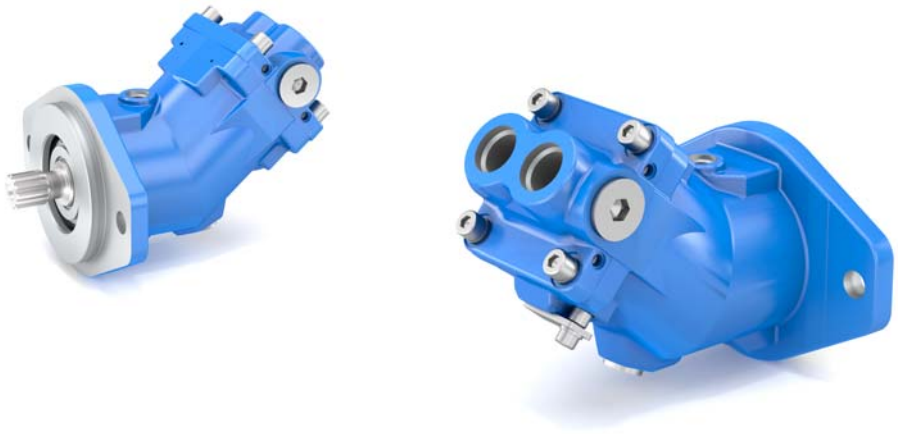
PAB

FIXED DISPLACEMENT BENT-AXIS PUMP



TECHNICAL CATALOG

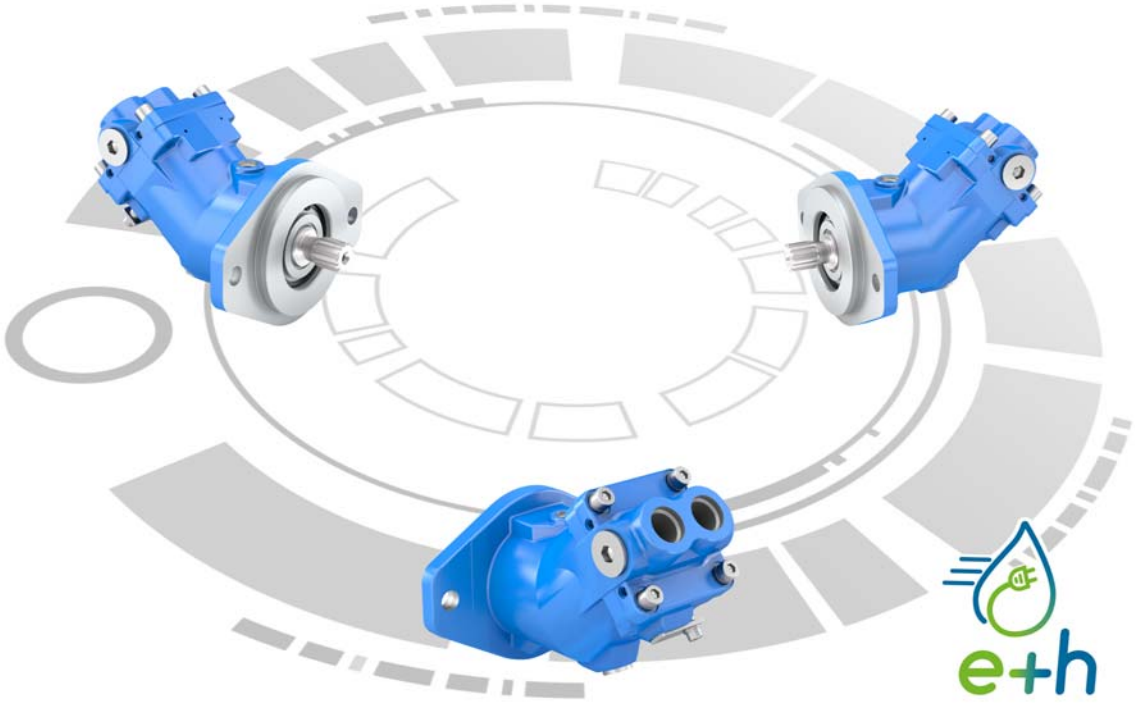
POCLAIN Hydraulics

e+h

INTRODUCTION

The Poclain Hydraulics bent-axis fixed displacement pumps are hydraulic axial piston pumps for closed-loop circuits.

Capacity	Pressure	Speed	Hydraulic ports	Coupling
10 - 18 cc	400 - 450 bar	6 500 rpm	UNF	SAE-B



CONTENT






SAFETY INSTRUCTIONS

Display of safety instructions

Standardized safety instructions, symbols, terms and abbreviations are used so that you can use this documentation to work quickly and safely with your product. To give you a better understanding they are explained in the sections below.

⚠ SIGNAL WORD **Type and source of the hazard!**

Consequences of not avoiding the hazard.

- Indication of how to avoid the hazard.

- **Safety sign:** Draws attention to the hazard.
- **Signal word:** Identifies the degree of the hazard.
- **Type and source of hazard:** Identifies the type and source of the hazard.
- **Precautions:** States how to avoid the hazard.

Danger classes in accordance with ANSI Z535.6

Safety sign, Signal word	Meaning
⚠ DANGER	**Identifies a dangerous situation that will result in death or serious injury if not avoided.**
⚠ WARNING	**Identifies a dangerous situation that may result in death or serious injury if not avoided.**
⚠ CAUTION	**Identifies a dangerous situation that will result in moderate or minor injuries if not avoided.**
NOTICE	**Damage to equipment: the product or the environment risks damage.**

Symbols

The following symbols mark notes that are not relevant to personal safety, but are intended to make this documentation easier to understand.

Symbol	Meaning
	**Poclain Hydraulics disclaims any liability for damage of any kind if use of the product is not compliant with a recommendation identified with this symbol.**
	**General information regarding the product or the repair procedure.**
	**Information on the model number.**
	**Weight of component without oil.**
	**Indication of necessary volume of oil.**
	**Units.**
	**Indication of necessary tightening torque.**
	**Screws.**
	**Information intended for Poclain-Hydraulics personnel.**

AND METHODOLOGY

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)

General safety instruction

WARNING **Risk for product user and by-stander!**

Inappropriate installation of the product can cause damage to product itself, to other components or to injuries to users and by-standers.

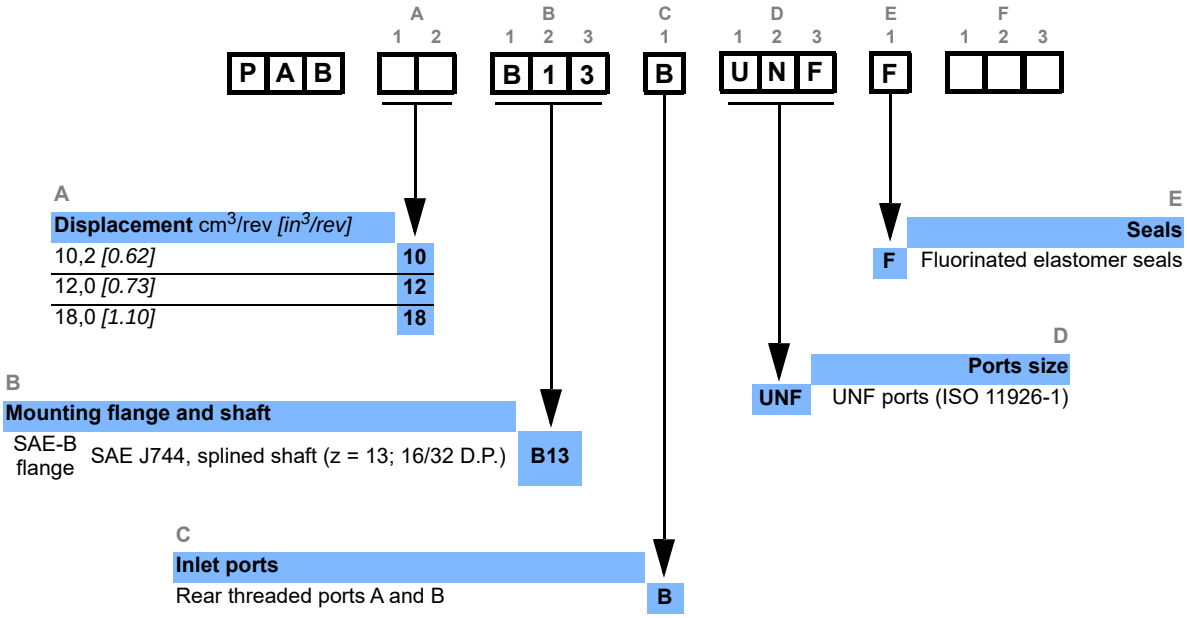
- Follow Poclain instructions for mounting in Installation Guide – B61352L.

Intended use

Poclain PAB pumps are specifically designed for Poclain “e+h” Electrohydraulic systems with Poclain ME1 emotors to drive close loop transmissions of mobile applications.
Refer to Poclain Electromobility system technical catalog B79372X for more details about intended use.

Any use other than that described as Intended use is considered improped and is therefore impermissible. Poclain Hydraulics accepts no liability whatsoever for damage resulting from improper use. The user bears all risks arising from improper use.

MODEL CODE



TECHNICAL SPECIFICATIONS

Commercial name		PAB 10	PAB 12	PAB 18
Part number		B68594H	B68098T	B68595J
Displacement	cm³/rev *[in³/rev.]*	10,2 *[0.62]*	12,0 *[0.73]*	18,0 *[1.10]*
Max. speed continuous	rpm		8 000	
Max. speed intermittent	rpm		8 800	
Max. flow absorbed	L/min *[GPM]*	82 *[21.6]*	96 *[25.4]*	144 *[38.0]*
Max. drain absolute pressure continuous / peak	bar *[PSI]*		4 *[58]* / 5,5 *[80]*	
Max. absolute pressure continuous	bar *[PSI]*		400 *[5 801]*	
Max. absolute pressure	bar *[PSI]*		450 *[6 525]* *	
Torque	Nm/bar *[lb.ft/PSI]*	0,16 *[0.0082]*	0,19 *[0.0097]*	0,29 *[0.0145]*
Torque at 350 bar *[5 100 PSI]*	Nm *[lb.ft]*	57 *[47]*	67 *[49]*	100 *[74]*
Theoretical max. power at 400 bar *[5 801 PSI]*	kW *[HP]*	54,4 *[72.9]*	64 *[85.7]*	96 *[128.7]*
Mounting flange and shaft			SAE-B	
Weight	kg *[lb]*		6,5 *[14.3]*	
Rotation			Clockwise or Counterclockwise	

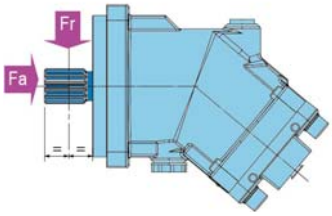
* Max pressure peak for 6s max in a row every minute.

Acceptable forces applied to motor shaft

Radial force measured at mid point of shaft (Fr)	N *[lbf]*	2 350 *[528]*	2 800 *[630]*	4 000 *[900]*
Axial force which tends to push the shaft inwards (Fa)	N/psi *[lbf/psi]*	0,83 *[0.19]*	1,03 *[0.23]*	1,37 *[0.31]*
	N/bar *	12	15	20

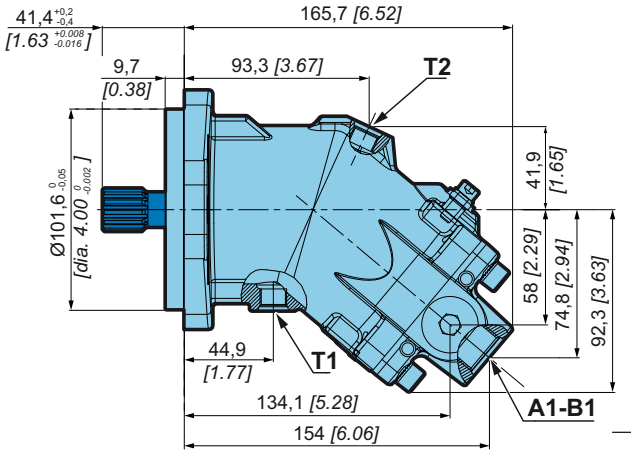
* Differential pressure between A and B.

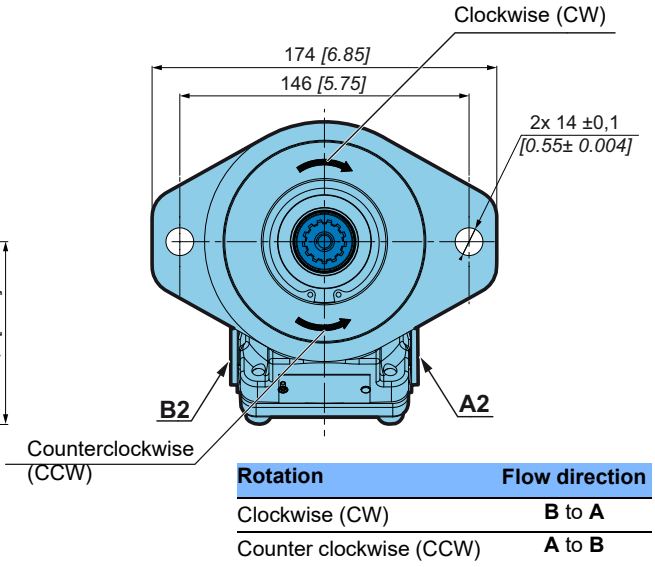
Fr: Radial force measured at mid point of length of shaft
Fa: Axial force which tends to push the shaft inwards



Do not strike on the motor shaft during the assembly.

Main dimensions

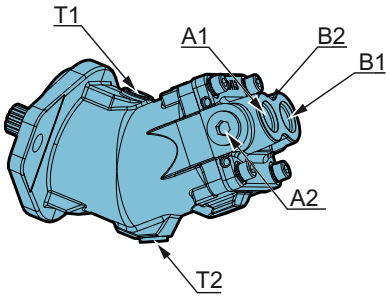




Rotation	Flow direction
Clockwise (CW)	**B** to **A**
Counter clockwise (CCW)	**A** to **B**

Standard motors are designed to run CW or CCW. The motors rotate clockwise or counter-clockwise depending on the direction of hydraulic flow entering the motor. For the mono-direction motors, respect the direction of rotation (see the drawing supplied at the validation of the item).

Port characteristics

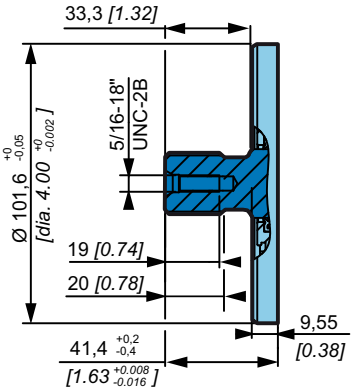


Port	Function	ISO 11926-1
A1-A2	Inlet / Outlet	7/8-14 UNF-2B
B1-B2		
T1-T2	Drain	9/16-18 UNF-2B

Splined shaft

	A		B			C	D			E	F		
	1	2	1	2	3	1	1	2	3	1	1	2	3
	P	A	B										
			B	1	3	B	U	N	F	F			

B13 **SAE J744, 13 teeth (16/32 D.P.)**

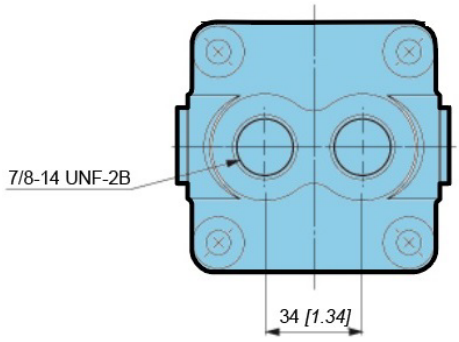


Splined ANSI B92.1b-1996
Pitch 16/32" DP
Pressure angle 30°
Tolerance class: 5

Inlet ports

	A		B			C	D			E	F		
	1	2	1	2	3	1	1	2	3	1	1	2	3
	P	A	B										
			B	1	3	B	U	N	F	F			

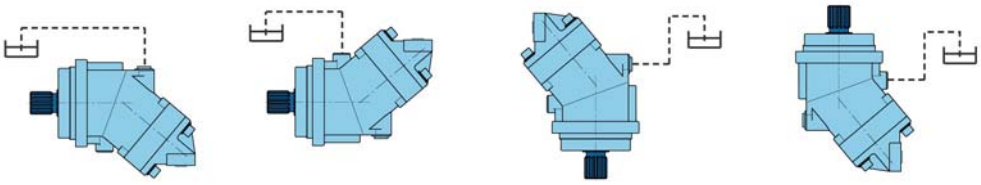
B **Rear threaded ports A and B**



OPERATING PARAMETERS

Mounting position

Motors can be used in whatever the mounting position. In "shaft upwards" position, make sure that the motor housing is completely filled with fluid.



Connection

Connect the pressure lines and drain line according to our recommendations. The customer is responsible for dimensioning the lines.

Pressure ratings

Maximum peak absolute pressure
It is the maximum allowable pressure. It is equivalent to the maximum setting. A self-propelled machine can reach the maximum peak pressure value no more than 1-2% of that work cycle.
* Max. pressure peak for 6s max in a row every minute.

Work cycle
A fundamental factor for ensuring correct hydrostatic transmission sizing is the machine work cycle (pressure-time ratio, seasonality, pressure vs. percentage of time at max. displacement, machine type). Part service life depends on the correct choice in relation to the work cycle.

Overloads
It is mandatory to protect parts against any possible overloads.

Speed ratings

The chapter Technical specifications,page 6, gives minimum and maximum rated speeds. Note that all displacements might operate under different speed limits. Definitions of these speed limits appear below.

Maximum speed is the highest operating speed allowed. Over speeding reduces pump life time, can lead to loss of hydrostatic power and braking capacity. Never exceed the maximum speed limit under any operating conditions.

Nominal speed is the speed offering the maximal efficiency.

Start-up

Start the motor at low speed and no load, until the motor is completely filled and no air remains.

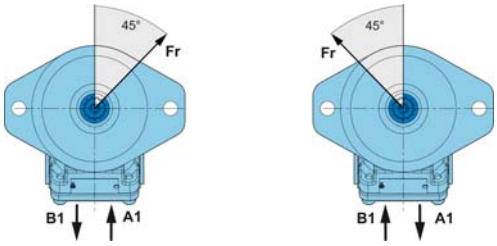
Drain line

Use the drain port which is in the highest position (T1 or T2). To avoid excessive pressure in the housing, the drain line must be connected directly to the tank and must always be submerged in fluid.

Maximum acceptable pressure in the housing	
Continuous	4 bar *[58 PSI]*
Peak	5,5 bar *[80 PSI]*

Maximizing service life of bearings

In cases where there is a radial force on motor shaft, keeping the direction of that force within the shaded areas will improve service life of the motor.



Theoretical output

Theoretical output flow is a function of pump displacement and speed. It is relevant to size the rest of the circuit. Theoretical flow does not take into account losses due to leakage or variations in displacement. Refer to Technical specifications, page 6.

Poclain Hydraulics recommendations for fluid

Poclain hydraulics recommends the use of hydraulic fluids defined by the ISO 15380 and ISO 6743-4 standards.
For temperate climates, the following types are recommended.
- HM 46 or HM 68 for fixed installations.
- HV 46 or HV 68 for mobile installations.
- HEES 46 for mobile installations.

These specifications correspond to category 91H of the CETOP standard, parts 1, 2 and 3 of the DIN 51524 standard, and grades VG32, VG 46 and VG68 of the ISO 6743-4 standards.

It is also possible to use ATF, HD, HFB, HFC or HFD type hydraulic fluid upon Poclain Hydraulics specific approval of the components' operating conditions.

Standardized designations for the fluids
- **HM :** Mineral fluids having specific antioxidant, anticorrosion and antiwear properties (HLP equivalent to DIN 51524 parts 1 and 2).
- **HV :** HM mineral fluids providing improved temperature and viscosity properties (DIN 51524 part 3).
- **HEES :** Biodegradable fluids based on organic esters.

It is also possible to use a fluid that meets the biodegradability criteria and is compatible in the event of accidental food contact. The BIOHYDRAN FG 46 fluid designed by the company Total has undergone testing of its properties and performance on our test benches. Since this type of fluid has not yet been categorized, it is the responsibility of machine manufacturers to validate its compatibility with all of the components used in order to guarantee that the intended functions will be fulfilled and this for the desired life time of all equipment items.

For biodegradable fluids, consult your Poclain Hydraulics' application engineer

During operation, the temperature of the oil must be between 0°C *[32°F]* and 80°C *[176°F]*; the minimum and maximum temperatures may be exceeded momentarily by ± 20°C *[+ 68°F / -4°F]* for a duration of less than 30 minutes.
For all applications outside these limits, please consult with your Poclain Hydraulics' application engineer.

Pump storage

If the pump stays on stock for more than 6 months, a status verification must be performed before you install it on a machine. Pay attention to sealing condition, rust presence and free rotation of shaft.

Pump installation

You are strongly advised to follow installation instructions specified in Installation guide No. B61352L.

Fluid and filtration

The contaminating particles suspended in the hydraulic fluid cause the hydraulic mechanisms moving part wear. On hydraulic pumps, these parts operate with very small dimensional tolerances. In order to reach the part life, it is recommended to use a filter that maintains the hydraulic fluid contamination class at a max. of:

9 according to NAS 1638
20/18/15 according to ISO 4406:2021

According to the type of application decided for the pump, it is necessary to use filtration elements with a filtration ratio of:

β 20 to 30 ≥ 100

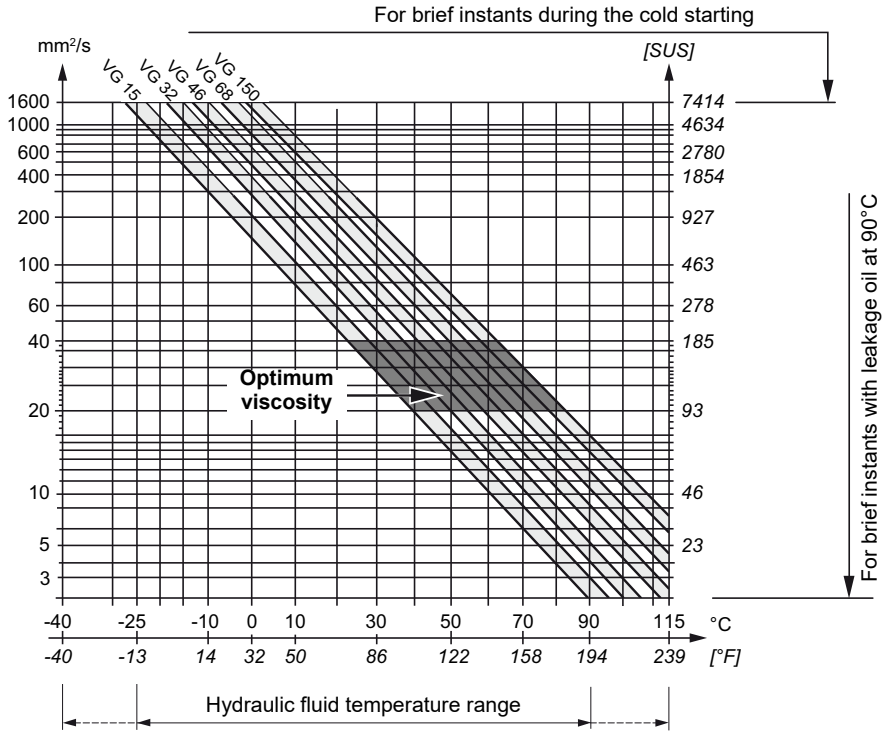
Making sure that this ratio does not worsen together with the increasing of the filter cartridge differential pressure.

If these values cannot be observed, the component life will consequently be reduced and it is recommended to contact the Poclain Hydraulics Customer Service.

Viscosity range

For both max. efficiency and life of the unit, the operative viscosity should be chosen within the optimum range of:
√opt = optimum operating viscosity from 16 to 36 mm^2/s *[from 74.1 to 166.8 SUS]* referred to the closed loop temperature.

Working conditions: the following limits of viscosity apply
√min = 5 mm^2/s *[23 SUS]* short-duration at a max. permissible leakage oil temperature of 90° C *[194°F]*
√max = 1000 mm^2/s *[4 634 SUS]* short-duration, on cold start.



Ensure fluid temperature and viscosity limits are concurrently satisfied.

POCLAIN
Hydraulics

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