



Hydraulic Motors M5* Series

Denison Vane Technology, fixed displacement



ENGINEERING YOUR SUCCESS.

AVAILABILITY

Worldwide distribution
sales force and service

FLEXIBILITY

Solutions for global
and regional challenges

SUSTAINABILITY

Protecting people
and environment

PROFITABILITY

Serving for greater value to you
and your business

RELIABILITY

Maximizing uptime
and optimizing performance



ENGINEERING YOUR SUCCESS.





With annual sales of **\$11 billion** in fiscal year 2016, Parker Hannifin is the world's leading diversified manufacturer of motion and control technologies and systems. Strong competitive advantages, a clear strategy and goals, consistent execution and performance, and many opportunities for growth, have allowed the company to consistently deliver strong shareholder returns. Parker has increased its annual dividends paid to shareholders for 60 consecutive fiscal years, among the top five longest-running dividend-increase records in the S&P 500 index

For more information, visit the company's website at www.parker.com or its investor information website at www.phstock.com

Contents

General Information	Introduction and product key features _____	3
	Description of the M5 motors _____	4 to 5
Main Technical Data	Maximum speed and pressure _____	6
	Displacement and specific torque _____	6
	Installation and connection _____	7
Ordering Code	M5A motor _____	8
	M5AS motor _____	9
	M5ASF motor _____	10
	M5AF motor _____	11
	M5B and M5BS motor _____	12
	M5BF motor _____	13
Technical Data	Max. ratings M5A - M5AS - M5ASF motors _____	14
	Max. ratings M5AF motor _____	15
	Max. ratings M5B - M5BS - M5BF motors _____	16
	Flow and torque data M5A - M5AS - M5ASF - M5AF motors _____	17
	Flow and torque data M5B - M5BS - M5BF motors _____	18
	Starting performances _____	19
	Permissible shaft loads _____	19
	Noise level charts _____	20
Circuit Design	Graphical symbols _____	21
	Motor selection example _____	22
	Hydraulic fluids, types of seals, motor installation _____	23
	Minimum replenishment pressure during deceleration _____	24
	Reverse cycle for fan drives _____	24
	Connection of several motors in the same circuit _____	24
	Electrohydraulic valves _____	25 to 26
	Start-up instructions _____	26
Dimension Drawings	M5A and M5AS motor with rear ports _____	27
	M5A and M5AS motors with opposite ports _____	28
	M5A and M5AS motors with side ports _____	29
	M5A and M5AS motors with reverse valve option _____	30
	M5ASF motor with opposite ports _____	31
	M5ASF motor with side ports _____	32
	M5ASF motor with reverse valve option _____	33
	M5AF motor _____	34
	M5B and M5BS motors _____	35
	M5B and M5BS motors with reverse valve option _____	36
	M5BF motor _____	37
M5BF motor with reverse valve option _____	38	
Warning _____	39	

The M5 hydraulic motors

Introduction

We are very pleased to present you with the M5 hydraulic motors of Parker Hannifin, a range of high quality products designed for the heavy duty applications, gathering the latest developments of our reference "Denison Vane Technology".

Not only are these M5 motors performing very well in many various applications such as mixers, shredders, compressor and generator drives, but they do it in silence and for a long service life. Dedicated construction types have been created for fan drives. They offer a very compact solution and, with their built-in valves, they turn into complete hydraulic cooling units, allowing optimal performances, time and money savings for our OEM customers and end users.

This catalogue describes the 3 existing sizes of M5 hydraulic vane motors in their various standard construction types. Equipment manufacturers who may request additional options or have specific requests, are welcome to contact us for a tailored solution study.



Key features

High performances

The M5 motors have been designed especially for severe duty applications which require long lasting high pressure, high speed capabilities even with low fluid lubricity. Their performances remain stable over time.

Long lifetime

The fully pressure balanced concept increases the motor lifetime over its full speed range. Double lip vanes reduce the sensitivity to fluid pollution. The bearing capabilities are totally dedicated to the external loads on the shaft ends, whatever the operating pressures are.

Low noise

Simply silent! The Denison Vane Technology allows a very low noise level, whatever the speed.

Low torque ripple

Thanks to their 12 vanes, advanced cam ring profile, two torque cycles per revolution and low internal dead volumes, the M5 motors exhibit a very low torque ripple (typical $\pm 1,5\%$), even at low speeds.

Versatility and compactness

Up to 7 different displacements for the same motor installation size.

M5 fan drive motors can be mounted directly on the radiator support with a very short overall length. The fan blade can be directly installed on the motor tapered shaft end.

Built-in valves

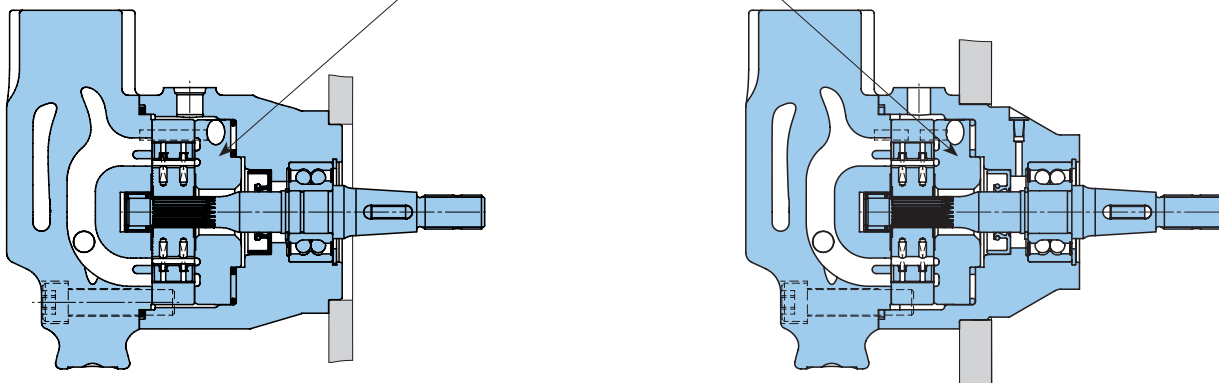
A selection of well proven Parker electro-hydraulic valves are adding even more functionalities. Being directly integrated into the motor they offer the best technical performances and the lowest cost of installation.

Description

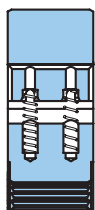
M5A - M5AS

M5ASF

The floating pressure port plate contains a shuttle valve that passes the highest pressure signal to the clamping area.

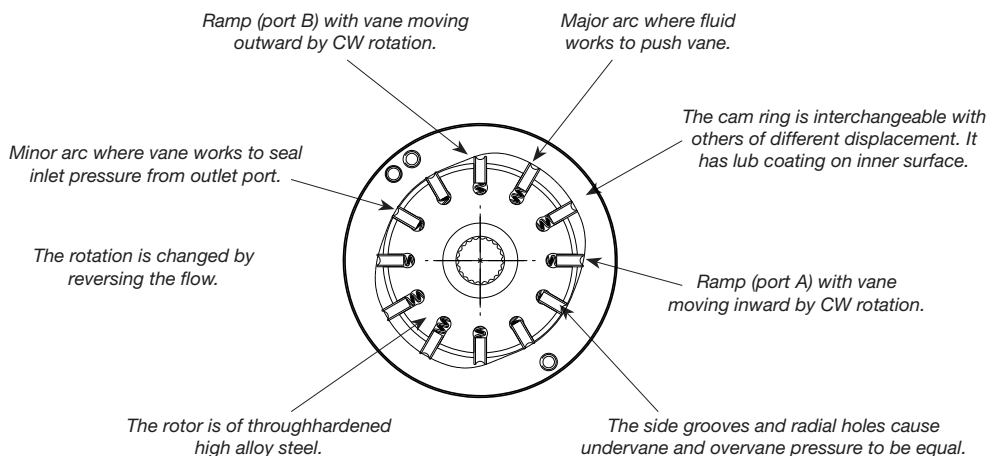


M5A*



Section A-A

The vane is urged outward by spring force and centrifugal force.

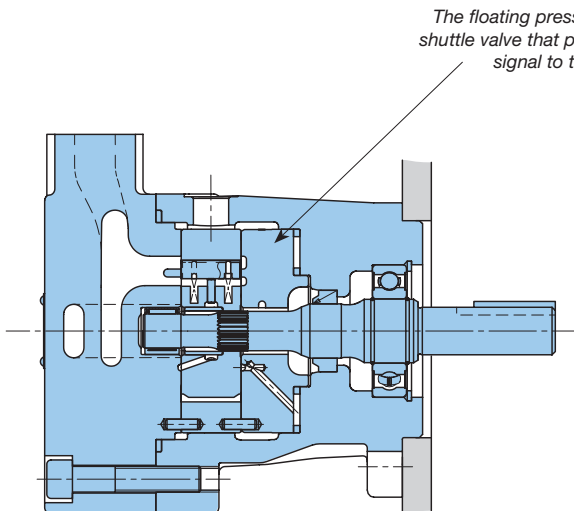


Operation

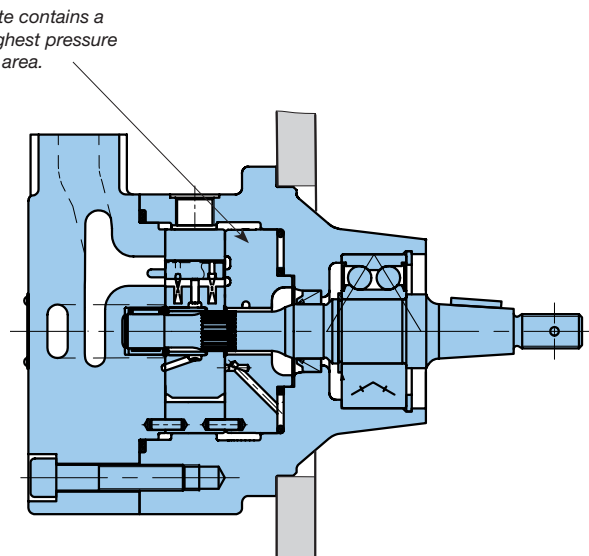
- The motor shaft is driven by the rotor. The vanes, closely fitted into the rotor slots move radially to seal against the cam ring. The ring has two major and two minor radial sections joined by transitional sections called ramps. These contours and the pressures exposed to them are balanced diametrically.
- 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 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 which connect to Port B from which it returns to the low pressure side of the system. Pressure at Port B torques the rotor counter-clockwise.
- The rotor is axially separated from the sideplate surface by the fluid film. The front pressure port plate 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 port plate 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. The cast iron port plate and the end cap are chemically etched to offer a fine crystalline surface allowing a better lubrication at start-up.

Description

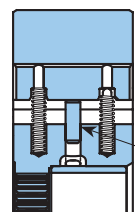
M5B - M5BS



M5BF



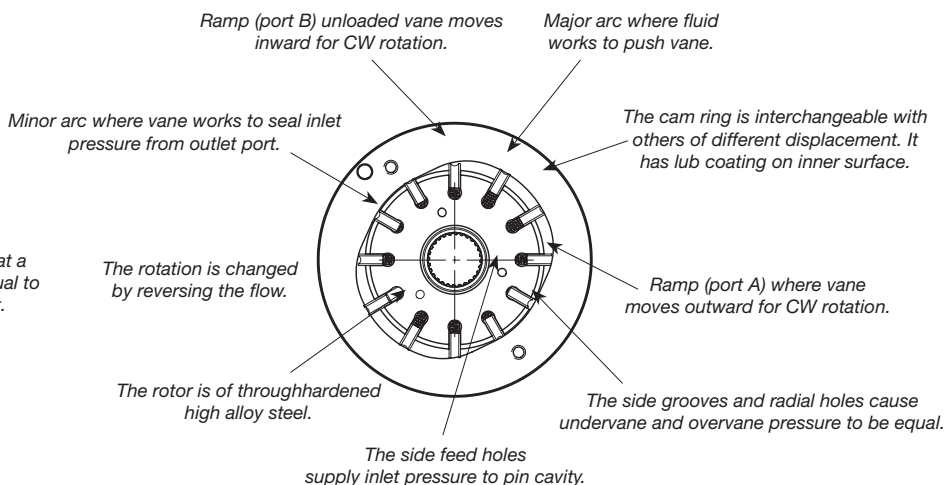
M5B*



Section A-A

The pins cavity is at a steady pressure equal to that at inlet port.

The vane is urged outward by the pin force, spring force and centrifugal force.



Operation

- The motor shaft is driven by the rotor. The 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.
- Hydraulic pins and 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 which connect to Port B from which it returns to the low pressure side of the system. Pressure at Port B torques the rotor counter-clockwise.
- The rotor is axially separated from the sideplate surface by the fluid film. The front pressure port plate 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 port plate 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. The cast iron port plate and the end cap are chemically etched to offer a fine crystalline surface allowing a better lubrication at start-up.

Max. speed and pressure

Model of motor	Series	Maximum speed		Maximum pressure with HF-0, HF-2 fluids			
		Int.	Cont.	Int. (6 s/min)	Cont.		
		rpm	rpm	bar	bar		
M5A	006	6000	5000	300 ²⁾	280		
	010						
	012	4500	3800				
M5AS	016						
M5ASF	018	4000	3300				
	023	3000	2500				
	025						
M5AF	006	6000	5000	300	300		
	010						
	012	4500	3800				
	016						
	018	4000	3300				
	023	3000	2500	280	280		
025							
M5B	012	6000	4000	320	290		
	018						
	023	4000	3000				
M5BS	028						
M5BF	036					3000 ¹⁾	2500
	045						

¹⁾ Bi-rotational motor only. Others = 2500 rpm

²⁾ For fan drive application only. Others = 280 bar max

Displacement and specific torque

Series	Theoretical Displacement V _i	Theoretical torque	Theoretical power at 100 rpm	Typical data at 2000 rpm - 280 bar		Typical data (M5AF only) at 2000 rpm - 300 bar	
	cm ³ /rev	N.m/bar	kW/bar	N.m	kW	N.m	kW
M5A	6,3	0,100	0,0011	24,4	5,1	26,1	5,5
	10,0	0,159	0,0017	40,8	8,6	43,7	9,2
M5AS	12,5	0,199	0,0021	52,0	10,9	55,7	11,7
M5ASF	16,0	0,255	0,0027	67,6	14,2	71,4	15,2
	18,0	0,286	0,0030	75,8	15,9	81,2	17,0
M5AF	23,0	0,366	0,0038	98,4	20,4	N/A ¹⁾	N/A ¹⁾
	25,0	0,398	0,0042	107,4	22,5	N/A ¹⁾	N/A ¹⁾

¹⁾ 023 - 025 = 280 bar max.

Series	Theoretical Displacement V _i	Theoretical torque	Theoretical power at 100 rpm	Typical data at 2000 rpm - 320 bar	
	cm ³ /rev	N.m/bar	kW/bar	N.m	kW
M5B	12,0	0,191	0,0020	50,6	10,6
	18,0	0,286	0,0030	81,2	17,0
M5BS	23,0	0,366	0,0038	117,1	24,5
	28,0	0,446	0,0047	132,1	27,7
M5BF	36,0	0,572	0,0060	172,8	36,2
	45,0	0,716	0,0075	N/A ¹⁾	N/A ¹⁾

¹⁾ 045 = 280 bar max.

Installation and connection

	Mounting flange	Shaft end	Port A	Port B	Drain port
M5A Uni-rotational	ISO 3019-2 80 A2 SW 2-bolts pilot Ø 80	Keyed taper 1/5 Keyed ISO G20N	Threaded port : - M22 x 1,5 - ISO 6149-1	Threaded port : - M27 x 2 - ISO-6149-1	Threaded port : - M12 x 1,5 - ISO-6149-1
M5A with reverse function					
M5A Bi-rotational					
M5AS Uni-rotational	SAE A J744 2-bolts pilot Ø 82,55	Keyed taper SAE B Keyed SAE B Keyed taper 1/5 Keyed ISO G20N	Threaded port : - SAE 10 - (7/8"-14 UNF) - 1/2" BSPP	Threaded port : - SAE 12 - (1.1/16"-12 UNF) - 3/4" BSPP	Threaded port : - SAE 6 - (9/16"-18 UNF) - 1/4" BSPP
M5AS with reverse function					
M5AS Bi-rotational					
M5ASF Uni-rotational	Special 2-bolts pilot Ø 100 or pilot Ø 101,6	Keyed taper SAE B Keyed SAE B Keyed taper 1/5 Keyed ISO G20N	Threaded port : - M22 x 1,5 - ISO 6149-1 - SAE 10 - (7/8"-14 UNF) - 1/2" BSPP	Threaded port : - M27 x 2 - ISO 6149-1 - SAE 12 - (1.1/16"-12 UNF) - 3/4" BSPP	Threaded port : - M12 x 1,5 - ISO 6149-1 - SAE 6 - (9/16"-18 UNF) - 1/4" BSPP
M5ASF with reverse function					
M5ASF Bi-rotational					
M5AF	Special 2 bolts pilot Ø 120	Keyed taper non SAE Keyed non SAE	- SAE flange 3/4" - 4 bolts with metric thread - SAE flange 3/4" - 4 bolts with UNC thread - Threaded port M22 x 1,5 - ISO 6149-1 - Threaded port SAE 12 - (1.1/16"-12 UNF)		Threaded port : - M12 x 1,5 - ISO 6149-1 - SAE 6 - (9/16"-18 UNF)
M5B	ISO 3019-2 100 A2 HW 100 B4 SW 2/4 bolts pilot Ø 100	Keyed cyl. SAE B Keyed cyl. ISO E25M	- SAE flange 3/4" - 4 bolts with metric thread - Threaded port M27 x 2 - ISO 6149-1		Threaded port : - M18 x 1,5 - ISO 6149-1 - SAE 6 - (9/16"-18 UNF)
M5B with reverse function			Keyed cyl. SAE B Keyed cyl. ISO E25M	Threaded port : - M27 x 2 - ISO 6149-1	
M5BS	SAE B J744 2/4 bolts pilot Ø 101,6	Splined SAE B Splined SAE BB	- SAE flange 3/4" - 4 bolts with metric thread - SAE flange 3/4" - 4 bolts with UNC thread - Threaded port M27 x 2 - ISO 6149-1 - Threaded port SAE 12 - (1.1/16"-12 UNF)		
M5BS with reverse function			Threaded port : - M27 x 2 - ISO 6149-1 - SAE 12 - (1.1/16"-12 UNF)	Threaded port : - M33 x 2 - ISO 6149-1 - SAE 16 - (1.5/16"-16 UNF)	
M5BF	Special 2 bolts pilot Ø 135	Keyed taper non SAE Keyed cyl. SAE C Keyed cyl. ISO G32N	- SAE flange 3/4" - 4 bolts with metric thread - SAE flange 3/4" - 4 bolts with UNC thread - Threaded port M27 x 2 - ISO 6149-1 - Threaded port SAE 12 - (1.1/16"-12 UNF)		
M5BF with reverse function			Threaded port : - M27 x 2 - ISO 6149-1 - SAE 12 - (1.1/16"-12 UNF)	Threaded port : - M33 x 2 - ISO 6149-1 - SAE 16 - (1.5/16"-16 UNF)	

Ordering Code

M5A model description

Model No. **M5A - 018 - 5 N 12 - A 1 Y - 0 0 0 00**

M5A series - ISO 3019-2
Mounting flange 80 A2 SW

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 M5A
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 any anti-cavitation check valve)

End cap type (See table)
Motor with opposite ports : 01, 02, 03, 04 (not combinable with a motor having the reverse valve option)
Motor with side ports : 11, 12, 13, 14
Motor with rear ports : 21, 22, 23, 24 (only combinable with a bi-rotational motor)

Design letter

Max pressure setting value
00 = For motor without pressure valve
21 = Valve set at 210 bar
28 = Valve set at 280 bar
** Customised value (please consult Parker)

Pressure valve type
0 = Without pressure valve
P = Proportional valve
M = Mechanical valve

Option
0 = No option
R = Reverse valve

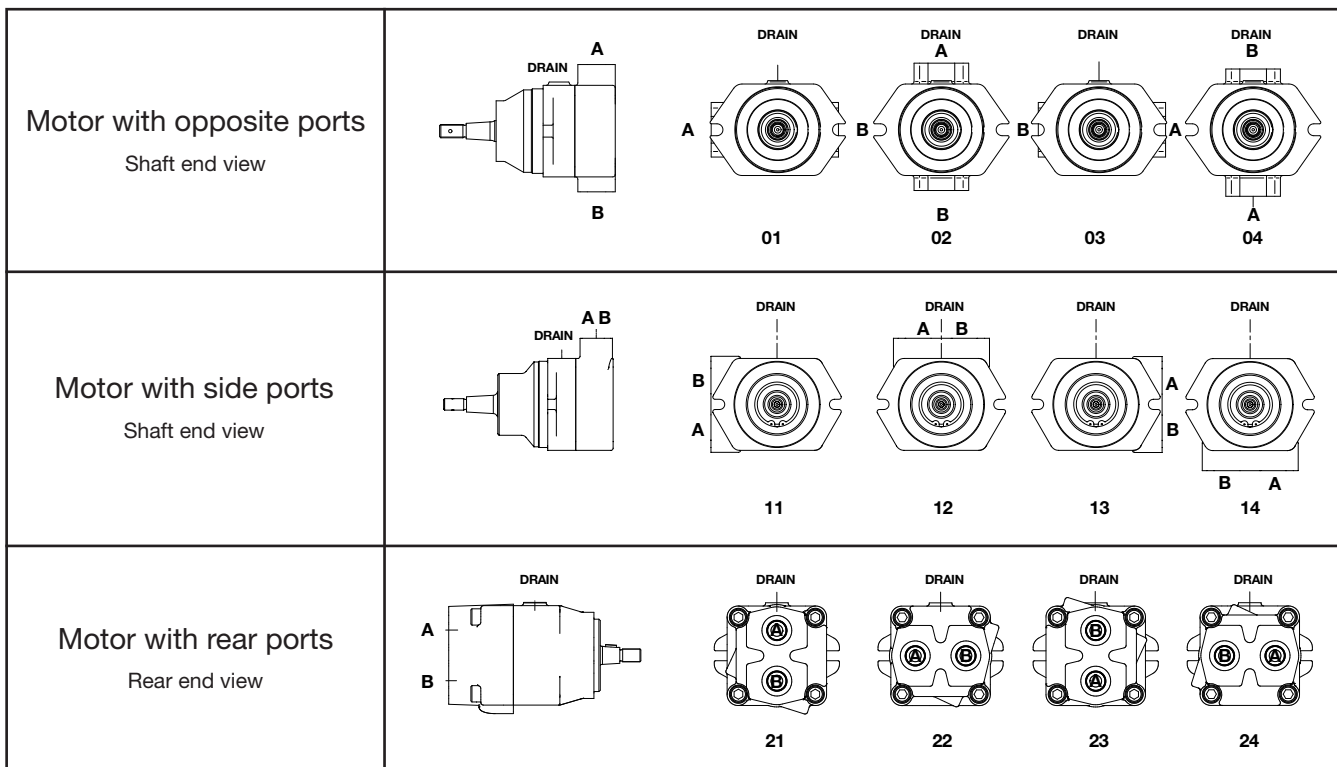
Connection variables

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

M5A uni-rotational series and reverse valve option			
Code	A port	B port	Drain port
Y	Metric threaded port M22 x 1,5	Metric threaded port M27 x 2	Metric threaded port M12 x 1,5

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

Position of the ports (Rotation way see page 21)



Ordering code

M5AS model description

Model No. **M5AS - 018 - 1 R 12 - A 1 W - 00 M 28**

M5AS series
SAE A 2-bolts mounting flange J744

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)
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 any anti-cavitation check valve)

End cap type (See table)
Motor with opposite ports : 01, 02, 03, 04 (not combinable with a motor having the reverse valve option)
Motor with side ports : 11, 12, 13, 14
Motor with rear ports : 21, 22, 23, 24 (only combinable with a bi-rotational motor)

Design letter

Max pressure setting value
00 = For motor without pressure valve
21 = Valve set at 210 bar
28 = Valve set at 280 bar
** Customised value (please consult Parker)

Pressure valve type
0 = Without pressure valve
P = Proportional valve
M = Mechanical valve

Option
0 = No option
R = Reverse valve

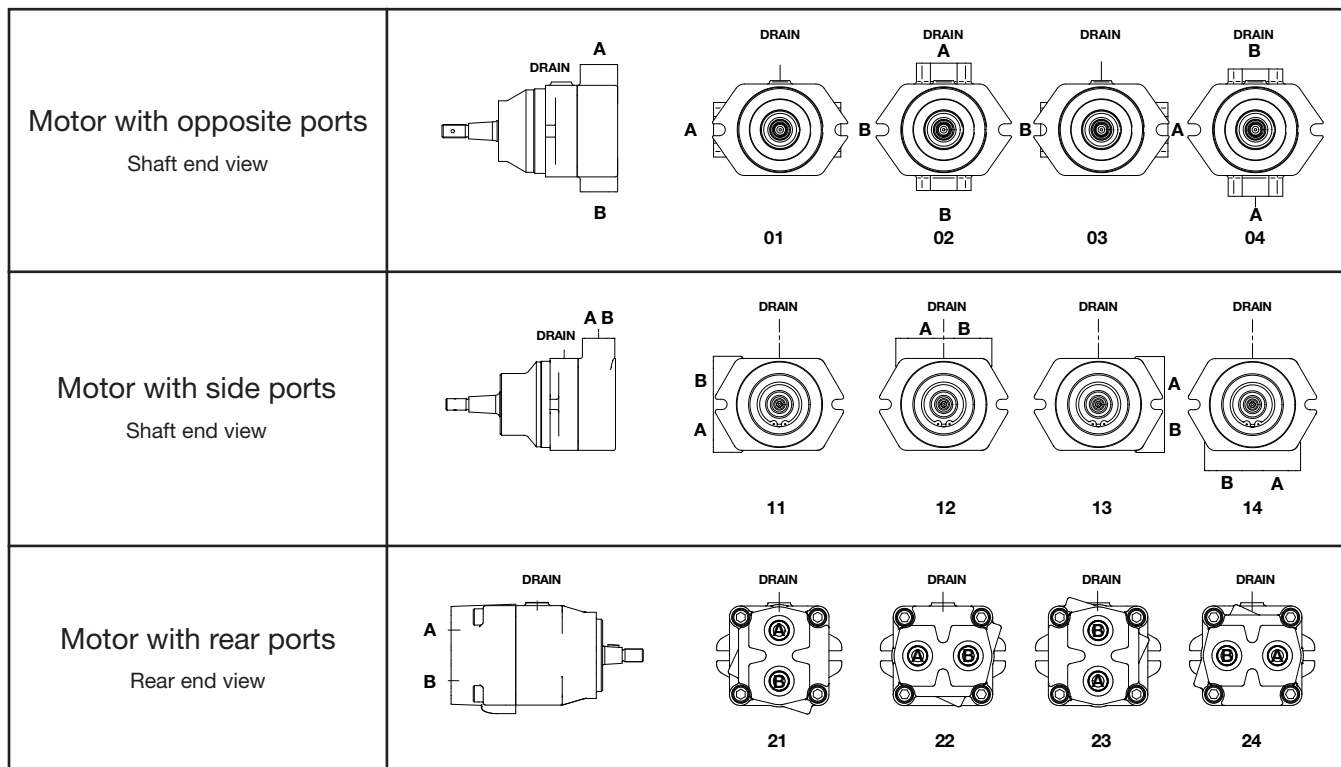
Connection variables

M5AS bi-rotational series		
Code	A & B ports	Drain port
W	UNF threaded port SAE 12	UNF threaded port SAE 6
Z	3/4" BSPP threaded port	1/4" BSPP threaded port

M5AS uni-rotational series and reverse valve option			
Code	A port	B port	Drain port
W	UNF threaded port SAE 10	UNF threaded port SAE 12	UNF threaded port SAE 6
Z	1/2" BSPP threaded port	3/4" BSPP threaded port	1/4" BSPP threaded port

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

Position of the ports (Rotation way see page 21)



Ordering Code

M5ASF model description

Model No. M5ASF - 018 - 1 R 12 - A 1 W - 0 R P 21

M5ASF series
2-bolts mounting flange, pilot Ø 101,6
2-bolts mounting flange, pilot Ø 100
(metric ports version Y)

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 any anti-cavitation check valve)

End cap type (See table)
Motor with opposite ports : 01, 02, 03, 04 (not combinable with motor having the reverse valve option)
Motor with side ports : 11, 12, 13, 14

Design letter

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

Max pressure setting value
00 = For motor without pressure valve
21 = Valve set at 210 bar
28 = Valve set at 280 bar
** Customised value (please consult Parker)

Pressure valve type
0 = Without pressure valve
P = Proportional valve
M = Mechanical valve

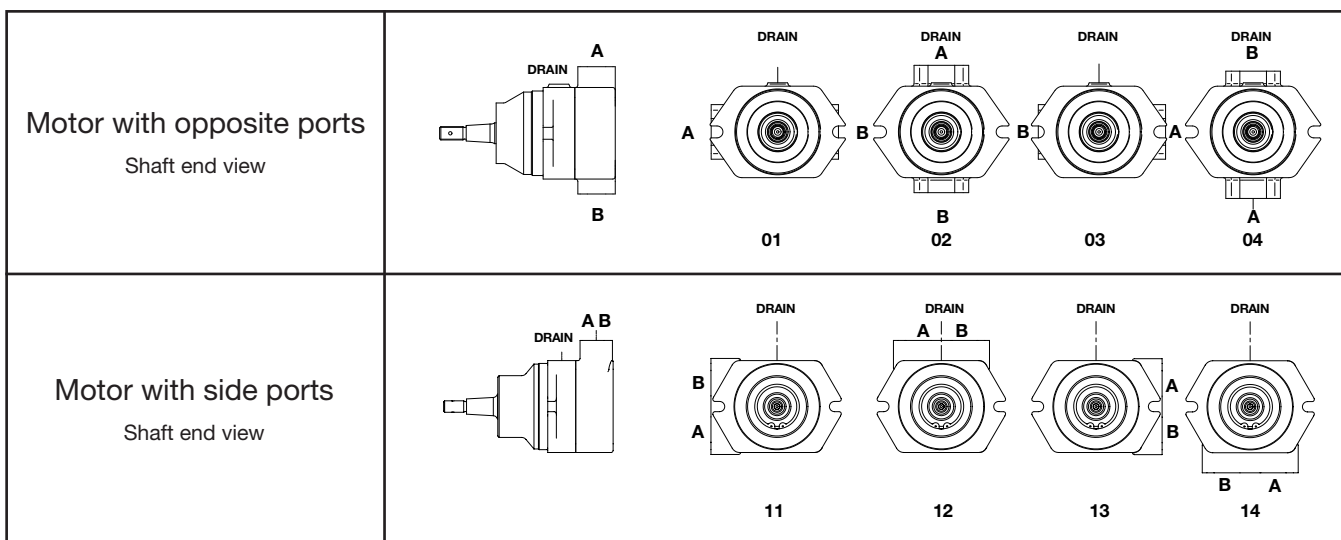
Option
0 = No option
R = Reverse valve

Connection variables

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

M5ASF uni-rotational and reverse valve option			
Code	A port	B port	Drain port
Y	Metric threaded port M22 x 1,5	Metric threaded port M27 x 2	Metric threaded port M12 x 1,5
W	UNF threaded port SAE 10	UNF threaded port SAE 12	UNF threaded port SAE 6
Z	1/2" BSPP threaded port	3/4" BSPP threaded port	1/4" BSPP threaded port

Position of the ports (Rotation way see page 21)



Ordering code

M5AF model description

Model No. M5AF - 018 - 1 R 02 - B 1 M - 0 0 P 21

M5AF series
2-bolts mounting flange, pilot Ø 120,0

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 (non SAE)
2 = Keyed (non SAE)

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 any anti-cavitation check valve)

End cap type (See table)
Motor with side ports : 01, 02, 03, 04

Design letter

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

Max pressure setting value
00 = For motor without pressure valve
21 = Valve set at 210 bar
28 = Valve set at 280 bar
** Customised value (please consult Parker)

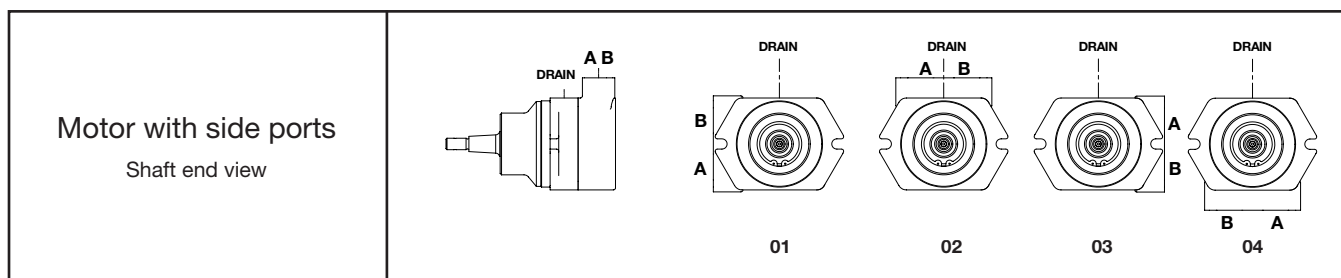
Pressure valve type
0 = Without pressure valve
P = Proportional valve
M = Mechanical valve

Option
0 = No option
A = Anti-starve valve (only with end cap M & 0)

Connection variables

M5AF uni-rotational and bi-rotational series		
Code	A & B ports	Drain port
M	4 bolts SAE flange 3/4" with metric threads	Metric threaded port M12 x 1,5
0	4 bolts SAE flange 3/4" with UNC threads	UNF threaded port SAE 6
Y	Metric threaded port M22 x 1,5	Metric threaded port M12 x 1,5
W	UNF threaded port SAE 12	UNF threaded port SAE 6

Position of the ports (Rotation way see page 21)



Ordering code

M5B - M5BS model description

Model No. M5BS - 036 - 1 R 02 - B 1 M - 0 0 M 28

M5B series - ISO 3019-2

Mounting flange 100 A2/B4 HW

M5BS series

SAE B 2/4 -bolts mounting flange J744

Cam ring

Volumetric displacement (ml/rev)

012 = 12,5 028 = 28,0

018 = 18,0 036 = 36,0

023 = 23,0 045 = 45,0

Type of shaft

- 1 = Keyed (SAE B)
- 2 = Keyed (ISO E25M)
- 3 = Splined (SAE B)
- 4 = Splined (SAE BB)

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 any anti-cavitation check valve)

End cap type (See table)

Motor with side ports : 01, 02, 03, 04

Design letter

Seal class

- 1 = S1 BUNA N
- 5 = S5 - VITON®

Max pressure setting value

- 00 = For motor without pressure valve
- 21 = Valve set at 210 bar
- 28 = Valve set at 280 bar
- ** Customised value (please consult Parker)

Pressure valve type

- 0 = Without pressure valve
- P = Proportional valve
- M = Mechanical valve

Option

- 0 = No option
- A = Anti-starve valve (only with end cap M & 0)
- R = Reverse valve (only Y and W)

Connection variables

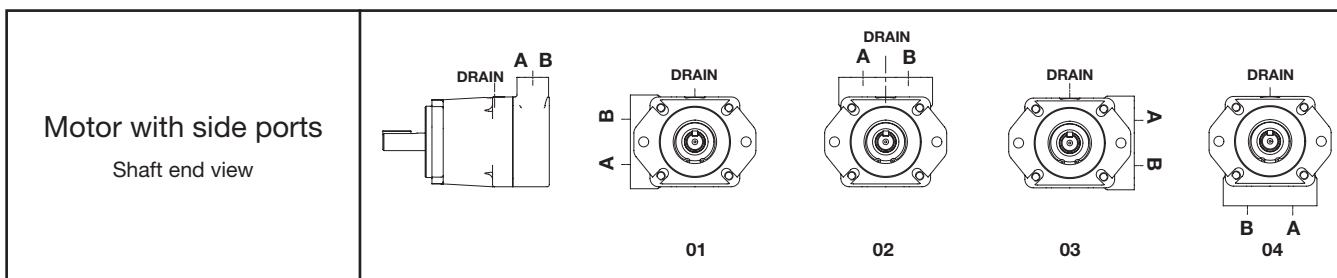
M5B - M5BS uni-rotational and bi-rotational series		
Code	A & B ports	Drain port
M	4 bolts SAE flange 3/4" with metric threads	Metric threaded port M18 x 1,5
Y	Metric threaded port M27 x 2	Metric threaded port M18 x 1,5

M5BS uni-rotational and bi-rotational series		
Code	A & B ports	Drain port
0	4 bolts SAE flange 3/4" with UNC threads	UNF threaded port SAE 6
W	UNF threaded port SAE 12	UNF threaded port SAE 6

M5B - M5BS reverse valve option			
Code	A port	B port	Drain port
Y	Metric threaded port M27 x 2	Metric threaded port M33 x 2	Metric threaded port M18 x 1,5

M5BS reverse valve option			
Code	A port	B port	Drain port
W	UNF threaded port SAE 12	UNF threaded port SAE 16	UNF threaded port SAE 6

Position of the ports (Rotation way see page 21)



Ordering code

M5BF model description

Model No. **M5BF - 036 - W R 04 - B 1 Y - 0 R P 28**

M5BF series _____
2-bolts mounting flange, pilot Ø 135

Cam ring _____
Volumetric displacement (ml/rev)
012 = 12,5 028 = 28,0
018 = 18,0 036 = 36,0
023 = 23,0 045 = 45,0

Type of shaft _____
1 = Taper (non SAE)
2 = Keyed (SAE C)
W = Keyed cyl. (ISO G32N)

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 any anti-cavitation check valve)

End cap type (See table) _____
Motor with side ports : 01, 02, 03, 04

Design letter _____

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

Max pressure setting value
00 = For motor without pressure valve
21 = Valve set at 210 bar
28 = Valve set at 280 bar
** Customised value (please consult Parker)

Pressure valve type
0 = Without pressure valve
P = Proportional valve
M = Mechanical valve

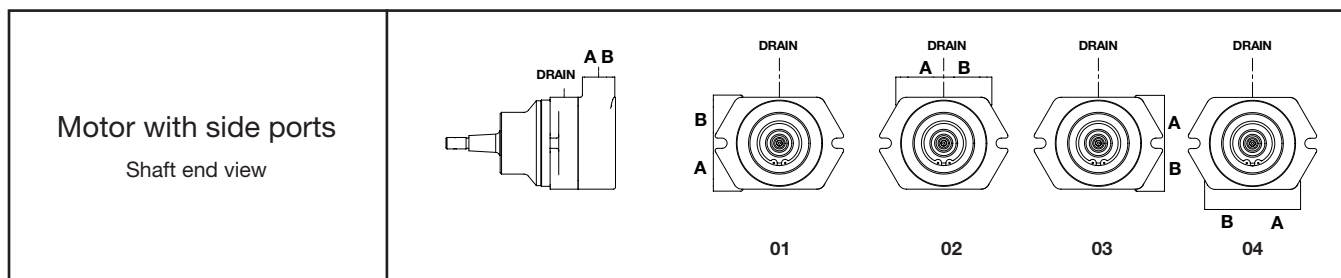
Option
0 = No option
A = Anti-starve valve (only with end cap M & 0)
R = Reverse valve (only Y and W)

Connection variables

M5BF uni-rotational and bi-rotational series		
Code	A & B ports	Drain port
M	4 bolts SAE flange 3/4" with metric threads	Metric threaded port M18 x 1,5
0	4 bolts SAE flange 3/4" with UNC threads	UNF threaded port SAE 6
Y	Metric threaded port M27 x 2	Metric threaded port M18 x 1,5
W	UNF threaded port SAE 12	UNF threaded port SAE 6

M5BF reverse valve option			
Code	A port	B port	Drain port
Y	Metric threaded port M27 x 2	Metric threaded port M33 x 2	Metric threaded port M18 x 1,5
W	UNF threaded port SAE 12	UNF threaded port SAE 16	UNF threaded port SAE 6

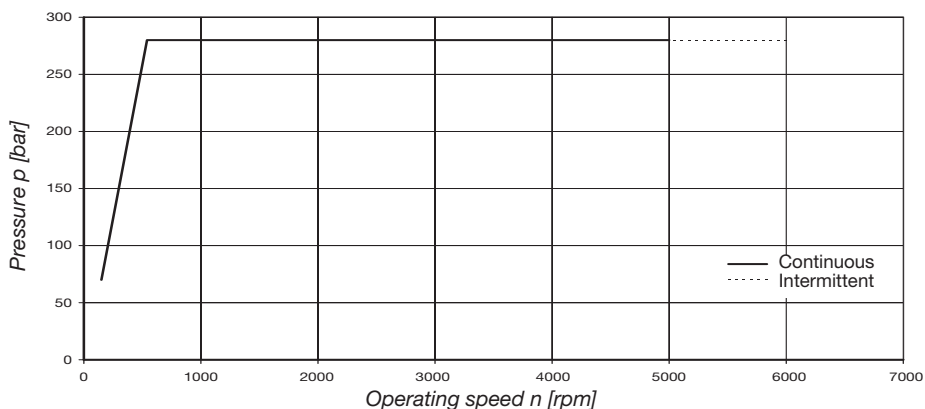
Position of the ports (Rotation way see page 21)



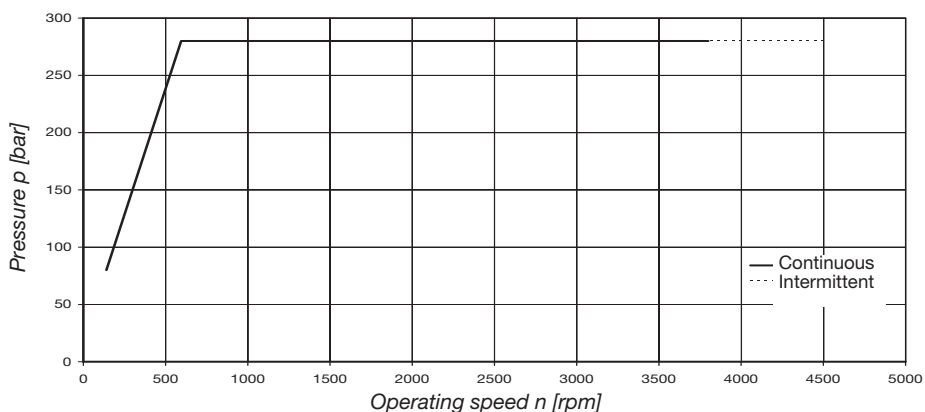
Technical Data

Max. ratings M5A - M5AS - M5ASF

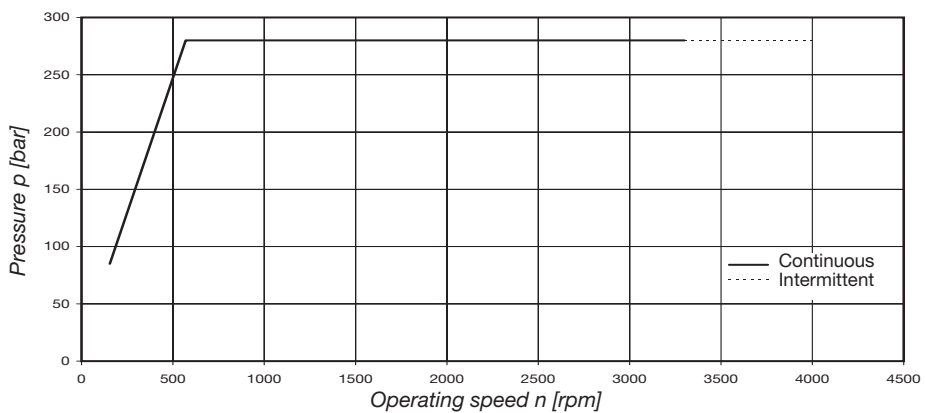
M5A - M5AS - M5ASF
 006 - 010



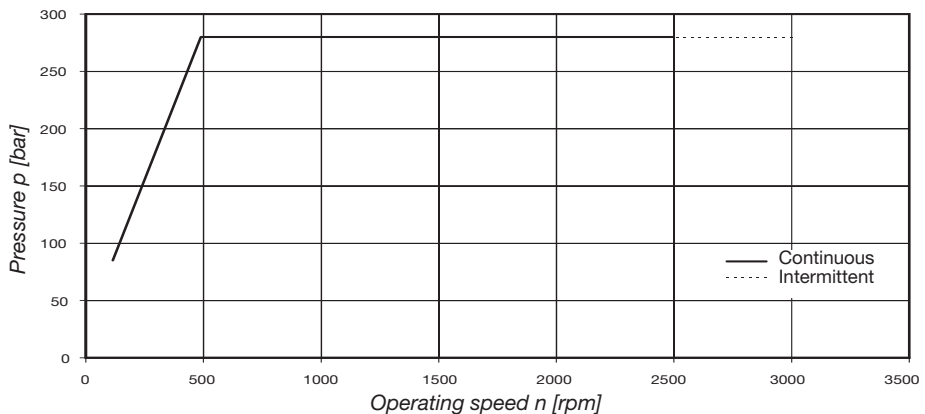
M5A - M5AS - M5ASF
 012 - 016



M5A - M5AS - M5ASF
 018



M5A - M5AS - M5ASF
 023 - 025

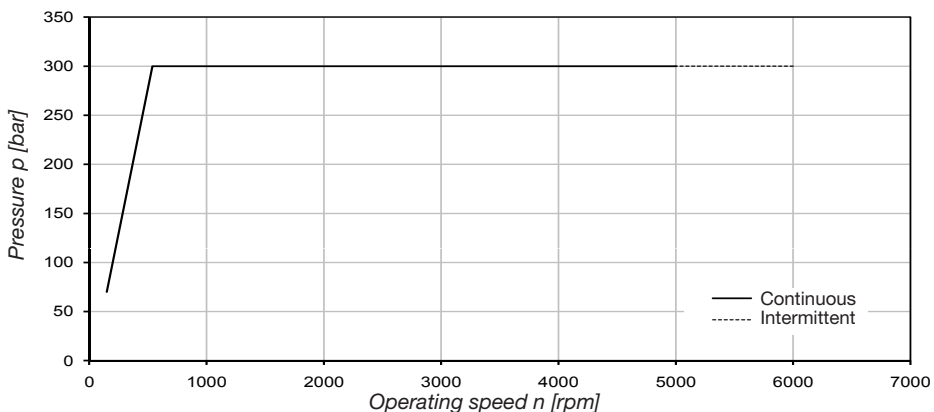


- Running condition limits - Typical curves at 26 cSt @ 45° - For starting performances see page 19.

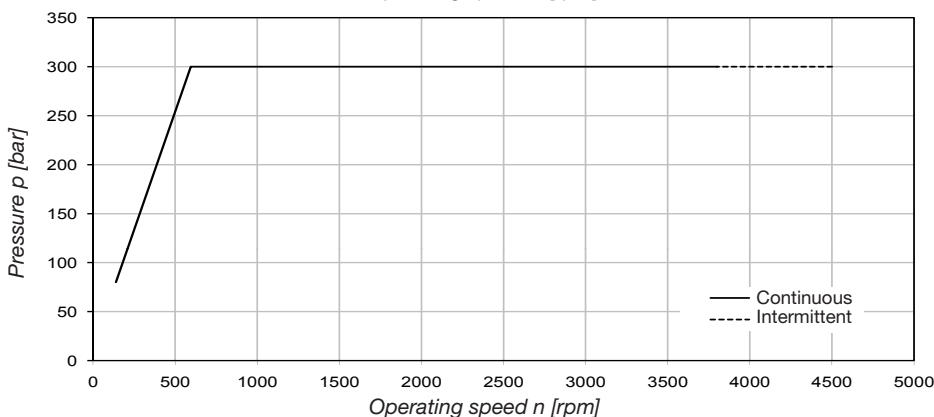
- For higher specifications or for operating speed under < 100 rpm, please consult Parker.

Max. ratings M5AF

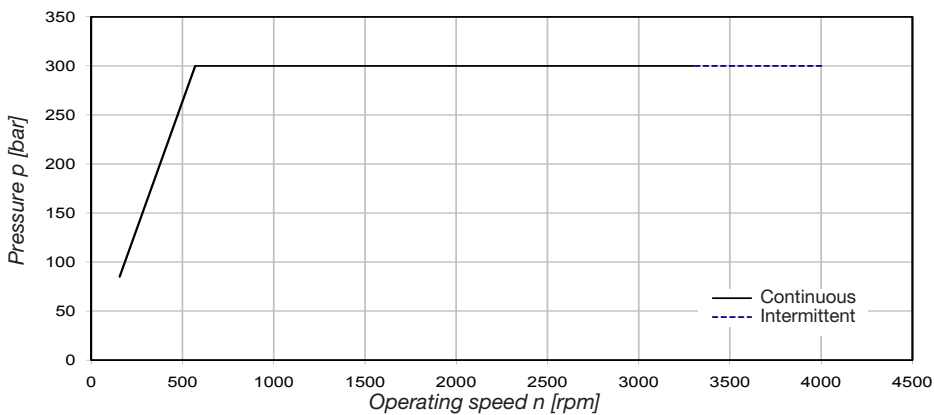
M5AF
006 - 010



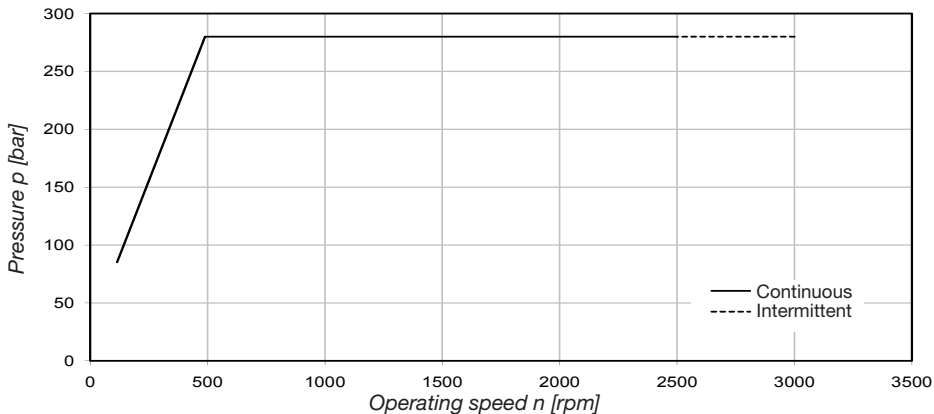
M5AF
012 - 016



M5AF
018



M5AF
023 - 025



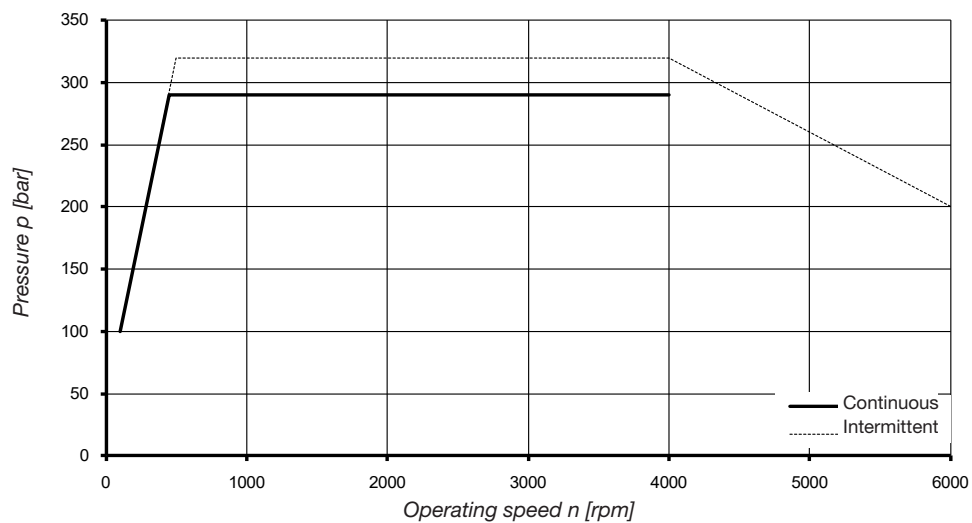
- Running condition limits - Typical curves at 26 cSt @ 45° - For starting performances see page 19.

- For higher specifications or for operating speed under < 100 rpm, please consult Parker.

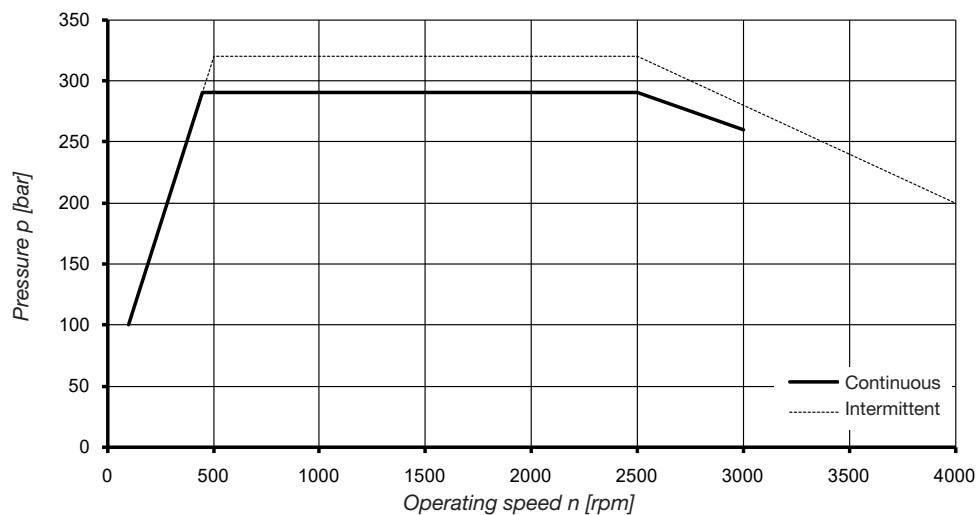
Technical Data

Max. ratings M5B - M5BS - M5BF

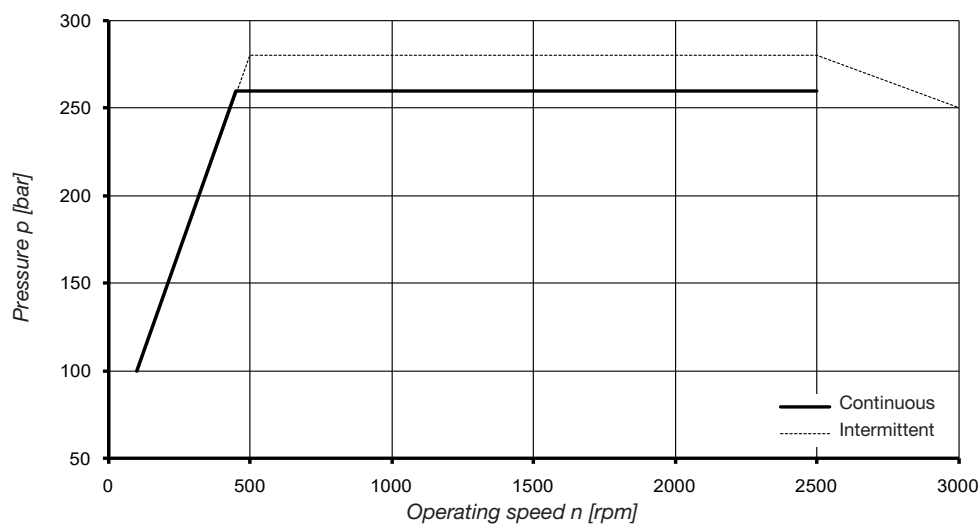
M5B - M5BS - M5BF
 012 - 018



M5B - M5BS - M5BF
 023 - 028 - 036



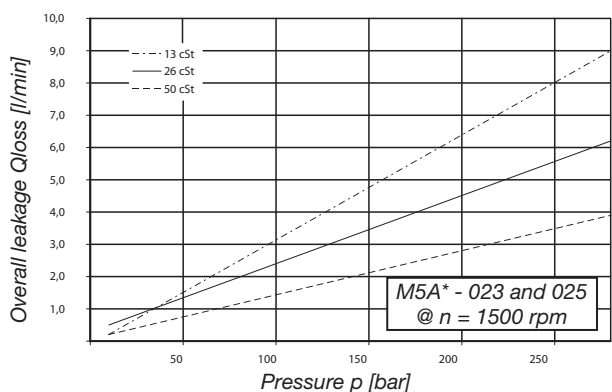
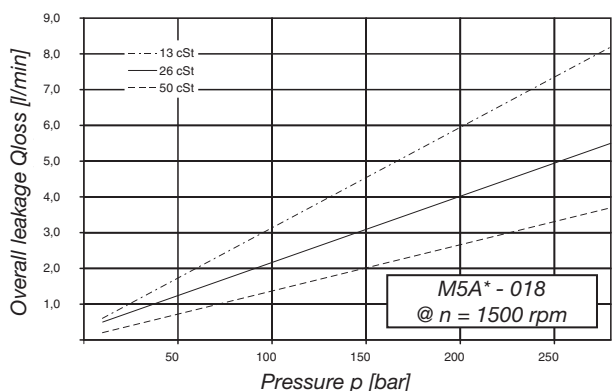
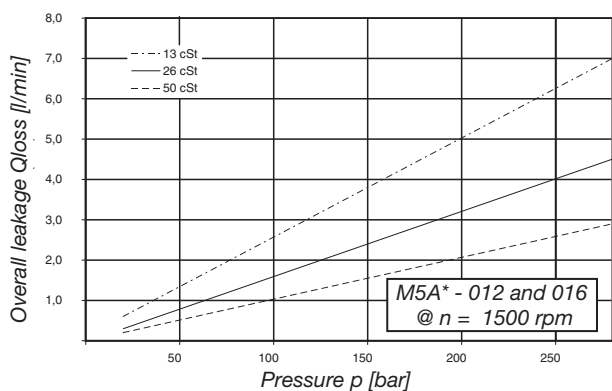
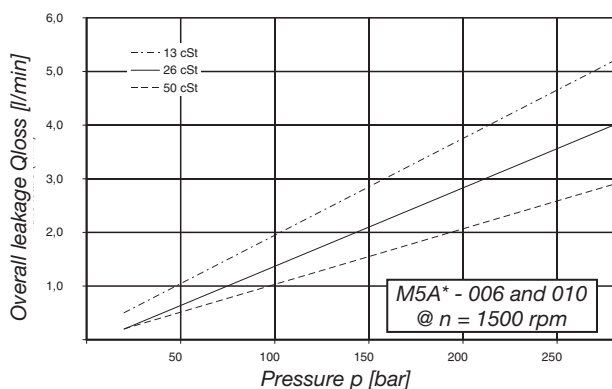
M5B - M5BS - M5BF
 045



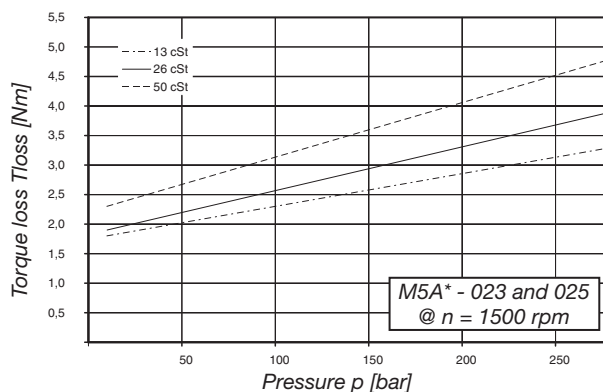
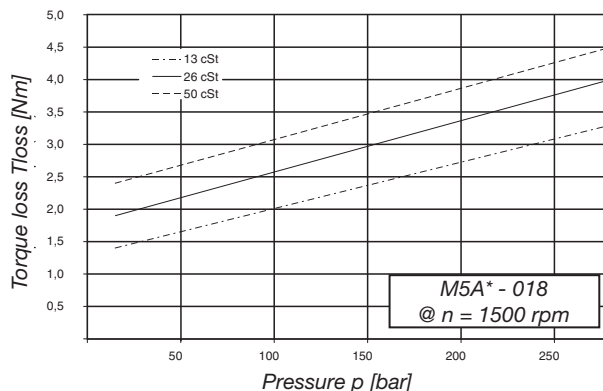
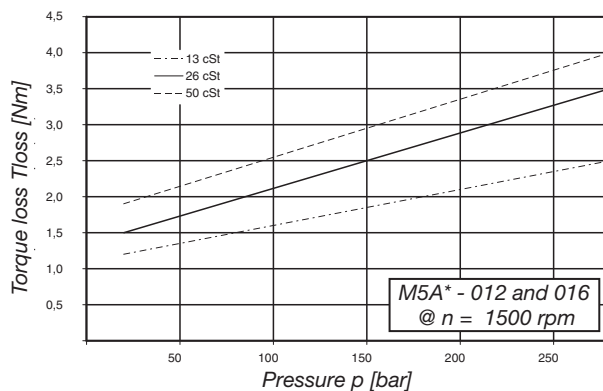
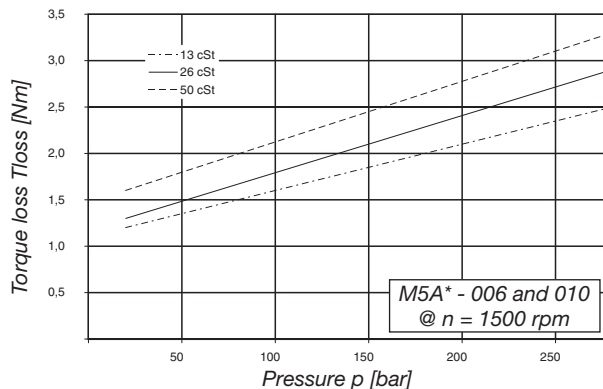
- Running condition limits - Typical curves at 26 cSt @ 45° - For starting performances see page 19.
- Intermittent conditions : do not exceed 6 seconds per minute of rotation.
- For higher specifications or for operating speed under < 100 rpm, please consult Parker.

M5A - M5AS - M5ASF - M5AF motors without reverse valve option

Overall Leakage (internal + external)

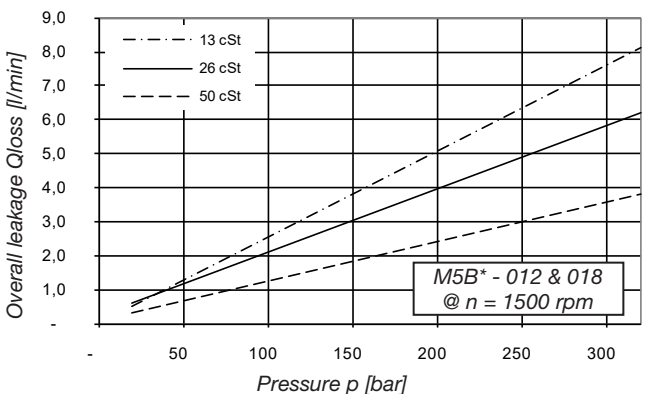


Torque Loss

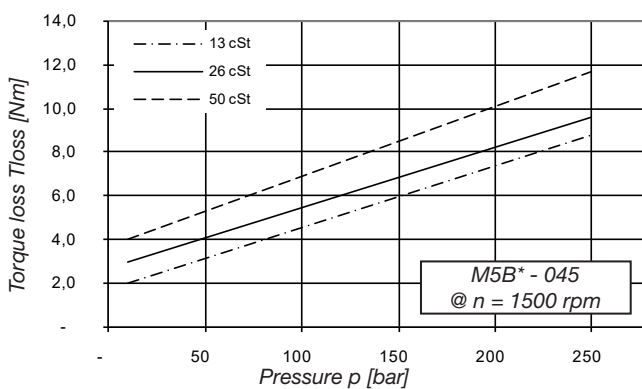
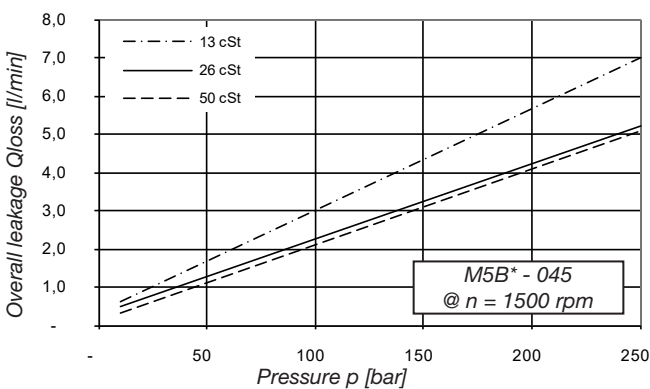
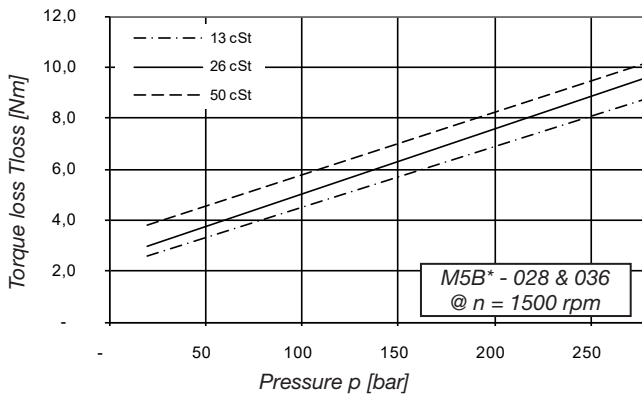
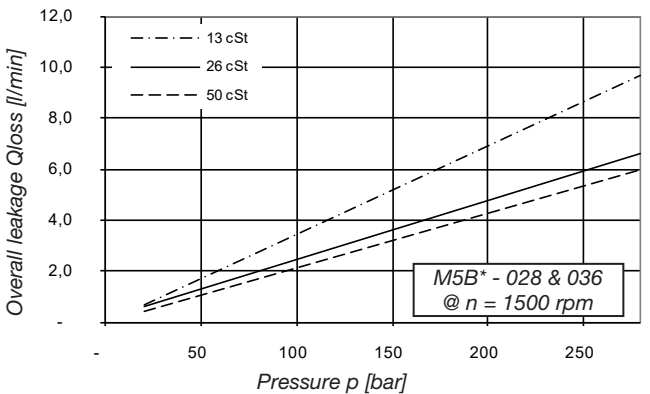
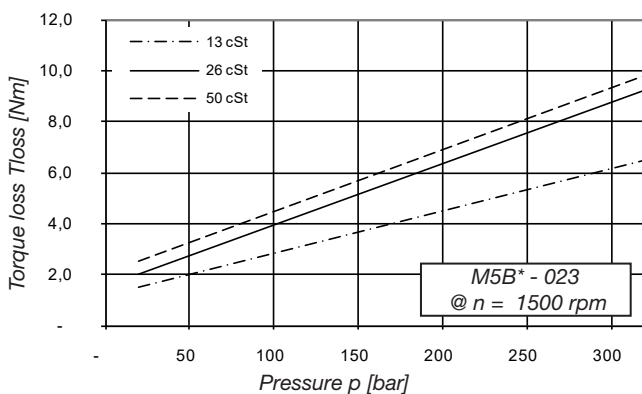
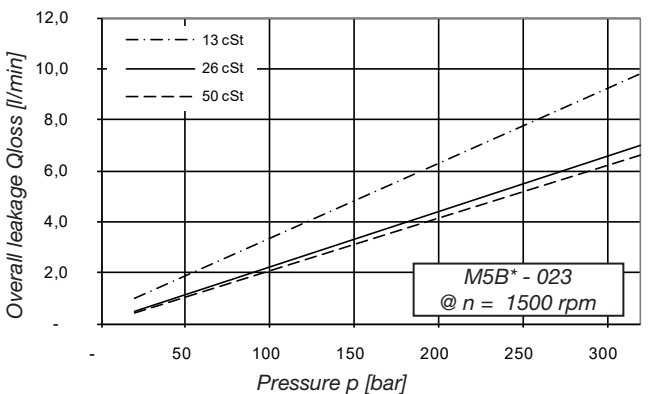
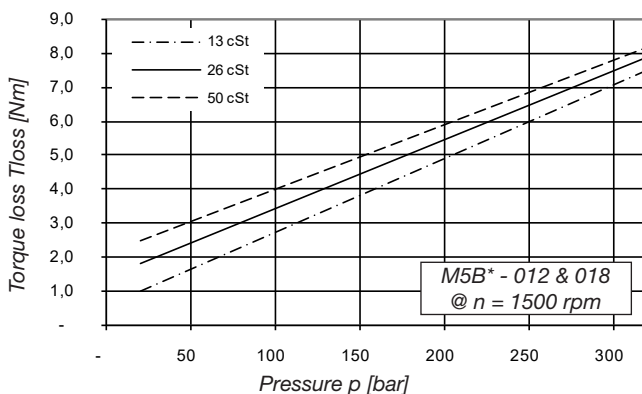


M5B - M5BS - M5BF motors without reverse valve option

Overall Leakage (internal + external)



Torque Loss



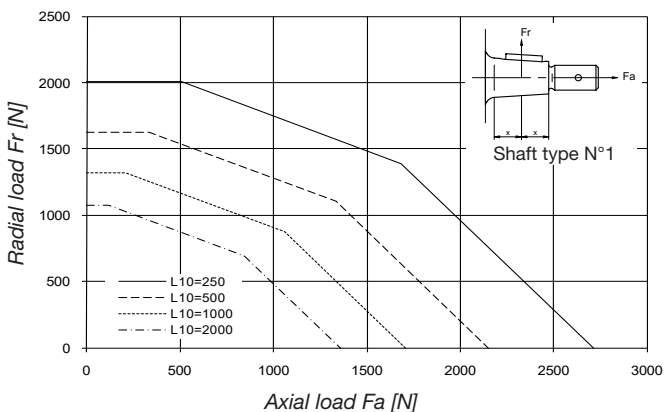
Starting performances

Min starting torque efficiency	100 bar	200 bar	280 bar	300 bar	320 bar
M5A - M5AS - M5ASF	83 %	88 %	90 %	NA	NA
M5AF	83 %	88 %	90 %	90 %	NA
M5B - M5BS - M5BF	79 %	81 %	81 %	81 %	81 %

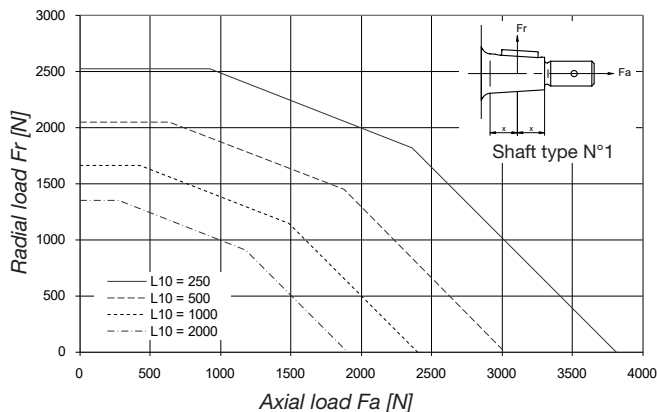
Max. cross-flow at start	100 bar	200 bar	280 bar	300 bar	320 bar
M5A - M5AS - M5ASF	0,6 lpm	7,4 lpm	8,9 lpm	NA	NA
M5AF	0,6 lpm	7,4 lpm	8,9 lpm	10,7 lpm	NA
M5B - M5BS - M5BF	1,8 lpm	7,8 lpm	11,1 lpm	11,9 lpm	12,5 lpm

Permissible shaft loads

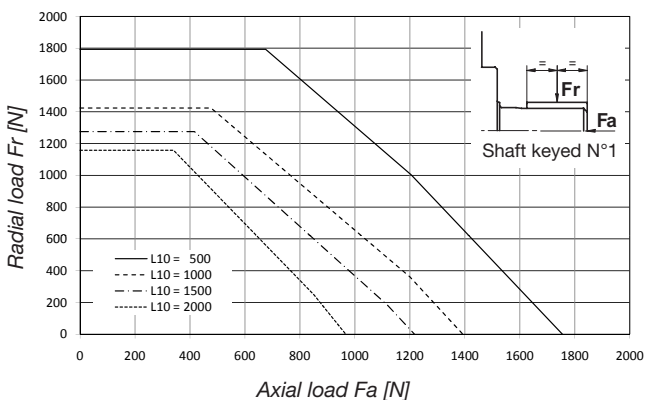
M5A - M5AS - M5ASF



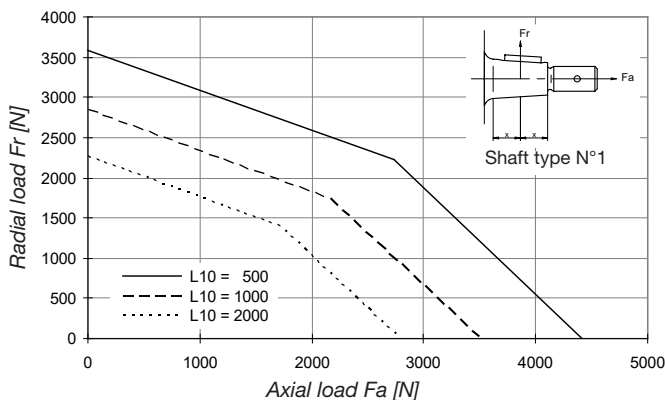
M5AF



M5BS



M5BF



Torsional stiffness (Nm/rad)							
Shaft type	1	2	3	4	5	6	W
M5A - M5AS - M5ASF	3251	4191	-	-	3184	3995	-
M5AF	3497	4530	-	-	-	-	-
M5B - M5BS	6254	6822	6080	6708	-	-	-
M5BF	4965	7489	-	-	-	-	7400

Technical Data

**Hydraulic Motors, Fixed
M5, Denison Vane Motors**

Lifetime

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

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

Example of theoretical lifetime calculation for M5ASF motor :

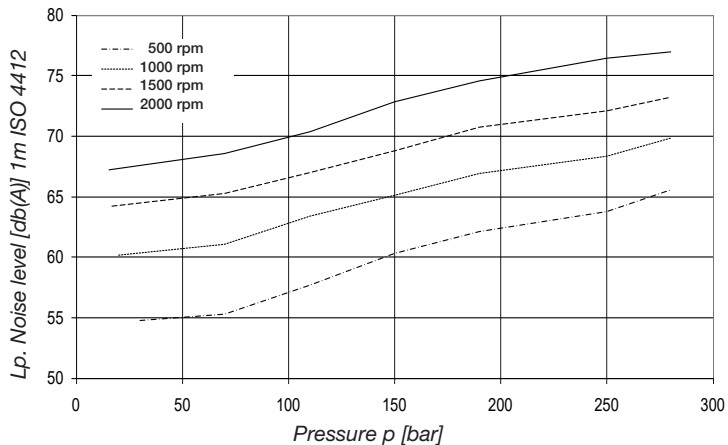
Axial load $F_a = 1000$ N
 Radial load $F_r = 500$ N
 Motor speed $N = 1500$ rpm

$L_{10} = 2000$ [10^6 rev] (See corresponding curve)

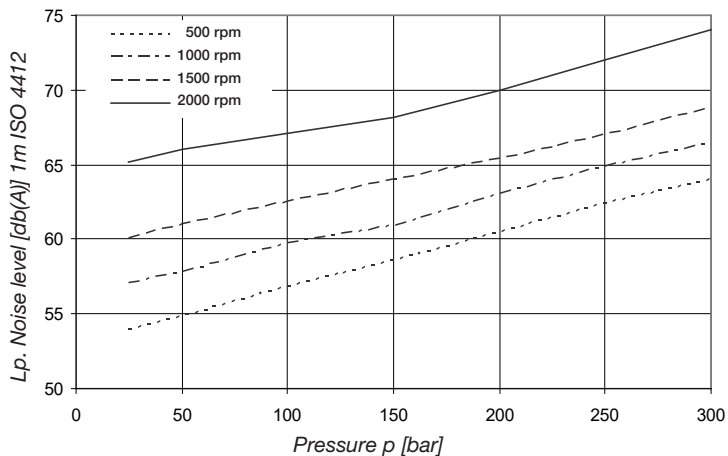
$$L_{10H} = \frac{16\,666}{1500} \times 2000 \quad L_{10H} = 22\,221 \text{ hours.}$$

Noise levels

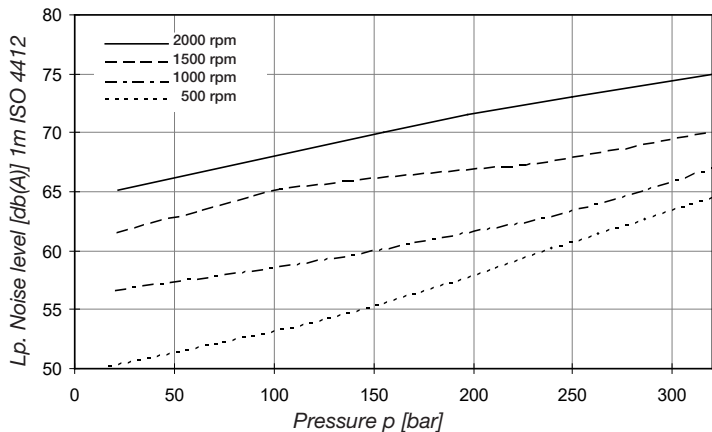
M5A - M5AS - M5ASF
025



M5AF
025

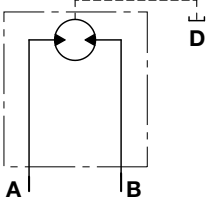
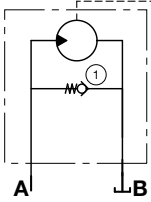
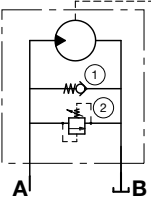
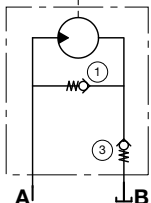
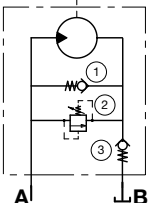
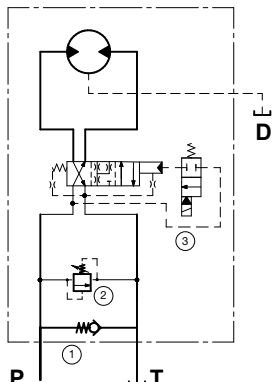
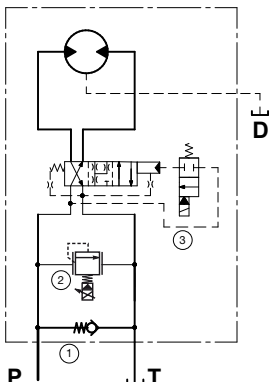


M5B - M5BS - M5BF
036



Circuit Design

Graphical symbols

Motor Type	Symbol	Rotation way	
		R	L
M5 all types	Bi-rotational (N) motor 		
		A = Inlet B = Outlet	A = Outlet B = Inlet
M5 all types	Uni-rotational (R or L) motor without reverse valve option with pressure relief valve  with prop. pressure relief valve 		
		A = Inlet B = Outlet	A = Inlet B = Outlet
M5AF M5B M5BS M5BF	Uni-rotational (R or L) motor without reverse valve, with anti-starve valve option with pressure relief valve  with prop. pressure relief valve 		
		A = Inlet B = Outlet	A = Inlet B = Outlet
M5A M5AS M5ASF M5B M5BS M5BF	Motor with reverse valve option with mech. pressure relief valve  with prop. pressure relief valve 		
		P = Inlet T = Outlet	P = Inlet T = Outlet

Circuit Design

Motor selection example

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).

$$0,85 \times \frac{Q \times p}{600} \geq \frac{T \times \pi \times n}{30 \times 1000}$$

$$10,6 > 8,7 \text{ kW}$$

$$0,85 \times \frac{30 \times 250}{600} \geq \frac{55 \times \pi \times 1500}{30 \times 1000}$$

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 V_i immediately greater
M5AS* 016 : $V_i = 16,0 \text{ cm}^3/\text{rev}$

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 17)

Calculate real pressure

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

5a. Flow loss at this pressure : 3,5 l/min (See page 17)

Real flow used by the motor :

$$Q_{\text{eff.}} = 30 - 3,5 = 26,5 \text{ l/min}$$

6a. Real speed of the motor :

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

Real performances

$$V_i = 16,0 \text{ cm}^3/\text{rev}$$

$$n_{\text{eff.}} = 1656 \text{ rpm}$$

$$T = 55 \text{ Nm.}$$

$$\Delta p_{\text{eff.}} = 228 \text{ bar}$$

2b.

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

3b. Choose motor from V_i immediately smaller
M5AS* 018 : $V_i = 18,0 \text{ cm}^3/\text{rev}$

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 17)

Calculate real pressure

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

5b. Flow loss at this pressure : 4 l/min (See page 17)

Real flow used by the motor :

$$Q_{\text{eff.}} = 30 - 4 = 26,0 \text{ l/min}$$

6b. Real speed of the motor :

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

Real performances

$$V_i = 18,0 \text{ cm}^3/\text{rev}$$

$$n_{\text{eff.}} = 1444 \text{ rpm}$$

$$T = 55 \text{ Nm.}$$

$$\Delta p_{\text{eff.}} = 204 \text{ bar}$$

Fluid power formulas

Volumetric efficiency	$1 - \frac{\text{total leakage} \times 1000}{\text{speed} \times \text{displacement}}$	Speed [rpm]
Mechanical efficiency	$1 - \frac{\text{torque loss} \times 20 \times \pi}{\Delta \text{ pressure} \times \text{displacement}}$	Displacement [cm ³ /rev]
Fluid motor speed	$\frac{1000 \times \text{flow rate} \times \text{volumetric eff.}}{\text{displacement}}$	Pressure [bar]
Fluid motor torque	$\frac{\Delta \text{ pressure} \times \text{displacement} \times \text{mech. eff.}}{20 \times \pi}$	Flow rate [l/min]
Fluid motor power	$\frac{\text{speed} \times \text{displacement} \times \Delta \text{ pressure} \times \text{overall eff.}}{600\,000}$	Leakage [l/min]
	or	Torque [Nm]
		Torque loss [Nm]
		Power [kW]
		$\frac{\text{torque} \times \text{speed} \times 20 \times \pi}{600\,000}$



Hydraulic fluids

Recommended fluids

Petroleum base anti-wear, anti-rust and anti-oxidation 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

HF-1, HF-4, HF-5 : The max. continuous pressure is limited to 210 bar

HF-4, HF-5 : The max. speed is limited to 1800 RPM

Fluids viscosity

The minimum Viscosity Index is 90. The kinematic viscosity range is as below. Over or under these values, please contact Parker.

Max. (cold start, low speed & pressure) 2000 cSt

Min. (full speed & pressure for HF-1, HF-4 & HF-5 fluids) 18 cSt

Max. (full speed & pressure) 108 cSt

Min. (full speed & pressure for HF-0 & HF-2 fluids) 10 cSt

Optimum (max. lifetime) 30 cSt

Fluids temperatures

The usual limiting factor of temperature (low or high) comes from the obtained viscosity. The seals are sometimes the limit.

Maximum fluid temperature (also depends on min. viscosity).

Minimum fluid temperature (also depends on max. viscosity).

	° C	° F
HF-0, HF-1, HF-2	+ 100	(+ 212)

	° C	° F
HF-0, HF-1, HF-2, HF-5	- 18	(- 0.4)

HF-4	+ 50	(+ 122)
------	------	---------

HF-4	+ 10	(+ 50)
------	------	--------

HF-5	+ 70	(+ 158)
------	------	---------

Filtration requirements

The fluid must be cleaned before and during operation to maintain a contamination level of ISO 18/16/13 (NAS 1638 class 7) for motors with proportional pressure valve and ISO 19/17/14 (NAS 1638 class 8) or better for others. Filters must be installed accordingly.

Water contamination in fluid

The maximum acceptable content of water shall be limited to 0,10 % for mineral base fluids, and 0,05 % for synthetic fluids, crankcase oils, and biodegradable fluids. The eventual excess of water must be drained off the circuit.

Types of seals

Seals type 1 (S1) : Use this seal type for applications with mineral oil and fluid temperature less than + 90° C (+ 194° F).

S1 seals temperature range : - 40°C to + 107° C (- 40° F to + 225° F).

Seals type 5 (S5) : Use this seal type with some fire resistant fluids and/or fluid temperature higher than + 90° C (+194° F).

S5 seal temperature range : - 29° C to + 204°C (- 20° F to + 400°F).

Motor installation

The M5 Motor may be installed in any position providing that its drain line is correctly laid and that the loads on the shaft are clearly identified and acceptable. M5 Motors fitted with valves will require some light back pressure.

The M5A, M5AS, M5ASF, M5AF, M5BF motors are equipped with high load capacity double ball bearings, this allows a direct mounting on shaft (like a fan or a belt for example).

The M5B, M5BS motors are designed primarily for coaxial drives which do not impose axial or radial loads on the motor shaft.

The M5 externally drained motors must have a drain line connected to their housing drain port. It must be of a sufficient size to prevent back pressure in excess of 3,5 bar (50 PSI), and return directly to the reservoir below the minimum fluid level, as far away as possible from the suction pipe of the pump.

It is preferable to install the housing with its drain port upward to facilitate the purge of the motor. If the motor is mounted vertically with the shaft pointing up, then the drain line must have a bend above the motor to purge it fully and to be sure that the shaft seal is well lubricated.



Circuit Design

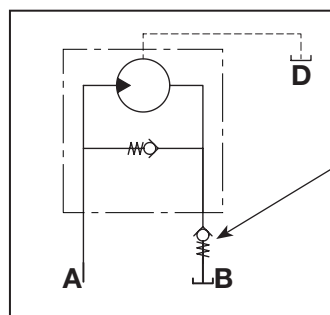
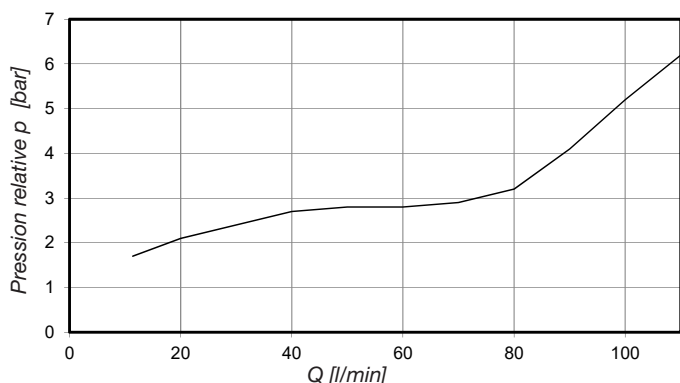
Minimum replenishment pressure during deceleration

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 M5 Motors are fitted with an internal anti-cavitation valve.

An anti-starve check (loading) 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).

Necessary pressure at B port of a M5 uni-rotational motor during deceleration



External anti-starve (loading) valve to be installed directly at motor outlet port.

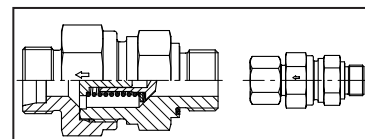
For an optimum flow recirculation, use loading valves that can be directly threaded in the return port of the motor. Parker can offer these check valves with various cracking pressures, threads, sealing and connection standards.

RHV-R-ED valves for BSPP threaded ports. See Parker Tube Fitting Catalogue 4100- UK

RHV-M-ED valves for Metric threaded ports. See Parker Tube Fitting Catalogue 4100- UK

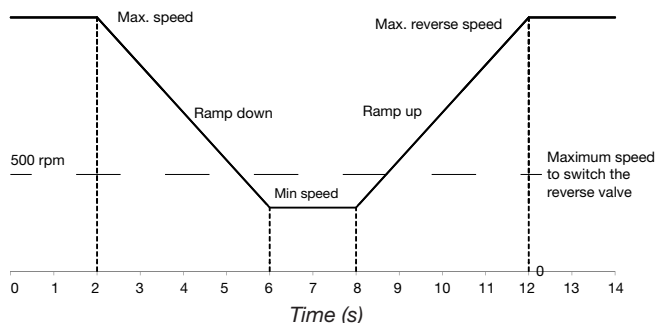
DT- MOMF valves for SAE threaded ports. See Parker Quick Coupling Catalog 3800

RHV-R-ED



Reverse cycles for fan drives

The rotation way R or L of motors with reverse option is denoting the normal cooling function for which the solenoid of the directional control valve is not energised. To reverse the rotation way from cooling to cleaning, the solenoid of the directional control valve has to be energised.



The motor must be decelerated from its (max.) rotation speed to less than 500 rpm in no less than 4 seconds time before energizing the solenoid of the reverse valve.

In the same way the motor must be ramped up to its (max.) reverse rotation speed in no less than 4 seconds time.

There should be no signs of cavitation during the reverse cycle (abnormal noise or lack of replenishment pressure).

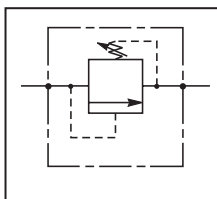
Connection of several motors in the same circuit

For application requiring several M5 motors to be driven simultaneously, we recommend to connect these in parallel circuits.

The use of several M5 motors connected in series is not recommended. Depending on the different inertia of the loads, the displacements and torque requirements, the motors may be subjected to pressure instability and noise. Also hydraulic pressure valves will not admit high levels of back pressure, restricting this use to motors without pressure valves. Please consult Parker.

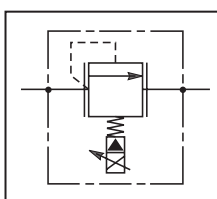
Electrohydraulic valves

Mechanical pressure valve

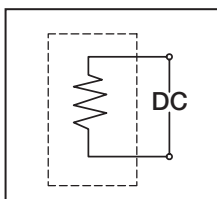


Parker RAH101S, pilot operated spool-type design with hexa screw adjustment.
 For pressure adjustment < 210 bar Parker RAH101S30
 For pressure adjustment > 210 bar Parker RAH101S50
 For more information see Parker Catalog HY 15-3502/US

Proportional pressure valve



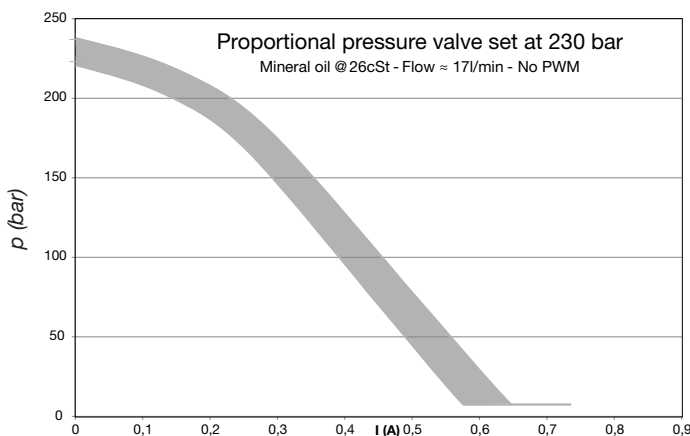
Parker AP04G2YR serie, pilot operated spool-type design. Decreasing pressure with increasing current, this normally closed pressure relief valve defaults to its mechanically adjusted pressure setting value when no current is applied to its coil.
 IP69K Integral TE Deutsch coil : 24VDC / 19W / 0,79 A / 30,3 Ohms.
 (IP67 AMPJr coil available as special feature, consult Parker).



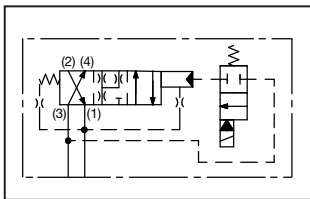
Coil type	CCP024H
Nominal wattage	19 W
Duty cycle	Continuous @ 100 % voltage
Magnetic wire insulation class	'N' Rated at 200° C
Temperature range	- 40° C to + 200° C
Temperature rise at nominal voltage and natural ventilation	P 95° C

Recommended PWM
 Frequency : 250 Hz min.

Hysteresis @ 250 Hz PWM
 ≤ 7% of max. pressure setting



Reverse valve



Parker 4 way, 2 position directional control valve. Pilot operated spool type valve.

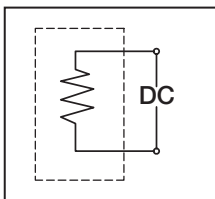
Additional flow data for motors with reverse valve option.

Motor in normal rotation way : Additional leakage = 0,5 lpm @ 210 bar with 26 cSt fluid.

Motor in reverse rotation way : Additional leakage = 3 lpm @ 210 bar with 26 cSt fluid.

IP69K Integral TE Deutsch coil : 24VDC / 14W / 0,58 A / 41,7 Ohms.

(IP67 AMPJr coil available as special feature, consult Parker).



Coil type	CCS024HSZN
Nominal wattage	14 W
Duty cycle	Continuous @ 100 % voltage
Magnetic wire insulation class	'N' Rated at 200° C
Temperature range	- 40° C to + 200° C
Temperature rise at nominal voltage and natural ventilation	S 75° C

Start-up instructions

All Parker hydraulic vane motors are individually factory tested to provide the best quality & reliability. They are to be used within the operation limits indicated in our documentation. Only qualified personnel who is competent and familiar with the installation and operation of hydraulic drives and has hydraulic circuits and hydraulic equipment knowledge is allowed to put the equipment into operation. Make sure to have all necessary documentation available and always conform yourself to the valid regulations (safety, electrical, environment...).

Pre-start checks

- Before the initial installation of the motor, please remove the protective covers or plugs from the connection ports and pour some clean and suitable hydraulic fluid in all ports.
- Before the initial starting of the motor, the following checks should be made :
 - a. Check the requested rotation way of the driven device and make sure that the hydraulic motor shaft will rotate accordingly.
 - b. Check entry, outlet and drain lines to be sure all connections are tight and properly connected.
 - c. Check the cleanliness of the piping, the hydraulic fluid type, its cleanliness and level. Make sure it can reach the motor entry port.
 - d. Check the correct fixture of the hydraulic motor mounting flange and of its driven device. Check their correct coupling.
 - e. For hydraulic motors with built-in solenoid valves, check the electrical wiring and the connections.

First start and air removing

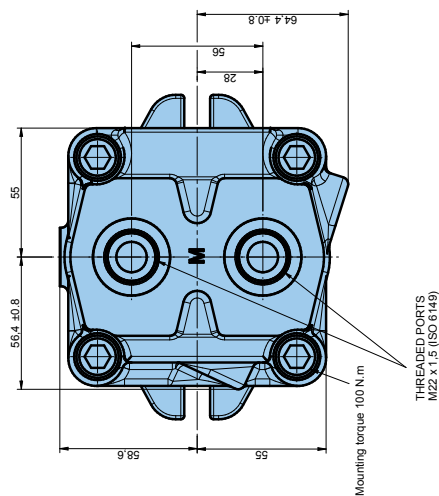
- The pressure relief valve of the circuit should be backed off to its minimum setting value to keep the hydraulic motor unloaded when first started. Circuit priming and air bleed off have to be performed before resetting the pressure relief valve.
- Start the hydraulic motor rotation in a jogging manner until a prime is picked up, and increase its speed from 500 to 1000 rpm. Check that there is no leakage or air suction neither at the ports (inlet, outlet, drain), nor at the shaft end.
- It is important to bleed the air off the circuit, and off the hydraulic motor itself. Purge the air off, preferably using air bleed off valves or pressure test points. Let the hydraulic motor rotate several minutes unloaded.
- Hydraulic motors equipped with a built-in proportional pressure relief valve have to purge the air off the pressure valve in the following way: energize and de-energize the coil 5 times from 0 Amp to max current. Check that the proportional pressure relief valve is properly air bled off by running the hydraulic motor at full speed. It should rotate without vibrations or pulses.

Notes

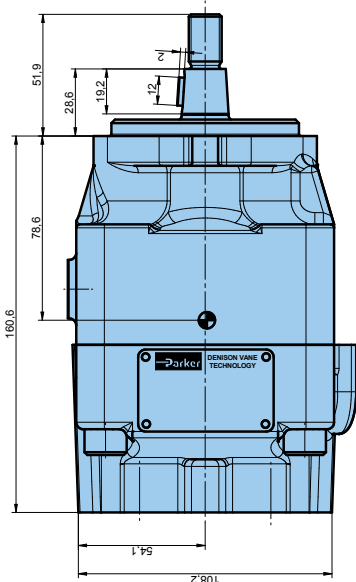
- In case of very cold temperature, the hydraulic motor should be kept at low pressure and low speed until the fluid warms up, before running it at high pressure or speed.
- If the motor does not work properly or pressure cannot be obtained within seconds, it should be shut down and conditions corrected. Refer to the machine/vehicle manufacturer instructions and motor catalogue.

M5A - M5AS motor with rear ports

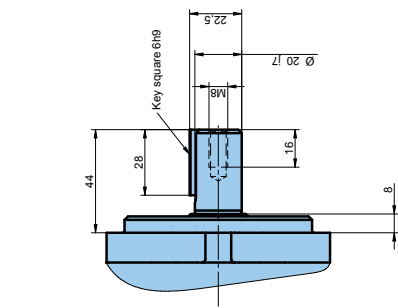
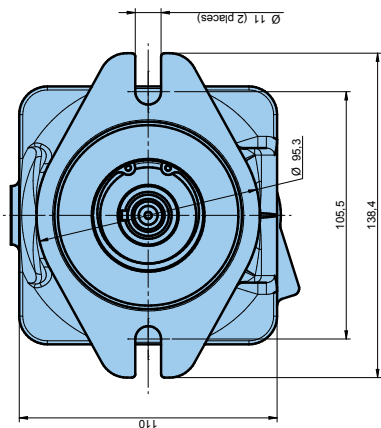
Weight : 11,0 kg



Mounting torque 100 N.m
THREADED PORTS
M22 x 1.5 (ISO 6149)

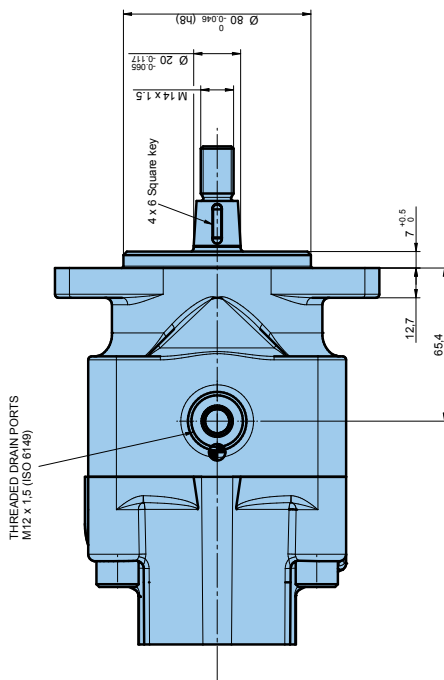


SHAFT code 5
KEYED TAPER 1:5



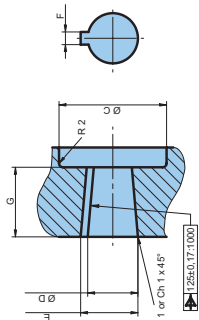
SHAFT code 6
ISO G20N KEYED

Centre of gravity (bi-rotational version)



THREADED DRAIN PORTS
M12 x 1.5 (ISO 6149)

Shaft	Code 5
Ø C	35,8/36,2
Ø D	19,8/20,0
E	22,3/22,43
F	4,03/4,08
G	21,9/22,1

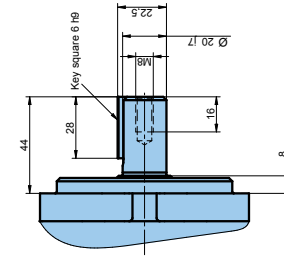
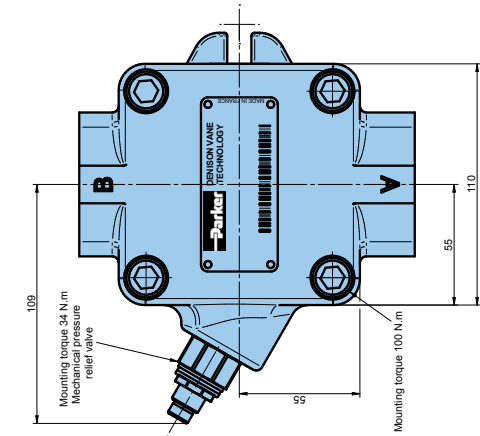


Torque of the steel nut : 80 Nm¹⁾

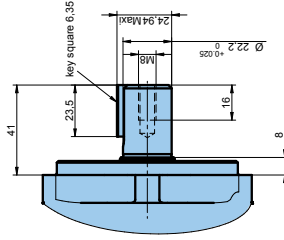
¹⁾ This torque is for a steel coupling and a nut of at least grade 8.8 quality. It is compulsory to install a castle nut and cotter pin for right-hand rotation and bi-rotational use.

M5A - M5AS motor with opposite ports

Weight : 11,2 kg

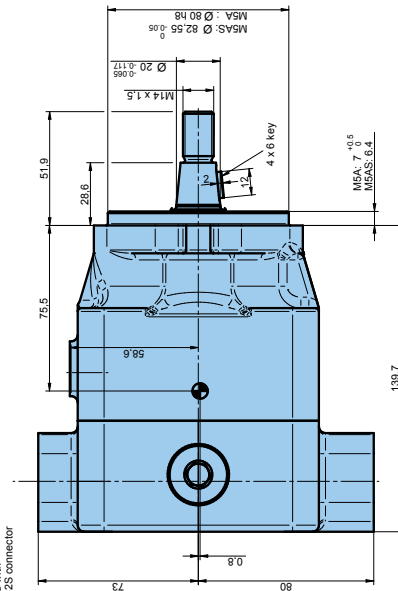


Shaft code 6
ISO G20N keyed

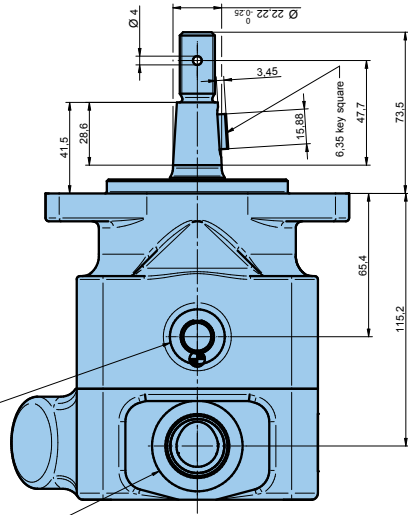


Shaft code 2
SAE B keyed

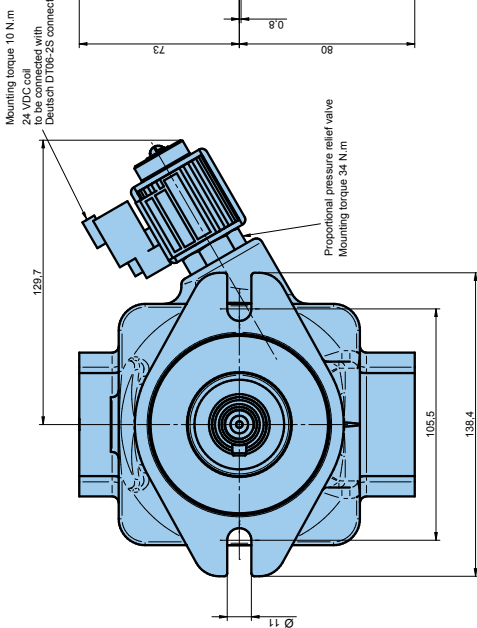
☉ Centre of gravity (bi-rotational version)



Shaft code 5
Keyed taper 1:5



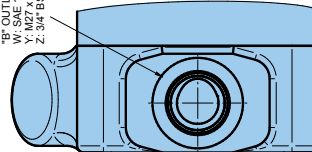
Shaft code 1
SAE B- J744 (Modified)
Taper 1:25 : 1000



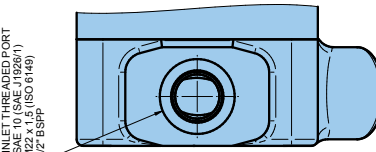
THREADED PORT
W: SAE 12 (SAE J1926/1)
Y: M22 x 1.5 (ISO 6149)
Z: 3/4" BSPP

UNI-ROTATIONAL VERSION

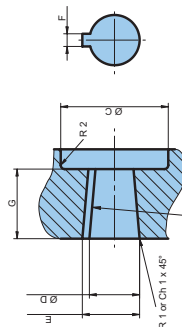
"A" INLET THREADED PORT
W: SAE 10 (SAE J1926/1)
Y: M22 x 1.5 (ISO 6149)
Z: 1/2" BSPP



"B" OUTLET THREADED PORT
W: SAE 12 (SAE J1926/1)
Y: M22 x 1.5 (ISO 6149)
Z: 3/4" BSPP



Shaft	Code 1	Code 5
Ø C	54.0	35.8/36.2
Ø D	22,09/22,22	19.8/20.0
E	25.64/25.77	22.3/22.43
F	6.31/6.36	4.03/4.08
G	31,6/32,0	21,9/22,1

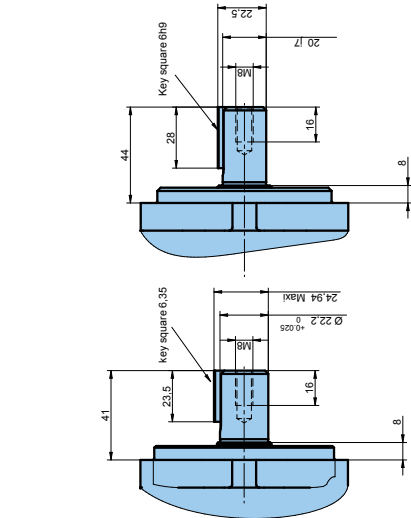
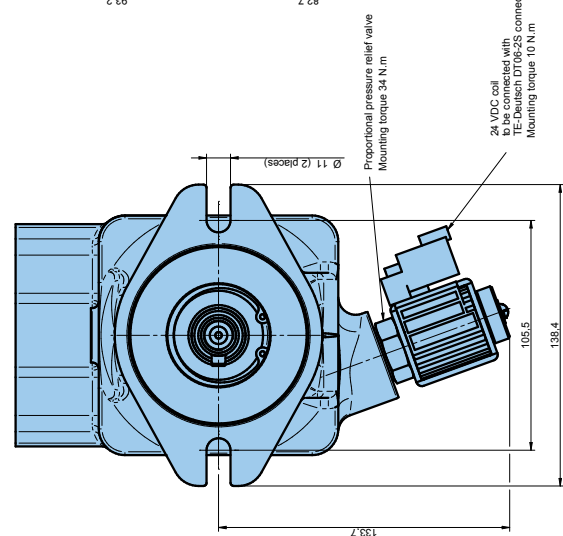
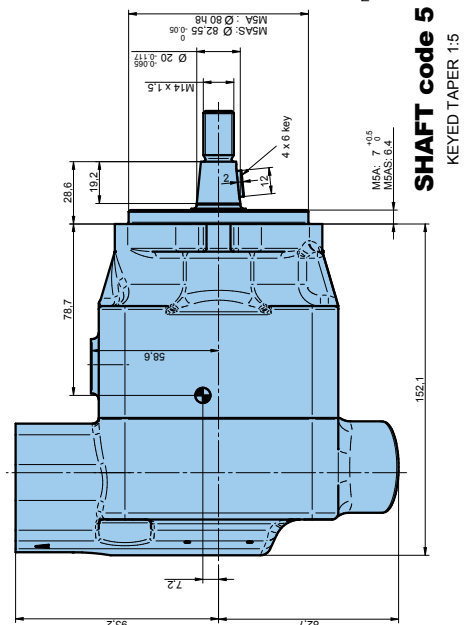
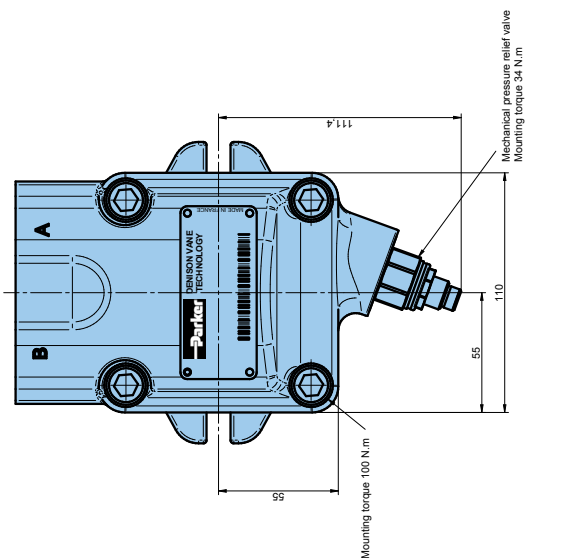


Torque of the nut : 80 Nm ¹⁾

¹⁾ This torque is for a steel coupling and a nut of at least grade 8.8 quality. It is compulsory to install a castle nut and cotter pin for right-hand rotation and bi-rotational use.

M5A - M5AS motor with side ports

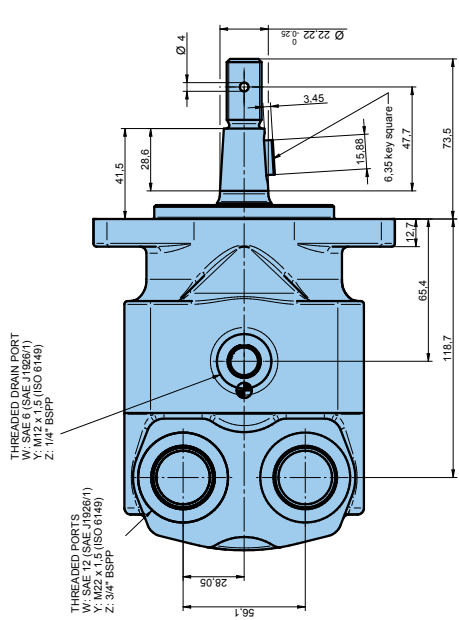
Weight : 12,2 kg



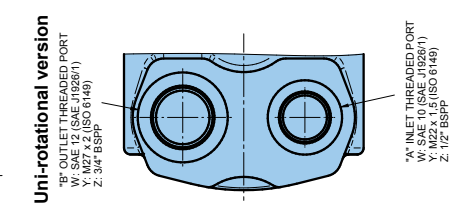
SHAFT code 2
 SAE B KEYED

SHAFT code 6
 ISO G20N KEYED

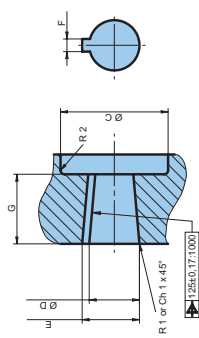
☉ Centre of gravity (bi-rotational version)



SHAFT code 1
 SAE B-1744
 (Modified)
 TAPER 125 : 1000



Shaft	Code 1	Code 5
Ø C	54,0	35,8/36,2
Ø D	22,09/22,22	19,8/20,0
E	25,64/25,77	22,3/22,43
F	6,31/6,36	4,03/4,08
G	31,6/32,0	21,9/22,1

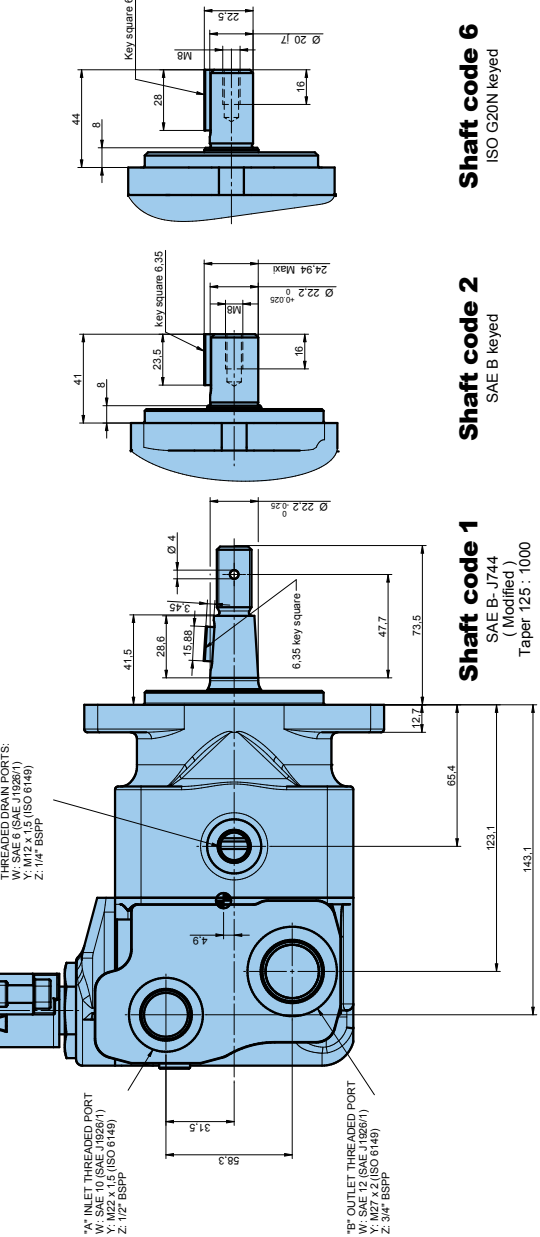
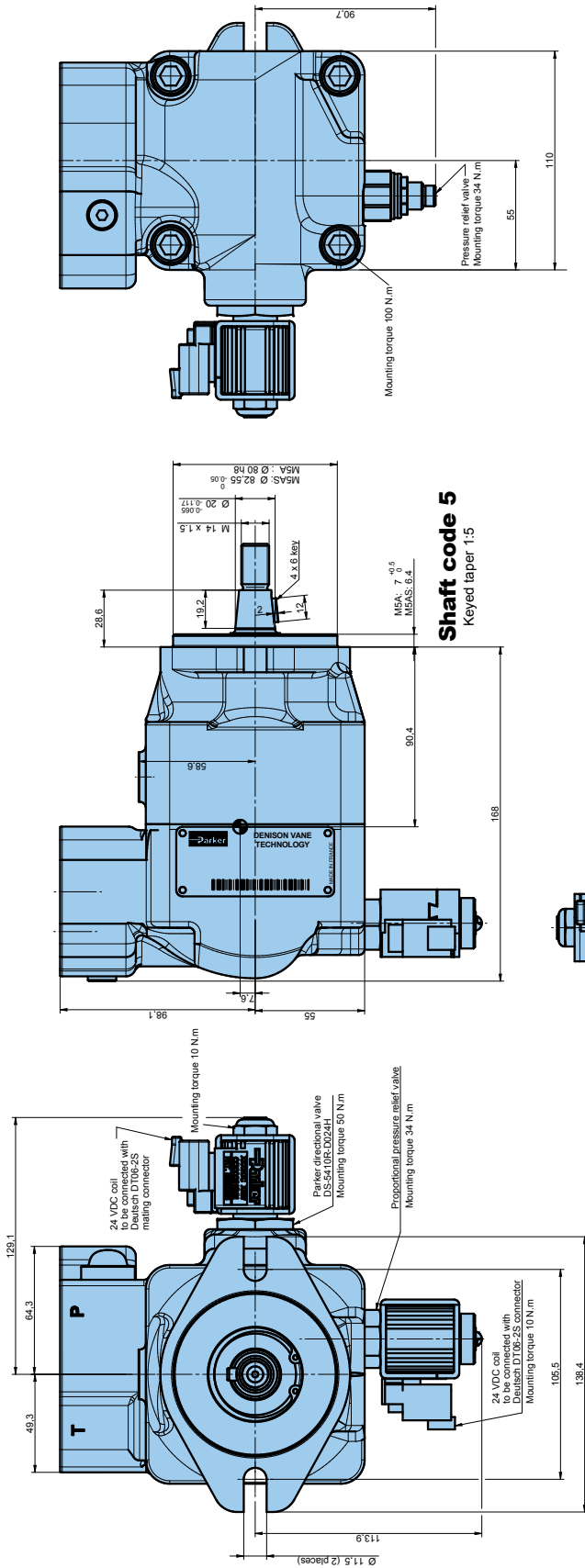


Torque of the steel nut : 80 Nm ¹⁾

¹⁾ This torque is for a steel coupling and a nut of at least grade 8.8 quality. It is compulsory to install a castle nut and cotter pin for right-hand rotation and bi-rotational use.

M5A - M5AS motor with reverse valve option

Weight : 13,9 kg



Shaft code 5
 Keyed taper 1:5

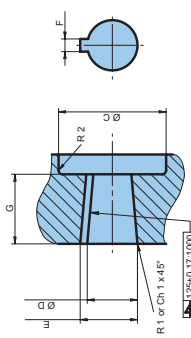
Shaft code 1
 SAE B- J744
 (Modified)
 Taper 125 : 1000

Shaft code 2
 SAE B keyed

Shaft code 6
 ISO G20N keyed

Centre of gravity (bi-rotational version)

Shaft	Code 1	Code 5
Ø C	54,0	35,8/36,2
Ø D	22,09/22,22	19,8/20,0
E	25,64/25,77	22,3/22,43
F	6,31/6,36	4,03/4,08
G	31,6/32,0	21,9/22,1

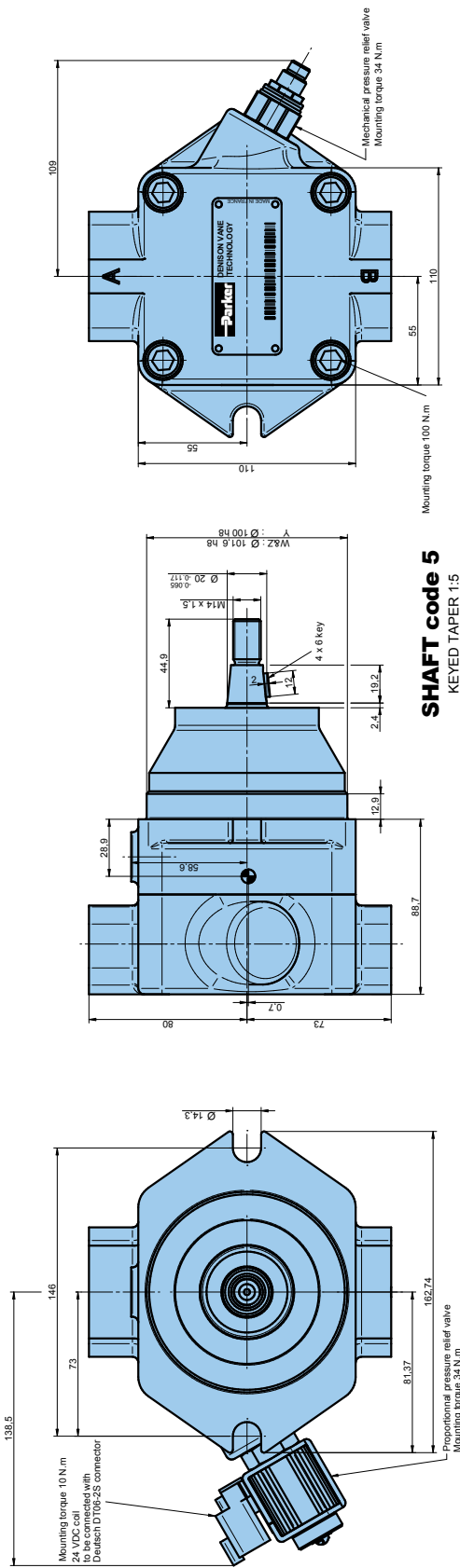


Torque of the steel nut : 80 Nm ¹⁾

¹⁾ This torque is for a steel coupling and a nut of at least grade 8.8 quality. It is compulsory to install a castle nut and cotter pin for right-hand rotation and bi-rotational use.

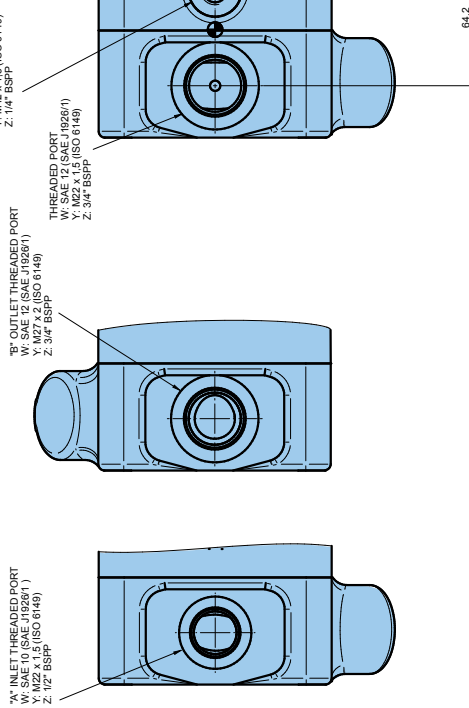
M5ASF motor with opposite ports

Weight : 10,5 kg



SHAFT code 5
 KEYED TAPER 1:5

UNI-ROTATIONAL VERSION



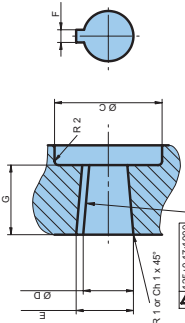
SHAFT code 6
 ISO G20N KEYED

SHAFT code 2
 SAE B KEYED

SHAFT code 1
 SAE B - J744
 (Modified)
 TAPER 125 : 1000

● Centre of gravity (bi-rotational version)

Shaft	Code 1	Code 5
Ø C	54,0	35,8/36,2
Ø D	22,09/22,22	19,8/20,0
E	25,64/25,77	22,3/22,43
F	6,31/6,36	4,03/4,08
G	31,6/32,0	21,9/22,1

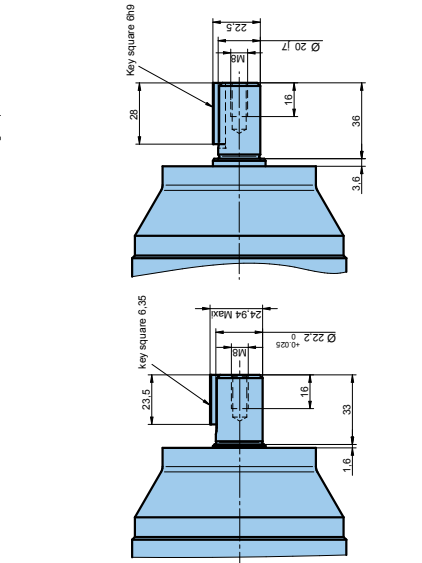
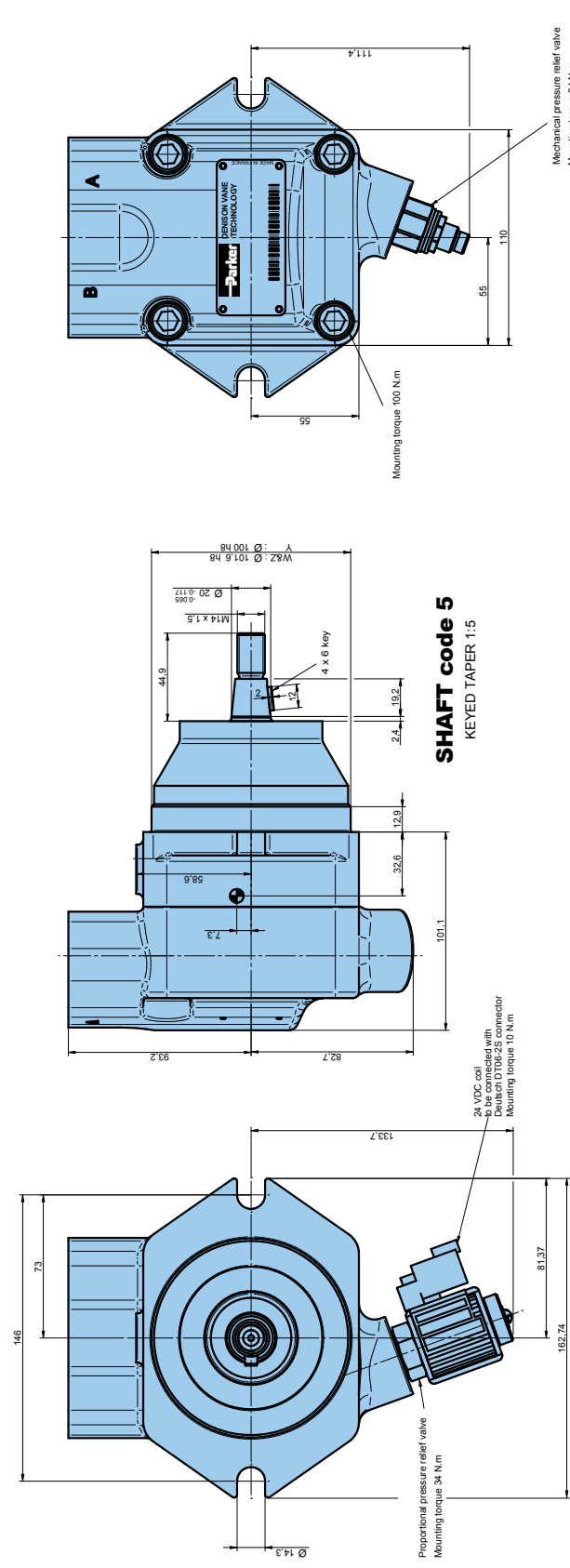


Torque of the nut : 80 Nm ¹⁾

¹⁾ This torque is for a steel coupling and a nut of at least grade 8.8 quality. It is compulsory to install a castle nut and cotter pin for right-hand rotation and bi-rotational use.

M5ASF motor with side ports

Weight : 11,5 kg

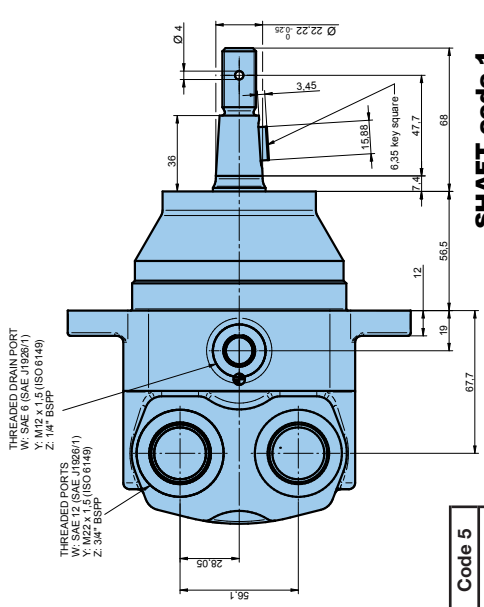


SHAFT code 1
SAE B-J744
(Modified)
TAPER 125 : 1000

SHAFT code 2
SAE B KEYED

SHAFT code 5
KEYED TAPER 1:5

ISO G20N KEYED
(bi-rotational version)



Uni-rotational version

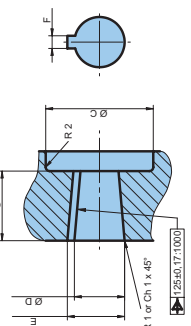
"A" INLET THREADED PORT
W: SAE 12 (SAE J1926/1)
Y: M22 x 1,5 (ISO 6148)
Z: 1/2" BSPP

"B" OUTLET THREADED PORT
W: SAE 12 (SAE J1926/1)
Y: M22 x 1,5 (ISO 6148)
Z: 3/4" BSPP

THREADED DRAIN PORT
W: SAE 6 (SAE J1926/1)
Y: M12 x 1,5 (ISO 6148)
Z: 1/4" BSPP

THREADED PORTS
W: SAE 12 (SAE J1926/1)
Y: M22 x 1,5 (ISO 6148)
Z: 3/4" BSPP

Shaft	Code 1	Code 5
Ø C	54,0	35,8/36,2
Ø D	22,09/22,22	19,8/20,0
E	25,64/25,77	22,3/22,43
F	6,31/6,36	4,03/4,08
G	31,6/32,0	21,9/22,1

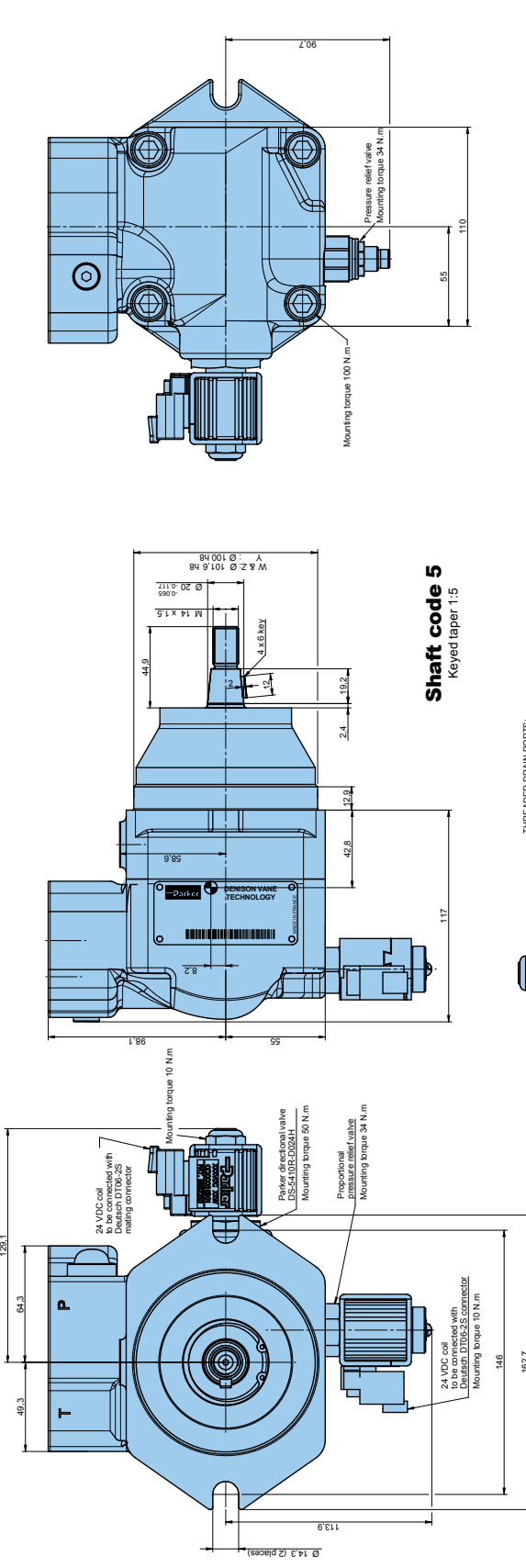


Torque of the nut : 80 Nm ¹⁾

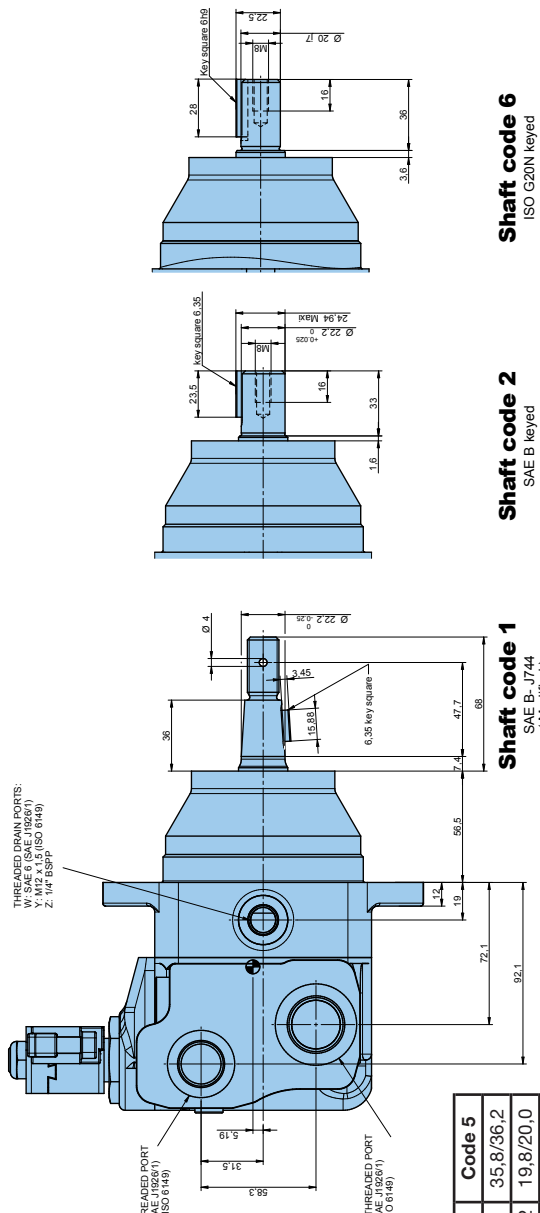
¹⁾ This torque is for a steel coupling and a nut of at least grade 8.8 quality. It is compulsory to install a castle nut and cotter pin for right-hand rotation and bi-rotational use.

M5ASF motor with reverse valve option

Weight : 13,2 kg



Shaft code 5
Keyed taper 1.5

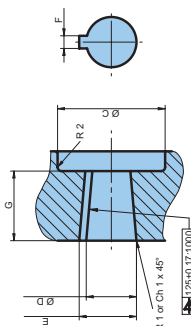


Shaft code 6
ISO G20N keyed

Shaft code 2
SAE B keyed

Centre of gravity (bi-rotational version)

Shaft	Code 1	Code 5
Ø C	54,0	35,8/36,2
Ø D	22,09/22,22	19,8/20,0
E	25,64/25,77	22,3/22,43
F	6,31/6,36	4,03/4,08
G	31,6/32,0	21,9/22,1



Torque of the nut : 80 Nm ¹⁾

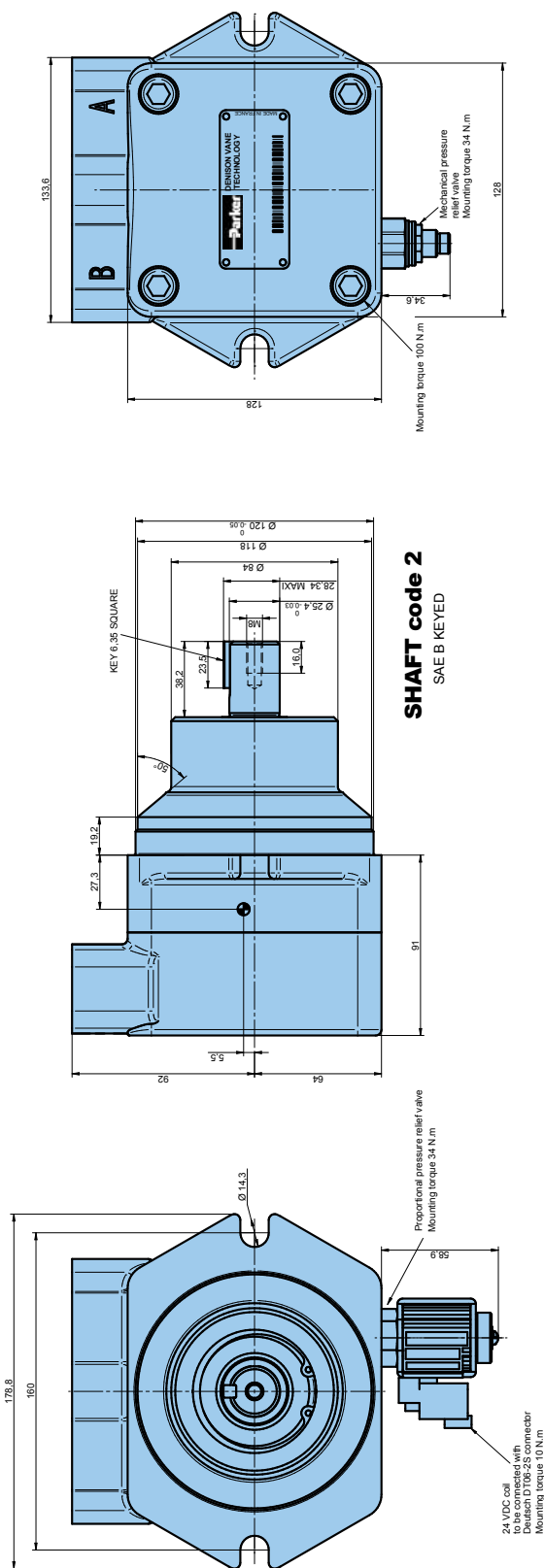
¹⁾ This torque is for a steel coupling and a nut of at least grade 8.8 quality. It is compulsory to install a castle nut and cotter pin for right-hand rotation and bi-rotational use.

Dimensions

Hydraulic Motors, Fixed M5, Denison Vane Motors

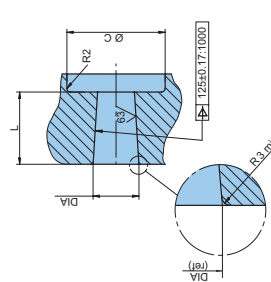
M5AF motor

Weight : 15,0 kg



Centre of gravity (bi-rotational version)

Shaft	Code 1
Ø C	25,27/25,40
Dia	53,5/54,5
L	39,6/40,0

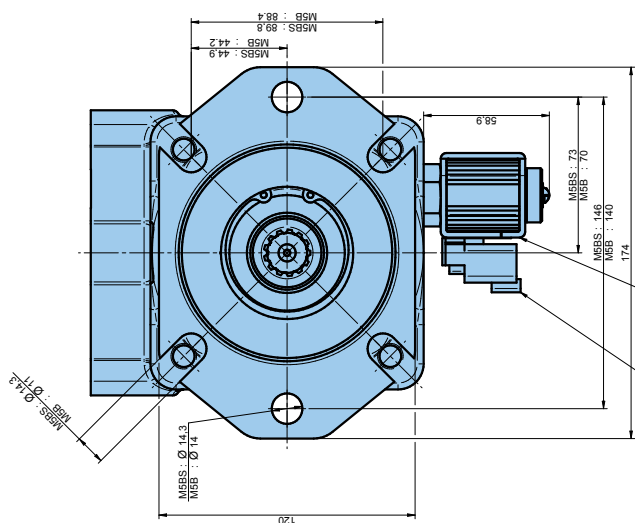
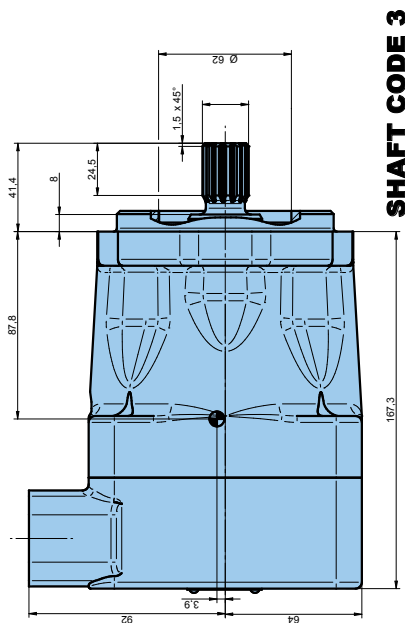
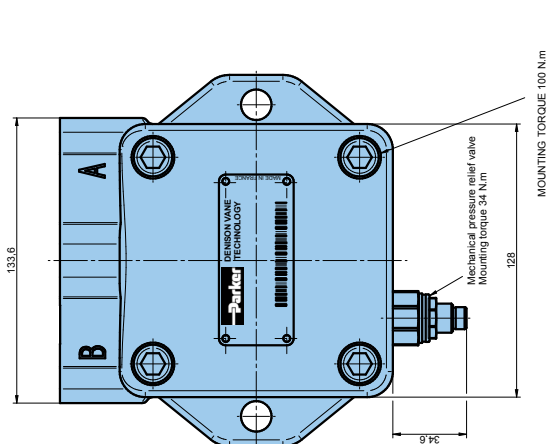


Torque of the steel nut : 80 Nm ¹⁾
¹⁾ This torque is for a steel coupling and a nut of at least grade 8.8 quality.
It is compulsory to install a castle nut and cotter pin for right-hand rotation and bi-rotational use.



M5B - M5BS motor

Weight : 18,5 kg



SHAFT CODE 3

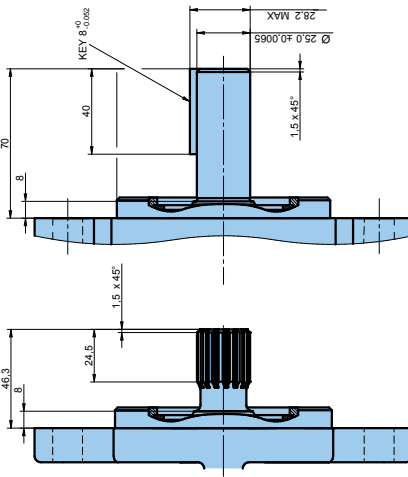
SAE B INVOLUTE SPLINE DATA
CLASS H-FILAT ROOT SIDE FIT
J4899 - PITCH 16/32
13 TEETH - 30° PRESSURE ANGLE

THREADED DRAIN PORT
MBS : Y & M : M18 x 1.5 (ISO 6149)
MBS : Y & M : SAE 1/8 (SAE 6149)
MBS : Y & M : M16 x 1.0 (ISO 6149)

0 : 3/8" 16 UNC 2B 19 DEEP 8 HOLES
M : M10 x 19 DEEP METRIC VERSION
Anti-strike valve option
(only for unidirectional version)

MBS : W : SAE 1/2 (SAE J19287)
MBS : Y : M27 x 2 (ISO 6149)

24 VDC coil
MBS : W : SAE 1/2 (SAE J19287)
MBS : Y : M27 x 2 (ISO 6149)

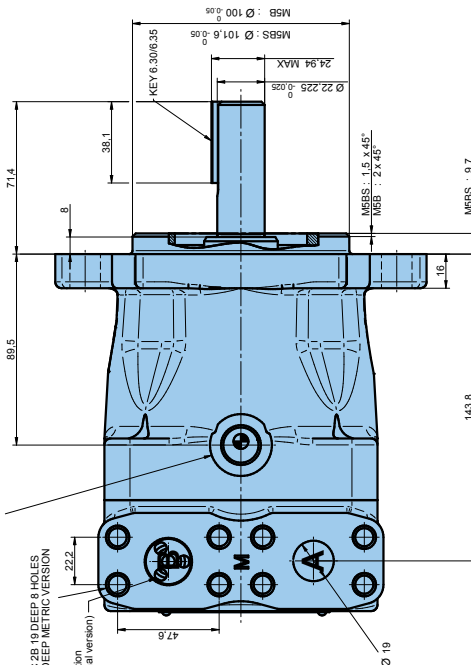


SHAFT CODE 2

KEYED ISO 3019/2 E2M

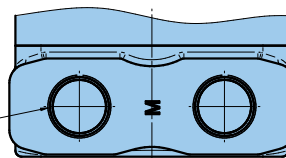
SHAFT CODE 4

SAE BB INVOLUTE SPLINE DATA
CLASS H-FILAT ROOT SIDE FIT
J4899 - PITCH 16/32
15 TEETH - 30° PRESSURE ANGLE



SHAFT CODE 1

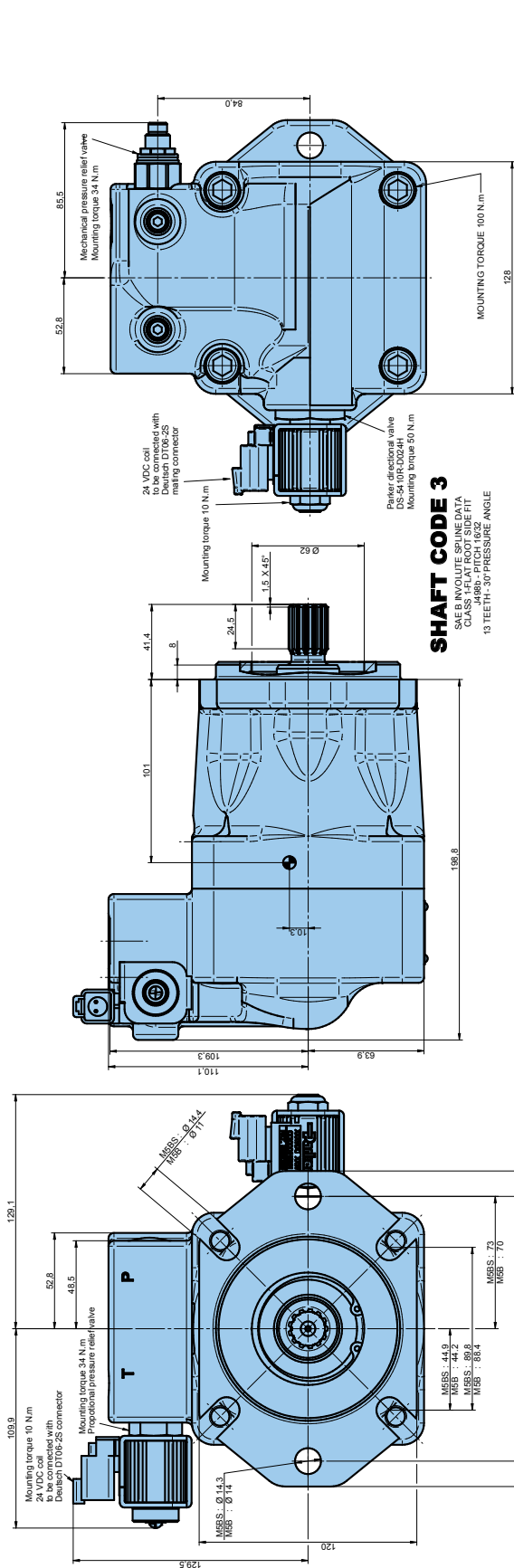
KEYED SAE-B



Centre of gravity (bi-rotational version)

M5B - M5BS motor with reverse valve option

Weight : 21,6 kg

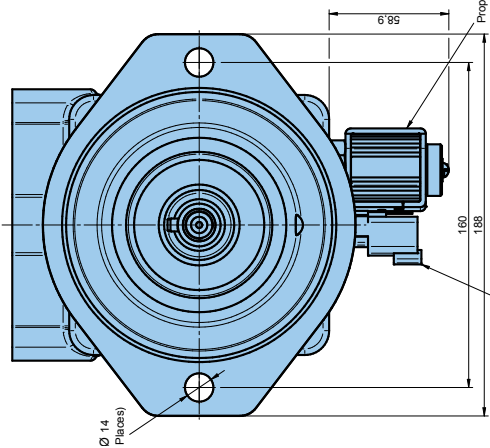
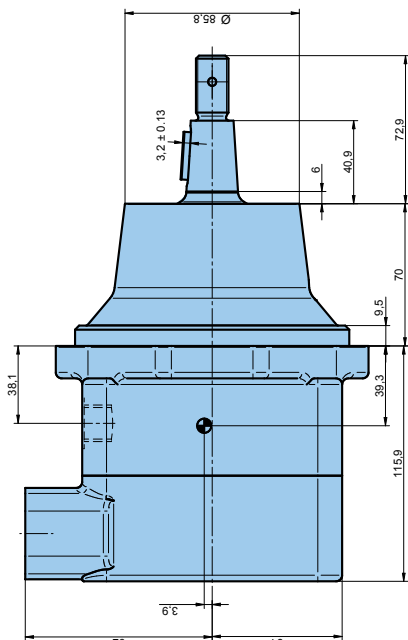
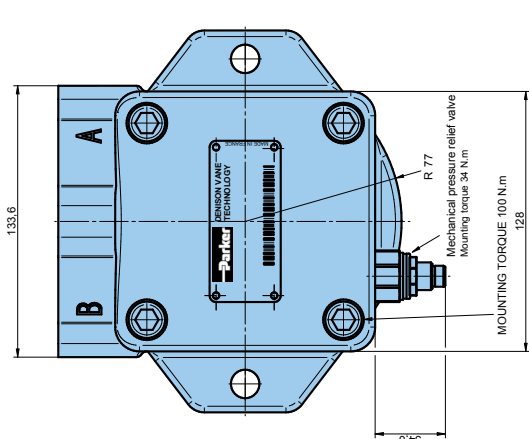


☉ Centre of gravity (bi-rotational version)



M5BF motor

Weight : 18,5 kg



SHAFT Code 1

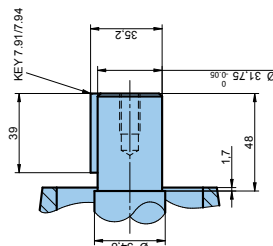
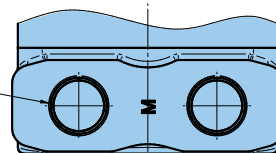
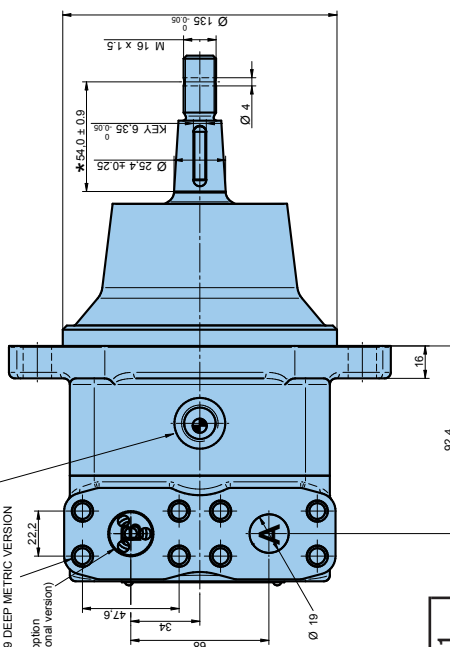
SAE "BB" - J 744
(MODIFIED *)
with M16 TAPER 125:1000

DRAIN PORT: 13.5 DEEP MAX
SPOT FACE Ø 28 DEEP 2 MAX
Y & M : M18 x 1.5 (ISO 6149)
W & O : SAE 6 (SAE J1926/1)

O : 3/8 16 UNC 28 19 DEEP 8 HOLES
M : M10 x 19 DEEP METRIC VERSION
Anti-stroke valve option
(Only for uni-rotational version)

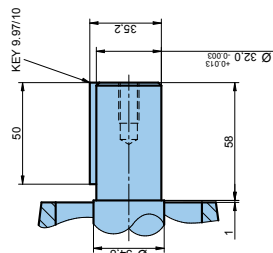
Y : M27 x 2 (ISO 6149)
W : SAE 12 (SAE J1926/1)

24 VDC coil
to be connected with
Deutsch DT06-2S connector
Mounting torque 10 N.m



SHAFT Code 2

SAE "C" - J744
WITH M10 - 20 DEEP

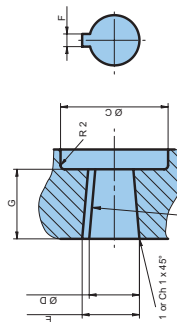


SHAFT Code W

ISO 3019/2 - G32N
WITH M10 - 20 DEEP

● Centre of gravity (bi-rotational version)

Shaft	Code 1
Ø C	52.5/53.5
Ø D	28,70/28,95
E	25,02/25,15
F	6,36/6,31
G	35,2/35,45

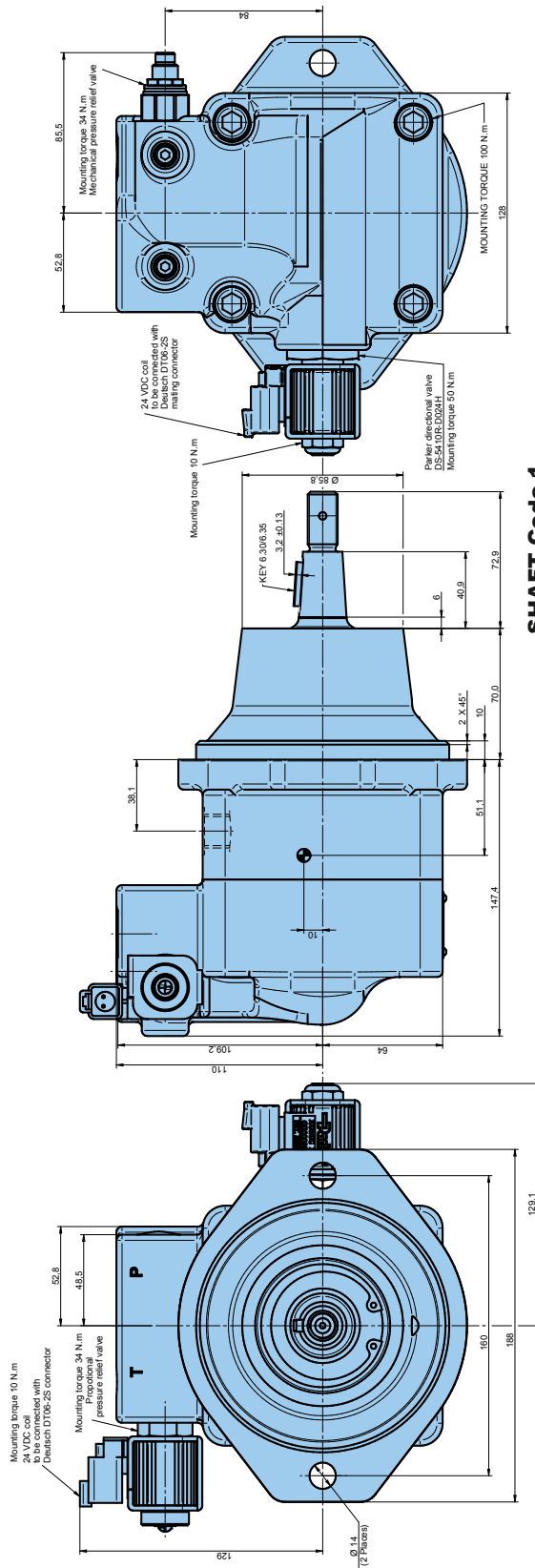


Torque of the steel nut : 80 Nm ¹⁾

¹⁾ This torque is for a steel coupling and a nut of at least grade 8.8 quality. It is compulsory to install a castle nut and cotter pin for right-hand rotation and bi-rotational use.

M5BF motor with reverse valve option

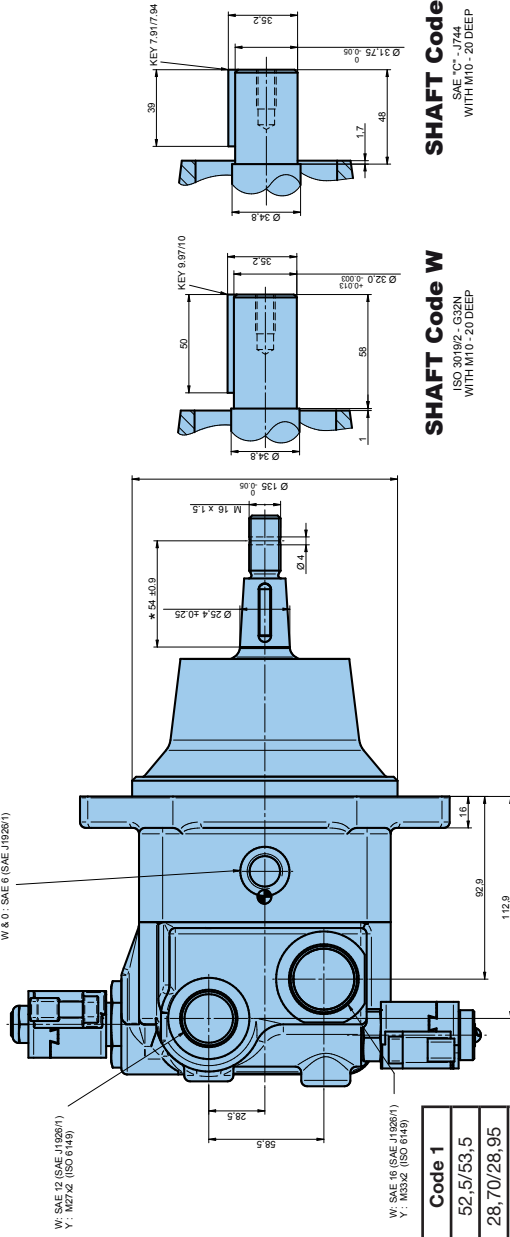
Weight : 21,6 kg



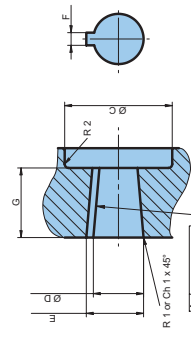
SHAFT Code 1

SAE "BB"-J744
(MODIFIED)
with M16 TAPER 125:1000

THREADED DRAIN PORT
MBS: Y & M: M18x1.5 (ISO 6149)
W & D: SAE 6 (SAE J19281)



Shaft	Code 1
Ø C	52,5/53,5
Ø D	28,70/28,95
E	25,02/25,15
F	6,36/6,31
G	35,2/35,45



Torque of the steel nut : 80 Nm 1)

1) This torque is for a steel coupling and a nut of at least grade 8.8 quality. It is compulsory to install a castle nut and cotter pin for right-hand rotation and bi-rotational use.

**WARNING – USER RESPONSIBILITY**

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Parker Worldwide

Europe, Middle East, Africa

AE – United Arab Emirates,
Dubai

Tel: +971 4 8127100
parker.me@parker.com

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

AZ – Azerbaijan, Baku
Tel: +994 50 22 33 458
parker.azerbaijan@parker.com

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

BG – Bulgaria, Sofia
Tel: +359 2 980 1344
parker.bulgaria@parker.com

BY – Belarus, Minsk
Tel: +48 (0)22 573 24 00
parker.poland@parker.com

CH – Switzerland, Etoy
Tel: +41 (0)21 821 87 00
parker.switzerland@parker.com

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

HU – Hungary, Budaörs
Tel: +36 23 885 470
parker.hungary@parker.com

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

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

KZ – Kazakhstan, Almaty
Tel: +7 7273 561 000
parker.easteurope@parker.com

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

NO – Norway, Asker
Tel: +47 66 75 34 00
parker.norway@parker.com

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

PT – Portugal
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

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

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

UA – Ukraine, Kiev
Tel: +48 (0)22 573 24 00
parker.poland@parker.com

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

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

North America

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

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

US – USA, Elk Grove Village
(mobile)
Tel: +1 847 258 6200

Asia Pacific

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

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

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Tel: +852 2428 8008

ID – Indonesia, Tangerang
Tel: +62 21 7588 1906

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

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

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

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

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

SG – Singapore
Tel: +65 6887 6300

TH – Thailand, Bangkok
Tel: +662 186 7000

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

VN – Vietnam, Ho Chi Minh City
Tel: +84 8 3999 1600

South America

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

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

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Tel: +56 2 623 1216

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Tel: +52 72 2275 4200

EMEA Product Information Centre

Free phone: 00 800 27 27 5374

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