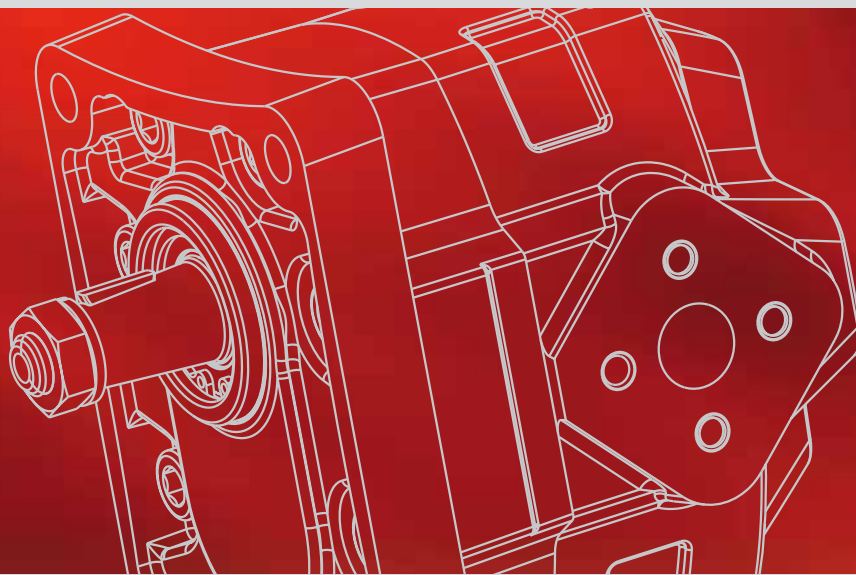




HYDRAULIC GEAR
PUMPS AND
MOTORS

FEATURES

Construction	External gear type pumps and motors
Mounting	EUROPEAN - SAE - ISO standard flanges
Line connections	Screw and flange
Direction of rotation (looking on drive shaft)	Anti-clock (S) - clockwise (D) - reversible (L, R or B)
Inlet pressure range for pumps	10 ÷ 44 psi - [0,7 ÷ 3 bar (abs.)]
Max back pressure for single rotation motors	p ₁ (continuous) max 73 psi (5 bar)
	p ₂ (for 20 s) max 116 psi (8 bar)
	p ₃ (for 8 s) max 218 psi (15 bar)
Max drain line pressure on reversible rotation motors	73 psi (5 bar)
Max back pressure on the series motors	2175 psi (150 bar)
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 technical sales department.
Viscosity range	From 60 to 456 SSU [12 to 100 mm ² /s (cSt)] recommended
Filtering requirement	See table (2)

Tab. 1

Type	Fluid composition	Max pressure psi - (bar)	Max speed min ⁻¹	Temperature °F - (°C)			Seals (◆)
				Min	Max continuous	Max peak	
ISO/DIN	Mineral oil based hydraulic fluid to ISO/DIN	See page 3, 4 75, 76	See page 3, 4 75, 76	-13 (-25)	176 (80)	212 (100)	N
				-13 (-25)	230 (110)		N-H
HFA	Oil emulsion in water 5 ÷ 15% of oil	725 (50)	1500	36 (2)	131 (55)	257 (125)	V
HFB	Water emulsion in oil 40 % of water	1740 (120)	1500	36 (2)	140 (60)		N
HFC	Water - glycol	1450 (100)	1500	-4 (-20)	140 (60)		N Bz
HFD	Phosphate ester	2175 (150)	1500	14 (-10)	176 (80)		V Bz

(◆) N= Buna N (standard) - N-H= Buna N and high back pressure shaft seals - V= Viton

N Bz= Buna N and Bronze thrust plates - V Bz= Viton and Bronze thrust plates

Tab. 2

Working pressure psi (bar)	Δp<2030 (140)	2030<Δp<3045 (140) (210)	Δp>3045 (210)
Contamination class NAS 1638	10	9	8
Contamination class ISO 4406:1999	21/19/16	20/18/15	19/17/14
Achieved with filter β ₁₀ (c) ≥ 200 according to ISO 16889	-	10 μm	10 μm
Achieved with filter β ₂₅ (c) ≥ 200 according to ISO 16889	25 μm	-	-

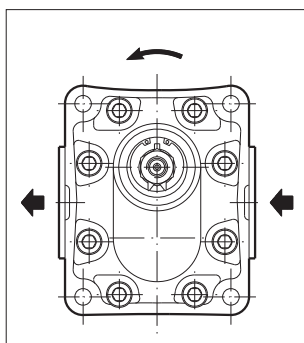
Casappa recommends to use its own production filters:



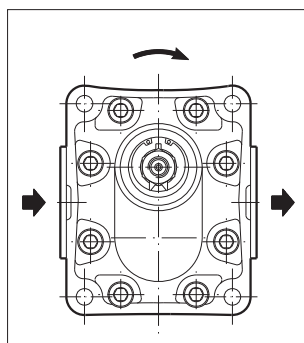
GENERAL NOTES

Available with different inlet and outlet ports. If you use fire resistant fluids specify the type of them at the order. For more information please consult our technical sales department.

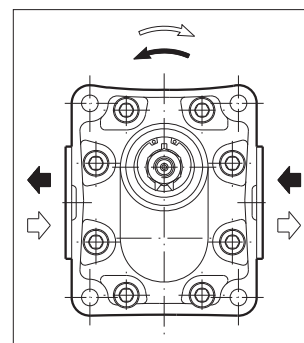
DEFINITION OF ROTATION DIRECTION LOOKING AT THE DRIVE SHAFT



Anti-clock rotation

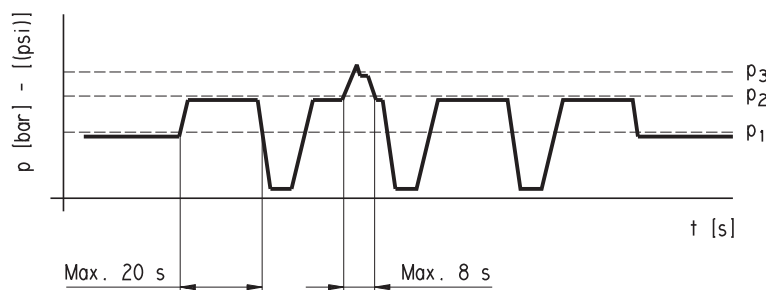


Clockwise rotation



Reversible rotation

PRESSURE DEFINITION



p_1 Max. continuous pressure

p_2 Max. intermittent pressure

p_3 Max. peak pressure

01/03.2002

KAPPA 30 GENERAL DATA MOTORS

KM 30

Motor type	Displacement	Max. pressure			Max. speed	Min. speed
		p ₁	p ₂	p ₃		
	in ³ /rev (cm ³ /rev)	psi (bar)			min ⁻¹	
KM 30•27	1.63 (26,7)	4060 (280)	4350 (300)	4495 (310)	3000	350
KM 30•34	2.11 (34,56)	3770 (260)	4060 (280)	4350 (300)	3000	350
KM 30•38	2.40 (39,27)	3770 (260)	4060 (280)	4350 (300)	3000	350
KM 30•43	2.68 (43,98)	3625 (250)	3915 (270)	4205 (290)	3000	350
KM 30•51	3.16 (51,83)	3335 (230)	3625 (250)	3915 (270)	2500	350
KM 30•56	3.45 (56,54)	3118 (215)	3408 (235)	3698 (255)	2500	350
KM 30•61	3.74 (61,26)	2900 (200)	3190 (220)	3480 (240)	2500	350
KM 30•73	4.50 (73,82)	2610 (180)	2900 (200)	3190 (220)	2500	350

p₁= Max. continuous pressure

p₂= Max. intermittent pressure

p₃= Max. peak pressure

The values in the table refer to unidirectional motors.

Reversible motors max pressures are 15% lower than those shown in table.

For different working conditions please consult our sales department.

01/03.2002

DESIGN CALCULATIONS FOR MOTORS

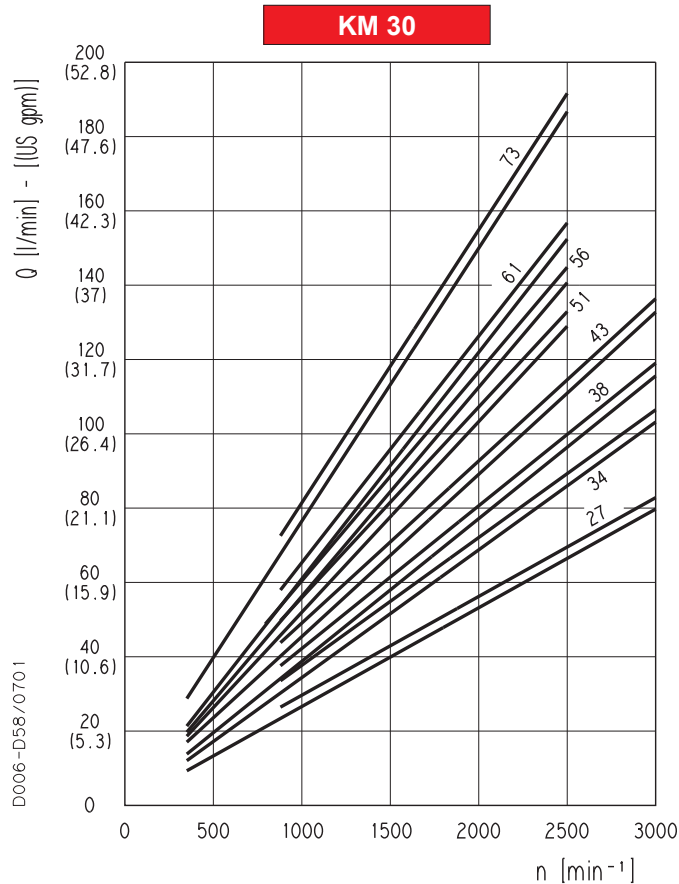
Q	US gpm (l/min)	Delivery
M	lbf in (Nm)	Torque
P	HP (kW)	Power
V	in ³ /rev (cm ³ /rev)	Displacement
n	min ⁻¹	Speed
Δp	psi (bar)	Pressure
η_v = η_v (V, Δp, n) (≈ 0,97) Volumetric efficiency		
η_{hm} = η_{hm} (V, Δp, n) (≈ 0,88) Hydro-mechanical efficiency		
η_t = η_v • η_m (≈ 0,85) Overall efficiency		

$$\begin{aligned}
 \text{Q} &= \frac{Q_{\text{theor.}}}{\eta_v} \quad [\text{l/min}] \\
 Q_{\text{theor.}} &= \frac{V \text{ (cm}^3\text{/rev)} \cdot n \text{ (min}^{-1}\text{)}}{1000} \\
 M &= M_{\text{theor.}} \cdot \eta_{hm} \quad [\text{Nm}] \\
 M_{\text{theor.}} &= \frac{\Delta p \text{ (bar)} \cdot V \text{ (cm}^3\text{/rev)}}{62,83} \\
 P_{IN} &= \frac{\Delta p \text{ (bar)} \cdot Q \text{ (l/min)}}{600} \quad [\text{kW}] \\
 P_{OUT} &= P_{IN} \cdot \eta_t
 \end{aligned}$$

Note: Diagrams providing approximate selection data will be found on subsequent pages.

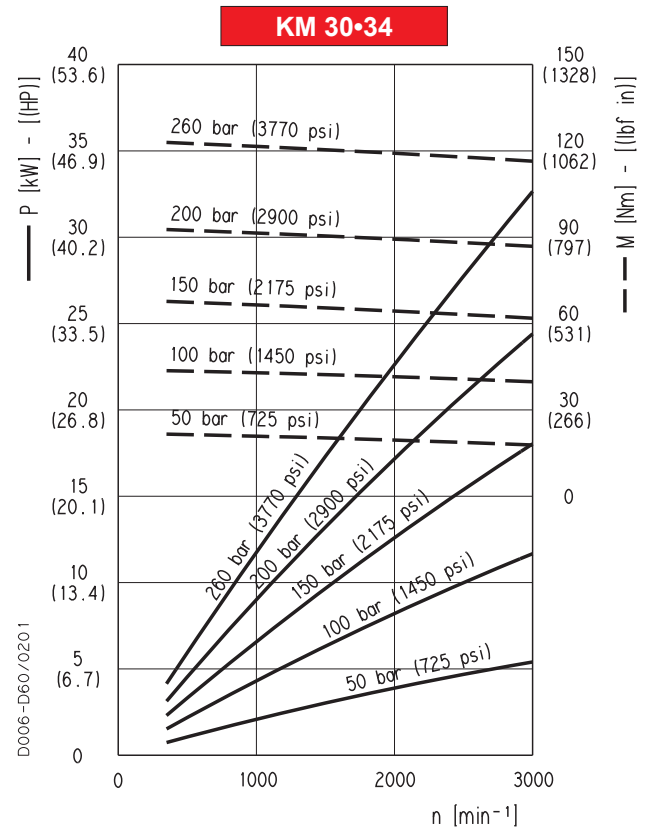
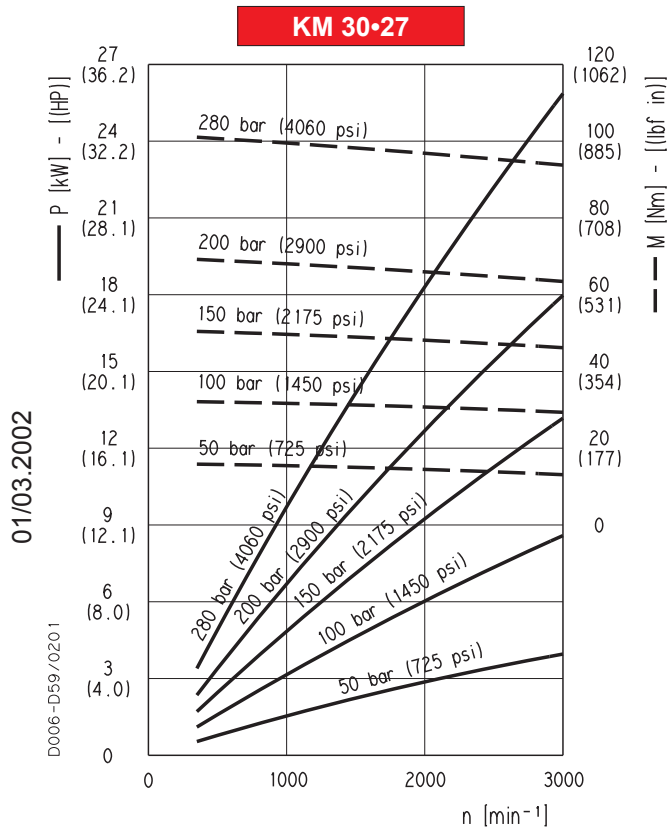
KAPPA 30 GEAR MOTORS PERFORMANCE CURVES

KM 30

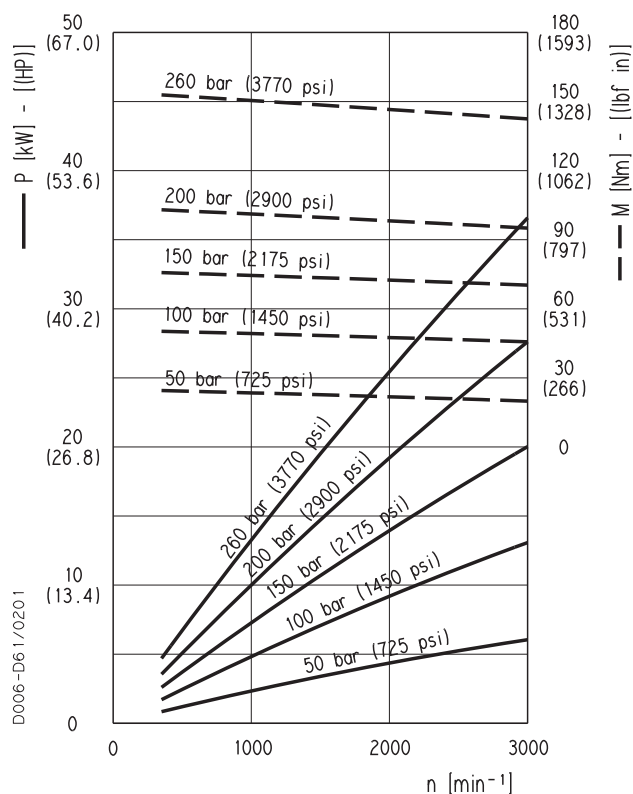
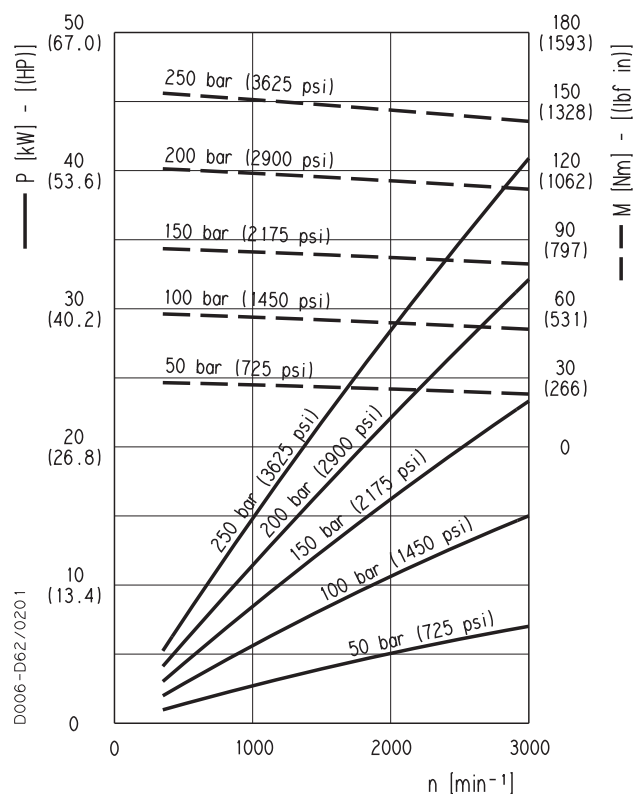
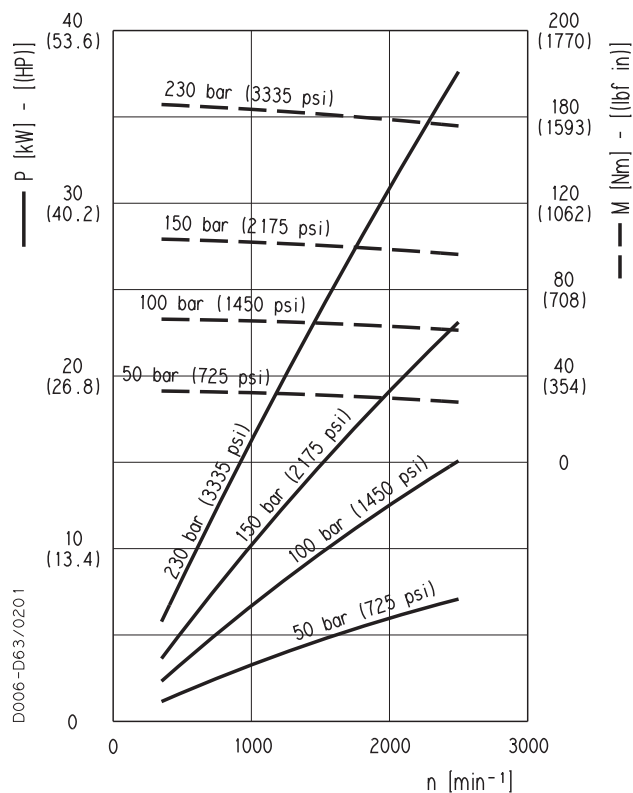
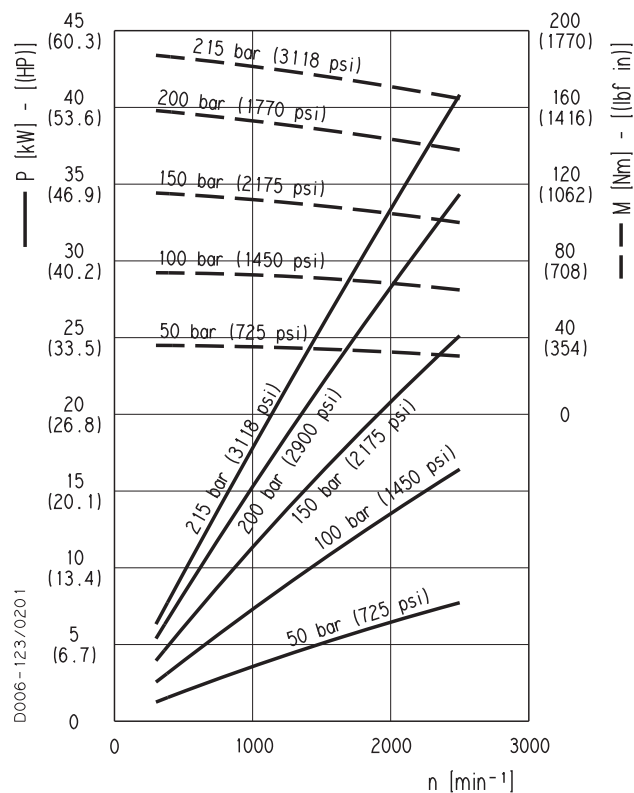


Each curve has been obtained at 122 °F (50 °C), using oil with viscosity 168 SSU (36 cSt) at 104 °F (40 °C) and at these pressures:

- KM 30•27 290-4060 psi (20-280 bar)
- KM 30•34 290-3770 psi (20-260 bar)
- KM 30•38 290-3770 psi (20-260 bar)
- KM 30•43 290-3625 psi (20-250 bar)
- KM 30•51 290-3335 psi (20-230 bar)
- KM 30•56 290-3118 psi (20-215 bar)
- KM 30•61 290-2900 psi (20-200 bar)
- KM 30•73 290-2610 psi (20-180 bar)



KAPPA 30 GEAR MOTORS PERFORMANCE CURVES

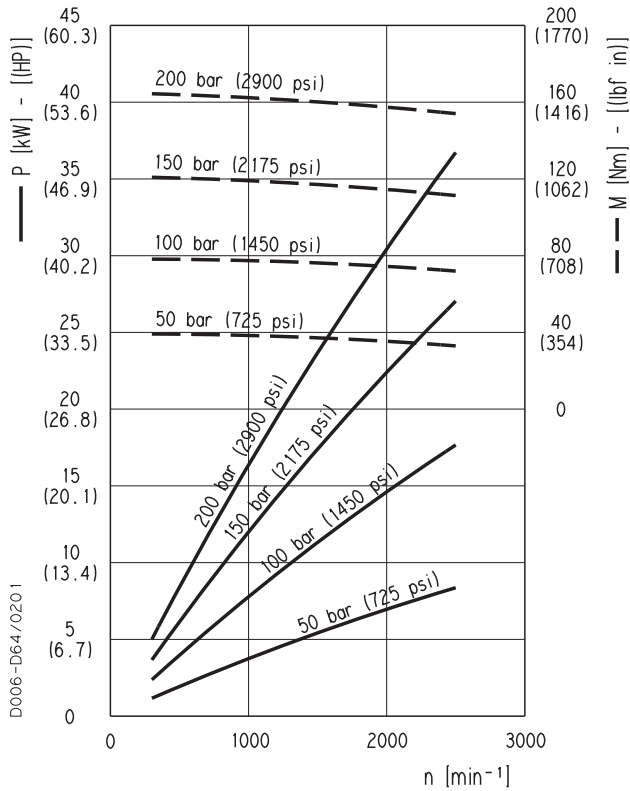
KM 30
KM 30-38

KM 30-43

KM 30-51

KM 30-56


01/03.2002

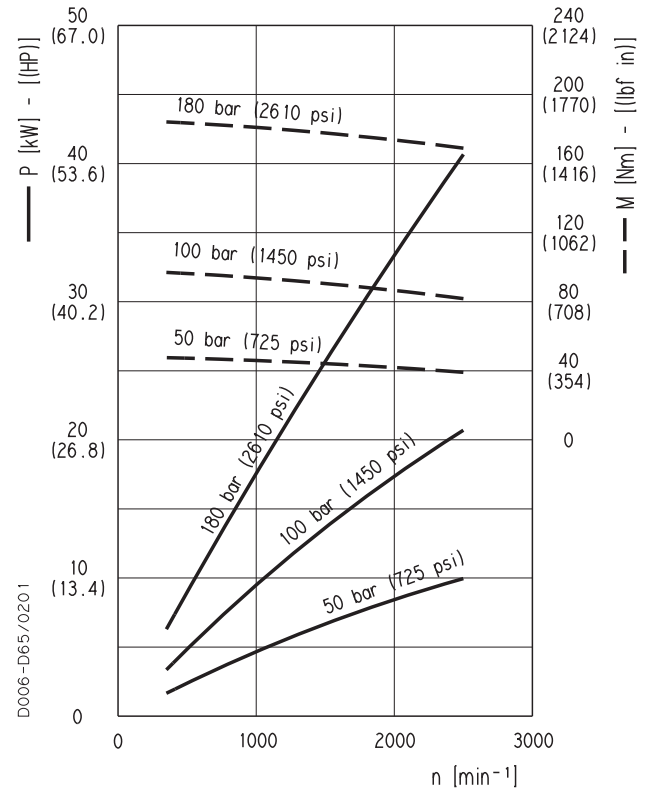
KAPPA 30 GEAR MOTORS PERFORMANCE CURVES

KM 30

KM 30-61



KM 30-73



01/03.2002

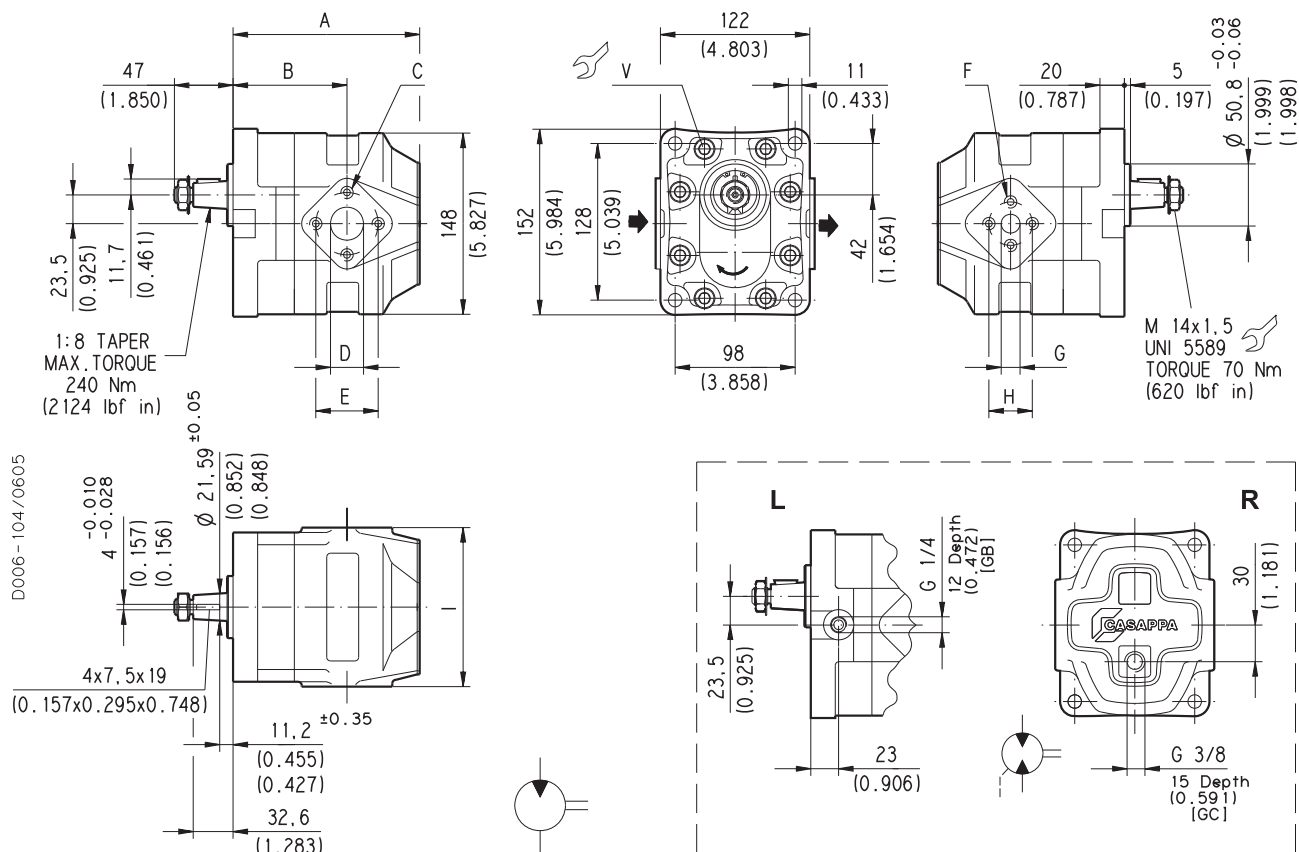
KAPPA 30

HYDRAULIC GEAR MOTORS EUROPEAN STANDARD

83 E3

EUROPEAN FLANGED PORTS - 4 Bolts

Metric thread ISO 60° conforms to ISO/R 262



V Screws tightening torque Nm (lbf in)

 70 ± 7 (558 ÷ 682)

Motor type		A	B	C	D	E	F	G	H	I
		mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)
KM 30•27	S D L R B	0-83 E3-L EB/ED-N		M 10 Depth 17 (0.669)	27 (1.063)	51 (2.008)	M 8 Depth 17 (0.669)	19 (0.748)	40 (1.575)	130 (5.118)
KM 30•34										
KM 30•38										
KM 30•43										
KM 30•51										
KM 30•56										
KM 30•61										
KM 30•73		0-83 E3-L ED/EF-N		M 12 Depth 17 (0.669)	33 (1.299)	62 (2.441)	M 10 Depth 17 (0.669)	27 (1.063)	51 (2.008)	135 (5.315)

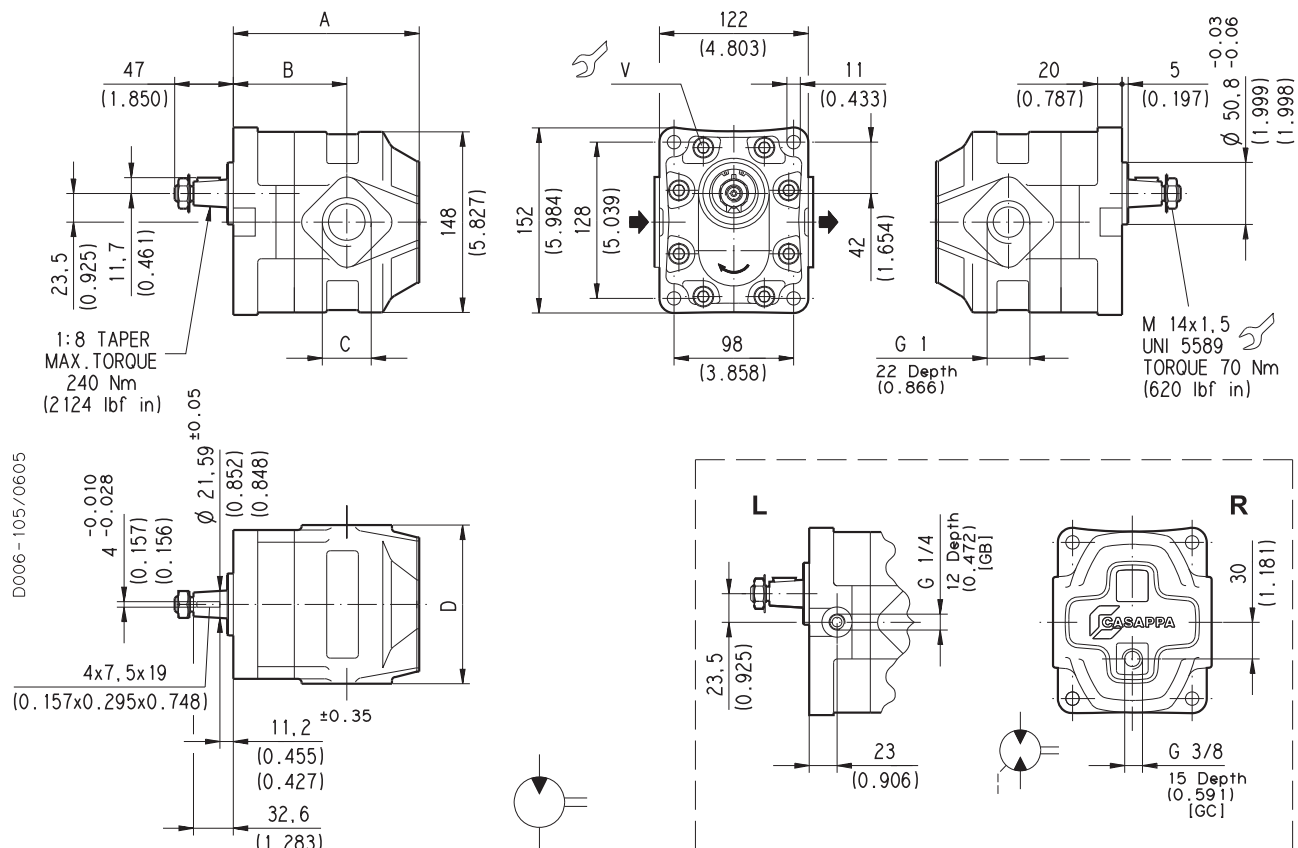
Rotation: S=left - D=right - L=reversible side drain - R=reversible rear drain - B=reversible internal drain

How to order:

KM 30•27 S0-83 E3-L EB/ED-N

GAS STRAIGHT THREAD PORTS

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


V Screws tightening torque Nm (lbf in)

70 ±7 (558 ÷ 682)

Motor type		A	B	C	D
		mm (in)	mm (in)	mm (in)	mm (in)
KM 30•27	S D L R B	133 (5.236)	85 (3.346)	G 1 Depth 22 (0.866)	130 (5.118)
KM 30•34		138 (5.433)	90 (3.543)		
KM 30•38		141 (5.551)	93 (3.661)		
KM 30•43		144 (5.669)	96 (3.780)		
KM 30•51		149 (5.866)	93 (3.661)		
KM 30•56		152 (5.984)	97 (3.819)		
KM 30•61		155 (6.102)	100 (3.937)		
KM 30•73		163 (6.417)	108 (4.252)	G 1 1/4 Depth 24 (0.945)	135 (5.315)

Rotation: S=left - D=right - L=reversible side drain - R=reversible rear drain - B=reversible internal drain

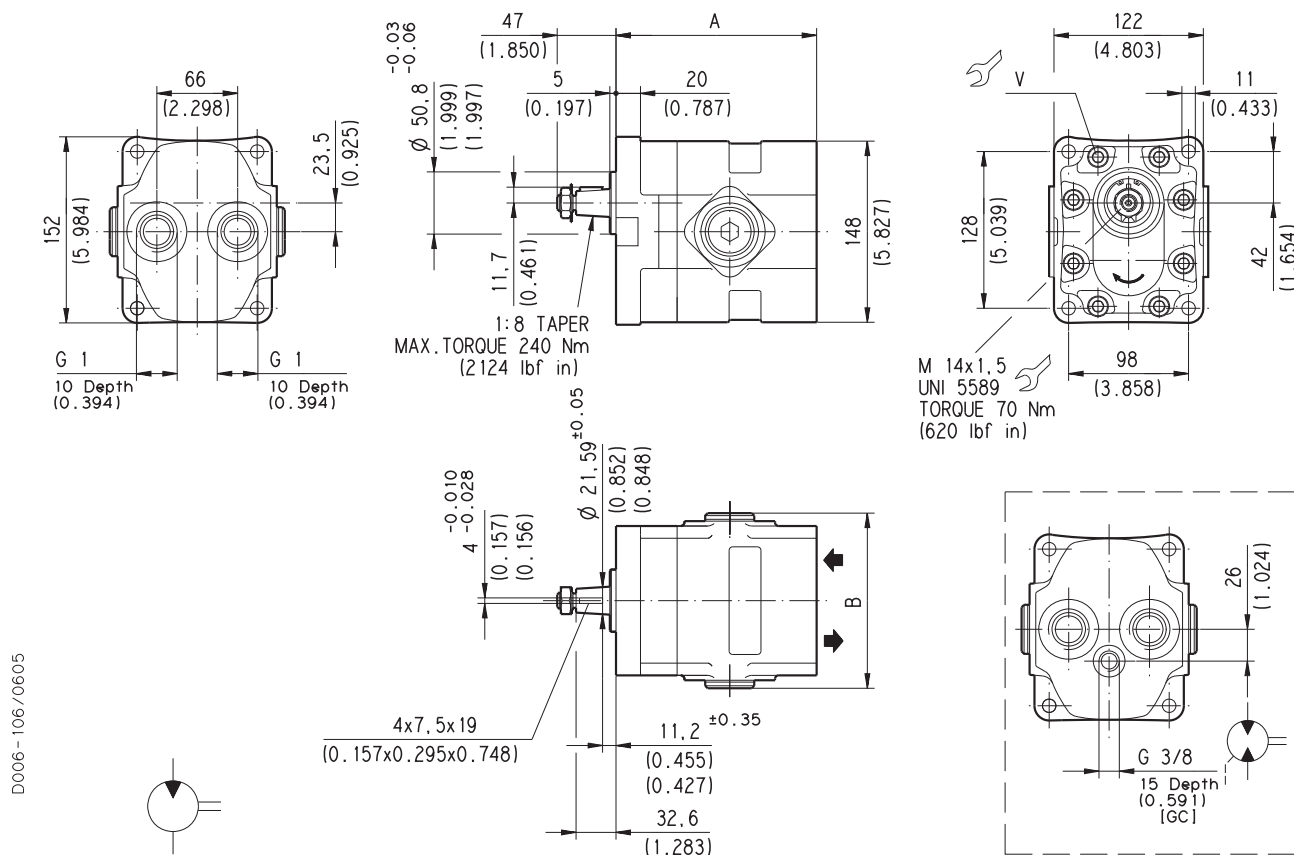
How to order:

KM 30•27 S0-83 E3-L GF/GF-N

02/06.2005

GAS STRAIGHT THREAD PORTS

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


V Screws tightening torque Nm (lbf in)

70 ± 7 (558 $\div$ 682)

Rear ports version (P)

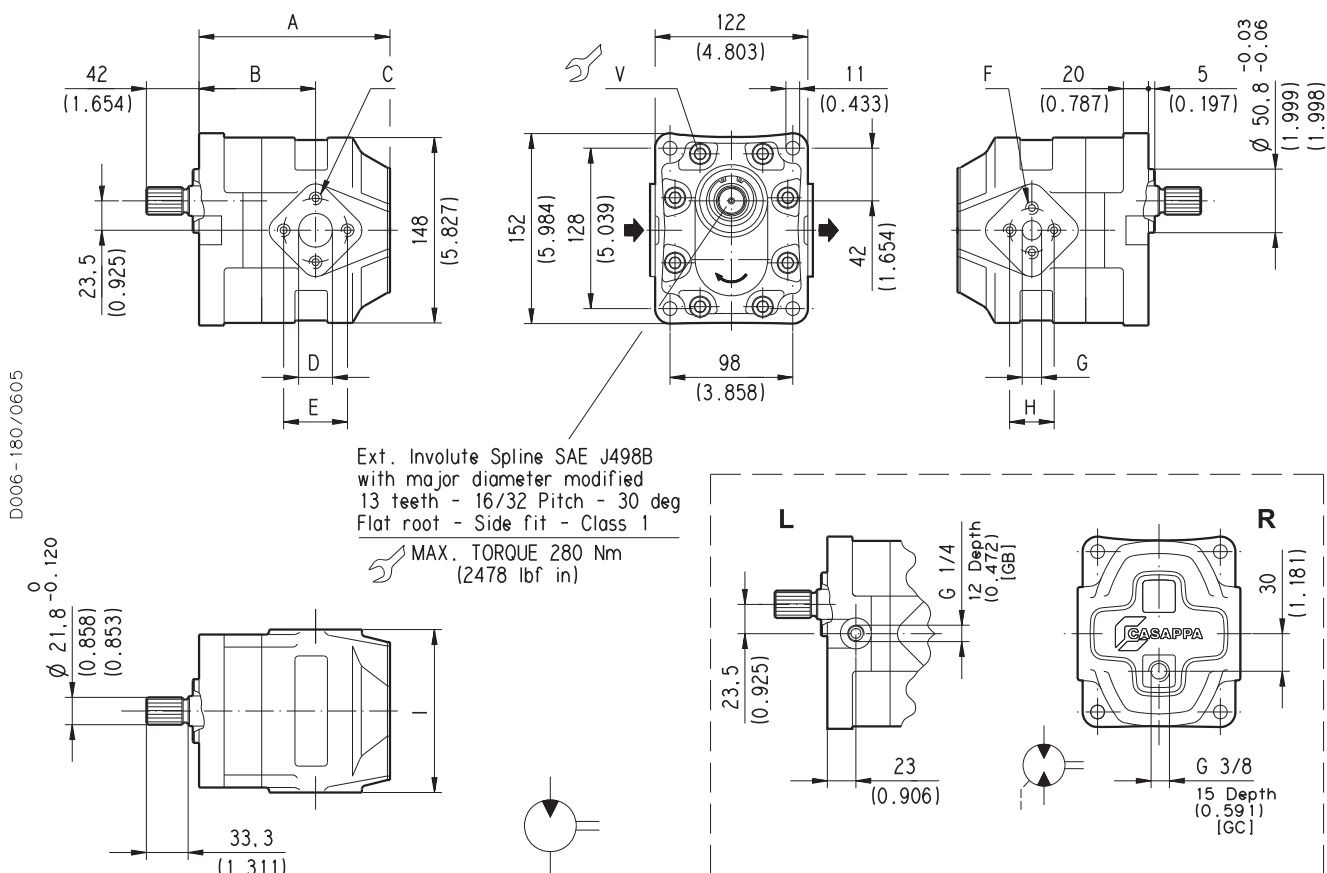
Motor type			A	B
			mm (in)	mm (in)
KM 30•27	S D R B	0-83 E3-P GF/GF-N	148 (5.827)	143 (5.630)
KM 30•34			153 (6.024)	
KM 30•38			156 (6.142)	
KM 30•43			159 (6.260)	
KM 30•51			164 (6.457)	
KM 30•56			167 (6.575)	148 (5.827)
KM 30•61			170 (6.693)	
KM 30•73			178 (7.008)	

Rotation: S=Left - D=Right - R=reversible rear drain - B=reversible internal drain

How to order:

KM 30•27 S0-83 E3-P GF/GF-N

EUROPEAN FLANGED PORTS - 4 Bolts
Metric thread ISO 60° conforms to ISO/R 262



Motor type		A	B	C	D	E	F	G	H	I
		mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)
KM 30•27	S D L R B	133 (5.236)	85 (3.346)	M 10 Depth 17 (0.669)	27 (1.063)	51 (2.008)	M 8 Depth 17 (0.669)	19 (0.748)	40 (1.575)	130 (5.118)
KM 30•34		138 (5.433)	90 (3.543)							
KM 30•38		141 (5.551)	93 (3.661)							
KM 30•43		144 (5.669)	96 (3.780)							
KM 30•51		149 (5.866)	93 (3.661)							
KM 30•56		152 (5.984)	97 (3.819)							
KM 30•61		155 (6.102)	100 (3.937)							
KM 30•73	0-83 E3-L EF/ED-N	163 (6.417)	108 (4.252)	M 12 Depth 17 (0.669)	33 (1.299)	62 (2.441)	M 10 Depth 17 (0.669)	27 (1.063)	51 (2.008)	135 (5.315)

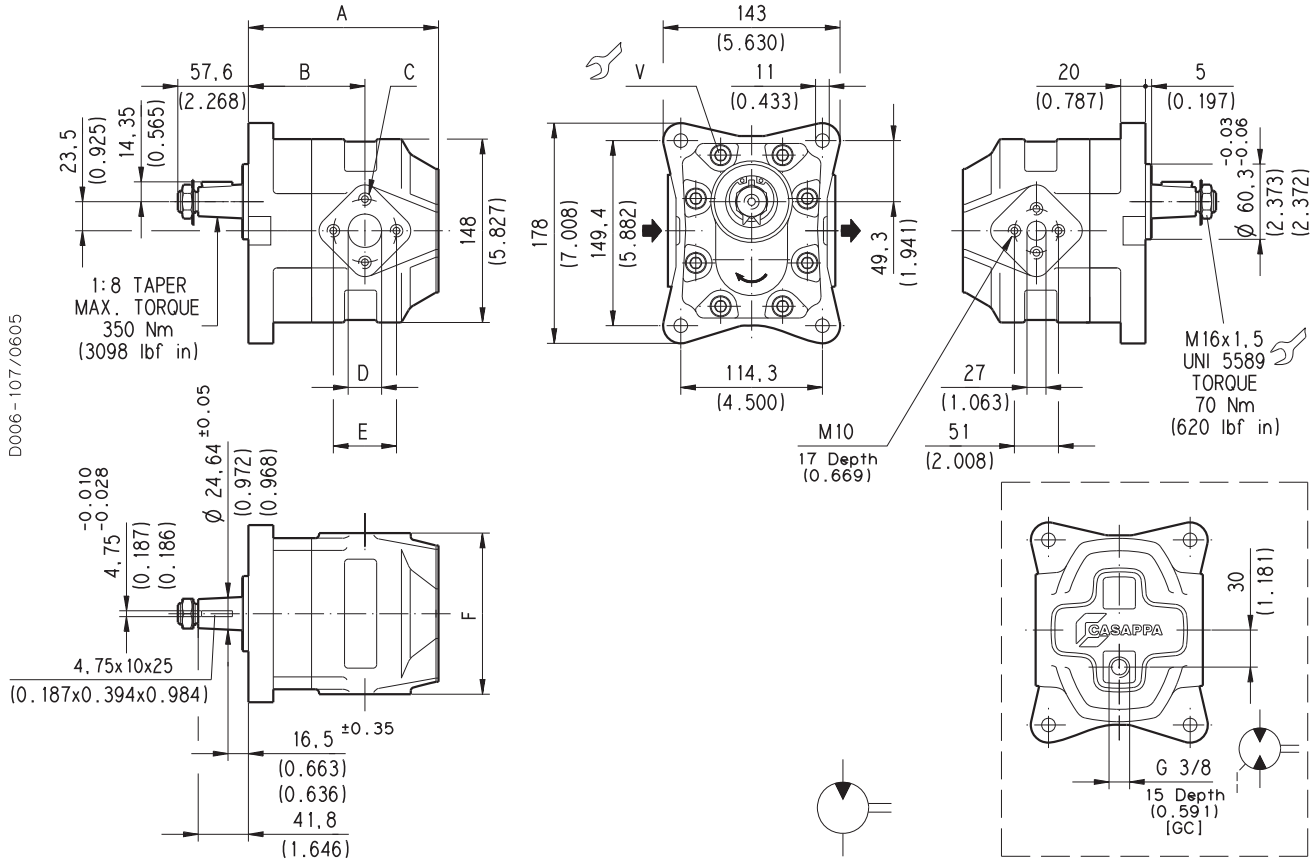
Rotation: S=left - D=right - L=reversible side drain - R=reversible rear drain - B=reversible internal drain

How to order:

KM 30•27 S0-83 E3-L ED/EB-N

02/06.2005

EUROPEAN FLANGED PORTS - 4 Bolts
Metric thread ISO 60° conforms to ISO/R 262



V Screws tightening torque Nm (lbf in)

70 ±7 (558 ÷ 682)

02/06.2005

Motor type			A	B	C	D	E	F
			mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)
KM 30•51	S D R B	0-84 E4-L ED/ED-N	150 (5.906)	94 (3.701)	M 10 Depth 17 (0.669)	27 (1.063)	51 (2.008)	130 (5.118)
KM 30•61		0-84 E4-L ED/EF-N	156 (6.142)	101 (3.976)	M 12 Depth 17 (0.669)	33 (1.299)	62 (2.441)	135 (5.315)
KM 30•73			164 (6.457)	109 (4.291)				

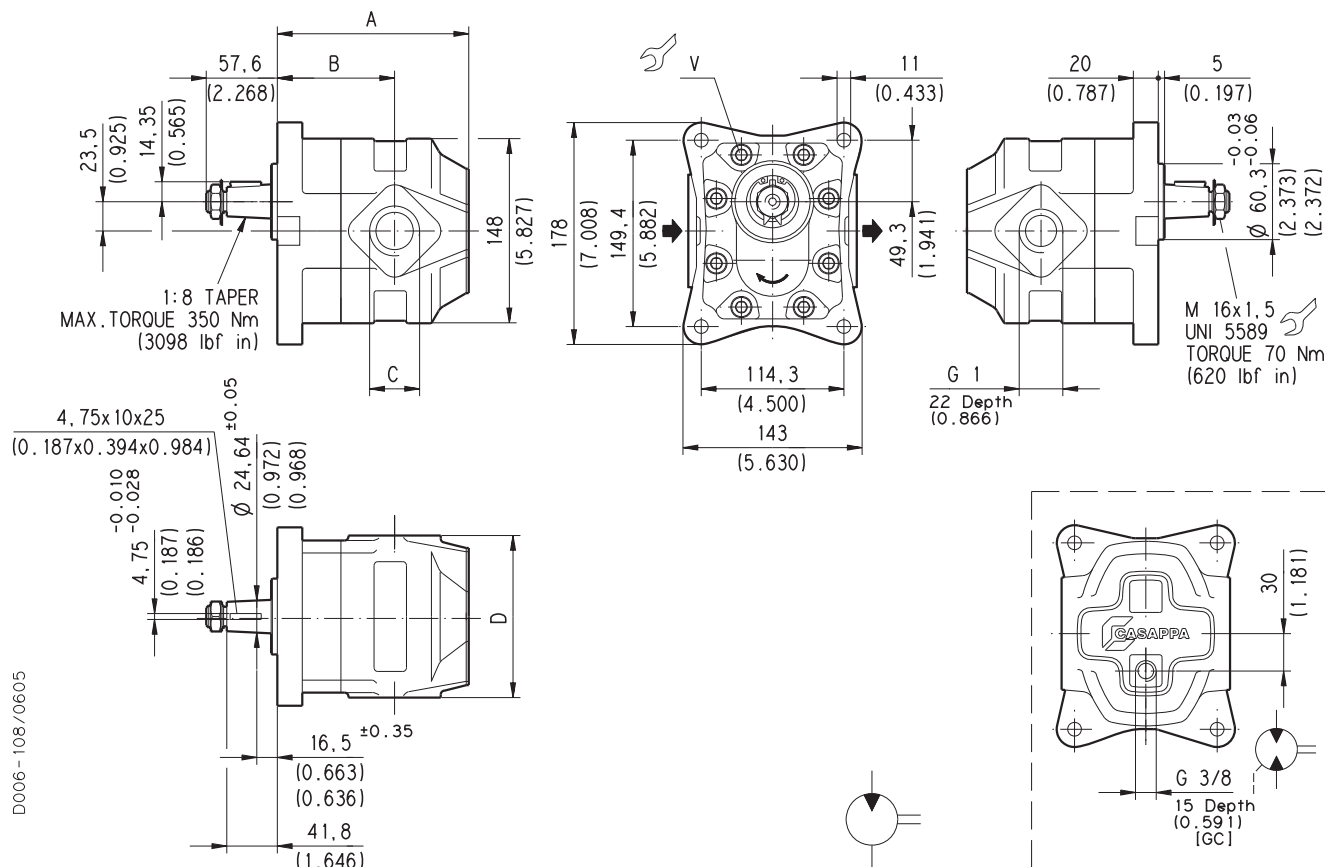
Rotation: S=left - D=right - R=reversible rear drain - B=reversible internal drain

How to order:

KM 30•51 S0-84 E4-L ED/ED-N

GAS STRAIGHT THREAD PORTS

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



V Screws tightening torque Nm (lbf in)

70 ±7 (558 ÷ 682)

Motor type			A	B	C	D
			mm (in)	mm (in)	mm (in)	mm (in)
KM 30•51	S D R B	0-84 E4-L GF/GF-N	150 (5.906)	94 (3.701)	G 1 Depth 22 (0.866)	130 (5.118)
KM 30•61		0-84 E4-L GF/GG-N	156 (6.142)	101 (3.976)	G 1 1/4 Depth 24 (0.945)	135 (5.315)
KM 30•73			164 (6.457)	109 (4.291)		

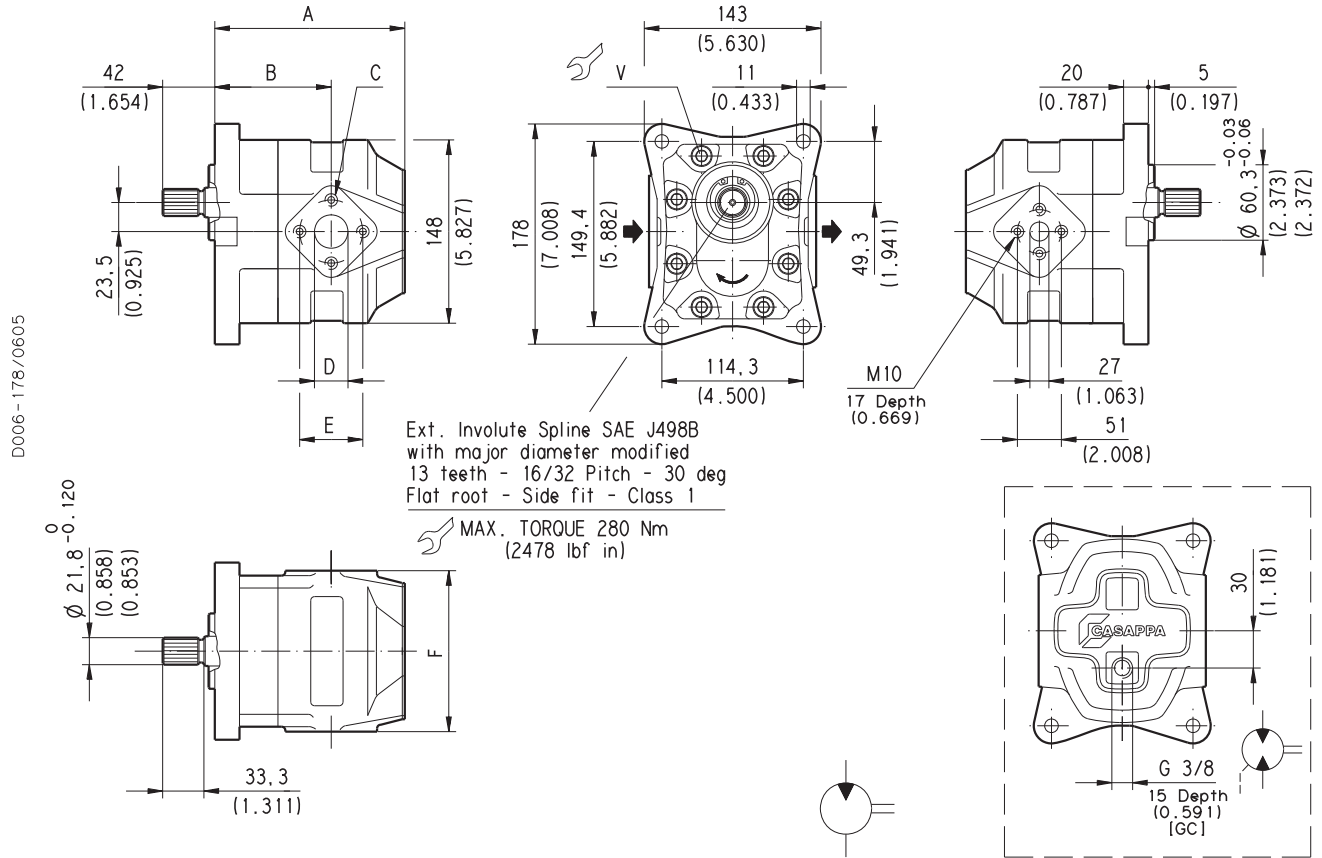
Rotation: S=left - D=right - R=reversible rear drain - B=reversible internal drain

How to order:

KM 30•51 S0-84 E4-L GF/GF-N

02/06.2005

EUROPEAN FLANGED PORTS - 4 Bolts
Metric thread ISO 60° conforms to ISO/R 262



V Screws tightening torque Nm (lbf in)

70 ±7 (558 ÷ 682)

02/06.2005

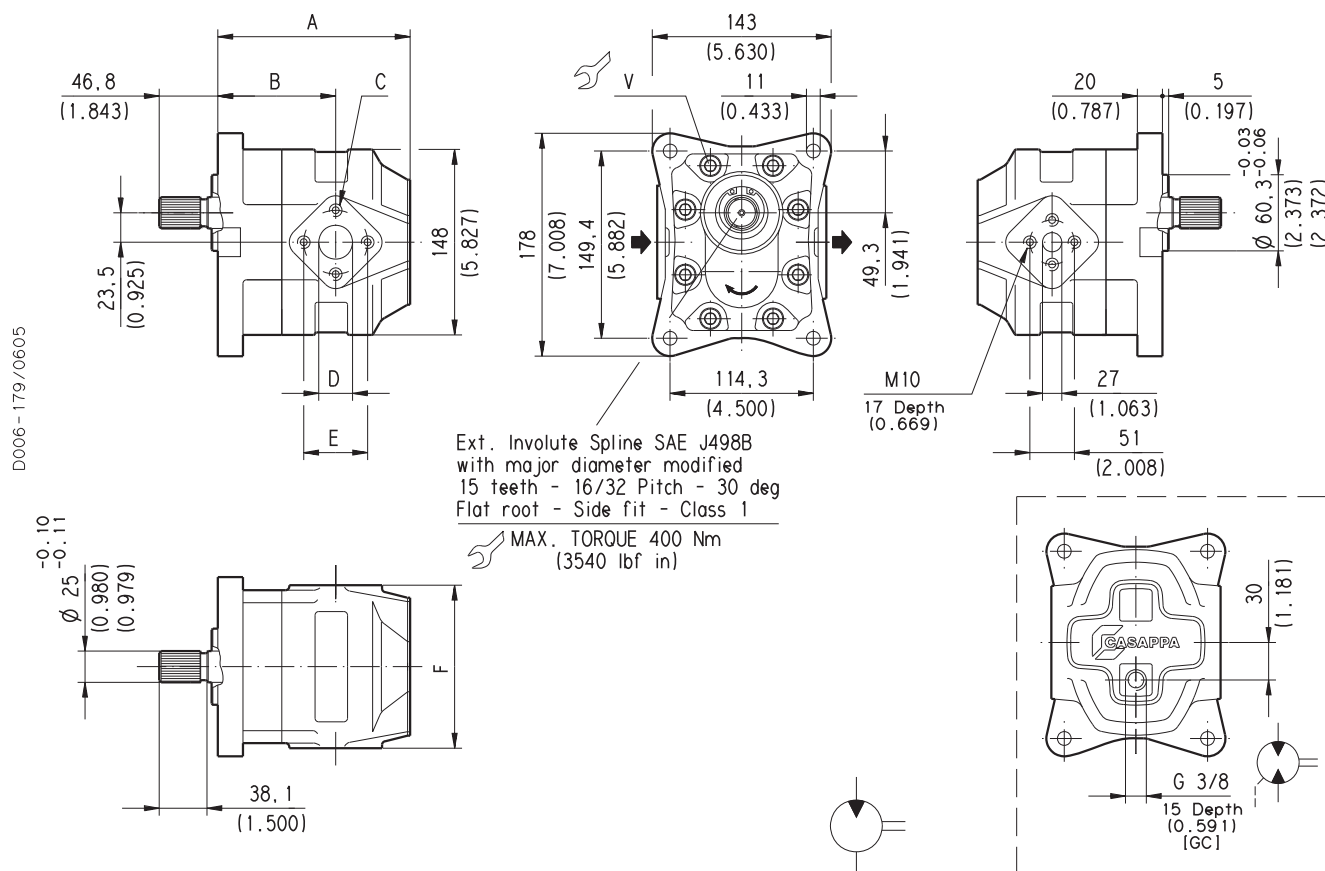
Motor type			A	B	C	D	E	F
			mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)
KM 30•51	S D R B	0-A8 E4-L ED/ED-N	150 (5.906)	94 (3.701)	M 10 Depth 17 (0.669)	27 (1.063)	51 (2.008)	130 (5.118)
KM 30•61		0-A8 E4-L ED/EF-N	156 (6.142)	101 (3.976)	M 12 Depth 17 (0.669)	33 (1.299)	62 (2.441)	135 (5.315)
KM 30•73			164 (6.457)	109 (4.291)				

Rotation: S=left - D=right - R=reversible rear drain - B=reversible internal drain

How to order:

KM 30•51 S0-A8 E4-L ED/ED-N

EUROPEAN FLANGED PORTS - 4 Bolts
Metric thread ISO 60° conforms to ISO/R 262



V Screws tightening torque Nm (lbf in)

70 ±7 (558 ÷ 682)

Motor type			A	B	C	D	E	F
			mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)
KM 30•51	S D R B	0-A5 E4-L ED/ED-N	150 (5.906)	94 (3.701)	M 10 Depth 17 (0.669)	27 (1.063)	51 (2.008)	130 (5.118)
KM 30•61		0-A5 E4-L ED/EF-N	156 (6.142)	101 (3.976)	M 12 Depth 17 (0.669)	33 (1.299)	62 (2.441)	135 (5.315)
KM 30•73			164 (6.457)	109 (4.291)				

Rotation: S=left - D=right - R=reversible rear drain - B=reversible internal drain

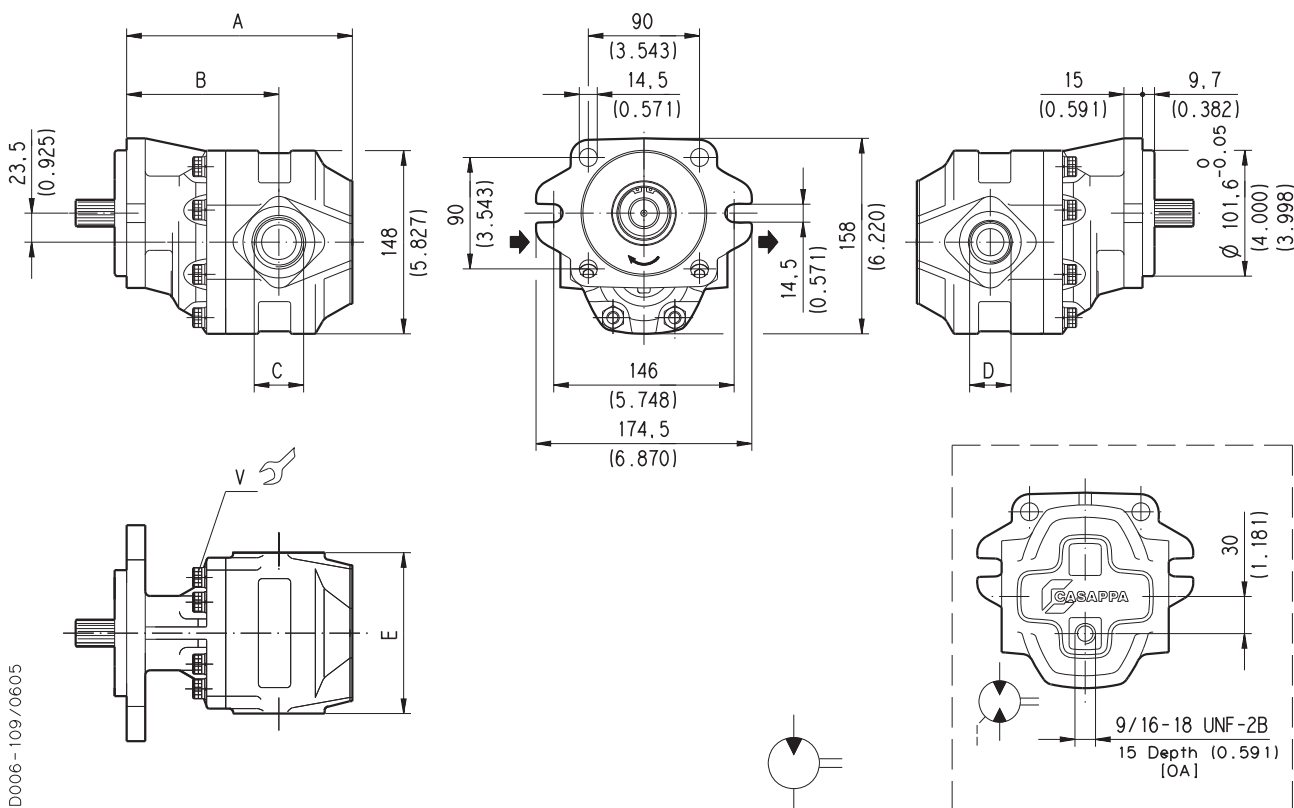
How to order:

KM 30•51 S0-A5 E4-L ED/ED-N

KAPPA 30
HYDRAULIC GEAR MOTORS SAE STANDARD
... S3

SAE STRAIGHT THREAD PORTS J514

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



D006-109/0605

V Screws tightening torque Nm (lbf in)

70 ±7 (558 ÷ 682)

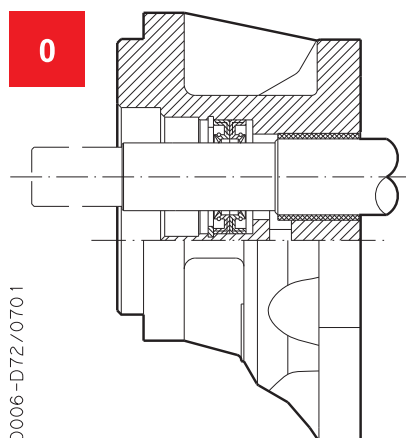
To order see page 104 e 105

Motor type	A	B	C	D	E	Ports code	
	mm (in)	mm (in)			mm (in)	IN	OUT
KM 30•27	164 (6.457)	115 (4.528)	1-5/16-12 UN-2B	1-1/16-12 UN-2B	130 (5.118)	OD	OF
KM 30•34	169 (6.654)	120 (4.724)					
KM 30•38	172 (6.772)	123 (4.843)	1-5/8-12 UN-2B	1-5/16-12 UN-2B		OF	OG
KM 30•43	175 (6.890)	126 (4.961)					
KM 30•51	180 (7.087)	123 (4.843)					
KM 30•56*	182 (7.165)	127 (5.000)	1-7/8-12 UN-2B	1-5/8-12 UN-2B	135 (5.433)	OG	OH
KM 30•61	186 (7.323)	130 (5.118)					
KM 30•73	194 (7.638)	138 (5.433)					

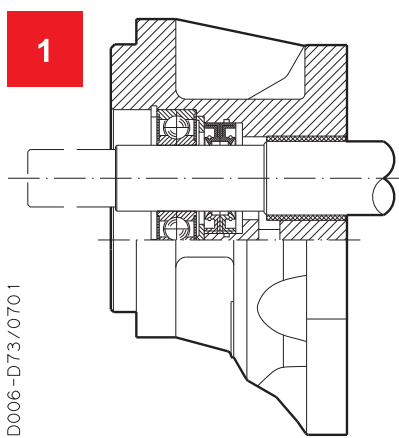
* Available only with 04 and 32 shaft for 0 and 1 version.

KAPPA 30 SAE VERSION

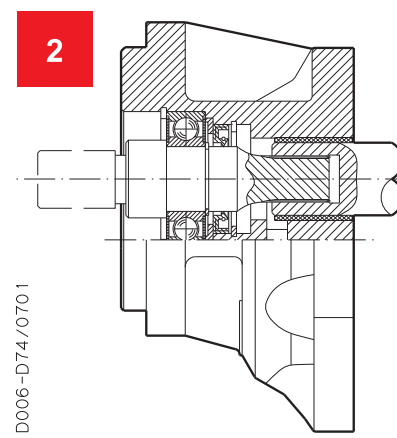
SAE



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



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



Special version with independent shaft for applications with low radial load and without axial load on the drive shaft.

Replaces: 01/03.2002

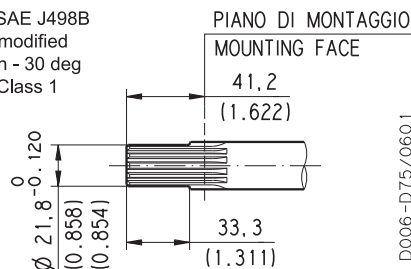
KAPPA 30 END DRIVE SHAFTS

SAE

SAE "B" SPLINE

04

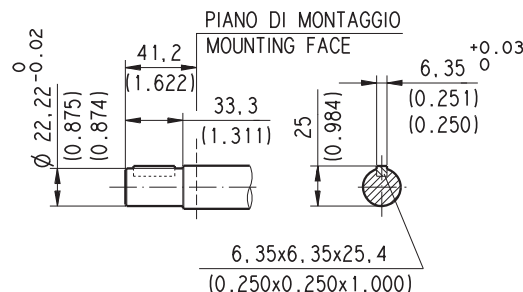
Ext. Involute Spline SAE J498B
with major diameter modified
13 teeth - 16/32 Pitch - 30 deg
Flat Root - Side fit - Class 1



MAX 2921 lbf in (330 Nm) ◆

SAE "B" STRAIGHT

32

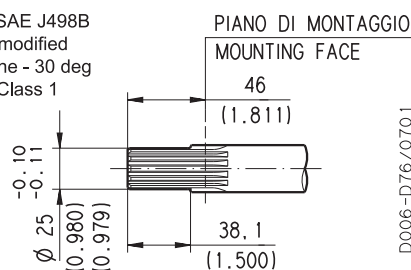


MAX 1770 lbf in (200 Nm) ◆

SAE "BB" SPLINE

05

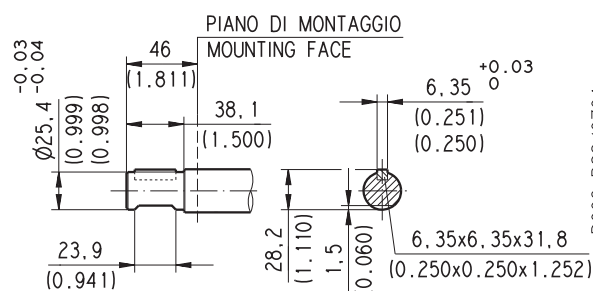
Ext. Involute Spline SAE J498B
with major diameter modified
15 teeth - 16/32 Spline - 30 deg
Flat Root - Side fit - Class 1



MAX 4426 lbf in (500 Nm) ◆

SAE "BB" STRAIGHT

33



MAX 2478 lbf in (280 Nm) ◆

03/03.2006

◆ For "2" version whichever end shaft, the max. torque applicable is M= 1505 lbf in (170 Nm)

HOW TO ORDER SINGLE MOTORS

1	2	3	4	5	6	7	8			
Motor type	Rotation	Version	–	Drive shaft	Mounting flange	–	Ports position	Ports IN/OUT	–	Seals
KM30•27	S	0	–	04	S3	–	L	OF/OD	–	N

1	Motor Type	CODE
in³/rev	(cm³/rev)	
1.63	26,7	KM 30•27
2.11	34,56	KM 30•34
2.40	39,27	KM 30•38
2.68	43,98	KM 30•43
3.16	51,83	KM 30•51
3.45	56,54	KM 30•56
3.74	61,26	KM 30•61
4.50	73,82	KM 30•73

2	Rotation	CODE
Left		S
Right		D
Reversible		R
Reversible with internal drain		B

3	Version	CODE
	Without outboard bearing	0
	With outboard bearing	1
	With outboard bearing and indep. shaft	2

4	Drive shaft	CODE
	SAE "B" spline (13 teeth)	04
	SAE "B" straight	32
	SAE "BB" spline (15 teeth)	05
	SAE "BB" straight	33

5	Mounting flange	CODE
SAE "B" 2-4 holes		S3

CODE	Ports position	6
L	Side	

CODE	Ports IN/OUT	7
SAE STRAIGHT THREAD PORTS (ODT)		
Side	Motor type	
OD/OF	KM 30•27	
OD/OF	KM 30•34	
OF/OG	KM 30•38	
OF/OG	KM 30•43	
OF/OG	KM 30•51	
OG/OH	KM 30•56	
OG/OH	KM 30•61	
OG/OH	KM 30•73	

CODE	Seals (a)	8
N	Buna N (standard) - no code	
N-H	Buna with high back pressure shaft seals	
V	Viton	
N Bz	Buna N and Bronze thrust plates	
V Bz	Viton and Bronze thrust plates	

(a) Choose the seals according to the temperature shown on page 2

ORDER EXAMPLE

Standard motor

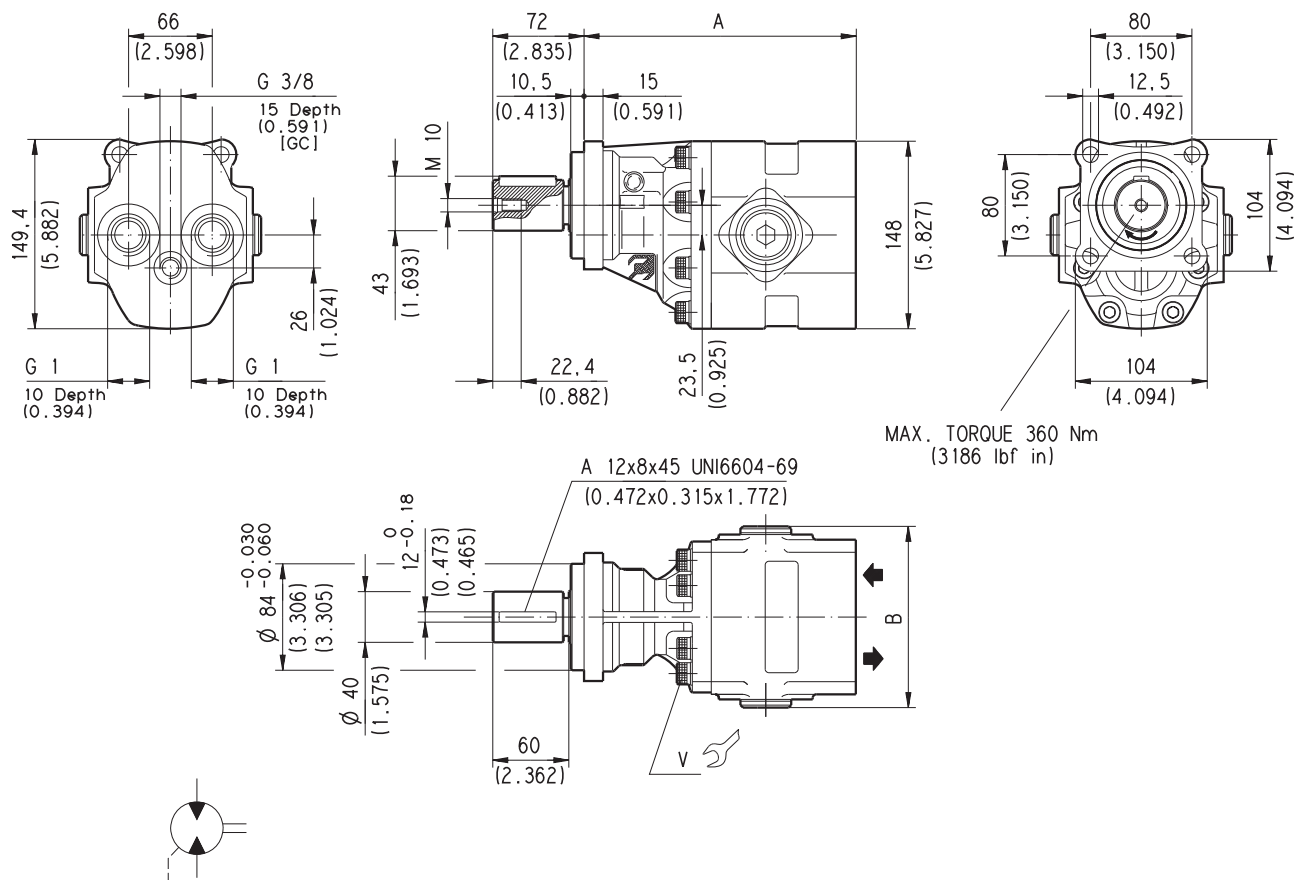
KM 30•27 S0 - 04 S3 - L OD/OF - N

Special version motor

KM 30•27 S2 - 32 S3 - L OD/OF - V Bz

GAS STRAIGHT THREAD PORTS

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

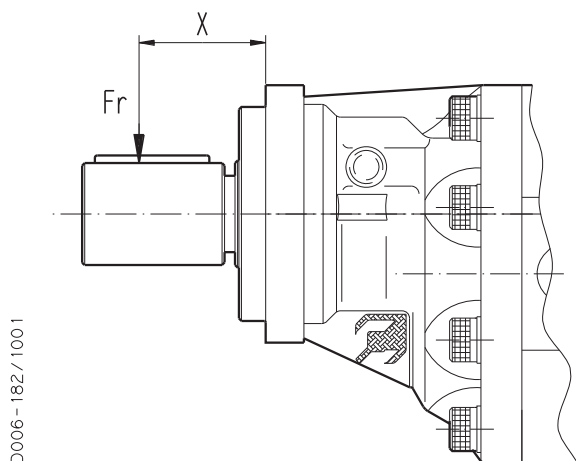

V Screws tightening torque Nm (lbf in)
70 ±7 (558 ÷ 682)

Motor type		A	B
		mm (in)	mm (in)
KM 30•27	R5-42 Z0-P GF/GF-N	198 (7.795)	143 (5.630)
KM 30•34		203,5 (8.012)	
KM 30•38		206,5 (8.130)	
KM 30•43		209,5 (8.248)	

Rotation: R=reversible rear drain

How to order:

KM 30•27 R5-42 Z0-P GF/GF-N



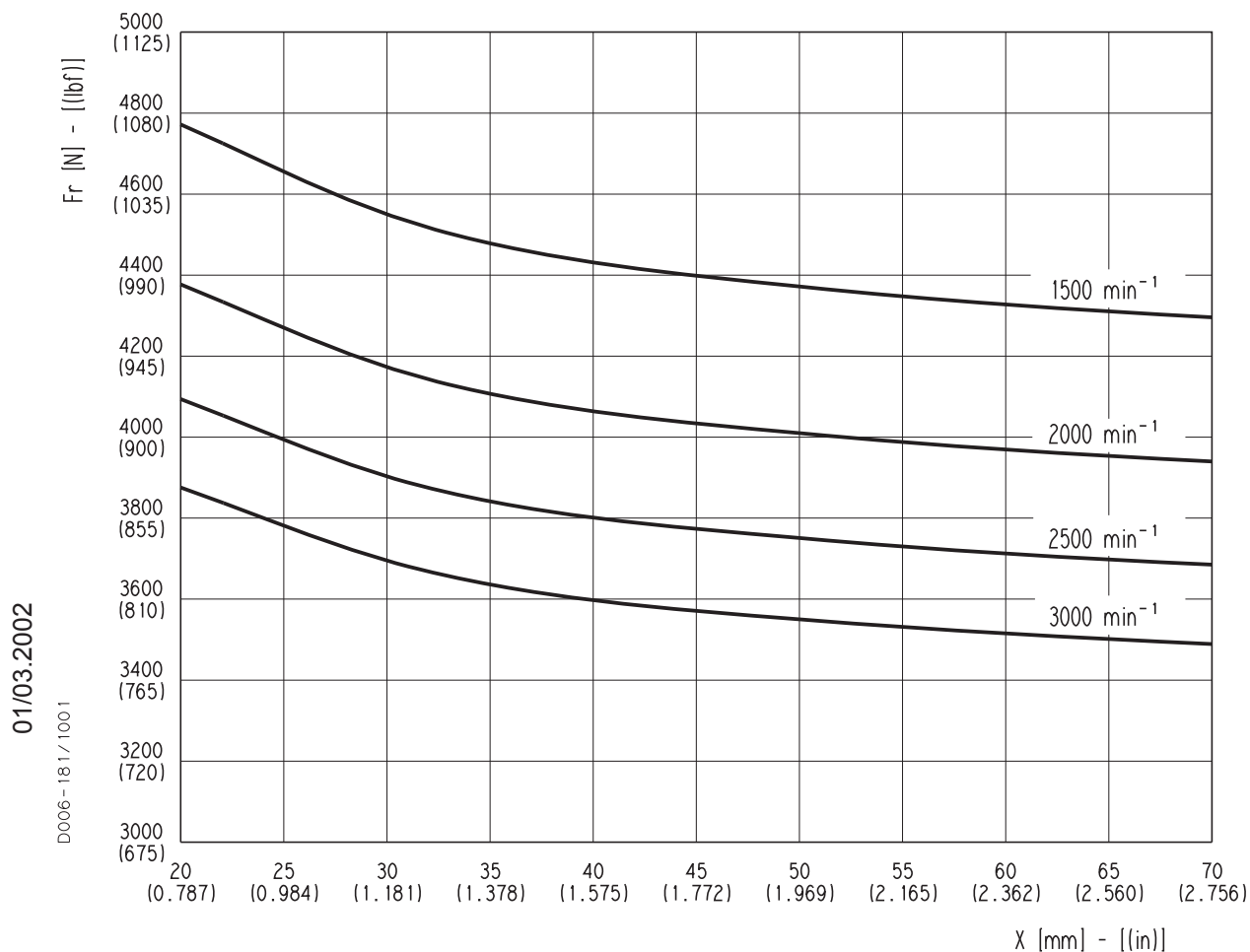
X= Distance of the radial load result from the mounting flange.

Each curve has been obtained at:

Operating temperature: 140 °F (60 °C)

Grease lubrication ISO VG 100

Rating fatigue life (hours) $L_h = 5000$ [h]



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.

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:



HYDRAULIC FLUID

Use hydraulic fluid conforming to ISO/DIN standards, having viscosity 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.

STARTING UP

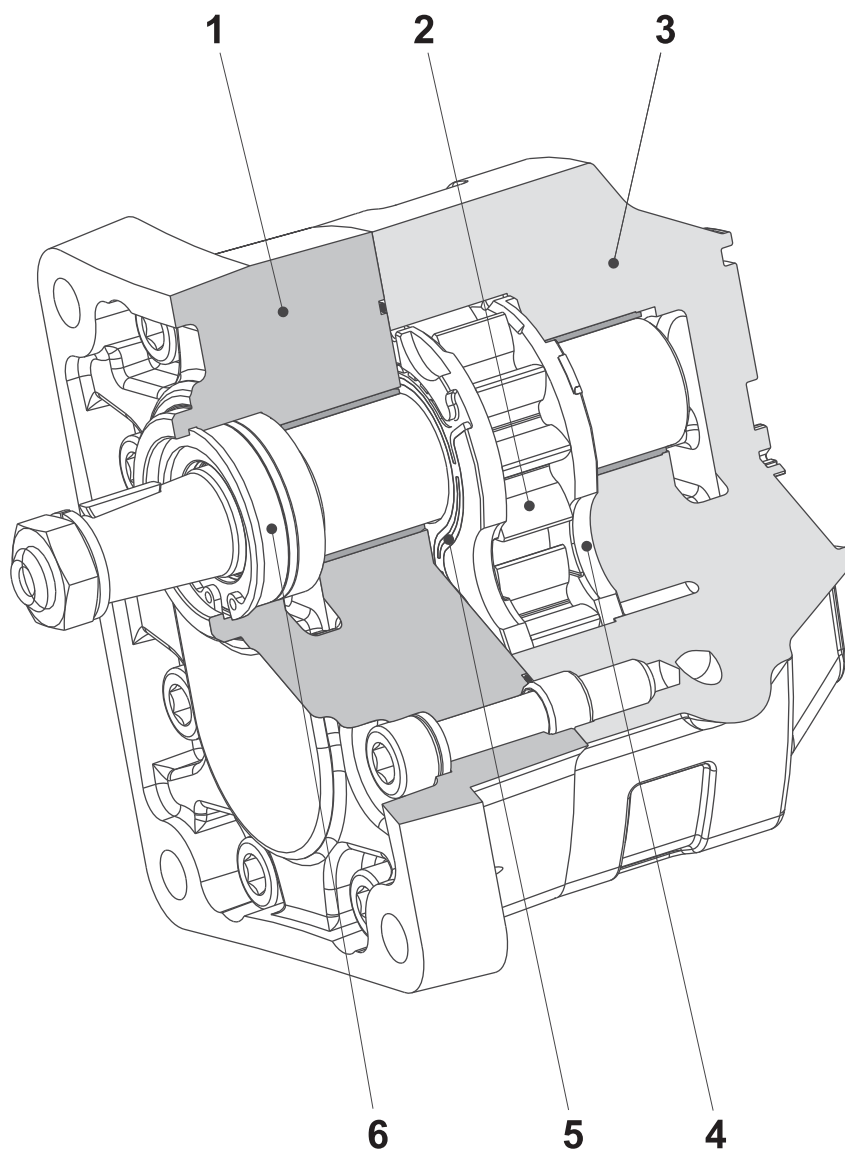
Check that all circuit connections are tight and that the entire system is completely clean. Insert the oil in the tank, using a filter. Bleed the circuit to assist in filling. Set the pressure relief valves to the lowest possible setting. Turn on the system for a few moments at minimum speed, then bleed the circuit again and check the level of oil in the tank. In the difference between pump or motor temperature and fluid temperature exceeds 50 °F (10 °C), 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.

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.

02/06.2005

INSTRUCTIONS



- 1 _ Mounting flange
- 2 _ Gear
- 3 _ Body
- 4 _ Thrust plate
- 5 _ Seal
- 6 _ Shaft seal

01/03.2002

K 05 T A

Edition: 05/03.2012

Replaces: K 04 T A



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