

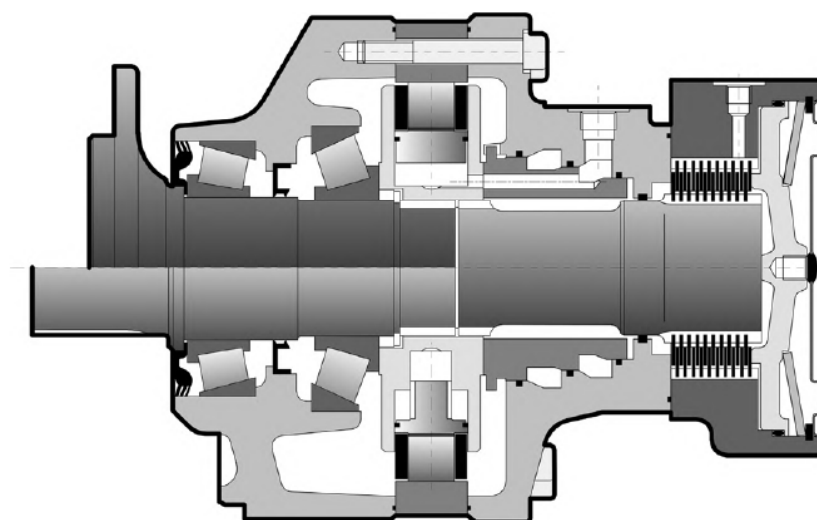


# MS MOTORS



## MS/MSE25. HYDRAULIC MOTOR.

### CHARACTERISTICS


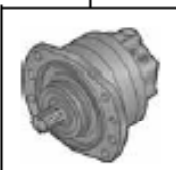

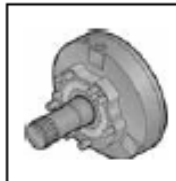
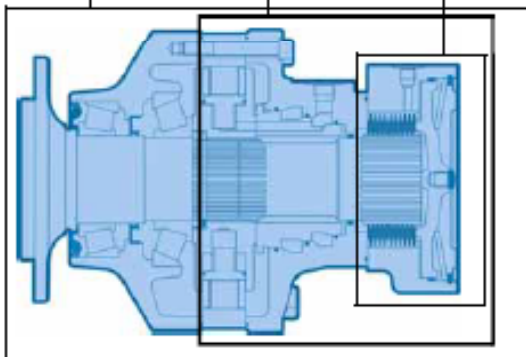


Motor inertia 0.4 kg.m<sup>2</sup>

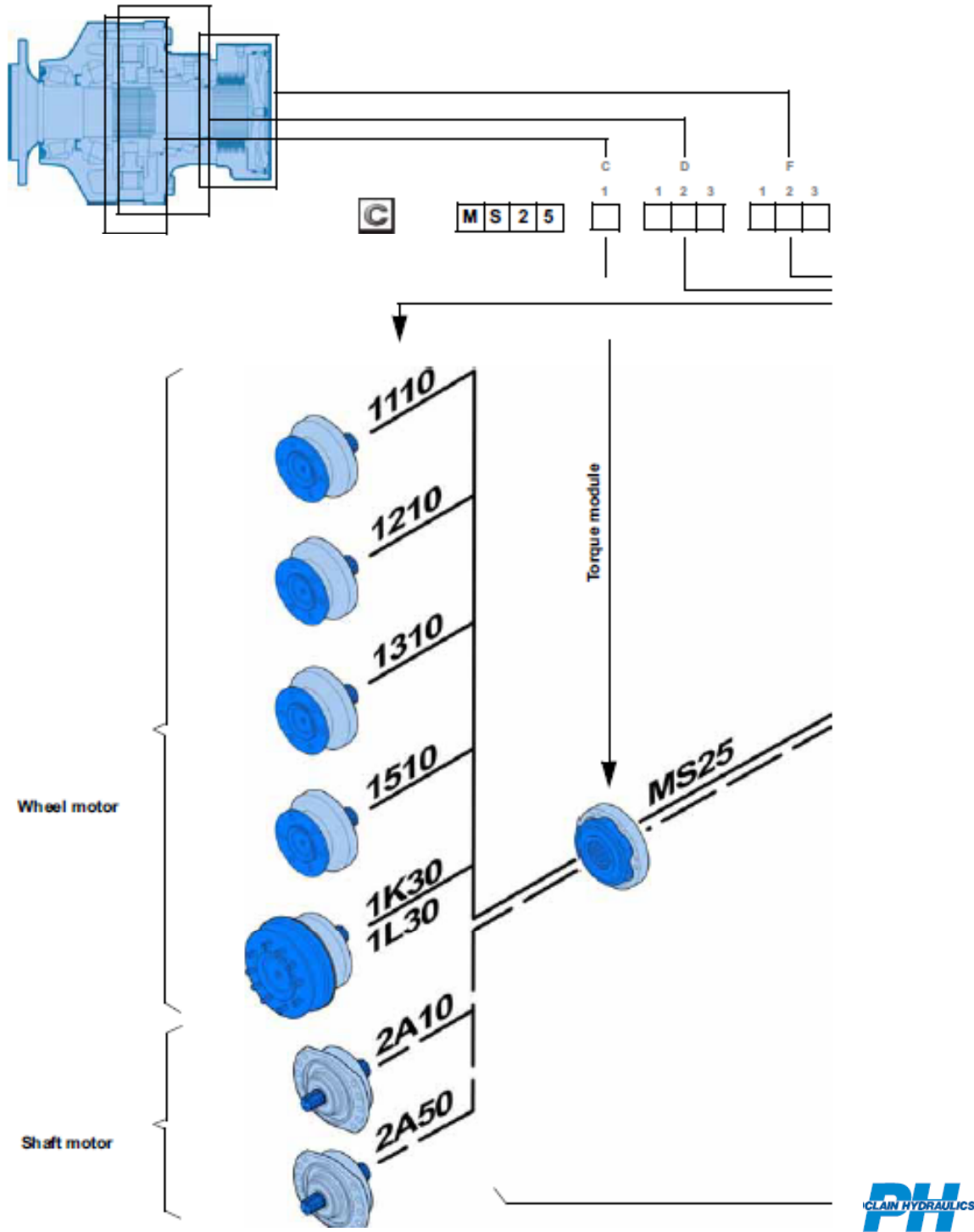
	C	Displacement		Theoretical torque		Max. power		Max. speed		Max. pressure
		1	2	1	1	2	2	1	2	
		cm <sup>3</sup> /tr [cu.in/rev.]	cm <sup>3</sup> /tr [cu.in/rev.]	at 100 bar Nm	at 1000 PSI [lb.ft]	preferred kW [HP]	non-preferred kW [HP]	tr/min [RPM]		
Cams with equal lobes	8	2 004 [122,2]	1 002 [61,1]	3 186	[1 620]	90 [121]	60 [80]	45 [60]	145	145
	0	2 498 [152,4]	1 249 [76,2]	3 972	[2 020]				137	137
	1	2 752 [167,8]	1 376 [83,9]	4 376	[2 225]				125	135
	2	3 006 [183,3]	1 503 [91,7]	4 780	[2 431]				115	130
Cams with unequal lobes	A	2 505 [152,8]	1 503 [91,7]	3 983	[2 025]	90 [121]	60 [80]	45 [60]	115	130
			1 002 [61,1]							

- ① First displacement
- ② Second displacement

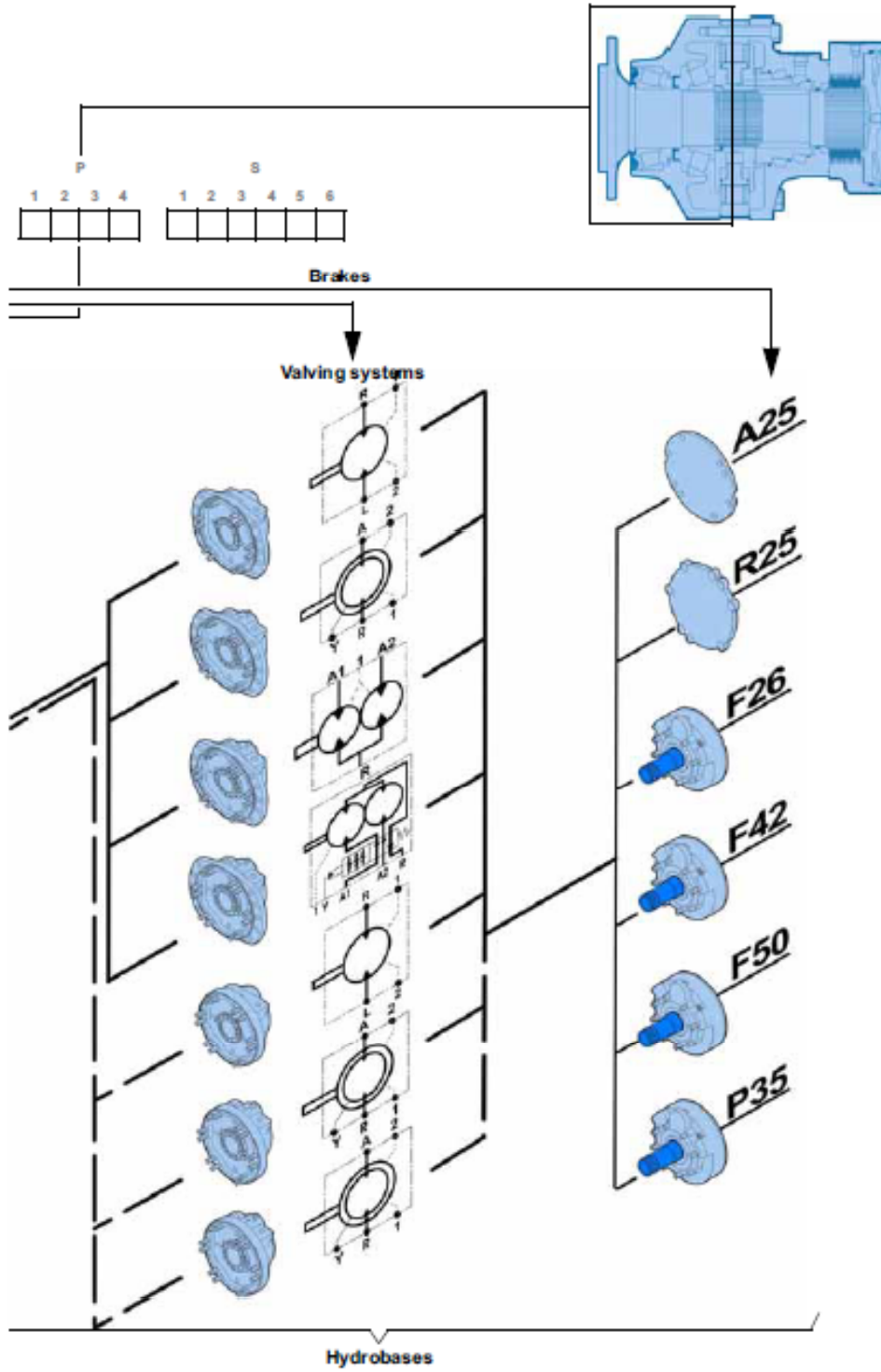
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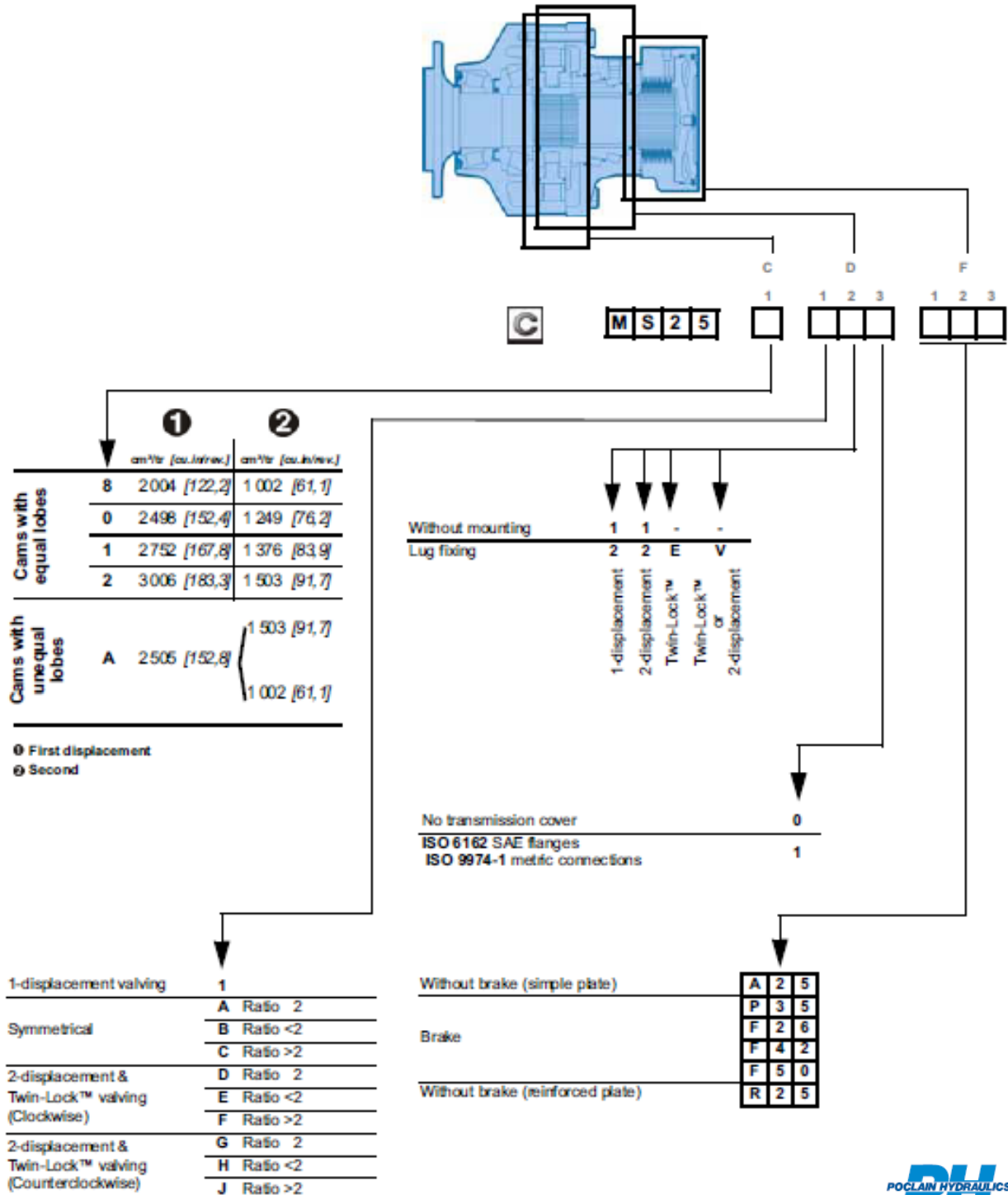
MODULARITY



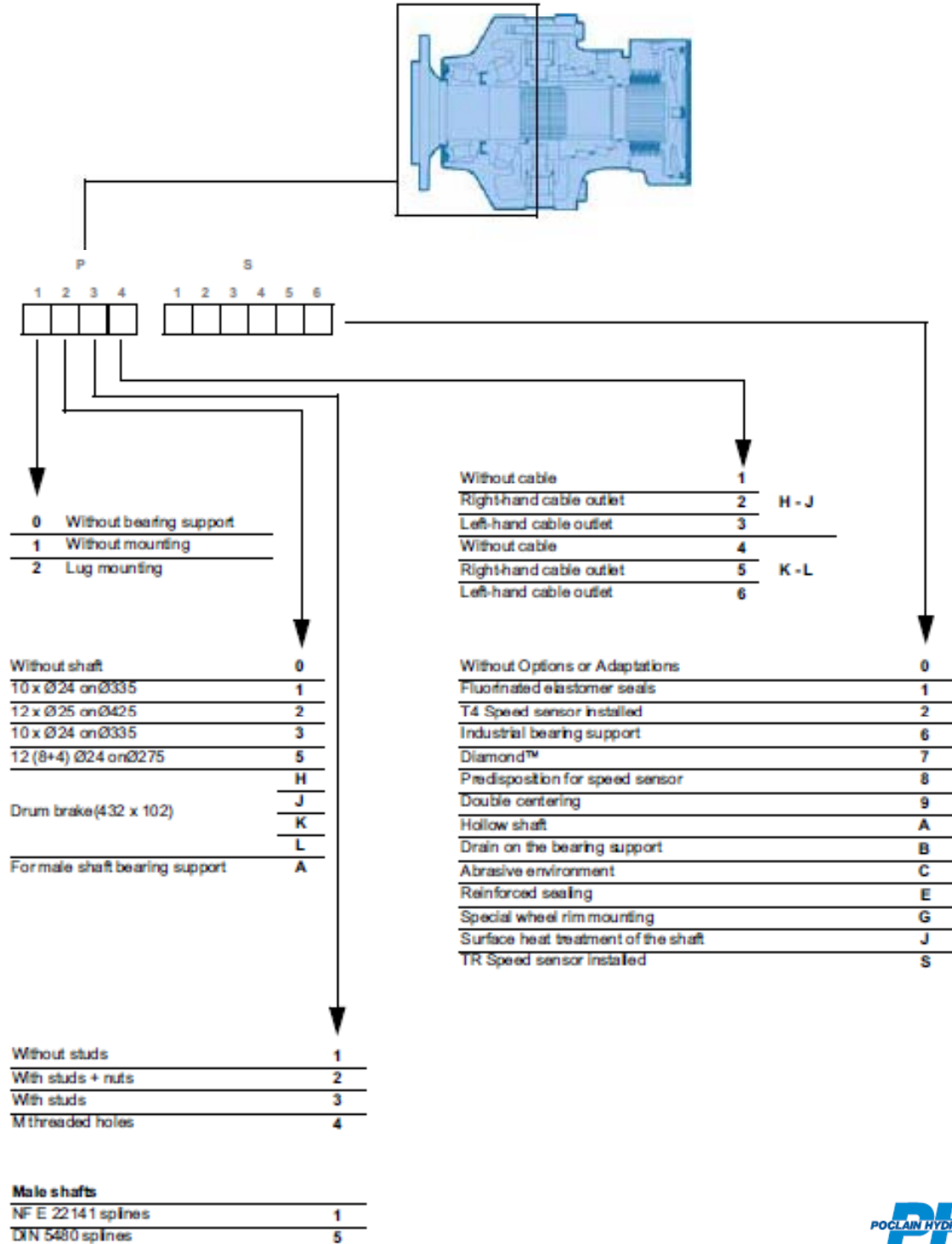
MODULARITY



MODEL CODE



## MODEL CODE



## MODEL CODE

### Methodology :

This document is intended for manufacturers of machines that incorporate Poclairn Hydraulics products. It describes the technical characteristics of Poclairn Hydraulics products and specifies installation conditions that will ensure optimum operation. This document includes important comments concerning safety. They are indicated in the following way:



**Safety comment.**

This document also includes essential operating instructions for the product and general information. These are indicated in the following way:



**Essential instructions.**



**General information .**



**Information on the model number. Information on the model code.**



**Weight of component without oil.**



**Volume of oil.**



**Units.**



**Tightening torque.**



**Screws.**



**Information intended for Poclairn-Hydraulics personnel.**

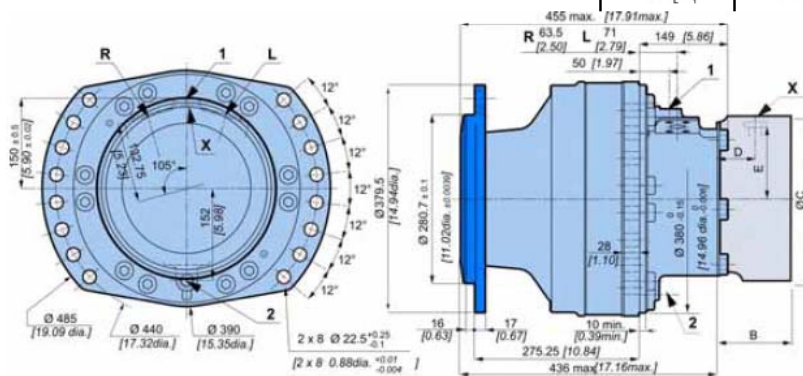
The views in this document are created using metric standards.

The dimensional data is given in mm and in inches (inches are between brackets and italic>)



### Dimensions for standard (1110) 1-displacement motor

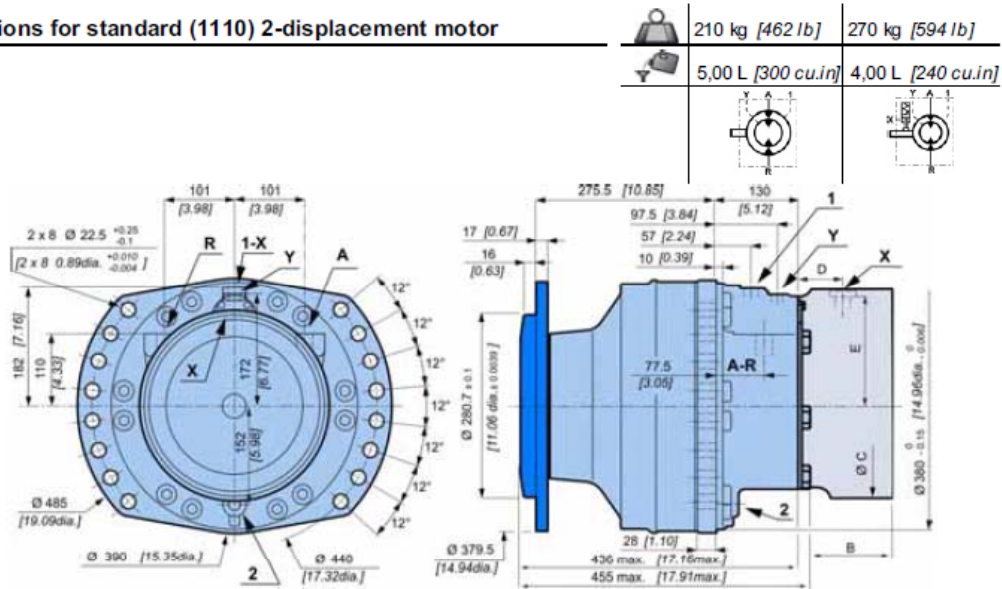
	210 kg [462 lb]	270 kg [594 lb]
	5,00 L [300 cu.in]	4,00 L [240 cu.in]



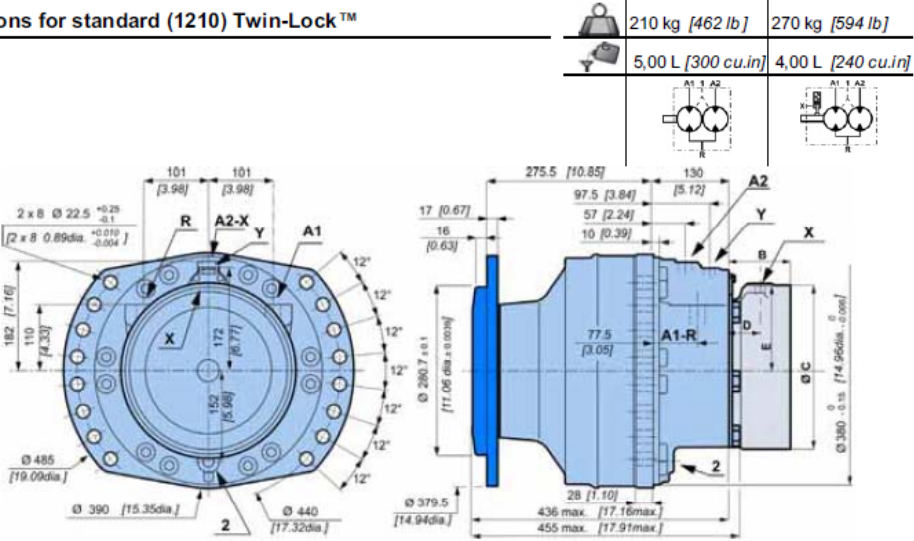


WHEEL MOTOR

Dimensions for standard (1110) 2-displacement motor



Dimensions for standard (1210) Twin-Lock™



Also see 'Valving systems and hydrobases' section (thumbnail opposite).

	<b>C</b>	<b>P 3 5</b>	<b>F 2 6</b>	<b>F 4 2</b>	<b>F 5 0</b>
<b>B</b>	85 [3.35]	128.5 [5.06]	142 [5.59]	152 [5.98]	
<b>C</b>	Ø280 [11.02 dia.]	Ø375 [14.76 dia.]	Ø375 [14.76 dia.]	Ø375 [14.76 dia.]	
<b>D</b>	57 [2.24]	50 [1.95]	64.0 [2.52]	63.5 [2.50]	
<b>E</b>	138.5 [5.45]	183.5 [7.22]	183.5 [7.22]	183.5 [7.22]	

Also see 'Brakes' section (thumbnail opposite).



Support types

	C				D			F			P				S					
	1				1 2 3			1 2 3			1 2 3 4				1 2 3 4 5 6					
	M S 2 5																			
<b>C</b>	A	B	C	D	E	N	Wheel rim mountings	L												
mm [in]	mm [in]	mm [in]	mm [in]	mm [in]	mm [in]	mm [in]		mm [in]												
1 1 1 0 P	Ø 280,7 [11,05 dia.]	Ø 335 [13,19 dia.]	Ø 379 [14,92 dia.]	275,5 [10,85]	Ø 390 [15,35 dia.]	Ø 24 [0,94 dia.]	10 x M22x1.5	17 [0,67]												
1 2 1 0 P	Ø 370 [14,57 dia.]	Ø 425 [16,73 dia.]	Ø 472 [18,58 dia.]	333,45 [13,13]	Ø 390 [15,35 dia.]	Ø 26 [1,02 dia.]	12 x M24x2	24 [0,94]												
1 3 1 0 P	Ø 280,7 [11,05 dia.]	Ø 335 [13,19 dia.]	Ø 385 [15,16 dia.]	236,5 [9,31]	Ø 390 [15,35 dia.]	Ø 24 [0,94 dia.]	10 x M22x1.5	17 [0,67]												
1 5 1 0 P	Ø 220,7 [8,69 dia.]	Ø 275 [10,83 dia.]	Ø 314 [12,36 dia.]	241,5 [9,51]	Ø 390 [15,35 dia.]	8 x Ø 22 [8 x 0,87 dia.] 4 x Ø 22 [4 x 0,87 dia.]	-	17 [0,67]												
1 K 3 0 1 L 3 0 P	Ø 280,7 [11,05 dia.]	Ø 335 [13,19 dia.]	Ø 461,5 [18,17 dia.]	337,95 [13,31]			10 x M22x1.5	45 [1,77]												
	Also see 'Brakes' section (thumbnail opposite).																			

Studs

		P	C min.	C max.	D	Class	(1)*	(2)*
		mm [in]	mm [in]	mm [in]	mm [in]		N.m [lb.ft]	N.m [lb.ft]
Various studs	M22 x 1.5	80 [3.15]	5 [0.20]	36 [1.42]	26 [1.02]		12.9	695 [512.6]
	M24 x 2	95 [3.74]		38 [1.50]	30 [1.18]			910 [671.2]
Screws	M20	-	-			12.9	600 [442.5]	770 [567.9]

(\*) The tightening torques are given for the indicated loads.  
 (1) **Wheel rim** : Suggested tightening torque for wheel rim mountings (Re steel disc > 240 N/mm<sup>2</sup> [>34 800 PSf]).  
 (2) **Standard** : Suggested tightening torque in other cases (Re steel flange 360 > N/mm<sup>2</sup> [>52 215 PSf])



See generic installation motors N°801478197L.



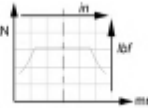
**Load curves**

**Permissible radial loads**

Test conditions :

Static : 0 *tr/min* [0 *RPM*] 0 bar [0 *PSI*]

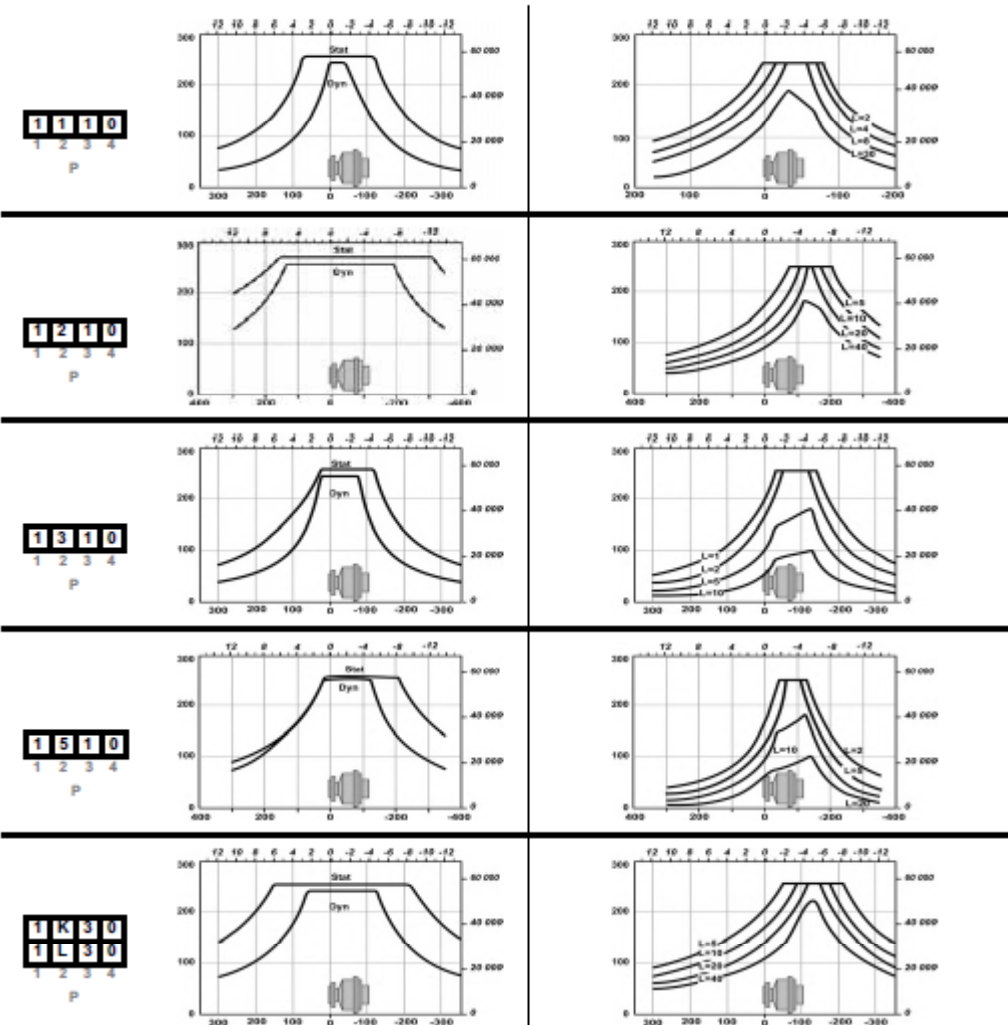
Dynamic : 0 *tr/min* [0 *RPM*], code 0 displacement, without axial load at max. torque



**Service life of bearings**

Test conditions :

L : Millions B10 revolutions at 150 bars (average pressure), with 25 cSt fluid, code 0 displacement, without axial load.

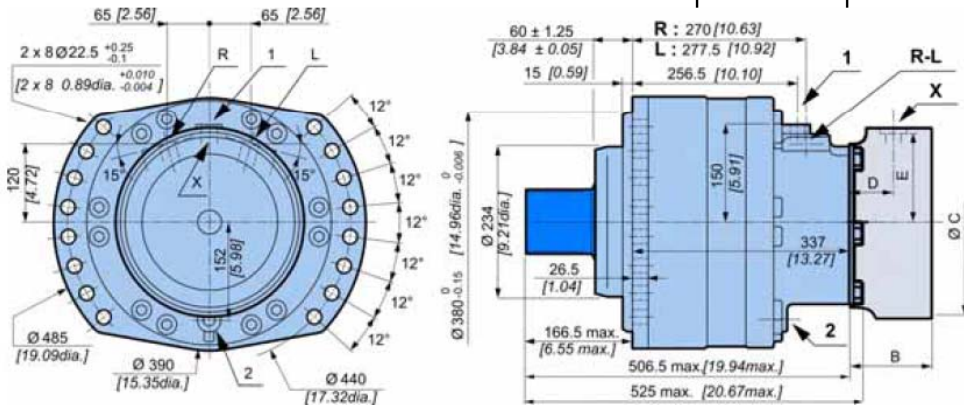


The service life of the components is influenced by the pressure. You must check that the combination of forces applied (Axial load / Radial load) is compatible with the permissible loads for the components, and that the resulting service lives of these components complies with the application's specifications. For an accurate calculation, consult your Poclair Hydraulics application engineer.



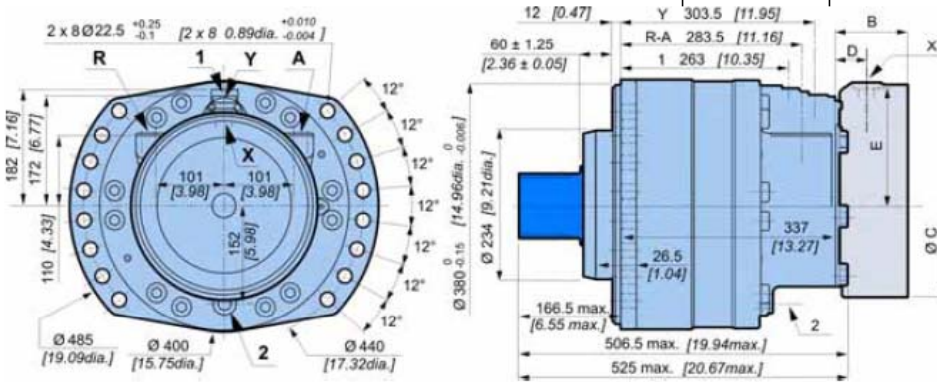
**SHAFT MOTOR**

**Dimensions for standard (2A50) 1-displacement motor**



	195 kg [429 lb]	255 kg [561 lb]
	5,00 L [300 cu.in]	4,00 L [240 cu.in]

**Dimensions for standard (2A50) 2-displacement motor**



	195 kg [429 lb]	255 kg [561 lb]
	5,00 L [300 cu.in]	4,00 L [240 cu.in]

Also see 'Valving systems and hydrobases' section (thumbnail opposite).

	<b>C</b>	<b>P 3 5</b>	<b>F 2 6</b>	<b>F 4 2</b>	<b>F 5 0</b>
<b>B</b>	85 [3.35]	128.5 [5.06]	142 [5.59]	152 [5.98]	
<b>C</b>	$\varnothing 280$ [11.02 dia.]	$\varnothing 375$ [14.76 dia.]	$\varnothing 375$ [14.76 dia.]	$\varnothing 375$ [14.76 dia.]	
<b>D</b>	57 [2.24]	50 [1.95]	64.0 [2.52]	63.5 [2.50]	
<b>E</b>	138.5 [5.45]	183.5 [7.22]	183.5 [7.22]	183.5 [7.22]	

Also see 'Brakes' section (thumbnail opposite).

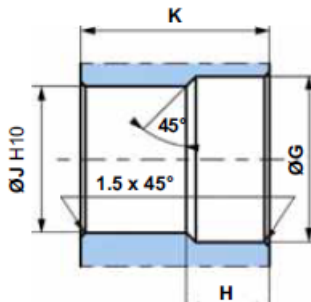


				C	D	F	P	S			
				1	1 2 3	1 2 3	1 2 3 4	1 2 3 4 5 6			
<b>M</b>	<b>S</b>	<b>2</b>	<b>5</b>								
				<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>		
<b>DIN 5480 splines</b>											
<b>2</b>	<b>A</b>	<b>5</b>	<b>0</b>	Nominal Ø	100 [3,94]	23	R4	35	2 x M14	25	105
1	2	3	4	Module	3	[0,91]	[R 0,16]	[1,38]		[0,98]	[4,13]
				Z	32						
<b>NF E22-141 splines</b>											
<b>2</b>	<b>A</b>	<b>1</b>	<b>0</b>	Nominal Ø	100 [3,94]	23	R4	35	2 x M14	26,5	105
1	2	3	4	Module	2,5	[0,91]	[R 0,16]	[1,38]		[1,04]	[4,13]
				Z	38						



Also see 'Valving systems and hydrobases' section (thumbnail opposite).

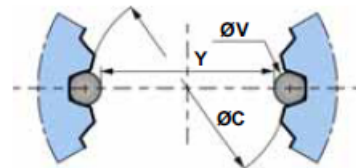
**Splined coupling**



**N** : Nominal Ø.  
**Mo** : Module.  
**Z** : Number of teeth.

**Standard DIN 5480**  
 Pressure angle 30°.  
 Centering on flanks.  
 Slide adjustment (7H quality).

**Standard NF E 22-141**  
 Pressure angle 20°.  
 Centering on flanks.  
 Slide adjustment (7H quality).



	Ø G	H	Ø J	K	N	Mo	Z	Offset	Ø C (H10)	Ø V	Y	Tolerance µm [µin]
<b>2 A 1 0</b> 1 2 3 4 P	101 [3,98]	28 [1,10]	95 [3,74]	104 [4,09]	100 [3,94]	2,5	38	2 [0,08]	95 [3,74]	5 [0,20]	90,125 [3,55]	+ 104 / 0 [+4.0945 / 0]
<b>2 A 5 0</b> 1 2 3 4 P	101,5 [4,00]	28 [1,10]	94 [3,70]	104 [4,09]	100 [3,94]	3	32	- 0,35 [0,0138]	94 [3,70]	5,25 [0,21]	89,066 [3,51]	+ 73 / 0 [+2.874 / 0]

General tolerances : ± 0.25 [±0.0098].

Material : Ex: 42CrMo4.

Hardening treatment to obtain R = 800 to 900 N/mm² [R = 116 030 to 130 533 PSI].



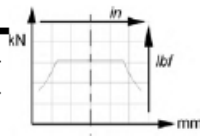
**Load curves**

**Permissible radial loads**

Test conditions :

**Static** : 0 tr/min [0 RPM] 0 bar [0 PSI]

**Dynamic** : 0 tr/min [0 RPM], code 0 displacement, without axial load at max. torque



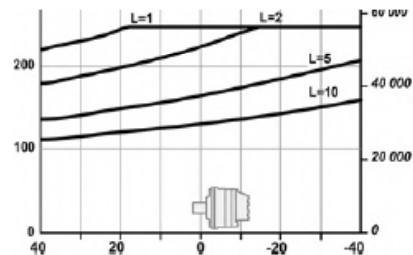
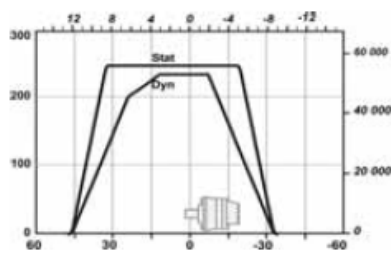
**Service life of bearings**

Test conditions :

**L** : Millions B10 revolutions at 150 bars (average pressure), with 25 cSt fluid, code 0 displacement, without axial load.

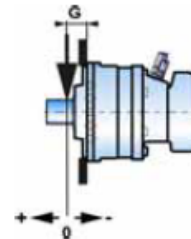
2	A	5	0
2	A	1	0
1	2	3	4

P



The service life of the components is influenced by the pressure. You must check that the combination of forces applied (Axial load / Radial load) is compatible with the permissible loads for the components, and that the resulting service lives of these components complies with the application's specifications. For an accurate calculation, consult your Poclain Hydraulics application engineer.

C	G
2 A 1 0	115,75 [4,56]
2 A 5 0	125 [4,92]

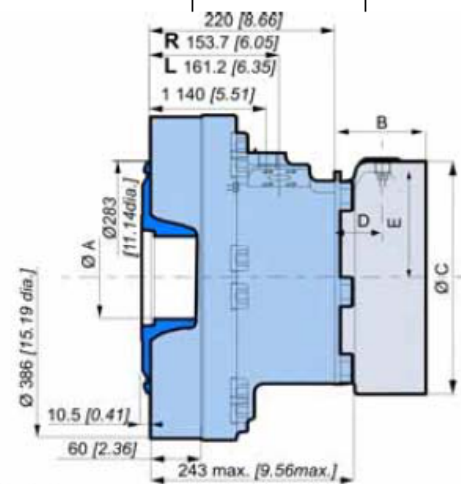
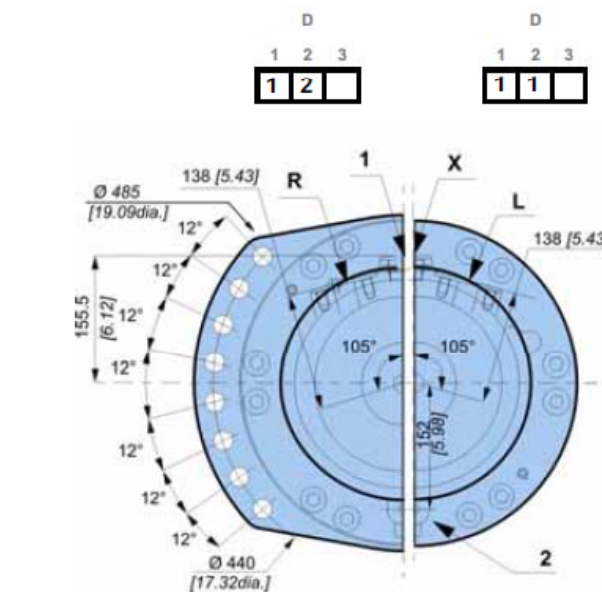


VALVING SYSTEM AND HYDROBASES



Dimensions for 1-displacement valving

	13,8 kg [30 lb]	19,9 kg [44 lb]
	0,35 L [21 cu.in]	0,45 L [27 cu.in]

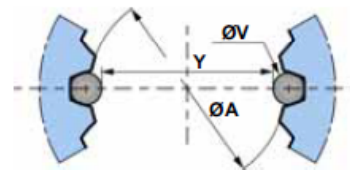


	<b>C</b>	<b>P 3 5</b>	<b>F 2 6</b>	<b>F 4 2</b>	<b>F 5 0</b>
<b>B</b>	85 [3.35]	128.5 [5.06]	142 [5.59]	152 [5.98]	
<b>C</b>	Ø280 [11.02 dia.]	Ø375 [14.76 dia.]	Ø375 [14.76 dia.]	Ø375 [14.76 dia.]	
<b>D</b>	57 [2.24]	50 [1.95]	64.0 [2.52]	63.5 [2.50]	
<b>E</b>	138.5 [5.45]	183.5 [7.22]	183.5 [7.22]	183.5 [7.22]	

Also see 'Brakes' section (thumbnail opposite).

Cylinder block splines  
(as per standard NF E22-141)

ØA	Module	Z	Dimension on 2 pins	
			Y	ØV
100 [3,937]	2,5	38	90,169 [3,550]	5 [0,197]



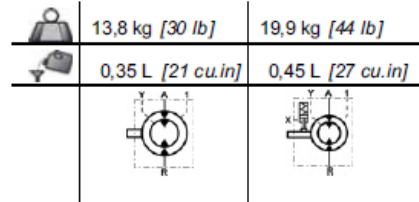
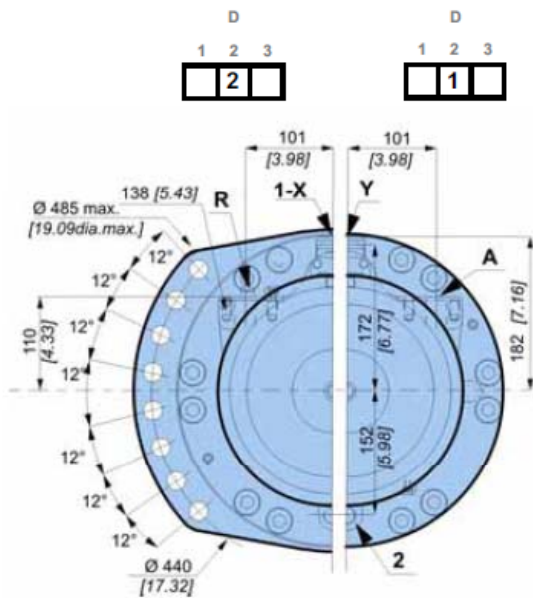
You are advised to have the installation validated by your Poclairn Hydraulics application engineer before using the hydraulic unit in an application.

We must provide you with a detailed plan of the interface for any hydraulic unit use, consult your Poclairn Hydraulics sales engineer.



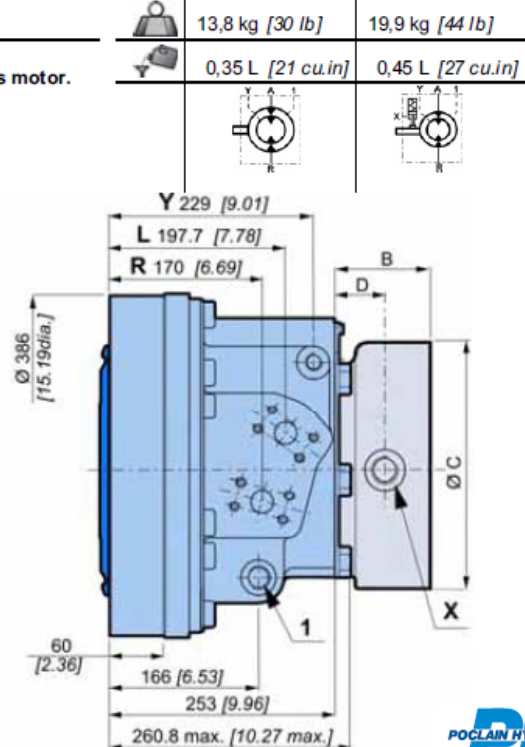
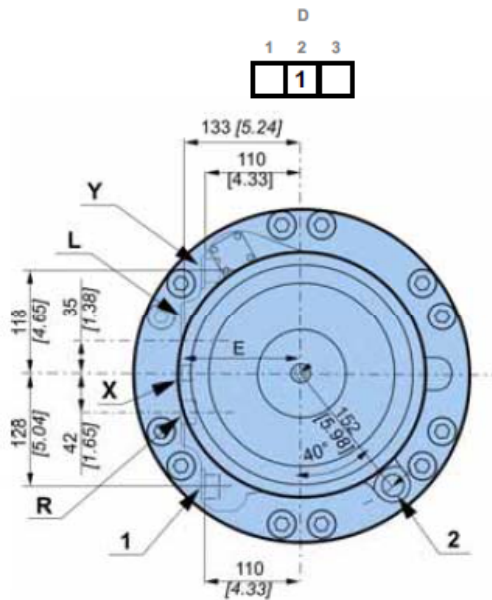
VALVING SYSTEM AND HYDROBASES

Dimensions for 2-displacement valving



Dimensions for 2-displacement symetrical valving

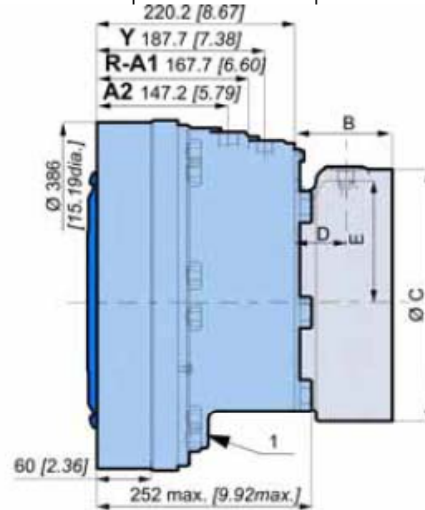
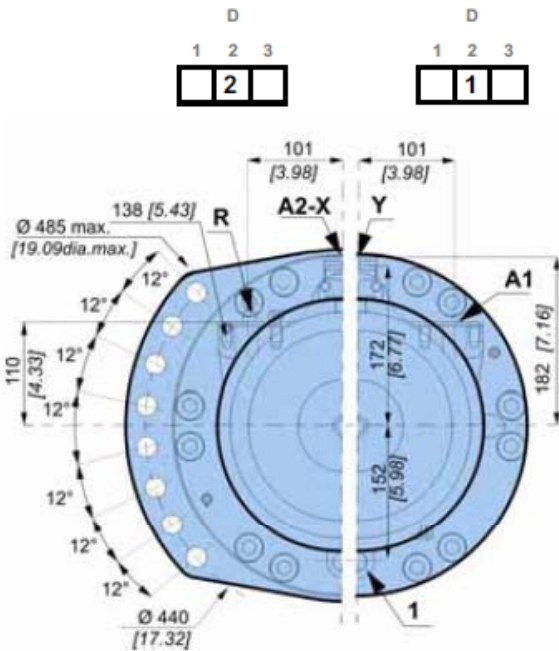
For a small displacement, there is no preferred orientation for this motor.





Dimensions for Twin-Lock™

	13,8 kg [30 lb]	19,9 kg [44 lb]
	0,35 L [21 cu.in]	0,45 L [27 cu.in]

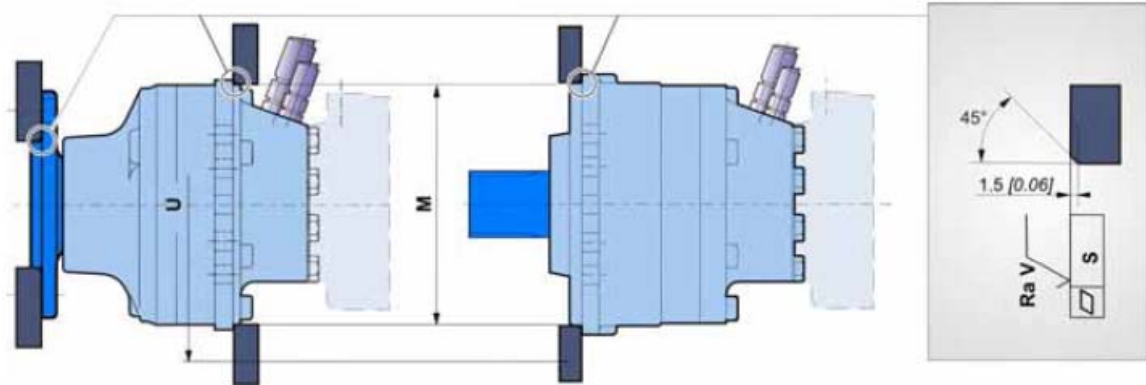


	<b>P 3 5</b>	<b>F 2 6</b>	<b>F 4 2</b>	<b>F 5 0</b>
<b>B</b>	85 [3.35]	128.5 [5.06]	142 [5.59]	152 [5.98]
<b>C</b>	Ø280 [11.02 dia.]	Ø375 [14.76 dia.]	Ø375 [14.76 dia.]	Ø375 [14.76 dia.]
<b>D</b>	57 [2.24]	50 [1.95]	64.0 [2.52]	63.5 [2.50]
<b>E</b>	138.5 [5.45]	183.5 [7.22]	183.5 [7.22]	183.5 [7.22]





Also see 'Brakes' section (thumbnail opposite).

### Chassis mountings



Take care over the immediate environment of the connections.

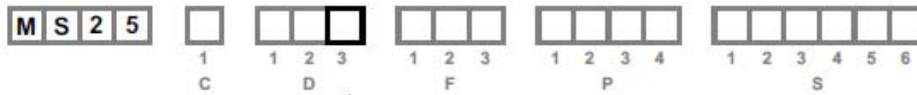
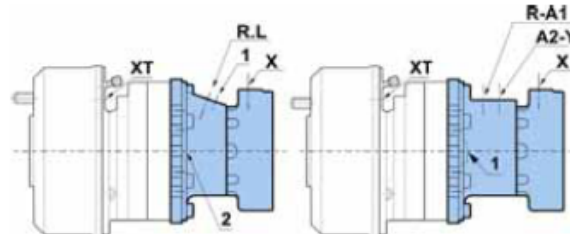
	ØM <sup>(1)</sup>	ØU	S	Ra V		Class	 *
Wheel motor	380	440	0,2	12,5µm	2 x 8 Ø22.5	8,8	410 N.m
Shaft motor	[14,96]	[17,32]	[0,008]	[0,49µin]	M20 x 2		[302 lb.ft]

(1) +0,3 [+0,012]  
+0,2 [+0,008]

\* : Min. values for torque and load to be transmitted.

Hydraulic connections

connections



	Old standards	Standards	Power supply	Case drain	2 <sup>nd</sup> displacement control	Control of parking break	Control of drum break	
	1	ISO 6 162 DIN 3 852	R-L DN25 PN400	1, 2 M22x1.5		X M18x1.5	XT	
	1	ISO 6 162 DIN 3 852	R-A DN25 PN400	1, 2 M22x1.5	Y M18x1.5	X M18x1.5		
	1*	ISO 6 162 DIN 3 852	DN25 PN400	M27x2	M20x1.5	M18x1.5		
	1	ISO 6 162 DIN 3 852	R-A1 DN25 PN400	A2 M27x2	1, 2 M22x1.5	Y M18x1.5	X M18x1.5	
							ISO 9 974-1	M14x1.5
<b>Max. pressures</b>		<b>MS bar [PSI]</b>	450 [6 527]	1 [15]	30 [435]	30 [435]	120 [1 740]	

\* : Only symmetrical valving

You are strongly advised to use the fluids specified in brochure "Installation guide" N° 801478197L.

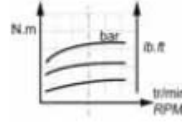
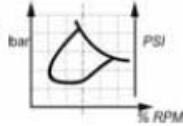
To find the connections' tightening torques, see the brochure "Installation guide" N° 801478197L.



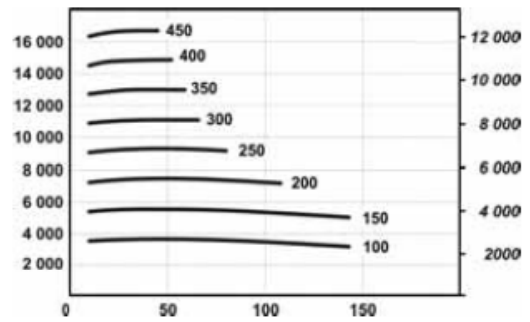
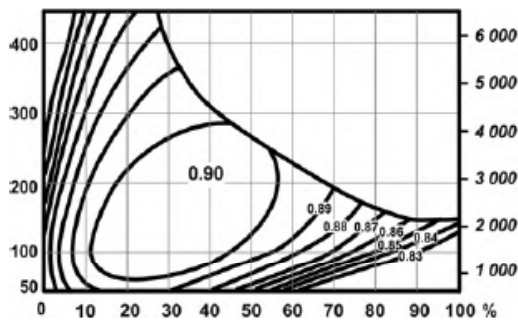
**Efficiency**

**Overall efficiency**

Average values given for guidance for code 0 displacement after 100 hours of operation with HV46 hydraulic fluid at 50°C [122°F].



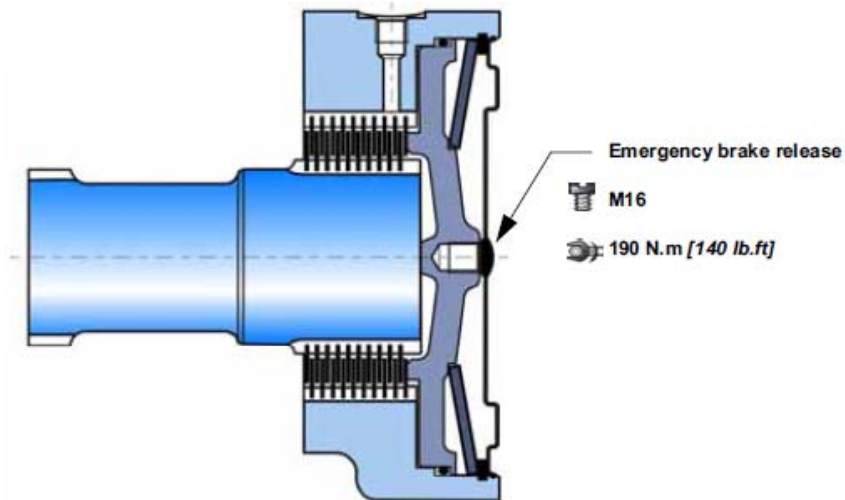
**Actual output torque**



The starting torque is taken to be approximately 85% of the first value for available pressure. For a precise calculation, consult your Poclain Hydraulics application engineer.

**BRAKES**

**Rear brake**



**Brake principle**

This is a multidisc brake which is activated by a lack of pressure. The spring exerts a force on the piston, which presses on the fixed and mobile discs, and immobilizes the shaft. The braking torque decreases in linear proportion to the brake release pressure.

<b>C</b>	<b>P 3 5</b>
Parking brake torque at 0 bars on housing (new brake)	20 500 Nm [15 120 lb.ft]
Dynamic emergency braking torque at 0 bars on housing (max. 10 uses of emergency brakes)	13 325 Nm [9 830 lb.ft]
Residual parking braking at 0 bars on housing *	15 375 Nm [11 340 lb.ft]
Min. brake release pressure	12 bar [174 PSI]
Max. brake release pressure	30 bar [435 PSI]
Oil capacity	700 cm <sup>3</sup> [42,7 cu.in]
Volume for brake release	70 cm <sup>3</sup> [4,3 cu.in]

\* After emergency brake has been used



**Do not run in multidisc brakes.**

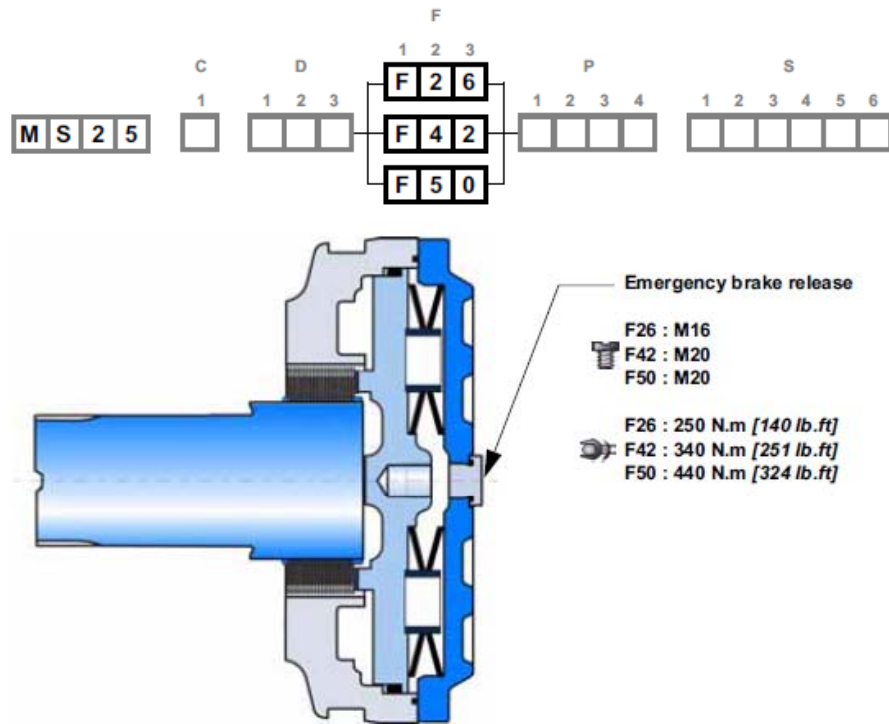


**A functional check of the parking brake must be carried out each time it is used as an auxiliary brake (or emergency brake). For all vehicles capable of speeds over 25 km/hour, please contact your Poclain Hydraulics application engineer.**



## BRAKES

### Rear brake



### Brake principle

This is a multidisc brake which is activated by a lack of pressure. The spring exerts a force on the piston, which presses on the fixed and mobile discs, and immobilizes the shaft. The braking torque decreases in linear proportion to the brake release pressure.

<b>C</b>	<b>F 2 6</b>	<b>F 4 2</b>	<b>F 5 0</b>
Parking brake torque at 0 bars on housing (new brake)	26 730 Nm [19 720 lb.ft]	25 000 Nm [18 440 lb.ft]	30 000 Nm [22 130 lb.ft]
Dynamic emergency braking torque at 0 bars on housing	17 375 Nm [12 820 lb.ft]	16 250 Nm [11 990 lb.ft]	19 500 Nm [14 380 lb.ft]
Residual parking braking at 0 bars on housing *	20 048 Nm [14 790 lb.ft]	18 750 Nm [13 830 lb.ft]	22 500 Nm [16 600 lb.ft]
Min. brake release pressure	10 bar [138 PSI]	12 bar [174 PSI]	12 bar [174 PSI]
Max. brake release pressure	30 bar [435 PSI]	30 bar [435 PSI]	30 bar [435 PSI]
Oil capacity	200 cm <sup>3</sup> [12,2 cu.in]	400 cm <sup>3</sup> [24,4 cu.in]	450 cm <sup>3</sup> [27,5 cu.in]
Volume for brake release	120 cm <sup>3</sup> [7,3 cu.in]	135 cm <sup>3</sup> [8,2 cu.in]	135 cm <sup>3</sup> [8,2 cu.in]

\* After emergency brake has been used



Do not run in multidisc brakes.

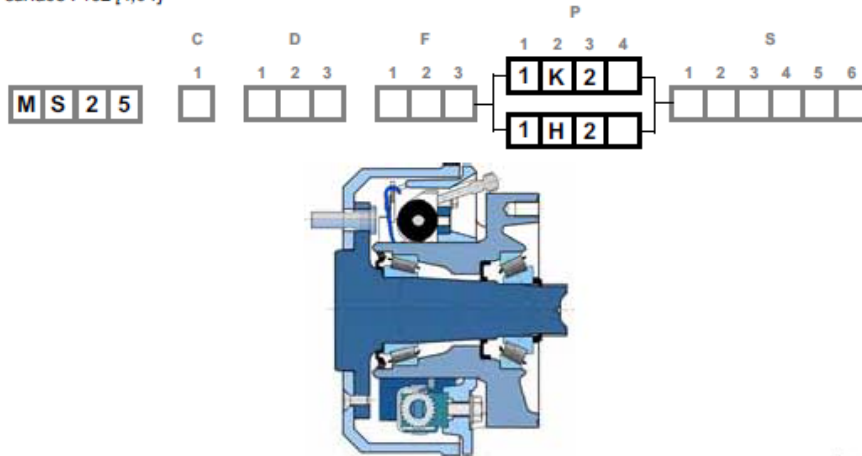


A functional check of the parking brake must be carried out each time it is used as an auxiliary brake (or emergency brake). For all vehicles capable of speeds over 25 km/hour, please contact your Poclairn Hydraulics application engineer.



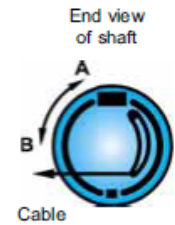
**Drum brake (432 x 102)**

Diameter of brake pads : Ø 432 [17 dia.]  
 Width of friction surface : 102 [4,01]



<b>Brake pads</b>		<b>C</b>
Asbestos free material	BERAL 1109 or JURID 505	
Compensation for wear	Automatic	
<b>Hydraulically controlled dynamic braking</b>		
Max. permissible continuous brake torque	16 200 N.m [11 948 lb.ft]	
Pressure to obtain max. permissible continuous brake torque	71 bar [1 028 PSI]	
Max. permissible brake torque	27 000 N.m [19 914 lb.ft]	
Pressure to obtain max. permissible brake torque	120 bar [1 740 PSI]	
<b>Fluid</b>		
Mineral	Yes	<b>H - K</b>
DOT 3 / DOT 4 / SAE J1703	No	
Max. volume required to bring pads into contact	10.2 cm <sup>3</sup> [0.62 cu.in]	
<b>Mechanically controlled parking brake</b>		
Max. braking torque	27 000 N.m [19 914 lb.ft]	
Max permissible force on the cable	5 700 N [1 281 lbf]	
Force required to bring pads into contact	37 N [8 lbf]	
Stroke required to bring pads into contact (new brake)	<b>A</b>	19 mm [0.73 "]
	<b>B</b>	16 mm [0.63 "]

**C**



The max. braking torque can only be obtained when the brake has been run in. Consult your Poclairn Hydraulics application engineer.

**Control**  
 The drum brakes can be controlled hydraulically (service brake) and by a cable (mechanical control for parking brake).

Do not use hydraulic and mechanical brake controls simultaneously.

See also 'Wheel motor' section (thumbnail opposite)

When making an encoding request, you must indicate the following information:  
 - The material of the brake linings,  
 - The type of connection at the end of the parking brake control cable,  
 - Fill out the technical questionnaire for validation of the brake.



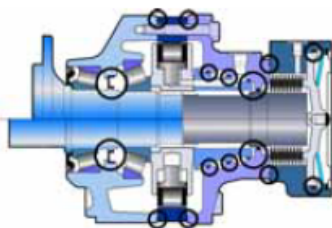
OPTIONS



You can accumulate more than one optional part. Consult your Poclair Hydraulics sales engineer.

1 - Fluorinated elastomer seals

Nitrile seals marked in the figure below replaced by fluorinated elastomer seals.

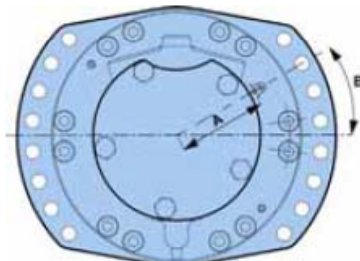


Consult your Poclair Hydraulics sales engineer.

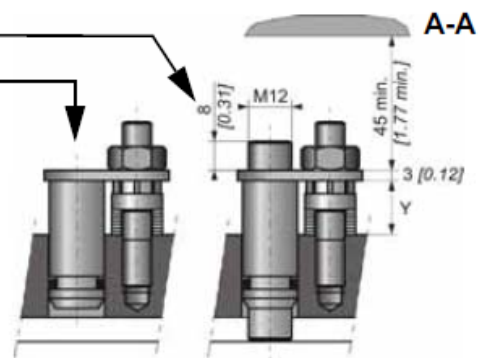
2 - S - 8 - Installed speed sensor or predisposition

Designation

T4 Speed sensor installed	<b>2</b>
TR Speed sensor installed (direction of rotation)	<b>S</b>
Predisposition for speed sensor	<b>8</b>



	mm [in]	mm [in]
<b>A</b>	118,9 [4,68]	118,9 [4,68]
<b>B</b>	0°	20°
	2-displacement	1-displacement



Max. length Y= 15.6

Standard number of pulses per revolution= 56



Look at the "Mobile Electronic" N° A01889D technical catalogue for the sensor specifications and its connection.



To install the sensor, see the "Installation guide" brochure No. 801478197L.





## 6 - Industrial support

Reduction of around 50% from the rated value in the bearings' preload value.



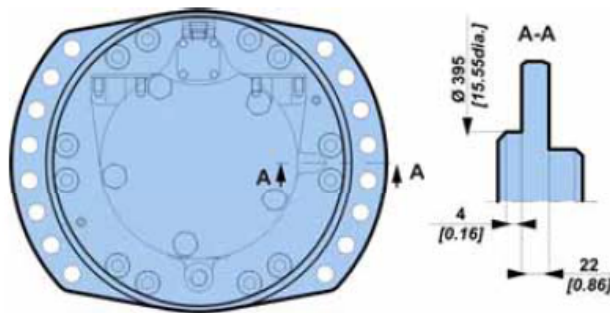
For a precise calculation, consult your Poclain Hydraulics application engineer.

## 7 - Diamond™

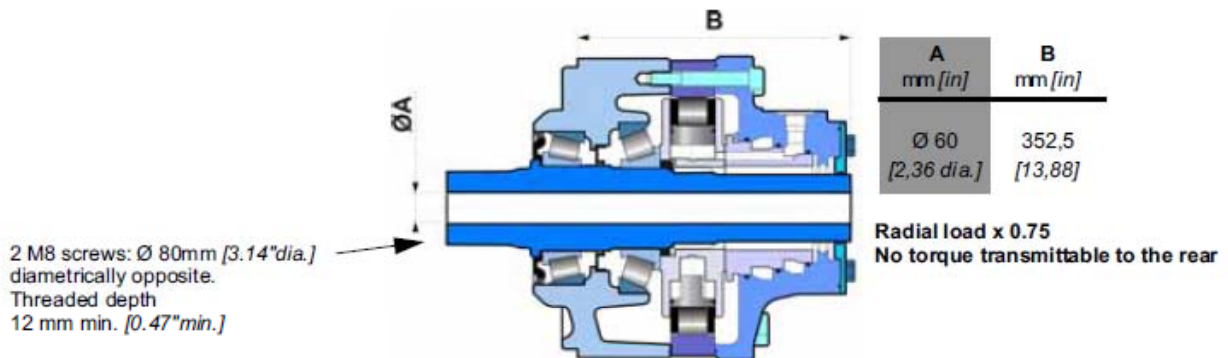
Special treatment of the motor core which considerably increases its strength, making the motor much more tolerant to temporary instances of the operating conditions being exceeded.

## 9 - Double-centering valving cover

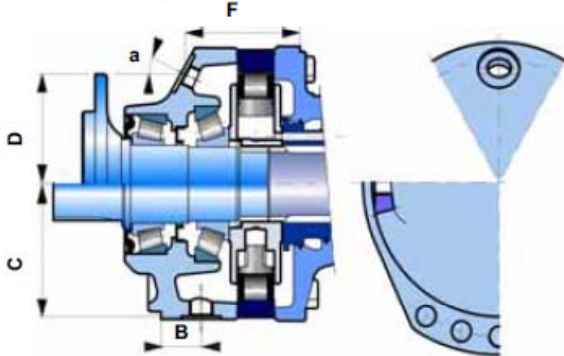
This option allows a motor to be installed from the front or the back.



## A - Hollow shaft



**B - Drain on the bearing support**

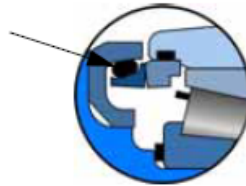


		B	C	D	F	a
		mm [in]	mm [in]	mm [in]	mm [in]	
Shaft motor	M22 x 1.5	56,0 [2,20]	193 [7,60]			
Wheel motor				112,0 [4,41]	113 [4,43]	30°

**C - Abrasive environments (mechanical seal)**

Some environments can be very harmful. The mirror seal gives reinforced motor sealing.

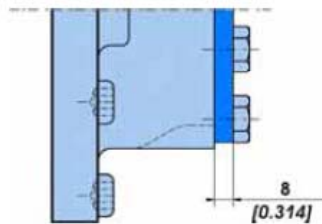
**Mechanical seal**



These seals are available for standard wheel motors and short wheel motors.

**E - Reinforced sealing**

Requires reinforced seals and, for an unbraked motor, a rear reinforced plate (R25 - 15 [0.594]thick, instead of 6 [0.237]).



**G - Special wheel rim mounting**

Enables certain combinations different from the standard mountings defined on page 10.



Consult your Poclairn Hydraulics sales engineer.



**J - Treated shaft**

Heat treatment on the indicated bearing radius and splines.

