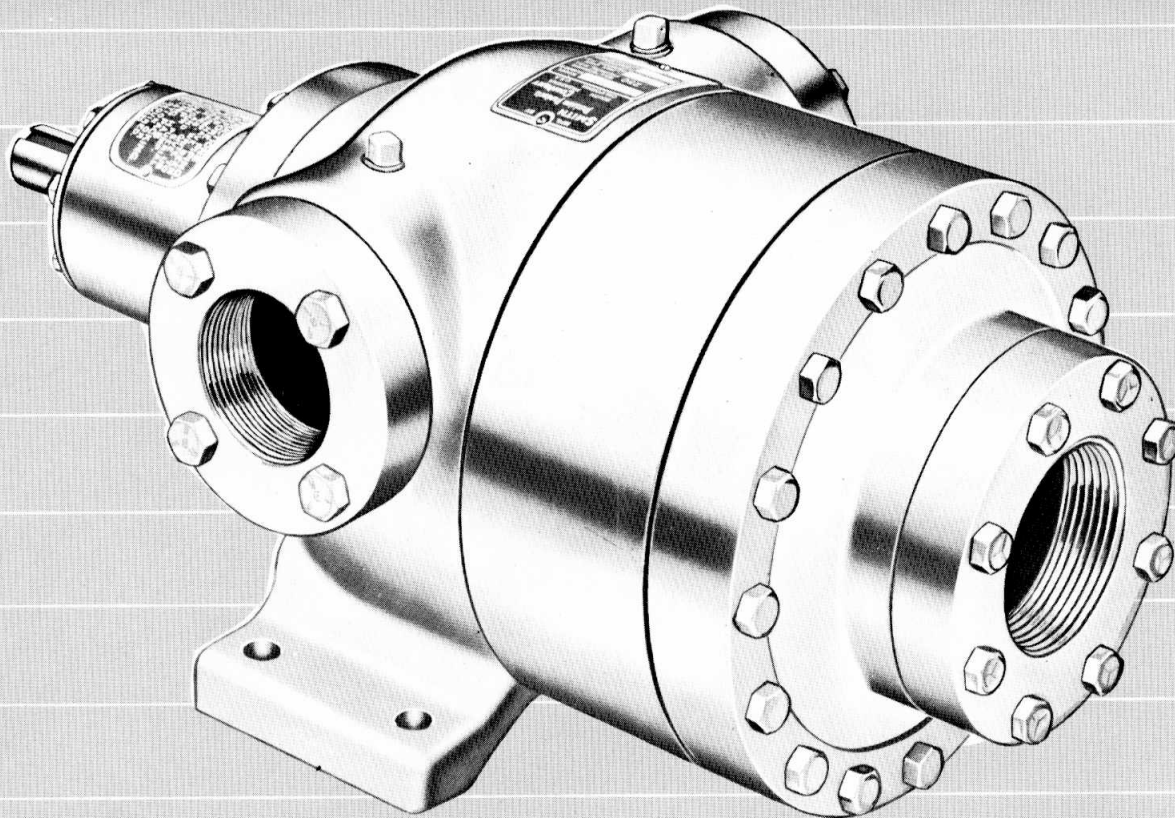


SMITH PRECISION PUMPS



DIELECTRIC COOLANTS
 BINARY REFRIGERANTS
 ALCOHOLS / KETONES
 NAPHTHA / GASOLINES
 CONDENSATES
 PROCESS LUBRICANTS
 EDIBLE OILS
 SYNTHETIC EMOLIENTS
 RESINS / POLYMERS
 SUGAR SOLUTIONS
 JET FUELS
 ACIDS

ALSO OTHER LIQUIDS
 OF SAME OR
 HIGHER VICOSITIES
 UP TO 100,000 S.S.U.

FOR SOLVENTS, OILS, AND SIMILAR LIQUIDS FROM THIN TO HIGHLY VISCOUS

CHOICE OF MODELS FOR:

Truck delivery • Plant operations
 High volume transfer up to 250 g.p.m.
 Refinery operations • Circulation loops
 Hydraulic applications • Process systems
 Cylinder filling

ALL MODELS HAVE THESE IMPORTANT ADVANTAGES:

- Chatter-free self-adjusting Smith mechanical seal assembly or packing gland assembly
- Non-pulsating, low shear transmission of liquid
- Leak-free operation
- Self-priming, high suction lift
- Mounting versatility (in any position)
- Self-lubricating sleeve bearings
- Balanced internal loading
- Reversible flow
- Simple design and rugged construction
- Vacuum capability of up to 25 in.-Hg
- Multiple porting

SMITH
PRECISION PRODUCTS COMPANY

1299 LAWRENCE DRIVE, NEWBURY PARK, CALIFORNIA 91320

FLEXIBLE APPLICATION

Smith Precision reversible rotary gear positive displacement pumps are noted for great flexibility of application. Smith pumps are built with extra thick-walled casings and high grade materials. The same Smith Pumps are ideal for efficiently transferring all liquids compatible with iron, steel, and stainless steel alloys. Standard units can be used with fluids from 0.06 Cps. to 100,000 S.S.U. viscosity at working pressures as high as 1,000 P.S.I.G., and differential pressures of up to 800 P.S.I.D..

WIDE TEMPERATURE RANGE

Temperatures of liquids handled by Smith pumps can be as high as +400°F., or as low as -150°F.. All have thermal shock capability, and are not affected by abrupt changes in liquid density or viscosity. Nominal outputs will remain constant as a factor of the positive-displacement design.

UNIQUE DESIGN

Exceptional ruggedness is provided by oversized shafting and bearings, which provide unmatched security against strains and stresses. Universal, belt, or chain drives present no problems. Reversible flow characteristics permit loading or unloading through the same piping, or provide a run method whereby only inlet pressure or only outlet pressure surrounds the shaft seals. This is an advantage in further simplifying design, maintenance, and choice of shaft seal components, including V-ring teflon rotary, simple grease seal rotary, packing rings, or our own mechanical seal assembly.

ECONOMY

Since the Company's inception in 1938, the highest pumping efficiency has always been maintained for lowest possible energy consumption. The Smith pump makes use of maximum possible porting sizes. Smith pumps are designed so that the drive gear does double or quadruple duty. In other words, each Smith pump is like two or four pumps in one.

BALANCED LOADING

Balanced gearing overcomes noise problems and objections to the usual gear or vane type pump wherein heavy unbalanced pressures result in radial and axial loads with undue pin and side wall wear and loss of efficiency. Pressure losses through Smith pumps are negligible. Matched coefficients of thermal expansion for cross sections maintain balanced working clearances at any temperature. High lifts and long draws are handled with ease.

EASE OF MAINTENANCE

Unlike other gear or vane pumps on the market, there is virtually no periodic maintenance required for a Smith pump. Periodic inspections for wear, when required, can be performed without removing the pump from the system, as well as can replacement of parts. No special tools or procedures are ever required for these operations. The gears are exceptionally easy to remove. The main shaft and seal assembly can also be removed and replaced without removing the pump from the piping system. Performance of a Smith gear pump remains constant through balance of work loads allowing for wear compensation automatically should it ever occur.

Our mechanical seal assembly, manufactured in-house, incorporates a unique self-adjusting design which eliminates shaft seal servicing because friction factors are cut down to one third, is compatible with continuous direction and pressure reversals, is capable of withstanding vacuums, and continues forming a positive seal even under vibration and lubricity loss. It can replace a packing gland in many cases.

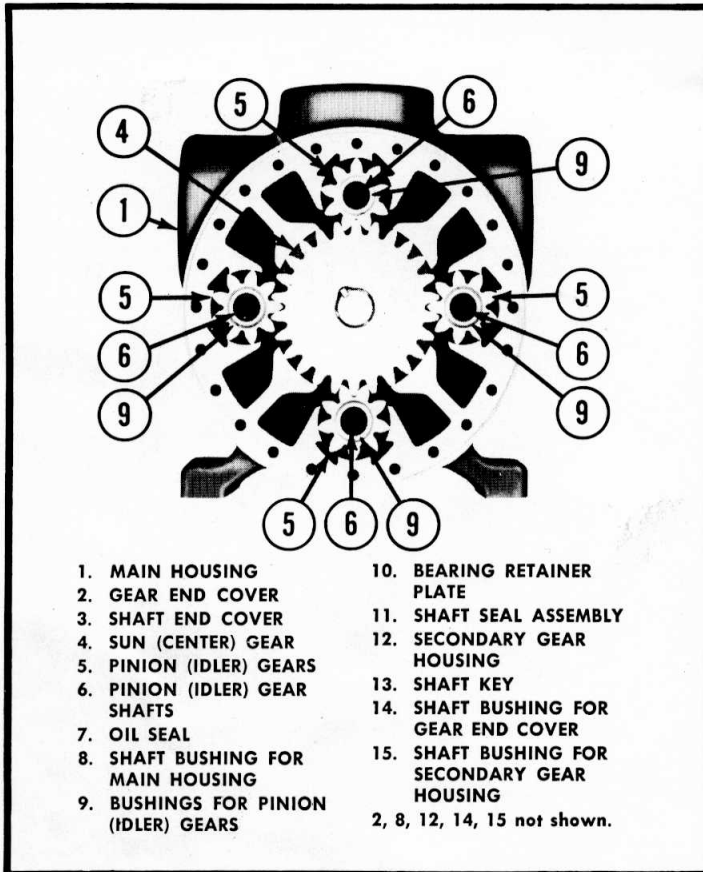
HIGH STANDARDS OF WORKMANSHIP

All Smith pumps and bypass valves are manufactured to the strictest of standards with no exception. All units are run-tested under full workload before shipment, without exception. All mechanical shaft seals are liquid tested before shipment.

WHERE TO LOOK FOR...

| | PAGE |
|---|------|
| ADVANTAGES OF SMITH PUMPS..... | 2 |
| HOW DOES THE SMITH PUMP WORK?..... | 4 |
| SMALL VOLUME SMITH PUMPS (TO 13 G.P.M.) | |
| SQ-SERIES PUMPS..... | 5 |
| MC-1 AND GC-1 PUMPS..... | 6 |
| MEDIUM VOLUME SMITH PUMPS (TO 50 G.P.M.) | |
| 1044-SERIES PUMPS..... | 7 |
| M-2 SERIES PUMPS..... | 8 |
| T-2 SERIES PUMPS..... | 9 |
| HIGH VOLUME SMITH PUMPS (TO 250 G.P.M.) | |
| T-3 SERIES PUMPS..... | 10 |
| M-3 SERIES PUMPS..... | 11 |
| M-4 SERIES PUMPS..... | 12 |
| M-5 SERIES PUMPS..... | 13 |
| FLANGED SMITH PUMPS (TO 250 G.P.M.) | |
| M-2F SERIES PUMPS..... | 14 |
| T-2F SERIES PUMPS..... | 15 |
| AT-2 SERIES PUMPS..... | 16 |
| T-3F SERIES PUMPS..... | 17 |
| M-3F SERIES PUMPS..... | 18 |
| AT-3 SERIES PUMPS..... | 19 |
| AT-4LF SERIES PUMPS..... | 20 |
| AT-5LF SERIES PUMPS..... | 21 |
| SMITH STRAINERS, FLEXIBLE DRIVE COUPLINGS, BYPASS VALVES..... | 22 |
| SEAL OPTIONS..... | 23 |
| TECHNICAL DATA AND CONSTRUCTION MATERIALS..... | 24 |
| APPROXIMATE WEIGHTS OF SMITH PUMPS AND MOTORS..... | 24 |
| PERFORMANCE FORMULAE AND EXAMPLES OF CALCULATIONS..... | 25 |
| SLIPPAGE FACTOR CHARTS..... | 26 |
| TYPICAL CURVE..... | 27 |
| REPAIR AND EXCHANGE POLICIES..... | 28 |

HOW DOES THE SMITH PUMP WORK?



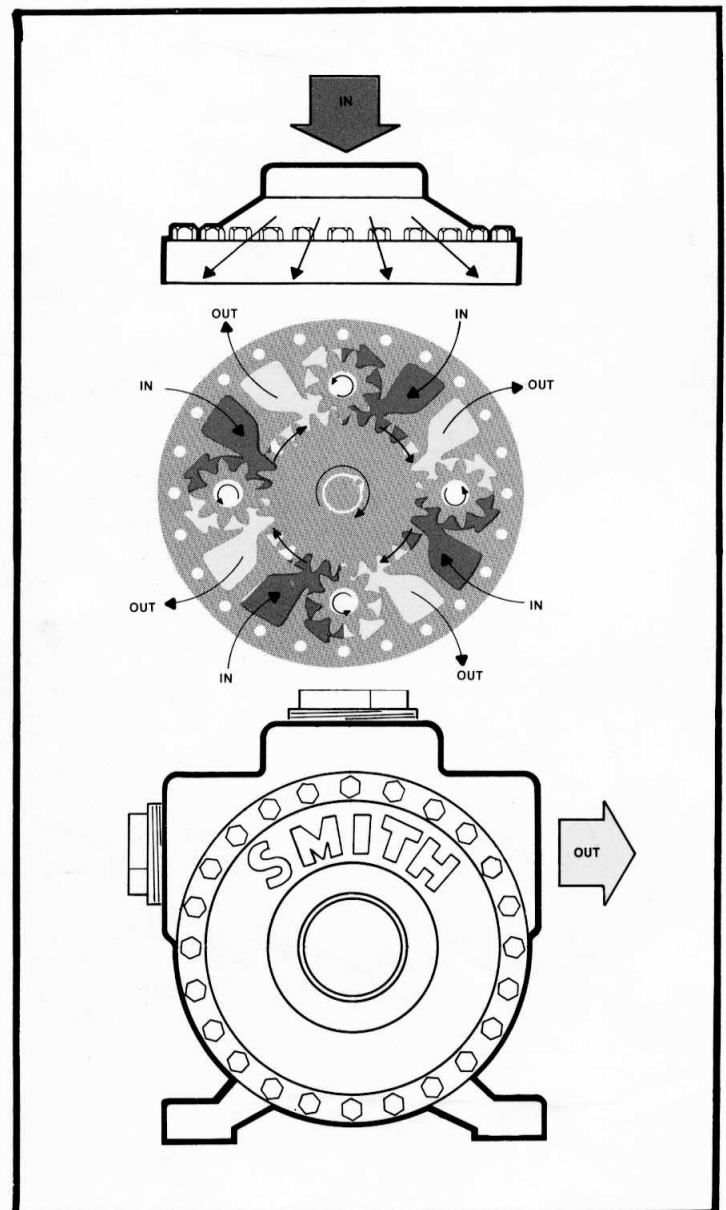
In the TC-2 Smith pump shown, liquid flow into the pump is broken up into eight separate pumping chambers, simultaneously. Each chamber is strategically located so as to balance axial and radial loads, and to eliminate flow resistance.

- (1) Liquid enters pump through gear end cover as shown at right.
- (2) Liquid flows simultaneously into four separate flow channels.
- (3) Liquid further breaks-up into eight separate pumping chambers, one for each idler gear, and four around the drive gear (green areas at right).
- (4) Pumped liquid reintegrates into four outlet flow chambers (orange areas at right).
- (5) Four outlet flows reintegrate into one port and exit pump.

The TC-2 pump illustrated makes use of one common drive gear with four idler gears. In a sense, it is like four separate pumps, in one, cutting down on weight, size, and wasted energy. The torque or turning force is applied to each gear so the pressures match on diametrically opposite meshing teeth, causing a negligible bearing load. The net result is a gear pump design of exceptional capacity and efficiency, yet comprised of few simple, rugged parts, with very little wear potential.

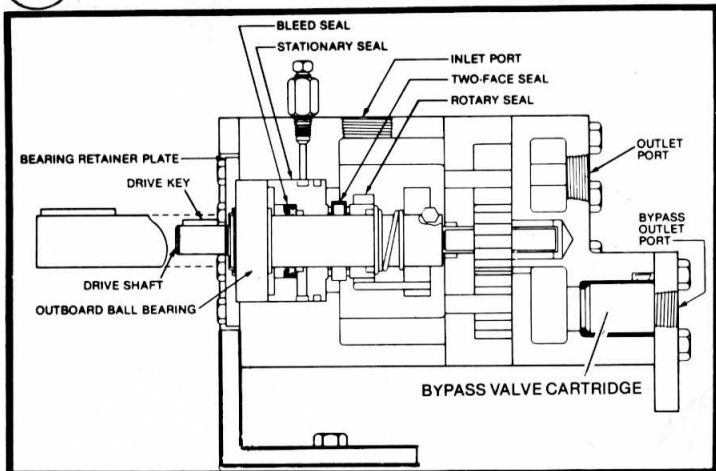
Such a design is theoretically capable of pumping fluids to any pressure with absolutely no increase in shaft bearing loads, and therefore there is no need for special efficiency-robbing internal lubrication flow channels, special external lube devices, thrust plates, balancing holes, etc. .

Should abrasive particles be present in the fluid, the pumping action forces most of them to flow harmlessly around, not through, the gears. Proper choice of very tough materials keeps abrasive wear to a tolerable level. Smith pumps are known for low particulate generation under all conditions, even with liquefied gases. They have been used successfully in ultra-critical cleaning operations with alcohols and other industrial solvents.



SMALL VOLUME SMITH PUMPS (TO 13 G.P.M.) WITH STANDARD 3/4-INCH F.N.P.T. INLET AND OUTLET PORTS

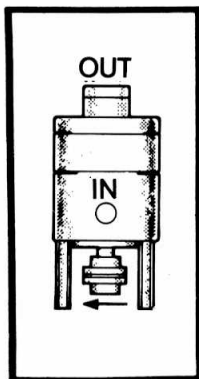
1 SQ-SERIES PUMPS



All standard model SQ-Series Smith pumps have 3/4" F.N.P.T. inlet and outlet ports, and a 5/8" drive shaft. For differential pressures in excess of 150 P.S.I.D., the one-inch drive shaft is recommended. Models shown are highly recommended where a large mechanical or rotary shaft seal is required, and low noise levels are important. Maximum recommended differential pressure is 800 P.S.I.D. on liquids above 500 S.S.U. viscosity.

Each model has a built-in internal bypass valve which must be connected with an external line, and is permanently set at 90 P.S.I.D.. For differential pressures in excess of this figure, the valve outlet can be left plugged, and an external bypass valve installed in a tee near the pump outlet.

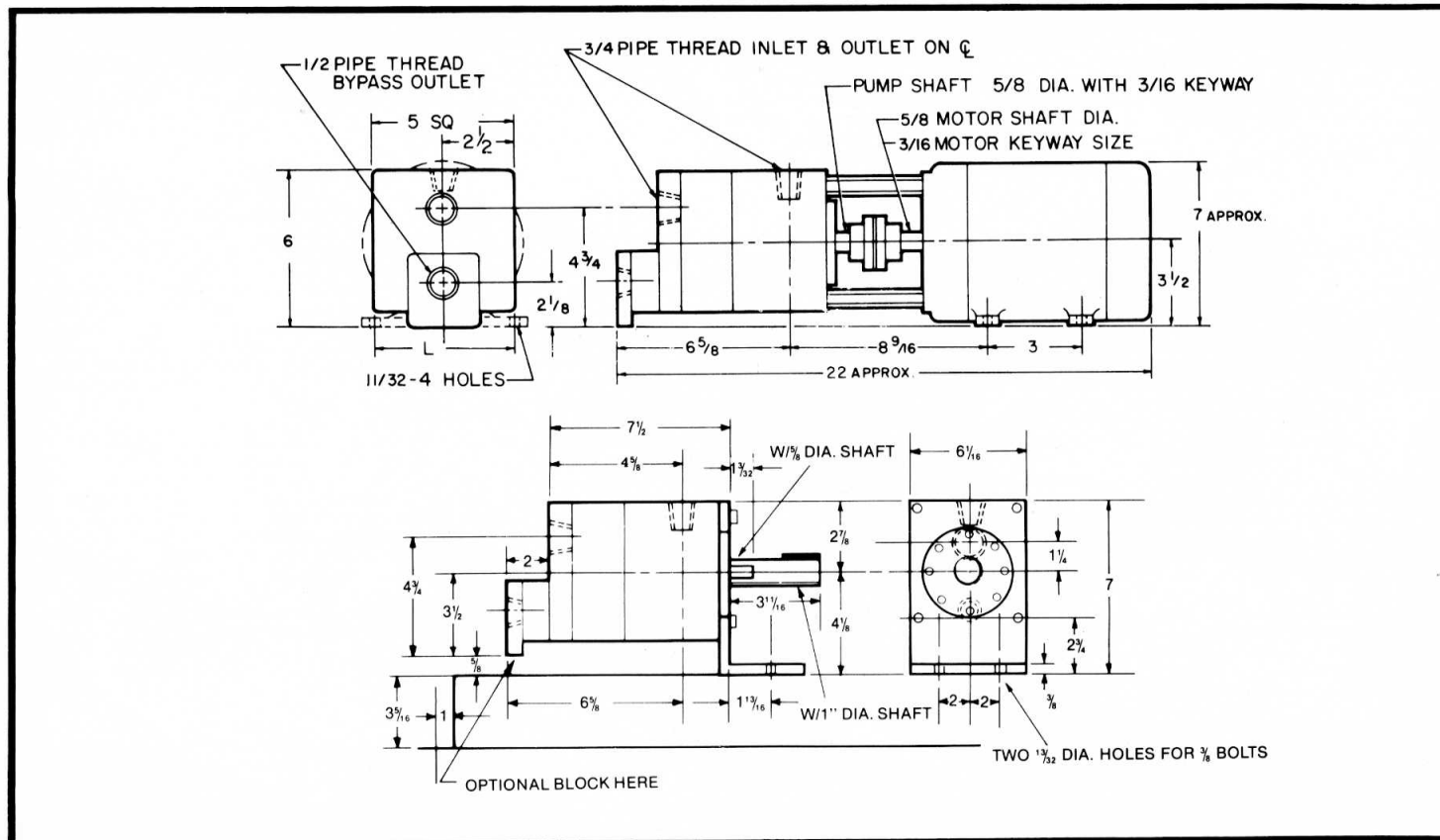
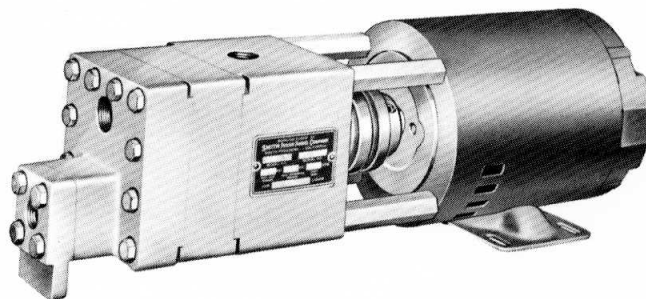
Most pumps are directly mounted to small C-Frame motors as shown, below. In such cases, the pump end of the assembly must be supported by either contacting the base, or by means of a support block welded in place. Foot mounting brackets are available also, when the pump must be run slower than direct-drive speeds allow, with belt or gear-reduction assembly.



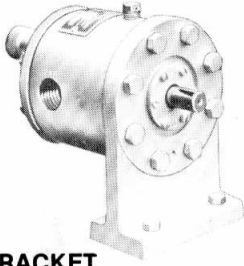
TYPICAL RATED OUTPUTS

- MODEL SQ-1: 1 1/4 GPM at 450 RPM
2 1/2 GPM at 900 RPM
5 GPM at 1800 RPM (max)
- MODEL SQ-H: 1 1/4 GPM at 450 RPM
3 1/2 GPM at 900 RPM
7 GPM at 1800 RPM (max)
- MODEL SQ-HH: 3 1/4 GPM at 450 RPM
6 1/2 GPM at 900 RPM
13 GPM at 1800 RPM (max)
- MODEL SQ-HH8: 3 1/4 GPM at 300 RPM
6 1/2 GPM at 600 RPM
13 GPM at 1200 RPM (max)
(1800 RPM not recommended)

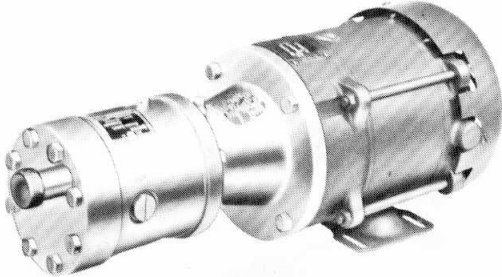
Models SQ-1, SQ-H, SQ-HH and SQ-HH8 pumps with motor.



② MC-1 AND GC-1 PUMPS



MODEL MC-1
WITH FOOT BRACKET

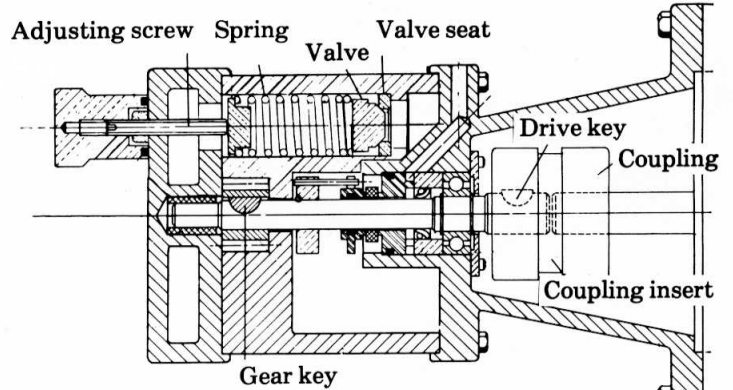


MODEL MC-1 PUMP WITH MOTOR

TYPICAL RATED OUTPUTS

Model MC-1: 1- $\frac{1}{4}$ GPM at 450 RPM
2- $\frac{1}{2}$ GPM at 900 RPM
5 GPM at 1800 RPM (max.)

Model GC-1: 1- $\frac{1}{4}$ GPM at 450 RPM
2- $\frac{1}{2}$ GPM at 900 RPM
5 GPM at 1800 RPM (max.)

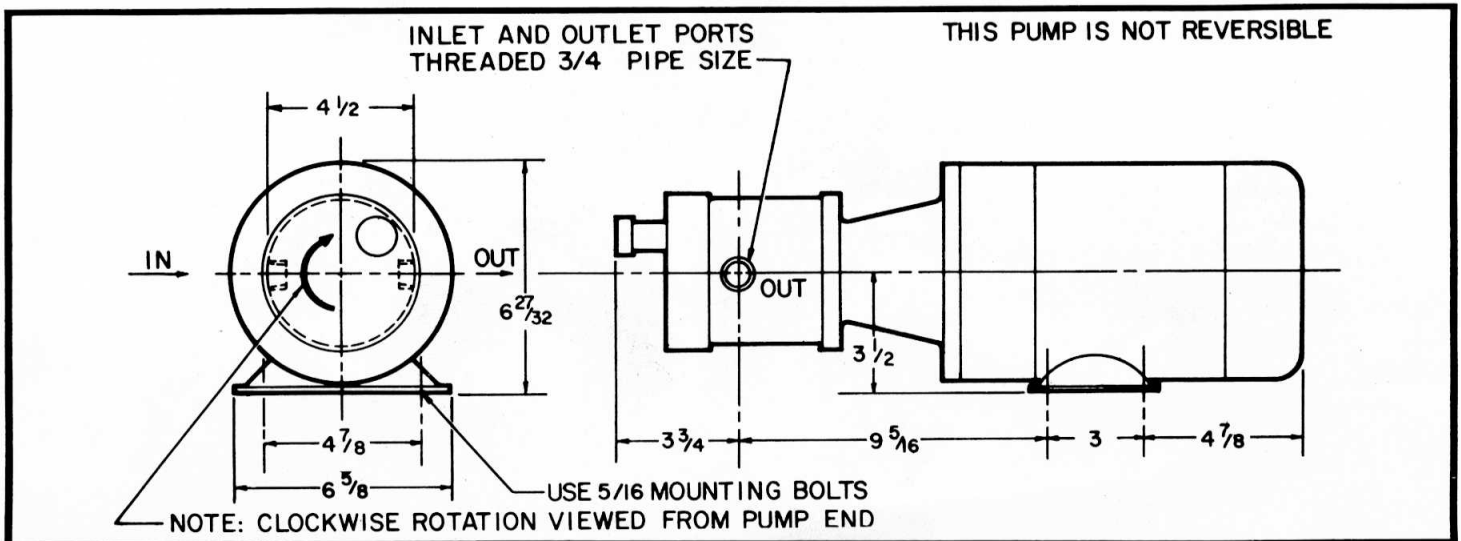
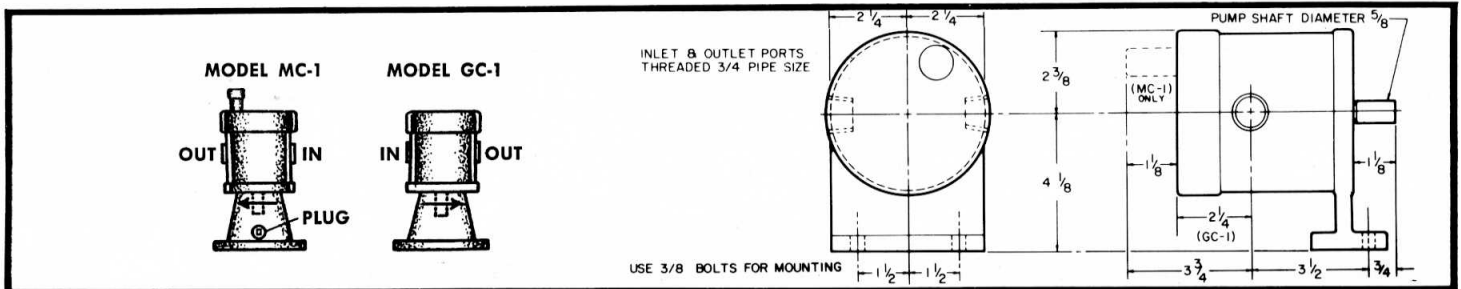


MC-1 CROSS-SECTION
SHOWING ADJUSTABLE BYPASS FEATURE

All standard model MC-1 and GC-1 Smith pumps have $\frac{3}{4}$ " F.N.P.T. inlet and outlet ports, and a $\frac{5}{8}$ " drive shaft. They are not recommended for differential pressures above 150 P.S.I.D.. They are successfully used where a small mechanical seal only is required, and no vacuum is present. 1800 R.P.M. drive speed can be used to 500 S.S.U. viscosity.

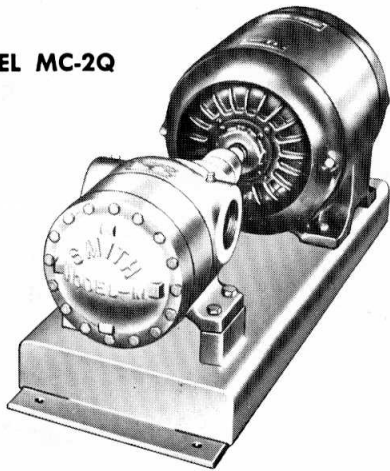
The model MC-1 has an adjustable internal bypass valve and is not reversible. The model GC-1 has a non-adjustable bypass valve set at 100 P.S.I.D., and is also not reversible. If the bypass feature is not supplied, the pump is reversible. In any case, the use of an external bypass valve is recommended, especially where back-to-inlet discharge is detrimental.

Most pumps are directly mounted to small C-Frame motors, as shown above. Foot mounting units are available, when pumps must be run slower than direct-drive speeds allow, with gear-reduction assemblies.

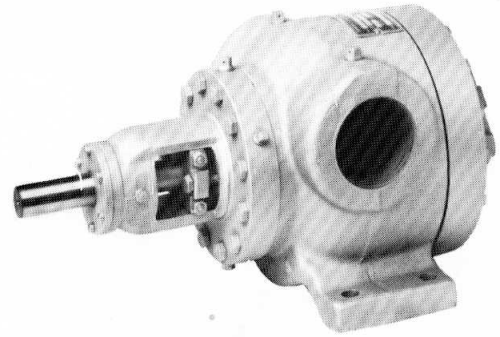


② "M-2 SERIES" PUMPS WITH 2-1/2 INCH F.N.P.T. PORTS

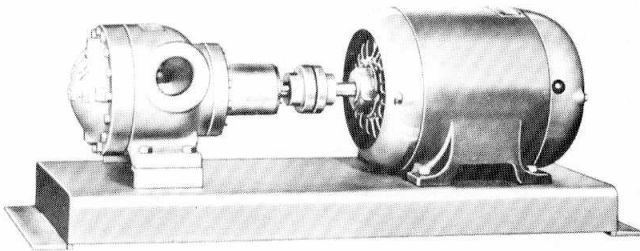
MODEL MC-2Q



MODEL M-2



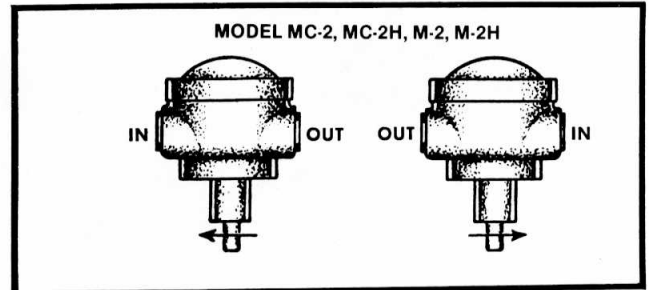
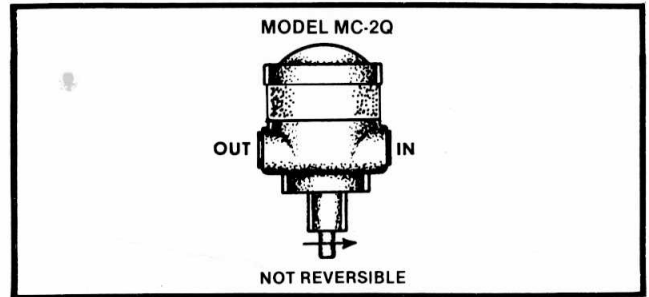
MODEL MC-2



SPECIFIC DATA: "M-2 Series" pumps, to 50 G.P.M. rated output.

- M-2: Packing gland, reversible, vacuum capability.
- MC-2: Rotary or mechanical seal, vacuum capability, reversible.
- M-2H: Packing gland, higher output at same speeds, reversible, vacuum capability.
- MC-2H: Rotary or mechanical seal, higher output at same speeds, reversible, vacuum capability.
- MC-2Q: Mechanical seal only, exceptionally quiet running, ideal for high continuous differential pressure service, **not reversible**, vacuum capability.

NOTE: Running the pump in a clockwise direction will expose the shaft seals to inlet pressure, only.



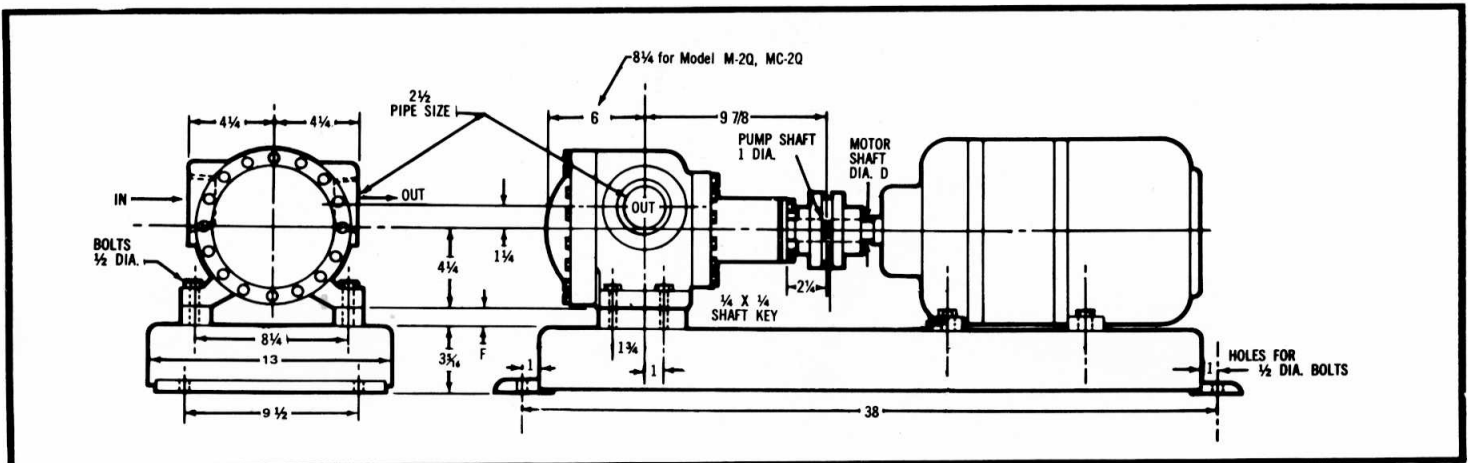
TYPICAL RATED OUTPUTS

Model M-2, MC-2, and MC-2Q

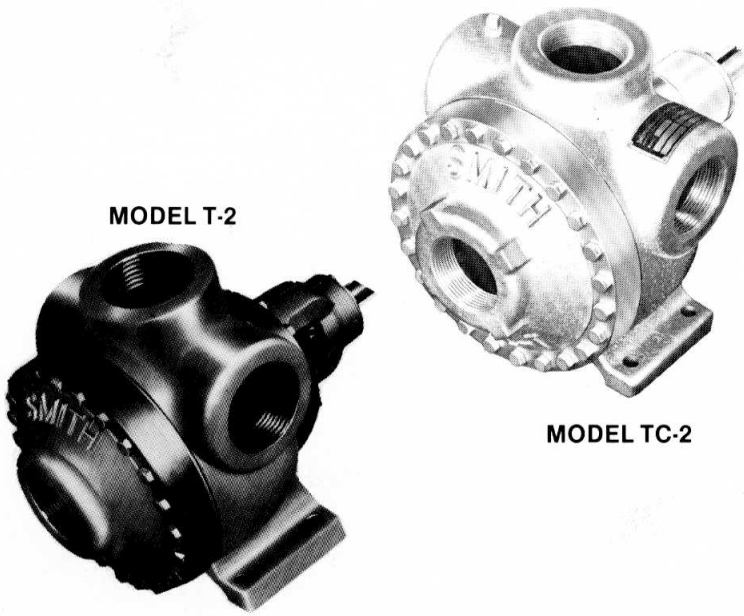
- 12½ GPM at 450 RPM
- 25 GPM at 900 RPM
- 50 GPM at 1800 RPM (max.)

Model M-2H, and MC-2H

- 12½ GPM at 375 RPM
- 25 GPM at 750 RPM
- 50 GPM at 1500 RPM (max.)



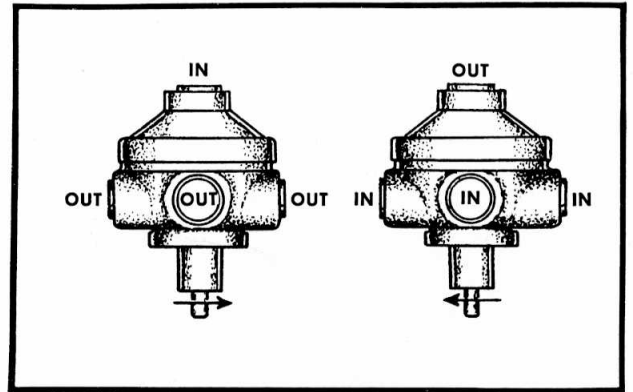
③ "T-2 SERIES" PUMPS WITH 2-1/2 INCH F.N.P.T. PORTS



MODEL T-2

MODEL TC-2

GENERAL DATA: Models T-2 and TC-2 shown are designed for low speeds with high output. Originally built for use with low speed power take-off drives, this pump is particularly suitable where minimal space is available, and feed lines must be simplified, by necessity. Unlike pumps shown on previous pages, this model has a top port in addition to the standard side ports, with the end cover port. The internal "drag" (N.P.S.H.R.) is reduced by dividing the inlet flow into twice as many separate channels as other Smith pumps in this catalog. 800 P.S.I.D. is possible at maximum speed (500 R.P.M.) with liquids around 500 S.S.U. viscosity. "T-2 Series" pumps cannot be direct motor coupled, but gear reducers, belt, or chain drives can easily be used.



SPECIFIC DATA: "T-2 Series" pumps, to 50 G.P.M. rated output.

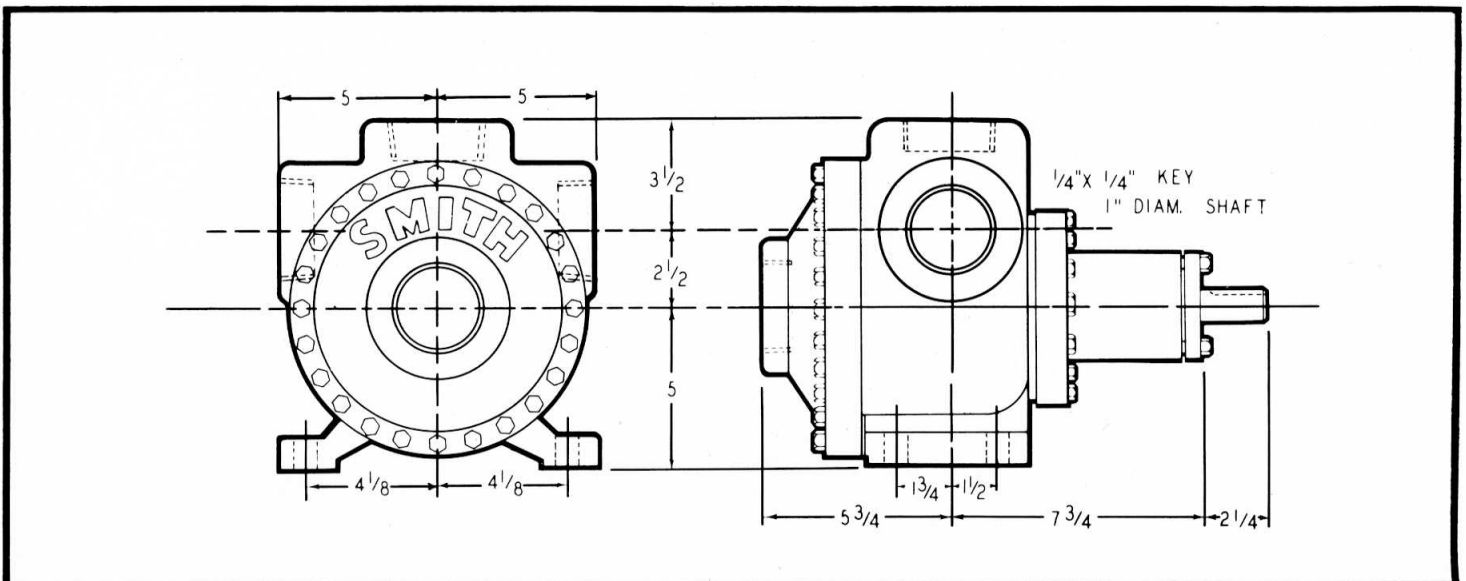
- T-2: Packing gland, reversible, vacuum capability.
- TC-2: Rotary or mechanical seal, reversible, vacuum capability.

NOTE: Running the pump with the inlet through the gear end cover lessens "drag" (N.P.S.H.R.). Running in the opposite direction exposes the shaft seals to inlet pressure **only**.

TYPICAL RATED OUTPUTS

Model T-2:
 12½ GPM at 125 RPM
 25 GPM at 250 RPM
 50 GPM at 500 RPM (max.)

Model TC-2:
 12½ GPM at 125 RPM
 25 GPM at 250 RPM
 50 GPM at 500 RPM (max.)



HIGH VOLUME SMITH PUMPS (TO 250 G.P.M.) WITH THREADED INLET AND OUTLET PORTS

There are two categories of Smith Precision pump models classified as "high capacity" types, all with threaded ports. These are the "M-Series" and the "T-Series". Their ranges are up to 100 G.P.M. with the "T-Series" units, and to 250 G.P.M. with the "M-Series", at maximum recommended drive speeds. They can all be equipped to handle vacuum, and can be direct

motor coupled, or used with gear reducers, belt, or chain drives. Maximum differential pressure capabilities vary, depending upon the model in question, at maximum drive speeds with liquids around 500 S.S.U. viscosity. To prevent deadheading, these pumps should be provided with a differential bypass valve. Strainers are also recommended.

② "T-3 SERIES" PUMPS WITH 2-1/2 INCH F.N.P.T. PORTS

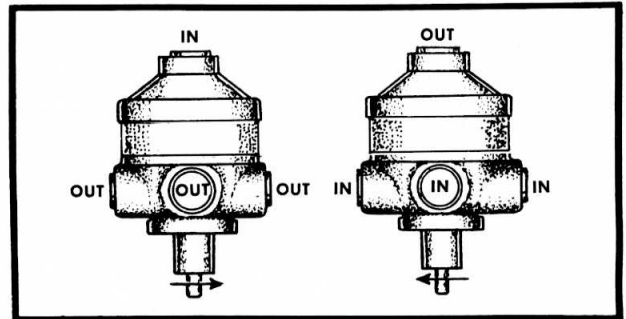
MODEL T-3



MODEL TC-3

GENERAL DATA: "T-3 Series" units, consisting of the models T-3, and TC-3 shown, are designed for low speeds with high output. Originally built for low speed power take-off drives, this pump is particularly suitable where minimal space is available, and feed lines must be simplified, by necessity. Unlike other Smith pumps shown on previous or following pages, this model has a top port in addition to the standard ports on the sides. It also has an end cover port.

The internal "drag" (N.P.S.H.R.) is reduced by dividing the inlet flow into twice as many separate channels as other Smith pumps in this catalog. 300 P.S.I.D. is possible at maximum drive speed with liquids around 500 S.S.U. viscosity. Direct motor drive speeds are not possible with "T-Series" pumps, but gear reducers, belt, or chain drives can easily be used.



TYPICAL RATED OUTPUTS

Model T-3:

25 GPM at 125 RPM
50 GPM at 250 RPM
100 GPM at 500 RPM (max.)

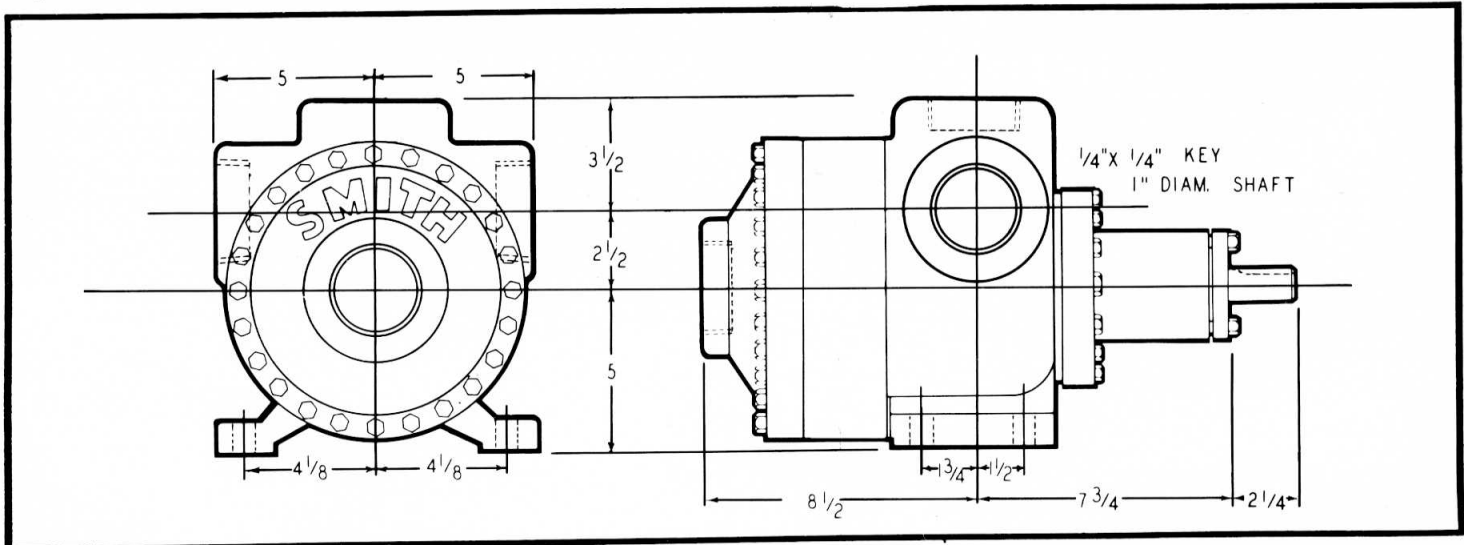
Model TC-3:

25 GPM at 125 RPM
50 GPM at 250 RPM
100 GPM at 500 RPM (max.)

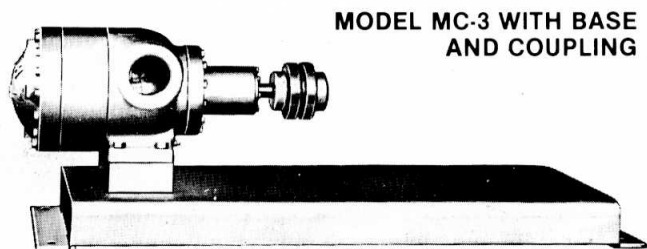
SPECIFIC DATA: "T-3 Series" pumps, to 100 G.P.M., rated output.

T-3: Packing gland, reversible, vacuum capability.
TC-3: Rotary or mechanical seal, vacuum capability, reversible.

NOTE: Running the pump with the inlet through the gear end cover lessens "drag" (N.P.S.H.R.). Running in the opposite direction exposes the shaft seals to inlet pressure, only.



② "M-3 SERIES" PUMPS WITH 2½-INCH F.N.P.T. PORTS

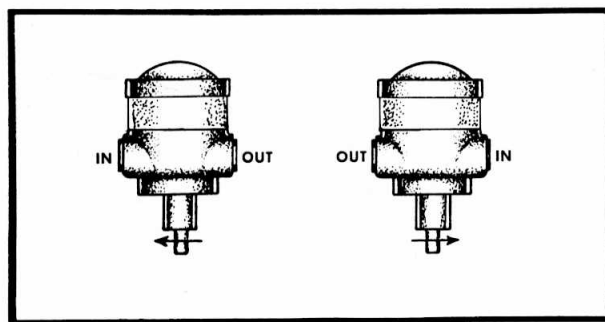


MODEL M-3



GENERAL DATA: "M-3 Series" units are all rated at 100 G.P.M. at their maximum drive speed. All are capable of up to 700 P.S.I.D. differential pressure with liquids around 500 S.S.U. viscosity at maximum drive speed. There are two basic pump types, "H" and "Non-H" models. All can be equipped to handle vacuum, and all are reversible. They can be direct motor coupled, or used with gear reducers, belt drives, and chain drives. All are for horizontal base mounting. All have ports through the main housing, only.

The "H" models, which carry the letter "H" after the model number, have the same capacities as the "Non-H" types, but at lower speeds. When direct motor coupled, an "MC-3H" will pump the same at 1500 R.P.M., that an "MC-3" will handle at 1800 R.P.M.. Although the two models have exactly the same external dimensions, the gears in the "H" unit are larger and handle more liquid per revolution.



SPECIFIC DATA: "M-3 Series" pumps, to 100 G.P.M., rated output.

M-3: Packing gland, reversible, vacuum capability.

MC-3: Rotary or mechanical seal, vacuum capability, reversible.

M-3H: Packing gland, reversible, vacuum capability, higher output at same speeds, same external dimensions.

MC-3H: Rotary or mechanical seal, vacuum capability, reversible, higher output at same speeds, same external dimensions.

NOTE: Running these pumps in a clockwise direction will expose the shaft seals to only inlet pressure.

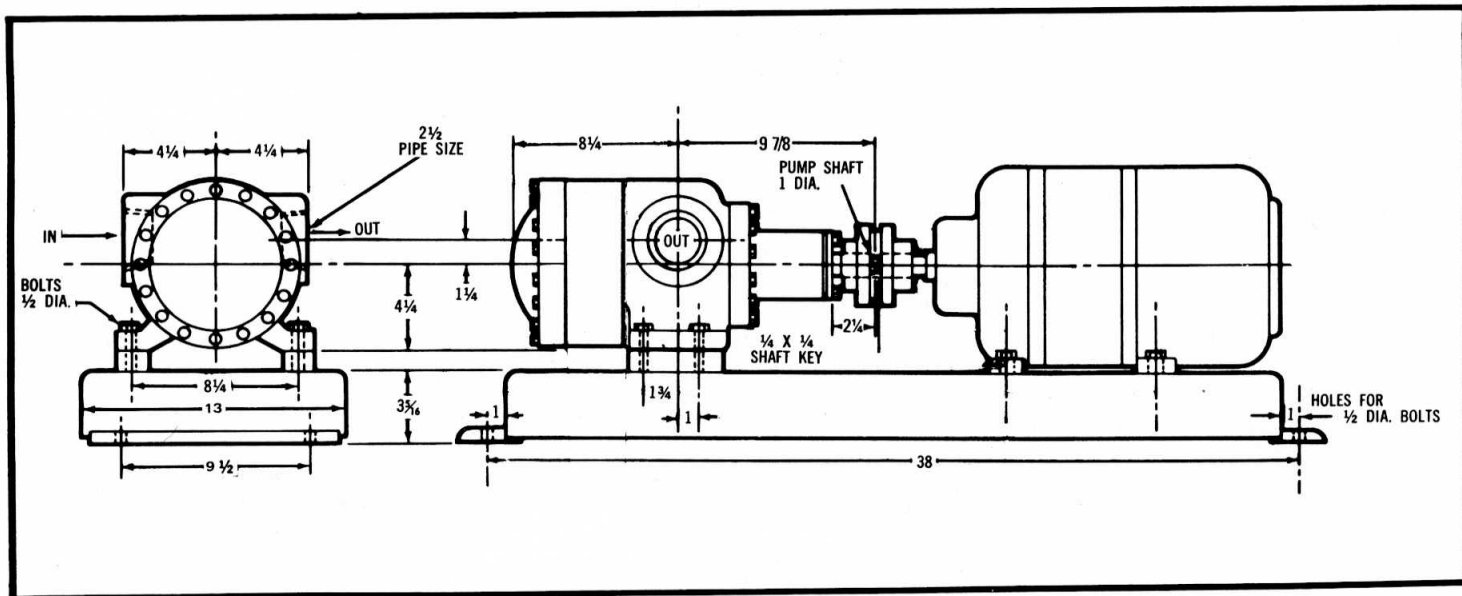
TYPICAL RATED OUTPUTS

Model M-3, and MC-3:

25 GPM at 450 RPM
50 GPM at 900 RPM
100 GPM at 1800 RPM (max.)

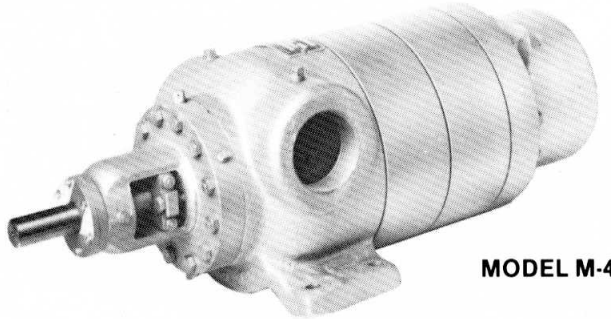
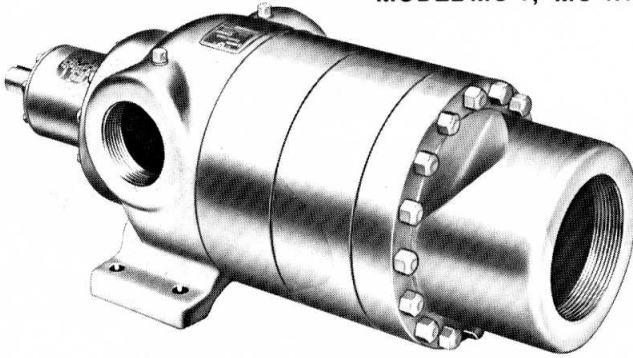
Model M-3H, and MC-3H:

25 GPM at 375 RPM
50 GPM at 750 RPM
100 GPM at 1500 RPM (max.)



③ "M-4 SERIES" PUMPS WITH 4 × 2½-INCH F.N.P.T. PORTS

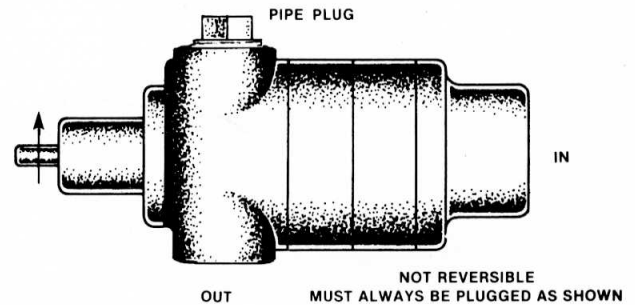
MODEL MC-4, MC-4H



MODEL M-4

GENERAL DATA: "M-4 Series" units are all rated at 150 G.P.M., at their maximum rated speeds. All are capable of up to 500 P.S.I.D. with liquids around 500 S.S.U. viscosity at maximum drive speed. There are two basic pump types, "H" and "Non-H" models. All can be equipped to handle vacuum, and are not reversible. They can be direct motor coupled, or used with gear reducers, belt drives, and chain drives. All are for horizontal base mounting. All have a 4-inch F.N.P.T. inlet, and a 2½-inch F.N.P.T. outlet. The port opposite the outlet should not be used, and must remain plugged at all times.

The "H" models, which carry the letter "H" after the model number, have the same capacities as the "Non-H" types, but at lower speeds. When direct motor coupled, an "MC-4H" will pump the same at 1500 R.P.M., that an "MC-4" will handle at 1800 R.P.M.. Although the two models have exactly the same external dimensions, the gears in the "H" unit are larger and handle more liquid per revolution.



SPECIFIC DATA: "M-4 Series" pumps, to 150 G.P.M. rated output.

- M-4: Packing gland, not reversible, vacuum capability.
- MC-4: Rotary or mechanical seal, vacuum capability, not reversible.
- M-4H: Packing gland, not reversible, vacuum capability, higher output at same speeds, same external dimensions.
- MC-4H: Rotary or mechanical seal, vacuum capability, not reversible, higher output at same speeds, same external dimensions.

NOTE: These pumps can be driven only in a counterclockwise direction, and the shaft seals are exposed only to pump outlet pressure.

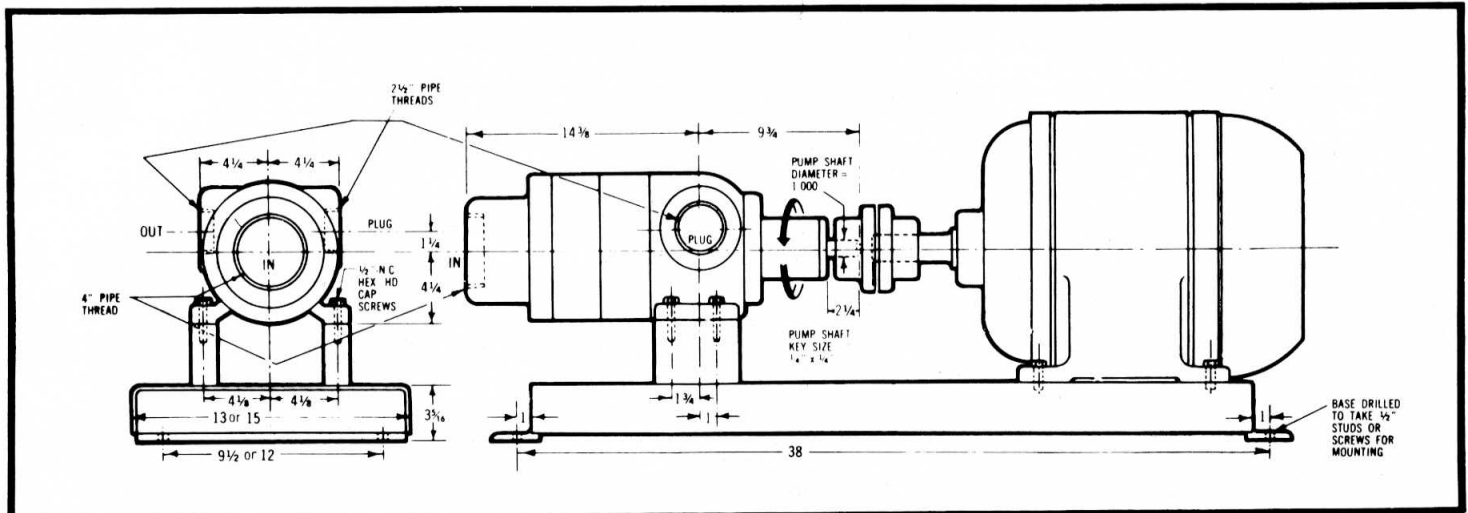
TYPICAL RATED OUTPUTS

Model M-4, and MC-4:

37.5 GPM at 450 RPM
75 GPM at 900 RPM
150 GPM at 1800 RPM(max.)

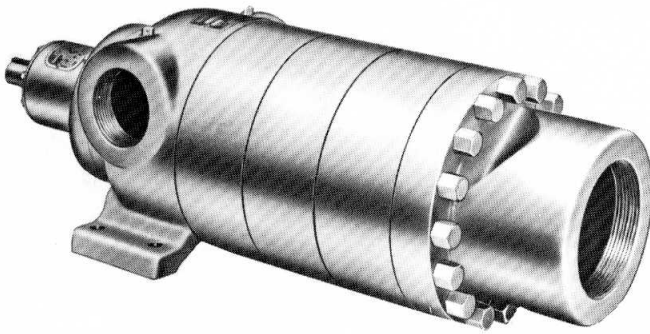
Model M-4H, and MC-4H:

45 GPM at 450 RPM
90 GPM at 900 RPM
150 GPM at 1500 RPM(max.)



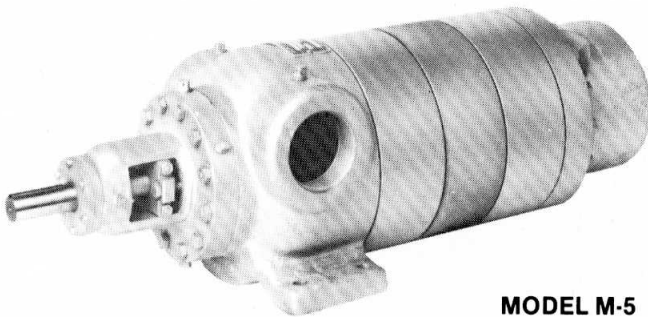
④ "M-5 SERIES" PUMPS WITH 4 × 2-½ INCH F.N.P.T. PORTS

MODEL MC-5

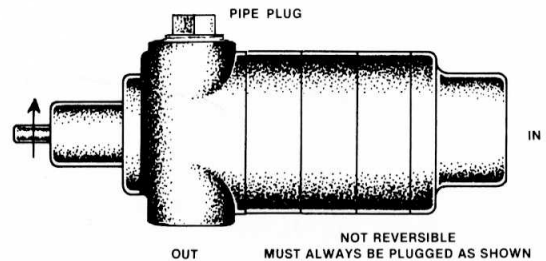


GENERAL DATA: There are three basic types of "M-5 Series" Smith pumps: these are the standard "M-5", the "M-5L", and the "M-5H" models. All have the same external dimensions, and are capable of up to 300 P.S.I.D. at maximum rated drive speeds with liquids around 500 S.S.U. viscosity. All can be equipped to handle vacuum, and none are reversible. They can be direct motor coupled, or used with gear reducers, belt drives, and chain drives. All are for horizontal base mounting. All have a 4-inch F.N.P.T. inlet, and a 2-½ inch F.N.P.T. outlet. The port opposite the outlet should not be used, and must remain plugged at all times.

The "H" models, which carry the letter "H" after the model number, have the same capacities as the "Non-H" types, but at lower speeds. The "L" models, which carry the letter "L" after the model number, have even higher capacities at the same drive speeds. In both cases, although the external dimensions are identical, the gears are progressively larger and handle more liquid per revolution.



MODEL M-5



SPECIFIC DATA: "M-5 Series" pumps to 250 G.P.M., rated output.

- M-5: Packing gland, not reversible, vacuum capability.
- MC-5: Rotary or mechanical seal, vacuum capability, not reversible.
- M-5H: Packing gland, not reversible, vacuum capability, higher output at same speeds, same external dimensions.
- MC-5H: Rotary or mechanical seal, vacuum capability, not reversible, higher output at same speeds, same external dimensions.
- M-5L: Packing gland, not reversible, vacuum capability, even higher output at same speeds, same external dimensions.
- MC-5L: Rotary or mechanical seal, vacuum capability, not reversible, even higher output at same speeds, same external dimensions.

TYPICAL RATED OUTPUTS

Model M-5, and MC-5:

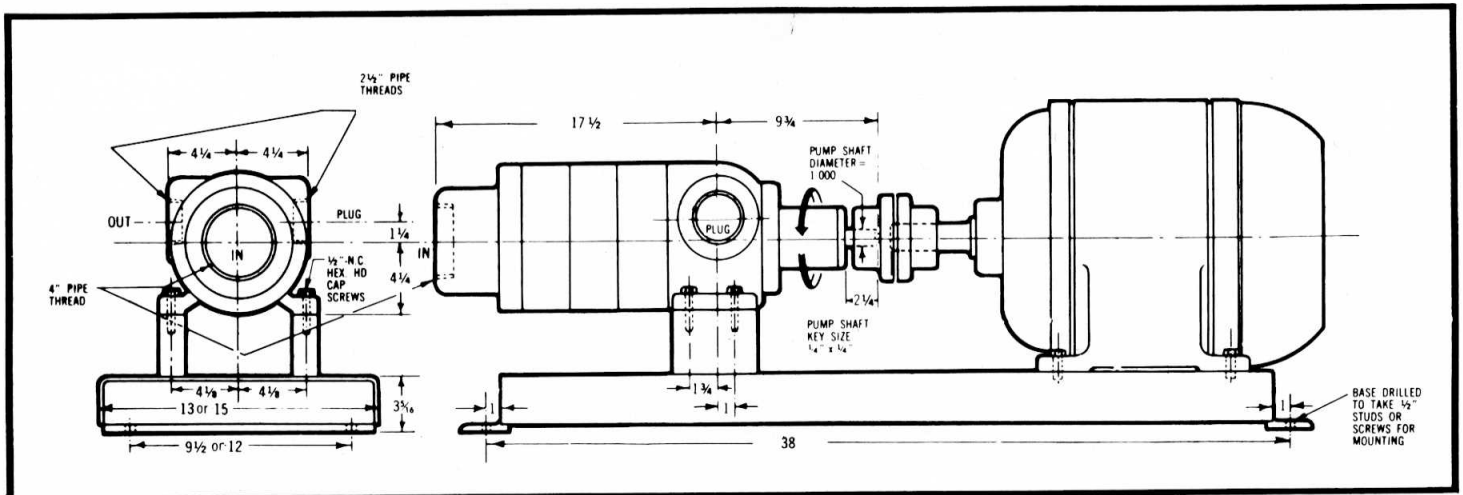
- 50 GPM at 450 RPM
- 100 GPM at 900 RPM
- 200 GPM at 1800 RPM(max.)

Model M-5H, and MC-5H:

- 60 GPM at 450 RPM
- 120 GPM at 900 RPM
- 200 GPM at 1500 RPM(max.)

Model M-5L, and MC-5L:

- 75 GPM at 450 RPM
- 125 GPM at 900 RPM
- 250 GPM at 1800 RPM(max.)

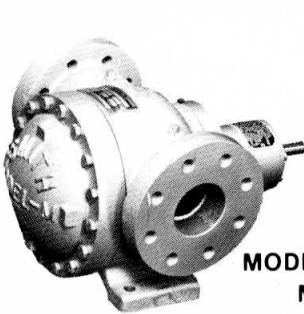


FLANGED SMITH PUMPS (TO 250 G.P.M.)

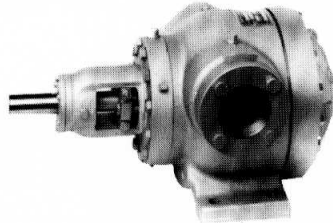
There are two basic flange types used with Smith pumps: (1) ASA 400 LB. style, and (2) Smith design. All flanged Smith pumps can be equipped to handle vacuum. Most are reversible and can be direct motor driven, or used with gear reducers, belt drives, or chain drives. Capacities are the same as equivalent

non-flanged models mentioned earlier in this catalog. At maximum drive speeds on liquids of about 500 S.S.U. viscosity, differential pressures of as high as 300 P.S.I.D. are possible. To prevent dead-heading, these pumps should be provided with a differential bypass valve. Strainers are also recommended.

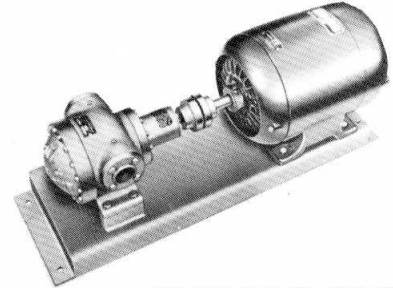
1 "M-2F SERIES" PUMPS (2 × 2-INCH FLANGES)



MODEL MC-2FS,
MC-2FSH



MODEL M-2F



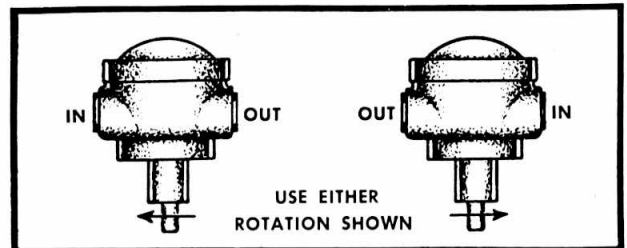
MODEL MC-2F MC-2FH

SPECIFIC DATA: "M-2F Series" pumps, to 50 G.P.M., rated output.

- M-2F: Packing gland, reversible, vacuum capability, Smith flanges 2" size available in three styles.
- MC-2F: Rotary or mechanical seal, vacuum capability, reversible, Smith flanges 2" size available in three styles.
- M-2FH: Packing gland, reversible, vacuum capability, Smith flanges 2" size available in three styles, higher output at same speeds, same external dimensions.
- MC-2FH: Rotary or mechanical seal, vacuum capability, reversible, Smith flanges 2" size available in three styles, higher output at same speeds, same external dimensions.
- M-2FS: Packing gland, reversible, vacuum capability, A.S.A. 400 LB. flange connections 2" pipe size.
- MC-2FS: Rotary or mechanical seal, vacuum capability, reversible, A.S.A. 400 LB. flange connections 2" pipe size.
- M-2FSH: Packing gland, reversible, vacuum capability, A.S.A. 400 LB. flange connections 2" pipe size, higher output at same speeds, same external dimensions.
- MC-2FSH: Rotary or mechanical seal, vacuum capability, reversible, A.S.A. 400 LB. flange connections 2" pipe size, higher output at same speeds, same external dimensions.

NOTE: Running the pump in a clockwise direction will expose the shaft seals to inlet pressure only.

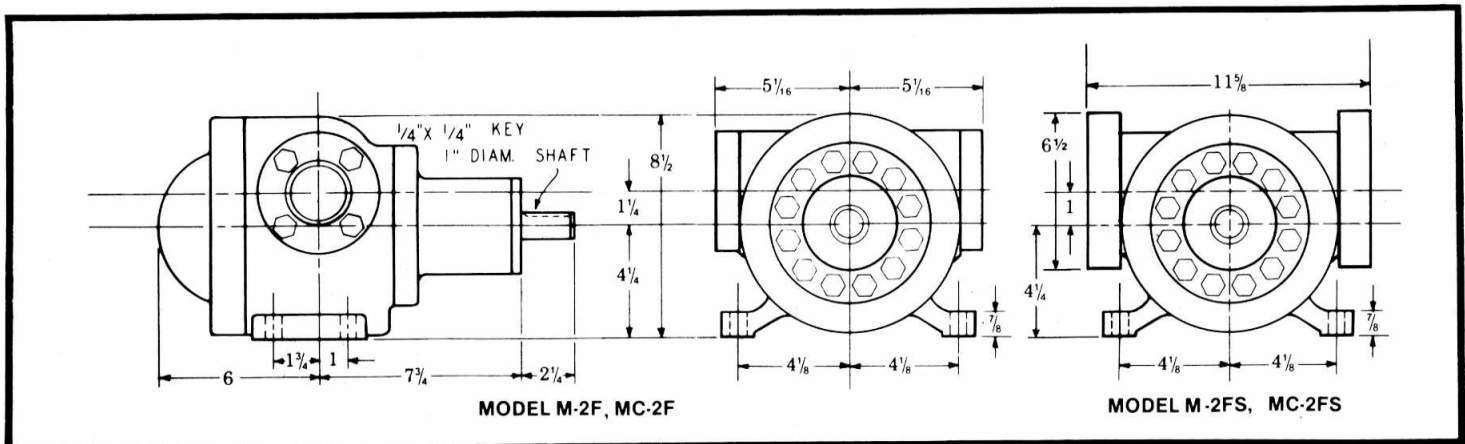
GENERAL DATA: "M-2F Series" units comprise several different flange designs all compatible with two-inch N.P.T. sizes. "M-2F" pumps come equipped with Smith design companion flanges in either threaded, butt-weld, or socket-weld configurations. "M-2FS" pumps are made to accept ASA 400 LB. style companion pipe flanges. Models carrying the letter "H" in the model number are capable of higher outputs at the same drive speeds. All of these pumps can be used with direct motor drives and are capable of up to 300 P.S.I.D. at maximum drive speed with liquids around 500 S.S.U. viscosity. They are designed for horizontal base mounting.



TYPICAL RATED OUTPUTS

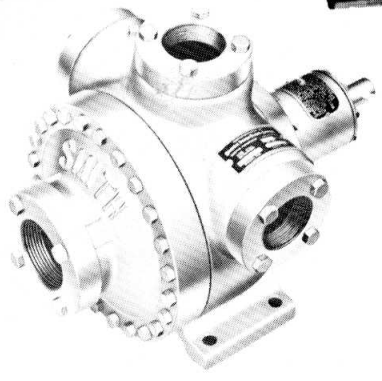
Model M-2F, MC-2F, MC-2FS, and M-2FS:
 12½ GPM at 450 RPM
 25 GPM at 900 RPM
 50 GPM at 1800 RPM (max)

Model M-2FH, MC-2FH, MC-2FSH, and M-2FSH:
 12½ GPM at 375 RPM
 25 GPM at 750 RPM
 50 GPM at 1500 RPM (max)

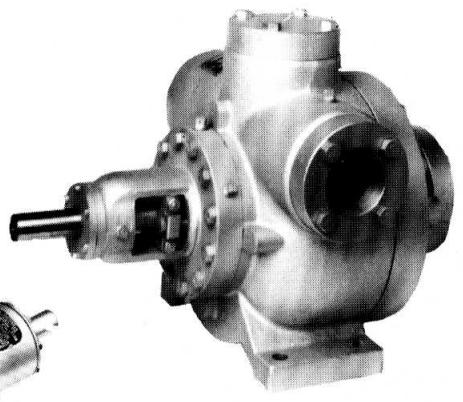


② "T-2F SERIES" PUMPS (2½ × 2-INCH FLANGES)

MODEL TC-2F



MODEL T-2F



GENERAL DATA: Models T-2F and TC-2F shown are designed for low speeds with high output. Originally built for use with low speed power take-off drives, this pump is particularly suitable where minimal space is available, and feed lines must be simplified, by necessity. Unlike pumps shown on previous pages, this model has a top port in addition to the standard side ports, with the end cover port. It is provided with Smith design companion flanges, in three styles: threaded, socket-weld, or butt weld.

The gear end cover flange is for 2½ inch pipe. The main housing flanges are all for 2 inch pipe, and blind flanges are provided for unused main housing ports. Be sure to specify which ports are to be used.

If the end cover port is used as the inlet port, the internal "drag" (N.P.S.H.R.) is reduced. Flow through this model divides into twice as many separate channels as other Smith pumps in this catalog. This unit is capable of differential pressures of at least 300 P.S.I.D., with liquids around 500 S.S.U. viscosity at maximum speed.

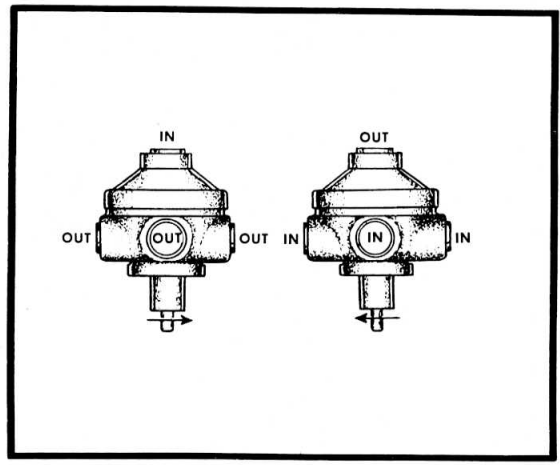
"T-2F Series" pumps cannot be direct motor coupled, but gear reducers, belt or chain drives can easily be used. Bypass valves and strainers are recommended additional equipment.

SPECIFIC DATA:"T-2F Series" pumps, to 50 G.P.M. rated output

T-2F: Packing gland, reversible, vacuum capability, Smith flanges provided in three different styles, 2½ inch cover port and 2 inch main housing ports, blind flanges provided for unused ports.

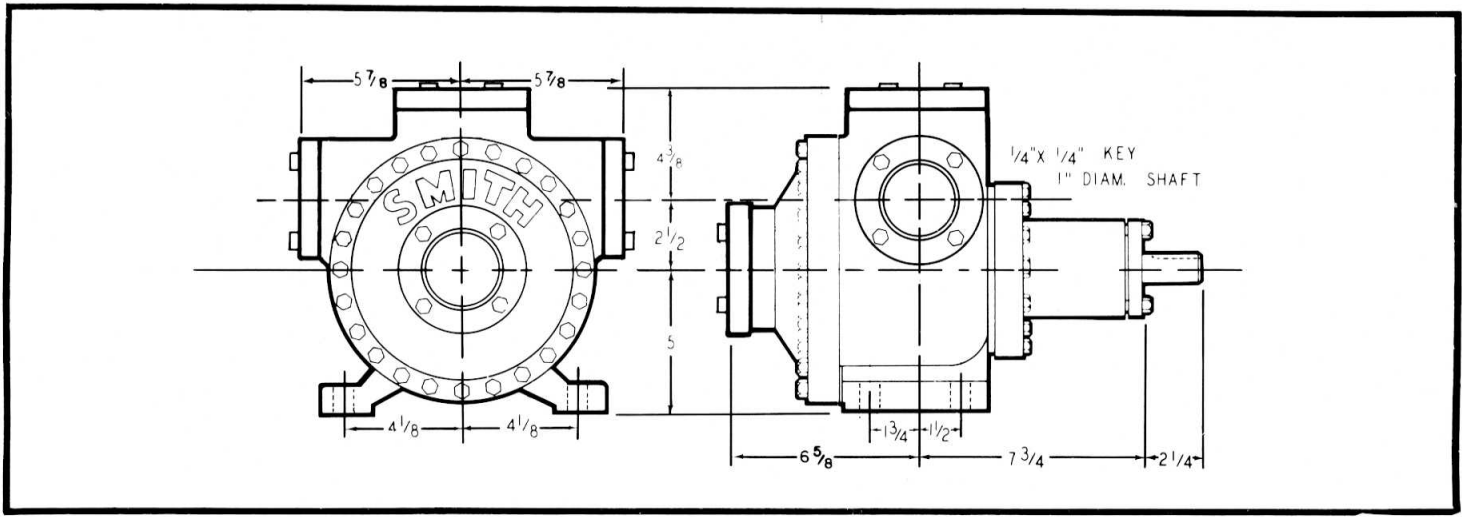
TC-2F: Rotary or mechanical seal, reversible, vacuum capability, Smith flanges provided in three different styles, 2½ inch cover port and 2 inch main housing ports, blind flanges provided for unused ports.

NOTE: Running the pump with the inlet through the gear end cover lessens "drag" (N.P.S.H.R.). Running in the opposite direction exposes the shaft seals to inlet pressure only.

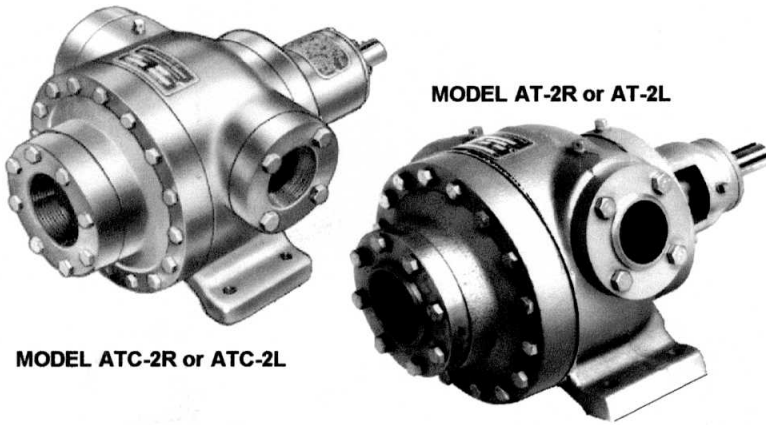


TYPICAL RATED OUTPUTS

| | |
|---------------------------|--------------------------|
| TC-2F: 12½ GPM at 125 RPM | T-2F: 12½ GPM at 125 RPM |
| 25 GPM at 250 RPM | 25 GPM at 250 RPM |
| 50 GPM at 500 RPM (max) | 50 GPM at 500 RPM (max) |



③ "AT-2 SERIES" PUMPS (2½ × 2-INCH FLANGES)



GENERAL DATA: "AT-2 Series" come equipped with Smith design companion flanges only. The gear end cover flange is designed to accept a 2-½ inch American Standard Pipe, and the side flanges, 2-inch. These are available in three different kinds: threaded, socket-weld, and butt-weld. All AT-2 pumps are particularly suitable for mobile applications, or where flanged connections are necessary. If the end port is used as the inlet, internal "drag" (N.P.S.H.R.) is reduced by providing liquid to both gear combinations simultaneously.

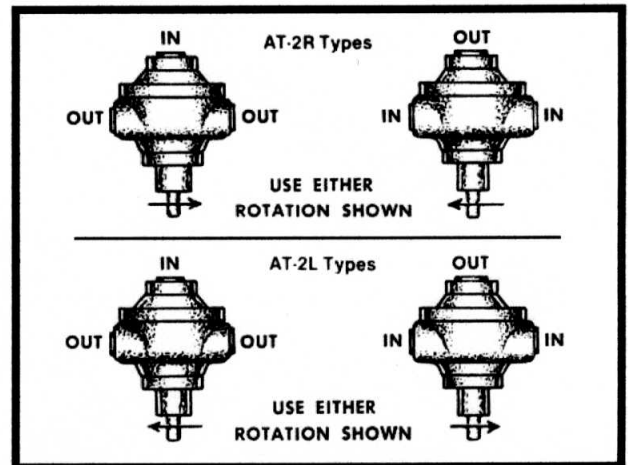
There are two basic configurations involving the "L" and the "R" types. "AT-2R" pumps and "AT-2L" pumps have the same porting, but turn in opposite directions as shown in the drawing below. A further distinction can be made between the "H" and "Non-H" types: models carrying the letter "H" in the model number have higher outputs at the same drive speeds.

These pumps are capable of differential pressures of at least 300 P.S.I.D., with liquids around 500 S.S.U. viscosity, at maximum speed. They are designed for horizontal base mounting and can be direct-motor connected, or used with gear reducers, belt drives, or chain drives. Bypass valves and strainers are recommended additional equipment.

SPECIFIC DATA: "AT-2 Series" pumps, to 50 G.P.M., rated output.

- AT-2R: Right-handed rotation for inlet through gear end cover, packing gland, reversible, vacuum capability, Smith flanges provided in three different styles, 2-½ inch cover port and 2-inch main housing ports, blind flange provided for unused main housing port.
- AT-2RH: Right-handed rotation for inlet through gear end cover, packing gland, reversible, vacuum capability, Smith flanges, higher output at same speeds, same dimensions.
- ATC-2R: Right-handed rotation for inlet through gear end cover, rotary or mechanical seal, reversible, vacuum capability, Smith flanges.
- ATC-2RH: Right-handed rotation for inlet through gear end cover, rotary or mechanical seal, reversible, vacuum capability, Smith flanges, higher output at same speeds, same dimensions.
- AT-2L: Left-handed rotation for inlet through gear end cover, packing gland, reversible, vacuum capability, Smith flanges provided in three different styles, 2-½ inch cover port and 2-inch main housing ports, blind flange provided for unused main housing port.
- AT-2LH: Left-handed rotation for inlet through gear end cover, packing gland, reversible, vacuum capability, Smith flanges, higher output at same speeds, same dimensions.
- ATC-2L: Left-handed rotation for inlet through gear end cover, rotary or mechanical seal, reversible, vacuum capability, Smith flanges.
- ATC-2LH: Left-handed rotation for inlet through gear end cover, rotary or mechanical seal, reversible, vacuum capability, Smith flanges, higher output at same speeds, same dimensions.

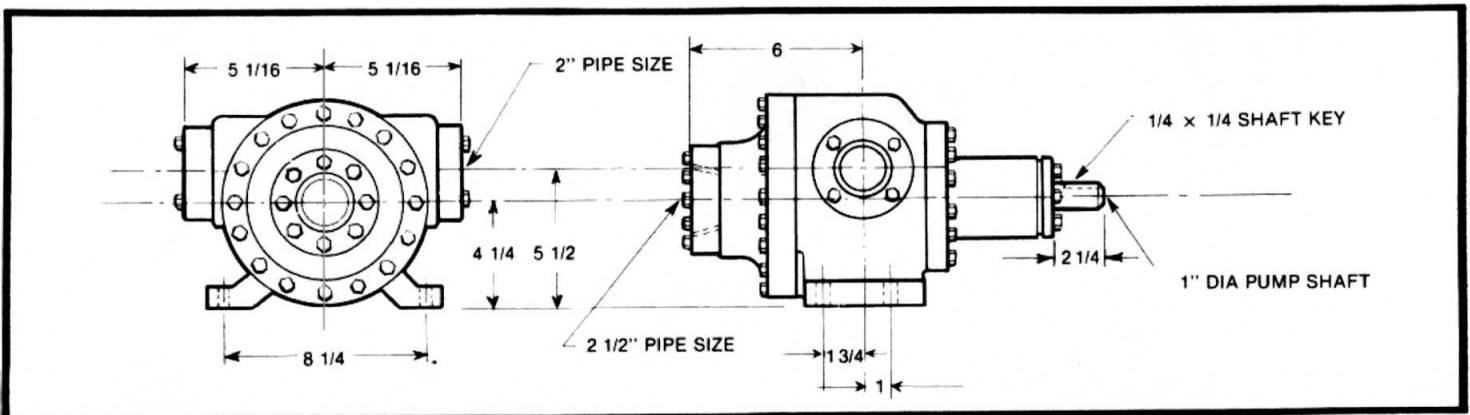
NOTE: Running the pump with the inlet through the gear end cover lessens "drag" (N.P.S.H.R.). Running in the opposite direction exposes the shaft seals to inlet pressure only.



TYPICAL RATED OUTPUTS

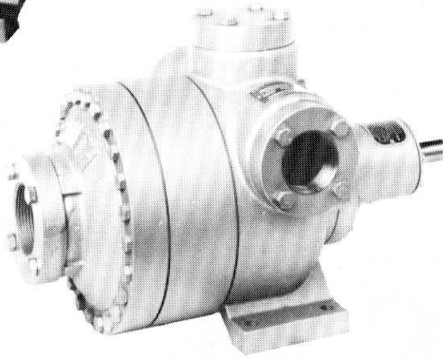
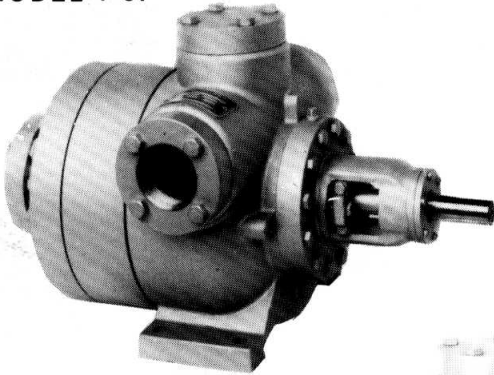
AT-2R, AT-2L, ATC-2R, and ATC-2L:
 12½ GPM at 450 RPM
 25 GPM at 900 RPM
 50 GPM at 1800 RPM (max.)

AT-2RH, AT-2LH, ATC-2RH, and ATC-2LH:
 12½ GPM at 375 RPM
 25 GPM at 750 RPM
 50 GPM at 1500 RPM (max.)



4 "T-3F SERIES" PUMPS (2½ × 2-INCH FLANGES)

MODEL T-3F



MODEL TC-3F

GENERAL DATA: Models T-3F and TC-3F shown are designed for low speeds with high output. Originally built for use with low speed power take-off drives, this pump is particularly suitable where minimal space is available, and feed lines must be simplified, by necessity. Unlike pumps shown on previous pages, this model has a top port in addition to the standard side ports, with the end cover port. It is provided with Smith design companion flanges, in three styles: threaded, socket-weld, or butt-weld.

The gear end cover flange is for 2-½ inch pipe. The main housing flanges are all for 2 inch pipe, and blind flanges are provided for unused main housing ports. Be sure to specify which ports are to be used.

If the end cover port is used as the inlet port, the internal "drag" (N.P.S.H.R.) is reduced. Flow through this model divides into twice as many separate channels as other Smith pumps in this catalog. This unit is capable of differential pressures of at least 300 P.S.I.D., with liquids around 500 S.S.U. viscosity at maximum speed.

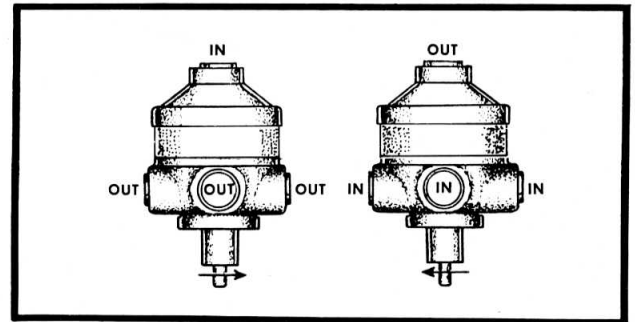
"T-3F Series" pumps cannot be direct motor coupled, but gear reducers, belt, or chain drives can easily be used. Bypass valves and strainers are recommended additional equipment.

SPECIFIC DATA: "T-3F Series" pumps, to 100 G.P.M. rated output.

T-3F: Packing gland, reversible, vacuum capability, Smith flanges provided in three different styles, 2-½ inch cover port and 2-inch main housing ports, blind flanges provided for unused ports.

TC-3F: Rotary or mechanical seal, reversible, vacuum capability, Smith flanges provided in three different styles, 2-½ inch cover port and 2-inch main housing ports, blind flanges provided for unused ports.

NOTE: Running the pump with the inlet through the gear end cover lessens "drag" (N.P.S.H.R.). Running in the opposite direction exposes the shaft seals to inlet pressure **only**.



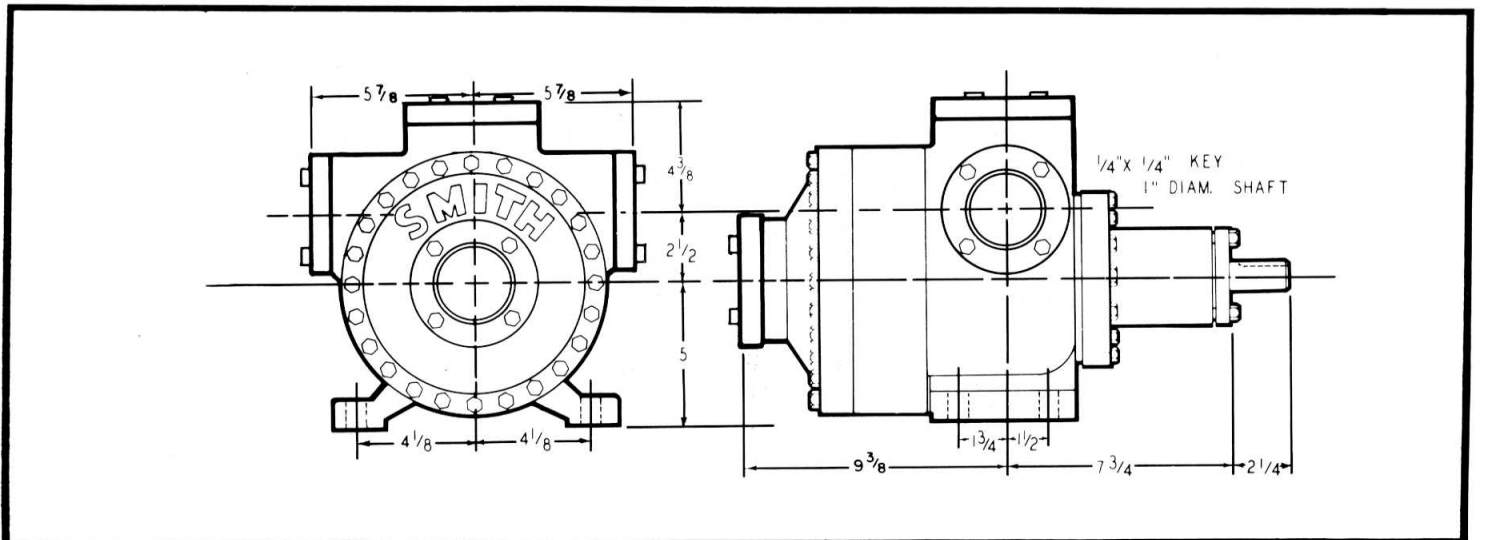
TYPICAL RATED OUTPUTS

TC-3F:

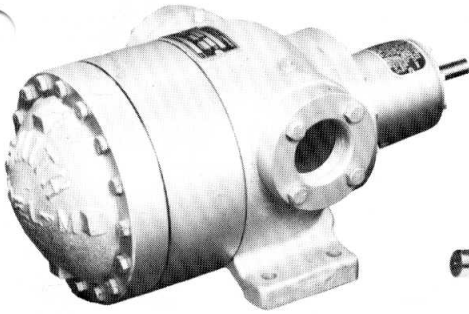
25 GPM at 125 RPM
50 GPM at 250 RPM
100 GPM at 500 RPM (max.)

T-3F:

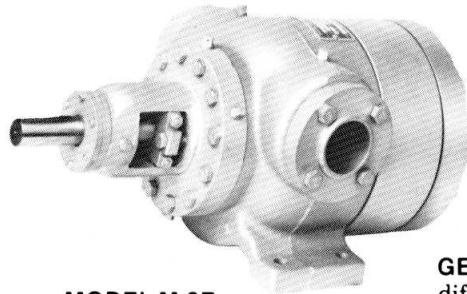
25 GPM at 125 RPM
50 GPM at 250 RPM
100 GPM at 500 RPM (max.)



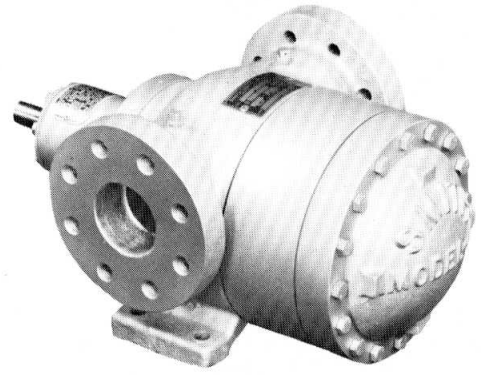
⑤ "M-3F SERIES" PUMPS (2 × 2-INCH FLANGES)



MODEL MC-3F



MODEL M-3F



MODEL MC-3FS, M-3FS

SPECIFIC DATA:

"M-3F Series" pumps, to 100 G.P.M., rated output.

M-3F: Packing gland, reversible, vacuum capability, Smith flanges 2" size available in three styles.

MC-3F: Rotary or mechanical seal, vacuum capability, reversible, Smith flanges 2" size available in three styles.

M-3FH: Packing gland, reversible, vacuum capability, Smith flanges 2" size available in three styles, higher output at same speeds, same external dimensions.

MC-3FH: Rotary or mechanical seal, vacuum capability, reversible, Smith flanges 2" size available in three styles, higher output at same speeds, same external dimensions.

M-3FS: Packing gland, reversible, vacuum capability, A.S.A. 400 LB. flange connections 2" pipe size.

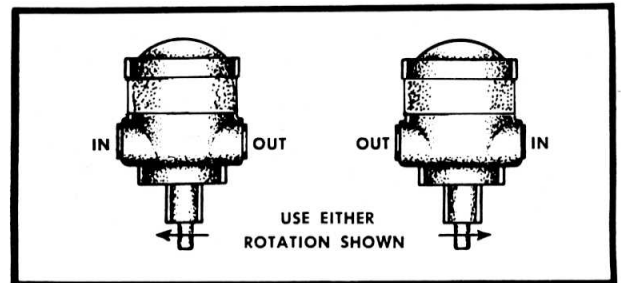
MC-3FS: Rotary or mechanical seal, vacuum capability, reversible, A.S.A. 400 LB. flange connections 2" pipe size.

M-3FSH: Packing gland, reversible, vacuum capability, A.S.A. 400 LB. flange connections 2" pipe size, higher output at same speeds, same external dimensions.

MC-3FSH: Rotary or mechanical seal, vacuum capability, reversible, A.S.A. 400 LB. flange connections 2" pipe size, higher output at same speeds, same external dimensions.

NOTE: Running the pump in a clockwise direction will expose the shaft seals to inlet pressure only.

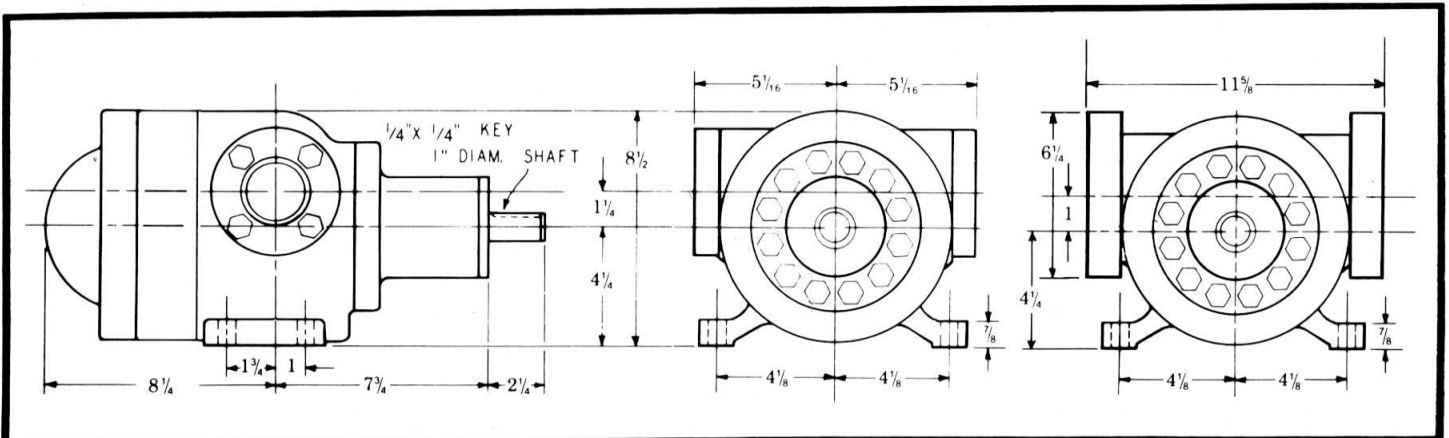
GENERAL DATA: "M-3F Series" units comprise several different flange designs all compatible with two-inch N.P.T. sizes. "M-3F" pumps come equipped with Smith design companion flanges in either threaded, butt-weld, or socket-weld configurations. "M-3FS" pumps are made to accept ASA 400 LB. style companion pipe flanges. Models carrying the letter "H" in the model number are capable of higher outputs at the same drive speeds. All of these pumps can be used with direct motor drives and are capable of up to 300 P.S.I.D. at maximum drive speed with liquids around 500 S.S.U. viscosity. They are designed for horizontal base mounting. Bypass valves and strainers are recommended additional equipment.



TYPICAL RATED OUTPUTS

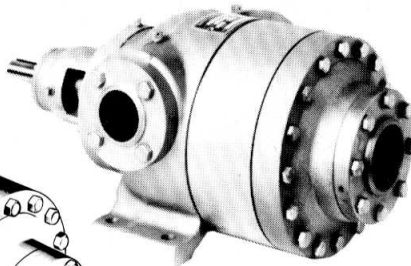
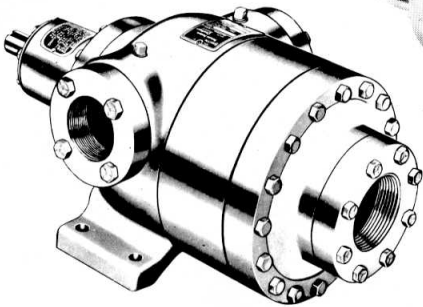
Model M-3F, MC-3F, MC-3FS, and M-3FS:
 12 GPM at 225 RPM
 25 GPM at 450 RPM
 50 GPM at 900 RPM

Model M-3FH, MC-3FH, MC-3FSH, and M-3FSH:
 12 GPM at 188 RPM
 25 GPM at 375 RPM
 50 GPM at 750 RPM



⑥ "AT-3 SERIES" PUMPS (2½ × 2-INCH FLANGES)

MODEL ATC-3R or ATC-3L



MODEL AT-3R

SPECIFIC DATA: "AT-3 Series" pumps, to 100 G.P.M., rated output.

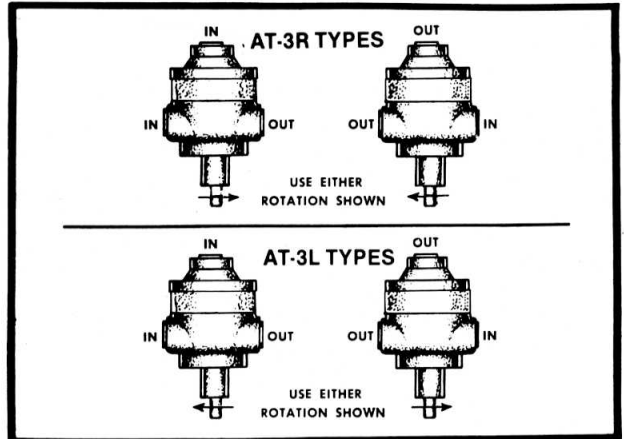
- AT-3R:** Right-handed rotation for inlet through gear end cover, packing gland, reversible, vacuum capability, Smith flanges provided in three different styles, 2-½ inch cover port and 2-inch main housing ports, blind flange provided for unused main housing port.
- AT-3RH:** Right-handed rotation for inlet through gear end cover, packing gland, reversible, vacuum capability, Smith flanges, higher output at same speeds, same dimensions.
- ATC-3R:** Right-handed rotation for inlet through gear end cover, rotary or mechanical seal, reversible, vacuum capability, Smith flanges.
- ATC-3RH:** Right-handed rotation for inlet through gear end cover, rotary or mechanical seal, reversible, vacuum capability, Smith flanges, higher output at same speeds, same dimensions.
- AT-3L:** Left-handed rotation for inlet through gear end cover, packing gland, reversible, vacuum capability, Smith flanges provided in three different styles, 2-½ inch cover port and 2-inch main housing ports, blind flange provided for unused main housing port.
- AT-3LH:** Left-handed rotation for inlet through gear end cover, packing gland, reversible, vacuum capability, Smith flanges, higher output at same speeds, same dimensions.
- ATC-3LH:** Left-handed rotation for inlet through gear end cover, rotary or mechanical seal, reversible, vacuum capability, Smith flanges.
- ATC-3LH:** Left-handed rotation for inlet through gear end cover, rotary or mechanical seal, reversible, vacuum capability, Smith flanges, higher output at same speeds, same dimensions.

NOTE: Running the pump with the inlet through the gear end cover lessens "drag" (N.P.S.H.R.). Running in the opposite direction exposes the shaft seals to inlet pressure only.

GENERAL DATA: "AT-3 Series" come equipped with Smith design companion flanges only. The gear end cover flange is designed to accept a 2-½ inch American Standard Pipe Size, and the side flanges, 2-inch. These are available in three different kinds: threaded, butt-weld, and socket-weld. All AT-3 pumps are particularly suitable for mobile applications, or where flanged connections are necessary. If the end port is used as the inlet, internal "drag" (N.P.S.H.R.) is reduced by providing liquid to both gear combinations simultaneously.

There are two basic configurations involving the "L" and the "R" types. "AT-3R" pumps and "AT-3L" pumps have the same porting, but turn in opposite directions as shown in the drawing below. A further distinction can be made between the "H" and "Non-H" types: models carrying the letter "H" in the model number have higher outputs at the same drive speeds.

These pumps are capable of differential pressures of at least 300 P.S.I.D., with liquids around 500 S.S.U. viscosity, at maximum speed. They are designed for horizontal base mounting and can be direct-motor connected, or used with gear reducers, belt drives, or chain drives. Bypass valves and strainers are recommended additional equipment.



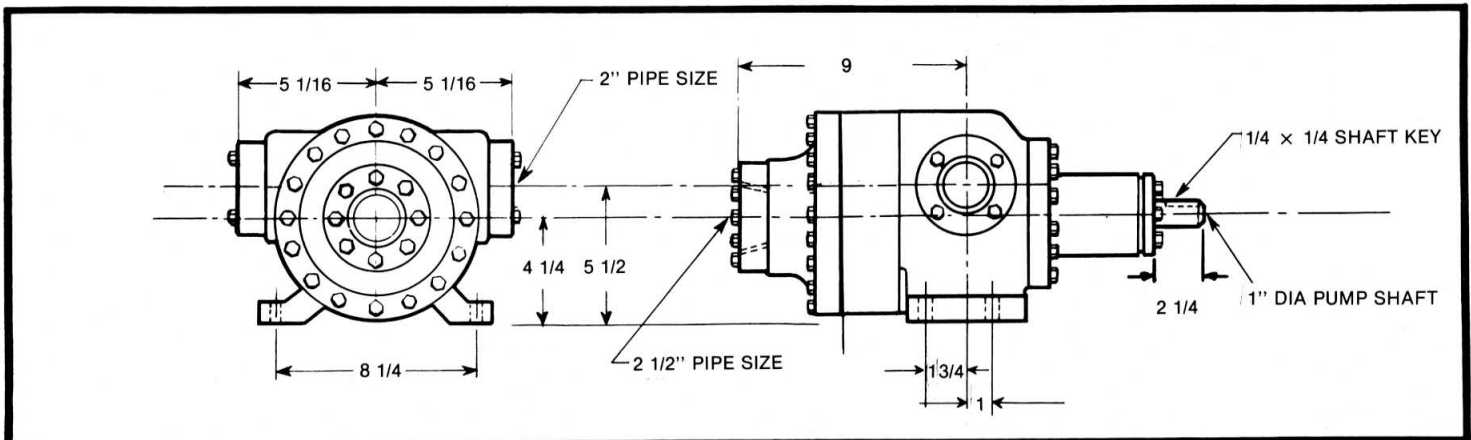
TYPICAL RATED OUTPUTS

AT-3R, AT-3L, ATC-3R, and ATC-3L:

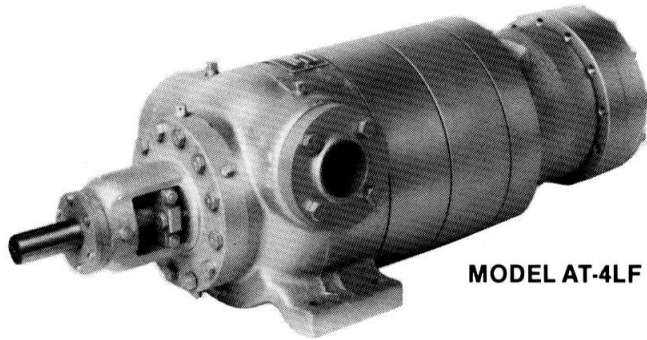
- 25 GPM at 450 RPM
- 50 GPM at 900 RPM
- 100 GPM at 1800 RPM (max.)

AT-3RH, AT-3LH, ATC-3RH, and ATC-3LH:

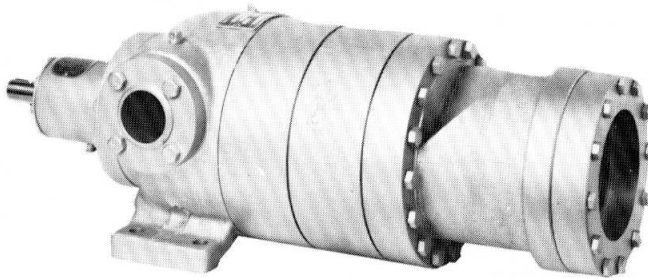
- 25 GPM at 375 RPM
- 50 GPM at 750 RPM
- 100 GPM at 1500 RPM (max.)



7 "AT-4LF SERIES" PUMPS (4 × 2-INCH FLANGES)



MODEL AT-4LF



MODEL ATC-4LF

GENERAL DATA: "AT-4LF Series" come equipped with Smith design companion flanges only. The gear end cover flange is designed to accept a 4-inch American Standard Pipe Size, and the side flanges, 2-inch. The end flange is available in either threaded, or socket-weld styles. The side flanges are available in three different kinds: threaded, butt-weld, and socket weld. The pump should only be run in a counterclockwise direction, as shown, below. Both outlets should be used.

There are two basic configurations of "AT-4LF" pumps: "H" and "Non-H". Models carrying the letter "H" in the model number have higher outputs at the same drive speeds.

Internal "drag" (N.P.S.H.R.) is reduced by using the end port as the inlet and supplying fluid to both gear combinations simultaneously.

These pumps are capable of differential pressures of at least 300 P.S.I.D., with liquids around 500 S.S.U. viscosity, at maximum speed. They are designed for horizontal base mounting, and can be direct-motor driven, or used with gear reducers, belt drives, or chain drives. Bypass valves and strainers are recommended additional equipment.

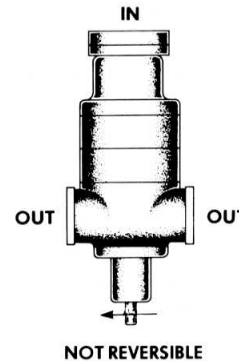
TYPICAL RATED OUTPUTS

AT-4LF:
 37 GPM at 450 RPM
 75 GPM at 900 RPM
 150 GPM at 1800 RPM (max.)

AT-4LFH:
 45 GPM at 450 RPM
 80 GPM at 900 RPM
 150 GPM at 1500 RPM (max.)

ATC-4LF:
 37 GPM at 450 RPM
 75 GPM at 900 RPM
 150 GPM at 1800 RPM (max.)

ATC-4LFH:
 45 GPM at 450 RPM
 80 GPM at 900 RPM
 150 GPM at 1500 RPM (max.)



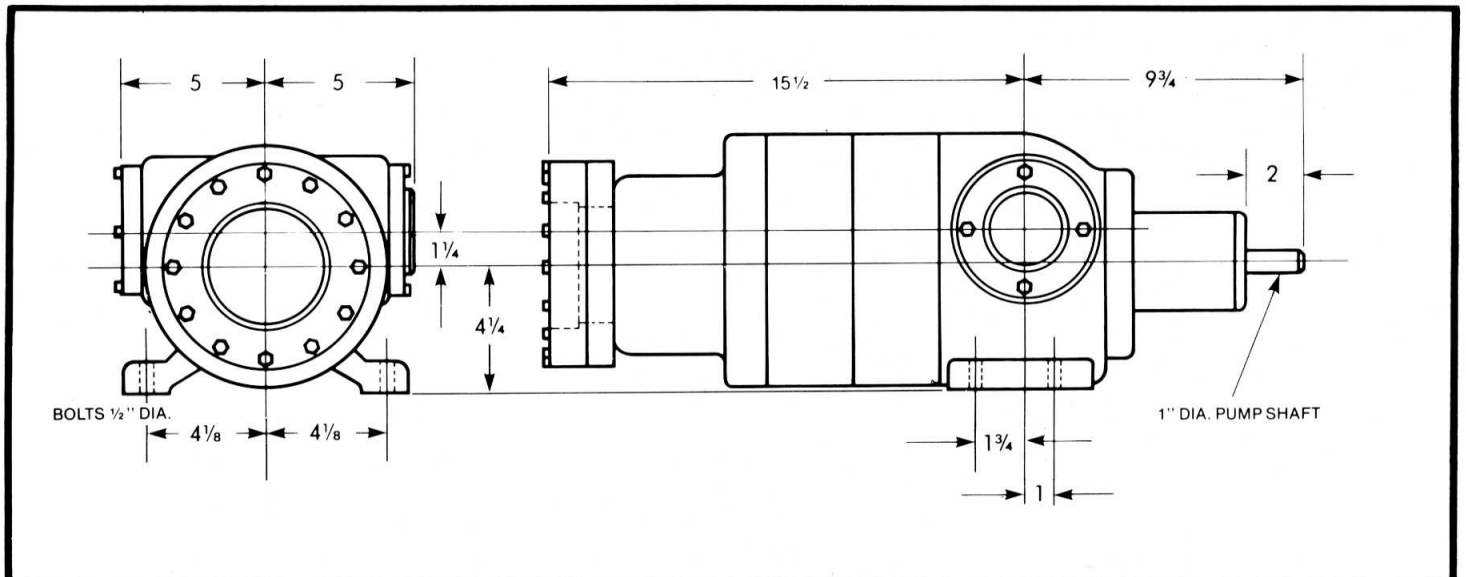
SPECIFIC DATA: "AT-4LF Series" pumps, to 150 G.P.M., rated output.

AT-4LF: Packing gland, **not** reversible, vacuum capability, Smith flanges, 4-inch inlet flange and 2-inch outlet flanges.

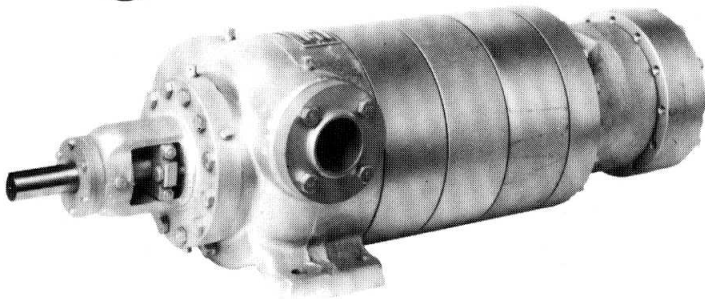
ATC-4LF: Rotary or mechanical seal, **not** reversible, vacuum capability, Smith flanges.

AT-4LFH: Packing gland, **not** reversible, vacuum capability, Smith flanges, higher output at same speeds, same dimensions.

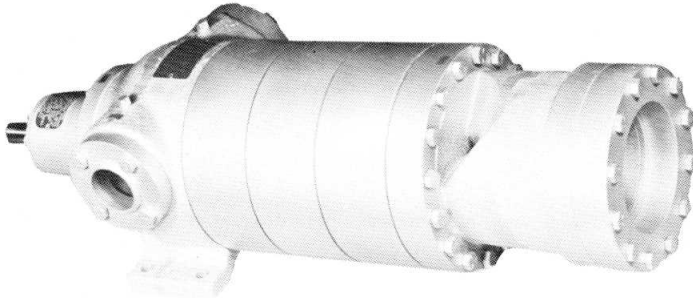
ATC-4LFH: Rotary or mechanical seal, **not** reversible, vacuum capability, Smith flanges, higher output at same speeds, same dimensions.



⑧ "AT-5LF SERIES" (4 X 2-Inch Flanges)



MODEL AT-5LF



MODEL ATC-5LF, ATC-5LFH

GENERAL DATA: "AT-5LF Series" come equipped with Smith design companion flanges only. The gear end cover flange is designed to accept a 4-inch American Standard Pipe Size, and the side flanges, 2-inch. The end flange is available in either threaded, or socket-weld styles. The side flanges are available in three different kinds: threaded, butt-weld, and socket-weld styles. The pump should only be run in a counterclockwise direction, as shown, below. Both outlets should be used.

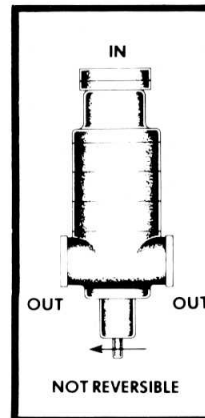
The "H" models, which carry the letter "H" after the model number, have the same capacities as the "Non-H" types, but at lower speeds. If the standard pump is supplied with special (L) gears, even higher output is possible. In both cases, although the external dimensions are identical, the gears are progressively larger and handle more liquid per revolution.

Internal "drag" (N.P.S.H.R.) is reduced by using the end port as the inlet and supplying fluid to both gear combinations simultaneously.

These pumps are capable of differential pressures of at least 300 P.S.I.D., with liquids around 500 S.S.U. viscosity, at maximum speed. They are designed for horizontal base mounting, and can be direct-motor driven, or used with gear reducers, belt drives, or chain drives. Bypass valves and strainers are recommended additional equipment.

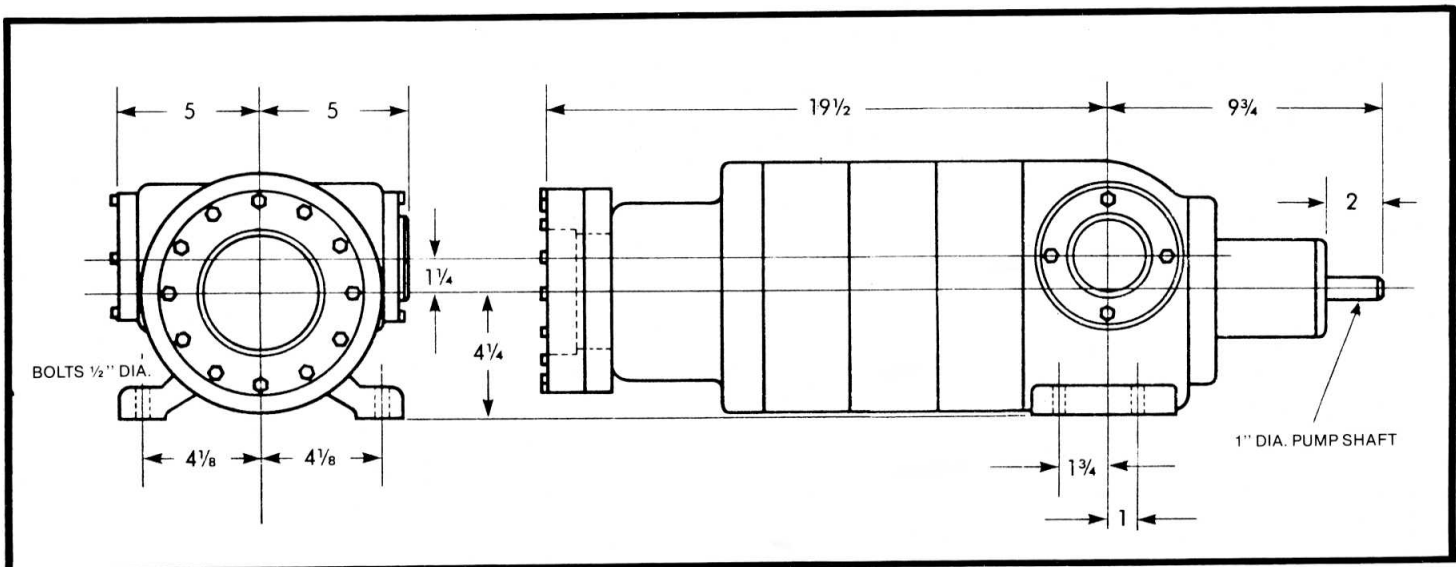
SPECIFIC DATA: "AT-5LF Series" pumps to 250 G.P.M., rated output.

- AT-5LF: Packing gland, **not** reversible, vacuum capability, Smith flanges, 4-inch inlet flange and 2-inch outlet flanges.
- ATC-5LF: Rotary or mechanical seal, **not** reversible, vacuum capability, Smith flanges.
- AT-5LFH: Packing gland, **not** reversible, vacuum capability, Smith flanges, higher output at same speeds, same dimensions.
- ATC-5LFH: Rotary or mechanical seal, **not** reversible, vacuum capability, Smith flanges, higher output at same speeds, same dimensions.
- AT-5LF (L): Special model with all large gears has even higher output at same speeds, **not** reversible, vacuum capability, Smith flanges, 4-inch inlet flange and 2-inch outlet flange, packing gland.
- ATC-5LF (L): Special model with all large gears has even higher output at same speeds, **not** reversible, vacuum capability, Smith flanges, 4-inch inlet flange and 2-inch outlet flange, rotary or mechanical seal.



TYPICAL RATED OUTPUTS

| |
|-----------------------------|
| AT-5LF and ATC-5LF: |
| 50 GPM at 450 RPM |
| 100 GPM at 900 RPM |
| 200 GPM at 1800 RPM (max.) |
| AT-5LFH and ATC-5LFH: |
| 60 GPM at 450 RPM |
| 120 GPM at 900 RPM |
| 200 GPM at 1500 RPM (max.) |
| AT-5LF (L) and ATC-5LF (L): |
| 75 GPM at 450 RPM |
| 125 GPM at 900 RPM |
| 250 GPM at 1800 RPM (max.) |

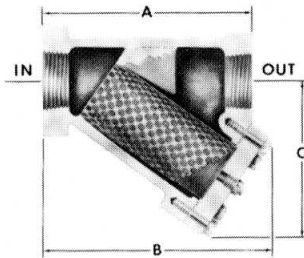


SMITH STRAINERS

The Smith strainer (Type W-1, W-2, W-3) was originally designed for high-pressure liquefied gas service and as such follows the same extra-heavy construction procedures as the Smith pumps. The Smith strainer is especially constructed to provide less resistance to flow, and has a readily removable screen. Strainer body dimensions are interchangeable with some other makes (refer to tabulated data.)

ADVANTAGES OF SMITH STRAINERS

1. Construction exceeds latest safety code requirements.
2. Screen easy to replace because of unique Smith design.
3. Reinforced screen mesh, traps more solid material with less resistance-to-flow.
4. Precision cut pipe threads to provide perfect seal, no leakage.
5. O-ring gasket in strainer flange, inexpensive to replace.
6. Flanged opening to strainer screen.
7. Flange made of steel. Easy to open for cleaning.



| STRAINER TYPE NO. | PIPE SIZES | | DIMENSIONS | | |
|-------------------|------------|--------|------------|--------|-------|
| | INLET | OUTLET | A | B | C |
| W-1 | 1 | 3/4 | 6 3/8 | 7 | 4 1/2 |
| W-1 | 1 | 1 | 6 3/8 | 7 | 4 1/2 |
| W-1 | 1 1/4 | 3/4 | 6 3/8 | 7 | 4 1/2 |
| W-1 | 1 1/4 | 1 | 6 3/8 | 7 | 4 1/2 |
| W-1 | 1 1/4 | 1 1/4 | 6 3/8 | 7 | 4 1/2 |
| W-2 | 2 | 1 1/2 | 8 3/16 | 9 | 6 5/8 |
| W-2 | 2 | 2 | 8 3/16 | 9 | 6 5/8 |
| W-3 | 2 1/2 | 2 1/2 | 10 1/4 | 11 1/4 | 7 1/2 |
| W-3 | 3 | 2 1/2 | 10 1/4 | 11 1/4 | 7 1/2 |
| W-3 | 3 | 3 | 10 1/4 | 11 1/4 | 7 1/2 |

STRAINER MAINTENANCE PLAN

1. Install a strainer between tank liquid outlet and pump inlet, with 40 mesh screen.
2. After initial installation, open the strainer for inspection every day until foreign matter from the tank has been washed out.
3. Thereafter, inspect and clean strainer often enough to assure free flow of liquid to pump.
4. Keep extra screen in stock in case the one in service becomes damaged.
5. Remember, strainer inspection is good pump insurance.

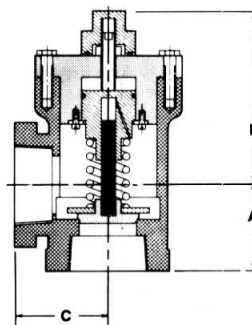
SMITH BYPASS VALVES

As with the Smith strainers described on the left, all Smith bypass valves are also originally designed for high-pressure liquefied gas service and as such follow the same extra-heavy construction procedures as the Smith pumps. All models are chatter-free and house a tough stainless steel spring for maximum service life. All models are rated 600 wog. U.L. listed valves for L.P.G. service are available with pressure settings from 30 to 125 p.s.i.d.. Higher settings also available. The Smith Bypass Valve is spring loaded and senses differential pressure. It does not house a diaphragm and does not require a separate vapor phase connection.

VALVE SELECTION TABLE

| Model | Size (Inches) | Weight (Lbs.) | Pump Recommended (Smith Model No.) | Flow (GPM) |
|--------|---------------|---------------|------------------------------------|------------|
| WW120 | 1/2 x 1/2 | 9 | MC-1, Eg-1, Kg-1, SQ-1, SQ-H | 5-10 |
| WW-340 | 3/4 x 3/4 | 9 | EC-H, SQ-HH, SQ-HH8 | 13-15 |
| WW-100 | 1x1 | 12 | MC-1044, MC-1044H, TC-1044H | 20-35 |
| WW-114 | 1 1/4 x 1 1/4 | 12 | MC-2, ATC-2R, ATC-2L, TC-2, MC-2H | 50 |
| WW-112 | 1 1/2 x 1 1/2 | 25 1/2 | MC-3, ATC-2R, ATC-3L, TC-3, MC-3H | 100 |
| WW-200 | 2x2 | 25 1/2 | MC-4, MC-4H | 150 |

ALL VALVES FPT



ADVANTAGES OF SMITH BYPASS VALVES

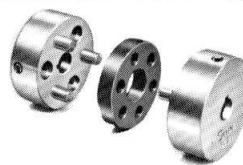
1. Simple spring-loaded design
2. Stainless steel spring
3. Temperature range -150°F. to +400°F.
4. Designed for continuous metering
5. Leak-free adjustment screw
6. Low overpressure
7. Pressure-balanced shock absorption which eliminates chattering
8. Large internal flow porting

OVERALL DIMENSIONS

| Model | Size | A | B | C |
|--------|---------------|-------|--------|-------|
| WW-120 | 1/2 x 1/2 | 1 5/8 | 5 7/16 | 1 3/4 |
| WW-340 | 3/4 x 3/4 | 1 5/8 | 5 7/16 | 1 3/4 |
| WW-100 | 1x1 | 1 7/8 | 5 5/8 | 2 5/8 |
| WW-114 | 1 1/4 x 1 1/4 | 1 7/8 | 5 5/8 | 2 5/8 |
| WW-112 | 1 1/2 x 1 1/2 | 3 | 6 1/8 | 3 1/4 |
| WW-200 | 2x2 | 3 | 6 1/8 | 3 1/4 |

FLEXIBLE DRIVE COUPLINGS

Flexible drive couplings are required for Smith Precision Pumps mounted on steel bases with motors or engines—or pumps mounted directly on motors. Recommended couplings consist of two metal flanges and one flexible rubber vibration-dampening insert disc. Special fabreeka, cord-impregnated, insert discs are available for most sizes at slightly higher cost, and are used for difficult applications. The following stock couplings and insert discs are carried at Smith Precision Products Company.



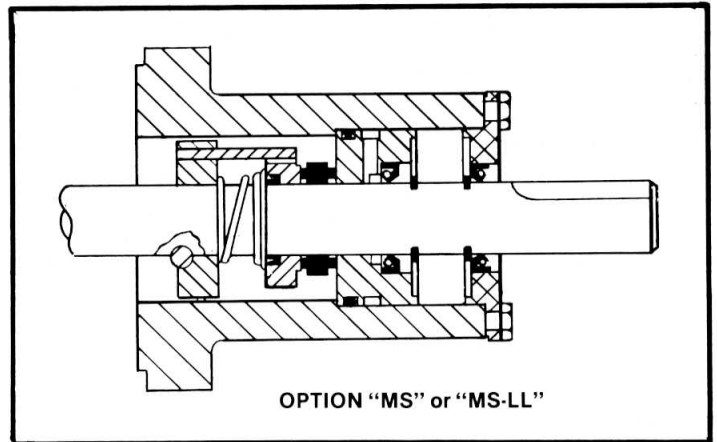
Custom sized bores for unusual motor-shaft sizes can be supplied with little delay, since custom machining is done at Smith Precision Products Company.

| PART NUMBER | AVAILABLE STOCK BORE DIAMETERS | WEIGHT | INSERT NO. |
|---|--------------------------------|------------|------------|
| Smith VC-20 (No. 2) for up to 1 HP motors | 5/8, 3/4 | 1 lb. | FD-20 |
| Smith VC-30 (No. 3) for up to 1 1/2 HP motors | 5/8, 3/4, 7/8, 1 | 3 lbs. | FD-30 |
| Smith VC-35 (No. 3 1/2) for up to 3 HP motors | 7/8, 1, 1 1/4 | 4 1/2 lbs. | FD-35 |
| Smith VC-40 (No. 4) for up to 7 1/2 HP motors | 1, 1 1/4, 1 1/2, 1 3/4 | 8 lbs. | FD-40 |
| Smith VC-50 (No. 5) for 10 and 15 HP motors | 1, 1 1/4, 1 1/2 | 16 lbs. | FD-50 |

SEAL OPTIONS

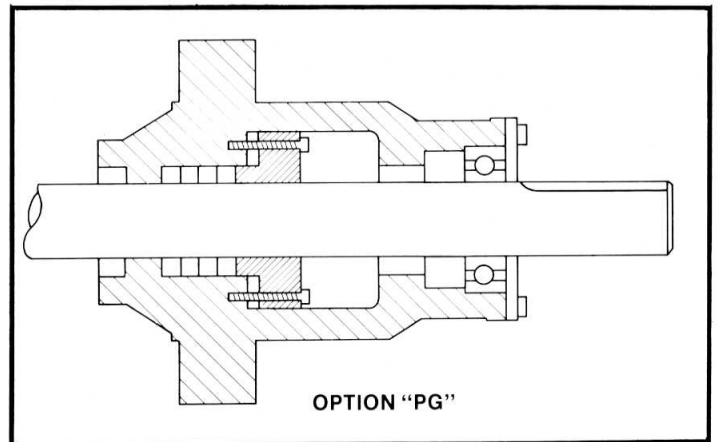
In the cross-sectional view at right, the standard Smith mechanical seal assembly is shown (option "MS"). Optional heavy-duty mechanical seal assembly is also available (option "MS-LL"). Many times, this configuration can replace a packing gland assembly (below). Modification can easily be made for cold or high temperatures within the specified ranges, and for up to 25 in/Hg of vacuum. See Price List for mechanical seal options. Smith pumps which use mechanical seals carry the letter "C" in their model numbers (Examples: TC-2, MC-2, MC-1044).

SMITH MECHANICAL SEAL ASSEMBLY



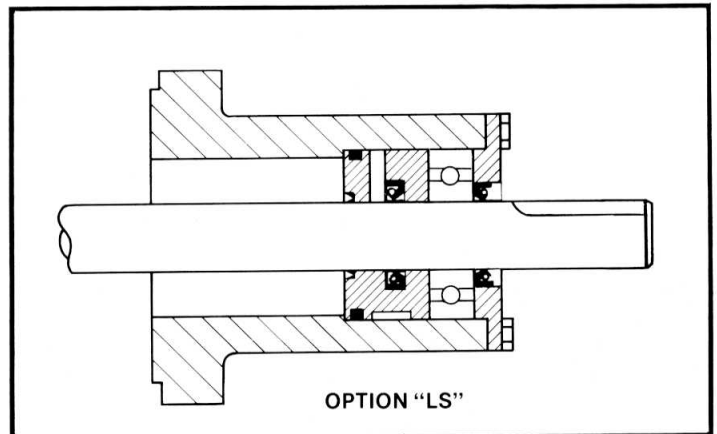
The packing gland seal assembly which can be fitted to the same pump, as shown on the right, features teflon, asbestos, or lead foil rings. Models fitted with the packing gland assembly do not carry the letter "C" in their model numbers (Examples: T-2, M-2, M-1044).

SMITH PACKING GLAND ASSEMBLY



The standard rotary lip seal used in all Smith pumps is shown to the right. Normally these units are run in the appropriate direction of rotation so that only inlet pressure contacts the seal assembly.

SMITH LIP SEAL ASSEMBLY



ADVANTAGES OF SMITH MECHANICAL SEALS:

The Smith mechanical seal assembly is not a cartridge-type seal, but one in assembly with the outboard ball bearing *and* drive shaft. This entire unit is manufactured, assembled, and pre-tested under full load, in house. It is a patented item, originally designed many years ago, and is continually upgraded.

As it is a complete "sub-assembly," the Smith mechanical seal is sold also under our exchange plan, with a generous trade-in allowance against the cost of a new one. The unique design employs a self-adjusting feature while cutting down frictional wear by means of an intermediary ring which rotates at half the speed of the drive shaft.

CONSTRUCTION MATERIALS

The following is a list of **standard** construction materials.

- Main Housing:** High quality alloy iron, steel
- Gear Housing:** High quality alloy iron, steel
- Gear End Cover:** High quality alloy iron, steel
- Foot Flange:** Stainless steel or carbon steel
- Bearing Retainer Plate:** Aluminum, stainless steel, high quality alloy iron, bronze, carbon steel
- Optional Seal Bleed Check Valve:** Brass, bronze, stainless steel
- Optional Bypass Valve Cartridge:** Brass, iron, steel
- Drive Keys:** Monel, H.T. Steel, stainless steel
- Drive Shaft:** Heat treated steel, stainless steel
- Bearing Lock Rings:** Hardened steel, stainless steel, bronze
- Outboard Ball Bearing:** With grease seal and/or shield configuration to suit application, -150° to +400°F.
- Stationary Seal:** High quality alloy iron, stainless steel
- Bleed Seal:** Neoprene, leather, nitrile, teflon
- O-Ring to Center Large Seal:** Nitrile, neoprene, viton, fluorosilicone, teflon, butyl, ethylene-propylene, silicone
- Intermediary Seal:** Carbon-graphite, linear monomeric thermoplastic
- Rotary Seal:** High quality alloy iron, steel alloys
- Seal for I.D. of Rotary to Shaft:** Synthetic elastomers, teflon u-cup
- Seal Assembly Retainer Spring with Optional Spacer(s):**
Cadmium plated heat treated steel, stainless steel
- Spring Collar:** High quality alloy iron, brass, stainless steel
- Collar Pin:** Steel, stainless steel
- Lock Ball:** Chrome steel, stainless steel, brass
- Idler Gear Shafts:** Aircraft quality nitridable steel, tungsten carbide, stainless steel
- Drive Gear:** Nitridable alloy iron, nitridable aircraft quality steel, stainless steel, high quality alloy iron
- Drive Shaft Bushing:** Carbon-graphite
- Idler Gear Bushing:** Carbon-graphite
- Idler Gears:** Aircraft quality nitridable steel, nitridable alloy iron, stainless steel, high quality alloy iron, bronze
- Optional Casing Materials:** Class 30 or 40 gray iron to ASTM A47-76
Ductile iron to ASTM A536-80
Steel to low or high temperature ASTM specs.

REAL HELP WITH TECHNICAL MATTERS

If you are interested in related matters not covered in this publication, contact Smith Precision Products Company directly, for immediate action and good service. We will try to fulfill your needs, as required. **Special** construction materials may be used, on request. Limitation ranges may be extended, depending upon special materials used.

TECHNICAL DATA

TEMPERATURE RANGE

-150°F. to +400°F.

PRESSURE RANGE

Inlet Pressure: to 25 In. -Hg vacuum

Outlet Pressure: to 1,000 P.S.I.G.

Differential Pressure: to 800 P.S.I.D.

Note: Vacuums to 25 inches of Mercury generally do not affect the pump's performance but do require seal modification.

VISCOSITY RANGE

0.06 Cps. to 100,000 S.S.U.

RECOMMENDED MAXIMUM DRIVE SPEEDS

Note: Contact factory if viscosity of fluid handled is to be below 28 S.S.U..

to 500 S.S.U. viscosity, rated R.P.M.

to 10,000 S.S.U. viscosity, ²/₃ rated R.P.M.

to 50,000 S.S.U. viscosity, ¹/₂ rated R.P.M.

to 100,000 S.S.U. viscosity, ¹/₄ rated R.P.M.

APPROXIMATE WEIGHTS OF SMITH PUMPS AND MOTORS

| Model Number | Weight Pump only (Lbs.) | Shipping Wt. Pump only (Lbs.) | Shipping Wt. Pump, base and Coupling (Lbs.) | Shipping Wt. Complete Unit, with Motor (Lbs.) |
|--------------------|-------------------------|-------------------------------|---|---|
| MC-1, GC-1 | 20 | 25 | — | 60 |
| SQ SERIES | 46 | 48 | — | 85 |
| MC-1044, MC-1044H | 50 | 60 | 125 | 200 to 275 |
| MC-2, MC-2F, MC-2H | 75 | 85 | 170 | 285 to 350 |
| MC-2Q | 100 | 115 | 200 | 315 to 500 |
| MC-3, MC-3H | 100 | 115 | 200 | 350 to 400 |
| MC-4, MC-4H | 135 | 150 | 245 | 450 to 500 |
| MC-5, MC-5H | 170 | 185 | 300 | 550 to 650 |
| ATC-2R, ATC-2L | 75 | 85 | 170 | 285 to 350 |
| ATC-3R, ATC-3L | 100 | 115 | 200 | 350 to 400 |
| ATC-2RH, ATC-2LH | 75 | 85 | -NA- | -NA- |
| TC-1044H | 50 | 60 | -NA- | -NA- |
| TC-2, TC-2F | 100 | 115 | -NA- | -NA- |
| TC-3, TC-3F | 135 | 150 | -NA- | -NA- |

PERFORMANCE FORMULAE FOR SMITH PUMPS

TABLE OF RATED TRANSFER CAPACITIES FOR USE WITH FORMULAE 1 AND 2

| Model No. | Rated Transfer Capacity (GPM) | Rated Shaft Speed (RPM) |
|----------------------------------|-------------------------------|-------------------------|
| MC-1 | 5 | 1800 |
| GC-1 | 5 | 1800 |
| SQ-1 | 5 | 1800 |
| SQ-H | 7 | 1800 |
| SQ-HH | 13 | 1800 |
| SQ-HH8 | 13 | 1200 |
| MC-1044, M-1044 | 20 | 1800 |
| MC-1044H, M-1044H | 35 | 1800 |
| MC-2, MC-2F, M-2, M-2F, M-2FS | 50 | 1800 |
| MC-2Q, M-2Q | 50 | 1800 |
| ATC-2R, ATC-2L, AT-2R, AT-2L | 50 | 1800 |
| ATC-3R, ATC-3L, AT-3R, AT-3L | 100 | 1800 |
| MC-3, M-3, M-3F, M-3FS | 100 | 1800 |
| MC-4, M-4, ATC-4LF, AT-5LF | 150 | 1800 |
| MC-5, M-5, ATC-5LF, AT-5LF | 200 | 1800 |
| MC-5L, M-5L (AND OTHERS) | 250 | 1800 |
| | | |
| ATC-2RH, ATC-2LH, AT-2RH, AT-2LH | 25 | 1000 |
| TC-1044H, T-1044, T-1044HA | 35 | 900 |
| TC-2, TC-2F, T-2, T-2F | 50 | 500 |
| TC-3, TC-3F, T-3, T-3F | 100 | 500 |
| | | |
| MC-2H, M-2H, MC-2HF, M-2HF | 50 | 1500 |
| MC-3H, M-3H, MC-3HF, M-3HF | 100 | 1500 |
| MC-4H, M-4H | 150 | 1500 |
| MC-5H, M-5H | 200 | 1500 |

FORMULA 1:

$$Qd = Qr \left(\frac{Nd}{Nr} - FsPd \right)$$

FORMULA 2:

$$HP = \frac{8.5 NdQr}{Nr} \times 10^{-4} (10 + Pd)$$

where Qd = actual pump delivery in U.S gallons per minute

Qr = rated transfer capacity in GPM (as given for each model pump in table at left)

Pd = differential pressure being pumped against, in pounds per square inch

HP = horsepower required to drive pump

Nd = actual speed of pump shaft, in revolutions per minute

Nr = rated speed of pump shaft (as given for each model pump in table at left)

Fs = slippage factor, a variable depending on the viscosity of the fluid pumped, as per graph on page 26

USE OF PUMP FORMULAE

The performance formulae for Smith Precision Pumps have a very real advantage over simple performance curves. Such curves apply to pumping capabilities of a NEW pump, in a perfect installation. The Smith formulae are conservative, and are applicable to a pump after considerable service, or in an installation that is somewhat less than perfect. When an installation is properly made, new Smith pumps will actually perform BETTER than indicated by the formulae.

RECOMMENDED MAXIMUM DRIVE SPEEDS

- TO 500 S.S.U. viscosity, rated RPM
- to 10,000 S.S.U. viscosity, $\frac{2}{3}$ rated RPM
- to 50,000 S.S.U. viscosity, $\frac{1}{2}$ rated RPM
- to 100,000 S.S.U. viscosity, $\frac{1}{4}$ rated RPM

In any case, the use of the conservative formulae is believed to be realistic and helpful. Pumps that are specified on the basis of the formulae and tables will have a long service life. The formulae, being conservative, can be guaranteed for all model Smith pumps in proper installations, that have been reviewed by our Engineering Department.

EXAMPLES OF CALCULATIONS

FIGURING PUMP OUTPUT

Conditions:

Example #1

Liquid - Oil

Viscosity - 400 S.S.U.

Differential pressure required - 100 P.S.I.

Gallons per minute flow rate req'd: 16 GPM

R.P.M. required: 1800

Qd = 16 GPM (from conditions above)

Qr = Rated transfer capacity of pump req'd.
(solve formula 1 for this item)

Nd = 1800 RPM

Nr = 1800 RPM

Fs = .00024 (from graph)

Pd = 100

Substitute in Formula 1 (above)

$$16 = Qr \left(\frac{1800}{1800} - .00024 (100) \right);$$

Qr = 16.39 GPM;

from the above table, MC-1044 would be recommended, as its

Qr (rated transfer capacity) is 20 GPM, close to the 16.39 GPM required.

Example #2

Calculate the projected output of this same pump if run at 1000 RPM

$$Qd = 20 \left(\frac{1000}{1800} - .00024 (100) \right);$$

Qd = 10.63 GPM;

FIGURING HORSEPOWER REQUIREMENTS

These are determined through the use of the above Formula 2. However, if the viscosity of the fluid handled is determined to be above 10,000 S.S.U., **double** the horsepower recommendation.

Example #1

Viscosity - 20,000 S.S.U.

Pump Model in consideration — MC-1044

Recommendation RPM — as per table above, it must be no more than one half of the rated RPM, which is 1800.

Therefore, 900 RPM is used

Qr = 20 GPM Nd = 900 RPM

Nr = 1800 Pd = 100 PSI

$$HP = \frac{8.5 (900) (20)}{1800} \times 10^{-4} (10 + 100)$$

HP = 0.935

HP X2 = 1.87; suggest 2 HP motor

Example #2

Viscosity — 400 S.S.U.

Pump Model in consideration — ATC-3R

Recommended RPM — as per table above, it can be same as rated RPM, which is 1800.

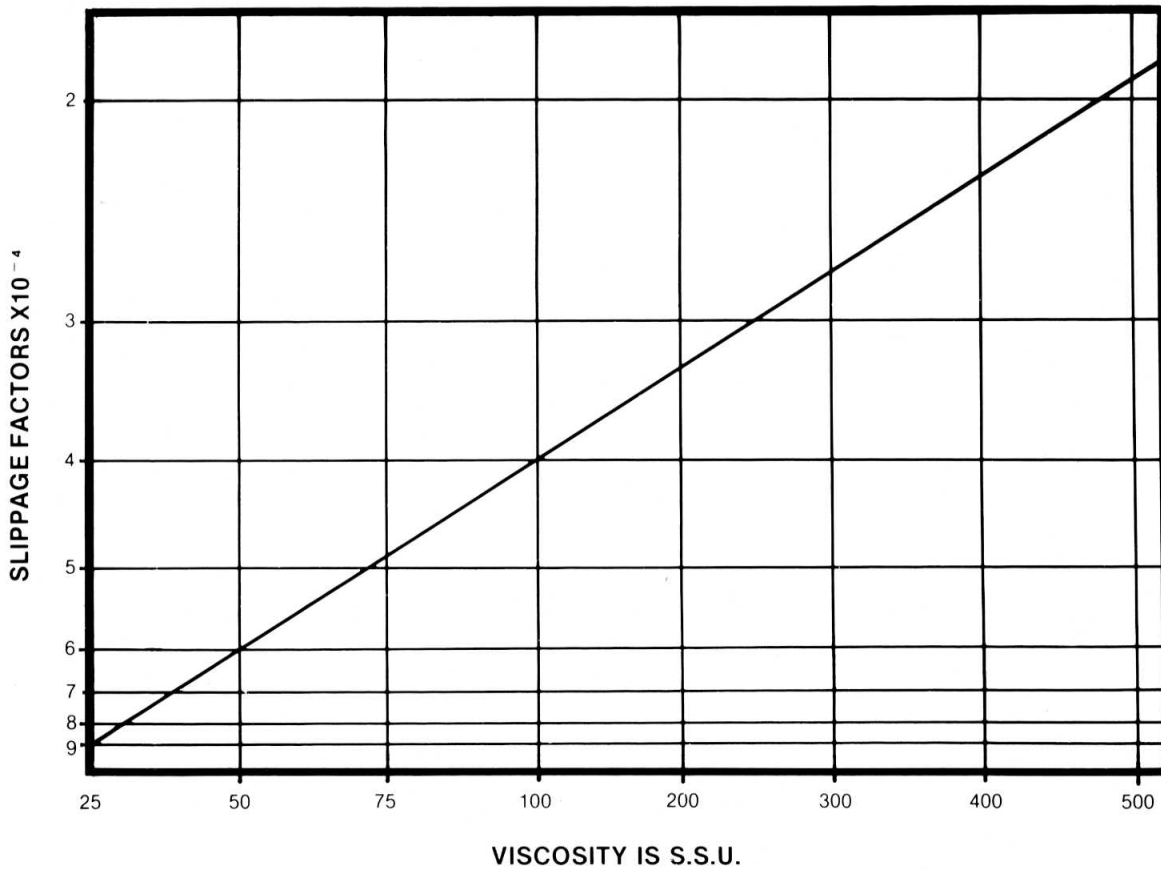
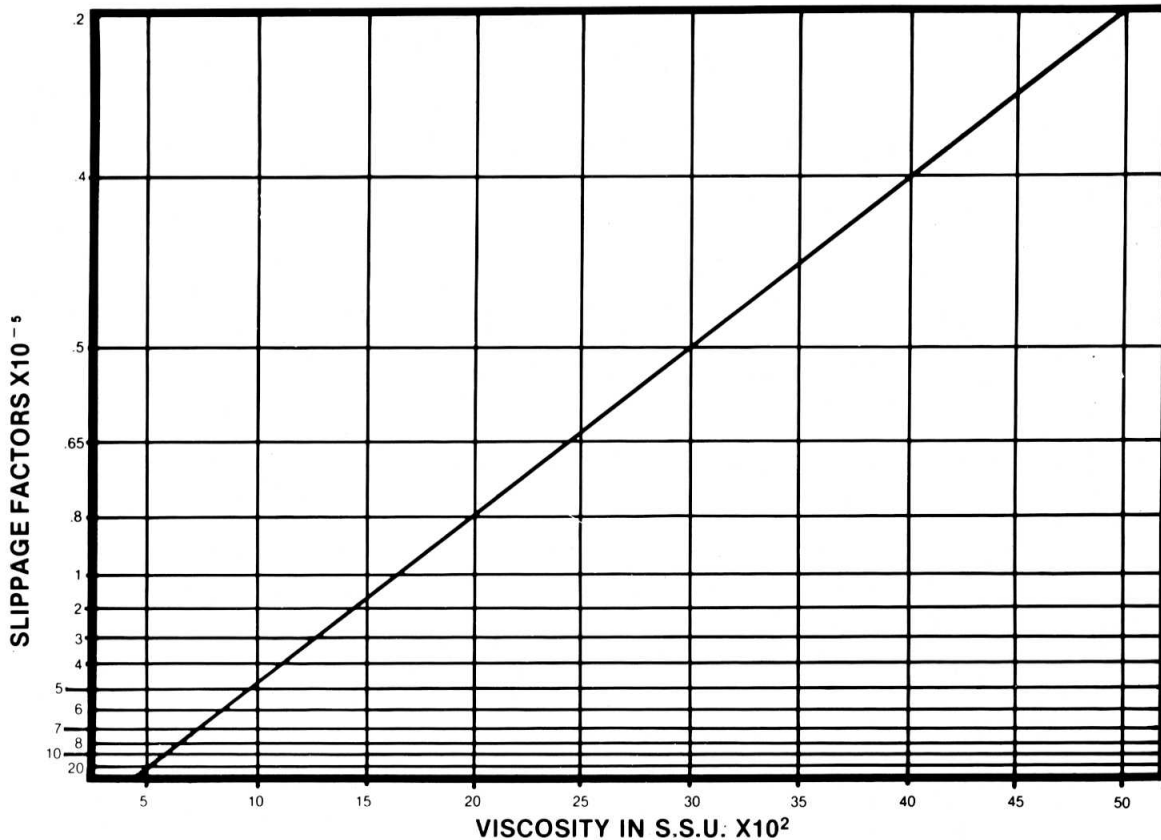
Qr = 100 GPM Nd = 1800

Nr = 1800 Pd = 75

$$HP = \frac{8.5 (1800) (100)}{1800} \times 10^{-4} (10 + 75)$$

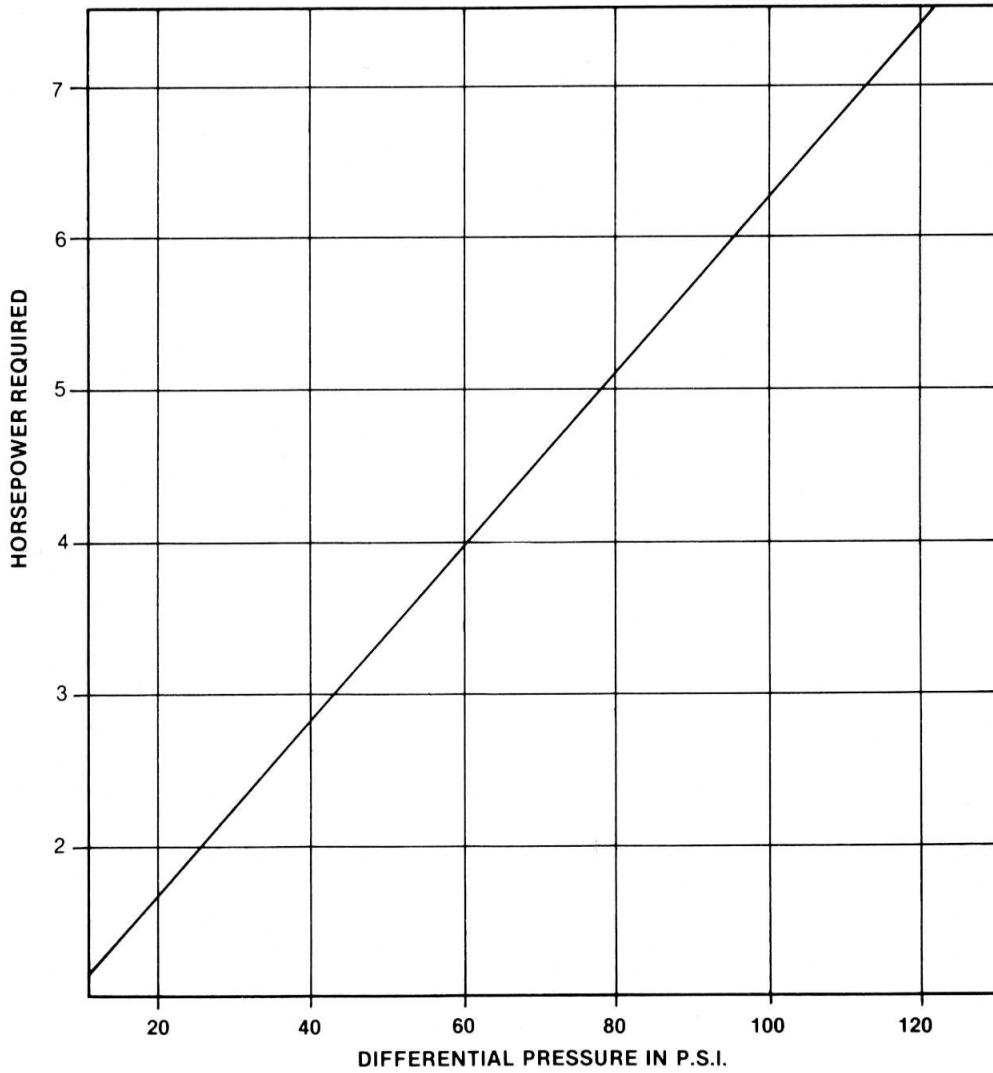
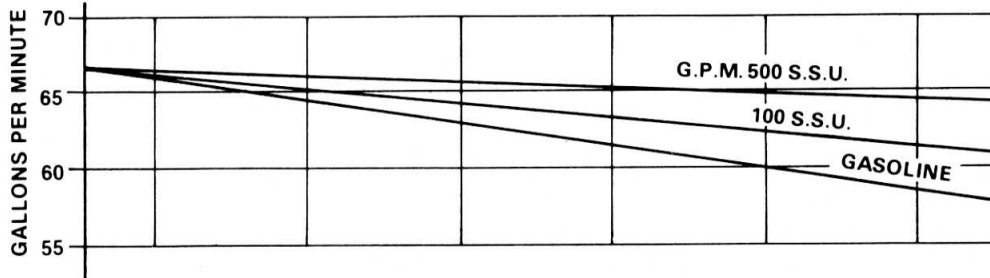
HP = 7.23, suggest 7-1/2 HP motor

SLIPPAGE FACTORS (F_s) TO BE USED WITH FORMULA NO. 1



TYPICAL CURVES FOR MODEL MC-3 PUMP OPERATED AT 1200 R.P.M.

(NOTE: FOR VISCOSITIES ABOVE 1000 S.S.U., UNDER 300 PSID,
SLIPPAGE FACTORS ARE NEGLIGIBLE)



REPAIRS AND EXCHANGE POLICIES

EXCHANGE PUMP PLAN

For many pump owners, the most economical and satisfactory way to handle necessary repairs is to run the pumps until they lose efficiency through long wear. Then simply order an exchange pump under the Smith exchange plan. If the need is urgent, phone the factory collect. Give us the model number and serial number from the pump label plate; we will send an exchange pump that will fit perfectly, and that is guaranteed to be in equal-to-new condition.

EXPEDITED SHIPMENT

In a rush, air freight is a good method of shipment. Air shipment will convey the pump to your nearest commercial airport within a day under normal conditions. Provide us your telephone number, and the airport will usually advise you immediately upon arrival of the pump. If you can wait a few days, fast truck service is more economical, and usually truck delivery can be made to your door.

LIBERAL EXCHANGE ALLOWANCE

Under the exchange pump plan, you do not need to be without a pump while factory reconditioning is done. We will provide the factory-reconditioned exchange pump from our stock. When you receive the exchange pump, you simply return your used pump for credit, using the same shipping crate. We recondition your pump, and put it in our exchange stock. You are billed initially for a new pump, and then given a generous credit for the used pump when it is returned promptly.

EXCHANGE FOR HIGHER CAPACITY PUMP

If your operation requires a higher capacity pump, Smith policy is to allow a one-for-one pump exchange for a higher capacity pump. The exchange charge includes reconditioning your old pump plus the cost of additional parts and assembly for the higher capacity pump. Many cost-conscious pump users have taken advantage of this offer to improve the capabilities of their installations at a bargain price.

MOTOR, ENGINE OR GEAR REDUCER REPAIRS

Motor, engine and gear reducer repairs within the warranty period are covered by the guarantee extended by the manufacturer. Should you require repairs under the guarantee, return them to the manufacturer's factory, or to his nearest AUTHORIZED repair station. The guarantees do not include shipping charges or any other liability. The guarantee is void unless necessary repairs are made at authorized places. Write or wire the manufacturer, using nameplate address, to locate his nearest authorized repair station, or look in the yellow pages of your telephone book. Motors, engines, and gear reducers worn out from long service are also best repaired at authorized repair stations.

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