

# 1CP2 SERİSİ KOMPAKT DİŞLİ POMPALAR

## 1CP2 SERIES COMPACT GEAR PUMPS



**Алматы** (7273)495-231  
**Ангарск** (3955)60-70-56  
**Архангельск** (8182)63-90-72  
**Астрахань** (8512)99-46-04  
**Барнаул** (3852)73-04-60  
**Белгород** (4722)40-23-64  
**Благовещенск** (4162)22-76-07  
**Брянск** (4832)59-03-52  
**Владивосток** (423)249-28-31  
**Владикавказ** (8672)28-90-48  
**Владимир** (4922)49-43-18  
**Волгоград** (844)278-03-48  
**Вологда** (8172)26-41-59  
**Воронеж** (473)204-51-73  
**Екатеринбург** (343)384-55-89

**Иваново** (4932)77-34-06  
**Ижевск** (3412)26-03-58  
**Иркутск** (395)279-98-46  
**Казань** (843)206-01-48  
**Калининград** (4012)72-03-81  
**Калуга** (4842)92-23-67  
**Кемерово** (3842)65-04-62  
**Киров** (8332)68-02-04  
**Коломна** (4966)23-41-49  
**Кострома** (4942)77-07-48  
**Краснодар** (861)203-40-90  
**Красноярск** (391)204-63-61  
**Курск** (4712)77-13-04  
**Курган** (3522)50-90-47  
**Липецк** (4742)52-20-81

**Магнитогорск** (3519)55-03-13  
**Москва** (495)268-04-70  
**Мурманск** (8152)59-64-93  
**Набережные Челны** (8552)20-53-41  
**Нижний Новгород** (831)429-08-12  
**Новокузнецк** (3843)20-46-81  
**Ноябрьск** (3496)41-32-12  
**Новосибирск** (383)227-86-73  
**Омск** (3812)21-46-40  
**Орел** (4862)44-53-42  
**Оренбург** (3532)37-68-04  
**Пенза** (8412)22-31-16  
**Петрозаводск** (8142)55-98-37  
**Псков** (8112)59-10-37  
**Пермь** (342)205-81-47

**Ростов-на-Дону** (863)308-18-15  
**Рязань** (4912)46-61-64  
**Самара** (846)206-03-16  
**Санкт-Петербург** (812)309-46-40  
**Саратов** (845)249-38-78  
**Севастополь** (8692)22-31-93  
**Саранск** (8342)22-96-24  
**Симферополь** (3652)67-13-56  
**Смоленск** (4812)29-41-54  
**Сочи** (862)225-72-31  
**Ставрополь** (8652)20-65-13  
**Сургут** (3462)77-98-35  
**Сыктывкар** (8212)25-95-17  
**Тамбов** (4752)50-40-97  
**Тверь** (4822)63-31-35

**Тольятти** (8482)63-91-07  
**Томск** (3822)98-41-53  
**Тула** (4872)33-79-87  
**Тюмень** (3452)66-21-18  
**Ульяновск** (8422)24-23-59  
**Улан-Удэ** (3012)59-97-51  
**Уфа** (347)229-48-12  
**Хабаровск** (4212)92-98-04  
**Чебоксары** (8352)28-53-07  
**Челябинск** (351)202-03-61  
**Череповец** (8202)49-02-64  
**Чита** (3022)38-34-83  
**Якутск** (4112)23-90-97  
**Ярославль** (4852)69-52-93

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## HEMA ENDÜSTRİ A.Ş. Şirket Profili

Hema Endüstri A.Ş. ilk olarak 1973 yılında Hema Hidrolik A.Ş. adı ile Çerkezköy / Tekirdağ organize sanayi bölgesinde kurulmuştur. Kurulduğu ilk yıllarda tarım traktörleri ve endüstriyel hidrolik uygulamaları için, dişli tip hidrolik basınç pompaları ve hidrolik kaldırıncılar üretmiştir. Zaman içerisinde bir çok endüstri alanına hizmet vermeye başlayan şirket 1998 yılında Hema Endüstri A.Ş. ismini almıştır.

Hema Endüstri A.Ş. günümüzde otomotiv sektörünün tüm branşlarına ve iş makinalarına komple hidrolik sistemler, orijinal parçalar ve üniteler üretmenin yanı sıra, tarım traktörleri üretimi de yapmaktadır. Hema Endüstri A.Ş. 2002 yılında; diğer ürünlere ek olarak iş makinaları ve endüstriyel uygulamalar için yüksek basınç ve yüksek debili pompalar ve valfler üretmeye başlamıştır.

Hema Endüstri A.Ş. Tarım traktörleri için; hidrolik dişli yüksek basınç pompaları, mekanik ve elektronik kumandalı hidrolik kaldırıncılar, hidrostatik direksiyon sistemleri, fren ve kumanda valfleri, distribütörler, krank milleri, dişli ve dişli kutuları, transmisyonlar, motor dengeleme kutuları (balanser) otomobiller, ticari araçlar ve hafif ticari araçlar için; hidrolik direksiyon sistemleri, krank milleri, motor zaman dişlileri ve otomobil fren sistemleri üretmektedir.

Savunma sanayii ve havacılık sanayii için, ciddi faaliyetler sürdürmekte olan Hema Endüstri A.Ş. tüm ürünlerini ana sanayilerin montaj bantlarına verilmek üzere üretmektedir.

ISO 9001 AQAP 120 ve ISO/TS 16949 kalite sertifikalarına sahip olan Hema Endüstri A.Ş. komple sistem teslimatçısı olarak, teslim etmekte olduğu tüm sistemlerin tüm sorumluluğunu üstlenmektedir. Müşterileri ile tasarım ortağı olarak çalışmakta olan Hema Endüstri A.Ş. araçların geliştirilmesinde müşterilerine teknik katkı sağlamaktadır.

Birbirinden bağımsız 10 farklı üretim birimine sahip olan Hema Endüstri A.Ş. 2005 yılı itibari ile 2000 kişi istihdam etmektedir.

Hema Endüstri A.Ş. üretiminin %70'ini doğrudan veya dolaylı olarak yurt dışına göndermekte olup 20'den fazla ülkeye kaliteli ürün ve uygun fiyatlarla satış yapmaktadır.

## Company Profile

*Hema Endüstri A.Ş. was founded with the trade name of Hema Hidrolik A.Ş. in 1973, in the Organized Industrial Zone of Çerkezköy / Tekirdağ, located in Northwest Turkey. During the first years of production, hydraulic gears pumps and hydraulic lift covers were produced for agricultural tractors. As the year passed, the company enlarged its product range to serve other industries and changed its name to Hema Endüstri A.Ş. in 1998.*

*Hema Endüstri A.Ş. currently produces complete hydraulic systems for earth moving, construction, forest mining equipments and all branches of the automotive industry, original parts and components, as well as complete agricultural tractors. In 2002, in addition to other products,*

*Hema Endüstri A.Ş. started manufacturing cast iron hydraulic pumps and valves, with standing to high pressure and flows for mobile hydraulic applications.*

*For agricultural tractors, Hema Endüstri A.Ş. produces high-pressure hydraulic gear pumps, mechanically and electronically controlled hydraulic lift covers, hydrostatic steering units, break valves and sectional control valves, distributors, crankshafts, gears and gears boxes, transmissions and engine balancer units.*

*For passenger cars and commercial-light commercial vehicles, Hema Endüstri A.Ş. produces hydraulic steering systems, crankshafts, gears and break systems.*

*Having existing investments on defense and aerospace industries. Hema Endüstri A.Ş. produces all units and parts to be delivered directly to the assembly lines of the main industries.*

*Hema Endüstri A.Ş. was awarded with the quality certificates of ISO 9001, AQAP 120, and ISO/TS 16949. Hema Endüstri A.Ş. is fulfilling all quality requirements of its products as a full system supplier. Hema Endüstri A.Ş. is working as a co-designer with its customers in developing vehicles.*

*Hema Endüstri A.Ş. recently employs 2000 people working in 10 separate production units running independently.*

*%70 of Hema Endüstri A.Ş. turnover is exported directly or indirectly to over 20 countries all around the world with competitive price and high quality.*

## ÜRÜN ÖZELLİKLERİ PRODUCT FEATURES

**Yüksek dayanımlı 3 parçalı sfero döküm yapı**  
*High strength 3 piece cast ductile iron construction*

**Düz dişli tasarımı**  
*Spur gear design*

**Yüksek hidrolik verim ve uzun ömür**  
*High volumetric efficiency and long life*

**Basınç dengeleme plakaları**  
*Pressure balance load plates*

**Viton keçeler**  
*Viton seals*

**276 bar çalışma basıncı**  
*Operating pressure 276 bar*

**7 – 45.1 cc/rev deplasman aralığı**  
*Displacements range from 7 – 45.1 cc/rev*

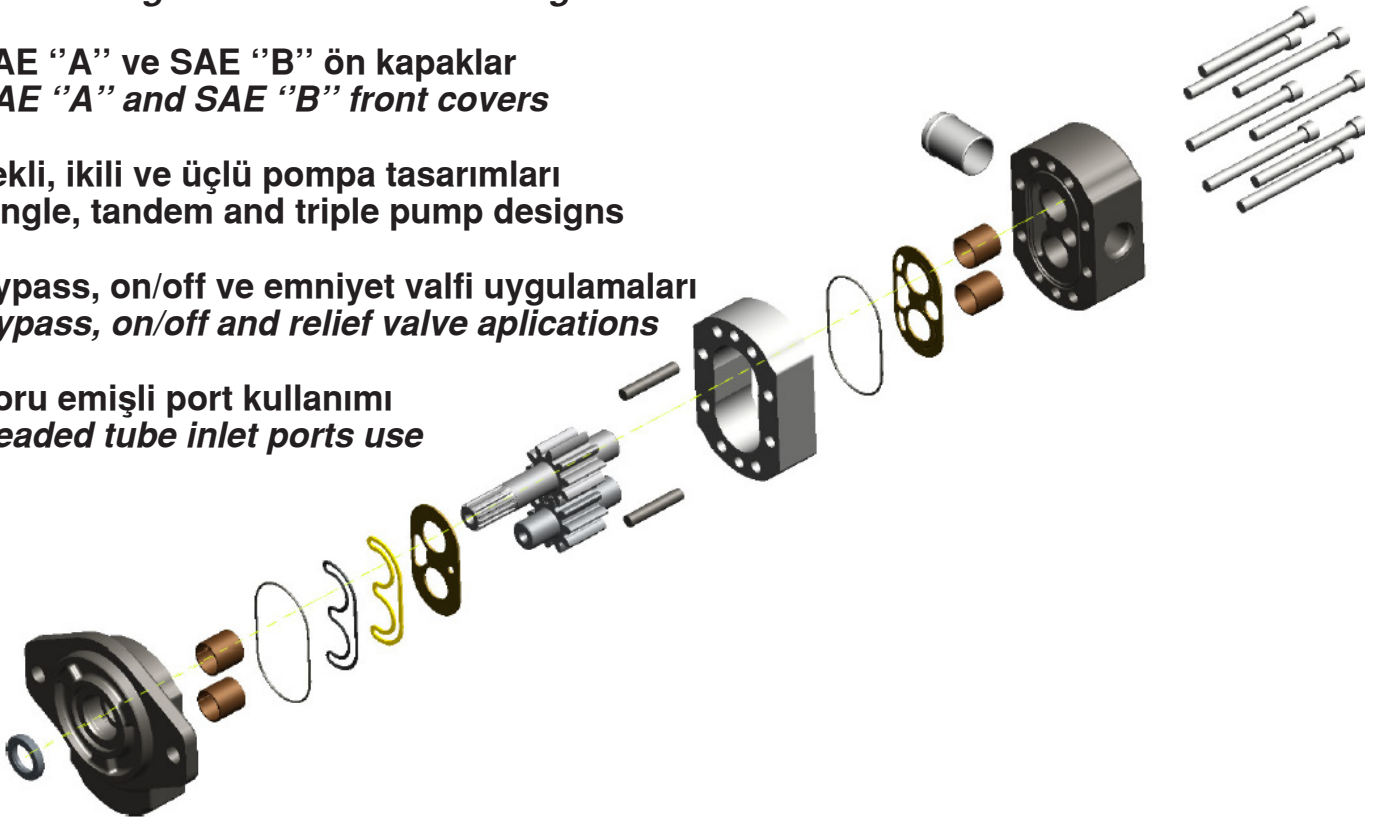
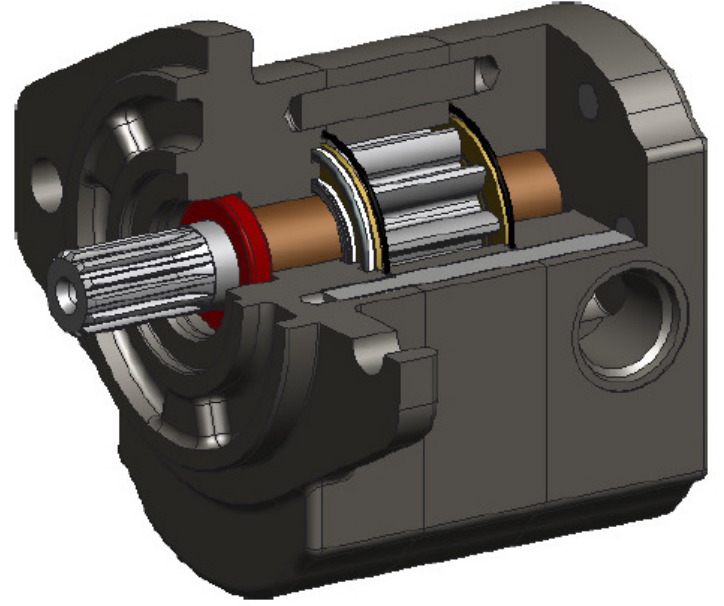
**Flanşa ve arka kapakta bulunan yataklar**  
*The bearings are located in the flange and rear cover*

**SAE "A" ve SAE "B" ön kapaklar**  
*SAE "A" and SAE "B" front covers*

**Tekli, ikili ve üçlü pompa tasarımları**  
*Single, tandem and triple pump designs*

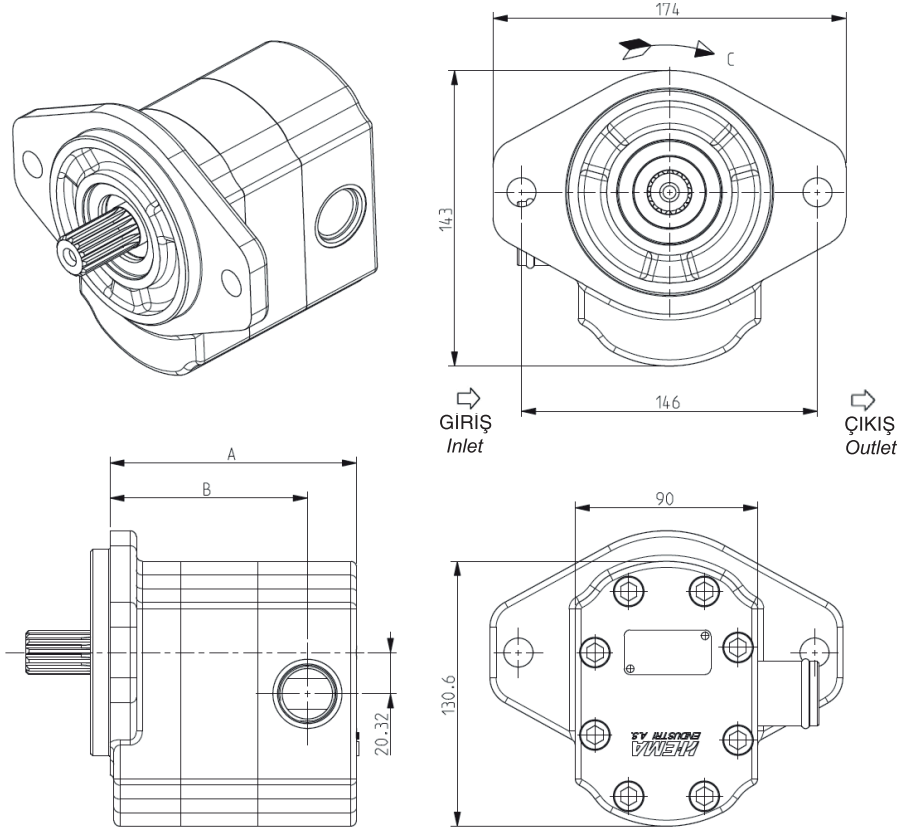
**Bypass, on/off ve emniyet valfi uygulamaları**  
*Bypass, on/off and relief valve applications*

**Boru emişli port kullanımı**  
*Beaded tube inlet ports use*



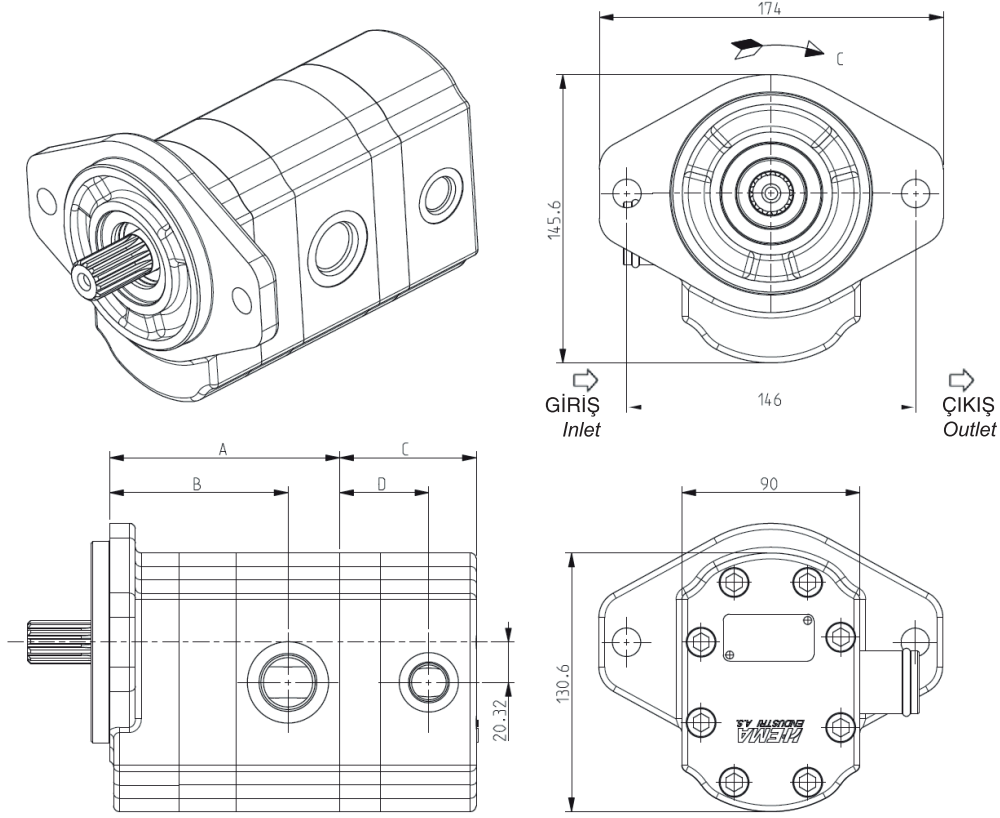
Ürün Özellikleri Product Features	Açıklamalar Description
Yapı Construction	3 parçalı döküm gövde, basınç dengeleme plakaları ve viton keçeler Ductile iron 3 piece construction with pressure balance load plates and viton seals
Montaj Mounting	SAE A 2 civatalı, SAE B 2 civatalı SAE A 2 bolt, SAE B 2 bolt
Portlar Ports	SAE & metric o-ring boss, SAE flanşli, boru emiş SAE & Metric o-ring boss, SAE split flanged, beaded tube inlet
Şaft tipi Shaft Type	Düz kamalı 3/4" ,7/8", 1:8 Konik kamalı, 9T, 11T, 13T SAE Spline Straight keyed 3/4" ,7/8", 1:8 Taper, 9T, 11T, 13T SAE Spline
İletim Hacmi Displacement	Sayfa 5'e bakınız See page 5
Çıkış Basıncı Outlet Pressure	Sayfa 5'e bakınız See page 5
Pik Basıncı Peak Pressure	303 bar – 32 cc/rev'ye kadar 303 bar up to 32 cc/rev
Devir Speed	600 - 3400 rpm
Çalışma Sıcaklığı Operating Temperature	-40°C minimum ilk çalıştırma 110°C normal çalışma şartlarında 115°C pik aralıklı -40°C minimum for cold start 110°C normal operating conditions 115°C peak intermittent
Akışkan viskozitesi Fluid Viscosity	Minimum 8 cSt, maksimum 1200 cSt 8 cSt minimum, 1200 cSt maximum
Filtrasyon Filtration	ISO 4406 'ya göre 22/18/13 According to ISO 4406 - 22/18/13
Dönüş yönü Rotation	Tahrik mili tarafından bakıldığında; saat yönünde veya saat yönü tersi Clockwise or Anti-clockwise viewed from shaft end (not reversible)
Akışkan hızı Fluid Velocity	Giriş hattındaki maksimum hız 2.5 m/s Max. In inlet line 2.5 m/h
Yağlar Fluids	Mineral yağlar Mineral Fluids

## TEKLİ POMPA ÖLÇÜLERİ SINGLE PUMP DIMENSIONS



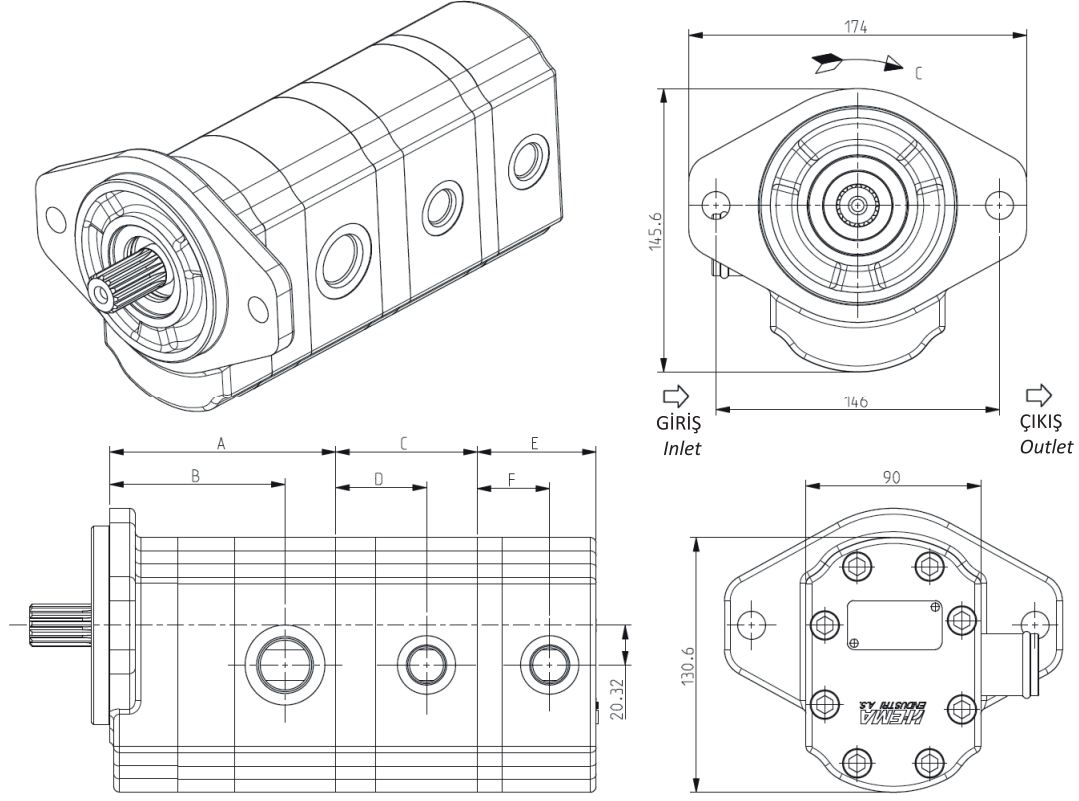
MODEL	İLETİM HACİM DISPLACEMENT  cm <sup>3</sup> /dev (cm <sup>3</sup> /rev)	MAKS. ÇIKIŞ BASINCI MAX. OUTLET PRESSURE  bar	MİN. HIZ MIN. SPEED  dev/dk -rpm	MAKS. HIZ MAX. SPEED  dev/dk -rpm	A  mm	B  mm	SAE "A" KAPAK İLE WITH FLANGE kg	SAE "B" KAPAK İLE WITH FLANGE kg
070	7.0	276	1200	3400	90.6	66.3	6.3	6.9
095	9.5	276	900	3400	93.1	68.8	6.5	7.1
108	10.8	276	900	3400	94.4	70.1	6.6	7.2
126	12.6	276	700	3400	96.2	71.9	6.7	7.3
143	14.3	276	700	3400	97.9	73.6	6.8	7.4
170	17.0	276	600	3400	100.6	76.3	7.0	7.6
190	19.0	276	600	3400	102.6	78.3	7.1	7.7
205	20.5	276	600	3400	104.1	79.8	7.2	7.8
225	22.5	276	600	3400	106.1	81.8	7.4	8.0
254	25.4	276	600	3400	109.0	84.7	7.6	8.2
290	29.0	276	600	3200	112.6	88.3	7.8	8.4
318	31.8	276	600	3000	115.4	91.1	8.0	8.6
361	36.1	276	600	2750	119.7	95.4	8.3	8.9
380	38.0	250	600	2750	121.6	97.3	8.4	9.0
410	41.0	225	600	2500	124.6	100.3	8.6	9.2
451	45.1	180	600	2500	128.7	104.4	8.9	9.5

## İKİLİ POMPA ÖLÇÜLERİ TANDEM PUMP DIMENSIONS



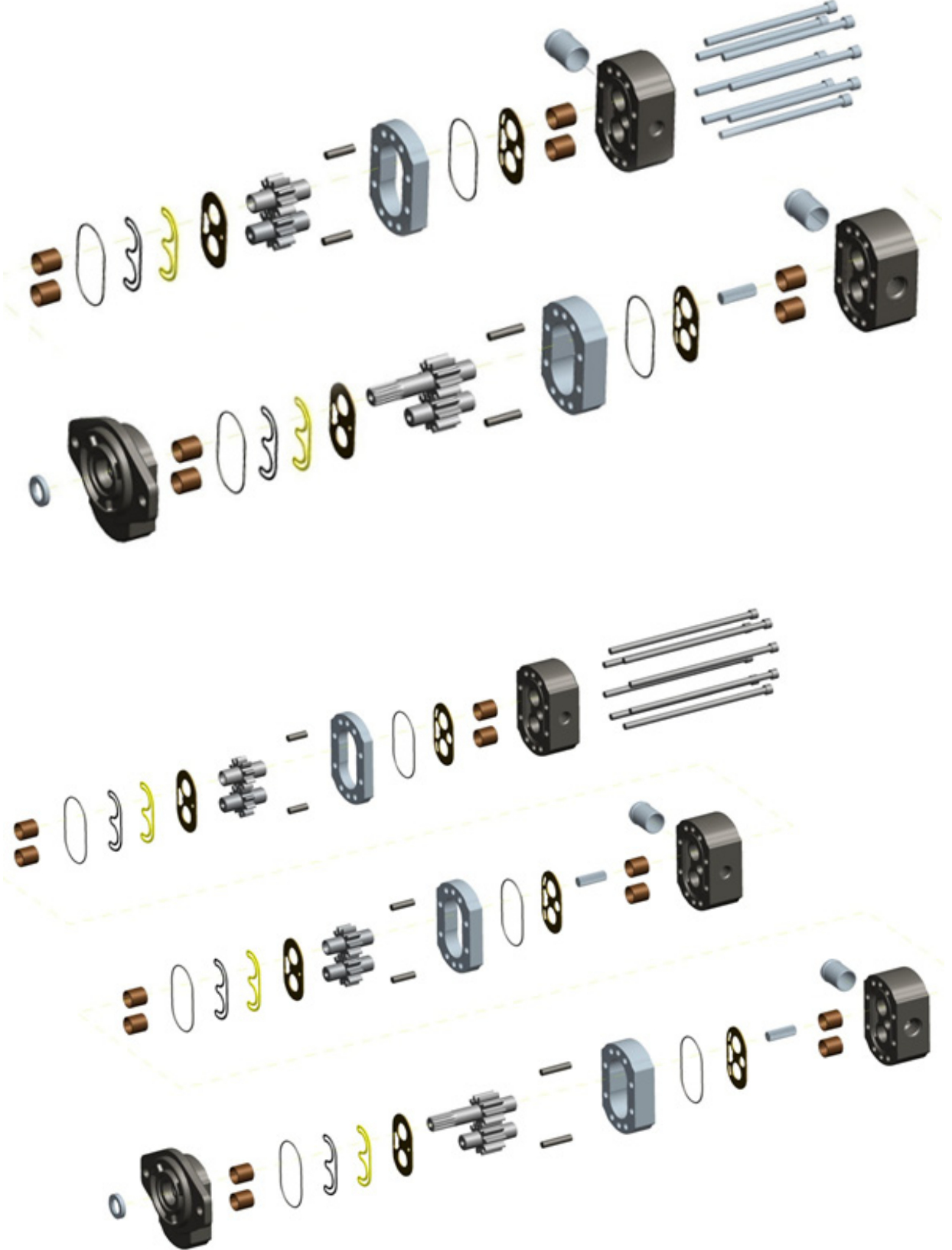
MODEL	İLETİM HACİM DISPLACEMENT  cm <sup>3</sup> /dev (cm <sup>3</sup> /rev)	ÖN POMPA FRONT PUMP				ARKA POMPA REAR PUMP		
		A mm	B mm	SAE "A" KAPAK İLE WITH FLANGE kg	SAE "B" KAPAK İLE WITH FLANGE kg	C mm	D mm	kg
070	7.0	94.3	68.2	6.3	6.9	55.6	31.3	3.9
095	9.5	96.8	70.7	6.5	7.1	58.1	33.8	4.1
108	10.8	98.1	72.0	6.6	7.2	59.4	35.1	4.2
126	12.6	99.9	73.8	6.7	7.3	61.2	36.9	4.3
143	14.3	101.6	75.5	6.8	7.4	62.9	38.6	4.4
170	17.0	104.3	78.2	7.0	7.6	65.6	41.3	4.6
190	19.0	106.3	80.2	7.1	7.7	67.6	43.3	4.7
205	20.5	107.8	81.7	7.2	7.8	69.1	44.8	4.8
225	22.5	109.8	83.7	7.4	8.0	71.1	46.8	5.0
254	25.4	112.7	86.6	7.6	8.2	74.0	49.7	5.2
290	29.0	116.3	90.2	7.8	8.4	77.6	53.3	5.4
318	31.8	119.1	93.0	8.0	8.6	80.4	56.1	5.6
361	36.1	123.4	97.3	8.3	8.9	84.7	60.4	5.9
380	38.0	125.3	99.2	8.4	9.0	86.6	62.3	6.0
410	41.0	128.3	102.2	8.6	9.2	89.6	65.3	6.2
451	45.1	132.4	106.3	8.9	9.5	93.7	69.4	6.5

## ÜÇLÜ POMPA ÖLÇÜLERİ TRIPLE PUMP DIMENSIONS



MODEL	İLETİM HACİM DISPLACEMENT cm <sup>3</sup> /dev (cm <sup>3</sup> /rev)	ÖN POMPA FRONT PUMP				ORTA POMPA MID PUMP			ARKA POMPA REAR PUMP		
		A mm	B mm	SAE "A" KAPAK İLE WITH FLANGE kg	SAE "B" KAPAK İLE WITH FLANGE kg	C mm	D mm	kg	E mm	F mm	kg
070	7.0	94.3	68.2	6.3	6.9	59.3	33.3	3.9	55.6	31.3	3.9
095	9.5	96.8	70.7	6.5	7.1	61.8	35.7	4.1	58.1	33.8	4.1
108	10.8	98.1	72.0	6.6	7.2	63.1	37.0	4.2	59.4	35.1	4.2
126	12.6	99.9	73.8	6.7	7.3	64.9	38.8	4.3	61.2	36.9	4.3
143	14.3	101.6	75.5	6.8	7.4	66.6	40.5	4.4	62.9	38.6	4.4
170	17.0	104.3	78.2	7.0	7.6	79.3	43.2	4.6	65.6	41.3	4.6
190	19.0	106.3	80.2	7.1	7.7	71.3	45.2	4.7	67.6	43.3	4.7
205	20.5	107.8	81.7	7.2	7.8	72.8	46.7	4.8	69.1	44.8	4.8
225	22.5	109.8	83.7	7.4	8.0	74.8	48.7	5.0	71.1	46.8	5.0
254	25.4	112.7	86.6	7.6	8.2	77.7	51.6	5.2	74.0	49.7	5.2
290	29.0	116.3	90.2	7.8	8.4	81.3	55.2	5.4	77.6	53.3	5.4
318	31.8	119.1	93.0	8.0	8.6	84.1	58.0	5.6	80.4	56.1	5.6
361	36.1	123.4	97.3	8.3	8.9	88.4	62.3	5.9	84.7	60.4	5.9
380	38.0	125.3	99.2	8.4	9.0	90.3	64.2	6.0	86.6	62.3	6.0
410	41.0	128.3	102.2	8.6	9.2	93.3	67.2	6.2	89.6	65.3	6.2
451	45.1	132.4	106.3	8.9	9.5	97.4	71.3	6.5	93.7	69.4	6.5

**İKİLİ VE ÜÇLÜ POMPA AÇINIM GÖRÜNÜMÜ**  
**TANDEM AND TRIPLE PUMP EXPLODED VIEW DIMENSIONS**

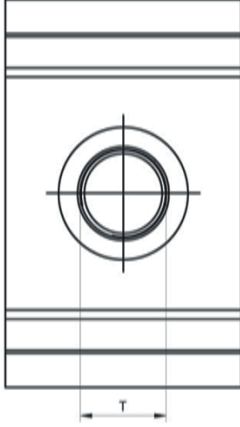




## DELİK TİPLERİ HOLE TYPES

1

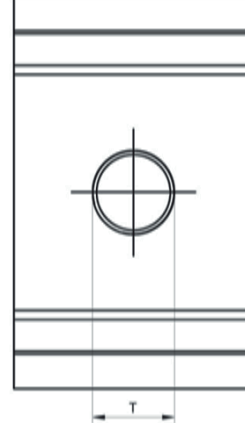
### DİŞLİ PORTLAR (SAE) THREAD PORTS (SAE)



KOD CODE	T
A	7/8"- 14 UNF 2B
B	1 1/16"-12 UN 2B
C	1 5/16"-12 UN 2B
D	1 5/8"-12 UN 2B

2

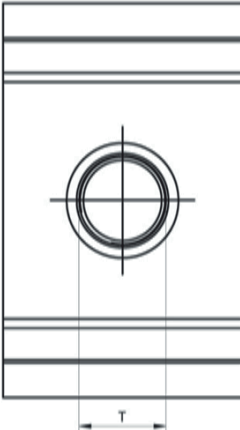
### DİŞLİ PORTLAR (GAS) THREAD PORTS (GAS)



KOD CODE	T
A	G 1/2
B	G 3/4
C	G 1

3

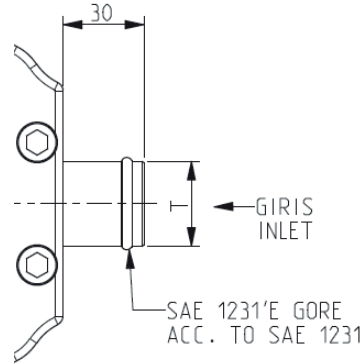
### DİŞLİ PORTLAR (METRİK) THREAD PORTS (METRIC)



KOD CODE	T
A	M22 x 1,5
B	M27 x 2
C	M33 x 2

4

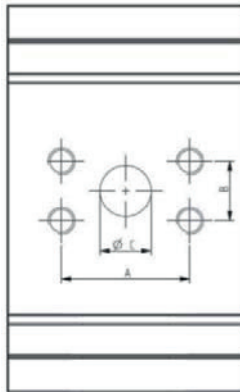
### BORU EMİŞLİ PORTLAR BEADED TUBE İNLET PORTS



KOD CODE	T
A	n31.75
B	n38.10

5

### FLANSLI PORT (SAE FLANŞLI) FLANGED PORTS (SAE FLANGE)

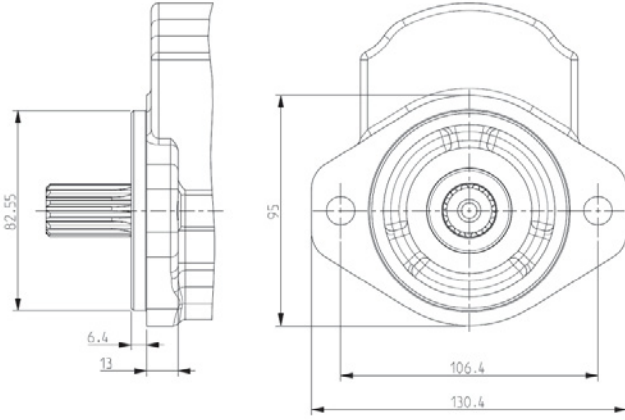


KOD CODE	ØC	A	B	T
A	19	47.6	22.2	M10x1.5
B	19	47.6	22.2	3/8"-16
C	25	52.4	26.2	M10x1.5
D	25	52.4	26.2	3/8"-16
E	32	58.6	30.2	M10x1.5
F	32	58.6	30.2	7/16"-14

## ÖN KAPAKLAR MOUNTING FLANGES

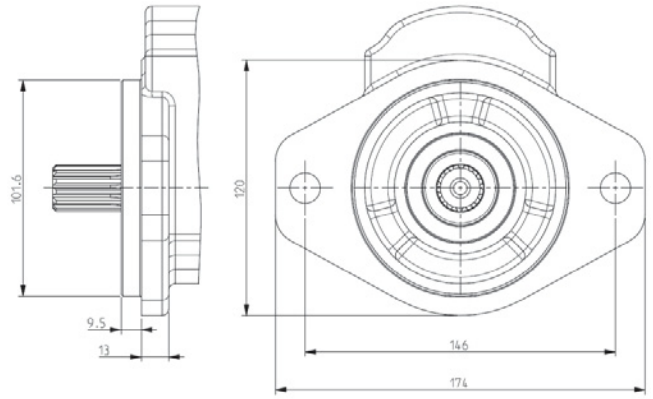
**G1**

**SAE A 2 CİVATALI  
SAE A 2 BOLTS**



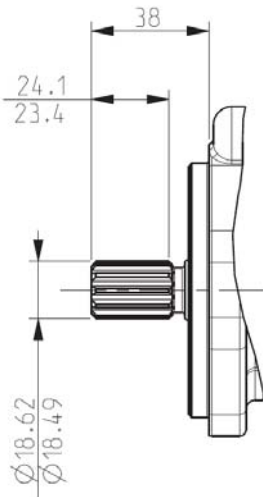
**G2**

**SAE B 2 CİVATALI  
SAE B 2 BOLTS**



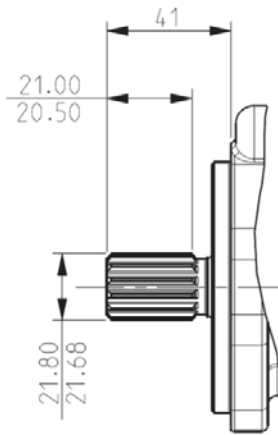
**S1**

**SAE SPLINE 11 DİŞ  
SAE SPLINE 11 TEETH**



**S2**

**SAE SPLINE 13 DİŞ  
SAE SPLINE 13 TEETH**



# POMPA HESAPLARI

## DESIGN CALCULATIONS FOR PUMPS

Pompa dizayn hesaplarında aşağıdaki parametreler esas alınır.

V (cm <sup>3</sup> /dev)	: İletim hacmi
Q (l/dk)	: Debi
P (bar)	: Basınç
M (Nm)	: Döndürme torku
n (dev/dk)	: Devir
N (Kw)	: Güç
μ <sub>v</sub> (%)	: Volumetrik verim
μ <sub>m</sub> (%)	: Hidrolik-mekanik verim
μ <sub>t</sub> (%)	: Toplam verim

The design calculations for pumps are based on the following parameters.

V (cm <sup>3</sup> /rev)	: Displacement
Q (l/min)	: Flow
P (bar)	: Pressure
M (Nm)	: Drive torque
n (dev/dk)	: Drive speed
N (Kw)	: Drive power
μ <sub>v</sub> (%)	: Volumetric efficiency
μ <sub>m</sub> (%)	:Hydraulic-mechanical efficiency
μ <sub>t</sub> (%)	: Overall efficiency

Aşağıdaki formüller değişik ilişkileri tanımlar. Bunlar, pratikte kullanılan ve karşılaşılan birimler için düzeltme faktörü içerir.

The following formulas describe the various relationships. They include correction factors for adapting the parameters to the usual units encountered in practice.

	DEBİ Flow	İLETİM HACMİ Displacement	DEVİR Drive speed
	$Q = V \cdot n \cdot \mu_v \cdot 10^{-5}$	$V = \frac{Q}{n \cdot \mu_v} \cdot 10^5$	$n = \frac{Q}{V \cdot \mu_v} \cdot 10^5$
	BASINÇ Pressure	İLETİM HACMİ Displacement	DÖNDÜRME TORKU Drive torque
	$P = \frac{M \cdot \mu_{hm}}{1,59 \cdot V}$	$V = \frac{M \cdot \mu_{hm}}{1,59 \cdot P}$	$M = \frac{1,59 \cdot V \cdot P}{\mu_{hm}}$
	GÜÇ Drive power	DEBİ Flow	BASINÇ Pressure
	$N = \frac{P \cdot Q}{6 \cdot \mu_t} = \frac{P \cdot Q}{600}$	$Q = \frac{6 \cdot N \cdot \mu_t}{P}$	$P = \frac{6 \cdot N \cdot \mu_t}{Q}$
TAVSİYE EDİLEN VERİM Recommended efficiency			μ = %95

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Ангарск (3955)60-70-56  
Архангельск (8182)63-90-72  
Астрахань (8512)99-46-04  
Барнаул (3852)73-04-60  
Белгород (4722)40-23-64  
Благовещенск (4162)22-76-07  
Брянск (4832)59-03-52  
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Псков (8112)59-10-37  
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Саранск (8342)22-96-24  
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Смоленск (4812)29-41-54  
Сочи (862)225-72-31  
Ставрополь (8652)20-65-13  
Сургут (3462)77-98-35  
Сыктывкар (8212)25-95-17  
Тамбов (4752)50-40-97  
Тверь (4822)63-31-35

Тольятти (8482)63-91-07  
Томск (3822)98-41-53  
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Челябинск (351)202-03-61  
Череповец (8202)49-02-64  
Чита (3022)38-34-83  
Якутск (4112)23-90-97  
Ярославль (4852)69-52-93