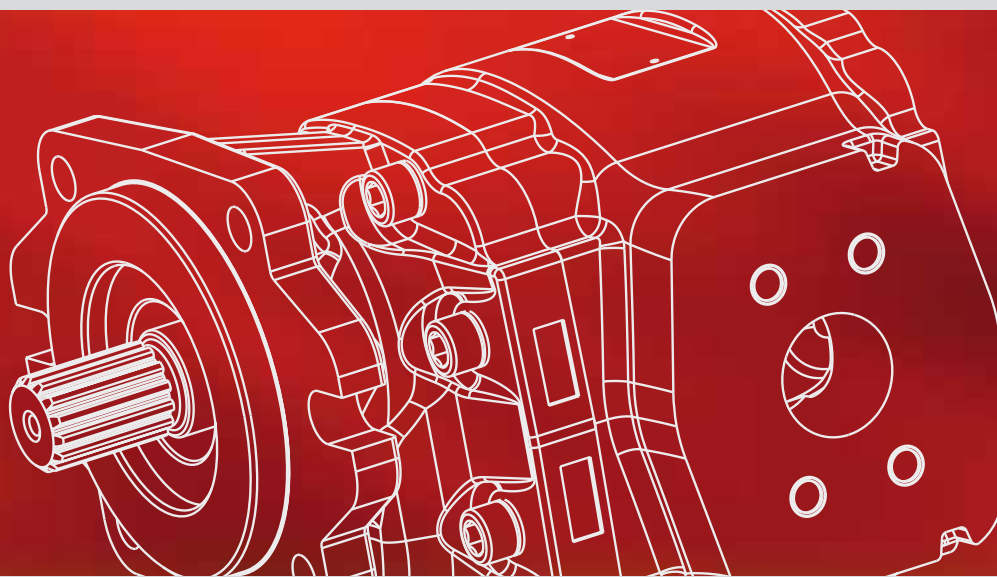




K40 K40 Plus

HYDRAULIC GEAR
PUMPS AND
MOTORS

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01/09.2019

INTRODUCTION

Kappa 40

Gear pumps and motors made of cast iron in two pieces.

A rigid and compact structure that makes it possible to incorporate a number of functions in a limited space

DISPLACEMENTS

From 61,43 cm³/rev (3.75 in³/rev)

To 150,79 cm³/rev (9.20 in³/rev)

PRESSURE

Max. constant operating pressure 240 bar (3480 psi)

Max. system pressure (relief valve setting) 260 bar (3770 psi)

Max. peak of pressure 280 bar (4060 psi)

SPEED

Max. 2800 min⁻¹

- Solid and compact design
- High efficiency at high temperature
- Low noise emission

Kappa 40 Plus

Large cast iron gear pumps for heavy duty applications.

DISPLACEMENTS

From 61,43 cm³/rev (3.75 in³/rev)

To 180,73 cm³/rev (11.02 in³/rev)

PRESSURE

Max. constant operating pressure 260 bar (3770 psi)

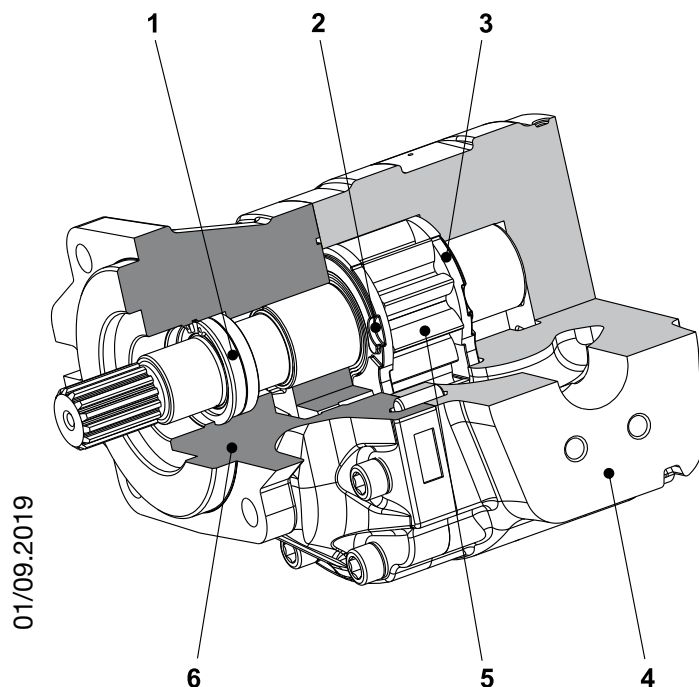
Max. system pressure (relief valve setting) 280 bar (4060 psi)

Max. peak of pressure 300 bar (4350 psi)

SPEED

Max. 2800 min⁻¹

- New design
- High performance
- High strength
- Bigger displacements range
- Bigger ports
- Exceptional working life expectancy



1	Shaft seals
2	Seal
3	Thrust plate
4	Body
5	Gear
6	Mounting flange

TYPICAL APPLICATIONS

- Building & Construction
- Mining
- Material Handling
- Agriculture

- Forestry
- Turf care & Mowers
- Fan Drive

INSTRUCTIONS

INSTALLATION

Pump

The direction of rotation of single-rotation pumps must be the same as that of the drive shaft. Check that the coupling flange correctly aligns the transmission shaft and the pump shaft. Flexible couplings should be used (never rigid fittings) which will not generate an axial or radial load on the pump shaft.

Motor

The direction of rotation of single-rotation motors must match circuit connections. Check that the coupling flange correctly aligns the transmission shaft and the motor shaft. Flexible couplings should be used (never rigid fittings) which will not generate an axial or radial load on the motor shaft.

TANK

Tank capacity must be sufficient for the system's operating conditions (~ 3 times the amount of oil in circulation) to avoid overheating of the fluid. A heat exchanger should be installed if necessary. The intake and return lines in the tank must be spaced apart (by inserting a vertical divider) to prevent the return-line oil from being taken up again immediately.

LINES

The lines must have a major diameter which is at least as large as the diameter of pump or motor ports, and must be perfectly sealed. To reduce loss of power, the lines should be as short as possible, reducing the sources of hydraulic resistance (elbow, throttling, gate valves, etc.) to a minimum. A length of flexible tubing is recommended to reduce the transmission of vibrations. All return lines must end below the minimum oil level, to prevent foaming. Before connecting the lines, remove any plugs and make sure that the lines are perfectly clean.

HYDRAULIC FLUID

Use hydraulic fluid conforming to viscosity data as specified in the first pages of the catalogue. Avoid using mixtures of different oils which could result in decomposition and reduction of the oil's lubricating power.

FILTERS

We recommend filtering the entire system flow. Filters on suction and return line must be fitted in according to the contamination class as indicated in the first pages of the catalogue. Casappa recommends to use its own production filters:

STORAGE

The storage must be in a dry environment.

Max storage time in ideal conditions is 24 months.

The ideal storage temperature is between 5°C (41°F) and 20°C (68°F). No problem in case of temperature between -40°C (-40°F) and 50°C (122°F). Below -40°C (-40°F) please consult our pre-sales department.

STARTING UP

Check that all circuit connections are tight and that the entire system is completely clean. Insert the oil in the tank, using a filter. Bleed the circuit to assist in filling. Set the pressure relief valves to the lowest possible setting. Turn on the system for a few moments at minimum speed, then bleed the circuit again and check the level of oil in the tank.

If the difference between pump or motor temperature and fluid temperature exceeds 10 °C (50 °F), rapidly switch the system on and off to heat it up gradually. Then gradually increase the pressure and speed of rotation until the pre-set operating levels as specified in the catalogue are attained.

COLD START

Cold start is meant short term and low idle. During cold start of the machine the following limits can be applied:

Minimum inlet pressure	0,5 bar abs. (7 psi)
Outlet pressure (pumps) Inlet pressure (motors)	≤ 50 bar (725 psi)
Max drain pressure / Max back pressure for single rotation motors	+ 50% of standard values
Speed	≤ 1500 min ⁻¹
Minimum temperature	-40 °C (-40 °F)
Max oil viscosity	2000 mm ² /s (cSt) [9100 SSU]

If the ambient temperature is lower than -20 °C (-4 °F) the system speed and pressure must be limited until the hydraulic oil temperature exceeds -20 °C (-4 °F).

PERIODICAL CHECKS - MAINTENANCE

Keep the outside surface clean especially in the area of the drive shaft seal. In fact, abrasive powder can accelerate wear on the seal and cause leakage. Replace filters regularly to keep the fluid clean. The oil level must be checked and oil replaced periodically depending on the system's operating conditions.



01/09.2019

FEATURES

Construction	Kappa 40: external gear pumps and motors Kappa 40 Plus: Heavy duty external gear pumps
Mounting	EUROPEAN and SAE standard flanges
Ports	Threaded or split flange
Direction of rotation (looking on drive shaft)	Kappa 40: Anti-clockwise (S) - clockwise (D) - reversible external drain (R) - reversible internal drain (B) Kappa 40 Plus: Anti-clockwise (S) - clockwise (D)
Inlet pressure range for pumps	0,7 ÷ 3 bar abs. (10 ÷ 44 psi) If p > 1,5 bar abs. (22 psi) specific shaft sealing have to be applied. Please consult our pre-sales department.
Max back pressure for single rotation motors	5 bar (73 psi) continuous @ min. speed 300 min ⁻¹ 1 bar (14.5 psi) continuous @ max. speed (see page 7)
Max drain line pressure on reversible rotation motors	5 bar (73 psi) continuous @ min. speed 300 min ⁻¹ 1 bar (14.5 psi) continuous @ max. speed (see page 7)
Max back pressure on in series motors	150 bar (2175 psi)
Fluid temperature range	See table (1)
Fluid	Mineral oil based hydraulic fluids to ISO/DIN and fire resistant fluids [see table (1)]. For other fluids please consult our pre-sales department.
Viscosity range	From 12 to 100 mm ² /s (cSt) [60 to 456 SSU] recommended Up to 750 mm ² /s (cSt) [3410 SSU] permitted
Filtering requirement and recommended fluid contamination	See table (2) page 6

Tab. 1

Type	Fluid composition	Max pressure bar (psi)	Max speed min ⁻¹	Temperature °C (°F)			Seals (●)	Shaft seals option (◆)
				Min	Max continuous	Max peak		
ISO/DIN	Mineral oil based hydraulic fluid to ISO/DIN	See page 7-8	See page 7-8	-25 (-13)	80 (176)	100 (212)	N	D C4
				-25 (-13)	110 (230)	125 (257)	V	
				-25 (-13)	110 (230)	125 (257)	T-PV	
HFA	Oil emulsion in water 5 ÷ 15% of oil	50 (725)	1500	2 (36)	55 (131)		N	D
HFB	Water emulsion in oil 40 % of water	120 (1740)	1500	2 (36)	60 (140)		N	
HFC	Water - glycol	100 (1450)	1500	-20 (-4)	60 (140)		N Bz	
HFD	Phosphate ester	150 (2175)	1500	-10 (14)	80 (176)		V Bz	

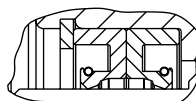
(●) **N**= Buna NBR (standard) - **V**= Viton-FKM - **T-PV**= Hydrogenated buna HNBR seals with Viton-FKM shaft seals
N Bz= Buna NBR and Bronze thrust plates - **V Bz**= Viton-FKM and Bronze thrust plates

D (◆) shaft seals with wiper seal

C4 (◆) High pressure special shaft seal (only with ISO/DIN hydraulic fluid)

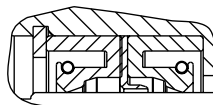
Single rotation pumps

Max drain line pressure:
0,5 bar (7 psi)

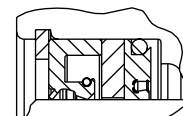


Single rotation motors
Reversible rotation pumps and motors

Max drain line pressure:
5 bar (73 psi)



Max drain line pressure:
10 bar (145 psi)



01/09.2019

FEATURES

Filtration

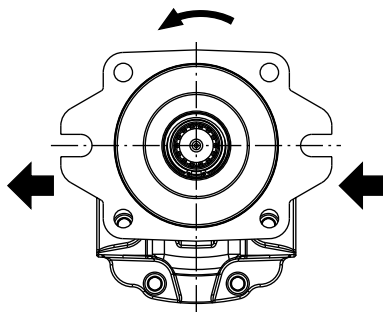
Tab. 2

Working pressure bar (psi)	$\Delta p < 140$ (2030)	$140 < \Delta p < 210$ (2030) (3045)	$\Delta p > 210$ (3045)
Contamination class NAS 1638	10	9	8
Contamination class ISO 4406	21/19/16	20/18/15	19/17/14
Achieved with filter $\beta_{10}(c) \geq 200$ according to ISO 16889	-	10 μm	10 μm
Achieved with filter $\beta_{25}(c) \geq 200$ according to ISO 16889	25 μm	-	-

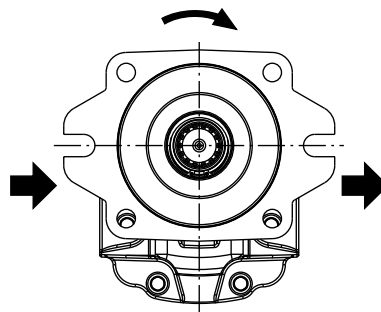
Casappa recommends to use its own production filters:



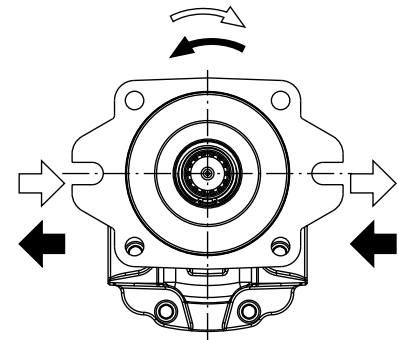
DEFINITION OF ROTATION DIRECTION LOOKING AT THE DRIVE SHAFT



Anti-clockwise rotation



Clockwise rotation

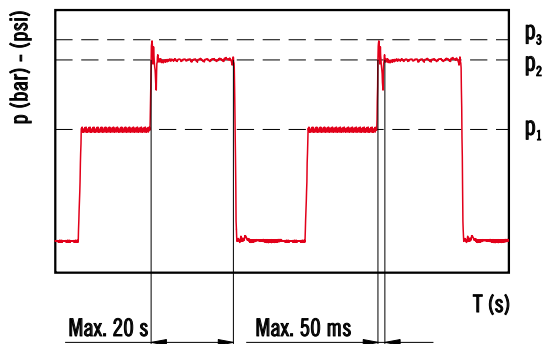


Reversible rotation

GENERAL NOTES

Available with different inlet and outlet ports. If you use fire resistant fluids, specify the fluid type when ordering.
For more information please consult our pre-sales department.

PRESSURE DEFINITION



- p_1 Constant operating pressure
- p_2 System pressure (relief valve setting)
- p_3 Peak of pressure

The peak of pressure is the max pressure allowed and it corresponds to the overshoot of the relief valve.

Please note that both relief valve setting and overshoot must be lower than their limits.

If the relief setting is compliant but the overshoot is higher than the limit, the relief setting must be decreased until the overshoot is compliant to Casappa limit.

For high frequency applications please consult our pre-sales department.

01/09.2019

KAPPA 40

FEATURES

Pump type KP Motor type KM	Displacement	Body design	Characteristics	Max. pressure			Max. speed	Min. speed
				p ₁	p ₂	p ₃		
	cm³/rev (in³/rev)			bar (psi)				
K. 40•63	61,43 (3.75)	CSC / CSL	Standard	240 (3480)	260 (3770)	280 (4060)	2800	300
K. 40•73	72,60 (4.43)	CSC / CSL	Standard	240 (3480)	260 (3770)	280 (4060)	2800	300
K. 40•87	86,56 (5.28)	CSC / CSL	Standard	240 (3480)	260 (3770)	280 (4060)	2800	300
K. 40•109	108,90 (6.64)	CSC / CSL	Standard	230 (3335)	250 (3625)	270 (3915)	2800	300
K. 40•121	121,80 (7.43)	CSC / CSL	Standard	210 (3600)	230 (3335)	250 (3625)	2500	300
K. 40•133	134,03 (8.18)	CSC / CSL	Standard	200 (2900)	220 (3190)	240 (3480)	2500	300
K. 40•151	150,99 (9.20)	CSC / CSL	Standard	190 (2755)	210 (3600)	230 (3335)	2500	300

Pressure values in the table refer to side ports single rotation pumps and motors.

For reversible pumps and motors, max pressures are 250 bar (3600 psi) excepted those with lower pressures value.

For different configurations and working conditions please consult our pre-sales department.

Q	l/min (US gpm)	Flow
M	Nm (lbf in)	Torque
P	kW (HP)	Power
V	cm ³ /rev (in ³ /rev)	Displacement
n	min ⁻¹	Speed
Δp	bar (psi)	Pressure

Efficiencies		Pumps	Motors
$\eta_v = \eta_v(V, \Delta p, n)$	Volumetric efficiency	(≈ 0,94)	(≈ 0,92)
$\eta_{hm} = \eta_{hm}(V, \Delta p, n)$	Hydro-mechanical efficiency	(≈ 0,88)	(≈ 0,85)
$\eta_t = \eta_v \cdot \eta_{hm}$	Overall efficiency	(≈ 0,83)	(≈ 0,78)

DESIGN CALCULATIONS FOR PUMP

$$Q = Q_{\text{theor.}} \cdot \eta_v \quad [\text{l/min}]$$

$$Q_{\text{theor.}} = \frac{V \cdot n}{1000} \quad [\text{l/min}]$$

$$M = \frac{M_{\text{theor.}}}{\eta_{hm}} \quad [\text{Nm}]$$

$$M_{\text{theor.}} = \frac{\Delta p \cdot V}{62,83} \quad [\text{Nm}]$$

$$P_{\text{IN}} = \frac{P_{\text{OUT}}}{\eta_t} \quad [\text{kW}]$$

$$P_{\text{OUT}} = \frac{\Delta p \cdot Q}{600} \quad [\text{kW}]$$

DESIGN CALCULATIONS FOR MOTOR

$$Q = \frac{Q_{\text{theor.}}}{\eta_v} \quad [\text{l/min}]$$

$$Q_{\text{theor.}} = \frac{V \cdot n}{1000} \quad [\text{l/min}]$$

$$M = M_{\text{theor.}} \cdot \eta_{hm} \quad [\text{Nm}]$$

$$M_{\text{theor.}} = \frac{\Delta p \cdot V}{62,83} \quad [\text{Nm}]$$

$$P_{\text{IN}} = \frac{\Delta p \cdot Q}{600} \quad [\text{kW}]$$

$$P_{\text{OUT}} = P_{\text{IN}} \cdot \eta_t \quad [\text{kW}]$$

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KAPPA 40 Plus

FEATURES

Pump type KP	Displacement	Body design	Characteristics	Max. pressure			Max. speed	Min. speed
	cm³/rev (in³/rev)			p ₁	p ₂	p ₃		
				bar (psi)				
KP 40•63	61,43 (3.75)	CSL	Standard	260 (3770)	280 (4060)	300 (4350)	2800	300
KP 40•73	72,60 (4.43)	CSL	Standard	260 (3770)	280 (4060)	300 (4350)	2800	300
KP 40•87	86,56 (5.28)	CSL	Standard	260 (3770)	280 (4060)	300 (4350)	2800	300
KP 40•100	99,79 (6.09)	CSL	Standard	260 (3770)	280 (4060)	300 (4350)	2700	300
KP 40•109	108,90 (6.64)	CSL	Standard	260 (3770)	280 (4060)	300 (4350)	2700	300
KP 40•121	121,80 (7.43)	CSL	Standard	260 (3770)	280 (4060)	300 (4350)	2700	300
KP 40•133	134,03 (8.18)	CSL	Standard	250 (3625)	270 (3915)	290 (4205)	2700	300
KP 40•151	150,79 (9.20)	CSL	Standard	240 (3480)	260 (3770)	280 (4060)	2700	300
KP 40•160	160,77 (9.81)	CSL	Standard	230 (3335)	250 (3625)	270 (3915)	2500	300
KP 40•180	180,73 (11.02)	CSL	Standard	230 (3335)	250 (3625)	270 (3915)	2200	300

Pressure values in the table refer to side ports unidirectional pumps.

For different configurations and working conditions please consult our pre-sales department.

Q	l/min (US gpm)	Flow
M	Nm (lbf in)	Torque
P	kW (HP)	Power
V	cm ³ /rev (in ³ /rev)	Displacement
n	min ⁻¹	Speed
Δp	bar (psi)	Pressure

Efficiencies		Pumps
$\eta_v = \eta_v(V, \Delta p, n)$	Volumetric efficiency	(≈ 0,94)
$\eta_{hm} = \eta_{hm}(V, \Delta p, n)$	Hydro-mechanical efficiency	(≈ 0,88)
$\eta_t = \eta_v \cdot \eta_{hm}$	Overall efficiency	(≈ 0,83)

DESIGN CALCULATIONS FOR PUMP

$$Q = Q_{\text{theor.}} \cdot \eta_v \quad [\text{l/min}]$$

$$Q_{\text{theor.}} = \frac{V \cdot n}{1000} \quad [\text{l/min}]$$

$$M = \frac{M_{\text{theor.}}}{\eta_{hm}} \quad [\text{Nm}]$$

$$M_{\text{theor.}} = \frac{\Delta p \cdot V}{62,83} \quad [\text{Nm}]$$

$$P_{\text{IN}} = \frac{P_{\text{OUT}}}{\eta_t} \quad [\text{kW}]$$

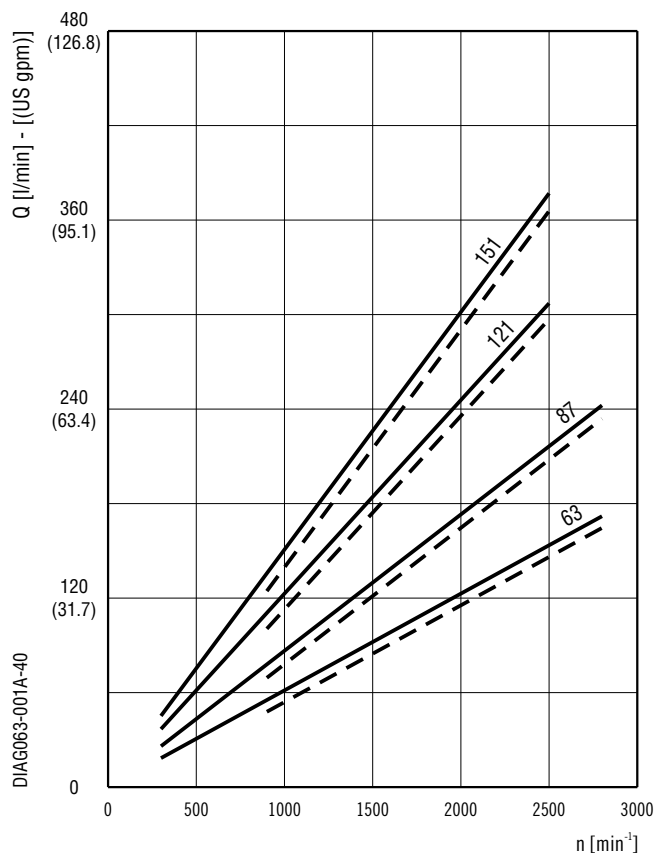
$$P_{\text{OUT}} = \frac{\Delta p \cdot Q}{600} \quad [\text{kW}]$$

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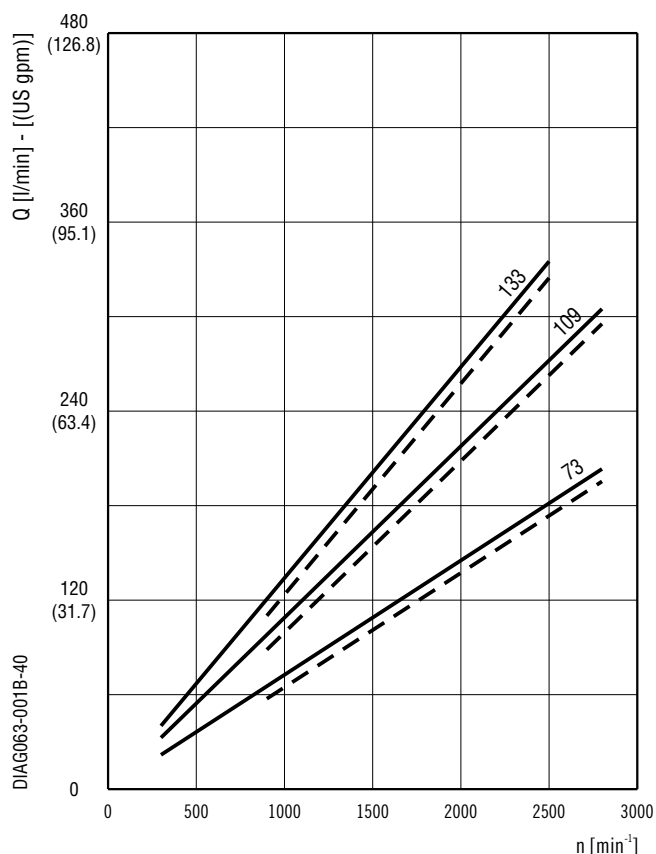
KAPPA 40

GEAR PUMPS PERFORMANCE CURVES

Each curve has been obtained at 50 °C (122 °F), using oil with viscosity 46 cSt (210 SSU) at 40 °C (104 °F) and at these pressures.



KP 40•63	—	20 bar (290 psi)
	- - -	240 bar (3480 psi)
KP 40•87	—	20 bar (290 psi)
	- - -	240 bar (3480 psi)
KP 40•121	—	20 bar (290 psi)
	- - -	210 bar (3600 psi)
KP 40•151	—	20 bar (290 psi)
	- - -	190 bar (2755 psi)



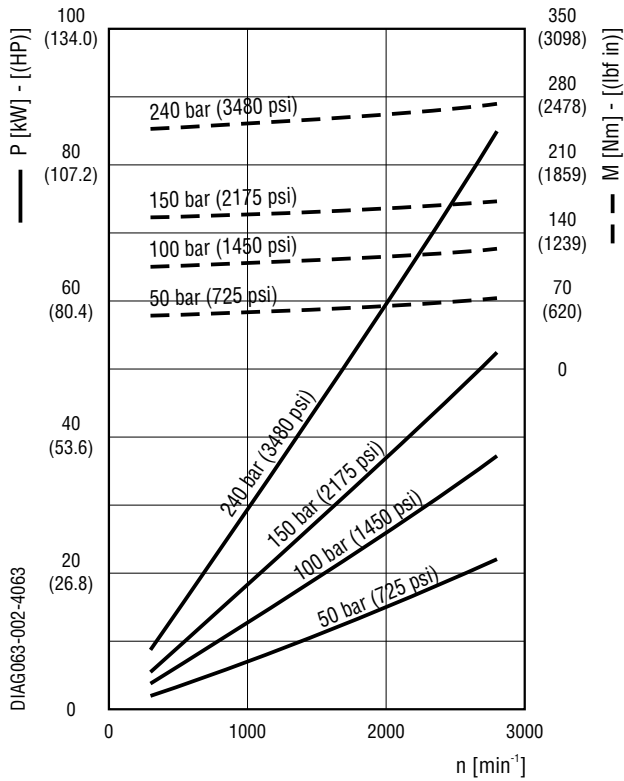
KP 40•73	—	20 bar (290 psi)
	- - -	240 bar (3480 psi)
KP 40•109	—	20 bar (290 psi)
	- - -	230 bar (3335 psi)
KP 40•133	—	20 bar (290 psi)
	- - -	200 bar (2900 psi)

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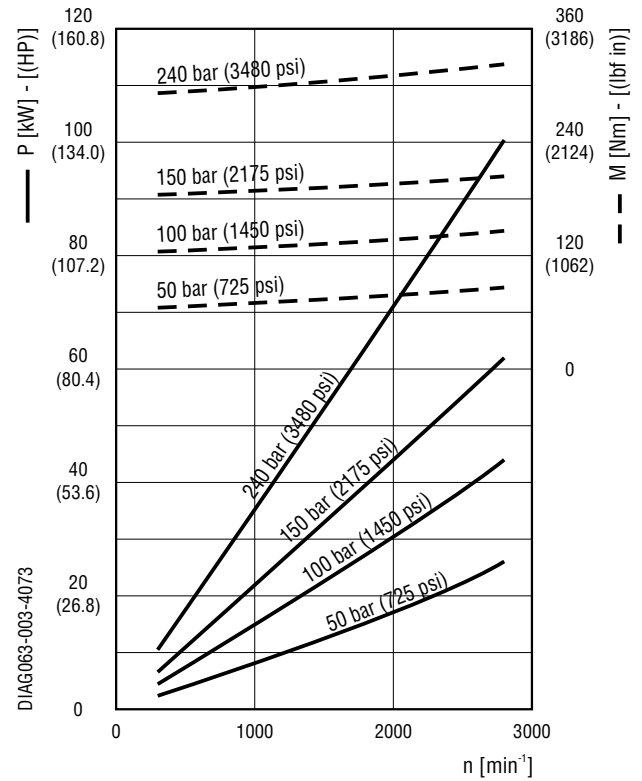
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GEAR PUMPS PERFORMANCE CURVES

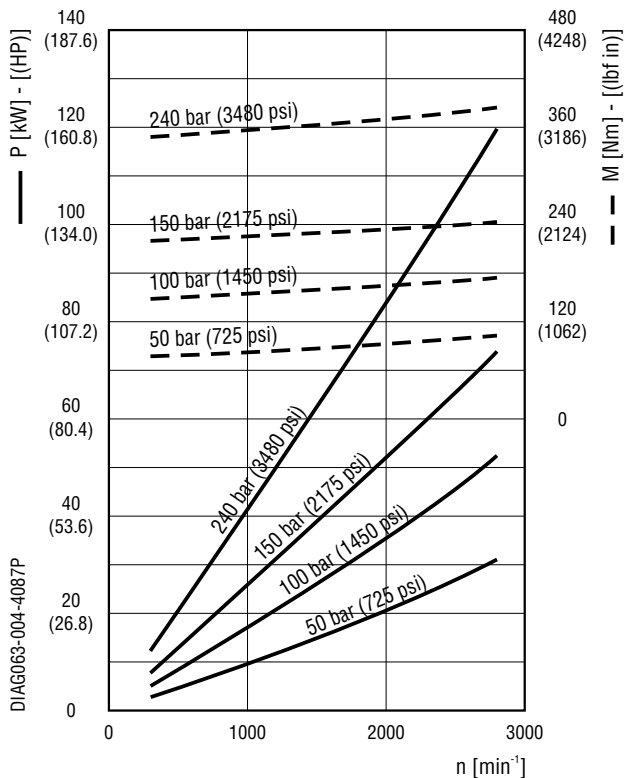
KP 40•63



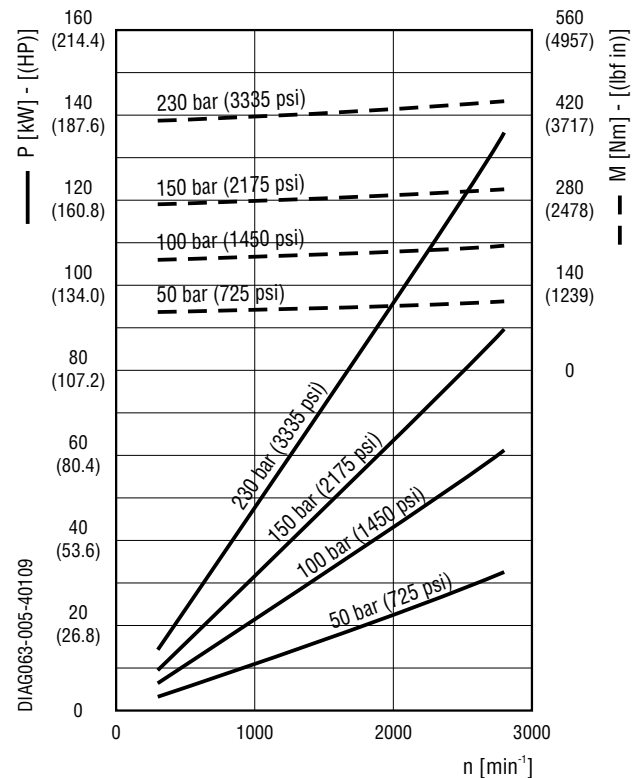
KP 40•73



KP 40•87



KP 40•109

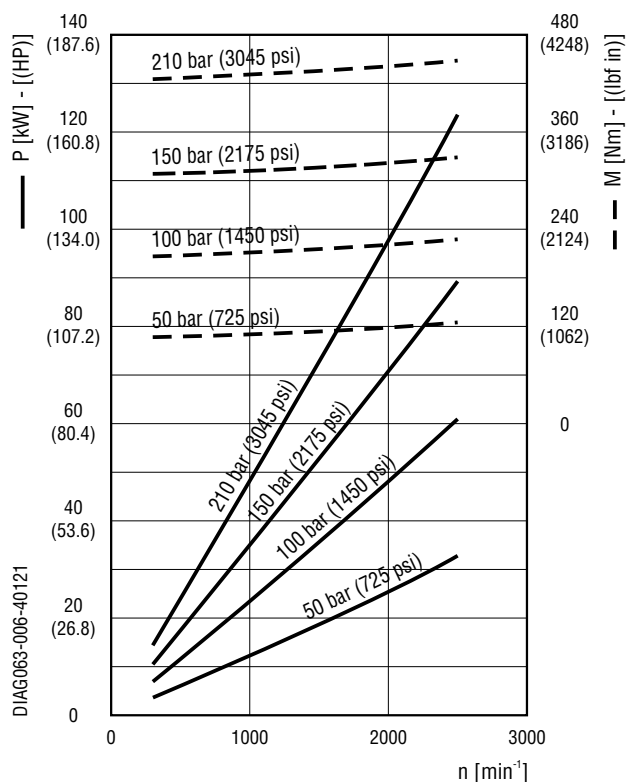


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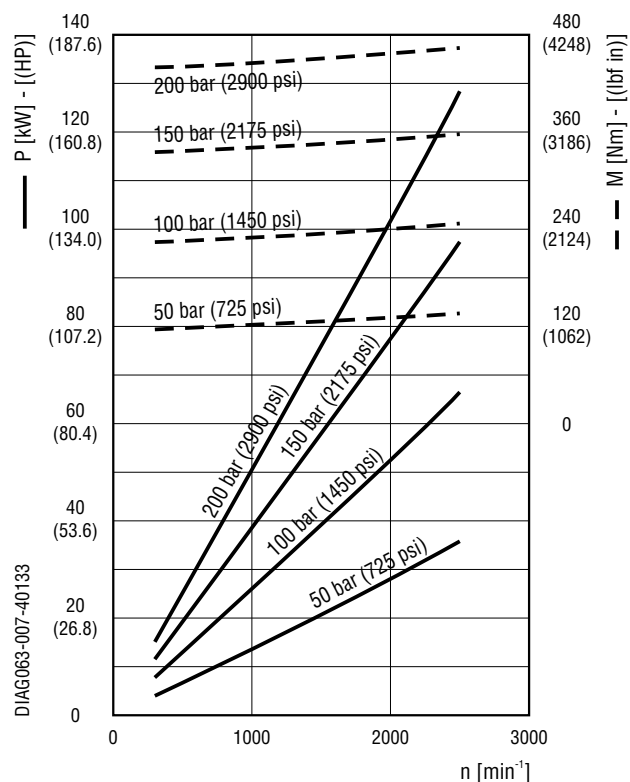
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GEAR PUMPS PERFORMANCE CURVES

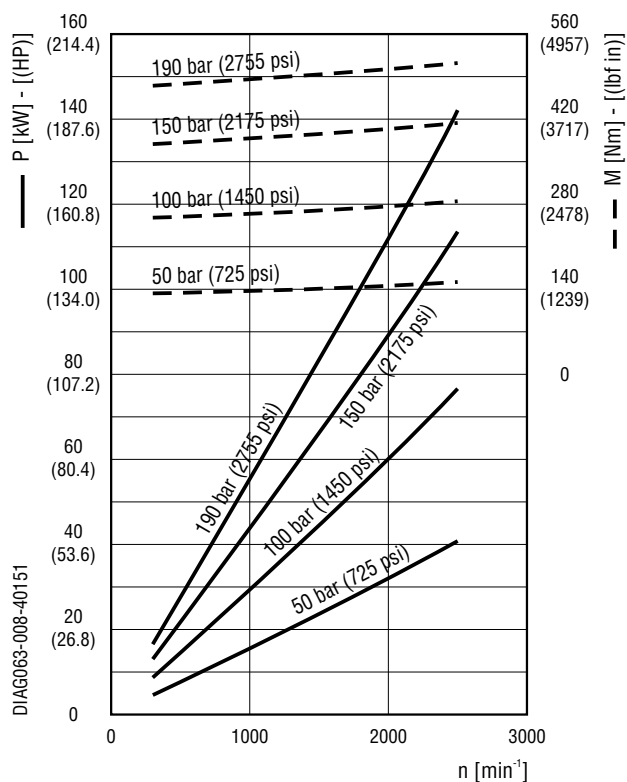
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KP 40•133



KP 40•151

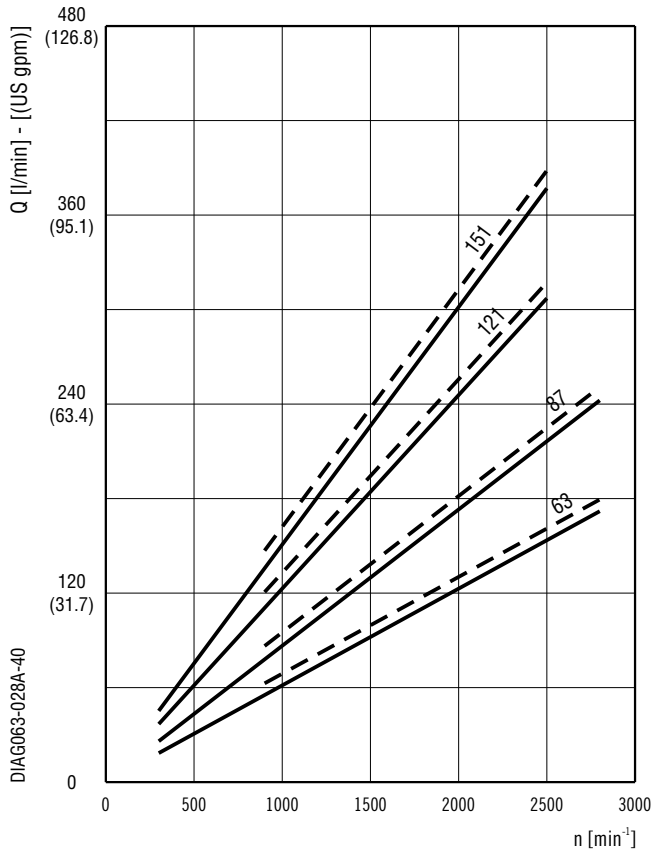


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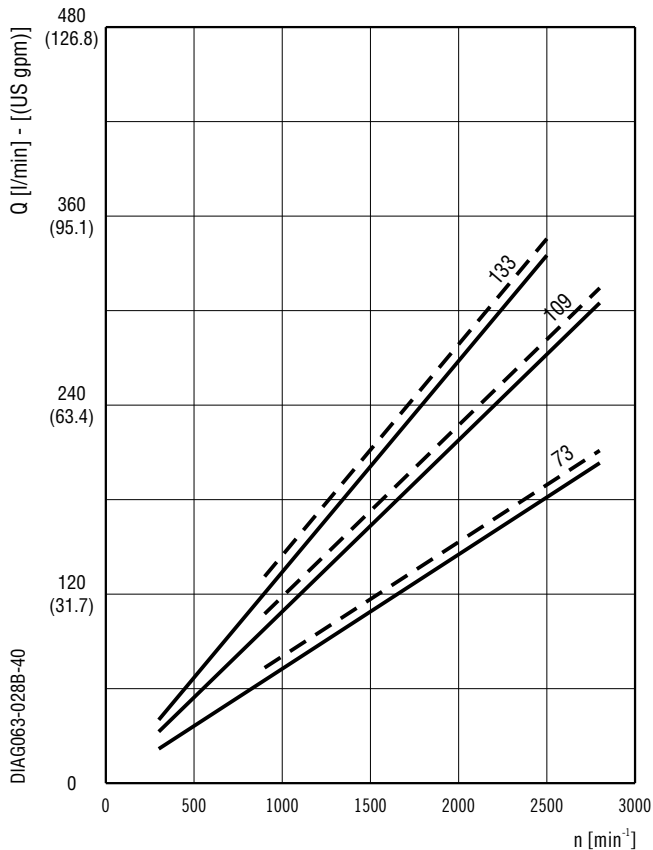
KAPPA 40

GEAR MOTORS PERFORMANCE CURVES

Each curve has been obtained at 50 °C (122 °F), using oil with viscosity 46 cSt (210 SSU) at 40 °C (104 °F) and at these pressures.



KM 40•63	—	20 bar (290 psi)
	- - -	240 bar (3480 psi)
KM 40•87	—	20 bar (290 psi)
	- - -	240 bar (3480 psi)
KM 40•121	—	20 bar (290 psi)
	- - -	210 bar (3600 psi)
KM 40•151	—	20 bar (290 psi)
	- - -	190 bar (2755 psi)



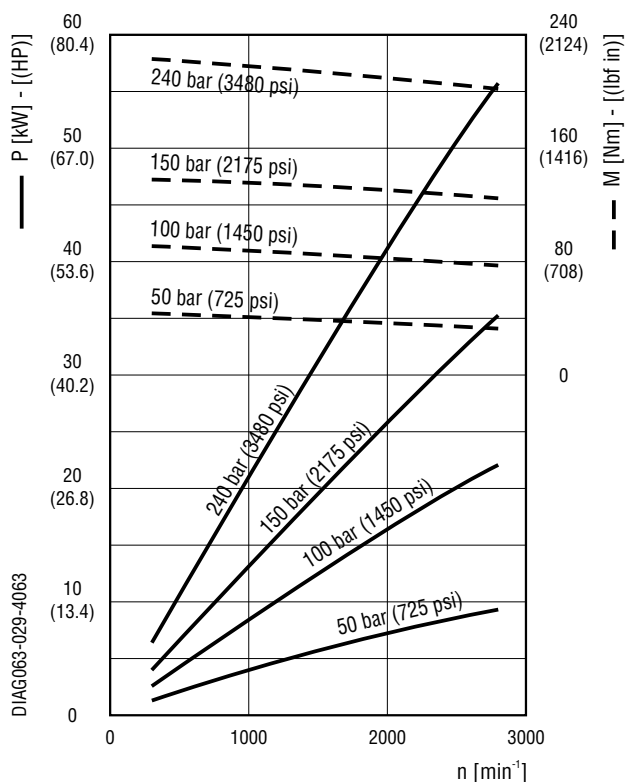
KM 40•73	—	20 bar (290 psi)
	- - -	240 bar (3480 psi)
KM 40•109	—	20 bar (290 psi)
	- - -	230 bar (3335 psi)
KM 40•133	—	20 bar (290 psi)
	- - -	200 bar (2900 psi)

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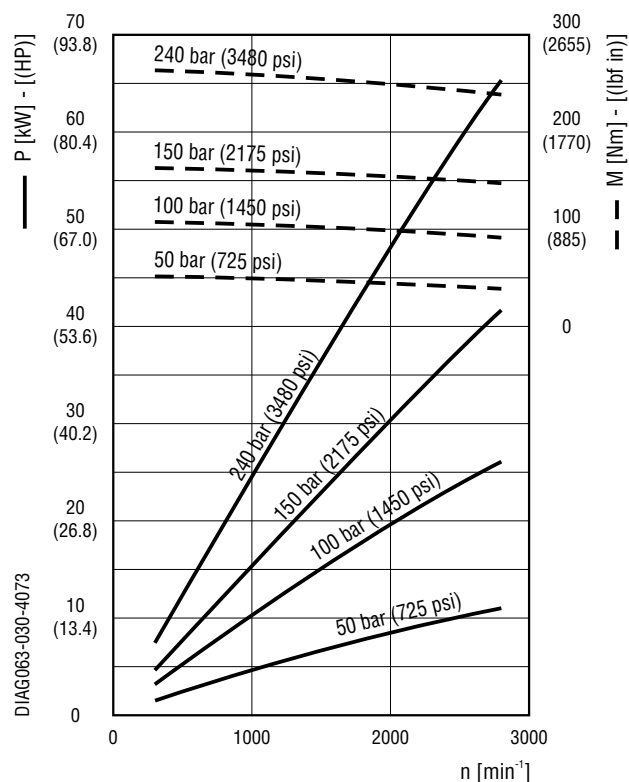
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GEAR MOTORS PERFORMANCE CURVES

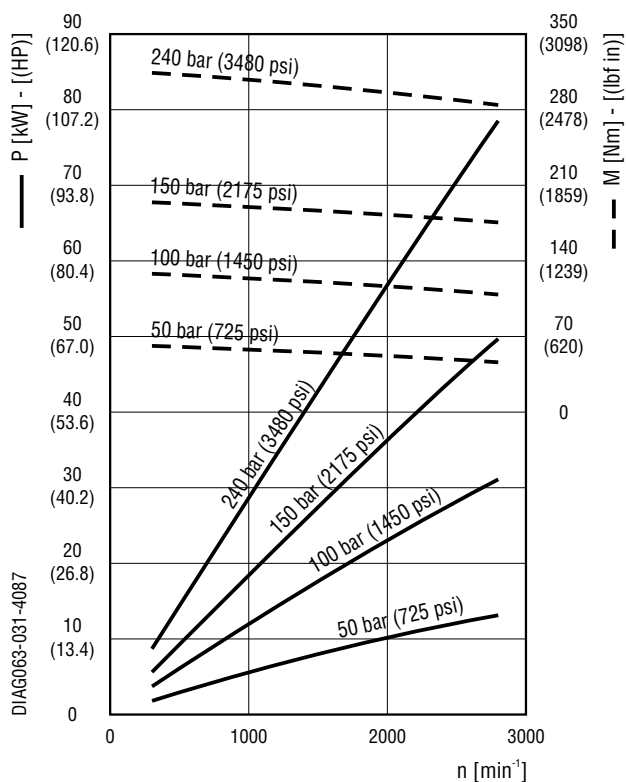
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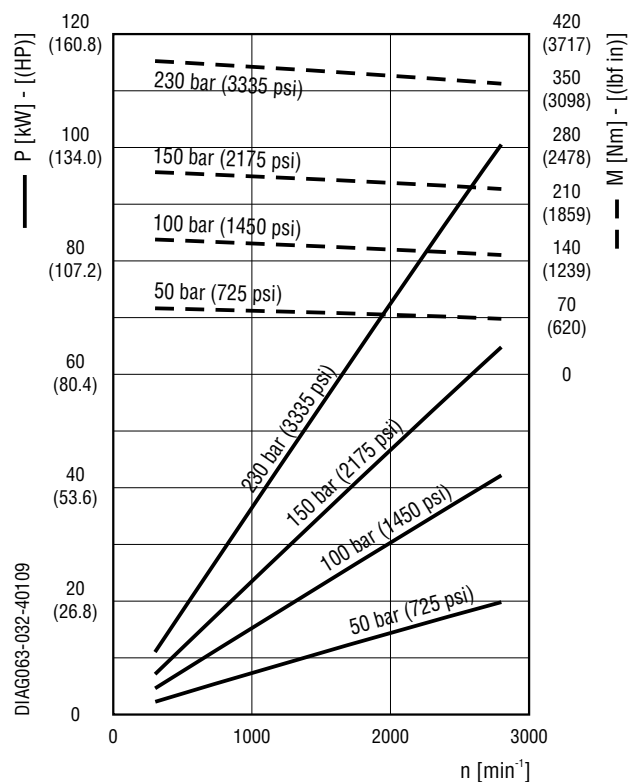
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KM 40•87



KM 40•109

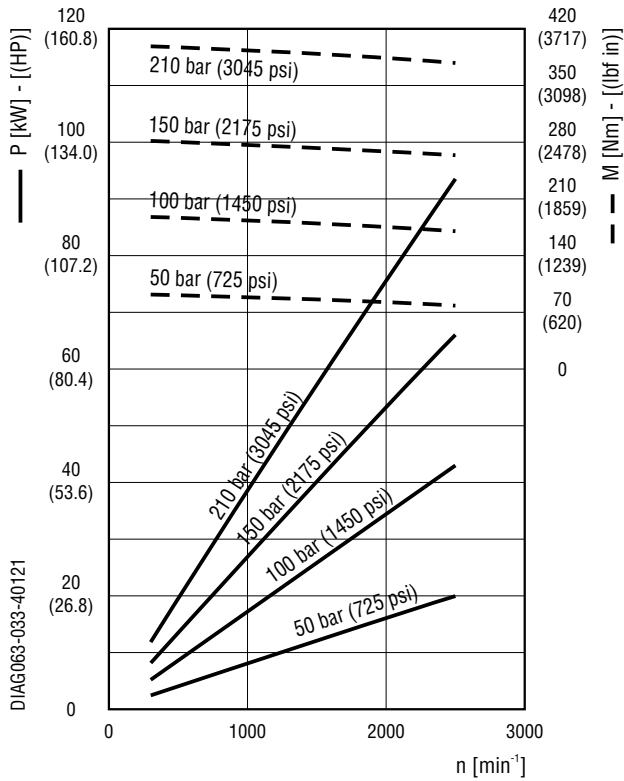


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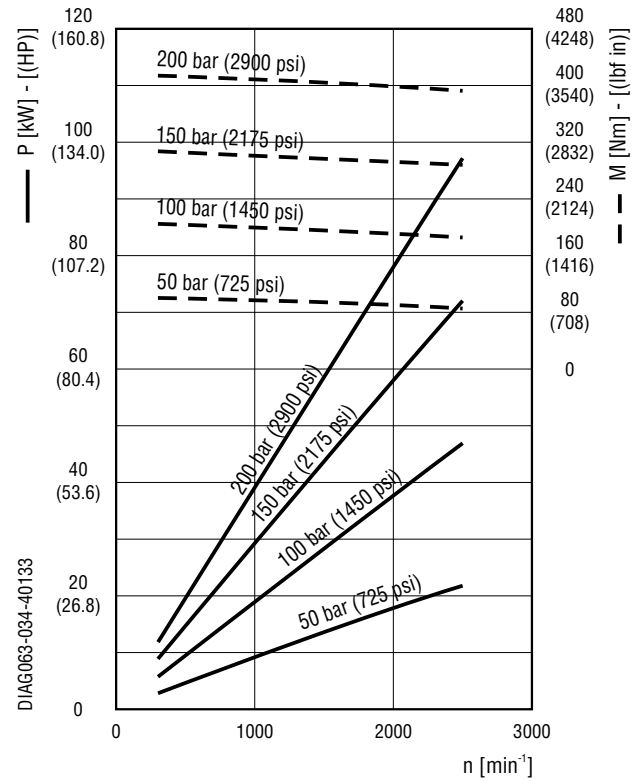
KAPPA 40

GEAR MOTORS PERFORMANCE CURVES

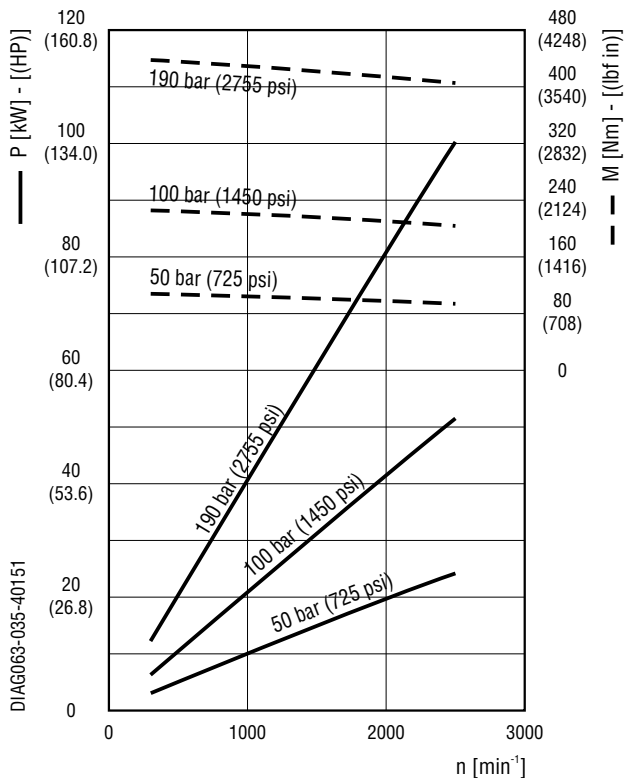
KM 40•121



KM 40•133



KM 40•151

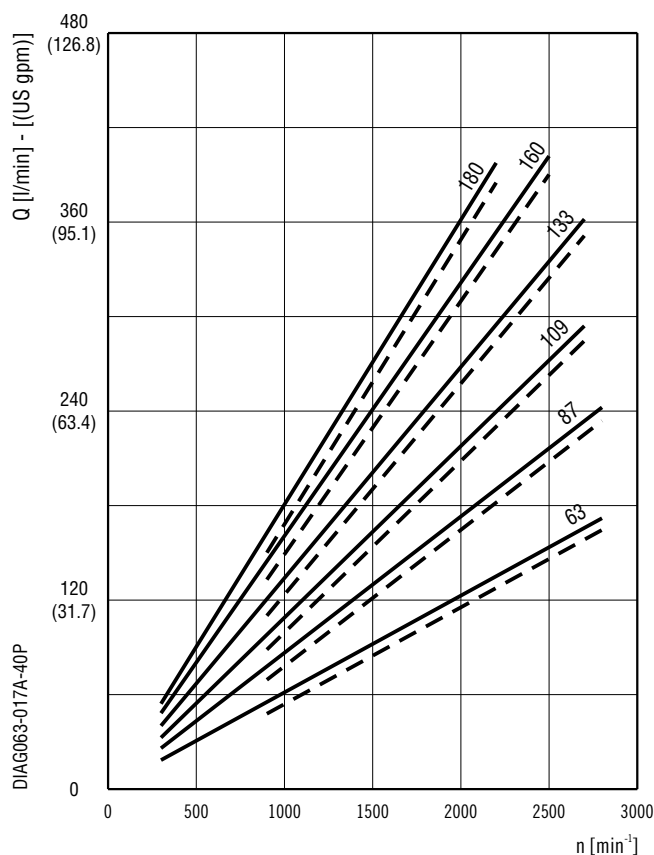


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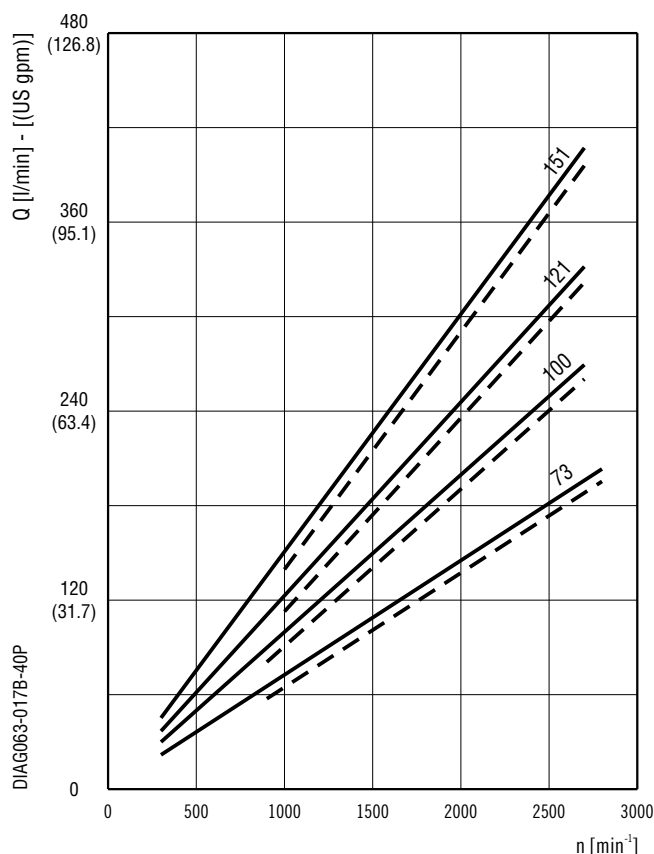
KAPPA 40 Plus

GEAR PUMPS PERFORMANCE CURVES

Each curve has been obtained at 50 °C (122 °F), using oil with viscosity 46 cSt (210 SSU) at 40 °C (104 °F) and at these pressures.



KP 40•63	—	20 bar (290 psi)
	- - -	260 bar (3770 psi)
KP 40•87	—	20 bar (290 psi)
	- - -	260 bar (3770 psi)
KP 40•109	—	20 bar (290 psi)
	- - -	260 bar (3770 psi)
KP 40•133	—	20 bar (290 psi)
	- - -	250 bar (3625 psi)
KP 40•160	—	20 bar (290 psi)
	- - -	230 bar (3335 psi)
KP 40•180	—	20 bar (290 psi)
	- - -	230 bar (3335 psi)



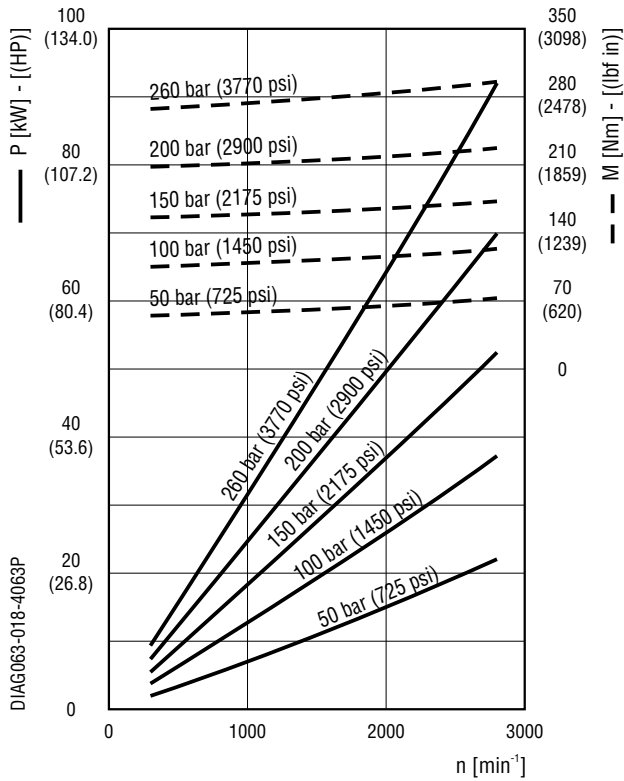
KP 40•73	—	20 bar (290 psi)
	- - -	260 bar (3770 psi)
KP 40•100	—	20 bar (290 psi)
	- - -	260 bar (3770 psi)
KP 40•121	—	20 bar (290 psi)
	- - -	260 bar (3770 psi)
KP 40•151	—	20 bar (290 psi)
	- - -	240 bar (3480 psi)

01/09.2019

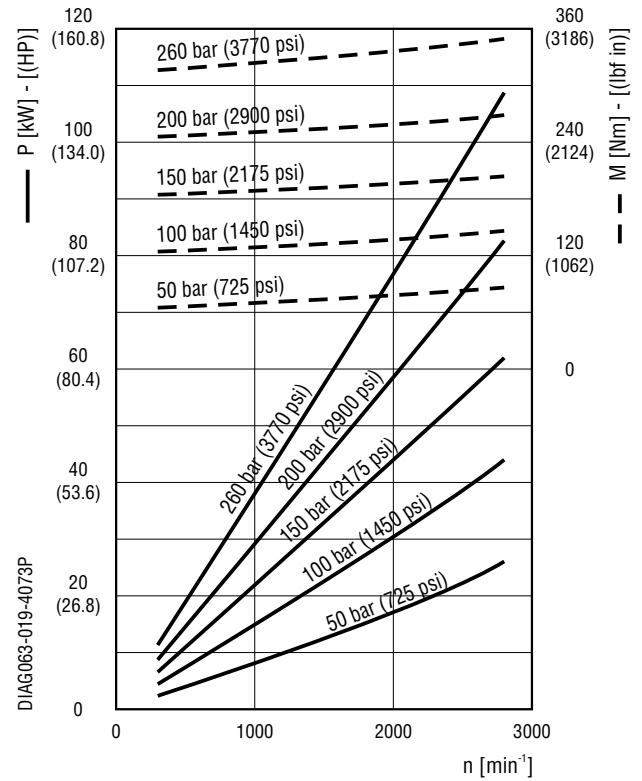
KAPPA 40 Plus

GEAR PUMPS PERFORMANCE CURVES

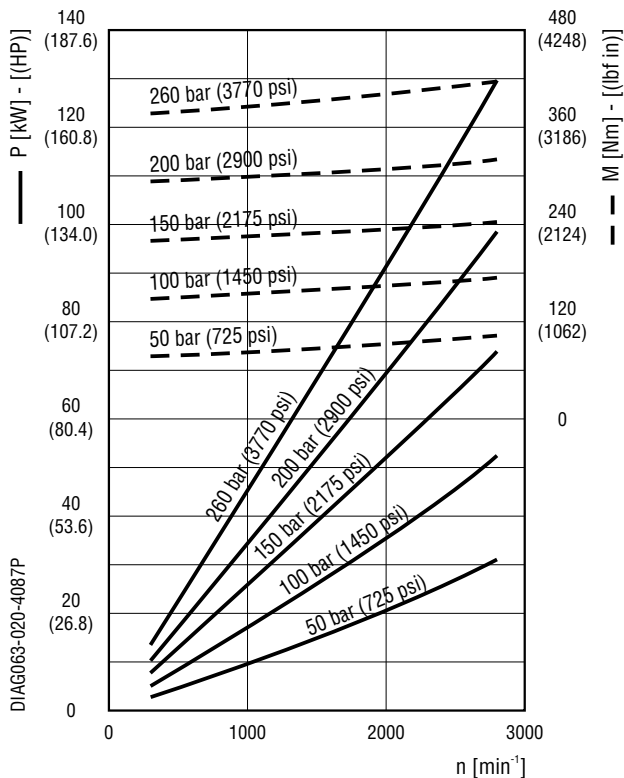
KP 40•63



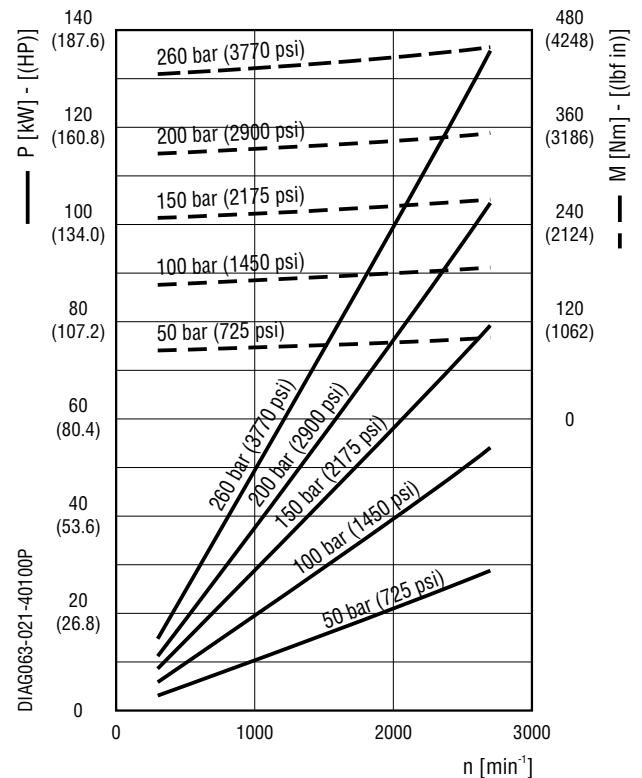
KP 40•73



KP 40•87



KP 40•100

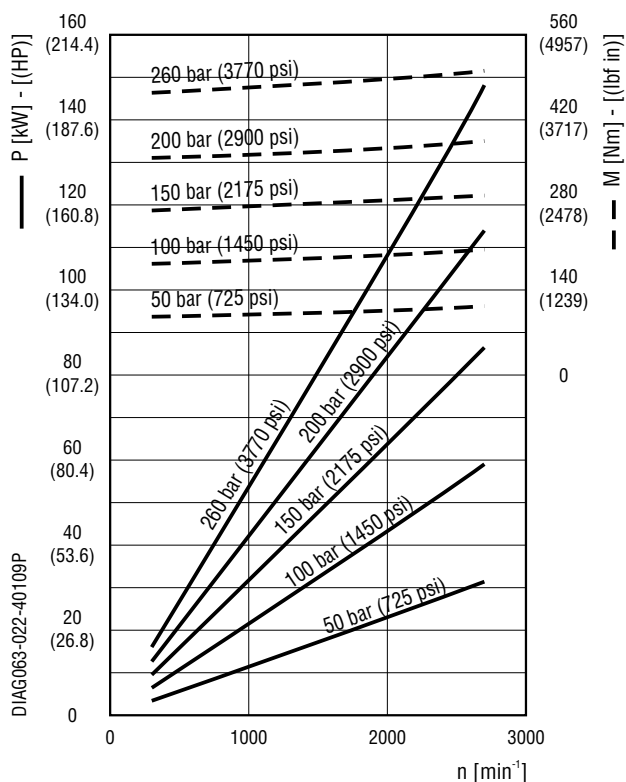


01/09.2019

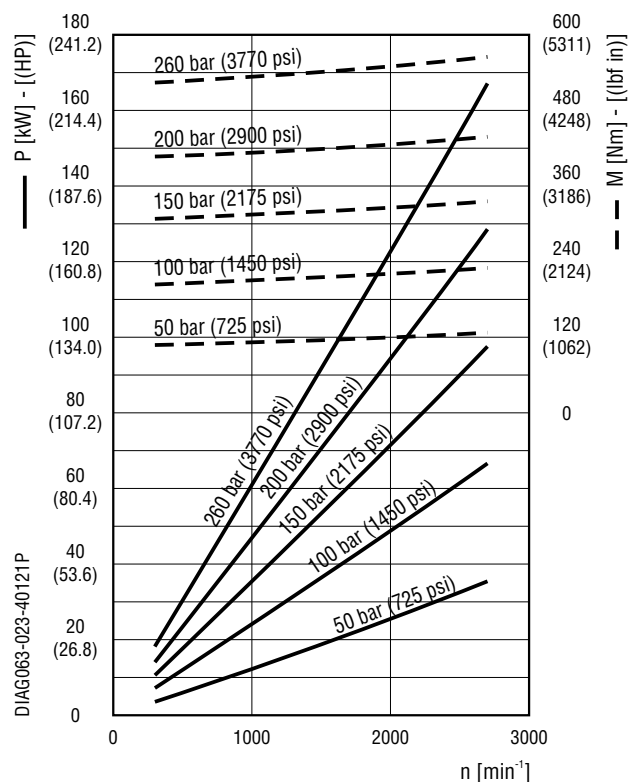
KAPPA 40 Plus

GEAR PUMPS PERFORMANCE CURVES

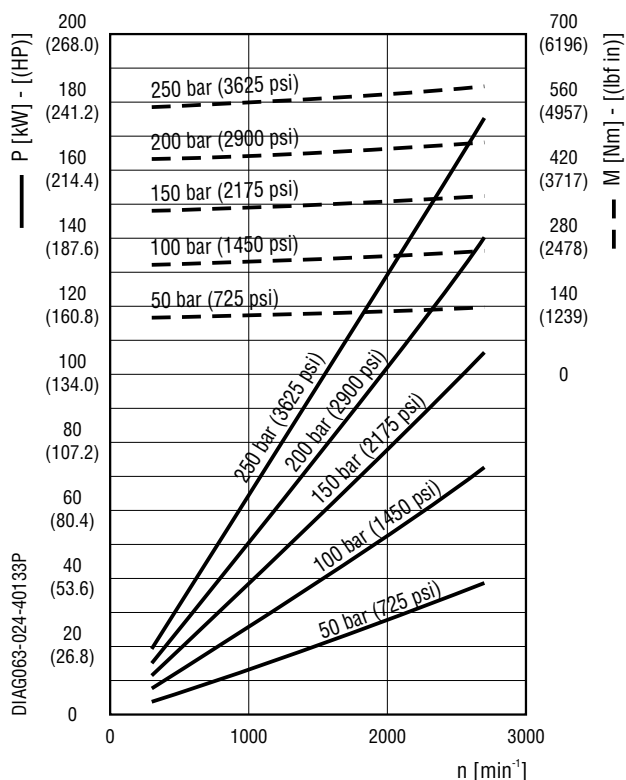
KP 40•109



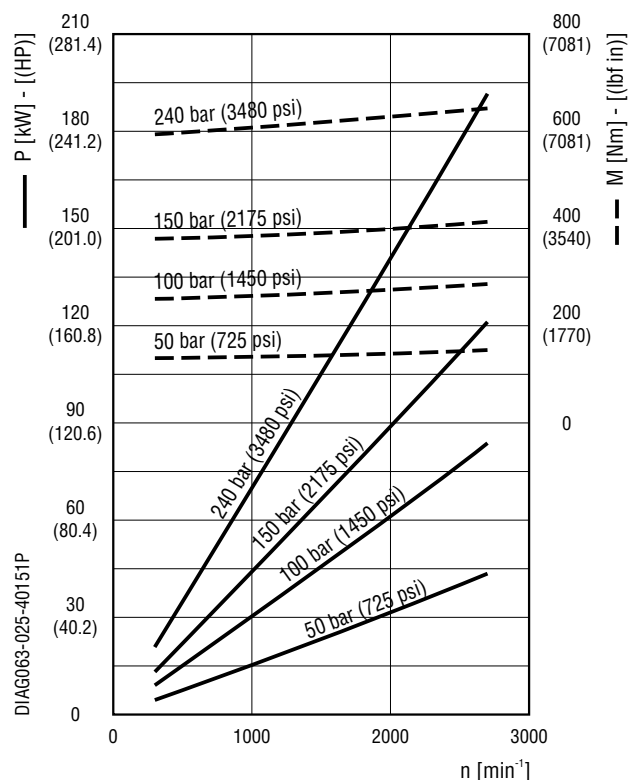
KP 40•121



KP 40•133



KP 40•151

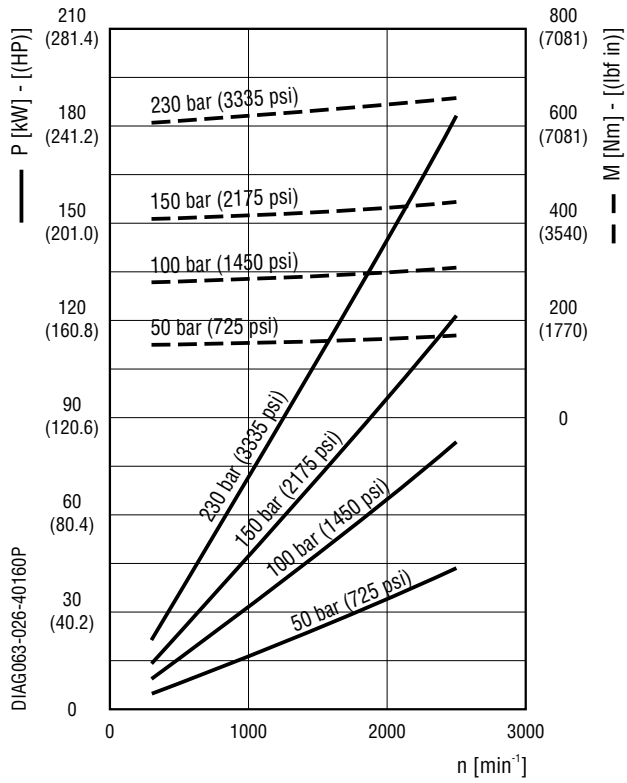


01/09.2019

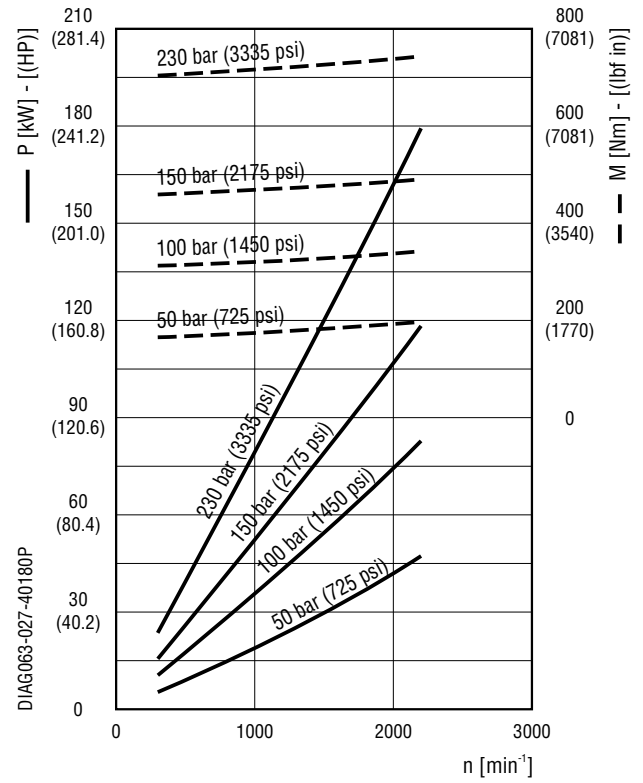
KAPPA 40 Plus

GEAR PUMPS PERFORMANCE CURVES

KP 40•160



KP 40•180

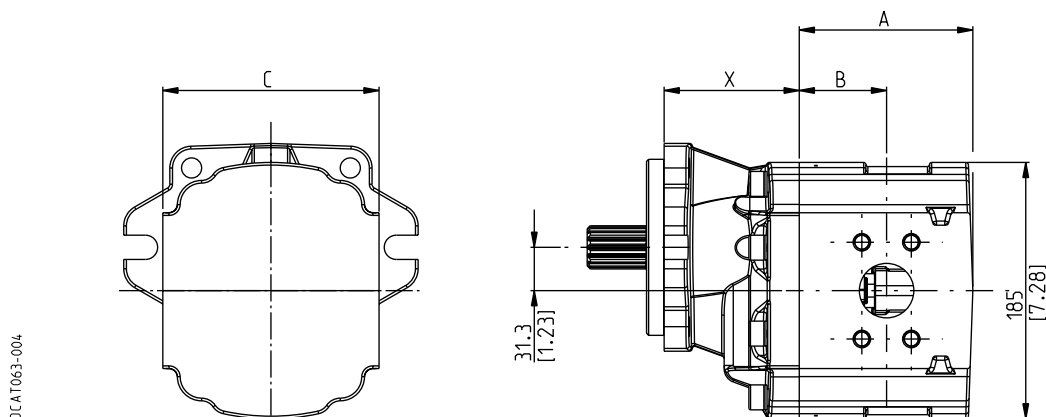
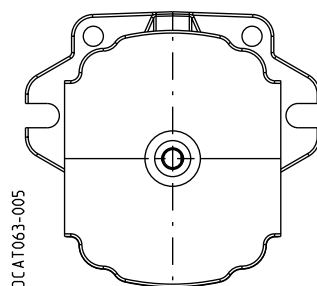


01/09.2019

KAPPA 40
SINGLE UNITS DIMENSIONS - SIDE PORTS
CSC

 Body design: CSC
 Characteristics: Standard

 Drive shaft: see pages 32
 Mounting flange: for X dimension see
 pages 34

 Ports availability: Split, Gas, SAE
 See page 36

Single rotation S - D and Reversible B

Reversible R

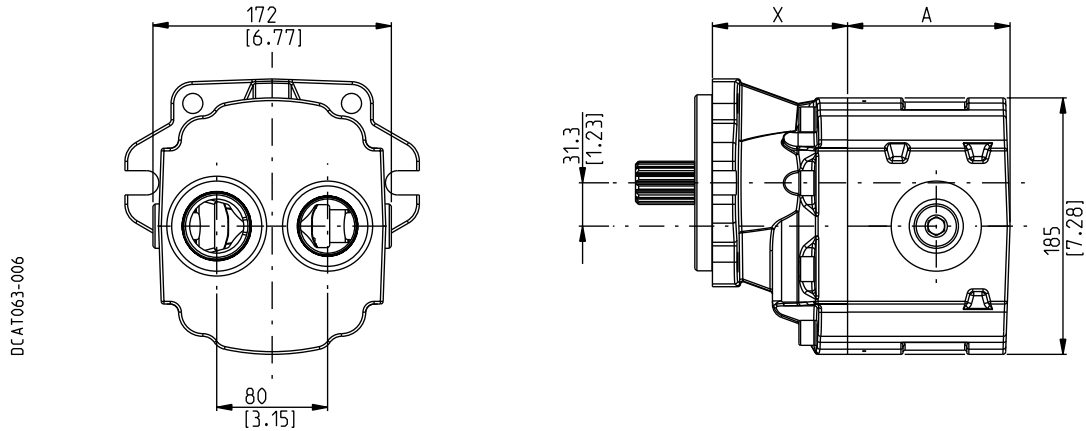
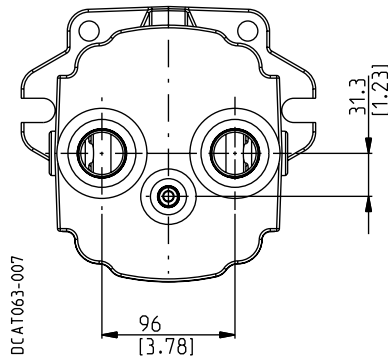
01/09.2019

Pump type Motor type	A	B	C	
			Split ports	Gas - SAE ports
	mm (in)	mm (in)	mm (in)	mm (in)
K. 40•63	108 (4.26)	55 (2.17)	156 (6.14)	164 (6.46)
K. 40•73	112 (4.41)	59 (2.32)	156 (6.14)	164 (6.46)
K. 40•87	117 (4.61)	64 (2.52)	156 (6.14)	164 (6.46)
K. 40•109	125 (4.92)	63 (2.48)	156 (6.14)	164 (6.46)
K. 40•121	130 (5.12)	68 (2.68)	156 (6.14)	164 (6.46)
K. 40•133	134 (5.28)	72 (2.83)	156 (6.14)	164 (6.46)
K. 40•151	140 (5.51)	78 (3.07)	156 (6.14)	164 (6.46)

KAPPA 40
SINGLE UNITS DIMENSIONS - REAR PORTS
CSC

 Body design: CSC
 Characteristics: Standard

 Drive shaft: see pages 32
 Mounting flange: for X dimension see
 pages 34

 Ports availability: Gas, SAE
 See page 36

Single rotation S - D and Reversible B

Reversible R

 Pump type
 Motor type

A

mm (in)

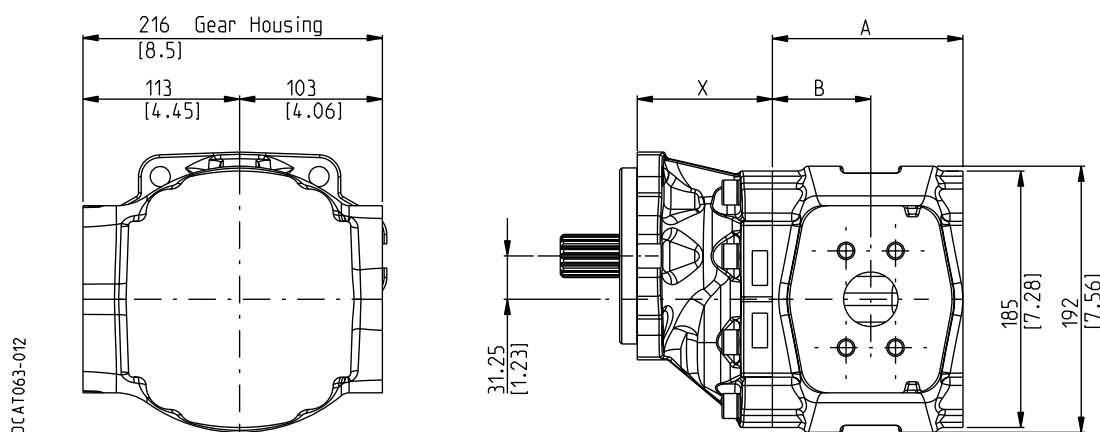
K. 40•63	108 (4.26)
K. 40•73	112 (4.41)
K. 40•87	117 (4.61)
K. 40•109	125 (4.92)
K. 40•121	130 (5.12)
K. 40•133	134 (5.28)
K. 40•151	140 (5.51)

01/09.2019

KAPPA 40 Plus
SINGLE PUMPS DIMENSIONS - SIDE PORTS
CSL

 Body design: CSL
 Characteristics: Standard

 Drive shaft: see pages 33
 Mounting flange: for X dimension see
 pages 35

 Ports availability: Split
 See page 37

Single rotation S - D

01/09.2019

Pump type	A	B
	mm (in)	mm (in)
KP 40•63	120 (4.72)	60 (2.36)
KP 40•73	124 (4.88)	64 (2.52)
KP 40•87	129 (5.08)	69 (2.72)
KP 40•100	134 (5.28)	68 (2.68)
KP 40•109	137 (5.39)	71 (2.80)
KP 40•121	142 (5.59)	76 (2.99)
KP 40•133	146 (5.75)	80 (3.15)
KP 40•151	152 (5.98)	71 (2.80)
KP 40•160	156 (6.14)	75 (2.95)
KP 40•180	163,2 (6.43)	82,2 (3.24)

MULTIPLE PUMPS

KAPPA series pumps can be coupled together in combination. In applications where the input power requirement of each section varies, the section with the greater requirement must be at the drive shaft end, and progressively smaller to the rear.

Features and performances are the same as the corresponding single pumps, but pressures must be limited by the transmissible torque of the drive and connecting shafts. To have appropriate data, use the formula below.

The maximum rotational speed is that of the lowest rated speed of the single units incorporated.

Available with common inlet. For more information please consult our pre-sales department.

M	Nm (lbf in)	Torque
V	cm ³ /rev (in ³ /rev)	Displacement
Δp	bar (psi)	Pressure
$\eta_{hm} = \eta_{hm}(V, \Delta p, n)$	(≈ 0,88)	Hydro-mechanical efficiency

$$M = \frac{M_{theor.}}{\eta_{hm}} \text{ [Nm]}$$

$$M_{theor.} = \frac{\Delta p \text{ (bar)} \cdot V \text{ (cm}^3\text{/rev)}}{62,83} \text{ [Nm]}$$

Note:

The torque absorbed from the shaft of the first pump results from the sum of the torques due to all single stages. The achieved value must not exceed the maximum torque limit given for the shaft of the first pump.

For multiple pumps with more than two sections we recommend to use a bracket.

01/09.2019

KAPPA 40

MULTIPLE PUMPS DIMENSIONS - SAME GROUPS

CSL/CSL/CSC

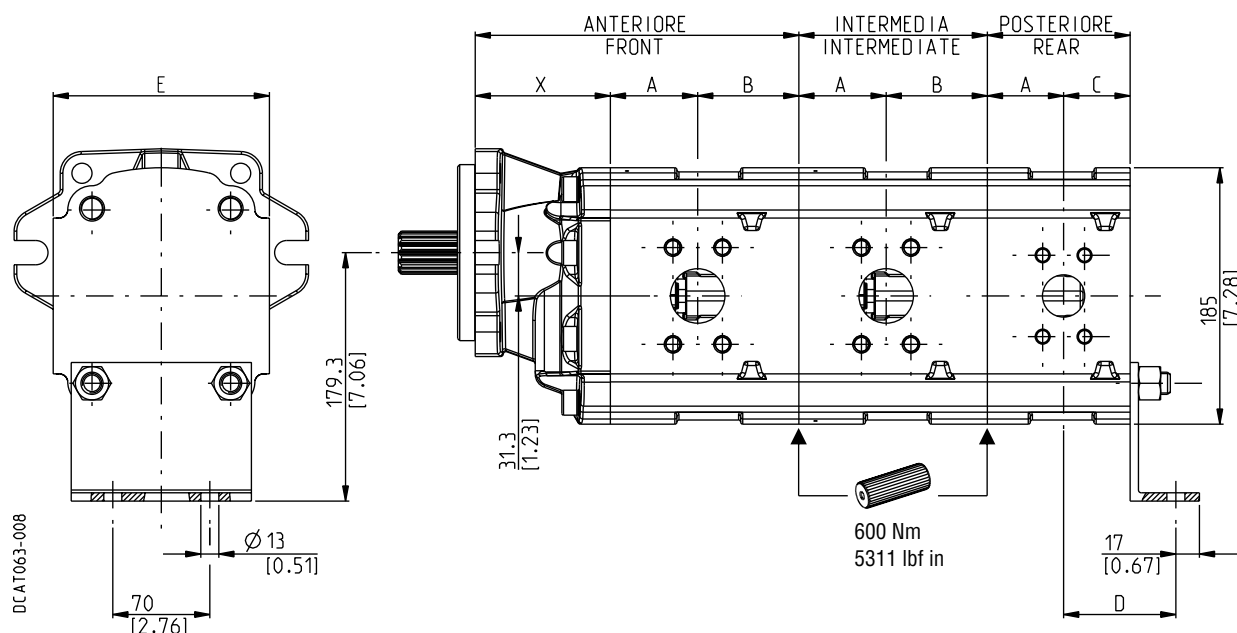
Characteristics: Standard

Drive shafts: page 32

Mounting flange: for X dimension see
page 34

Ports availability: Split, Gas, SAE

See page 36



	Front	Intermediate	Rear
Body design	CSL	CSL	CSC

For multiple pumps with more than two sections we recommend to use a bracket.

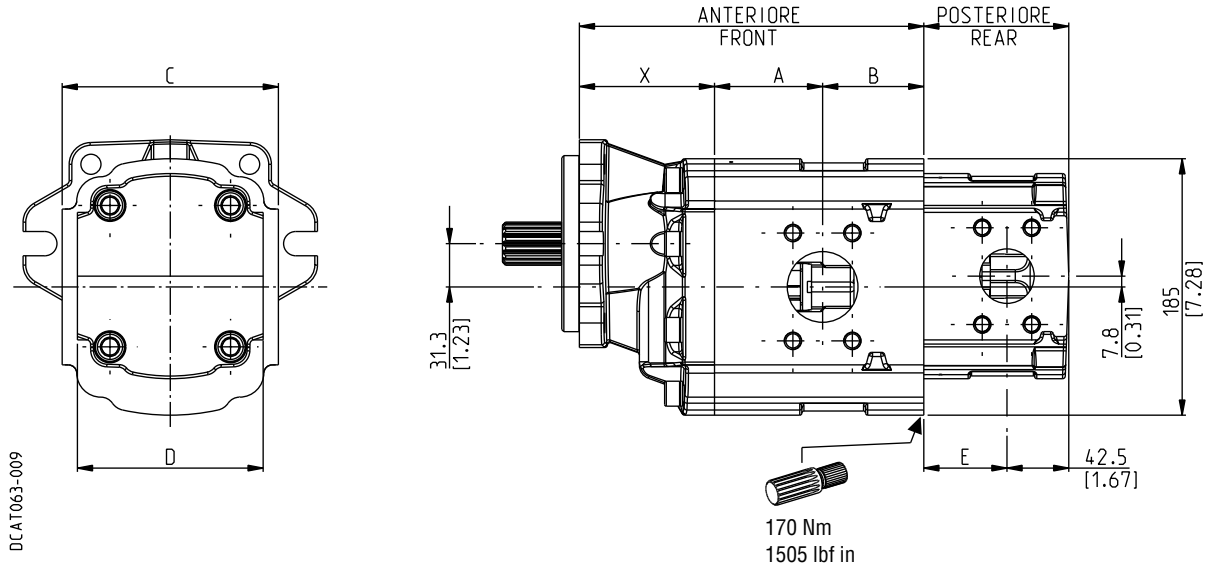
Pump type	A	B	C	D	E	
					Split ports	Gas - SAE ports
	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)
KP 40•63	55 (2.17)	64 (2.52)	48 (1.89)	81 (3.19)	156 (6.14)	164 (6.46)
KP 40•73	59 (2.32)	64 (2.52)	48 (1.89)	81 (3.19)	156 (6.14)	164 (6.46)
KP 40•87	64 (2.52)	64 (2.52)	48 (1.89)	81 (3.19)	156 (6.14)	164 (6.46)
KP 40•109	63 (2.48)	73 (2.87)	57 (2.24)	90 (3.54)	156 (6.14)	164 (6.46)
KP 40•121	68 (2.68)	73 (2.87)	57 (2.24)	90 (3.54)	156 (6.14)	164 (6.46)
KP 40•133	72 (2.83)	73 (2.87)	57 (2.24)	90 (3.54)	156 (6.14)	164 (6.46)
KP 40•151	78 (3.07)	73 (2.87)	57 (2.24)	90 (3.54)	156 (6.14)	164 (6.46)

01/09.2019

KAPPA 40
DOUBLE PUMPS DIMENSIONS - KP40/30
CSL/CSC

Characteristics: Standard

 Drive shafts: page 32
 Mounting flange: for X dimension see
 page 34

 Ports availability: Split, Gas, SAE
 See page 36


	Front	Rear
Body design	CSL	Kappa 30 Series CSC (●)

 (●) Available also with body design **BSC** and **HSC**.

For features please consult the proper technical catalog

Pump type	C			
	A	B	Split ports	Gas - SAE ports
	mm (in)	mm (in)	mm (in)	mm (in)
KP 40•63	55 (2.17)	64 (2.52)	156 (6.14)	164 (6.46)
KP 40•73	59 (2.32)	64 (2.52)	156 (6.14)	164 (6.46)
KP 40•87	64 (2.52)	64 (2.52)	156 (6.14)	164 (6.46)
KP 40•109	63 (2.48)	73 (2.87)	156 (6.14)	164 (6.46)
KP 40•121	68 (2.68)	73 (2.87)	156 (6.14)	164 (6.46)
KP 40•133	72 (2.83)	73 (2.87)	156 (6.14)	164 (6.46)
KP 40•151	78 (3.07)	73 (2.87)	156 (6.14)	164 (6.46)

Pump type	D		E
	Eur. - Split ports	Gas - SAE ports	
	mm (in)	mm (in)	mm (in)
KP 30•22	134 (5.28)	142 (5.59)	38 (1.50)
KP 30•27	134 (5.28)	142 (5.59)	41 (1.61)
KP 30•31	134 (5.28)	142 (5.59)	43,5 (1.71)
KP 30•34	134 (5.28)	142 (5.59)	46 (1.81)
KP 30•38	134 (5.28)	142 (5.59)	49 (1.93)
KP 30•41	134 (5.28)	142 (5.59)	50,5 (1.99)
KP 30•43	134 (5.28)	142 (5.59)	52 (2.05)
KP 30•46	134 (5.28)	142 (5.59)	53,5 (2.11)
KP 30•51	134 (5.28)	142 (5.59)	57 (2.24)
KP 30•56	134 (5.28)	142 (5.59)	60 (2.36)
KP 30•61	134 (5.28)	142 (5.59)	63 (2.48)
KP 30•73	134 (5.28)	142 (5.59)	71 (2.80)

01/09.2019

KAPPA 40
DOUBLE PUMPS DIMENSIONS - KP40/PHP20
CSC

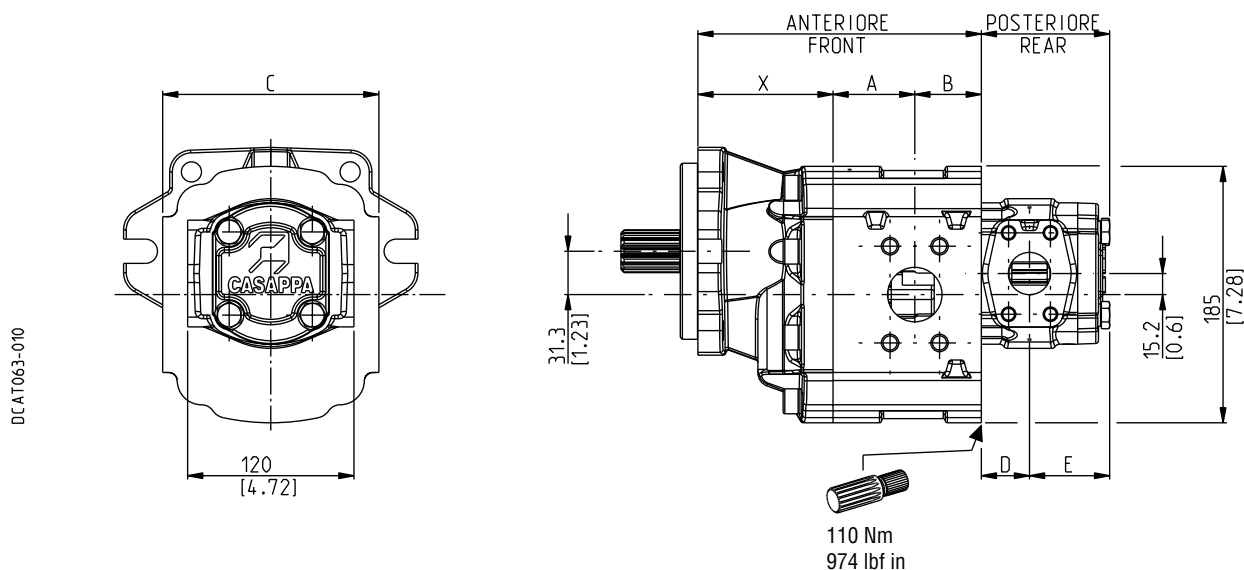
Characteristics: Standard

Drive shafts: page 32

 Mounting flange: for X dimension see
 page 34

Ports availability: Split, Gas, SAE

See page 36



	Front	Rear
Body design	CSC	Polaris PH Series (●)

(●) For features please consult the proper technical catalog

Pump type	C		Split ports	Gas - SAE ports
	A	B		
	mm (in)	mm (in)	mm (in)	mm (in)
KP 40•63	55 (2.17)	48 (1.89)	156 (6.14)	164 (6.46)
KP 40•73	59 (2.32)	48 (1.89)	156 (6.14)	164 (6.46)
KP 40•87	64 (2.52)	48 (1.89)	156 (6.14)	164 (6.46)
KP 40•109	63 (2.48)	57 (2.24)	156 (6.14)	164 (6.46)
KP 40•121	68 (2.68)	57 (2.24)	156 (6.14)	164 (6.46)
KP 40•133	72 (2.83)	57 (2.24)	156 (6.14)	164 (6.46)
KP 40•151	78 (3.07)	57 (2.24)	156 (6.14)	164 (6.46)

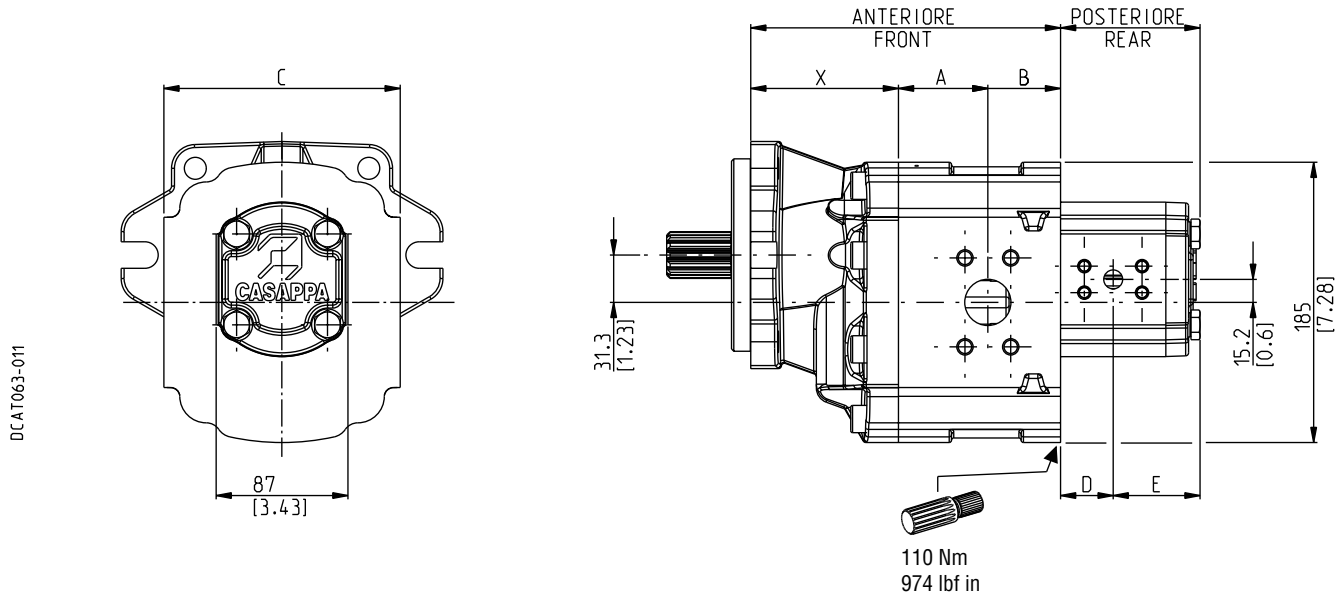
Pump type	D	E
	mm (in)	mm (in)
PHP 20•8	32,5 (1.28)	47,6 (1.87)
PHP 20•10,5	36,5 (1.44)	47,6 (1.87)
PHP 20•11,2	37 (1.46)	47,6 (1.87)
PHP 20•14	42 (1.65)	47,6 (1.87)
PHP 20•16	34,75 (1.37)	58,35 (2.30)
PHP 20•18	35,85 (1.41)	59,45 (2.34)
PHP 20•19	36,45 (1.44)	60,05 (2.36)
PHP 20•20	38 (1.50)	61,6 (2.43)
PHP 20•23	39,65 (1.56)	63,25 (2.49)
PHP 20•24,5	40,8 (1.61)	64,4 (2.54)
PHP 20•25	42 (1.65)	65,6 (2.58)
PHP 20•27,8	43,35 (1.71)	66,95 (2.64)
PHP 20•31,5	47 (1.85)	70,6 (2.78)

01/09.2019

KAPPA 40
DOUBLE PUMPS DIMENSIONS - KP40/PLP20
CSC

Characteristics: Standard

 Drive shafts: page 32
 Mounting flange: for X dimension see
 page 34

 Ports availability: Split, Gas, SAE
 See page 36


	Front	Rear
Body design	CSC	Polaris 20 Series (●)

(●) For features please consult the proper technical catalog

Pump type	A	B	C	
			Split ports	Gas - SAE ports
	mm (in)	mm (in)	mm (in)	mm (in)
KP 40•63	55 (2.17)	48 (1.89)	156 (6.14)	164 (6.46)
KP 40•73	59 (2.32)	48 (1.89)	156 (6.14)	164 (6.46)
KP 40•87	64 (2.52)	48 (1.89)	156 (6.14)	164 (6.46)
KP 40•109	63 (2.48)	57 (2.24)	156 (6.14)	164 (6.46)
KP 40•121	68 (2.68)	57 (2.24)	156 (6.14)	164 (6.46)
KP 40•133	72 (2.83)	57 (2.24)	156 (6.14)	164 (6.46)
KP 40•151	78 (3.07)	57 (2.24)	156 (6.14)	164 (6.46)

Pump type	D	E
	mm (in)	mm (in)
PLP 20•4	25,8 (1.02)	49,3 (1.94)
PLP 20•6,3	27 (1.06)	50,5 (1.99)
PLP 20•7,2	27,5 (1.08)	51 (2.01)
PLP 20•8	28,3 (1.11)	51,8 (2.04)
PLP 20•9	28,9 (1.14)	52,4 (2.06)
PLP 20•10,5	30,3 (1.19)	53,8 (2.12)
PLP 20•11,2	30,5 (1.20)	54 (2.13)
PLP 20•14	33 (1.30)	56,5 (2.22)
PLP 20•16	34,8 (1.37)	58,3 (2.30)
PLP 20•19	36,5 (1.44)	60 (2.36)
PLP 20•20	38 (1.50)	61,5 (2.42)
PLP 20•24,5	40,8 (1.61)	64,3 (2.53)
PLP 20•25	42 (1.65)	65,5 (2.58)
PLP 20•27,8	43,4 (1.71)	66,9 (2.63)
PLP 20•31,5	47 (1.85)	70,5 (2.78)

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KAPPA 40 Plus
DOUBLE PUMPS DIMENSIONS - SAME GROUPS
CSL/CSL

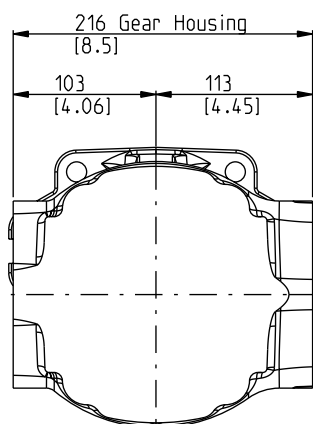
Characteristics: Standard

Drive shafts: page 33

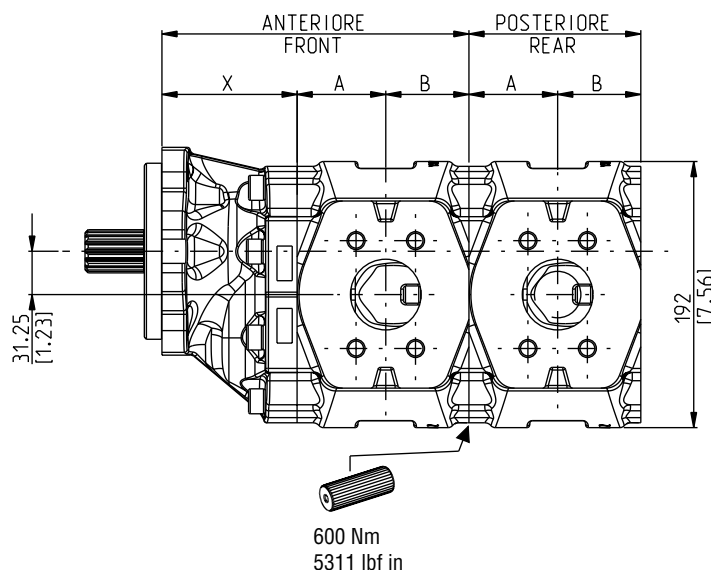
 Mounting flange: for X dimension see
 page 35

Ports availability: Split

See page 37



DCAT063-013



	Front	Rear
Body design	CSL	CSL

 For multiple pumps with more than two sections we recommend
 to use a bracket.

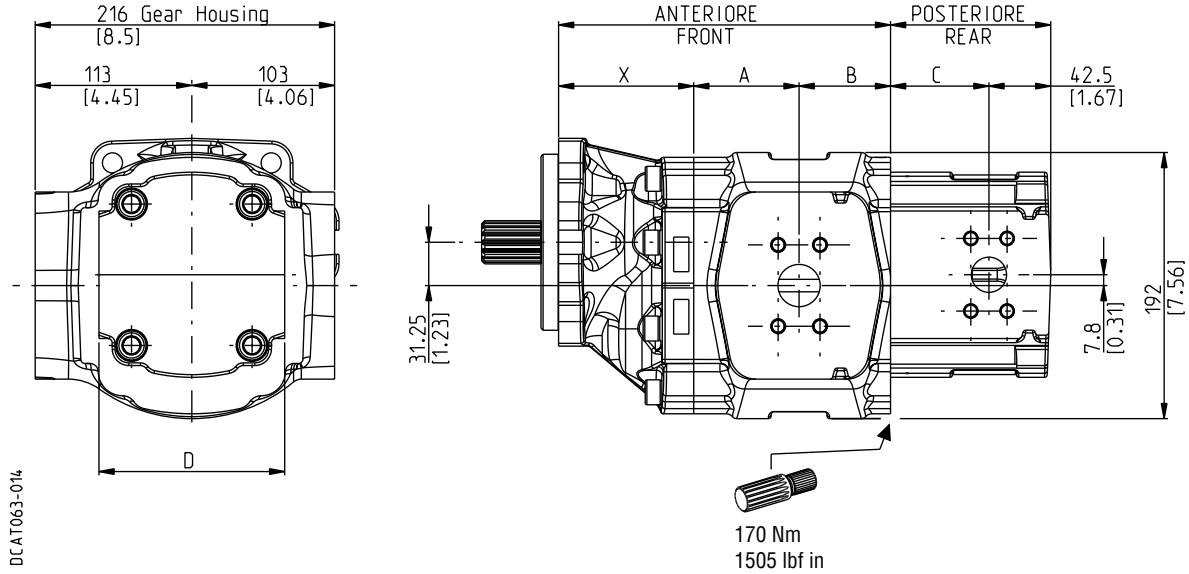
01/09.2019

Pump type	A	B
	mm (in)	mm (in)
KP 40•63	60 (2.36)	60 (2.36)
KP 40•73	64 (2.52)	60 (2.36)
KP 40•87	69 (2.72)	60 (2.36)
KP 40•100	68 (2.68)	66 (2.60)
KP 40•109	71 (2.80)	66 (2.60)
KP 40•121	76 (2.99)	66 (2.60)
KP 40•133	80 (3.15)	66 (2.60)
KP 40•151	71 (2.80)	81 (3.19)
KP 40•160	75 (2.95)	81 (3.19)
KP 40•180	82,2 (3.24)	81 (3.19)

KAPPA 40 Plus
DOUBLE PUMPS DIMENSIONS - KP40/30
CSL/CSC

Characteristics: Standard

 Drive shafts: page 33
 Mounting flange: for X dimension see
 page 35

 Ports availability: Split
 See page 37


	Front	Rear
Body design	CSL	Kappa 30 Series CSC (●)

 (●) Available also with body design **BSC** and **HSC**.

For features please consult the proper technical catalog

Pump type	A	B
	mm (in)	mm (in)
KP 40•63	60 (2.36)	60 (2.36)
KP 40•73	64 (2.52)	60 (2.36)
KP 40•87	69 (2.72)	60 (2.36)
KP 40•100	68 (2.68)	66 (2.60)
KP 40•109	71 (2.80)	66 (2.60)
KP 40•121	76 (2.99)	66 (2.60)
KP 40•133	80 (3.15)	66 (2.60)
KP 40•151	71 (2.80)	81 (3.19)
KP 40•160	75 (2.95)	81 (3.19)
KP 40•180	82,2 (3.24)	81 (3.19)

Pump type	C	D	
	mm (in)	Eur. - Split ports mm (in)	Gas - SAE ports mm (in)
KP 30•22	38 (1.50)	134 (5.28)	142 (5.59)
KP 30•27	41 (1.61)	134 (5.28)	142 (5.59)
KP 30•31	43,5 (1.71)	134 (5.28)	142 (5.59)
KP 30•34	46 (1.81)	134 (5.28)	142 (5.59)
KP 30•38	49 (1.93)	134 (5.28)	142 (5.59)
KP 30•41	50,5 (1.99)	134 (5.28)	142 (5.59)
KP 30•43	52 (2.05)	134 (5.28)	142 (5.59)
KP 30•46	53,5 (2.11)	134 (5.28)	142 (5.59)
KP 30•51	57 (2.24)	134 (5.28)	142 (5.59)
KP 30•56	60 (2.36)	134 (5.28)	142 (5.59)
KP 30•61	63 (2.48)	134 (5.28)	142 (5.59)
KP 30•73	71 (2.80)	134 (5.28)	142 (5.59)

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KAPPA 40 Plus
DOUBLE PUMPS DIMENSIONS - KP40/PHP20
CSL

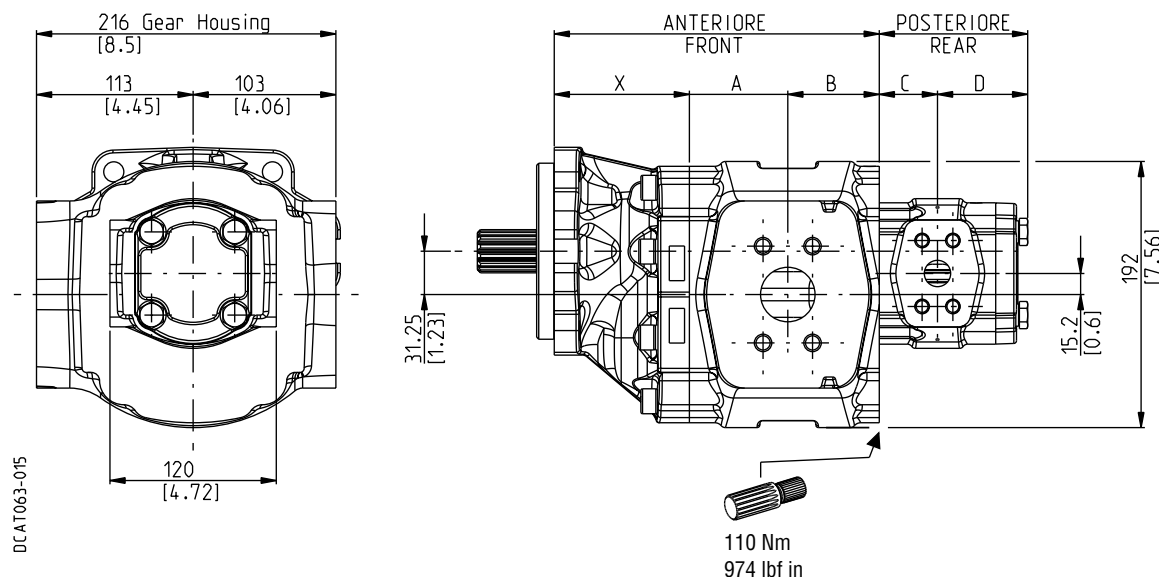
Characteristics: Standard

Drive shafts: page 33

 Mounting flange: for X dimension see
page 35

Ports availability: Split

See page 37



	Front	Rear
Body design	CSL	Polaris PH Series (●)

(●) For features please consult the proper technical catalog

Pump type	A	B
	mm (in)	mm (in)
KP 40•63	60 (2.36)	60 (2.36)
KP 40•73	64 (2.52)	60 (2.36)
KP 40•87	69 (2.72)	60 (2.36)
KP 40•100	68 (2.68)	66 (2.60)
KP 40•109	71 (2.80)	66 (2.60)
KP 40•121	76 (2.99)	66 (2.60)
KP 40•133	80 (3.15)	66 (2.60)
KP 40•151	71 (2.80)	81 (3.19)
KP 40•160	75 (2.95)	81 (3.19)
KP 40•180	82,2 (3.24)	81 (3.19)

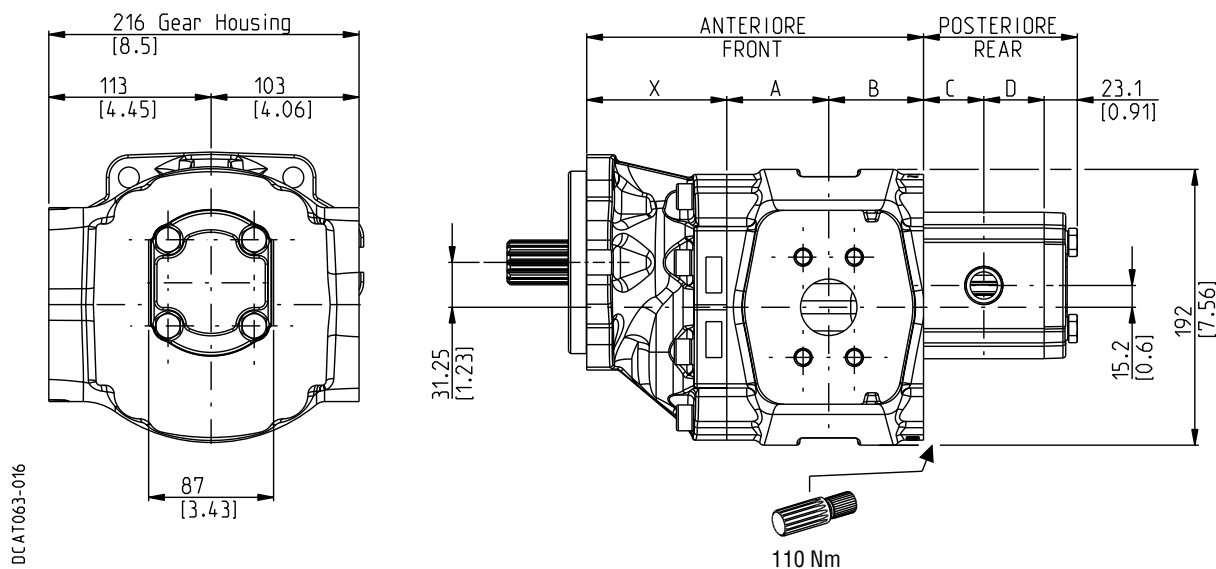
Pump type	C	D
	mm (in)	mm (in)
PHP 20•8	32,5 (1.28)	47,6 (1.87)
PHP 20•10,5	36,5 (1.44)	47,6 (1.87)
PHP 20•11,2	37 (1.46)	47,6 (1.87)
PHP 20•14	42 (1.65)	47,6 (1.87)
PHP 20•16	34,75 (1.37)	58,35 (2.30)
PHP 20•18	35,85 (1.41)	59,45 (2.34)
PHP 20•19	36,45 (1.44)	60,05 (2.36)
PHP 20•20	38 (1.50)	61,6 (2.43)
PHP 20•23	39,65 (1.56)	63,25 (2.49)
PHP 20•24,5	40,8 (1.61)	64,4 (2.54)
PHP 20•25	42 (1.65)	65,6 (2.58)
PHP 20•27,8	43,35 (1.71)	66,95 (2.64)
PHP 20•31,5	47 (1.85)	70,6 (2.78)

01/09.2019

KAPPA 40 Plus
DOUBLE PUMPS DIMENSIONS - KP40/PLP20
CSL

Characteristics: Standard

 Drive shafts: page 33
 Mounting flange: for X dimension see
 page 35

 Ports availability: Split
 See page 37


	Front	Rear
Body design	CSL	Polaris 20 Series (●)

(●) For features please consult the proper technical catalog

Pump type	A	B
	mm (in)	mm (in)
KP 40•63	60 (2.36)	60 (2.36)
KP 40•73	64 (2.52)	60 (2.36)
KP 40•87	69 (2.72)	60 (2.36)
KP 40•100	68 (2.68)	66 (2.60)
KP 40•109	71 (2.80)	66 (2.60)
KP 40•121	76 (2.99)	66 (2.60)
KP 40•133	80 (3.15)	66 (2.60)
KP 40•151	71 (2.80)	81 (3.19)
KP 40•160	75 (2.95)	81 (3.19)
KP 40•180	82,2 (3.24)	81 (3.19)

Pump type	C	D
	mm (in)	mm (in)
PLP 20•4	25,8 (1.02)	49,3 (1.94)
PLP 20•6,3	27 (1.06)	50,5 (1.99)
PLP 20•7,2	27,5 (1.08)	51 (2.01)
PLP 20•8	28,3 (1.11)	51,8 (2.04)
PLP 20•9	28,9 (1.14)	52,4 (2.06)
PLP 20•10,5	30,3 (1.19)	53,8 (2.12)
PLP 20•11,2	30,5 (1.20)	54 (2.13)
PLP 20•14	33 (1.30)	56,5 (2.22)
PLP 20•16	34,8 (1.37)	58,3 (2.30)
PLP 20•19	36,5 (1.44)	60 (2.36)
PLP 20•20	38 (1.50)	61,5 (2.42)
PLP 20•24,5	40,8 (1.61)	64,3 (2.53)
PLP 20•25	42 (1.65)	65,5 (2.58)
PLP 20•27,8	43,4 (1.71)	66,9 (2.63)
PLP 20•31,5	47 (1.85)	70,5 (2.78)

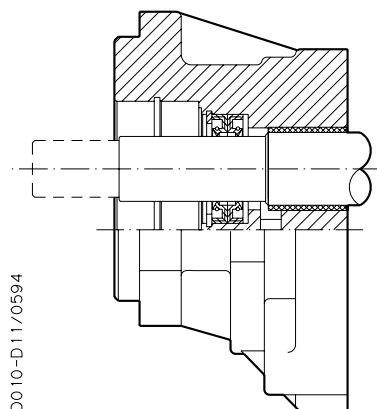
01/09.2019

VERSIONS - OUTBOARD BEARING OPTIONS

For each version, the possible combination between drive shafts and mounting flanges are shown on pages 36 ÷ 37.

VERSION

0

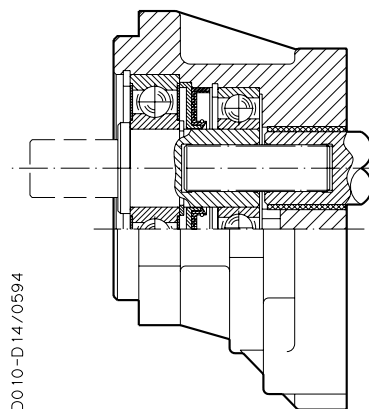


Version for applications without radial and axial load on the drive shaft.

VERSION

6

Only for Kappa 40



Version for applications with radial and low axial load on the drive shaft.

Max. torque version 6:
KAPPA 40: 600 Nm (5310 lbf in)

For the outboard bearings life expectancy, diagrams providing approximate selection data will be found on subsequent pages. For particular applications please consult our pre-sales department.

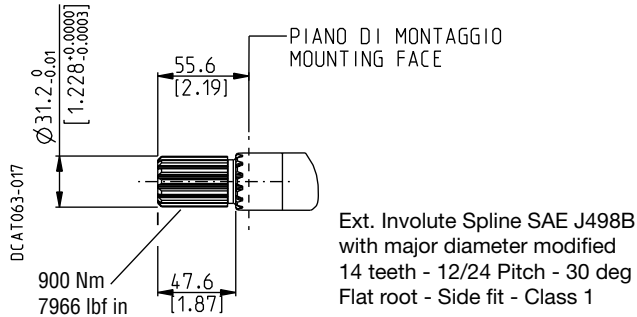
KAPPA 40

DRIVE SHIFTS

SAE "C" SPLINE

06

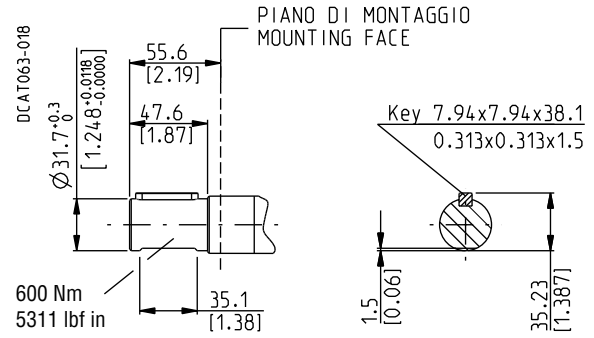
Mounting face refer to flange code **S8**



SAE "C" STRAIGHT

34

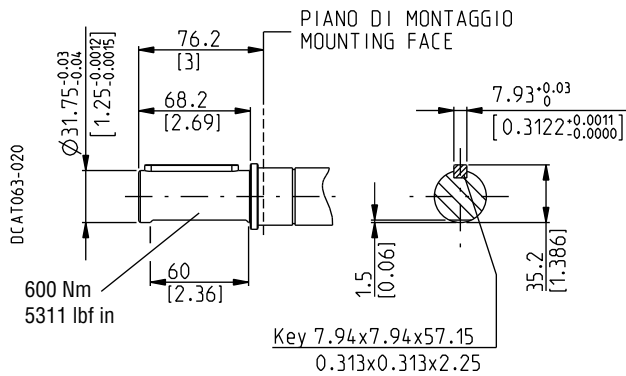
Mounting face refer to flange code **S8**



STRAIGHT

40

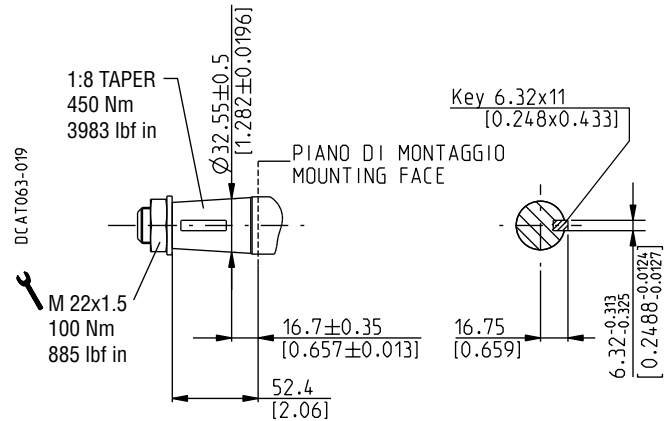
Mounting face refer to flange code **S8**



EUROPEAN TAPERED 1:8

85

Mounting face refer to flange code **E5**



01/09.2019

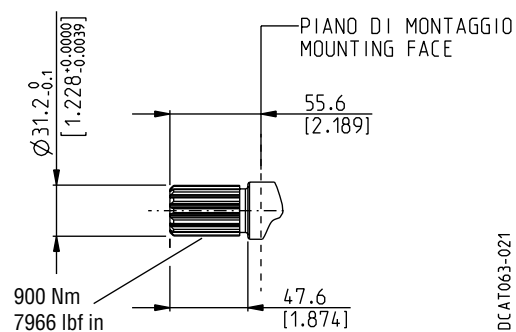
KAPPA 40 Plus

DRIVE SHFTS

SAE "C" SPLINE

06

Mounting face refer to flange code **S8**

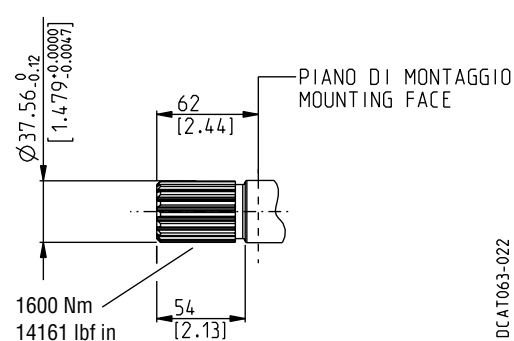


Ext. Involute Spline SAE J498B
with major diameter modified
14 teeth - 12/24 Pitch - 30 deg
Flat root - Side fit - Class 1

SAE "CC" SPLINE

DK

Mounting face refer to flange code **S8**



Ext. Involute Spline SAE J498B
with major diameter modified
17 teeth - 12/24 Pitch - 30 deg
Flat root - Side fit - Class 1

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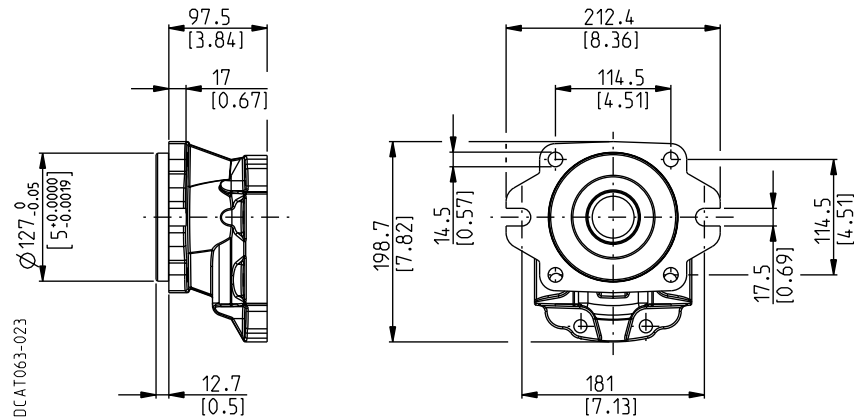
KAPPA 40

MOUNTING FLANGES AND TABLE OF COMPATIBILITY

SAE "C" 2-4 HOLES

S8

Conforms to SAE J744



DRIVE SHAFTS

See page 32

VERSIONS

See page 31

06

34

40

0

#

#

6

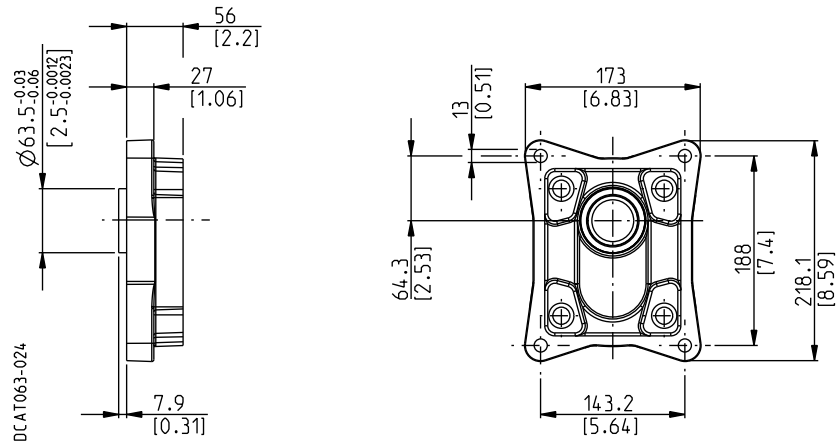
#

Standard combination

x Available combination

EUROPEAN

E5



DRIVE SHAFTS

See page 32

VERSIONS

See page 31

85

0

#

Standard combination

x Available combination

01/09.2019

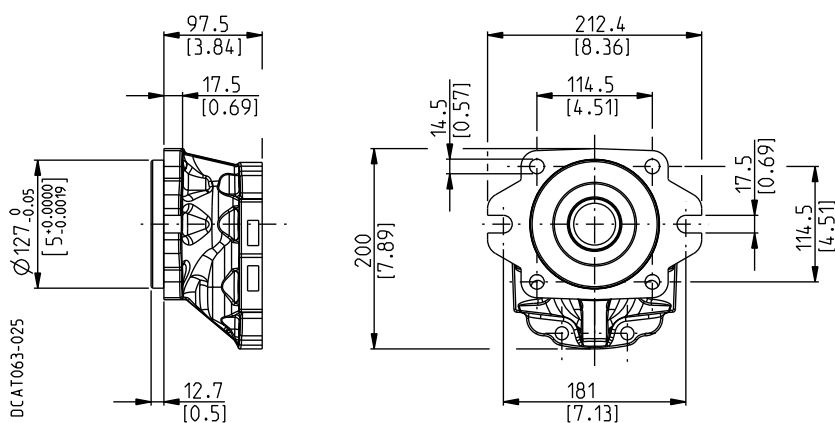
KAPPA 40 Plus

MOUNTING FLANGES AND TABLE OF COMPATIBILITY

SAE "C" 2-4 HOLES

S8

Conforms to SAE J744



DRIVE SHAFTS

See page 33

VERSIONS

See page 31

06

DK

0

#

#

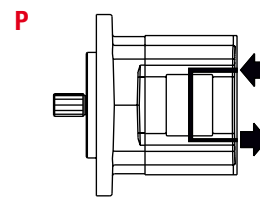
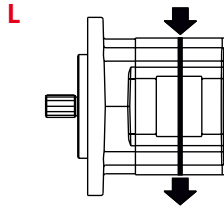
Standard combination

x Available combination

01/09.2019

KAPPA 40

PORTS POSITION AND TYPE



PORTS TYPE	SIDE PORTS								REAR PORTS			
	Split SSM		Spit SSS		Gas BSPP		SAE ODT		Gas BSPP		SAE ODT	
Pump type	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
Motor type	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN
K. 40•63	ME	MD	SE	SD	GF	GE	OF	OD	GF	GE	OF	OD
K. 40•73	ME	MD	SE	SD	GF	GE	OF	OD	GF	GE	OF	OD
K. 40•87	MF	ME	SF	SE	GG	GF	OG	OF	GG	GF	OG	OF
K. 40•109	MF	ME	SF	SE	GG	GF	OG	OF	GG	GF	OG	OF
K. 40•121	MF	ME	SF	SE	GH	GF	OH	OF	GH	GF	OH	OF
K. 40•133	MF	ME	SF	SE	GH	GF	OH	OF	GH	GF	OH	OF
K. 40•151	MF	ME	SF	SE	GH	GF	OH	OF	GH	GF	OH	OF

Different ports are available on request.

For more information please consult our pre-sales department.

EXTERNAL DRAIN PORTS

PORTS TYPE	Gas BSPP	SAE ODT
K. 40	GC	OA

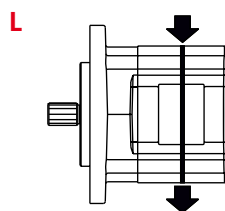
Different ports are available on request.

For more information please consult our pre-sales department.

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KAPPA 40 Plus

PORTS POSITION AND TYPE



SIDE PORTS

PORTS TYPE	Split SSM		Spit SSS	
Pump type	IN	OUT	IN	OUT
KP 40•63	MF	MC	SF	SC
KP 40•73	MF	MC	SF	SC
KP 40•87	MF	MC	SF	SC
KP 40•100	MG	MD	SG	SD
KP 40•109	MG	MD	SG	SD
KP 40•121	MG	MD	SG	SD
KP 40•133	MG	MD	SG	SD
KP 40•151	MP	ME	SP	SE
KP 40•160	MP	ME	SP	SE
KP 40•180	MP	ME	SP	SE

Different ports are available on request.

For more information please consult our pre-sales department.

01/09.2019

PORT SIZES



Tightening torque for low pressure side port.



Tightening torque for high pressure side port.

For reversible rotation, please consult only the tightening torque for high pressure side port.

SAE FLANGED PORTS J518 - Standard pressure series 3000 PSI

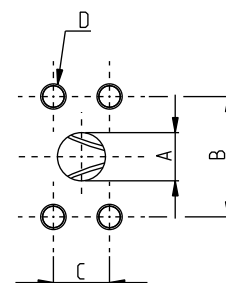
SSM

Metric thread ISO 60° conforms to ISO/R 262

CODE	A	B	C	D		
	mm (in)	mm (in)	mm (in)	Thread Depth mm (in)	Nm (lbf in)	Nm (lbf in)
MC (#)	25,4 (1.00)	52,4 (2.06)	26,2 (1.03)	M 10 18 (0.71)	—	35 ^{+2,5} (310 ÷ 332)
MD	30,5 (1.20)	58,7 (2.31)	30,2 (1.19)	M 10 22 (0.87)	20 ⁺¹ (177 ÷ 186)	40 ^{+2,5} (354 ÷ 376)
ME	39,3 (1.55)	69,8 (2.75)	35,7 (1.41)	M 12 27 (1.06)	30 ^{+2,5} (266 ÷ 288)	60 ⁺⁵ (531 ÷ 575)
MF	51 (2.01)	77,8 (3.06)	42,9 (1.69)	M 12 27 (1.06)	30 ^{+2,5} (266 ÷ 288)	—
MG (#)	65 (2.56)	88,9 (3.50)	50,8 (2.00)	M 12 27 (1.06)	30 ^{+2,5} (266 ÷ 288)	—
MP (#)	76,2 (3.00)	106,4 (4.19)	61,9 (2.44)	M 12 27 (1.06)	30 ^{+2,5} (266 ÷ 288)	—

(#) Only for KAPPA 40 Plus

DCAT_006_025_21064252



Replaces: 01/06.2009

SAE FLANGED PORTS J518 - Standard pressure series 3000 PSI

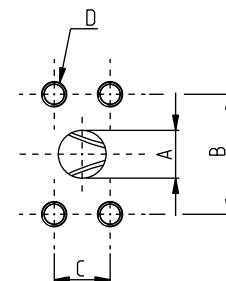
SSS

American straight thread UNC-UNF 60° conforms to ANSI B 1.1

CODE	A	B	C	D		
	mm (in)	mm (in)	mm (in)	Thread Depth mm (in)	Nm (lbf in)	Nm (lbf in)
SC (#)	25,4 (1.00)	52,4 (2.06)	26,2 (1.03)	3/8 - 16 UNC-2B 17 (0.67)	—	35 ^{+2,5} (310 ÷ 332)
SD	30,5 (1.20)	58,7 (2.31)	30,2 (1.19)	7/16 - 14 UNC-2B 17 (0.67)	20 ⁺¹ (177 ÷ 186)	40 ^{+2,5} (354 ÷ 376)
SE	39,3 (1.55)	69,8 (2.75)	35,7 (1.41)	1/2 - 13 UNC-2B 27 (1.06)	30 ^{+2,5} (266 ÷ 288)	70 ⁺⁵ (620 ÷ 664)
SF	51 (2.01)	77,8 (3.06)	42,9 (1.69)	1/2 - 13 UNC-2B 27 (1.06)	30 ^{+2,5} (266 ÷ 288)	—
SG (#)	65 (2.56)	88,9 (3.50)	50,8 (2.00)	1/2 - 13 UNC-2B 27 (1.06)	30 ^{+2,5} (266 ÷ 288)	—
SP (#)	76,2 (3.00)	106,4 (4.19)	61,9 (2.44)	5/8 - 11 UNC-2B 30 (1.18)	30 ^{+2,5} (266 ÷ 288)	—

(#) Only for KAPPA 40 Plus

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01/09.2019

PORT SIZES



Tightening torque for low pressure side port.



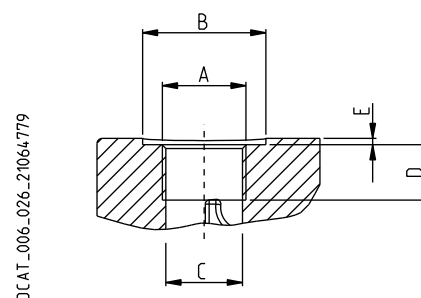
Tightening torque for high pressure side port.

For reversible rotation, please consult only the tightening torque for high pressure side port.

GAS STRAIGHT THREAD PORTS

BSPP

British standard pipe parallel (55°) conforms to UNI - ISO 228



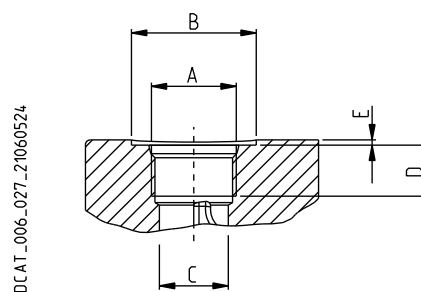
CODE	Nominal size	A	Ø B	Ø C	D	E		
			mm (in)	mm (in)	mm (in)	mm (in)	Nm (lbf in)	Nm (lbf in)
GC (x)	3/8"	G 3/8	25 (0.98)	15 (0.59)	14 (0.55)	1 (0.08)	15 ⁺¹ (133 ÷ 142)	—
GE	3/4"	G 3/4	39 (1.54)	24,5 (0.96)	20 (0.79)	2,5 (0.10)	30 ^{+2,5} (266 ÷ 288)	—
GF	1"	G 1	49 (1.93)	30,5 (1.20)	19 (0.75)	2,5 (0.10)	50 ^{+2,5} (443 ÷ 465)	130 ⁺¹⁰ (1151 ÷ 1239)
GG	1" 1/4	G 1 1/4	60 (2.36)	39 (1.54)	24 (0.95)	2,5 (0.10)	60 ⁺⁵ (531 ÷ 575)	170 ⁺¹⁰ (1505 ÷ 1593)
GH	1" 1/2	G 1 1/2	72 (2.84)	45 (1.77)	26 (1.02)	2,5 (0.10)	70 ⁺⁵ (620 ÷ 664)	210 ⁺¹⁰ (1859 ÷ 1947)

(x) = Drain port

SAE STRAIGHT THREAD PORTS J514

ODT

American straight thread UNC-UNF 60° conforms to ANSI B 1.1



CODE	Nominal size	A	Ø B	Ø C	D	E		
			mm (in)	mm (in)	mm (in)	mm (in)	Nm (lbf in)	Nm (lbf in)
OA (x)	3/8"	9/16" - 12 UNF - 2B	26 (1.02)	13 (0.51)	15 (0.59)	2 (0.08)	15 ⁺¹ (133 ÷ 142)	—
OD	3/4"	1 1/16" - 12 UNF - 2B	42 (1.65)	24,8 (0.98)	20 (0.79)	2 (0.08)	40 ^{+2,5} (354 ÷ 376)	120 ⁺¹⁰ (1062 ÷ 1151)
OF	1"	1 5/16" - 12 UNF - 2B	49 (1.93)	30,5 (1.20)	20 (0.79)	2 (0.08)	60 ⁺⁵ (531 ÷ 575)	170 ⁺¹⁰ (1505 ÷ 1593)
OG	1" 1/4	1 5/8" - 12 UNF - 2B	58 (2.28)	39,1 (1.54)	20 (0.79)	2 (0.08)	70 ⁺⁵ (620 ÷ 664)	200 ⁺¹⁰ (1770 ÷ 1859)
OH	1" 1/2	1 7/8" - 12 UNF - 2B	65 (2.56)	45 (1.77)	20 (0.79)	2 (0.08)	100 ⁺⁵ (885 ÷ 929)	270 ⁺¹⁵ (1770 ÷ 1859)

(x) = Drain port

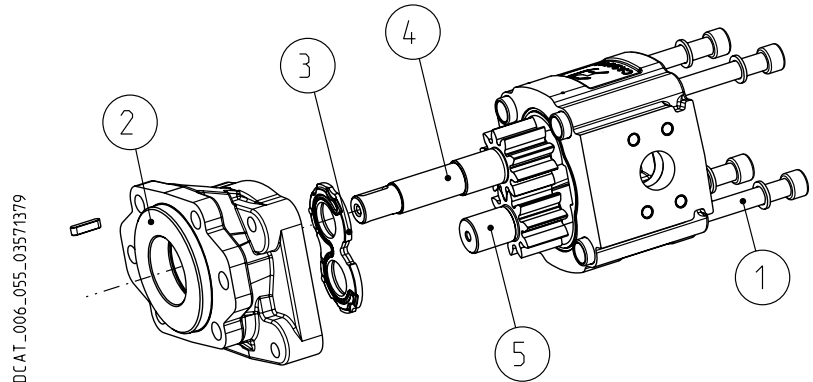
01/09.2019

CHANGING ROTATION

Example of changing rotation: from KP40 pump counterclockwise to clockwise

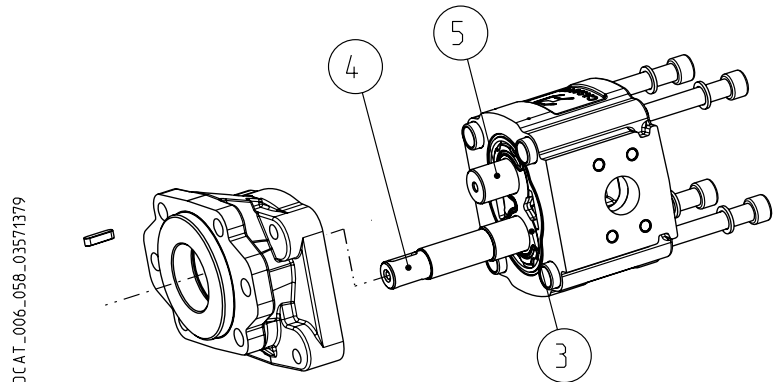
To change rotation of unidirectional pumps and motors is necessary to operate in the following way:

1. Clean the pump externally with care.
2. Loosen, and remove, the clamp bolts (1).
3. Coat the sharp edges of the drive shaft (4) with adhesive tape and smear a layer of clean grease on the shaft end extension to avoid damaging the lip of the shaft seal when removing the mounting flange.
4. Remove the mounting flange (2), taking care to keep the flange as straight as possible during removal. If the flange is stuck, tap around the edge with a fibre or rubber mallet in order to break away from the body. Ensure that while removing the front mounting flange, the drive shaft and other components remain position.

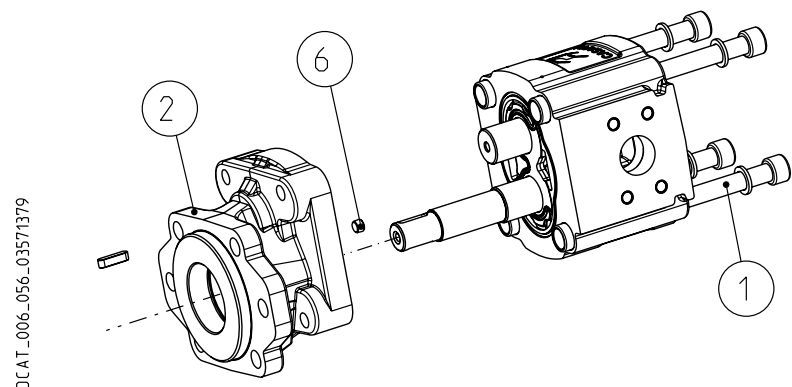


5. Ease the drive gear (4) up to facilitate removal the front plate (3), taking care that the precision ground surfaces do not become damaged, and remove the drive gear.
6. Remove the driven gear (5) without overturning. The rear plate has not to be removed.

7. Re-locate the driven gear (5) in the position previously occupied by the drive gear (4).
8. Re-locate the drive gear (4) in the position previously occupied by the driven gear (5).
9. Replace the front plate (3) in its original position.



10. Remove the grub screw (6) from the mounting flange (2) and re-locate it in the other threaded hole in the same flange.
11. Gently wipe the machined surface of the mounting flange (2) and the body with a flat hand stone.
12. Refit the front mounting flange (2) turned 180° from its original position.
13. Refit the clamp bolts (1) with the washers and tighten in a crisscross pattern to a torque value of 100 ± 15 Nm ($752 \div 1018$ lbf in).
14. Check that the pump rotates freely when the drive shaft (4) is turned by hand. If not a pressure plate seal may be pined.
15. The pump is ready for installation with the original rotation reversed.



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NOTES

01/09.2019

KAPPA 40

HOW TO ORDER - SINGLE UNITS

1	2	3	4	5	6	7	8	9	10	11	12							
KP 40•63	R	0	-	06	S8	-	L	OF/OD	-	N	-	OA	-	C4	-	CSC	-	VNR01

1	Type	Pump type	Motor type
61,43 cm³/rev (3.75 in³/rev)		KP 40•63	KM 40•63
72,60 cm³/rev (4.43 in³/rev)		KP 40•73	KM 40•73
86,56 cm³/rev (5.28 in³/rev)		KP 40•87	KM 40•87
108,90 cm³/rev (6.64 in³/rev)		KP 40•109	KM 40•109
121,80 cm³/rev (7.43 in³/rev)		KP 40•121	KM 40•121
134,03 cm³/rev (8.18 in³/rev)		KP 40•133	KM 40•133
150,99 cm³/rev (9.20 in³/rev)		KP 40•151	KM 40•151

2	Rotation	Code
Left		S
Right		D
Reversible rear external drain		R
Reversible internl drain		B

3	Versions - Outboard bearing options	Code
Without outboard bearing		0
Version		6

4	Drive shaft	Code
SAE "C" spline (14 teeth)		06
SAE "C" straight		34
Straight		40
European tapered 1:8		85

5	Mouning flange	Code
SAE "C" 2-4 holes		S8
European		E5

6	Ports position	Code
Side		L
Rear		P

Code	Ports IN/OUT	7
SAE FLANGED PORTS (SSM)		
Side	Rear	Type
ME/MD	KP 40	60-73
MD/ME	KM 40	
MF/ME	KP 40	87-109-121-133-151
ME/MF	KM 40	

SAE FLANGED PORTS (SSS)		
Side	Rear	Type
SE/SD	KP 40	60-73
SD/SE	KM 40	
SF/SE	KP 40	87-109-121-133-151
SE/SF	KM 40	

GAS STRAIGHT THREAD PORTS (BSPP)		
Side	Rear	Type
GF/GE	KP 40	63-73
GE/GF	KM 40	
GG/GF	KP 40	87-109
GF/GG	KM 40	
GH/GF	KP 40	121-133-151
GF/GH	KM 40	

SAE STRAIGHT THREAD PORTS (ODT)		
Side	Rear	Type
OF/OD	KP 40	63-73
OD/OF	KM 40	
OG/OF	KP 40	87-109
OF/OG	KM 40	
OH/OF	KP 40	121-133-151
OF/OH	KM 40	

Code	Seals (a)	8
N	Buna NBR (standard)	
V	Viton-FKM	
T-PV	Hydrogenated buna HNBR seals with Viton-FKM shaft seals	
N Bz	Buna NBR and bronze thrust plates	
V Bz	Viton-FKM and bronze thrust plate	

Code	Drain port	9
GC	GAS straight thread ports (BSPP)	
OA	SAE straight thread ports (ODT)	

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KAPPA 40**HOW TO ORDER - SINGLE UNITS**

10	Shaft seal options	Code
	Shaft seal with wiper seal	D
	High pressure special shaft seal	C4

11	Body design	Code
	Standard	CSC

12	Painting	Code
	Without painting (standard) no code	...
	Black painting (b)	VNR01
	Grey painting (b)	VGR01

- (a) Choose the seals according to the temperature shown on page 5
- (b) Salt spray resistance of 300 hours. For more information please consult our pre-sales department

01/09.2019

KAPPA 40 Plus
HOW TO ORDER - SINGLE PUMPS

1	2	3	4	5	6	7	8	9	10	11	
KP 40•63	S	0	- DK	S8	- L	MF/MC	- N	- C4	- CSL	- PLUS	- VNR01

1	Type	Pump type
61,43 cm³/rev (3.75 in³/rev)		KP 40•63
72,60 cm³/rev (4.43 in³/rev)		KP 40•73
86,56 cm³/rev (5.28 in³/rev)		KP 40•87
99,79 cm³/rev (6.09 in³/rev)		KP 40•100
108,90 cm³/rev (6.64 in³/rev)		KP 40•109
121,80 cm³/rev (7.43 in³/rev)		KP 40•121
134,03 cm³/rev (8.18 in³/rev)		KP 40•133
150,99 cm³/rev (9.20 in³/rev)		KP 40•151
160,77 cm³/rev (9.81 in³/rev)		KP 40•160
180,73 cm³/rev (11.02 in³/rev)		KP 40•180

2	Rotation	Code
Left		S
Right		D

3	Versions - Outboard bearing options	Code
Without outboard bearing		0

4	Drive shaft	Code
SAE "C" spline (14 teeth)		06
SAE "CC" spline (17 teeth)		DK

5	Mouning flange	Code
SAE "C" 2-4 holes		S8

6	Ports position	Code
Side		L

7	Ports IN/OUT	Code
SAE FLANGED PORTS (SSM)		
Type		Side
63-73-87	KP 40	MF/MC
100-109-121-133	KP 40	MG/MD
151-160-180	KP 40	MP/ME
SAE FLANGED PORTS (SSS)		
Type		Side
63-73-87	KP 40	SF/SC
100-109-121-133	KP 40	SG/SD
151-160-180	KP 40	SP/SE

Code	Seals (a)	8
N	Buna NBR (standard)	
V	Viton-FKM	
T-PV	Hydrogenated buna HNBR seals with Viton-FKM shaft seals	
N Bz	Buna NBR and bronze thrust plates	
V Bz	Viton-FKM and bronze thrust plate	

Code	Shaft seal options	9
D	Shaft seal with wiper seal	
C4	High pressure special shaft seal	

Code	Body design	10
CSL	Standard	

Code	Painting	11
...	Without painting (standard) no code	
VNR01	Black painting (b)	
VGR01	Grey painting (b)	

- (a) Choose the seals according to the temperature shown on page 5
- (b) Salt spray resistance of 300 hours. For more information please consult our pre-sales department

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1	2	3	4	5	6	7	8	9	10	11	12
KP 40•63	-	06	S8	-	L	ME/MD	-	-	CSL	/	
Front section											
40•63	-		-	L	ME/MD	-	-	CSL	/		
Intermediate section											
40•63	-		L	ME/MD	-	-	CSC	-	S	0	- V - C4 - VNR01
Rear section											

1	Type	Pump type
61,43 cm³/rev (3.75 in³/rev)		KP 40•63
72,60 cm³/rev (4.43 in³/rev)		KP 40•73
86,56 cm³/rev (5.28 in³/rev)		KP 40•87
108,90 cm³/rev (6.64 in³/rev)		KP 40•109
121,80 cm³/rev (7.43 in³/rev)		KP 40•121
134,03 cm³/rev (8.18 in³/rev)		KP 40•133
150,99 cm³/rev (9.20 in³/rev)		KP 40•151

2	Drive shaft	Code
SAE "C" spline (14 teeth)		06
SAE "C" straight		34
Straight		40
European tapered 1:8		85

3	Mouning flange	Code
SAE "C" 2-4 holes		S8
European		E5

4	Ports position	Code
Side		L

5	Ports IN/OUT	Code
SAE FLANGED PORTS (SSM)		
Type	Side	
63-73	KP 40	ME/MD
87-109-121-133-151	KP 40	MF/ME
SAE FLANGED PORTS (SSS)		
Type	Side	
63-73	KP 40	SE/SD
87-109-121-133-151	KP 40	SF/SE

Code	Ports IN/OUT	5
GAS STRAIGHT THREAD PORTS (BSPP)		
Side	Type	
GF/GE	KP 40	63-73
GG/GF	KP 40	87-109
GH/GF	KP 40	121-133-151
SAE STRAIGHT THREAD PORTS (ODT)		
Side	Type	
OF/OD	KP 40	60-73
OG/OF	KP 40	87-109
OH/OF	KP 40	121-133-151
Code	Body for common inlet (a)	6
A5	Combination KP40 / KP40	
Code	Body design	7
FRONT SECTION		
CSL	Standard	
INTERMEDIATE SECTION		
CSL	Standard	
REAR SECTION (b)		
CSC	Standard	
Code	Rotation	8
S	Anti-clockwise	
D	Clockwise	
Code	Versions - Outboard bearing options	9
0	Without outboard bearing (standard) no code	
6	Version	

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HOW TO ORDER - MULTIPLE PUMPS SAME GROUPS

10	Seals (c)	Code
	Buna NBR (standard)	N
	Viton-FKM	V
	Hydrogenated buna HNBR seals with Viton-FKM shaft seals	T-PV
	Buna NBR and bronze thrust plates	N Bz
	Viton-FKM and bronze thrust plate	V Bz

11	Shaft seal options	Code
	Shaft seal with wiper seal	D
	High pressure special shaft seal	C4

12	Painting	Code
	Without painting (standard) no code	...
	Black painting (d)	VNR01
	Grey painting (d)	VGR01

- (a) Please write this code only for common inlet pumps (see page 53).
- (b) For multiple pumps with more than two sections we recommend to use a bracket.
- (c) Choose the seals according to the temperature shown on page 5. Buna NBR no code.
- (d) Salt spray resistance of 300 hours. For more information please consult our pre-sales department

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HOW TO ORDER - DOUBLE PUMPS DIFFERENT GROUPS

KP40 / KP30

1	2	3	4	5	6	7	8	10	11	12	13	14	
KP40•63 - 06 S8 - L ME/MD - 43 -						CSL /							
Front section													
KP30•51 - L MD/MC -						- CSC -		S 0 -		V - C4 VNR01			
Rear section													

KP40 / PHP20

1	2	3	4	5	6	7	8	9	10	11	12	13	14
KP40•63 - 06 S8 - L ME/MD - 41						-	CSC	/					
Front section													
PHP20•19 -				L MB/MA -			-	L - S 0 / FS V - C4 VNR01					
Rear section													

KP40 / PLP20

1	2	3	4	5	6	7	8	9	10	11	12	13	14
KP40•63 - 06 S8 - L ME/MD - 41 -							CSC /						
Front section													
PLP20•14 -				L MB/MA -			-	L - S 0 / FS V - C4 VNR01					
Rear section													

1	Type (a)	Pump type
	The same of multiple pumps on page 48	KP 40•...
2	Drive shaft	Code
	The same of multiple pumps on page 48	...
3	Mounting flange	Code
	The same of multiple pumps on page 48	...
4	Ports position	Code
	Side	L
5	Ports IN/OUT	Code
	The same of multiple pumps on page 48	.../...
6	Connecting shaft	Code
	Combination KP40/KP30	43
	Combination KP40/PHP20 and KP40/PLP20	41

Code	Body for common inlet (b)	7
C5	Combination KP40/KP30	
N7	Combination KP40/PHP20 and KP40/PLP20	
Code	Body design	8
FRONT SECTION		
CSL	Combination KP40/KP30	
CSC	Combination KP40/PHP20 and KP40/PLP20	
Code	Rear cover options	9
...	Cast iron (standard) no code	
L	Aluminium	
Code	Rotation	10
S	Anti-clockwise	
D	Clockwise	
Code	Versions - Outboard bearing options	11
...	The same of multiple pumps on page 46	

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HOW TO ORDER - DOUBLE PUMPS DIFFERENT GROUPS

12	Seals	Pump type
The same of multiple pumps on page 47		
13	Shaft seal options	Code
The same of multiple pumps on page 47		...
14	Painting	Code
Without painting (standard) no code		...
Black painting (c)		VNR01
Grey painting (c)		VGR01

- (a) For KP 30, PHP 20 and PLP 20 features please consult the proper technical catalogue
- (b) Please write this code only for common inlet pumps.
(see page 53)
- (c) Salt spray resistance of 300 hours. For more information please consult our pre-sales department

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HOW TO ORDER - DOUBLE PUMPS SAME GROUPS

1	2	3	4	5	6	7	8	9	10	11	12
KP 40•63	-	06	S8	-	L	MF/MC	-	-	CSL	/	
Front section											
40•63	-			L	MF/MC	-	-	CSL	-	S	0 - V - C4 - PLUS - VNR01
Rear section											

1	Type	Pump type
61,43 cm³/rev (3.75 in³/rev)		KP 40•63
72,60 cm³/rev (4.43 in³/rev)		KP 40•73
86,56 cm³/rev (5.28 in³/rev)		KP 40•87
99,79 cm³/rev (6.09 in³/rev)		KP 40•100
108,90 cm³/rev (6.64 in³/rev)		KP 40•109
121,80 cm³/rev (7.43 in³/rev)		KP 40•121
134,03 cm³/rev (8.18 in³/rev)		KP 40•133
150,99 cm³/rev (9.20 in³/rev)		KP 40•151
160,77 cm³/rev (9.81 in³/rev)		KP 40•160
180,73 cm³/rev (11.02 in³/rev)		KP 40•180

2	Drive shaft	Code
SAE "C" spline (14 teeth)		06
SAE "CC" spline (17 teeth)		DK

3	Mounting flange	Code
SAE "C" 2-4 holes		S8

4	Ports position	Code
Side		L

5	Ports IN/OUT	Code
SAE FLANGED PORTS (SSM)		
Type		Side
63-73-87	KP 40	MF/MC
100-109-121-133	KP 40	MG/MD
151-160-180		MP/ME
SAE FLANGED PORTS (SSS)		
Type		Side
63-73-87	KP 40	SF/SC
100-109-121-133	KP 40	SG/SD
151-160-180	KP 40	SP/SE

Code	Body for common inlet (a)	6
A5	Combination KP40 / KP40	

Code	Body design	7
FRONT SECTION		
CSL	Standard	
REAR SECTION		
CSL	Standard	

Code	Rotation	8
S	Anti-clockwise	
D	Clockwise	

Code	Versions - Outboard bearing options	9
0	Without outboard bearing (standard) no code	

Code	Seals (b)	10
N	Buna NBR (standard)	
V	Viton-FKM	
T-PV	Hydrogenated buna HNBR seals with Viton-FKM shaft seals	
N Bz	Buna NBR and bronze thrust plates	
V Bz	Viton-FKM and bronze thrust plate	

Code	Shaft seal options	11
D	Shaft seal with wiper seal	
C4	High pressure special shaft seal	

Code	Painting	12
...	Without painting (standard) no code	
VNR01	Black painting (c)	
VGR01	Grey painting (c)	

- (a) Please write this code only for common inlet pumps. (see page 53)
- (b) Choose the seals according to the temperature shown on page 5. Buna NBR no code.
- (c) Salt spray resistance of 300 hours. For more information please consult our pre-sales department

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HOW TO ORDER - DOUBLE PUMPS DIFFERENT GROUPS

KP40 / KP30

1	2	3	4	5	6	7	8	10	11	12	13	14
KP40•63	-	06	S8	-	L	ME/MD	-	43	-	CSL	/	
Front section												
KP30•51	-		L	MD/MC	-		-	CSC	-	S	0	-
Rear section												
										V	-	C4
										PLUS	-	VNR01

KP40 / PHP20

1	2	3	4	5	6	7	8	9	10	11	12	13	14
KP40•63 - 06 S8 - L ME/MD - 41 -						CSL /							
Front section													
PHP20•19 -				L MB/MA -			-	L - S 0 / FS V - C4 PLUS - VNR01					
Rear section													

KP40 / PLP20

1	2	3	4	5	6	7	8	9	10	11	12	13	14
KP40•63 - 06 S8 - L ME/MD - 41 -						CSL /							
Front section													
PLP20•14 -				L MB/MA -			-	L - S 0 / FS V - C4 PLUS - VNR01					
Rear section													

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1	Type (a)	Pump type	Code	Body for common inlet (b)	7
	The same of double pumps on page 56	KP 40•...	C5	Combination KP40/KP30	
			N7	Combination KP40/PHP20 and KP40/PLP20	
2	Drive shaft	Code	Code	Body design	8
	The same of double pumps on page 56	...		FRONT SECTION	
			CSL	Standard	
3	Mounting flange	Code	Code	Rear cover options	9
	The same of double pumps on page 56	...	...	Cast iron (standard) no code	
			L	Aluminium	
4	Ports position	Code	Code	Rotation	10
	Side	L	S	Anti-clockwise	
			D	Clockwise	
5	Ports IN/OUT	Code	Code	Versions - Outboard bearing options	11
	The same of double pumps on page 56	.../...	...	The same of double pumps on page 50	
6	Connecting shaft	Code			
	Combination KP40/KP30	43			
	Combination KP40/PHP20 and KP40/PLP20	45			

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HOW TO ORDER - DOUBLE PUMPS DIFFERENT GROUPS

12	Seals	Pump type
----	-------	-----------

The same of double pumps on page 52

13	Shaft seal options	Code
----	--------------------	------

The same of double pumps on page 52 ...

14	Painting	Code
----	----------	------

Without painting (standard) no code ...

Black painting (c) **VNR01**

Grey painting (c) **VGR01**

- (a) For KP 30, PHP 20 and PLP 20 features please consult the proper technical catalogue
- (b) Please write this code only for common inlet pumps.
(see page 53)
- (c) Salt spray resistance of 300 hours. For more information please consult our pre-sales department

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HOW TO ORDER - MULTIPLE PUMPS COMMON INLET

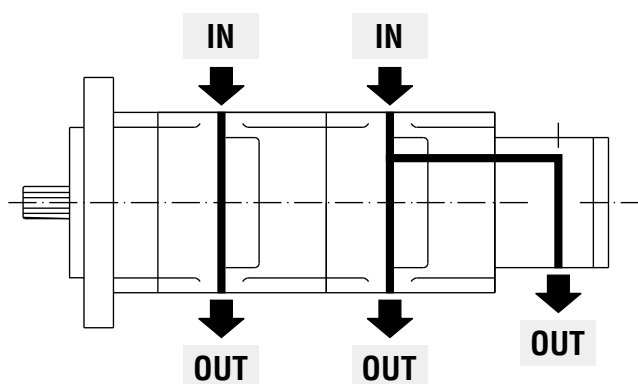
Depending on the required version, the common inlet codes must be used only for the section which has the common suction. For pumps with common inlet for all sections, the code must be used only for the last section. For the sections with only an outlet port, the code of the inlet port must be omitted.

Front pump	Identification code of common inlet body	Rear pump
KP 40	A5	KP 40
KP 40	C5	KP 30
KP 40	D7	PHP 20 PLP 20

Order example

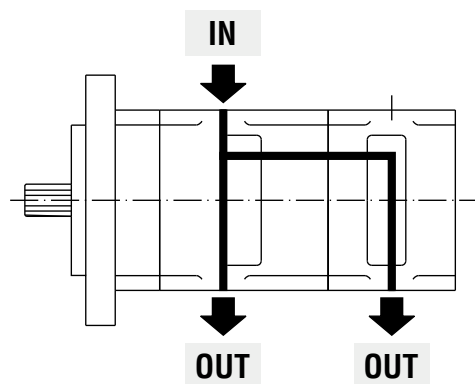
Triple pump Kappa 40+Kappa 40+ PLP 20.
Common inlet intermediate pump and rear pump.

KP 40•63-06 S8-L ME/MD-CSL /
Front pump
KP 40•63-L ME/MD-41-D7-CSC /
Intermediate pump
PLP 20•14-L /MA-L-S/FS
Rear pump



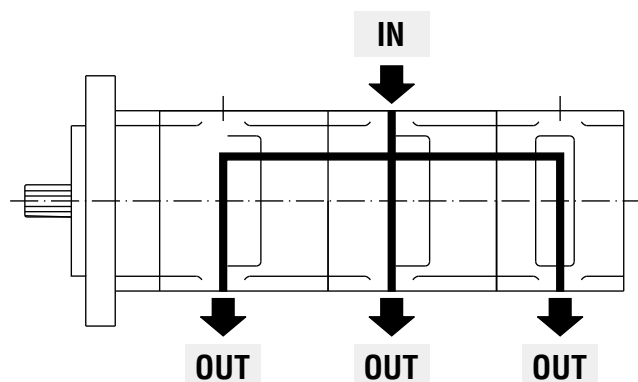
Double pump Kappa 40+Kappa 40.
Common inlet all pumps.

KP 40•63-06 S8-L ME/MD-CSL /
Front pump
KP 40•63-L /MD-A5-CSL-S
Rear pump



Triple pump Kappa 40+Kappa 40+ Kappa 40
Common inlet all pumps.

KP 40•63-06 S8-L /MD-CSL /
Front pump
KP 40•63-L ME/MD-CSL /
Intermediate pump
KP 40•63-L /MD-A5-CSL-S
Rear pump



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Our policy is one of continuous improvement in product. Specification of items may, therefore, be changed without notice.

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