

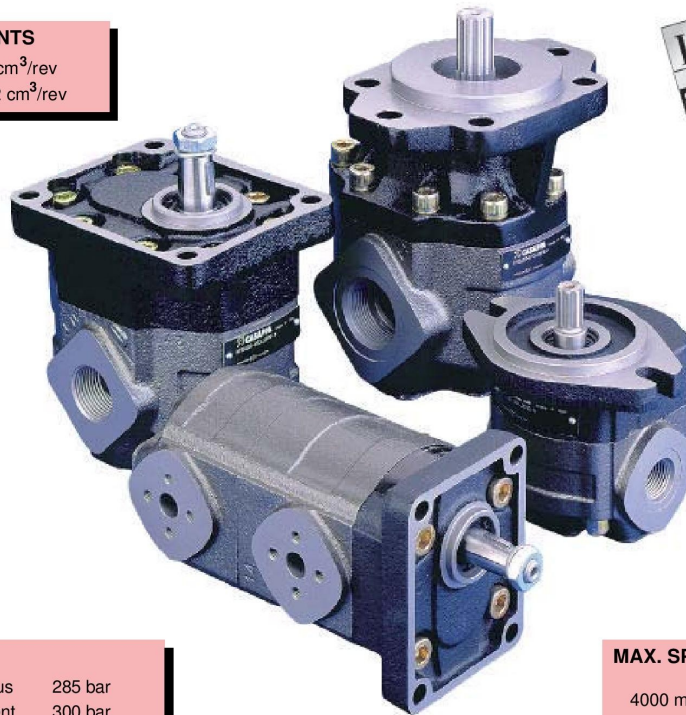
KAPPA®

Hydraulic gear pumps two pieces cast iron housing

Replaces: K 01 T E

DISPLACEMENTS

From 4,95 cm³/rev
To 73,82 cm³/rev



PRESSURE

Max. continuous 285 bar
Max. intermittent 300 bar
Max. peak 330 bar

MAX. SPEED

4000 min⁻¹

- High operating pressures
- High efficiency at high temperature
- Exceptional working life expectancy

Edition: 02/09.2002

KAPPA pump and motor units consist essentially of a housing and a mounting flange in cast iron of superior mechanical specifications. KAPPA is available with mounting flanges and side or rear ports according to SAE and European standard. The rigidity of assembly and the compact design of KAPPA pumps and motors ensure reliability and high volumetric efficiency also at high operating pressures. Infinite care and attention is taken over the design and construction of each single component, and with quality monitored unceasingly, the result is a consistent, perfectly balanced assembly that guarantees unbroken service under the most arduous operating conditions. KAPPA series is the right choice wherever noise, contamination, non inflammable fluids and size are critical factors. The wide choice of combinations of mounting flanges, shafts and ports ensure to KAPPA series to be applied in a vast range of application.

 **CASAPPA®**
FLUID POWER DESIGN

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	0,7 ÷ 3 bar (abs.)
Max back pressure for single rotation motors	p_1 (continuous) max 5 bar
	p_2 (for 20 s) max 8 bar
	p_3 (for 8 s) max 15 bar
Max drain line pressure on the reversible rotation motors	5 bar
Max back pressure on the series motors	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 12 to 100 mm ² /s (cSt) recommended
	Up to 750 mm ² /s (cSt) permitted
Filtering requirement	See table (2)

Tab. 1

Type	Fluid composition	Max pressure [bar]	Max speed [min ⁻¹]	Temperature [°C]	Seals (◆)
ISO/DIN	Mineral oil based hydraulic fluid to ISO/DIN	See page 3 - 4	See page 3 - 4	-25 ÷ +80	N
					N-H
				-25 ÷ +110	V
HFA	Oil emulsion in water 5 ÷ 15% of oil	50	1500	2 ÷ 55	N
HFB	Water emulsion in oil 40 % of water	120	1500	2 ÷ 60	
HFC	Water - glycol	100	1500	-20 ÷ +60	N Bz
HFD	Phosphate ester	150	1500	-10 ÷ +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

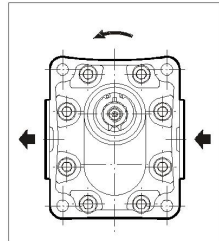
Tab. 2

Working pressure	$\Delta p > 200$ bar	$\Delta p < 200$ bar
Contamination class NAS 1638	8	10
Contamination class ISO 4406	19/17/14	21/19/16
Achieved with filter $\beta_{x=75}$	10 μ m	25 μ m

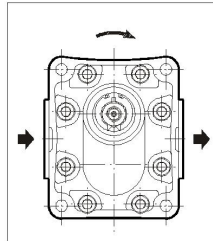
GENERAL NOTES

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.

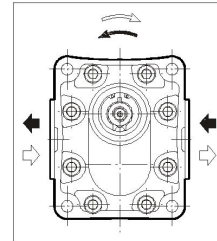
DEFINITION OF ROTATION DIRECTION LOOKING ON THE DRIVE SHAFT



Anti-clock rotation

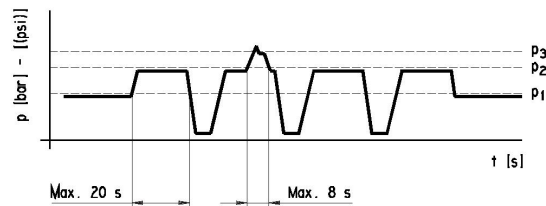


Clockwise rotation



Reversible rotation

PRESSURE DEFINITION



p_1 Max. continuous pressure
 p_2 Max. intermittent pressure
 p_3 Max. peak pressure

01/01.02

KAPPA 20 GENERAL DATA MOTORS

KM 20

Motor type	Displacement cm ³ /rev	Max. pressure			Max. speed	Min. speed
		p ₁	p ₂	p ₃		
		bar			min ⁻¹	
KM 20-4	4,95	285	300	330	4000	350
KM 20-6,3	6,61	285	300	330	4000	350
KM 20-8	8,26	285	300	330	3500	350
KM 20-11,2	11,23	275	290	320	3500	350
KM 20-14	14,53	265	290	320	3500	350
KM 20-16	16,85	260	290	320	3000	300
KM 20-20	21,14	210	230	250	3000	300
KM 20-25	26,42	180	200	220	2500	300
KM 20-31,5	33,03	140	160	180	2000	300

p₁= Max. continuous pressure p₂= Max. intermittent pressure p₃= Max. peak pressure

The values in the table refer to unidirectional motors.
Reversible motor max pressures are 15% lower than those shown in table.
For different working conditions please consult our sales department.

01/01.02

DESIGN CALCULATIONS FOR MOTORS

Q	[l/min]	Delivery
M	[Nm]	Torque
P	[kW]	Power
V	[cm ³ /rev]	Displacement
n	[min ⁻¹]	Speed
Δp	[bar]	Pressure
$\eta_v = \eta_v(V, \Delta p, n) \quad (\approx 0,96)$		Volumetric efficiency
$\eta_m = \eta_m(V, \Delta p, n) \quad (\approx 0,85)$		Mechanical efficiency
$\eta_t = \eta_v \cdot \eta_m \quad (\approx 0,82)$		Overall efficiency

$$Q = \frac{V \cdot n \cdot 10^{-3}}{\eta_v} \quad [\text{l/min}]$$

$$M = \frac{\Delta p \cdot V \cdot \eta_m}{62,83} \quad [\text{Nm}]$$

$$P = \frac{\Delta p \cdot V \cdot n \cdot \eta_t}{600 \cdot 1000} \quad [\text{kW}]$$

01/01.02

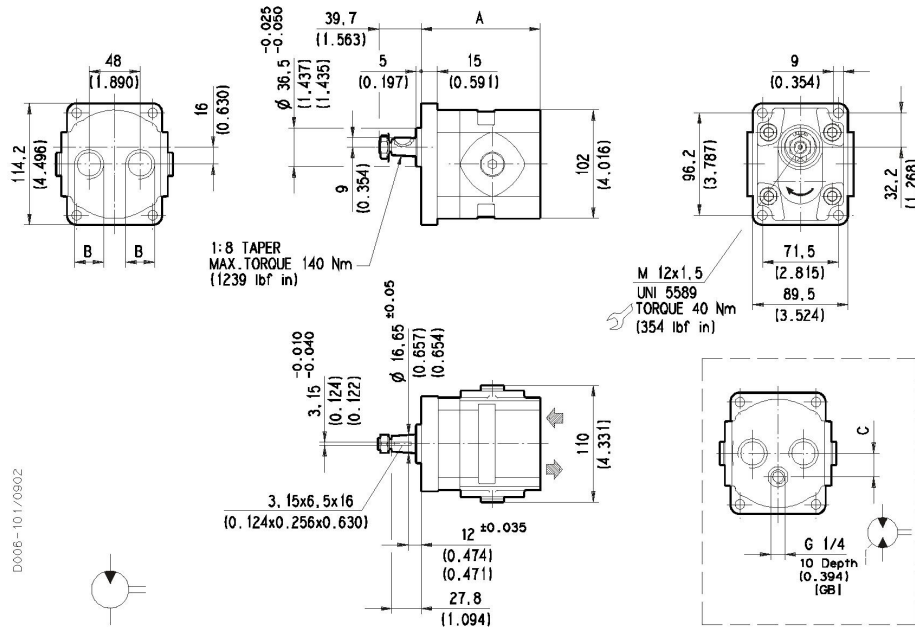
Note: Diagrams providing approximate selection data will be found on subsequent pages.

KAPPA 20

HYDRAULIC GEAR MOTORS EUROPEAN STANDARD

82 E2 - P

GAS STRAIGHT THREAD PORTS
British standard pipe parallel (55°) conforms to UNI - ISO 228



1:8 TAPER
MAX. TORQUE 140 Nm
(1239 lbf in)

M 12x1.5
UNI 5589
TORQUE 40 Nm
(354 lbf in)

3.15x6,5x16
(0.124x0.256x0.630)

12 ±0.035
(0.474)
(0.471)
27.8
(1.094)

G 1/4
10 Depth
(0.394)
IGB1

Rear ports version.

Motor type		A	B	C	
		mm (in)	mm (in)	mm (in)	
KM 20-4 KM 20-6,3 KM 20-8 KM 20-11,2	S D R B	0-82 E2-P GD/GD-N	84,5 (3.327)	G 1/2 Depth 17 (0.670)	19 (0.748)
			87 (3.425)		
			89,5 (3.524)		
			93 (3.661)		
KM 20-14 KM 20-16 KM 20-20 KM 20-25 KM 20-31,5	S D R B	0-82 E2-P GE/GE-N	112 (4.409)	G 3/4 Depth 18 (0.709)	22 (0.866)
			115,5 (4.547)		
			122 (4.803)		
			130 (5.118)		
			140 (5.512)		

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

How to order:

KM 20-4 S0-82 E2-P GD/GD-N

Replaces: 01/01.02

02/09.02

KAPPA 20

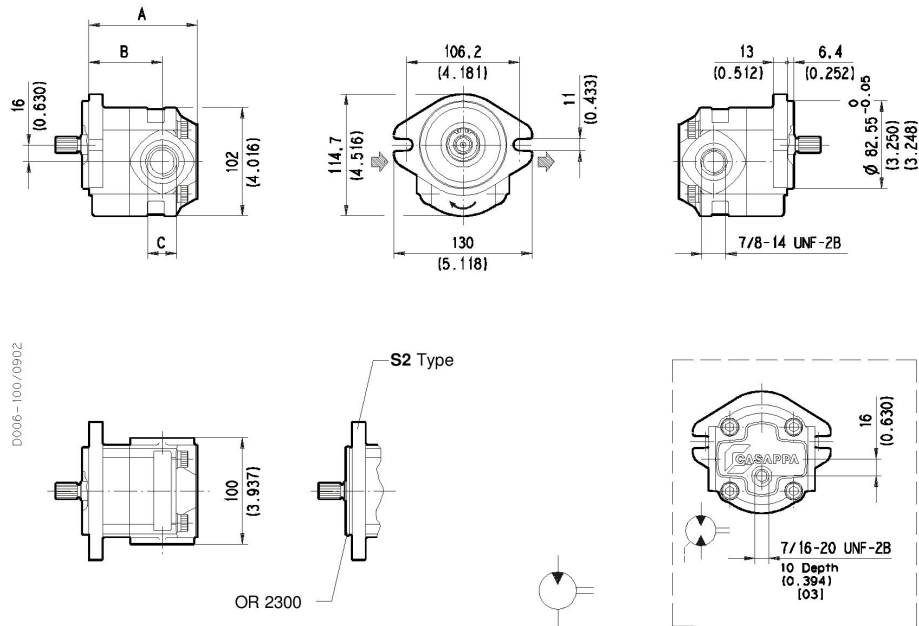
HYDRAULIC GEAR MOTORS SAE STANDARD

... S1

SAE STRAIGHT THREAD PORTS J514

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

Replaces: 01/01_02



Side ports version (L) - To order see page 93 and 94

02/09_02

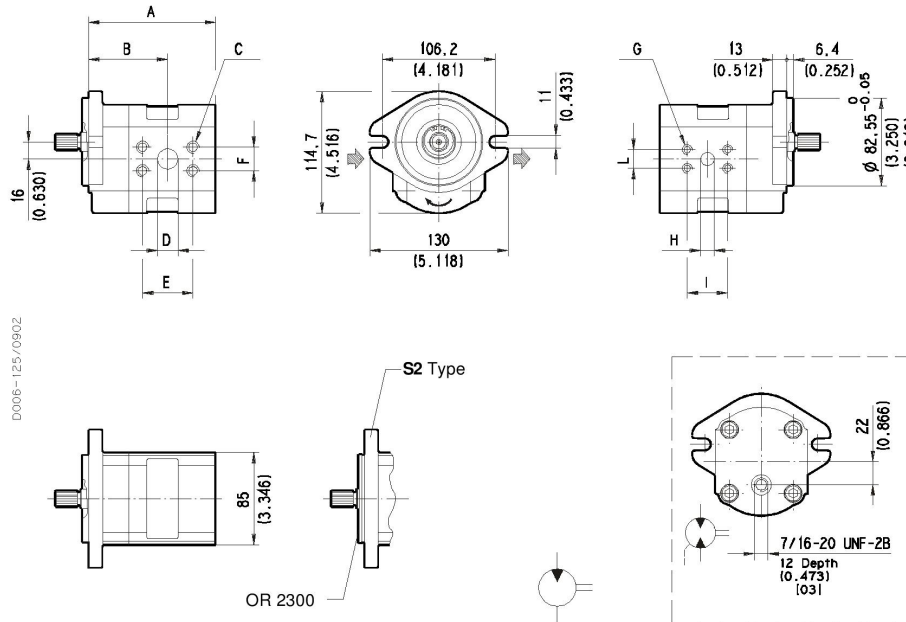
Motor type	A	B	C	Ports code	
	mm (in)	mm (in)	mm (in)	IN	OUT
KM 20-4	89,5 (3.524)	62 (2.441)	7/8-14 UNF-2B	OC	OC
KM 20-6,3	92 (3.622)	64,5 (2.539)			
KM 20-8	94,5 (3.720)	67 (2.638)			
KM 20-11,2	98 (3.858)	70,5 (2.776)			
KM 20-14	102 (4.016)	69 (2.717)	1-1/16-12 UN-2B	OC	OD
KM 20-16	107,5 (4.232)	74,5 (2.933)			
KM 20-20	114 (4.488)	81 (3.189)			
KM 20-25	122 (4.803)	74 (2.913)			
KM 20-31,5	132 (5.197)	84 (3.307)			

KAPPA 20

HYDRAULIC GEAR MOTORS SAE STANDARD

... S1

SAE FLANGED PORTS J518 - Standard pressure series 3000 PSI
Metric thread ISO 60° conforms to ISO/R 262



D0006-125/0902

Replaces: 01/01.02

Side ports version (L) - To order see page 93 and 94

Motor type	A	B	C	D	E	F	G	H	I	L	Ports code	
	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	IN	OUT
KM 20-4	101,5 (3.996)	62 (2.441)	M 8 Depth 12 (0.472)	12,5 (0.492)	38,1 (1.500)	17,5 (0.689)	M 8 Depth 12 (0.472)	12,5 (0.492)	38,1 (1.500)	17,5 (0.689)	MA	MA
KM 20-6,3	104 (4.094)	64,5 (2.539)										
KM 20-8	106,5 (4.193)	67 (2.638)										
KM 20-11,2	111 (4.370)	70,5 (2.776)	M 10 Depth 12 (0.472)	19 (0.748)	47,6 (1.874)	22,2 (0.874)	M 10 Depth 12 (0.472)	19 (0.748)	47,6 (1.874)	22,2 (0.874)	MA	MB
KM 20-14	116 (4.567)	69 (2.717)										
KM 20-16	119,5 (4.705)	74,5 (2.933)										
KM 20-20	126 (4.961)	81 (3.189)										
KM 20-25	134 (5.276)	74 (2.913)	M 10 Depth 12 (0.472)	25,4 (1.000)	52,4 (2.063)	26,2 (1.031)	M 10 Depth 12 (0.472)	19 (0.748)	47,6 (1.874)	22,2 (0.874)	MB	MC
KM 20-31,5	144 (5.669)	84 (3.307)										

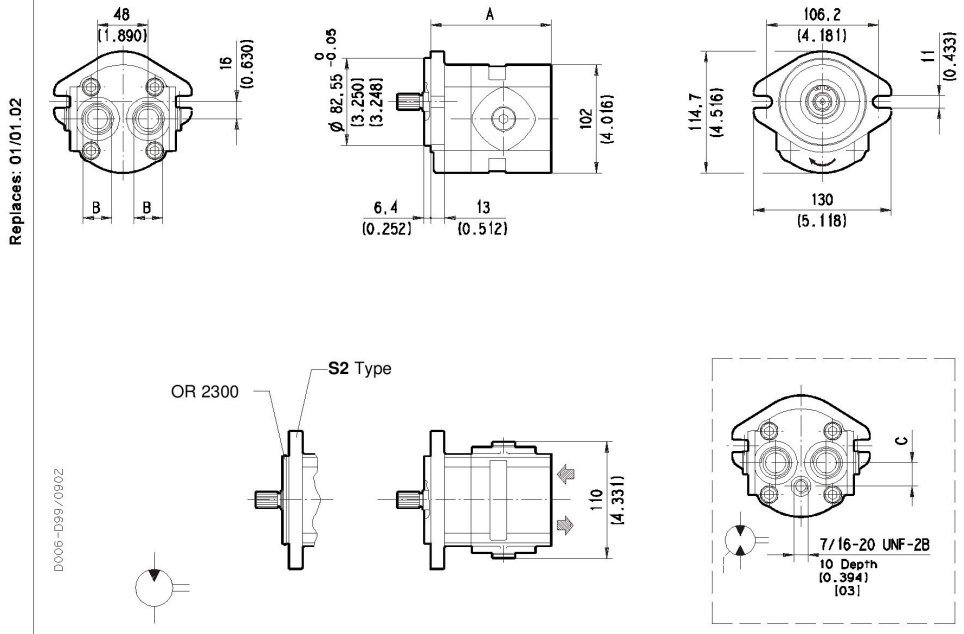
02/09.02

KAPPA 20

HYDRAULIC GEAR MOTORS SAE STANDARD

... S1

SAE STRAIGHT THREAD PORTS J514
American straight thread UNC-UNF 60° conforms to ANSI B 1.1



Replaces: 01/01.02

02/09.02

Rear ports version (P) - To order see page 93 and 94

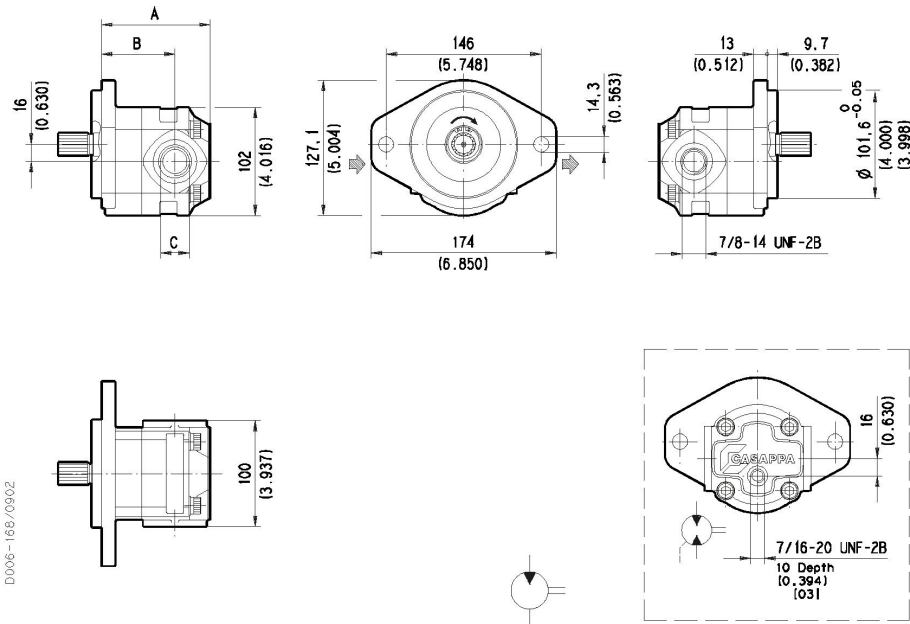
Motor type	A	B	C	Ports code	
	mm (in)	mm (in)	mm (in)	IN	OUT
KM 20-4	86,5 (3.406)	7/8-14 UNF-2B	19 (0.748)	OC	OC
KM 20-6,3	89 (3.504)				
KM 20-8	91,5 (3.602)				
KM 20-11,2	95 (3.740)				
KM 20-14	114 (4.488)	1-1/16-12 UN-2B	22 (0.866)	OC	OD
KM 20-16	117,5 (4.623)				
KM 20-20	124 (4.882)				
KM 20-25	132 (5.197)				
KM 20-31,5	142 (5.591)				

KAPPA 20

HYDRAULIC GEAR MOTORS SAE STANDARD

... S5

SAE STRAIGHT THREAD PORTS J514
American straight thread UNC-UNF 60° conforms to ANSI B 1.1



D0006-16B/0902

Replaces: 01/01.02

Side ports version (L) - To order see page 93 and 94

Motor type	A	B	C	Ports code	
	mm (in)	mm (in)	mm (in)	IN	OUT
KM 20-4	89,5 (3.524)	62 (2.441)	7/8-14 UNF-2B	OC	OC
KM 20-6,3	92 (3.622)	64,5 (2.539)			
KM 20-8	94,5 (3.720)	67 (2.638)			
KM 20-11,2	98 (3.858)	70,5 (2.776)			
KM 20-14	102 (4.016)	69 (2.717)	1-1/16-12 UN-2B	OC	OD
KM 20-16	107,5 (4.232)	74,5 (2.933)			
KM 20-20	114 (4.488)	81 (3.189)			
KM 20-25	122 (4.803)	74 (2.913)			
KM 20-31,5	132 (5.197)	84 (3.307)			

02/09.02

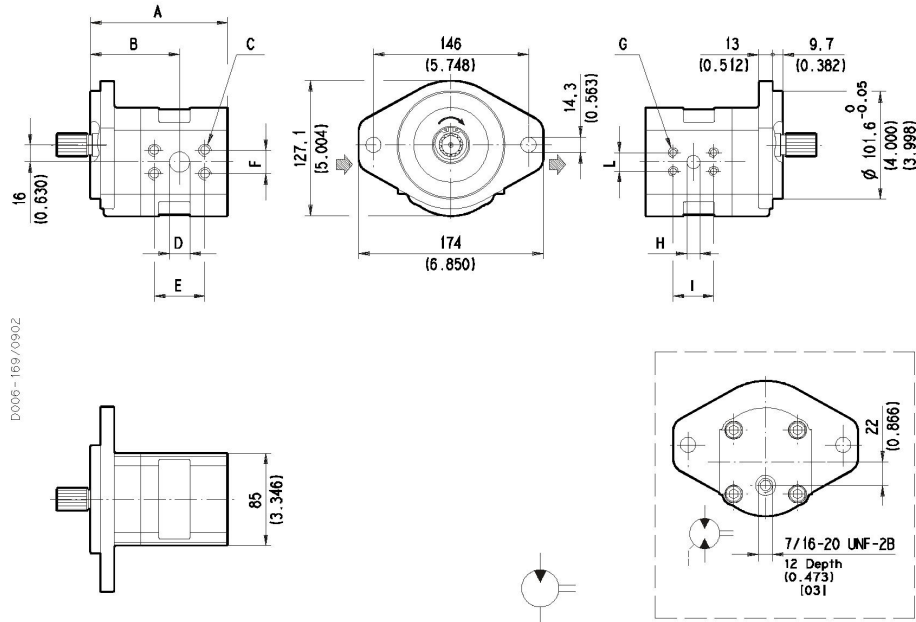
KAPPA 20

HYDRAULIC GEAR MOTORS SAE STANDARD

... S5

SAE FLANGED PORTS J518 - Standard pressure series 3000 PSI
Metric thread ISO 60° conforms to ISO/R 262

Replaces: 01/01.02



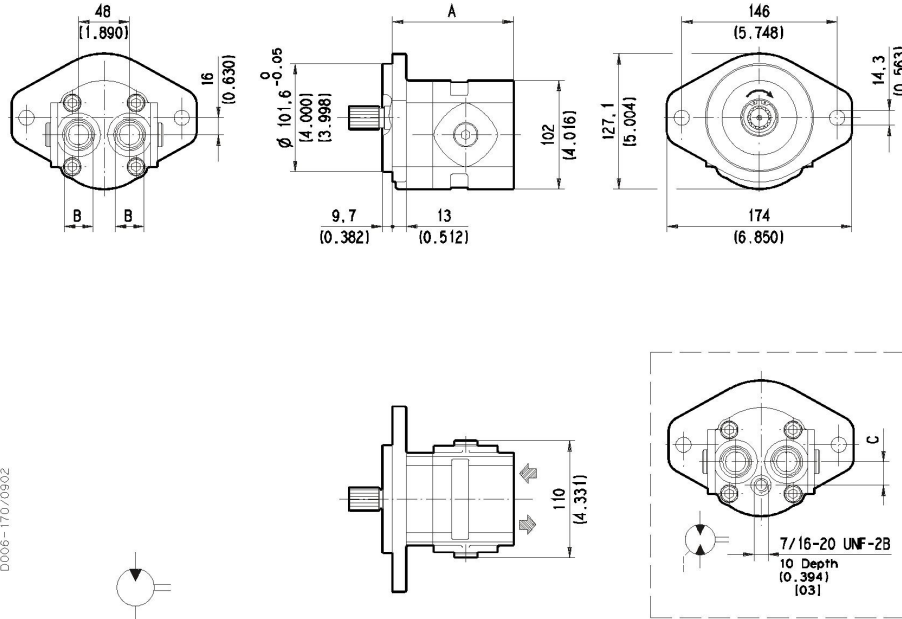
D006-169/090Z

02/09.02

Side ports version (L) - To order see page 93 and 94

Motor type	A	B	C	D	E	F	G	H	I	L	Ports code	
	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	IN	OUT
KM 20-4	101,5 (3.996)	62 (2.441)	M 8 Depth 12 (0.472)	12,5 (0.492)	38,1 (1.500)	17,5 (0.689)	M 8 Depth 12 (0.472)	12,5 (0.492)	38,1 (1.500)	17,5 (0.689)	MA	MA
KM 20-6,3	104 (4.094)	64,5 (2.539)										
KM 20-8	106,5 (4.193)	67 (2.638)										
KM 20-11,2	111 (4.370)	70,5 (2.776)	M 10 Depth 12 (0.472)	19 (0.748)	47,6 (1.874)	22,2 (0.874)	M 10 Depth 12 (0.472)	19 (0.748)	47,6 (1.874)	22,2 (0.874)	MB	MC
KM 20-14	116 (4.567)	69 (2.717)										
KM 20-16	119,5 (4.705)	74,5 (2.933)										
KM 20-20	126 (4.961)	81 (3.189)										
KM 20-25	134 (5.276)	74 (2.913)										
KM 20-31,5	144 (5.669)	84 (3.307)		25,4 (1.000)	52,4 (2.063)	26,2 (1.031)	M 10 Depth 12 (0.472)	19 (0.748)	47,6 (1.874)	22,2 (0.874)	MB	MC

SAE STRAIGHT THREAD PORTS J514
American straight thread UNC-UNF 60° conforms to ANSI B 1.1



D006-170/0802

Replaces: 01/01.02

Rear ports version (P) - To order see page 93 and 94

Motor type	A	B	C	Ports code	
	mm (in)		mm (in)	IN	OUT
KM 20-4	86,5 (3.406)	7/8-14 UNF-2B	19 (0.748)	OC	OC
KM 20-6,3	89 (3.504)				
KM 20-8	91,5 (3.602)				
KM 20-11,2	95 (3.740)				
KM 20-14	114 (4.488)	1-1/16-12 UN-2B	22 (0.866)	OC	OD
KM 20-16	117,5 (4.623)				
KM 20-20	124 (4.882)				
KM 20-25	132 (5.197)				
KM 20-31,5	142 (5.591)				

02/09.02

Replaces: 01/01.02

02/09.02

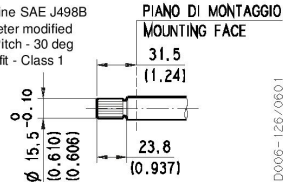
KAPPA 20 END DRIVE SHAFTS

SAE

SAE "A" SPLINE

03

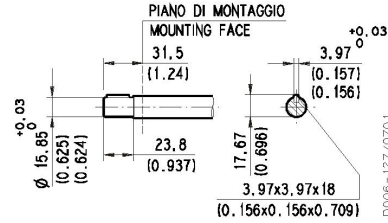
Ext. Involute Spline SAE J498B with major diameter modified 9 teeth - 16/32 Pitch - 30 deg Flat Root - Side fit - Class 1



MAX 100 Nm (885 lbf in)

SAE "A" STRAIGHT

31

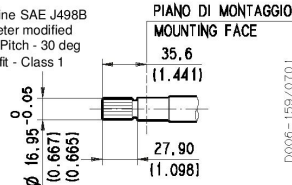


MAX 70 Nm (620 lbf in)

SAE SPLINE

01

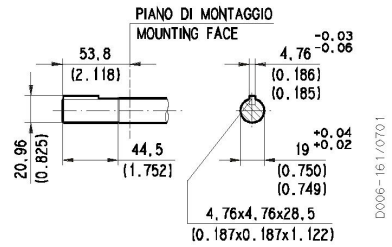
Ext. Involute Spline SAE J498B with major diameter modified 10 teeth - 16/32 Pitch - 30 deg Flat Root - Side fit - Class 1



MAX 100 Nm (885 lbf in)

STRAIGHT

49

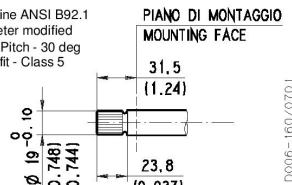


MAX 140 Nm (1239 lbf in)

SAE SPLINE

07

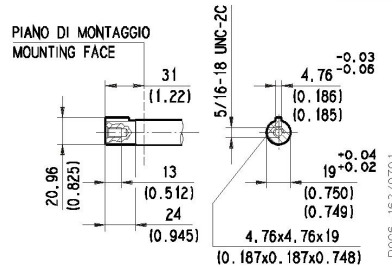
Ext. Involute Spline ANSI B92.1 with major diameter modified 11 teeth - 16/32 Pitch - 30 deg Flat Root - Side fit - Class 5



MAX 170 Nm (1505 lbf in)

STRAIGHT

50

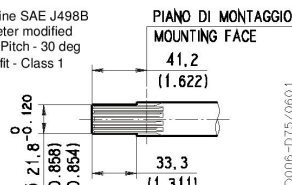


MAX 100 Nm (885 lbf in)

SAE "B" SPLINE

04

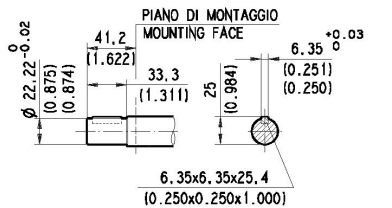
Ext. Involute Spline SAE J498B with major diameter modified 13 teeth - 16/32 Pitch - 30 deg Flat Root - Side fit - Class 1



MAX 300 Nm (2655 lbf in)

SAE "B" STRAIGHT

32



MAX 200 Nm (1770 lbf in)

HOW TO ORDER SAE STADARD MOTORS

1	2	3	-	4	5	-	6	7	-	8
Motor type	Rotation	Version	-	Drive shaft	Mounting flange	-	Ports position	Ports IN/OUT	-	Seals
KM20-4	S	0	-	03	S1	-	L	OC/OC	-	N

1	Motor type	CODE
	cm ³ /rev	
	4,95	KM 20-4
	6,61	KM 20-6,3
	8,26	KM 20-8
	11,23	KM 20-11,2
	14,53	KM 20-14
	16,85	KM 20-16
	21,14	KM 20-20
	26,42	KM 20-25
	33,03	KM 20-31,5

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

3	Version	CODE
	Without outboard bearing	0

4	Drive shaft	CODE
	SAE "A" spline (9 theeth)	03
	SAE spline (10 theeth)	01
	SAE spline (11 theeth)	07
	SAE "B" spline (13 theeth)	04
	SAE "A" straight	31
	Straight	49
	Straight	50
	SAE "B" straight	32

5	Mounting flange	CODE
	SAE "A" 2 holes	S1
	SAE "A" 2 holes (with o-ring seal)	S2
	SAE "B" 2 holes (a)	S5

CODE	Ports position	6
L	Side	
P	Rear	

CODE	Ports IN/OUT	7
SAE STRAIGHT THREAD PORTS (ODT)		
	Side	Rear
	Motor type	
OC/OC	OC/OC	KM 20-4
OC/OC	OC/OC	KM 20-6,3
OC/OC	OC/OC	KM 20-8
OC/OC	OC/OC	KM 20-11,2
OC/OD	OD/OD	KM 20-14
OC/OD	OD/OD	KM 20-16
OC/OD	OD/OD	KM 20-20
OC/OD	OD/OD	KM 20-25
OC/OD	OD/OD	KM 20-31,5

METRIC SAE SPLIT PORTS SAE J518 C		
	Side	Rear
	Motor type	
MA/MA		KM 20-4
MA/MA		KM 20-6,3
MA/MA		KM 20-8
MA/MA		KM 20-11,2
MA/MB		KM 20-14
MA/MB		KM 20-16
MA/MB		KM 20-20
MB/MC		KM 20-25
MB/MC		KM 20-31,5

CODE	Seals (b)	8
N	Buna (standard)	
V	Viton	
V Bz	Viton and Bronze thrust plates	

(a) Available only with 04 and 32 shaft

(b) Choose the seals according to the temperature shown on page 1

ORDER EXAMPLE

Standard motor **KM 20-4 S0 - 03 S1 - L OC/OC - N**

Special version motor **KM 20-4 S0 - 04 S5 - L MA/MA - V Bz**

01/01.02