PRODUCT CATALOG

STAR HYDRAULICS

PERFORMANCE UNDER **PRESSURE**

PERFORMANCE-PROVEN *HYDRAULIC PUMPS, CYLINDERS, JACKS AND RELATED PRODUCTS*

MADE TO MEET YOUR NEEDS

Star Hydraulics is a global supplier of robust, high-quality hydraulic products from small and simple to large and complex.

We provide a mix of standard and custom manual hydraulic pumps, cylinders, jacks, swivels and related specialized products to the hydraulics industry. We have the engineering expertise, skilled machinists and machining capabilities to develop new or customize existing products for your specific applications.

OIL AND GAS • TRANSPORTATION • AEROSPACE • INDUSTRIAL • MILITARY
MARINE • RAIL • MINING AND CONSTRUCTION • MEDICAL AND NUCLEAR

THE STAR QUALITY PLEDGE

Star Hydraulics is committed to providing durable, high-quality products and dependable delivery, and continuing the engineering and service support you have come to expect. We pledge to continuously and effectively improve our products and processes to meet your needs.

Rest assured: we fully understand that product dimensions and performance characteristics are critical to your applications. You can count on Star to supply the same high-quality products, made to the same specifications time after time, so you never have to worry about changes that could affect your application. We pledge not to change critical parameters on our standard products. In addition, we will continue to offer new or customized products that provide improved performance.

Joel Brackett, head project engineer (left), talks with Mike Lenisa, sales manager, about modifications made to this special pump – gasket materials, reservoir size, port locations, valve styles and much more – to meet a customer's unique specifications.

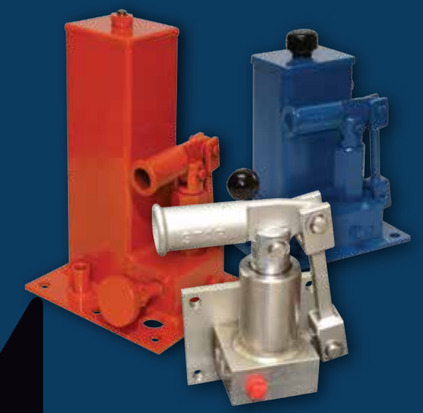
For more than 60 years, customers have turned to Star Hydraulics for rugged, hard-working hydraulic products. Beginning as the Star Jack Company, we soon expanded to design and build pumps, jacks, cylinders and related hydraulic products with that same superior durability.

With Star's purchase in 1969, we expanded further, extending our reputation for reliability to customized pumps and cylinders, post straighteners, concrete testers, swivels, double-acting pumps and stainless steel products.

Today, companies around the world count on Star Hydraulics products for robust service and longevity. And we share that proud tradition of quality and reliability with our new family, Alkon Corporation.

OUR WARRANTY

Star Hydraulics warrants its products to be free of defects in materials and workmanship when properly installed and maintained. No other warranty is implied or expressed. Star Hydraulics' liability for and remedy to warranty claims are limited to repair or replacement at Star's sole discretion if the parts are returned within 12 months of purchase. Star will not be liable for consequential or other damages or expenses incurred through the use of its products.



CONTACT STAR:

To find out how Star Hydraulics can work for you, or to contact Sales, call ***708.453.3238*** *or email* ***sales@starhyd.com.***

CONTENTS

Pump Basics and Selection Criteria

Pumps move cylinders to raise/lower heavy loads, transfer liquids from one container to another, provide manual back-up for intricate, electronically controlled hydraulics systems and perform critical work in a wide range of rugged environments.

Star Hydraulics makes robust, solidly built pumps using time-tested designs, the latest equipment, meticulous workmanship and high quality standards. In fact, one long-time customer recently sent us a pump we had built in 1963, and it still looks almost new after more than 40 years of use.

How to Select a Pump

We build three types of manually operated pumps: single-piston pumps, two-speed pumps and double-acting pumps. Pumps with 4-way valves are also offered. Your application determines the type of pump you need.

- If there is **a constantly applied load,** such as a cylinder raising a heavy weight, use the single-piston pump or the double-acting pump (Figure 1).

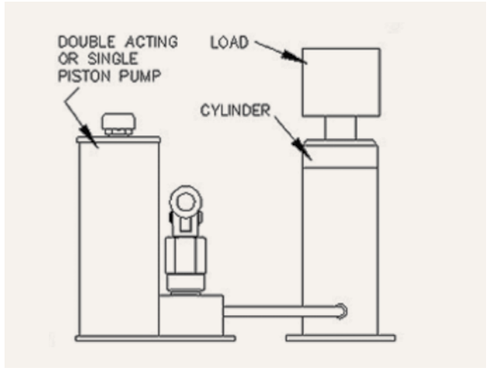


Figure 1

- If there is **initially little or no resistance, but high force is needed later,** use the two-speed dual-piston pump; for example, a press in which a cylinder advances until it contacts a load and then applies a much greater bending or cutting force. The dual-piston pump supplies high-volume/low-pressure flow until the increased force is needed, at which time it automatically switches to high-pressure/lower-volume (Figure 2).

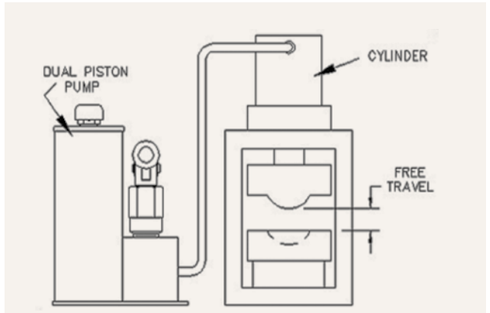


Figure 2

- If the application calls for a **double-acting cylinder, which exerts force in either direction,** use a pump with a 4-way valve (Figure 3).

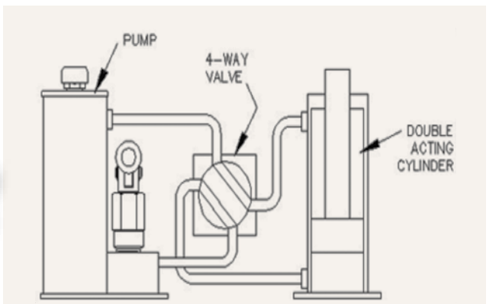


Figure 3

Important Information When Ordering

When ordering, you must send the following information so we can calculate the appropriate pump pressure and reservoir volume:

1. The load (in lbs.) to be lifted.

2. The piston diameter (in inches) of your cylinder.

3. The number of cylinders being used to lift the load.

4. The cylinder travel length, or stroke (in inches).

Custom Designs

Star will customize pumps to meet your needs, including, but not limited to:

- Added manifold block assembly, gauges, sight glass
- Alternate seals, mounting holes, port type, valve styles, paint colors
- Special settings, test requirements, certifications
- Special reservoir size or type, base plate, port locations
- Custom plated or polished parts

Accessories

We can put you in touch with a distributor near you for accessories to set up your hydraulic system. If you have special requests, we're happy to help.

How to Maintain Your Pump

It is important to keep pumps clean and well maintained and follow operating guidelines for best operation and longevity. Keep foreign materials away from the piston area to prevent surface damage. Use the proper oil and *never* let the reservoir run dry. Do not exceed pressure ratings on pumps with no overload relief valve. For pumps with an overload valve, always take care when adjusting or resetting.

If you need to replace seals on a pump, we offer repair/replacement kits with service instructions for each pump. If you need assistance, please call us at **708.453.3238.**

Types of Oil

We recommend using light hydraulic oil with Star Hydraulics pumps. Oils with 75-150 SUS viscosity at 100°F (ISO grade 15, 22 or 32) will give satisfactory performance. In an emergency, when the suggested oils are not available, use 5w or 10w motor oil or automatic transmission fluid.

Be aware that unless there is a specific need to do so, **Star pumps are shipped without oil.**

Surface Protection

Star pumps are made to work in tough environments, so all exposed surfaces of standard pumps have one coat of industrial-quality paint. Pumps with special colors have two-coat finishes, unless you specify prime coat only.

We also provide pumps with special plated or polished parts.

Charles Rodgers applies industrial-quality paint for an added layer of protection. All standard steel pumps are painted to withstand the tough environments found in typical product applications. In addition to our standard pump colors, custom colors are available upon request.

Inspections and SPC play a major role at Star from components like the pump blocks seen here to our finished products. Product quality requires that all components are within specification.

Manifold Pumps

Star manifold-mounted hand pumps provide a low-cost, efficient means to manually develop or increase pressure in a hydraulic system. Use it as a primary pump for a hydraulic system or a standby pump for emergencies. It operates presses, valves, doors, safety locks and other devices. This manifold pump is complete with suction and pressure check valves. Designed to mount directly in your manifold block, it eliminates the need for a costly valve body.

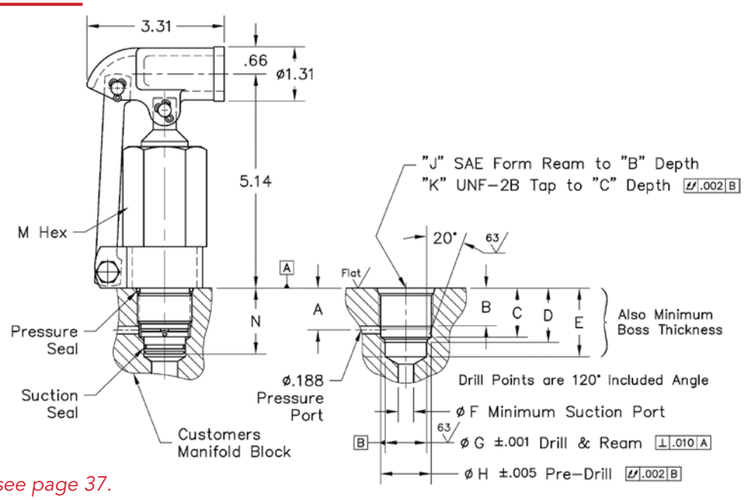
Features

- Designed to mount in a modified SAE O-ring port (see drawing)
- Complete pump with suction and pressure check valves
  - Does not include release or overload valves
- Up to 5,000 PSI
- Ground and hard chrome-plated piston
- All-aluminum body (unpainted finish)
- Handle socket rotates 360°
- 18 in. operating handle

MANIFOLD PUMP MODELS

Model	Displacement (Cu-in / stroke)	Max Pressure (PSI)	Lever Force (per 100 PSI)
MK2331	1.2	1,500	5 lb.
MK2156	0.555	2,800	3 lb.
MK2329	0.38	5,000	2 lb.

Dim	MK2331	MK2156	MK2329
A	1.01	0.72	0.72
B	0.94	0.68	0.68
C	1.06	0.78	0.78
D	1.19	0.88	0.88
E	1.75	1.28	1.28
F	0.406	0.406	0.406
G	1.001	0.626	0.626
H	1.187	0.781	0.781
J	SAE-16	SAE-16	SAE-10
K	1.312-12	.875-14	.875-14
M	1 3/4"	1 3/8"	1 3/8"
N	1.59"	1.25"	1.25"



TO CUSTOMIZE:
Any standard pump for your application, see page 37.

Economy Pumps

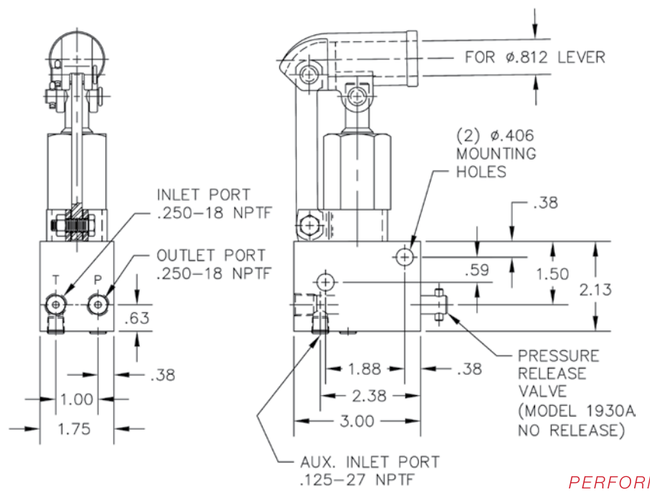
Our most economical, self-contained hand pump is ideal for developing or increasing pressure in a hydraulic system at low cost. Use as a primary pump for a hydraulic system or a standby pump for emergencies. It operates presses, valves, doors, safety locks and other devices.

Features

- Available with or without a pressure release valve
- Various mounting styles
- Up to 2,800 PSI
- Ground and hard chrome-plated piston
- Aluminum pump body
- 18 in. operating handle, handle direction optional
- Unpainted finish

ECONOMY PUMP MODELS

Model	Max Pressure (PSI)	Piston Diameter (inches)	Volume per Stroke (cu-in)	Lever Force per 100 PSI (lbs)	Inlet / Outlet Port Size (inches)	Net Weight (lbs)	Release Valve
MK1930	2,800	3/4	0.55	3.0	1/4	3	Yes
MK1930A	2,800	3/4	0.55	3.0	1/4	3	No



Single-Piston Pumps

Our Star simple pump is a low-cost, efficient means to develop or increase pressure in a hydraulic system. This is a basic pump with no reservoir, overload relief valve or release valve; it is meant for use in a hydraulic system with its own reservoir and control valves. In emergencies, it supplies reliable hydraulic power to operate presses, valves, doors and safety locks, or cylinders that actuate other devices.

Features

- Hand- or foot-operated versions
- Flange mount available
- Up to 10,000 PSI
- 24 in. operating handle or foot lever
- Often used as standby pump for emergencies

Steel (Standard) Design Details

- Ground and hard chrome-plated piston
- All-steel body

Stainless Steel Design Details

- Available 100% stainless steel or with "wetted" parts made of brass and stainless steel
- Ground and hard chrome-plated piston
- Bronze piston available for water applications
- Excellent choice for medical, food-handling, corrosive environments and wash-down applications

Design Notes

- Does **not** include overload, relief or release valves; use only on equipment with existing reservoir and release valves
- System designer must provide overload relief protection for system if required: these pumps do **not** have an overload relief valve and can exceed maximum rated pressure if too much force is applied
- Flange mount (PL) pumps do **not** have threaded inlet ports; they must be gasket mounted to reservoir

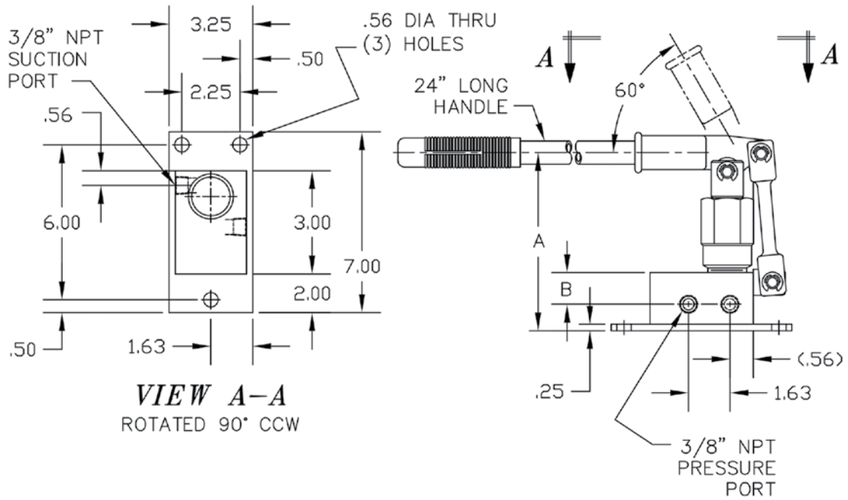
BASE MOUNT

SP: BASE MOUNT MODELS

Standard Model	100% Stainless Steel* Model	Max Pressure (PSI)	Piston Diameter (in)	Volume per Stroke (cu-in)	Lever Force per 100 PSI (lbs)	Inlet/Outlet Port Size (inches)	Net Weight (lbs)
SP1A	SP1A-SS	10,000	1/2	0.29	1.2	3/8	10
SP2A	SP2A-SS	5,000	3/4	0.66	2.8	3/8	10
SP3A	SP3A-SS	2,500	1	1.18	4.9	3/8	10
SP4A	SP4A-SS	1,500	1-1/4	1.84	7.8	3/8	10
SP5A	SP5A-SS	1,000	1-1/2	2.65	11	3/8	10
SP6A	SP6A-SS	500	2	4.71	20	3/8	10

* Use a suffix of "SC" rather than "SS" to denote the use of stainless steel for wetted parts ONLY and carbon steel for all other parts of the pump

SP BASE MOUNT DRAWING



MODEL	"A"	"B"
SP1A	7.00	.88
SP2A	7.00	.88
SP3A	7.00	.88
SP4A	6.50	.75
SP5A	6.50	.75
SP6A	6.50	.75

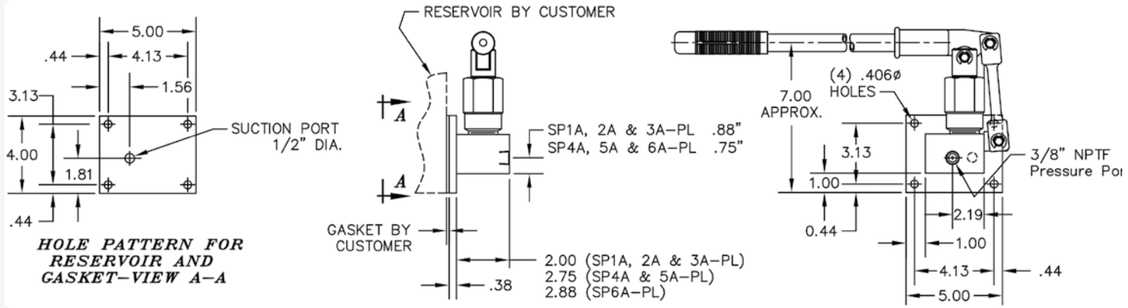
FLANGE MOUNT

SP: FLANGE MOUNT MODELS

Standard Model	100% Stainless Steel* Model	Max Pressure (PSI)	Piston Diameter (inches)	Volume per Stroke (cu-in)	Lever Force per 100 PSI (lbs)	Inlet/Outlet Port Size (inches)	Net Weight (lbs)
SP1A-PL	SP1A-PL-SS	10,000	1/2	0.29	1.2	3/8	10
SP2A-PL	SP2A-PL-SS	5,000	3/4	0.66	2.8	3/8	10
SP3A-PL	SP3A-PL-SS	2,500	1	1.18	4.9	3/8	10
SP4A-PL	SP4A-PL-SS	1,500	1-1/4	1.84	7.8	3/8	10
SP5A-PL	SP5A-PL-SS	1,000	1-1/2	2.65	11	3/8	10
SP6A-PL	SP6A-PL-SS	500	2	4.71	20	3/8	10

* Use a suffix of "SC" rather than "SS" to denote the use of stainless steel for wetted parts ONLY and carbon steel for all other parts of the pump

SP: FLANGE MOUNT DRAWING



Stellar Customer Assistance

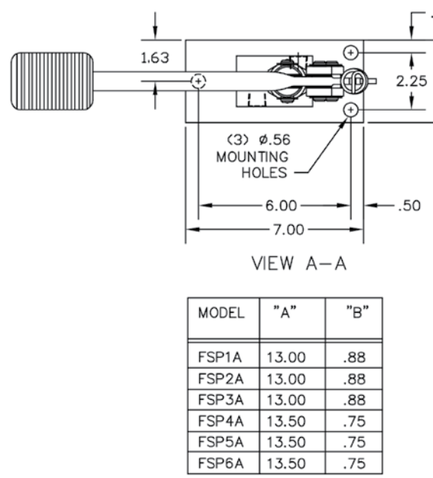
With Mary Locascio (left) and Gail Quinlan in the office, customer assistance is in good hands, whether it's entering or tracking customer orders, product data, account questions, shipment tracking or special paperwork.

FOOT-OPERATED

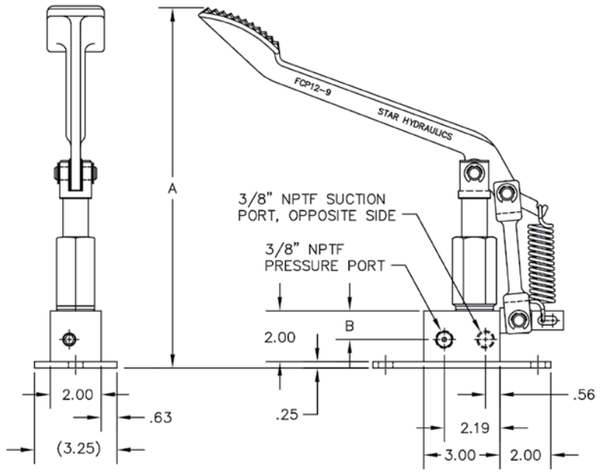
FSP: FOOT-OPERATED MODELS

Model	Max Pressure (PSI)	Piston Diameter (inches)	Volume per Stroke (cu-in)	Pedal Force per 100 PSI (lbs)	Inlet/Outlet Port Size (inches)	Net Weight (lbs)
FSP1A	5,000	1/2	0.29	2.3	3/8	11
FSP2A	2,500	3/4	0.66	5.2	3/8	11
FSP3A	1,250	1	1.18	9.2	3/8	11
FSP4A	750	1-1/4	1.84	14.5	3/8	11
FSP5A	500	1-1/2	2.65	21	3/8	11
FSP6A	250	2	4.71	37	3/8	11

FSP: FOOT-OPERATED DRAWING



MODEL	"A"	"B"
FSP1A	13.00	.88
FSP2A	13.00	.88
FSP3A	13.00	.88
FSP4A	13.50	.75
FSP5A	13.50	.75
FSP6A	13.50	.75



Single-Piston Pumps
(less reservoir)

P Series-LR single-piston pumps are solid, heavy-duty, versatile manual pumps for use in hydraulic systems with a built-in reservoir. Available in base or flange mount models, P Series pumps come with adjustable overload valves and pressure relief valves. The standard model has a simple screw pressure release valve for controlled lowering speed. Time-saving and easy-to-use cam pressure release valves are also available. Additional options include foot-operated models, stainless steel versions and 4-way valve models.

Features

- Multi-use pump for developing or increasing hydraulic pressure
- Factory-set overload relief valve
- Manual pressure release valve with screw, cam or foot release
- Up to 10,000 PSI
- 24 in. operating handle or foot lever

Options

- Base- or flange-mounted
- Hand- or foot-operated lever
- Screw-, cam- or foot-activated pressure release valve
- Steel (standard) or stainless steel
- Lower factory pressure setting if specified
- 4-way valve configuration

Steel (Standard) Design Details

- Ground and hard chrome-plated piston
- All-steel body

Stainless Steel Design Details

- Available 100% stainless steel or with "wetted" parts made of brass and stainless steel
- Ground and hard chrome-plated piston
- Bronze piston available for water applications
- Excellent choice for medical, food-handling, corrosive environments and wash-down applications

Design Note

Adjustable overload is set at maximum unless a lower pressure is specified. To specify, add PSI value to end of part number (ex: P1AC-LR-8000).

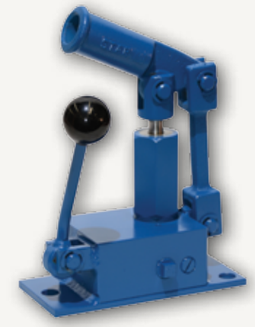
BASE MOUNT

P-LR: BASE MOUNT – SCREW RELEASE MODELS

Standard Model	100% Stainless Steel* Model	Max Pressure (PSI)	Piston Diameter (inches)	Volume per Stroke (cu-in)	Lever Force per 100 PSI (lbs)	Inlet/Outlet Port Size (inches)	Net Weight (lbs)
P1A-LR	P1A-LR-SS	10,000	1/2	0.29	1.2	3/8	15
P2A-LR	P2A-LR-SS	5,000	3/4	0.66	2.8	3/8	15
P3A-LR	P3A-LR-SS	2,500	1	1.18	4.9	3/8	15
P4A-LR	P4A-LR-SS	1,500	1-1/4	1.84	7.8	3/8	16
P5A-LR	P5A-LR-SS	1,000	1-1/2	2.65	11	3/8	16
P6A-LR	P6A-LR-SS	500	2	4.71	20	3/8	16

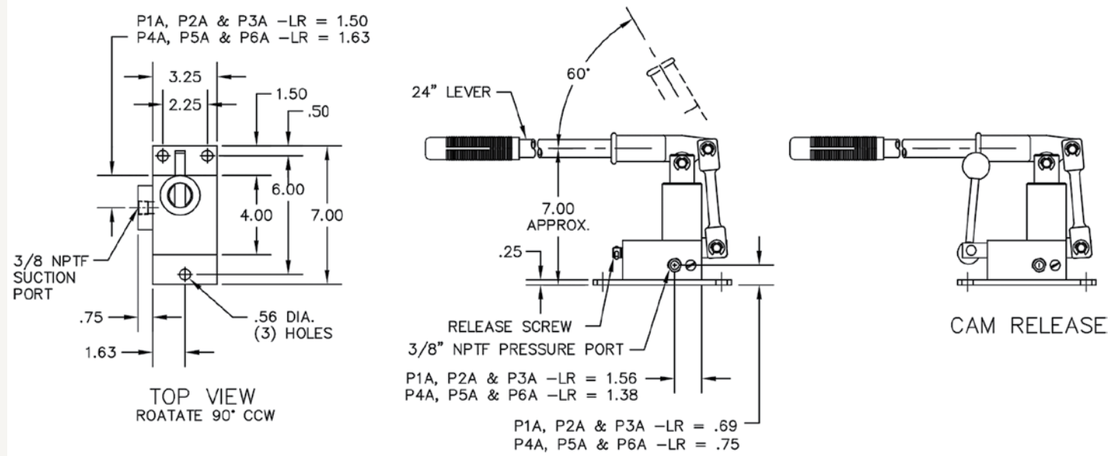
P-LR: BASE MOUNT – CAM RELEASE MODELS

Standard Model	100% Stainless Steel* Model	Max Pressure (PSI)	Piston Diameter (inches)	Volume per Stroke (cu-in)	Lever Force per 100 PSI (lbs)	Inlet/Outlet Port Size (inches)	Net Weight (lbs)
P1AC-LR	P1AC-LR-SS	10,000	1/2	0.29	1.2	3/8	15
P2AC-LR	P2AC-LR-SS	5,000	3/4	0.66	2.8	3/8	15
P3AC-LR	P3AC-LR-SS	2,500	1	1.18	4.9	3/8	15
P4AC-LR	P4AC-LR-SS	1,500	1-1/4	1.84	7.8	3/8	16
P5AC-LR	P5AC-LR-SS	1,000	1-1/2	2.65	11	3/8	16
P6AC-LR	P6AC-LR-SS	500	2	4.71	20	3/8	16



* Use a suffix of "SC" rather than "SS" to denote the use of stainless steel for wetted parts ONLY and carbon steel for all other parts of the pump

P-LR: BASE MOUNT – SCREW/CAM RELEASE DRAWING



FLANGE MOUNT

P-LR: FLANGE MOUNT – SCREW RELEASE MODELS

Standard Model	100% Stainless Steel* Model	Max Pressure (PSI)	Piston Diameter (inches)	Volume per Stroke (cu-in)	Lever Force per 100 PSI (lbs)	Inlet/Outlet Port Size (inches)	Net Weight (lbs)
P1A-PL	P1A-PL-SS	10,000	1/2	0.29	1.2	3/8	15
P2A-PL	P2A-PL-SS	5,000	3/4	0.66	2.8	3/8	15
P3A-PL	P3A-PL-SS	2,500	1	1.18	4.9	3/8	15
P4A-PL	P4A-PL-SS	1,500	1-1/4	1.84	7.8	3/8	16
P5A-PL	P5A-PL-SS	1,000	1-1/2	2.65	11	3/8	16
P6A-PL	P6A-PL-SS	500	2	4.71	20	3/8	16

P-LR: FLANGE MOUNT – CAM RELEASE MODELS

Standard Model	100% Stainless Steel* Model	Max Pressure (PSI)	Piston Diameter (inches)	Volume per Stroke (cu-in)	Lever Force per 100 PSI (lbs)	Inlet/Outlet Port Size (inches)	Net Weight (lbs)
P1AC-PL	P1AC-PL-SS	10,000	1/2	0.29	1.2	3/8	15
P2AC-PL	P2AC-PL-SS	5,000	3/4	0.66	2.8	3/8	15
P3AC-PL	P3AC-PL-SS	2,500	1	1.18	4.9	3/8	15
P4AC-PL	P4AC-PL-SS	1,500	1-1/4	1.84	7.8	3/8	16
P5AC-PL	P5AC-PL-SS	1,000	1-1/2	2.65	11	3/8	16
P6AC-PL	P6AC-PL-SS	500	2	4.71	20	3/8	16

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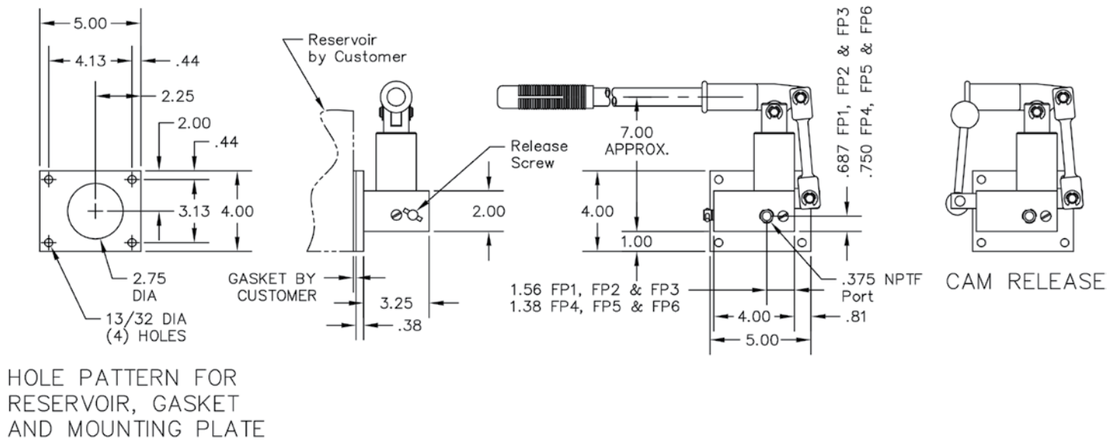
P-PL: FLANGE MOUNT DRAWING



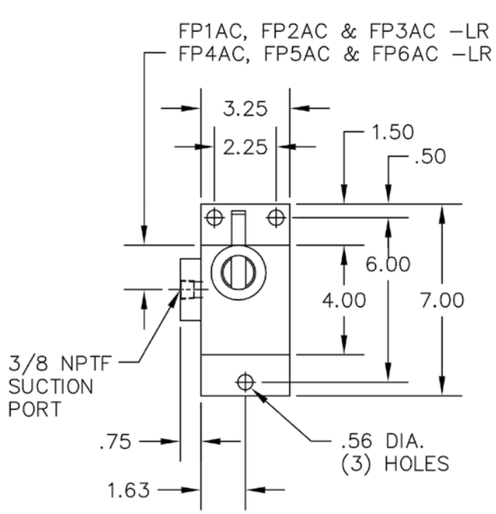
P SERIES–LR: SINGLE-PISTON PUMPS

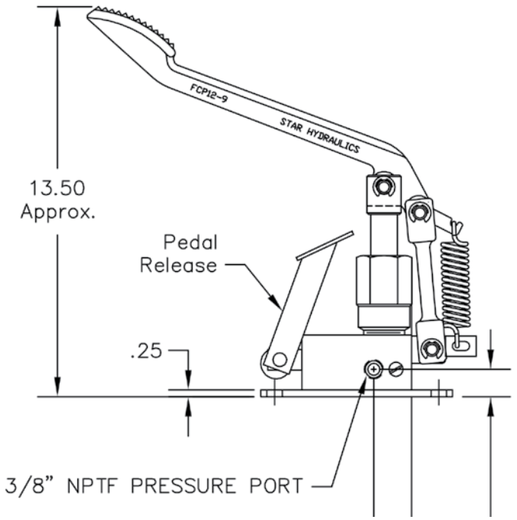
FOOT-OPERATED

FP-LR: FOOT-OPERATED MODELS

Model	Max Pressure (PSI)	Piston Diameter (inches)	Volume per Stroke (cu-in)	Pedal Force per 100 PSI (lbs)	Inlet/Outlet Port Size (inches)	Net Weight (lbs)
FP1AC-LR	5,000	1/2	0.29	2.3	3/8	15
FP2AC-LR	2,500	3/4	0.66	5.2	3/8	15
FP3AC-LR	1,250	1	1.18	9.2	3/8	15
FP4AC-LR	750	1-1/4	1.84	14.5	3/8	16
FP5AC-LR	500	1-1/2	2.65	21	3/8	16
FP6AC-LR	250	2	4.71	37	3/8	16

FP-LR: FOOT-OPERATED DRAWING





Single-Piston Pumps
(with reservoir)

These **single-piston pumps** are solid, heavy-duty, versatile manual pumps with built-in reservoir. P Series pumps include both adjustable overload valves and pressure relief valves. The standard model provides a simple screw pressure release valve for controlled lowering speed. Or save time and reduce pressure with an easy-to-use cam pressure release valve. Options include foot-activated models, stainless steel versions and 4-way valve models.

Features

- Multi-use pump for developing or increasing hydraulic pressure
- Adjustable overload relief valve
- Manual pressure release valve with optional screw, cam or foot release
- 80, 160 or 250 in^3 standard capacities
- Up to 10,000 PSI
- 24 in. operating handle

Reservoir Details

- Includes standard reservoir with breather filter
- 80, 160, 250 in^3 standard capacities; others available
- Specify appropriate reservoir size at end of model number (ex: P1AC-160)
- Shipped without oil

Options

- Hand- or foot-operated lever
- Screw-, cam- or foot-activated pressure release valve
- Steel (standard) or stainless steel
- 4-way valve configuration

Steel (Standard) Design Details

- Ground and hard chrome-plated piston
- All-steel body

Stainless Steel Design Details

- Available 100% stainless steel or with "wetted" parts made of brass and stainless steel
- Ground and hard chrome-plated piston
- Bronze piston available for water applications
- Excellent choice for medical, food-handling, corrosive environments and wash-down applications

Design Note

Adjustable overload set at maximum unless lower pressure is specified. To specify, add PSI value at end of part number (ex: P1A-250-8000).

BASE MOUNT

P SERIES: BASE MOUNT – SCREW RELEASE MODELS

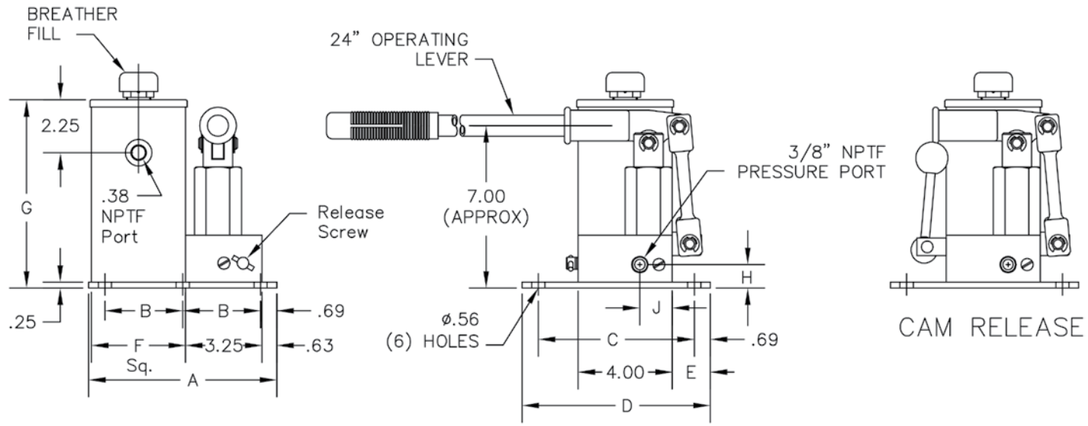
Standard Model	100% Stainless Steel* (SS) Model	Max Pressure (PSI)	Piston Diameter (inches)	Volume per Stroke (cu-in)	Lever Force per 100 PSI (lbs)	Inlet/Outlet Port Size (inches)
P1A	P1A-SS	10,000	1/2	0.29	1.2	3/8
P2A	P2A-SS	5,000	3/4	0.66	2.8	3/8
P3A	P3A-SS	2,500	1	1.18	4.9	3/8
P4A	P4A-SS	1,500	1-1/4	1.84	7.8	3/8
P5A	P5A-SS	1,000	1-1/2	2.65	11	3/8
P6A	P6A-SS	500	2	4.71	20	3/8

P SERIES: BASE MOUNT – CAM RELEASE MODELS

Model	100% Stainless Steel* (SS) Model	Max Pressure (PSI)	Piston Diameter (inches)	Volume per Stroke (cu-in)	Lever Force per 100 PSI (lbs)	Inlet/Outlet Port Size (inches)
P1AC	P1AC-SS	10,000	1/2	0.29	1.2	3/8
P2AC	P2AC-SS	5,000	3/4	0.66	2.8	3/8
P3AC	P3AC-SS	2,500	1	1.18	4.9	3/8
P4AC	P4AC-SS	1,500	1-1/4	1.84	7.8	3/8
P5AC	P5AC-SS	1,000	1-1/2	2.65	11	3/8
P6AC	P6AC-SS	500	2	4.71	20	3/8

* Use a suffix of "SC" rather than "SS" to denote the use of stainless steel for wetted parts ONLY and carbon steel for all other parts of the pump

P SERIES: BASE MOUNT – SCREW/CAM RELEASE DRAWING



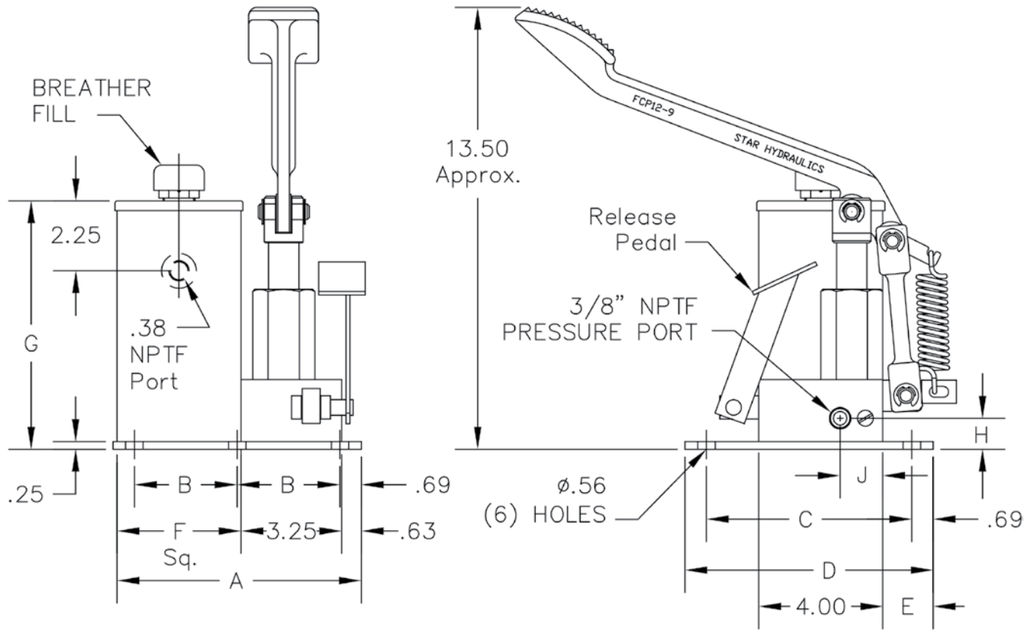
P SERIES: SINGLE-PISTON PUMPS

FOOT-OPERATED

FP SERIES: FOOT-OPERATED MODELS

Model	Max Pressure (PSI)	Piston Diameter (inches)	Volume per Stroke (cu-in)	Pedal Force per 100 PSI (lbs)	Inlet/Outlet Port Size (inches)
FP1AC-LR	5,000	1/2	0.29	2.3	3/8
FP2AC-LR	2,500	3/4	0.66	5.2	3/8
FP3AC-LR	1,250	1	1.18	9.2	3/8
FP4AC-LR	750	1-1/4	1.84	14.5	3/8
FP5AC-LR	500	1-1/2	2.65	21	3/8
FP6AC-LR	250	2	4.71	37	3/8

FP SERIES: FOOT-OPERATED DRAWING



in³	A	B	C	D	E	F	G	H (P1-3)	H (P4-6)	J (P1-3)	J (P4-6)	Wt (no oil) (lbs)
80	8	3-5/16	6-5/8	8	1-5/8	4	9-1/2	1.06	1.00	1.56	1.38	22 - 26
160	8	3-5/16	6-5/8	8	1-5/8	4	15-1/2	1.06	1.00	1.56	1.38	25 - 29
250	10	4-15/16	7-5/8	9	2-1/2	6	10-1/2	1.06	1.00	1.56	1.38	29 - 34

* Weight range for models and mounting positions for P1 through P6

TO ORDER:
Call **708.453.3238** or email **sales@starhyd.com**

Quality-Driven from the Top

Our reputation for Performance Under Pressure is the result of a conscious commitment to customer satisfaction. Achieving that calls for robust products, flexible manufacturing processes and, most of all, knowing what you're doing.

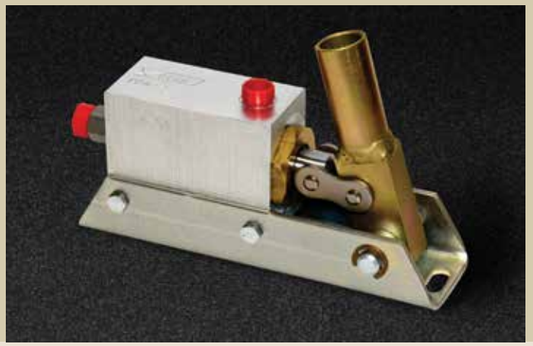
All Star associates take great pride in making our products the best they can be. From raw material through machining, welding, assembly, painting, testing and inspection, you can be sure our associates do their best to provide you products they're proud to stand behind.

Management proudly stands behind every product made at Star Hydraulics. Our management team is guided by Doug Moser (left), Senior Sales Agent, and Star President Brian Althoff.

Expert machinists like Frank Palumbo bring a wealth of machining know-how, allowing Star to provide custom and replacement cylinders and other hydraulic components.

PDA SERIES:

Double-Acting Pumps



This **double-acting pump** delivers oil when the pump handle is moved in either direction. This feature provides a more even flow of oil than the single-piston pump, which delivers oil when the piston moves in, but no oil when it moves out. Our PDA pump is compact and lightweight, made with aluminum, bronze and stainless steel components. It does not include overload, relief or release valves, so these pumps are to be used only with equipment that has its own reservoir and release valves.

Features

- Pumps oil when handle moves in either direction
- Versatile – horizontal or vertical mounting
- 24 in. operating handle
- Does not include overload or manual pressure relief valves

Design Details

- Aluminum, bronze and stainless steel "wetted" parts
- 100% O-ring seals
- Leakproof O-ring ports
- Predrilled mounting holes

PDA MODELS

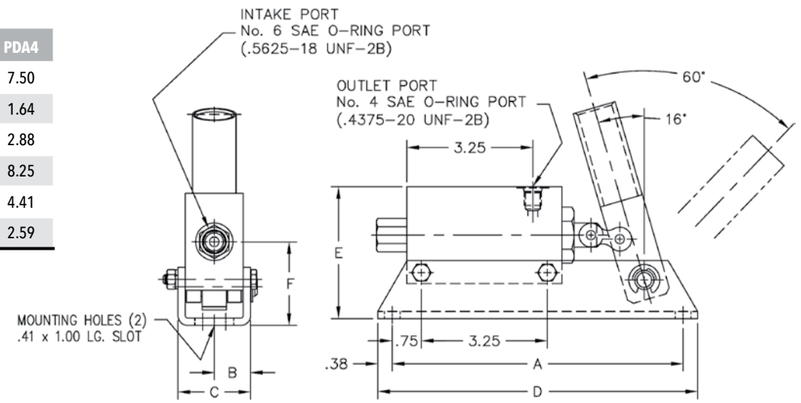
Model	Max Pressure (PSI)	Volume per Stroke (cu-in)	Lever Force per 100 PSI (lbs)	Inlet Port Size, O-Ring Type (inches)	Outlet Port Size, O-Ring Type (inches)	Net Weight (with handle) (lbs)
PDA1	4,000	0.75	1.6	9/16 - 18	7/16 - 20	7
PDA2	2,000	1.5	3.9	9/16 - 18	7/16 - 20	10
PDA3	1,500	1.97	4.5	9/16 - 18	7/16 - 20	10
PDA4	1,000	2.9	7.8	9/16 - 18	9/16 - 18	11

Design Note

System designer must provide overload relief protection for system if required; pumps do **not** have an overload relief valve and can exceed maximum rated pressure if too much force is applied.

PDA DRAWING (TYPICAL)

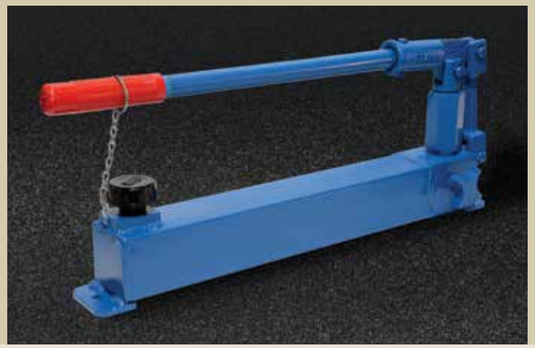
Dimensions	PDA1	PDA2	PDA3	PDA4
A	7.50	7.88	7.88	7.50
B	0.94	1.19	1.19	1.64
C	1.88	2.38	2.38	2.88
D	8.25	8.63	8.63	8.25
E	3.4	3.7	3.7	4.41
F	2.16	2.22	2.22	2.59



IMMEDIATE DELIVERY:
Available for all standard pumps.

PH SERIES:

Portable Pumps



The **Star PH Series pump** is great for applications that require portability. It can be used with or without fixed mounting and operate in horizontal or vertical position. It's compact for tight spaces and easily transported. This pump is made of steel for durability and reliability and includes a reservoir, a manual pressure relief valve and an adjustable overload release valve. Use it as a primary pump for a hydraulic system or a standby pump for emergencies.

Features

- No mounting required
- Predrilled holes for optional mounting
- 70 in^3 reservoir with breather filter
- Manual pressure release valve
- Factory-set overload relief valve
- Lightweight – only 17 lbs.
- Up to 10,000 PSI
- Ground and hard chrome-plated piston
- Versatile – operates in horizontal or vertical position
- All-steel body (standard)

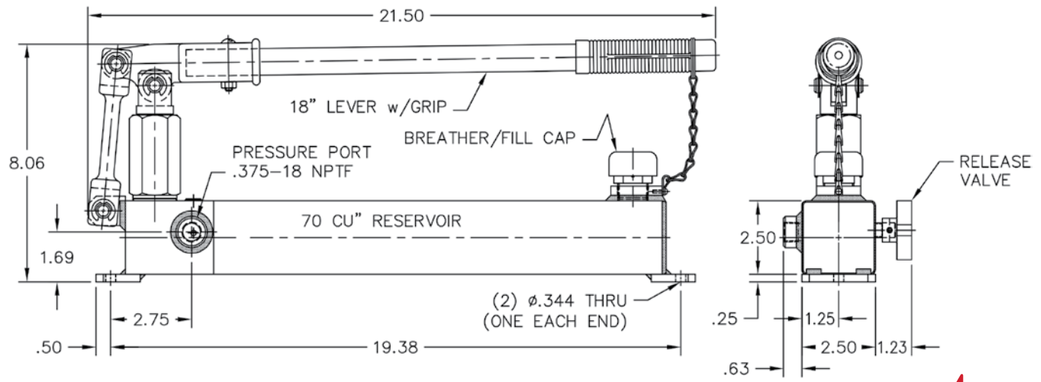
PH SERIES MODELS

Model	Max Pressure (PSI)	Piston Diameter (inches)	Volume per Stroke (cu-in)	Lever Force per 100 PSI (lbs)	Inlet/Outlet Port Size (inches)	Net Weight (no oil) (lbs)
PH1	10,000	1/2	0.29	1.35	3/8	15
PH2	5,000	3/4	0.66	3.0	3/8	15
PH3	2,500	1	1.18	5.4	3/8	15

Design Note

Adjustable overload is set at maximum unless lower pressure is specified. To specify, add PSI value to end of part number (ex: PH-1-8500).

PH SERIES DRAWING



PS SERIES:

Compact Pumps

The **Star PS Series Compact Pump** is an efficient, economical tool for developing or increasing pressure in a hydraulic system when installation space is limited. This is a basic pump with an optional pressure relief valve. Use only in a hydraulic system with its own reservoir and overload valve.

Features

- Compact size for tight mounting applications
- Optional pressure release valve
- Up to 5,000 PSI
- Ground and hard chrome-plated piston
- All-steel body (standard)
- 24-in. handle

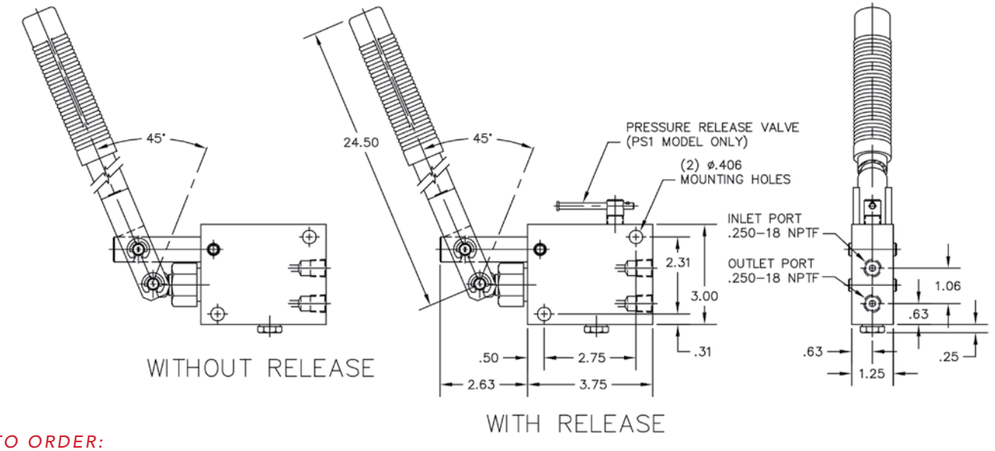
Design Notes

- To be used on equipment with its own reservoir
- System designer must provide overload relief protection for system if required; these pumps do not have an overload relief valve and can exceed maximum rated pressure if too much force is applied

PS SERIES MODELS

Model	Max Pressure (PSI)	Piston Diameter (inches)	Volume per Stroke (cu-in)	Lever Force per 100 PSI (lbs)	Inlet/Outlet Port Size (inches)	Net Weight no oil (lbs)	Release Valve
PS1	5,000	5/8	0.3	1.9	3/8	6	Yes
PS2	5,000	5/8	0.3	1.9	3/8	6	No

PS SERIES DRAWING



TO ORDER:
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Machining Know-How, Hydraulics Expertise

Star has been making hydraulic products since 1948. Our veteran machinists have earned a lifetime of skills and hands-on knowledge that proves invaluable in training and developing our next generation of machinists. In addition to our people, Star continues to invest in high-performance, automated equipment to provide continuing improvement in our processes, capabilities and competitiveness.

CNC programmer and machinist Gabe Bueno sets up one of Star's multiple-spindle machining centers.

Dual-Piston Pumps
(less reservoir)

Star two-speed, dual-piston (Hi-Lo) pumps provide rapid movement at low pressure for the part of a cylinder's stroke when no work is encountered. The pump automatically switches to high pressure when the cylinder must deliver maximum push or pull force. Changeover from high-volume/low-pressure to low-volume/high-pressure occurs automatically at approximately 300 PSI. Star's unique valve design uses a single 24 in. lever for high-pressure and low-pressure pumping; no need to interrupt pumping to move the lever. These pumps are used on hydraulic systems with a built-in reservoir.

Features

- Up to 20,000 PSI
- Rapid movement at low pressure when minimal work is needed
- Switches to high pressure for maximum force
- Automatic changeover at approximately 300 PSI
- Base- and flange-mounted options
- Foot-operated versions available
- Includes manual pressure release valve with screw or cam release
- Customer-specified overload relief valve setting
- Does not include a reservoir
- 24 in. operating lever

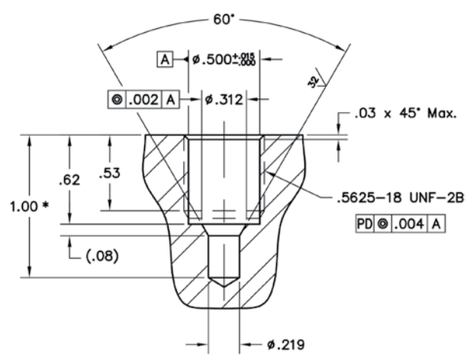
Design Details

- Ground and hard chrome-plated piston
- All-steel body (standard)

Design Notes

- Factory overload set at maximum unless lower pressure is specified. To specify, add the PSI value to end of part number (ex: CPS13-LR-8000)
- PL pumps do not have threaded inlet ports; they must be gasket mounted to reservoir
- All CP04 style pumps have a unique port to handle high pressure requirements (see CP04 port drawing for details)

CP04 Port: Detail Drawing



BASE MOUNT

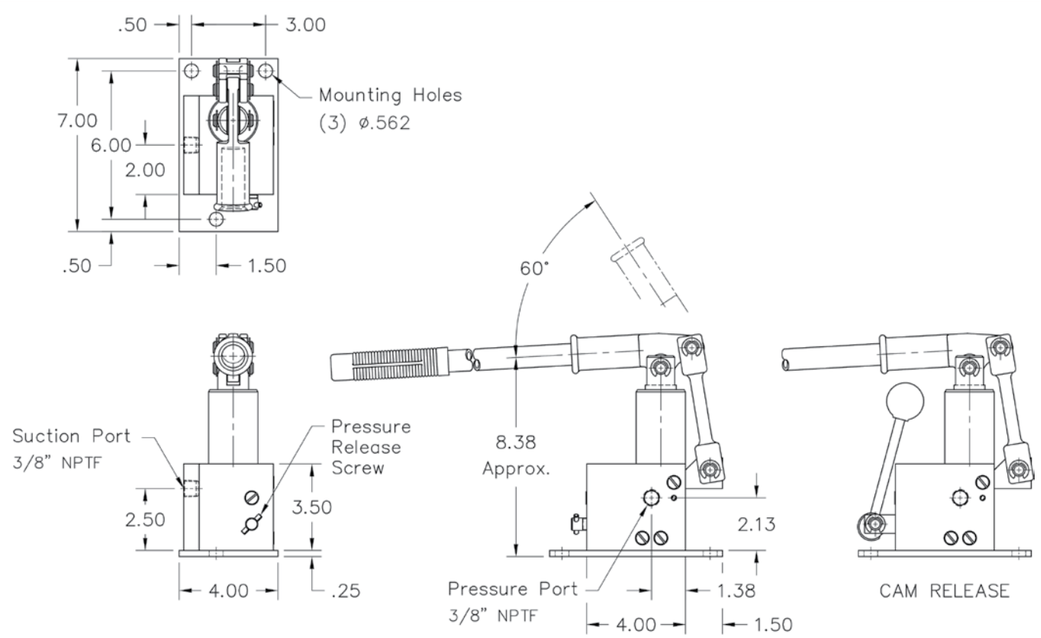
CPS-LR: BASE MOUNT – SCREW RELEASE MODELS

Standard Model	Max Pressure (PSI)	Piston Diameter (inches)	Volume per Stroke Lg Piston (cu-in)	Volume per Stroke Sm Piston (cu-in)	Lever Force per 100 PSI (lbs)	Inlet/Outlet Port Size (inches)	Net Weight (lbs)
CPS13-LR	10,000	1-1/4 – 1/2	1.84	0.29	12	3/8	23
CPS14-LR	10,000	1-1/2 – 1/2	2.65	0.29	12	3/8	23
CPS15-LR	10,000	2 – 1/2	4.71	0.29	12	3/8	23
CPS04-LR	20,000	1-1/4 – 5/16	2.65	0.11	4.8	CP04	23

CP-LR: BASE MOUNT – CAM RELEASE MODELS

Standard Model	Max Pressure (PSI)	Piston Diameter (inches)	Volume per Stroke Lg Piston (cu-in)	Volume per Stroke Sm Piston (cu-in)	Lever Force per 100 PSI (lbs)	Inlet/Outlet Port Size (inches)	Net Weight (lbs)
CP13-LR	10,000	1-1/4 – 1/2	1.84	0.29	12	3/8	23
CP14-LR	10,000	1-1/2 – 1/2	2.65	0.29	12	3/8	23
CP15-LR	10,000	2 – 1/2	4.71	0.29	12	3/8	23
CP04-LR	20,000	1-1/4 – 5/16	2.65	0.11	4.8	CP04	23

CPS-LR BASE MOUNT, SCREW/CAM RELEASE DRAWING



FLANGE MOUNT

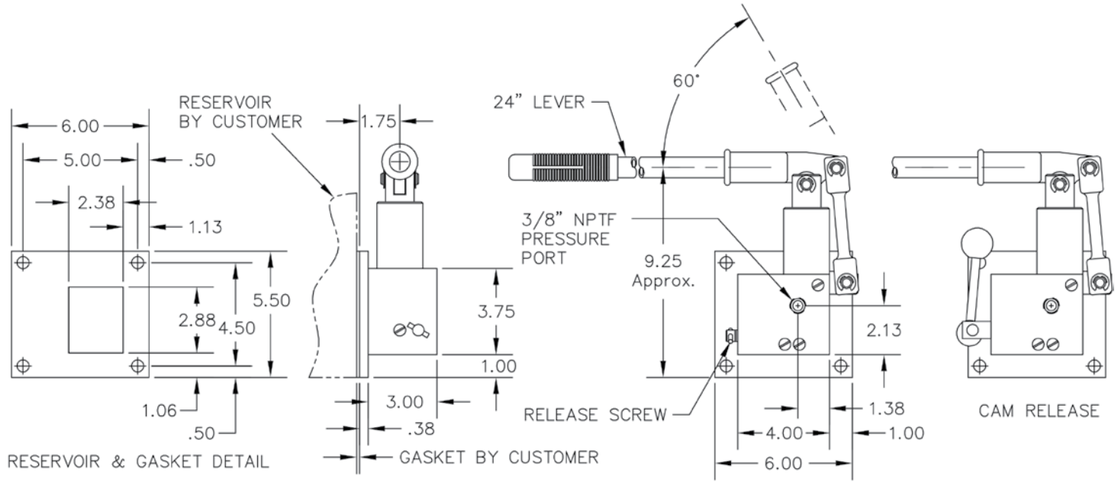
CPS-PL: FLANGE MOUNT – SCREW RELEASE MODELS

Standard Model	Max Pressure (PSI)	Piston Diameter (inches)	Volume per Stroke Lg Piston (cu-in)	Volume per Stroke Sm Piston (cu-in)	Lever Force per 100 PSI (lbs)	Inlet/Outlet Port Size (inches)	Net Weight (lbs)
CPS13-PL	10,000	1-1/4 – 1 /2	1.84	0.29	12	3/8	23
CPS14-PL	10,000	1-1/2 – 1/2	2.65	0.29	12	3/8	23
CPS15-PL	10,000	2 – 1/2	4.71	0.29	12	3/8	23
CPS04-PL	20,000	1-1/4 – 5/16	2.65	0.11	4.8	CP04	23

CP-PL: FLANGE MOUNT – CAM RELEASE MODELS

Standard Model	Max Pressure (PSI)	Piston Diameter (inches)	Volume per Stroke Lg Piston (cu-in)	Volume per Stroke Sm Piston (cu-in)	Lever Force per 100 PSI (lbs)	Inlet/Outlet Port Size (inches)	Net Weight (lbs)
CP13-PL	10,000	1-1/4 – 1 /2	1.84	0.29	12	3/8	23
CP14-PL	10,000	1-1/2 – 1/2	2.65	0.29	12	3/8	23
CP15-PL	10,000	2 – 1/2	4.71	0.29	12	3/8	23
CP04-PL	20,000	1-1/4 – 5/16	2.65	0.11	4.8	CP04	23

CP-PL FLANGE MOUNT, SCREW/CAM RELEASE DRAWING

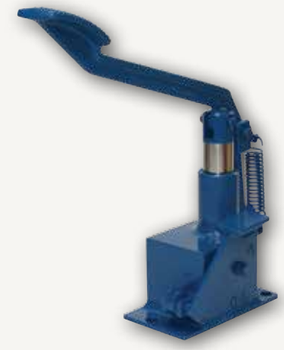


CP-LR SERIES: DUAL-PISTON PUMPS

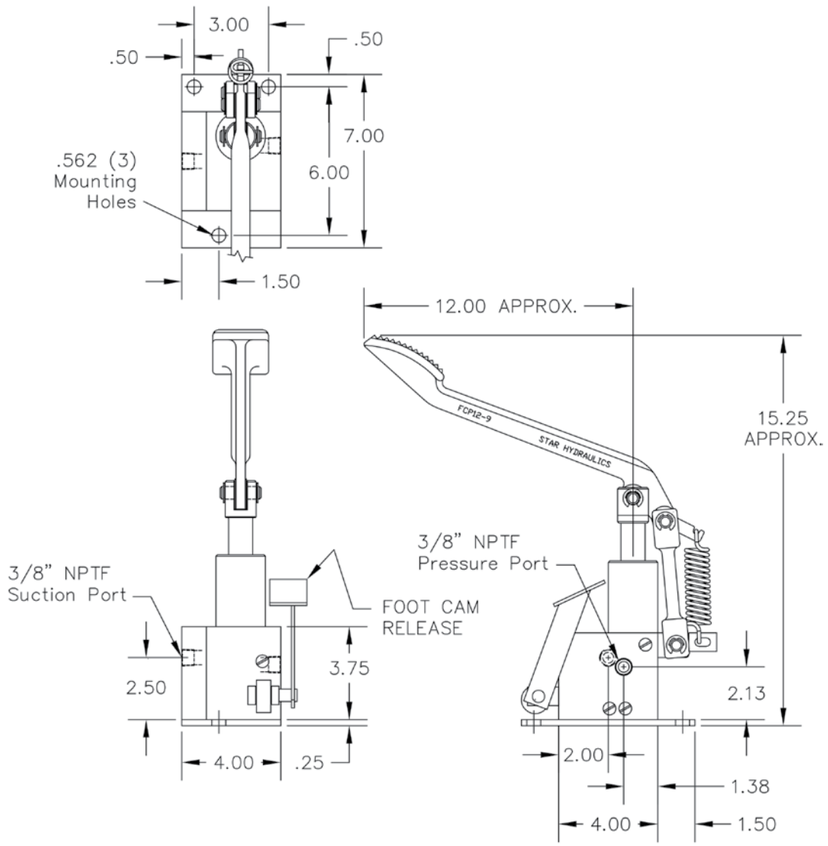
FOOT-OPERATED

FCP-LR FOOT-OPERATED MODELS

Standard Model	Max Pressure (PSI)	Piston Diameter (inches)	Volume per Stroke Lg Piston (cu-in)	Volume per Stroke Sm Piston (cu-in)	Lever Force per 100 PSI (lbs)	Inlet/Outlet Port Size (inches)	Net Weight (lbs)
FCP13-LR	5,000	1-1/4 – 1/2	1.84	0.29	23	3/8	19
FCP14-LR	5,000	1-1/2 – 1/2	2.65	0.29	23	3/8	19
FCP15-LR	5,000	2 – 1/2	4.71	0.29	23	3/8	19
FCP04-LR	10,000	1-1/4 – 5/16	2.65	0.11	9	CP04	19



FP SERIES: FOOT-OPERATED DRAWING



Dual-Piston Pumps
(with reservoir)

Star two-speed, dual-piston (Hi-Lo) pumps provide rapid movement at low pressure for the part of a cylinder's stroke when no work is encountered. The pump automatically switches to high pressure when the cylinder must deliver maximum push or pull force. Changeover from high-volume/low-pressure to low-volume/high-pressure occurs automatically at approximately 300 PSI. Star's unique valve design uses a single 24 in. lever for high-pressure and low-pressure pumping; no need to interrupt pumping to move the lever. These pumps include a built-in reservoir.

Features

- Up to 20,000 PSI
- Rapid movement at low pressure when minimal work is needed
- Switches to high pressure for maximum force
- Automatic changeover at approximately 300 PSI
- Base- and flange-mounted options
- Base-mounted pumps in hand- or foot-operated versions
- Includes manual pressure release valve with screw or cam release
- Adjustable overload relief valve
- Includes reservoir – 80, 160 and 250 in^3 standard sizes
- Supplied with 24 in. operating handle

Design Details

- Ground and hard chrome-plated piston
- All-steel body (standard)

Design Note

Factory overload is set at maximum unless lower pressure is specified. To specify, add PSI value to end of part number (ex: CPS13-80-8000).

BASE MOUNT

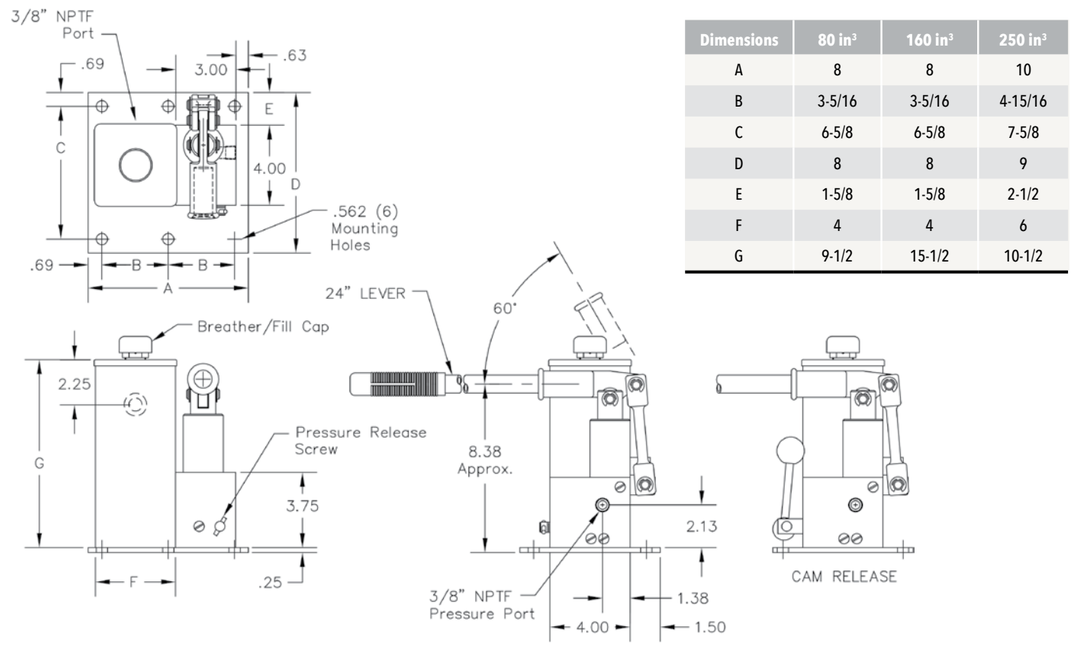
CPS BASE MOUNT – SCREW RELEASE MODELS

Model	Max Pressure (PSI)	Piston Diameter (inches)	Volume per Stroke Lg Piston (cu-in)	Volume per Stroke Sm Piston (cu-in)	Lever Force per 100 PSI (lbs)	Inlet/Outlet Port Size (inches)	Net Weight (80 cu-in no oil) (lbs)
CPS13	10,000	1-1/4 – 1/2	1.84	0.29	12	3/8	28
CPS14	10,000	1-1/2 – 1/2	2.65	0.29	12	3/8	28
CPS15	10,000	2 – 1/2	4.71	0.29	12	3/8	28
CPS04	20,000	1-1/4 – 5/16	2.65	0.11	4.8	CP04	28

CP BASE MOUNT – CAM RELEASE MODELS

Standard Model	Max Pressure (PSI)	Piston Diameter (inches)	Volume per Stroke Lg Piston (cu-in)	Volume per Stroke Sm Piston (cu-in)	Lever Force per 100 PSI (lbs)	Inlet/Outlet Port Size (inches)	Net Weight (80 cu-in no oil) (lbs)
CP13	10,000	1-1/4 – 1/2	1.84	0.29	12	3/8	28
CP14	10,000	1-1/2 – 1/2	2.65	0.29	12	3/8	28
CP15	10,000	2 – 1/2	4.71	0.29	12	3/8	28
CP04	20,000	1-1/4 – 5/16	2.65	0.11	4.8	CP04	28

CP BASE MOUNT, SCREW/CAM RELEASE DRAWING

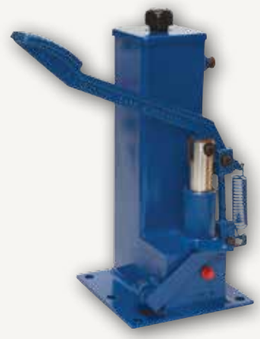


Dimensions	80 in^3	160 in^3	250 in^3
A	8	8	10
B	3-5/16	3-5/16	4-15/16
C	6-5/8	6-5/8	7-5/8
D	8	8	9
E	1-5/8	1-5/8	2-1/2
F	4	4	6
G	9-1/2	15-1/2	10-1/2

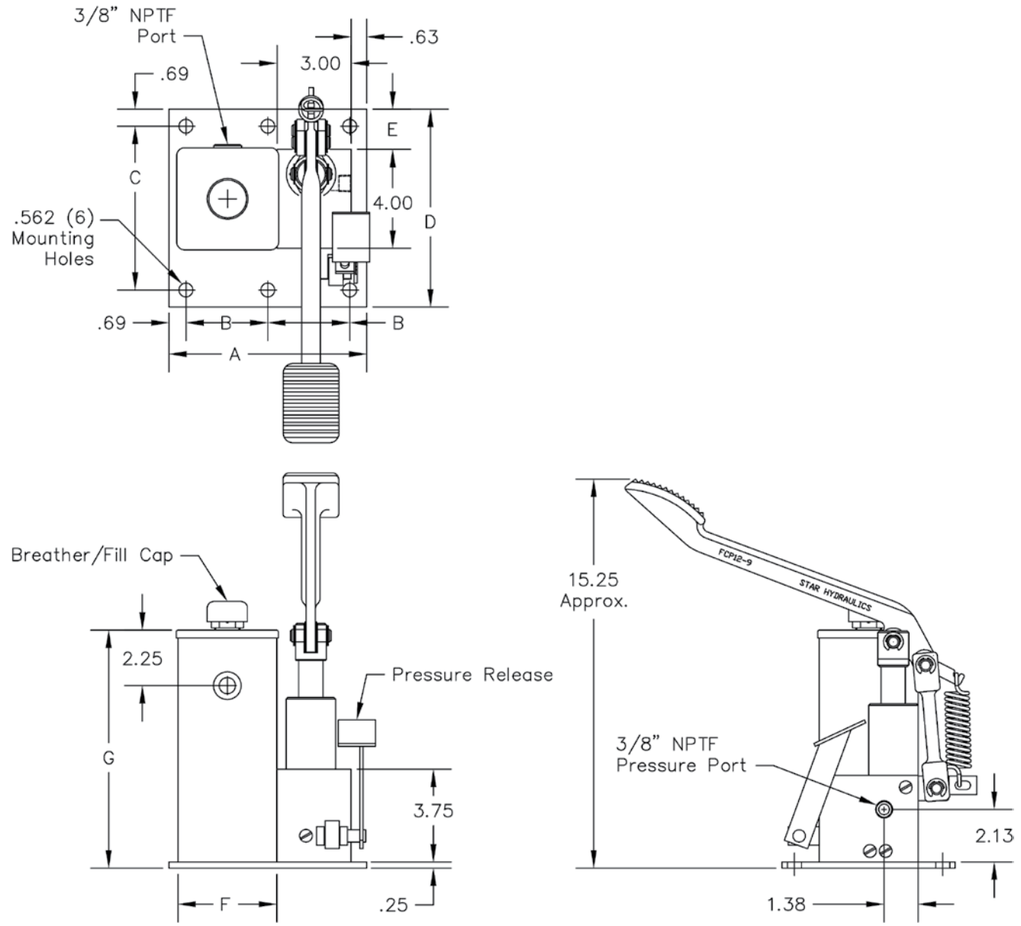
FOOT-OPERATED

FCP FOOT-OPERATED MODELS

Standard Model	Max Pressure (PSI)	Piston Diameter (inches)	Volume per Stroke Lg Piston (cu-in)	Volume per Stroke Sm Piston (cu-in)	Lever Force per 100 PSI (lbs)	Inlet/Outlet Port Size (inches)	Net Weight (80 cu-in no oil) (lbs)
FCP13	5,000	1-1/4 – 1/2	1.84	0.29	23	3/8	29
FCP14	5,000	1-1/2 – 1/2	2.65	0.29	23	3/8	29
FCP15	5,000	2 – 1/2	4.71	0.29	23	3/8	29
FCP04	10,000	1-1/4 – 5/16	2.65	0.11	9	CP04	29



FCP FOOT-OPERATED DRAWING



This automated multi-spindle CNC lathe is being set up by machinist Tony Marchev. It allows Star to make complex parts from a bar of steel to a finished part with a single set-up. Once set up, this machine can run continuously to meet high-volume requirements with its lights-out capability.

The Full Range of Technology

From state-of-the-art CNC mills to low-horsepower equipment, Star has the technology and expertise on hand for the job. Multi-axis machining centers hold precise tolerances, supported by statistical process controls and confirmed by periodic inspections. Star's 60-tool Haas CNC mill and this multiple-spindle Mori Seiki lathe (seen here) are just two of many machines used during our manufacturing process.

Pumps with 4-Way Valves

Pumps with 4-way valves are used with double-acting cylinders. This 4-way valve allows the pump to advance or retract a double-acting cylinder at full pump pressure.

A 4-way valve can be placed on any **P, PH and CP** series pump. To order, simply add "-4V" after the pump model number (ex: P2A-160-4V).

Features

- Same features as each model without this 4-way valve

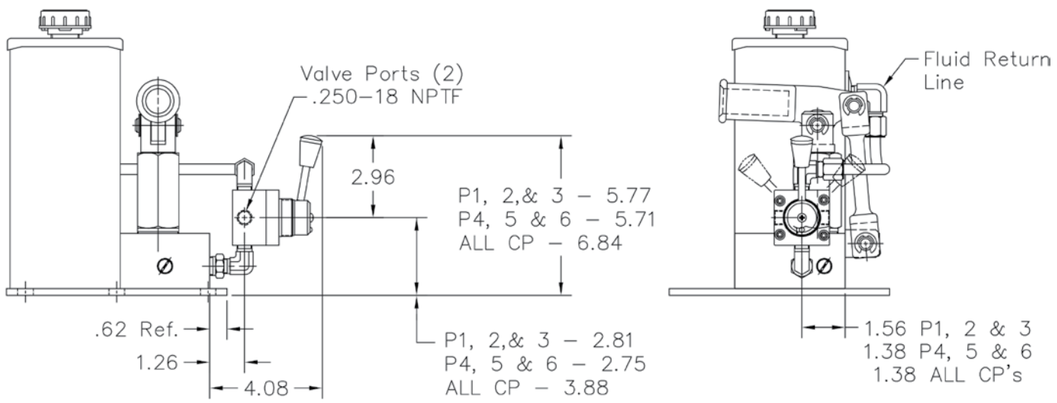
Typical Applications

- Industrial transfer of liquid
- Operates presses, valves, doors, safety locks and various other devices

Design Details

- These valves do not have release valves because the 4-way valve is used to release pressure
- Use 4-way valves only on pumps up to 10,000 PSI

TYPICAL 4-WAY VALVE DRAWING



Custom Pumps

Star can customize standard pumps to match your unique application. Often, this is achieved with components common to standard designs. But we also customize blocks, pistons and other features as needed. Some of the more common customization features are listed below.

Modification Options

- 4-way valve
- Sight glass
- Gauges
- Carrying handle
- Valves, fittings, clamps, hose

Typical Custom Modifications

- Extended pump lever
- Extended release lever
- Special seals (e.g., arctic seals for low-temperature use)
- Custom reservoir size
- Paint color
- Plating material
- Port type (such as SAE ports)
- Overload settings
- Mounting holes and slots
- Special piston materials
- Soft seat release

Design, Test Customization

- Special test, valve setting and certification requirements
- Ganged (multiple) pump configurations
- Custom pump base plate
- Reversed pump handle
- Pump block, overload and release valve
- Addition of a special cylinder

Specifying a Custom Feature

Our customer service and engineering staff will be happy to help you with any customization you need. Whether you send us your drawing and specifications or we provide them to you, we strive to meet your special requirements as quickly and efficiently as possible.

Reservoirs

Star can provide both standard and customized reservoirs to match your application. Our reservoirs are made heavy-duty with all-steel construction to last in tough environments. Our reservoirs are available in two standard cross-sectional sizes and can be made to any length to meet your capacity requirements. These reservoirs can be mounted horizontally or vertically.

Features

- Heavy duty: all-steel construction, painted
- Can mount horizontally or vertically
- Custom capacities available – order the length you need
- Uses a ¾ N.P.T. breather plug

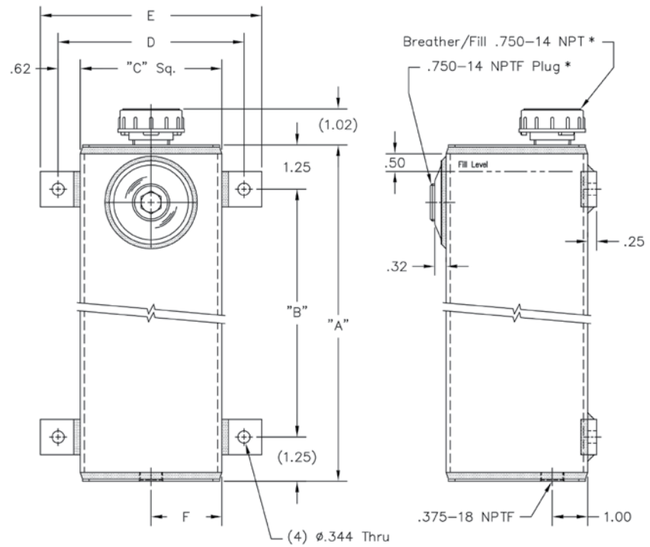
Specifying Reservoir Length

- Add reservoir length to standard model R4 or R6 (Example: R4-17 is a 4 in. x 4 in. x 17 in. reservoir with capacity = 1 gal [231 in^3])

RESERVOIR MODELS

Model	Capacity (gal)	Volume – Vertical (cu-in)	Volume – Horizontal (cu-in)	Length (in)
R4-9	0.5	119	74	9.5
R4-17	1.0	232	140	17.5
R4-25	1.5	345	206	25.5
R4-34	2.0	472	280	34.5
R4-50	3.0	697	412	50.5
R6-4	0.5	116	96	4.5
R6-8	1.0	248	193	8.5
R6-12	1.5	380	290	12.5
R6-15	2.0	480	362	15.5
R6-23	3.0	745	555	23.5
Custom R4–R6	Customer-specified length			

OIL RESERVOIR DRAWING



R4 Reservoir Size/Length						
RESERVOIR	"A"	"B"	"C"	"D"	"E"	"F"
R4–9	9.50	7.00	4.00	5.25	6.50	2.00
R4–17	17.50	15.00	4.00	5.25	6.50	2.00
1.50	25.50	23.00	4.00	5.25	6.50	2.00
2.00	34.50	32.00	4.00	5.25	6.50	2.00
3.00	50.50	48.00	4.00	5.25	6.50	2.00
R6 Reservoir Size/Length						
RESERVOIR	"A"	"B"	"C"	"D"	"E"	"F"
R6–4	4.50	2.00	6.00	7.25	8.50	3.00
R6–8	8.50	6.00	6.00	7.25	8.50	3.00
R6–12	12.50	10.00	6.00	7.25	8.50	3.00
R6–15	15.50	13.00	6.00	7.25	8.50	3.00
R6–23	23.50	21.00	6.00	7.25	8.50	3.00

* For use in the horizontal position swap the .750–14 breather and plug.

Deep Roots, Midwestern Values

This 30,000 sq. ft. facility in River Grove, Illinois, continues to be home to Star Hydraulics manufacturing and administrative offices. Some Star employees have come through these doors every day for 30 years or more.

CNC programmer and machinist Gabe Bueno inspects cutting of pump blocks as they get machined using our Haas EC400 machining center.

Star Replacement Parts/Kits

At Star Hydraulics, we design and build our pumps with heavy-duty materials to withstand extensive use in some of the toughest environments. Our pumps are often used in critical applications and must work when called upon. However, even with robust designs and high-quality components, the piston and piston packing materials must be in motion for the pump to work, so there will be wear and tear on some pump components.

Over time, you may need to replace some of the piston packing materials such as springs, seals and wipers. We design our pumps to make it easy to replace these items while in application. We have standard seal kits and repair kits with instructions for every pump.

Standard Service Parts

- **Repair Kit** – Piston packing components, wiper, release valve and overload valve components
- **Seal Kit** – Piston packing components; standard seal material is nitrile; for other seal materials, please contact us
- Foot pump lever return spring
- Foot release return spring
- Pump levers
- Ball seating tool

Ordering

To order a repair kit, just add "-RK" at the end of your pump's model number. For example:

- P1A Repair Kit is P1A-RK
- CP-04 Repair Kit is CP-04-RK
- P5AC Repair Kit is P5AC-RK

If you need help with a service parts order, **please be sure to have the pump model number handy**, so we can make sure you get the correct service kits or parts. If you don't know the model number, or you have any questions about what you need to order, visit our website – **www.starhyd.com** – for an easy-to-use guide that helps you identify the repair kit, the pump model or other components you're looking for.

Factory Rebuilding

If you'd like us to repair or rebuild your pump(s), just **call Customer Service at 708.453.3238.** We'll provide pricing, rebuild time and instructions for shipping.

Operated by Mike Schultz, this programmable, high-precision, dual-column Cosen saw allows us to easily program the cut and length of bars and rods to eliminate waste and reduce cycle time when machining parts.

Stellar Service Every Step of the Way

Star goes to great lengths – from cutting our own bulk raw material to control quality and costs to multipoint inspections all along the production process – to make sure every product and service you get with Star is everything it should be. That's customer service the Star way. Call 708.453.3238 or click www.starhyd.com for a quote, and see for yourself, today.

Hydraulic Jacks

In a single, compact, lightweight unit, Star combines an efficient pump and durable cylinder with 1-ton lifting capacity. The HF500 jack is easy to operate – it takes only 4½ lbs. of pedal force per 100 lbs. of load – and fast acting. For each stroke of the folding pump foot pedal, the cylinder piston rod moves ½ in. It has a built-in release pedal for rapid lowering, and the jack is equipped with lugs that make it easy to mount. Star will provide any cylinder stroke length, subject to the limitations in the specification table below.

Features

- Full 2,000 lb. lifting capacity
- Easily operated pedal type pump – 4½ lbs. pedal force per 100 lbs. of load
- Release pedal for rapid lowering
- Folding foot pedal
- Relief valve at top of stroke
- Optional overload relief valve (within stroke length)

Design Details

- Ground and hard chrome-plated piston
- Maximum stroke with 2,000 lb. load and no eccentric loading
- Cylinder and rod pinned ends – 25 in. stroke maximum
- Cylinder fixed and rod guided – 40 in. stroke maximum
- Minimum stroke with pedal return spring – 9 in.
- Piston rod travel per pump stroke – ½ in.
- Custom stroke lengths available

Typical Custom Modifications

- Stroke length (min. 4.5 in., max. 40 in. with guided load)
- Foot pedal tread plate
- Compact pedal
- Rod thread type
- Paint color
- Special mounting holes and slots
- Special piston materials
- Soft seat release

Specifying a Custom Feature

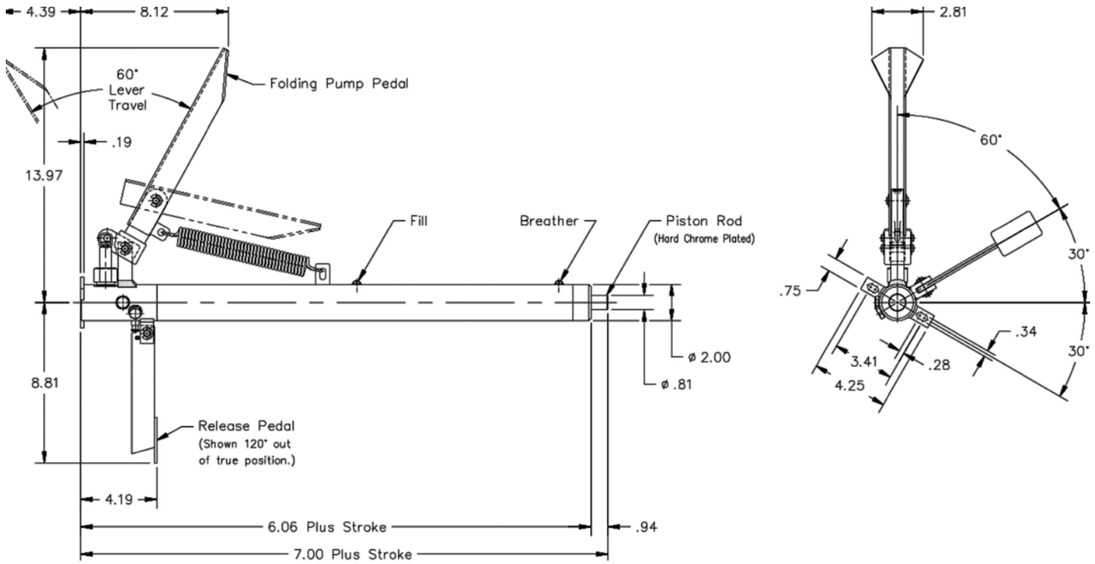
Our customer service and engineering personnel will be happy to help you with any customization you need. Whether you send us your drawing and specifications or we provide them to you, we strive to meet your special requirements as quickly and efficiently as possible.

HF500 STANDARD MODELS

Model	Stroke Length (in)	Total Length Retracted (in)	Total Length Extended (in)	Weight (lbs)
HF500-7IN	7	14	21	12.0
HF500-9IN	9	16	25	13.0
HF500-12IN	12	19	31	14.5
HF500-15IN	15	22	37	16.0
HF500-19IN	19	26	45	18.0
HF500-25IN	25	32	57	21.0
HF500-31IN	31	38	69	24.0
HF500-36IN	36	43	79	26.5

To add relief valve, add "-RV" to the end of the model number

HF500 HYDRAULIC JACK DRAWING



Hydraulic Cylinders

When you can't buy the cylinder you need off the shelf or you need someone to build a cylinder to your custom design, come to Star Hydraulics. With our specialized engineering knowledge and skills, we can analyze your hydraulic cylinder problems and build a custom solution for your application, from a single piece to hundreds of parts.

We use a wide variety of materials: steel, brass, aluminum, cast iron, cast steel, bronze and stainless steel. We also offer every type of seal: O-rings, T-seals, U-cups, V-rings and piston rings in all materials – buna, viton, teflon, urethane and cast iron.

Meticulous standards of design, engineering and manufacturing ensure dependable cylinder performance, long life and minimal maintenance. At Star, we pressure-test 100% of our products before shipping to ensure you receive a properly functioning cylinder ready for use.

Features

- Single- or double-acting pumps
- Telescopic
- Up to 10,000 PSI
- Capacities to 1,500 tons
- Bores to 20 in.
- Strokes to 16 ft.
- Solid and hole-thru rods
- Double rod end
- Stroke indicating devices

We also use a wide variety of materials to meet all operating conditions.

- Corrosive atmospheres
- Extreme heat and cold
- Special hydraulic fluids

Industry Focus
Aerospace
Automotive/transportation
Construction
Electrical
Food processing
Machine tool
Marine
Medical
Mining
Oil/gas/petroleum
Railroad
Steel

Typical Applications
Booms
Braking and locking
Clamping
Cranes
Mill duty
Positioning
Press
Shock absorbers
Spreading

Cylinder Styles
Air-oil
Double-acting
Hydro-pneumatic
Multiple bore
Non-rotating
Single-acting
Smooth body
Spring advance
Tie rod
Welded

Configurations
Bolted
Diaphragm
Double end rod
Hollow rod
Low profile
Mechanical locking
Screw-on caps
Telescoping

Body/Rod Materials
Alloy steel
Aluminum
Carbon steel
Stainless steel

Mounting
ACME threaded rod
Centerline lugs
Extended tie rods
Flange
Head clevis
Head trunnion
Intermediate trunnion
Rear clevis
Rear trunnion
Side lugs
Side tapped
Threaded cylinder collar

Cylinder Positioning
Fixed
Pivot

Cylinder Rod End
Clevis
Rod Eye
Spherical Rod End
Threaded

Position Sensing
Hall effect
Reed switch

Finishes
Epoxy
Paint

Cylinder Characteristics
Adjustable stroke
Corrosion-proof
Corrosion-resistant
High-pressure
High-temperature (to 400°)
Large-bore
Bore: Max. 20 in./508 mm; min. ¾ in./19.05 mm
Stroke: Max. 16 ft./4.88 m
Outside diameter: Max. 30 in./762 mm
Operating pressure: Max. 10,000 PSI, min. 1 PSI
Maximum weight: 10 tons
Maximum capacity/force (push): 1.1 million lbf.
Tolerances to + 0.002 in., + 0.051 mm

File Formats Accepted for Customer Designs
AutoCAD (DWG, DWZ)
BMP (Bit-Mapped Graphics)
DXF (Drawing Interchange Format or Drawing Exchange Format)
GIF (Graphics Interchange Format)
JPG or JEPG (Joint Photographic Experts Group)
PDF (Portable Document Format)
TIFF (Tagged Image File Format)

Production Volume Capability
Prototype to low volume
Specialty production shop
High volume (typical 50 units/week)
Reconditioning (we recondition products we manufacture)

Star Products Meet These Industry Standards
American Society of Mechanical Engineers (ASME)
American Society for Testing and Materials (ASTM)
American Welding Society (AWS)
Coast Guard specifications
DNV
Military specifications (Mil-Spec)
Restriction of Hazardous Substances compliant (RoHS)

Post Straighteners

One person can operate this compact, lightweight, **portable post straightener** with 1-ton lifting capacity to straighten concrete-mounted pipes and posts up to 2 in. thick. Our heavy-duty model has a 2-ton lifting capacity and can straighten posts made of 2½ in. pipe. These tools are designed for straightening parking meter posts, sign posts, fence posts and other posts made of heavy-duty pipe. One person can easily straighten a post in just a few minutes.

Features

- Full 1-ton or 2-ton (heavy-duty model) lifting capacity
- Includes chain, post clamp and pump lever bar
- Release lever to release pressure

Using the Post Straightener

1. Secure the clamp to the top of the post.
2. Place the straightener at an angle to the post.
3. Place the chain around the bottom of the post to be straightened.
4. Pump until the post is fully upright.
5. Use the lever to release pressure and remove the straightener.

POST STRAIGHTENER MODELS

Model	Stroke Length (in)	Capacity	Weight (lbs)	Clamp Size (in)	Max Post Diameter (in)
QH525	25	1 ton	40	2-3/8	2.0" Pipe (2-3/8" O.D.)
QH550	22.5	2 ton	55	2-7/8	2.5" Pipe (2-7/8" O.D.)

Hydraulic Swivel Joints

Can't buy it off the shelf? Star Hydraulics can design and/or manufacture the custom hydraulics parts you need. One such part is a **swivel joint**, like the one shown here. Star hydraulic swivels are integrated into heavy machinery applications with rotating platforms.

Features

- Customized designs to meet application requirements
- Special valving to meet the needs of the application
- Up to 7,500 PSI
- Seals suitable for extreme heat and cold
- Designed to operate in corrosive environments
- Various coating/painting options
- The right materials for all operating conditions
- Special hydraulic fluids

Typical Applications

Swivel applications include heavy construction, oil/gas, material handling, mining and agriculture, where they're used with gantries, decks, cranes and other machines for rotation of a large load.

Contact Star today.

Put our line of standard and custom hydraulic pumps, cylinders, jacks, swivels and specialized products to work for you. We have the engineering expertise, skilled machinists and machining capabilities to develop new or customize existing products for your specific applications.

Find out how Star Hydraulics can work for you. Contact us by calling 708.453.3238, or visit www.starhyd.com.

STAR HYDRAULICS

PERFORMANCE UNDER **PRESSURE**

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