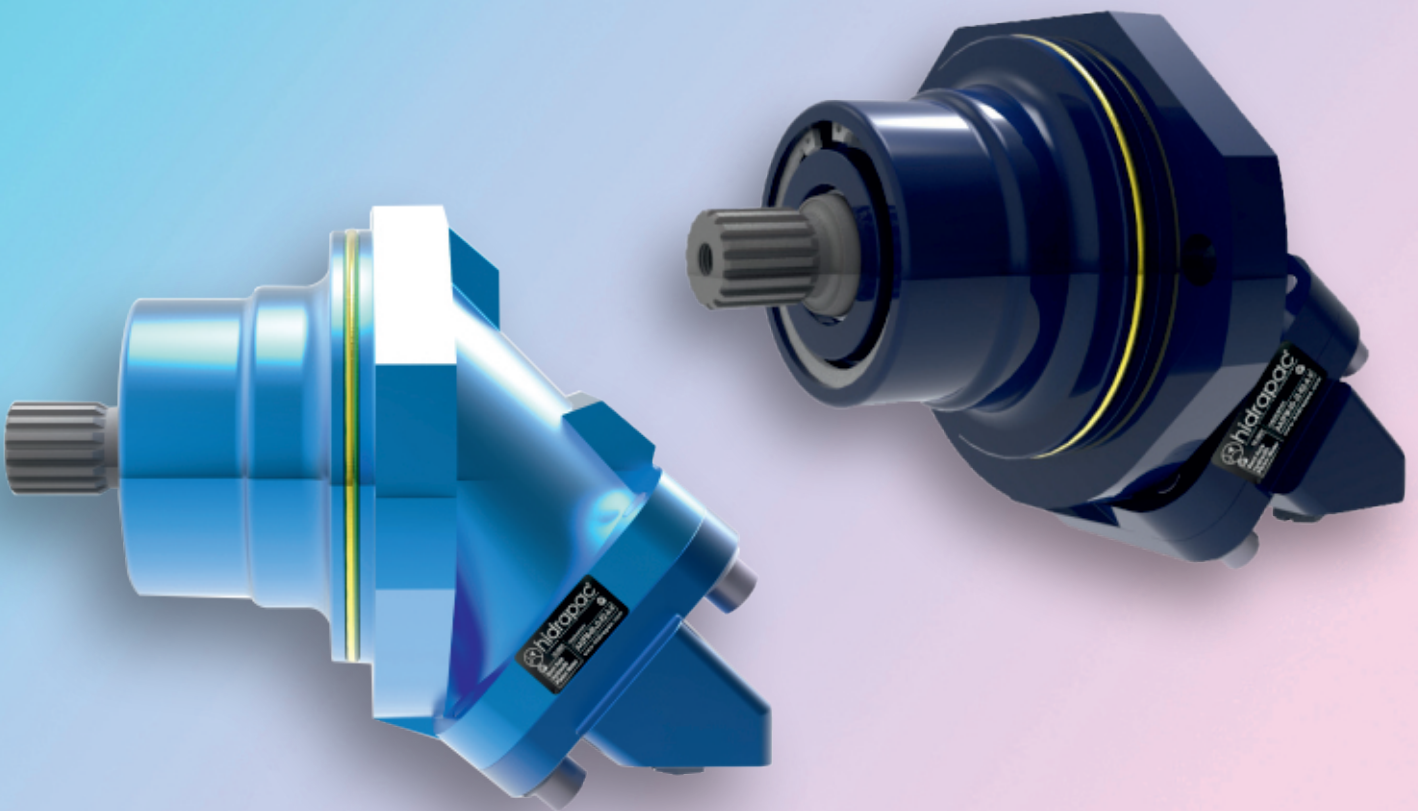


# A2FP (Fixed Plugin) Bent Axis Pumps 2022

High Pressure Hydraulic Bent Axis Piston Pumps, High Pressure, 450/500 BAR Working Pressure. High Rotational Speed, High Efficiency, Slim Design, Cast Iron Pump Body, Re-Designed in 2022.

## Designation;

28cc, 32cc, 41cc, 50cc, 56cc,  
63cc, 80cc, 90cc, 108cc, 125cc

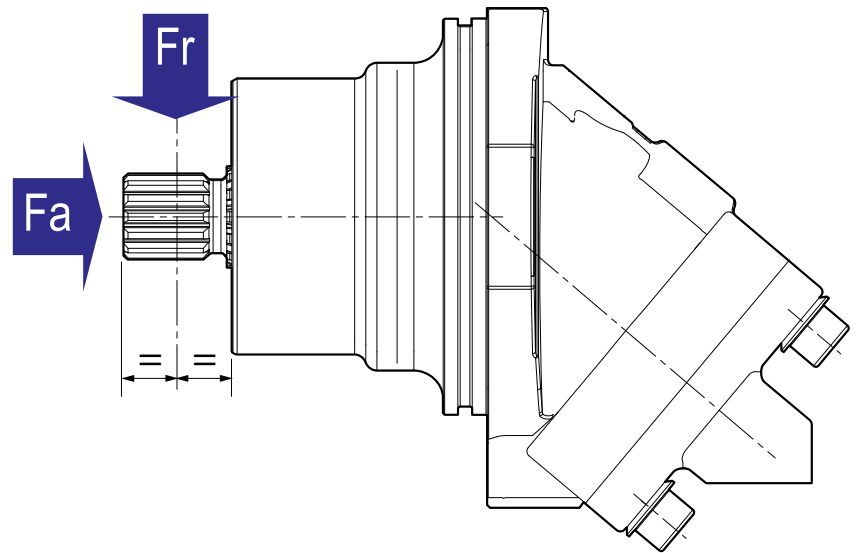


Hidrapac **Store**

[www.HIDRAPAC.com.tr](http://www.HIDRAPAC.com.tr)

## Characteristics of the A2FP (Fixed Plugin) Flange Bent Axis Pumps

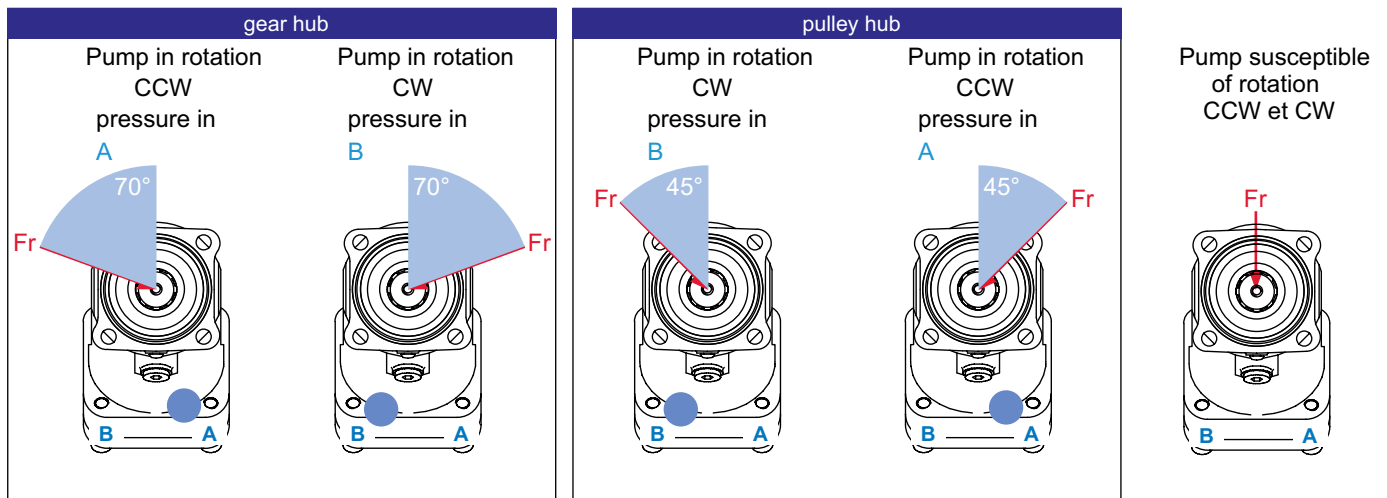
Pump MODEL	DISPL. (cc)	CONTINUOUS MAX. SPEED (rpm)	INTERMITTENT MAX. SPEED (rpm)	MAX. FLOW ABSORBED (l/mn)	TORQUE BAR (m.N/bar)	TORQUE AT 350 BAR (m.N)	THEORETICAL MAX. POWER AT 400 BAR (HP / kW)	MAX. ALLOW PRESSURE CONTN./PEAK (bar)	WEIGHT (kg)
28 cc	28.0	6300	6900	158	0.40	139	140.0 / 104.4	400 / 450	11.4
32 cc	32.0	6300	6900	202	0.50	178	180.5 / 134.4	400 / 450	11.5
41 cc	41.0	5600	6200	230	0.65	228	205.2 / 153.1	400 / 450	11.6
50 cc	50,3	5000	5500	252	0.80	280	224.1 / 167.5	400 / 450	18.1
56 cc	56,0	5000	5500	280	0.90	320	244.5 / 187.1	400 / 450	18.1
63 cc	63.0	5000	5500	315	1.00	351	281.6 / 209.1	400 / 450	18.2
80 cc	80,4	4500	5000	362	1.27	447	323.6 / 241.5	400 / 450	26.1
90 cc	90,1	4500	5000	405	1.43	500	361.5 / 269.9	400 / 450	26.2
108 cc	108	4000	4400	435	1.70	598	328.8 / 245.6	400 / 450	33.2
125 cc	125	3400	4400	428	2.00	698	382.6 / 284.6	400 / 450	33.8



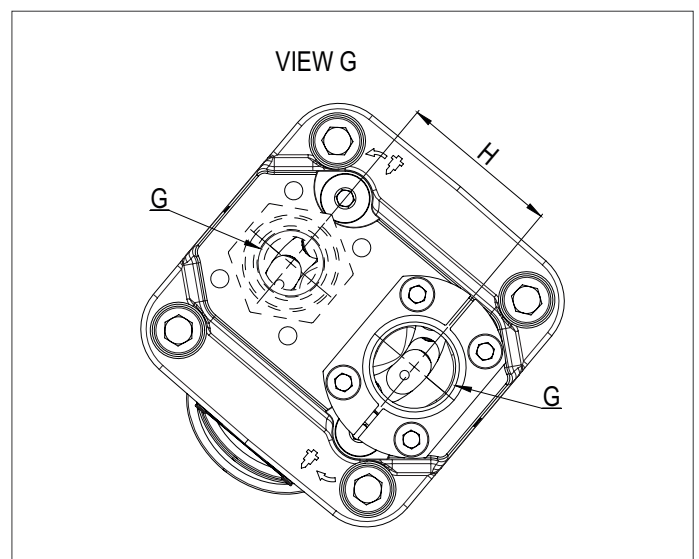
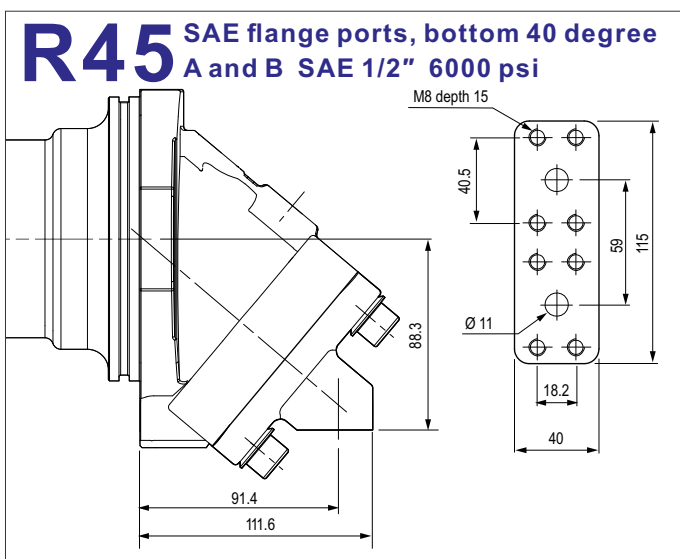
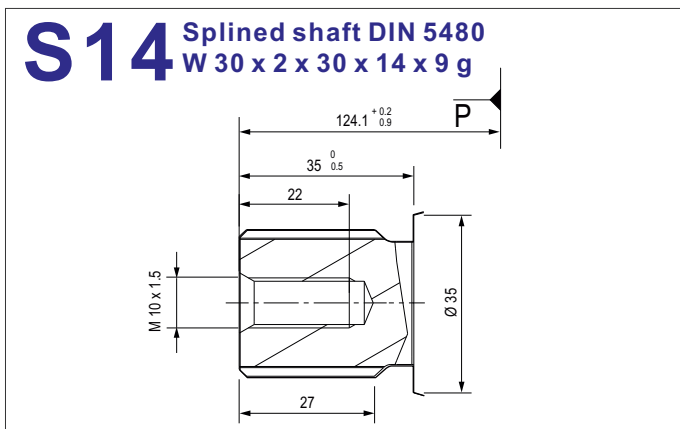
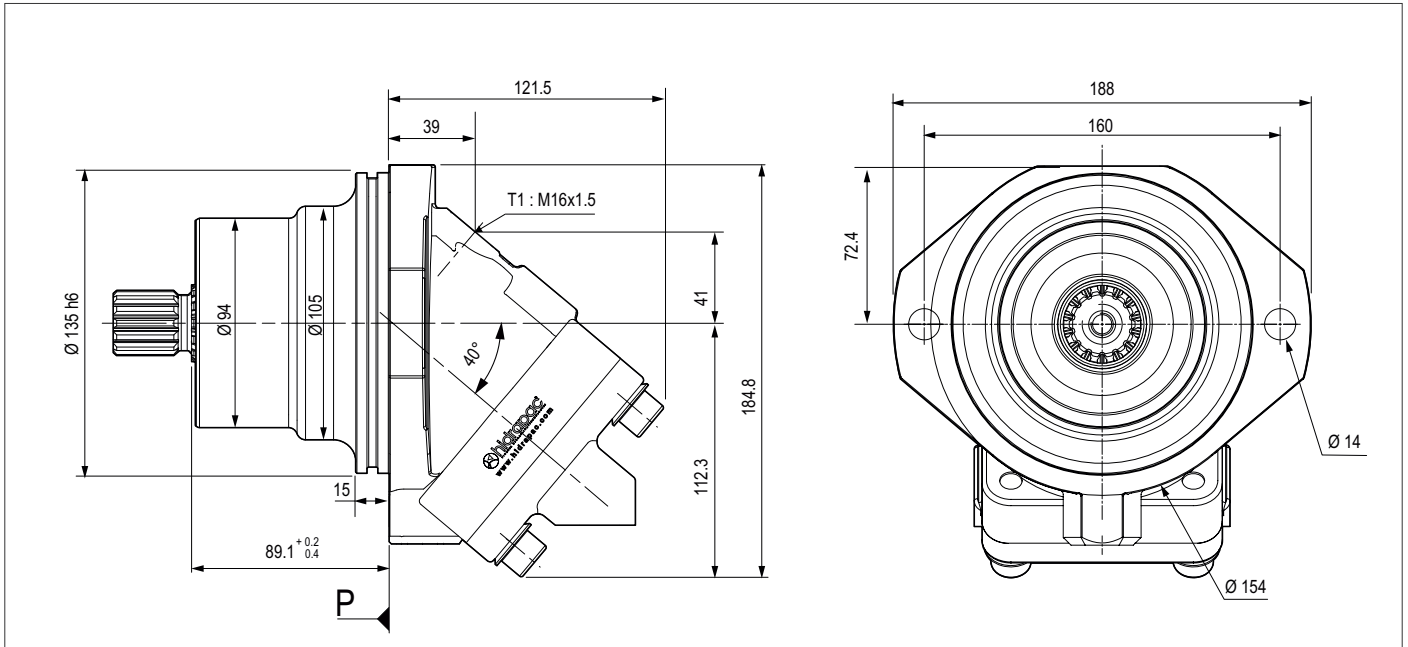
Pump model	28 cc	32 cc	41. 45	50 cc	56, 63cc	80,90,108	125 cc
Fr ( lbf )	1350	1462.5	1462.5	1686	2023	2812	3262
Fr ( N/bar)	6000	6500	6500	7500	9000	12500	14500
Fa ( lbf )	0.42	0.46	0.62	0.62	0.77	1.24	1.33
Fa ( N/bar)	(27)	(30)	(40)	(40)	(50)	(80)	(86)

## Ordering Code; A2FP (Fixed Plugin) Bent Axis Pumps

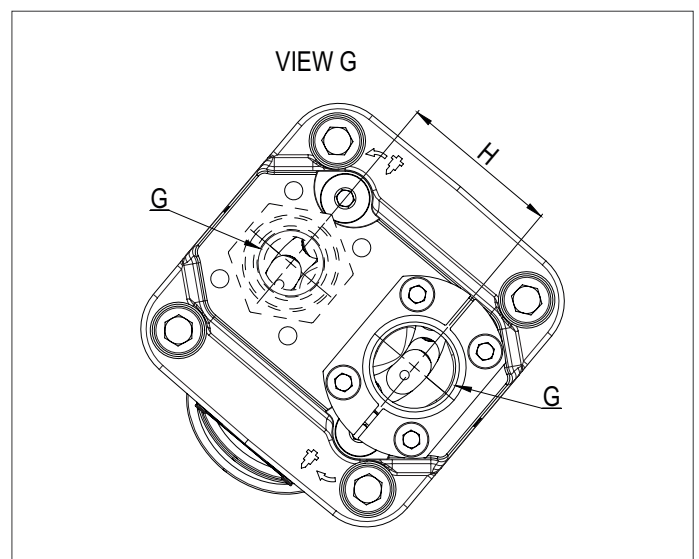
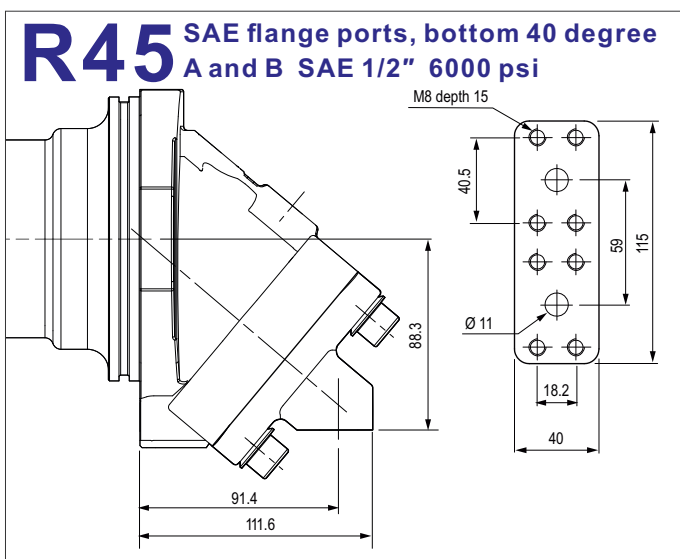
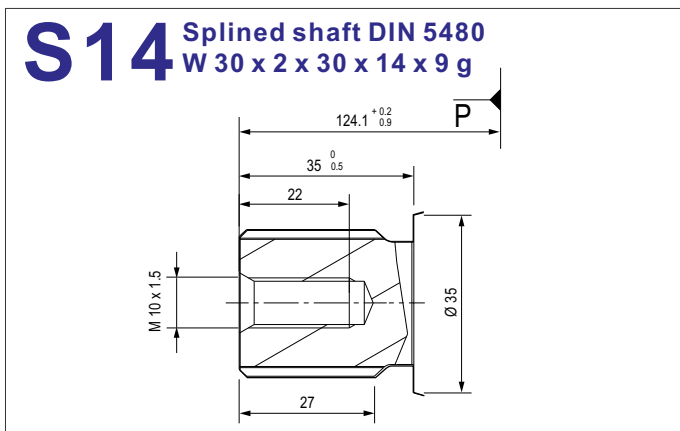
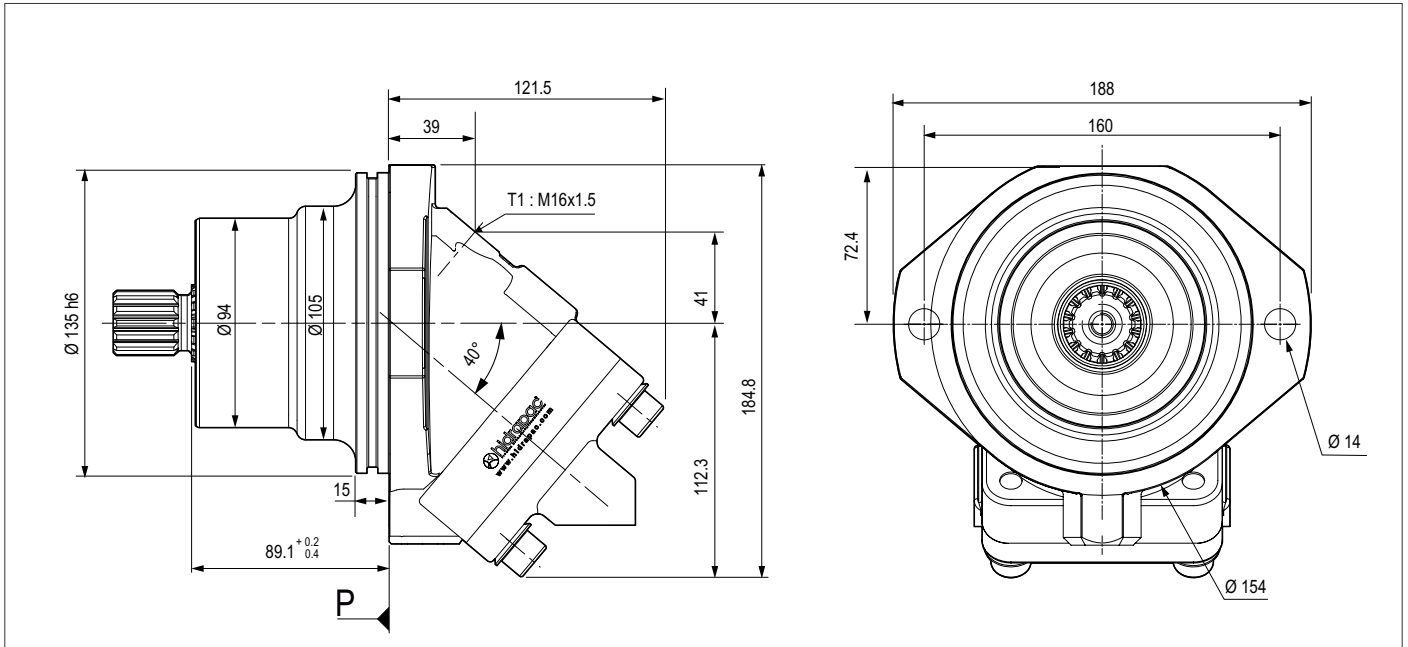
Model Code	Displacement	Shaft Type	Flange Type	Rotation	Sealing
<b>A2FP</b>	<b>28</b>	<b>S14</b>	<b>B2</b>	<b>CW</b>	<b>V</b>
<b>A2FP</b> Bent Axis Hydraulic Pump Fixed Plugin	28	<b>S14</b> Splined Shaft W30x2x30x14x9g	<b>B2</b> 2 Bolt ISO 3019-2	<b>CW</b> Right Direction of Rotation	<b>V</b> Viton High Pressure Seal
	32				
	41				
	50				
	56	<b>S16</b> Splined Shaft W35x2x30x16x9g	<b>CCW</b> Left Direction of Rotation	<b>N</b> Nitrile Seal 5/10 Bar	
	63				
	80				
	90				
108	<b>S18</b> Splined Shaft W40x2x30x18x9g	<b>CCW</b> Left Direction of Rotation	<b>N</b> Nitrile Seal 5/10 Bar		
125					
		<b>S21</b> Splined Shaft W45x2x30x21x9g			



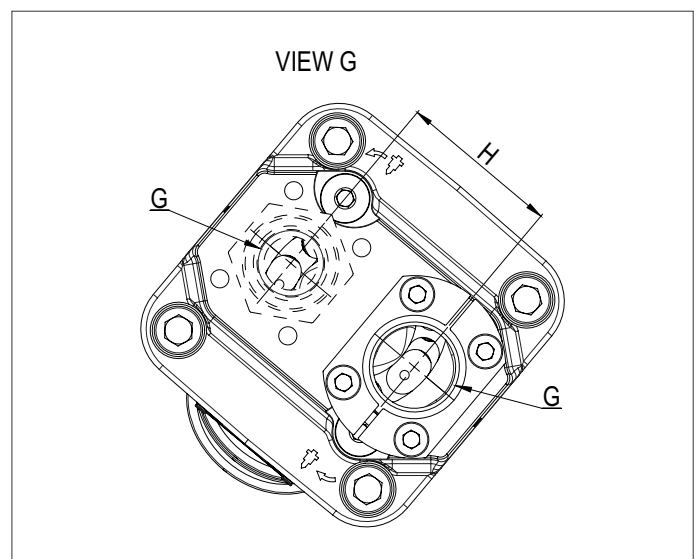
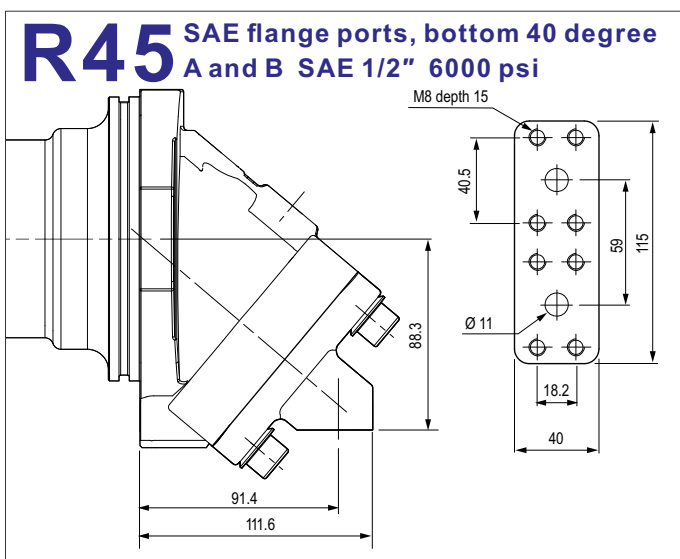
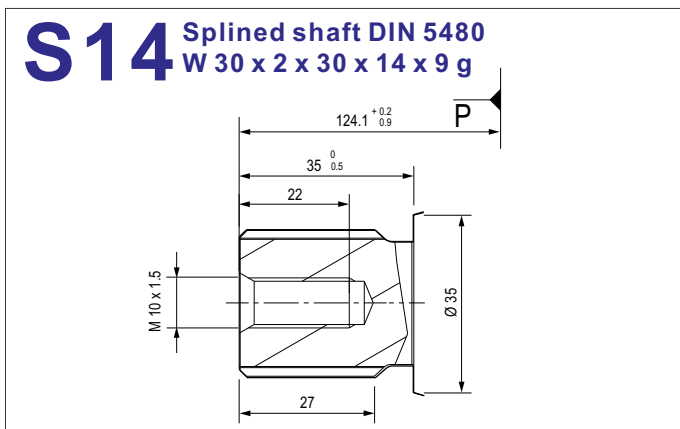
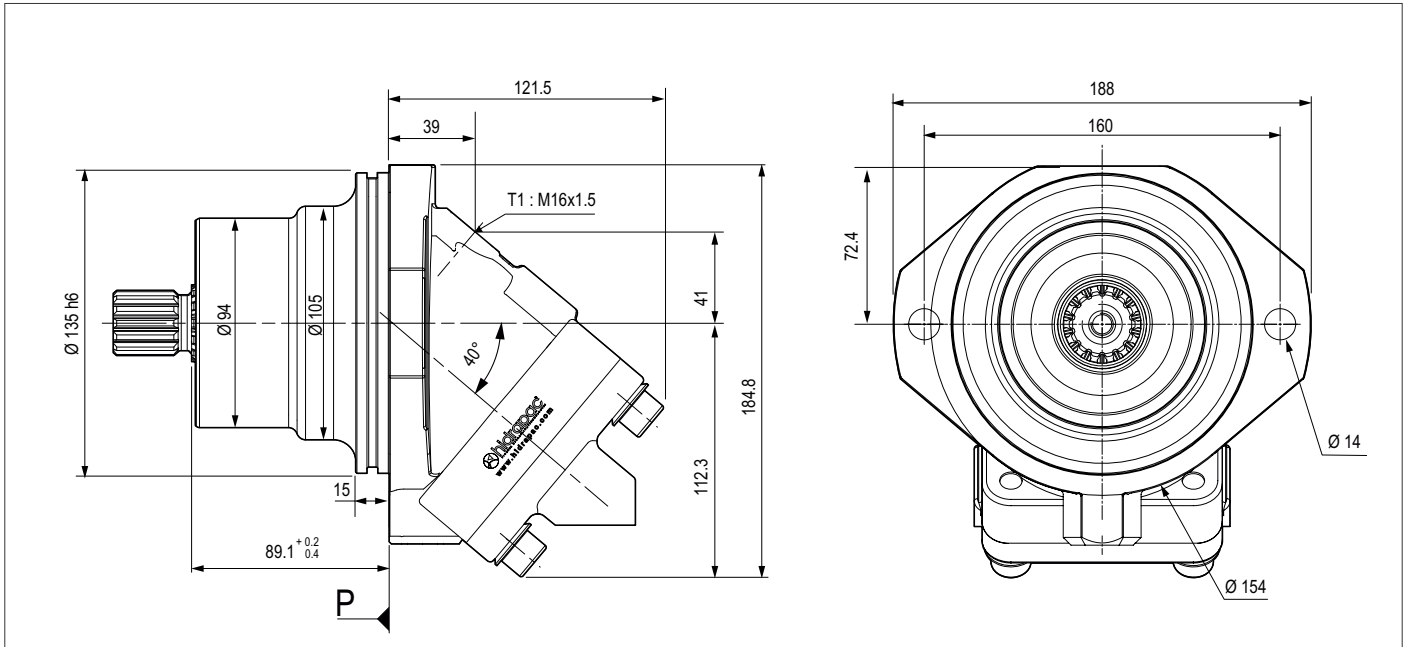
# A2FP - 28 cc (Fixed Plugin) - 2 Bolt



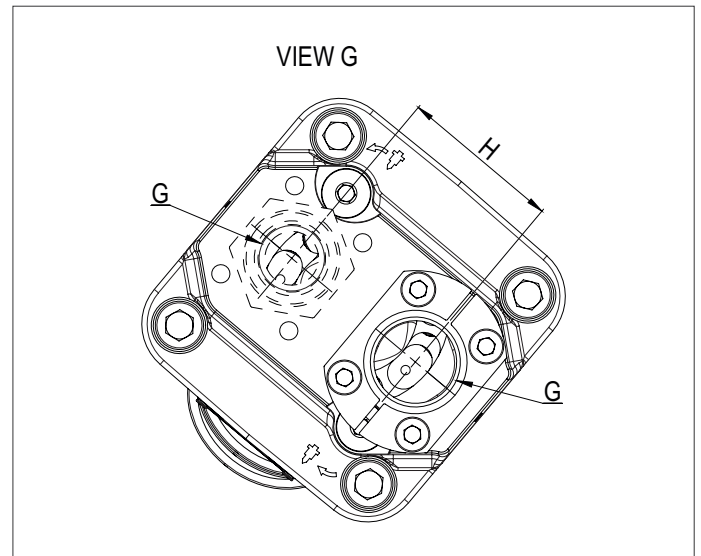
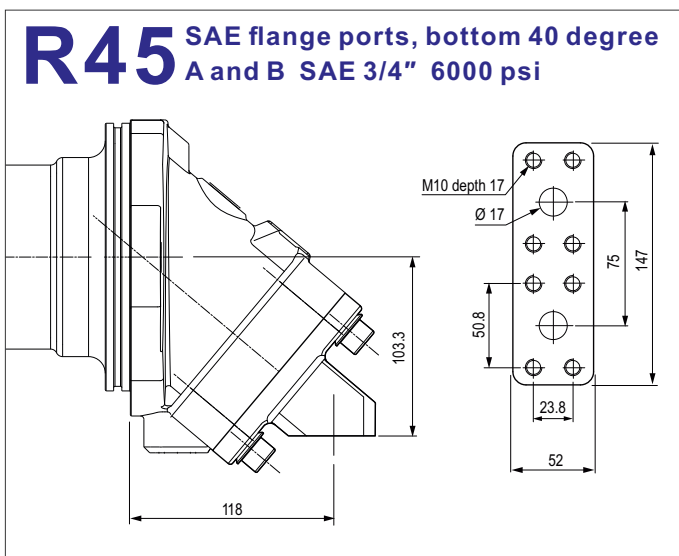
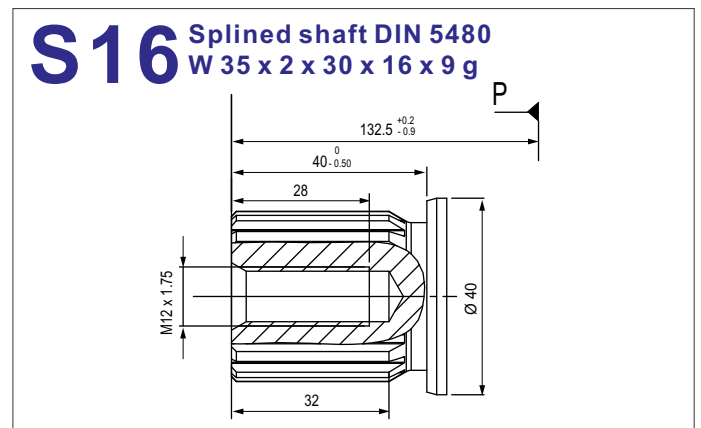
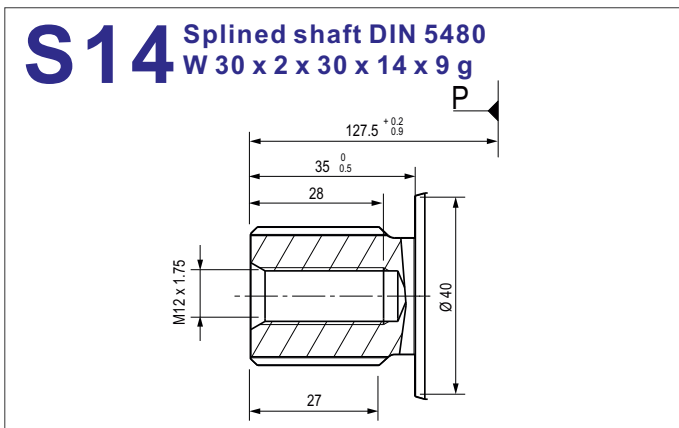
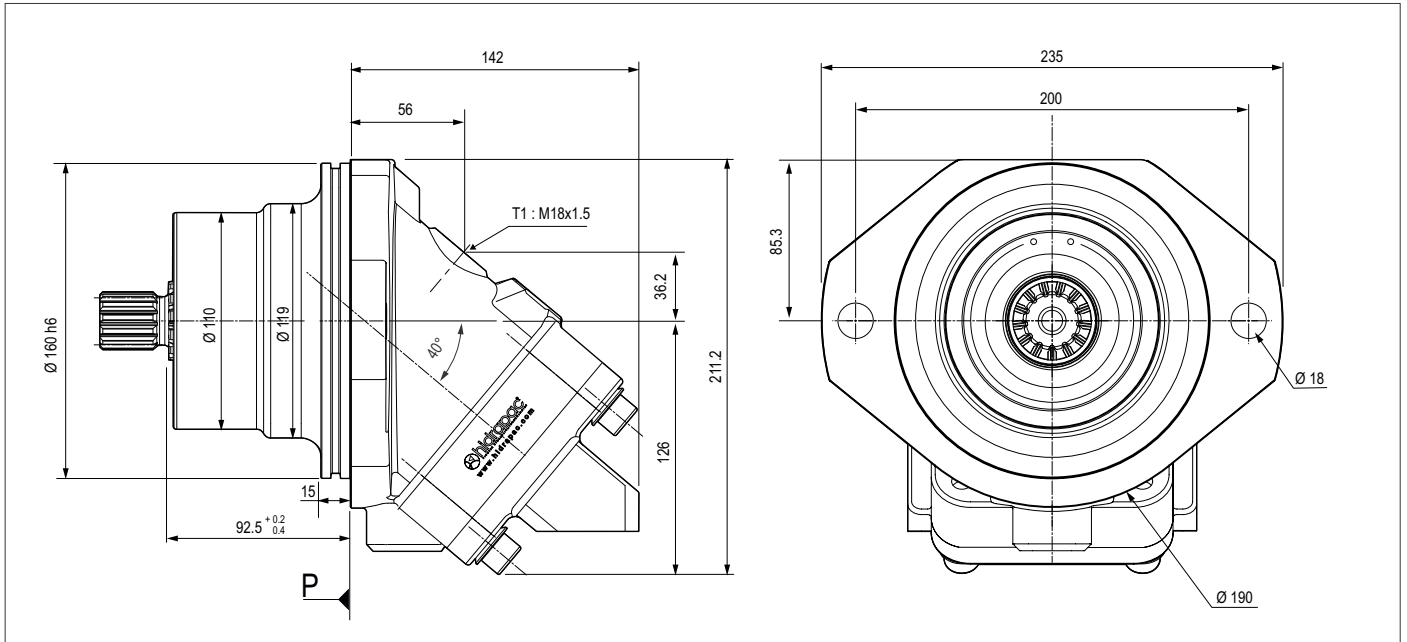
# A2FP - 32 cc (Fixed Plugin) - 2 Bolt



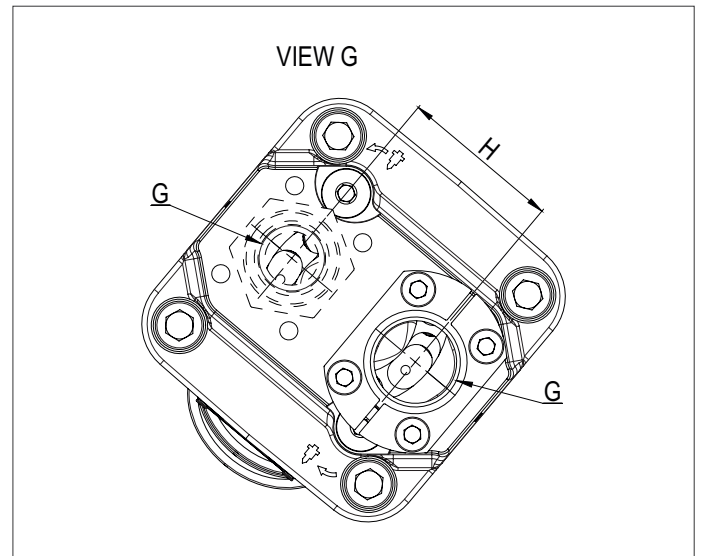
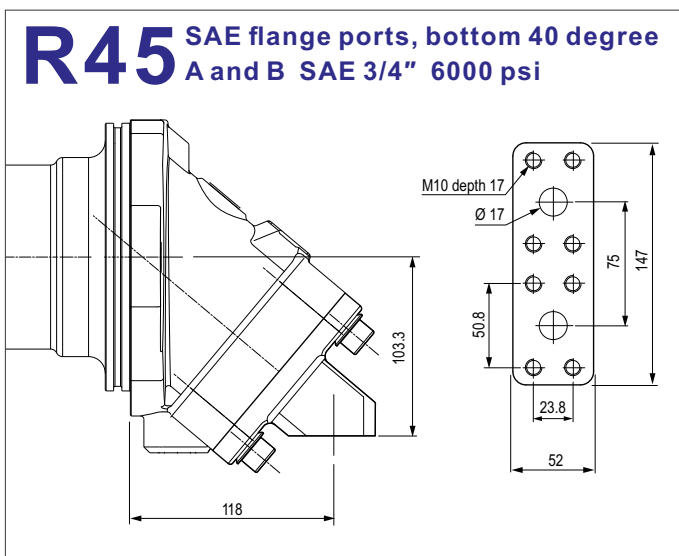
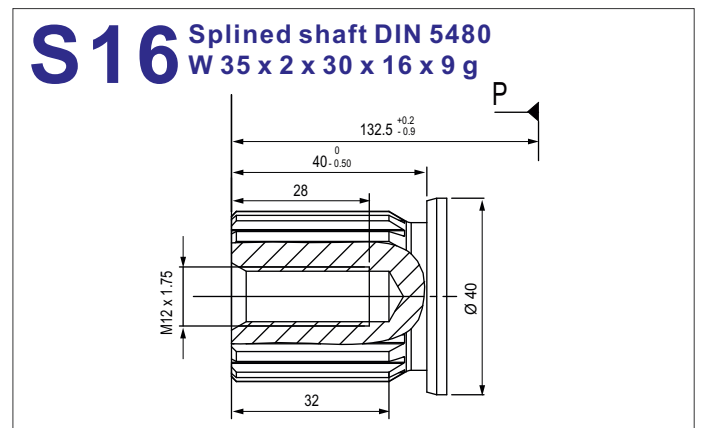
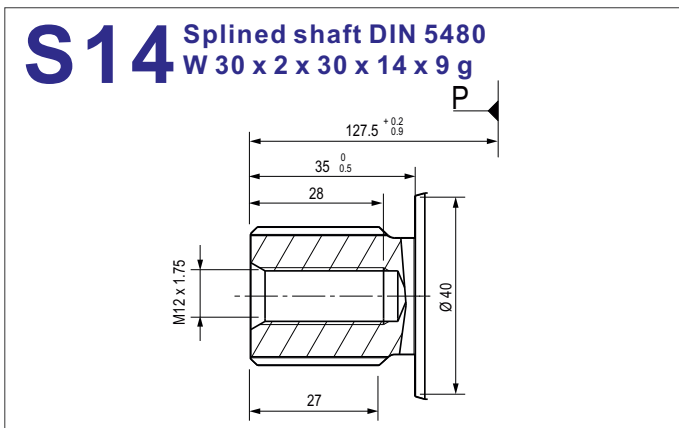
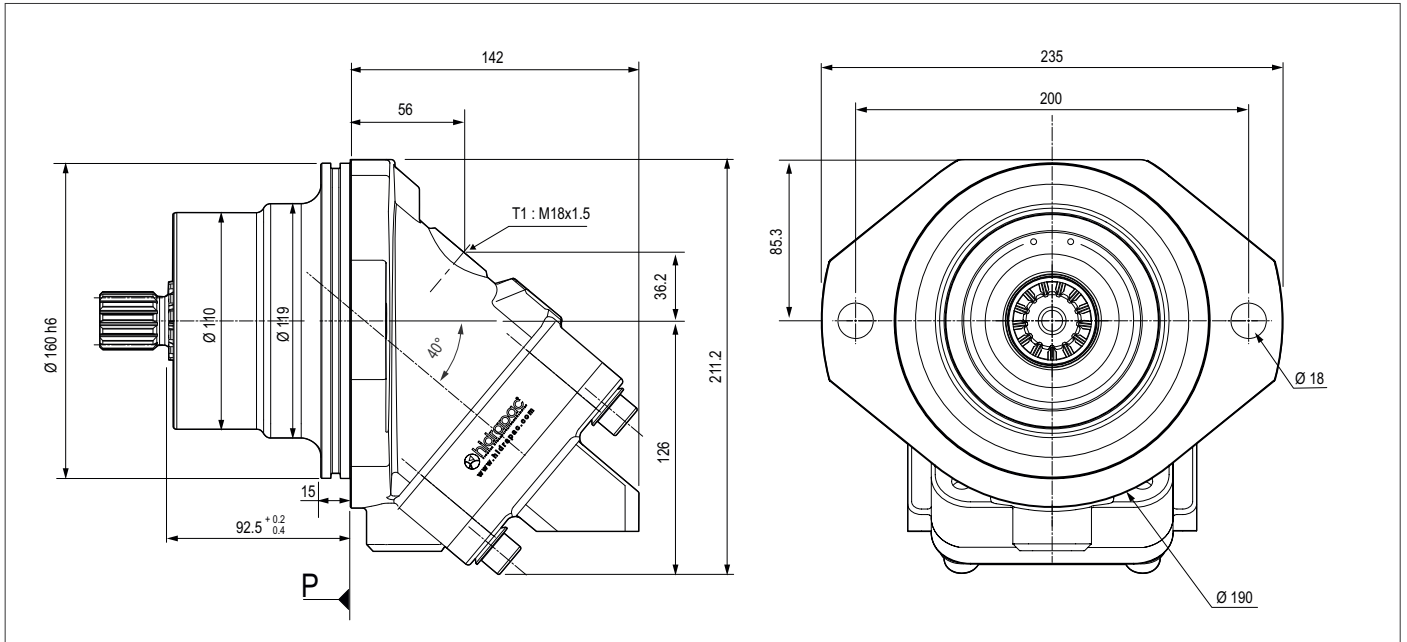
# A2FP - 41 cc (Fixed Plugin) - 2 Bolt



# A2FP - 50 cc (Fixed Plugin) - 2 Bolt

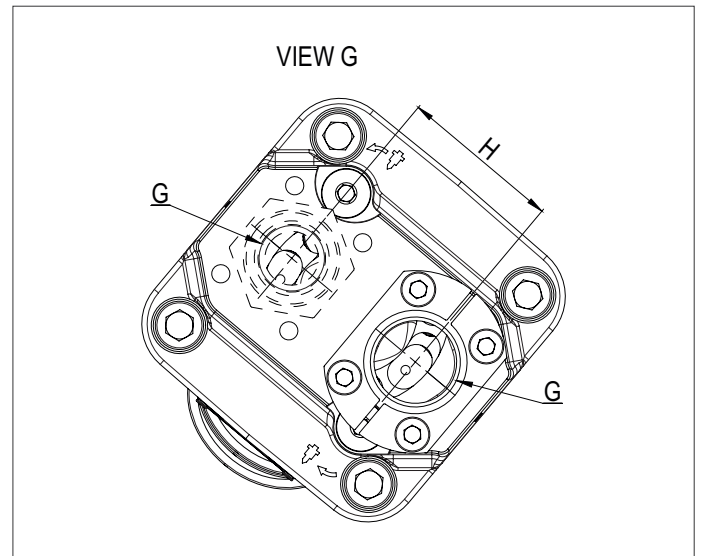
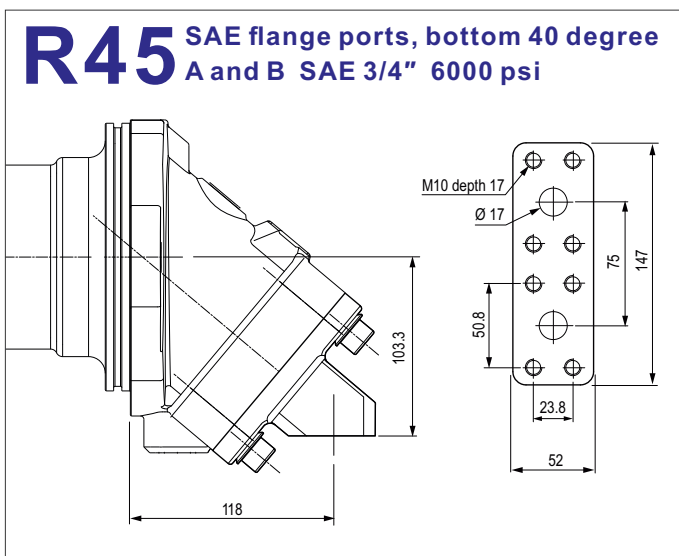
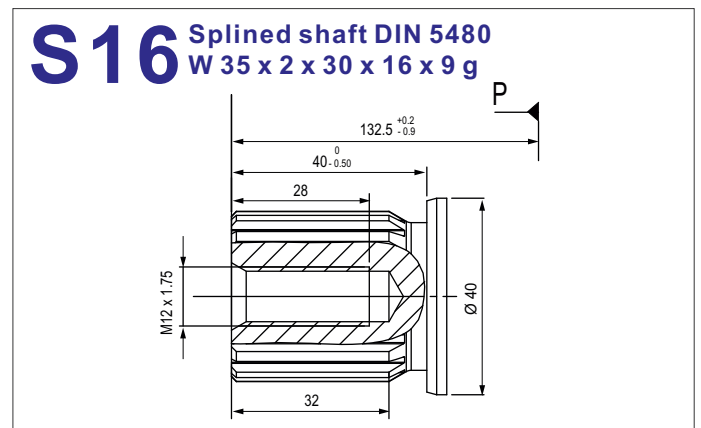
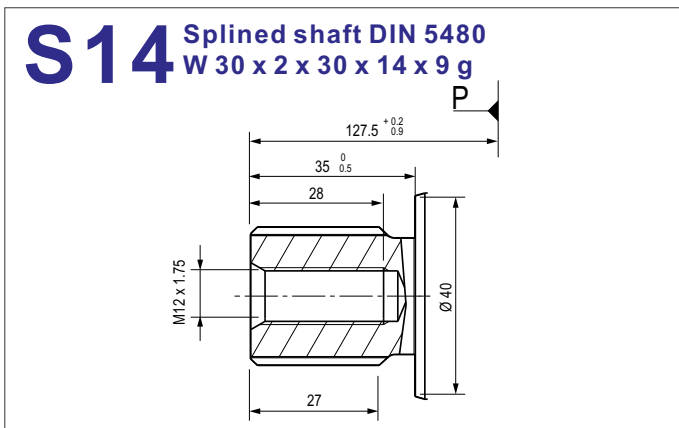
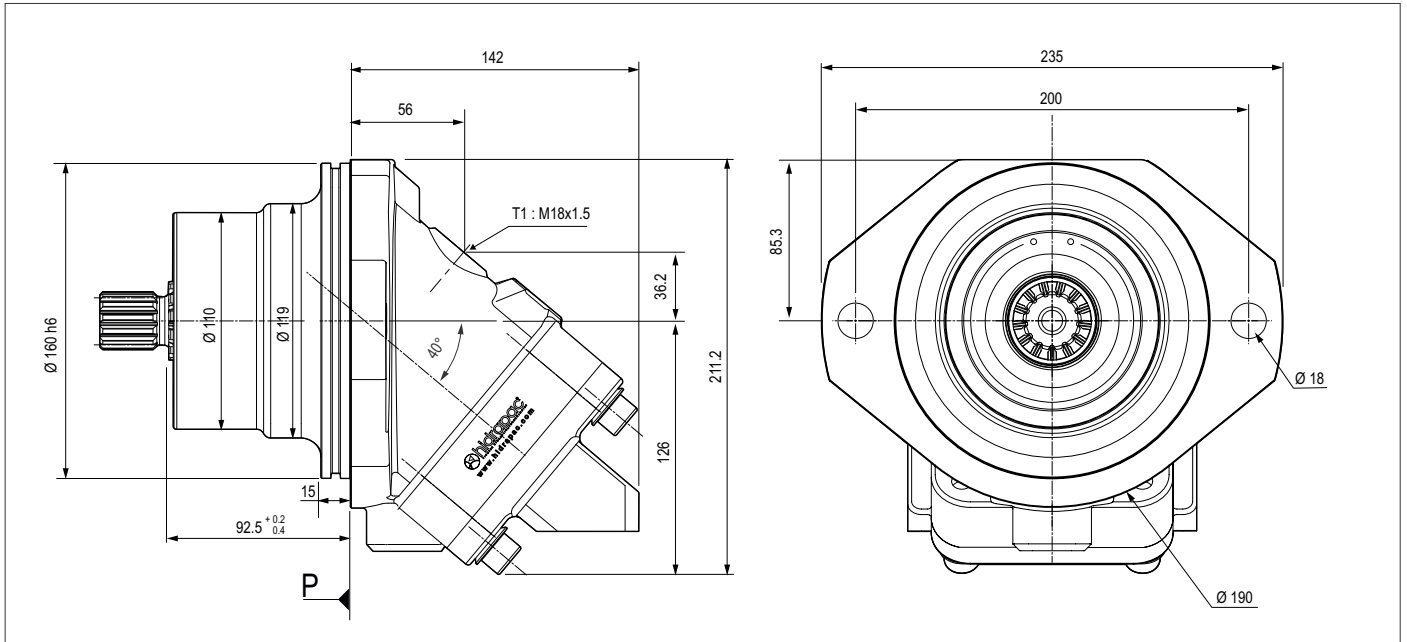


# A2FP - 56 cc (Fixed Plugin) - 2 Bolt

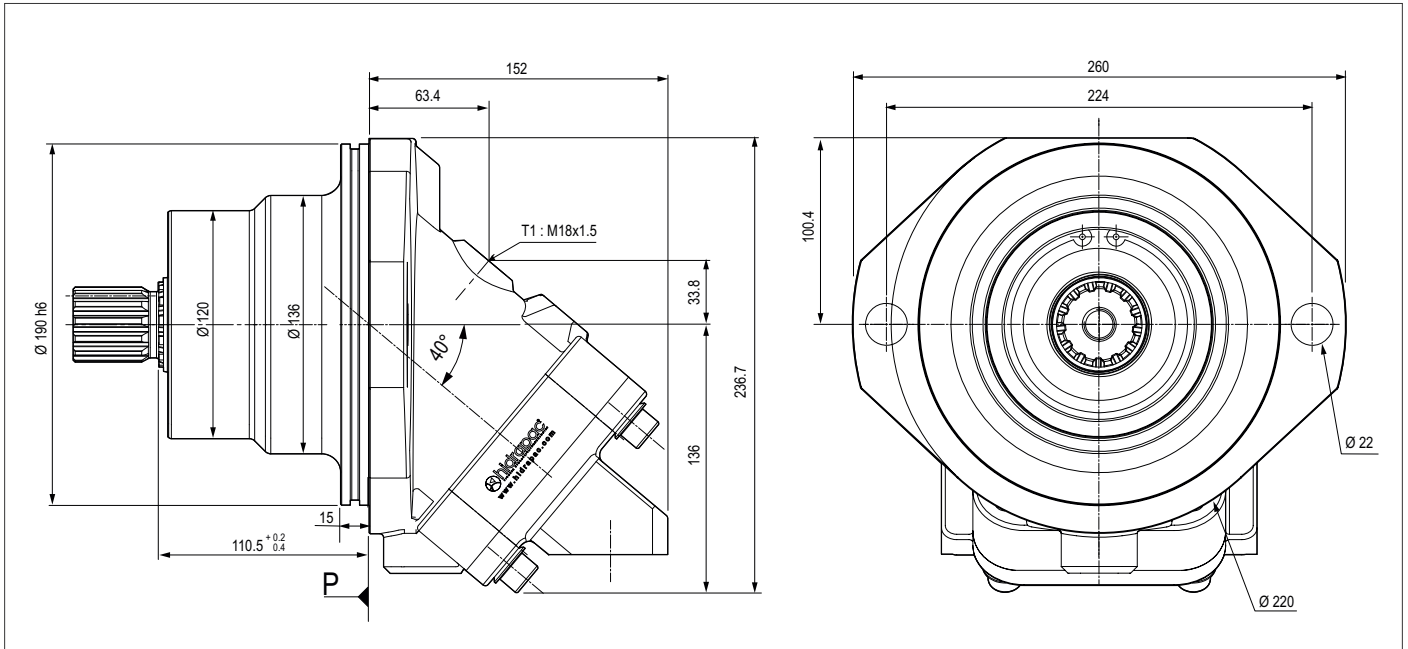




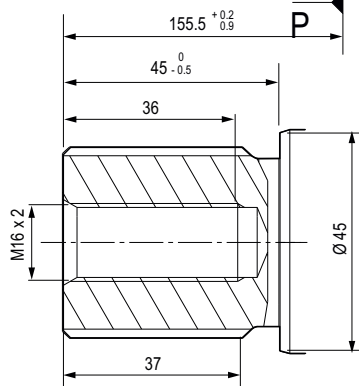
# A2FP - 63 cc (Fixed Plugin) - 2 Bolt



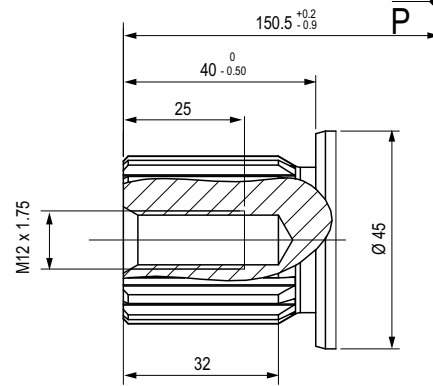
# A2FP - 80 cc (Fixed Plugin) - 2 Bolt



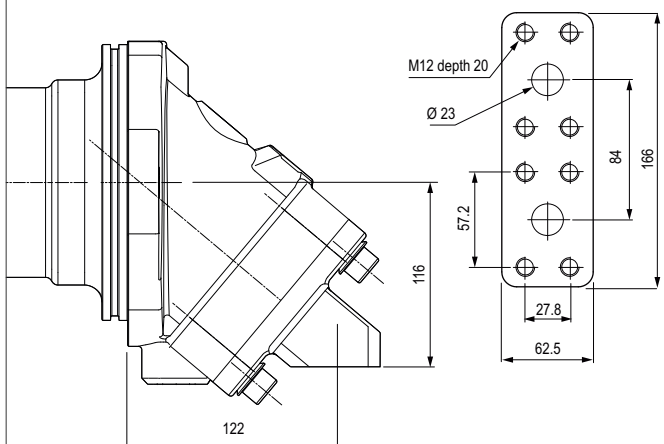
## S18 Splined shaft DIN 5480 W 40 x 2 x 30 x 18 x 9 g



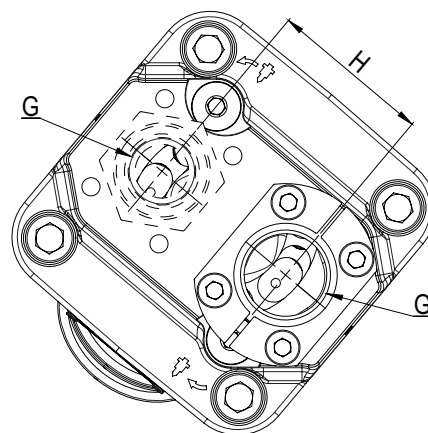
## S16 Splined shaft DIN 5480 W 35 x 2 x 30 x 16 x 9 g



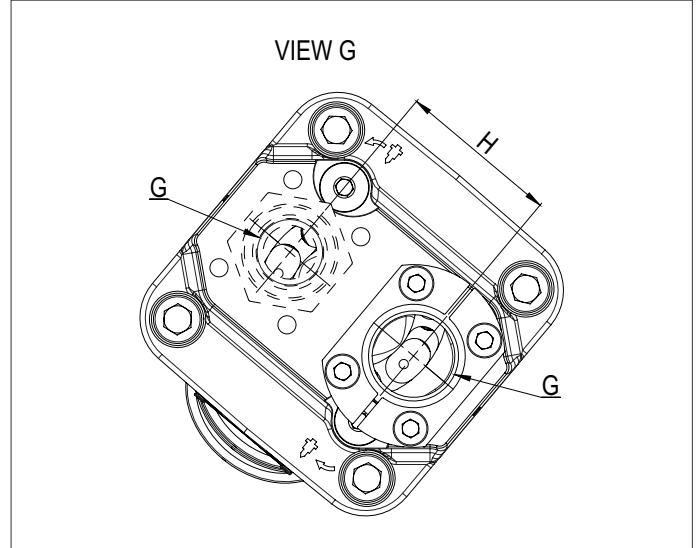
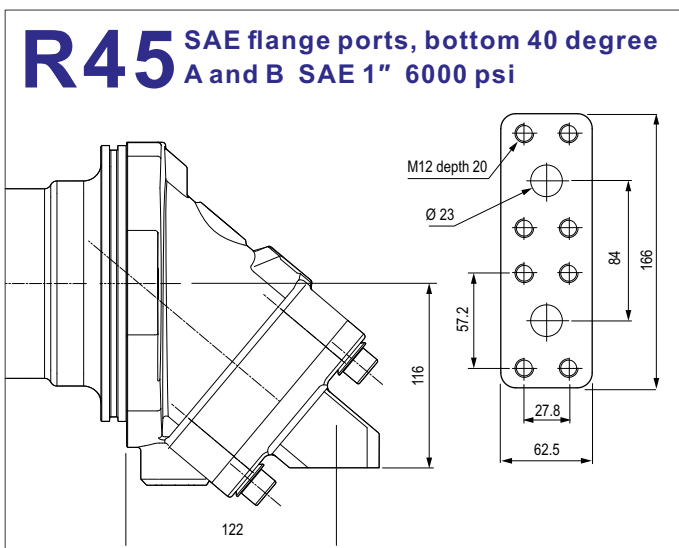
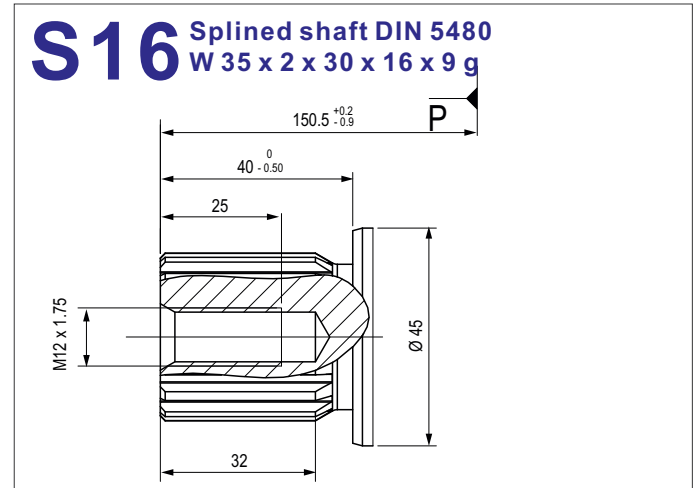
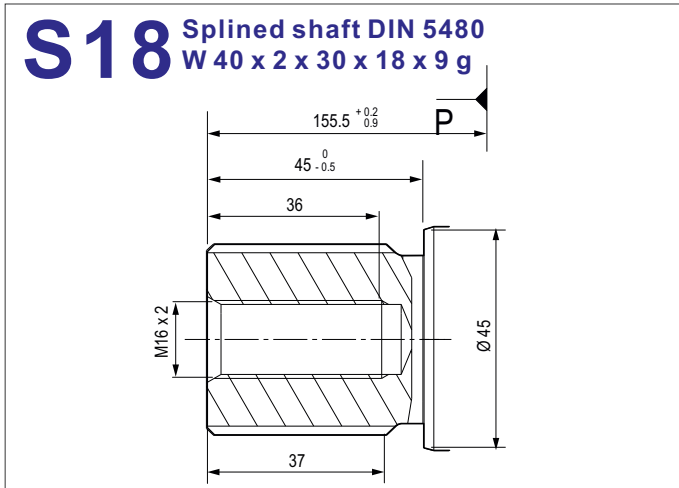
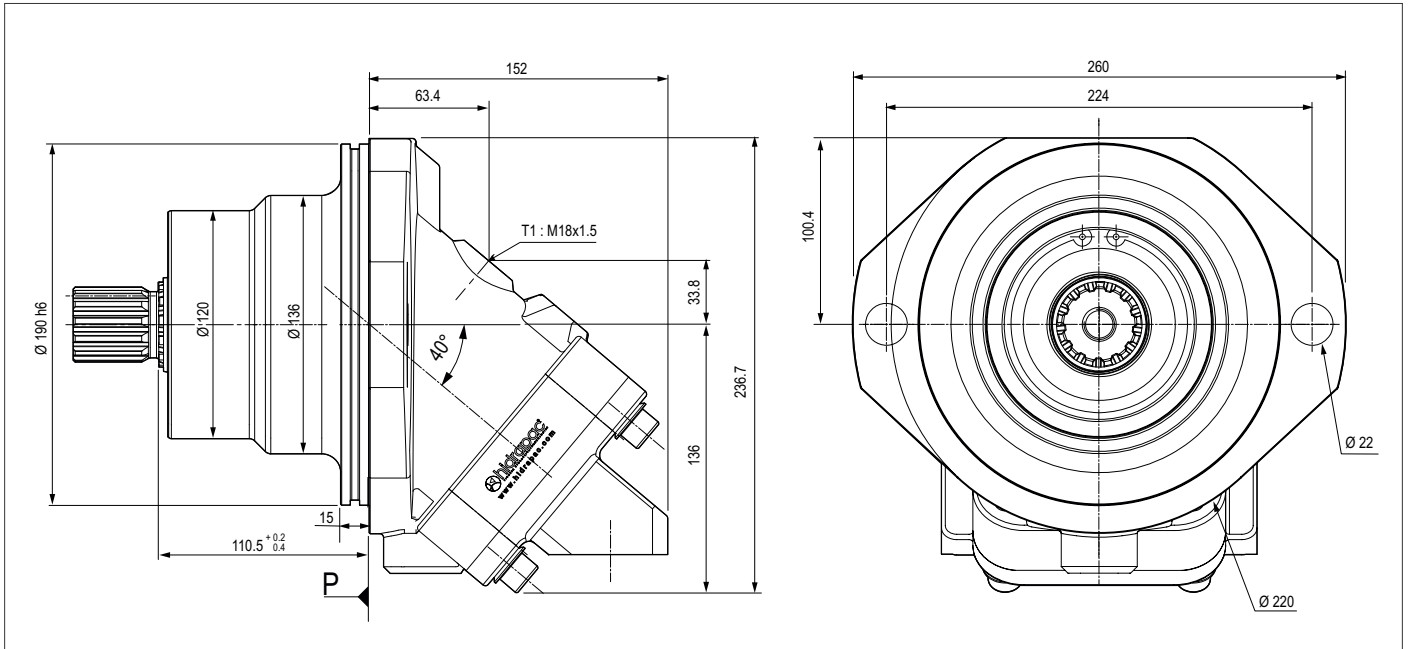
## R45 SAE flange ports, bottom 40 degree A and B SAE 1" 6000 psi



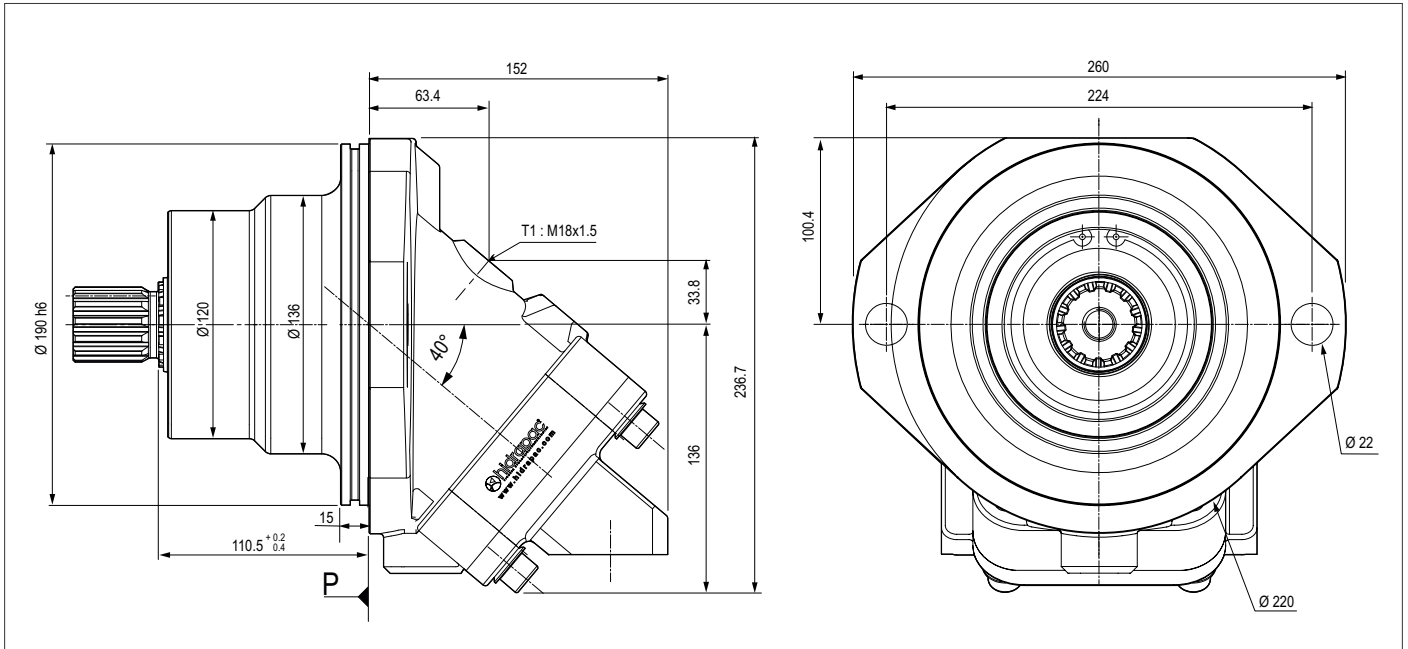
### VIEW G



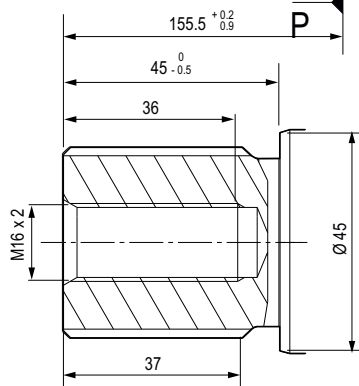
# A2FP - 90 cc (Fixed Plugin) - 2 Bolt



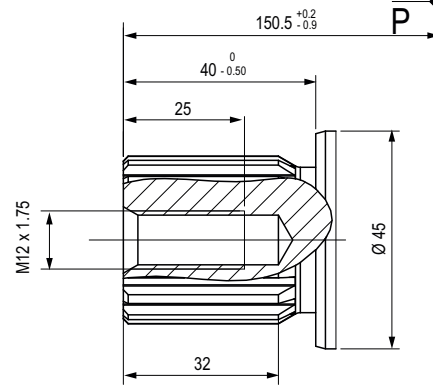
# A2FP - 108 cc (Fixed Plugin) - 2 Bolt



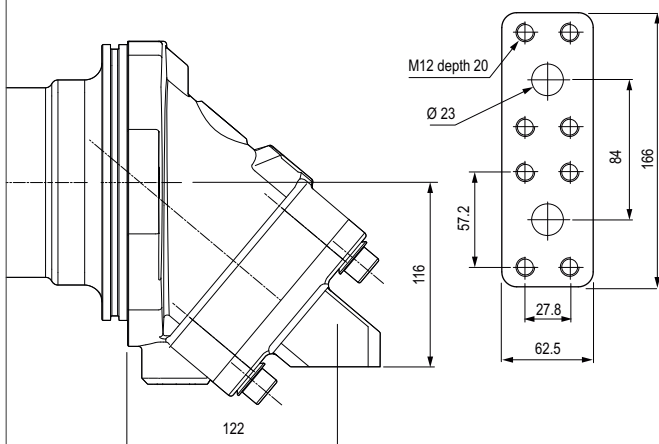
## S18 Splined shaft DIN 5480 W 40 x 2 x 30 x 18 x 9 g



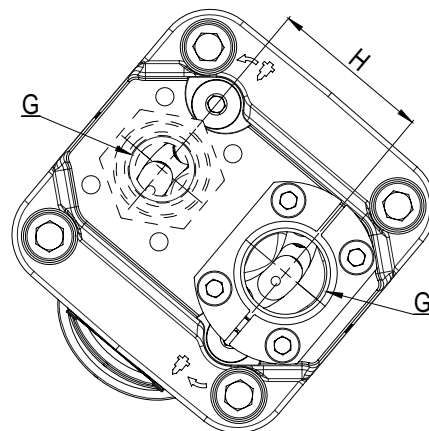
## S16 Splined shaft DIN 5480 W 35 x 2 x 30 x 16 x 9 g



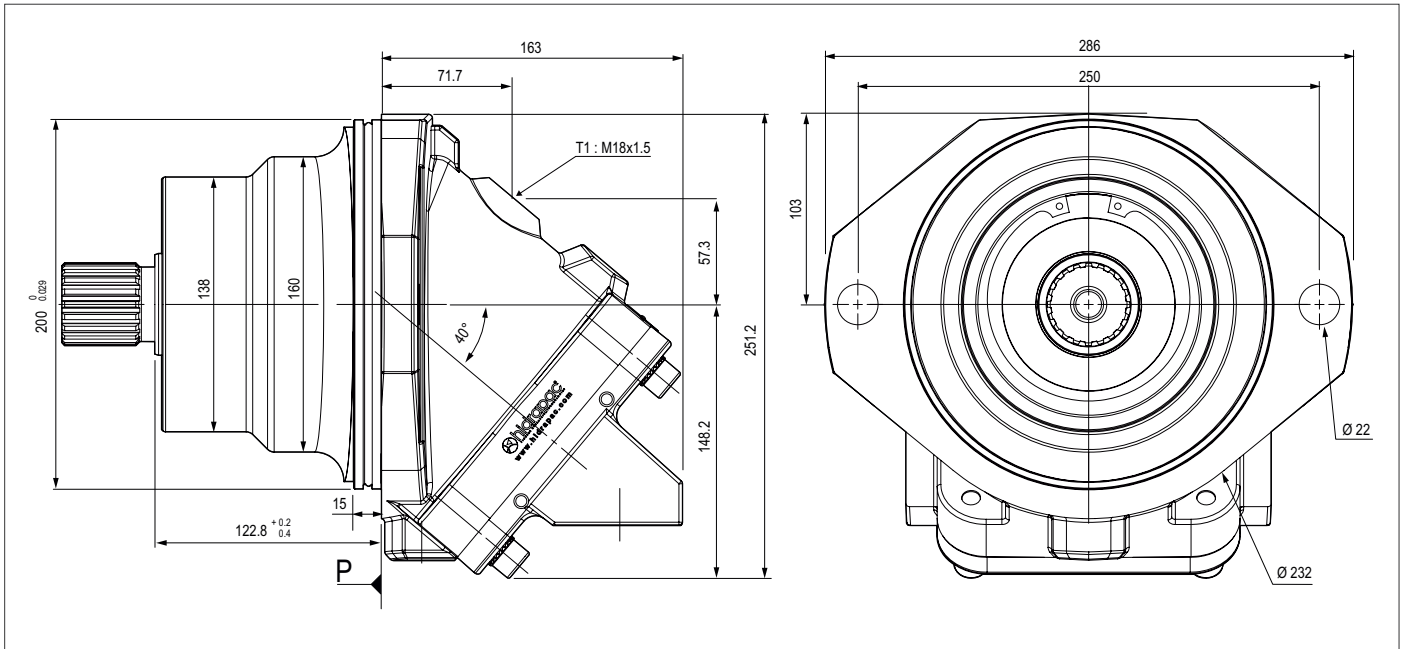
## R45 SAE flange ports, bottom 40 degree A and B SAE 1" 6000 psi



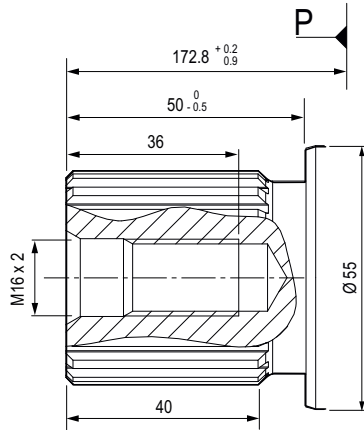
## VIEW G



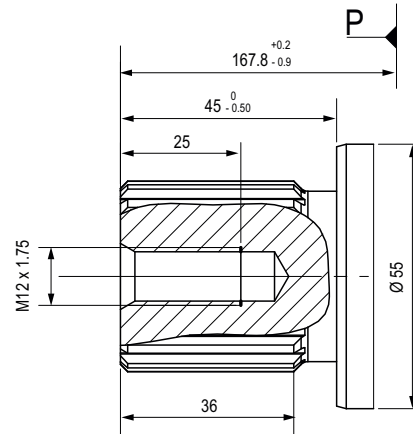
# A2FP - 125 cc (Fixed Plugin) - 2 Bolt



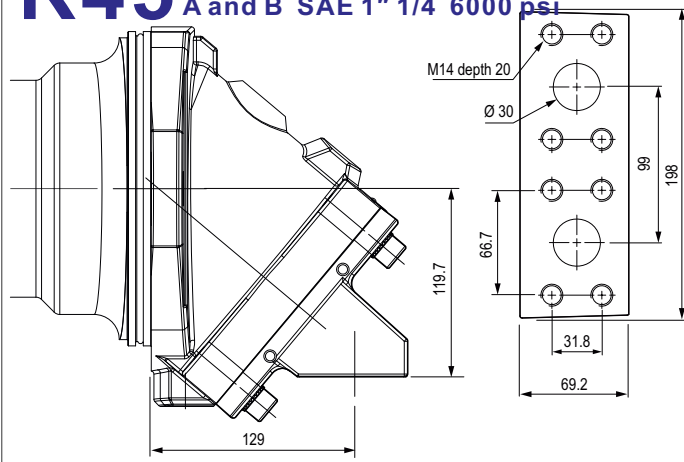
## S21 Splined shaft DIN 5480 W 45 x 2 x 30 x 21 x 9 g



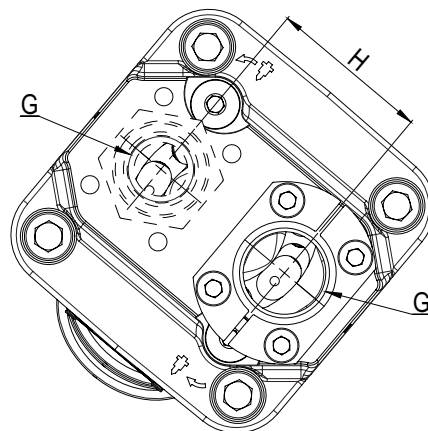
## S18 Splined shaft DIN 5480 W 40 x 2 x 30 x 18 x 9 g



## R45 SAE flange ports, bottom 40 degree A and B SAE 1" 1/4 6000 psi

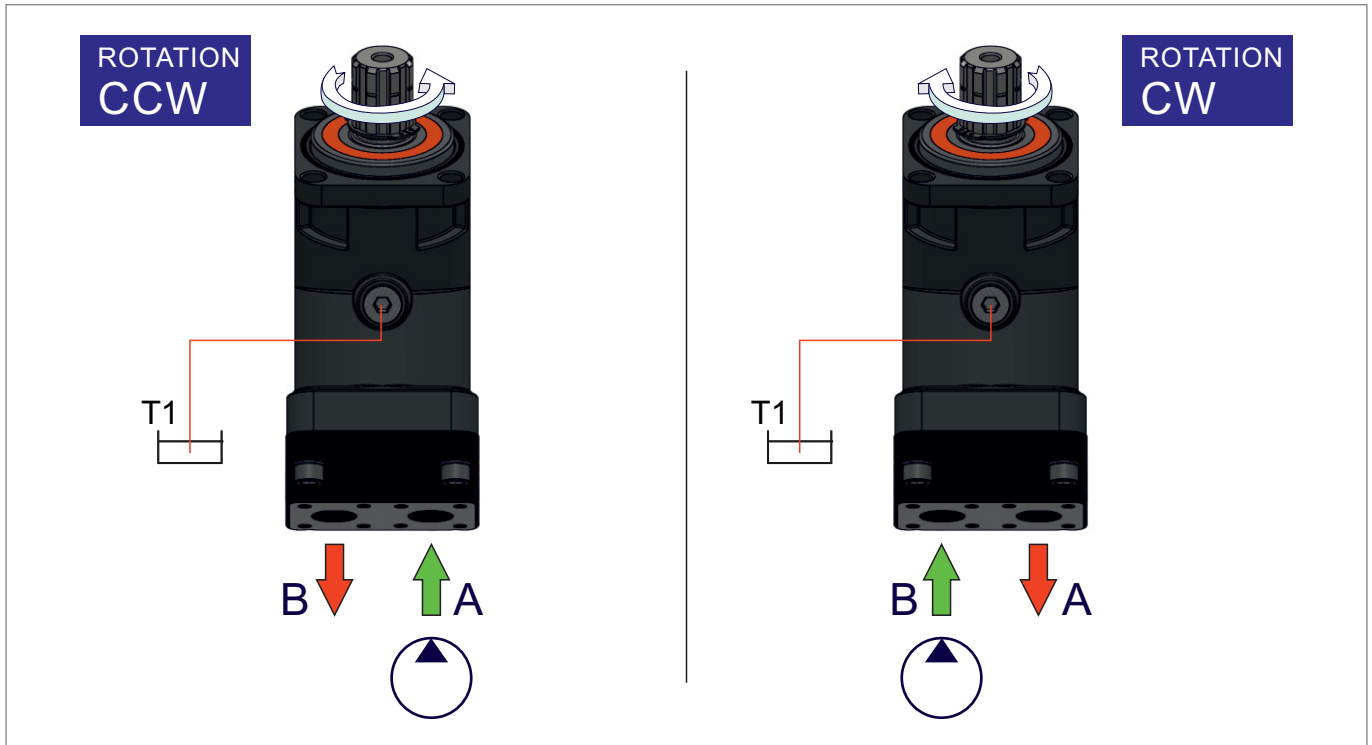


### VIEW G



## Direction of Rotation; CW/CCW

The Pumps rotate clockwise or counter-clockwise depending on the direction of hydraulic flow entering the Pump.



Formulas			
<b>Pump Output Flow</b>	GPM	$GPM = (\text{Speed (rpm)} \times \text{disp. (cu. in.)}) / 231$	$GPM = (n \times d) / 231$
<b>Pump Input Horsepower</b>	HP	$HP = GPM \times \text{Pressure (psi)} / 1714 \times \text{Efficiency}$	$HP = (Q \times P) / 1714 \times E$
<b>Pump Efficiency</b>	E	Overall Efficiency = Output HP / Input HP	$E_{\text{Overall}} = \text{HPOut} / \text{HPIn} \times 100$
		Overall Efficiency = Volumetric Eff. $\times$ Mechanical Eff.	$E_{\text{Overall}} = \text{EffVol.} \times \text{EffMech.}$
<b>Pump Volumetric Efficiency</b>	E	Volumetric Efficiency = Actual Flow Rate Output (GPM) / Theoretical Flow Rate Output (GPM) $\times$ 100	$\text{EffVol.} = \text{QAct.} / \text{QTheo.} \times 100$
<b>Pump Mechanical Efficiency</b>	E	Mechanical Efficiency = Theoretical Torque to Drive / Actual Torque to Drive $\times$ 100	$\text{EffMech} = \text{TTheo.} / \text{TAct.} \times 100$
<b>Pump Displacement</b>	CIPR	$\text{Displcmnt (In.}^3 \text{ / rev.)} = \text{Flow Rate (GPM)} \times 231 / \text{Pump RPM}$	$\text{CIPR} = \text{GPM} \times 231 / \text{RPM}$
<b>Pump Torque</b>	T	Torque = Horsepower $\times$ 63025 / RPM	$T = 63025 \times \text{HP} / \text{RPM}$
		Torque = Pressure (PSIG) $\times$ Pump Displacement (CIPR) / $2\pi$	$T = P \times \text{CIPR} / 6.28$

- Horsepower for driving a pump** : For every 1 hp of drive, the equivalent of 1 gpm @ 1500 psi can be produced.
- Horsepower for idling a pump** : To idle a pump when it is unloaded will require about 5% of it's full rated power
- Wattage for heating hydraulic oil** : Each watt will raise the temperature of 1 gallon of oil by 1° F. per hour.
- Flow velocity in hydraulic lines** : Pump suction lines 2 to 4 feet per second, pressure lines up to 500 psi - 10 to 15 ft./sec., pressure lines 500 to 3000 psi - 15 / 20 ft./sec.; all oil lines in air-over-oil systems; 4 ft./sec.

## Installation & Assemble Informations for Bent Axis Pumps

### POSITION

Fixed Flange Bent Axis Pumps can be operate any position.

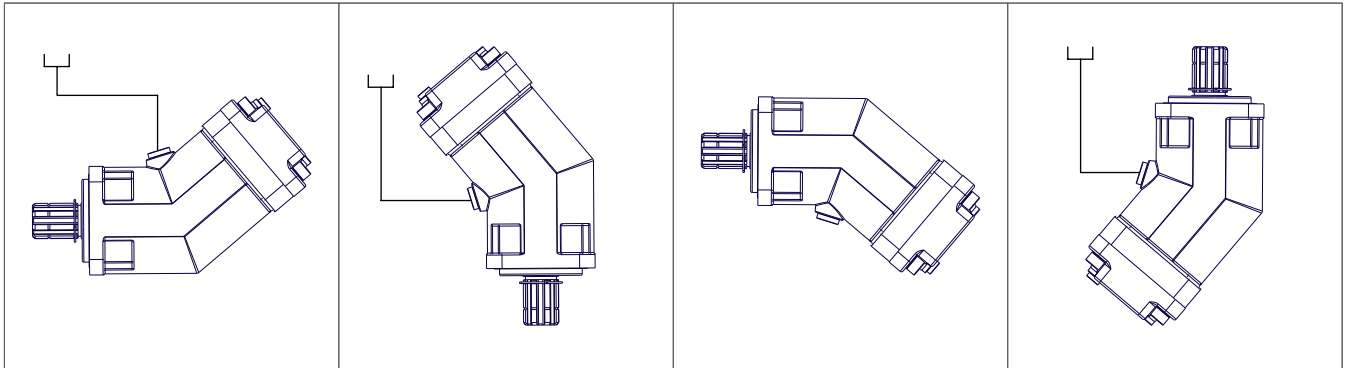
### DIRECTION OF ROTATION

Fixed Flange Bent Axis Pumps can be operate in both directions of rotation.

Before of Installation operation, the Pump must be filled with hydraulic fluid and air bled.

### INSTALLATION POSITION

See following examples.

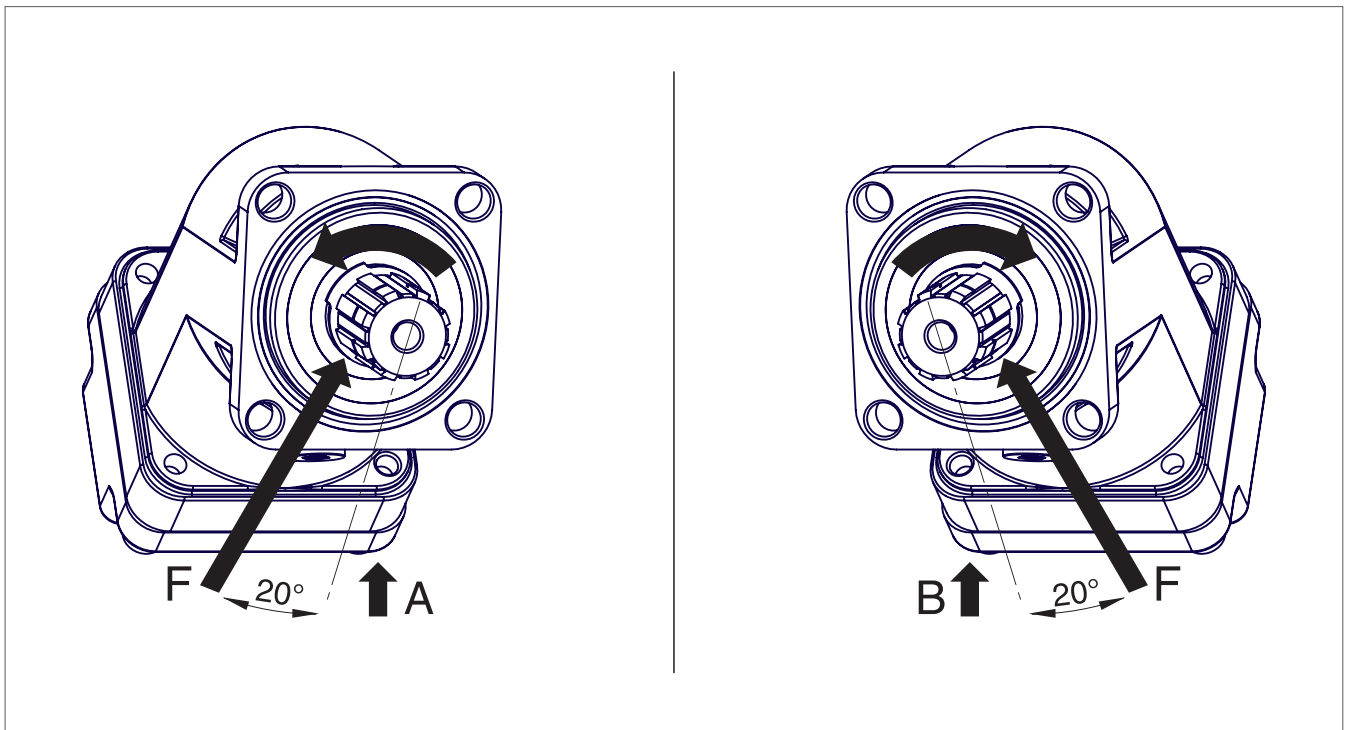


### HYDRAULIC FLUID

Recommended ;

Generally : between 15 and 200 cSt.

Maximum : between 5 and 1600 cSt.



### FOR USE;

Available via e-mail on request or each Pump is supplied via Starting datasheet.

## Formulas, Calculations, Installation Guide

### Quick Calculation

#### Flow rate

$$Q = \frac{V_S \cdot n}{1000 \eta_v} \text{ (lpm)}$$

#### Torque

$$M = \frac{V_S \cdot \Delta p \cdot \eta_{mh}}{63} \text{ (Nm)}$$

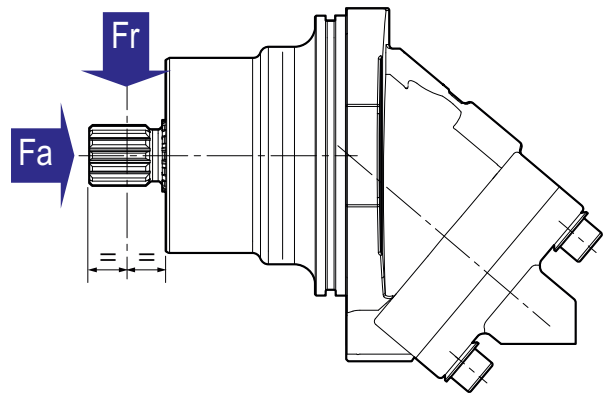
#### Power

$$P = \frac{2\pi \cdot M \cdot n}{60000} = \frac{M \cdot n}{9549} = \frac{Q \cdot \Delta p \cdot \eta_t}{600} \text{ (kw)}$$

#### Speed

$$n = \frac{1000 \cdot Q \cdot \eta_v}{V_S} \text{ (lpm)}$$

- $V_S$  = Displacement (ccm/rev.)
- $\Delta p$  = Diff. pressure (bar)
- $n$  = Speed (rpm)
- $Q$  = Flow (lpm)
- $\eta_v$  = Volumetric efficiency
- $\eta_{mh}$  = Mechanical-hydraulic efficiency
- $\eta_t$  = Total efficiency ( $\eta_t = \eta_v \times \eta_{mh}$ )



Pump model	28 cc	32 cc	41.45	50 cc	56, 63cc	80,90,108	125 cc
<b>Fr (lbf)</b>	1350	1462.5	1462.5	1686	2023	2812	3262
<b>Fr (N/bar)</b>	6000	6500	6500	7500	9000	12500	14500
<b>Fa (lbf)</b>	0.42	0.46	0.62	0.62	0.77	1.24	1.33
<b>Fa (N/bar)</b>	(27)	(30)	(40)	(40)	(50)	(80)	(86)

### Other Advantages of Flange Bent Axis Pumps

- Interchangeable and Compatible with other Bent Axis Pumps,
- Special Designed Pistons,
- One-Piece Piston with Piston Rings,
- For use in stationary and mobile applications,
- Compact Pump design and extra durable parts,
- High Operational Reliability and High Starting Torque
- Extra Warranty with Wide Service



## Complete Product Range

### Bent Axis Piston Motors

K2FM (DIN) Bent Axis Motor  
K3FH (HYBRID) Bent Axis Motor  
A2MS (SAE) Bent Axis Motor  
A3MS (SAE2) Bent Axis Motor  
A2FM (ISO) Bent Axis Motor  
A2FE (Fixed Plugin) Bent Axis Motor  
A2FE (Two Speed) Bent Axis Motor  
A2FT 45 (Inline) Bent Axis Motor

### Bent Axis Piston Pumps

K2FA (DIN) Bent Axis Pump  
K2FH (HYBRID) Bent Axis Pump  
K2FL (Aluminum) Bent Axis Pump  
A2FS (SAE) Bent Axis Pump  
A3FS (SAE2) Bent Axis Pump  
A2FO (ISO) Bent Axis Pump  
A3FO (ISO2) Bent Axis Pump  
A2FP (Fixed Plugin) Bent Axis Pump

### Variable Displacement Motors

AXMV Variable Piston Motor  
AXMA Variable Piston Motor  
AXMI Variable Piston Motor

### Variable Displacement Pumps

AXVP Variable Piston Motor  
AXVA Variable Piston Motor  
AXVI Variable Piston Motor

### Dual Flow Piston Pumps

A2FD (DIN) Dual Flow Pumps  
A2FD (SAE) Dual Flow Pumps  
A2PD Axial Dual Output Pumps

### Axial Piston & Gear Pumps

A3PP Axial Piston Pumps  
A3PH High Pressure Pumps  
A2GP Gear Pumps  
A2GPT Tandem Gear Pumps  
A2GM Gear Motors  
A2GMT Tandem Gear Motors

### Valve (ByPass) (Flushing) (Cavitation)

Circulation Valve  
ByPass Valve  
Anti-Cavitation Valve  
Flushing Valve  
LS Valve  
AntiShock Valve  
Speed Sensor

### Hydraulic Spare Parts

Suction Fittings  
Couplars  
Adapters  
Flanges  
Power Take Off  
Monoblock Valve  
Section Valve

## Hydraulic Pumps, Pumps

Bent Axis Hydraulic Piston Pumps, Bent Axis Hydraulic Piston Pumps, Bent Axis Pumps, Variable Displacement Piston Pumps, Variable Displacement Piston Pumps, Axial Piston Pumps, High Pressure Piston Pumps, Gear Pumps, Gear Pumps, Hydraulic Valve.

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