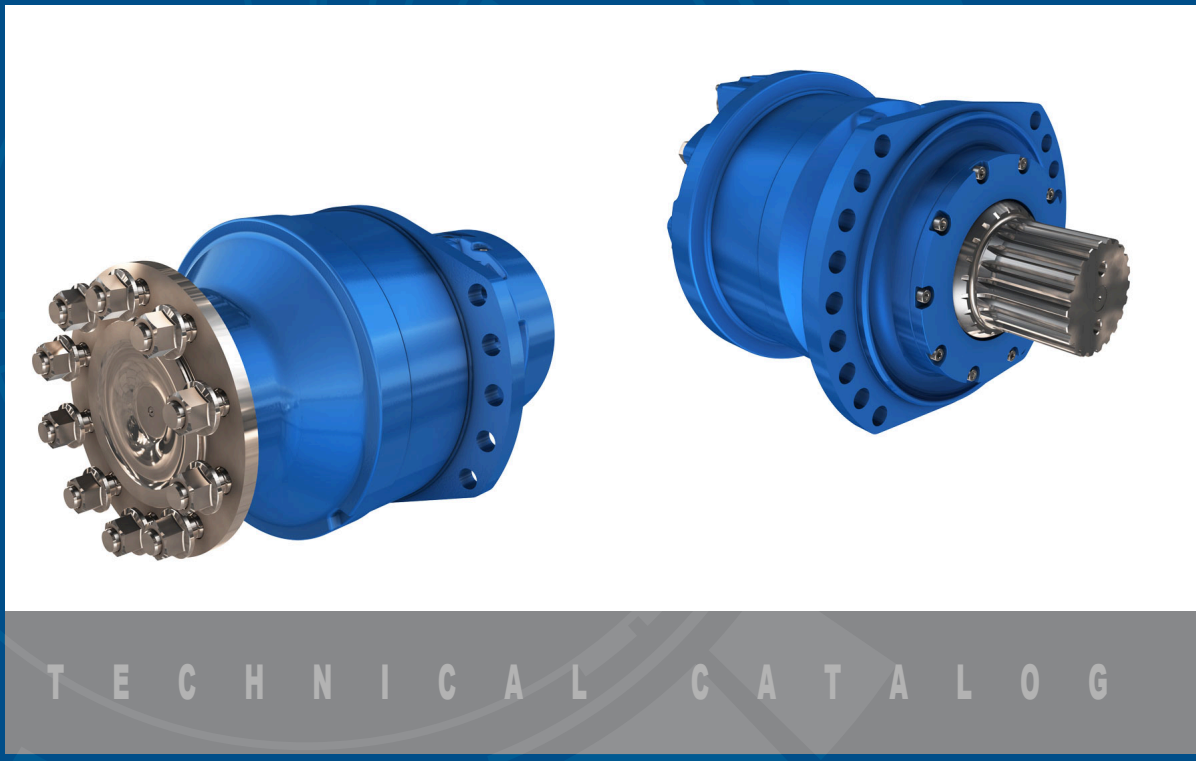
MS25

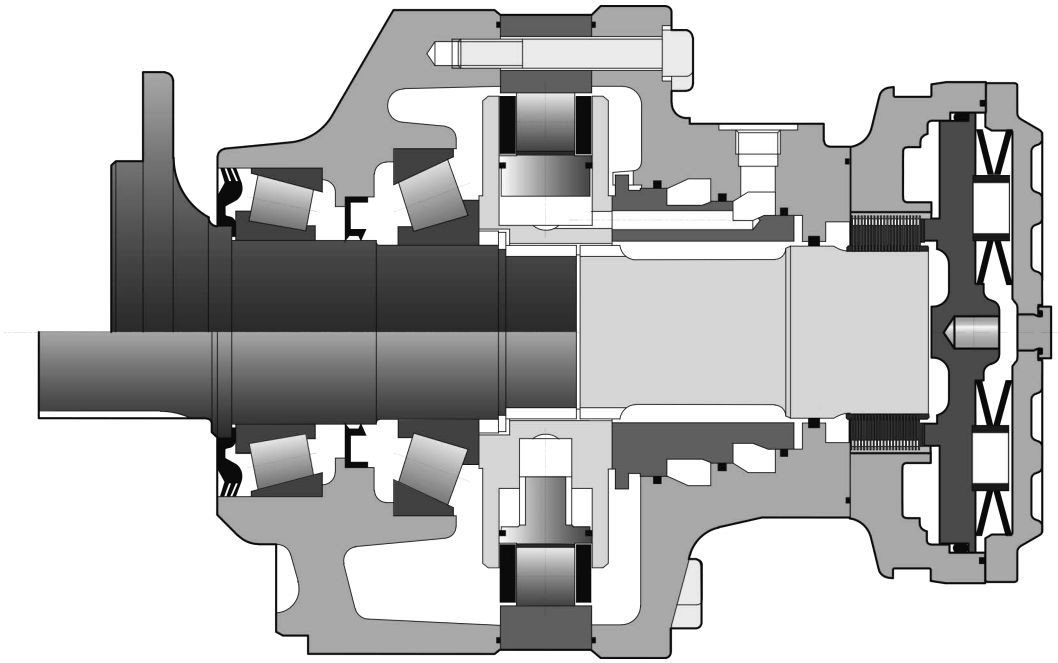
HYDRAULIC MOTORS



TECHNICAL CATALOG

POCLAIN Hydraulics

CHARACTERISTICS



Motor inertia **0.4 kg.m²**

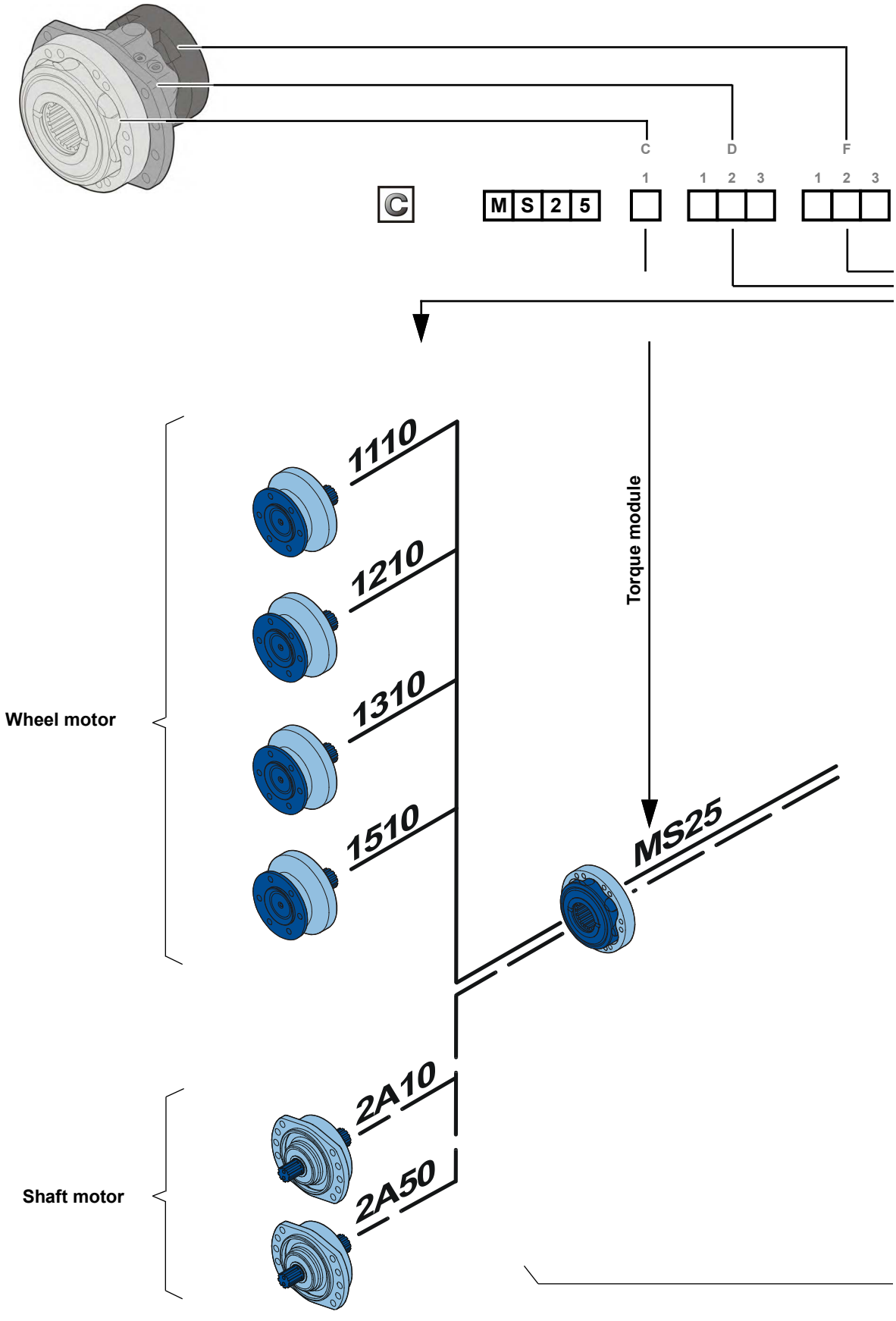
	C	❶ cm³/tr *[cu.in/rev.]*	❷ cm³/tr *[cu.in/rev.]*	Theoretical torque ❶ at 100 bar Nm	Theoretical torque ❶ *at 1000 PSI [lb.ft]*	Max.power ❶ kW *[HP]*	Max.power ❷ preferred kW *[HP]*	Max.power ❷ non-preferred kW *[HP]*	Max. speed ❶ tr/min*[RPM]*	Max. speed ❷ tr/min*[RPM]*	Max. pressure bar *[PSI]*
Cams with equal lobes	8	2,004 *[122.2]*	1,002 *[61.1]*	3,186	*[1,620]*	90 *[121]*	60 *[80]*	45 *[60]*	145	145	450 *[6,527]*
	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]* / 1,002 *[61.1]*	3,983	*[2,025]*	90 *[121]*	60 *[80]*	45 *[60]*	115	130	

❶ **First displacement**

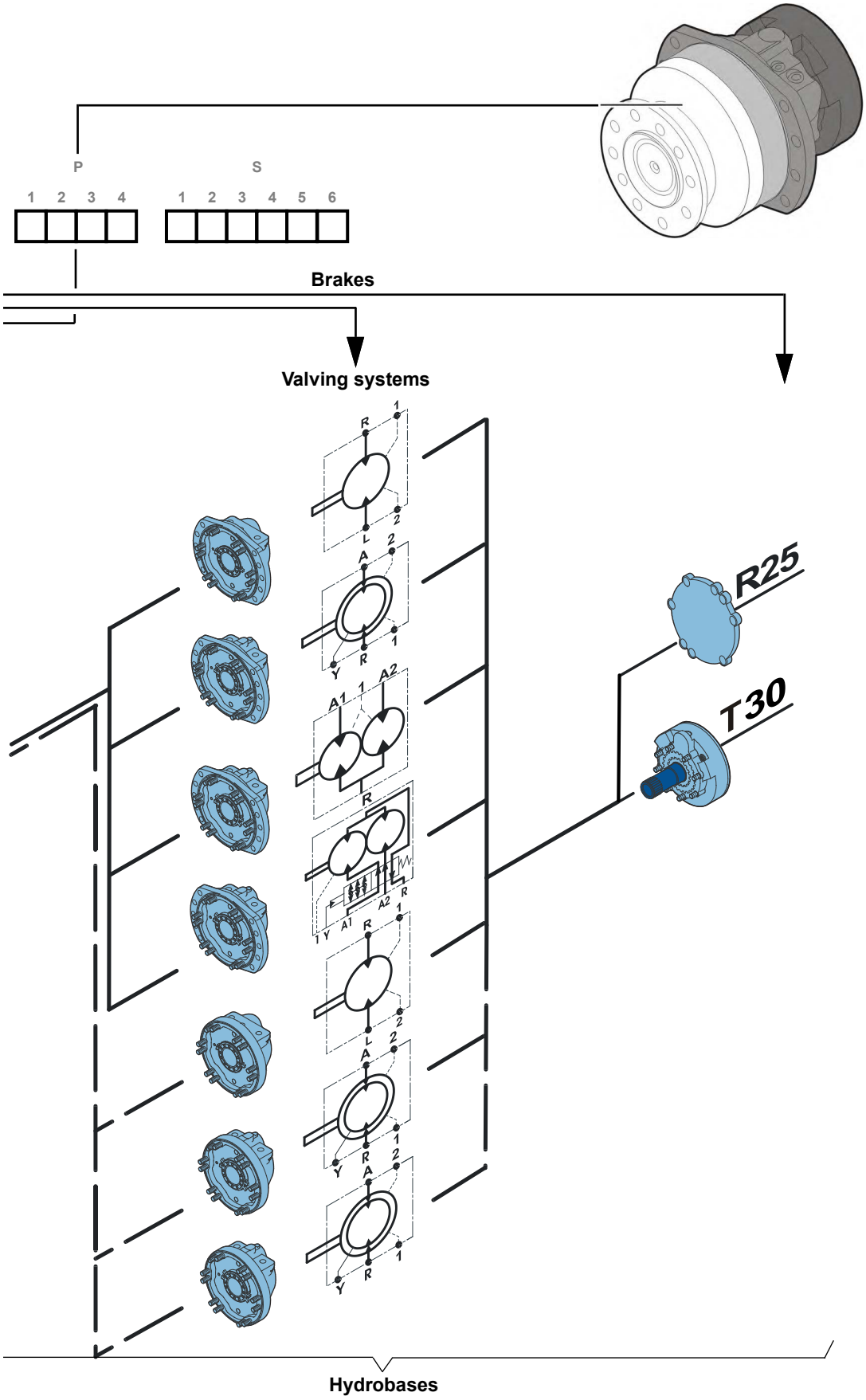
❷ **Second displacement**

CONTENT

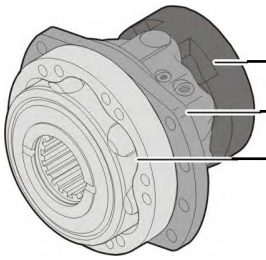
MODUL


C
D
F
1
1 2 3
1 2 3
C
M S 2 5
Torque module
1110
1210
1310
1510
Wheel motor
MS25
2A10
2A50
Shaft motor

ARITY



MODEL



Brake

Valving System

Torque Module

	C	D		F		
	1	1	2	3	1	2	3
C	M	S	2	5						

	❶ cm³/tr *[cu.in/rev.]*	❷ cm³/tr *[cu.in/rev.]*
Cams with equal lobes **8**	2 004 *[122,2]*	1 002 *[61,1]*
0	2 498 *[152,4]*	1 249 *[76,2]*
1	2 752 *[167,8]*	1 376 *[83,9]*
2	3 006 *[183,3]*	1 503 *[91,7]*
Cams with unequal lobes **A**	2 505 *[152,8]*	1 503 *[91,7]* / 1 002 *[61,1]*

❶ **First displacement**
❷ **Second**

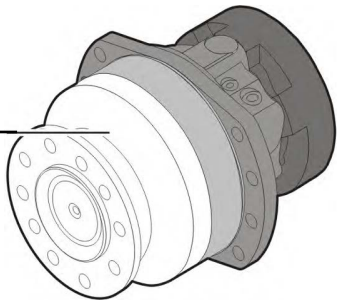
	1	1	-	-
Without mounting				
Lug fixing	2	2	E	V
	1-displacement	2-displacement	Twin-Lock™	Twin-Lock™ or 2-displacement

No transmission cover	**0**
ISO 6162 SAE flanges **ISO 9974-1** metric connections	**1**

1-displacement valving	**1**	
Symmetrical	**A**	Ratio 2
	B	Ratio <2
	C	Ratio >2
2-displacement & Twin-Lock™ valving (Clockwise)	**D**	Ratio 2
	E	Ratio <2
	F	Ratio >2
2-displacement & Twin-Lock™ valving (Counterclockwise)	**G**	Ratio 2
	H	Ratio <2
	J	Ratio >2

		R	2	5
Without brake	Reinforced plate			
Brake	Screwed environmental cover	T	3	0

CODE



Bearing support

P S

1 2 3 4 | 1 2 3 4 5 6

0

0	Without bearing support
1	Without mounting
2	Lug mounting

Without shaft	**0**
10 x Ø24 on Ø335	**1**
12 x Ø25 on Ø425	**2**
10 x Ø24 on Ø335	**3**
12 (8+4) Ø24 on Ø275	**5**
For male shaft bearing support	**A**

Without Options or Adaptations	**0**
Fluorinated elastomer seals	**1**
T4 speed sensor (without rotation direction)	**2**
Industrial bearing support	**6**
Diamond™	**7**
Predisposition for speed sensor	**8**
Double centering	**9**
Hollow shaft	**A**
Drain on the bearing support	**B**
Abrasive environment	**C**
Reinforced sealing	**E**
Special wheel rim mounting	**G**
Surface heat treatment of the shaft	**J**
TD speed sensor (two phase shifted frequencies)	**Q**
TR speed sensor (digital rotation direction)	**S**

Without studs	**1**
With studs + nuts	**2**
With studs	**3**
M threaded holes	**4**

Male shafts	
NF E22-141 splines	**1**
DIN 5480 splines	**5**

Methodology :
This document is intended for manufacturers of machines that incorporate Poclain Hydraulics products. It describes the technical characteristics of Poclain 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:

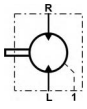
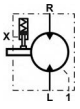
	Safety comment.

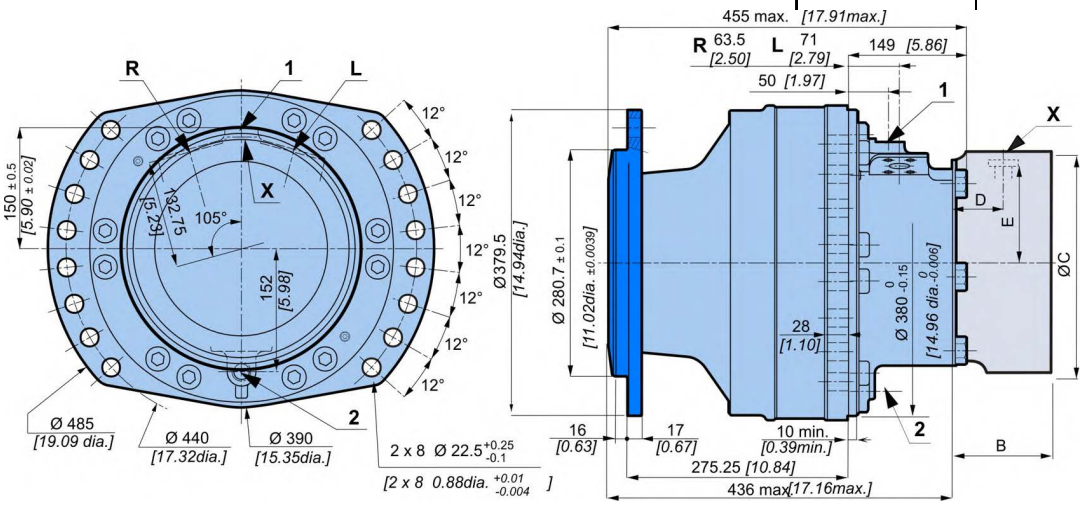
This document also includes essential operating instructions for the product and general information. These are indicated in the following way:

	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 Poclain-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

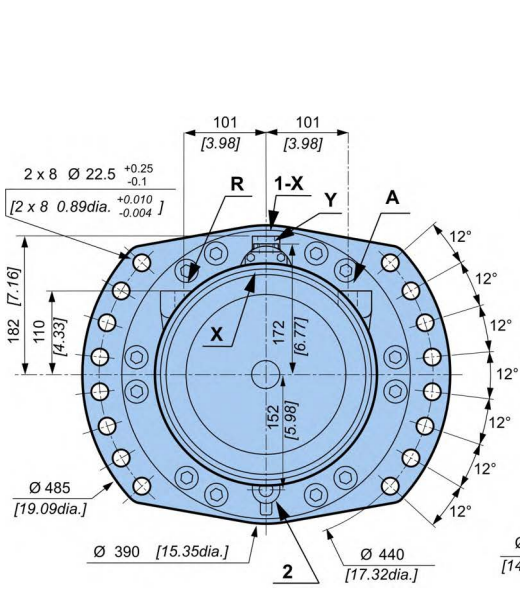
	210 kg *[462 lb]*	270 kg *[594 lb]*
	5.00 L *[300 cu.in]*	4.00 L *[240 cu.in]*
		

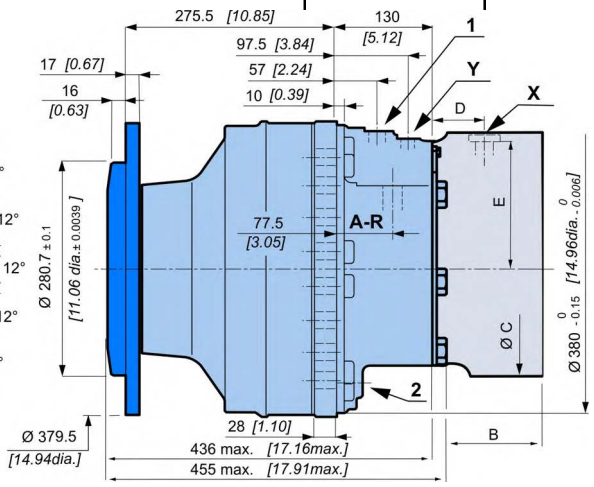


WHEEL MOTOR

Dimensions for standard (1110) 2-displacement motor

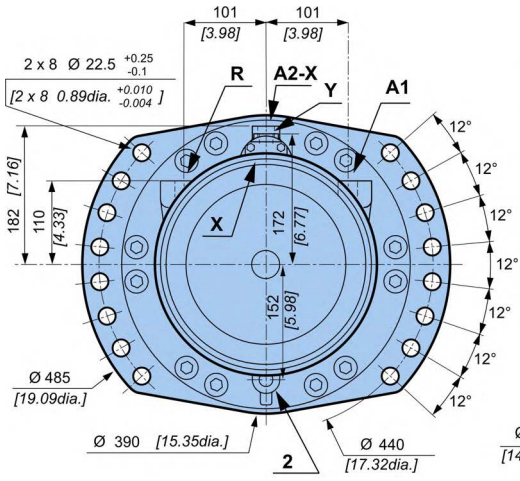
	210 kg *[462 lb]*	270 kg *[594 lb]*
	5.00 L *[300 cu.in]*	4.00 L *[240 cu.in]*

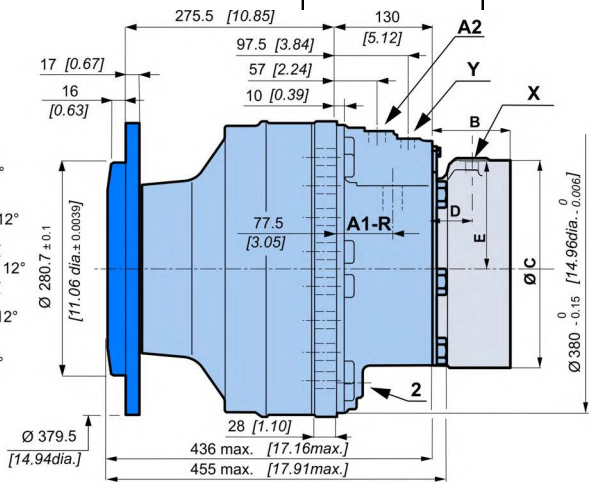




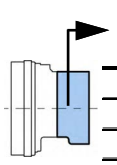
Dimensions for standard (1210) Twin-Lock™

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





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

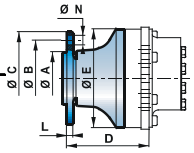
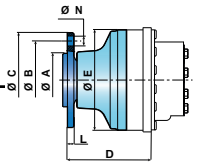


C	T30
B	136.5 *[5.37]*
C	Ø375 *[14.76 dia.]*
D	64.0 *[2.52]*
E	183.5 *[7.22]*

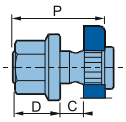
Also see "Brake" section (thumbnail opposite).

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					

C	A mm *[in]*	B mm *[in]*	C mm *[in]*	D mm *[in]*	E mm *[in]*	N mm *[in]*	Wheel rim mountings	L mm *[in]*	
1 1 1 0 (1 2 3 4 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 (1 2 3 4 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 (1 2 3 4 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 (1 2 3 4 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]*	

Studs

		P mm *[in]*	C min. mm *[in]*	C max. mm *[in]*	D mm *[in]*		Class
Various studs	M22 x 1.5	80 *[3.15]*	5 *[0.20]*	36 *[1.42]*	26 *[1.02]*		**12.9**
	M24 x 2	95 *[3.74]*		38 *[1.50]*	30 *[1.18]*		
Screws	M20	-	-				**12.9**

See generic installation motors N°B59689D.

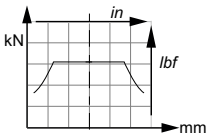
Load curves

Permissible radial loads

Test conditions :

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

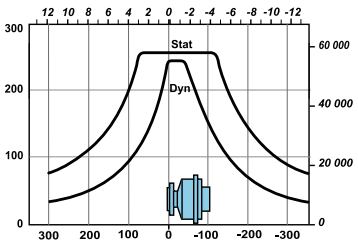
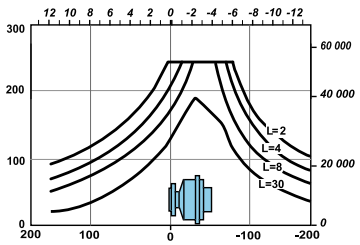
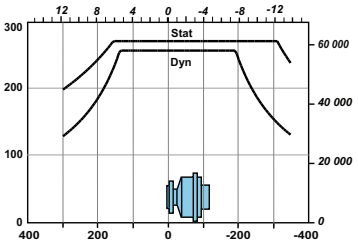
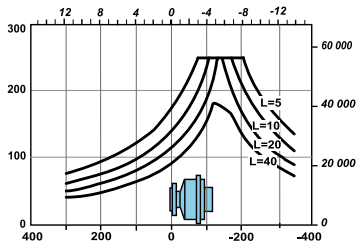
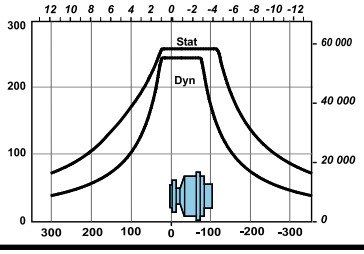
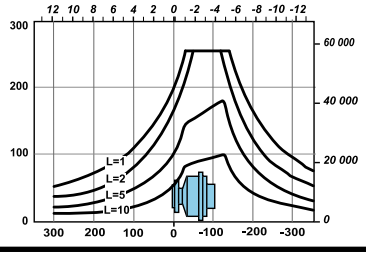
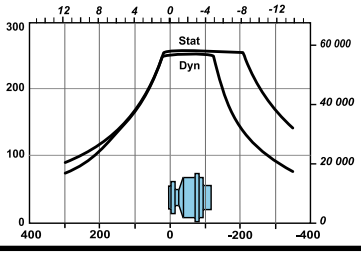
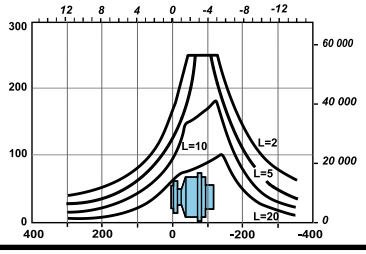
Dynamic : 0 tr/min *[0 RPM]*, code 0 displacement, without axial load at max. torque



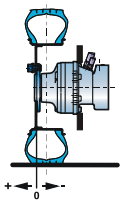
Service life of bearings

Test conditions :

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

1 1 1 0 (1 2 3 4) P		
1 2 1 0 (1 2 3 4) P		
1 3 1 0 (1 2 3 4) P		
1 5 1 0 (1 2 3 4) P		

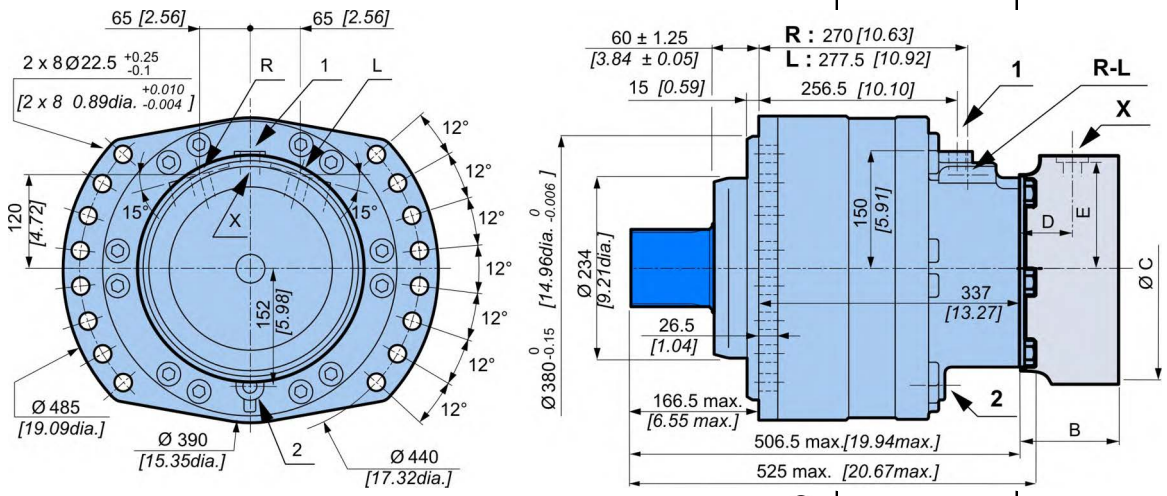
The service life of the components is influenced by the pressure.You must check that the combination of forces applied (Axial load / Radial load) is compatible with the permissible loads for the components, and that the resulting service lives of these components complies with the application's specifications.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



SHAFT MOTOR

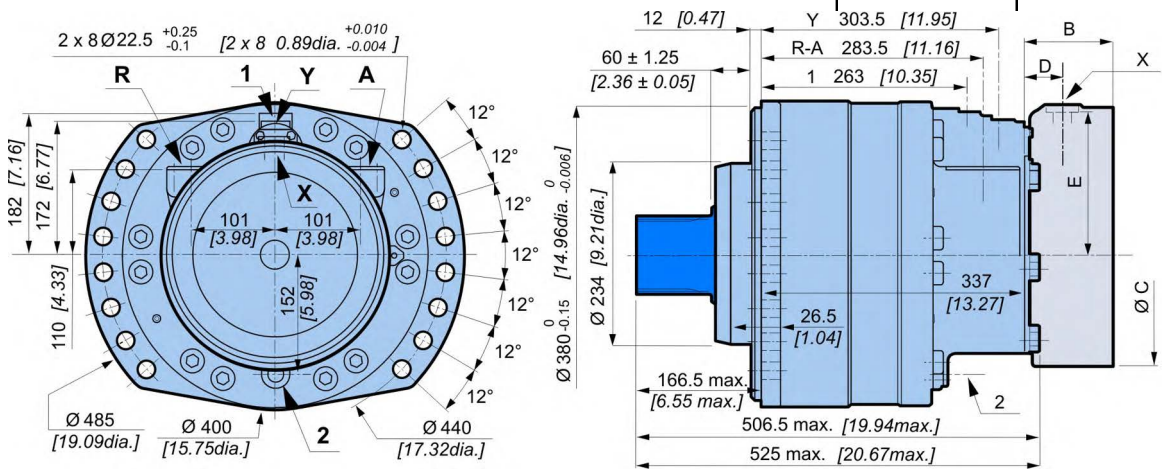
Dimensions for standard (2A50) 1-displacement motor

	195 kg *[429 lb]*	255 kg *[561 lb]*
	5.00 L *[300 cu.in]*	4.00 L *[240 cu.in]*

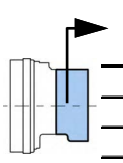


Dimensions for standard (2A50) 2-displacement motor

	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).



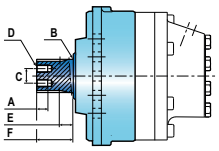
T	3	0

B	136.5 *[5.37]*
C	Ø375 *[14.76 dia.]*
D	64.0 *[2.52]*
E	183.5 *[7.22]*

Also see "Brake" section (thumbnail opposite).

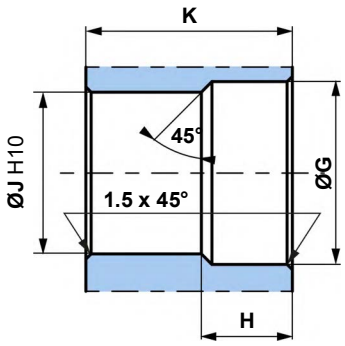
Support types

	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					

			A	B	C	D	E	F	
	DIN 5480 splines								
2 A 5 0 (1 2 3 4 P)	Nominal Ø	100 *[3.94]*	23 *[0.91]*	R 4 *[R 0.16]*	35 *[1.38]*	2 x M14	25 *[0.98]*	105 *[4.13]*	
	Module	3							
	Z	32							
	NF E22-141 splines								
2 A 1 0 (1 2 3 4 P)	Nominal Ø	100 *[3.94]*	23 *[0.91]*	R 4 *[R 0.16]*	35 *[1.38]*	2 x M14	26.5 *[1.04]*	105 *[4.13]*	
	Module	2.5							
	Z	38							

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

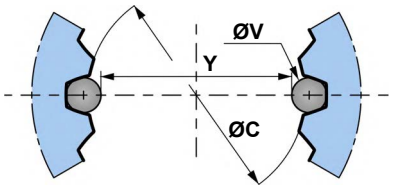
Splined coupling



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

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

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

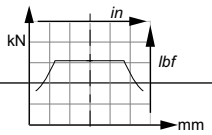


	Ø G	H	Ø J	K	N	Mo	Z	Offset	Ø C (H10)	Ø V	Y	Tolerance µm *[µin]*
2 A 1 0 (1 2 3 4 P)	101 *[3.98]*	28 *[1.10]*	95 *[3.74]*	104 *[4.09]*	100 *[3.94]*	2.5	38	2 *[0.08]*	95 *[3.74]*	5 *[0.20]*	90.125 *[3.55]*	+ 104 / 0 *[+4.0945 / 0]*
2 A 5 0 (1 2 3 4 P)	101.5 *[4.00]*	28 *[1.10]*	94 *[3.70]*	104 *[4.09]*	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



Max. permissible loads: 0 tr/min *[0 RPM]*; 0 bar *[0 PSI]*

Continuous permissible loads:
> 0 tr/min *[> 0 RPM]*; 275 bar *[3 988 PSI]*.

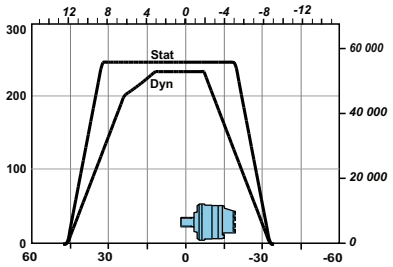
Service life of bearings

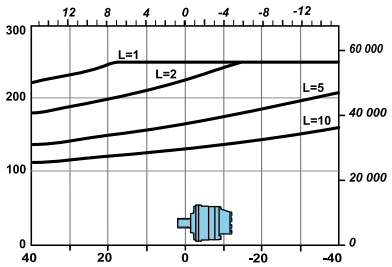
Test conditions :

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

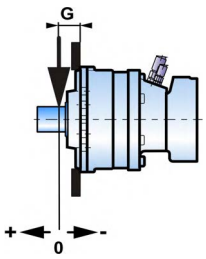
2	A	5	0
2	A	1	0
1	2	3	4

P



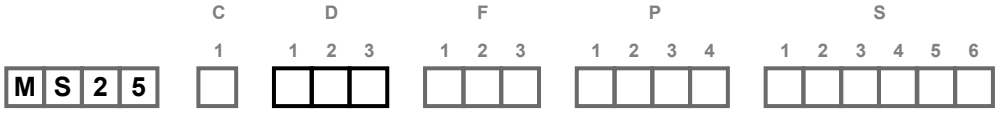


The service life of the components is influenced by the pressure.You must check that the combination of forces applied (Axial load / Radial load) is compatible with the permissible loads for the components, and that the resulting service lives of these components complies with the application's specifications.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



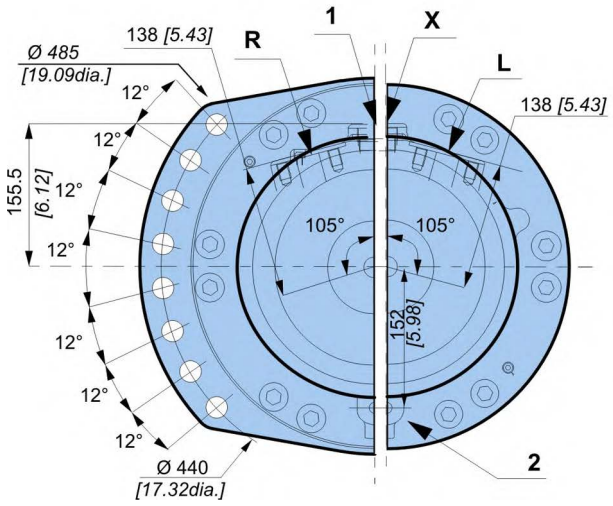
C	G
2 A 1 0	115.75 *[4.56]*
2 A 5 0	125 *[4.92]*

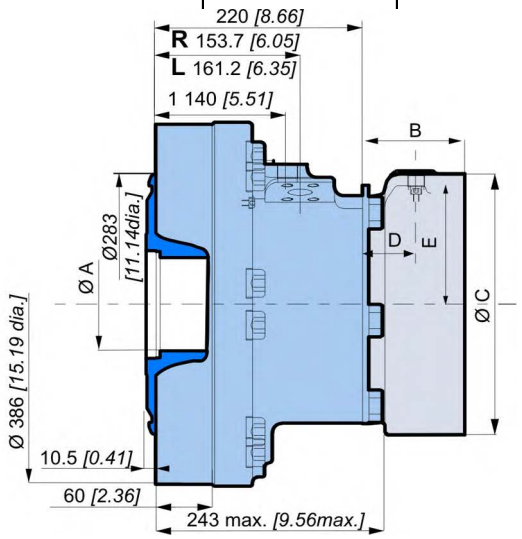
VALVING SYSTEMS AND HYDROBASES

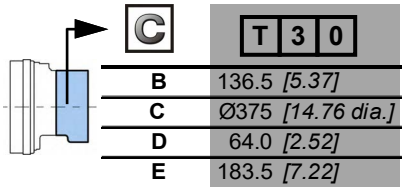


Dimensions for 1-displacement valving

	13.8 kg *[30 lb]*	19.9 kg *[44 lb]*
	0.35 L *[21 cu.in]*	0.45 L *[27 cu.in]*







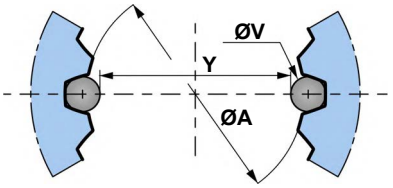
T 3 0	
B	136.5 *[5.37]*
C	Ø375 *[14.76 dia.]*
D	64.0 *[2.52]*
E	183.5 *[7.22]*

Also see “Brake” section (thumbnail opposite).

Cylinder block splines

(as per standard NF E22-141)

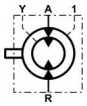
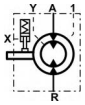
ØA	Module	Z	Dimension on 2 pins Y	ØV
100 *[3.937]*	2.5	38	90.169 *[3.550]*	5 *[0.197]*

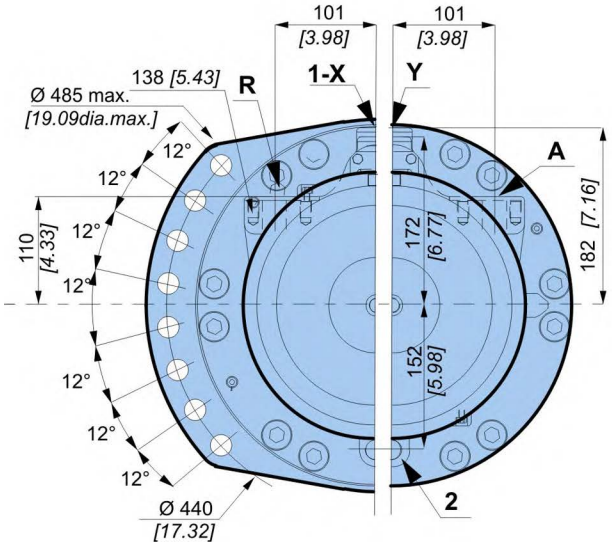


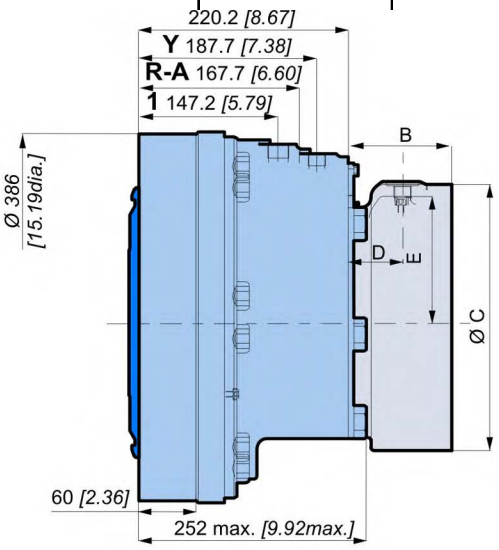
You are advised to have the installation validated by your Poclain Hydraulics application engineer before using the hydraulic unit in an application.

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

Dimensions for 2-displacement valving

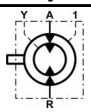
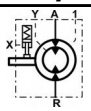
	13.8 kg *[30 lb]*	19.9 kg *[44 lb]*
	0.35 L *[21 cu.in]*	0.45 L *[27 cu.in]*
		

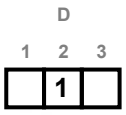


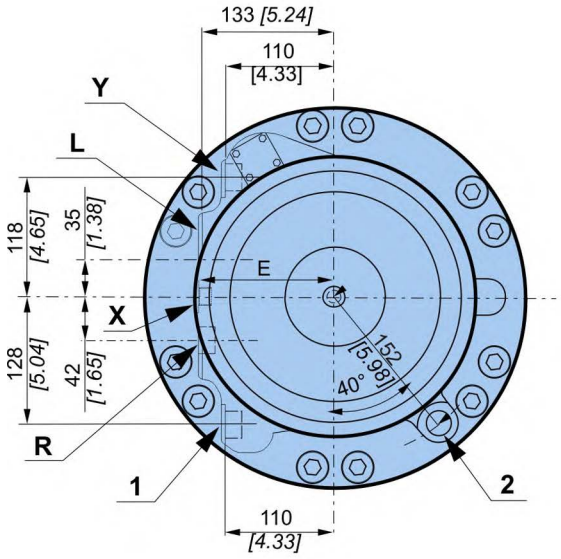


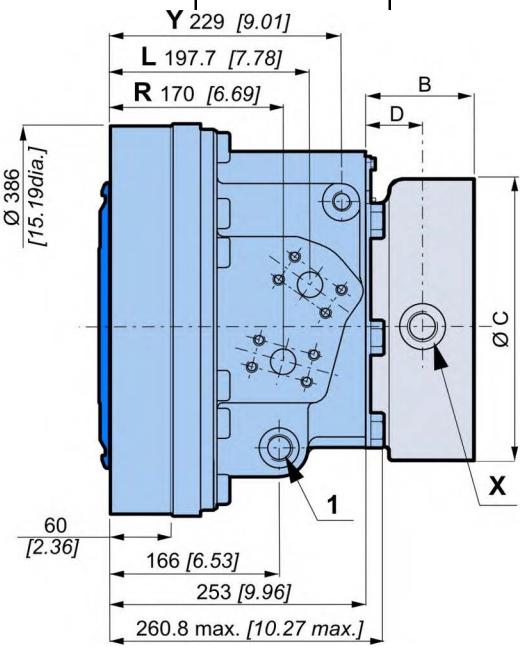
Dimensions for 2-displacement symetrical valving

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

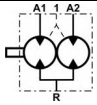
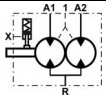
	13.8 kg *[30 lb]*	19.9 kg *[44 lb]*
	0.35 L *[21 cu.in]*	0.45 L *[27 cu.in]*
		

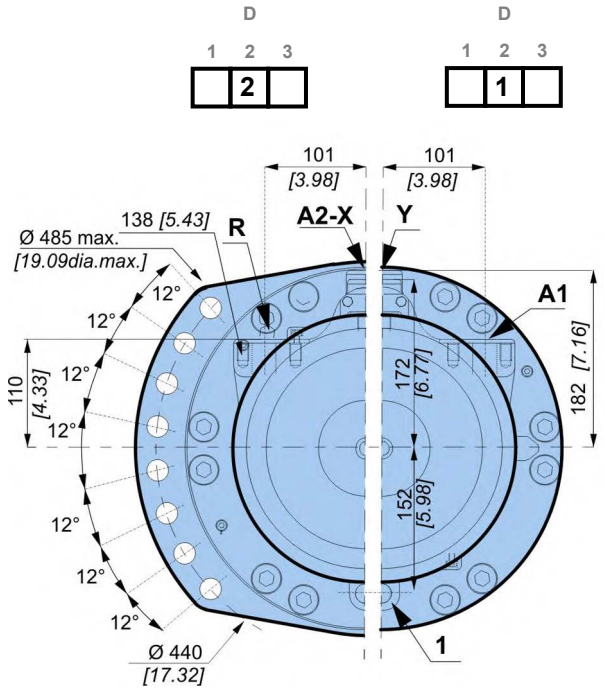


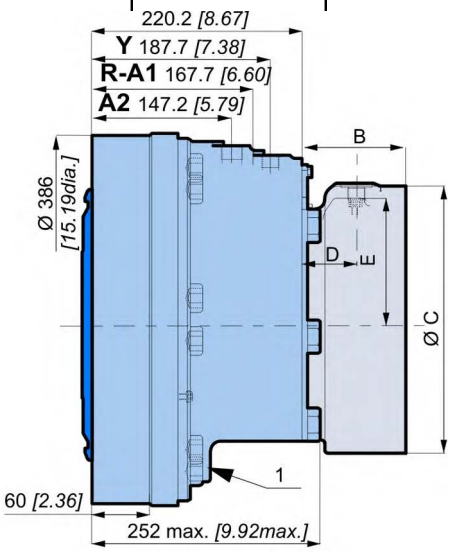


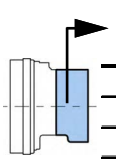


Dimensions for Twin-Lock™

	13.8 kg *[30 lb]*	19.9 kg *[44 lb]*
	0.35 L *[21 cu.in]*	0.45 L *[27 cu.in]*
		



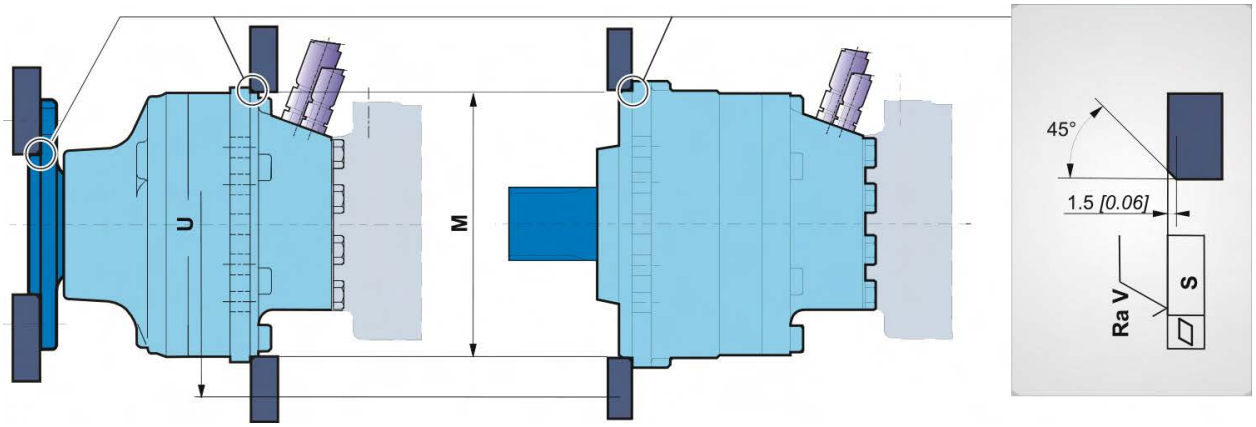




C	T	3	0
B	136.5 *[5.37]*		
C	Ø375 *[14.76 dia.]*		
D	64.0 *[2.52]*		
E	183.5 *[7.22]*		

Also see “Brake” section (thumbnail opposite).

Chassis mountings

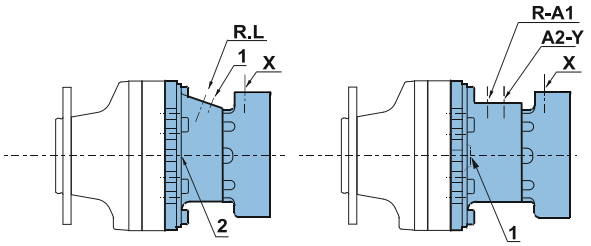


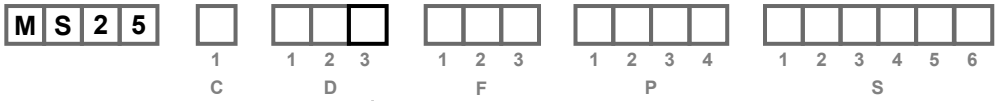
Take care over the immediate environment of the connections.

	ØM (1)	ØU	S	Ra V		Class
Wheel motor Shaft motor	380 *[14.96]*	440 *[17.32]*	0.2 *[0.008]*	12.5µm *[0.49µin]*	2 x 8 Ø22.5 M20 x 2	**8.8**

(1) +0.3 *[+0.012]*
+0.2 *[+0.008]*

Hydraulic connections





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

***** : Only symmetrical valving

You are strongly advised to use the fluids specified in brochure "Installation guide" N° B59689D.

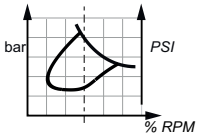
To find the connections' tightening torques, see the brochure "Installation guide" N° B59689D.

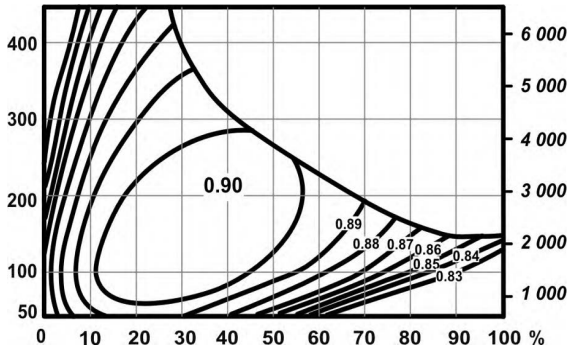
Do not put either a check valve or a poppet valve on the pilot lines (parking brake and displacement change) between the charge pump and the pilot valve. Do not use a piloting valve with integrated check valve.

Efficiency

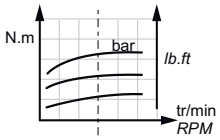
Overall efficiency

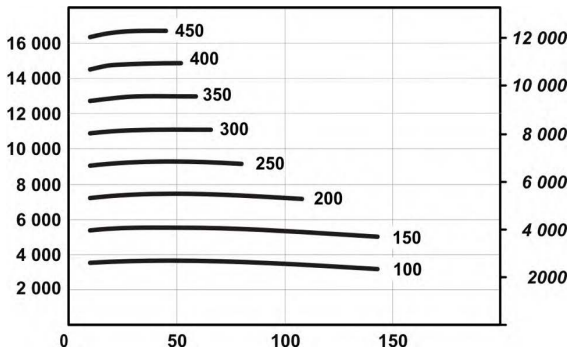
Average values given for guidance for code 0 displacement after 100 hours of operation with HV46 hydraulic fluid at 50°C *[122°F]*.





Actual output torque



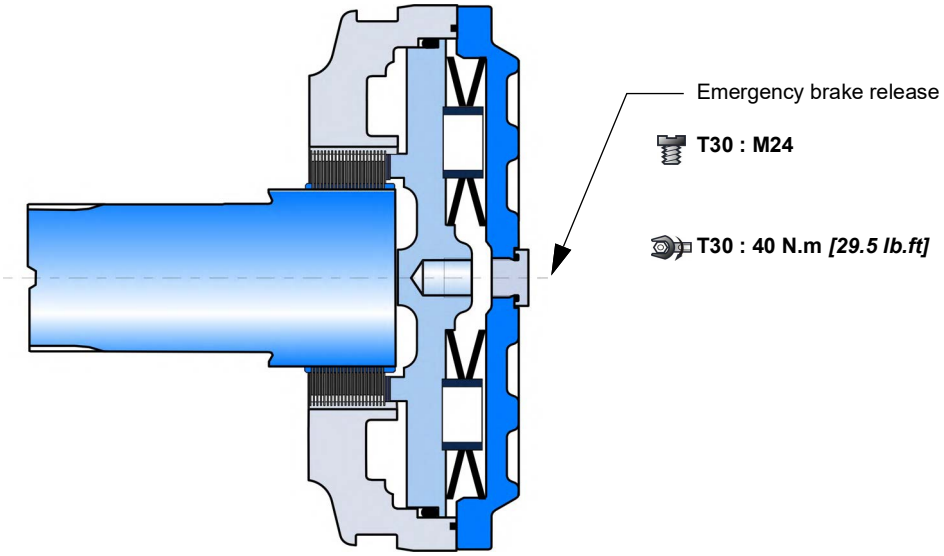


The starting torque is taken to be approximately 85% of the first value for available pressure. For a precise calculation, consult your Poclain Hydraulics application engineer.

BRAKES

Rear brake

	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					T	3	0										



Brake principle

This is a multidisc brake which functions through the absence of pressure. The spring exerts a force on the piston, which acts on the fixed and mobile discs, and thus immobilizes the shaft. The braking torque decreases in linear proportion to the brake release pressure.

C	T 3 0
Parking brake torque at 0 bars on housing (new brake)	30,000 Nm *[22,130 lb.ft]*
Dynamic emergency braking torque at 0 bars on housing (max. 10 uses of emergency brakes)	16,250 Nm *[11,990 lb.ft]*
Residual parking braking at 0 bars on housing *	18,750 Nm *[13,830 lb.ft]*
Min. brake release pressure	10 bar *[145 PSI]*
Max. brake release pressure	30 bar *[435 PSI]*
Oil capacity	450 cm³ *[27.5 cu.in]*
Volume for brake release	96 cm³ *[5.9 cu.in]*

*After emergency brake has been used.

Do not run-in the 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.

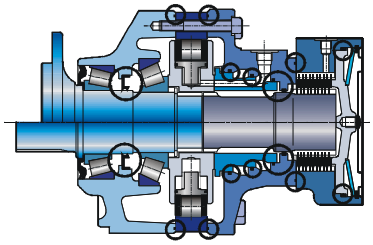
OPTIONS

	C	D		F		P			S					
	1	1	2	3	1	2	3	1	2	3	4	1	2	3	4	5	6
MS25																	

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

1 - Fluorinated elastomer seals

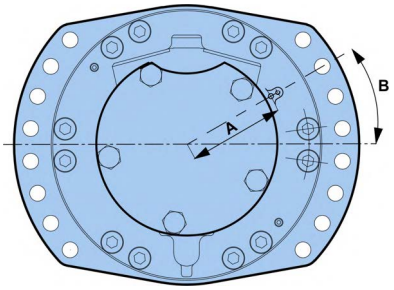
Nitrile seals marked in the figure below replaced by fluorinated elastomer seals.



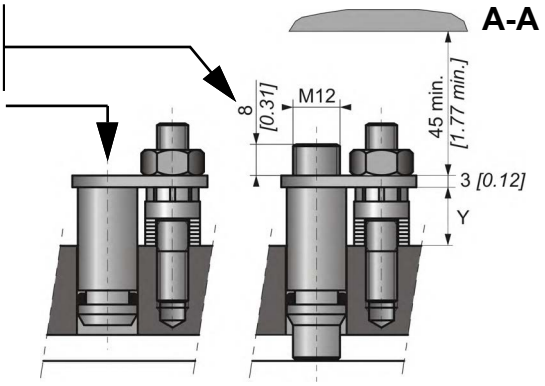
Consult your Poclain Hydraulics sales engineer.

2 - S - Q - 8 - Installed speed sensor or predisposition

Designation	C
T4 speed sensor (without rotation direction)	2
TR speed sensor (digital rotation direction)	S
TD speed sensor (two phase shifted frequencies)	Q
Predisposition for speed sensor	8



	mm *[in]*	mm *[in]*
A	118.9 *[4.68]*	118.9 *[4.68]*
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. B61352L.

6 - Industrial support

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

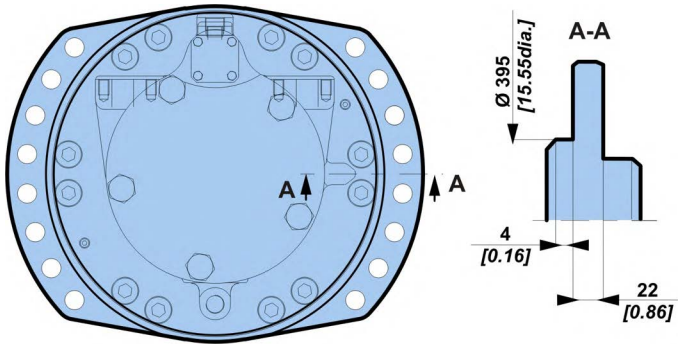
For a precise calculation, consult your Poclain Hydraulics application engineer.

7 - Diamond™

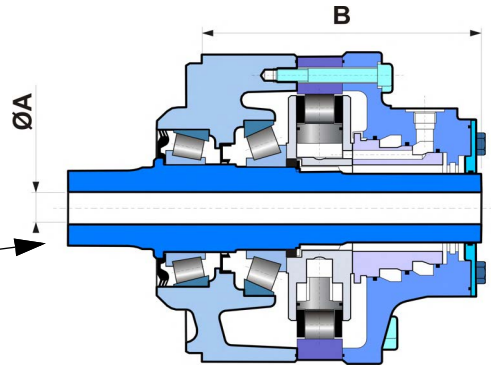
Special treatment of the motor core which considerably increases its strength, making the motor much more tolerant to temporary instances of the operating conditions being exceeded.

9 - Double-centering valving cover

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



A - Hollow shaft

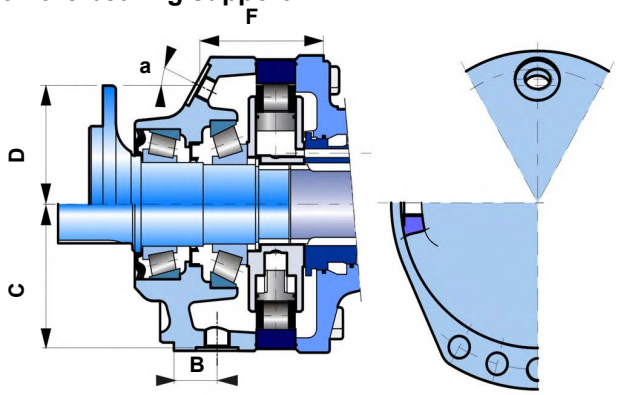


2 M8 screws: Ø 80mm *[3.14"dia.]* diametrically opposite.
Threaded depth
12 mm min. *[0.47"min.]*

A mm *[in]*	B mm *[in]*
Ø 60 *[2.36 dia.]*	352.5 *[13.88]*

Radial load x 0.75
No torque transmittable to the rear

B - Drain on the bearing support

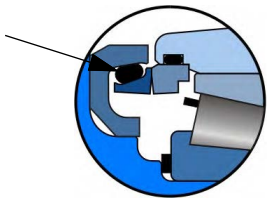


		B	C	D	F	a
		mm *[in]*	mm *[in]*	mm *[in]*	mm *[in]*	
Shaft motor	**M22 x 1.5**	56.0 *[2.20]*	193 *[7.60]*			
Wheel motor				112.0 *[4.41]*	113 *[4.43]*	30°

C - Abrasive environments (mechanical seal)

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

Mechanical seal

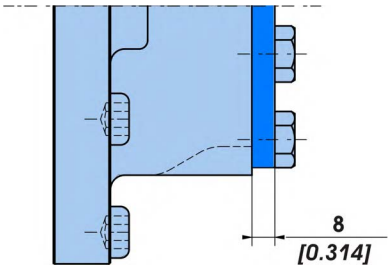


These seals are available for standard wheel motors and short wheel motors.

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]*).

	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		R 2 5		E



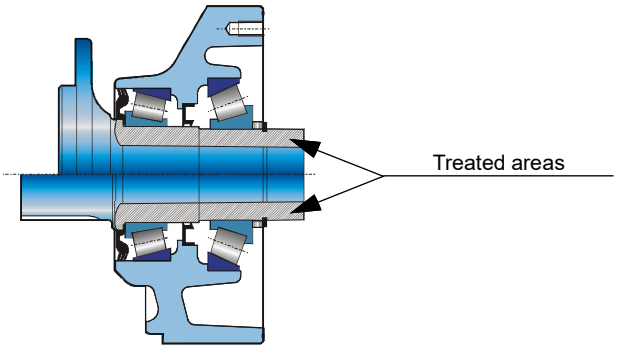
G - Special wheel rim mounting

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

Consult your Poclain Hydraulics sales engineer.

J - Treated shaft

Heat treatment on the indicated bearing radius and splines.



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