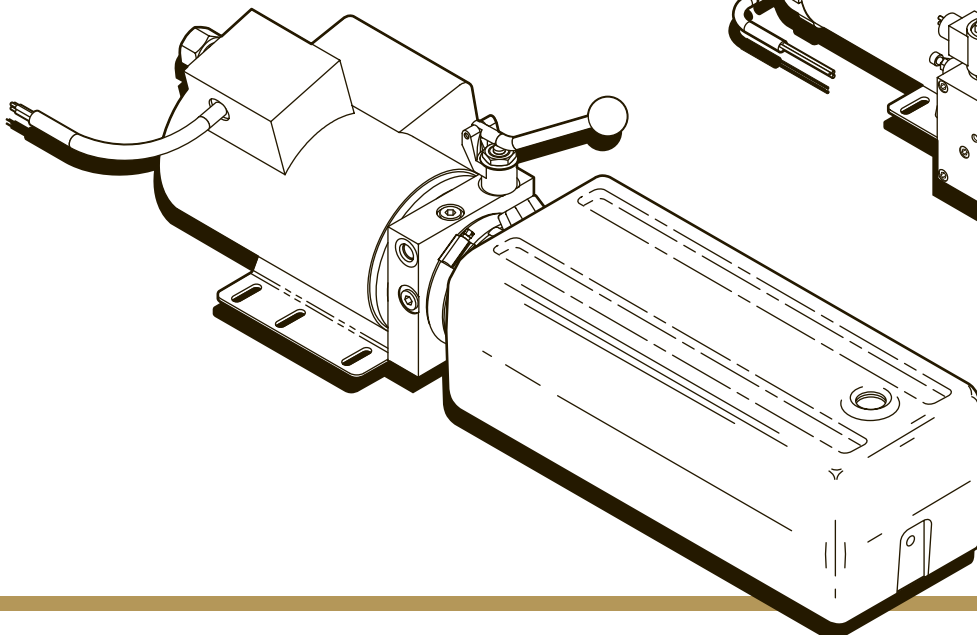
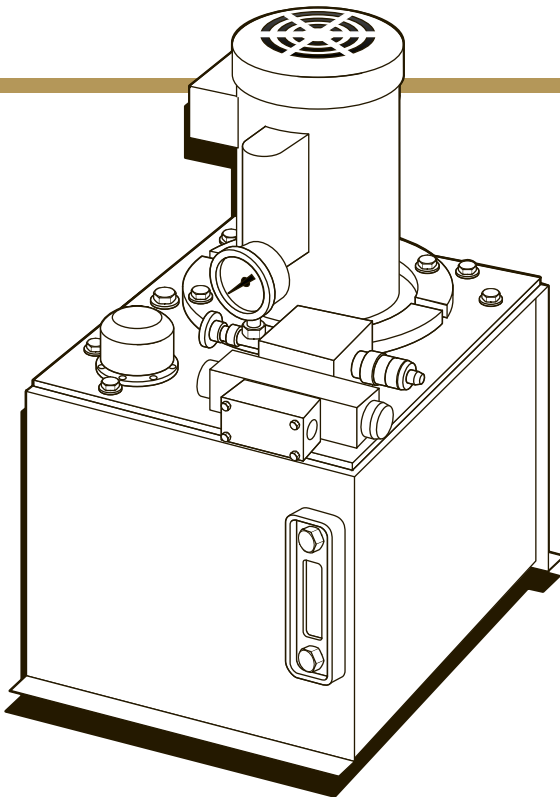


MONARCH
Hydraulics, Inc.

A.C. Hydraulic Power Systems

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



ISO-9001 REGISTERED



Monarch M-Series A.C. Hydraulic Power Systems

Introduction

This catalogue illustrates the technical specifications for Monarch'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 materials handling, transport, construction, defense, access, machine tool, ergonomic, and other labor saving devices.

The Monarch name is synonymous with precise and cost-efficient designs, robust construction and rapid backup service. Under the direction of the Jackoboice family for over 150 years the company continues to strive for your confidence by offering personal, reliable service and "Quality Machinery Since 1856" to customers around the world.

Mission Statement

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

Quality Policy

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

Monarch Value Statements

- Monarch will be honest, moral and ethical.
- Monarch will accept responsibility for its actions.
- Monarch will treat people with equality.
- Monarch will remain a family business.
- Monarch will make a profit.

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.



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Model M-4505	41.0		
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Model M-466 Mini System	45.0		
Model M-457 Mini System	46.0		
Model M-4593-C	47.0		



WARNING

- Always wear eye protection and protective clothing when working on and around hydraulic systems.
- 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, or example pressure, is released. Also, extended equipment or cylinders should be lowered and mechanically locked as required.
- Monarch 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.



Monarch M-Series A.C. Hydraulic Power Systems

Features and Benefits

STANDARD M-400 SERIES FEATURES

- FLEXIBLE COUPLING EXTENDS PUMP LIFE, ELIMINATES MISALIGNMENT
- ACCEPTS STANDARD NEMA 56C THROUGH 184C MOTORS
- 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 MOTORS
- 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

How to Use This Product Guide

- I. 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.
- II. 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 4.0).
- III. Follow the “**How To Order Your M-4XX 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.
- IV. The operating and design characteristics for all of the basic components are listed on pages 5.0-15.0 of this guide.

Select Pump and HP on Page 5.0, 8.0, or 9.0.
Select Motor on Pages 6.0, 8.0 or 9.0.
Select Reservoir on Page 10.0 - 12.0.
Select Valve(s) on Pages 13.0-14.0.
Select Accessories on Page 15.0.

EXAMPLE:
- V. **Order Your Hydraulic Power System As Follows:**

Select Circuit: Pump/Motor/Reservoir. Page 4.0.
Select Model: M-404. Page 4.0.
Performance Required: 1.0 GPM @ 2000 PSI.
Reference Page 5.0.
Select Pump: -270 (51) (1.02 GPM @ 1725 RPM).
Page 5.0
Select Motor: 08747 (1-1/2 HP, 1725 RPM).
Page 6.0.
Select Reservoir: 06073, Page 10.0.
Accessories: None
Model Code: M-404-51-08747-06073
Horizontal Mounting
- VI. 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.
- VII. When selecting **Motor**, choose the HP required or the next highest HP available.
- VIII. 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.
- IX. All system wiring should be completed by a certified electrician according to local codes.



WARNING

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- Fluid under pressure can pierce the skin and enter the bloodstream causing death or serious injury.
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- Prior to performing any maintenance make sure the equipment is turned off and that any stored energy, or example pressure, is released. Also, extended equipment or cylinders should be lowered and mechanically locked as required.
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- Fluids should be contained and disposed of properly.



M-400 Series Power System Selection Guide

CIRCUIT	DESCRIPTION	MODEL	PAGE
	PUMP + MOTOR	M-455 MINI M-426	22.0 23.0
	PUMP + MOTOR + RESERVOIR	M-454 MINI M-404	24.0 25.0
	OPERATES SINGLE ACTING CYLINDER		
	PUMP + MOTOR + RESERVOIR + MANUAL VALVE	M-413 M-4509 M-4509-C M-401 M-415	26.0 27.0 28.0 29.0 30.0
	PUMP + MOTOR + RESERVOIR + SOLENOID VALVE	M-459 MINI M-458 MINI M-419 M-4519-C M-403	31.0 32.0 33.0 34.0 35.0
	OPERATES DOUBLE ACTING CYLINDER		
	PUMP + MOTOR + RESERVOIR + MANUAL VALVE	M-410	36.0
	PUMP + MOTOR + RESERVOIR + SOLENOID VALVE	M-4551-C M-452 MINI M-453 MINI M-4506 M-4505	37.0 38.0 39.0 40.0 41.0
	OPERATES 2 DOUBLE ACTING CYLINDERS		
	PUMP + MOTOR + RESERVOIR + SOLENOID VALVES	M-428 M-428-P M-4528	42.0 43.0 44.0
	INDEPENDENT OPERATION OF 2 SINGLE ACTING CYLINDERS OR MASTER/SLAVE		
	PUMP + MOTOR + RESERVOIR + SOLENOID VALVES	M-466 MINI M-457 MINI	45.0 46.0
	OPERATES 1 DOUBLE ACTING AND 1 SINGLE ACTING CYLINDER		
	PUMP + MOTOR + RESERVOIR + SOLENOID VALVES	M-4593-C	47.0

Many other circuits are available. Please contact Monarch direct so we can design a special circuit for your requirements.

M-400 Series Pump/Motor Performance Data

PUMP CODE	DISPLACEMENT		RPM	GPM	INPUT HP REQUIRED AT PRESSURE (PSI)					
	In ³ /Rev (Cm ³ /Rev)				500	1000	1500	2000	2500	3000
12637-150 (72) *	.032		1725	0.24	0.20	0.30	0.35	0.50	0.55	0.75
	(.524)		3450	0.48	0.40	0.60	0.70	1.00	1.10	1.50
12637-270 (62) *	.057		1725	0.42	0.20	0.35	0.45	0.60	0.70	0.90
	(.934)		3450	0.85	0.40	0.70	0.90	1.20	1.40	1.80
12172-150 (42)	.077		1725	0.58	0.25	0.45	0.60	0.80	1.00	1.15
	(1.26)		3450	1.15	0.50	0.90	1.20	1.60	2.00	2.30
12172-200 (43)	.099		1725	0.74	0.35	0.55	0.80	1.05	1.30	1.50
	(1.66)		3450	1.48	0.70	1.10	1.60	2.10	2.60	3.00
12172-250 (03)	0.125		1725	0.93	0.45	0.75	1.10	1.40	1.70	2.15
	(2.13)		3450	1.87	0.90	1.50	2.20	2.80	3.40	3.95
12172-270 (51)	0.137		1725	1.02	0.50	0.80	1.15	1.50	2.00	2.25
	(2.31)		3450	2.05	1.00	1.60	2.30	3.00	3.60	
12172-330 (55)	.168		1800	1.31		1.04	1.49	1.94	2.39	2.84
	(2.76)		3600	1.31		2.09	2.99	3.89	4.79	5.69
12172-380 (05)	0.193		1725	1.44	0.60	1.10	1.50	2.00	2.50	3.00
	(3.23)		3450	2.88	1.20	2.20	3.00	3.90		
12172-510 (07)	0.251		1725	1.85	1.00	1.65	2.50	3.00	3.75	
	(4.11)		3450	3.70	2.00	3.30				

Bold = 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

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

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
- Bearing on Drive Shaft Minimizes Axial Thrust Effects
- 100% Tested for Volumetric Efficiency and Pressure
- Over Two Million Power Units Sold



Monarch M-Series A.C. Hydraulic Power Systems

M-400 Series Motor Information

MONARCH 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-400 units include:

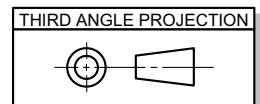
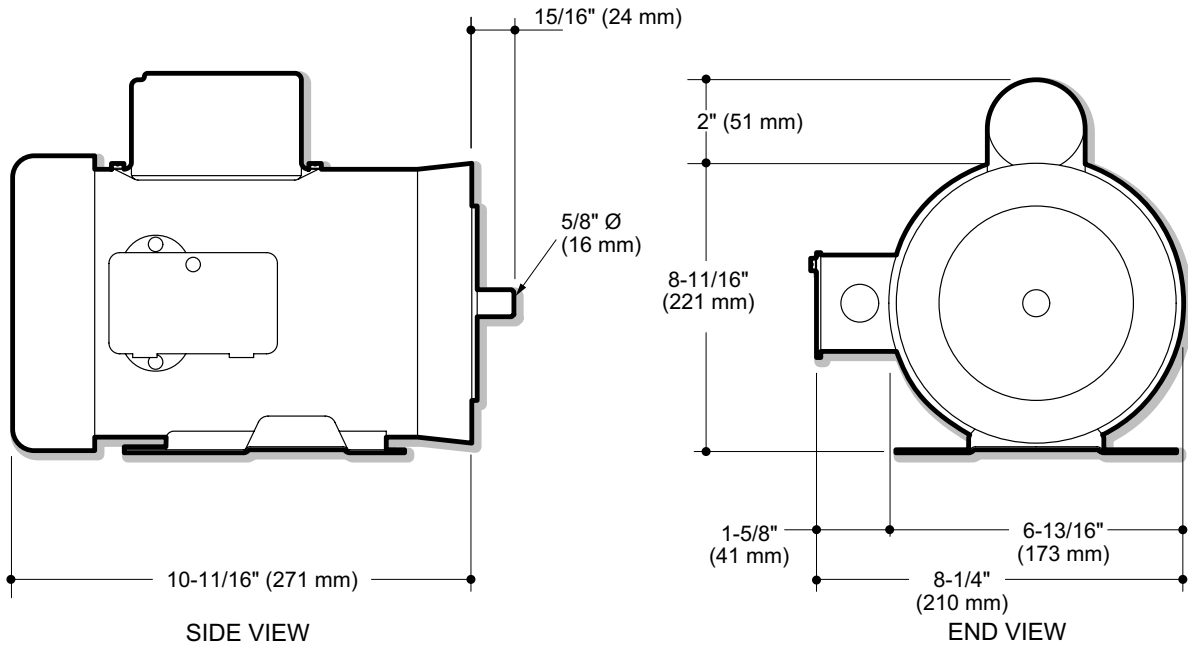
- Explosion Proof
- Dual Frequency (50/60 Hz)
- Intermittent Duty - Custom Designed
- Washdown Duty
- 575V AC
- Open Drip Proof
- Totally Enclosed Non-Ventilated
- Custom Designed Motors for Special Applications

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

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.





Monarch M-Series A.C. Hydraulic Power Systems

II. Close Coupled Motors For M-400 Units

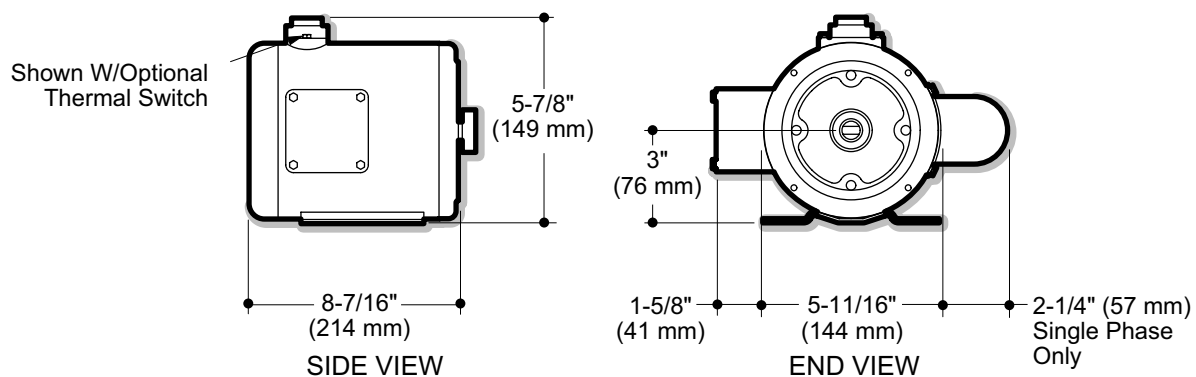
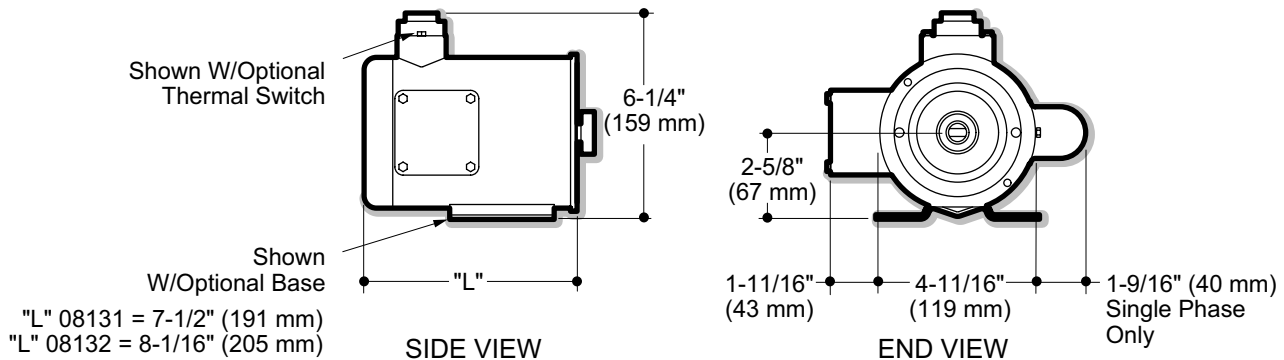
The following direct drive (partial) motors are supplied with an adapter for mounting the pump base directly to the motor. The 01605 and/or 01615 extended pump/motor adapter and flexible coupling is not required. The

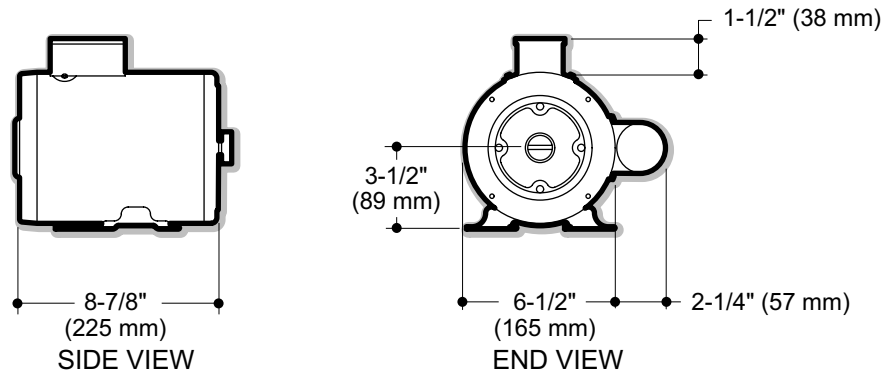
close coupled motors may be used on Models: M-401, M-404, M-410, M-415, M-419, M-426, M-428 and M-428-P.

MONARCH 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
08155	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
08158	2.8	5 MINUTE	3450	208/230	1	56	TENV
08173-B	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



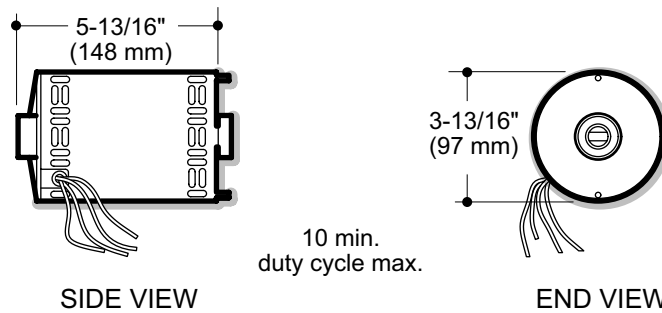


56 FRAME MOTOR AND ADAPTER

III. Close Coupled Motors for Monarch M-450 Mini Units

The 08149 110 V AC, PSC 1 Phase, 60 Hz Motor is standard on all Mini Units. The motor includes a thermal overload with automatic reset. A capacitor is required.

The 03862 60 μ F 330V AC Capacitor is available as optional equipment. Note: Other Voltages, Enclosures, and Capacitors are available.



MINI AC MOTOR

PUMP CODE	DISPLACEMENT			Maximum Run Time in Minutes at Maximum Pressure (PSI) with 03862 Capacitor					
	In ³ /Rev (Cm ³ /Rev)	RPM	GPM	500	1000	1500	2000	2500	3000
12637-100 (70)	.021 (.34)	1800	.16	7.6	7.7	8.0	8.4	8.9	9.5
12637-120 (71)	.025 (.41)	1800	.20	7.6	7.8	8.2	8.8	9.5	9.5
12637-150 (72)	.032 (.524)	1800	.25	7.7	7.8	8.6	9.5	9.5	9.5
12637-270 (62)	.057 (.934)	1800	.44	7.7	8.7	9.5	9.5		
12172-150 (42)	.077 (1.26)	1800	.60	9.1	9.5				

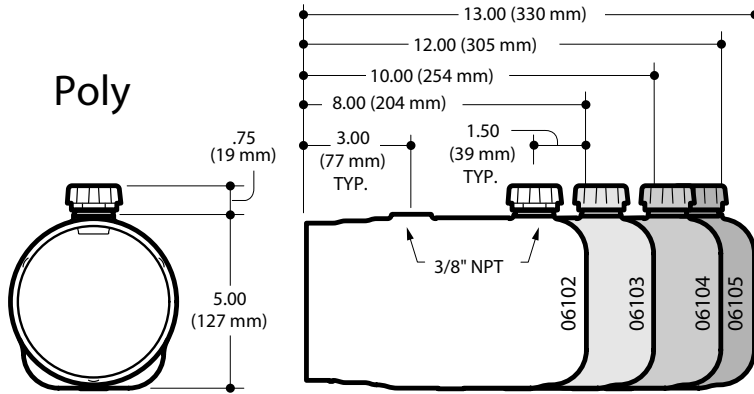
Longer run time available with decrease in pressure. Contact Factory.



Reservoirs for M-400 Units

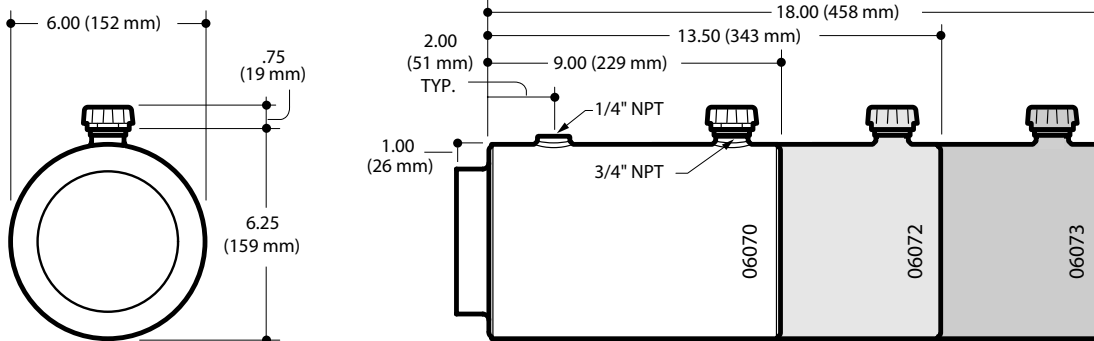
Horizontal Mounting			
Part No.	Length	Useable Capacity	
		In ³	Liter
06102	8.00	79	1.3
06103	10.00	106	1.75
06104	12.00	134	2.20
06105	13.00	148	2.40

Vertical Mounting			
Part No.	Length	Useable Capacity	
		In ³	Liter
04616	8.00	55	.90
04617	10.00	90	1.50
04618	12.00	125	2.05
04619	13.00	140	2.30



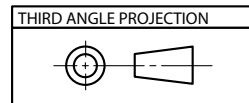
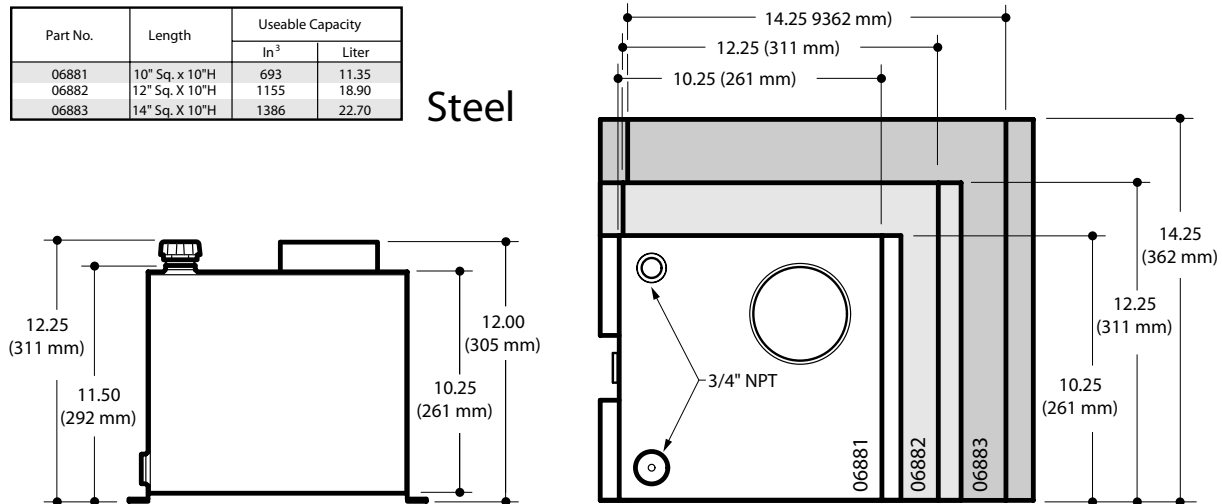
Part No.	Length	Useable Capacity			
		Horizontal		Vertical	
		In ³	Liter	In ³	Liter
06070	9.00	190	3.10	168	2.75
06072	13.50	292	4.80	285	4.70
06073	18.00	394	6.45	405	6.65

Steel



Part No.	Length	Useable Capacity	
		In ³	Liter
06881	10" Sq. x 10"H	693	11.35
06882	12" Sq. X 10"H	1155	18.90
06883	14" Sq. X 10"H	1386	22.70

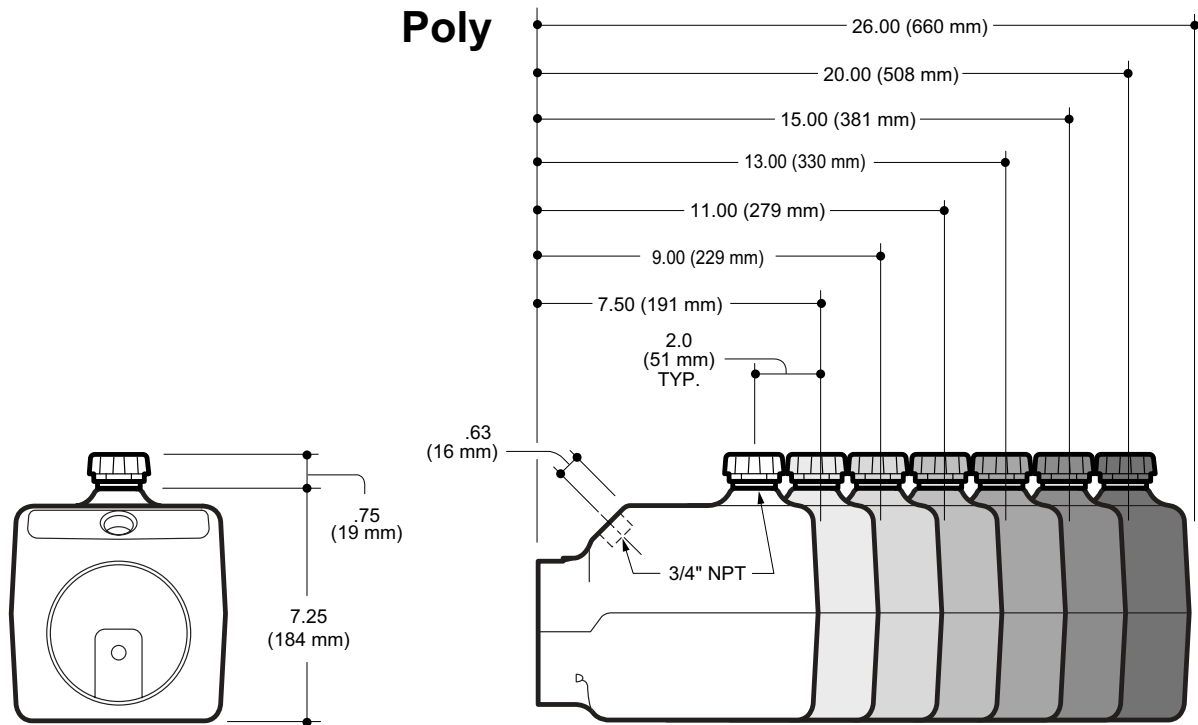
Steel



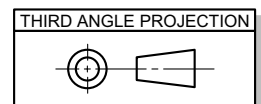
For reservoirs not found in this catalog, please contact factory.

M-Series Reservoirs

Part No.	Length In(mm)	Useable Capacity in Cubic Inches					
		Vertical Mounting			Horizontal Mounting		
		Oil Level Above Suction Screen			Oil Level Above Suction Screen		
		1/2" Not Recommended	1"	Using Shroud	1/2" Not Recommended	1"	Using Shroud
14164	7.5 (191 mm)	106	85	127	163	139	187
14165	9.00 (229 mm)	168	148	190	202	173	241
14166	11.00 (279 mm)	254	232	274	253	217	288
14167	13.00 (330 mm)	338	316	358	306	264	348
14168	15.00 (381 mm)	423	402	444	357	309	406
14169	20.00 (508 mm)	634	612	676	488	423	553
14170	26.00 (660 mm)	887	872	914	643	559	728



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



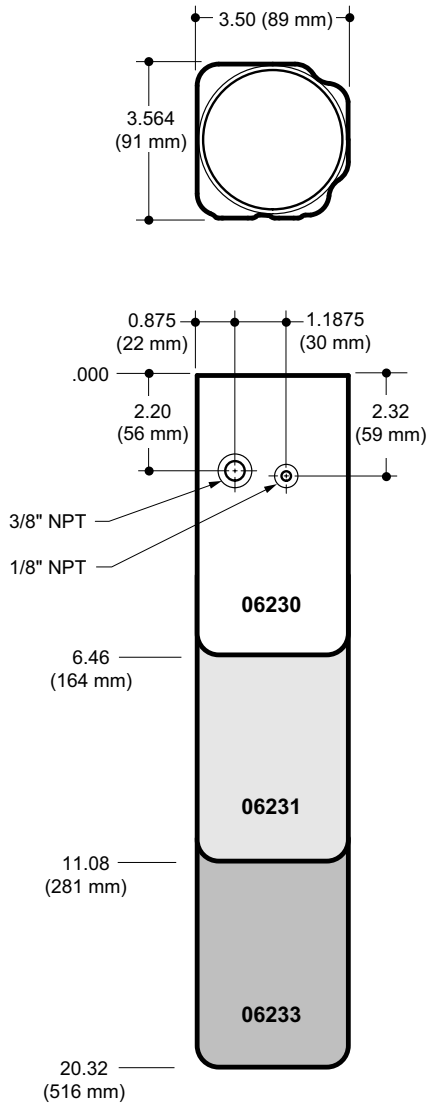


Monarch M-Series A.C. Hydraulic Power Systems

Reservoirs for Mini Units

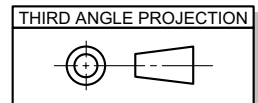
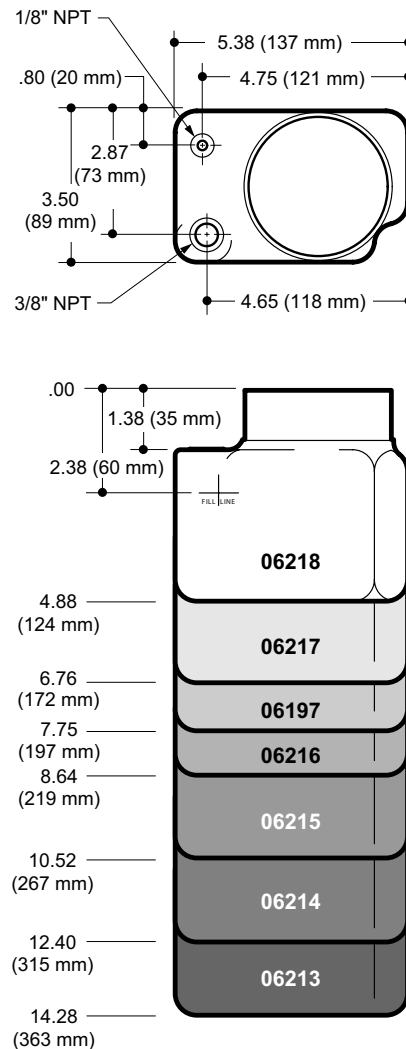
Part No.	Length	Useable Capacity			
		Horizontal		Vertical	
		In ³	Liter	In ³	Liter
06230	6.46	31	.50	27	.45
06231	11.08	61	1.00	73	1.21
06233	20.32	122	2.00	168	2.72

Poly



Part No.	Length	Useable Capacity			
		Horizontal		Vertical	
		In ³	Liter	In ³	Liter
06218	4.88	31	.50	39	.64
06217	6.76	61	1.00	63	1.03
06197	7.75	77	1.26	76	1.24
06216	8.64	92	1.50	87	1.43
06215	10.52	122	2.00	111	1.82
06214	12.40	152	2.50	135	2.21
06213	14.28	183	3.00	159	2.61

Poly



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

Valves for M-400 Series Units

I. 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 Monarch Directional Control Valve brochure for additional information and selection.

PART NUMBER	SCHEMATIC	DESCRIPTION
00970		4-Way/3-Position. Solenoid Operated. Tandem Center. 110V AC.
00967		4-Way/3-Position. Solenoid Operated. Open Center. 110V AC.
00968		4-Way/3-Position. Solenoid Operated. Closed Center. 110V AC.
00969		4-Way/3-Position, P Blocked. A and B to T. "Motor Spool". 110V AC.
01041		4-Way/2-Position. P to A. Spring Offset. 110V AC.
00692		4-Way/2-Position. Dual Detent. 110V 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

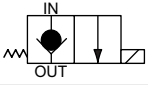
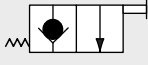
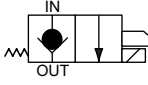
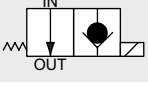
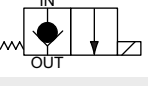

symbols related to solenoid identity "A" or "B" according to NFPA/ANSI standards, i.e., energizing solenoid "A" gives flow P to A, solenoid "B" gives flow P to B (As Applicable).



Monarch M-Series A.C. Hydraulic Power Systems

II. Cartridge Valves

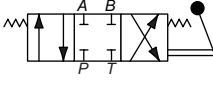
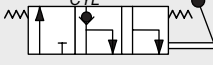
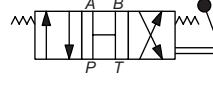
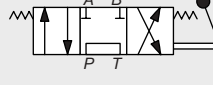
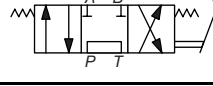
Solenoid operated cartridge valves are used in the M-403, M-419, and M-452 units.

PART NUMBER	SCHEMATIC	DESCRIPTION
00986		2-Way/2-Position Normally Closed. Modified Cavity #8. 110V AC. Conduit Connector.
07144		2-Way/2-Position Normally Closed. Modified Cavity #8. Manual Operation. Pull to Open. Spring Close.
00708		2-Way/2-Position Normally Closed. Modified. Cavity #8. Manual Override. 110V AC. Conduit Connector.
00987		2-Way/2-Position Normally Open. Modified Cavity #8. 110V AC. Conduit Connector.
00585		2-Way/2-Position Normally Closed. Modified Cavity #8. 220V AC. DIN 43650 Connection.
07145		4-Way/2-Position. Common Cavity #8. 110V AC. Conduit Connector.

Consult Factory or your Monarch Distributor about additional valve options.

III. Manual Valves

Manually Operated Directional Control Valves are used on Models M-401 and M-410.

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. NFPA DO3.

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

Please consult factory for additional accessories.



Monarch M-Series A.C. Hydraulic Power Systems

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.

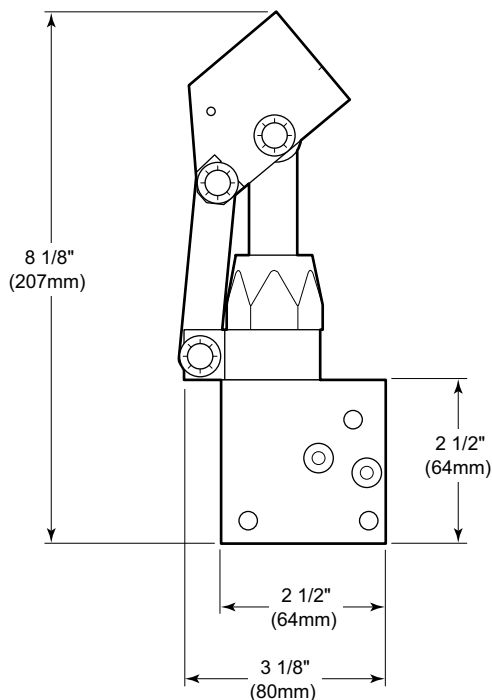
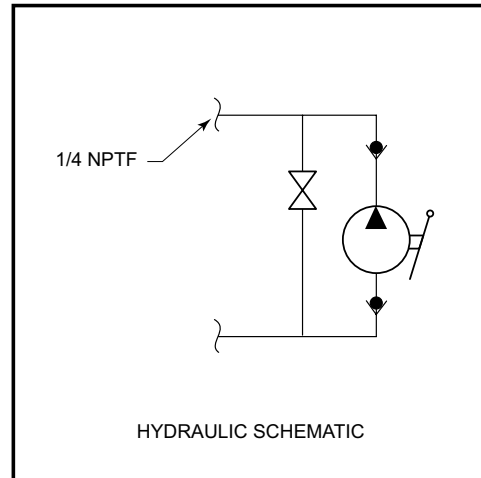
STANDARD HAND PUMPS

Description:

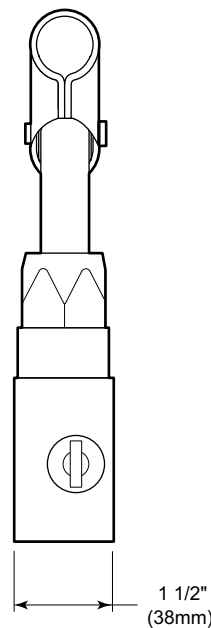
- 0.50 In³/Stroke (8.20 Cm³/Stroke)
- Single Acting
- 2000 PSI (138 Bar)
- Outlet Port: 1/4" NPTF
- Ideal For Emergency Back-Up Application in Case of Primary Pump Failure
- Horizontal or Vertical Mounting
- Designed for Mounting Directly to Monarch Power Units
- Handle May Positioned in any Direction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

Options:

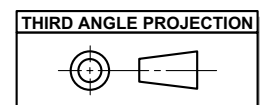
- Remote Mounting
- Ports. Other Styles Available
- Relief Valve
- Integral Reservoir



SIDE VIEW



END VIEW



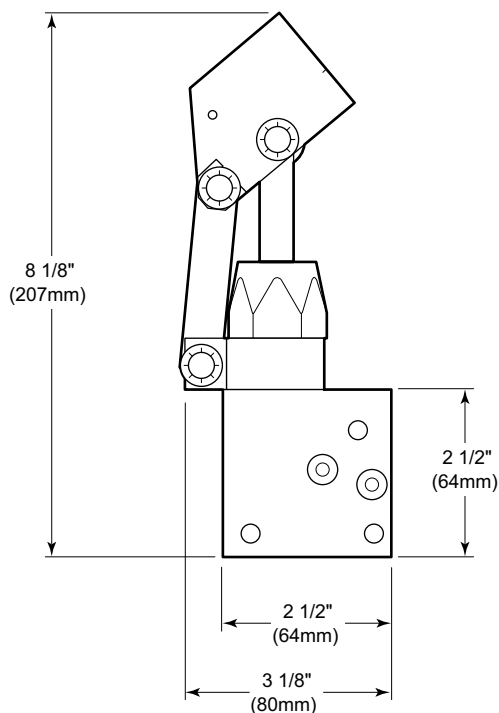
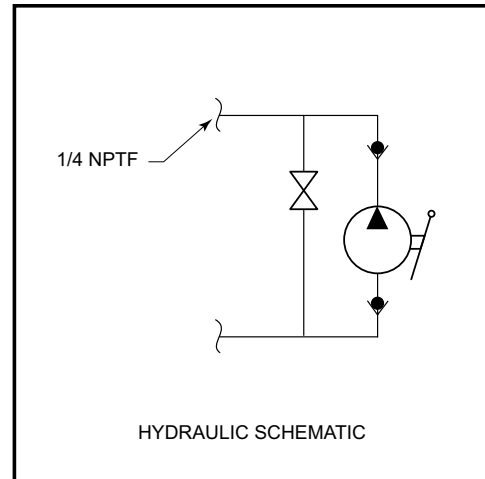
HIGH PRESSURE - LOW DISPLACEMENT HAND PUMP

Description:

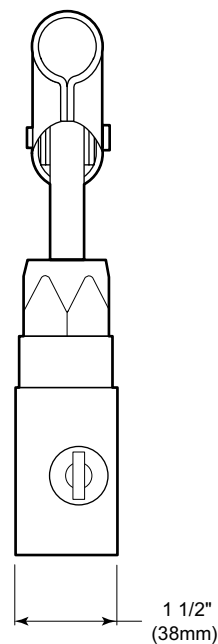
- 0.25 In³/Stroke (4.10 Cm³/Stroke)
- Single Acting
- 3500 PSI (240 Bar)
- Outlet Port: 1/4" NPTF
- Ideal For Emergency Back-Up Application in Case of Primary Pump Failure
- Horizontal or Vertical Mounting
- Designed for Mounting Directly to Monarch Power Units
- Handle May Positioned in any Direction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

Options:

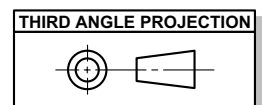
- Remote Mounting
- Ports. Other Styles Available
- Relief Valve



SIDE VIEW



END VIEW





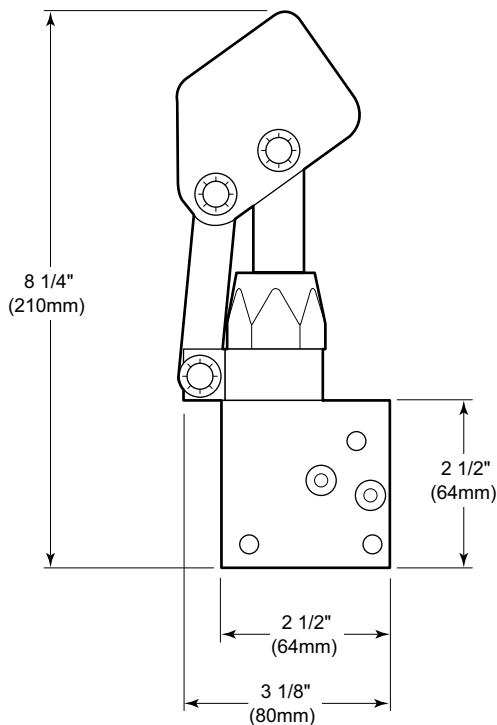
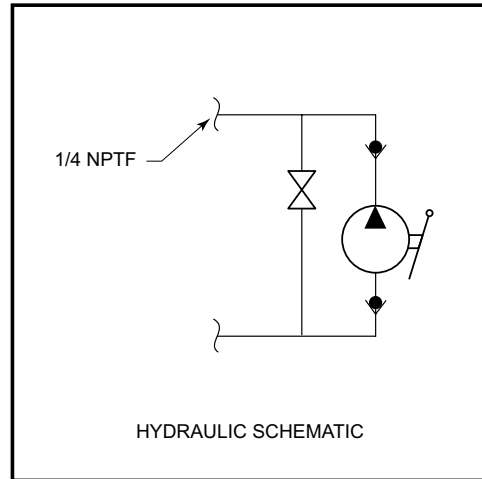
HIGH PRESSURE - HEAVY DUTY HAND PUMP

Description:

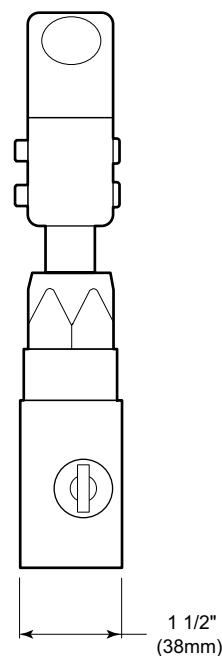
- 0.50 In³/Stroke (8.20 Cm³/Stroke)
- Single Acting
- 4000 PSI (275 Bar)
- Outlet Port: 1/4" NPTF
- Heavy Duty Plated Steel Tension Link and Extruded Aluminum Top and Bottom Brackets
- Ideal For Emergency Back-Up Application in Case of Primary Pump Failure
- Horizontal or Vertical Mounting
- Designed 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

Options:

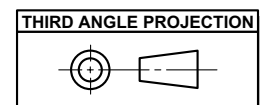
- Remote Mounting
- 1/4" NPTF Ports. Other Styles Available
- Relief Valve



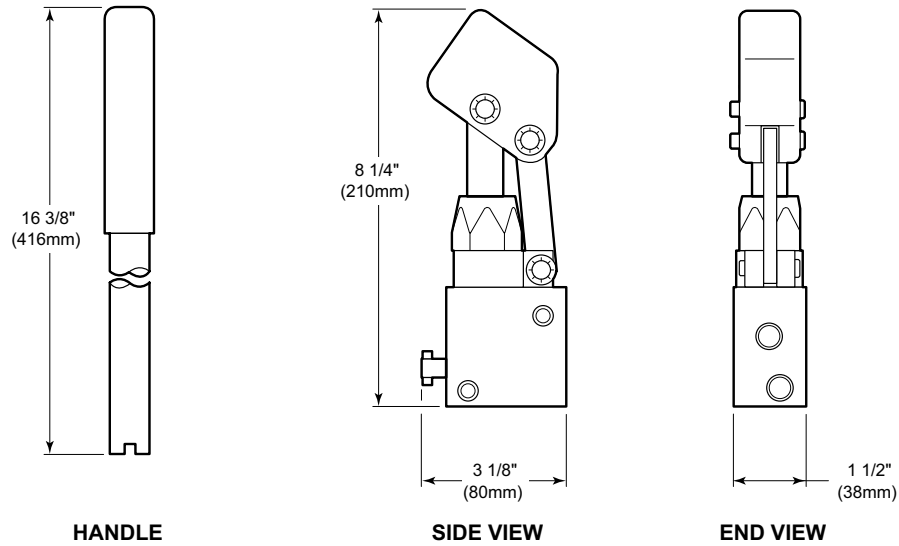
SIDE VIEW



END VIEW

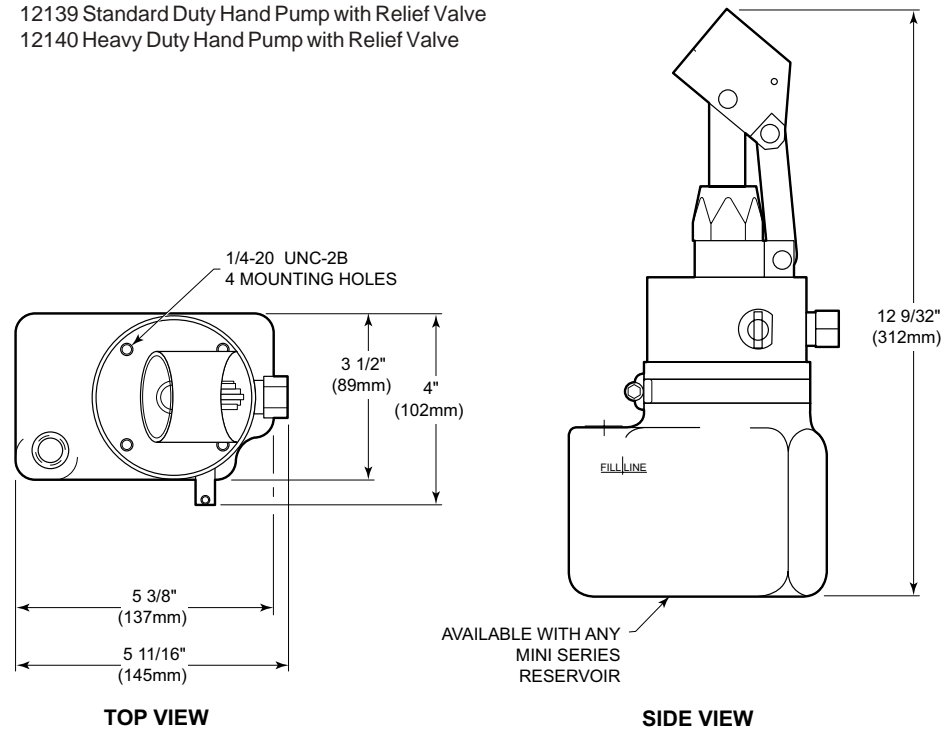


HEAVY DUTY REMOTE HAND PUMP



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





Monarch M-Series A.C. Hydraulic Power Systems

NOTES:

Monarch A.C. Hydraulic Power Systems

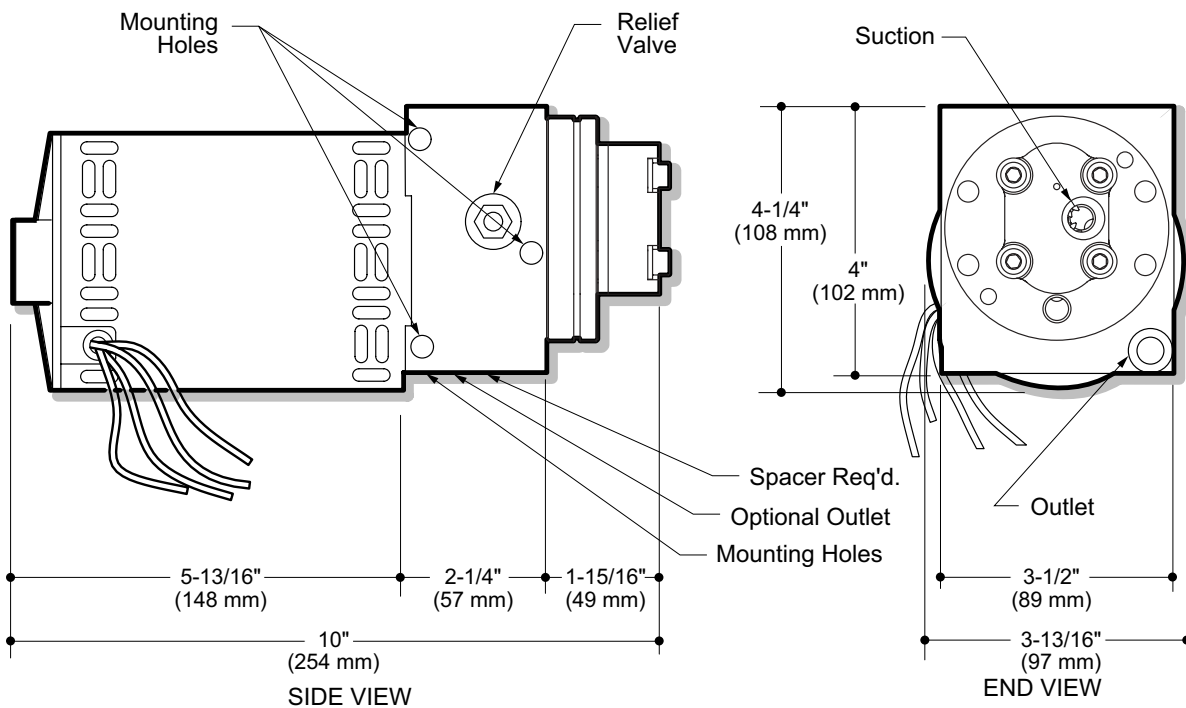
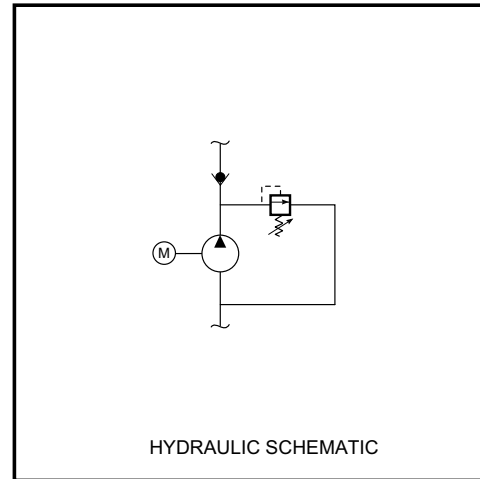


Monarch M-Series A.C. Hydraulic Power Systems

MODEL M-455 Mini System

Description:

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



How to Order Your M-455 Mini System

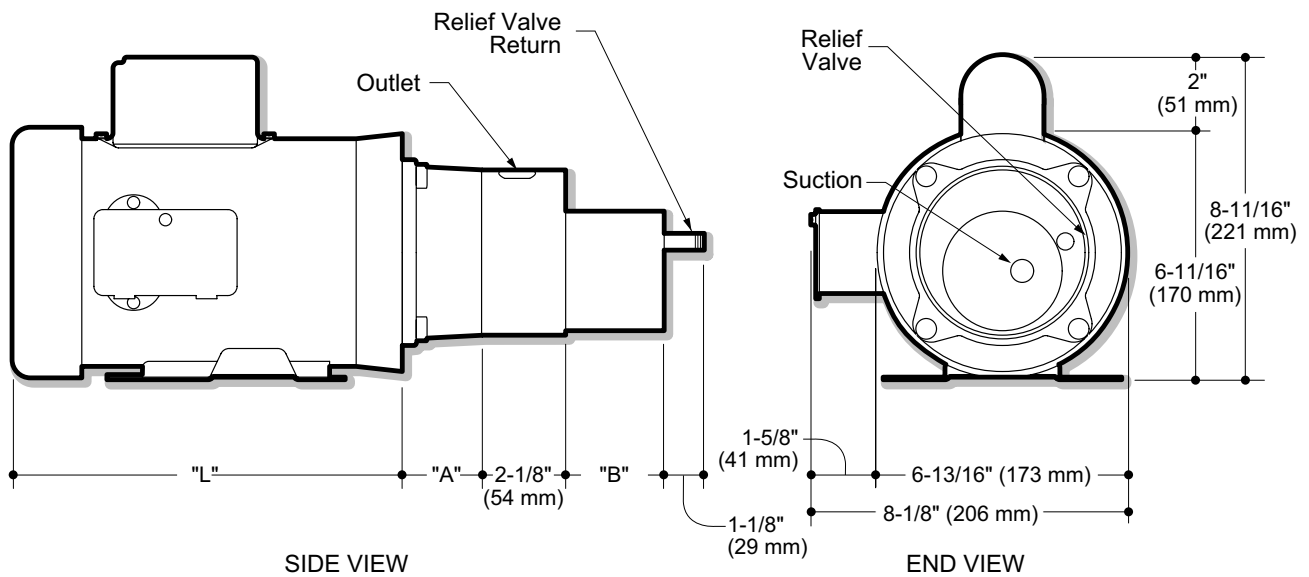
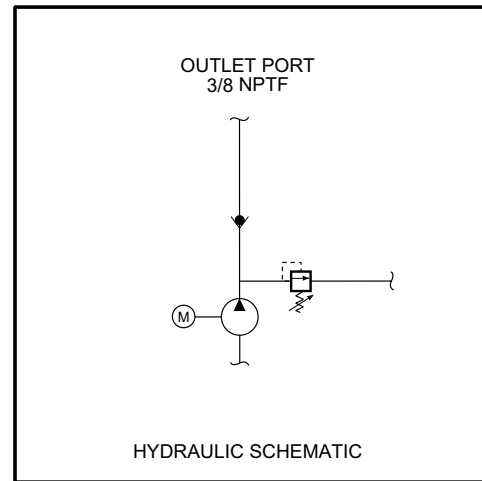
Comprehensive information may be found on the page referenced below each selection category.

PUMP	MOTOR	CAPACITOR	MOUNTING POSITION	OPTIONAL ACCESSORIES
Ref. Page 9.0	Ref. Page 9.0	Ref. Page 9.0		Ref. Page 15.0

MODEL 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



"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-426 Power System

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

PUMP	MOTOR	ADAPTER	CLOSE COUPLED	MOUNTING POSITION	OPTIONAL ACCESSORIES
Ref. Page 5.0	Ref. Page 6.0	Ref. Page 7.0	Ref. Page 8.0		Ref. Page 15.0

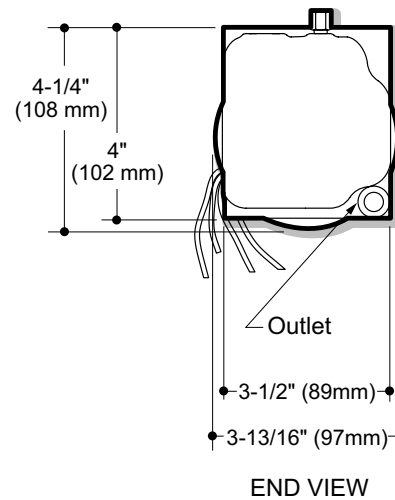
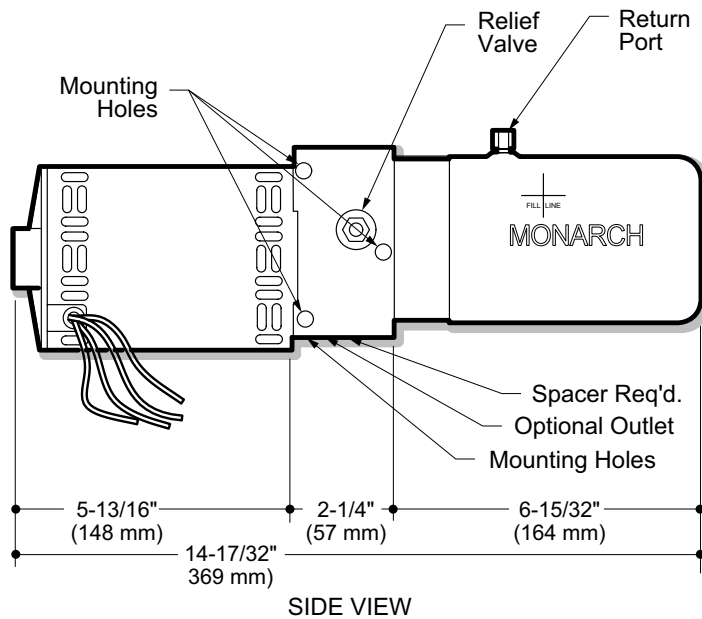
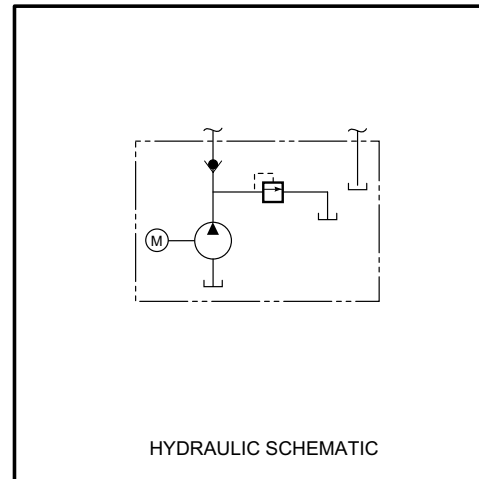


Monarch M-Series A.C. Hydraulic Power Systems

MODEL M-454 Mini System

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) Optional



How to Order Your M-454 Mini System

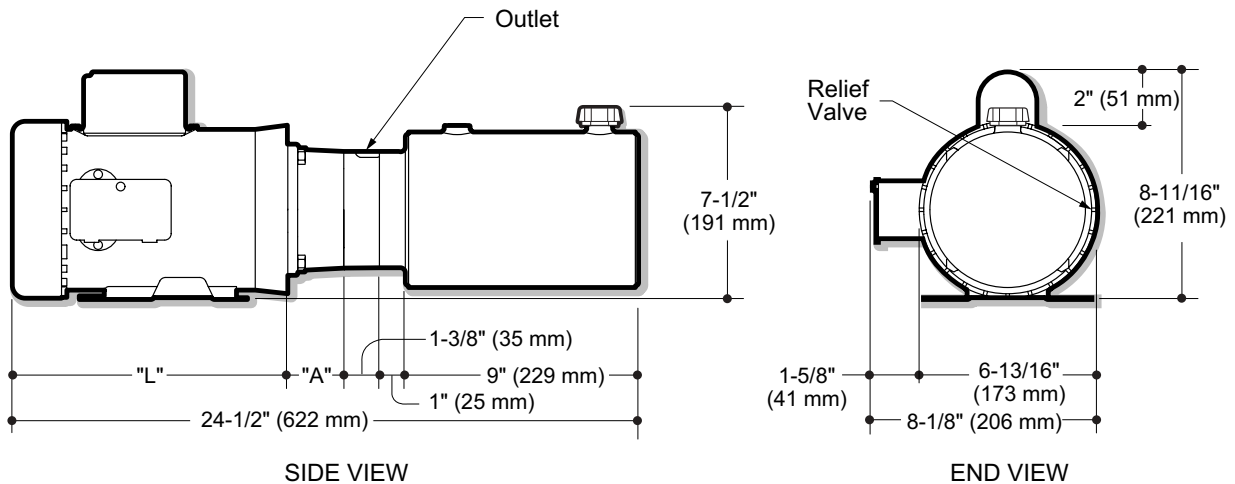
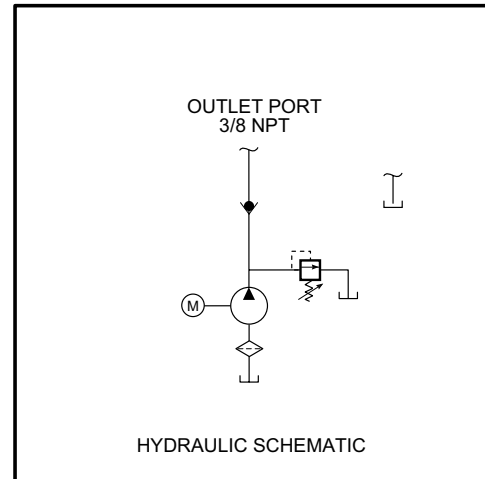
Comprehensive information may be found on the page referenced below each selection category.

PUMP	MOTOR	CAPACITOR	RESERVOIR	MOUNTING POSITION	OPTIONAL ACCESSORIES
Ref. Page 9.0	Ref. Page 9.0	Ref. Page 9.0	Ref. Page 11.0		Ref. Page 15.0

MODEL 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) Optional



"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-404 Power System

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

PUMP	MOTOR	ADAPTER	CLOSE COUPLED	RESERVOIR (LENGTH)	MOUNTING POSITION	OPTIONAL ACCESSORIES
Ref. Page 5.0	Ref. Page 6.0	Ref. Page 7.0	Ref. Page 8.0	Ref. Page 10.0		Ref. Page 15.0

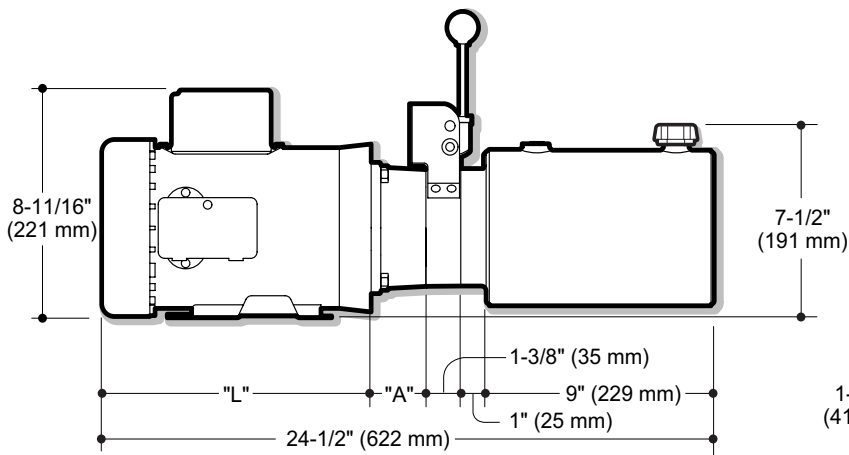
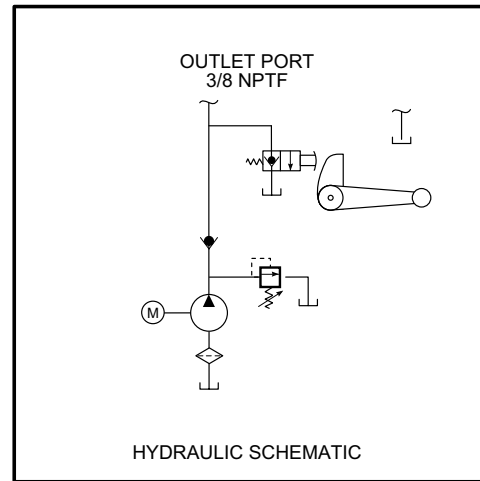


Monarch M-Series A.C. Hydraulic Power Systems

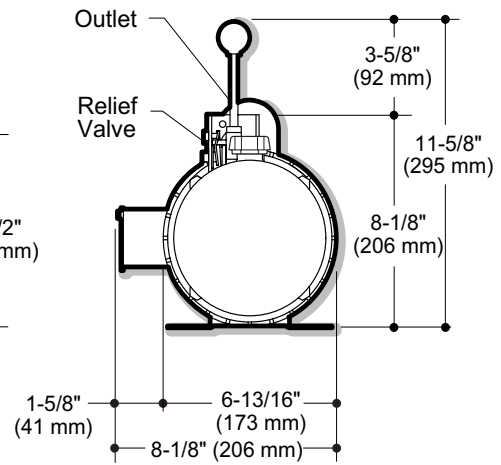
MODEL M-413

Description:

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



SIDE VIEW



END VIEW

"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-413 Power System

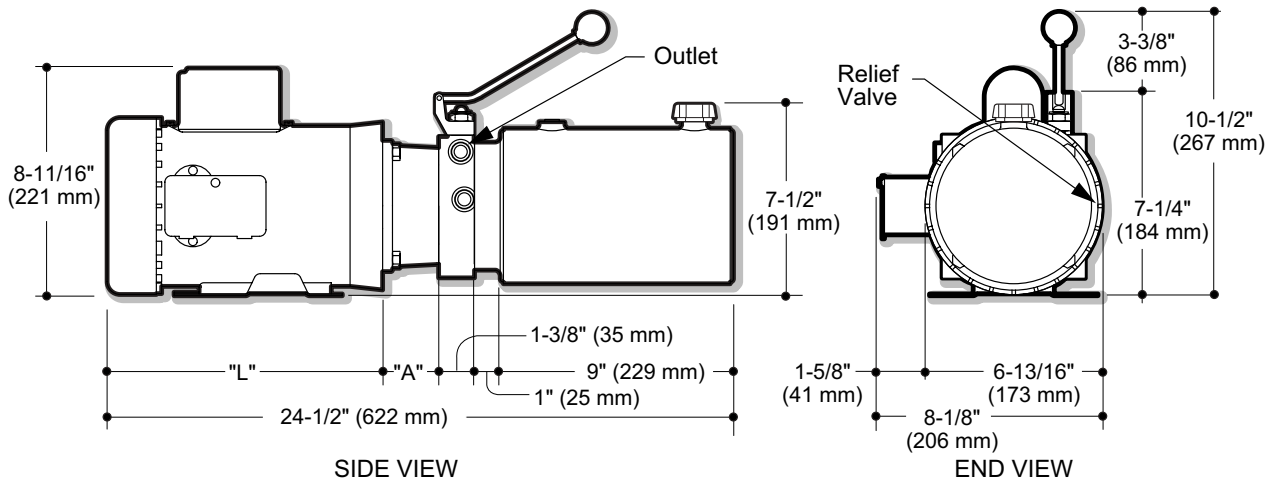
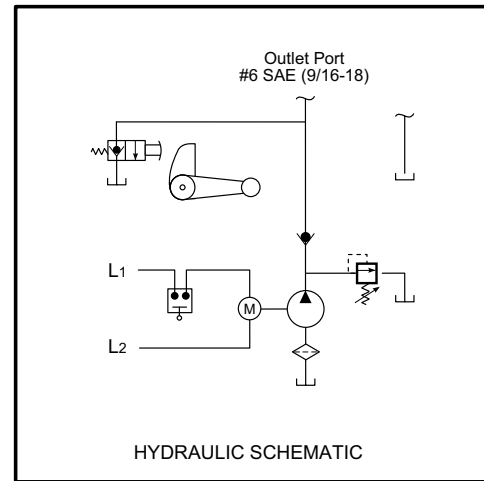
Comprehensive information may be found on the page referenced below each selection category.

PUMP	MOTOR	ADAPTER	RESERVOIR (LENGTH)	MOUNTING POSITION	OPTIONAL ACCESSORIES
Ref. Page 5.0	Ref. Page 6.0	Ref. Page 7.0	Ref. Page 10.0		Ref. Page 15.0

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)

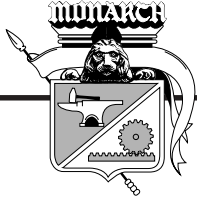


"L" dimension shown for 08751 motor is 10-11/16" (271 mm)
 "A" dimension for standard 01605 adapter is 2-5/32" (55 mm)
 "A" dimension for optional 01615 adapter is 3-11/32" (85 mm)
 Dimensions will vary according to motor output and manufacturer

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	VALVES	OPTIONAL ACCESSORIES
Ref. Page 5.0	Ref. Page 6.0	Ref. Page 7.0	Ref. Page 10.0		Ref. Page 13.0	Ref. Page 15.0



Monarch M-Series A.C. Hydraulic Power Systems

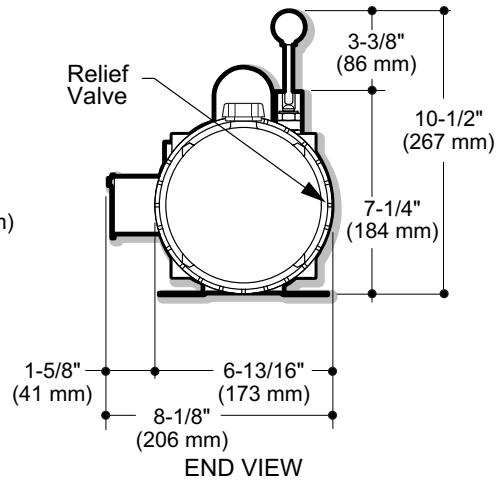
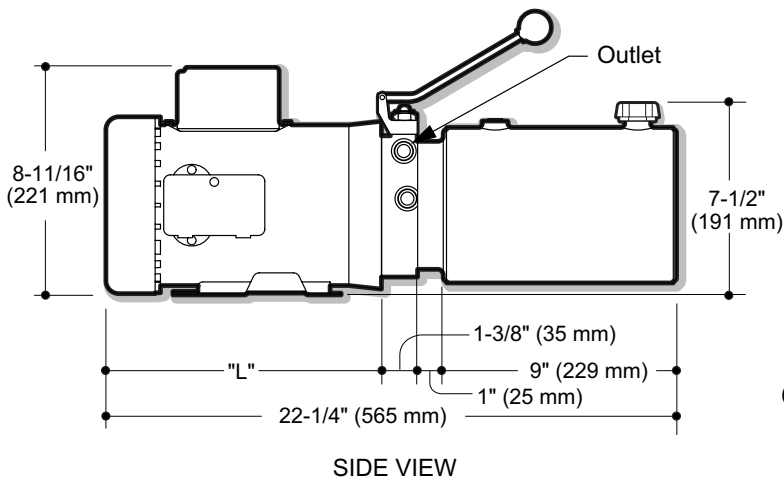
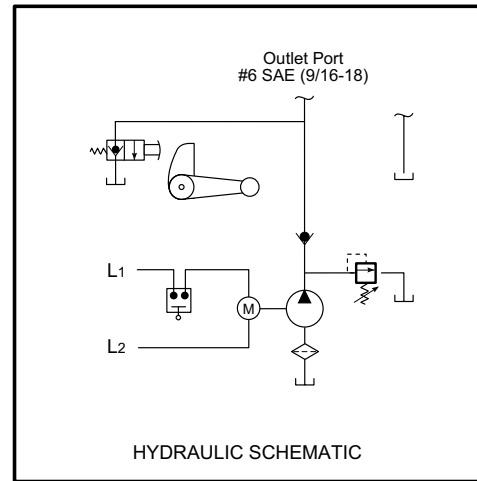
MODEL M-4509-C

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 Options:

- Horizontal Mounting



"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

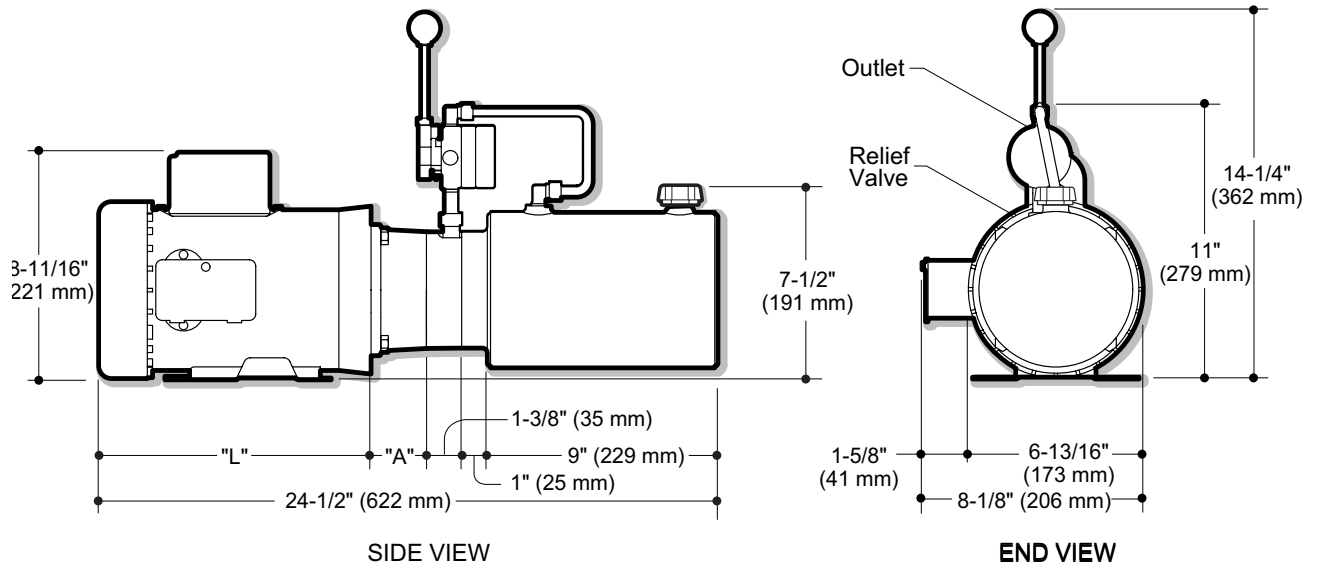
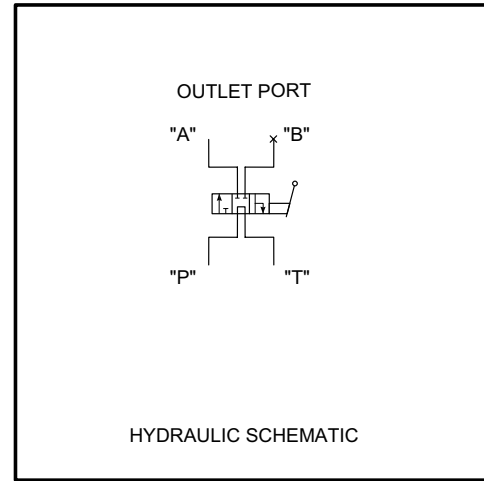
Comprehensive information may be found on the page referenced below each selection category.

PUMP	MOTOR	ADAPTER	CLOSE COUPLED	RESERVOIR (LENGTH)	MOUNTING POSITION	OPTIONAL ACCESSORIES
Ref. Page 5.0	Ref. Page 6.0	Ref. Page 7.0	Ref. Page 8.0	Ref. Page 10.0		Ref. Page 15.0

MODEL M-401

Description:

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



"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-401 Power System

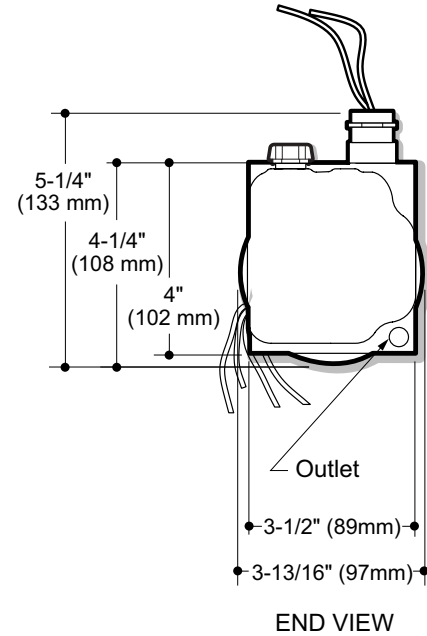
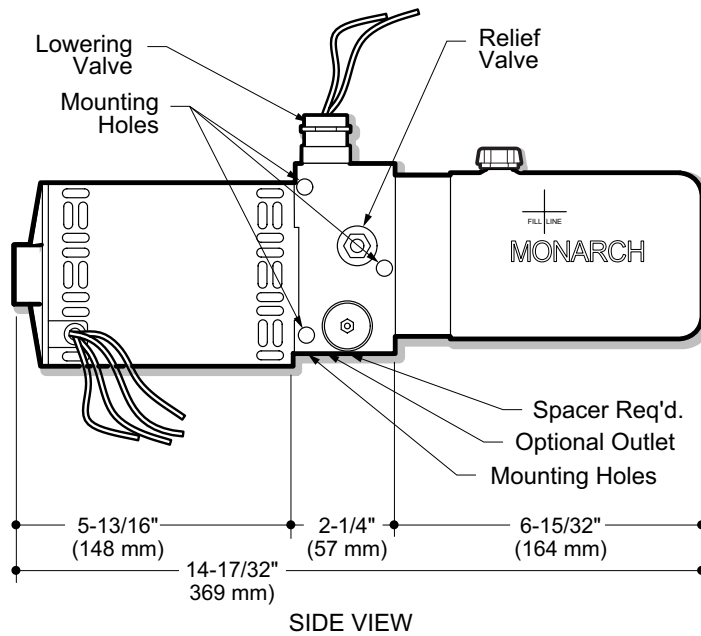
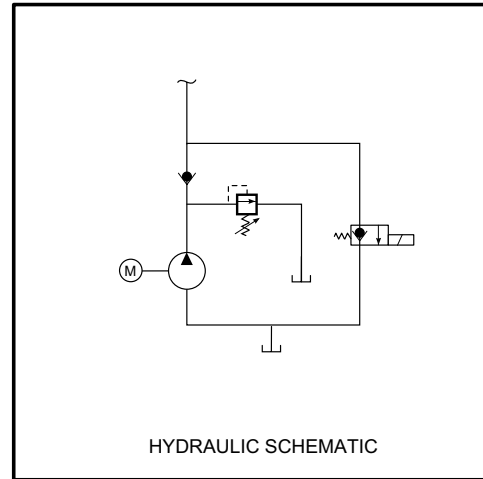
Comprehensive information may be found on the page referenced below each selection category.

PUMP	MOTOR	ADAPTER	CLOSE COUPLED	RESERVOIR (LENGTH)	MOUNTING POSITION	OPTIONAL ACCESSORIES
Ref. Page 5.0	Ref. Page 6.0	Ref. Page 7.0	Ref. Page 8.0	Ref. Page 10.0		Ref. Page 15.0

MODEL M-459 Mini System

Description:

- Pump/Motor/Valve/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



How to Order Your M-459 Mini System

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

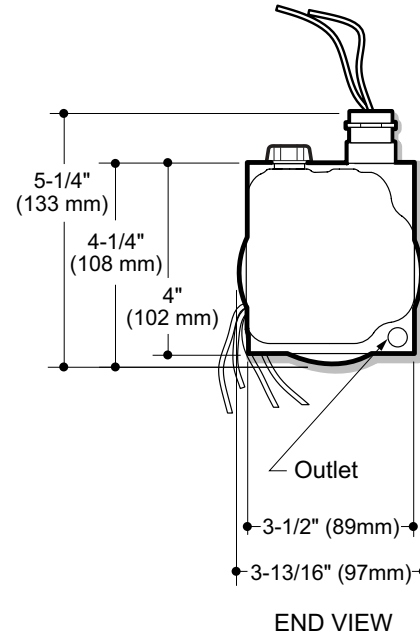
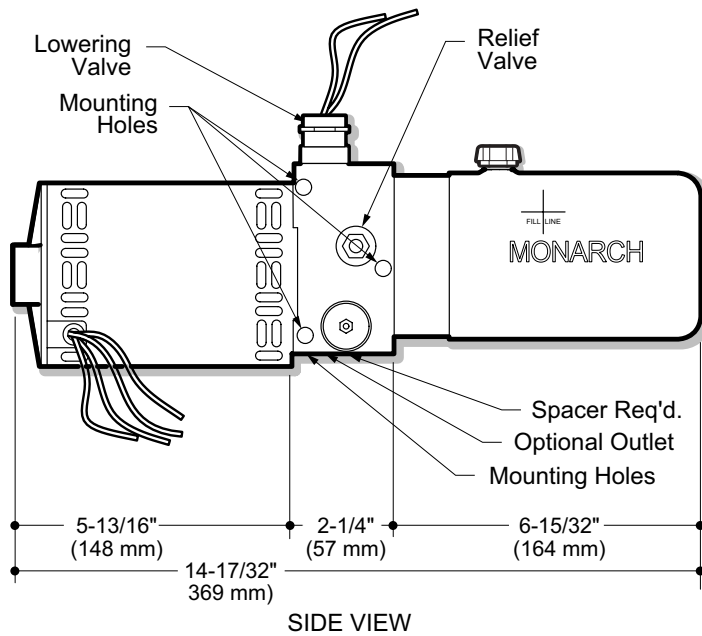
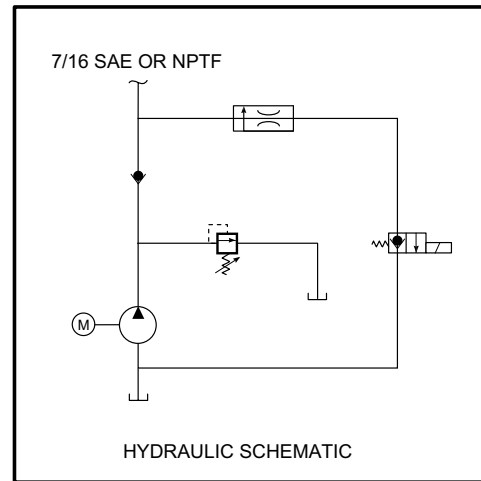
PUMP	MOTOR	CAPACITOR	RESERVOIR	MOUNTING POSITION	OPTIONAL ACCESSORIES
Ref. Page 9.0	Ref. Page 9.0	Ref. Page 9.0	Ref. Page 11.0		Ref. Page 15.0



MODEL M-458 Mini System

Description:

- Pump/Motor/Valve/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



How to Order Your M-458 Mini System

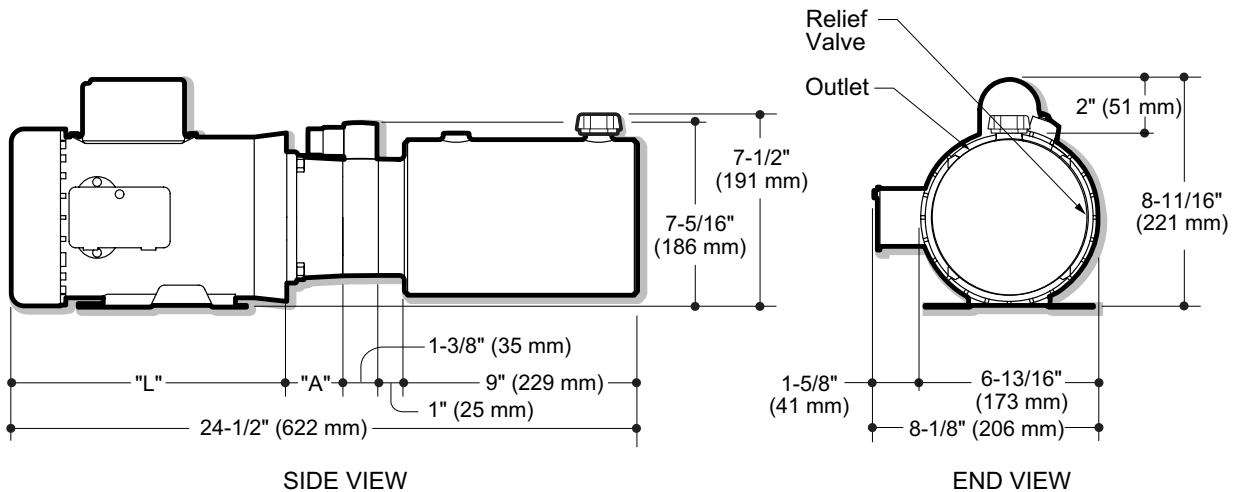
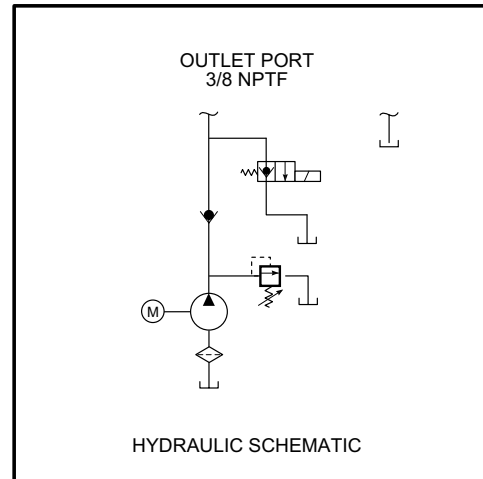
Comprehensive information may be found on the page referenced below each selection category.

PUMP	MOTOR	CAPACITOR	RESERVOIR	MOUNTING POSITION	OPTIONAL ACCESSORIES
Ref. Page 9.0	Ref. Page 9.0	Ref. Page 9.0	Ref. Page 11.0		Ref. Page 15.0

MODEL 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



"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-419 Power System

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

PUMP	MOTOR	ADAPTER	CLOSE COUPLED	RESERVOIR (LENGTH)	MOUNTING POSITION	OPTIONAL ACCESSORIES
Ref. Page 5.0	Ref. Page 6.0	Ref. Page 7.0	Ref. Page 8.0	Ref. Page 10.0		Ref. Page 15.0



Monarch M-Series A.C. Hydraulic Power Systems

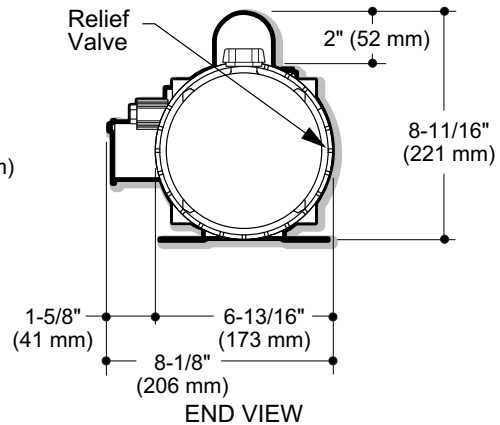
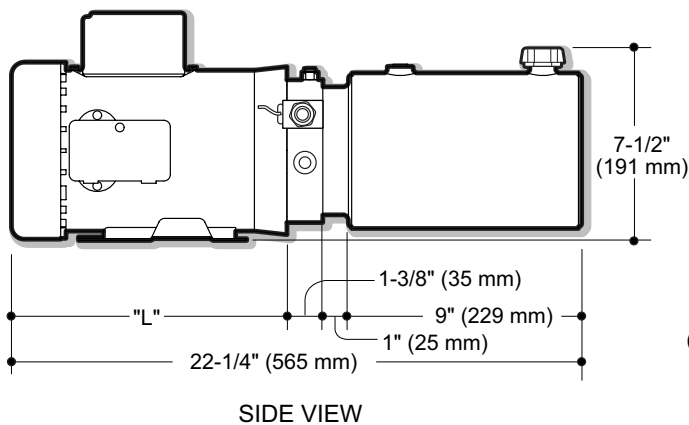
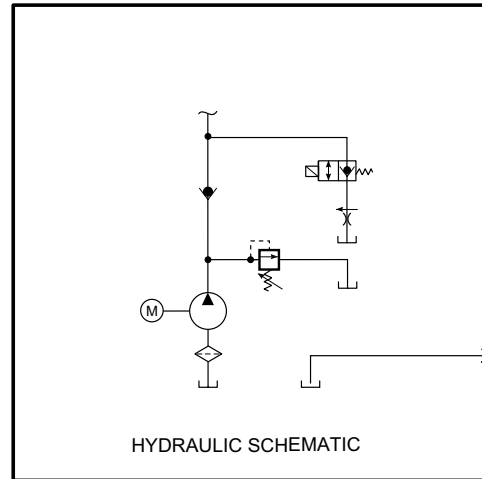
MODEL M-4519-C

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 Options:

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



"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

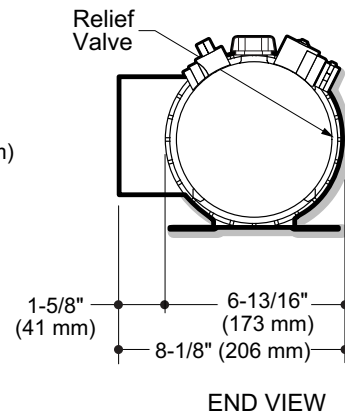
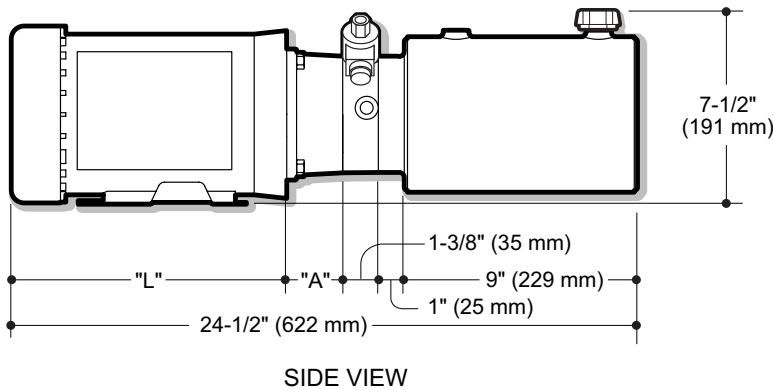
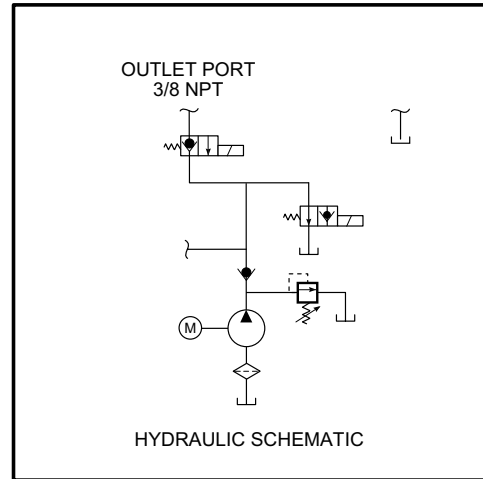
Comprehensive information may be found on the page referenced below each selection category.

PUMP	MOTOR	ADAPTER	CLOSE COUPLED	RESERVOIR (LENGTH)	MOUNTING POSITION	OPTIONAL ACCESSORIES
Ref. Page 5.0	Ref. Page 6.0	Ref. Page 7.0	Ref. Page 8.0	Ref. Page 10.0		Ref. Page 15.0

MODEL 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

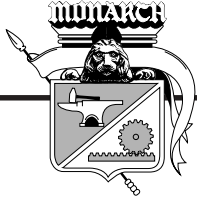


"L" dimension shown for 08751 motor is 10-11/16" (271 mm)
 "A" dimension for standard 01605 adapter is 2-5/32" (55 mm)
 "A" dimension for optional 01615 adapter is 3-11/32" (85 mm)
 Dimensions will vary according to motor output and manufacturer

How to Order Your M-403 Power System

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

PUMP	MOTOR	ADAPTER	RESERVOIR (LENGTH)	MOUNTING POSITION	OPTIONAL ACCESSORIES
Ref. Page 5.0	Ref. Page 6.0	Ref. Page 7.0	Ref. Page 10.0		Ref. Page 15.0

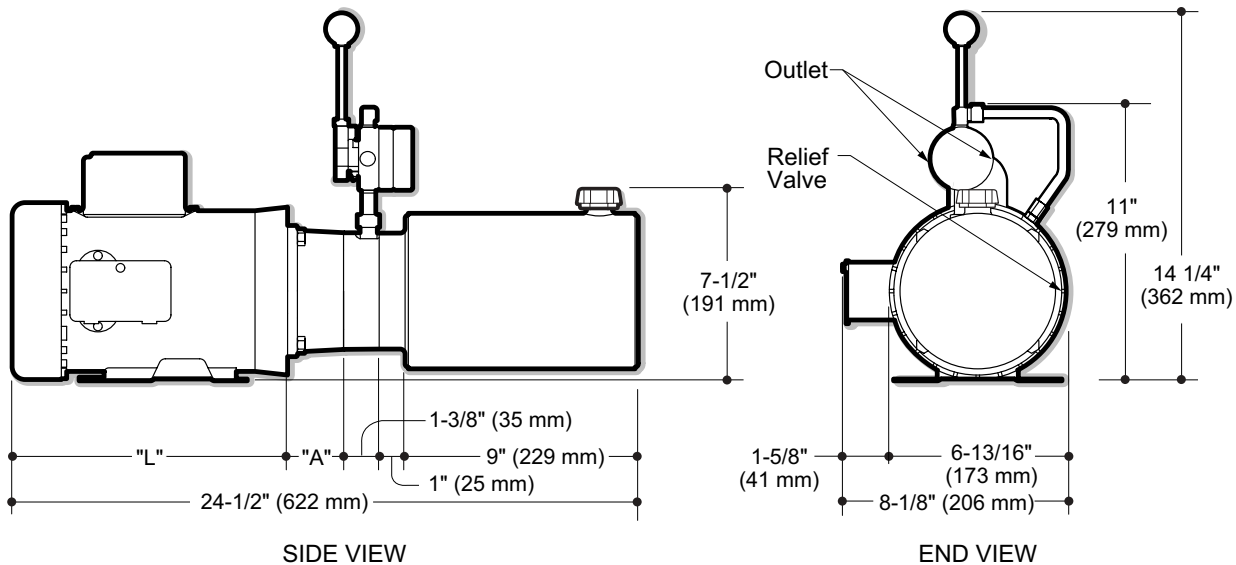
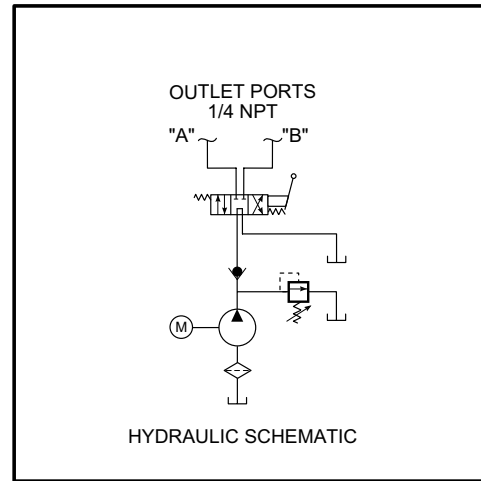


Monarch M-Series A.C. Hydraulic Power Systems

MODEL 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



"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-410 Power System

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

PUMP	MOTOR	ADAPTER	CLOSE COUPLED	RESERVOIR (LENGTH)	MOUNTING POSITION	VALVES	OPTIONAL ACCESSORIES
Ref. Page 5.0	Ref. Page 6.0	Ref. Page 7.0	Ref. Page 8.0	Ref. Page 10.0		Ref. Page 14.0	Ref. Page 15.0

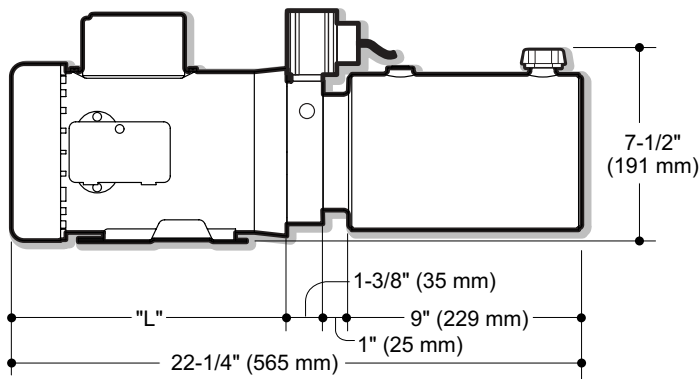
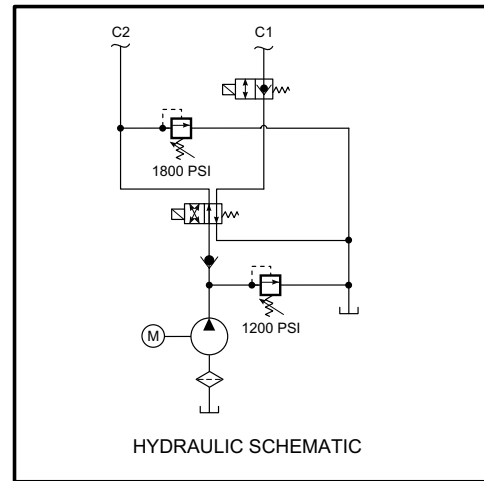
MODEL M-4551-C

Description:

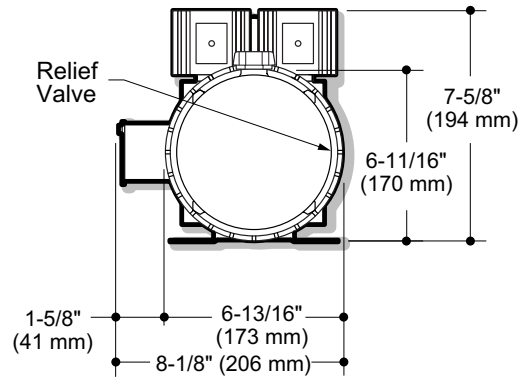
- Pump/Motor/Reservoir/Valve Unit
- Check Valve
- Externally Adjustable Relief Valve
- (1) 4 Way/2 Position and (1) 2 Way/2 Position Normally Closed Solenoid Cartridge Valve Located in the Base
- C1 Port Positively Checked
- Externally Adjustable Relief Valve in C2 Port
- #6 SAE Outlets
- Horizontal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

Popular Options:

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



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.

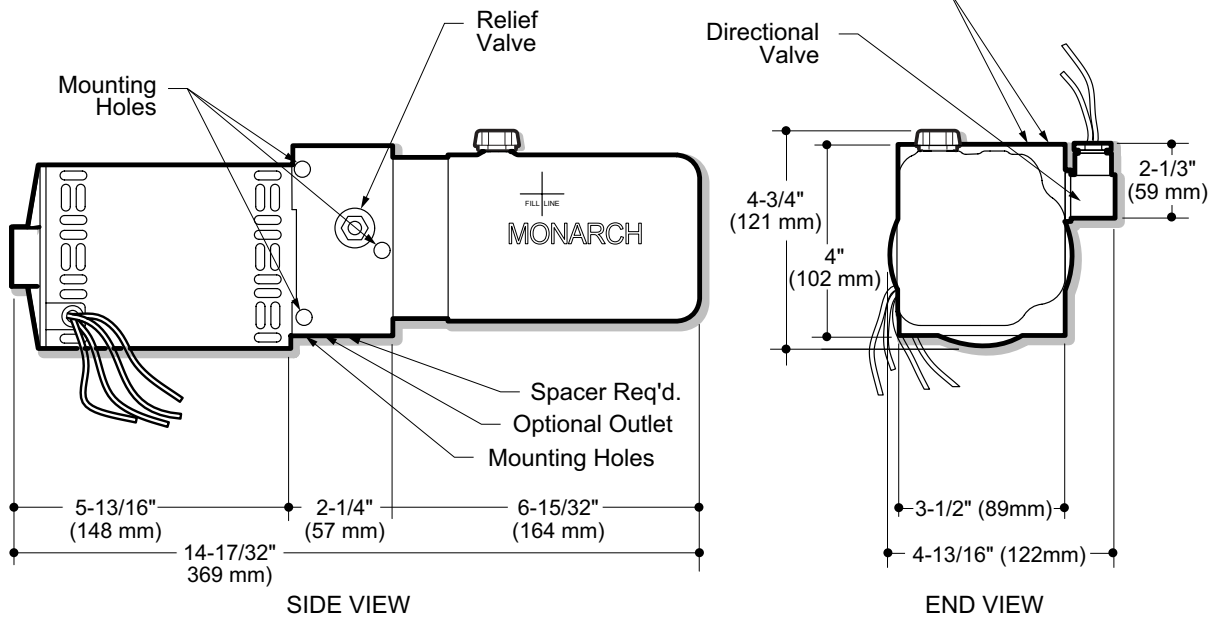
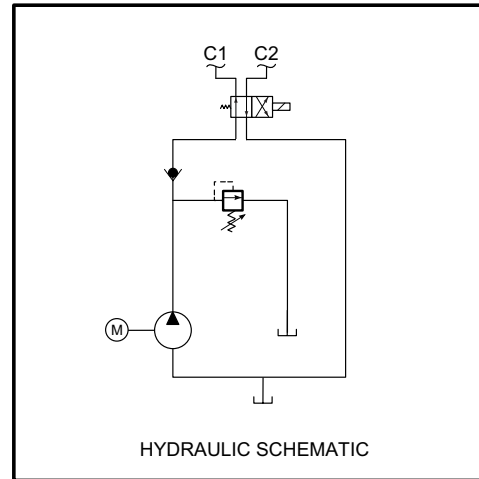
PUMP	MOTOR	ADAPTER	CLOSE COUPLED	RESERVOIR (LENGTH)	MOUNTING POSITION	OPTIONAL ACCESSORIES
Ref. Page 5.0	Ref. Page 6.0	Ref. Page 7.0	Ref. Page 8.0	Ref. Page 10.0		Ref. Page 15.0



MODEL M-452 Mini System

Description:

- Pump/Motor/Valve/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



How to Order Your M-452 Mini System

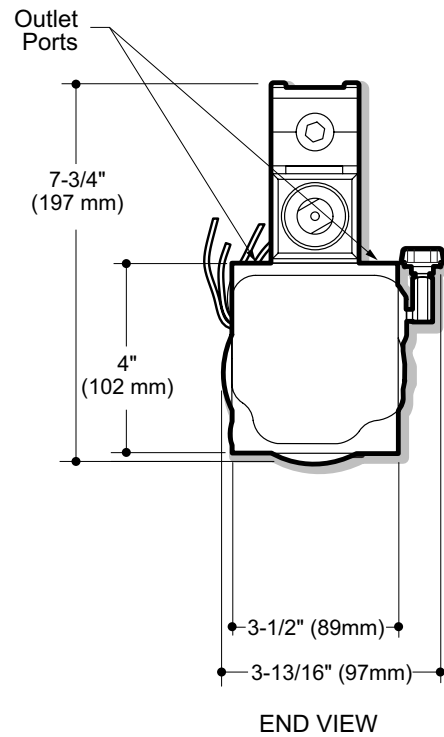
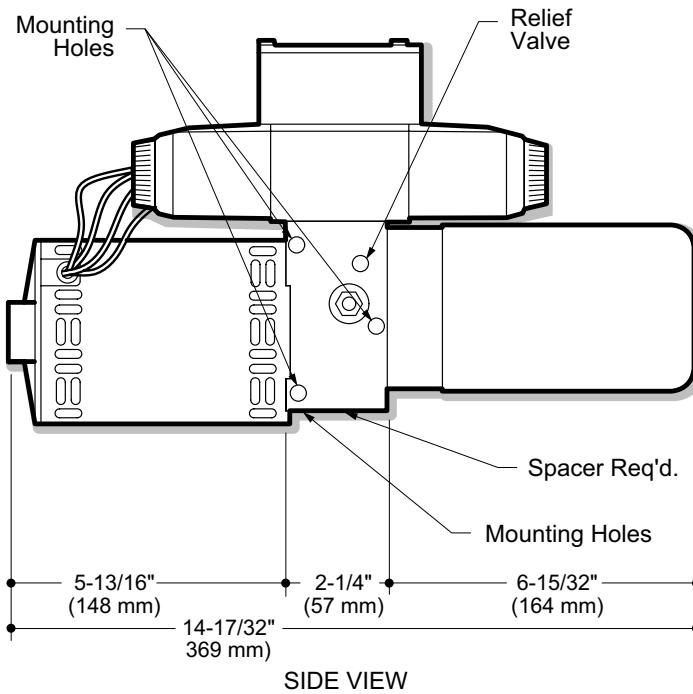
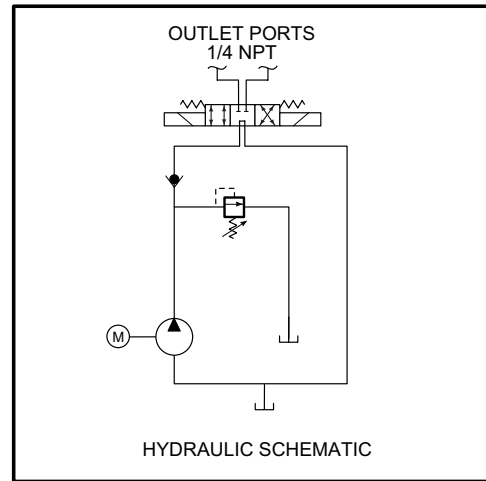
Comprehensive information may be found on the page referenced below each selection category.

PUMP	MOTOR	CAPACITOR	RESERVOIR	MOUNTING POSITION	OPTIONAL ACCESSORIES
Ref. Page 9.0	Ref. Page 9.0	Ref. Page 9.0	Ref. Page 11.0		Ref. Page 15.0

MODEL M-453 Mini System

Description:

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



How to Order Your M-453 Mini System

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

PUMP	MOTOR	CAPACITOR	RESERVOIR	MOUNTING POSITION	VALVE	OPTIONAL ACCESSORIES
Ref. Page 9.0	Ref. Page 9.0	Ref. Page 9.0	Ref. Page 11.0		Ref. Page 13.0/14.0	Ref. Page 15.0

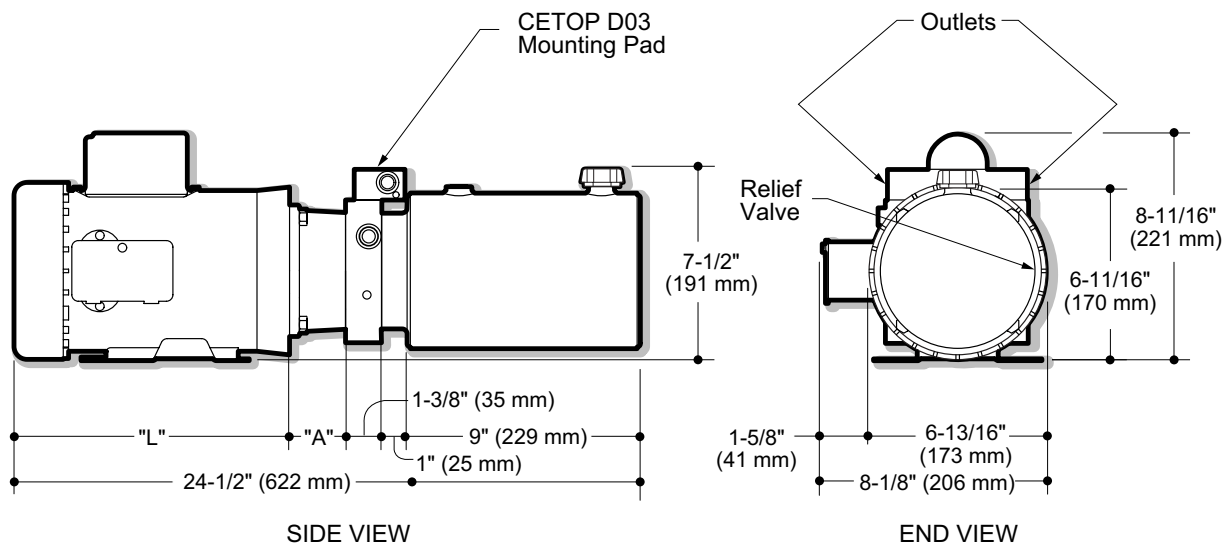
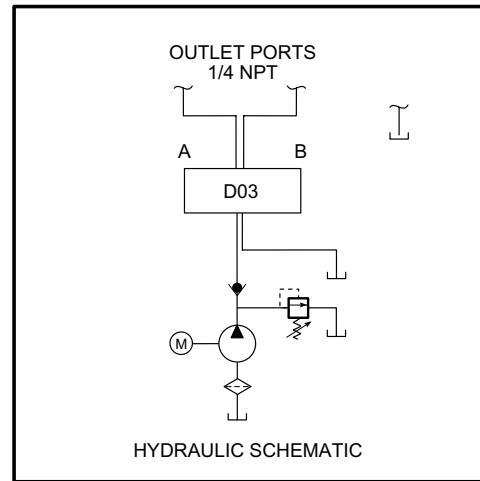


Monarch M-Series A.C. Hydraulic Power Systems

MODEL M-4506

Description:

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



"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

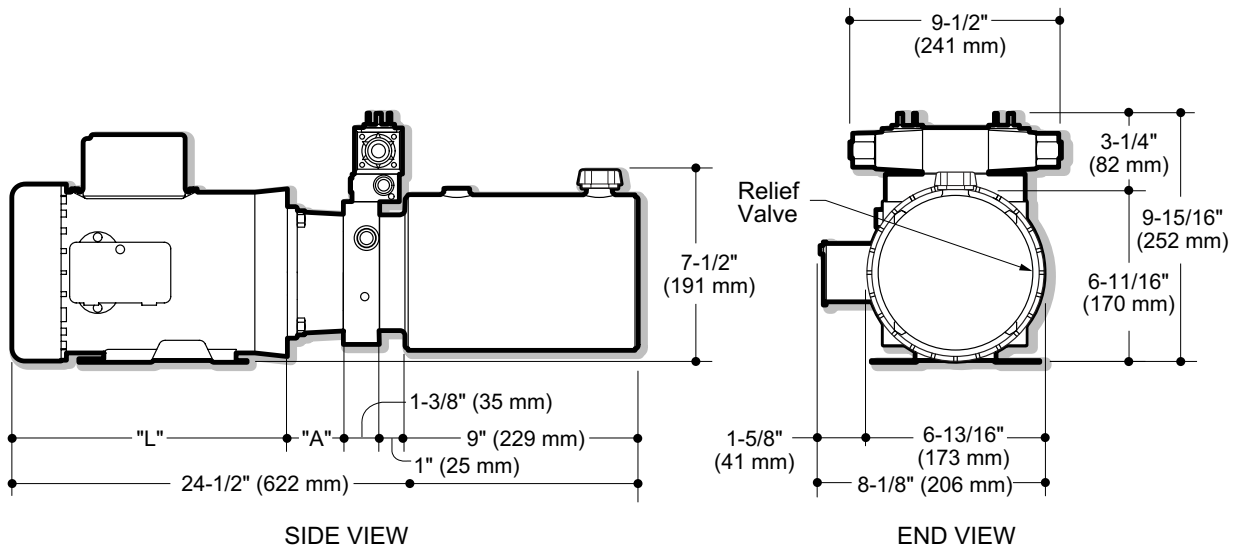
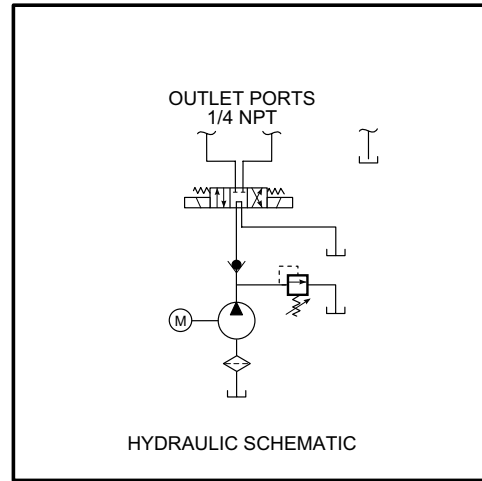
Comprehensive information may be found on the page referenced below each selection category.

PUMP	MOTOR	ADAPTER	RESERVOIR (LENGTH)	MOUNTING POSITION	VALVES	OPTIONAL ACCESSORIES
Ref. Page 5.0	Ref. Page 6.0	Ref. Page 7.0	Ref. Page 10.0		Ref. Page 13.0	Ref. Page 15.0

MODEL M-4505

Description:

- Pump/Motor/Reservoir/Valve 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



"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	OPTIONAL ACCESSORIES
Ref. Page 5.0	Ref. Page 6.0	Ref. Page 7.0	Ref. Page 10.0		Ref. Page 13.0	Ref. Page 15.0



Monarch M-Series A.C. Hydraulic Power Systems

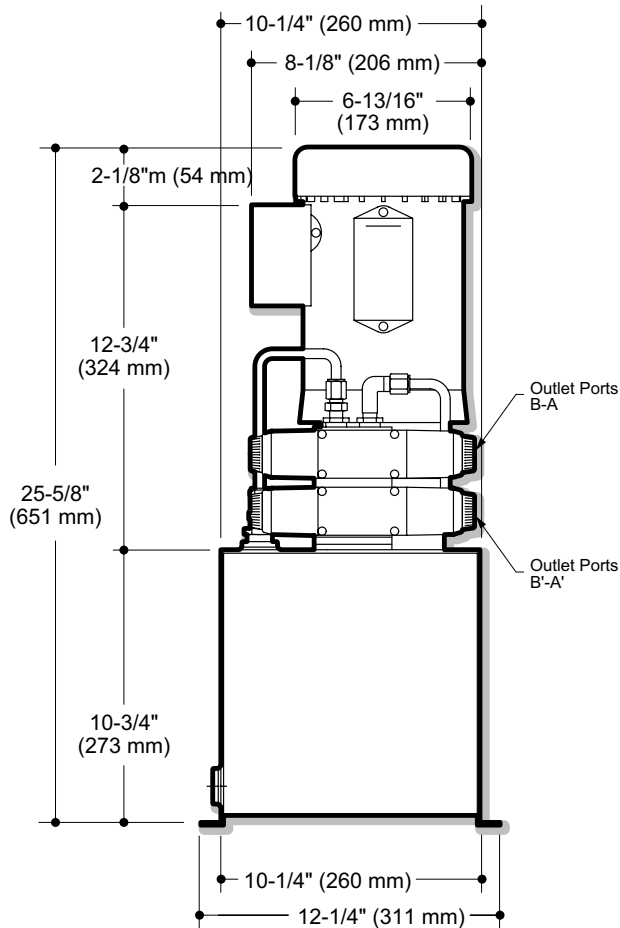
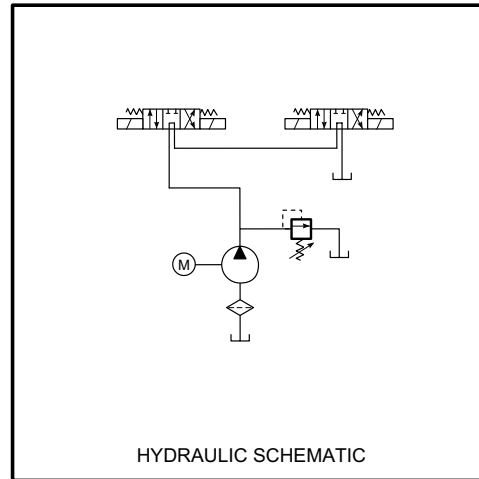
MODEL M-428

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

Popular Option:

- Unit Less D03 Valves



How to Order Your M-428 Power System

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

PUMP	MOTOR	CLOSE COUPLED	RESERVOIR (LENGTH)	MOUNTING POSITION	VALVES	OPTIONAL ACCESSORIES
Ref. Page 5.0	Ref. Page 6.0	Ref. Page 8.0	Ref. Page 10.0		Ref. Page 13.0	Ref. Page 15.0

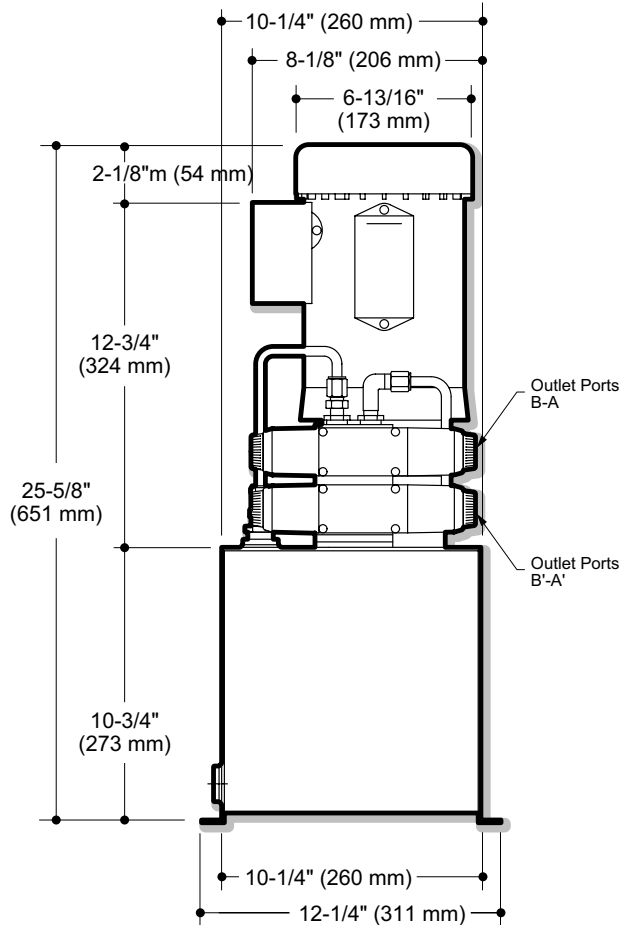
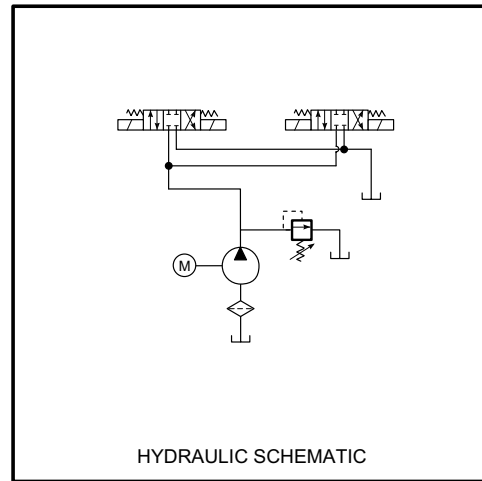
MODEL M-428-P

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

Popular Options:

- Unit Built with unloading valve
- Unit Less DO3 Valves



How to Order Your M-428P Power System

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

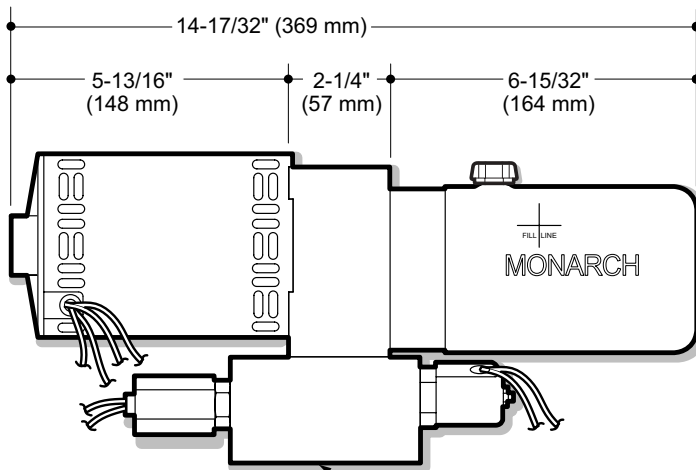
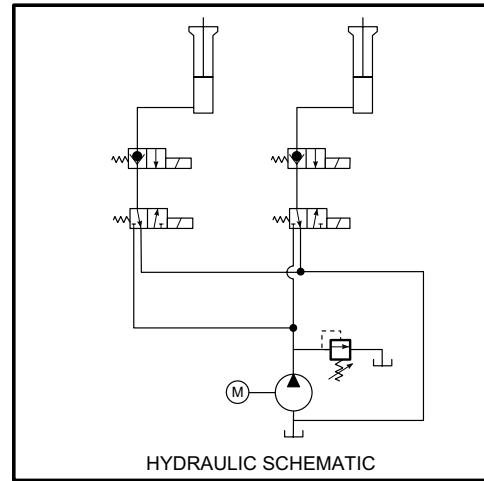
PUMP	MOTOR	CLOSE COUPLED	RESERVOIR (LENGTH)	MOUNTING POSITION	VALVES	OPTIONAL ACCESSORIES
Ref. Page 5.0	Ref. Page 6.0	Ref. Page 8.0	Ref. Page 10.0		Ref. Page 13.0	Ref. Page 15.0

MODEL M-466 Mini System

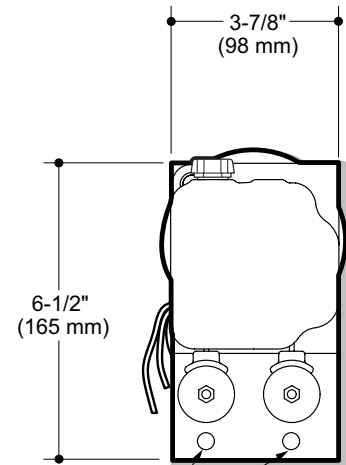
Description:

- 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) Optional

NOTE: Consult factory regarding return flow limitations.



SIDE VIEW

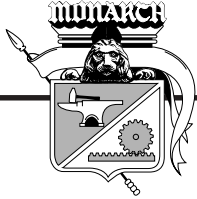


END VIEW

How to Order Your M-466 Mini System

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

PUMP	MOTOR	CAPACITOR	RESERVOIR	MOUNTING POSITION	OPTIONAL ACCESSORIES
Ref. Page 9.0	Ref. Page 9.0	Ref. Page 9.0	Ref. Page 11.0		Ref. Page 15.0



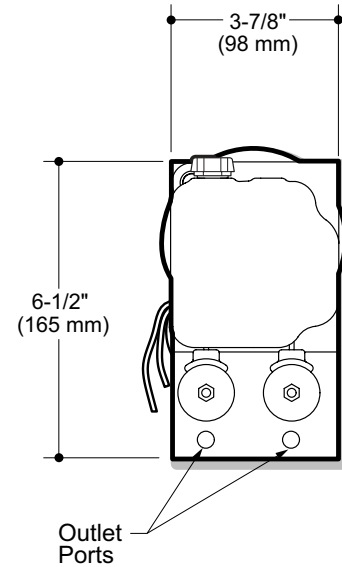
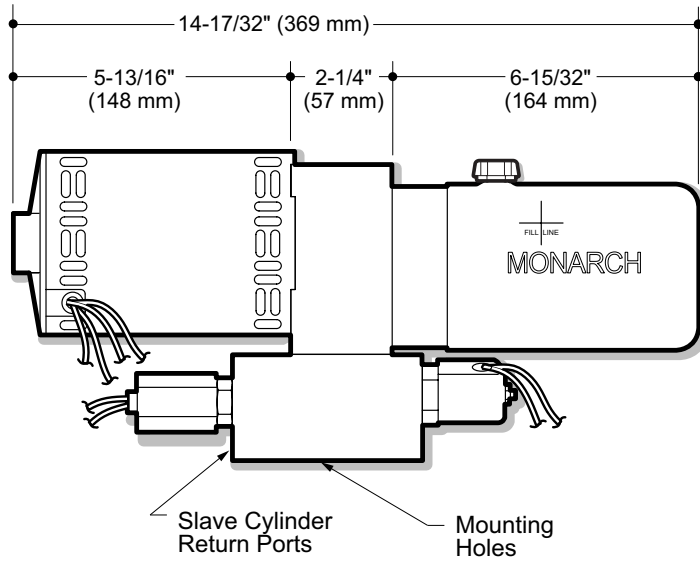
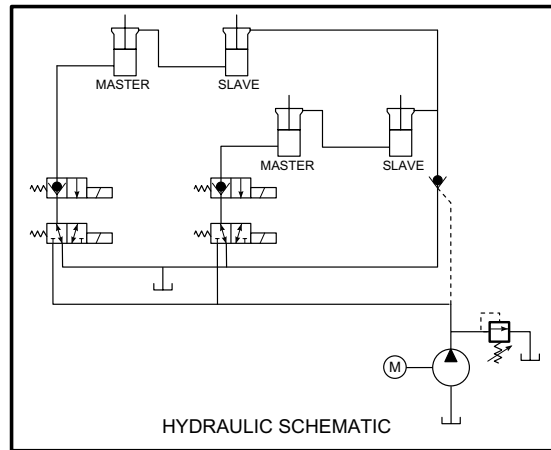
Monarch M-Series A.C. Hydraulic Power Systems

MODEL M-457 Mini System

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) Optional

NOTE: Consult factory regarding return flow limitations.



How to Order Your M-457 Mini System

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

PUMP	MOTOR	CAPACITOR	RESERVOIR	MOUNTING POSITION	OPTIONAL ACCESSORIES
Ref. Page 9.0	Ref. Page 9.0	Ref. Page 9.0	Ref. Page 11.0		Ref. Page 15.0

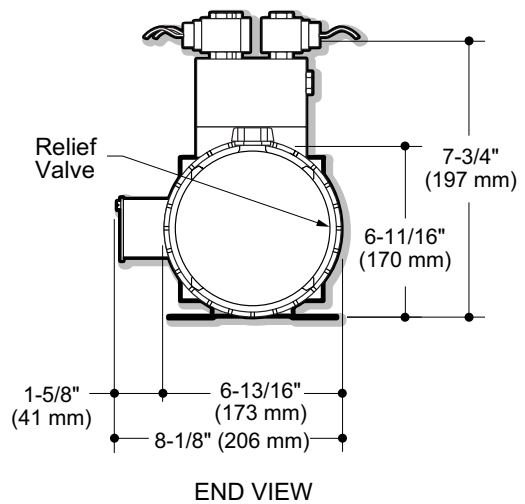
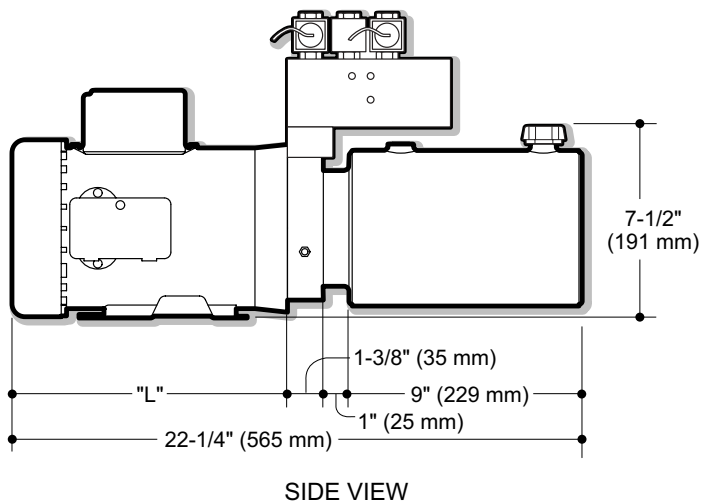
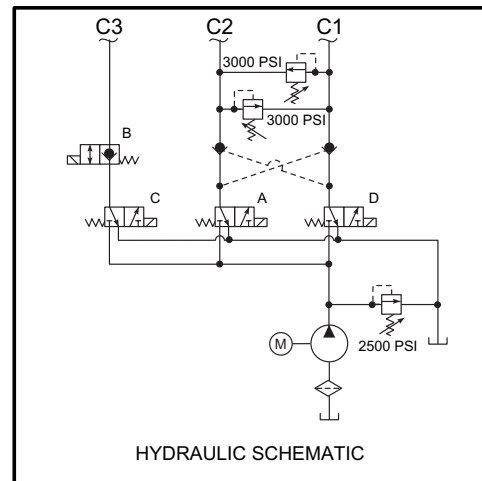
MODEL M-4593-C

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 Options:

- Vertical Mounting, Motor Up



"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 Power System

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

PUMP	MOTOR	ADAPTER	CLOSE COUPLED	RESERVOIR (LENGTH)	MOUNTING POSITION	OPTIONAL ACCESSORIES
Ref. Page 5.0	Ref. Page 6.0	Ref. Page 7.0	Ref. Page 8.0	Ref. Page 10.0		Ref. Page 15.0



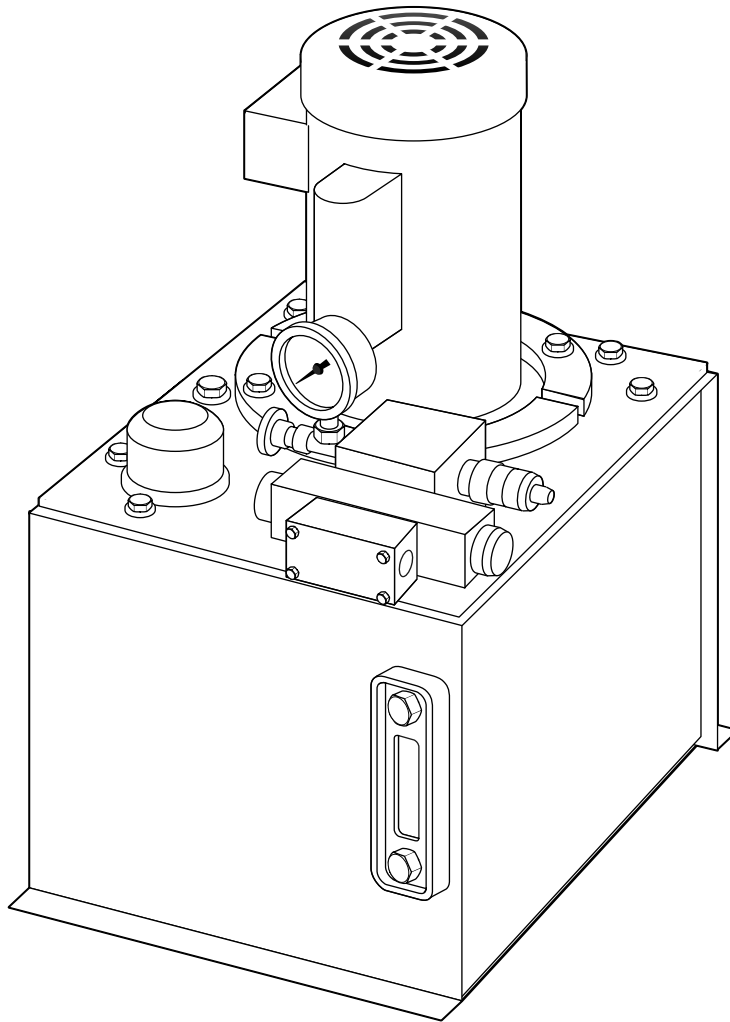
Monarch M-Series A.C. Hydraulic Power Systems

NOTES:

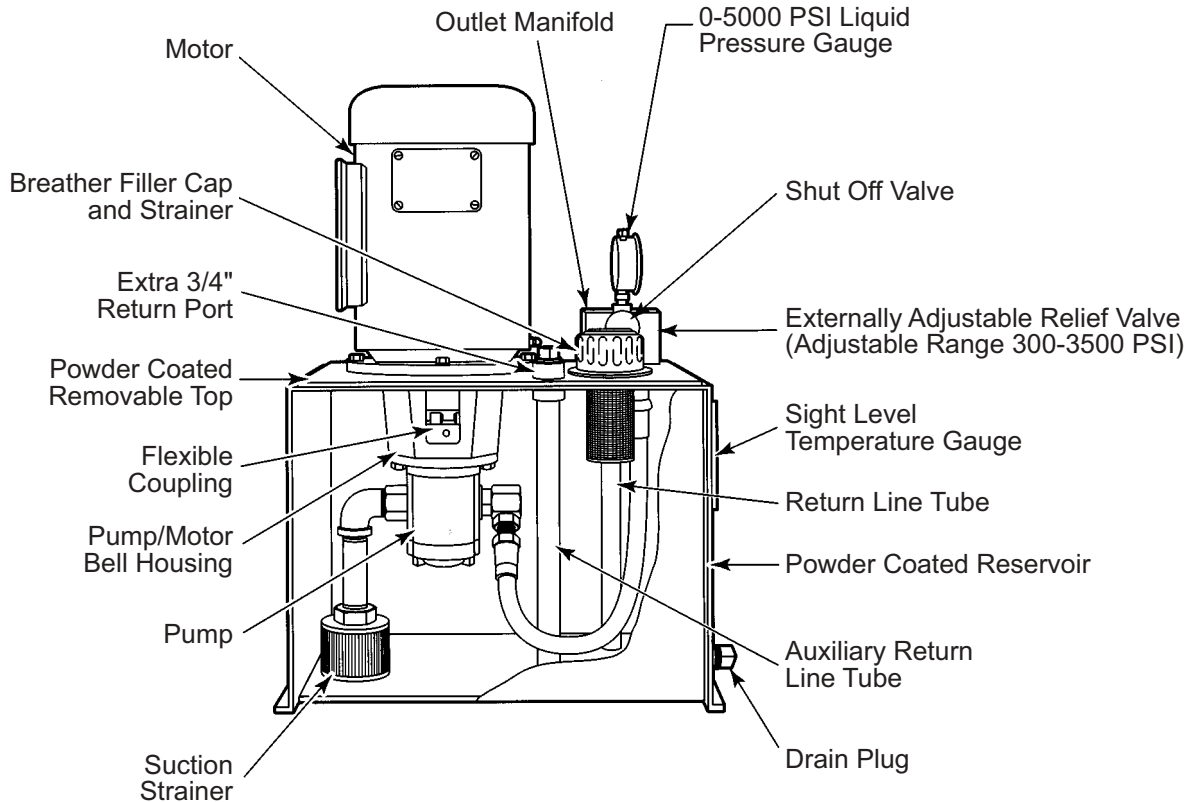
MT & T Series Industrial Power Units



**MT & T Series
Industrial Power Units**



**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



Monarch M-Series A.C. Hydraulic Power Systems

MT & T Series Pump Performance Data

MT Series

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

T Series

PUMP CODE	IN ³ /REV	RPM	GPM	500	1000	1500	2000	2500	3000		
				HP	HP	HP	HP	HP	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.

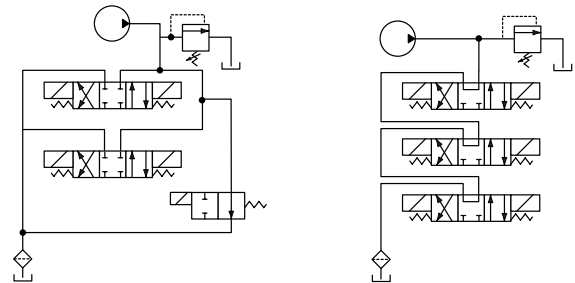
* Contact the factory for operating T Series pumps at speeds above 1800 RPM.

Standard D03 and D05 Directional Control Valves

SCHEMATIC	DESCRIPTION
	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.

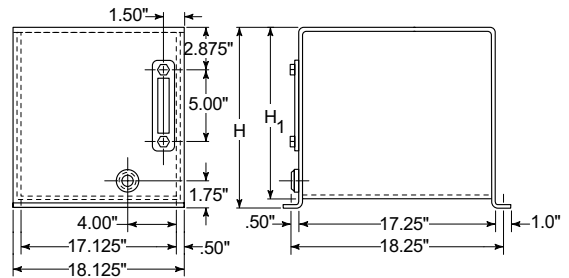
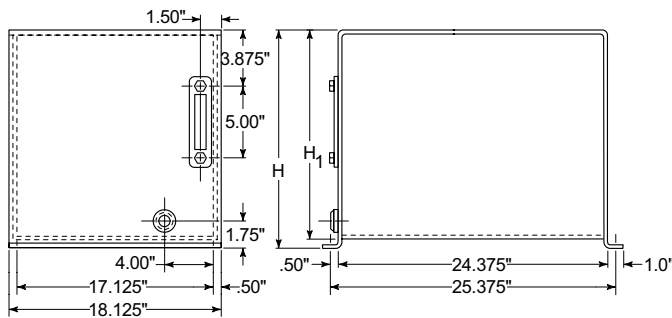
Example:



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

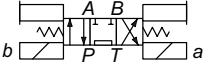
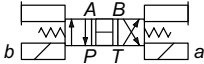


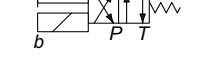
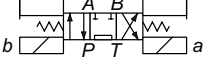
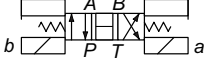
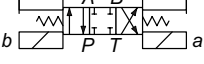
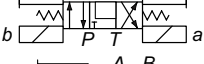
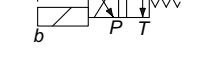
DIM. IN INCHES	RESERVOIR CAPACITY TOTAL/USABLE IN GALLONS		
	8.5/4.4	10.1/5.2	15.2/9.8
H	12 3/4	14 1/4	19
H ₁	12	13 1/2	18 1/4



Monarch M-Series A.C. Hydraulic Power Systems

MT-400 and T-400 Selection Guide

SERIES	PUMP	RESERVOIR	HEAT EXCHANGER	MOTOR	VALVE MANIFOLD
MT 0.25-4.0 GPM	MT-400 17 P72 14 P62 01 P42 --- 02 P43 03 P03 04 P51 05 P05	TOTAL CAPACITY GALLONS 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.	(SEE SELECTION CHART ON REVERSE PAGE) 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	(ALL STANDARD MOTORS TEFC) 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 1/2 1800 115/230 1 10 1/2 1800 230/460 3 11 1/2 3600 115/230 1 12 1/2 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 7/2 1800 230/460 3 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	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* D03 3 Station Parallel & Unloading Valve 35 D03 3 Station Parallel & Unloading Valve 06 4 Station Parallel* 36 D03 4 Station Parallel & Unloading Valve 08 5 Station Parallel* D03 5 Station Parallel & Unloading Valve 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.
	*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.				

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>Specialty 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</p> <p>- SPIN ON TYPE</p> <p>- 10 MICRON NOMINAL</p> <p>2 RETURN</p> <p>- SPIN ON TYPE</p> <p>- 10 MICRON NOMINAL</p> <p>- INDICATING GAGE</p> <p>3 RETURN</p> <p>- SPIN ON TYPE</p> <p>- FLEXIBLE TUBING</p> <p>4 RETURN</p> <p>- SPIN ON TYPE</p> <p>- FLEXIBLE TUBING</p> <p>- 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>



Limited 1 Year Warranty

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

Monarch 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, Monarch 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 Monarch product by Monarch to the purchaser.

To obtain warranty service, the purchaser must call Monarch 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: Monarch Hydraulics, Inc., 1363 Michigan Street N.E., Grand Rapids, MI. 49503. Monarch will then repair or replace, at its option, items which it finds to have been defective. Monarch will return such repaired or replacement items to the sender free of charge. Items claimed by the purchaser, but not found by Monarch, 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 Monarch 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 Monarch.

Monarch hereby expressly disclaims any liability for consequential damages to property other than this Monarch product to perform as warranted hereinabove.

Note: Supersedes all former warranties written or implied.



WARNING

- Always wear eye protection and protective clothing when working on and around hydraulic systems.
- 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.
- Monarch 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.



Monarch M-Series A.C. Hydraulic Power Systems

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Monarch M-Series A.C. Hydraulic Power Systems

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Distributed By:



U.S.A.:
MONARCH HYDRAULICS, INC.
1363 Michigan St NE, Grand Rapids, MI 49503, U.S.A.
Telephone: (616) 458-1306
Telefax: (616) 458-1616
<http://www.monarchhyd.com>

CHINA:
ZHAOQING MONARCH HYDRAULICS CO. LTD.
5F, 434, Yeuxiu Road North
Guangzhou, 510050, PRC
Telephone: 0758-3642371
Telefax: 0758-3642373
www.monarch-hyd.cn

CANADA:
FLUID-PACK CORPORATION
A Part of the Monarch Hydraulics Group
460 Newbold St., London, Ontario, Canada N6E 1K3
Telephone: (519) 686-5900
Telefax: (519) 686-8976
www.fluidpack.com

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