

## Bent Axis Pumps



### Description

This hydraulic pump is a Bent - Axis type pump, with fixed displacement, developed under the design of spherical head pistons. This design is extremely efficient, as well as high performance. This hydraulic pump is a **NEW GENERATION** pump for the Global Auxiliary Power market. Because of the high torque requirements this pump comes with an ISO 7653 DIN this pump comes with an ISO 7653 DIN mount and SAE B/BB standards. All global PTO manufacturers offer this output option.

### Installation and start up

All of our pumps have ISO 7653 DIN mounting flanges. FR pumps can be driven by the PTO of the truck, an electric motor, diesel engine (with an elastic coupling) or cardan shaft.

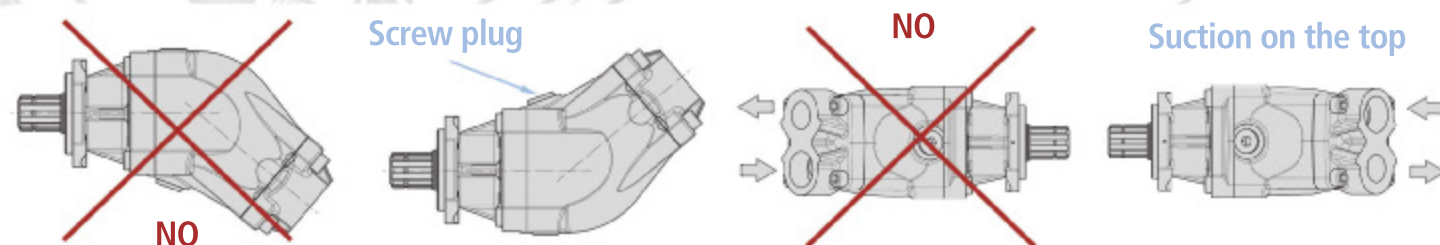
Mounting position: the drive shaft should be horizontal.

If pump is mounted above the tank level, special measures should be taken to assure that the pump will be full of oil under all circumstances.

**Important: Assure that O-ring is in the slot of the suction pipe.**

Initial start up:

Clean all the hydraulic system before filling with oil. Fill the pump with oil through the suction and pressure orifices. If the pump is mounted above the tank, you should also add oil through the screw plug in the housing. FR pumps are self bleeding and self priming. Start without pressure at a moderate speed (500 r.p.m.). If no oil flow is detected after 15 seconds, stop and check that the suction line is open and the direction of rotation is correct.



### Hydraulic Fluid

Use mineral based oils for hydraulic systems. To select the correct viscosity, the operating temperature of the oil, measured in the tank should be considered. At operating temperature, the viscosity of the oil should be within the range of 20-35 cSt. The oil in the housing of the pump (leakage oil) is typically at a higher temperature than the tank temperature. Maximum temperature at any point in the system must be less than 90°C / 194°F. If this temperature is exceeded in the housing of the pump, special shaft seals should be used.

Please, use the following guidelines to choose the correct oil grade:

20-40°C: VG 22 - VG 32.

40-60°C: VG 32 - VG 46

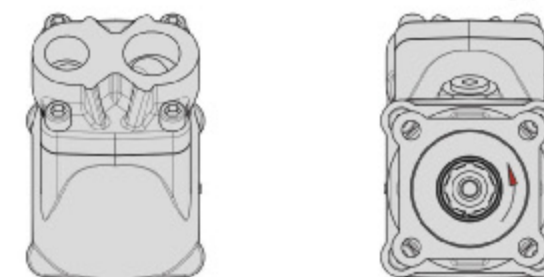
60-90°C: VG 68 - VG 100

The finer the filtration, the better the achieved purity grade of the fluid, and the longer the life of the pump. Purity grades of 18/13 (ISO 4406) or 9 (Nas 1638) should be guaranteed by the filtration system. We suggest a return filter, (avoid a filter in the suction line) with a mesh from 10 µm (high pressure and/or contaminated environment) to 25 µm (low pressure and clean environment). The flow capacity of the filter should be at least twice the pump flow under the operating conditions.

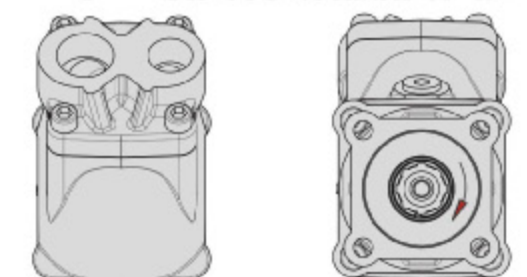
### Rotation

The direction of rotation of the pump can be changed by removing the four screws of the iron cover, and rotating it 180°. An arrow is drawn in both the housing and the cover indicating the direction of rotation. All pumps are supplied with clockwise rotation unless otherwise specified.

#### Counterclockwise

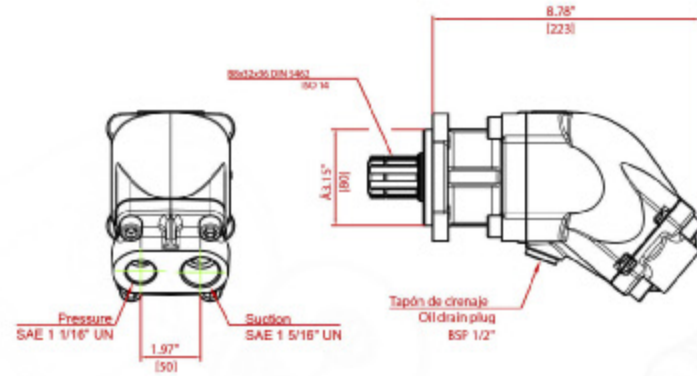


#### Clockwise rotation

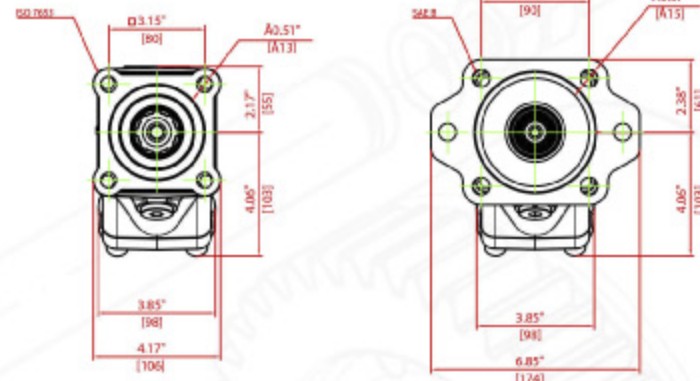


## Dimensions

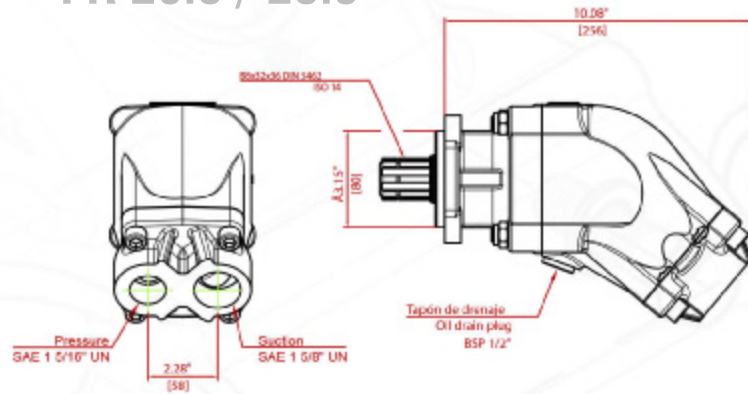
### FR 10.4 / 15.8



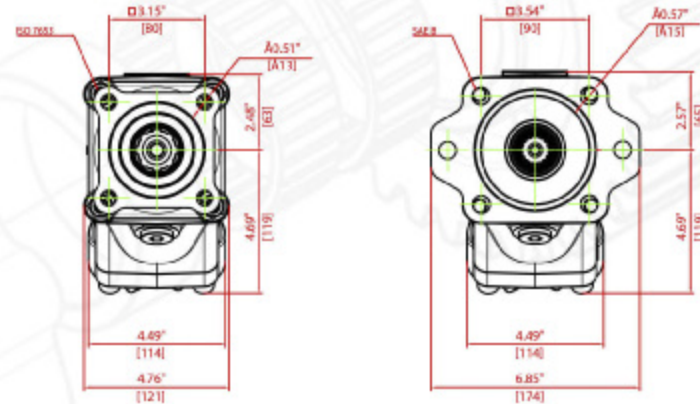
### (SAE B FLANGE Z=13) FRB 10.4 / 15.8



### FR 20.8 / 28.9

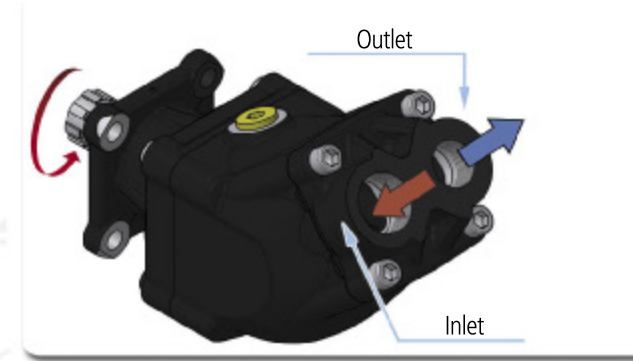


### (SAE BB FLANGE Z=15) FRB 20.8 / 28.9

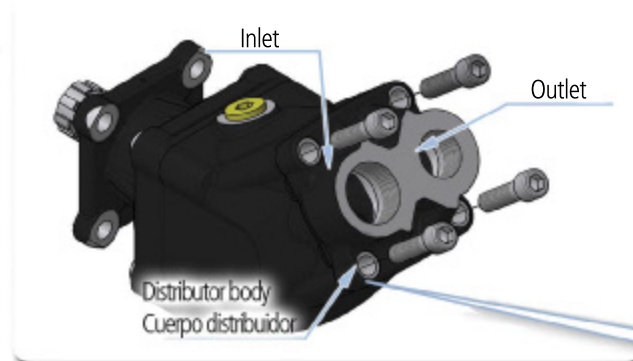


Pump		Bent Axis Pump 10.4	Bent Axis Pump 15.8	Bent Axis Pump 20.8	Bent Axis Pump 28.9
P/N Clockwise	ISO	5042206	5042406	5042606	5042806
	SAE	5045406 (Z=13)	5045606 (Z=13)	5045806 (Z=15)	5046006 (Z=15)
P/N Counterclockwise	ISO	5042306	5042506	5042706	5042906
	SAE	5045306 (Z=13)	5045506 (Z=13)	5045706 (Z=15)	5045906 (Z=15)
Displacement (Cuin / rev)		2.44	3.66	4.88	6.71
Pressure max. (PSI)	ISO	5076	5076	5076	5076
	SAE	4500	4500	4500	4500
Speed r.p.m.	Máx. continuous	2000	1700	1500	1400
	Máx. intermittent	2600	2300	2000	1900
Power (HP)	Cont.	50	60	72	95
	Máx. int	67	78	88	
Weight (Lb)	ISO	20.94	22.04	33.06	33.06
	SAE	22	23.72	34.39	34.39

## Direction of Rotation / Change of Rotation



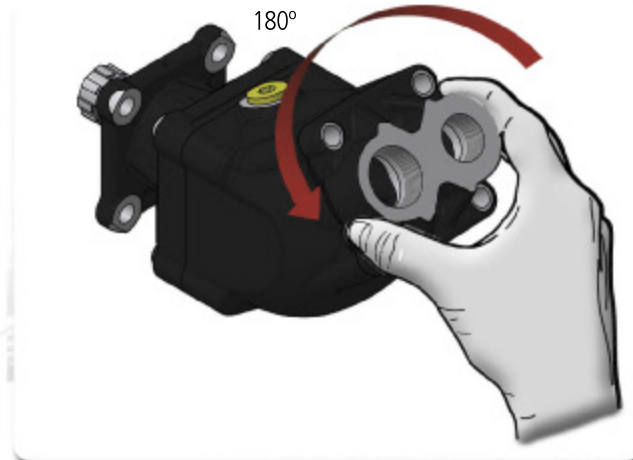
Choosing the direction of rotation.  
Clockwise rotating pump.



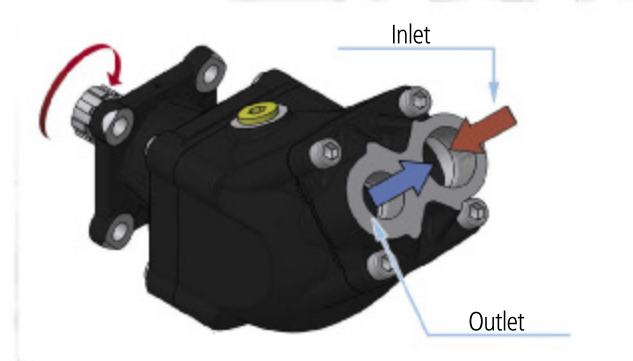
To change the direction of rotation remove the 4 screws and, keeping the distributor body close to the pump, rotate it by 180°. Tighten the 4 screws at 58 ± 4 L.b.f.t.



"Arrow indicating the direction of rotation"



Be sure not to break the gasket.  
During this operation the distributor body must not move away from the pump body more than 0.08"



Anticlockwise rotating pump