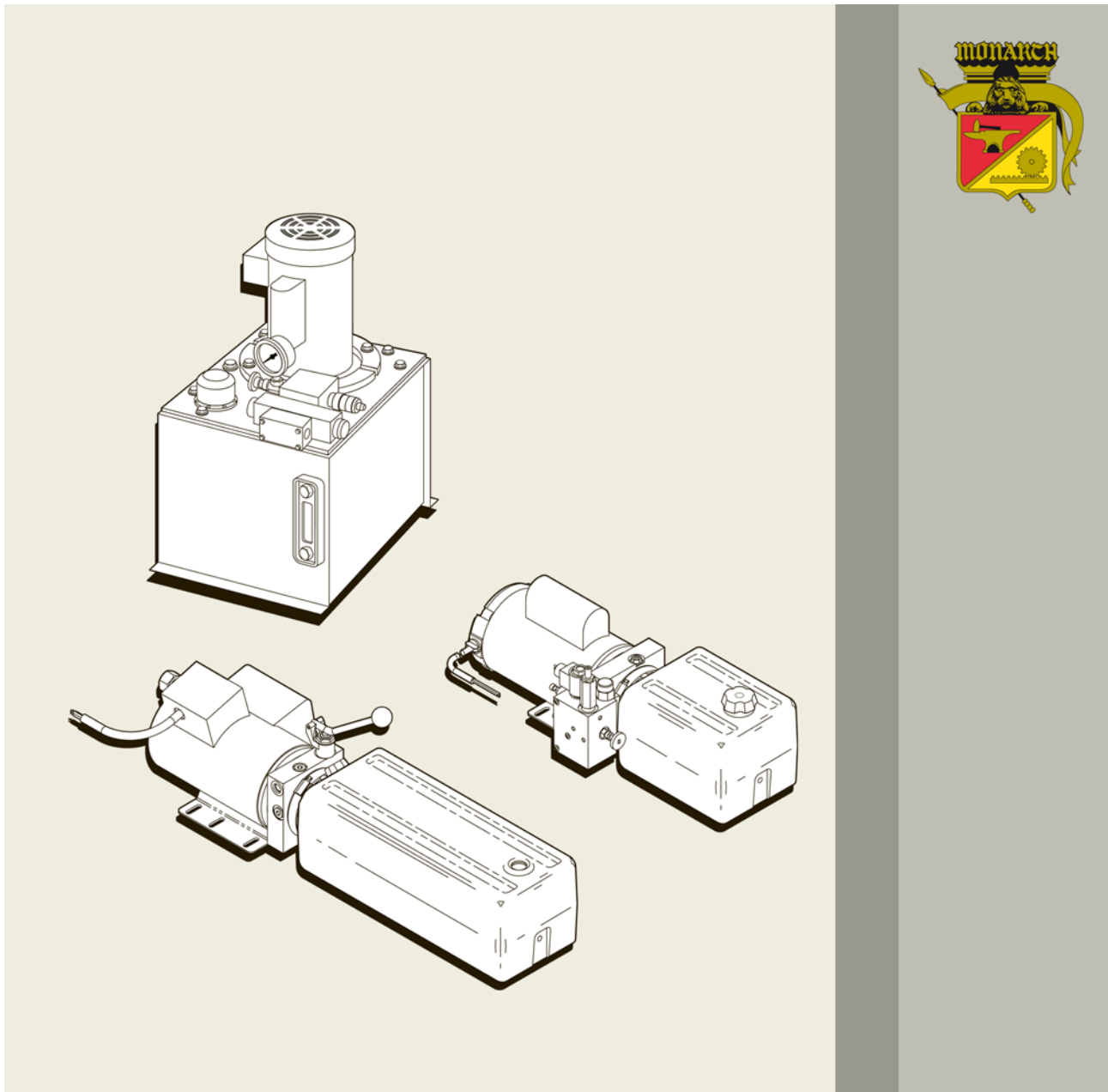


A.C. Hydraulic Power Systems

Monarch-Dyna-Pack M-450 Mini & M-400 Series



motion and progress

Reference: 500-P-000002-E-01

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1 General information

1.1 Introduction

This catalogue illustrates the technical specifications for Bucher Hydraulic's A.C. range of Hydraulic Power Units. Designed for compactness and durability, millions of A.C. Series systems have been sold worldwide for actuating mobile, material handling, transport, construction, defense, access, machine tool, ergonomic, and other labor saving devices.

The Bucher Hydraulic name is synonymous with precise and cost efficient designs, robust construction and rapid backup service. Only eliminate "under the direction of the Jack Family". Reliable service and "Quality Machinery Since 1856" to around the world.

1.2 Mission Statement

Bucher Hydraulics designs, manufactures and delivers innovative fluid power solutions and provides unparalleled support for its customers.

1.3 Quality Policy

Bucher Hydraulics will provide its customers with products and services of continually improving quality to the mutual satisfaction of all parties.

1.4 Bucher Hydraulics Value Statement

- Bucher Hydraulics will be honest, moral and ethical.
- Bucher Hydraulics will accept responsibility for its actions.
- Bucher Hydraulics will treat people with equality.
- Bucher Hydraulics will make a profit.

1.5 Prototype Policy

We invite you to try our Prototype Program for Solutions to Your Special Hydraulic Needs.

While Monarch offers a broad line of hydraulic systems and components, it is impossible to anticipate the needs of every customer, especially those developing new products. Our unique prototype program allows us to respond to your specific needs when an existing "catalogue model" does not fit your application.

To participate in this program, simply submit a print, schematic, or sketch of the hydraulic power pack that you need along with a purchase order. We will review the system requirements with you and then manufacture the system that we believe will satisfy your objectives. The unit will be invoiced at an agreed upon price and marked Prototype.

You have 90 days free use of this product for testing and evaluation from the date of invoice. At the end of this period you can (1) extend the testing and evaluation period for an additional 90 days or (2) purchase the unit as invoiced (and order more if needed) or (3) return the unit via prepaid transportation for full credit.

There is no risk to you. Just the opportunity to solve your hydraulic problem with the performance and quality of Monarch Hydraulics.



ATTENTION!

- Always wear eye protection and protective clothing.
- Remove jewelry and objects that might conduct electricity while working on power units.
- Hydraulic fluid does pose a fire hazard, can cause burning or skin irritation if not properly handled.
- Fluid under pressure can pierce the skin and enter the bloodstream causing death or serious injury.
- Devices being operated by the hydraulic system should be immobilized so they cannot move and cause injury while being inspected or repaired.
Disconnect from electrical source.
- Prior to performing any maintenance make sure the equipment is turned off and that any stored energy, for example pressure, is released. Also, extended equipment or cylinders should be lowered and mechanically locked as required.
- Bucher Hydraulics is not responsible for misuse or misapplication of product. If you have any questions about application, please contact local dealer.
- Fluids should be contained and disposed of properly.

1.6 Features and Benefits

Standard M-4300 series Features:

- Flexible coupling extends pump life, eliminates misalignment
- All powdered metal gears
- Hardcoated pump end plates for unmatched durability in demanding environments and severe duty applications
- Externally adjustable relief valve with lock nut
- 1 year limited warranty on system
- Monarch's personal customer service
- 24 hour shipment on most parts orders
- Over two million power units sold
- Worldwide distributor network

Options

- Pressure gauges
- Sae ports on most models
- Complete selection of nfpa do3 control valves and auxiliary valves
 - Cross port relief
 - Pressure reducing
 - Single and double flow control
 - Direct and pilot operated check
 - Sequence
 - Counter balance
 - Relief
- Pressure switches
- Water/oil heat exchangers
- Float switches
- Reservoirs
- 56 frame air motor
- Explosion proof, 50 hertz, chemical duty, dual frequency, metric frame, high torque and special duty electric motors
- Gasoline and diesel engines
- Close coupled motors available on many systems

2 How to Use This Product Guide

- Select the Circuit that will satisfy your design objectives (refer to page 4.0). Contact the Monarch Factory or your Distributor if you require assistance.
- Select the Model that will provide the desired performance (Flow/Pressure) and Valve Activation (Solenoid or Manual) listed in the Power System Selection Guide (refer to page ??).
- Follow the “How To Order Your M-4XXX Power System” provided after each Model description. Only the recommended combinations are listed for the particular system. Custom configurations are available and should be discussed with the Monarch Factory or your Distributor.
- The operating and design characteristics for all of the basic components are listed on pages ??-?? of this guide.

Select Pump and HP on Page 9, or 11.

Select Motor on Pages 10 or 11.

Select Reservoir on Page 13 - 16.

Select Valve(s) on Pages 18 - 19.

Select Accessories on Page 20.

Example:

Order Your Hydraulic Power System As Follows:

Select Circuit: Pump/Motor/Reservoir. Page 8.

Select Model: M-4304. Page 8.

Performance Required: 1.0 GPM @ 2000 PSI. Reference Page 9

Select Pump: 12172-270 (51) (1.02 GPM @ 1725 RPM). Page 9

Select Motor: 08747 (1-1/2 HP, 1725 RPM). Page 10

Select Reservoir: 06073, Page 13


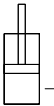

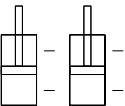
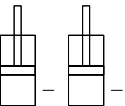
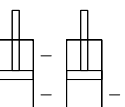
Accessories: 12172-270

Model Code: M-4304-08747-06073

Horizontal Mounting

- Nominal Dimensions are shown for all basic components. Dimensions may be found for your particular system by deleting the component shown on the unit drawing and adding the dimension for the same item you have selected. Note: Motor dimensions may vary according to the manufacturer and should be confirmed by the Monarch Factory or your Distributor.
- When selecting Motor, choose the HP required or the next highest HP available.
- When selecting a Reservoir, consideration should be given to dissipating heat, separating air from the oil, and settling out contamination in the oil. The traditional “rule of thumb” is that the reservoir should be 2-3 times larger than the pump output per minute. There must always be a reserve of oil in the reservoir when all cylinders are fully extended. Contact the Monarch Factory or your Distributor for proper reservoir sizing for your application.
- All system wiring should be completed by a certified electrician according to local codes.

2.1 M-400 Series Power System Selection Guide

Circuit	Description	Model	Page
	Pump + Motor	M-4226 Mini	25
		M-4326	12
	Pump + Motor + Reservoir	M-4204	13
		M-4304	14
Operates Single Acting Cylinder			
	Pump + Motor + Reservoir + Manual Valve	M-4313	15
		M-4509	16
		M-4509-C	17
		M-4301	18
		M-4315	
	Pump + Motor + Reservoir + Solenoid Valve	M-4219	19
		M-458 Mini	20
		M-4319	21
		M-4519-C	22
		M-4303	23
Operates Double Acting Cylinder			
	Pump + Motor + Reservoir + Manual Valve	M-4310	29
	Pump + Motor + Reservoir + Solenoid Valve	M-4551-C	34
		M-4252	35
		M-4253	38
		M-4506	24
		M-4505	25
Operates 2 Double Acting Cylinder			
	Pump + Motor + Reservoir + Solenoid Valves	M-4328	41
		M-4328-P	42
		M-4528	42
Independent Operation of 2 Single Acting Cylinders or Master / Slave			
	Pump + Motor + Reservoir + Solenoid Valves	M-4266	39
		M-4257	40
Operates 1 Double Acting and 1 Single Acting Cylinder			
	Pump + Motor + Reservoir + Solenoid Valves	M-4593-C	39

2.2 M-400 Series Pump/Motor Performance Data

Pump Code	Displacement In ³ / Rev (Cm ³ / Rev)	RPM	GPM	Input HP Required at Pressure (PSI)					
				500	1000	1500	2000	2500	3000
12637-150 (72) *	0.032 (0.524)	1725	0.24	0.20	0.30	0.35	0.50	0.55	0.75
		3450	0.48	0.40	0.60	0.70	1.00	1.10	1.50
12637-270 (62) *	0.057 (0.934)	1725	0.42	0.20	0.35	0.45	0.60	0.70	0.90
		3450	0.85	0.40	0.70	0.90	1.20	1.40	1.80
12172-150 (42)	0.077 (1.26)	1725	0.58	0.25	0.45	0.60	0.80	1.00	1.15
		3450	1.15	0.50	0.90	1.20	1.60	2.00	2.30
12172-200 (43)	0.099 (1.66)	1725	0.74	0.35	0.55	0.80	1.05	1.30	1.50
		3450	1.48	0.70	1.10	1.60	2.10	2.60	3.00
12172-250 (03)	0.125 (2.13)	1725	0.93	0.45	0.75	1.10	1.40	1.70	2.15
		3450	1.87	0.90	1.50	2.20	2.80	3.40**	3.95**
12172-270 (51)	0.137 (2.31)	1725	1.02	0.50	0.80	1.15	1.50	2.00	2.25
		3450	2.05	1.00	1.60	2.30	3.00	3.60**	
12172-330 (55)	0.168 (2.76)	1800	1.31		1.04	1.49	1.94	2.39	2.84
		3600	1.31		2.09	2.99	3.89	4.79	5.69
12172-380 (05)	0.193 (3.23)	1725	1.44	0.60	1.10	1.50	2.00	2.50	3.00
		3450	2.88	1.20	2.20	3.00	3.90**		
12172-510 (07)	0.251 (4.11)	1725	1.85	1.00	1.65	2.50	3.00	3.75**	
		3450	3.70	2.00	3.30**				

** = Intermittent Service Only. Contact the Monarch Factory or your Distributor for operating limits. The above pumps tested

using Mobil DTE 24 at 100°F 165 SUS, 95 Viscosity. Note: kW = HP x 0.746

* = Denotes i-Pump

Recommended Operating Conditions for M-400 Series Pumps:

Oil Temperature Range: 10°F to 170°F (-25°C to 77°C)

Operating Temperature: 50°F to 130°F (10°C to 54°C)

Oil Viscosity:

- Optimum 100 to 350 SUS (Cst = .22 x SUS - 135/SUS)

- Minimum 100 SUS at Operating

- Maximum Start Up 4000 SUS

Recommended Filtration:

- 10 micron nominal or better

Recommended Fluid for indoor use:

- Mobil DTE 24 or equal

Recommended Fluid for outdoor use:

- Mobil DTE 13 or equal

Recommended Fluid for outdoor use:

- ATF Dexron II or equal

Contact factory for use with non-petroleum based fluids and availability of special seals.

STANDARD PUMP FEATURES:

- Fixed Displacement, External Tooth, Powdered Metal Gears
- Hardcoat Processed Internal Pump Surfaces Extend Service Life
- Extremely Tolerant of Fluid Contaminants and Resistant to Galling Caused by Low Viscosity Start-up
- Wide Temperature and Viscosity Operation
- Cost Effective
- 100% Tested for Volumetric Efficiency and Pressure
- Over Five Million Power Units Sold

2.3 M-400 Series Motor Information

Part Number	HP	RPM	Voltage	Phase	Frame	Enclosure
08740	1/2	1725	115/230/60	1	56C	TEFC
08742	1/2	3450	115/230/60	1	56C	TEFC
08741	1/2	1725	230/460/60	3	56C	TEFC
08743	1	1725	115/230/60	1	56C	TEFC
08744	1	1725	230/460/60	3	56C	TEFC
08745	1	3450	115/230/60	1	56C	TEFC
08746	1	3450	230/460/60	3	56C	TEFC
08747	1 1/2	1725	115/230/60	1	56C	TEFC
08748	1 1/2	1725	230/460/60	3	56C	TEFC
08749	1 1/2	3450	115/230/60	1	56C	TEFC
08750	1 1/2	3450	230/460/60	3	56C	TEFC
08177-B	2 2.8	3450	208/230/60	1	56C	TENV 15 MIN DUTY @ 2.0 HP 5 MIN DUTY @ 2.8 HP
08754	2	1725	115/230/60	1	56C	TEFC
08753	2	1725	230/460/60	3	56C	TEFC
08751	2	3450	115/230/60	1	56C	TEFC
08752	2	3450	230/460/60	3	56C	TEFC
08760	3	3450	115/230/60	1	56C	TEFC
08761	3	3450	230/460/60	3	56C	TEFC

Monarch Supplied 56C Motors have the standard length NEMA shaft shortened by 1-3/16". All other frame size motors and all special ordered units are supplied with NEMA standard length drive shafts when possible. The above motors may be specified with standard NEMA 56C length drive shafts.

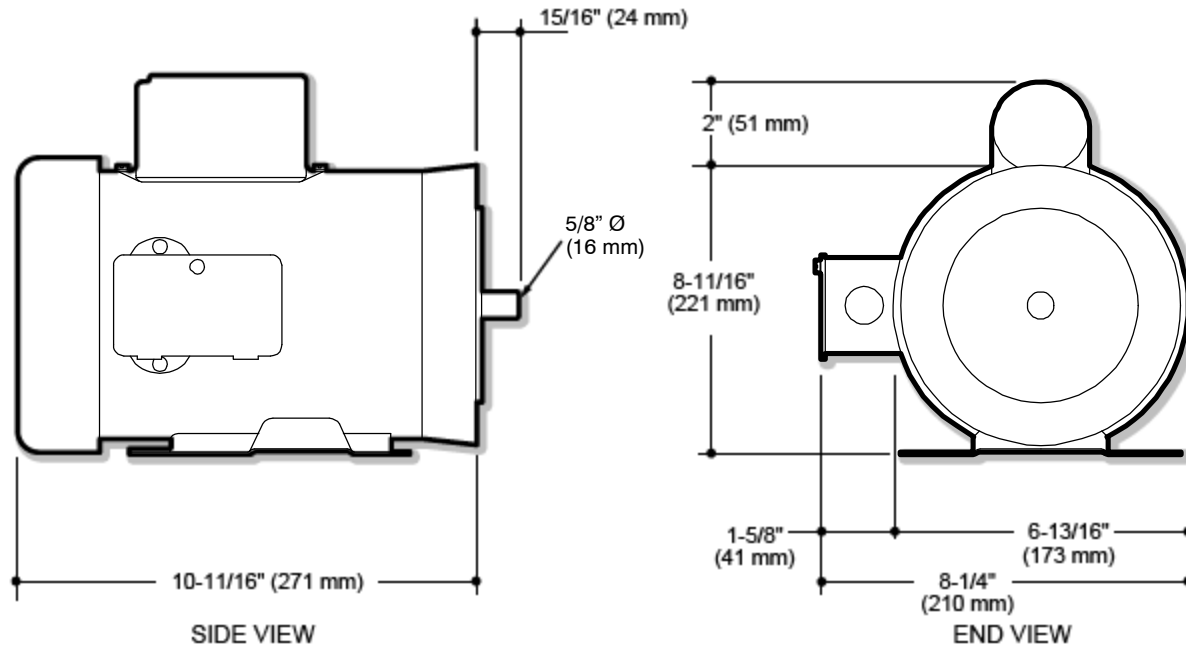
Special Motors commonly available for use with M-4300 units include:

- Explosion Proof
- Dual Frequency (50/60 Hz)
- Intermittent Duty - Custom Designed
- Washdown Duty
- 575V AC
- Open Drip Proof
- Totally Enclosed Non-Ventilated
- Custom Designed Motors for Special Applications

2.4 Dimensional Information for Standard M-400 Motors With Flexible Couplings

Motor Number 08751 is a 2 HP, 3450 RPM, 115/230 V AC, 60 Hz, 1 Phase, NEMA 56C TEFC and is shown as a general reference. Dimensions will vary according to motor output and manufacturer. Contact the Monarch Factory for more information.

Monarch standard adapter 01605 requires the NEMA motor shaft be shortened by 1-3/16". Adapter 01615 should be specified when a standard NEMA motor shaft is required.



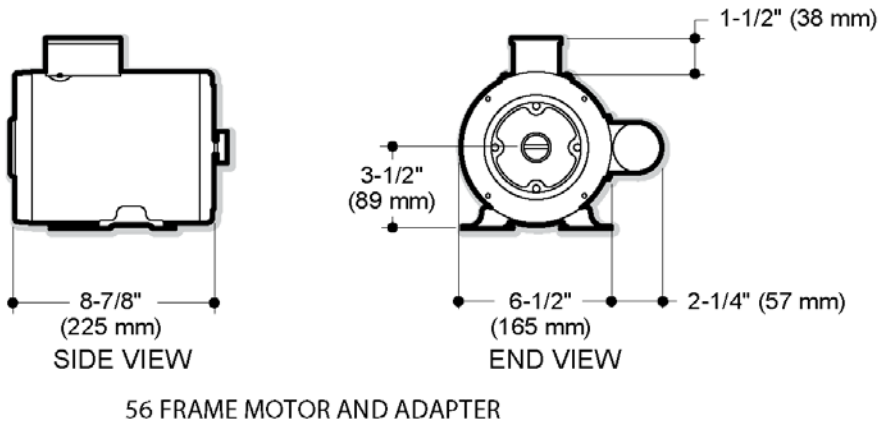
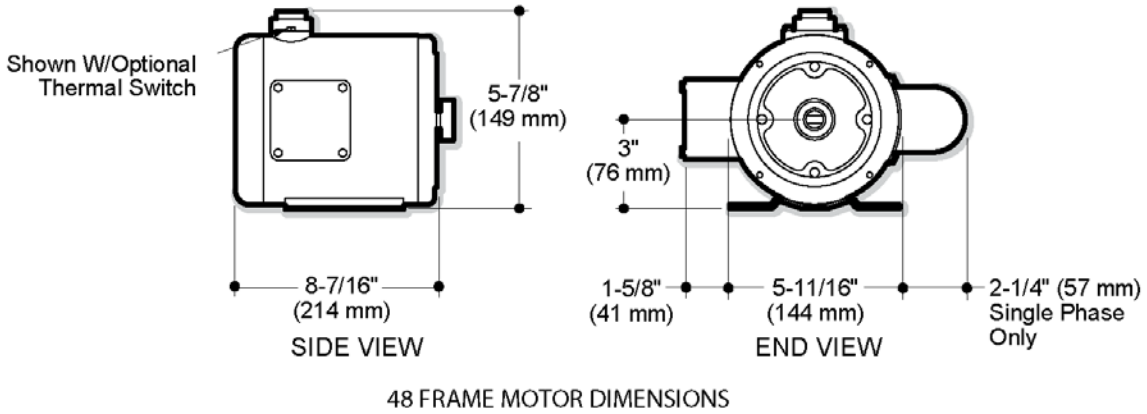
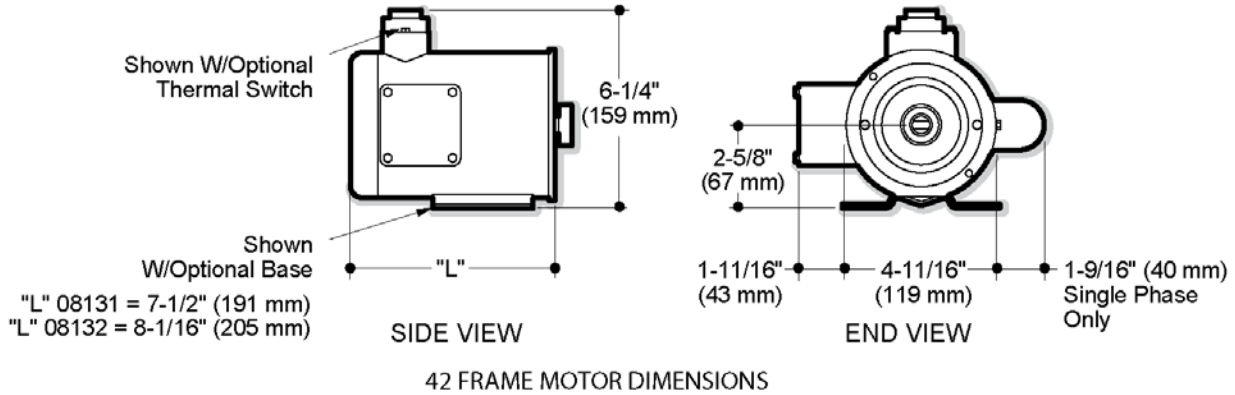
2.4.1 Close Coupled Motors For M-400 Units

The following direct drive (partial) motors are supplied with an adapter for mounting the pump base directly to the motor. The 01605 and/or 01615 extended pump/motor adapter and flexible coupling is not required. The close coupled motors may be used on Models: M-4301, M-4304, M-4315, M-4319, M-4326, M-4328 and M-4328-P

Part Number	HP	Duty	RPM	Voltage	Phase	Frame	Enclosure
08131	1/2	15 MINUTE	1725	115/230	1	42	TENV
08132	3/4	3 MINUTE	1725	115/230	1	42	TENV
08160	1	15 MINUTE	3450	115/230	1	48	TENV
08157	1	15 MINUTE	3450	230/460	3	48	TENV
08156	1	15 MINUTE	3450	575	3	48	TENV
18502-001	2.5	5 MINUTE	3450	208/230	1	56	TENV

For motors not found in this catalog, please contact factory.

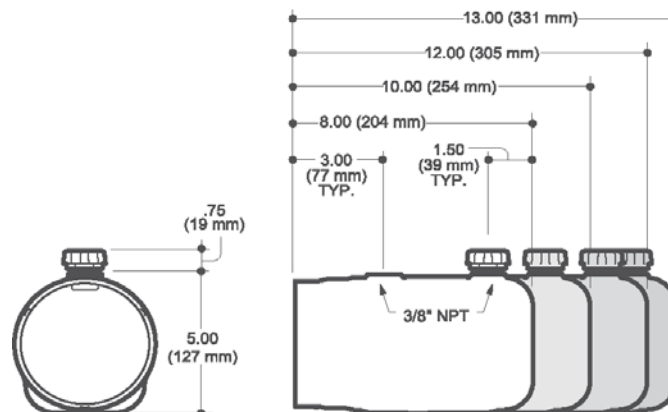
Dimensional Information for Close Coupled Motors



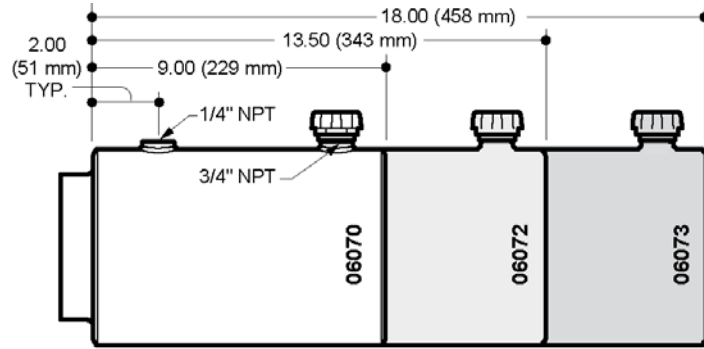
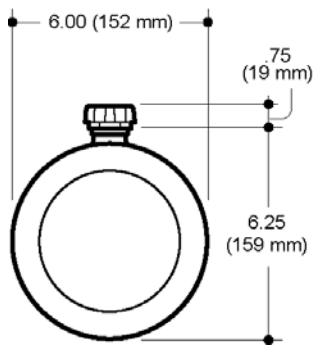
2.5 Reservoirs for M-400 Units

Part Number	Horizontal		Length in / (mm)
	Useable Capacity		
	Cubic inch (in ³)	Liter (L)	
06102	79	1.3	8.00 (203.20)
06103	106	1.75	10.00 (254.00)
06104	134	2.20	12.00 (304.80)
06105	148	2.40	13.00 (330.20)

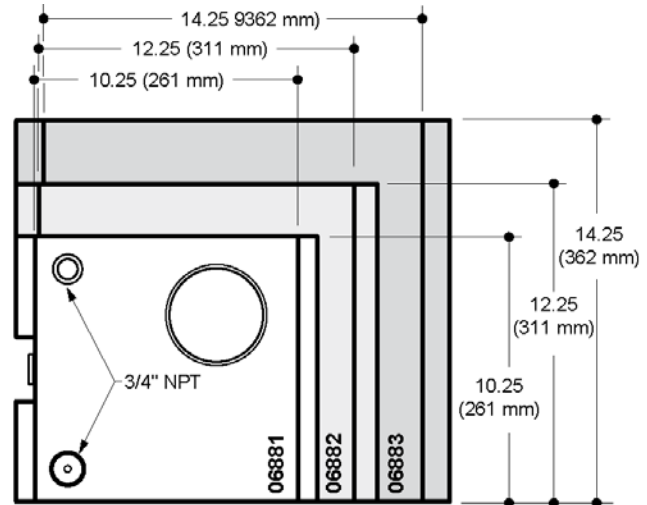
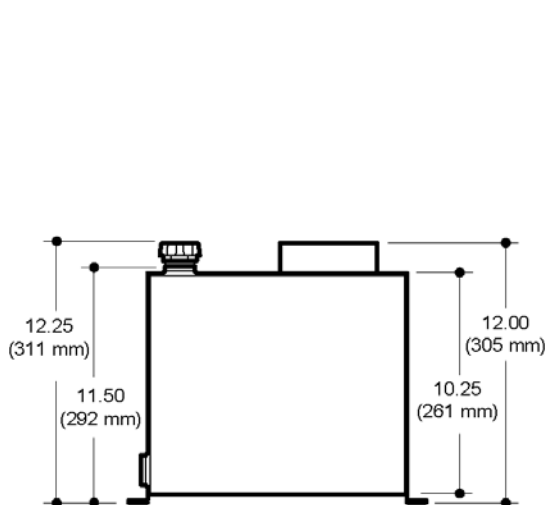
Part Number	Vertical		Length in / (mm)
	Useable Capacity		
	Cubic inch (in ³)	Liter (L)	
04616	55	0.90	8.00 (203.20)
04617	90	1.50	10.00 (254.00)
04618	125	2.05	12.00 (304.80)
04619	140	2.30	13.00 (330.20)



Part Number	Useable Capacity				Length in / (mm)
	Horizontal		Vertical		
	Cubic inch (in ³)	Liter (L)	Cubic inch (in ³)	Liter (L)	
06070	190	3.10	168	2.75	9.00 (229)
06072	292	4.80	285	4.70	13.50 (343)
06073	394	6.45	405	6.65	18.00 (458)



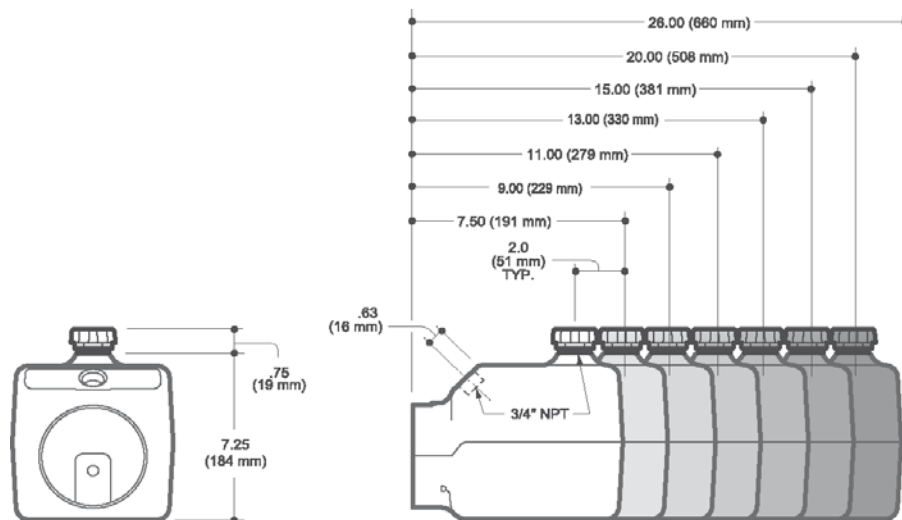
Part Number	Vertical		Length in / (mm)
	Useable Capacity		
	Cubic inch (in ³)	Liter (L)	
06881	693	11.35	10" Sq. x 10"H
06882	1155	18.90	12" Sq. x 10"H
06883	1386	22.70	14" Sq. x 10"H



For reservoirs not found in this catalog, please contact factory..

Horizontal			Length in / (mm)
Part Number	Useable Capacity		
	Cubic inch (in ³)	Liter (L)	
14164	157.14	2.58	7.50 (190.50)
14165	203.21	3.33	9.00 (228.60)
14166	264.64	4.34	11.00 (279.40)
14167	326.07	5.34	13.00 (330.20)
14168	387.50	6.35	15.00 (381.00)
14169	541.08	8.87	20.00 (508.00)
14170	725.37	11.89	26.00 (660.40)

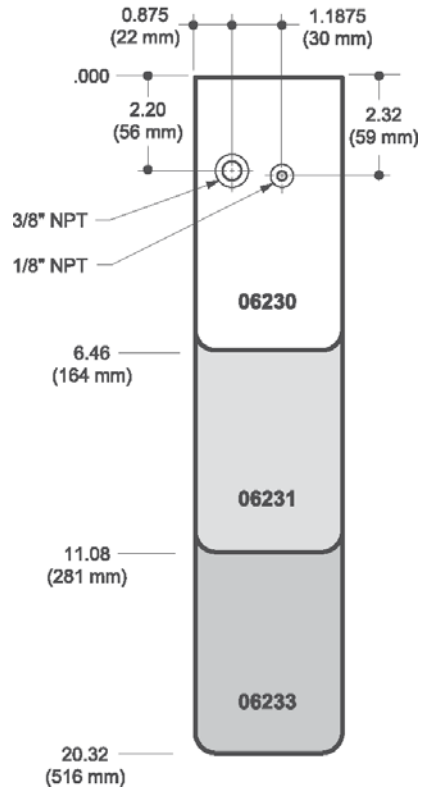
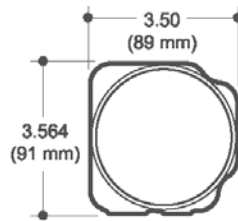
Vertical			Length in / (mm)
Part Number	Useable Capacity		
	Cubic inch (in ³)	Liter (L)	
14183	85.43	1.40	7.50 (190.50)
14184	149.51	2.45	9.00 (228.60)
14185	234.94	3.85	11.00 (279.40)
14186	320.37	5.25	13.00 (330.20)
14187	404.81	6.63	15.00 (381.00)
14188	619.39	10.15	20.00 (508.00)
14189	875.69	14.35	26.00 (660.40)



For reservoirs not found in this catalog, please contact factory.

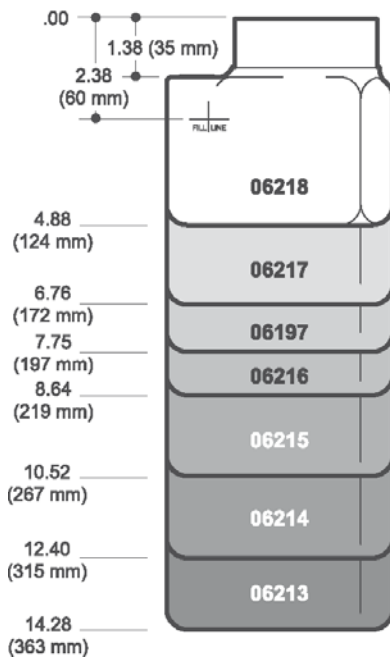
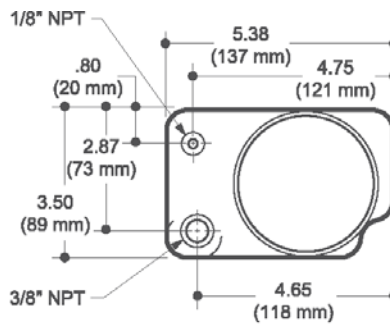
2.6 Reservoirs for Mini Units

Part Number	Horizontal		Vertical		Length in / (mm)
	Useable Capacity				
	Cubic inch (in ³)	Liter (L)	Cubic inch (in ³)	Liter (L)	
06230	31	0.50	27	0.45	6.46 (164.08)
06231	61	1.00	73	1.21	11.08 (281.43)
06233	122	2.00	168	2.72	20.32 (516.13)



For reservoirs not found in this catalog, please contact factory.

Part Number	Horizontal		Vertical		Length in / (mm)
	Useable Capacity				
	Cubic inch (in ³)	Liter (L)	Cubic inch (in ³)	Liter (L)	
06218	31	0.50	39	0.64	4.88 (123.95)
06217	61	1.00	63	1.03	6.76 (171.70)
06197	77	1.26	76	1.24	7.75 (196.85)
06216	92	1.50	87	1.43	8.64 (219.46)
06215	122	2.00	111	1.82	10.52 (267.21)
06214	152	2.50	135	2.21	12.40 (314.96)
06213	183	3.00	159	2.61	14.28 (362.71)

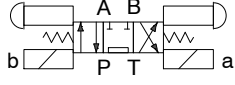
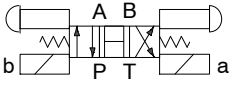
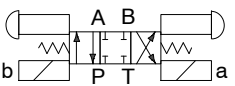
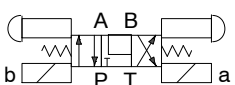
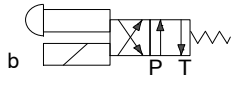
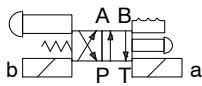
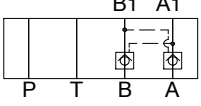
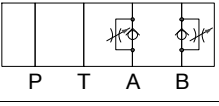
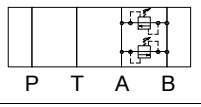
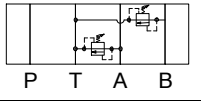


* Reservoir should not be used in a horizontal application without first consulting engineering (Special supports may be required).

2.7 Valves for M-400 Series Units

2.7.1 NPFA DO3 Directional and Auxiliary Control Valves.

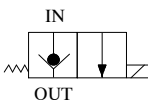
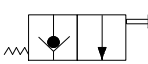
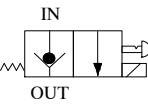
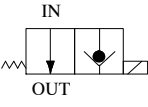
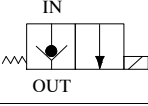
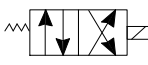
Solenoid directional and auxiliary controls are typically added to the M-4505, M-428, and M-429. Please refer to the Bucher Hydraulics Directional Control Valve brochure for additional information and selection.

Part Number	Schematic	Description
00970		4-Way/3-Position. Solenoid Operated. Tandem Center. 110 V AC
00967		4-Way/3-Position. Solenoid Operated. Open Center. 110 V AC
00968		4-Way/3-Position. Solenoid Operated. Closed Center. 110 V AC
00969		4-Way/3-Position, P Blocked. A and B to T. "Motor Spool". 110 V AC
01041		4-Way/2-Position. P to A. Spring Offset. 110 V AC
00692		4-Way/2-Position. P to A. Spring Offset. 110 V AC
00468		Dual Pilot Operated Check. A and B Port.
00469		Flow Control. Dual Meter Out. A and B Port.
00443		Cross Port Relief. A and B Ports. Adjustable.
00474		Dual Relief. A and B Ports to T. Adjustable.

Consult your local Monarch distributor or the factory about special requirements for explosion proof, shockless (soft shift) and other function and spool configurations not shown here. 12 and 24 VDC, 24 VAC and other voltages are available. Functional symbols related to solenoid identity "A" or "B" according to NFPA/ANSI standards, i.e., energizing solenoid "A" gives flow P to A, solenoid "B" gives flow P to B (As Applicable).

2.7.2 Cartridge Valves

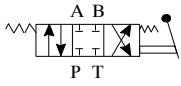
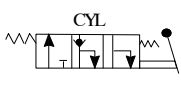
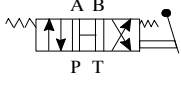
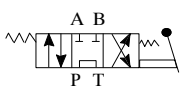
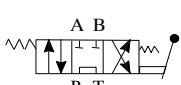
Solenoid operated cartridge valves are used in the M-403, M-419, and M-452 units.

Part Number	Schematic	Description
00986		2-Way/2-Position Normally Closed. Modified Cavity #8. 110 V AC Grounded Coil.
07144		2-Way/2-Position Normally Closed. Modified Cavity #8. Manual Operation. Pull to Open. Spring Closed.
00708		2-Way/2-Position Normally Closed. Modified. Cavity #8. Manual Override. 110 V AC. Conduit Connector.
00987		2-Way/2-Position Normally Open. Modified Cavity #8. 110 V AC. Conduit Connector.
00585		2-Way/2-Position Normally Closed. Modified Cavity #8. 220 V AC. DIN 43650 Connection.
07145		4-Way/2-Position. Common Cavity #8. 110 V AC. Conduit Connector.

Consult Factory about many additional valve voltages, coil terminations and other options.

2.7.3 Manual Valves

Manually Operated Directional Control Valves are used on Models M-4301 and M-4310.

Part Number	Schematic	Description
00948		4-Way/3-Position. Closed Center. Manually Operated.
00800		3-Way/3-Position. Cylinder Port Checked.
00949		4-Way/3-Position. Open Center. Manually Operated.
00806		4-Way/3-Position. Tandem Center. Manually Operated.
00957		4-Way/3-Position. Tandem Center. NFFA DO3.

2.8 M-400 Series Accessories

Part Number	Description
01436	Sight Level/Temperature Gauge.
01516	Reservoir Breather, Flush Mount, .375" NPT. Cross Scored.
03171	Reservoir Breather, .375" NPT.
01143	Reservoir Breather, .750" NPT.
01670	Sight Glass. 3/4" NPT.
03219	Pressure Gauge, Liquid Filled. 1/4" NPT. 0-500 PSI.
01434	Pressure Gauge, Liquid Filled. 1/4" NPT. 0-3000 PSI.
01790	Pressure Gauge, Liquid Filled. 1/4" NPT. 0-5000 PSI.
00570	Gauge Shutoff. 1/4" NPT.
00904	Flow Control, Adjustable. 1/4" NPT. - 0-7 GPM
03642	Float Switch, Electrical N.O or N.C.
01875	Filter Only, Return Line. 15 GPM. 10 Micron Nominal, includes filterhead.
04369	Filter, Return Line. 5 GPM. 10 Micron Nominal, includes filterhead.
01425	Filler/Breather, Chrome Plated. Basket Strainer.

Other Available Options and Accessories Include:

- Air Motors
- Heat Exchangers
- Temperature Switches
- Pressure Switches
- Motor Controls
- Multi-Function Valve Controls - Monoblock and Sectional

Consult Factory about many additional valve voltages, coil terminations and other options.

2.9 Monarch Hand Pumps

Standard - Standard Displacement (0.50 In³/Stroke) High Pressure - Low Displacement (0.25 In³/Stroke) High Pressure/
Heavy Duty - Standard Displacement (0.50 In³/Stroke)

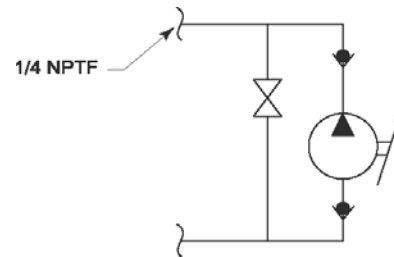
Note: It is recommended that pins and piston be periodically lubricated to prolong hand pump life.

2.10 Standard Hand Pumps

Description

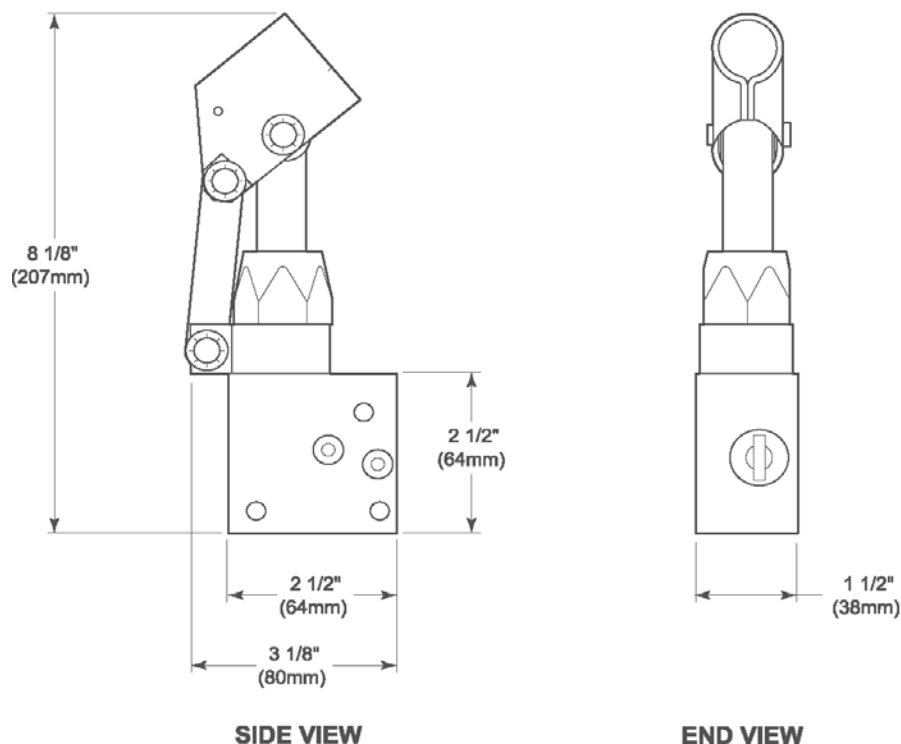
- 0.50 In³/Stroke (8.20 Cm³/Stroke)
- Single Acting
- 2000 PSI (138 Bar)
- Outlet Port: 1/4" NPTF
- Ideal For Emergency Back-Up Application in Case of Primary Pump Failure
- Horizontal or Vertical Mounting
- Designed for Mounting Directly to Monarch Power Units
- Handle May Positioned in any Direction
- Release Valve (Use Handle for Actuating)
- Supplied with Painted Steel "Comfort Grip" Handle
- All Exposed Materials are Aluminum or Plated Steel for Corrosion Resistance

Schematic



Popular Options

- Remote Mounting
- Ports. Other Styles Available
- Relief Valve
- Integral Reservoir



2.11 High Pressure - Low Displacement Hand Pump

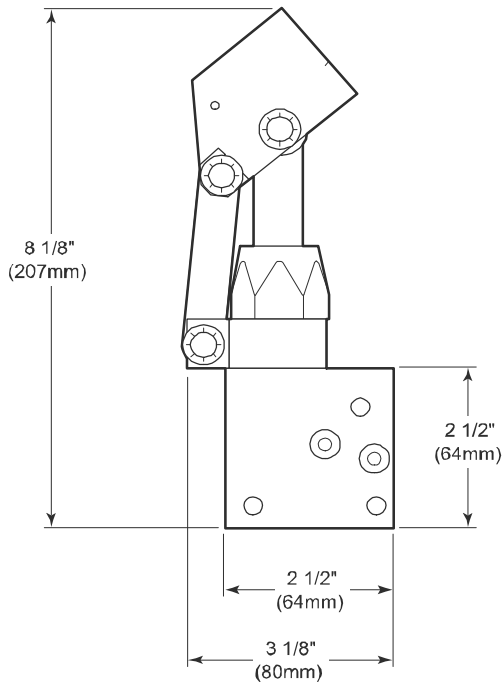
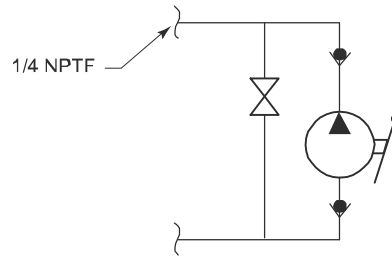
Description

- 0.25 In³/Stroke (4.10 Cm³/Stroke)
- Single Acting
- 3500 PSI (240 Bar)
- Outlet Port: 1/4" NPTF
- Ideal For Emergency Back-Up Application in Case of Primary Pump Failure
- Horizontal or Vertical Mounting
- Designed for Mounting Directly to Monarch Power Units
- Handle May Positioned in any Direction
- Release Valve (Use Handle for Actuating)
- Supplied with Painted Steel "Comfort Grip" Handle
- All Exposed Materials are Aluminum or Plated Steel for Corrosion Resistance

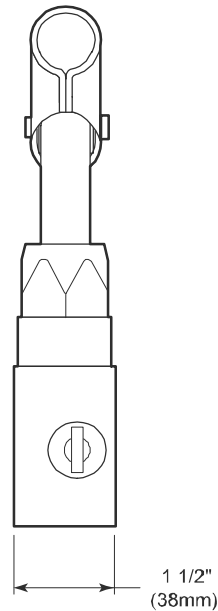
Popular Options

- Remote Mounting
- Ports. Other Styles Available
- Relief Valve

Schematic



SIDE VIEW



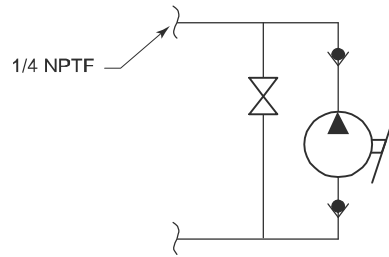
END VIEW

2.12 High Pressure - Heavy Duty Hand Pump

Description

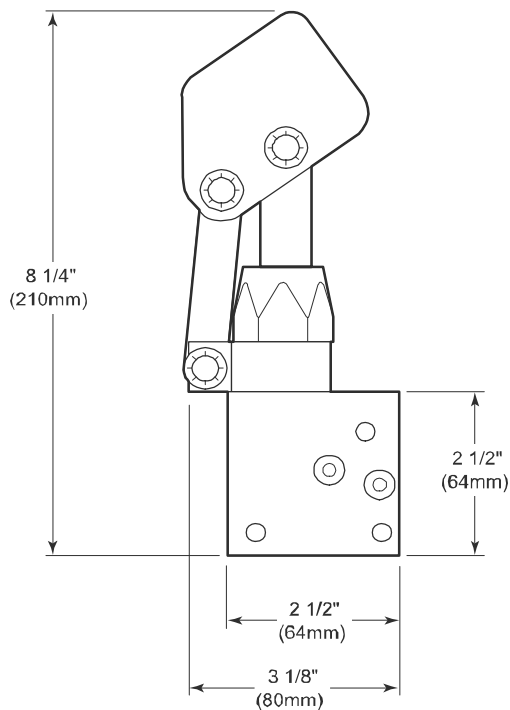
- 0.50 In³/Stroke (8.20 Cm³/Stroke)
- Single Acting
- 4000 PSI (275 Bar)
- Outlet Port: 1/4" NPTF
- Heavy Duty Plated Steel Tension Link and Extruded Aluminum Top and Bottom Brackets
- Ideal For Emergency Back-Up Application in Case of Primary Pump Failure
- Horizontal or Vertical Mounting
- Designed for Mounting Directly to Monarch Power Units
- Handle May Positioned in any Direction
- Release Valve (Use Handle for Actuating)
- Supplied with Painted Steel "Comfort Grip" Handle
- All Exposed Materials are Aluminum or Plated Steel for Corrosion Resistance

Schematic

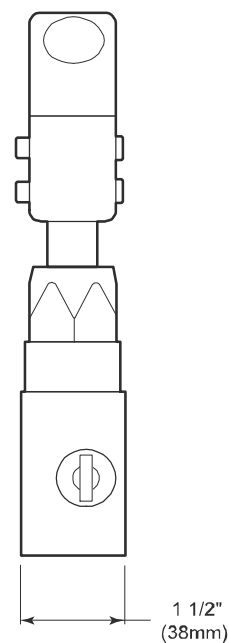


Popular Options

- Remote Mounting
- 1/4" NPTF Ports. Other Styles Available
- Relief Valve

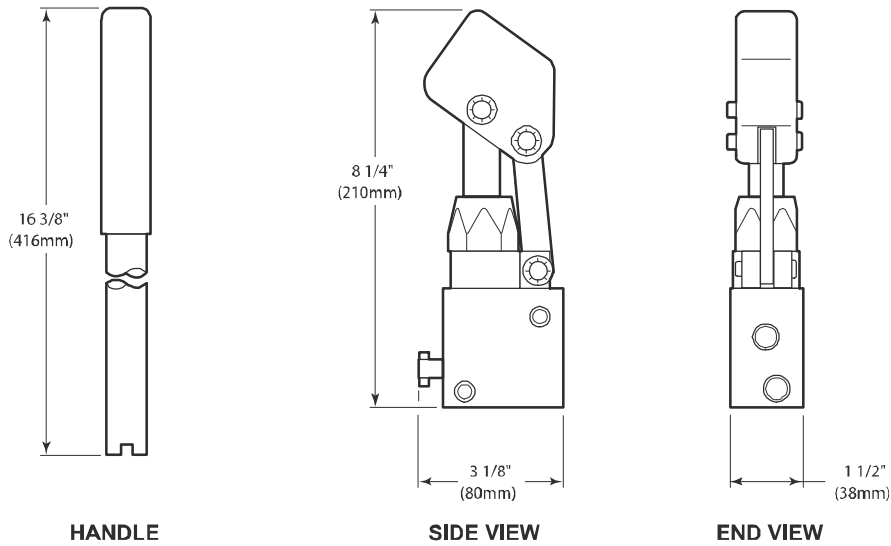


SIDE VIEW



END VIEW

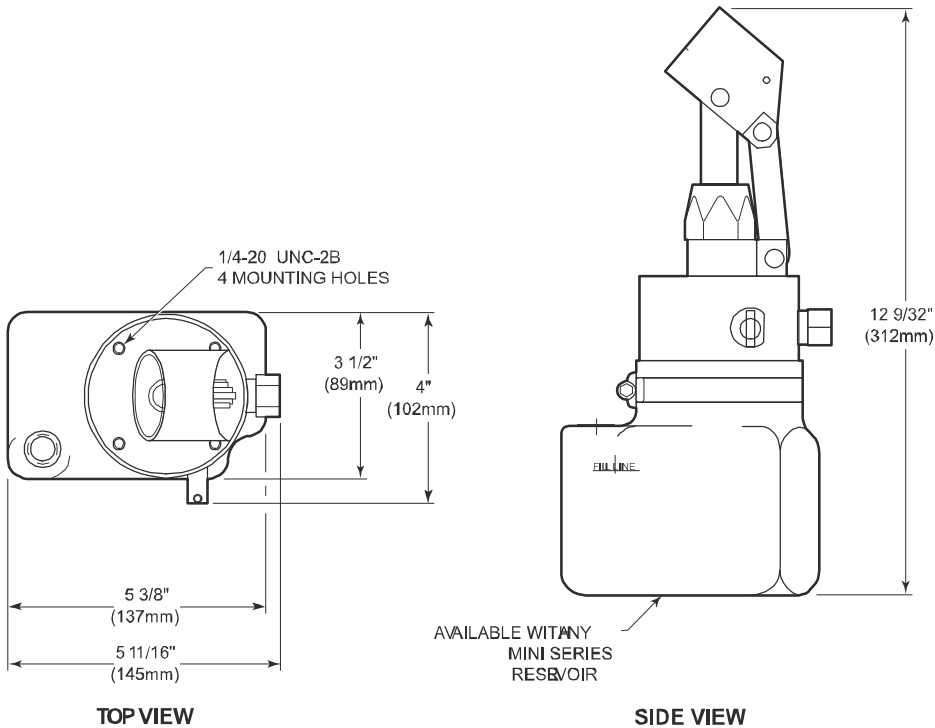
2.13 Heavy Duty Remote Hand Pump



2.14 Model H-100 Series Hand Pumps With Reservoirs

Hand Pump with Relief Valve and Reservoir

- 12139 Standard Duty Hand Pump with Relief Valve
- 12140 Heavy Duty Hand Pump with Relief Valve



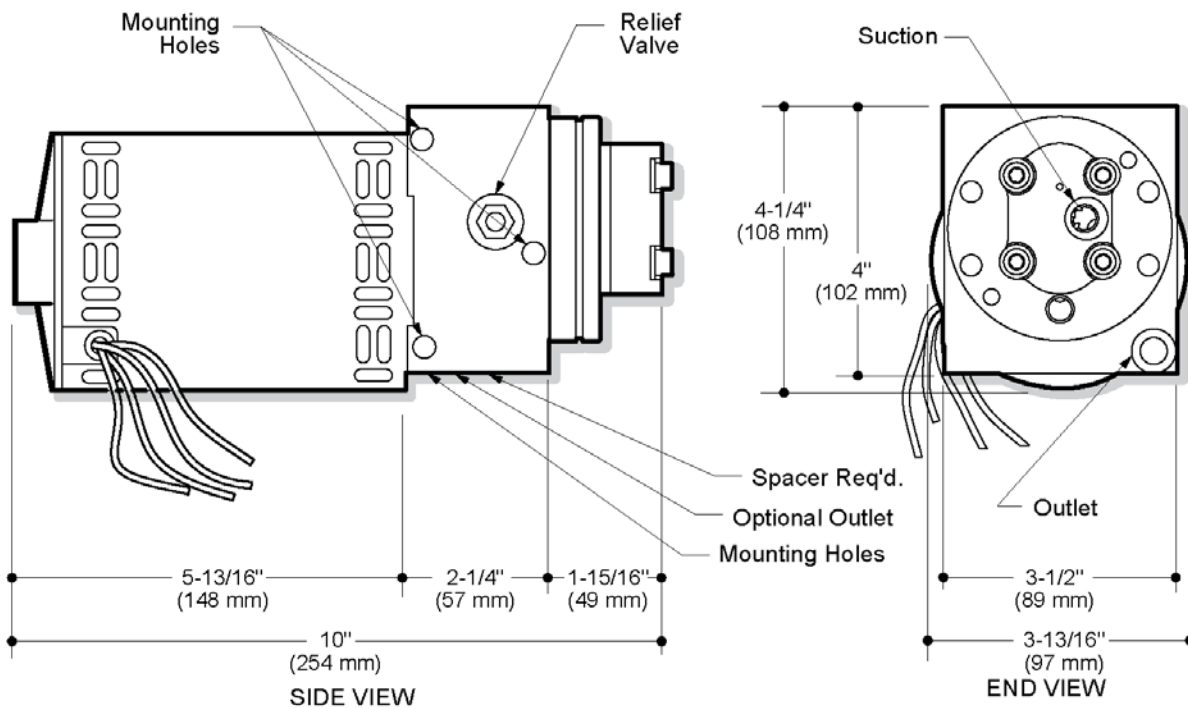
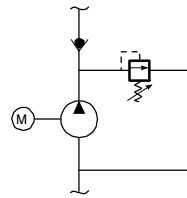
3 Monarch A.C. Hydraulic Power Systems

3.1 Model M-4226 Mini System (Formerly M-455)

Description

- Pump Motor Unit
- Check Valve
- Externally Adjustable Relief Valve
- .375 Inch NPT Suction
- 7/16-20 SAE Outlet Port

Schematic



How to Order Your M-4226 Mini System

Comprehensive information may be found on the page referenced below each selection category.

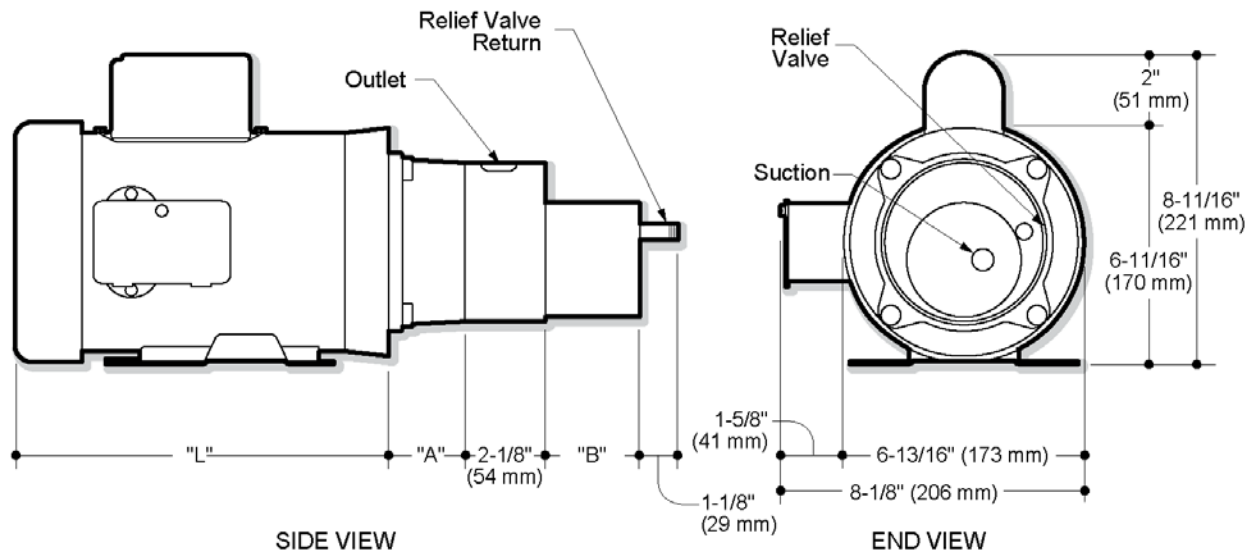
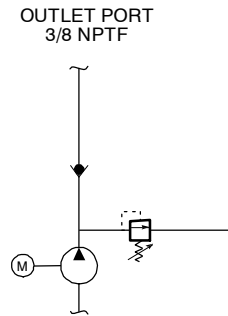
Pump	Motor	Voltage	Mounting Position	Accessories
Ref. Page 9	Ref. Page 10	Ref. Page 10		Ref. Page 20

3.2 Model M-4326 (Formerly M-426)

Description

- Pump Motor Unit
- Check Valve
- Externally Adjustable Relief Valve
- .375 Inch NPT Suction
- .375 Inch NPT Outlet
- .125 Inch NPT Relief Valve Return Port

Schematic



"L" dimension shown for 08751 motor is 10-11/16" (271 mm)
 "A" dimension for standard 01605 adapter is 2-5/32" (55 mm)
 "A" dimension for optional 01615 adapter is 3-11/32" (85 mm)
 "B" pump dimensions vary depending on pump used
 Dimensions will vary according to motor output and manufacturer

How to Order Your M-4326 Power System

Comprehensive information may be found on the page referenced below each selection category.

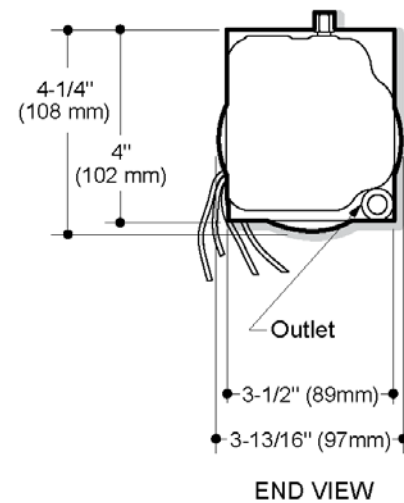
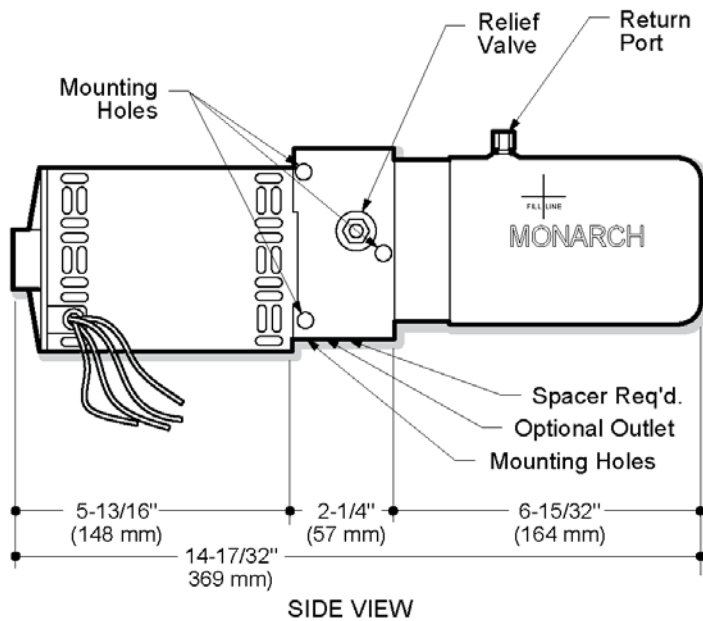
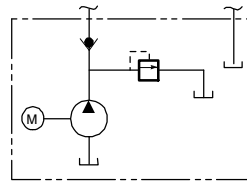
Pump	Motor	Mounting Position	Accessories
Ref. Page 9	Ref. Page 10		Ref. Page 20

3.3 Model M-4204 Mini System (Formerly M-454)

Description

- Pump / Motor / Reservoir / Unit
- Externally Adjustable Relief Valve
- 7/16-20 SAE O-Ring Outlet Port, 3/8" NPT Return
- Horizontal Mounting Standard
- Vertical Mounting / Motor Up

Schematic



How to Order Your M-4204 Mini System

Comprehensive information may be found on the page referenced below each selection category.

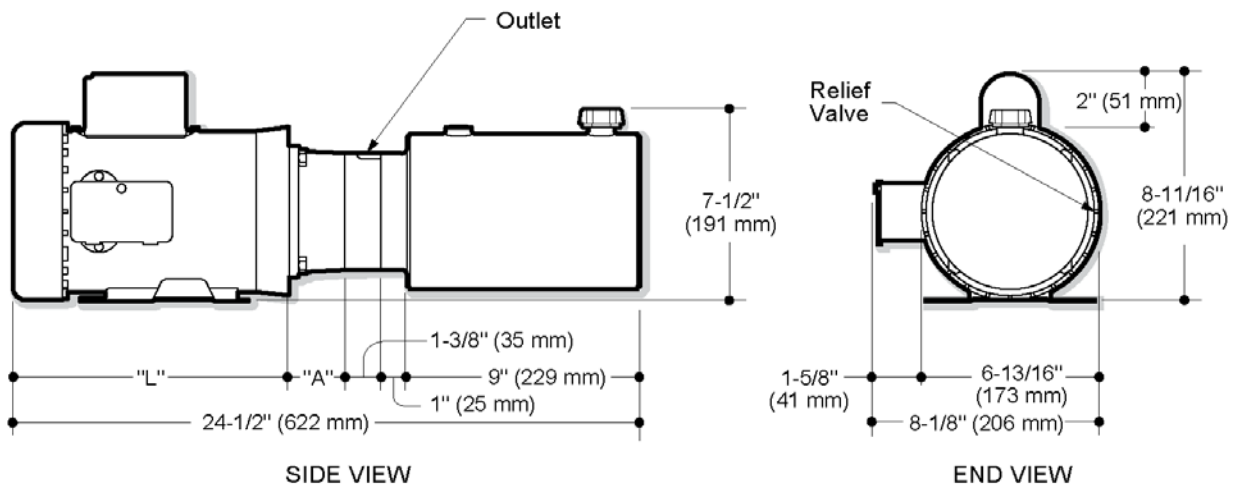
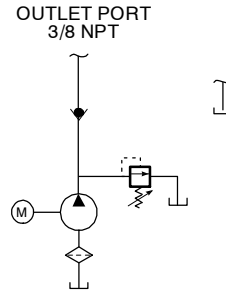
Pump	Motor	Reservoir	Mounting Position	Accessories
Ref. Page 9	Ref. Page 10	Ref. Page 16		Ref. Page 20

3.4 Model M-4304 (Formerly M-404)

Description

- Pump / Motor / Reservoir / Unit
- Check Valve
- Externally Adjustable Relief Valve
- .375 Inch NPT Outlet and Return
- Horizontal Mounting Standard
- Vertical Mounting / Motor Up

Schematic



"L" dimension shown for 08751 motor is 10-11/16" (271 mm)
 "A" dimension for standard 01605 adapter is 2-5/32" (55 mm)
 "A" dimension for optional 01615 adapter is 3-11/32" (85 mm)
 Dimensions will vary according to motor output and manufacturer

How to Order Your M-4304 Power System

Comprehensive information may be found on the page referenced below each selection category.

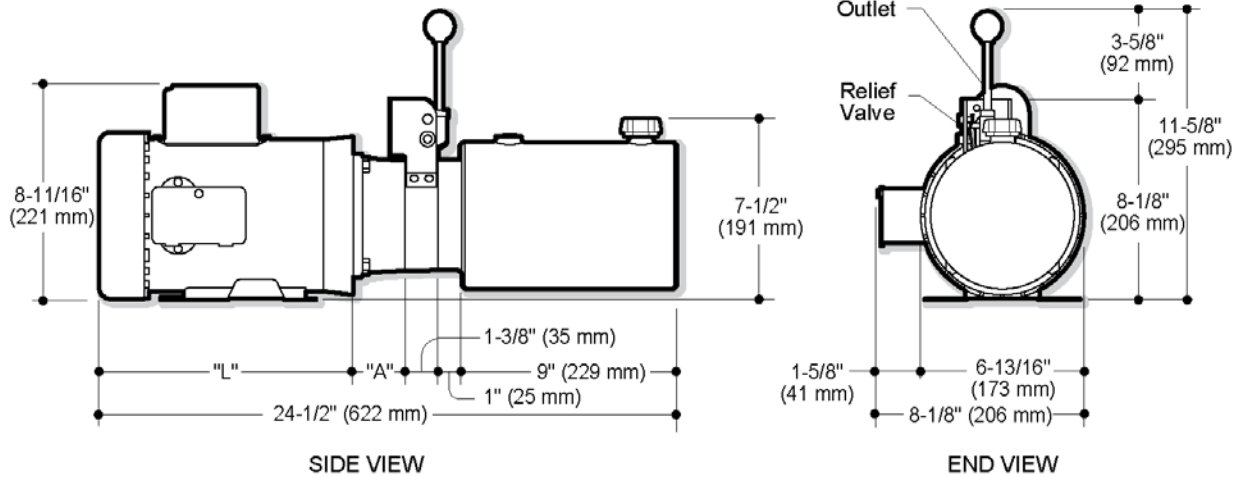
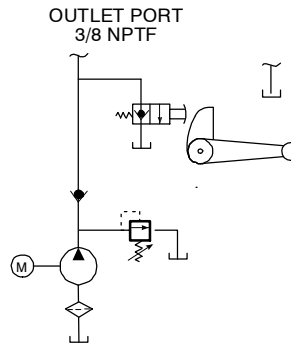
Pump	Motor	Adapter	Reservoir (Length)	Mounting Position	Accessories
Ref. Page 9	Ref. Page 10	Ref. Page 11	Ref. Page 13		Ref. Page 20

3.5 Model M-4313 (Formerly M-413)

Description

- Pump / Motor / Reservoir / Unit
- Manually Operated 2-Way/2-Position Normally Closed Valve
- Externally Adjustable Relief Valve
- .375 Inch NPT Outlet and Return
- Horizontal Mounting Standard
- Vertical Mounting / Motor Up

Schematic



"L" dimension shown for 08751 motor is 10-11/16" (271 mm)
 "A" dimension for standard 01605 adapter is 2-5/32" (55 mm)
 "A" dimension for optional 01615 adapter is 3-11/32" (85 mm)
 Dimensions will vary according to motor output and manufacturer

How to Order Your M-4313 Power System

Comprehensive information may be found on the page referenced below each selection category.

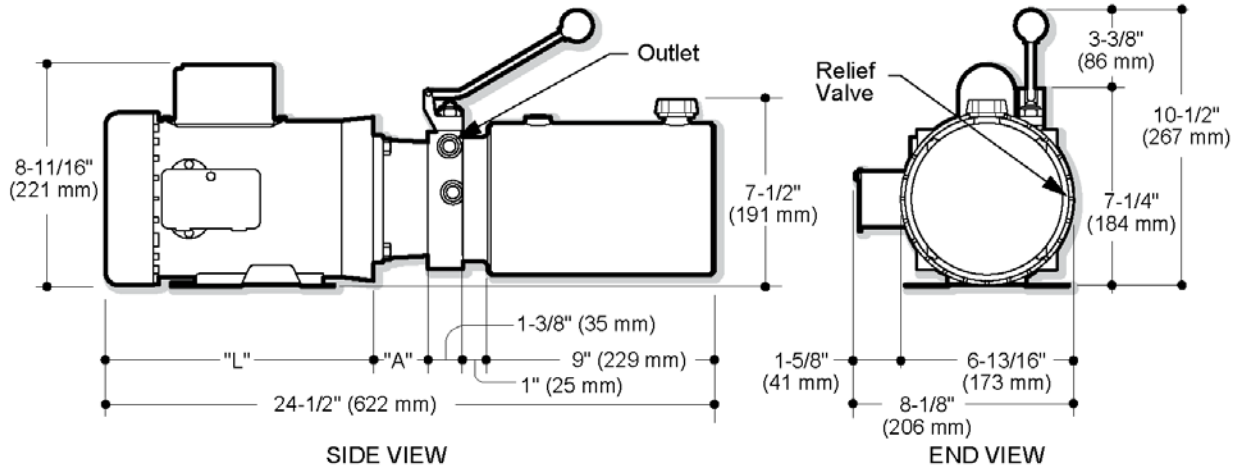
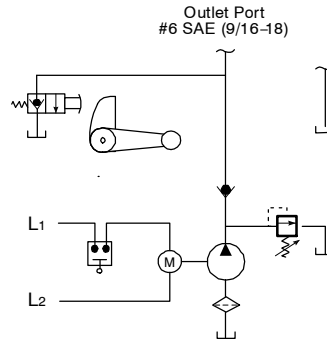
Pump	Motor	Adapter	Reservoir (Length)	Mounting Position	Accessories
Ref. Page 9	Ref. Page 10	Ref. Page 11	Ref. Page 13		Ref. Page 20

3.6 Model M-4509

Description

- Pump / Motor / Reservoir / Valve Unit
- 3-Way Manually Operated Valve
- Externally Adjustable Relief Valve
- #6 SAE
- Vertical Mounting Standard (Motor Up)
- Snap Action Push Button Start Switch in Motor
- Kill Switch in Motor (Optional)
- Cord and Plug from Motor (Optional)

Schematic



"L" dimension shown for 08751 motor is 10-11/16" (271 mm)
 "A" dimension for standard 01605 adapter is 2-5/32" (55 mm)
 "A" dimension for optional 01615 adapter is 3-11/32" (85 mm)
 Dimensions will vary according to motor output and manufacturer

How to Order Your M-4509 Power System

Comprehensive information may be found on the page referenced below each selection category.

Pump	Motor	Adapter	Reservoir (Length)	Mounting Position	Accessories
Ref. Page 9	Ref. Page 10	Ref. Page 11	Ref. Page 13		Ref. Page 20

3.7 Model M-4509-C

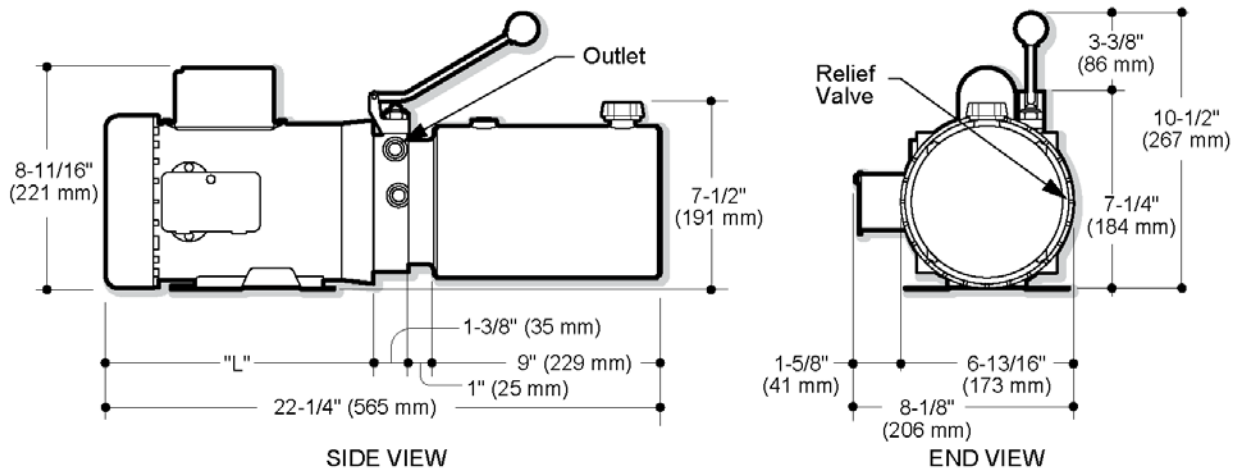
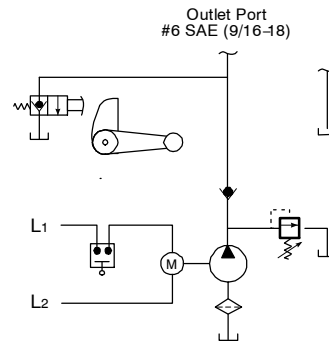
Description

- Pump / Motor / Reservoir / Valve Unit
- Check Valve
- Externally Adjustable Relief Valve
- Manually Operated Lowering Valve
- Pressure Compensated Flow Control
- #6 SAE Outlet
- Vertical Mounting Standard, Motor Up

Popular Features

- Horizontal Mounting

Schematic



"L" dimension shown for 08751 motor is 10-11/16" (271 mm)
 Dimensions will vary according to motor output and manufacturer

How to Order Your M-4509-C Power System

Comprehensive information may be found on the page referenced below each selection category.

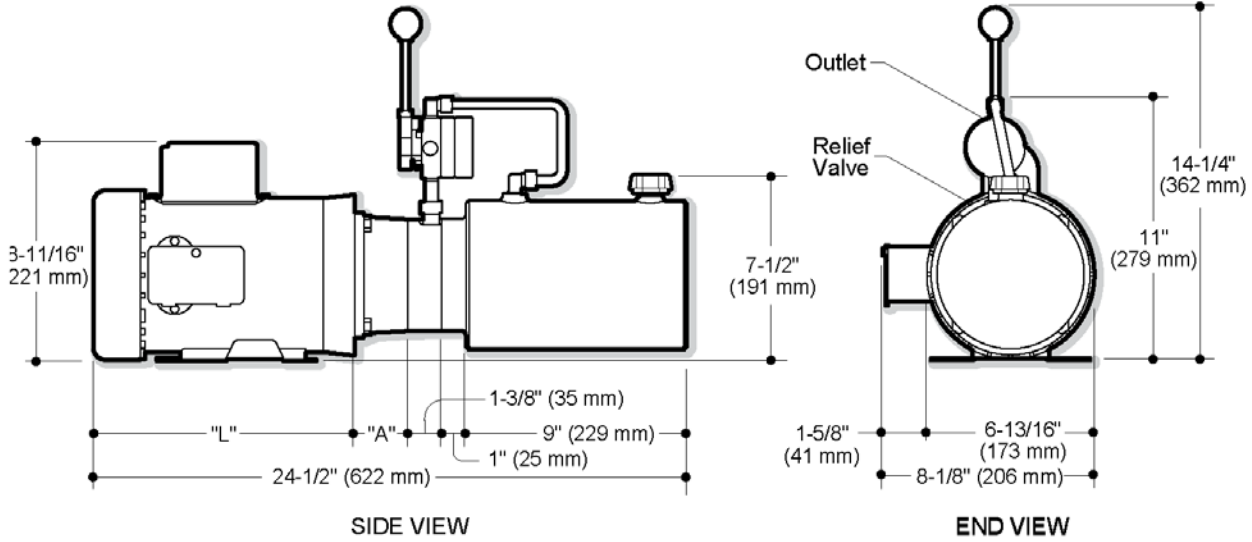
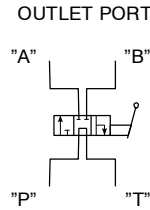
Pump	Motor	Adapter	Reservoir (Length)	Mounting Position	Accessories
Ref. Page 9	Ref. Page 10	Ref. Page 11	Ref. Page 13		Ref. Page 20

3.8 Model M-4301 (Formerly M-401)

Description

- Pump / Motor / Reservoir / Unit
- 3-Way Manually Operated Valve
- Externally Adjustable Relief Valve
- .250 Inch NPT Outlet
- Horizontal Mounting Standard
- Vertical Mounting (Motor Up) Optional

Schematic



"L" dimension shown for 08751 motor is 10-11/16" (271 mm)
 "A" dimension for standard 01605 adapter is 2-5/32" (55 mm)
 "A" dimension for optional 01615 adapter is 3-11/32" (85 mm)
 Dimensions will vary according to motor output and manufacturer

How to Order Your M-4301 Power System

Comprehensive information may be found on the page referenced below each selection category.

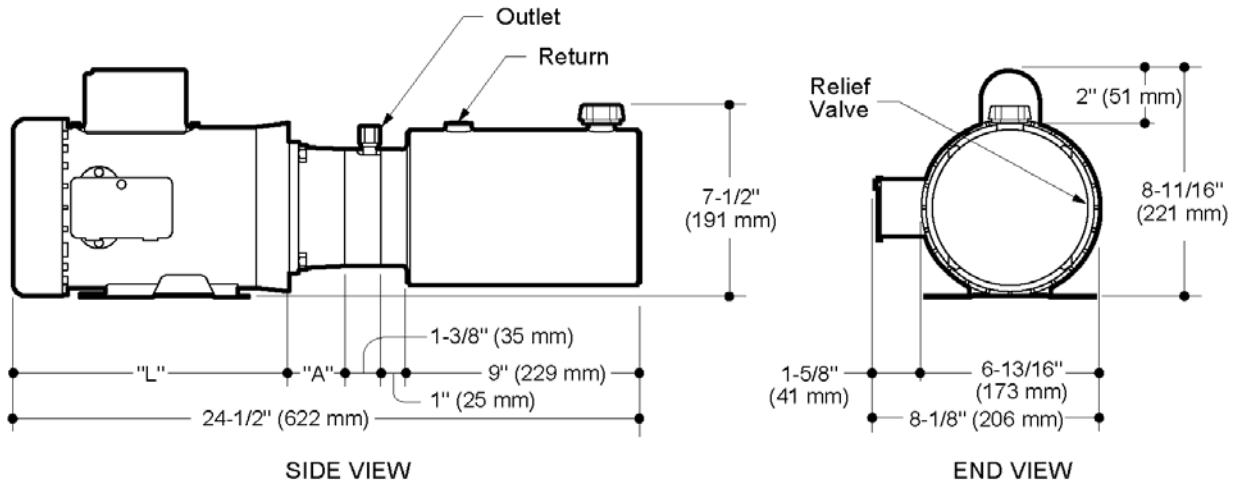
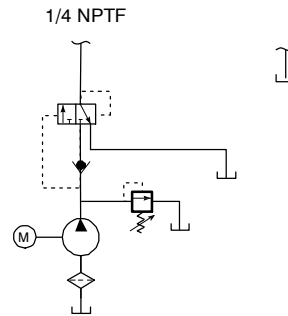
Pump	Motor	Adapter	Reservoir (Length)	Mounting Position	Accessories
Ref. Page 9	Ref. Page 10	Ref. Page 11	Ref. Page 13		Ref. Page 20

3.9 Model M-4315 (Formerly M-415)

Description

- Pump / Motor / Reservoir / Unit
- Integral Shuttle Valve
- Externally Adjustable Relief Valve
- .250 Inch NPT Outlet
- Horizontal Mounting Standard
- Vertical Mounting (Motor Up) Optional

Schematic



How to Order Your M-4315 Power System

Comprehensive information may be found on the page referenced below each selection category.

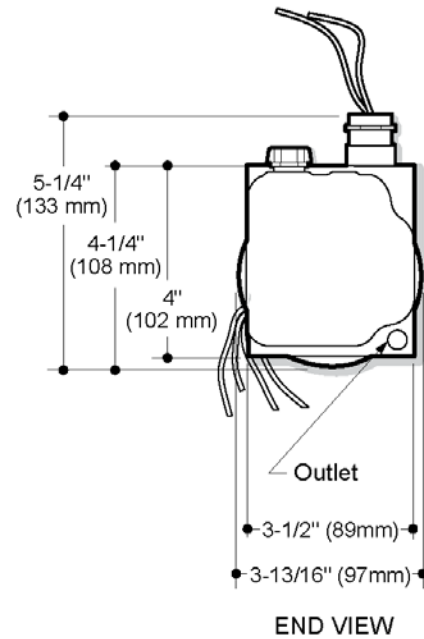
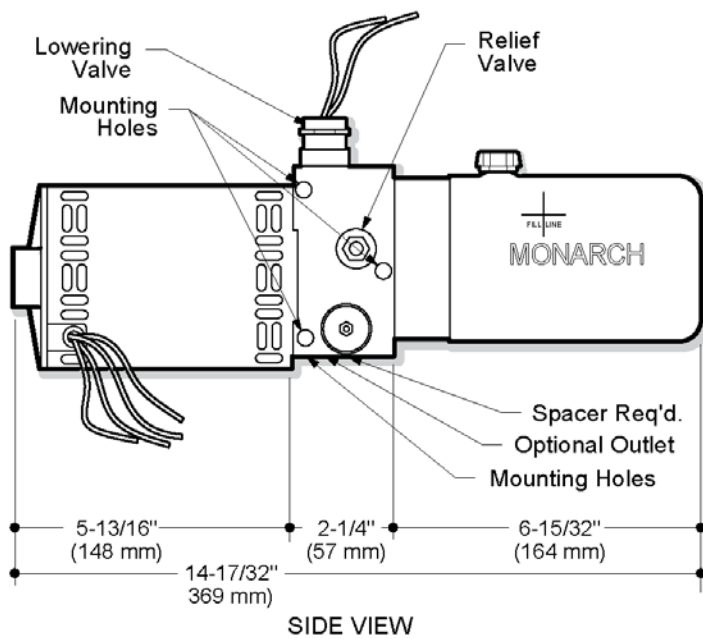
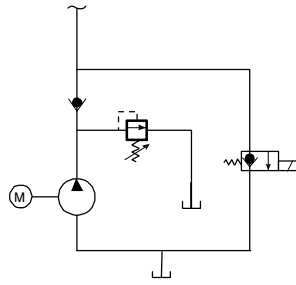
Pump	Motor	Adapter	Reservoir (Length)	Mounting Position	Accessories
Ref. Page 9	Ref. Page 10	Ref. Page 11	Ref. Page 13		Ref. Page 20

3.10 Model M-4219 (Formerly M-459)

Description

- Pump / Motor / Reservoir / Unit
- Check Valve
- Externally Adjustable Relief Valve
- 2-Way/2-Position Normally Closed Solenoid Operated Lowering Valve
- Outlet Port Options:
Check Valve Port 7/16-20 SAE O-Ring or
Face Port: 7/16-20 SAE O-Ring
- Horizontal Mounting Standard
- Vertical Mounting (Motor Up) Optional

Schematic



How to Order Your M-4219 Power System

Comprehensive information may be found on the page referenced below each selection category.

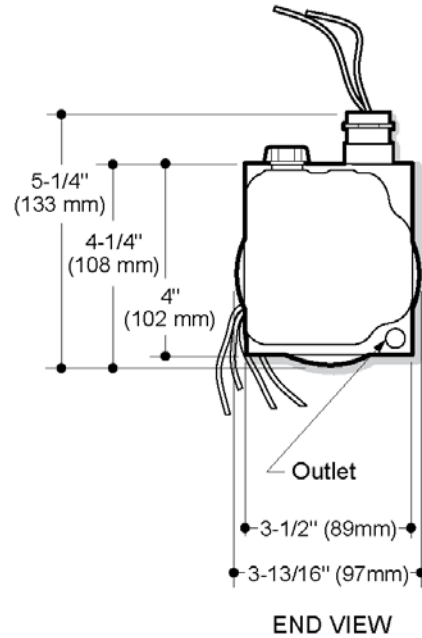
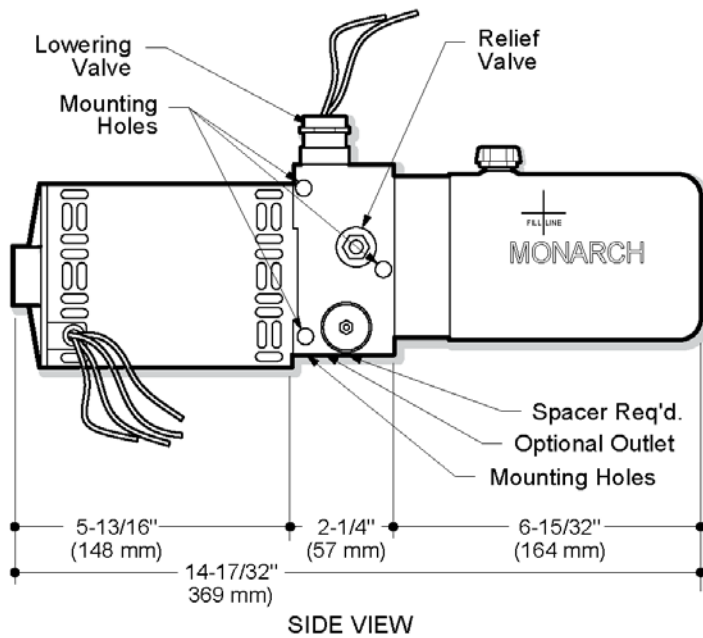
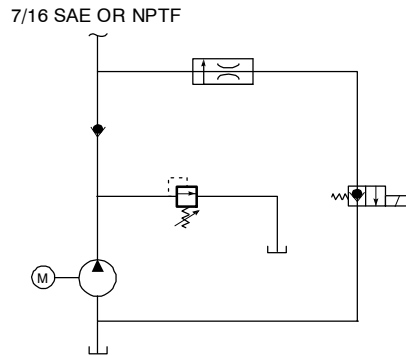
Pump	Motor	Reservoir	Mounting Position	Accessories
Ref. Page 9	Ref. Page 10	Ref. Page 16		Ref. Page 20

3.11 Model M-4219 w/PCFC

Description

- Pump / Motor / Reservoir / Unit
- Check Valve
- Externally Adjustable Relief Valve
- 2-Way/2-Position Normally Closed Solenoid Operated Lowering Valve
- Cartridge Style Pressure Compensated Lowering Valve
- Outlet Port **Options:**
Check Valve Port 7/16-20 SAE O-Ring or Face Port: 7/16-20 SAE O-Ring
- Horizontal Mounting Standard
- Vertical Mounting (Motor Up) Optional

Schematic



How to Order Your M-4219 w/PCFC Power System

Comprehensive information may be found on the page referenced below each selection category.

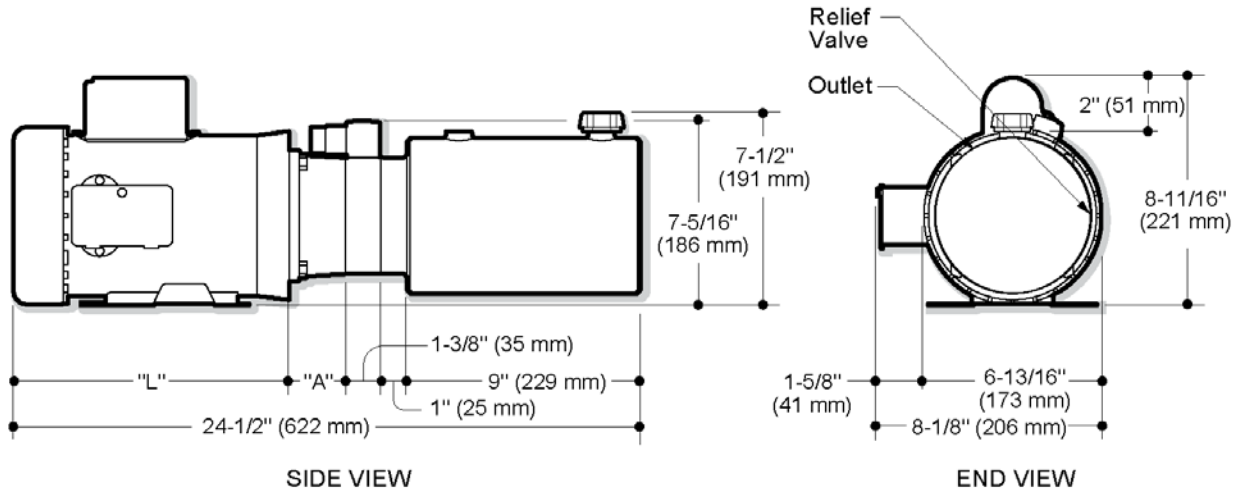
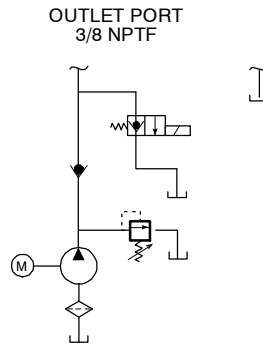
Pump	Motor	Reservoir	Mounting Position	Accessories
Ref. Page 9	Ref. Page 10	Ref. Page 16		Ref. Page 20

3.12 Model M-4319 (Formerly M-419)

Description

- Pump/Motor/Reservoir/Valve Unit
- Solenoid Operated 2-Way/2-Position Normally Closed Valve
- Externally Adjustable Relief Valve
- .375 Inch NPT Outlet
- Horizontal Mounting Standard
- Vertical Mounting (Motor Up) Optional

Schematic



"L" dimension shown for 08751 motor is 10-11/16" (271 mm)
 "A" dimension for standard 01605 adapter is 2-5/32" (55 mm)
 "A" dimension for optional 01615 adapter is 3-11/32" (85 mm)
 Dimensions will vary according to motor output and manufacturer

How to Order Your M-4319 Power System

Comprehensive information may be found on the page referenced below each selection category.

Pump	Motor	Adapter	Reservoir (Length)	Mounting Position	Accessories
Ref. Page 9	Ref. Page 10	Ref. Page 11	Ref. Page 13		Ref. Page 20

3.13 Model M-4519-C

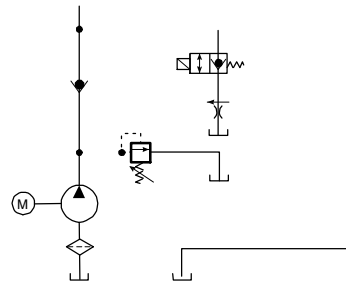
Description

- Pump/Motor/Reservoir/Valve Unit
- Check Valve
- Externally Adjustable Relief Valve
- 2 Way/2 Position Normally Closed Cartridge Valve
- #6 SAE Outlet
- Horizontal Mounting Standard

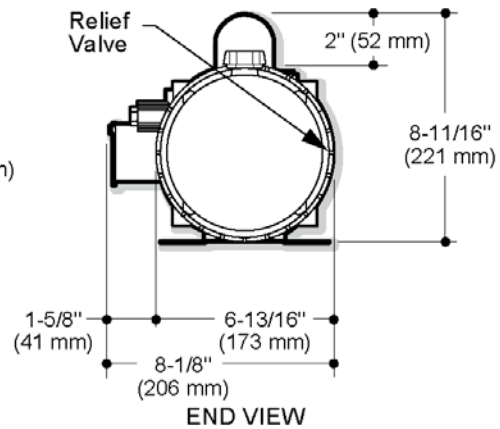
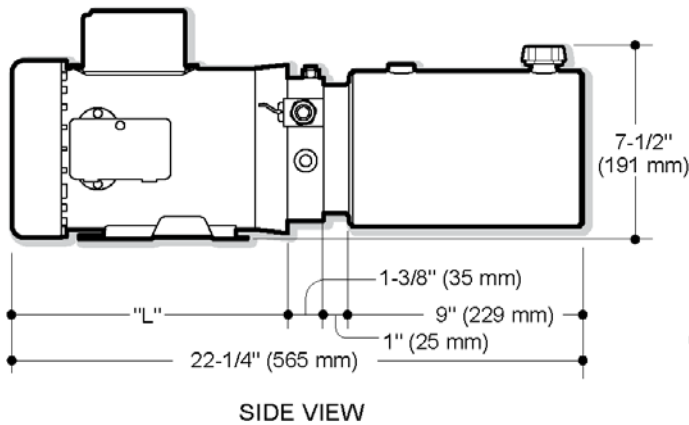
Popular Features

- Vertical Mounting / Motor Up
- Pressure Compensated Cartridge Style On Lowering Circuit
- Manual Override

Schematic



HYDRAULIC SCHEMATIC



"L" dimension shown for 08751 motor is 10-11/16" (271 mm)
 Dimensions will vary according to motor output and manufacturer

How to Order Your M-4519-C Power System

Comprehensive information may be found on the page referenced below each selection category.

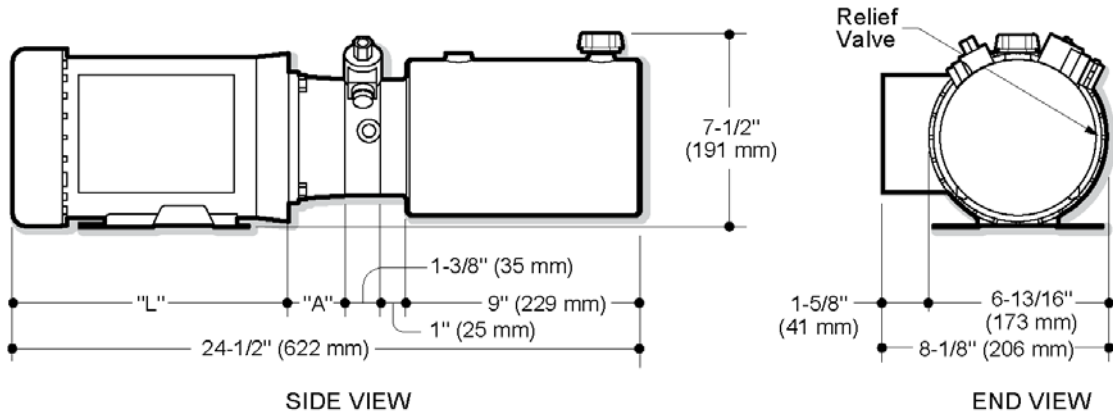
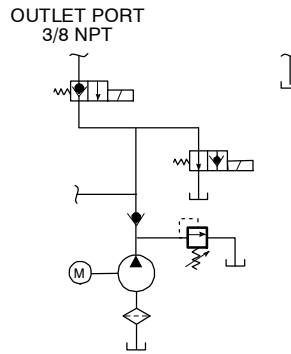
Pump	Adapter	Motor	Reservoir (Length)	Mounting Position	Accessories
Ref. Page 9	Ref. Page 11	Ref. Page 10	Ref. Page 13		Ref. Page 20

3.14 Model M-4303 (Formerly M-403)

Description

- Pump/Motor/Reservoir/Valve Unit
- Solenoid Operated 2-Way/2-Position Normally Closed Valve and Solenoid Operated 2-Way/2-Position Normally Open Valve
- Externally Adjustable Relief Valve
- .375 Inch NPT Outlet
- Horizontal Mounting Standard
- Vertical Mounting (Motor Up) Optional

Schematic



"L" dimension shown for 08751 motor is 10-11/16" (271 mm)
 "A" dimension for standard 01605 adapter is 2-5/32" (55 mm)
 "A" dimension for optional 01615 adapter is 3-11/32" (85 mm)
 Dimensions will vary according to motor output and manufacturer

How to Order Your M-4303 Power System

Comprehensive information may be found on the page referenced below each selection category.

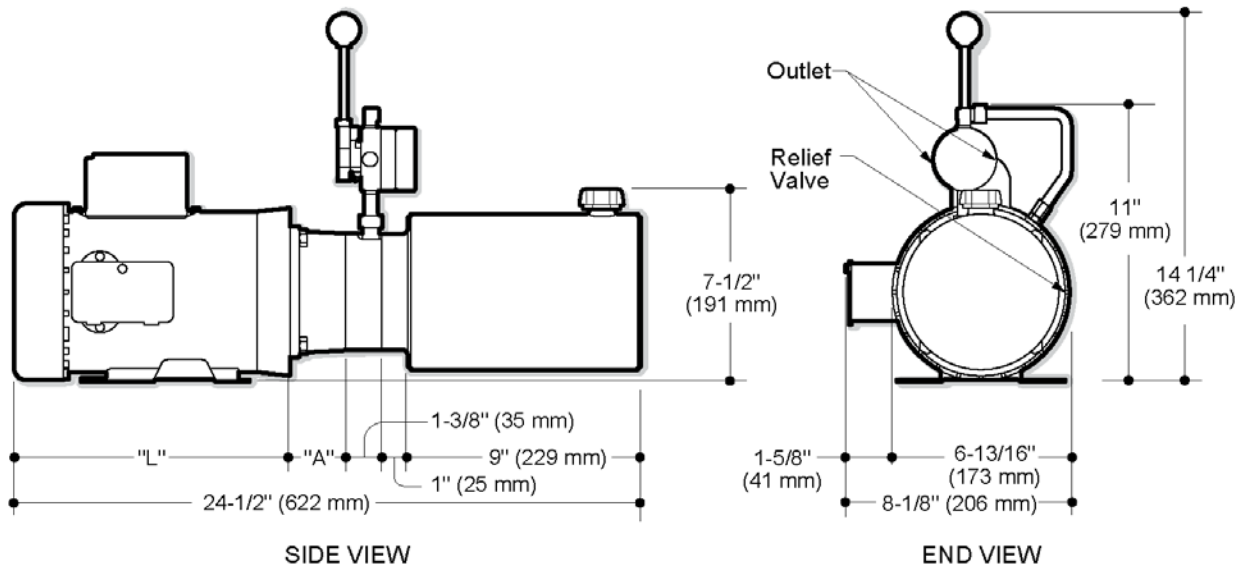
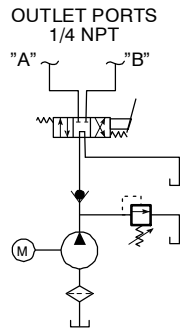
Pump	Motor	Adapter	Reservoir (Length)	Mounting Position	Accessories
Ref. Page 9	Ref. Page 10	Ref. Page 11	Ref. Page 13		Ref. Page 20

3.15 Model M-4310 (Formerly M-410)

Description

- Pump/Motor/Reservoir/Valve Unit
- 4-Way Manually Operated Valve
- Externally Adjustable Relief Valve
- .250 Inch NPT Outlets
- Horizontal Mounting Standard
- Vertical Mounting (Motor Up) Optional

Schematic



"L" dimension shown for 08751 motor is 10-11/16" (271 mm)
 "A" dimension for standard 01605 adapter is 2-5/32" (55 mm)
 "A" dimension for optional 01615 adapter is 3-11/32" (85 mm)
 Dimensions will vary according to motor output and manufacturer

How to Order Your M-4310 Power System

Comprehensive information may be found on the page referenced below each selection category.

Pump	Motor	Adapter	Reservoir (Length)	Mounting Position	Valves	Accessories
Ref. Page 9	Ref. Page 10	Ref. Page 11	Ref. Page 13		Ref. Page 18	Ref. Page 20

3.16 Model M-4551-C

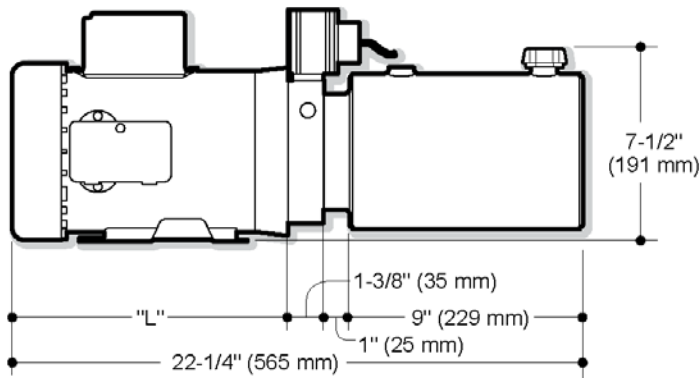
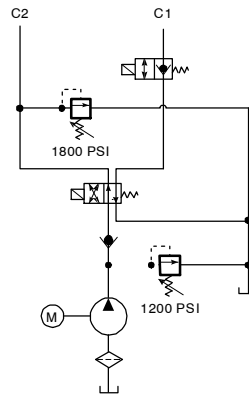
Description

- Pump/Motor/Reservoir/Valve Unit
- Check Valve
- Externally Adjustable Relief Valve
- (1) 4 Way/2 Position and (1) 2 Way/2 Position Normally Closed Solenoid Cartridge Valve Located in the Base
- C1 Port Positively Checked
- Externally Adjustable Relief Valve in C2 Port
- #6 SAE Outlets
- Horizontal Mounting Standard

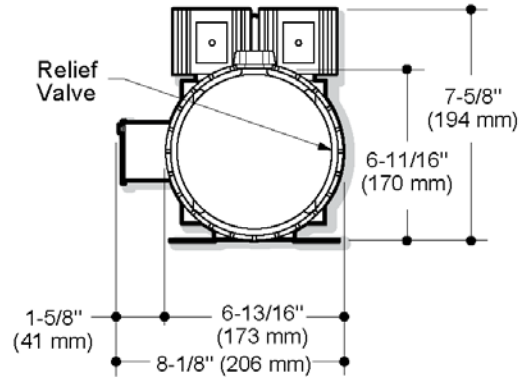
Popular Features

- Pressure Compensated Cartridge Style Flow Control
- Vertical Mounting, Motor Up

Schematic



SIDE VIEW



END VIEW

"L" dimension shown for 08751 motor is 10-11/16" (271 mm)
Dimensions will vary according to motor output and manufacturer

How to Order Your M-4551-C Power System

Comprehensive information may be found on the page referenced below each selection category.

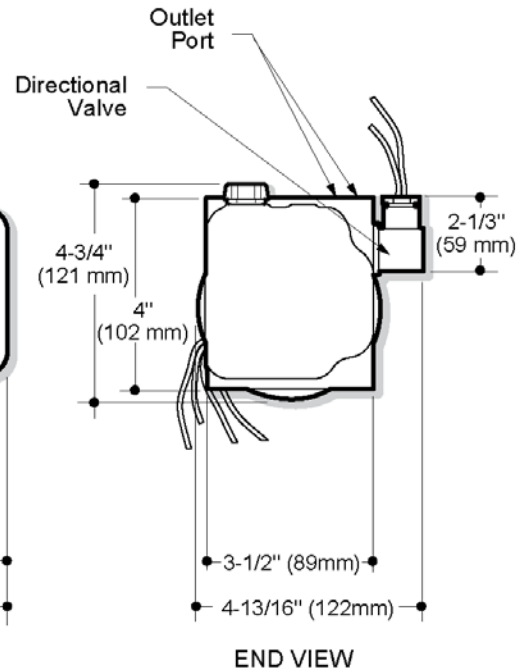
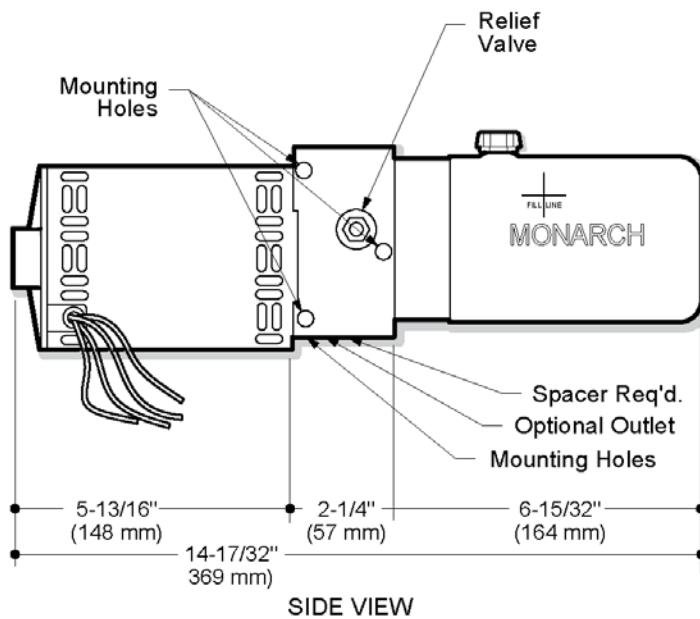
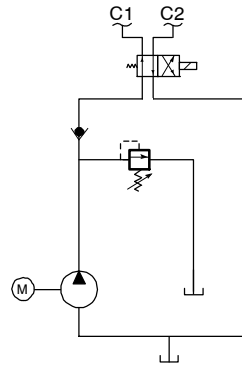
Pump	Motor	Adapter	Reservoir (Length)	Mounting Position	Accessories
Ref. Page 9	Ref. Page 10	Ref. Page 11	Ref. Page 13		Ref. Page 20

3.17 Model M-4252 (Formerly M-452)

Description

- Pump / Motor / Reservoir / Unit
- Check Valve
- 4-Way/2-Position Solenoid Cartridge Valve Mounts Directly to Unit
- 7/16-20 SAE O-Ring Outlet
- Horizontal Mounting Standard
- Vertical Mounting (Motor Up) Optional

Schematic



How to Order Your M-4252 Mini System

Comprehensive information may be found on the page referenced below each selection category.

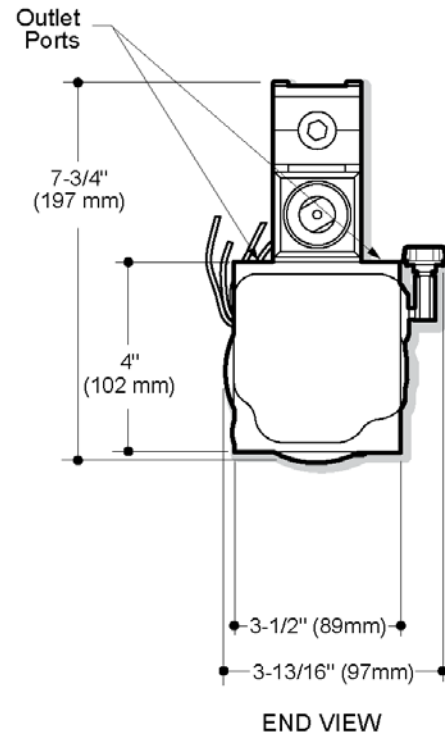
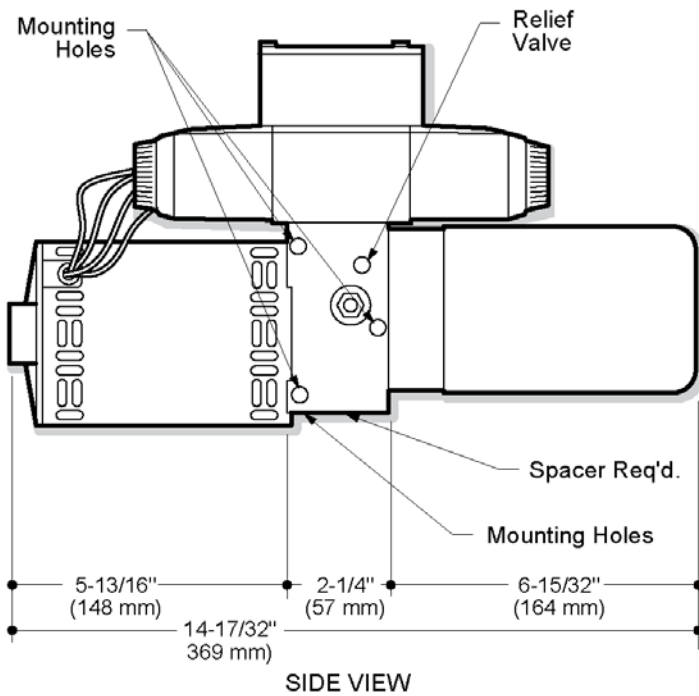
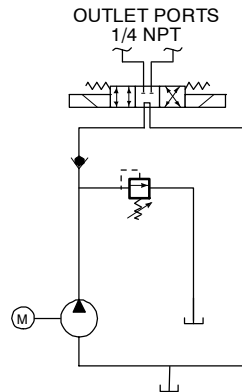
Pump	Motor	Reservoir	Mounting Position	Accessories
Ref. Page 9	Ref. Page 10	Ref. Page 16		Ref. Page 20

3.18 Model M-4253 (Formerly M-453)

Description

- Pump / Motor / Reservoir / Unit
- 4-Way/3-Position DO3 Solenoid Valve
- 7/16-20 SAE O-Ring Outlet
- Horizontal Mounting Standard
- Vertical Mounting (Motor Up) Optional

Schematic



How to Order Your M-4253 Mini System

Comprehensive information may be found on the page referenced below each selection category.

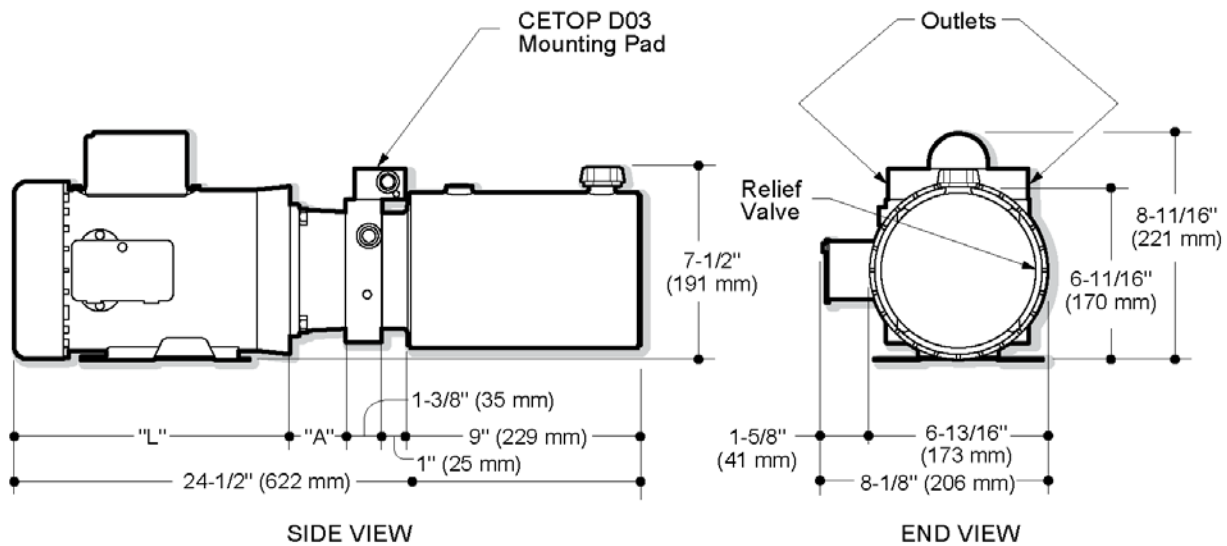
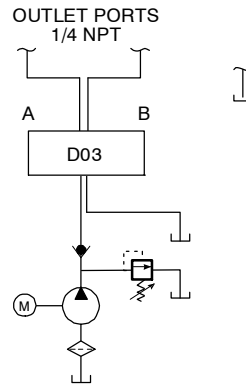
Pump	Motor	Reservoir	Mounting Position	Accessories
Ref. Page 9	Ref. Page 10	Ref. Page 16		Ref. Page 20

3.19 Model M-4506 (Replaces M-406)

Description

- Pump / Motor / Reservoir / Unit
- NPFA D03 Valve Mounting Surface
- Externally Adjustable Relief Valve
- .250 Inch NPT Outlets
- Horizontal Mounting Standard
- Vertical Mounting (Motor Up) Optional

Schematic



"L" dimension shown for 08751 motor is 10-11/16" (271 mm)
 "A" dimension for standard 01605 adapter is 2-5/32" (55 mm)
 "A" dimension for optional 01615 adapter is 3-11/32" (85 mm)
 Dimensions will vary according to motor output and manufacturer

How to Order Your M-4506 Power System

Comprehensive information may be found on the page referenced below each selection category.

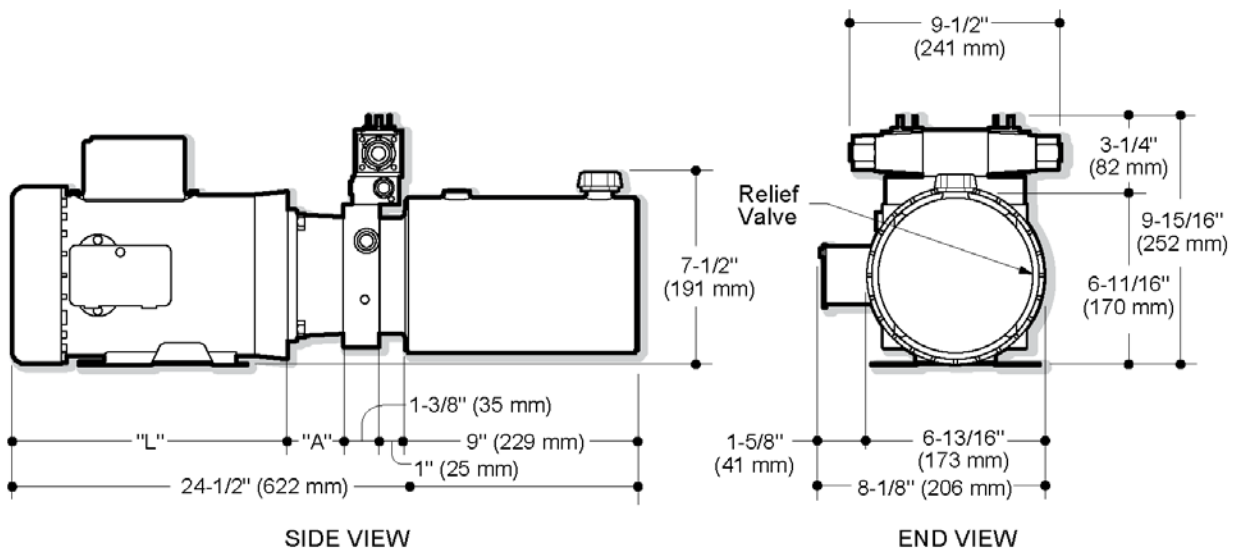
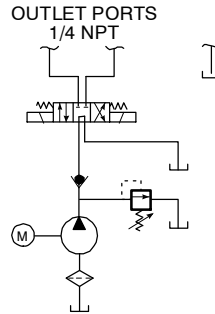
Pump	Motor	Adapter	Reservoir (Length)	Mounting Position	Valves	Accessories
Ref. Page 9	Ref. Page 10	Ref. Page 11	Ref. Page 13		Ref. Page 18	Ref. Page 20

3.20 Model M-4505 (Replaces M-405)

Description

- Pump / Motor / Reservoir / Unit
- Externally Adjustable Relief Valve
- 4-Way/3-Position Solenoid Operated DO3 Valve. Standard Tandem Center Shown. Other Spool Types Available.
- .250 Inch NPT Outlets
- Horizontal Mounting Standard
- Vertical Mounting (Motor Up) Optional

Schematic



"L" dimension shown for 08751 motor is 10-11/16" (271 mm)
 "A" dimension for standard 01605 adapter is 2-5/32" (55 mm)
 "A" dimension for optional 01615 adapter is 3-11/32" (85 mm)
 Dimensions will vary according to motor output and manufacturer

How to Order Your M-4505 Power System

Comprehensive information may be found on the page referenced below each selection category.

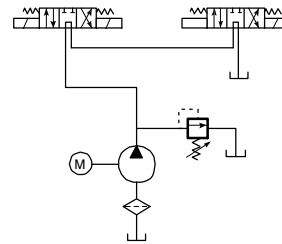
Pump	Motor	Adapter	Reservoir (Length)	Mounting Position	Valves	Accessories
Ref. Page 9	Ref. Page 10	Ref. Page 11	Ref. Page 13		Ref. Page 18	Ref. Page 20

3.21 Model M-4328 (Formerly M-428)

Description

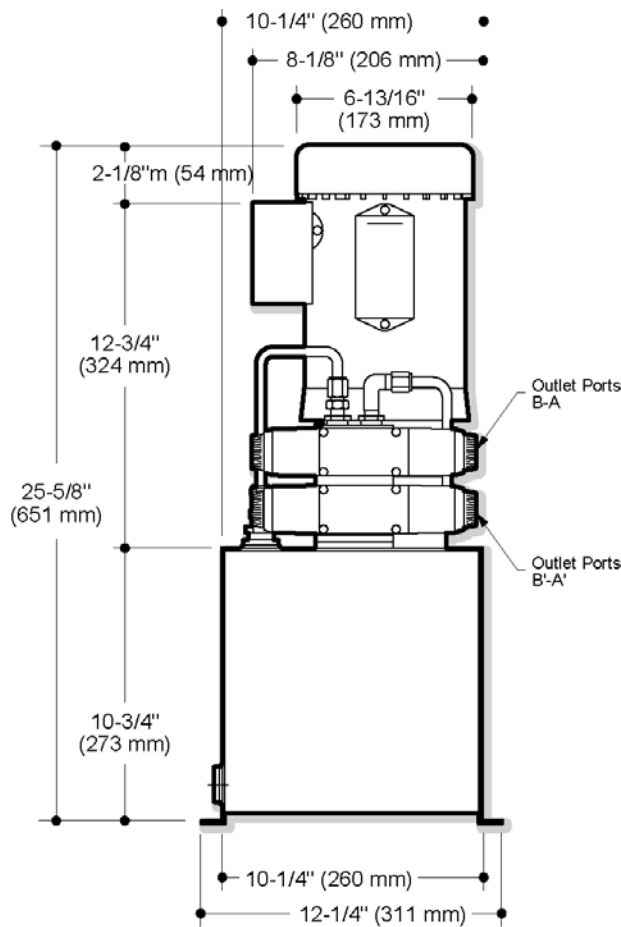
- Pump/Motor/Reservoir/Valve Unit
- Externally Adjustable Relief Valve
- Two 4-Way/3-Position Solenoid Operated Tandem Center DO3 Valves in One Two Station Manifold for Series Operation
- Maximum Relief Valve Setting 1400 PSI
- ..375 Inch NPT Outlets
- Vertical Mounting

Schematic



Popular Features

- Unit Less D03 Valves



How to Order Your M-4328 Power System

Comprehensive information may be found on the page referenced below each selection category.

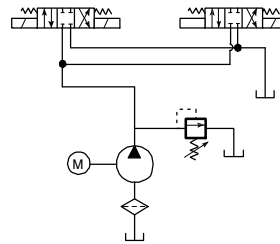
Pump	Motor	Reservoir (Length)	Mounting Position	Valves	Accessories
Ref. Page 9	Ref. Page 10	Ref. Page 13		Ref. Page 18	Ref. Page 20

3.22 Model M-4328-P (Formerly M-428-P)

Description

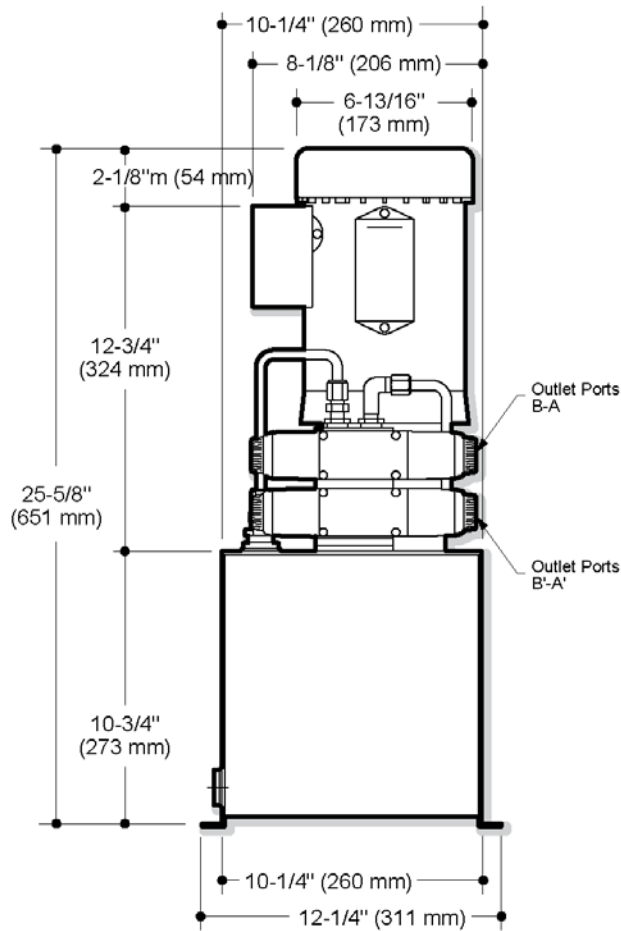
- Pump/Motor/Reservoir/Valve Unit
- Externally Adjustable Relief Valve
- Two 4-Way/3-Position Solenoid Operated Tandem Center DO3 Valves in One Two Station Manifold for **Parallel** Operation
- ..375 Inch NPT Outlets
- Vertical Mounting

Schematic



Popular Features

- Unit Built with unloading valve
- Unit Less D03 Valves



How to Order Your M-4328-P Power System

Comprehensive information may be found on the page referenced below each selection category.

Pump	Motor	Reservoir (Length)	Mounting Position	Valves	Accessories
Ref. Page 9	Ref. Page 10	Ref. Page 13		Ref. Page 18	Ref. Page 20

3.23 Model M-4528

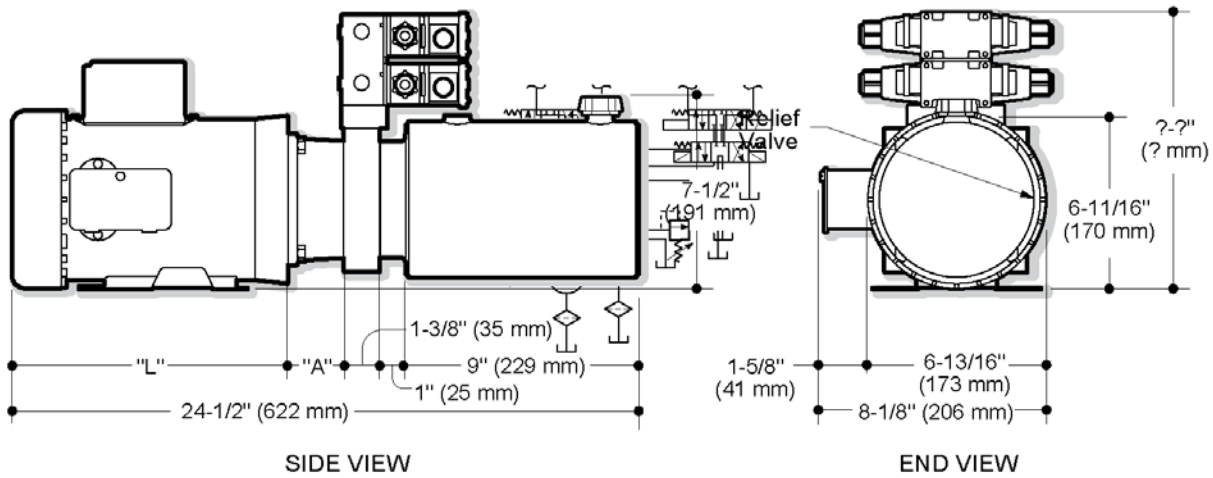
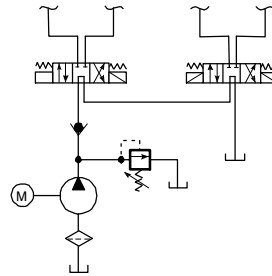
Description

- Pump/Motor/Reservoir/Valve Unit
- Check Valve in "P" Port
- Externally Adjustable Relief Valve
- (2) D03 Double Solenoid Valves
- #6 SAE Outlets
- 250 Inch NPT Outlets

Popular Features

- Vertical Mounting, Motor Up
- Large Selection of D03/CETOP Valves and Accessories
- Parallel Circuit Available

Schematic



"L" dimension shown for 08751 motor is 10-11/16" (271 mm)
 "A" dimension for standard 01605 adapter is 2-5/32" (55 mm)
 "A" dimension for optional 01615 adapter is 3-11/32" (85 mm)
 Dimensions will vary according to motor output and manufacturer

How to Order Your M-4528 Power System

Comprehensive information may be found on the page referenced below each selection category.

Pump	Motor	Adapter	Reservoir (Length)	Mounting Position	Accessories
Ref. Page 9	Ref. Page 10	Ref. Page 11	Ref. Page 13		Ref. Page 20

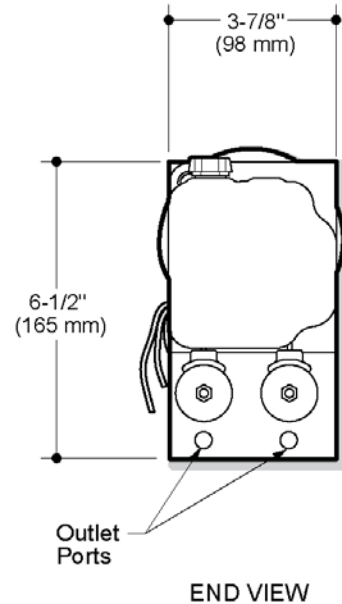
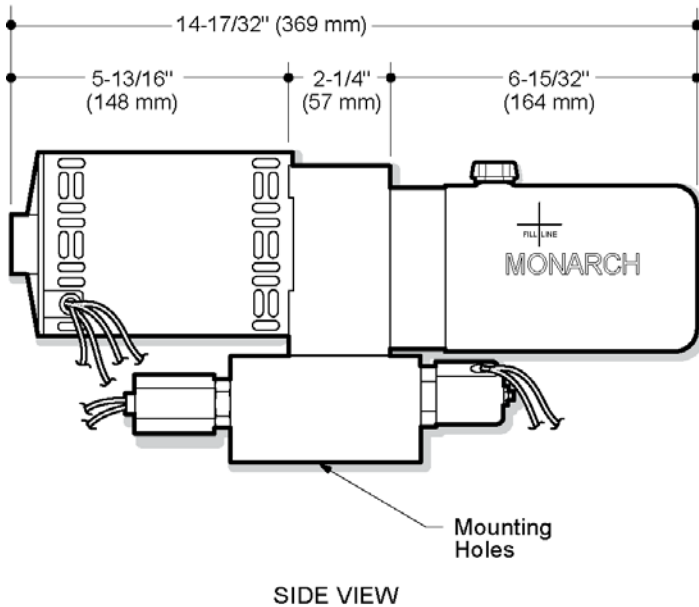
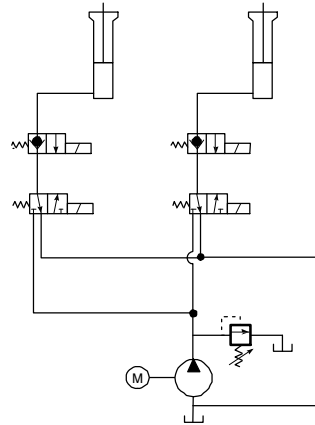
3.24 Model M-4266 (Formerly M-466)

Description

- Pump/Motor/Reservoir/Valve Unit
- Cartridge Valve Block Manifolded Directly to Power Unit
- Controls 2 Single Acting Cylinders Independently
- .125 Inch NPT Outlets
- Horizontal Mounting Standard
- Vertical Mounting / Motor Up

NOTE: Consult factory regarding return flow limitations.

Schematic



How to Order Your M-4266 Mini System

Comprehensive information may be found on the page referenced below each selection category.

Pump	Motor	Reservoir	Mounting Position	Accessories
Ref. Page 9	Ref. Page 10	Ref. Page 16		Ref. Page 20

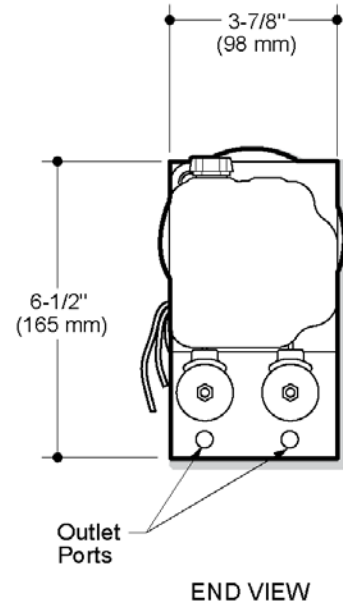
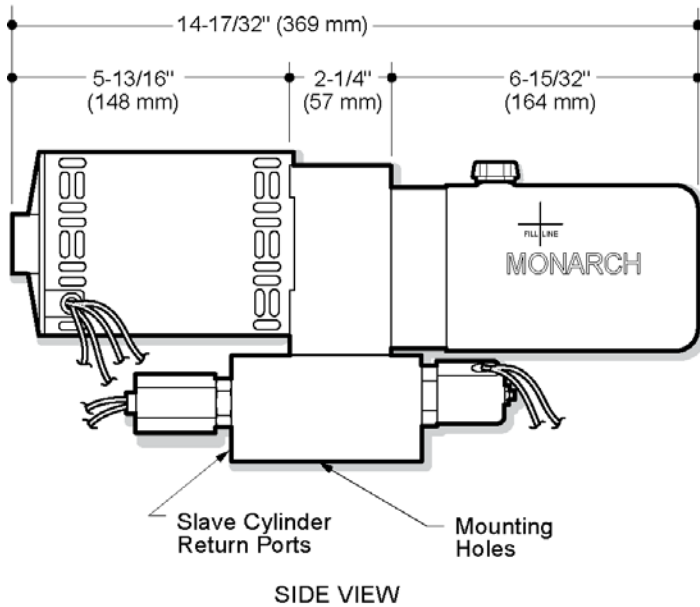
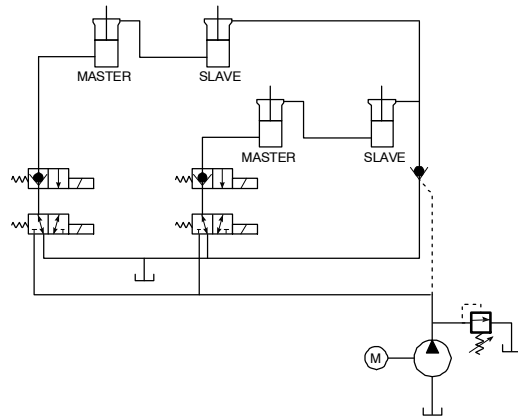
3.25 Model M-4257 (Formerly M-457)

Description

- Pump/Motor/Reservoir/Valve Unit
- Independent Operation of Two Single Acting Master/Slave Cylinder Circuits
- Cartridge Valve Block Manifolded Directly to Power Unit
- .125 Inch NPT Outlets
- Horizontal Mounting Standard
- Vertical Mounting / Motor Up

NOTE: Consult factory regarding return flow limitations.

Schematic



How to Order Your M-4257 Mini System

Comprehensive information may be found on the page referenced below each selection category.

Pump	Motor	Reservoir	Mounting Position	Accessories
Ref. Page 9	Ref. Page 10	Ref. Page 16		Ref. Page 20

3.26 Model M-4593-C

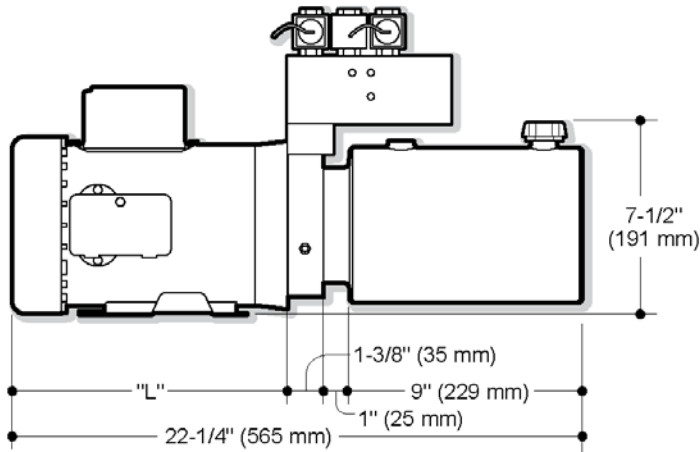
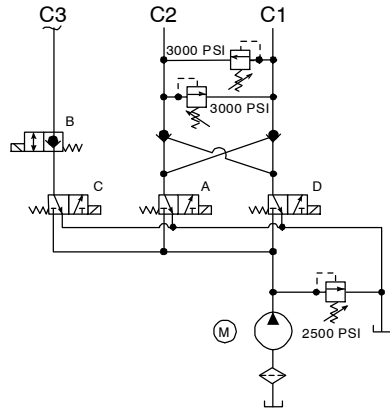
Description

- Pump/Motor/Reservoir/Valve Unit
- Externally Adjustable Relief Valve
- Solenoid Cartridge Valves, Pilot Operated
- Check Valves, and Adjustable Cross-Over Relief System Mounted in a Compact Manifold
- Horizontal Mounting Standard

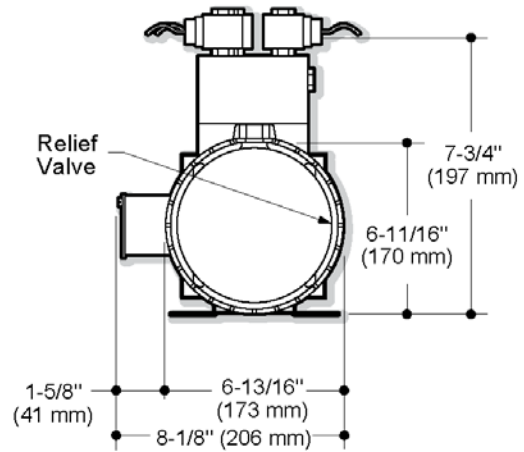
Popular Features

- Vertical Mounting, Motor Up

Schematic



SIDE VIEW



END VIEW

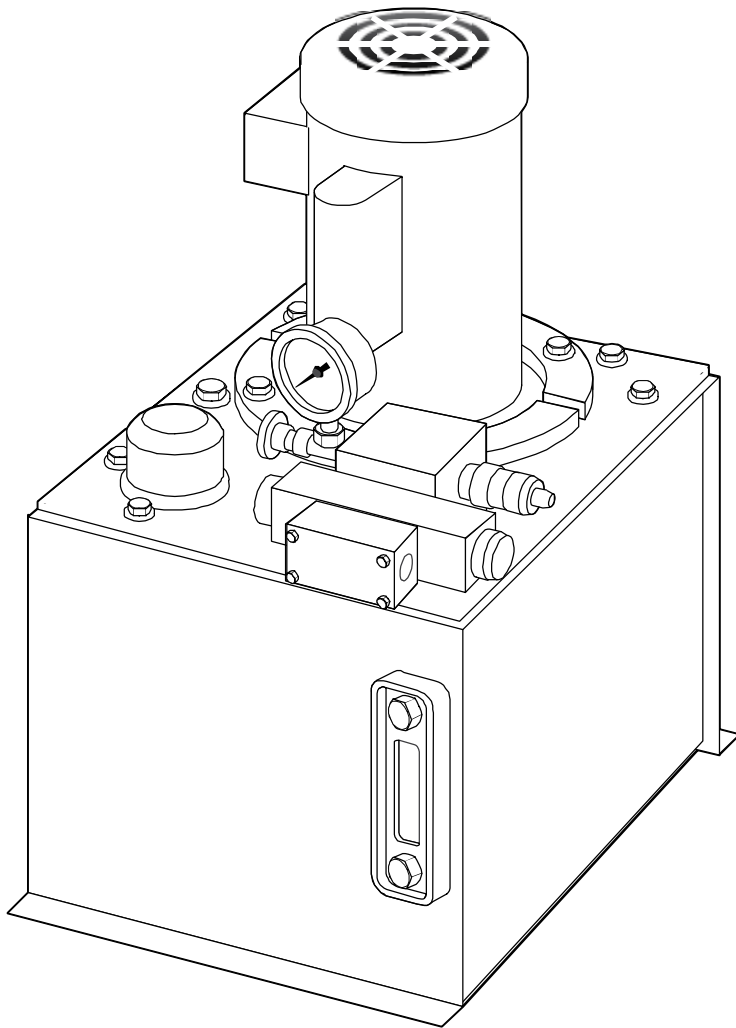
"L" dimension shown for 08751 motor is 10-11/16" (271 mm)
Dimensions will vary according to motor output and manufacturer

How to Order Your M-4593-C Mini System

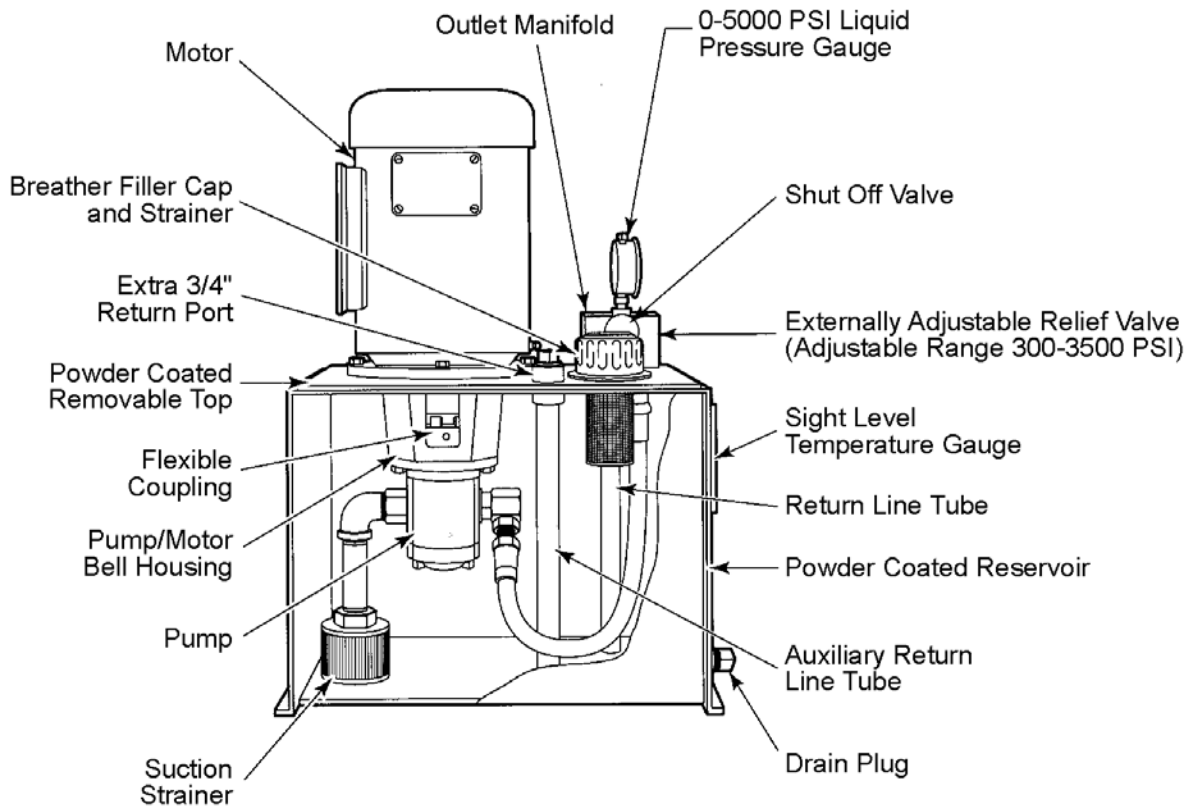
Comprehensive information may be found on the page referenced below each selection category.

Pump	Motor	Adapter	Reservoir (Length)	Mounting Position	Accessories
Ref. Page 9	Ref. Page 10	Ref. Page 11	Ref. Page 13		Ref. Page 20

4 MT & T Series Industrial Power Units



4.1 Standard System Side View w/cutaway



Options:

- Water/Oil Heat Exchangers
- Air/Oil Heat Exchangers
- Wide Range of Pressure Gauges
- Heaters
- Viton Seals
- NPT Ports
- Return Filter, 10 Micron Nominal
- A Wide Selection of D03 and D05 Directional
- Control Valves
- Pressure Switches
- Float Switches
- Custom Systems
- Synthetic Fluids - Consult Factory
- Subplate Mounted D03 and D05 Stack Valves
- Cross Port Relief
- Pressure Reducing
 - Single and Double Flow Control
 - Directional and Pilot Operated Check
 - Sequence
- Counter Balance Relief

Recommended Operating Conditions for T Power Units

Oil Temperature Range:	10°F - 170°F
Recommended Operating Temperature:	50°F - 130°F
Oil Viscosity: Optimum:	100 - 350 SUS
Minimum:	100 SUS
Maximum Start Up:	3500 SUS
Recommend Filtration:	25 Micron nominal or less

4.2 MT & T Series Pump Performance Data

4.2.1 MT Series

Pump Code	IN ³ /REV	RPM	GPM	500 HP	1000 HP	1500 HP	2000 HP	2500 HP	3000 HP
12637-150 (72)	0.032	1800 3600	0.25 0.50	0.20 0.40	0.30 0.60	0.35 0.70	0.50 1.00	0.55 1.10	0.75 1.50
12637-270 (62)	0.57	1800 3600	0.45 0.90	0.20 0.40	0.35 0.70	0.56 0.90	0.60 1.20	0.70 1.40	0.90 1.80
12172-150 (42)	0.77	1800 3600	0.60 1.20	0.25 0.50	0.45 0.90	0.60 1.20	0.80 1.60	1.00 2.00	1.15 2.30
12172-200 (43)	0.099	1800 3600	0.80 1.60	0.35 0.70	0.55 1.10	0.80 1.60	1.05 2.10	1.30 2.60	1.50 3.00
12172-250 (03)	0.125	1800 3600	1.00 2.00	0.45 0.90	0.75 1.50	1.10 2.20	1.40 2.80	1.70	2.15
12172-270 (51)	0.137	1800 3600	1.10 2.20	0.50 1.00	0.80 1.60	1.15 2.30	1.50 3.00	2.00	2.25
12172-380 (05)	0.193	1800 3600	1.50 3.00	0.60 1.20	1.10 2.20	1.50 3.00	2.00	2.50	3.00

4.2.2 T Series

Pump Code	IN ³ /REV	RPM	GPM	500 HP	1000 HP	1500 HP	2000 HP	2500 HP	3000 HP		
02913	0.27	1800	2.10	0.85	2.00	2.30	3.00	3.90	4.80		
02908	0.37	1800	2.90	1.10	2.10	3.10	4.15	5.15	6.25		
02902	0.50	1800	3.90	1.50	2.80	4.00	5.30	6.60	8.10		
02909	0.68	1800	5.30	1.90	3.71	5.56	7.42	9.28	11.13		
02904	0.84	1800	6.55	2.40	4.60	6.65	8.65	10.65	12.85		
02910	0.97	1800	7.60	2.70	5.32	7.90	10.50	13.20	16.00		
02911	1.15	1800	9.00	3.15	6.30	9.45	12.62	15.80	18.90		
02912	1.37	1800	10.7	3.80	7.50	11.20	14.90	18.70			
02907	1.58	1800	12.3	4.30	8.60	12.90	17.20				
2948/2949*	0.960	1800	3.5 to 7.5 GPM. See Below.								

* Pump supplied standard with adjustable maximum displacement stop which can be set between 3.0 GPM and 7.5 GPM. Maximum speed pump 2000 RPM.

* When selecting motor, choose the HP required or the next HP available.

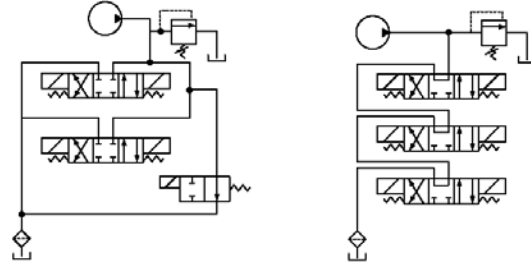
* Contact the factory for operating T Series pumps at speeds above 1800 RPM.

4.3 Standard D03 and D05 Directional Control Valves

Schematic	Pump Code
	4-Way/3-Position. Solenoid Operated. Tandem Center.
	4-Way/3-Position. Solenoid Operated. Open Center.
	4-Way/3-Position. Solenoid Operated. Closed Center.
	4-Way/3-Position, P Blocked. A and B to T. "Motor Spool".
	4-Way/2-Position. P to A. Spring Offset

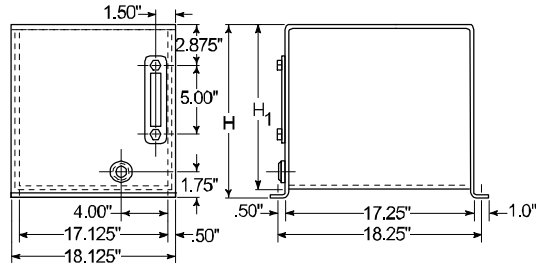
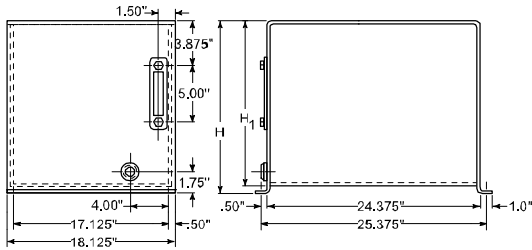
Manifolds are available from stock in Parallel and Series configurations. These manifolds may be combined in multiples of 2 and 3 to form multi-station valve banks.

Example:



PARALLEL 2 STATION SERIES 3* STATION



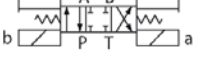






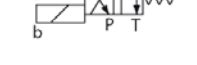
* Back pressure in tank line must not exceed 1000 PSI in Series configuration with D05 valves or 1500 PSI with D03 valves.



DIM. in Inches	Reservoir Capacity Total/Usable in Gallons		
	20/12	30/21.8	40/29
H	16 ^{3/4}	22 ^{1/4}	34
H ₁	16	21 ^{1/2}	33 ^{1/4}

DIM. in Inches	Reservoir Capacity Total/Usable in Gallons		
	8.5/4.4	10.1/5.2	15.2/9.8
H	12 ^{3/4}	14 ^{1/4}	19
H ₁	12	13 ^{1/2}	18 ^{1/4}

Series	Pump	Reservoir	Heat Exchanger	Motor	Valve Manifold
MT 0.25-4.0 GPM	MT-400	TOTAL CAPACITY GALLONS	(SEE SELECTION CHART ON REVERSE PAGE)	(ALL STANDARD MOTORS TEFC)	
	17 P72 14 P62 01 P42 *** P43 02 P03 04 P51 05 P05	08 T-8* 10 T-10* 15 T-15 20 T-20* 30 T-30 40 T-40 01 WITHOUT RESERVOIR - DOES NOT INCLUDE SUCTION LINE, RETURN LINE OR SUCTION STRAINER. 07 SPECIAL *Do not specify for piston pump applications.	1 AIR/OIL TYPE - MOUNTS ON MOTOR FAN COVER 2 WATER TYPE - MOUNTS ON TANK 3 AIR/OIL With Filter 4 WATER/OIL With Filter 0 Without Cooler 7 SPECIAL	HP RPM VOLTAGE PHASE 01 1/2 1800 115/230 1 02 1/2 1800 230/460 3 03 1/2 3600 115/230 1 04 1 1800 115/230 1 05 1 1800 230/460 3 06 1 3600 115/230 1 08 1 3600 230/460 3 09 1 1800 115/230 1 10 1 1800 230/460 3 11 1 3600 115/230 1 12 1 3600 230/460 3 30 2 1800 115/230 1 13 2 1800 230/460 3 14 2 3600 115/230 1 15 2 3600 230/460 3 16 3 1800 230/460 3 32 3 1800 230/460 3 17 3 3600 230/460 3 29 3 3600 115/230 1 34 5 1800 208/230 1 18 5 1800 230/460 3 19 7 1800 230/460 3 20 10 1800 230/460 3 21 15 1800 230/460 3	01 P&T 3/4-16 SAE Ports - Aux Gauge Port - Relief Valve cavity - Use as subplate for multi-station manifolds 02 D03 Single Station - 3/4-16 SAE Ports - Aux Gauge Port - Relief Valve cavity 03 D05 Single Station - 3/4-16 SAE Ports - Aux Gauge Port - Relief Valve cavity NFPA D03 Interface 04 2 Station Parallel* 34 D03 2 Station Parallel & Unloading Valve 05 3 Station Parallel* 35 D03 3 Station Parallel & Unloading Valve 06 4 Station Parallel* 36 D03 4 Station Parallel & Unloading Valve 08 5 Station Parallel* 38 D03 5 Station Parallel & Unloading Valve 09 2 Station Series 10 3 Station Series 11 4 Station Series 69 Power Up, Gravity Down with Check NFPA D05 Interface 13 2 Station Parallel** 43 D05 2 Station Parallel & Unloading Valve 14 3 Station Parallel** 44 D05 3 Station Parallel & Unloading Valve 15 4 Station Parallel** 45 D05 4 Station Parallel & Unloading Valve 16 5 Station Parallel** 46 D05 5 Station Parallel & Unloading Valve 17 2 Station Series 18 3 Station Series 19 4 Station Series 07 SPECIAL NOTE: If ordering a multi-station D03 manifold, valve manifold 01 will be included for use as a subplate. If ordering a multi-station D05 manifold, valve manifold 01 and a transition plate will be included for use as a subplate. *D03 - If an unloading valve is required, substitute a 3 for the 0 in the option code. **D05 - If an unloading valve is required, substitute a 4 for the 1 in the option code.
T 2.10-12.3 GPM	T-400				
	08 02913 09 02908 16 02902 10 02909 18 02904 11 02910 12 02911 13 02912 06 02907 21 2948 22 2949 23 2948 (3-5 HP)* 24 2948 (7.5-15 HP)* 25 2949 (3-5 HP)** 26 2949 (7.5-15 HP)** 07 SPECI- AL *2948 Variable Displacement Pump furnished with factory preset, adjustable remote Pressure Compensating Valve. Specify Compensator setting. **2949 Variable Displacement Pump furnished with factory preset Pressure Compensator. Specify Compensator setting. NOTE: T-400 Pumps available with Viton seals - Consult factory for use with synthetic fluids.			20 10 1800 230/460 3 21 15 1800 230/460 3 Without motor but with MONARCH supplied hardware. 96 182C Frame 97 56C Frame 98 182TC-184TC 99 213TC-215TC 07 SPECIAL	

Relief Valve	Directional Control Valves	Coil Voltage and Electrical Connection	Filter	Economy Options
<p>1 Relief Valve, 300-3500 PSI* Externally Adjustable, Pilot Operated.</p> <p>2 100-300 PSI</p> <p>3 100-2000 PSI</p> <p>4 550-5000 PSI</p> <p>0 Without Relief Valve</p> <p>7 SPECIAL</p> <p>*Specify Setting</p>	<p>NOTE: Valves for multi-station manifolds should be listed sequentially starting from the base.</p> <p>(OTHERS ARE AVAILABLE)</p> <p>DO3</p> <p>01 </p> <p>02 </p> <p>03 </p> <p>04 </p> <p>05 </p> <p>D05</p> <p>08 </p> <p>09 </p> <p>10 </p> <p>11 </p> <p>12 </p> <p>00 WITHOUT VALVE</p> <p>07 SPECIAL</p> <p>Specially valves are available such as pressure reducing, sequence, pilot operated check, meter in, meter out, etc. Please consult the factory or your distributor.</p>	<p>(CHOOSE ONE FROM (EACH GROUP))</p> <p>GROUP 1</p> <p>1 120V/50-60 HZ</p> <p>2 240V/50-60 HZ</p> <p>3 24V/50-60 HZ</p> <p>4 12V D.C.</p> <p>5 24V D.C.</p> <p>GROUP 2</p> <p>6 STANDARD LEAD</p> <p>8 HIRSCHMANN</p> <p>9 BRAD HARRISON</p> <p>00 WITHOUT</p> <p>07 SPECIAL</p> <p>NOTE: Not all of the above electrical connection types are available from certain valve manufacturers. Consult factory.</p>	<p>(PETROLEUM BASED FLUIDS ONLY)</p> <p>1 RETURN - SPIN ON TYPE - 10 MICRON NOMINAL</p> <p>2 RETURN - SPIN ON TYPE - 10 MICRON NOMINAL - INDICATING GAGE</p> <p>3 RETURN - SPIN ON TYPE - FLEXIBLE TUBING</p> <p>4 RETURN - SPIN ON TYPE - FLEXIBLE TUBING - GAUGE</p> <p>0 WITHOUT FILTER</p> <p>7 SPECIAL</p> <p>*Consult factory for use with synthetic fluids.</p>	<p>0 0-5000 PSI Gauge & Shut-Off Valve (Standard)</p> <p>1 Delete Pressure Gauge</p> <p>2 0-3000 PSI Gauge</p> <p>3 0-2000 PSI Gauge</p> <p>4 0-1500 PSI Gauge</p> <p>5 0-1000 PSI Gauge</p> <p>6 0-600 PSI Gauge</p> <p>7 SPECIAL</p>

4.4 Limited 1 Year Warranty

Bucher Hydraulics, Inc. ("Bucher") makes the following warranty to any party who purchases this Bucher Hydraulics, Inc. product directly from Bucher Hydraulics, Inc. with the intention of either reselling this Bucher Hydraulics, Inc. product or incorporating it into or attaching it to some other product ("the purchaser").

Bucher Hydraulics, Inc. warrants to the purchaser that this product is free from any substantial defects in materials and workmanship. If this product proves to be defective in materials or workmanship during the period of this warranty, Bucher Hydraulics, Inc. will repair or replace, at its option, the defective product free of charge (except for transportation charges as provided below). The period of this warranty is the (1) year period beginning from the date of shipment of this Bucher Hydraulics, Inc. product by Bucher Hydraulics, Inc. to the purchaser.

To obtain warranty service, the purchaser must call Bucher Hydraulics, Inc. to have a return goods authorization number assigned to them. The purchaser should then send the product claimed to be defective within the warranty period, transportation prepaid, to: Bucher Hydraulics, Inc., 1363 Michigan Street N.E., Grand Rapids, MI. 49503, USA. Bucher Hydraulics, Inc. will then repair or replace, at its option, items which it finds to have been defective. Bucher Hydraulics, Inc. will return such repaired or replacement items to the sender free of charge. Items claimed by the purchaser, but not found by Bucher Hydraulics, Inc., to be defective will be returned to the purchaser by a reasonably expeditious means at the purchaser's expense. This expense may include labor charges incurred from inspecting the unit.

This warranty does not extend to any failure of this Bucher Hydraulics, Inc. product to perform as warranted hereinabove which is caused by misuse, abuse or material alteration of this product, or any negligence in connection with the installation, service, or use of this product by any person other than Bucher Hydraulics, Inc.

Bucher Hydraulics, Inc. hereby expressly disclaims any liability for consequential damages to property other than this Bucher Hydraulics, Inc. product to perform as warranted hereinabove.

Note: Supersedes all former warranties written or implied.