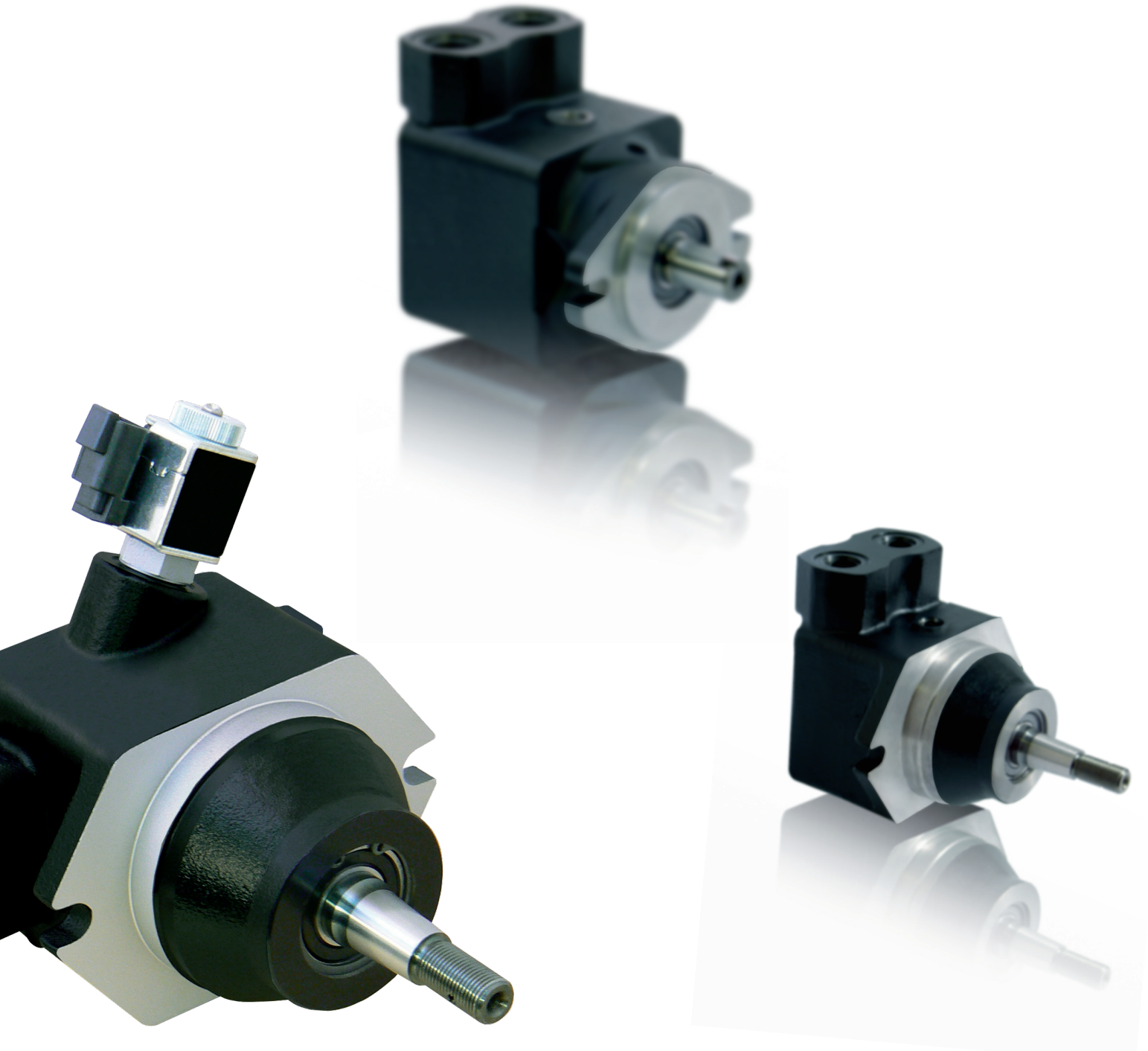


Hydraulic Motors M5AS/M5ASF

Denison Vane Technology, fixed displacement

aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding

Parker

ENGINEERING YOUR SUCCESS.

LOW NOISE MOTOR

12 vanes and a patented cartridge design allows a very low noise level, whatever the speed.

HIGH PERFORMANCE MOTOR

The M5 series have been designed especially for severe duty applications wich require high pressure , high speed and low fluid lubricity.

Max. pressure (continuous) : 280 bar
Max. speed (continuous)
M5AS* 006 and 010 ..... : 5000 rpm
M5AS* 012 and 016 ..... : 3800 rpm
M5AS* 018 ..... : 3300 rpm
M5AS* 023 and 025 ..... : 2800 rpm

HIGH STARTING TORQUE

The high starting torque efficiency of the vane type motors allows them to start under high load without pressure overshoots, jerks and high instantaneous horsepower loads.

LOW TORQUE RIPPLE

This 12 vane type motor exhibits a very low torque ripple (typical ± 1,5%), even at low speeds.

LONG LIFETIME

The vane, rotor and cam ring are pressure balanced to increase life over the full speed range. Double lip vanes reduce the sensitivity to fluid pollution.

INTERCHANGEABLE ROTATING GROUPS

Our precise manufacturing allows any component to be interchangeable. Rotating groups may be easily replaced to renew the motor or change the displacement to suit altered requirements for speed or torque.

ROTATION AND DRAIN

The M5AS and M5ASF externally drained, are available in three types of rotation : bi-directional, clockwise, counter-clockwise.

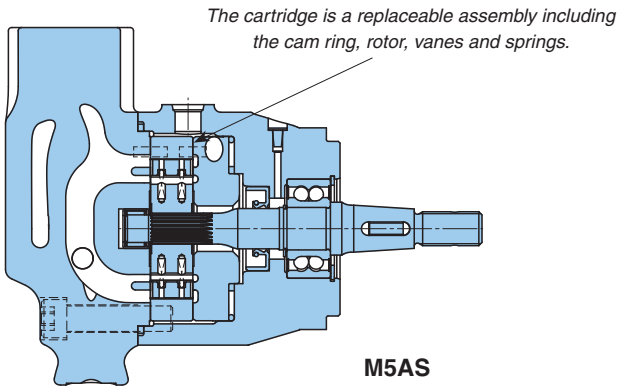
CROSS PORT CHECK VALVE

The uni-directional M5AS, M5ASF are designed with an internal valve that allows smooth dynamic braking, with a very simple hydraulic circuit and without risk of motor cavitation.

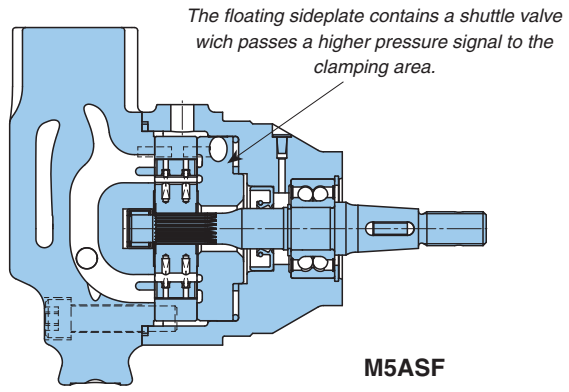
MOUNTING

The M5AS, M5ASF motors have a stiff tapered or cylindrical keyed shaft and a high load capacity double ball bearing allow the direct mounting on shaft (like a fan for example).

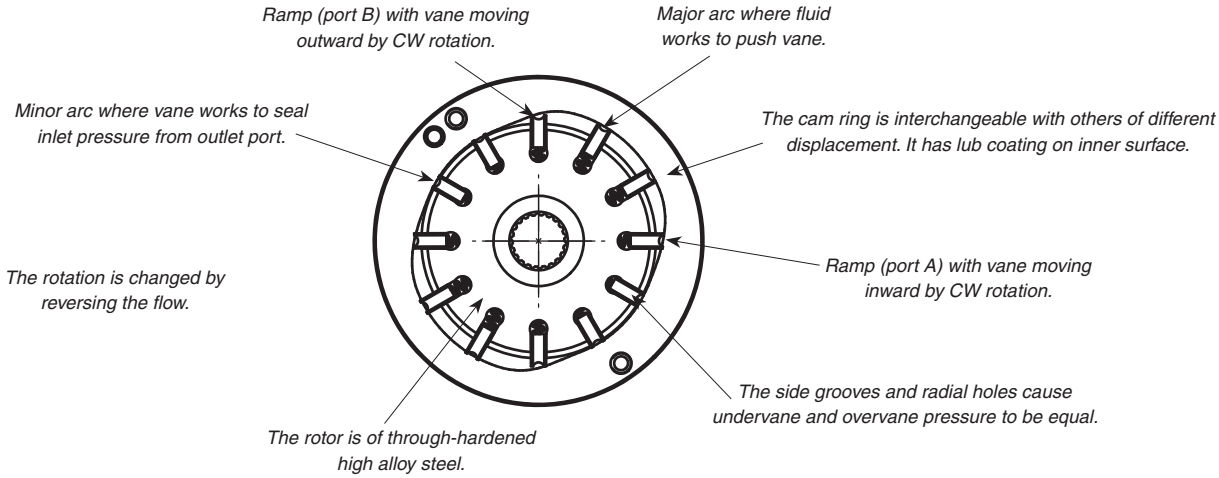
For applications with motors in series or with high back pressure, please contact Parker.



M5AS



M5ASF



OPERATION - SINGLE CARTRIDGE

- The motor shaft is driven by the rotor. Vanes, closely fitted into the rotor slots move radially to seal against the cam ring. The ring has two major and two minor radial sections joined by transitional sections called ramps. These contours and the pressures exposed to them are balanced diametrically.

- Light springs urge the vanes radially against the cam contour assuring a seal at zero speed so that the motor can develop starting torque. The springs and pins are assisted by centrifugal force at higher speeds. Radial grooves and holes through the vanes equalize radial hydraulic forces on the vanes at all times. Fluid enters and leaves the motor cartridge through opening in the side plates at the ramps. Each motor port connects to two diametrically opposed ramps. Pressurized fluid entering at Port A torques the rotor clockwise. The rotor transports it to the ramp openings wich connect to Port B from wich it returns to the low pressure side of the system. Pressure at Port B torques the rotor counter-clockwise.

- The rotor is separated axially from the sideplate surface by the fluid film. The front sideplate is clamped against the cam ring by the pressure, maintains optimum clearance as dimensions change with temperature and pressure. A 3-way shuttle valve in the sideplate causes clamping pressure in Port A or B, whichever is the highest.

- Materials are chosen for long life efficiency. The vanes, rotor and cam ring are made out of hardened high alloy steels. Cast semi-steel sideplates are chemically etched to have a fine crystalline surface for good lubrification at start-up.

EXTERNAL DRAIN

This motor must have a drain line connected to the housing drain connection of sufficient size to prevent back pressure in excess of 3,5 bar, and returned to the reservoir below the surface of the oil as far away as possible from the suction pipe of the pump.

RECOMMENDED FLUIDS

Petroleum base anti-wear R & O fluids (covered by Parker Denison HF-0 and HF-2 specifications).
Maximum catalogue ratings and performance data are based on operation with these fluids.

ACCEPTABLE ALTERNATE FLUIDS

The use of fluids other than petroleum base anti-wear R & O fluids requires that the maximum ratings of the motor will be reduced. In some cases, the minimum replenishment pressure must be increased.

HF-1 : non antiwear petroleum base.
HF-4 : water glycols solutions.
HF-5 : synthetic fluids.

Max. continuous pressure : 210 bar (HF-1, HF-4, HF-5)
Max. speed : 1500 RPM (HF-4, HF-5)

VISCOSITY

Max. (cold start, low speed and pressure)	2000 mm2/s (cSt)
Max. (full speed and pressure)	100 mm2/s (cSt)
Optimum (max. lifetime)	30 mm2/s (cSt)
Min. (full speed and pressure, HF-1 fluid)	18 mm2/s (cSt)
Min. (full speed and pressure, HF-0 & HF-2 fluids)	10 mm2/s (cSt)

For cold starts, the motor should operate at low speed and pressure until fluid warms up to an acceptable viscosity for full power operation.

VISCOSITY INDEX

90 min.
Higher values extend the range of operating temperatures and lifetime.

TEMPERATURE

Max. fluid temperature (HF-0, HF-1 & HF-2)	+ 100° C
Min. fluid temperature (HF-0, HF-1 & HF-2)	- 18° C

FLUID CLEANLINESS

The fluid must be cleaned before and during operation to maintain a contamination level of NAS 1638 class 8 (or ISO 19/17/14) or better. Filters with 25 micron (or better, $\beta 10 \geq 100$) nominal ratings may be adequate but do not guarantee the required cleanliness levels.

WATER CONTAMINATION IN FLUID

Maximum acceptable content of water is :
- 0,10 % for mineral base fluids.
- 0,05 % for synthetic fluids, crankcase oils, biodegradable fluids.

If amount of water is higher, then it should be drained off the circuit.

Parker Hannifin SAS
VPDE, Denison Vane Motors
Vierzon - France

Motor performances required
Torque..... T [Nm.] 55
Speed..... n [rpm] 1500
Pump available data
Flow..... Q [l/min] 30
Δ Pressure..... Δ p [bar] 250

1. *Check if available power is greater than required power (0.85 estimated overall efficiency).*

$$0{,}85 \times \frac{Q \times p}{600} \geqslant \frac{T \times \pi \times n}{30 \times 1000} \qquad 0.85 \times \frac{30 \times 250}{600} \geqslant \frac{55 \times \pi \times 1500}{30 \times 1000}$$

10,6 > 8,7 kW

2. *Two ways of calculation : Calculate V_i from T required torque, or from Q available flow.*

2a.

$$V_i = \frac{20 \times \pi \times T}{p} = \frac{20 \times \pi \times 55}{250} = 13{,}8 \text{ cm}^3/\text{rev}$$

3a. *Choose motor from Vi immediately greater*
M5AS 016 : V_i = 16,0 cm³/rev*

4a. *Check theoretical motor pressure*

$$\Delta p = \frac{20 \times \pi \times T}{V_i} = \frac{20 \times \pi \times 55}{16{,}0} = 216 \text{ bar}$$

Torque loss at this pressure = 3,0 Nm
(See page 9)
Calculate real pressure

$$\Delta p_{eff.} = \frac{20 \times \pi \times (T + Tl)}{V_i} = \frac{20 \times \pi \times 58}{16{,}0} = 228 \text{ bar}$$

5a. *Flow loss at this pressure : 3,5 l/min*
(See page 9)
Real flow used by the motor :
$Q_{eff.}$ *= 30 - 3,5 = 26,5 l/min*

6a. *Real speed of the motor :*

$$n_{eff.} = \frac{Q_{eff.} \times 1000}{V_i} = \frac{26{,}5 \times 1000}{16{,}0} = 1656 \text{ rpm}$$

Real performances
V_i *= 16,0 cm³/rev*
$n_{eff.}$ *= 1656 rpm*
T = 55 Nm.
$\Delta p_{eff.}$ *= 228 bar*

2b.

$$V_i = \frac{1000 \times Q}{n} = \frac{1000 \times 30}{1500} = 20{,}0 \text{ cm}^3/\text{rev}$$

3b. *Choose motor from Vi immediately smaller*
M5AS 018 : V_i = 18,0 cm³/rev*

4b. *Check theoretical motor pressure with T = 55 Nm*

$$\Delta p = \frac{20 \times \pi \times T}{V_i} = \frac{20 \times \pi \times 55}{18{,}0} = 192 \text{ bar}$$

Torque loss at this pressure = 3,3 Nm
(See page 9)
Calculate real pressure

$$\Delta p_{eff.} = \frac{20 \times \pi \times (T + Tl)}{V_i} = \frac{20 \times \pi \times 58{,}3}{18{,}0} = 204 \text{ bar}$$

5b. *Flow loss at this pressure : 4 l/min*
(See page 9)
Real flow used by the motor :
$Q_{eff.}$ *= 30 - 4 = 26,0 l/min*

6b. *Real speed of the motor:*

$$n_{eff.} = \frac{Q_{eff.} \times 1000}{V_{i.}} = \frac{26{,}0 \times 1000}{18{,}0} = 1444 \text{ rpm}$$

Real performances
V_i *= 18,0 cm³/rev*
$n_{eff.}$ *= 1444 rpm*
M = 55 Nm.
$\Delta p_{eff.}$ *= 204 bar*

FLUID POWER FORMULAS

Volumetric efficiency

$$\frac{1}{1 + \frac{\text{total leakage} \times 1000}{\text{speed} \times \text{displacement}}}$$

Mechanical efficiency

$$1 - \frac{\text{torque loss} \times 20 \times p}{\Delta \text{ pressure} \times \text{displacement}}$$

Fluid motor speed *rpm*

$$\frac{1000 \times \text{flow rate} \times \text{volumetric eff.}}{\text{displacement}}$$

Fluid motor torque *N.m*

$$\frac{\Delta \text{ pressure} \times \text{displacement} \times \text{mech. eff.}}{20 \times p}$$

Fluid motor power *kW*

$$\frac{\text{speed} \times \text{displacement} \times \Delta \text{ pressure} \times \text{overall eff.}}{600\,000} \quad \text{or} \quad \frac{\text{torque} \times \text{speed} \times 20 \times p}{600\,000}$$

Speed	*[rpm]*
Displacement	*[cm³/rev]*
Pressure	*[bar]*
Flow rate	*[l/min]*
Leakage	*[l/min]*
Torque	*[Nm]*
Torque loss	*[Nm]*

Parker Hannifin SAS
VPDE, Denison Vane Motors
Vierzon - France

	Mounting flange	Threaded port A	Threaded port B	Threaded drain port	Shaft end
M5A Uni-rotational	2-bolts ISO 3019-2 80 A2 HW	M22 x 1,5	M27 x 2	M12 x 1,5	Taper 1/5 Keyed ISO G20N
M5A Bi-rotational		M22 x 1,5		M12 x 1,5	
M5AS Uni-rotational	2-bolts SAE A J744	SAE 10 - (7/8"-14 UNF) 1/2" BSPP	SAE 12 - (1.1/16"-12 UNF) 3/4" BSPP	SAE 6 - (9/16" -18 UNF) 1/4" BSPP	Taper SAE B Keyed SAE B Taper 1/5 Keyed ISO G20N
M5AS Bi-rotational		SAE 12 - (1.1/16"-12 UNF) 3/4" BSPP		SAE 6 - (9/16"-18 UNF) 1/4" BSPP	
M5ASF Uni-rotational	2-bolts Ø 101,6 h8 cartridge / outrigger bearing version	M22 x 1,5 SAE 10 - (7/8"-14 UNF) 1/2" BSPP	M27 x 2 SAE 12 - (1.1/16"-12 UNF) 3/4" BSPP	M12 x 1,5 SAE 6 - (9/16"-18 UNF) 1/4" BSPP	Taper SAE B Keyed SAE B Taper 1/5 Keyed ISO G20N
M5ASF Bi-rotational		M22 x 1,5 SAE 12 - (1.1/16"-12 UNF) 3/4" BSPP		M12 x 1,5 SAE 6 - (9/16"-18 UNF) 1/4" BSPP	

Series	Theoretical Displacement V_i	Theoretical torque	Theoretical power at 100 rpm	Typical data at 2000 rpm - 280 bar	
	cm³/rev	N.m/bar	kW/bar	N.m	kW
M5A M5AS M5ASF	6,3	0,100	0,0011	24,4	5,1
	10,0	0,159	0,0017	40,8	8,6
	12,5	0,199	0,0021	52,0	10,9
	16,0	0,255	0,0027	67,6	14,2
	18,0	0,286	0,0030	75,8	15,9
	23,0	0,366	0,0038	98,4	20,4
	25,0	0,398	0,0042	107,4	22,5

PERMISSIBLE SHAFT LOADS

Theoretical lifetime [10^6 rev] : L_{10}

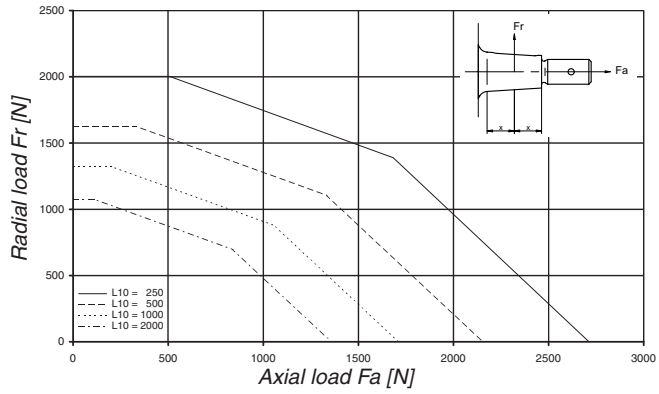
Theoretical lifetime [Hours] : $L_{10H} = \frac{16\,666}{N\ [min^{-1}]} \times L_{10}$

Example of theoretical lifetime calculation
Axial load Fa = 1000 N
Radial load Fr = 500 N
Motor speed N = 1500 rpm

L10 = 2000 [10^6 rev] (See Curve)

$L_{10H} = \frac{16\,666}{1500} \times 2000$ L_{10H} = 22 221 hours.

Theoretical Lifetime [10^6 rev]



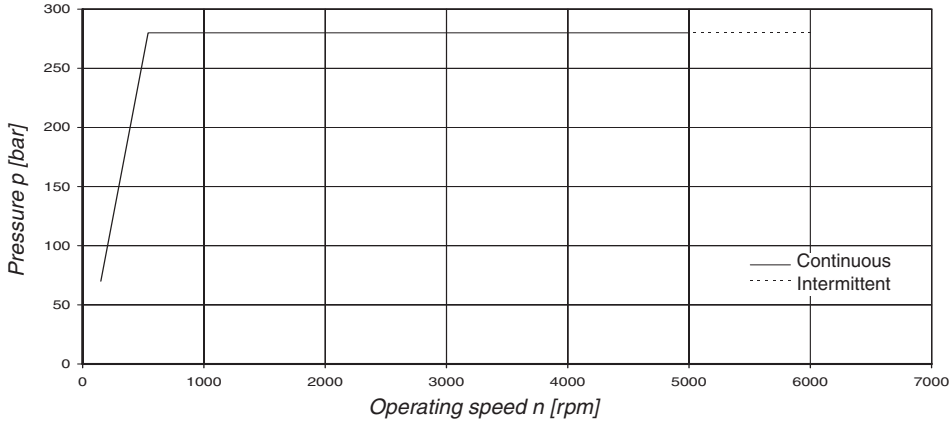
STARTING PERFORMANCES

Typical data at 24 cSt @ 45° C

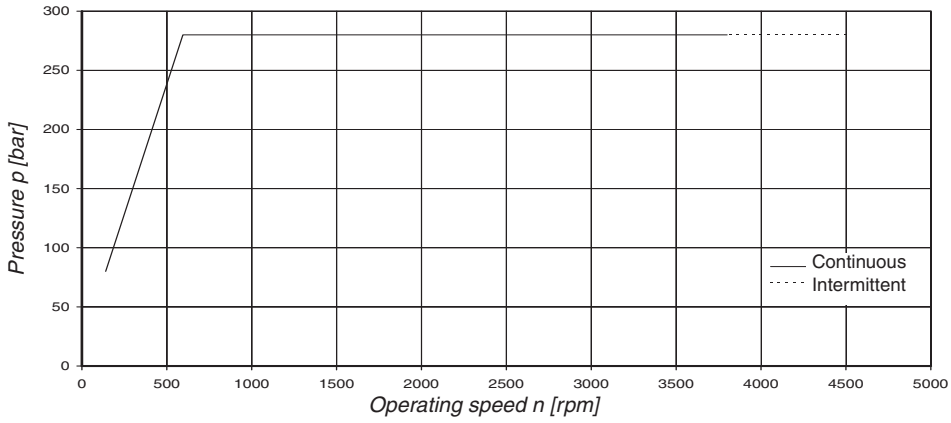
Maximum cross flow 100 bar : 0,6 l/min
200 bar : 7,4 l/min
280 bar : 8,9 l/min

Parker Hannifin SAS
VPDE, Denison Vane Motors
Vierzon - France

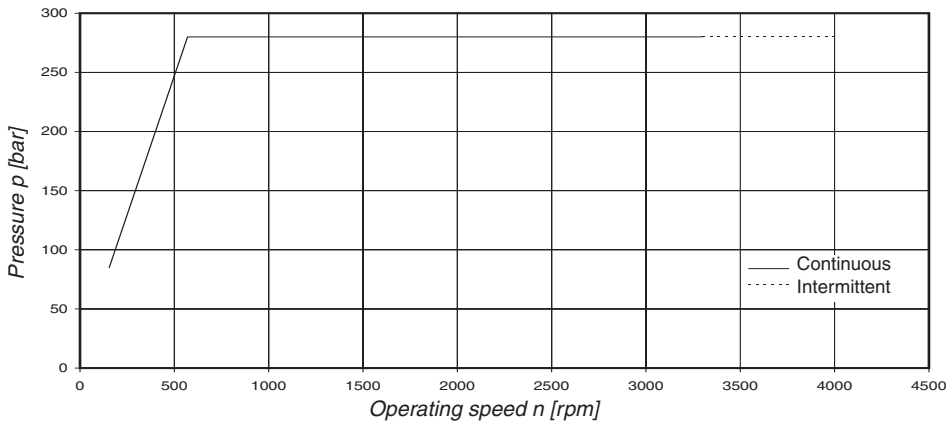
006 - 010



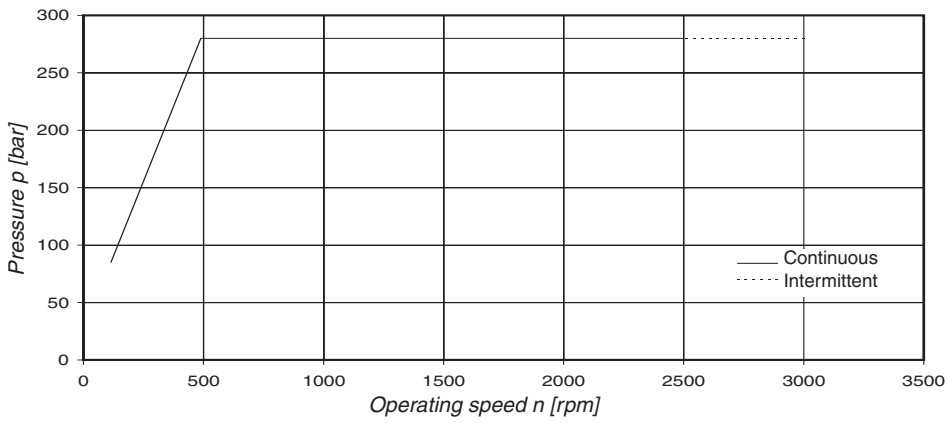
012 - 016



018

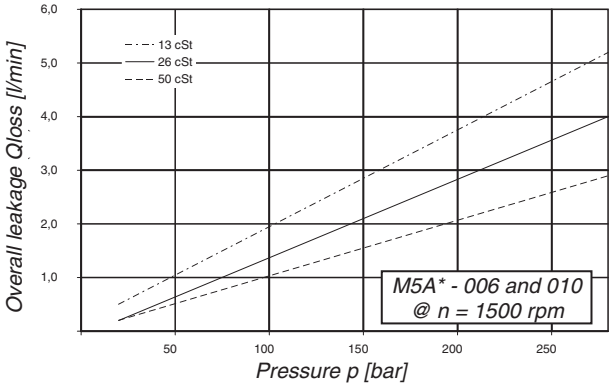


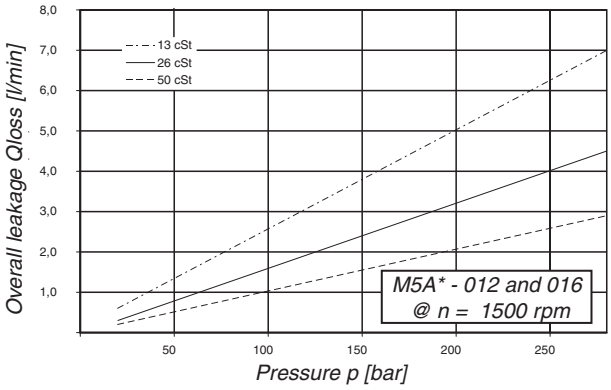
023 - 025

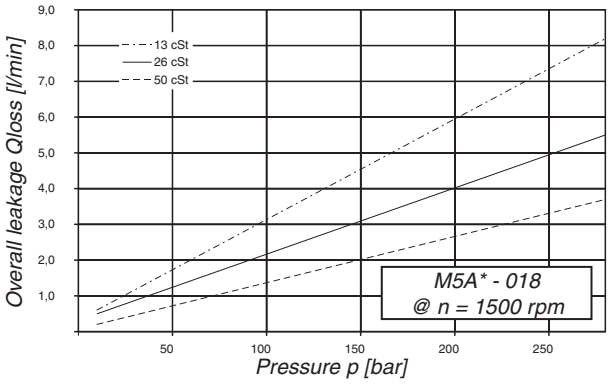


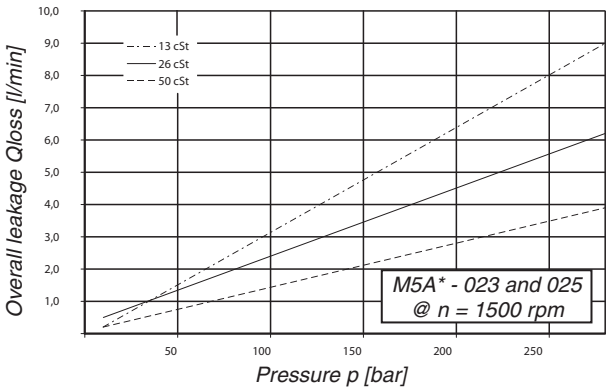
- These are running condition limits; for starting performances see page 7.
- Typical curves, at 24 cSt @ 45° C.
- For higher specifications or for operating speed under < 100 rpm, please consult us.

OVERALL LEAKAGE (internal + external)

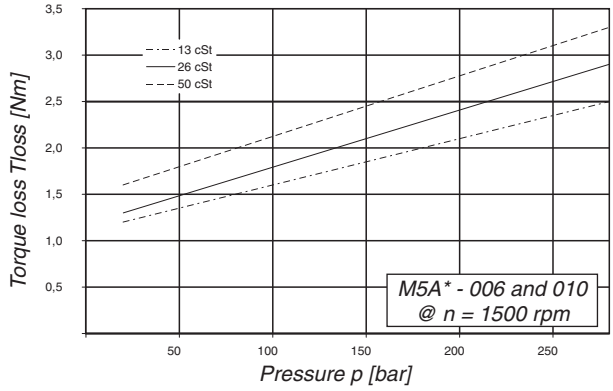


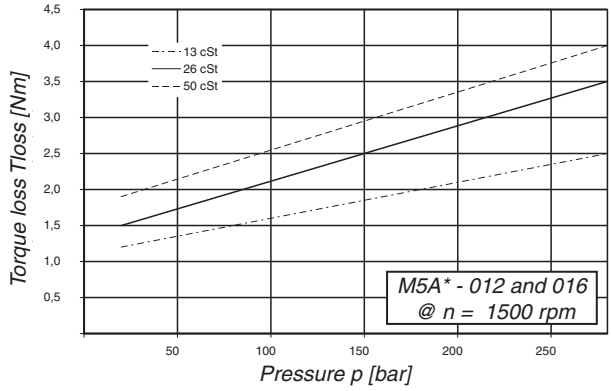


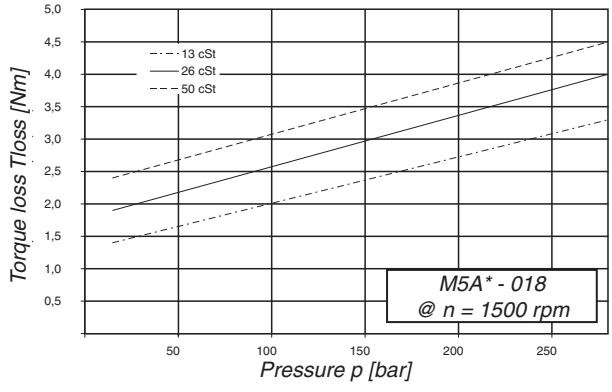


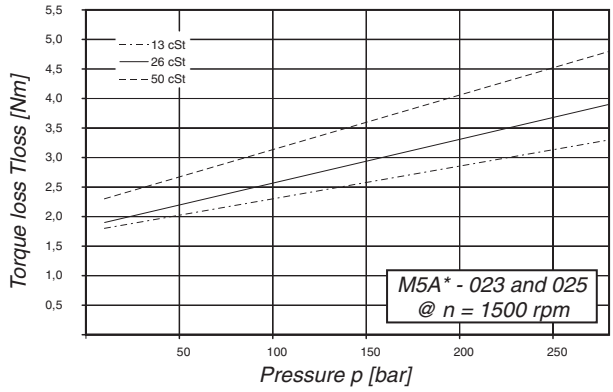


TORQUE LOSS

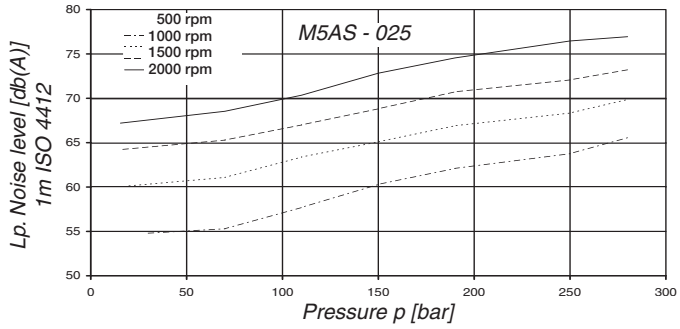








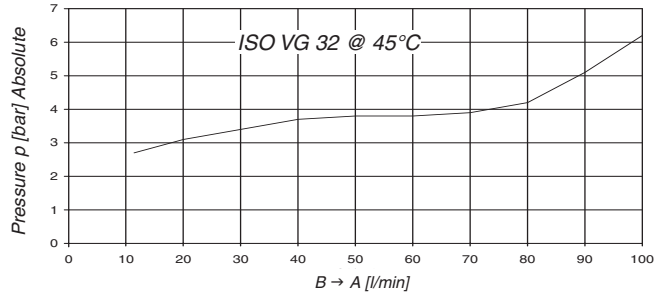
NOISE LEVEL



MINIMUM REPLENISHMENT PRESSURE DURING DECELERATION

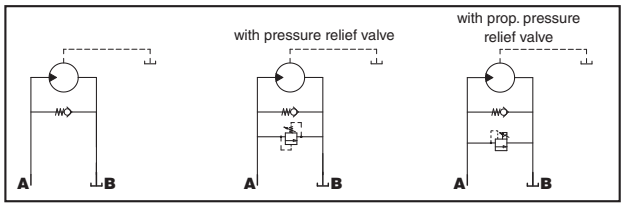
The hydraulic circuit should be designed in a way that when switching off the hydraulic motor, it remains supplied with fluid, without risk of cavitation (anti-cavitation valve may be needed).
Uni rotational M5AS* Motors are fitted with an internal anti-cavitation valve.

Necessary pressure [bar absolute] at B port of M5AS* uni-rotational during deceleration



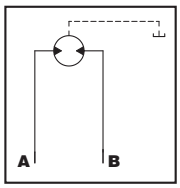
R OR L ROTATION New rotation concept - (Patent pending) :

R or L rotation are featuring a new internal concept where A is always “in” and B is always “out”.



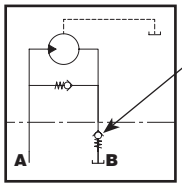
View from shaft end : CW or CCW rotations A = inlet
B = outlet

BI-ROTATIONAL (N)



View from shaft end : CW rotation A = inlet
B = outlet
CCW rotation A = outlet
B = inlet

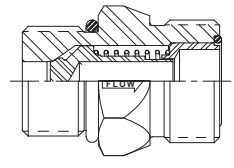
OPTION FOR M5AS - M5ASF UNI-ROTATIONAL MOTORS : ANTI STARVE VALVE



An anti-starve check valve can be screwed directly onto the B port of the uni-rotational motors, to ensure the minimum replenishment pressure during deceleration phases of high inertia systems (i.e. fan drive).

Parker DT series check valves

Ex : for SAE 12 treads DT - 750 - MOMF - 65
DT - 75 - MOMS - 65



Parker Hannifin SAS
VPDE, Denison Vane Motors
Vierzon - France

Model No. M5AS - 018 - 1 N 0 2 - A 1 W - P21

M5A series - ISO 3019-2
Mounting flange 80 A2 SW
M5AS series - SAE A 2-bolts
J744 mounting flange

Cam ring
Volumetric displacement (ml/rev)

006 = 6,3	**018 = 18,0**
010 = 10,0	**023 = 23,0**
012 = 12,5	**025 = 25,0**
016 = 16,0	

Type of shaft M5AS
1 = Taper (SAE B)
2 = Keyed (SAE B)
Type of shaft M5A or M5AS
5 = Taper 1/5
6 = Keyed (ISO G20N)

Direction of rotation (shaft end view)
R = Clockwise (with anti-cavitation check valve)
L = Counter-clockwise (with anti-cavitation check valve)
N = Bi-rotational (without anti-cavitation check Valve)

End cap type
0 = with opposite ports
1 = with side ports

Porting combination
(See table)

Modifications or special option
Ex. : P21 = Proportional pressure relief valve set at 210 bar at 1000 rpm

End cap variables

M5A bi-rotational series		
Code	A & B ports	Drain port
Y	Metric thread M22 x 1,5	Metric thread M12 x 1,5

M5A uni-rotational series			
Code	A port	B port	Drain port
Y	Metric thread M22 x 1,5	Metric thread M27 x 2	Metric thread M12 x 1,5

M5AS bi-rotational series		
Code	A & B ports	Drain Port
W	**SAE 12 thread 1.1/16"-12 UNF**	**SAE 6 thread 9/16"-18 UNF**
Z	3/4" BSPP	1/4" BSPP

M5AS uni-rotational series			
Code	A port	B port	Drain port
W	**SAE 10 thread 7/8"-14 UNF**	**SAE 12 thread 1.1/16"-12 UNF**	**SAE 6 thread 9/16"-18 UNF**
Z	1/2" BSPP	3/4" BSPP	1/4" BSPP

Seal class
1 = S1 BUNA N
5 = S5 - VITON®

Design letter

Model No. M5ASF - 018 - 1 N 0 2 - A 1 W - P21

M5ASF - 2-bolts flange
Ø 101,6 h8

Cam ring
Volumetric displacement (ml/rev)

006 = 6,3	**018 = 18,0**
010 = 10,0	**023 = 23,0**
012 = 12,5	**025 = 25,0**
016 = 16,0	

Type of shaft
1 = Taper (SAE B)
2 = Keyed (SAE B)
5 = Taper 1/5
6 = Keyed (ISO G20N)

Direction of rotation (shaft end view)
R = Clockwise (with anti-cavitation check valve)
L = Counter-clockwise (with anti-cavitation check valve)
N = Bi-rotational (without anti-cavitation check Valve)

End cap type
0 = with opposite ports
1 = with side ports

Porting combination
(See table)

Modifications or special option
Ex. : P21 = Proportional pressure relief valve set at 210 bar at 1000 rpm

End cap variables

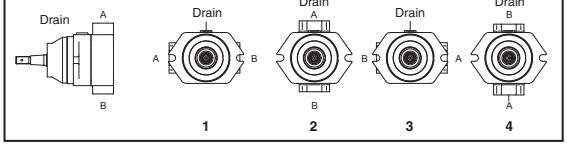
M5ASF bi-rotational series		
Code	A & B ports	Drain port
Y	Metric thread M22 x 1,5	Metric thread M12 x 1,5
W	**SAE 12 thread 1.1/16"-12 UNF**	**SAE 6 thread 9/16"-18 UNF**
Z	3/4" BSPP	1/4" BSPP

M5ASF uni-rotational series			
Code	A port	B port	Drain port
Y	Metric thread M22 x 1,5	Metric thread M27 x 2	Metric thread M12 x 1,5
W	**SAE 10 thread 7/8"-14 UNF**	**SAE 12 thread 1.1/16"-12 UNF**	**SAE 6 thread 9/16"-18 UNF**
Z	1/2" BSPP	3/4" BSPP	1/4" BSPP

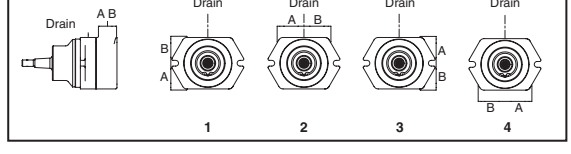
Seal class
1 = S1 BUNA N
5 = S5 - VITON®

Design letter

End cap = 0



End cap = 1

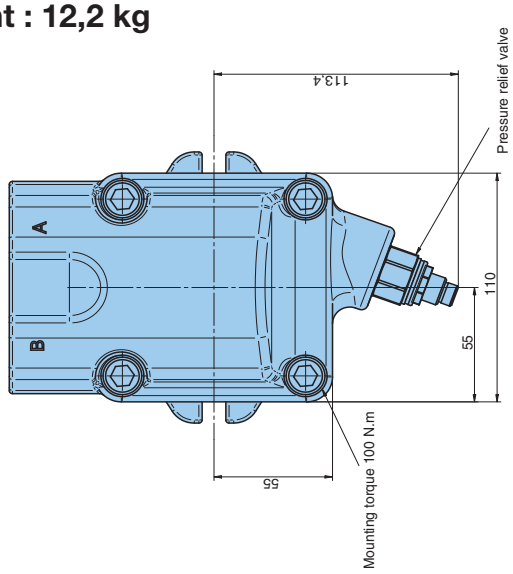


Preferred types are printed in bold.

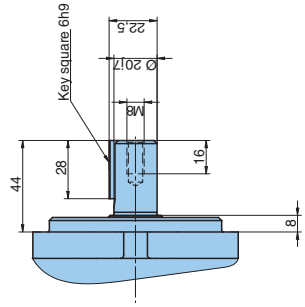
Parker Hannifin SAS
VPDE, Denison Vane Motors
Vierzon - France

Motor with side ports

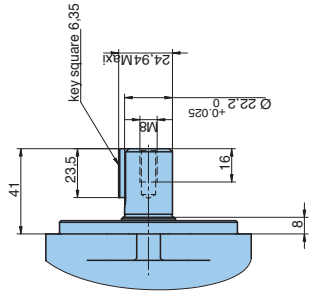
Weight : 12,2 kg



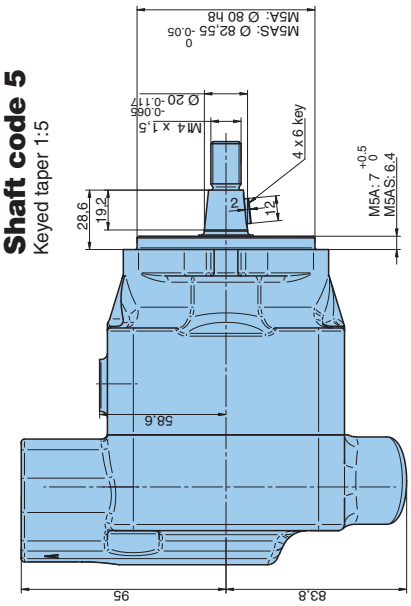
Shaft code 6
ISO G20N keyed



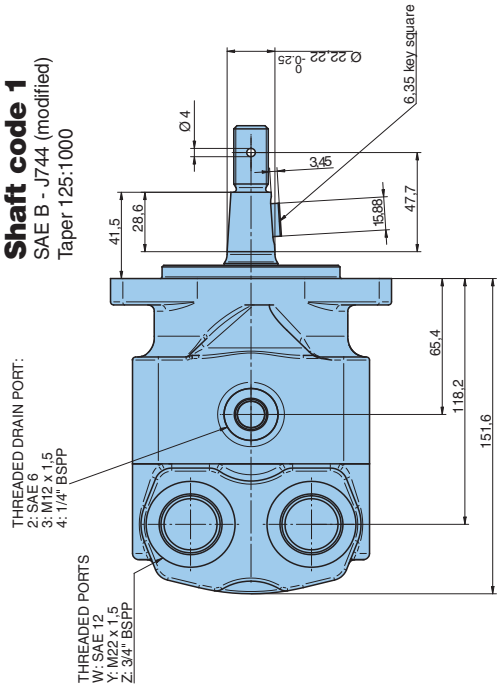
Shaft code 2
SAE B keyed

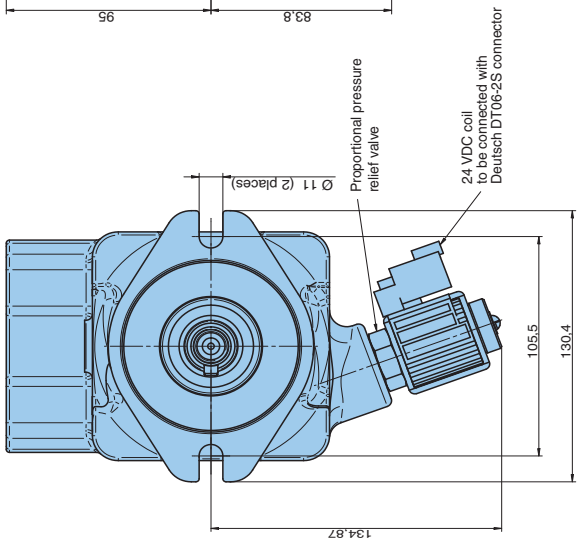


Shaft code 5
Keyed taper 1:5

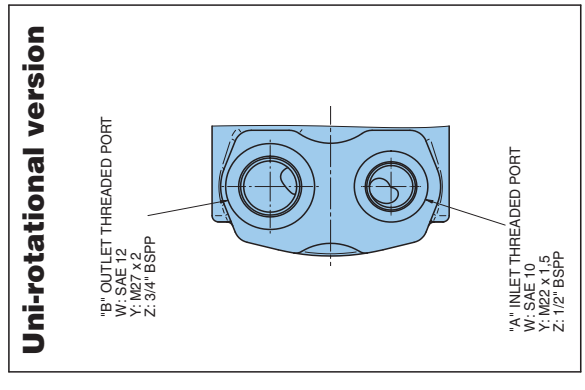


Shaft code 1
SAE B - J744 (modified)
Taper 125:1000





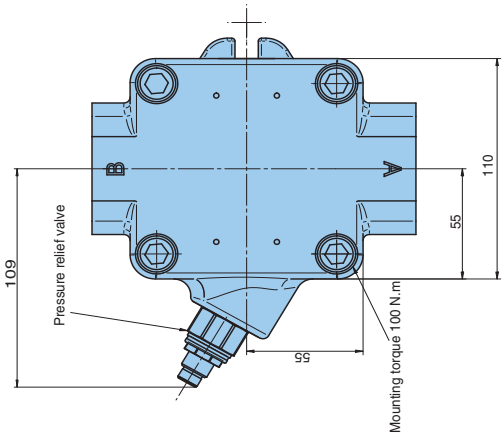
Uni-rotational version

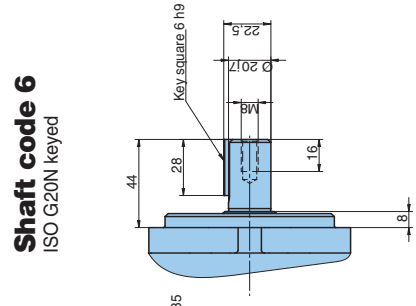


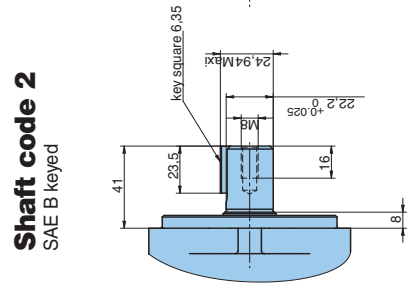
Parker Hannifin SAS
VPDE, Denison Vane Motors
Vierzon - France

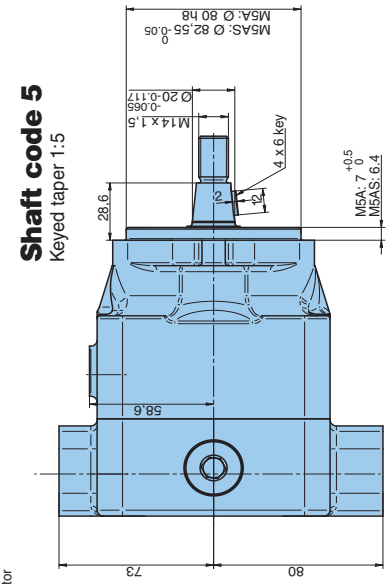
Motor with opposite ports

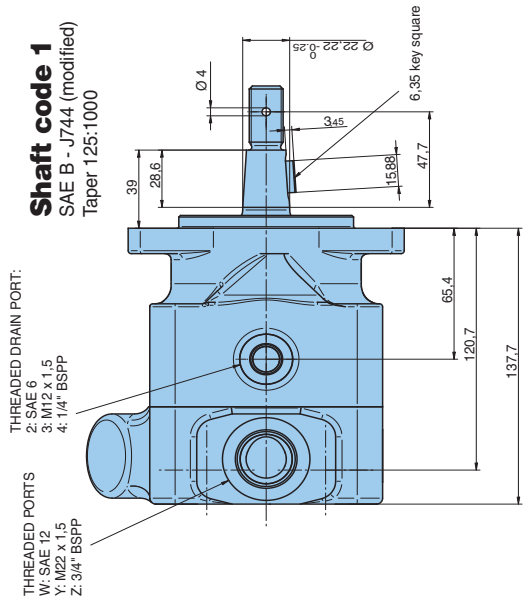
Weight : 11,2 kg

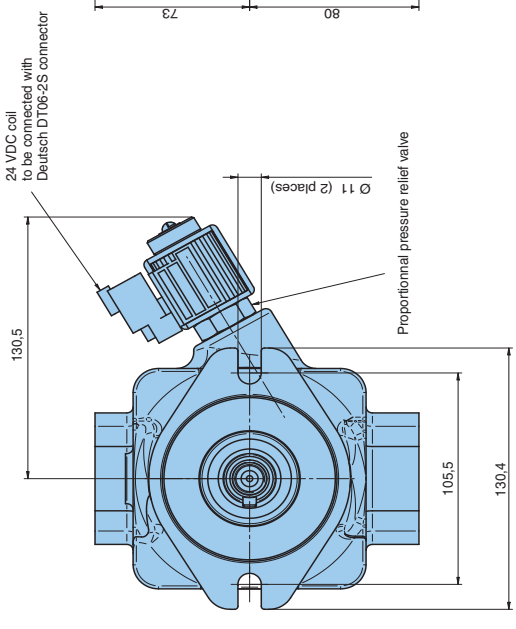


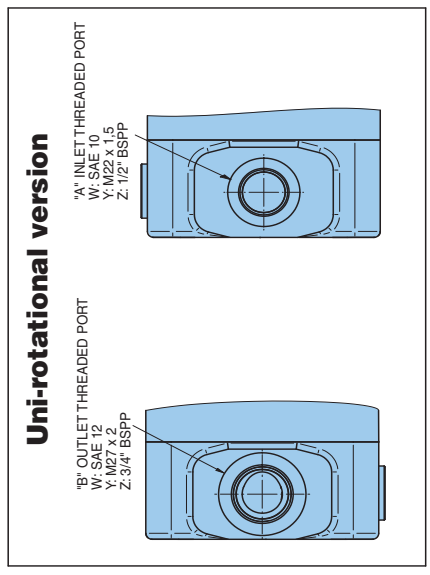






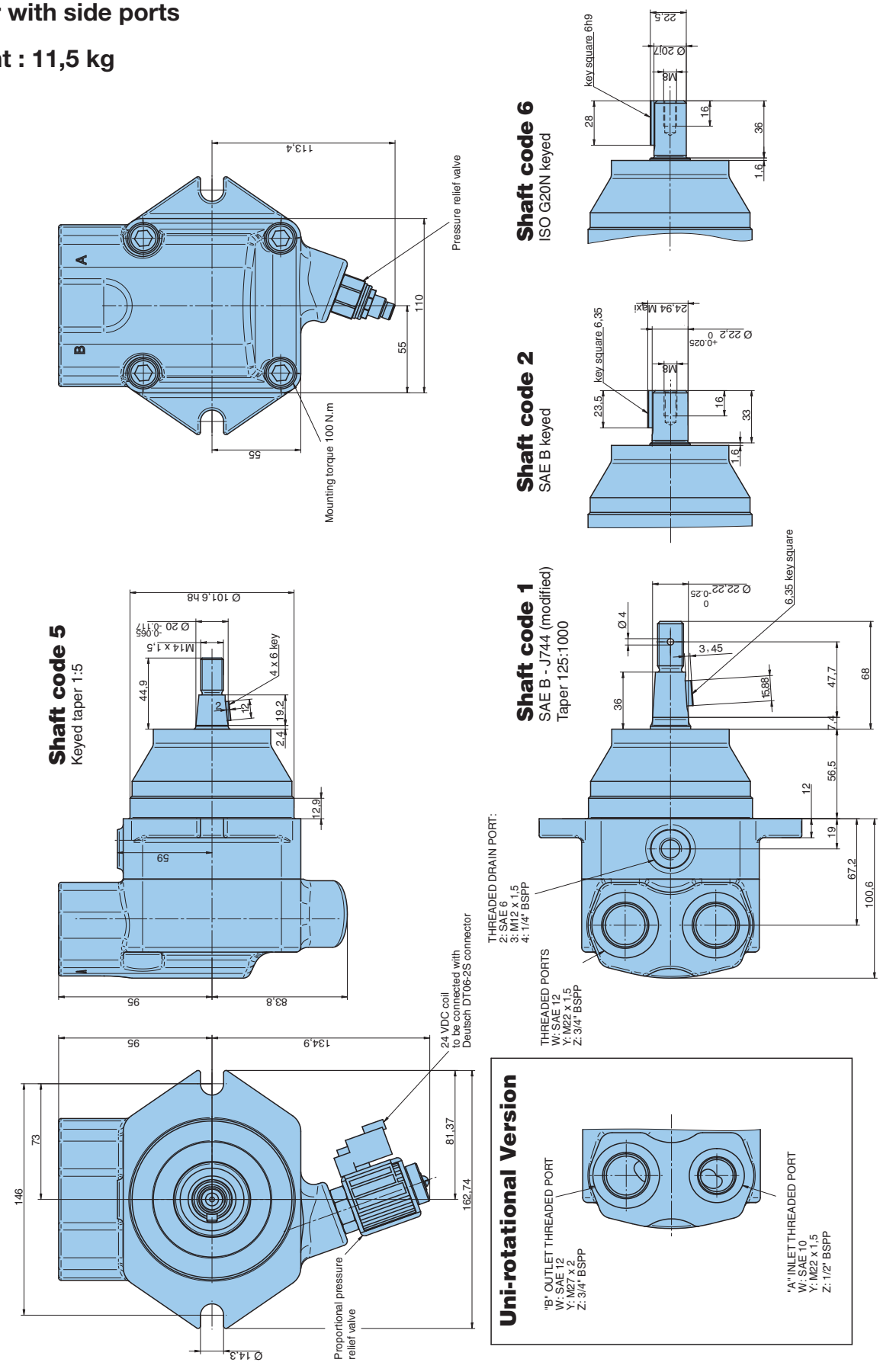






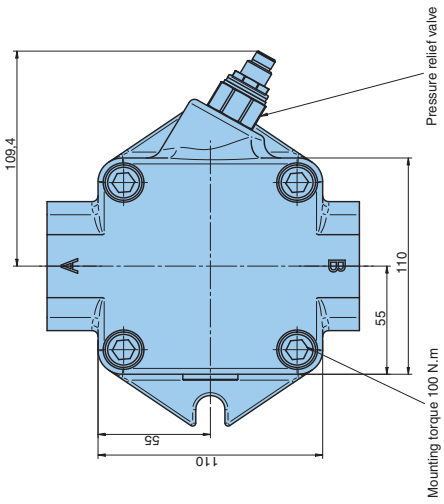
Motor with side ports

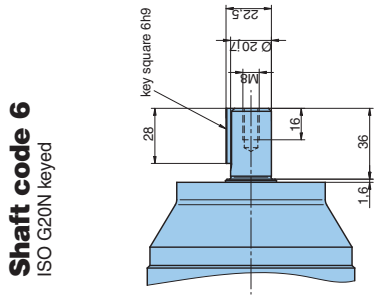
Weight : 11,5 kg

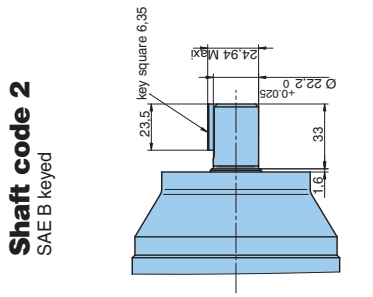


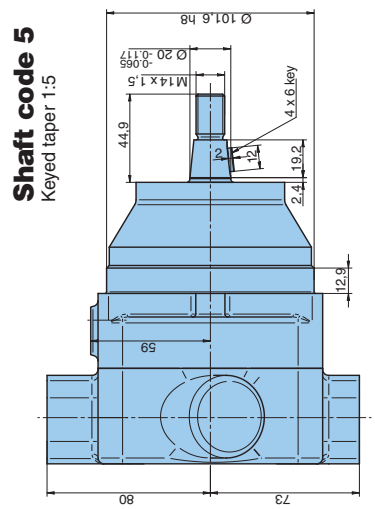
Motor with opposite ports

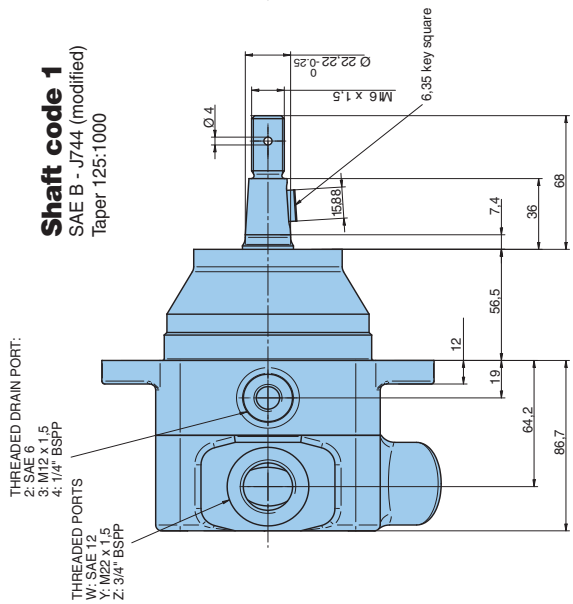
Weight : 10,5 kg

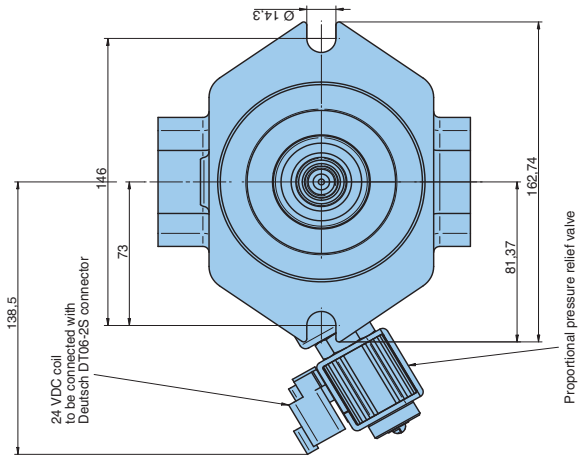


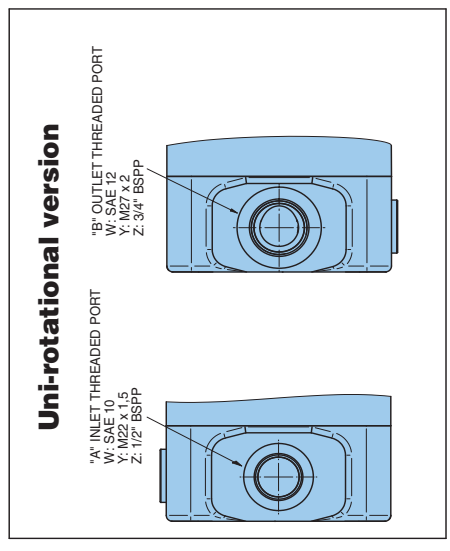












Parker Worldwide

AE – UAE, Dubai
Tel: +971 4 8127100
parker.me@parker.com

AR – Argentina, Buenos Aires
Tel: +54 3327 44 4129

AT – Austria, Wiener Neustadt
Tel: +43 (0)2622 23501-0
parker.austria@parker.com

AT – Eastern Europe,
Wiener Neustadt
Tel: +43 (0)2622 23501 900
parker.easteurope@parker.com

AU – Australia, Castle Hill
Tel: +61 (0)2-9634 7777

AZ – Azerbaijan, Baku
Tel: +994 50 2233 458
parker.azerbaijan@parker.com

BE/LU – Belgium, Nivelles
Tel: +32 (0)67 280 900
parker.belgium@parker.com

BR – Brazil, Cachoeirinha RS
Tel: +55 51 3470 9144

BY – Belarus, Minsk
Tel: +375 17 209 9399
parker.belarus@parker.com

CA – Canada, Milton, Ontario
Tel: +1 905 693 3000

CH – Switzerland, Etoy
Tel: +41 (0) 21 821 02 30
parker.switzerland@parker.com

CL – Chile, Santiago
Tel: +56 2 623 1216

CN – China, Shanghai
Tel: +86 21 2899 5000

CZ – Czech Republic, Klecany
Tel: +420 284 083 111
parker.czechrepublic@parker.com

DE – Germany, Kaarst
Tel: +49 (0)2131 4016 0
parker.germany@parker.com

DK – Denmark, Ballerup
Tel: +45 43 56 04 00
parker.denmark@parker.com

ES – Spain, Madrid
Tel: +34 902 330 001
parker.spain@parker.com

FI – Finland, Vantaa
Tel: +358 (0)20 753 2500
parker.finland@parker.com

FR – France, Contamine s/Arve
Tel: +33 (0)4 50 25 80 25
parker.france@parker.com

GR – Greece, Athens
Tel: +30 210 933 6450
parker.greece@parker.com

HK – Hong Kong
Tel: +852 2428 8008

HU – Hungary, Budapest
Tel: +36 1 220 4155
parker.hungary@parker.com

IE – Ireland, Dublin
Tel: +353 (0)1 466 6370
parker.ireland@parker.com

IN – India, Mumbai
Tel: +91 22 6513 7081-85

IT – Italy, Corsico (MI)
Tel: +39 02 45 19 21
parker.italy@parker.com

JP – Japan, Fujisawa
Tel: +81 (0)4 6635 3050

KR – South Korea, Seoul
Tel: +82 2 559 0400

KZ – Kazakhstan, Almaty
Tel: +7 7272 505 800
parker.easteurope@parker.com

LV – Latvia, Riga
Tel: +371 6 745 2601
parker.latvia@parker.com

MX – Mexico, Apodaca
Tel: +52 81 8156 6000

MY – Malaysia, Shah Alam
Tel: +60 3 7849 0800

NL – The Netherlands,
Oldenzaal
Tel: +31 (0)541 585 000
parker.nl@parker.com

NO – Norway, Ski
Tel: +47 64 91 10 00
parker.norway@parker.com

NZ – New Zealand, Mt Wellington
Tel: +64 9 574 1744

PL – Poland, Warsaw
Tel: +48 (0)22 573 24 00
parker.poland@parker.com

PT – Portugal, Leca da Palmeira
Tel: +351 22 999 7360
parker.portugal@parker.com

RO – Romania, Bucharest
Tel: +40 21 252 1382
parker.romania@parker.com

RU – Russia, Moscow
Tel: +7 495 645-2156
parker.russia@parker.com

SE – Sweden, Spånga
Tel: +46 (0)8 59 79 50 00
parker.sweden@parker.com

SG – Singapore
Tel: +65 6887 6300

SK – Slovakia, Banská Bystrica
Tel: +421 484 162 252
parker.slovakia@parker.com

SL – Slovenia, Novo Mesto
Tel: +386 7 337 6650
parker.slovenia@parker.com

TH – Thailand, Bangkok
Tel: +662 717 8140

TR – Turkey, Istanbul
Tel: +90 216 4997081
parker.turkey@parker.com

TW – Taiwan, Taipei
Tel: +886 2 2298 8987

UA – Ukraine, Kiev
Tel +380 44 494 2731
parker.ukraine@parker.com

UK – United Kingdom,
Warwick
Tel: +44 (0)1926 317 878
parker.uk@parker.com

US – USA, Cleveland
(industrial)
Tel: +1 216 896 3000

US – USA, Lincolnshire
(mobile)
Tel: +1 847 821 1500

VE – Venezuela, Caracas
Tel: +58 212 238 5422

ZA – South Africa,
Kempton Park
Tel: +27 (0)11 961 0700
parker.southafrica@parker.com

www.parker.com/vanepump

HYGE Ed. 2010-02-17

European Product Information Centre
Free phone: 00 800 27 27 5374
(from AT, BE, CH, CZ, DE, EE, ES, FI, FR, IE, IL, IS, IT, LU, MT, NL, NO, PT, SE, SK, UK)

Catalogue HY29-0024/UK. 1M 03/2010 IRO

Your local authorized Parker distributor