~ Kg		
PAM B5	PA/PF 92	PA/PF 93
132	-	522
160	528	539
180	528	539
200	535	546
225	545	556
250	605	616
280	605	616
315	-	-

~ Kg	
PAM B14	PA/PF 93
132	517

PA 102



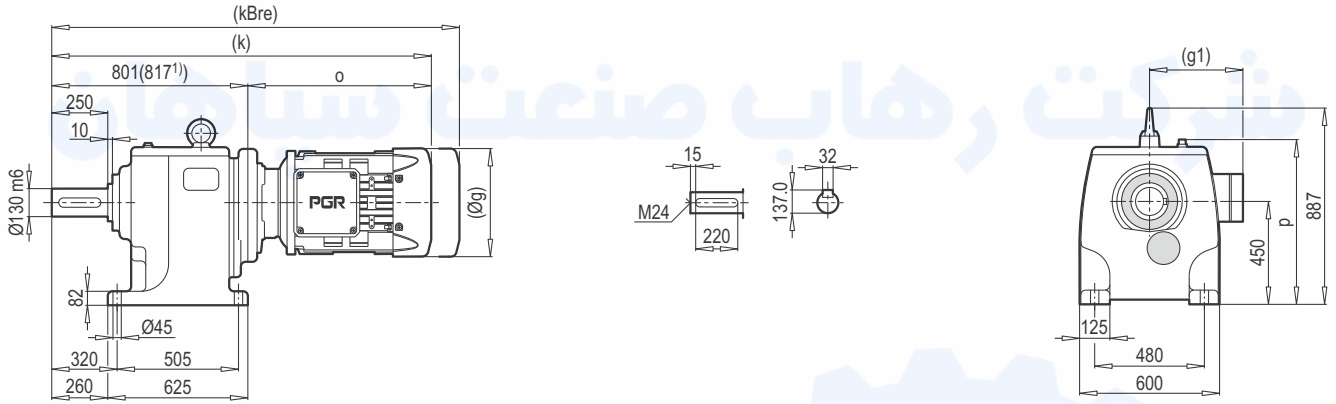
PF 102



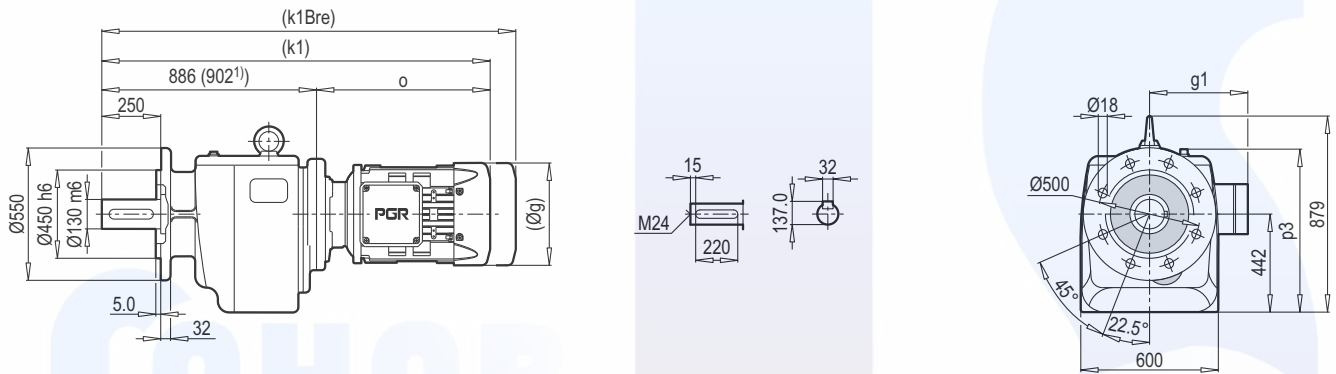
	250 M	280 M	315 S	315 M				
g	495	510	-	-				
g1	392	372	-	-				
k	1452	1696	-	-				
kBre	1582	-	-	-				
k1	1537	1781	-	-				
k1Bre	1667	-	-	-				
o	644	888	-	-				
p	702	754	-	-				
p3	706	758	-	-				

Not : (...) İşaretli olan ölçüler Motor markasına göre farklılık gösterir.
Note : The dimensions which have (...) sign vary depending on the motor brand.

PA 103



PF 103



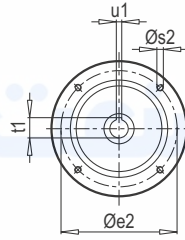
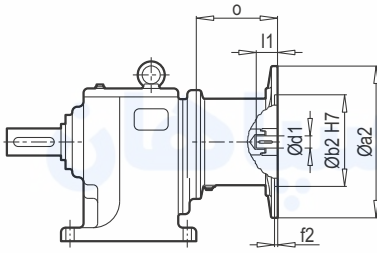
	132 S	132 M	160 M/L	180 M/L	200 L	225 S/M	250 M ¹⁾	280 M ¹⁾	315 S ¹⁾	315 M ¹⁾
g	279	279	323	370	415	456	495	510	-	-
g1	182	182	200	248	260	260	392	372	-	-
k	1164	1199	1265	1324	1419	1501	1461	1705	-	-
kBre	1272	1340	1417	1486	1566	1673	1591	-	-	-
k1	1249	1284	1350	1409	1504	1586	1546	1790	-	-
k1Bre	1357	1425	1502	1571	1651	1758	1676	-	-	-
o	363	398	464	523	618	700	644	888	-	-
p	702	702	702	702	702	702	710	754	-	-
p3	706	706	706	706	706	706	710	758	-	-

Not : (...) İşaretli olan ölçüler Motor markasına göre farklılık gösterir.
Note : The dimensions which have (...) sign vary depending on the motor brand.

PA 102
PA 103

IEC

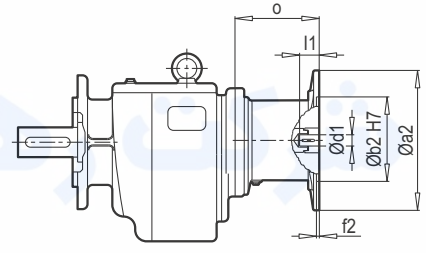
PF 102
PF 103



IEC 132...200



IEC 225...315



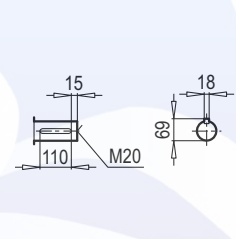
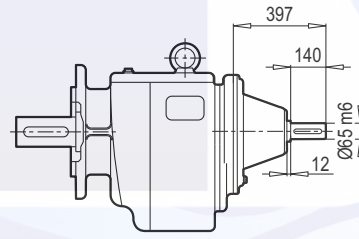
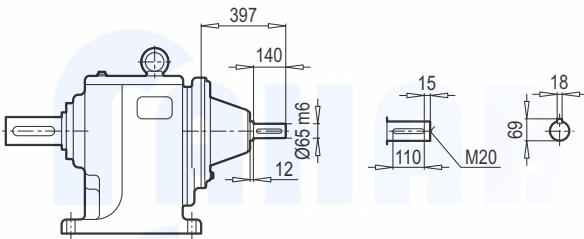
Tip / Type	IEC	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	o
PA/PF 103	132	300	230	265	5.0	M12	38	80	41.3	10	177
PA/PF 103	160	350	250	300	6.0	M16	42	110	45.3	12	266
PA/PF 103	180	350	250	300	6.0	M16	48	110	51.8	14	266
PA/PF 103	200	400	300	350	6.0	M16	55	110	59.3	16	229
PA/PF 103	225	450	350	400	6.0	M16	60	140	64.4	18	303
PA/PF 102-103	250	550	450	500	6.0	M16	65	140	69.4	18	304
PA/PF 102-103	280	550	450	500	6.0	M16	75	140	79.9	20	304
PA/PF 102-103	315	660	550	600	7.0	M20	80	170	85.4	22	382

~ Kg		
IEC	PA/PF 102	PA/PF 103
132	-	801
160	-	828
180	-	828
200	-	843
225	-	859
250	907	917
280	907	917
315	992	1002

PA 102
PA 103

W

PF 102
PF 103

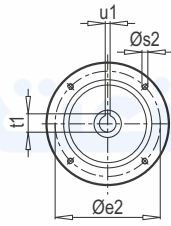
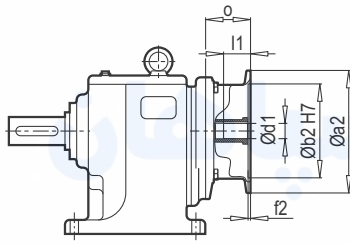


W ~ Kg	
PA/PF 102	870
PA/PF 103	880

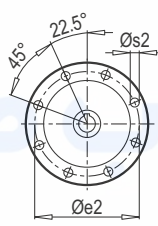
PA 102
PA 103

PAM B5/B14

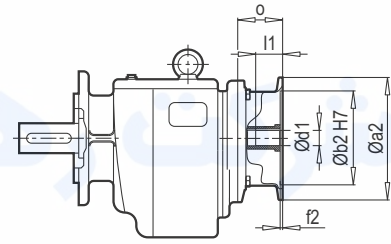
PF 102
PF 103



PAM 132...200



PAM 225...315



Tip / Type	PAM B5	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	o
PA/PF 103	132	300	230	265	5.0	M12	38	80	41.3	10	110
PA/PF 103	160	350	250	300	6.0	M16	42	110	45.3	12	145
PA/PF 103	180	350	250	300	6.0	M16	48	110	51.8	14	145
PA/PF 103	200	400	300	350	6.0	M16	55	110	59.3	16	157
PA/PF 103	225	450	350	400	6.0	M16	60	140	64.4	18	183
PA/PF 102-103	250	550	450	500	6.0	M16	65	140	69.4	18	202
PA/PF 102-103	280	550	450	500	6.0	M16	75	140	79.9	20	202
PA/PF 102-103	315	660	550	600	7.0	M20	80	170	85.4	22	-

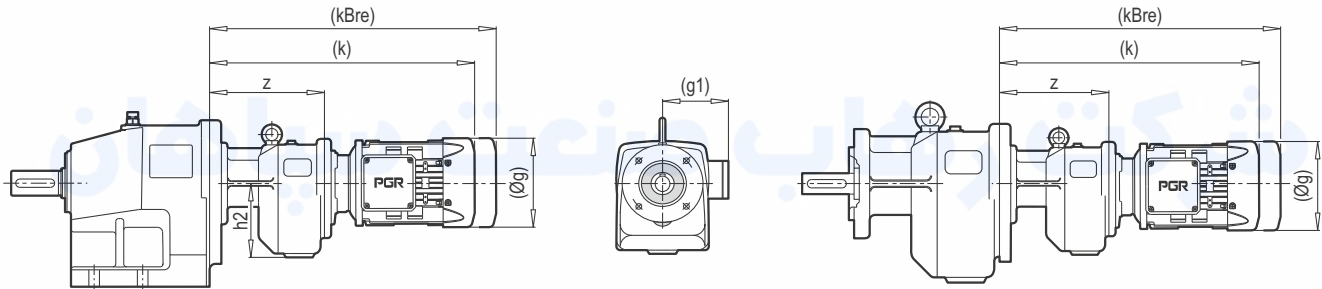
~ Kg		
PAM B5	PA/PF 102	PA/PF 103
132	-	741
160	-	758
180	-	758
200	-	765
225	-	775
250	826	835
280	826	835
315	-	-

Tip / Type	PAM B14	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	o
PA/PF 103	132	200	130	165	5.0	11	38	80	41.3	10	110

~ Kg	
PAM B14	PA/PF 103
132	736

PA 12/02 PA 32/12
PA 22/02 PA 42/12
PA 52/12

PF 12/02 PF 32/12
PF 22/02 PF 42/12
PF 52/12



Tip / Type	Motor	g	g1	h2	z	k	kBre
PA/PF 12/02	63 M	124	111	91	143	341	393
	71 M	140	119			383	443
PA/PF 22/02	63 M	124	111	91	159	357	409
	71 M	140	119			399	459
	80 M	159	127			426	488
PA/PF 32/12	63 M	124	111	108	172	370	422
	71 M	140	119			412	472
	80 M	159	127			439	501
PA/PF 42/12 PA/PF 52/12	63 M	124	111	108	176	374	426
	71 M	140	119			416	476
	80 M	159	127			443	505

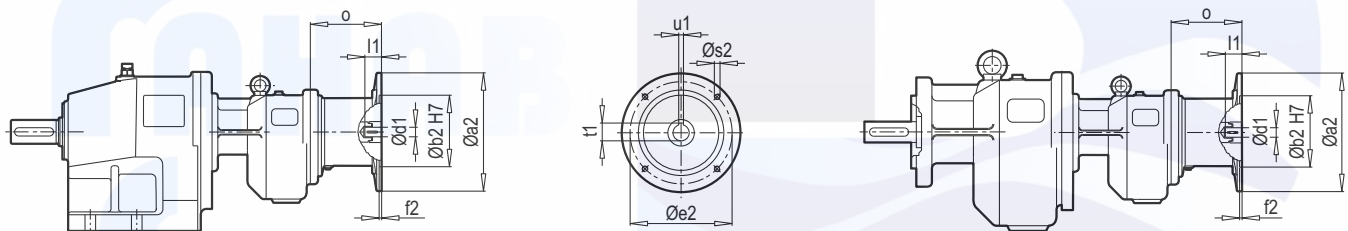
Not : (...) İşaretli olan ölçüler Motor markasına göre farklılık gösterir.

Note : The dimensions which have (...) sign vary depending on the motor brand.

PA 12/02 PA 32/12
PA 22/02 PA 42/12
PA 52/12

IEC

PF 12/02 PF 32/12
PF 22/02 PF 42/12
PF 52/12



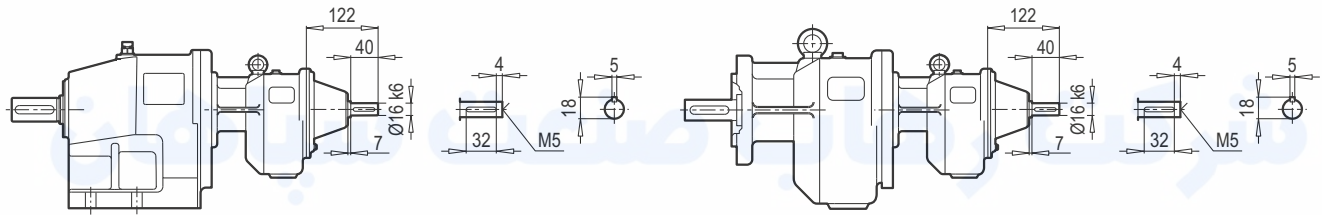
Tip / Type	IEC	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	o
PA/PF 12/02 - 22/02 - 32/12 - 42/12 - 52/12	63	140	95	115	3.5	M8	11	23	12.8	4	85
PA/PF 12/02 - 22/02 - 32/12 - 42/12 - 52/12	71	160	110	130	4.0	M8	14	30	16.3	5	89
PA/PF 12/02 - 22/02 - 32/12 - 42/12 - 52/12	80	200	130	165	4.0	M10	19	40	21.8	6	105
PA/PF 12/02 - 22/02 - 32/12 - 42/12 - 52/12	90	200	130	165	4.0	M10	24	50	27.3	8	105
PA/PF 32/12 - 42/12 - 52/12	100	250	180	215	5.0	M12	28	60	31.3	8	130
PA/PF 32/12 - 42/12 - 52/12	112	250	180	215	5.0	M12	28	60	31.3	8	130

~ Kg					
IEC	PA/PF 12/02	PA/PF 22/02	PA/PF 32/12	PA/PF 42/12	PA/PF 52/12
63	24	37	51	69	100
71	25	38	52	70	101
80	28	42	55	73	104
90	28	42	55	73	104
100	-	-	62	80	111
112	-	-	62	80	111

PA 12/02 PA 32/12
PA 22/02 PA 42/12
PA 52/12

W

PF 12/02 PF 32/12
PF 22/02 PF 42/12
PF 52/12

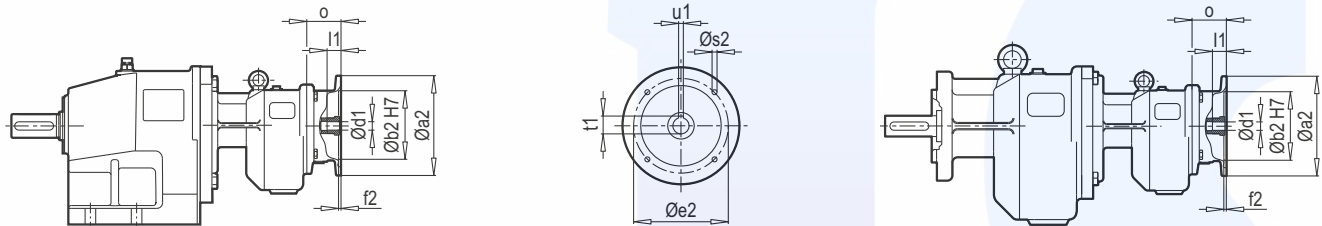


W ~ Kg	
PA/PF 12/02	23
PA/PF 22/02	36
PA/PF 32/12	50
PA/PF 42/12	68
PA/PF 52/12	99

PA 12/02 PA 32/12
PA 22/02 PA 42/12
PA 52/12

PAM B5/B14

PF 12/02 PF 32/12
PF 22/02 PF 42/12
PF 52/12



Tip / Type	PAM B5	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	o
PA/PF 12/02 - 22/02 - 32/12 - 42/12 - 52/12	63	140	95	115	3.5	M8	11	23	12.8	4	85
PA/PF 12/02 - 22/02 - 32/12 - 42/12 - 52/12	71	160	110	130	4.0	M8	14	30	16.3	5	55
PA/PF 12/02 - 22/02 - 32/12 - 42/12 - 52/12	80	200	130	165	4.0	M10	19	40	21.8	6	74
PA/PF 12/02 - 22/02 - 32/12 - 42/12 - 52/12	90	200	130	165	4.0	M10	24	50	27.3	8	74
PA/PF 32/12 - 42/12 - 52/12	100	250	180	215	5.0	M12	28	60	31.3	8	132
PA/PF 32/12 - 42/12 - 52/12	112	250	180	215	5.0	M12	28	60	31.3	8	132

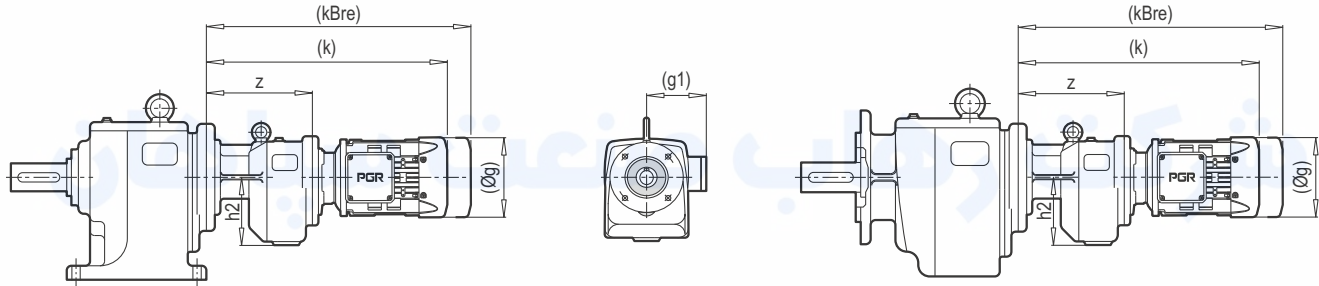
~ Kg						
PAM B5	PA/PF 12/02	PA/PF 22/02	PA/PF 32/12	PA/PF 42/12	PA/PF 52/12	
63	22	34	47	65	94	
71	22	34	47	65	94	
80	23	35	48	66	95	
90	23	35	48	66	95	
100	-	-	55	73	102	
112	-	-	55	73	102	

Tip / Type	PAM B14	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	o
PA/PF 12/02 - 22/02 - 32/12 - 42/12 - 52/12	63	90	60	75	4.0	6	11	23	12.8	4	60
PA/PF 12/02 - 22/02 - 32/12 - 42/12 - 52/12	71	105	70	85	4.0	7	14	30	16.3	5	55
PA/PF 12/02 - 22/02 - 32/12 - 42/12 - 52/12	80	120	80	100	4.0	7	19	40	21.8	6	74
PA/PF 12/02 - 22/02 - 32/12 - 42/12 - 52/12	90	140	95	115	4.0	9	24	50	27.3	8	74
PA/PF 32/12 - 42/12 - 52/12	100	160	110	130	5.0	9	28	60	31.3	8	75
PA/PF 32/12 - 42/12 - 52/12	112	160	110	130	5.0	9	28	60	31.3	8	75

~ Kg						
PAM B14	PA/PF 12/02	PA/PF 22/02	PA/PF 32/12	PA/PF 42/12	PA/PF 52/12	
63	21	33	46	64	93	
71	21	33	46	64	93	
80	22	34	47	65	94	
90	22	34	47	65	94	
100	-	-	48	66	95	
112	-	-	48	66	95	

PA 63/22 PA 73/32
PA 73/22 PA 83/32

PF 63/22 PF 73/32
PF 73/22 PF 83/32



Tip / Type	Motor	g	g1	h2	z	k	kBre
PA/PF 63/22 PA/PF 73/22	71 M	140	119	127	196	432	492
	80 M	159	127			458	520
	90 S/L	193	151			481/501	554/574
	100 L	217	160			529	610
PA/PF 73/32 PA/PF 83/32	80 M	159	127	159	238	500	562
	90 S/L	193	151			523/543	596/616
	100 L	217	160			571	652
	112 M	232	168			616	696
	132 S/M	279	182			623/658	731/799

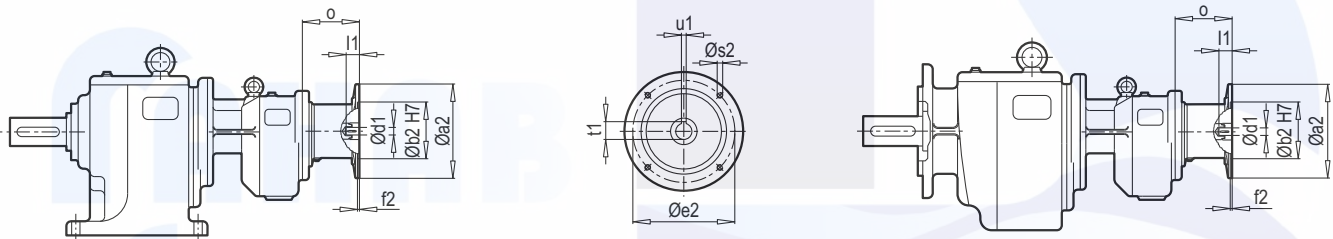
Not : (...) İşaretili olan ölçüler Motor markasına göre farklılık gösterir.

Note : The dimensions which have (...) sign vary depending on the motor brand.

PA 63/22 PA 73/32
PA 73/22 PA 83/32

IEC

PF 63/22 PF 73/32
PF 73/22 PF 83/32



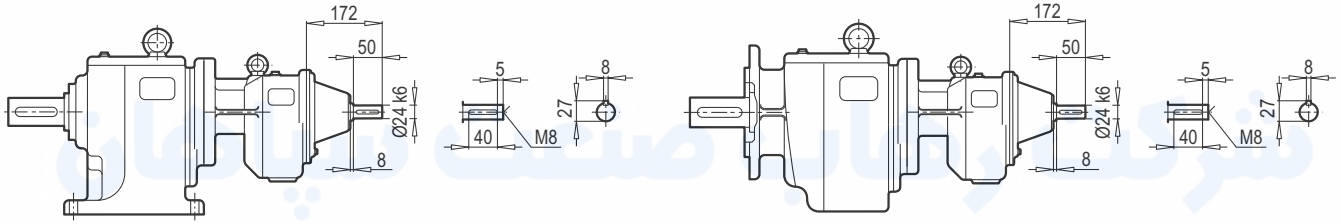
Tip / Type	IEC	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	o
PA/PF 63/22 - 73/22 - 83/32	71	160	110	130	4.0	M8	14	30	16.3	5	88
PA/PF 63/22 - 73/22 - 83/32	80	200	130	165	4.0	M10	19	40	21.8	6	107
PA/PF 63/22 - 73/22 - 73/32 - 83/32	90	200	130	165	4.0	M10	24	50	27.3	8	107
PA/PF 63/22 - 73/22 - 73/32 - 83/32	100	250	180	215	5.0	M12	28	60	31.3	8	124
PA/PF 63/22 - 73/22 - 73/32 - 83/32	112	250	180	215	5.0	M12	28	60	31.3	8	124
PA/PF 73/32 - 83/32	132	300	230	265	5.0	M12	38	80	41.3	10	156

~ Kg				
IEC	PA/PF 63/22	PA/PF 73/22	PA/PF 73/32	PA/PF 83/32
71	164	249	-	376
80	168	253	-	381
90	168	253	265	381
100	172	257	269	385
112	172	257	269	385
132	-	-	278	394

PA 63/22 PA 73/32
PA 73/22 PA 83/32

W

PF 63/22 PF 73/32
PF 73/22 PF 83/32

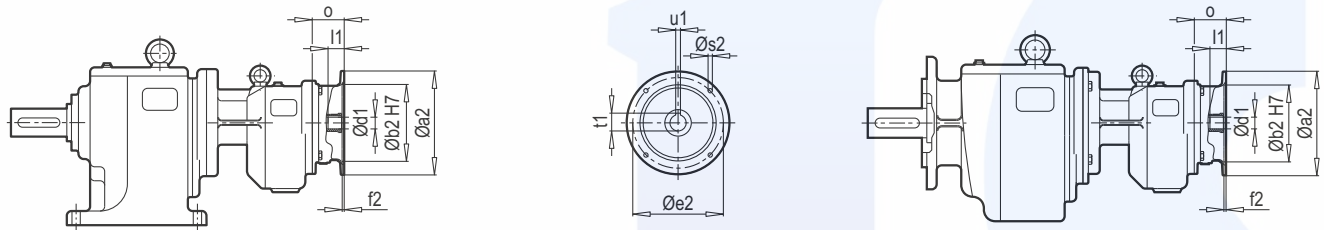


W ~ Kg	
PA/PF 63/22	166
PA/PF 73/22	251
PA/PF 73/32	263
PA/PF 83/32	378

PA 63/22 PA 73/32
PA 73/22 PA 83/32

PAM B5/B14

PF 63/22 PF 73/32
PF 73/22 PF 83/32



Tip / Type	PAM B5	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	o
PA/PF 63/22 - 73/22 - 83/32	71	160	110	130	4.0	M8	14	30	16.3	5	88
PA/PF 63/22 - 73/22 - 83/32	80	200	130	165	4.0	M10	19	40	21.8	6	72
PA/PF 63/22 - 73/22 - 73/32 - 83/32	90	200	130	165	4.0	M10	24	50	27.3	8	72
PA/PF 63/22 - 73/22 - 73/32 - 83/32	100	250	180	215	5.0	M12	28	60	31.3	8	75
PA/PF 63/22 - 73/22 - 73/32 - 83/32	112	250	180	215	5.0	M12	28	60	31.3	8	75
PA/PF 73/32 - 83/32	132	300	230	265	5.0	M12	38	80	41.3	10	94

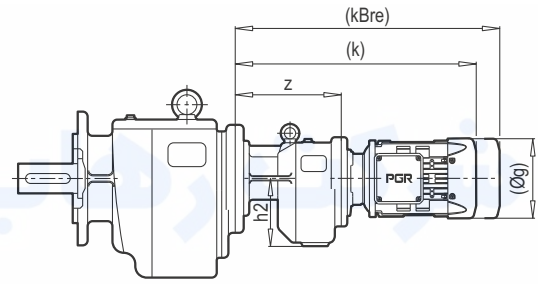
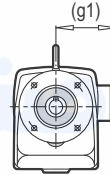
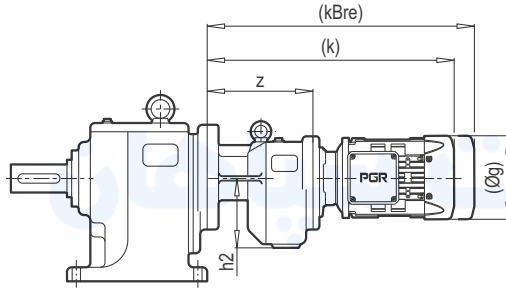
~ Kg				
PAM B5	PA/PF 63/22	PA/PF 73/22	PA/PF 73/32	PA/PF 83/32
71	155	236	-	354
80	156	237	-	355
90	156	237	248	355
100	157	238	249	356
112	157	238	249	356
132	-	-	259	366

Tip / Type	PAM B14	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	o
PA/PF 63/22 - 73/22 - 83/32	71	105	70	85	4.0	7	14	30	16.3	5	88
PA/PF 63/22 - 73/22 - 83/32	80	120	80	100	4.0	7	19	40	21.8	6	72
PA/PF 63/22 - 73/22 - 73/32 - 83/32	90	140	95	115	4.0	9	24	50	27.3	8	72
PA/PF 63/22 - 73/22 - 73/32 - 83/32	100	160	110	130	5.0	9	28	60	31.3	8	75
PA/PF 63/22 - 73/22 - 73/32 - 83/32	112	160	110	130	5.0	9	28	60	31.3	8	75
PA/PF 73/32 - 83/32	132	200	130	165	5.0	11	38	80	41.3	10	94

~ Kg				
PAM B14	PA/PF 63/22	PA/PF 73/22	PA/PF 73/32	PA/PF 83/32
71	153	234	-	352
80	154	235	-	353
90	154	235	246	353
100	156	237	248	355
112	156	237	248	355
132	-	-	252	359

PA 83/42 PA 93/52
PA 93/42 PA 103/52

PF 83/42 PF 93/52
PF 93/42 PF 103/52



Tip / Type	Motor	g	g1	h2	z	k	kBre
PA/PF 83/42 PA/PF 93/42	90 S/L	193	151	179	282	547/567	620/640
	100 L	217	160			595	676
	112 M	232	168			640	720
	132 S/M	279	182			647/682	755/896
PA/PF 93/52 PA/PF 103/52	90 S/L	193	151	218	321	586/606	659/679
	100 L	217	160			634	715
	112 M	232	168			679	759
	132 S/M	279	182			686/721	794/862
	160 M/L	323	200			826	978
	180 M/L	370	248			900	1062

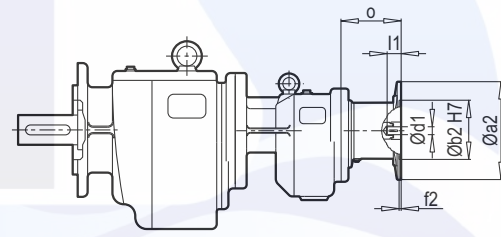
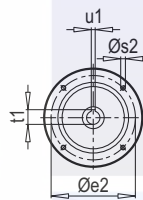
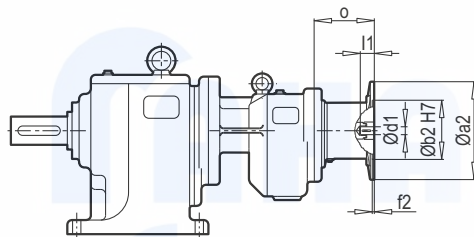
Not : (...) İşaretili olan ölçüler Motor markasına göre farklılık gösterir.

Note : The dimensions which have (...) sign vary depending on the motor brand.

PA 83/42 PA 93/52
PA 93/42 PA 103/52

IEC

PF 83/42 PF 93/52
PF 93/42 PF 103/52



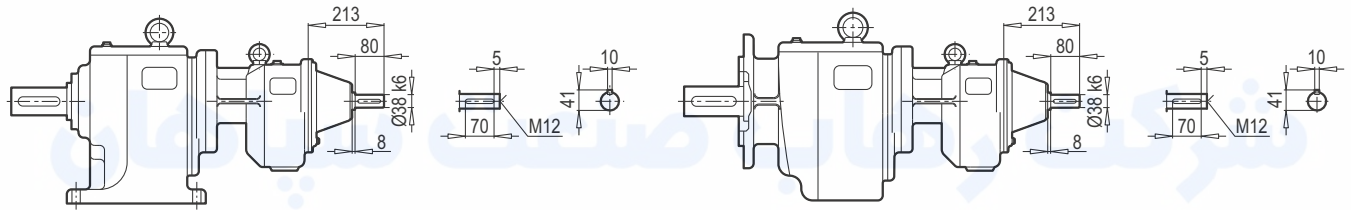
Tip / Type	IEC	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	o
PA/PF 83/42 - 93/42 - 103/52	90	200	130	165	4.0	M10	24	50	27.3	8	109
PA/PF 83/42 - 93/42 - 93/52 - 103/52	100	250	180	215	5.0	M12	28	60	31.3	8	133
PA/PF 83/42 - 93/42 - 93/52 - 103/52	112	250	180	215	5.0	M12	28	60	31.3	8	133
PA/PF 83/42 - 93/42 - 93/52 - 103/52	132	300	230	265	5.0	M12	38	80	41.3	10	190
PA/PF 83/42 - 93/42 - 93/52 - 103/52	160	350	250	300	6.0	M16	42	110	45.3	12	194
PA/PF 93/52 - 103/52	180	350	250	300	6.0	M16	48	110	51.8	14	194

~ Kg				
IEC	PA/PF 83/42	PA/PF 93/42	PA/PF 93/52	PA/PF 103/52
90	400	589	-	852
100	407	597	628	860
112	407	597	628	860
132	422	612	642	875
160	432	622	653	885
180	-	622	653	885

PA 83/42 PA 93/52
PA 93/42 PA 103/52

W

PF 83/42 PF 93/52
PF 93/42 PF 103/52

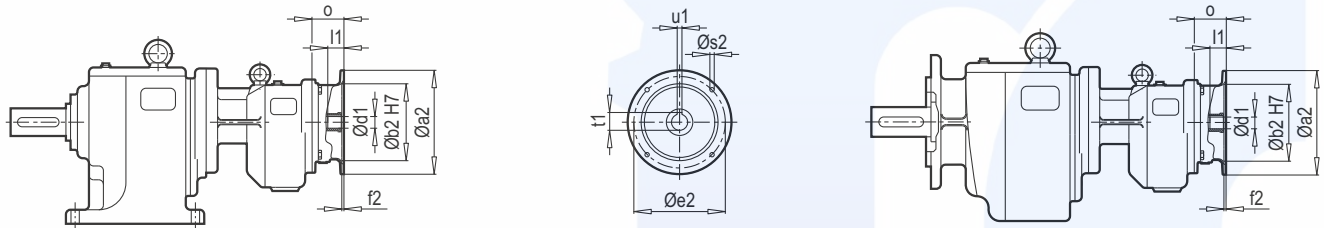


W ~ Kg	
PA/PF 83/42	405
PA/PF 93/42	595
PA/PF 93/52	625
PA/PF 103/52	858

PA 83/42 PA 93/52
PA 93/42 PA 103/52

PAM B5/B14

PF 83/42 PF 93/52
PF 93/42 PF 103/52



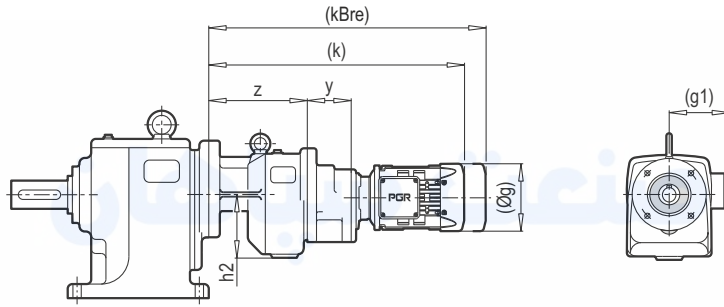
Tip / Type	PAM B5	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	o
PA/PF 83/42 - 93/42 - 103/52	90	200	130	165	4.0	M10	24	50	27.3	8	72
PA/PF 83/42 - 93/42 - 93/52 - 103/52	100	250	180	215	5.0	M12	28	60	31.3	8	75
PA/PF 83/42 - 93/42 - 93/52 - 103/52	112	250	180	215	5.0	M12	28	60	31.3	8	75
PA/PF 83/42 - 93/42 - 93/52 - 103/52	132	300	230	265	5.0	M12	38	80	41.3	10	94
PA/PF 83/42 - 93/42 - 93/52 - 103/52	160	350	250	300	6.0	M16	42	110	45.3	12	120
PA/PF 93/52 - 103/52	180	350	250	300	6.0	M16	48	110	51.8	14	120

~ Kg				
PAM B5	PA/PF 83/42	PA/PF 93/42	PA/PF 93/52	PA/PF 103/52
90	373	552	-	800
100	374	553	582	801
112	374	553	582	801
132	383	562	591	810
160	391	570	599	818
180	-	570	599	818

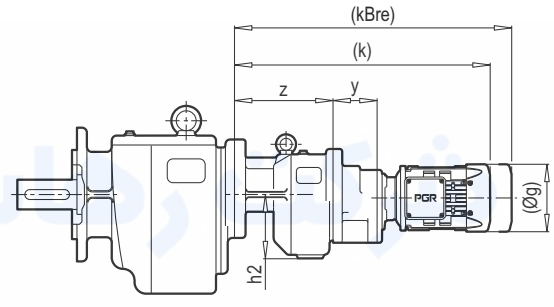
Tip / Type	PAM B14	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	o
PA/PF 83/42 - 93/42 - 103/52	90	140	95	115	4.0	9	24	50	27.3	8	72
PA/PF 83/42 - 93/42 - 93/52 - 103/52	100	160	110	130	5.0	9	28	60	31.3	8	75
PA/PF 83/42 - 93/42 - 93/52 - 103/52	112	160	110	130	5.0	9	28	60	31.3	8	75
PA/PF 83/42 - 93/42 - 93/52 - 103/52	132	200	130	165	5.0	11	38	80	41.3	10	94

~ Kg				
PAM B14	PA/PF 83/42	PA/PF 93/42	PA/PF 93/52	PA/PF 103/52
90	372	551	-	799
100	373	552	582	800
112	373	552	582	800
132	378	557	586	805

PA 63/23



PF 63/23



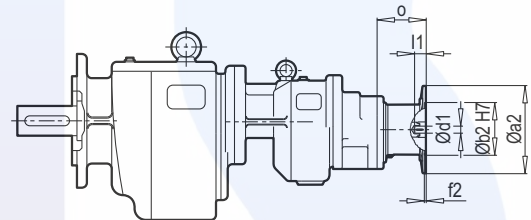
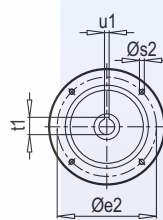
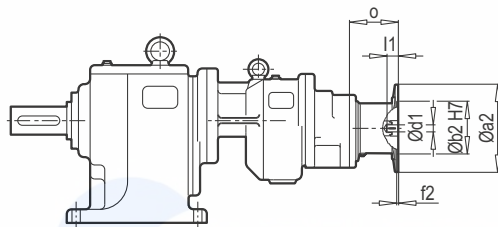
Tip / Type	Motor	g	g1	h2	z	y	k	kBre
PA/PF 63/23	71 M	140	119	127	196	60	496	556
	80 M	159	127	127	196	60	523	585

Not : (...) İşaretli olan ölçüler Motor markasına göre farklılık gösterir.
Note : The dimensions which have (...) sign vary depending on the motor brand.

PA 63/23 PA 83/33 PA 93/43 PA 103/53
PA 73/23

IEC

PF 63/23 PF 83/33 PF 93/43 PF 103/53
PF 73/23



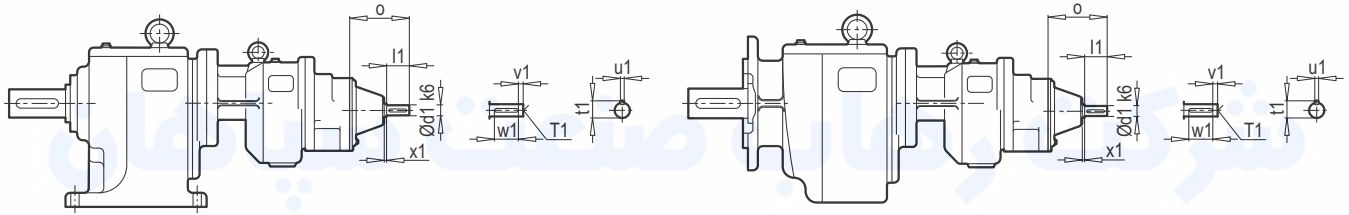
Tip / Type	IEC	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	PA/PF 63/23 73/23 83/33 o	PA/PF 93/43 103/53 o
PA/PF 63/23-73/23-83/33	63	140	95	115	3.5	M8	11	23	12.8	4	85	-
PA/PF 63/23-73/23-83/33-93/43-103/53	71	160	110	130	4.0	M8	14	30	16.3	5	89	88
PA/PF 63/23-73/23-83/33-93/43-103/53	80	200	130	165	4.0	M10	19	40	21.8	6	105	107
PA/PF 63/23-73/23-83/33-93/43-103/53	90	200	130	165	4.0	M10	24	50	27.3	8	105	107
PA/PF 93/43-103/53	100	250	180	215	5.0	M12	28	60	31.3	8	-	124
PA/PF 93/43-103/53	112	250	180	215	5.0	M12	28	60	31.3	8	-	124

~ Kg					
IEC	PA/PF 63/23	PA/PF 73/23	PA/PF 83/33	PA/PF 93/43	PA/PF 103/53
63	169	254	383	-	-
71	170	255	384	598	865
80	173	258	387	602	869
90	173	258	387	602	869
100	-	-	-	606	873
112	-	-	-	606	873

PA 63/23 PA 83/33 PA 93/43 PA 103/53
PA 73/23

W

PF 63/23 PF 83/33 PF 93/43 PF 103/53
PF 73/23



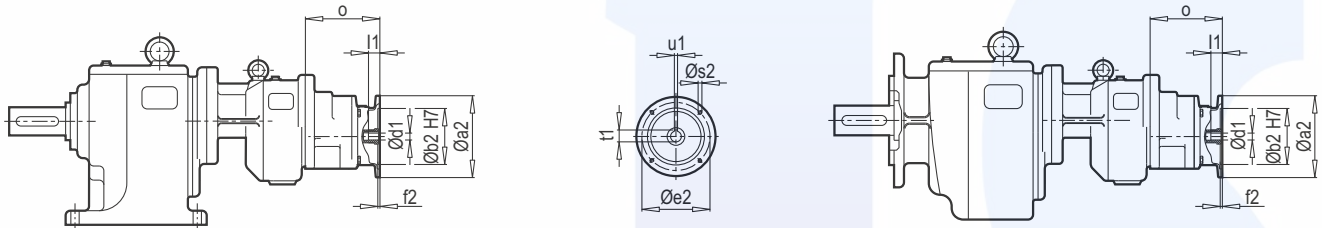
Tip / Type	Ød1	x1	l1	o	T1	t1	u1	v1	w1
PA/PF 63/23 PA/PF 73/23 PA/PF 83/33	16	7	40	122	M5	18	5	4	32
PA/PF 93/43 PA/PF 103/53	24	8	50	172	M8	27	8	5	40

W ~ Kg	
PA/PF 63/23	168
PA/PF 73/23	253
PA/PF 83/33	382
PA/PF 93/43	600
PA/PF 103/53	867

PA 63/23 PA 83/33 PA 93/43 PA 103/53
PA 73/23

PAM B5/B14

PF 63/23 PF 83/33 PF 93/43 PF 103/53
PF 73/23



Tip / Type	PAM B5	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	PA/PF 63/23 73/23 83/33 o	PA/PF 93/43 103/53 o
PA/PF 63/23 - 73/23 - 83/33	63	140	95	115	3.5	M8	11	23	12.8	4	85	-
PA/PF 63/23 - 73/23 - 83/33 - 93/43 - 103/53	71	160	110	130	4.0	M8	14	30	16.3	5	55	88
PA/PF 63/23 - 73/23 - 83/33 - 93/43 - 103/53	80	200	130	165	4.0	M10	19	40	21.8	6	74	72
PA/PF 63/23 - 73/23 - 83/33 - 93/43 - 103/53	90	200	130	165	4.0	M10	24	50	27.3	8	74	72
PA/PF 93/43 - 103/53	100	250	180	215	5.0	M12	28	60	31.3	8	-	75
PA/PF 93/43 - 103/53	112	250	180	215	5.0	M12	28	60	31.3	8	-	75

~ Kg					
PAM B5	PA/PF 63/23	PA/PF 73/23	PA/PF 83/33	PA/PF 93/43	PA/PF 103/53
63	160	241	360	-	-
71	160	241	360	563	815
80	161	242	361	564	816
90	161	242	361	564	816
100	-	-	-	565	817
112	-	-	-	565	817

Tip / Type	PAM B14	Øa2	Øb2	Øe2	f2	Øs2	Ød1	l1	t1	u1	PA/PF 63/23 73/23 83/33 o	PA/PF 93/43 103/53 o
PA/PF 63/23 - 73/23 - 83/33	63	90	60	75	4.0	6	11	23	12.8	4	60	-
PA/PF 63/23 - 73/23 - 83/33 - 93/43 - 103/53	71	105	70	85	4.0	7	14	30	16.3	5	55	88
PA/PF 63/23 - 73/23 - 83/33 - 93/43 - 103/53	80	120	80	100	4.0	7	19	40	21.8	6	74	72
PA/PF 63/23 - 73/23 - 83/33 - 93/43 - 103/53	90	140	95	115	4.0	9	24	50	27.3	8	74	72
PA/PF 93/43 - 103/53	100	160	110	130	5.0	9	28	60	31.3	8	-	75
PA/PF 93/43 - 103/53	112	160	110	130	5.0	9	28	60	31.3	8	-	75

~ Kg					
PAM B14	PA/PF 63/23	PA/PF 73/23	PA/PF 83/33	PA/PF 93/43	PA/PF 103/53
63	159	240	359	-	-
71	159	240	359	561	813
80	160	241	360	562	814
90	160	241	360	562	814
100	-	-	-	564	816
112	-	-	-	564	816