

H1 Axial Piston Pumps Single and Tandem



For more than 40 years, Danfoss has been developing state-of-the-art components and systems for mobile machinery used in off-highway operations around the world.

We have become a preferred supplier by offering the best of what really matters: The hardware inside your vehicle application.

The H1 range is built around an advanced control and available in a wide range of displacements. It is designed for quality and reliability and offers expanded functionality, greater total efficiency, and easy installation.

All H1 control and sensor options are PLUS+1® Compliant. PLUS+1® allows you to rapidly develop and customize electronic machine control. It opens up the future by combining machine controls and diagnostics in an integrated operating network.



Features

Designed for quality and reliability

- One design concept
- Single piece swash plate **Wide range of controls**
- Electro-hydraulic controls:
 - Electrical Displacement Control (EDC)
 - Forward-Neutral-Reverse (FNR)
 - Non-Feedback Proportional Electric (NFPE)
- Automotive Control (AC)
- Fan Drive Control (FDC)
- Manual Displacement Control (MDC)
- Common control across entire family

Greater total efficiency

- Minimized control losses
- Improved charge circuit
- Lower control pressure for less power consumption

Installation and packaging benefits

- Length optimized pump
- Minimum one clean side
- Higher corner HP / package size ratio
- Standardized connector interface

Expanded functionality

- PLUS+1® Compliant control and sensor options
- Integral filtration available with integrated filter bypass sensors and switch

H1 Axial Piston Pumps, Single and Tandem

Technical specifications

Overview of H1 pumps technical specifications

The table below shows the available range of H1 pumps as of this printing, with their respective speed, pressure, weight and mounting flange:

Feature	045	053	060	068	069	078	089	100	115	130	147	165	210	250
Displacement cm ³ [in ³]	45.0 [2.75]	53.8 [3.28]	60.4 [3.69]	68.0 [4.15]	69.2 [4.22]	78.1 [4.77]	89.2 [5.44]	101.7 [6.21]	115.2 [7.03]	130.0 [7.93]	147.2 [8.98]	165.1 [10.08]	211.5 [12.91]	251.7 [15.36]
Rated speed min ⁻¹ (rpm)	3400	3400	3500	3500	3500	3500	3300	3300	3200	3200	3000	3000	2600	2600
Max speed min ⁻¹ (rpm)	3500	3500	4000	4000	4000	4000	3800	3800	3400	3400	3100	3100	2800	2800
Max working pressure¹⁾ bar [psi]	420 [6090]	380 [5510]	420 [6090]	380 [5510]	450 [6525]	450 [6525]	450 [6525]	450 [6525]	450 [6525]	450 [6525]	450 [6525]	450 [6525]	450 [6525]	450 [6525]
Max pressure bar [psi]	450 [6525]	400 [5800]	450 [6525]	400 [5800]	480 [6960]	480 [6960]	480 [6960]	480 [6960]	480 [6960]	480 [6960]	480 [6960]	480 [6960]	480 [6960]	480 [6960]
Weight dry (W/O PTO, filter); kg [lb]	single: 41 [90] tandem: 65 [143]		50 [110]	50 [110]	56 [123]	56 [123]	62 [137]	62 [137]	83 [187]	83 [187]	96 [211]	96 [211]	163 [360]	163 [360]
Mounting flange	SAE B 2-bolt	SAE B 2-bolt	SAE C 4-bolt	SAE C 4-bolt	SAE C 4-bolt	SAE C 4-bolt	SAE C 4-bolt	SAE C 4-bolt	SAE D 4-bolt	SAE D 4-bolt	SAE D 4-bolt	SAE D 4-bolt	SAE E 4-bolt	SAE E 4-bolt

¹⁾ Applied pressures above maximum working pressure requires SAMER srls application approval.

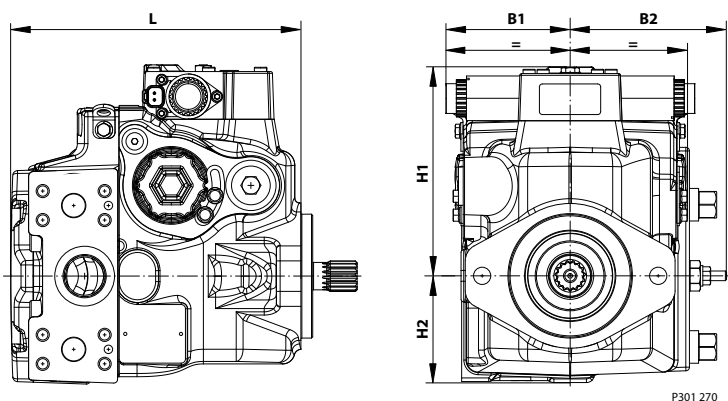
Control options

Size	045/053 Tandem	045/053 Single	060/068	069/078	089/100	115/130	147/165	210/250
EDC	●	●	●	●	●	●	●	●
MDC	●	●	●	●	●	●	●	●
FNR	●	●	●	●	●	●	–	–
NFPE	●	●	●	●	●	●	●	●
FDC	–	●	●	●	●	●	●	●
AC	–	●	●	●	●	●	●	●

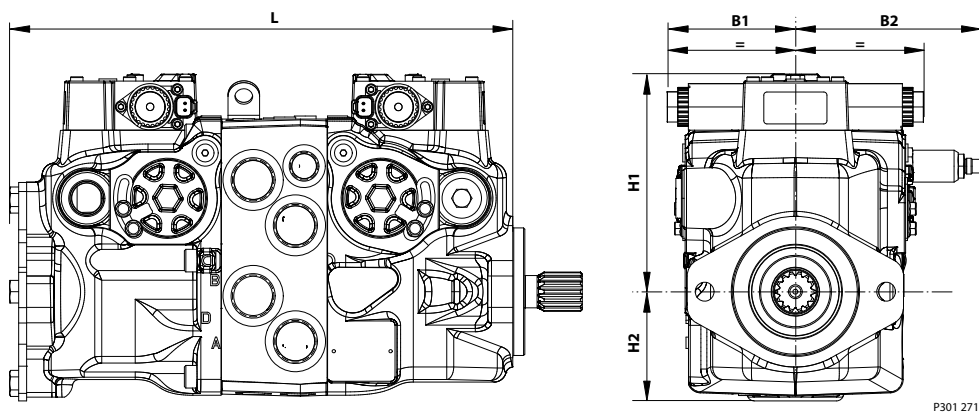
H1 Axial Piston Pumps, Single and Tandem

Dimensions

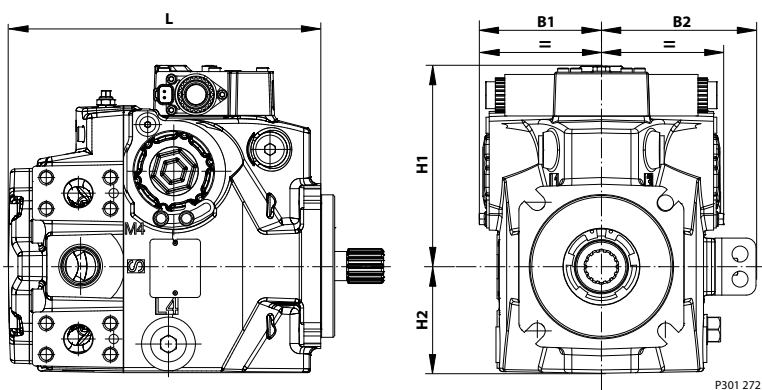
Frame size 045/053 (Single)



Frame size 045/053 (Tandem)



Frame size 060-250 (Single)



Dimensions

H1 pumps dimensions

Dimensions (mm)

Size	L	B1	B2	H1	H2
045/053 Single	238.2	103.0	129.7	173.3	88.5
045/053 Tandem	405.0	103.0	129.7	173.3	87.0
060/068	255.9	106.0	135.5	173.9	99.4
069/078	278.3	108.9	138.2	178.9	95.0
089/100	295.3	112.4	139.2	187.3	99.0
115/130	316.9	121.9	148.1	204.3	110.0
147/165	333.3	131.9	152.6	208.3	112.0
210/250	418.9	155.0	172.2	245.0	136.0

Services of Samer:

- Systems design with pumps and motors in closed and open loop circuits including valves,
- Sale of hydraulic components and electronic devices.
- Commissioning and start up on machinery.
- Repair of hydraulic components
- Postsale and service troubleshoot on phone

MP1 Axial Piston Pumps

28/32 cm³, 38/45 cm³

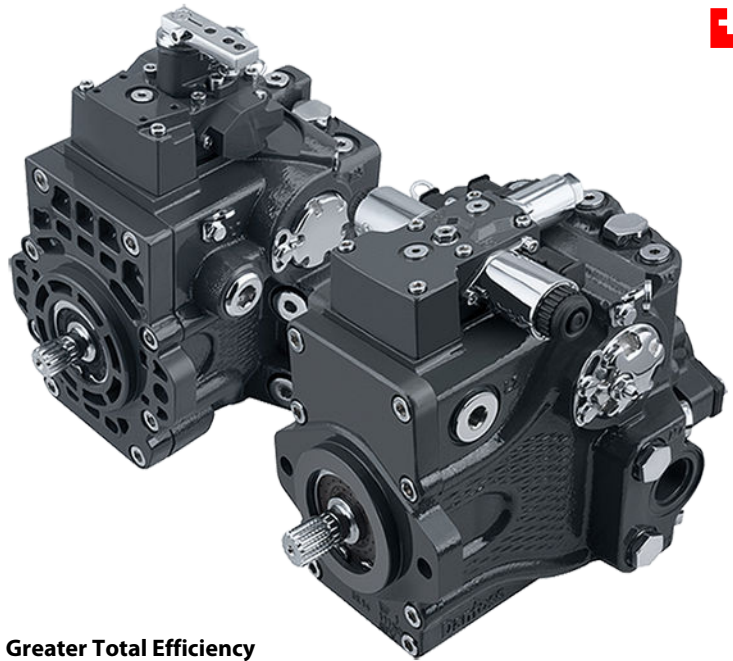


For more than 40 years, Danfoss has been developing state-of-the-art components and systems for mobile machinery used in off-highway operations around the world. We have become a preferred supplier by offering the best of what really matters: The hardware inside your vehicle application.

The Future is here - MP1 Pumps. (MP1) This is just the beginning of a new generation of Danfoss pumps that will change the way you do business with Danfoss.

The MP1 pump has built off years of experience to capture the reliability, modularity and controllability of products you know well. Additionally the MP1 pump has added features while maintaining a competitive package size. The result is a pump that is fit for the future.

All controls related to electric options are PLUS+1[®] Compliant. PLUS+1[®] allows you to rapidly develop and customize electronic machine control.



Features

Designed for Quality and Reliability

- Uniform design concept across frame sizes
- Single piece housing to minimize leaks
- Technologically advanced kit and servo system
- Predictable, low friction swashplate bearing for precise machine control

Machine Integration Benefits

- Industry leading pump length
- Clean side for easier machine integration
- Metric and Inch O-ring boss and Split flange (38/45 only) system port interfaces
- Standard connection interfaces

Expanded Functionality

- PLUS+1[®] Compliant control and options
- Easy integration with Telematics
- Integrated Flushing valve available (28/32 and 38/45)

Modularity

- Common control, charge pump and auxiliary pad options
- Easy and quick conversion to the right configuration

Greater Total Efficiency

- Increased pump efficiency
- Lower control pressure for less power consumption

Control Options

- Electro-hydraulic control options include
 - Electrical Displacement Control (EDC)
 - Forward-Neutral-Reverse (FNR)
 - Non-Feedback Proportional Electric (NFPE)
- Manual displacement control (MDC)
- Non-Feedback Proportional Hydraulic (NFPH)
- Common control across entire family

Technical Specification

Physical properties

Features	Unit	28	32	38	45
Displacement	cm ³	28.0	31.8	38.0	45.1
Weight (dry)	kg	29.6		38.0	

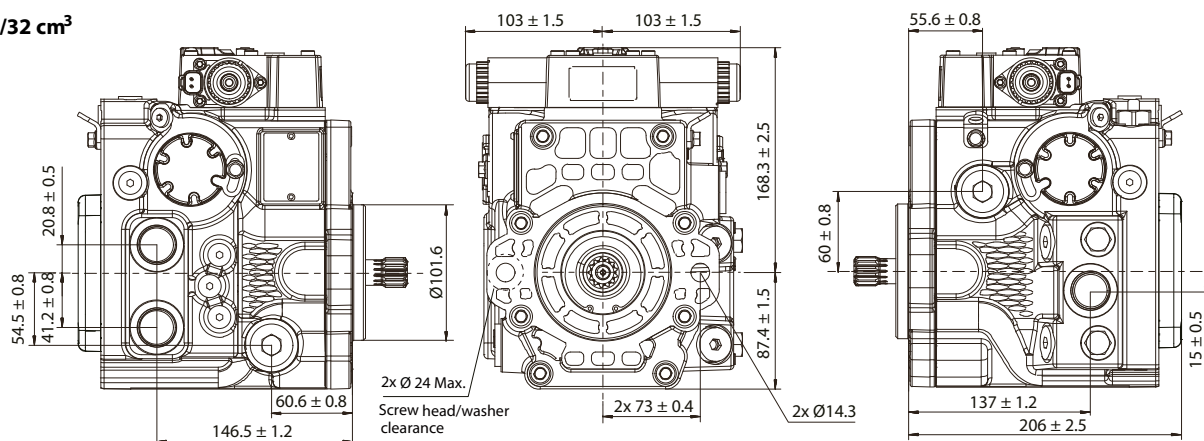
Operating parameters

Features		Unit	28/32	38/45
Input Speed	Minimum	min ⁻¹	500	500
	Rated		3400	3300
	Maximum		4000	3900
System Pressure	Max. working pressure*	bar	350	
	Max. pressure		380	
	Min. low loop		10	
Case Pressure	Rated	bar	3	
	Maximum		5	

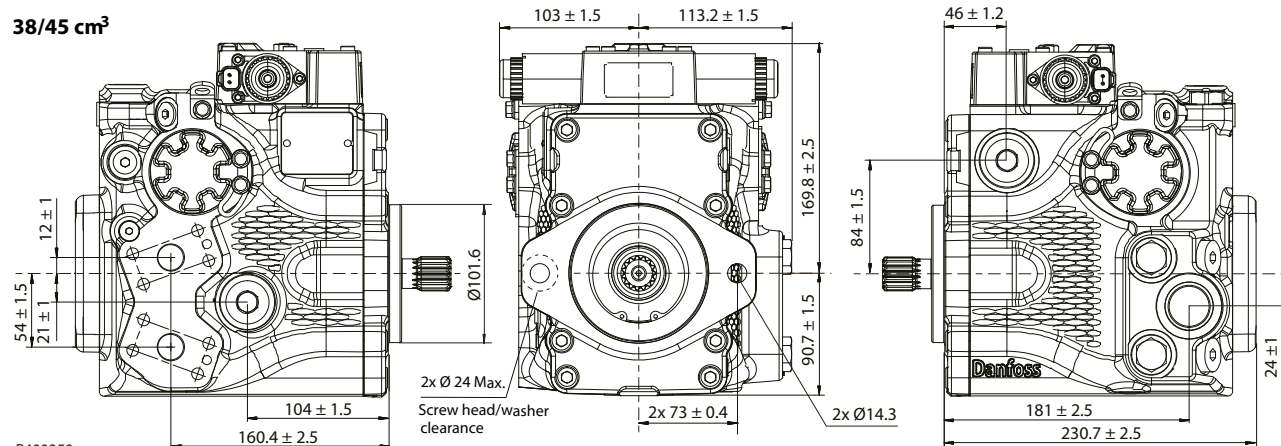
* Applied pressures above maximum working pressure requires SAMER srl application approval.

Dimension

28/32 cm³

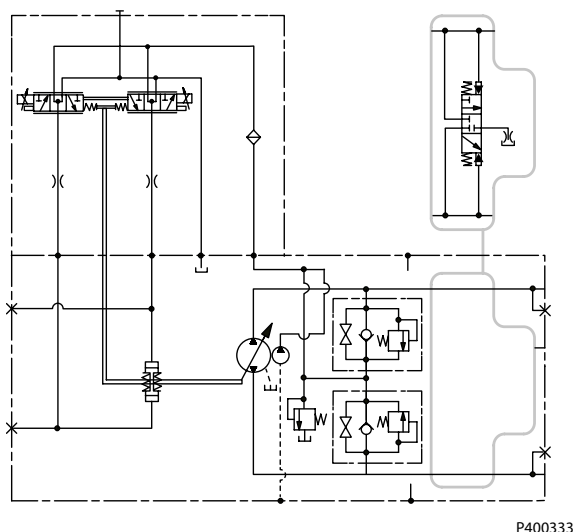


38/45 cm³



P400350

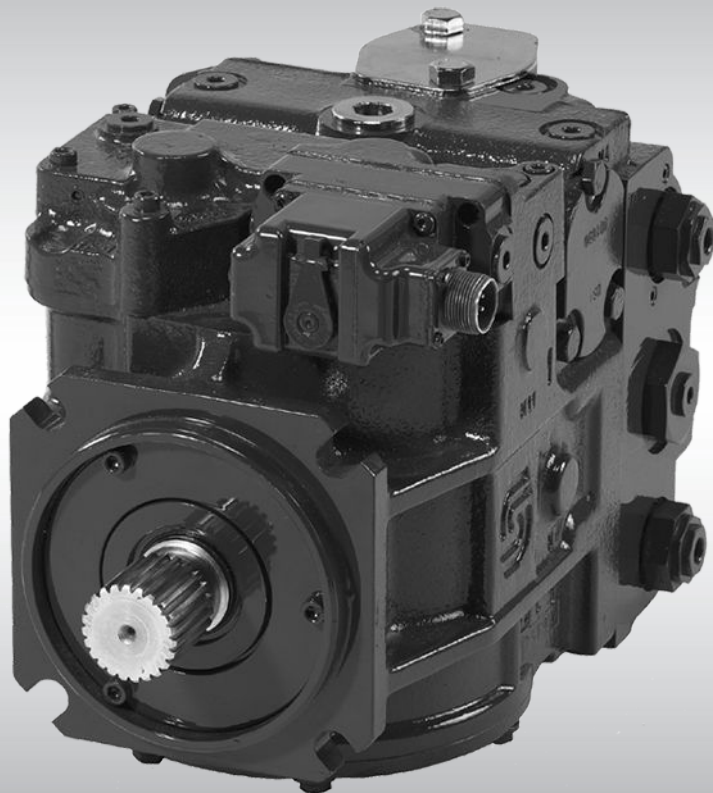
Schematic



Axial Piston Pumps Series 90

Size

55/75/100/130/180/250 cm³



General Description

Series 90 Family of Pumps and Motors

Series 90 hydrostatic pumps and motors can be applied together or combined with other products in a system to transfer and control hydraulic power. They are intended for closed circuit applications.

- Series 90 – advanced technology
- Seven sizes of variable displacement pumps
- Proven reliability and performance
- Compact, lightweight
- Worldwide sales and service
- PLUS+1™ compliant controls and sensors

Series 90 variable displacement pumps are compact, high power density units. All models utilize the parallel axial piston/slipper concept in conjunction with a tiltable swashplate to vary the pump's displacement. Reversing the angle of the swashplate reverses the flow of oil from the pump and thus reverses the direction of rotation of the motor output.

Series 90 pumps include an integral charge pump to provide system replenishing and cooling oil flow, as well as control fluid flow. They also feature a range of auxiliary mounting pads to accept auxiliary hydraulic pumps for use in complementary hydraulic systems. A complete family of control options is available to suit a variety of control systems (mechanical, hydraulic, electric).

Series 90 motors also use the parallel axial piston/slipper design in conjunction with a fixed or tiltable swashplate. They can intake/discharge fluid through either port; they are bidirectional. They also include an optional loop flushing feature that provides additional cooling and cleaning of fluid in the working loop. For more information on Series 90 motors, refer to *Series 90 Motors Technical Information 520L0604*.

PLUS+1 Compliant Controls and Sensors

A wide range of Series 90 controls and sensors are PLUS+1™ compliant. PLUS+1 compliance means our controls and sensors are directly compatible with the PLUS+1 machine control architecture. Adding Series 90 pumps to your application using PLUS+1 GUIDE software is as easy as drag-and-drop. Software development that used to take months can now be done in just a few hours. For more information on PLUS+1 GUIDE, visit www.sauer-danfoss.com/plus1.

Series 90 pumps can be used together in combination with other Danfoss pumps and motors in the overall hydraulic system. Danfoss hydrostatic products are designed with many different displacement, pressure and load-life capabilities.

Go to the Danfoss website or applicable product catalog to choose the components that are right for your complete closed circuit hydraulic system.

Technical Specifications
Operating Parameters

Parameter	Unit	Frame						
		042	055	075	100	130	180	250
Input speed								
Minimum	min-1(rpm)	500	500	500	500	500	500	500
Rated Speed		4200	3900	3600	3300	3100	2600	2300
Maximum		4600	4250	3950	3650	3400	2850	2500

Operating parameters

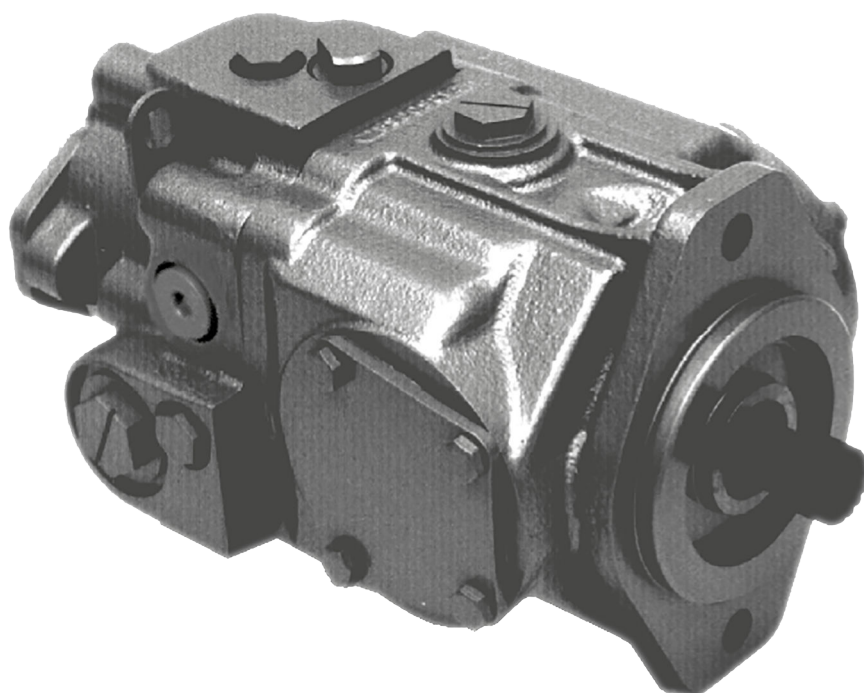
System pressure	Maximum working pressure	bar	[psi]	450	[6525]
	Maximum pressure			480	[6960]
	Maximum low loop			45	[650]
	Minimum low loop pressure			10	[145]
Charge pressure	Minimum	bar	[psi]	18	[261]
	Maximum			34	[493]
Control pressure	Minimum (at corner power for EDC and FNR)	bar	[psi]	14	[203]
	Minimum (at corner power for NFPE)			22	[319]
	Maximum			40	[580]
Charge pump inlet pressure	Rated	bar (absolute)	[in Hg vacuum]	0.7	[9]
	Minimum (cold start)			0.2	[24]
	Maximum	bar	[psi]	4.0	[58]
Case pressure	Rated	bar	[psi]	3.0	[44]
	Maximum			5.0	[73]
Lip seal external pressure	Maximum	bar	[psi]	0.4	[5.8]

Services of Samer:

- Systems design with pumps and motors in closed and open loop circuits including valves,
- Sale of hydraulic components and electronic devices.
- Commissioning and start up on machinery.
- Repair of hydraulic components
- Postsale and service troubleshoot on phone

Axial Piston Pumps Series 40

Size 25/35/44/46 cm³



Technical Specifications

Model	Unit	M25 PV	M35 PV	M44 PV	M25 PT	M35 PT	M44 PT
Pump configuration		Single variable pump			Tandem variable pump		
Displacement	cm ³ /rev [in ³ /rev]	24.6 [1.50]	35.0 [2.14]	43.5 [2.65]	24.6 x 2 [1.50 x 2]	35.0 x 2 [2.14 x 2]	43.5 x 2 [2.65 x 2]
Weight	kg [lb]	19 [41.5]	25 [55]	25 [55]	24 [56]	45 [99]	45 [99]
Mass moment of inertia	kg·m ² [slug·ft ²]	0.0018 [0.0014]	0.0033 [0.0024]	0.0032 [0.0023]	0.0037 [0.0028]	0.0066 [0.0048]	0.0064 [0.0047]

Operating Parameters

Model	Unit	M25 PV	M35 PV	M44 PV	M25 PT	M35 PT	M44 PT
Case pressure							
Continuous	bar [psi]	1.7 [25]					
Maximum	bar [psi]	5.2 [75]					
Speed limits							
Rated @ max angle	min ⁻¹ (rpm)	4000	3600	3300	4000	3600	3300
Maximum @ max angle	min ⁻¹ (rpm)	5000	4500	4100	5000	4500	4100
Minimum	min ⁻¹ (rpm)	500	500	500	500	500	500
System pressure							
Maximum Working	bar [psi]	345 [5000]	380 [5511]	345 [5000]	345 [5000]	380 [5511]	345 [5000]
Maximum	bar [psi]	385 [5584]	415 [6019]	415 [6019]	385 [5584]	415 [6019]	415 [6019]

Options

Model	Unit	M25 PV	M35 PV	M44 PV	M25 PT	M35 PT	M44 PT
Type of mounting		SAE B	SAE B	SAE B	SAE B	SAE B	SAE B
Port connections		Twin	Twin	Twin	Twin	Twin	Twin

Specifications

Model	Unit	M25 PV	M35 PV	M44 PV	M25 PT	M35 PT	M44 PT
Integral charge pump (std)	cm ³ /rev [in ³ /rev]	-	11.8 [0.72]	11.8 [0.72]	-	16.4 [1.00]	16.4 [1.00]
Charge relief valve setting	bar [psi]	14.0 [200]	14.0 [200]	14.0 [200]	14.0 [200]	14.0 [200]	14.0 [200]
System pressure regulation	bar [psi]	140-345 [2030-5000]					
Displacement limiters		-	-	-	-	-	-
Input shaft option		Splined, Tapered, or Straight Key					
Auxiliary mounting pad		SAE A	SAE A SAE B	SAE A SAE B	SAE A	SAE A SAE B	SAE A SAE B
Control options		DDC	DDC	DDC	DDC	DDC	DDC
Filtration configuration		Suction Filtration or Remote Charge Pressure Filtration					

General Information

Series 40 Family of Pumps and Motors

Series 40 is a family of hydrostatic pumps and motors for medium power applications with maximum loads of 345 bar [5000 psi]. These pumps and motors can be applied together or combined with other products in a system to transfer and control hydraulic power.

Series 40 pump + motor transmissions provide an infinitely variable speed range between zero and maximum in both forward and reverse modes of operation. The pumps and motors each come in four frame sizes: M25, M35, M44, and M46.

Series 40 pumps are compact, high power density units. All models use the parallel axial piston / slipper concept in conjunction with a tiltable swashplate to vary the pump's displacement. Reversing the angle of the swashplate reverses the flow of fluid from the pump, reversing the direction of rotation of the motor output.

Series 40 - M35 and M44 pumps may include an integral charge pump to provide system replenishing and cooling fluid flow. M25 pumps are designed to receive charge flow from an auxiliary circuit or from a gear pump mounted on the auxiliary mounting pad. Series 40 pumps feature a range of auxiliary mounting pads to accept auxiliary hydraulic pumps for use in complementary hydraulic systems.

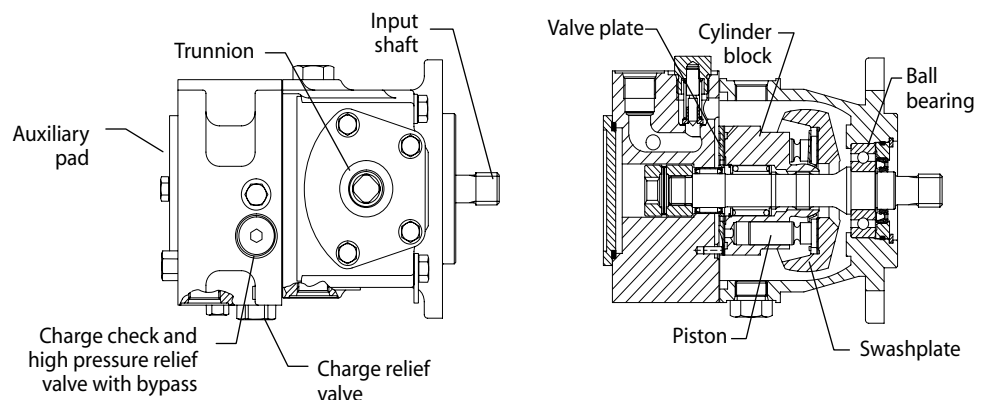
For complete technical information on M46 pumps, refer to *M46 Pumps Technical Information, L1001029*.

Series 40 motors use the parallel axial piston/slipper design in conjunction with a fixed or tiltable swashplate. The family includes M25, M35, M44 fixed motor units and M35, M44, M46 variable motor units. For complete technical information on Series 40 motors, refer to *Series 40 Motors Technical Information, 520L0636*.

The M35 and M44 variable motors feature a trunnion style swashplate and direct displacement control. The M46 variable motors use a cradle swashplate design and a two-position hydraulic servo control.

The M46 variable motor is available in a cartridge flange version, which is designed to be compatible with CW and CT compact planetary gearboxes. This combination provides a short final drive length for applications with space limitations.

M25 Variable Pump



P100 583E

Options

High Pressure Relief Valve (HPRV) - A high pressure relief valve limits the system pressure to protect the system from over-pressure.

Charge Relief Valve - The charge pressure relief valve regulates charge pressure.

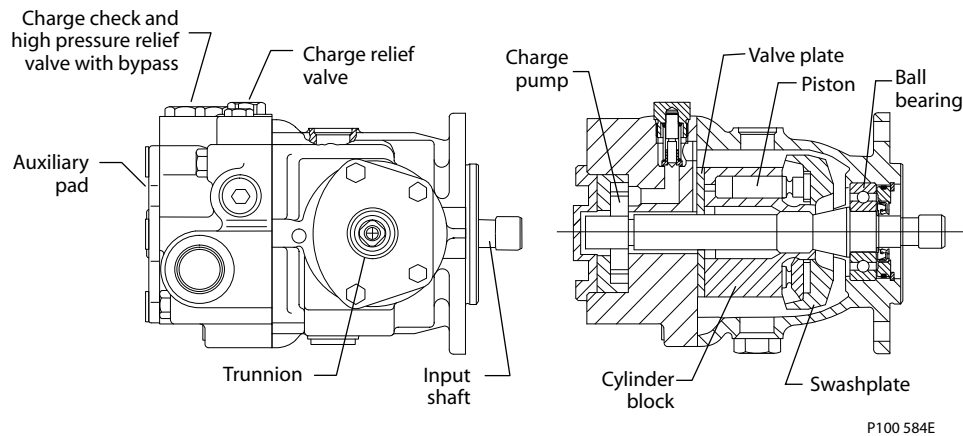
Displacement Limiters - Optional displacement limiters allow maximum displacement adjustment to allow for fine tuning of the propel system.

Auxiliary Mounting Pads - Several auxiliary mounting pad options allow for adding a second pump.

Input Shafts - Straight keyed, tapered keyed, and several splined shaft options are available.

General Information

M35 Variable Pump (M44 is similar)



A variable pump is shown in a hydraulic circuit with a fixed motor. The pump shown features manual displacement control. The circuit features suction filtration and heat exchanger.

Features and Options

Key Features

- 3 sizes of variable displacement pumps
- 3 sizes of tandem pumps
- 3 sizes of variable displacement motors
- 3 sizes of fixed displacement motors
- Efficient axial piston design
- Proven reliability and performance
- Compact, lightweight
- Worldwide sales and service

Services of Samer:

- Systems design with pumps and motors in closed and open loop circuits including valves,
- Sale of hydraulic components and electronic devices.
- Commissioning and start up on machinery.
- Repair of hydraulic components
- Postsale and service troubleshoot on phone

SAMER S.r.l.

C.da Molino 58/C - Campofilone FM - 63828

Tel: +39 0734 340364 - 06 30818297 - Cell.+39 348 6937145

info@samer.company - www.samer.company