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# Truck Hydraulics

Series GPA, GP1, F1, T1, F2, F3, F4, VP1,  
Fixed and Variable Displacement Pumps,  
Motors and Accessories



ENGINEERING YOUR SUCCESS.

## Basic formulas for hydraulic pumps

Flow (q)	D – displacement [cm <sup>3</sup> /rev]
$q = \frac{D \times n \times \eta_v}{1000}$ [l/min]	n – shaft speed [rpm]
	$\eta_v$ – volumetric efficiency
Torque (M)	$\Delta p$ – differential pressure [bar] (between inlet and outlet)
$M = \frac{D \times \Delta p}{63 \times \eta_{hm}}$ [Nm]	$\eta_{hm}$ – mechanical efficiency
Power (P)	$\eta_t$ – overall efficiency ( $\eta_t = \eta_v \times \eta_{hm}$ )
$P = \frac{q \times \Delta p}{600 \times \eta_t}$ [kW]	

## Conversion factors

1 kg .....	2.20 lb
1 N.....	0.225 lbf
1 Nm.....	0.738 lbf ft
1 bar .....	14.5 psi
1 l .....	0.264 US gallon
1 cm <sup>3</sup> .....	0.061 cu in
1 mm .....	0.039 in
$\frac{9}{5} \text{ }^\circ\text{C} + 32$ .....	1 <sup>°</sup> F
1 kW.....	1.34 hp

On our website, [www.parker.com/pmde](http://www.parker.com/pmde),  
you can find:  
2D & 3D drawings,  
Installation Manuals,  
Service Manuals,  
Spare Parts Lists

**F1 Pump**  
**F1-ISO**



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**F1-25 to -101, ISO**

**Specifications**

Frame size F1-	25	41	51	61	81	101
<b>Displacement</b> [cm <sup>3</sup> /rev]	25.6	40.9	51.1	59.5	81.6	102.9
<b>Max flow</b> <sup>1)</sup> [l/min]	78	104	125	143	180	216
<b>Max operating pressure</b> [bar]	400	400	400	400	400	400
<b>Mass moment of inertia J</b> [kgm <sup>2</sup> ]	0.00274	0.00266	0.00261	0.00257	0.00532	0.00524
<b>Shaft speed</b> [rpm]						
- short circuited pump (low press.)	3100	2700	2700	2700	2300	2300
- max selfpriming speed <sup>2)</sup>	3050	2550	2450	2400	2200	2100
<b>Torque</b> <sup>1)</sup> [Nm]	163	260	324	378	518	653
<b>Max Input power</b> <sup>3)</sup> [kW]	45	61	73	83	105	126
<b>Weight</b> [kg]	8.5	8.5	8.5	8.5	12.3	12.1

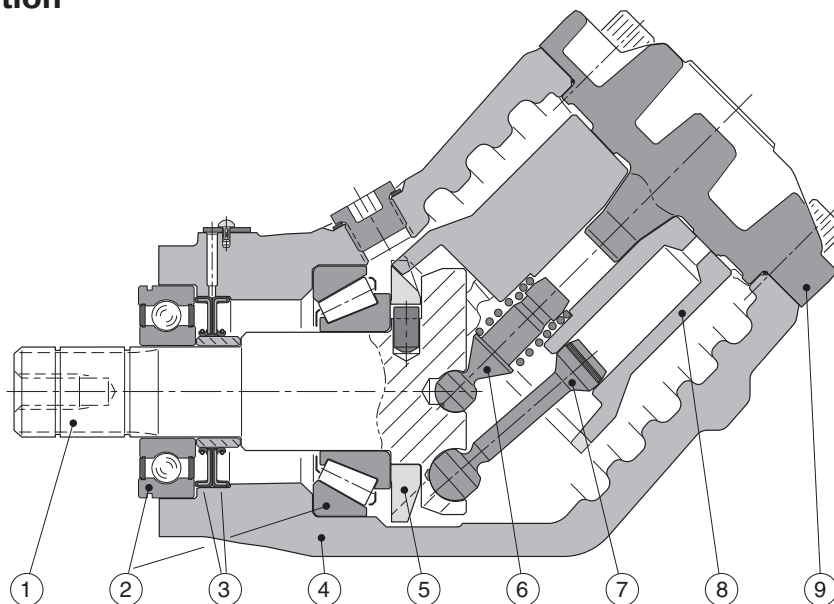
1) Theoretical values

2) Valid at an inlet pressure of 1.0 bar (abs.) when operating on mineral oil at a viscosity of 30 mm<sup>2</sup>/s (cSt).

3) Max 6 seconds in any one minute.

**NOTE:** For noise level information, contact Parker Hannifin

**Pump cross section**

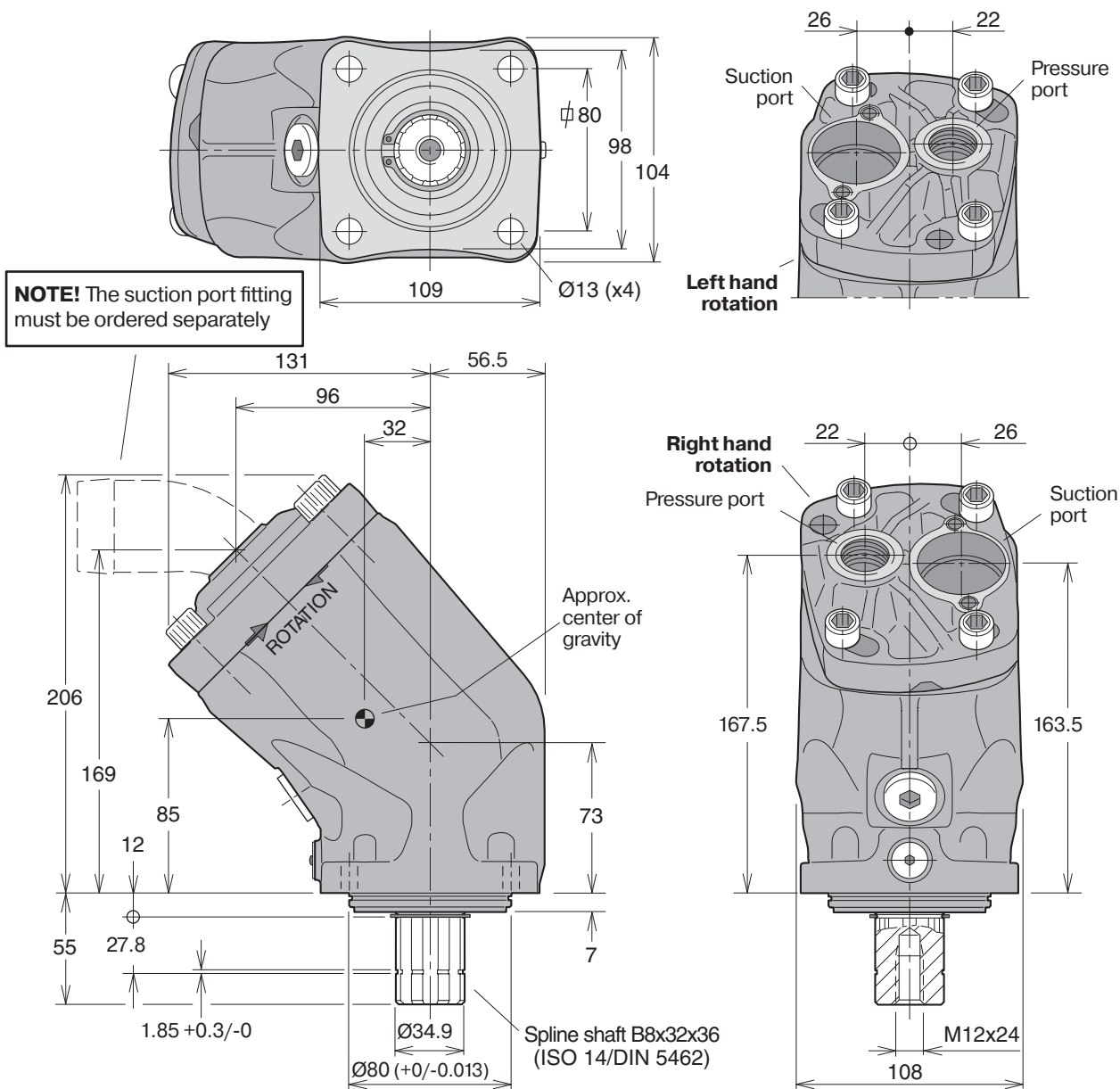


- 1. Input shaft
- 2. Bearings
- 3. Shaft seals

- 4. Housing
- 5. Timing gear
- 6. Barrel support

- 7. Piston with piston ring
- 8. Cylinder barrel
- 9. End cap

F1-25, -41, -51 and -61



Ordering code

Example: **F1-81-R**

F1 frame size  
**25, 41, 51, 61, 81 or 101**

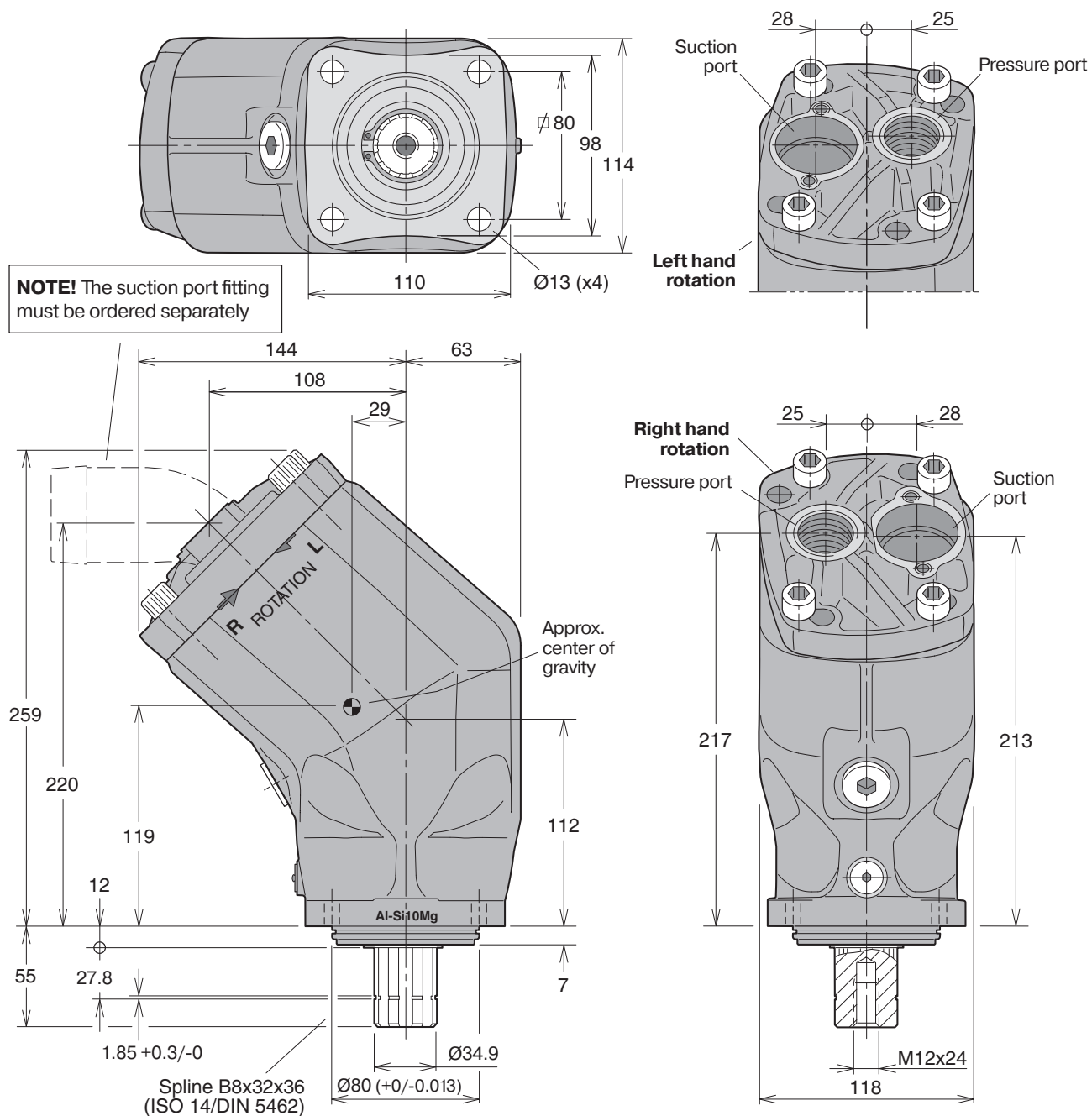
Shaft rotation  
**R** Right hand  
**L** Left hand

**NOTE:** The pump **does not** include a suction fitting; it must be ordered separately. See page 63ff..

Standard versions

Designation	Ordering no.
F1-25-R	378 1024
F1-25-L	378 1025
F1-41-R	378 1040
F1-41-L	378 1041
F1-51-R	378 1050
F1-51-L	378 1051
F1-61-R	378 1060
F1-61-L	378 1061

F1-81 and -101



Port size

F1 frame size	Pressure port <sup>1)</sup>
-25	3/4"
-41	3/4"
-51	3/4"
-61	3/4"
-81	1"
-101	1"

<sup>1)</sup> BSP thread (fitting not included)

Standard versions

Designation	Ordering no.
F1-81-R	378 1080
F1-81-L	378 1081
F1-101-R	378 1100
F1-101-L	378 1101

**NOTE:** The pump **does not** include a suction fitting; it must be ordered separately. See page 63ff.

**F1-12 ISO with BSP port treads**

**Specifications**

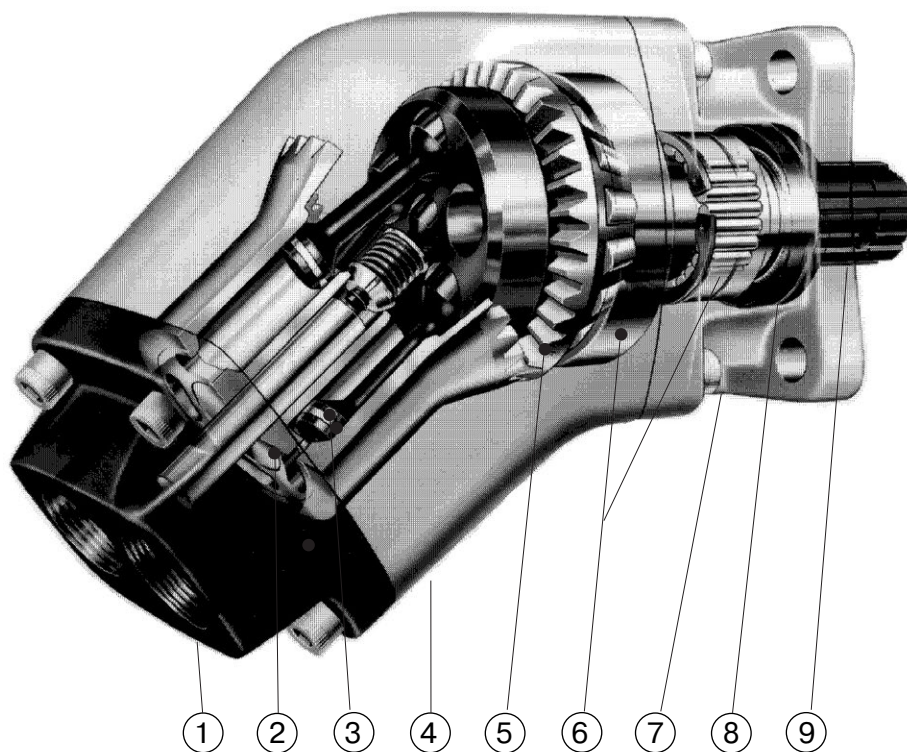
Frame size F1-	12
<b>Displacement</b> [cm <sup>3</sup> /rev]	12
<b>Max flow</b> <sup>1)</sup> [l/min]	28
<b>Max operating pressure</b> [bar]	350
<b>Shaft speed</b> [rpm]	
- short circuited pump (low press.)	3100
- max selfpriming speed	2300
<b>Torque</b> <sup>1)</sup> [Nm]	67
<b>Max input power</b> [kW]	16
<b>Weight</b> [kg]	6.7

<sup>1)</sup> Theoretical values

**NOTE:**

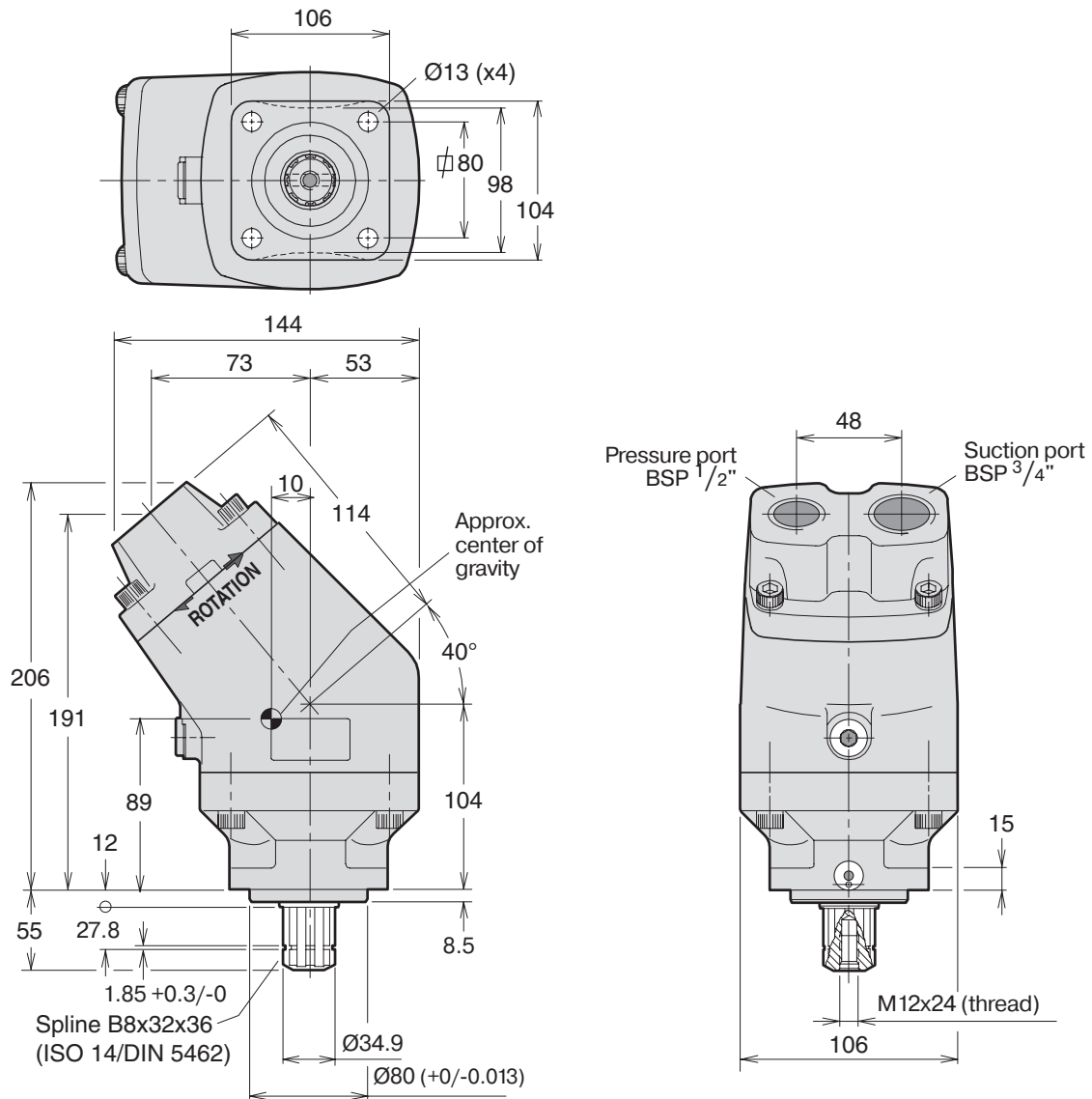
For noise level information, contact Parker Hannifin

**Pump cross section**



- |                           |                   |                               |
|---------------------------|-------------------|-------------------------------|
| 1 End cap                 | 4 Barrel housing  | 7 Bearing housing with flange |
| 2 Cylinder barrel         | 5 Timing gear     | 8 Shaft seals                 |
| 3 Piston with piston ring | 6 Roller bearings | 9 Input shaft                 |

● **F1-12 with BSP port treads**



● **Ordering code**

Example: **F1-12-R**

F1 frame size **12**

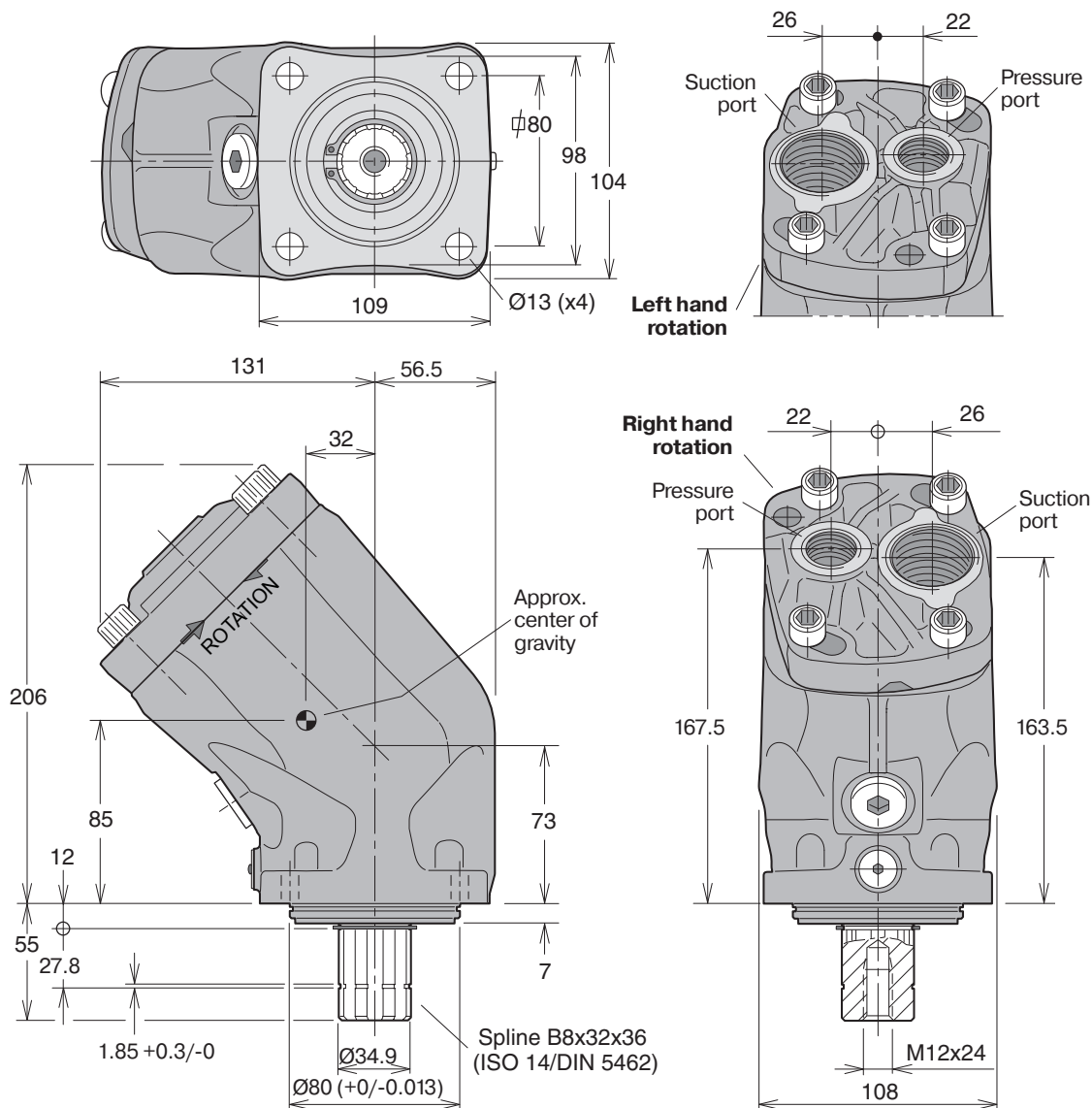
Shaft rotation **R** Right hand  
**L** Left hand

**Standard versions**

Designation	Ordering no.
F1-12-R	378 2212
F1-12-L	378 2211

**NOTE:** The pump **does not** include a suction fitting; it must be ordered separately. See page 63ff.

F1-25, -41, -51 and -61 with BSP port treads



Port size (all ports are BSP)

F1 frame size	Pressure port <sup>1)</sup>	Suction port
-25	3/4"	1"
-41	3/4"	1"
-51	3/4"	1"
-61	3/4"	1"

Ordering code

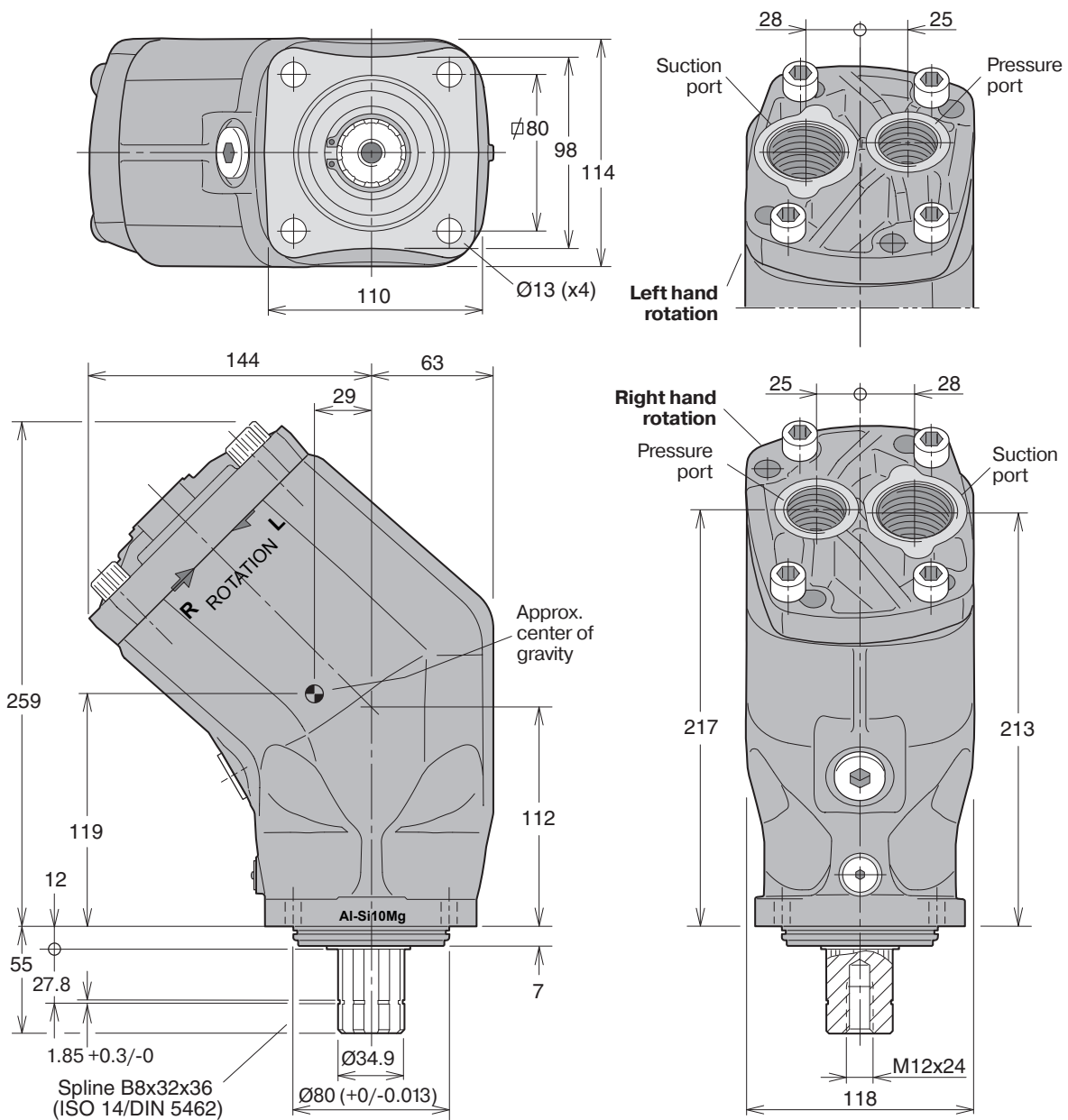
Example: **F1 - 61 - RB**  
 F1 frame size ————— 25, 41, 51, 61, 81 or 101  
 Shaft rotation/port threads —————  
**RB** Right hand/BSP  
**LB** Left hand/BSP

Standard versions

Designation	Ordering no.
F1-25-RB	378 4024
F1-25-LB	378 4025
F1-41-RB	378 4040
F1-41-LB	378 4041
F1-51-RB	378 4050
F1-51-LB	378 4051
F1-61-RB	378 4060
F1-61-LB	378 4061

**NOTE:** The pump **does not** include a suction fitting; it must be ordered separately. See page 63ff.

● **F1-81 and -101 with BSP port treads**



● **Port size** (all ports are BSP)

F1 frame size	Pressure port <sup>1)</sup>	Suction port
-81	1"	1 1/4"
-101	1"	1 1/4"

● **Ordering code**

Example: **F1-81-RB**  
 F1 frame size —————  
**25, 41, 51, 61, 81 or 101**  
 Shaft rotation/port threads —————  
**RB** Right hand/BSP  
**LB** Left hand/BSP

**Standard versions**

Designation	Ordering no.
F1-81-RB	378 4080
F1-81-LB	378 4081
F1-101-RB	378 4100
F1-101-LB	378 4101

**NOTE:** The pump **does not** include a suction fitting; it must be ordered separately. See page 63ff.

**T1 Pump**



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## Specifications

Frame size T1-	81	121
<b>Displacement</b> [cm <sup>3</sup> /rev]	81.5	118.5
<b>Max flow</b> <sup>1)</sup> [l/min]	163	190
<b>Max operating pressure</b> [bar]		
continuous	250	250
intermittent <sup>3)</sup>	350	350
<b>Shaft speed</b> [rpm]		
- short circuited pump (low press.)	2300	2300
max speed <sup>2)</sup>	2000	1600
<b>Torque</b> <sup>1)</sup> [Nm]		
at 200 bar	258	376
at 350 bar	453	658
<b>Max input power</b> <sup>3)</sup> [kW]	95	111
<b>Weight</b> [kg]	8.5	12.5

1) Theoretical values

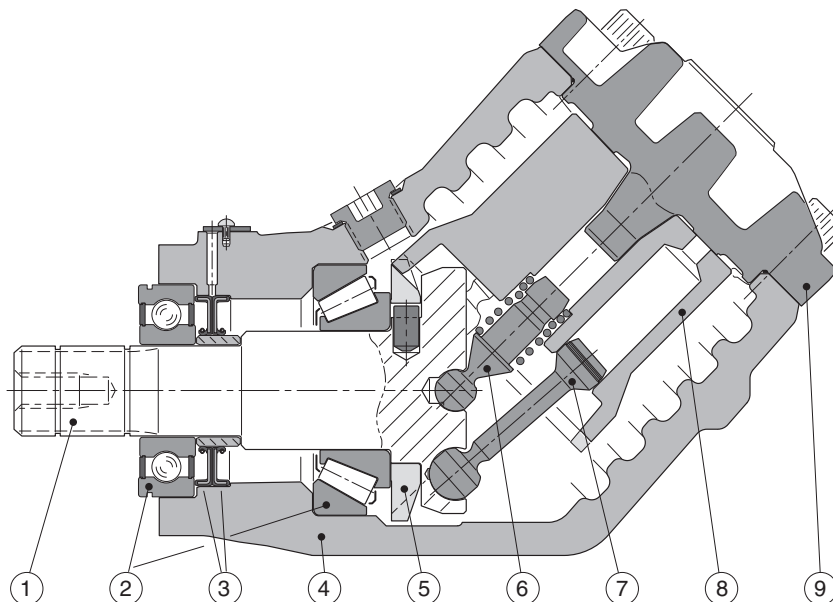
2) Valid at an inlet pressure of 1.0 bar (abs.) when operating on mineral oil at a viscosity of 30 mm<sup>2</sup>/s (cSt).

3) Max 6 seconds in any one minute.

**NOTE:** For noise level information, contact Parker Hannifin.

## Pump cross section

(T1-121 shown)

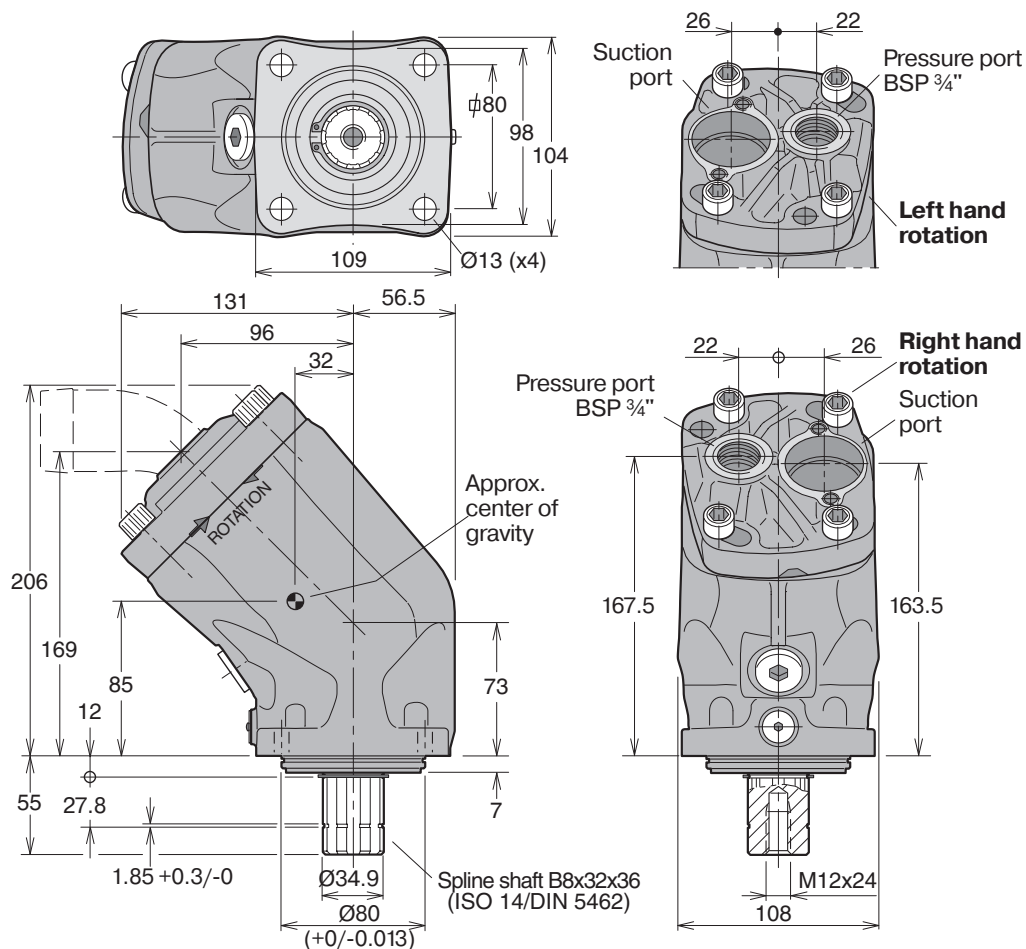


- 1. Input shaft
- 2. Bearings
- 3. Shaft seals

- 4. Housing
- 5. Timing gear
- 6. Barrel support

- 7. Piston with piston ring
- 8. Cylinder barrel
- 9. End cap

**T1-81**



**Ordering code**

Example:

**T1 - 81 - R**

T1 frame size  
**81** or **121**

Shaft rotation  
**R** Right hand  
**L** Left hand

**Port size**

T1 frame size	Pressure port <sup>1)</sup>
-81	3/4"
-121	1"

<sup>1)</sup> BSP thread (fitting not included).

**Standard versions**

Designation	Ordering no.
T1-81-R	378 2180
T1-81-L	378 2181
T1-121-R	378 2120
T1-121-L	378 2121

**NOTE:** The pump **does not** include a suction fitting; it must be ordered separately. See page 63ff.

**T1-121**

