



DESIGNER AND MANUFACTURER OF HYDRAULIC AND PNEUMATIC EQUIPMENT

***SC HYDRAULIC ENGINEERING CORPORATION***

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# 10 SERIES AIR OPERATED LIQUID PUMPS



## *A "High Pressure" History...*

An innovator and pioneer in the field of hydraulic engineering, SC Hydraulic has been manufacturing air-driven liquid pumps for more than a half of a century.

Founded in 1953 by Bob Vedder and Willie Mohler, the company started with only a few core products. Basically air-driven liquid pumps. Today, SC Hydraulics' product line has expanded to

include an extensive collection of air and gas boosters, power units, systems and selected high-pressure valves.



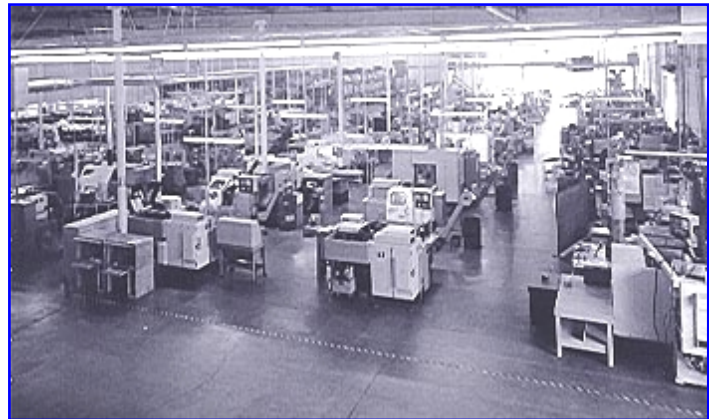
The product line remained stable through the 1980's seeing successful operation in an ever-increasing number of installations and applications, while sales grew through an expansion of distribution.

Under the leadership of Bob Vedder's daughter, Donna Perez, SC Hydraulic operates a state-of-the-art 65,000 square-foot facility in Brea, California, and is well prepared for future growth and innovation.

## *Where Hydraulic Force Meets Custom Engineering*

With products capable of achieving pressures exceeding 70,000 psig, SC Hydraulic Engineering Corp. is a force to be reckoned with in the field of hydraulic engineering.

SC Hydraulic manufactures a vast array of air-operated hydraulic pumps and boosters for a variety of industries. In addition to our current line of hydraulic products, we can work with you to custom design products to fit the exact specifications of your applications.



An international leader in hydraulic engineering, SC Hydraulic is continually developing new products which are in sync with newly emerging applications, both in the United States and abroad.

*In a 65,000 square foot facility, SC Hydraulic is capable of setting the industry's highest standard while maintaining the best delivery times*

## *For Fluid Power...*

Contact SC Hydraulic today, to find out more about our capabilities or for a technical data sheet.

# PRESSURE RATIO OLD & NEW PART NUMBERS

In the mid 1990's with the advent of a new inventory and computer system, SC Hydraulic Engineering was forced to change the part numbering system for better control and understanding.

Prior to that time, a typical part number stated the basic series number, a ratio reference number, and a suffix if there were any modifications. Typically, a call out might be 10-500-1.5 or perhaps 10-600-20BA. The biggest change, and where some confusion may occur, is in the pressure ratio model call out for the various sizes available.

The chart below can be used as an aid in determining the correct number. Take careful note to similar call outs such as .5 (now 005) and 5 (now 050). At the time of the change, it was decided that all new products would use actual pressure ratios for hydraulic section call outs. Hence, with the D5 and D6 Series the model suffix is just that. Note however, the actual physical size of the unit is identical to the 10 Series model.

Additional changes of the part numbers from the old model numbers and the new numbers are shown on the 'How to Order Table'.

10-4 SERIES			10-5 & D5 SERIES			10-6 & D6 SERIES		
HYDRAULIC SECTION MODEL			HYDRAULIC SECTION MODEL			HYDRAULIC SECTION MODEL		
OLD	NEW	RATIO	OLD	NEW	D5 / RATIO	OLD	NEW	D6 / RATIO
0.25	003	5	0.24	003	5	.35QR	003	5
0.5	005	10	0.5	005	10	.5QR	005	10
1	010	15	0.65	007	12	1	010	20
1.5	015	30	1	010	20	1.5	015	25
2	020	35	1.5	015	25	2	020	35
3	030	55	1.75	018	30	3	030	55
5	050	100	2	020	35	5	050	95
8	080	140	3	030	55	8	080	145
12.5	125	220	4	040	70	10	100	180
			4.5	045	85	15	151	240
			6	060	105	20	201	330
			8	080	140	30	301	460
			10	100	195	40	402	740
			16	160	280			
			25	250	440			
			35	350	555			

# NO OTHER PUMPS OFFER ALL THESE ADVANTAGES

**Simple operating principle** – SC air operated hydraulic pumps operate on the simple but efficient principle of pressure intensification through the use of differential areas. Fulfilling Boyle's Law, a larger air-driven piston delivers pressure to a proportionally lesser diameter hydraulic piston, providing fluid flow at relatively higher pressures.

**High output capacity** and outstanding performance provided at very low cost.

**Guaranteed performance** – All SC Hydraulic pumps will give years of low cost, trouble free service when properly installed and maintained to manufacturer's instruction.

**Wide range of operating pressures** is provided by all models. For example, the 10-5000W030 operates efficiently when delivering from 400 to 5800 psi (see 10-5 Series specifications).

**Wide range of output capacities** – Only 100 psi air pressure is required for all models to attain maximum rate of flow (see performance charts for data).

**Complete flexibility** – SC Hydraulic pumps adapt to a wide variety of applications, from simple manual controls to fully automatic operation. Air motors are interchangeable for most models within each series.

**Automatic restart** – Whenever an SC Hydraulic pump is idle, the pilot valve is designed to re-position the pump on the power stroke for the next cycle of operation.

**Smooth operation** – The air piston actuating valve is precision fit to close tolerances for maximum efficiency and long service life.

**Both pressure and volume of flow** are easily and accurately controlled by a pressure regulator installed in the air supply line.

**Fluid Compatibility** – Pumps can operate with almost any type fluid service (specify when ordering).

**Hydraulic cylinders** are constructed from aluminum-bronze, stainless steel, or carbon steel.

**Hydraulic pistons** are constructed from stainless steel, hard chrome-plated.

**Materials incorporated** in the hydraulic assembly vary depending upon type of service and pump model.

**Designed for easy maintenance** – Costly down time is reduced to a minimum when service is required. "D" Dry Lube Series pumps are packed at the factory with valve lubricant and may be operated without a lubricator in air supply. Hydraulic cylinder packing may be replaced without dismantling the air motor.

**Three Series available** – choose from:

10-4 Series • 9 models • to 22,000 psi

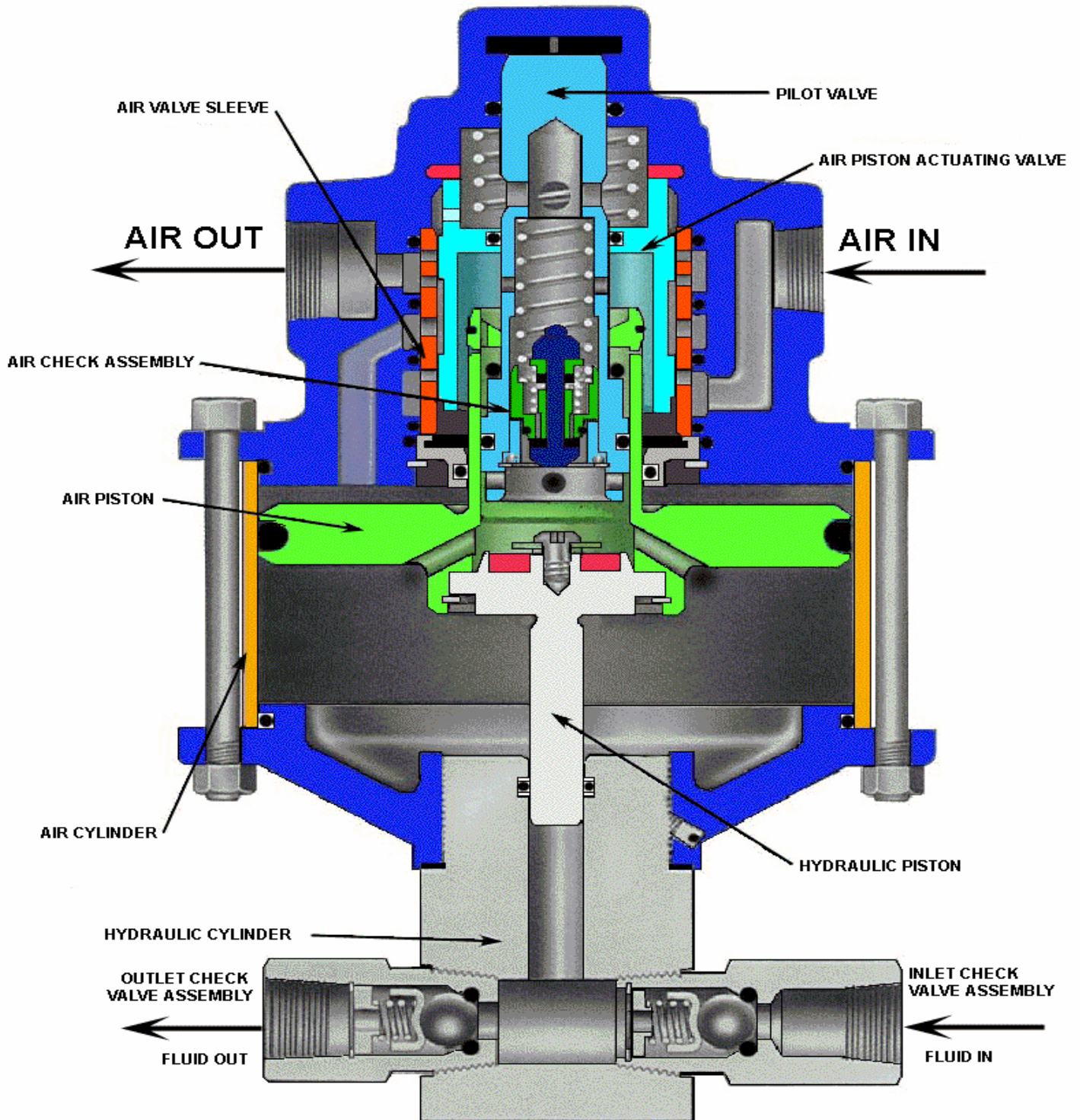
10-5/D5 Series • 16 models • to 55,000 psi

10-6/D6 Series • 13 models • to 65,000 psi

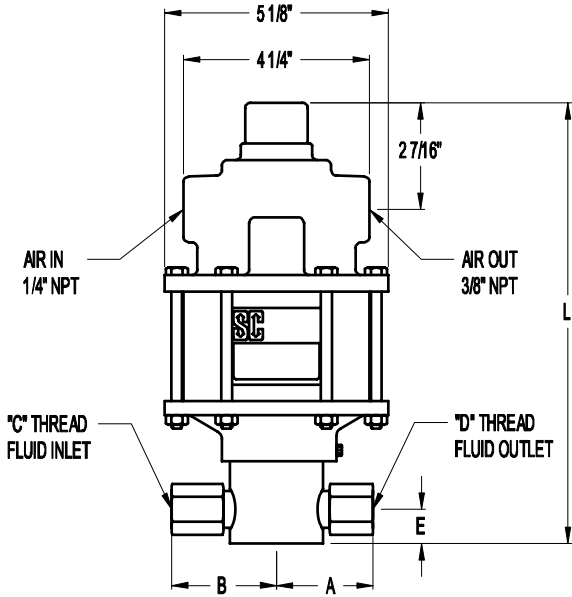
**Applications include** static and burst testing, flow testing requiring relatively low flows at high pressures, operation of hydraulic presses, clamping, pressing, metal forming, piercing, blanking, staking, etc. Applications requiring extreme intermittent pressure and velocity commonly associated with water blasting and jetting.



# Liquid Pump Cut-a-way



# 10-4 SERIES



10-4 Series pumps have a 4" diameter air piston and a 1 1/4" stroke. Nine models are available with pressures up to 22,000 psig.

When operating from 0 to rated hydraulic pressure, air consumption will be approximately 14 scfm of free air at 100 psi output. At lower air pressures and higher hydraulic pressures, air consumption will be reduced proportionately to flow rates indicated.

Mounting may be in any position, vertical preferred. When mounting in an inverted position, a drain cock should be provided to drain off any liquid that may accumulate in the pilot valve air chamber.

**Mounting Dimensions in Inches**

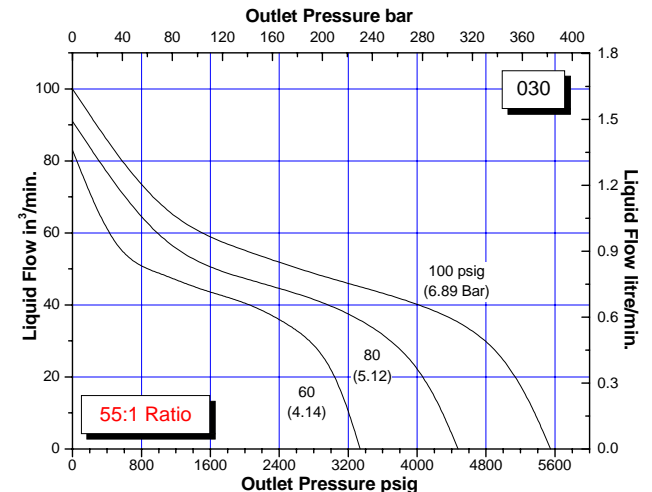
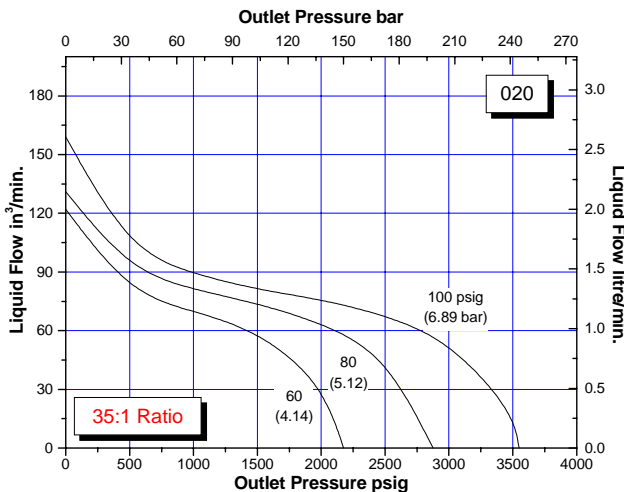
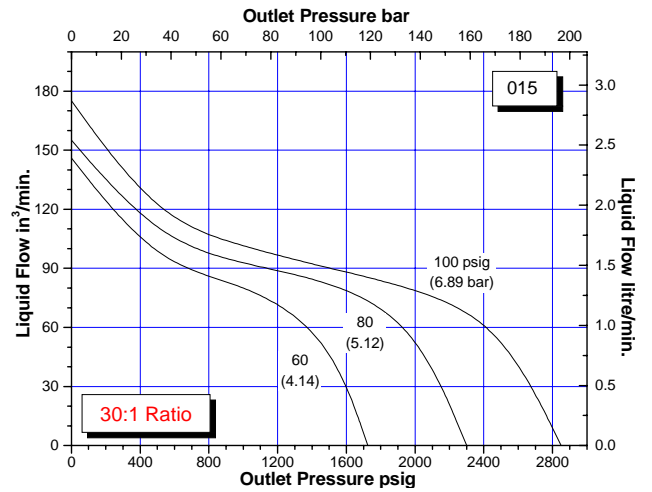
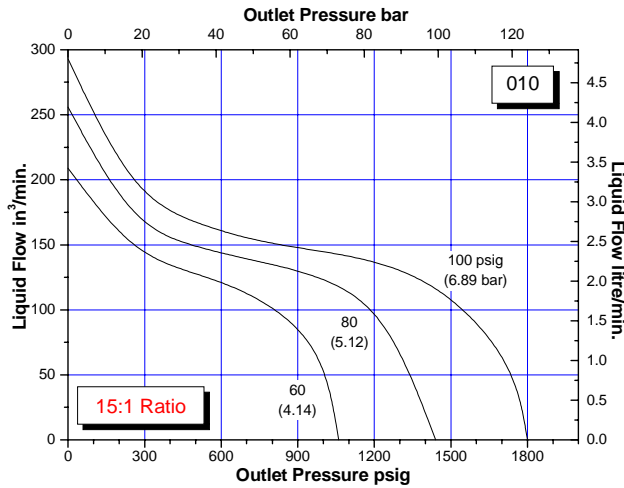
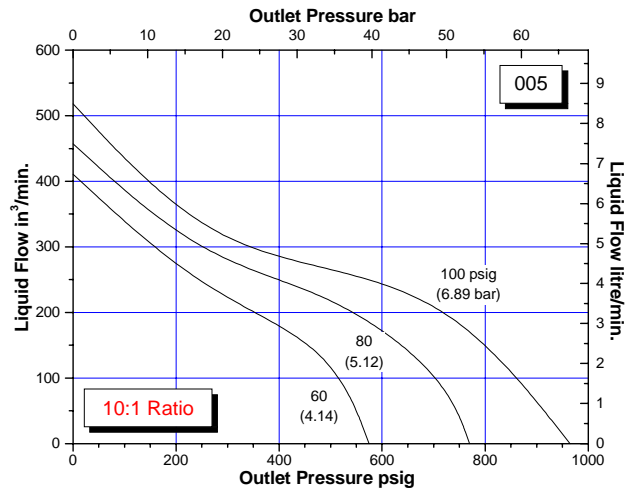
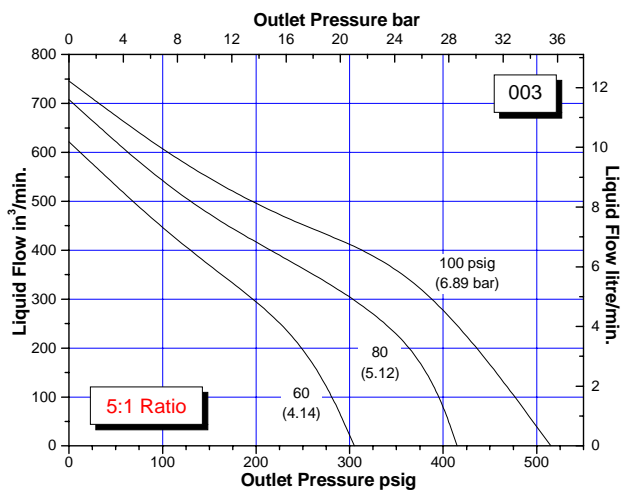
10-4 Series Model	L	A	B	NPT (Standard)		E	F
				C Thread	D Thread		
-003	11.375	2.438	3.000	1/2"	3/8"	.813	1.500
-005	11.188	2.438	3.000	1/2"	3/8"	.813	1.500
-010 thru -015	11.063	2.438	2.438	3/8"	3/8"	.813	1.500
-020 thru -300	10.063	2.438	2.438	3/8"	3/8"	.813	1.500
-050 thru -125	10.500	2.375	2.313	3/8"	3/8"	.813	1.500

**Measurements & Approximate Air to Hydraulic Pressure Ratios – Static Conditions**

10-4 Series Model	Hydraulic Piston Diameter (in)	Hydraulic Piston Area (in <sup>2</sup> )	Volume per Stroke (in <sup>3</sup> )	Air Pressure (PSI)										
				10	20	30	40	50	60	70	80	90	100	
-003	1.6250	2.070	2.590	35	90	145	200	250	305	360	415	465	515	
-005	1.1875	1.110	1.390	80	180	280	375	475	575	675	770	870	965	
-010	0.8750	0.601	0.751	160	340	520	700	880	1060	1240	1440	1600	1800	
-015	0.6875	0.371	0.464	250	550	850	1150	1425	1725	2000	2300	2575	2850	
-020	0.6250	0.307	0.384	300	675	1050	1450	1800	2175	2525	2875	3225	3550	
-030	0.5000	0.196	0.245	500	1040	1620	2200	2750	3340	3850	4475	5000	5550	
-050	0.3750	0.110	0.138	950	1850	2900	3800	4850	5900	6875	7900	8900	9900	
-080	0.3125	0.077	0.096	1300	2700	4150	5700	7100	8600	9900	11200	12600	14000	
-125	0.2500	0.049	0.061	2100	4400	6750	8750	11250	13250	15250	17500	19750	22000	

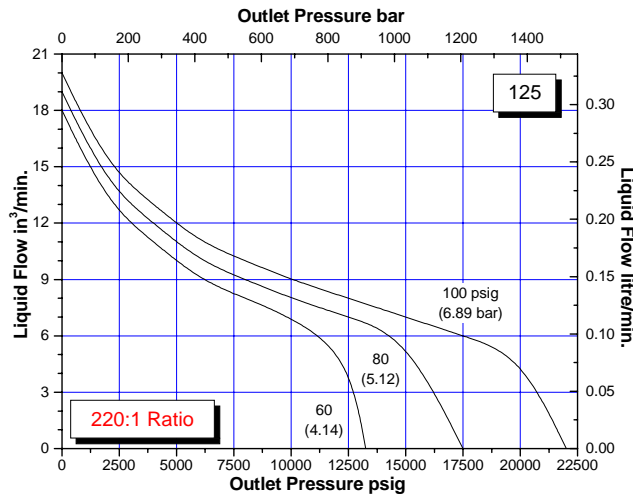
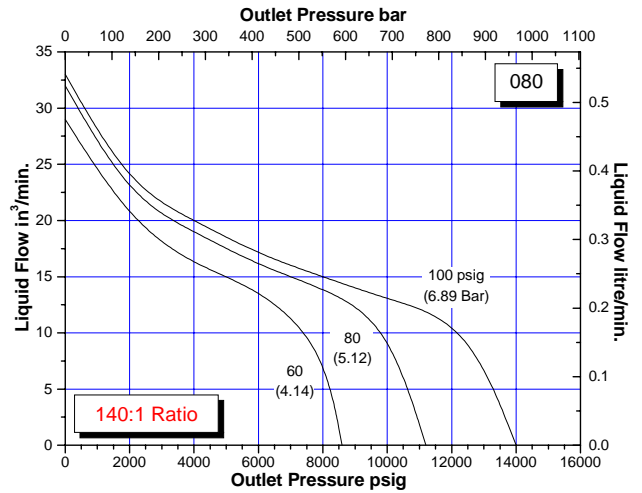
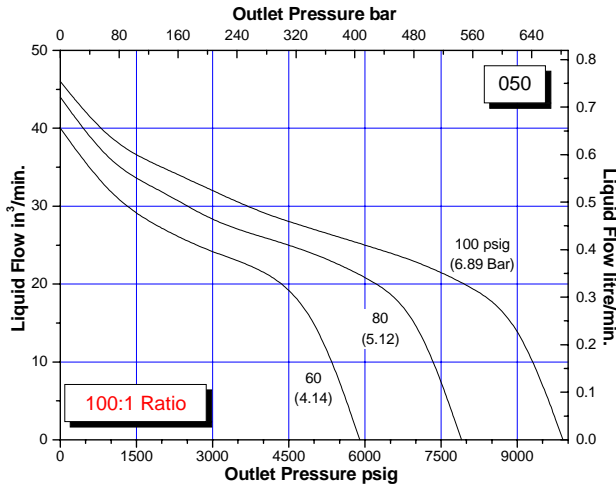
# 10-4 SERIES

## APPROXIMATE RATE OF DISCHARGE



# 10-4 SERIES

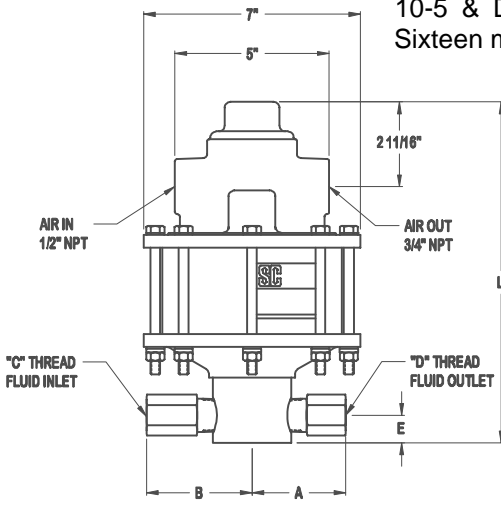
## APPROXIMATE RATE OF DISCHARGE





# 10-5 & D-5 SERIES

10-5 & D5 Series pumps have a 5 ½" diameter air piston and a 1 ¼" stroke. Sixteen models are available with pressures up to 55,000 psig.



When operating from 0 to rated hydraulic pressure, air consumption will be approximately 28 scfm of free air at 100 psi output. At lower air pressures and higher hydraulic pressures air consumption will be reduced proportionately to flow rates indicated.

Mounting may be in any position, vertical preferred. When mounting in an inverted position, a drain cock should be provided to drain off any liquid that may accumulate in the pilot valve air chamber.

The D5 Series "Dry Lube" pump is identical to the 10-5 Series except it is pre-lubricated and therefore does not require an air line lubricator. The part number distinguishes it from the 10-5 Series by the D5 prefix and using the actual ratio rather than a numerical code in the model suffix.

## Mounting Dimensions in Inches

10-5 Series Model	D5 Series Model (ratio)	L	A	B	NPT/HF4 (Std)		SAE/HF4 (Optional)		E	F	G
					C Thread	D Thread	C Thread	D Thread			
-003	5	13.125	3.500	4.750	1"	1/2"	-	-10 SAE	1.125	2.375	3.125
-005 thru -010	10 thru 20	12.313	3.000	4.000	1"	1/2"	-	-10 SAE	1.000	1.750	2.500
-015 thru -060	25 thru 105	10.875	3.000	3.375	1/2"	1/2"	-10 SAE	-10 SAE	0.875	1.750	2.500
-080 thru -250	140 thru 440	11.250	2.500	2.313	3/8"	3/8"	-	9/16-18 *	0.875	1.750	2.500
-350	555	11.188	3.750	2.313	3/8"	9/16-18 *	-	-	.0875	1.750	2.500

\*Coned and Threaded High Pressure Connection for ¼" O.D. Tubing

## Measurements & Approximate Air to Hydraulic Pressure Ratios – Static Conditions

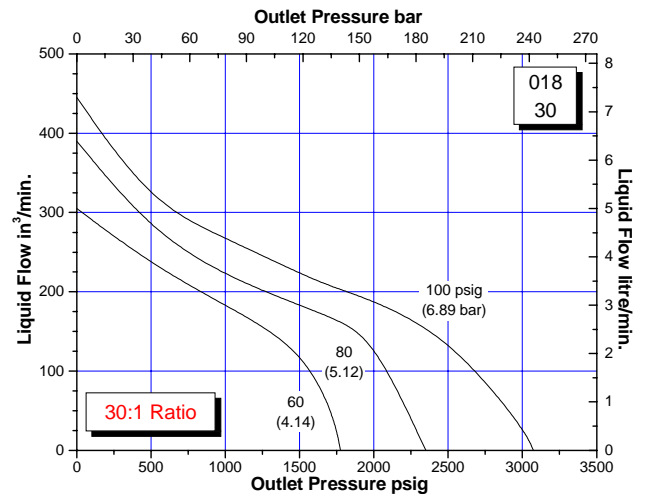
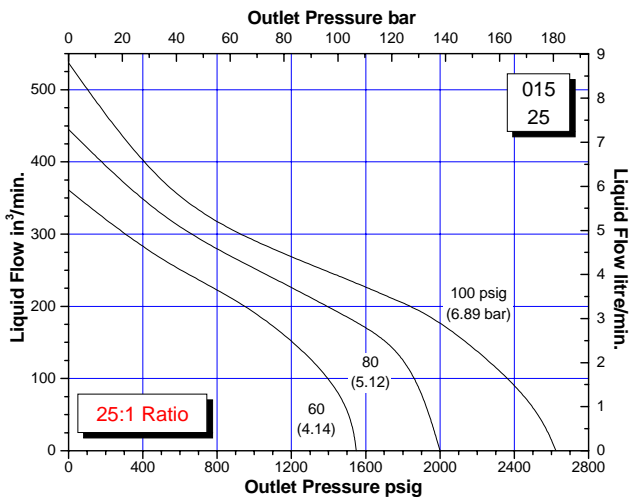
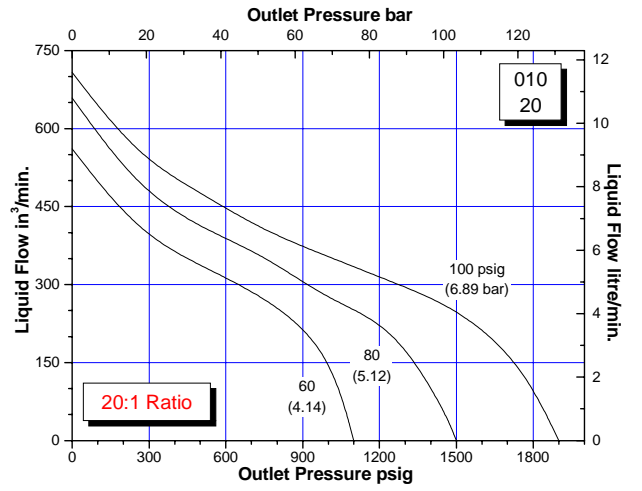
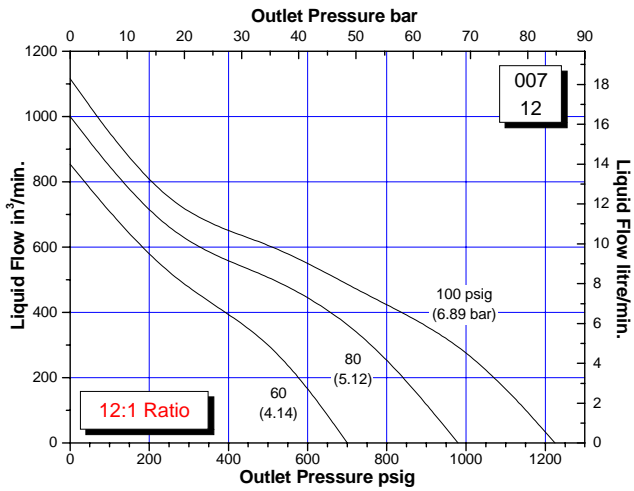
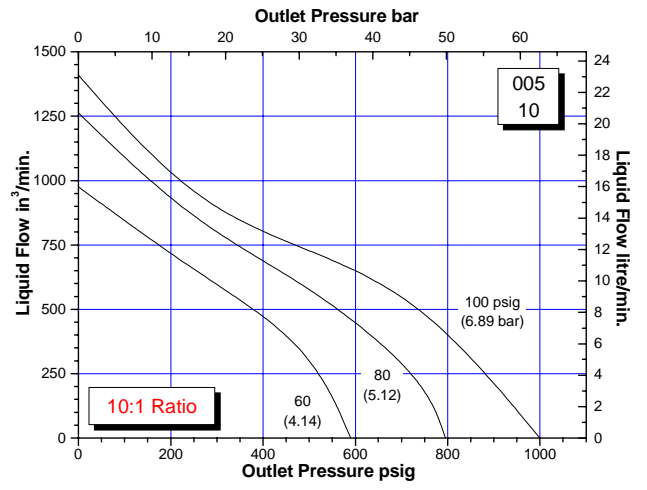
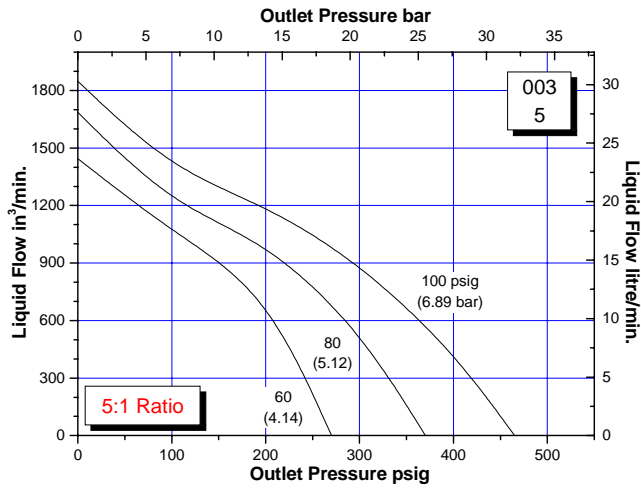
10-5 Series Model	D5 Series Model (ratio)	Hydraulic Piston Diameter (in)	Hydraulic Piston Area (in <sup>2</sup> )	Volume per Stroke (in <sup>3</sup> )	Air Pressure (PSI)									
					10	20	30	40	50	60	70	80	90	100
-003	5	2.3750	4.430	5.540	30	75	130	175	220	270	320	370	415	465
-005	10	1.6250	2.070	2.590	80	180	285	385	490	590	690	795	900	1000
-007	12	1.5000	1.770	2.210	90	200	340	450	560	700	850	980	1100	1225
-010	20	1.1875	1.110	1.390	145	330	525	700	925	1100	1300	1500	1700	1900
-015	25	1.0000	0.785	0.981	200	475	750	1000	1300	1550	1800	2000	2350	2625
-018	30	0.9375	0.689	0.861	225	525	875	1150	1500	1775	2050	2350	2700	3075
-020	35	0.8750	0.601	0.751	250	600	1000	1400	1775	2125	2475	2825	3200	3625
-030	55	0.6875	0.371	0.464	400	1000	1700	2200	2900	3400	4000	4600	5200	5800
-040	70	0.6250	0.307	0.384	500	1175	1950	2600	3350	4100	4900	5600	6350	7000
-045	85	0.5625	0.248	0.310	800	1700	2600	3400	4400	5100	6000	6900	7800	8600
-060	105	0.5000	0.196	0.245	900	2000	3150	4200	5400	6400	7450	8500	9700	10700
-080	140	0.4375	0.150	0.188	1100	2400	3900	5400	6900	8300	9800	11200	12600	14000
-100	195	0.3750	0.110	0.138	1400	3250	5250	7250	9250	11250	13250	15000	17000	18750
-160	280	0.3125	0.077	0.096	2250	4000	7750	10500	13500	16250	18750	21500	24500	27500
-250**	440	0.2500	0.049	0.061	5000	8000	12500	16500	21000	25500	30000	34000	38000	42500
-350**	555	0.2187	0.038	0.048	6250	12500	18750	25000	31250	37500	43750	47500	51250	55000

\*\* Recommended for continuous duty at pressures up to 30,000 psi. Intermittent duty above 30,000 psi.

# 10-5 & D5 SERIES

## APPROXIMATE RATE OF DISCHARGE

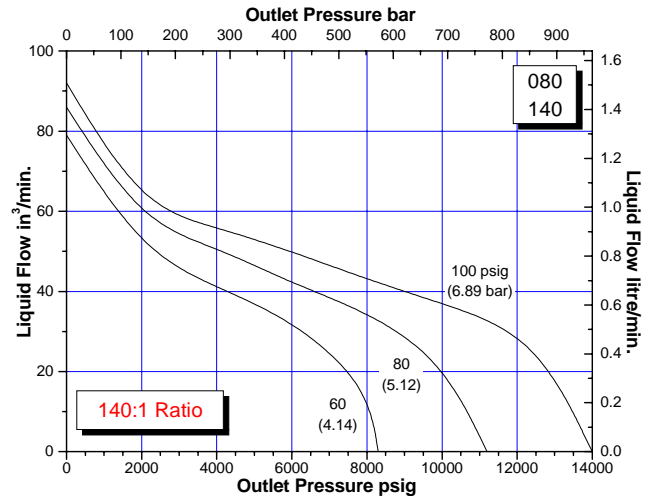
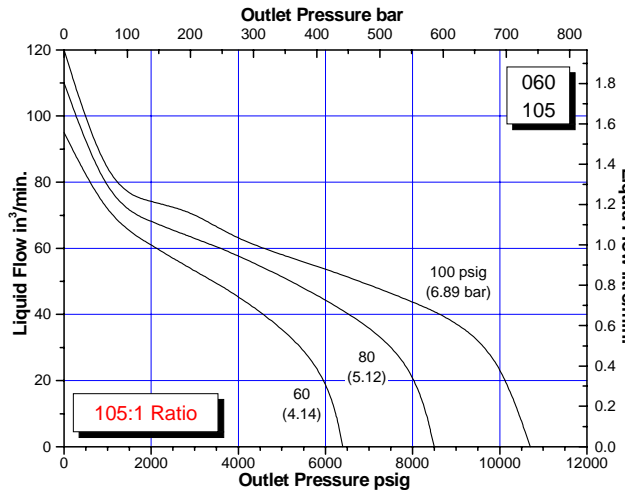
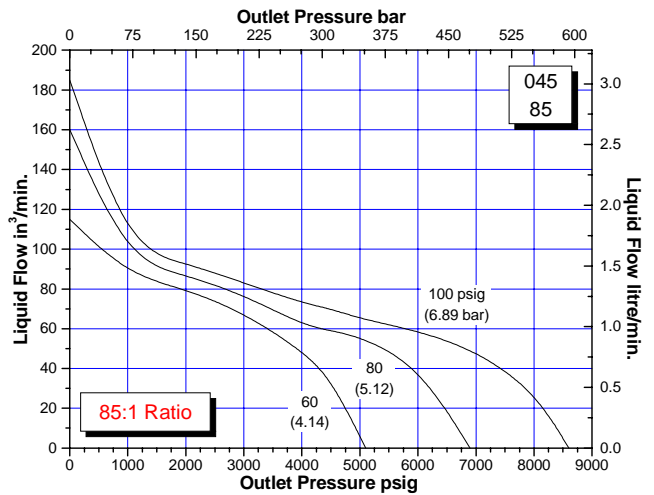
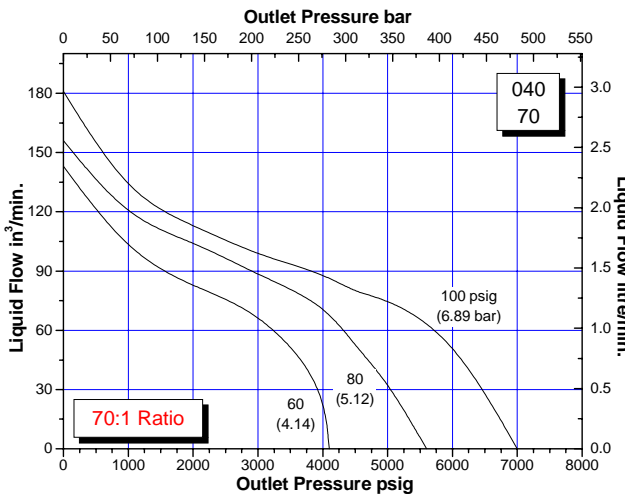
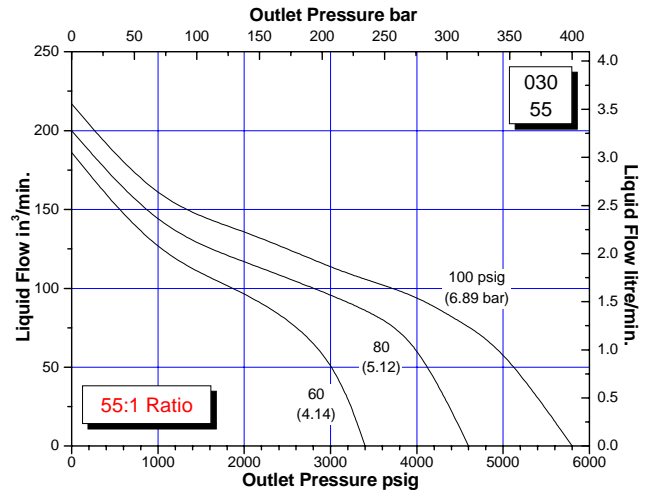
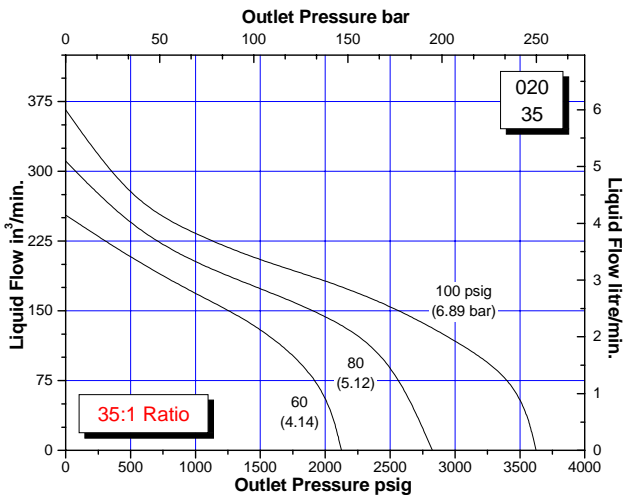
Model Code  
Use Top for 10-5  
Use Bottom for D5



Model Code  
 Use Top for 10-5  
 Use Bottom for D5

# 10-5 & D5 SERIES

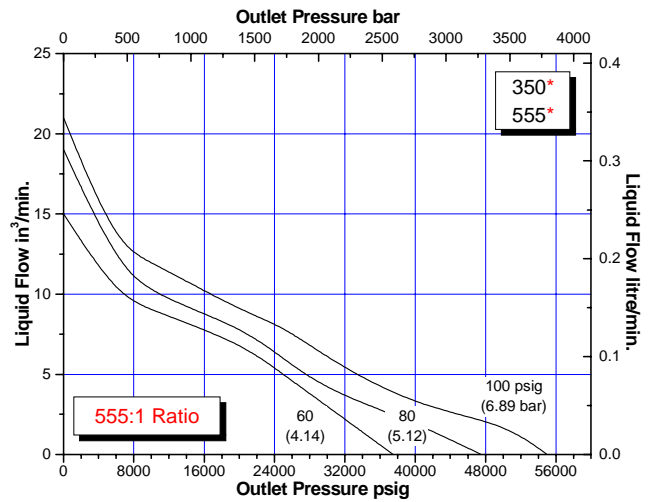
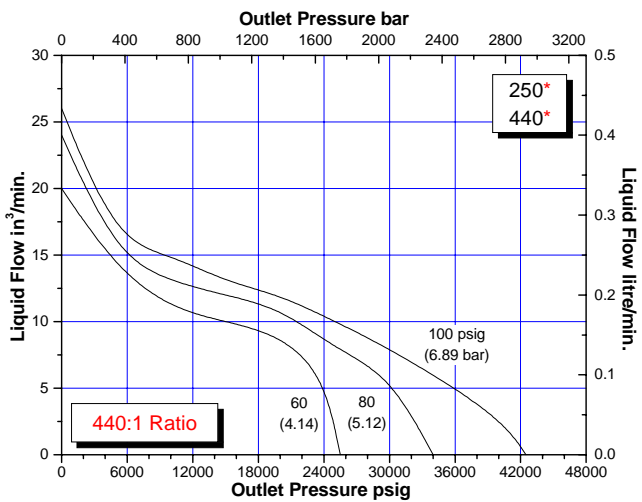
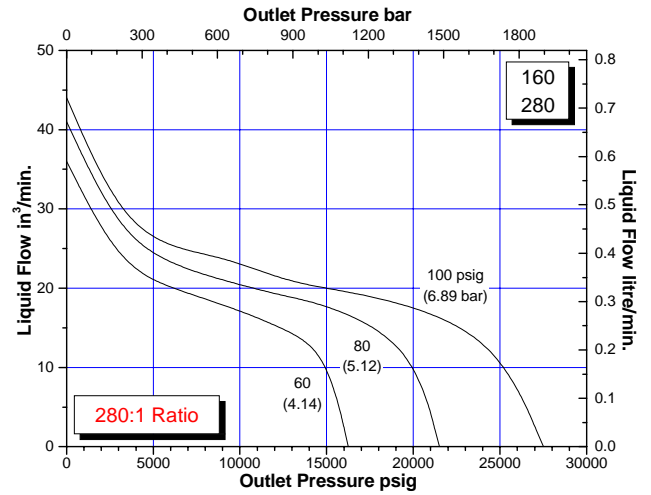
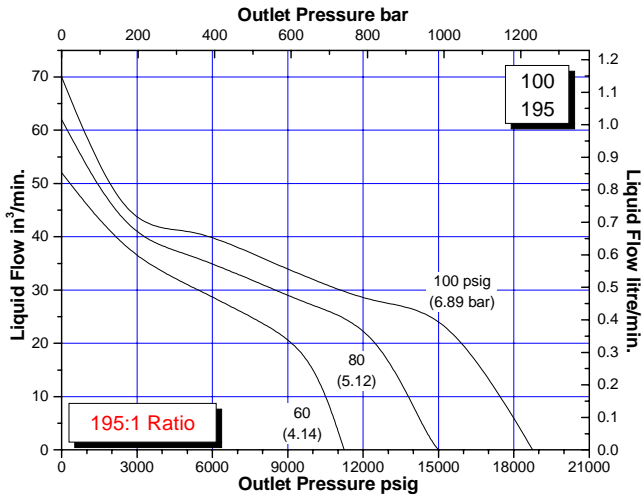
## APPROXIMATE RATE OF DISCHARGE



# 10-5 & D5 SERIES

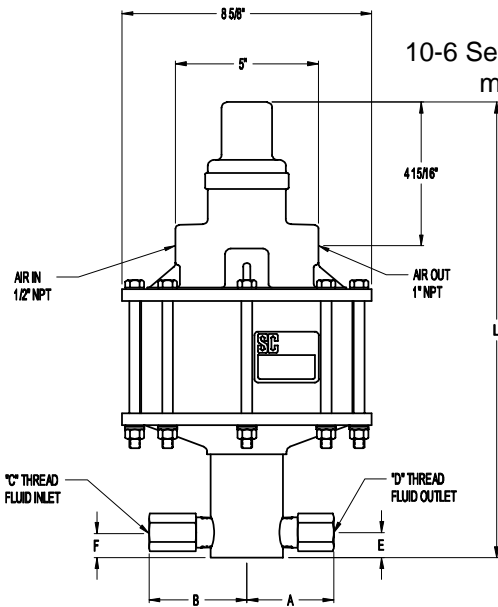
## APPROXIMATE RATE OF DISCHARGE

Model Code  
Use Top for 10-5  
Use Bottom for D5



\* Recommended for continuous duty at pressure up to 30,000 psi. Intermittent duty above 30,000 psi.

# 10-6 & D-6 SERIES

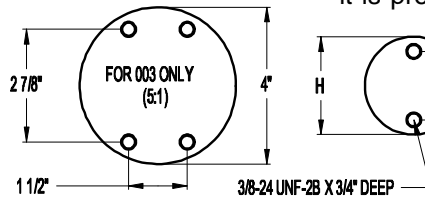


10-6 Series pumps have a 7" diameter air piston and a 2 1/2" stroke. Thirteen models are available with pressures up to 65,000 psig.

When operating from 0 to rated hydraulic pressure, air consumption will be approximately 56 scfm of free air at 100 psi output. At lower air pressures and higher hydraulic pressures air consumption will be reduced proportionately to flow rates indicated.

Mounting may be in any position, vertical preferred. When mounting in an inverted position, a drain cock should be provided to drain off any liquid that may accumulate in the pilot valve air chamber.

The D6 Series "Dry Lube" pump is identical to the 10-6 Series except it is pre-lubricated and therefore does not require an air line lubricator.



The part number distinguishes it from the 10-6 Series by the D6 prefix and using the actual ratio rather than a numerical code in the model suffix.

## Mounting Dimensions in Inches

10-6 Series Model	D6 Series Model (ratio)	L	A	B	NPT/HF4 (Std)		SAE/HF4 (Optional)		E	F	G	H
					C Thread	D Thread	C Thread	D Thread				
-003	5	19.625	4.875	2.375	1 1/4"	1"	-	-	1.500	2.500	---	4.000
-005	10	18.625	4.750	4.375	1"	1"	-	-	1.375	1.375	2.375	3.000
-010 thru -020	20 thru 35	17.063	3.000	4.000	1"	1/2"	-	-10 SAE	1.000	1.000	1.750	2.500
-030 thru -100	55 thru 180	15.750	3.000	3.375	1/2"	1/2"	-10 SAE	-10 SAE	0.875	0.875	1.750	2.500
-151 thru -201	240 thru 330	16.000	2.500	2.313	3/8"	3/8"	-	9/16-18 *	0.875	0.875	1.750	2.500
-301	460	16.000	3.750	2.313	3/8"	9/16-18 *	-	-	0.875	0.875	1.750	2.500
-402	740	16.250	4.250	2.313	3/8"	9/16-18 *	-	-	1.125	1.125	2.375	3.000

\*Coned and Threaded High Pressure Connection for 1/4" O.D. Tubing

## Measurements & Approximate Air to Hydraulic Pressure Ratios – Static Conditions

10-6 Series Model	D6 Series Model (ratio)	Hydraulic Piston Diameter (in)	Hydraulic Piston Area (in <sup>2</sup> )	Volume per Stroke (in <sup>3</sup> )	Air Pressure (PSI)									
					10	20	30	40	50	60	70	80	90	100
003	5	3.000	7.070	17.70	50	100	150	200	250	300	350	400	450	500
005	10	2.125	3.560	8.900	85	185	285	390	490	590	690	795	900	1000
010	20	1.438	1.620	4.050	165	425	650	875	1075	1300	1550	1750	1950	2150
015	25	1.315	1.350	3.380	180	450	725	1000	1300	1550	1850	2125	2400	2700
020	35	1.125	0.994	2.490	250	625	1025	1400	1800	2150	2500	2850	3250	3600
030	55	0.875	0.601	1.500	450	1050	1700	2275	2900	3500	4100	4650	5200	6000
050	95	0.688	0.371	0.928	750	1750	2800	3700	4750	5900	6875	7700	8750	9700
080	145	0.563	0.249	0.623	1100	2600	4200	5550	7100	8500	10000	11500	12950	14400
100	180	0.500	0.196	0.490	1500	3200	5200	7100	9000	10800	12500	14500	16300	18000
151	240	0.438	0.150	0.375	1900	4400	6900	9100	11600	14000	16400	18800	21300	23700
201 **	330 **	0.375	0.110	0.275	3000	6000	9500	12600	16000	19100	22300	25600	29000	32300
301 **	460 **	0.313	0.077	0.193	4000	8800	13700	18000	22500	27000	31500	36500	41400	45800
402 **	740 **	0.250	0.049	0.123	6000	13000	21000	27000	34000	40500	46000	52000	59000	65000

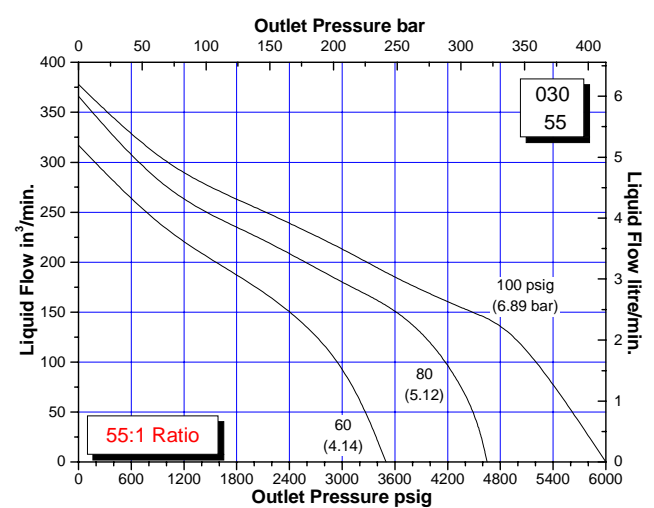
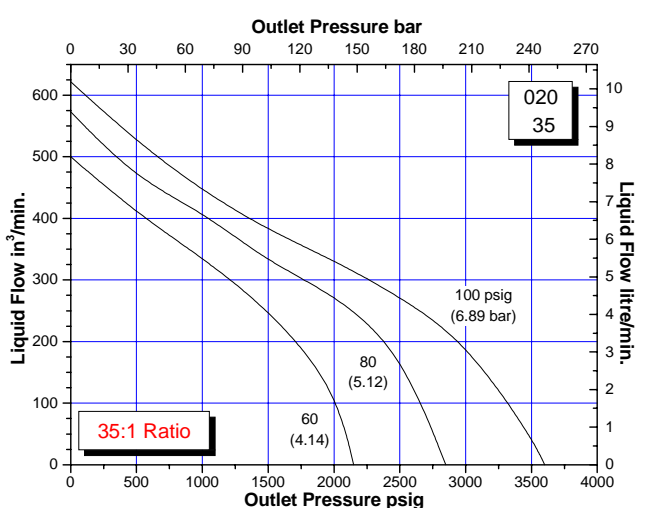
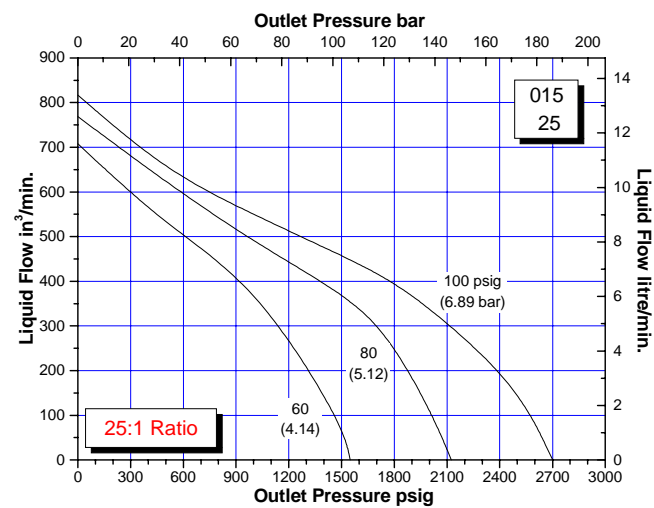
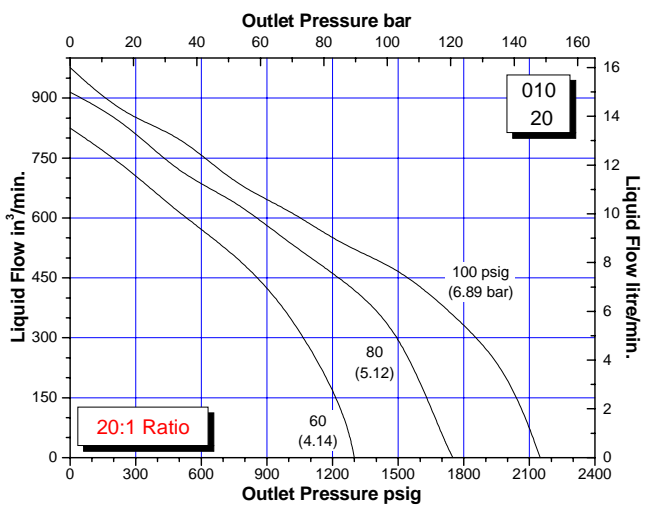
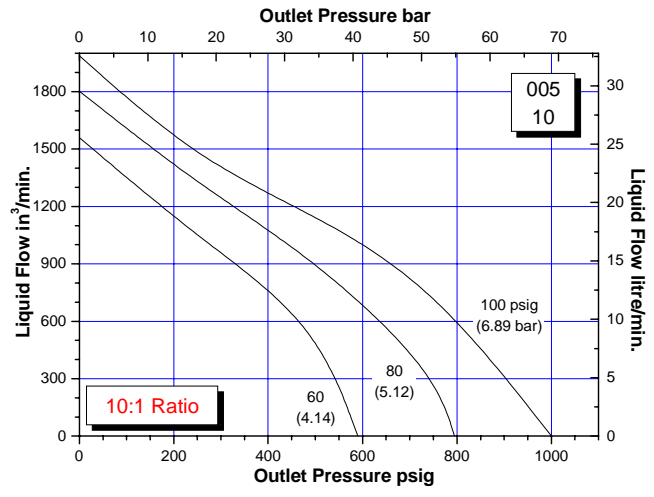
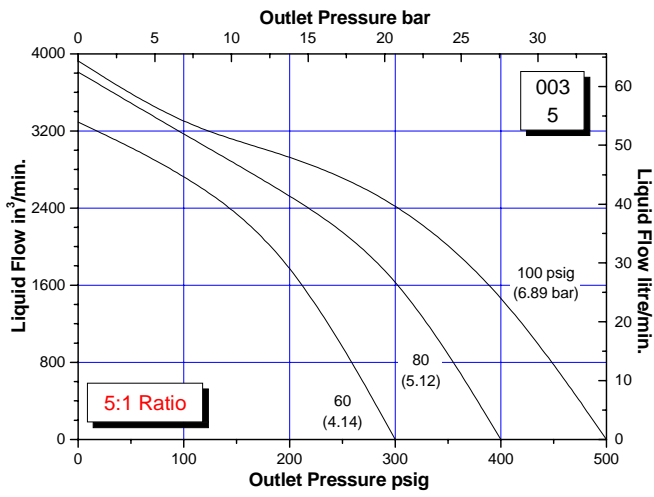
\*\* Recommended for continuous duty at pressures up to 30,000 psi. Intermittent duty above 30,000 psi.



Model Code  
 Use Top for 10-6  
 Use Bottom for D6

# 10-6 & D6 SERIES

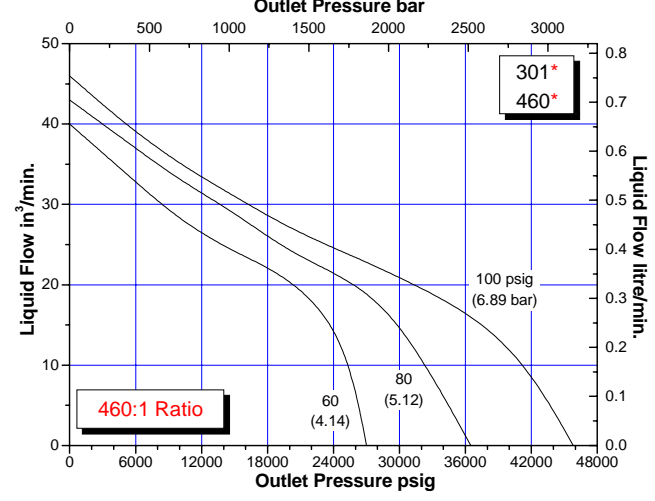
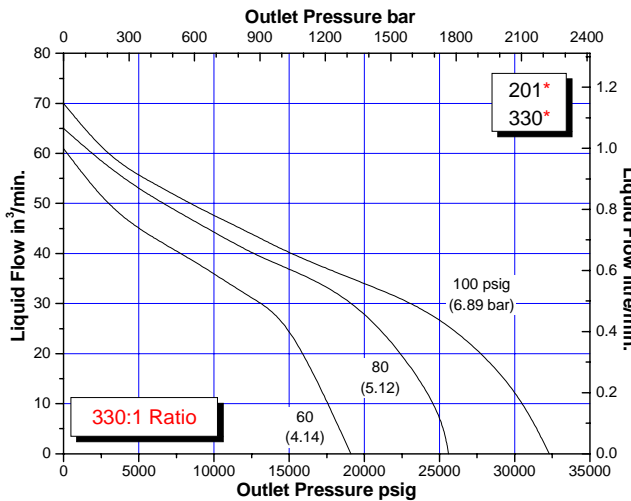
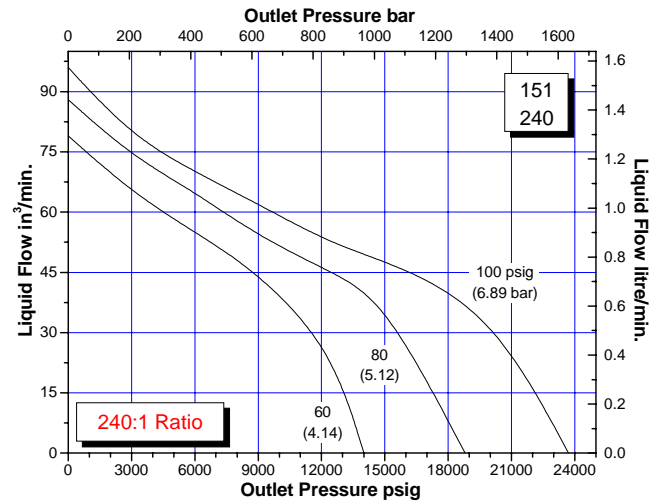
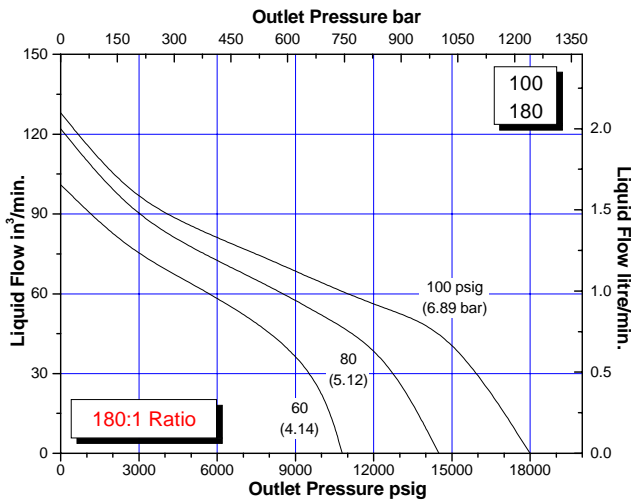
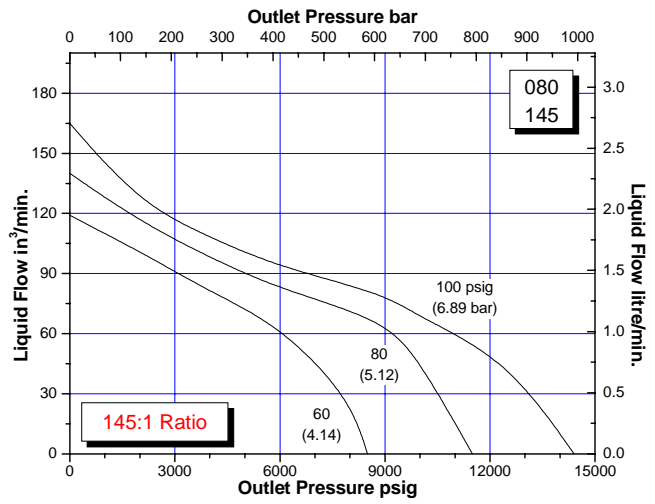
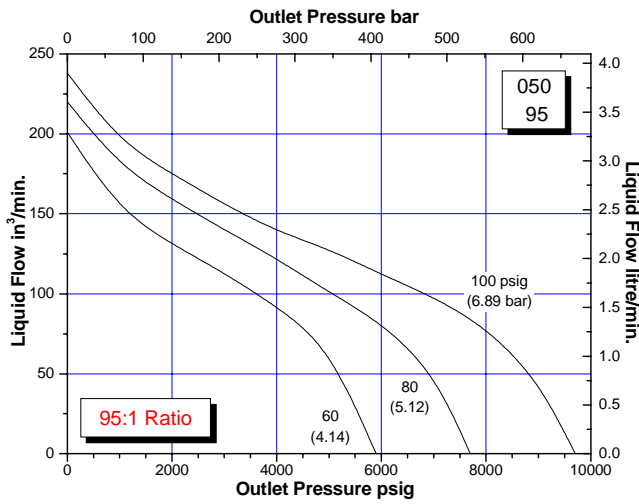
## APPROXIMATE RATE OF DISCHARGE



Model Code  
 Use Top for 10-6  
 Use Bottom for D6

# 10-6 & D6 SERIES

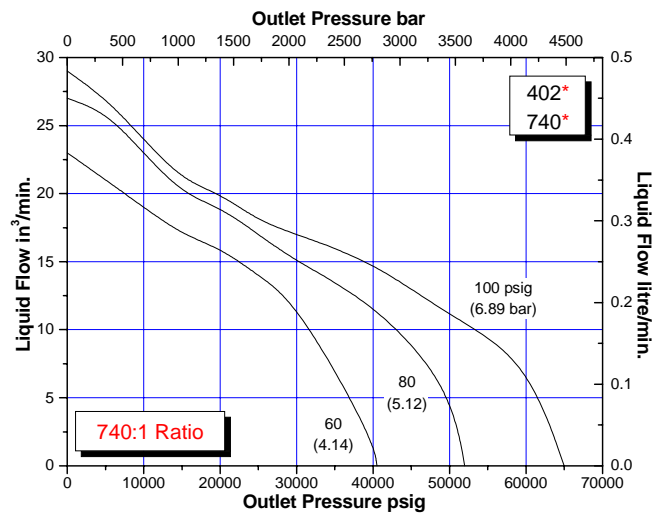
## APPROXIMATE RATE OF DISCHARGE



Model Code  
Use Top for 10-6  
Use Bottom for D6

# 10-6 & D6 SERIES

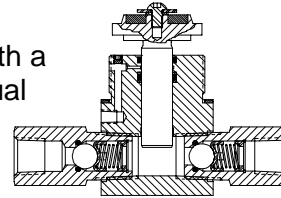
## APPROXIMATE RATE OF DISCHARGE



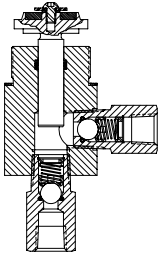
# PUMP MODIFICATIONS

A combination of any of the modifications shown can be supplied upon request. Consult factory for additional information and dimensional data if required.

- **“A” Modification** – Available on all models  
This modification utilizes dual seals in the hydraulic assembly with a bleed-off between the seals to atmosphere, thus providing a visual indication of hydraulic seal leakage. Used where contamination of the air motor from the hydraulic fluid being pumped is objectionable.

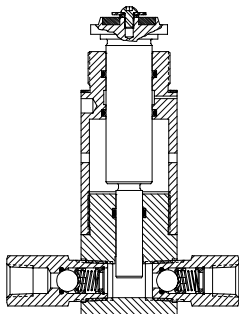
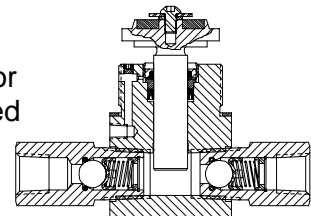


- **”K” Modification** – Available on 10-5/D5 and 10-6/D6  
This modification utilizes a special air piston in the air motor assembly which decreases the stroke of the pump, thus minimizing the internal forces and increasing air motor life. Used in applications exhibiting rapid pressure losses, such as burst testing.



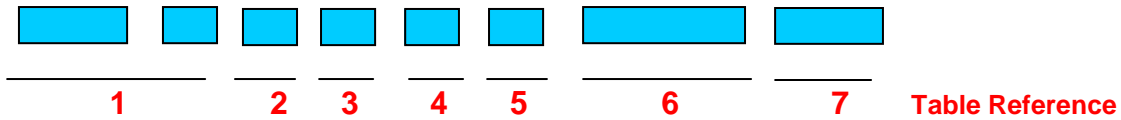
- **“B” Models** – Available on 10-5/D5 and 10-6/D6  
The “B” models have a bottom inlet connection for convenient tank top installation or alternate mounting configuration.

- **“H” Models** – Available on 10-5/D5 and 10-6/D6  
The “H” Models utilize special packing in the hydraulic assembly for maximum performance where hydraulic fluid media is contaminated with foreign matter, thus providing for a much greater life expectancy from the hydraulic seals than with standard o-ring seals. The “A” modification is included on all “H” models.



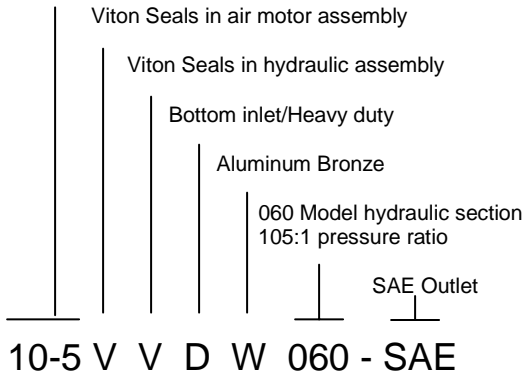
- **“R” Modification** – Available on 10-5/D5 and 10-6/D6  
The “R” Models are furnished with an isolator attachment which prevents the hydraulic piston retracting into the air motor during operation, thus providing for 100% non-contamination of the hydraulic assembly from the air motor. The isolator also acts as a heat barrier.

# HOW TO ORDER TABLE



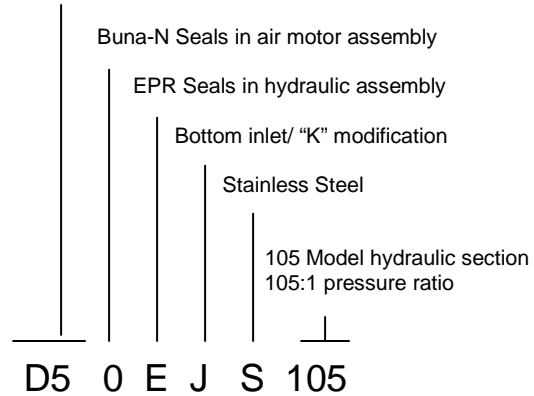
## Example #1 Pump Selection

10-5 Series air operated hydraulic pump



## Example #2 Pump Selection

D5 Series air operated hydraulic pump



### TABLE 1 <sup>(4)</sup> Pump Series Designation

- 10-4** 10-4 Series standard pump
- 10-5** 10-5 Series standard pump
- D5** D5 Series "Dry Lube" pump
- 10-6** 10-6 Series standard pump
- D6** D6 Series "Dry Lube" pump

### TABLE 2 Seal Compound - Air Motor

- 0** Buna-N (standard)
- V** Viton

### TABLE 3 Seal Compound – Hydraulic Section

- 0** Buna-N nitrile (standard)
- E** EPR - ethylene propylene
- V** Fluorocarbon
- \*** Consult factory for special compounds

### TABLE 4 Modifications

- 0** Standard pump
- A** "A" modification
- B** Bottom inlet <sup>(1)</sup>
- D** Bottom inlet – heavy duty <sup>(1,3)</sup>
- E** Bottom inlet – "A" modification <sup>(1)</sup>
- G** Isolator – heavy duty <sup>(1,3)</sup>
- H** Heavy duty <sup>(1)</sup>
- J** Bottom inlet – "K" modification <sup>(1)</sup>
- K** "K" modification <sup>(1)</sup>

### TABLE 4 Modifications (continued)

- M** Bottom inlet – "A" and "K" modification <sup>(1)</sup>
- N** Isolator – "A" modification <sup>(1)</sup>
- P** Isolator – "K" modification <sup>(1)</sup>
- Q** Isolator – "A" and "K" modification <sup>(1)</sup>
- R** Isolator <sup>(1)</sup>
- S** Heavy duty – "K" modification <sup>(1,3)</sup>
- U** Heavy duty – bottom inlet – "K" mod. <sup>(1,3)</sup>
- V** Heavy duty – isolator – "K" modification <sup>(1,3)</sup>

### TABLE 5 Material of Construction – Hyd. Section

- W** Aluminum bronze & stainless steel (10-4, 10-5, 10-6 Series) standard
- B** Aluminum bronze & stainless steel (D5, D6 Series) standard
- S** All stainless steel
- C** Cad plate carbon steel, stainless steel <sup>(2)</sup>

### TABLE 6 Model designation –Pressure ratio

Refer to pressure ratio charts for proper selection

### TABLE 7 Port option

- Blank** Standard
- SAE** Straight thread as indicated on chart
- HF4** 9/16-18 x 1/4" OD tube 60K psi

#### Notes:

- (1) Not available for 10-4 Series
- (2) 25 piece minimum order
- (3) "A" modification included with all "H" modifications.
- (4) Do not fill gap on a two digit description. Refer to Example #2



## LIMITED WARRANTY

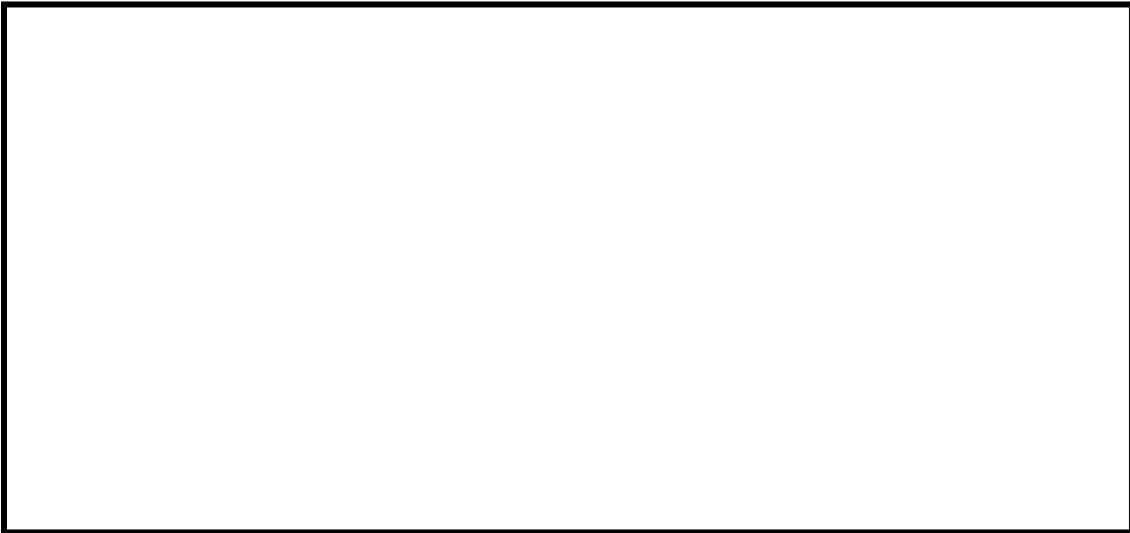
SC manufactured products are warranted free of original defects in material and workmanship for a period of one year from date of purchase to first user. This warranty does not include packing, seals or failures caused by lack of proper maintenance, incompatible fluids, foreign materials in the air media, in the fluid media or application of pressures beyond catalog ratings. Products believed to be originally defective may be returned, freight prepaid, for repair and/or replacement to the distributor, authorized service representative or to the factory. If upon inspection by the factory or authorized service representative and the problem is found to be originally defective material or workmanship, repair or replacement will be made at no charge for labor and materials, F.O.B. the point of repair or replacement. Permission to return under warranty should be requested prior to shipment. A Return Material Authorization Number (RMA), the original purchase date, purchase order number, serial number, model number, reason for return or other pertinent data to establish warranty claim must be included in the documentation to expedite the return or replacement to the owner.

If the unit has been disassembled, misused, or altered without prior **written** authorization, warranty is void. If it has been improperly reassembled or substitute parts have been used in place of factory manufactured parts, warranty is void.

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