

Axial Piston Fixed Pump

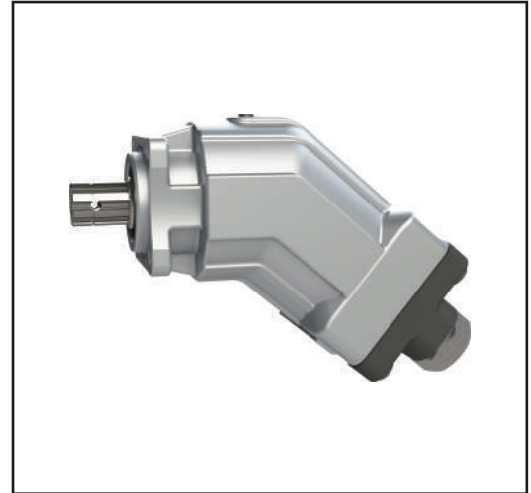
MA17F Series



MAXMA FLUID POWER INC.

Axial Piston Pump MA17F Series

- *MA17F DIN is a series of Bent-axis Piston pump with a fixed displacement for demanding mobile hydraulics.*
- *Open circuit. covers the entire displacement range 23 to 125cc/rev.*
- *Nominal pressure/maximum pressure 350/400 bar.*
- *High-pressure pump for commercial vehicles.*
- *It is a modern, compact pump which meets the market's high demands on flow performance, pressure, efficiency and small installation dimensions.*



Features

- *Flange and shaft designed for direct mounting on the power take-off of commercial vehicles or on a frame bracket via an intermediate shaft.*
- *Weight-optimized thanks to diecast aluminum housing.*
- *No case drain line necessary.*
- *Pumps deliver high speed while maintaining low noise levels.*
- *Straight forward adjustment of direction of drive.*
- *Optional unloading valve for equipment with continuous pump operation.*
- *The optimized design allows the bearing to bear a more constant load, thereby reducing pulsation and outputting a smoother flow rate.*
- *Long service life due to high demands on bearings, seals, etc.,*

Ordering Information

| | | | | | | | |
|-------|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| MA17F | | | | | | | |

Pos.1 Product Series

Bent-axis design, fixed displacement for commercial vehicles (truck)

Pos.2 Displacement cc/rev

| Code | Displacement |
|------|--------------|
| 23 | 22.8 |
| 32 | 32.1 |
| 45 | 45.5 |
| 56 | 56.2 |
| 63 | 63.1 |
| 80 | 80.6 |
| 90 | 90.2 |
| 107 | 107.1 |
| 125 | 125.1 |

Pos.3 Direction of rotation (viewed on shaft)

| | |
|---|------------------------|
| R | - CW (clockwise) |
| L | - CCW (Anti-clockwise) |

Pos.4 Sealing Material

| | |
|------|-----------------------|
| Omit | - Standard seal (NBR) |
| F | - Option (FKM) |

Pos.5 Mounting flange

Omit - Special flange ISO 7653(for trucks)

Pos.6 Drive Shaft

| | |
|------|---------------------------------------|
| Omit | - DIN 5462 8x32x36 (ISO14) for trucks |
| S | - Option (SAE-14T12/24) |

Pos.7 Porting

| | |
|------|-------------|
| Omit | - BSPP(GAS) |
| U | - UNF |
| M | - Metri |

Technical Data

| Size | NG | | 23 | 32 | 45 | 56 | 63 | 80 | 90 | 107 | 125 |
|---|-------------------------------------|-----------------|-------|------|------|------|------|------|------|-------|-------|
| Displacement, geometric, per revolution | V_g | cm ³ | 22.8 | 32.1 | 45.5 | 56.2 | 63.1 | 80.6 | 90.2 | 107.1 | 125.1 |
| Speed maximum ¹⁾ | $n_{nom}^{2)}$ | rpm | 3100 | 2700 | 2600 | 2450 | 2200 | 2100 | 2100 | 2000 | 1800 |
| | $n_{nom}^{3)}$ | rpm | 4200 | 3900 | 3700 | 3500 | 3200 | 3100 | 3100 | 2800 | 2500 |
| Flow | at n_{nom} | q_v | l/min | 70 | 88 | 121 | 137 | 139 | 173 | 189 | 225 |
| Max. Continue pressure | | bar | 350 | 350 | 350 | 350 | 350 | 350 | 350 | 350 | 250 |
| Peak Pressure | | bar | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 300 |
| Power | at n_{nom} and $\Delta P=350$ bar | P | kW | 42 | 53 | 70 | 80 | 81 | 102 | 110 | 131 |
| Torque | at $\Delta P=350$ bar | T | Nm | 128 | 175 | 252 | 312 | 352 | 446 | 502 | 697 |
| Case volume | V | l | 0.25 | 0.29 | 0.4 | 0.5 | 0.5 | 0.6 | 0.6 | 0.75 | 0.75 |
| Mass (approx.) | m | kg | 5.9 | 5.9 | 8.4 | 9.3 | 9.3 | 12.3 | 12.3 | 15 | 15 |

1) The values are applicable:

- for the optimum viscosity range from $\nu_{opt} = 36$ bis 16 mm²/s
- for hydraulic fluids based on mineral oils.

2) The values apply at absolute pressure $p_{abs} = 1$ bar at suction port S

3) Maximum speed (speed limit) with increased inlet pressure p_{abs} at suction port S (see diagram).

| Determining the operating characteristics | | | |
|---|-------|---|---------|
| Flow | q_v | $= \frac{V_g \times n \times \eta_v}{1000}$ | [l/min] |
| Torque | T | $= \frac{V_g \times \Delta p}{20 \times \pi \times \eta_{hm}}$ | [Nm] |
| Power | P | $= \frac{2 \pi \times T \times n}{60000} = \frac{q_v \times \Delta p}{600 \times \eta_t}$ | [kW] |

V_g Displacement per revolution [cm³]

Δp Differential pressure [bar]

n Speed [rpm]

η_v Volumetric efficiency

η_{hm} Hydraulic-mechanical efficiency

η_t Total efficiency ($\eta_t = \eta_v \times \eta_{hm}$)

Note

- Theoretical values, without efficiency and tolerances; values rounded.
- Operation above the maximum values or below the minimum values may result in a loss of function, a reduced service life or in the destruction of the axial piston unit. Other permissible limit values, such as speed variation, reduced angular acceleration as a function of the frequency and the permissible angular acceleration at start (lower than the maximum angular acceleration).

Hydraulic Fluid

The Bent axis piston Pump MA17F is designed for operation with HLP mineral oil according to DIN 51524. Application instructions and requirements for hydraulic fluid selection, should be taken from the following data sheets before the start of project planning and consider about operation as well as disposal and environmental protection.

- ▶▶ 90220: Hydraulic fluids based on mineral oils and related hydrocarbons
- ▶▶ 90221: Environmentally acceptable hydraulic fluids
- ▶▶ 90222: Fire-resistant, water-free hydraulic fluids (HFDR/HFDU)
- ▶▶ 90225: Limited technical data for operation with water free and water-containing fire-resistant hydraulic fluids (HFAE, HFAS, HFB, HFC)

Notes on selection of hydraulic fluid

The hydraulic fluid should be selected such that the operating viscosity in the operating temperature range is within the optimum range (vopt see selection diagram).

Viscosity and temperature of hydraulic fluids

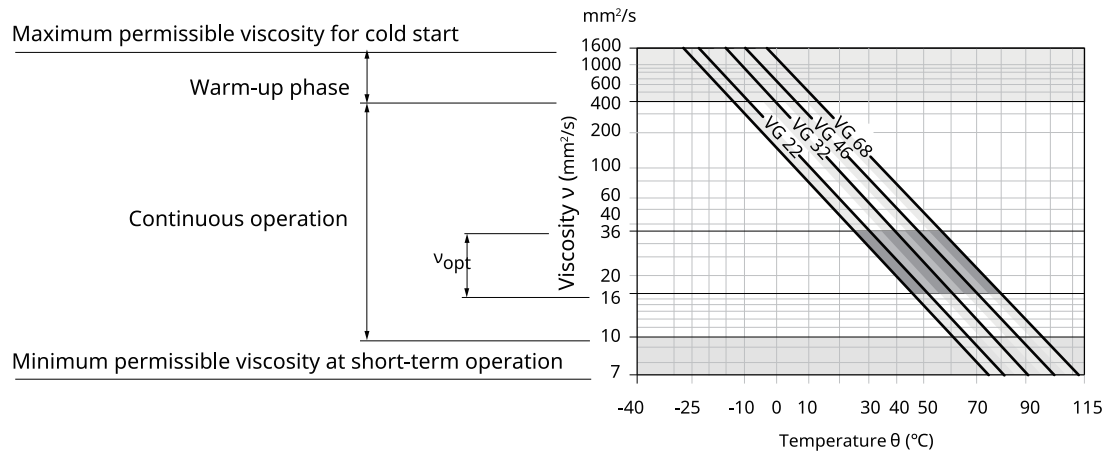
| | Viscosity | Shaft seal | Temperature | Comment |
|----------------------|---|------------|---|---|
| Cold start | $v_{\max} \leq 7400$ (1600) | NBR | $\theta_{St} \geq -40^{\circ}\text{C}$ | $t \leq 3\text{min}$, without load ($p \leq 725\text{psi}$ (50bar) $n \leq 1000\text{rpm}$, Permissible temperature difference between axial piston unit and hydraulic fluid in the system maximum 45°F (25K) |
| | | FKM | $\theta_{St} \geq -25^{\circ}\text{C}$ | |
| Warm-up phase | $v = 7400 \text{---} 1850$ (1600---400) | | | $t \leq 15\text{min}$, $p \leq 0.7 \times p_{\text{nom}}$, $n \leq 0.5 \times n_{\text{nom}}$ |
| Continuous operation | $v = 1850 \text{---} 60$ (400---10) | NBR | $\theta_{St} \geq +85^{\circ}\text{C}$ | Range of optimum operating viscosity and efficiency |
| | | FKM | $\theta_{St} \geq +105^{\circ}\text{C}$ | |
| | $v_{\text{opt}} = 170 \text{---} 82$ (36---16) | | | |
| Short-term operation | $v_{\min} = 60 \text{---} 49$ (10---7) | NBR | $\theta_{St} \geq +85^{\circ}\text{C}$ | $t \leq 3\text{min}$, $p \leq 0.3 \times p_{\text{nom}}$, measured at port T |
| | | FKM | $\theta_{St} \geq +105^{\circ}\text{C}$ | |

Notice:

At no point of the component may the temperature be higher than 105°C . The temperature difference specified in the table is to be taken into account when determining the viscosity in the bearing. Please contact Maxma if the above conditions cannot be met due to extreme operating parameters

Hydraulic Fluid

• Selection diagram



• Filtration of the hydraulic fluid

Finer filtration improves the cleanliness level of the hydraulic fluid, which increases the service life of the axial piston unit.

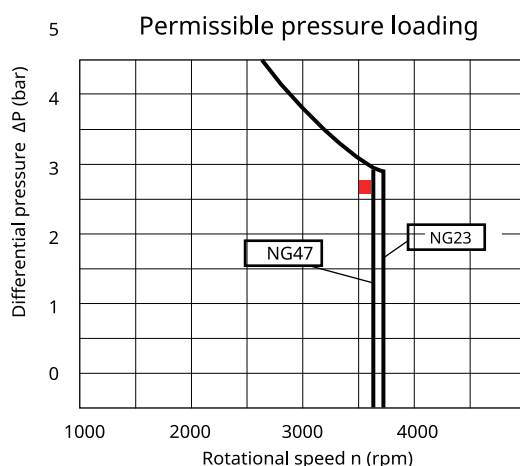
A cleanliness level of at least 20/18/15 is to be maintained according to ISO 4406.

We recommend, depending on the system and application, for the V90C : filter cartridges $\beta_{20} \geq 100$.

At very high hydraulic fluid temperatures (90°C , to maximum 105 °C , measured at port T), a cleanliness level of at least 19/17/14 according to ISO 4406 is necessary.

Shaft seal

The service life of the shaft seal is influenced by the speed of the axial piston unit and the leakage pressure in the housing (case pressure). Momentary pressure spikes ($t < 0.1$ s) of up to 10 bar are permitted. The service life of the shaft seal decreases with increasing frequency of pressure spikes and increasing mean differential pressure. The case pressure must be equal to or higher than the ambient pressure.




The FKM shaft seal may be used for leakage temperatures from -25°C to +105°C .

For application cases below -25°C , an NBR shaft seal is required (permissible temperature range: -40°C to +90°C).

Axial forces of the drive shaft

Permissible axial forces of the drive shaft

| Size | | NG | 23 | 32 | 45 | 56 | 63 | 80 | 90 | 107 | 125 |
|--|---|-----------------|----|----|----|----|----|----|----|-----|-----|
| Maximum axial force, at stand still or pressure-free operation |  | + $F_{ax\ max}$ | N | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | - $F_{ax\ max}$ | N | 24 | 33 | 43 | 48 | 53 | 60 | 65 | 71 |

Note

- The values given are maximum values and do not apply to continuous operation.
- The permissible axial force in direction -Fax is to be avoided as the lifetime of the bearing is reduced.
- Radial forces are not permissible.

Direction of rotation

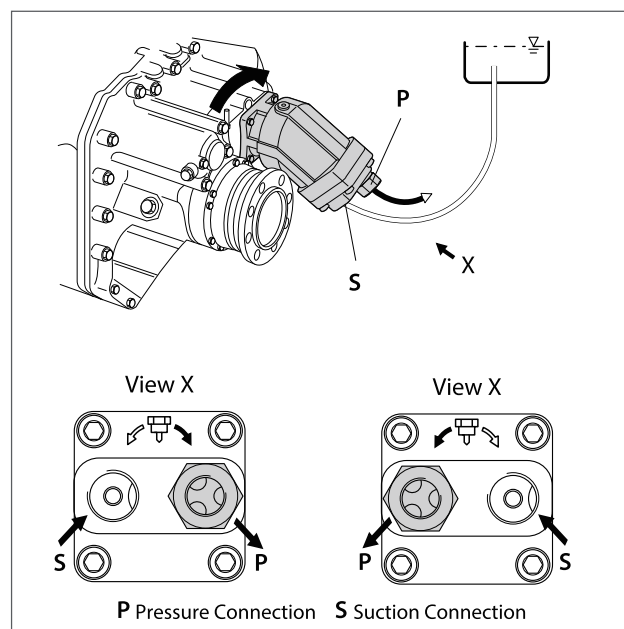
Direction of rotation

The direction of rotation of the bent axial piston unit is defined by means of a pressure connection screwed into the working port and can easily be changed.

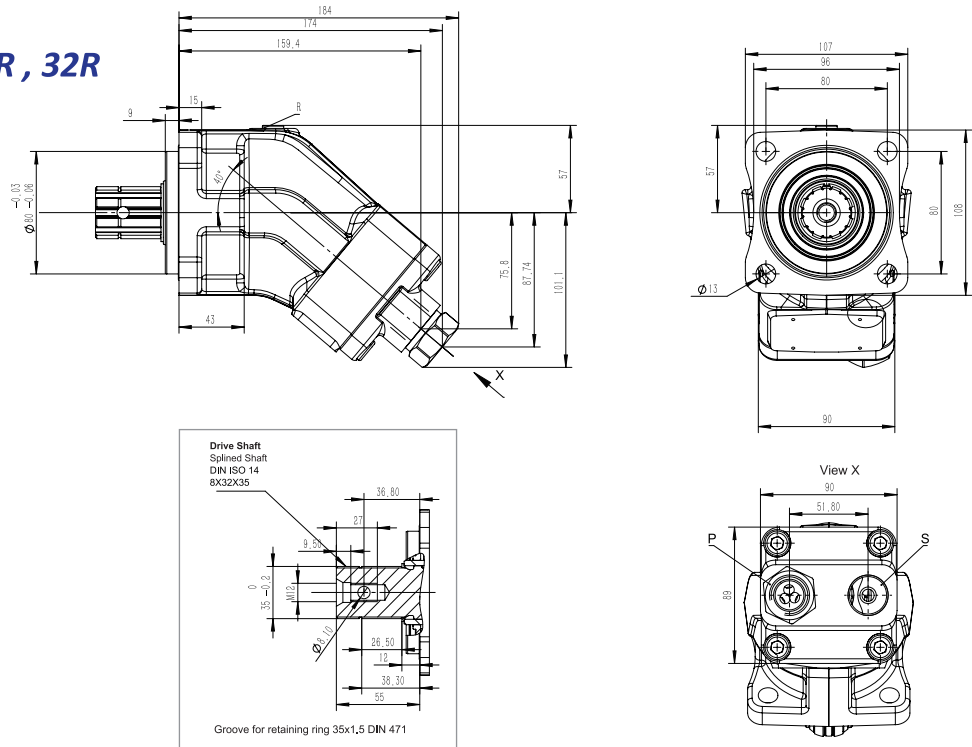
By changing the pressure connection, the working port and the suction port are exchanged. As a result, the permissible drive direction is changed. This is necessary when mounting on a power take-off with counter-clockwise rotation, for example. The procedure for conversion of the pressure nipple can be found in the instruction manual ("Direction of rotation and change of direction of rotation").

Note

The pressure connection nipple is pre-installed upon delivery and must be tightened with the torque stipulated for the appropriate thread size prior to installation (see instruction manual).

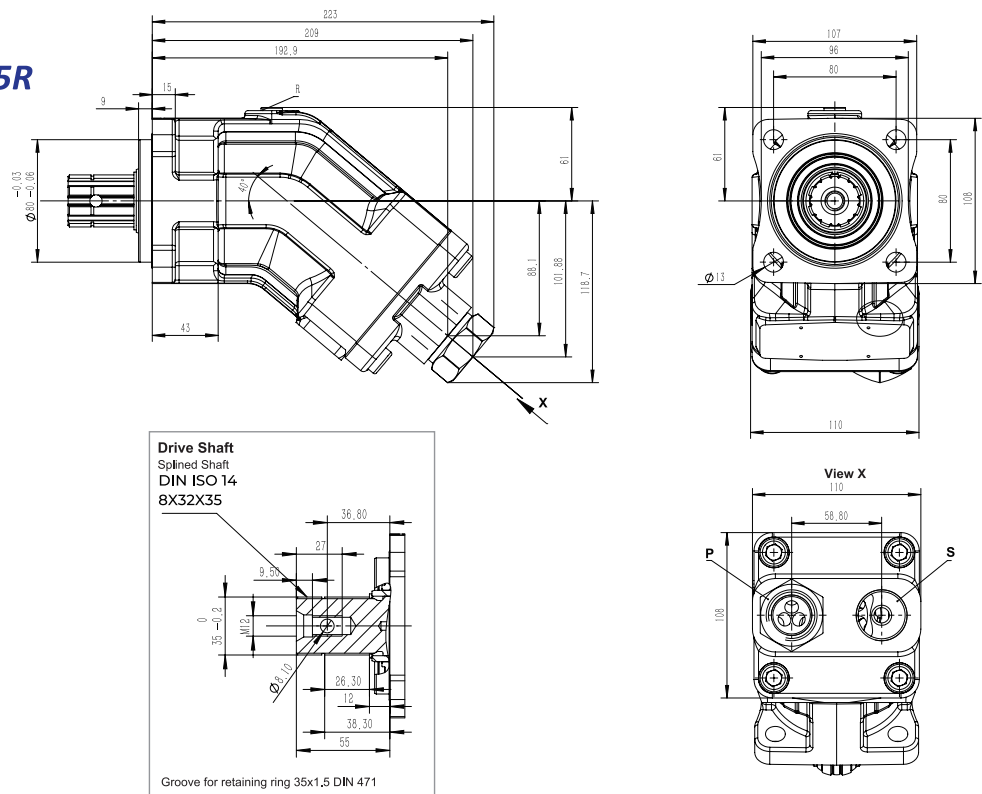


MA17F-23R , 32R



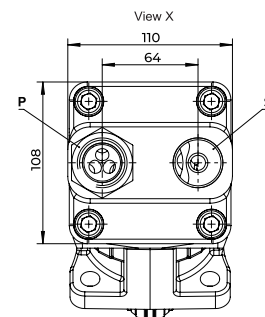
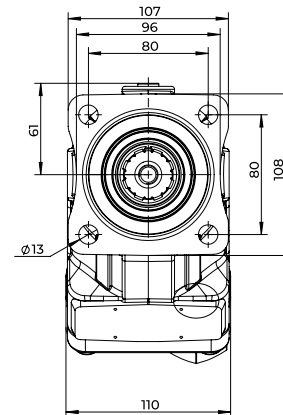
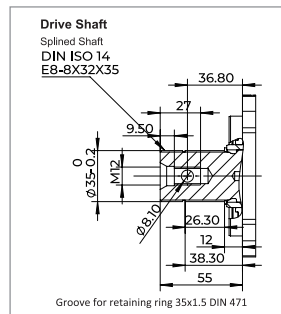
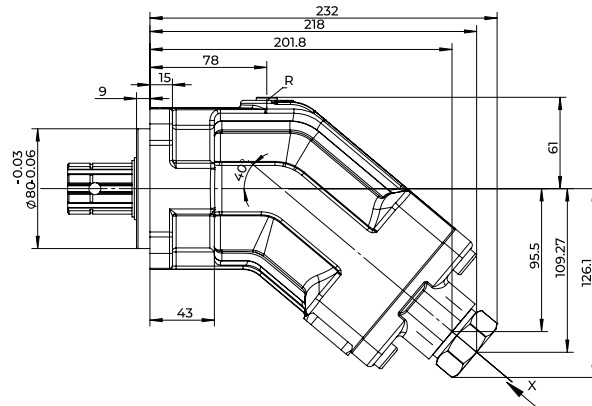
| Ports | | Standard | Size | P max(bar) | State |
|-------|----------------|-------------|-----------------|------------|---------|
| P | Working port | DIN ISO 228 | G1/2; 14 deep | 400 | Open |
| S | Suction port | DIN ISO 228 | G3/4; 16 deep | 2 | Open |
| R | Air bleed port | DIN 3852 | M10 x 1; 8 deep | 2 | Plugged |

MA17F-45R

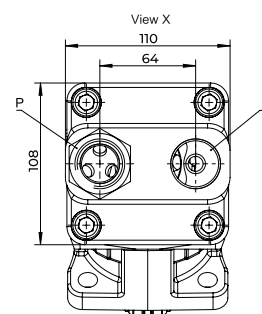
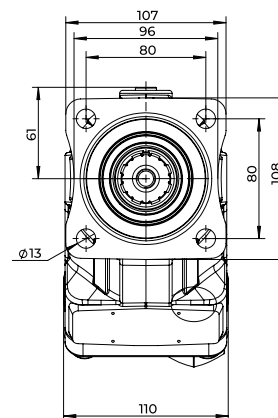
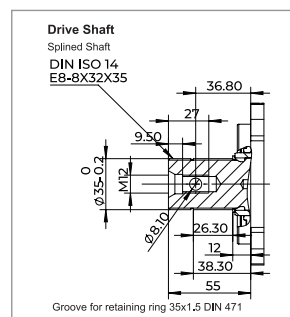
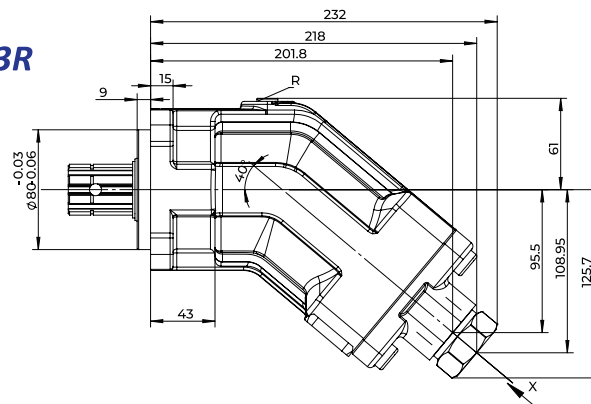


| Ports | | Standard | Size | P max(bar) | State |
|-------|----------------|-------------|-----------------|------------|---------|
| P | Working port | DIN ISO 228 | G3/4; 18 deep | 400 | Open |
| S | Suction port | DIN ISO 228 | G1; 18 deep | 2 | Open |
| R | Air bleed port | DIN 3852 | M10 x 1; 8 deep | 2 | Plugged |

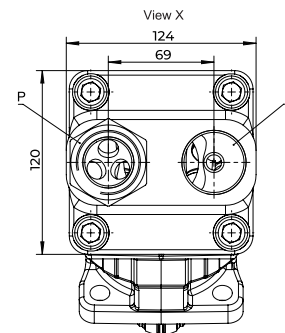
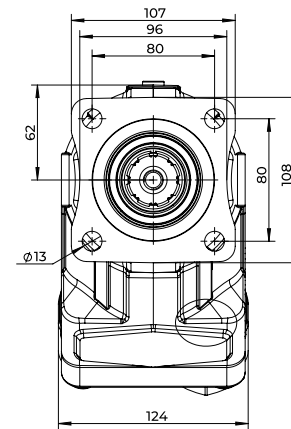
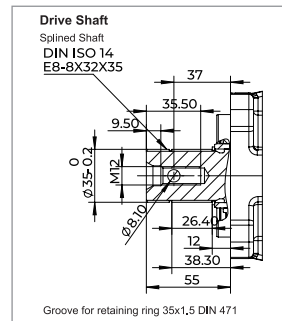
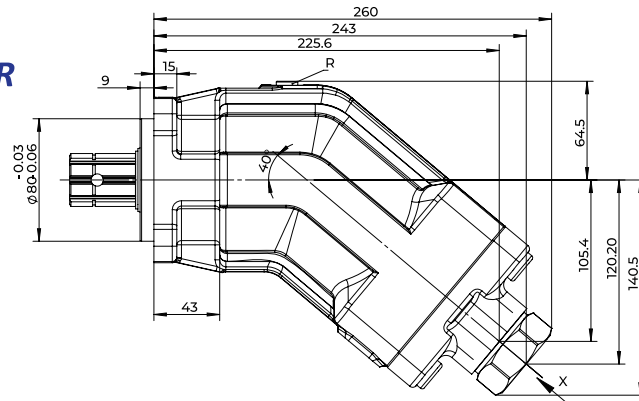
MA17F-56R



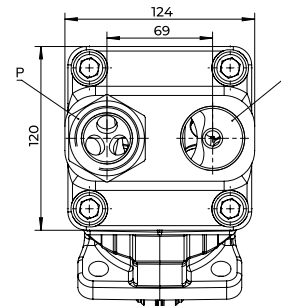
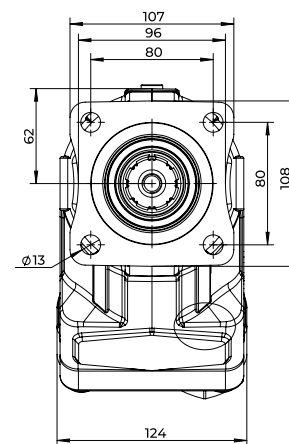
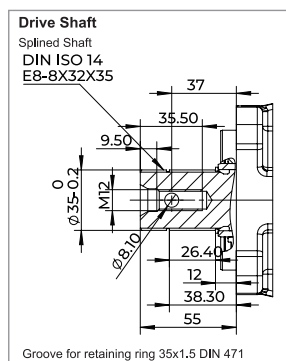
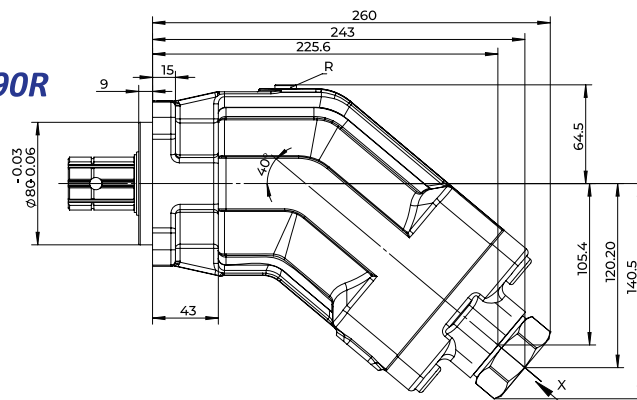
| Ports | | Standard | Size | P max(bar) | State |
|-------|----------------|-------------|-----------------|------------|---------|
| P | Working port | DIN ISO 228 | G3/4; 18 deep | 400 | Open |
| S | Suction port | DIN ISO 228 | G1; 18 deep | 2 | Open |
| R | Air bleed port | DIN 3852 | M10 x 1; 8 deep | 2 | Plugged |

MA17F-63R

| Ports | | Standard | Size | P max(bar) | State |
|-------|----------------|-------------|-----------------|------------|---------|
| P | Working port | DIN ISO 228 | G3/4; 18 deep | 400 | Open |
| S | Suction port | DIN ISO 228 | G1; 18 deep | 2 | Open |
| R | Air bleed port | DIN 3852 | M10 x 1; 8 deep | 2 | Plugged |

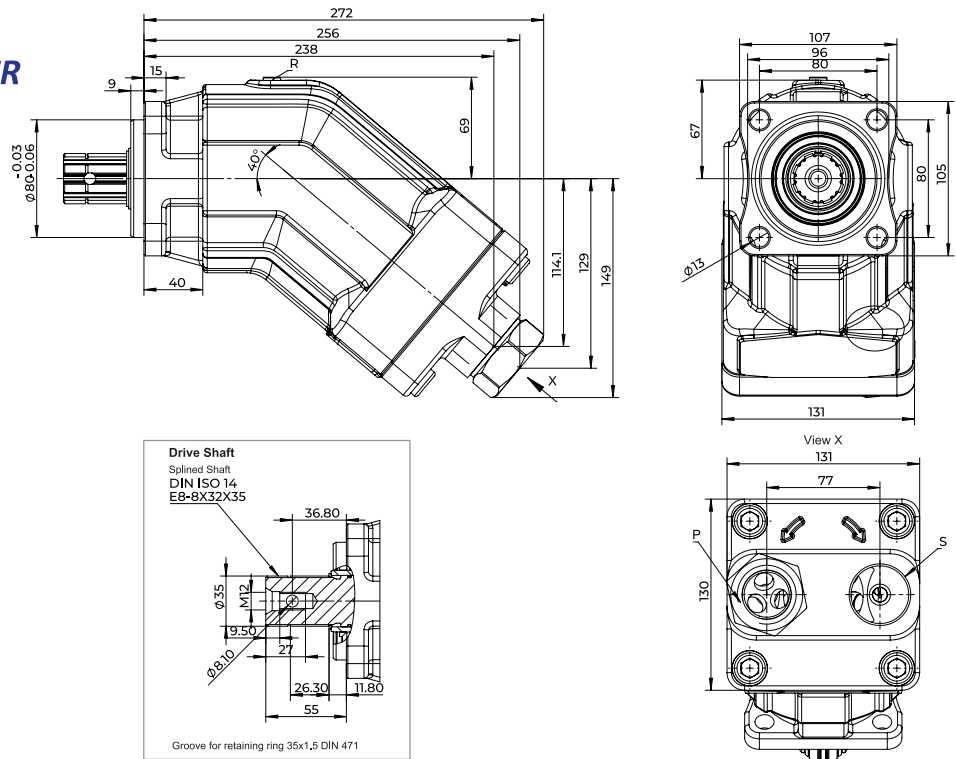
MA17F-80R

| Ports | | Standard | Size | P max(bar) | State |
|-------|----------------|-------------|-----------------|------------|---------|
| P | Working port | DIN ISO 228 | G1; 18 deep | 400 | Open |
| S | Suction port | DIN ISO 228 | G1 1/4; 20 deep | 2 | Open |
| R | Air bleed port | DIN 3852 | M10 x 1; 8 deep | 2 | Plugged |

MA17F-90R

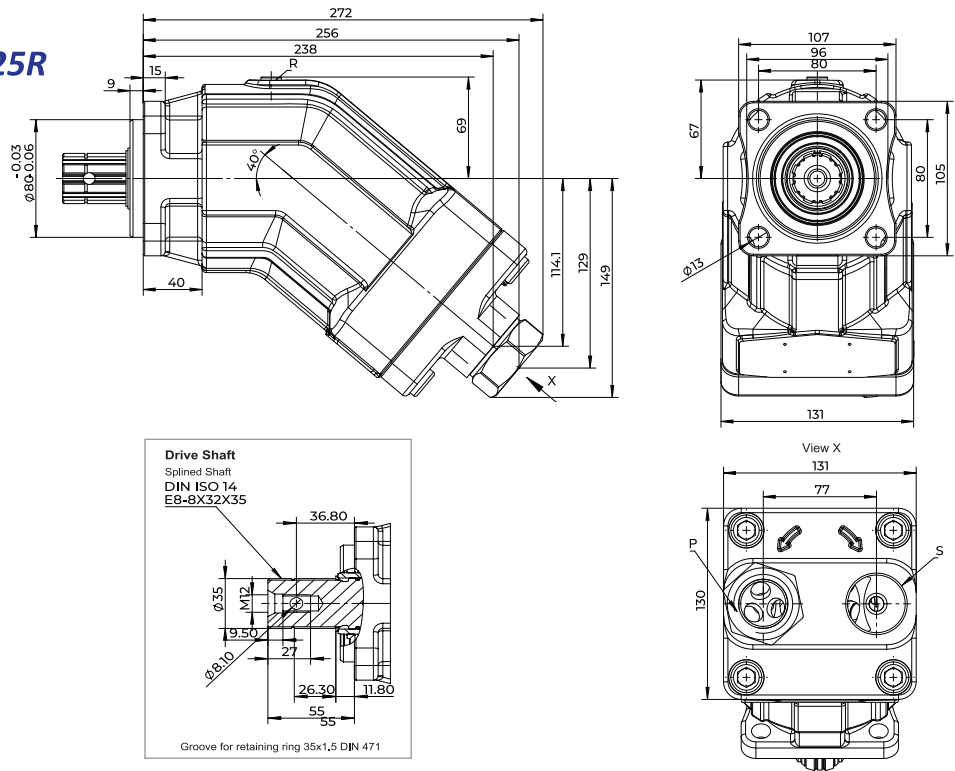
| Ports | | Standard | Size | P max(bar) | State |
|-------|----------------|-------------|-----------------|------------|---------|
| P | Working port | DIN ISO 228 | G1; 18 deep | 400 | Open |
| S | Suction port | DIN ISO 228 | G1 1/4; 20 deep | 2 | Open |
| R | Air bleed port | DIN 3852 | M10 x 1; 8 deep | 2 | Plugged |

MA17F-107R

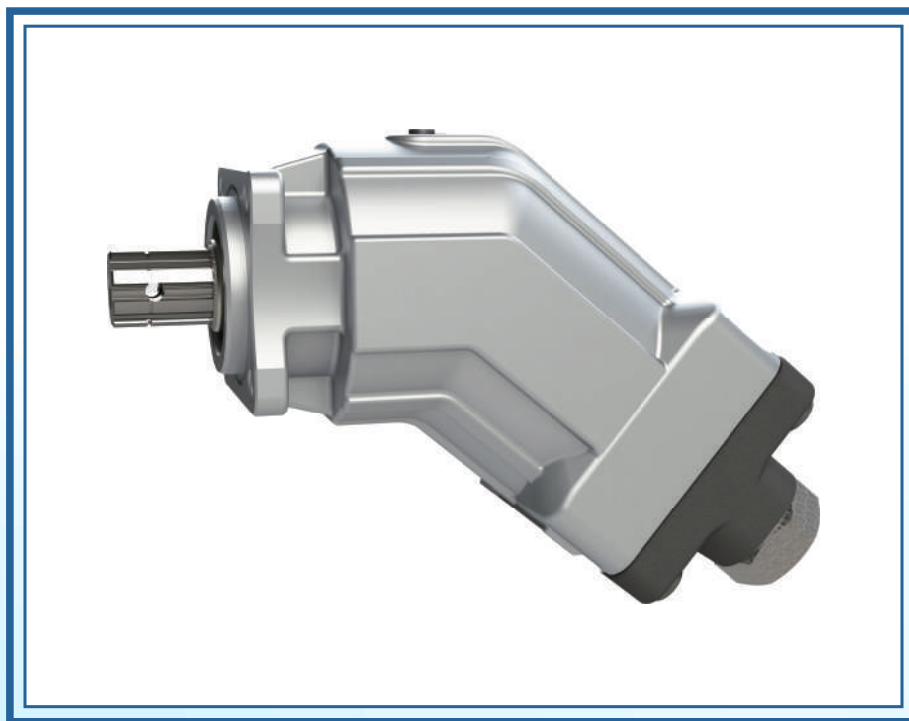


| Ports | | Standard | Size | P max(bar) | State |
|-------|----------------|-------------|-----------------|------------|---------|
| P | Working port | DIN ISO 228 | G1; 18 deep | 400 | Open |
| S | Suction port | DIN ISO 228 | G1 1/4; 18 deep | 2 | Open |
| R | Air bleed port | DIN 3852 | M10 x 1; 8 deep | 2 | Plugged |

MA17F-125R



| Ports | | Standard | Size | P max(bar) | State |
|-------|----------------|-------------|-----------------|------------|---------|
| P | Working port | DIN ISO 228 | G1; 18 deep | 400 | Open |
| S | Suction port | DIN ISO 228 | G1 1/4; 20 deep | 2 | Open |
| R | Air bleed port | DIN 3852 | M10 x 1; 8 deep | 2 | Plugged |



MAXMA FLUID POWER INC.

Mailing Address: P. O. Box 47-83, Taipei 103, Taiwan

***Shipping Address: 7F-5, No. 12, Lane 609, Sec. 5,
Chung-Hsin Rd., San-Chung Dist.,
New Taipei City 241, Taiwan***

Website: www.maxma.com.tw

E-Mail: info@maxma.com.tw

Tel: 886-2-2999-7998

Fax: 886-2-2999-7118

MAX-2505E