

Technical Information



Case Drain Port L2
use highest
port as outlet
M12x1,5
Optional:
7/8-14 UNF-2B

L2

L1

Optional:
Port for
Pulse-Pick-Up
7/8-14 UNF-2R

Case Drain Port L1
M12x1,5
Optional:
7/8 UNF-2R

SPLINE DATA

Pitch dia : 33,338
Pressure angle : 30°
Number of teeth : 21
Pitch : 16/32
ANSI B92.1-1970, Class 5
Fillet Root Side Fit

GENERAL DESCRIPTION

These motors are designed primarily to be combined with other products in closed circuit systems to transfer and control hydraulic power.
New generation with up to 27% shorter length and 25% lower weight.

- **Innovation with reliable technology**
- **Flange and shaft configuration like Series 20**
- **Proven rotating group**
- **Loop flushing device integrated**
- **High pressure relief valves integrated**
- **Hose connections in SAE**
- **High pressure ports 1- 6000 psi on one side**
- **Nearly equal hardware for size 070 and 089 cm³**
- **Significant reduction of the envelope size**

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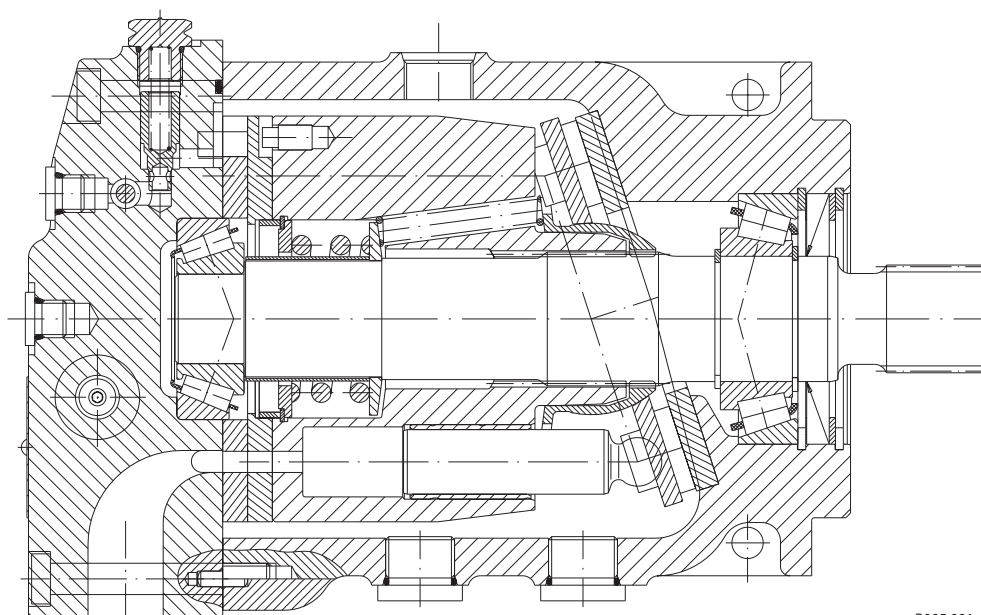
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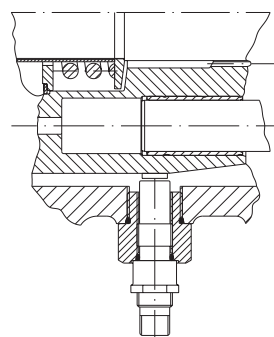
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**TMM WITH HIGH
PRESSURE RELIEF VALVES**

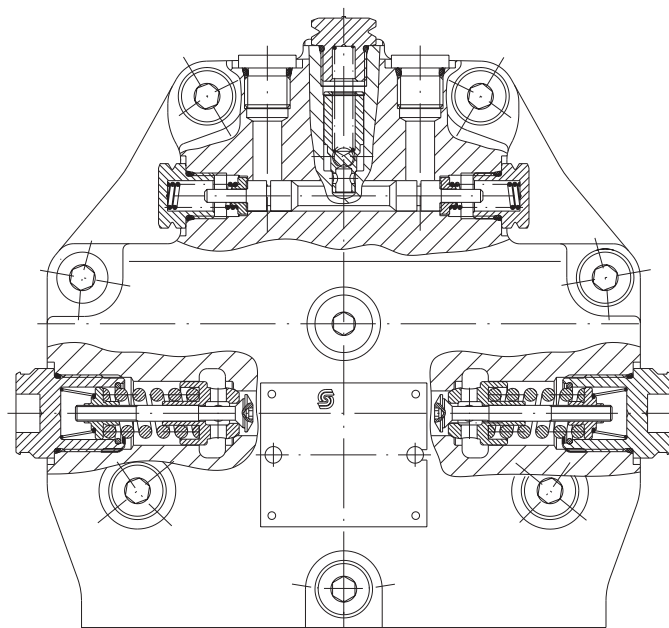


P005 001

Optional

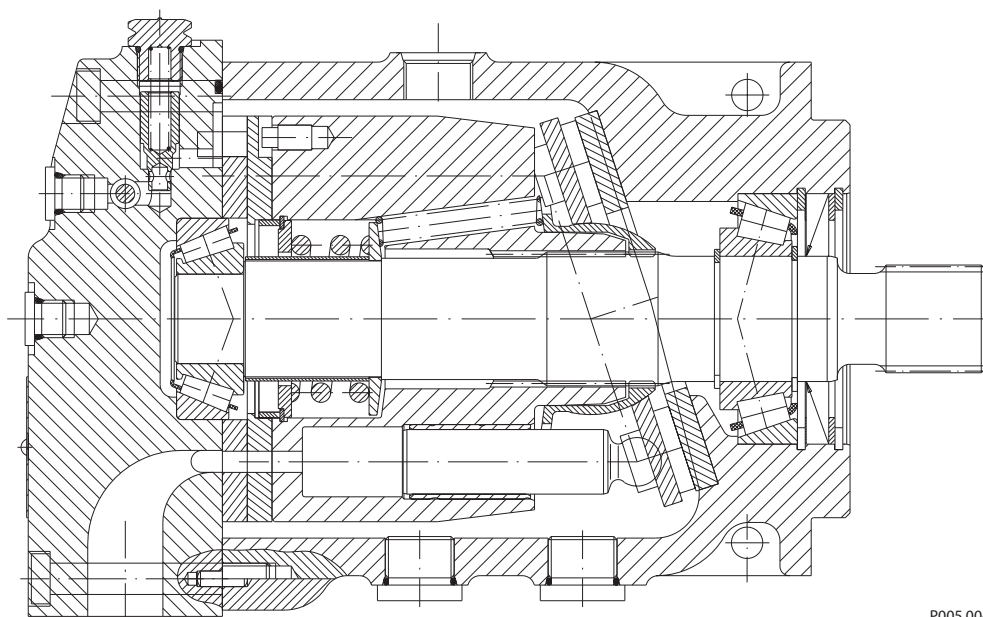


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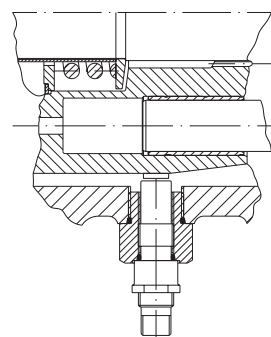
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**TMM WITHOUT HIGH
PRESSURE RELIEF VALVES**

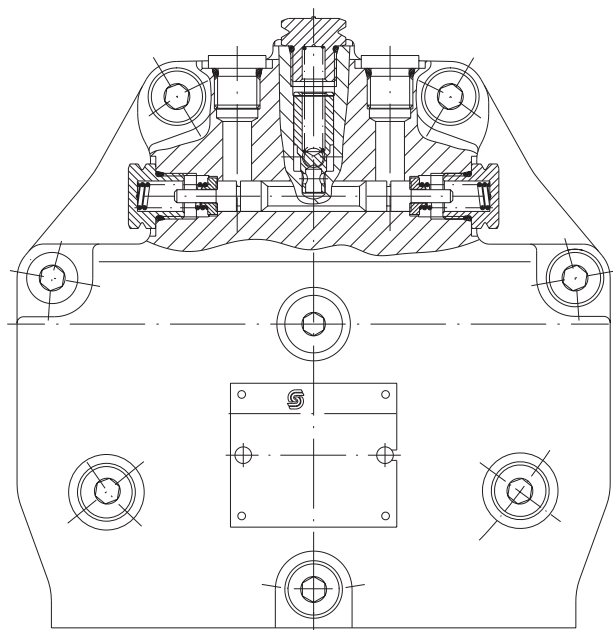


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Optional

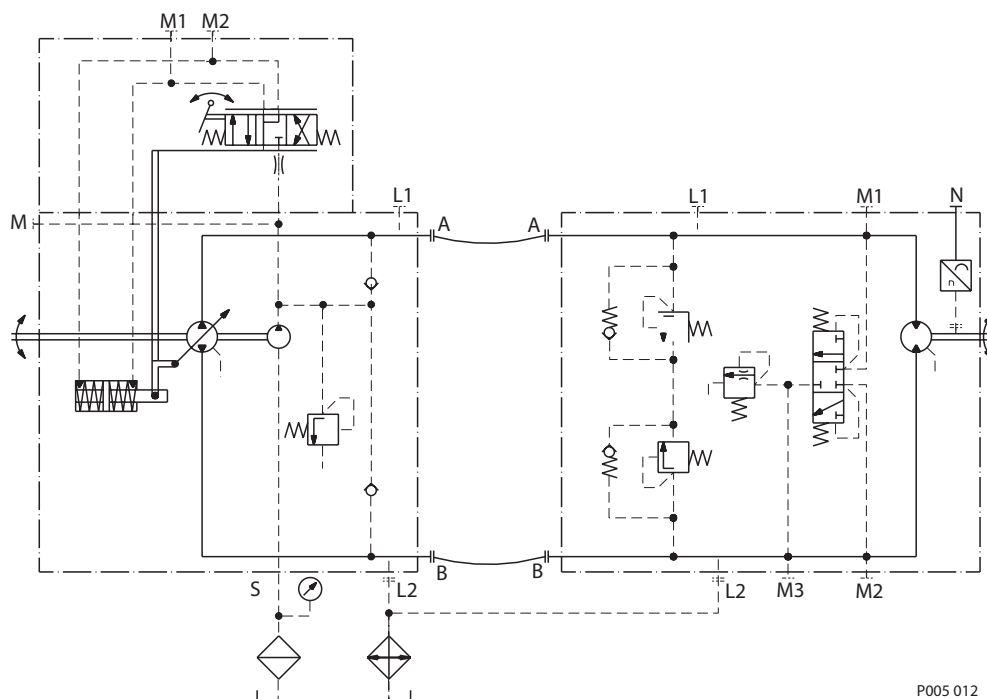


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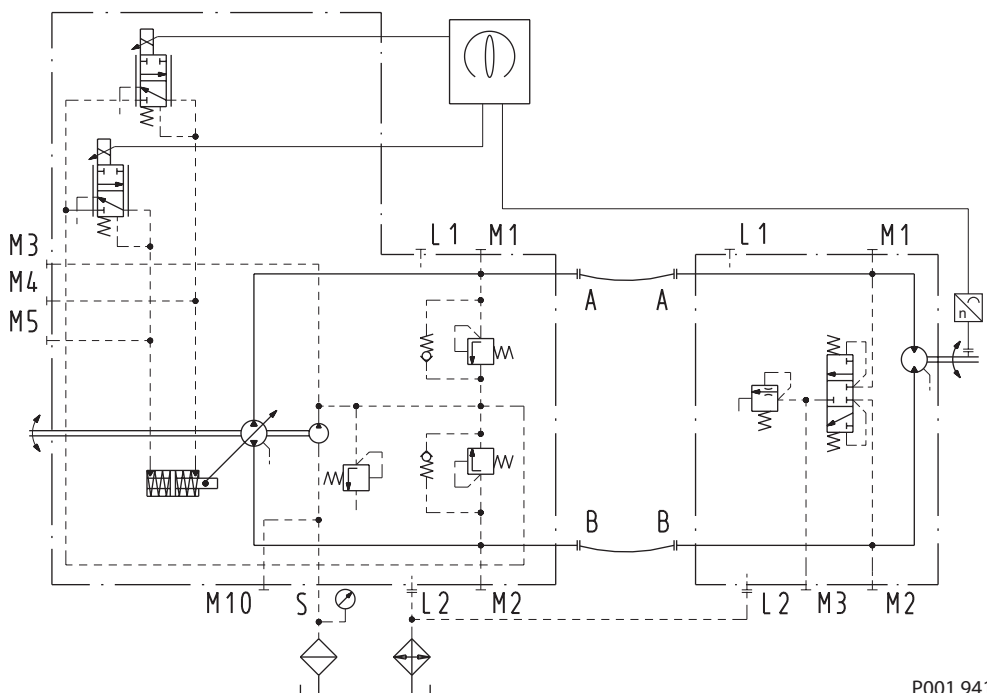
P005 005

**TMM WITH HIGH
PRESSURE RELIEF VALVES**



P005 012

**TMM WITHOUT HIGH
PRESSURE RELIEF VALVES**



P001 941

GENERAL SPECIFICATION

Most specifications for axial piston motor with fixed displacement swashplate axial piston design are listed on these pages. For definitions of the various specifications, see the related pages in this publication.

General Specifications	
Motor type	Axial piston motor with fixed displacement swashplate axial piston design
Direction of rotation	Clockwise and counter-clockwise (bi-directional)
Installation position	Discretionary, the housing must always be filled with hydraulic fluid
Other system requirements	Circuit overpressure protection, suitable reservoir
T005 009E	

SPECIFIC DATA

Specific Data				
Dimension			Frame Size	
			070	089
Displacement	V _g	cm ³ [in ³]	70 [4.27]	89 [5.43]
Maximum flow	Q _{max}	l/min [US gal/min]	203 [54]	258 [68]
Maximum corner power	p corner _{max}	kW [hp]	142 [190]	180 [242]
Weight	m	kg [lb]	35 [77]	35 [77]
Mass moment of inertia of the internal rotating parts	J	kg m ² [lb·ft ²]	0.01777 [0.42]	0.01777 [0.42]
Type of mounting	Four (4) bolt flange, SAE flange configuration			
Pipe connections	Main pressure ports: SAE flange Remaining ports: SAE straight thread O-ring boss			
Shaft configuration	Splined ANSI			
T005 010				

TECHNICAL DATA

Case Pressure	
	bar [psi]
Rated pressure	3 [44.0]
Maximum pressure (cold start)	5 [73.0]
Minimum pressure	1 [14.5]
T000 003E	

Theoretical Torque			
		Frame size	
		070	089
At maximum displacement	Nm/bar [lbf·in/1000 psi]	1.11 [680]	1.42 [864]
T005 011E			

Speed Limits			
		Frame size	
		070	089
Rated speed	min ⁻¹ (rpm)	2500	
Maximum speed	min ⁻¹ (rpm)	2900	
T005 012E			

System pressure range, Input	
	bar [psi]
Maximum delta pressure	420 [6000]
T005 013E	

FLUID SPECIFICATIONS

Temperature Range ¹⁾		
	°C	[°F]
Minimum	-40	[-40]
Rated	104	[220]
Maximum	115	[240]
T002 006E		

¹⁾ At the hottest point, normally the case drain port.

Viscosity		
	mm ² /s	[SUS]
Minimum	7	[47]
Recommended operating range	12-60	[70-278]
Maximum	1600	[7500]
T002 010E		

Cleanliness Level and β_x -Ratio	
Required Fluid Cleanliness Level	ISO 4406 Class 18/13
Recommended β_x -Ratio for Suction Filtration	$\beta_{35-45} = 75$ ($\beta_{10} \geq 2$)
Recommended β_x -Ratio for Charge Pressure Filtration	$\beta_{15-20} = 75$ ($\beta_{10} \geq 10$)
Recommended Inlet Screen Size for Charge Pressure Filtration	100 μ m-125 μ m
T002 007E	

DETERMINATION OF NOMINAL MOTOR SIZES

Metric System/Inch System

$$\text{Input flow: } Q_e = \frac{Vg \cdot n}{1\,000 \cdot \eta_v} \text{ l/min}$$

$$Q_e = \frac{Vg \cdot n}{231 \cdot \eta_v} \text{ [US gal/min]}$$

$$\text{Output torque: } M_e = \frac{Vg \cdot \Delta p \cdot \eta_{mh}}{20 \cdot \pi} \text{ Nm}$$

$$M_e = \frac{Vg \cdot \Delta p \cdot \eta_{mh}}{2 \cdot \pi} \text{ [lbf}\cdot\text{in]}$$

$$\text{Output power: } P_e = \frac{M_e \cdot n}{9\,550} = \frac{Q_e \cdot \Delta p \cdot \eta_t}{600} \text{ kW}$$

$$P_e = \frac{Vg \cdot n \cdot \Delta p \cdot \eta_t}{396\,000} \text{ [hp]}$$

$$\text{Speed: } n = \frac{Q_e \cdot 1\,000 \cdot \eta_v}{Vg} \text{ min}^{-1}$$

$$n = \frac{Q_e \cdot 231 \cdot \eta_v}{Vg} \text{ (rpm)}$$

Where:

Vg = Motor displacement per rev. cm³ [in³]

Δp = $p_{HD} - p_{ND}$ bar [psid]

η_v = Motor volumetric efficiency

η_{mh} = Motor mechanical-hydraulic (Torque) efficiency

η_t = Motor overall efficiency

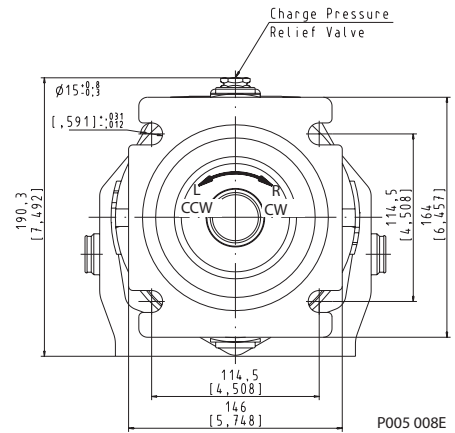
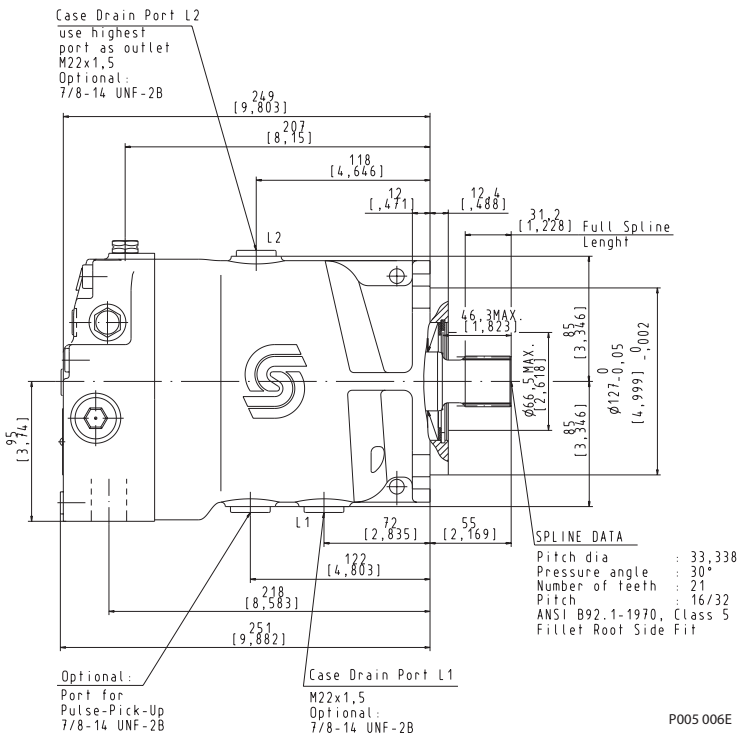
p_{HD} = High pressure bar [psid]

p_{ND} = Low pressure bar [psid]

Series TMM – Axial Piston Motor

Technical Information

General Dimensions – Frame Size 070 and 089

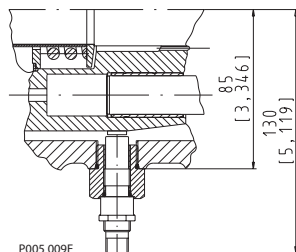


Direction of Rotation

	Port "A"	Port "B"
Clockwise (CW)	Output	Input
Counterclock (CCW)	Input	Output

T005 024E

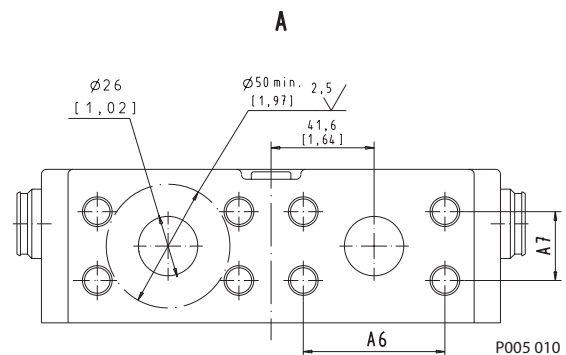
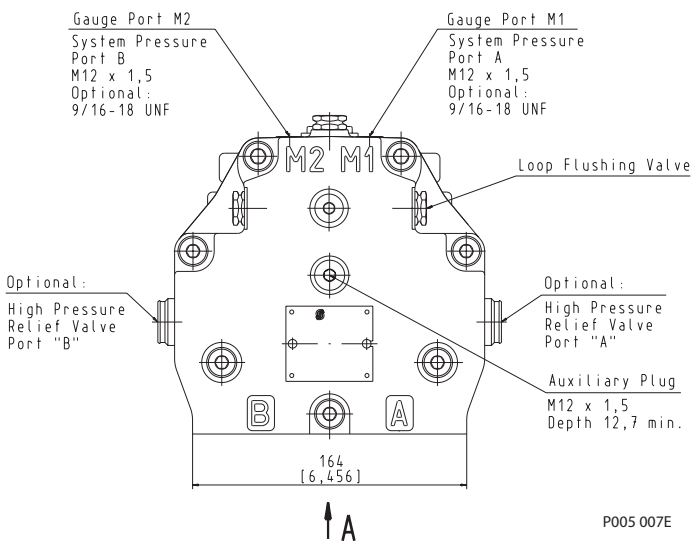
Optional



SAE - Building dimensions

	A6 mm [in]	A7 mm [in]
SAE Flange Size 1, J512C Code 62 [6000 psi] 4 Threads 7/16-14 UNC 20 Depth	57,2 [2,252]	27,8 [1,063]
SAE Flange Size 1, J512C Code 62 [6000 psi] 4 Threads M12-6H 21 Depth		

T005 025E



The diagram shows a power plant layout with two main power sources: a steam turbine and a gas turbine. The steam turbine is represented by a large circle with a vertical line through it, and the gas turbine is represented by a smaller circle with a vertical line through it. Both turbines are connected to a common shaft, indicated by a horizontal line with arrows at both ends. The steam turbine is connected to a generator, represented by a rectangle with a circle inside. The gas turbine is connected to a compressor, represented by a rectangle with a circle inside. The compressor is connected to a combustor, represented by a rectangle with a circle inside. The combustor is connected to a turbine, represented by a rectangle with a circle inside. The turbine is connected to a generator, represented by a rectangle with a circle inside. The diagram also shows various components like pumps, valves, and pipes, all labeled with letters and numbers. The layout is enclosed in a dashed rectangular boundary.

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