



LIQUID PUMP CATALOG

OUR PRODUCTS ARE BACKED BY OUTSTANDING TECHNICAL SUPPORT, AN
EXCELLENT REPUTATION FOR RELIABILITY AND WORLDWIDE DISTRIBUTION





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Haskel International, Inc. has over 50 years of hydraulic and pneumatic engineering experience in the design and manufacture of their wide range of air driven liquid pumps.

Located in Burbank, California, U.S.A. with an additional manufacturing plant in Sunderland, United Kingdom, the company is supported by a worldwide network of offices and distributors.

Haskel air driven pumps now offer the most complete range of models in this industry whether measured by ultimate pressure, flow or output horsepower capability; or by variety of liquids with which they are compatible.

Continuous investment in the most modern machinery and technology ensures that Haskel will remain the leader in the field.

Why Use Haskel Air Driven Pumps?

Haskel air driven pumps offer many advantages over conventional electrical driven units as follows:

- Ability to install at any predetermined pressure and hold this fixed pressure without consuming power or generating heat.
- No heat, flame or spark risk.
- Infinitely variable cycling speed output.
- Up to 100,000 psi (7,000 bar) pressure capability.
- Easy to apply automatic controls.
- No limit or adverse effect to continuous stop/start applications.
- Air drive does not require an external line lubricator thus saving on running cost and preventing oil vapor contamination of the surrounding environment.
- Reliable, easy to maintain, compact and robust.

Haskel products are backed by an international network of highly trained distributors with application engineering expertise who can provide a complete problem solving service.

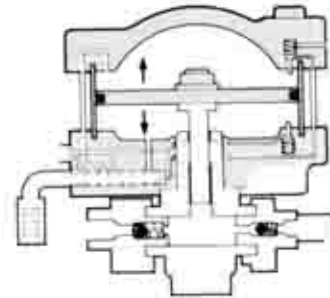
Key Features:

- Wide range of modifications and control options.
- Noise reduction kits for selected models.
- Unbalanced cycling spool provides immediate operation in response to output pressure change.
- Suitable for large variety of liquids and liquefied gases.
- Bottled gas, boil off from a liquefied tank or natural gas can be used as an alternative to air drive.
- Range of standard and specially built systems.
- Ability to design and manufacture systems to customer specifications.

What is a Haskel Air Driven Liquid Pump ?

1. Air Drive Section

This consists of a light weight inertia reducing piston complete with o-ring seal inside an epoxy filled wound fiberglass or hard coated aluminum barrel. The diameter of the air piston is constant for any series of air driven pumps. When compressed air is fed into the air drive it forces the piston down on the compression stroke. The air then drives the piston back on the suction stroke (except in the case of the M series pumps which have a spring return). Unlike many competitive pumps, air drive line lubricators are not required nor desired due to the inherent low friction characteristics of the Haskel design and lubrication during assembly.



1. AIR DRIVE SECTION

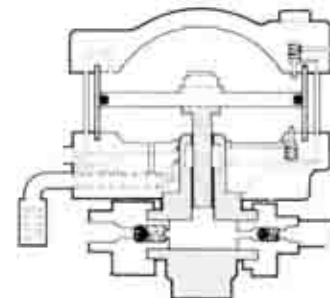
2. Hydraulic Section

The hydraulic piston/plunger is directly linked to the air piston and its lower portion is housed inside the hydraulic body. Its diameter determines the ratio of the pump (for any particular series) which in turn determines the output flow and maximum pressure capability. Its function is to induce liquid into the the hydraulic body through the inlet check valve and force it out through the outlet check valve at a higher pressure.

These are spring loaded non-return valves that control the passage of liquid into and out of the pump. When the hydraulic piston/plunger is on the suction stroke the inlet check valve opens to the maximum, the liquid is induced into the pump while the outlet check valve is held closed by its spring. On the pressure stroke the inlet check valve is closed as the hydraulic piston/plunger force the liquid out through the outlet check valve.

A dynamic seal encircles the hydraulic piston/plunger, and is one of the few wearing parts. Its function is to contain the liquid under pressure during cycling and prevent external leakage or leakage into the air drive. Different seal materials and configurations are used, based on the compatibility of the liquid to be pumped, operating temperature and the pressure rating.

NOTE: With most Haskel pumps a distance piece can be incorporated, between the air drive section and the hydraulic section, for complete separation and contaminant free operation.

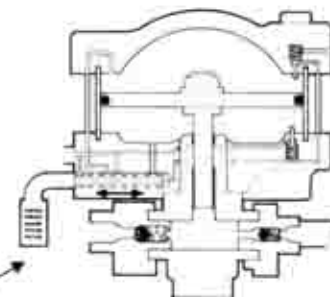


2. HYDRAULIC SECTION

3. Air Cycling Valve

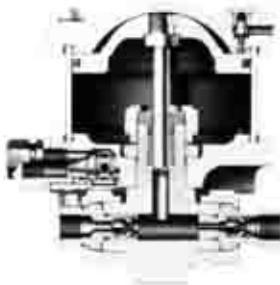
This consists of a unbalanced, pilot operated, light weight spool that channels the compressed air to either side of the air piston, depending on position. The air piston actuates pilot valves at the top and bottom of its stroke, alternately pressurizing and venting the large area of the spool, causing it to reciprocate and control the air flow to the air piston to maintain automatic cycling. The air is exhausted from the pump through an exhaust muffler. Unlike many competitive pumps, Haskel does not use close metal to metal fits in their design. This eliminates the costly air leakage that would otherwise result in a spool hang up condition.

Exhaust muffler



3. AIR CYCLING VALVE

Principle of Operation



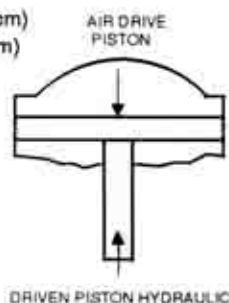
Haskel air driven liquid pumps work on an automatic reciprocating differential area principle that uses a large area air drive piston connected to a smaller area hydraulic piston/plunger to convert compressed air power into hydraulic power.

The nominal ratio between the area of the air drive piston and the hydraulic piston is indicated by the dash number in the model description and approximates the maximum pressure the pump is capable of generating. Unlike other air driven pumps the actual ratio is approximately 15% higher than the nominal so that the pump will still cycle when the ratio of the output hydraulic pressure to the air drive pressure equals the nominal ratio. For example an AW-35 has an actual ratio of 40:1.

Example

If air drive piston area = 25.9 sq. in. (167 sq. cm)
and liquid piston area = 0.65 sq. in. (4.2 sq. cm)
then actual pump ratio = 40:1
and nominal pump ratio = 35:1

If air drive pressure = 75 psi (5.2 bar)
the maximum outlet stall pressure will be close to $40 \times 75 = 3000$ psi (204 bar) (depending on friction)



If the air drive pressure is increased to 100 psi (7 bar) then minimum outlet pressure may be close to 4000 psi (272 bar) at stall.

When compressed air is first applied to the pump it will cycle at its maximum speed producing maximum flow and act as a transfer pump filling the pressure receiver with liquid. The pump will then gradually start to cycle at a slower rate as the pressure in the receiver increases and offers more resistance to the reciprocating differential piston assembly, until it stops (stalls) when a balance of forces is reached. i.e. when air drive pressure x air drive piston area = stall pressure x driven hydraulic piston area.

The hydraulic pressure drop (hysteresis) required to cause the Haskel air driven pump to restart is extremely small due to the very low frictional resistance offered by the large diameter air drive piston seal and hydraulic seal. Under ideal conditions (lubricity, etc.) this can be as low as two PSI times the pump's ratio.

Output Horsepower ratings

Nominal horsepower ratings use 85 psi (5.5 bar) air drive pressure and are approximate. They assume an ample air supply at adequate pressure at the pump. Inadequate air drive pipe line sizes, dirty air filters, etc. can effect the performance of any pump. Peak hp is obtained at approximately 75% of nominal ratio x air drive pressure.

i.e. 100:1 pump being driven at 100 psi (7 bar) will produce peak power at a hydraulic output pressure of approximately $100 \times 100 \times 0.75 = 7500$ psi (517 bar).

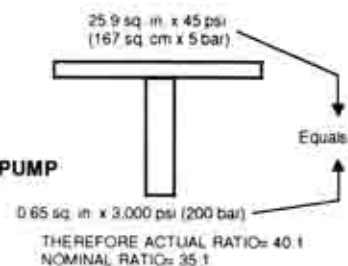
Double and Triple Air Head Pumps

The pressure capability of the pumps in the 1.5 horse power (hp) (1.12 kw) range can be extended by stacking air pistons on top of each other to double or triple the intensification ratio without changing the hydraulic piston. The double or triple air head pumps consume less air than competitors pumps with a single air piston of equivalent area since only one of the two or three heads is pressurized on the return stroke.

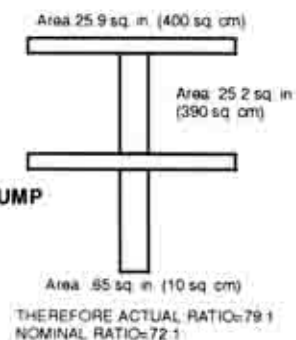
The addition of a second and third air head increased the pump hp from approximately 1.5 to 2 hp (1.12 kw).

Double air head pumps are identified by the last digit 2 in the pump model number. Thus, a nominal 50:1 ratio pump with two air heads is described as a 52, similarly, a triple air head pump is identified with a last digit 3. Thus a 900 ratio pump with 3 air heads is described as a 903.

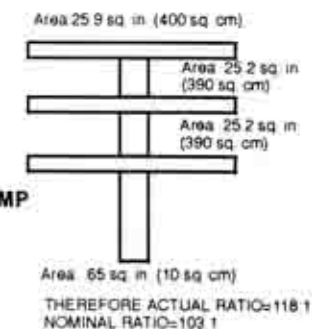
SINGLE AIR HEAD PUMP



DOUBLE AIR HEAD PUMP



TRIPLE AIR HEAD PUMP



Pump Selection Information

All Haskel pumps are identified by letters coding the type of pump, followed by a number indicating the practical working ratio of the air drive area to the hydraulic plunger area. These letters are explained in the pump model and seal coding chart below.

PUMP MODEL LETTER CODING

M	1" stroke 1/3 hp miniature pump series.	XH	2" stroke 1.5 + 2 hp Extreme High Pressure Pump series.
S	Stainless steel hydraulic piston and body.	G	4-1/2" stroke 6 hp Pump series.
MCPV	1/3 hp Chemical Pump.	8"	4-1/2" stroke 8 hp Pump series.
D (Prefix)	Pump incorporates a Distance Piece.	14"	4" stroke 10 hp Pump series.
D (Suffix)	Double Acting Pump.	W	Polyurethane U-cup dynamic seal.
4B	1" stroke 3/4 hp Pump series (bottom inlet only).	F	UHMWPE (Ultra-high molecular weight polyethylene dynamic seal).
A	2" stroke 1.5 + 2 hp Pump series.	T	Reinforced Teflon dynamic seal.
H	2" stroke 1.5 + 2 hp High Pressure Pump series.	V	Viton O-Ring static seal.
		-B	Bottom inlet.

One of the more important features of the Haskel pump is the seal assembly for the hydraulic piston. Haskel's expertise in this field is considerable. Longer life and more versatile seals are continually being developed by Haskel to meet demanding applications.

Liquids compatible with Haskel Pumps

To assist in easier pump selection, we have allocated below a service code number against certain popular liquids, classified in groups. These service code numbers are referred to in the tables "Wetted materials of construction and services" which are provided throughout this catalog under each pump series, i.e. Page 7 for 1/3 HP "M" series pumps. For other liquids consult factory.

SERVICES

Service Code

- [1] Petroleum base oils, Kerosene, Diesel fuel, Water with 5% soluble oil.
- [2] Plain Water.
- [3] Most Phosphate Ester base fire resistant hydraulic fluids: e.g., Pydraul, Lindol, Cellulube, Fyrquel, and Houghtosafe 1120 and Petroleum base solvents compatible with UHMWPE (Ultrahigh Molecular Weight Polyethylene) dynamic, and Viton static seals.
- [4] Petroleum base solvents, e.g., Boron fuels, Aromatic hydrocarbons (Benzene, Toluene, Xylene, Hylene, etc.); Chlorinated solvents (Trichloroethylene, Carbon Tetrachloride, Chlorobenzene, etc.); Mercaptans, Dowtherm A, Fluorinated solvents (Fluorobenzene, Fluorochloroethylene, etc.), Dowtherm E, plus all of group 3 plus some mildly corrosive acids compatible with wetted materials.
See note [5A] for service with Methyl-Ethyl-Ketone, Methyl Acetone, Diaacetone, Alcohol and Freon 22.
- [5] Skydrol and Aerosafe hydraulic fluid. Acetone and some alcohols (Ethyl, Methyl and Isopropyl).
Also suitable for these fluids if viton static seals replaced with EPR, specify modification number 51331 (no extra charge), e.g., 51331-MDTV-5. (Most Phosphate Ester base fluids solidify at approximately 30,000 psi.)
- [6] Deionized water.

NOTE: Dynamic seal life with non-lubricating fluids will understandably be less than with lubricating types.

OPERATING TEMPERATURES

Air Drive Section

+25° thru +150° f (low temperature seals are available. Please consult factory).

Liquid Section

For reasonable seal life, high temperatures should be limited to 125° - 130° F for the "F" or "W" seal models; 275° F for the "T" or "TV" seal models (with distance piece).

Factory Assistance

Circuit assistance is available. Please consult with the factory or any authorized Haskel distributor for further information.

Quick Model Comparison Chart

Typical performance of the total Haskel pump program is shown on the chart. The diagonal lines show constant output horsepower for each series. Encircled numbers show the specific model ratios in each series.

The diagonal horsepower lines are based on 100 psi (7 bar) air drive pressure. Air drive flow requirement is different for each series as follows:

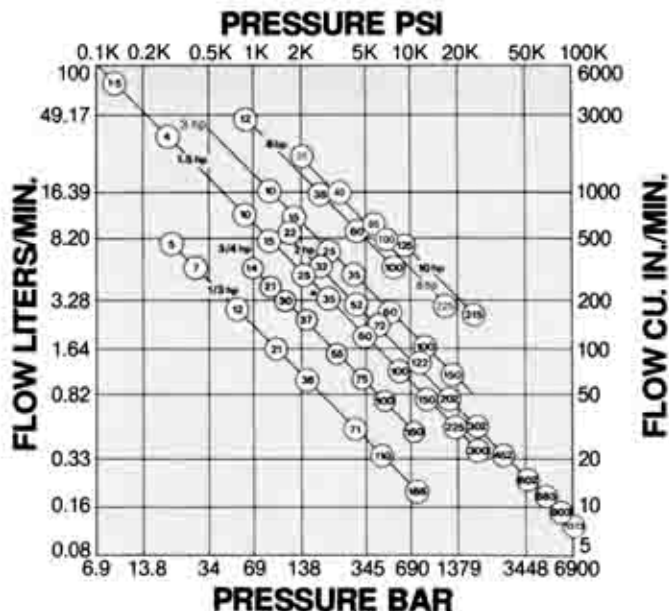
- 1/3 HP 15 scfm (0.43 N cu m/min)
- 3/4 HP 45 scfm (1.25 N cu m/min)
- 1.5 HP 70 scfm (2.0 N cu m/min)
- 2 HP 85 scfm (2.43 N cu m/min)
- 3 HP 85 scfm (based on 150psi)
- 6 HP 175 scfm (5.0 N cu m/min)
- 8 HP 225 scfm (6.4 N cu m/min)
- 10 HP 270 scfm (7.7 N cu m/min)

Reduced air drive flow or pressure will result in a corresponding reduction in output horsepower. This chart can be used to select pump series and model ratio.

Example:

Pressure required – 2200 psi (150 bar)

Flow Required – 239 cu. in./min. (3.8 l/min.)



The black dot on the graph indicates the pressure and flow requirement. Only models on the diagonal lines to the right of the black dot can meet the demand. The –35 ratio 1.5 HP series can meet the demand providing 100 psi (7 bar) air drive pressure and 70 scfm air flow can be guaranteed. If air drive pressure less than 100 psi (7 bar) is available, then select –52 in the 2 HP series.

MODEL RANGES

• 1/3 HP (.25 kw)

- Pressures to 15,000 psi
- Flow rates to 3 gpm (12 l/min.)
- 25 Models
- All Hydraulic fluids, Water-plain or DI, Solvents, Mild chemicals, Liquefied gases



• 6 HP (4.5 kw)

- Pressures to 10,000 psi
- Flow rates to 15 gpm (56 l/min.)
- 20 Models
- All Hydraulic fluids, Water-plain or DI, Solvents

• 3/4 HP (.56 kw)

- Pressures to 15,000 psi
- Flow rates to 2-4 gpm (9.0 l/min.)
- 9 Models
- Hydraulic fluids: –Petroleum Base, –HWCF & 95/5 Plain water Liquefied gases



• 8 HP (6.0 kw)

- Pressures to 22,500 psi
- Flow rates to 12 gpm (45 l/min.)
- 9 Models
- All Hydraulic fluids, Water-plain or DI, Solvents, Liquefied gases

• 1.5–2.2 HP (1.12 – 1.6 kw)

- Pressures to 100,000 psi
- Flow rates to 2-4 gpm (9.0 l/min.)
- 97 Models
- Same as 1/3 HP Modifications also available for temperature extremes



• 10 HP (7.5 kw)

- Pressures to 36,000 psi
- Flow rates to 3 gpm (12 l/min.)
- 2 Models
- All Hydraulic fluids, Water-plain or DI, Solvents, Liquefied gases

• 3 HP (2.25 kw)

- Pressures to 15,000 psi
- Flow rates to 8gpm (18 l/min.)
- 7 Models
- Hydraulic fluids, Petroleum base, HWCF & 95/5, Plain water



M-SERIES 1/3 HP (.25 kw) PUMPS

Incorporating 21 different models and a choice of output pressures, up to 15,000 psi (1030 bar), this series is the smallest in the Haskel liquid pump range.

Available in a choice of wetted part materials, the M-series range provides output flow of up to 3 gpm (12 l/min.).

A noise reduction modification is available for applications where noise level is an important criteria.

All models operate on an air drive pressure of between 25 and 125 psi (1.8 and 9 bar) and a hand pump option is available for applications requiring precision pressure control or where no air drive is available.

Hand pump optional.



Maximum Air Supply 125 psi, Single Air Head											
MODEL	RATIO DASH NO.	ACTUAL AREA RATIO	MAXIMUM RATED OUTPUT PRESSURE				DISPLACEMENT/CYCLE		CONNECTION PORTS		
			CONTINUOUS		INTERMITTENT						
			PSI	BAR	PSI	BAR	CU. IN.	M.L.	AIR DRIVE	INLET	OUTLET
M, MS	-5	-5.6	625	43	625	43	0.83	13.6	1/4"	3/4"	1/2"
	-7	7.8	900	62	900	62	0.60	9.8	1/4"	3/4"	1/2"
	-12	14	1,500	103	1,500	103	0.36	5.9	1/4"	3/4"	1/2"
M, MS, 29723 ⁽¹⁾	-21	25	2,600	179	2,600	179	0.20	3.3	1/4"	3/8"	1/4"
	-36	41	4,500	310	4,500	310	0.12	2.0	1/4"	3/8"	1/4"
	-71	82	8,800	607	8,800	607	.060	1.0	1/4"	3/8"	1/4"
	-110	126	13,500	931	13,500	931	.039	0.6	1/4"	3/8"	1/4"
	-188	217	15,000	1,034	15,000	1,034	.023	0.4	1/4"	3/8"	1/4"

(1) Maximum intermittent pressure for stainless steel in MS and 29723 series pumps is 10,000 psi (690 bar). All port sizes are female NPT (National Pipe Tapered) unless otherwise noted.

Wetted Materials of Construction and Services				
MODEL	SERVICES (Refer to pg. 5)	WETTED MATERIALS		NON METALLICS
		PUMP SECTION	PLUNGERS	
M	[1]	Cad plated steel, Aluminum & SS	416 SS	Urethane, PTFE, Buna
MS	[1] [2]	All SS	316 SS	UHMWPE, PTFE, Buna
29723	[1] [2] [3] [5] [6]	Separation - All SS	Hard Chrome Plated 15.5PH SS + Dichronite	UHMWPE, PTFE, Ryton

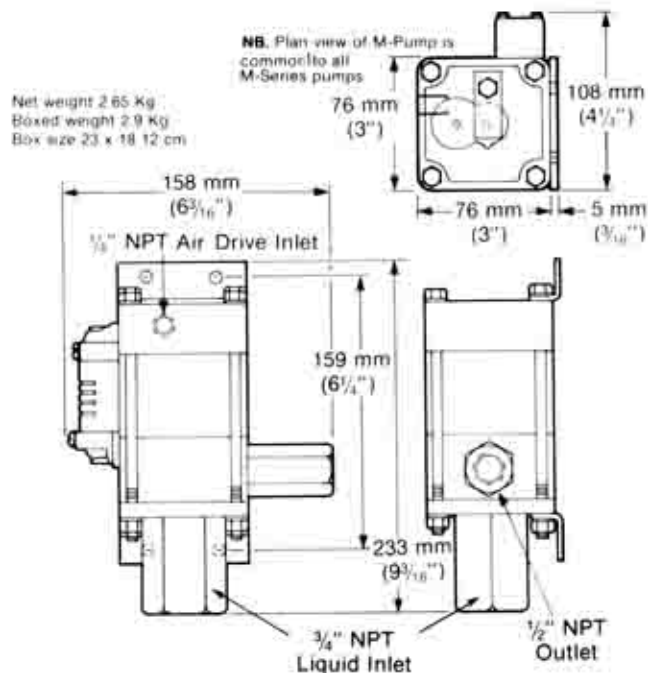
Accessories		
NUMBER	DESCRIPTION	PORTS
26065-3	Speed Control Valve	1/4 NPT
26063-3	Dead Man Valve	1/4 NPT
26064-3	Combination Air Regulator/Filter with Gauge	1/4 NPT
26065-2 plus 26064-3	-C Air Controls Installed on pump	1/4 NPT
51804	Muffler (For use with piped exhaust modifications on next page)	1/4 NPT Male

1/3 HP (.25 kw) PUMP MODELS

Optional Modifications 1/3 HP (.25) Series		
NUMBER	DESCRIPTION	
-HP	Hand Pump Attachment (with handle)	Provides manual operation of pump for precision pressure control or use without air power.
26082 26220-2 26220-3	Handle only With handle Without handle	Kits for converting existing units.
-V	Manual release with relief valve For M & MS pumps only.	Provides high pressure needle valve with internal adjustable safety relief downstream of pump outlet checks. Tank return is 1/8 NPT in pump body.
28320	Manifold mount inlet port	Provides o-ring boss in aluminum block to enable mounting on side of tank below oil level. Modification applies to M-21 through M-188 only.
28590	Palm or foot start/stop button drive	Spring loaded shut.
28926	Remote start/stop control	Provides 1/8 NPT bleed signal port for single line remote control.
29697	Single stroke from remote air pulse	Useful for metering applications. One stroke per air pulse signal, eliminates automatic cycling 1/8 NPT signal port.
51788	Piped exhaust - standard	Provides connection ports for drive and pilot exhausts. Enables under tank top mounting and/or natural gas drive.
51794	Piped exhaust - sour gas	With hand pump (HP). Conforms to NACE MR-01-75
51794-2	Piped exhaust - sour gas	Without hand pump (HP)
51809	Normally open air operated release with relief valve	Provides highest release flow capacity. Will hold full pump psi piloted from drive air. Vents are not threaded. Ref. drawing 56643 for tank top mounting parts.
51809-1	Normally closed air operated release with relief valve	Used to hold hydraulic jacks. Will release up to 11,000 psi (using 100 psi air). Vents are not threaded. Ref. drawing 56643 for tank top mounting parts. Not available in 188:1 ratio.
51810	Safety relief valve	Relief is upstream of outlet check. Vent hole 1/16 NPT. M or MS series -21 thru -188.
51811	External air pilot	Provides 1/8 NPT port for external air to pilot for remote start/stop.
52950	Electric stroke counter provision	Micro switch (BZE6-2RQ) mounted on upper cap trips with each cycle.
53304	Superpressure outlet port	Fits 1/4" O.D. high pressure threaded and coned tube.
53784	Piped exhaust (drive only)	For field conversion of any 1/3 HP pump. Provides 1/4 NPT exhaust port.
53935	Low temperature drive	Enables operation down to 5° F. Some sacrifice of seal life at normal temperature. M or MS series.
54179	Stroke adjuster (includes 29697 above)	Useful for metering applications. Knurled knob with vertical scale on pump cap.
57905	No return spring	Provides improved fill on suction stroke pumping liquified gases, by utilizing the inlet pressure. Only available on M & MS series.
80103	Noise reduction kit	Fitted

NOTE: Not all modifications can be combined or used together. Consult factory when requiring more than one modification.

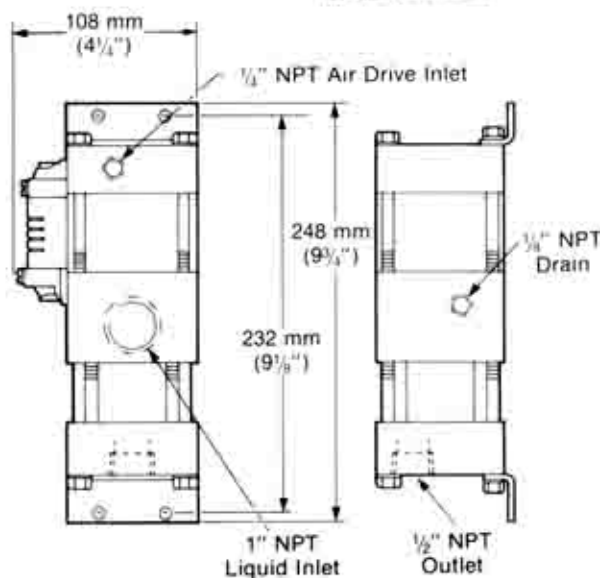
Dimensional Data 1/3 HP (.25 kw) Pumps



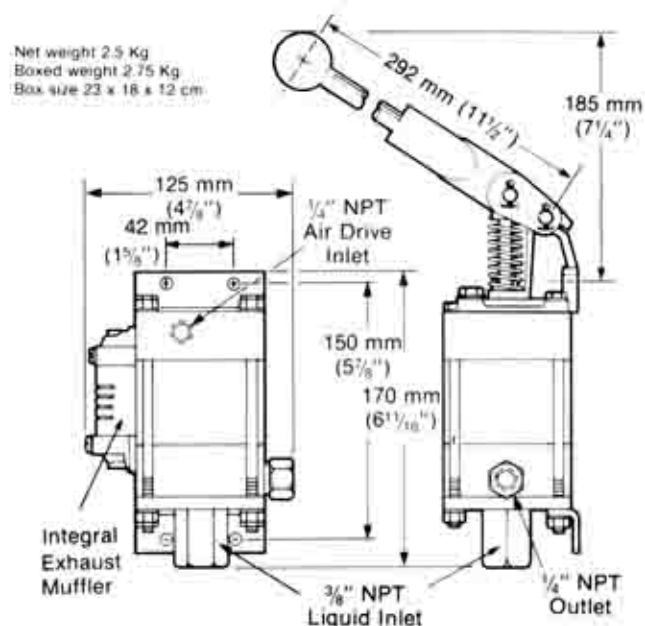
M-7, M-12
approx. wt. 9 lbs.
[4 kg]

MS-7, MS-12
approx. wt. 9 lbs.
[4 kg]

Net weight 6 Kg
Boxed weight 6.5 Kg
Box size 30 x 20 x 15 cm



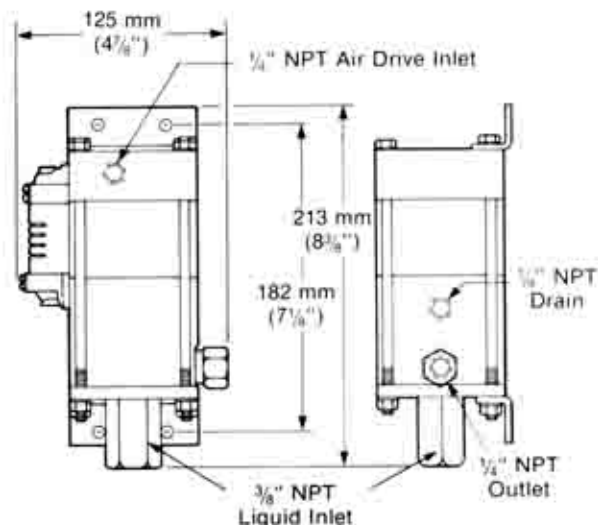
M-5
approx. wt. 9 lbs. [4 kg]



**MS-21, MS-36, MS-71,
MS-110, MS-188**
approx. wt. 6 lbs.
[2.7 kg]

**M-21, M-36, M-71,
M-110, M-188**
approx. wt. 6 lbs.
[2.7 kg]

Net weight 4 Kg
Boxed weight 4.25 Kg
Box size 23 x 18 x 12 cm



**29723-21, 29723-36,
29723-71, 29723-110**
approx. wt. 6-1/2 lbs.
[3 kg]

NOTE: Hand pump attachment will increase height by 7-1/4" (185 mm) and weight by 1/2 lb. [0.22 kg]

Performance Curves 1/3 HP (.25 kw) PUMPS

These curves show the capability of each model using 75, 100 and 125 psi drive pressures (intermediate pressures can be easily interpolated). Tests were run with the air pressure initially set at a static condition with a supply line equivalent to 1/4" schedule pipe. A standard 1/4" NPT filter-regulator was installed on the pump drive.

Note: "Mini" type air regulators (as supplied with -c air controls) will reduce output flow by about 25%.

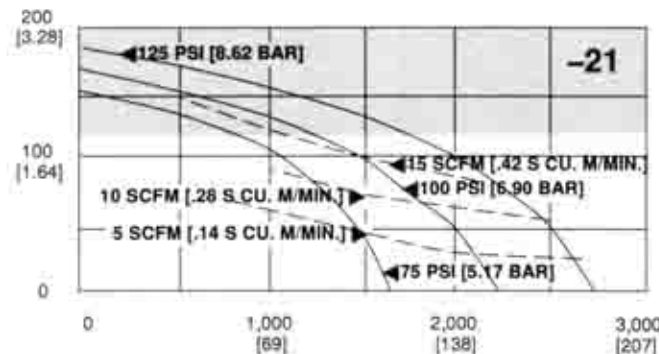
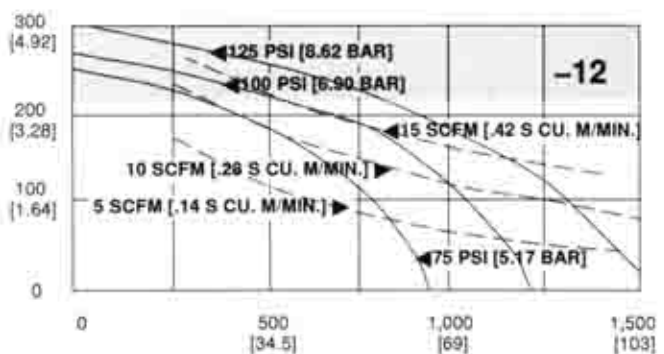
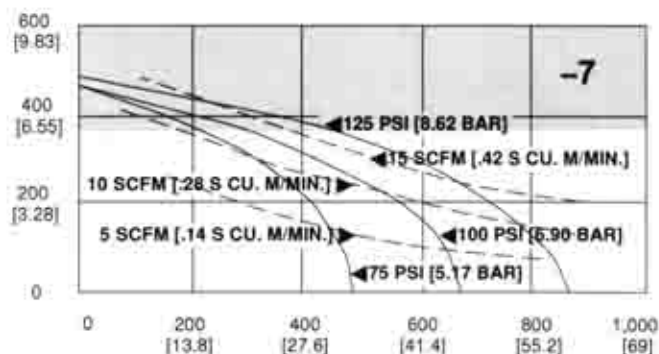
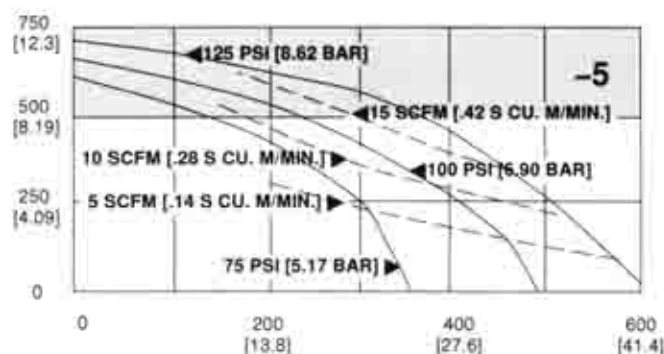
Stall pressure: The air piston assembly is returned with a large coil spring. The Drive force varies, with position, as much as 2 psi (equivalent), thus affecting stall pressure (2 x ratio). Therefore, for precise test work the HP (hand Pump modification) is recommended.

* Curves reflect losses due to piston return spring.

AIR DRIVE PRESSURE (Solid curved lines) AIR DRIVE FLOW (Dotted curve lines)

Shaded areas indicate excessive cycle rates and should be avoided except for intermittent duty.

LIQUID FLOW - CU. IN. / MIN. (LITRES / MIN.)



OUTPUT PRESSURE PSI (BAR)

Performance Curves 1/3 HP (.25 kw) PUMPS

These curves show the capability of each model using 75, 100 and 125 psi drive pressures (intermediate pressures can be easily interpolated). Tests were run with the air pressure initially set at a **static** condition with a supply line equivalent to 1/4" schedule pipe. A standard 1/4" NPT filter-regulator was installed on the pump drive.

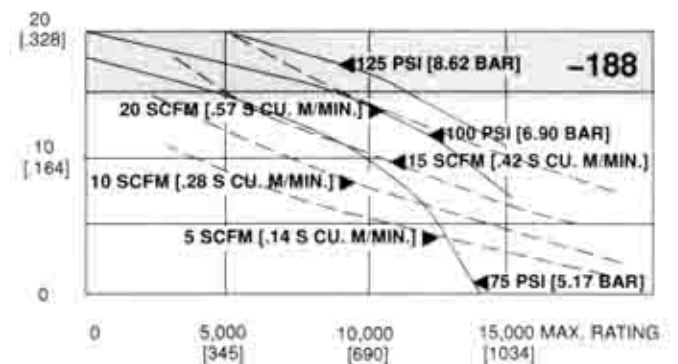
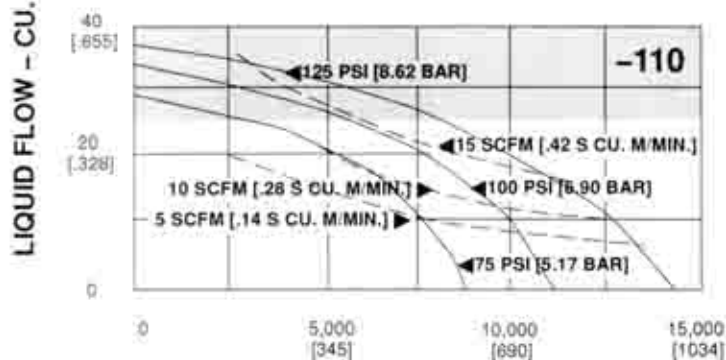
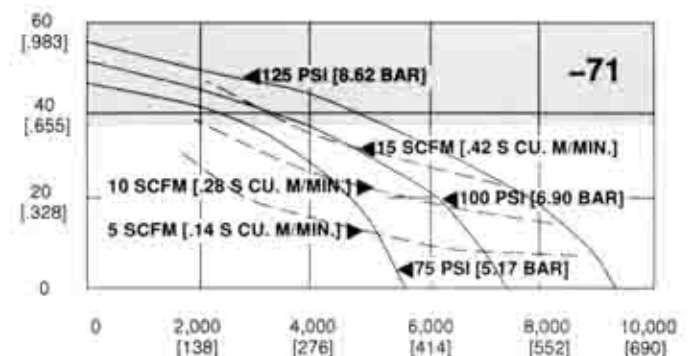
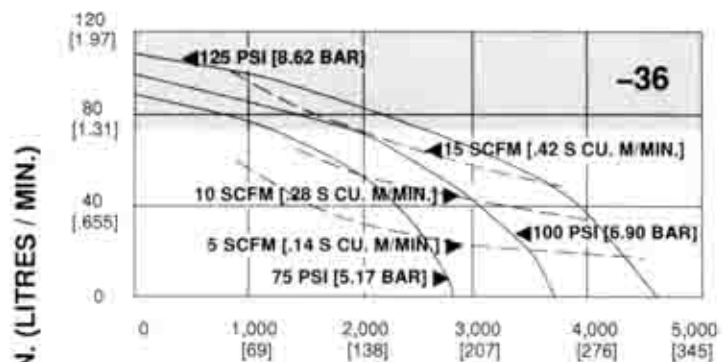
Note: "Mini" type air regulators (as supplied with -c air controls) will reduce output flow by about 25%.

Stall pressure: The air piston assembly is returned with a large coil spring. The Drive force varies, with position, as much as 2 psi (equivalent), thus affecting stall pressure (2 x ratio). Therefore, for precise test work the HP (hand Pump modification) is recommended.

* Curves reflect losses due to piston return spring.

AIR DRIVE PRESSURE (Solid curved lines) AIR DRIVE FLOW (Dotted curve lines)

Shaded areas indicate excessive cycle rates and should be avoided except for intermittent duty.



OUTPUT PRESSURE PSI (BAR)

PRESSURE TEST PAC 33

These Test Pacs are self contained, ready to operate units, which only require connection to your compressed air supply and to the test component.

Each standard Test Pac incorporates the following items: Air pressure regulator, air filter, air pressure gauge on/off speed control valve, Haskel air driven liquid pump, liquid tank; outlet pressure gauge; return to tank valve and discharge outlet connection.

They are suited for operation in petrochemical, offshore and industrial areas where an immediate pressure test is needed.

OPTIONAL EXTRAS

Hand pump attachment as illustrated, and Relief Valves

PERFORMANCE

See pages 10 and 11 for details

DATA

1/3 HP (.25 kw) Output-M type

Pressure range: 500-15,000 psi (34-1,000 bar) with 8 basic models

Flow range: 0-3 gpm (0-12 litre/min.) nominal

Construction options for oils, water and chemical applications

Width 17-3/4" (450mm) x Depth 12-1/4" (310mm) x Height 21-3/4" (555mm)

Weight: 24 lbs (11 kg)

Tank size: 1.1 gal (4 litre)



PRESSURE TEST PAC 75

These Test Pacs are self contained, ready to operate units, which only require connection to your compressor air supply and to the test component.

Each standard Test Pac incorporates the following items: Air pressure regulator, air filter, air pressure gauge and on/off speed control valve; Haskel air driven liquid pump; liquid tank; outlet pressure gauge; return to tank valve and discharge outlet connection.

They are suited for operation in petrochemical, offshore and industrial areas where an immediate pressure test is needed.

OPTIONAL EXTRAS

Relief Valves

PERFORMANCE

See page 17 for details

DATA

3/4 HP (.56 kw) Output-4" air drive type

Pressure range: 1,000-15,000 psi (70-1000 bar) with 9 basic models

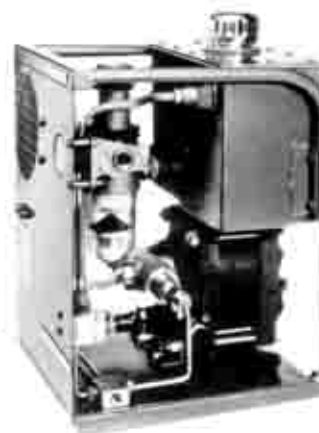
Flow range: 0-2.4 gpm (0-9 litre/min.) nominal

Construction options for oils and water

Width 11.8" (300mm) x Depth 11.8" (300mm) x Height 15.8" (400mm)

Weight: 48 lbs (22 kg)

Tank size: 2 gal (8 litre)



3/4 HP (.56 kw) SERIES PUMP MODELS

Incorporating 9 different models offering pressures up to 15,000 psi (1034 bar) and flow rates up to 2.4 gpm (9.0 l/min.), this series of pumps takes full advantage of Haskel's many years of proven design basics.

This series operates with maximum air drive pressures up to 100 psi (7 bar) and utilizes a bottom liquid inlet port as standard.

A noise reduction modification is available for applications where noise level is an important criteria.

Mufflers standard on all pumps.



Maximum Air Supply 100 psi (7 bar), Single Air Head

MODEL	RATIO DASH NO.	ACTUAL AREA RATIO	MAXIMUM RATED OUTPUT PRESSURE CONTINUOUS OR INTERMITTENT		DISPLACEMENT/CYCLE		CONNECTION PORTS		
			PSI	BAR	CU. IN.	M.L.	AIR DRIVE	INLET	OUTLET
4B	-14	16:1	1,500	103	.9	14.7	1/2"	3/4"	1/2"
	-21	24:1	2,300	159	.6	9.8	1/2"	3/4"	1/2"
	-25	29:1	2,700	186	.5	8.2	1/2"	3/4"	1/2"
	-30	34:1	3,200	221	.43	7.0	1/2"	3/4"	1/2"
	-37	42:1	3,800	262	.35	5.7	1/2"	1/2"	1/4"
	-55	63:1	6,000	414	.22	3.6	1/2"	1/2"	1/4"
	-75	86:1	7,800	538	.17	2.8	1/2"	1/2"	1/4"
	-100	114:1	10,600	731	.13	2.0	1/2"	1/2"	1/4"
	-150	171:1	15,000	1,034	.088	1.44	1/2"	3/8"	1/4"

Accessories

NUMBER	DESCRIPTION
-C	Air Drive Controls (includes mufflers)

Wetted Materials of Construction and Services

MODEL	SERVICES (Refer to pg. 5)	WETTED MATERIALS		
		PUMP SECTION	PLUNGERS	NON-METALLIC
4B-14 thru -37	1,2	Aluminum	Aluminum(Hard coated)	UHMWPE, Buna
4B-55 thru -150	1,2	303 SS	440 C. SS	UHMWPE, Buna

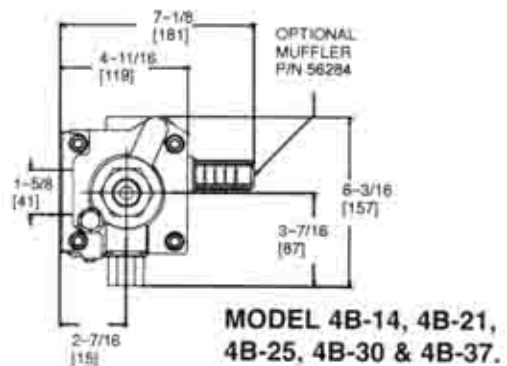
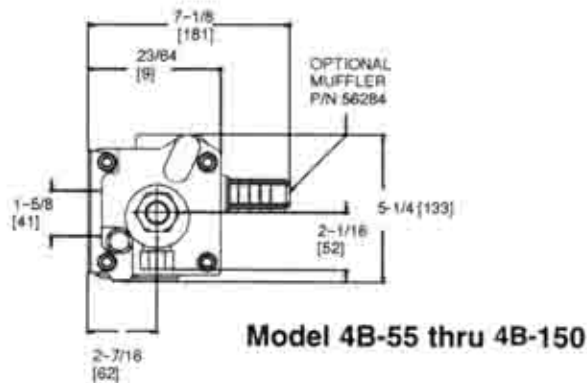
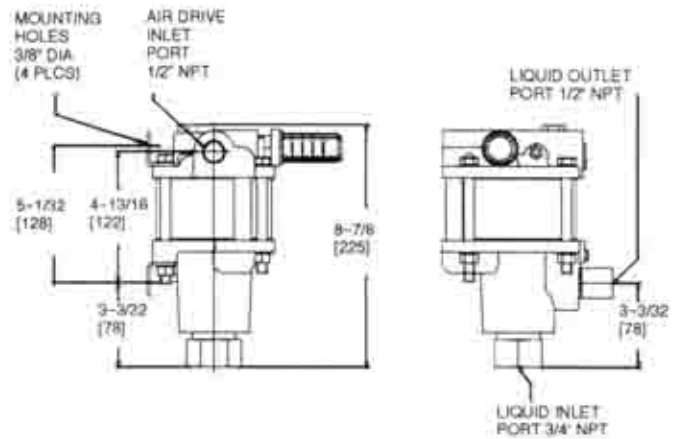
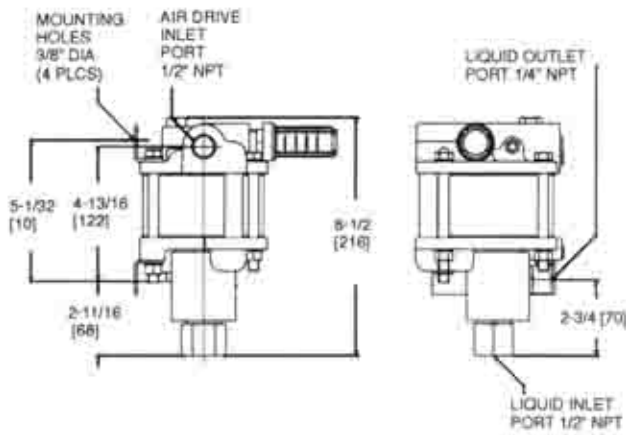
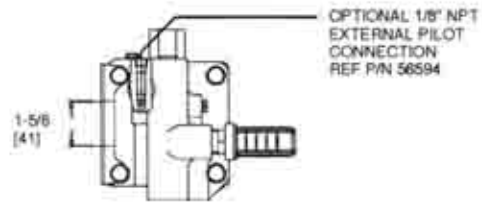
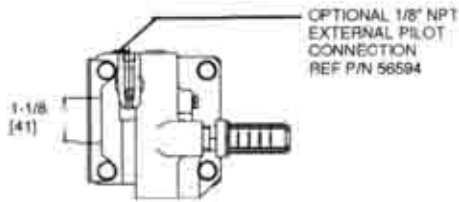
Optional Modifications

NUMBER	DESCRIPTION	
56584	Extreme cycling service	Not recommended for long stall periods
56594	External air pilot port 1/8 NPT	Allows remote start/stop of pump
57639	Low drive air pressure	Allows user to regulate drive air to as low as 3 psi (0.21 bar)
57960	Single acting drive	Used for pumping liquified gases under pressure
59354	Noise reduction kit	Fitted

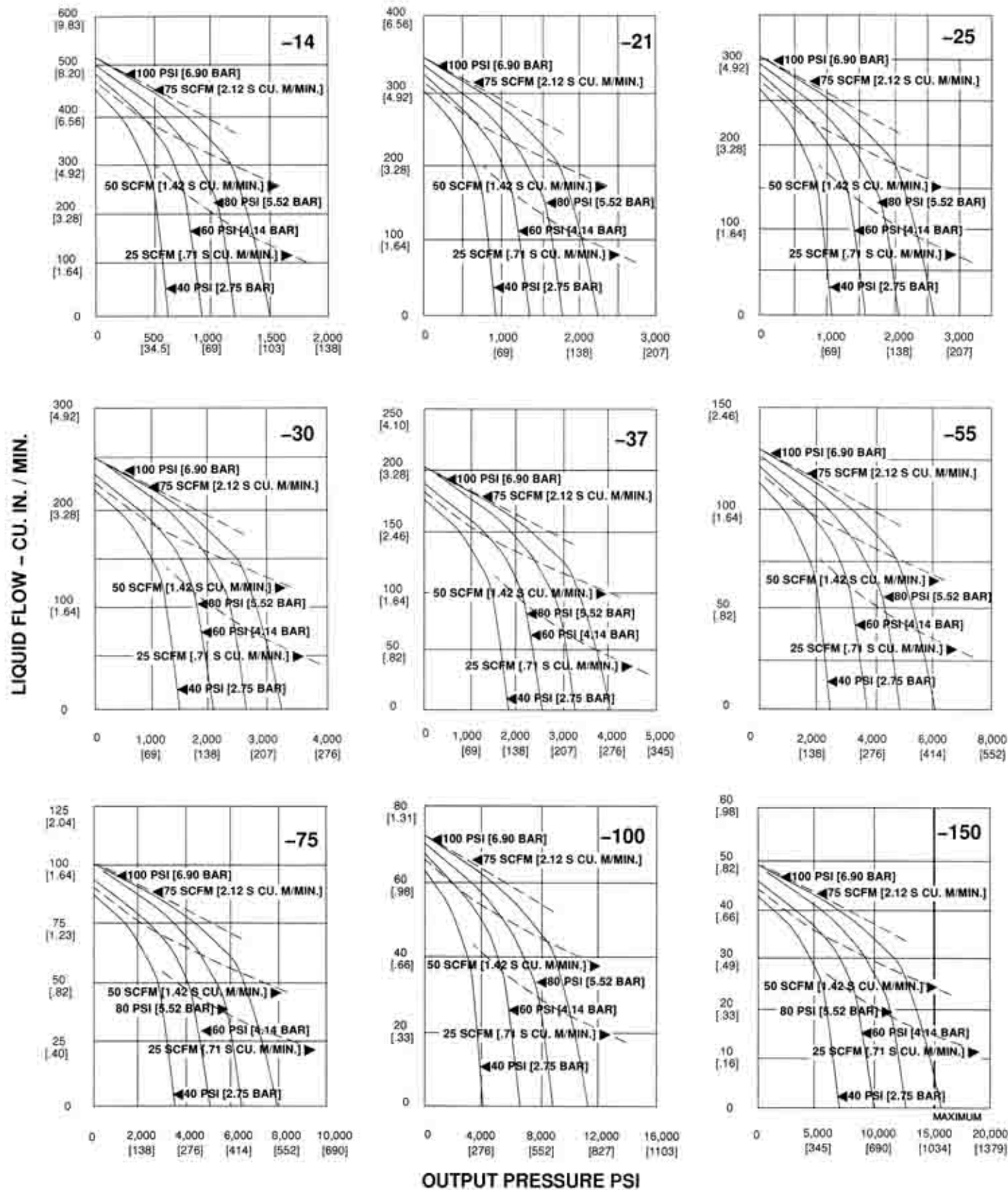
NOTE: Not all modifications can be combined or used together. Consult factory when requiring more than one modification.

3/4 HP (.56 kw) SERIES PUMP MODELS

DIMENSIONAL DATA



Performance Curves 3/4 HP (.56 kw) PUMPS



1.5 HP (1.12 kw) PUMP MODELS



1.5 HP (1.12 kw) LOW/MEDIUM OUTPUT FLOW PUMPS

Incorporating 48 different models and a wide choice of pressure outputs, this series of pumps is one of the most popular in the Haskel range.

Capable of pressures up to 45,000 psi (3,100 bar) and flow rates up to 5 GPM (19 l/min) these pumps can also be modified to operate from an air drive pressure as low as 3 psi (0.2 bar) enabling a much wider minimum/maximum operating range from each model.

By stacking air pistons in double or triple airheads, this pump range can be increased from 1.5 HP to 2.2 HP as described on pages 18 thru 23. A noise reduction modification is available for applications where noise level is an important criteria.

Mufflers available on all pumps.

All models in this series include a 1/2" air drive inlet port and 1/2" exhaust.

1.5 HP (1.12 kw) HIGH OUTPUT

Available in a choice of 3 models, these high output, low ratio pumps are capable of pressures to 1200 psi (82 bar) and flow rates of up to 27 GPM (103 l/min).

These are "lift" pumps whereby the outlet pressure equals the air drive x the pump ratio plus the inlet pressure.

Model DSTV-1.5 has a maximum air drive of 100 psi (7 bar) and is capable of pressures up to 160 psi (11 bar). The model ATV and DTV-4 work on a maximum air drive of 150 psi (10 bar) and have a maximum pressure rating of 1200 psi (83 bar). A noise reduction modification is available for applications where noise level is an important criteria.

Maximum Air Supply 150 psi (10 bar), Single Air Head

MODEL	RATIO DASH NO.	ACTUAL AREA RATIO	MAXIMUM RATED OUTPUT PRESSURE				DISPLACEMENT/CYCLE		CONNECTION PORTS		
			CONTINUOUS		INTERMITTENT						
			PSI	BAR	PSI	BAR	CU. IN.	M.L.	AIR DRIVE	INLET	OUTLET
DSTV	-1.5	1.6	120	8	160	11	31.9	513.0	1/2"	1"	3/4"
ATV, DTV	-4	4.6	690	48	1,200	83	20.0	328.0	1/2"	1/2"	1/2"
AW, DF, ASF, DSF, DSTV	-B10	11.5	1,600	110	1,600	110	4.05	66.4	1/2"	1"	1/2"
	-B15	17	2,400	165	2,400	165	2.70	44.3	1/2"	1"	1/2"
	-25	29	4,000	276	4,000	276	1.62	26.6	1/2"	1/2"	1/2"
	-35	40	5,700	393	5,700	393	1.16	19.0	1/2"	1/2"	1/2"
	-60	69	9,800	676	9,800	676	0.67	11.0	1/2"	1/2"	1/2"
	-100	115	15,000	1,034	16,500	1,138	0.41	6.7	1/2"	1/2"	1/2"
	-150	173	15,000	1,034	20,000	1,379	0.27	4.5	1/2"	1/2"	1/2"
HF, HSF, DSHF	-151	173	25,000	1,724	25,000	1,724	0.27	4.5	1/2"	1/2"	1/4" H.P.
	-225	260	30,000	2,069	37,000	2,551	0.18	3.0	1/2"	1/2"	1/4" H.P.
	-300	346	30,000	2,069	50,000	3,448	0.14	2.3	1/2"	1/2"	1/4" H.P.
HF	-450	533	(1)	—	45,000	3,403	.091	1.5	1/2"	1/2"	1/4" H.P.

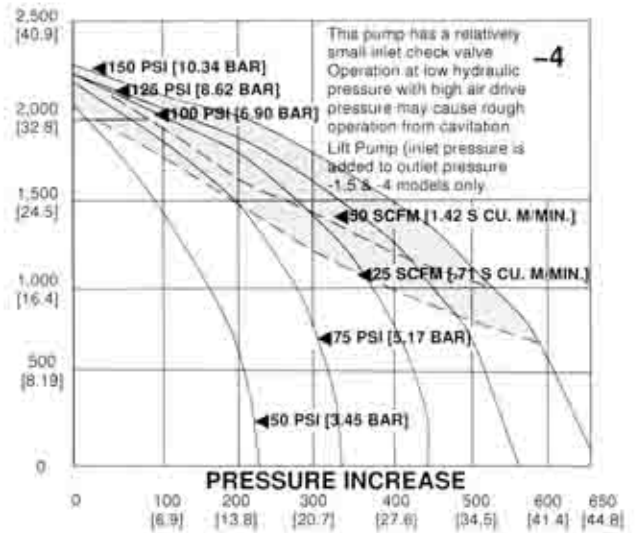
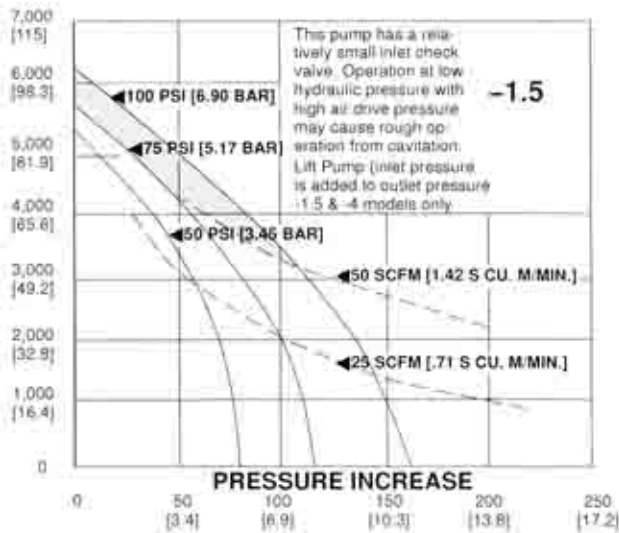
(1) Intermittent duty pump – consult factory for application advice.

Wetted Materials of Construction and Services

MODEL	SERVICES (Refer to pg. 5)	PUMP SECTION	PLUNGERS	NON METALLICS
AW	1	Nickel Plated Steel & SS	440C SS	Urethane, Buna N, PTFE
ASF	1, 2	All SS	440C SS	UHMWPE, Viton, PTFE, Rylon
DF	1, 3, 5	Separation - Nickel Plated Steel & SS	440C SS	UHMWPE, Viton, PTFE, Rylon
DSF	1, 2, 3, 5, 6	Separation - All SS	440C SS Hard Chrome Plated	UHMWPE, Viton, PTFE, Rylon
HF	1	Nickel Plated Steel & SS	Stellite	UHMWPE, Buna N
HSF	1, 2	All SS	Stellite	UHMWPE, Buna N
DSHF	1, 2, 5, 6	Separation - All SS	Stellite	UHMWPE, Buna N
ATV	1, 2	Aluminum, Bronze & SS	15.5PH SS	PTFE, Viton
DTV	1, 2, 5	Separation - Aluminum, Bronze & SS	15.5PH SS	PTFE, Viton
DSTV-1.5	1, 2, 3, 4, 5, 6	Separation - All SS	17.4PH SS	PTFE, Viton
DSTV	1, 2, 3, 4, 5	Separation - All SS	440C SS Hard Chrome Plated	PTFE, Viton

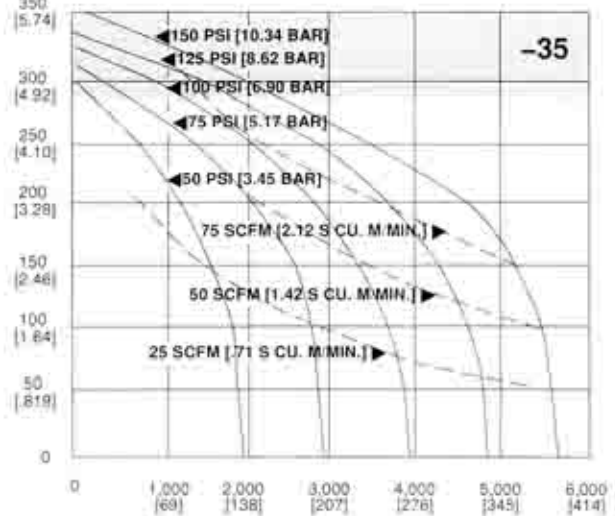
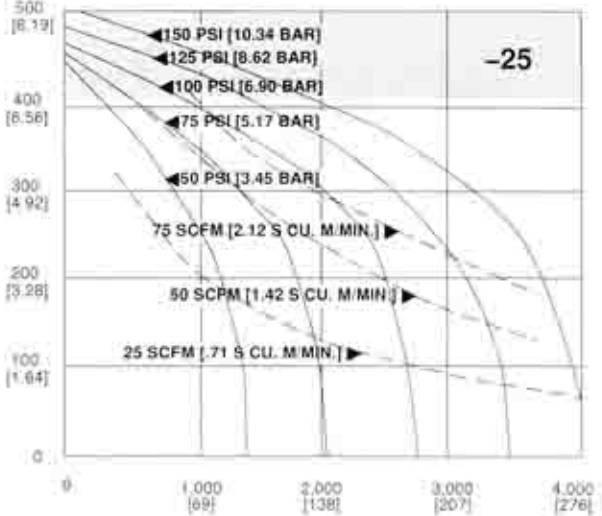
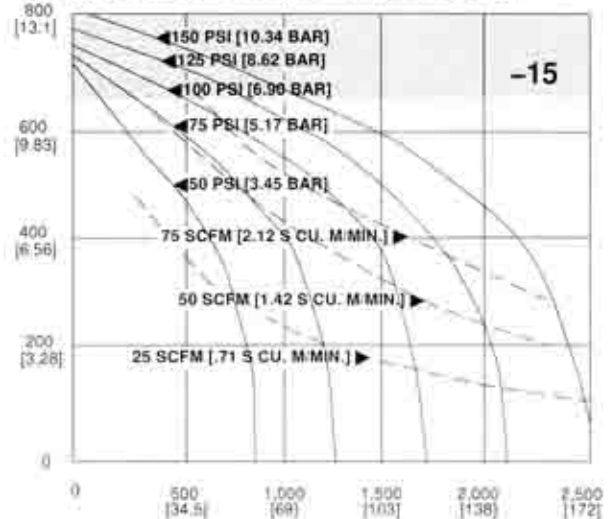
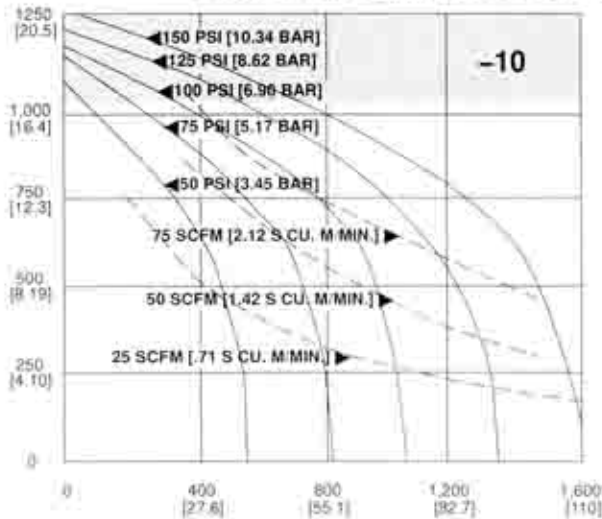
Performance Curves 1.5 HP (1.12 kw)

Light horizontal shaded area indicates an excessively high cycle rate. This should be allowed only for intermittent duty to prevent possibly excessive noise and maintenance.



Lift pump (Inlet pressure is added to Outlet pressure -1.5 and -4 models only)

LIQUID FLOW - CU. IN. / MIN. (LITRES / MIN.)

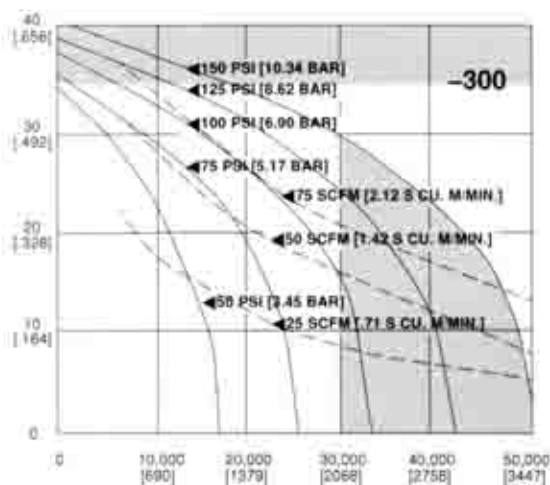
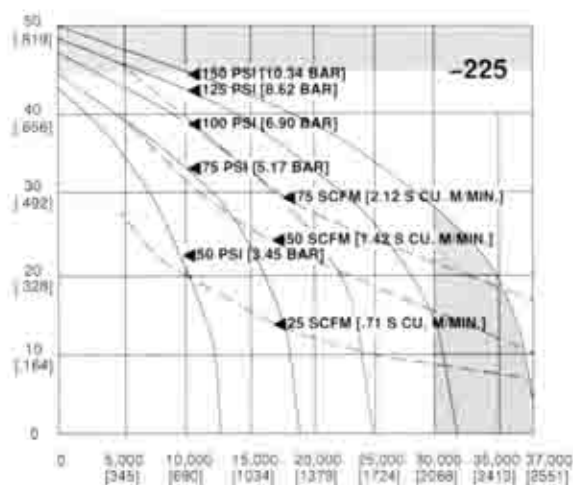
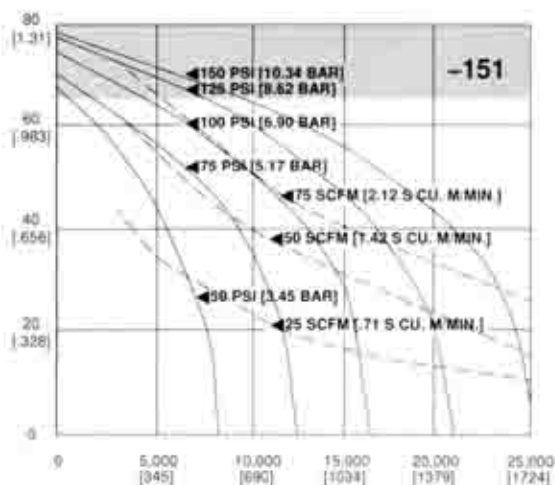
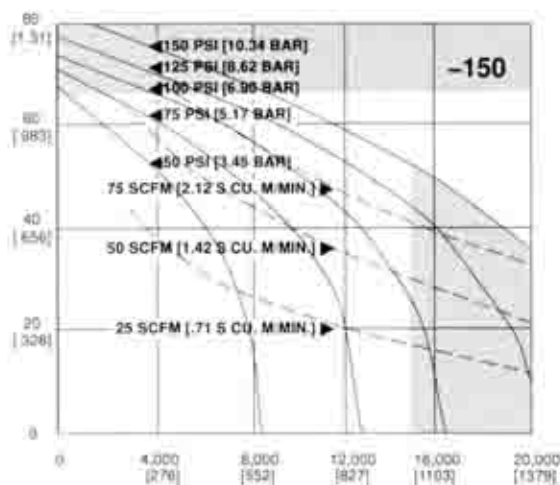
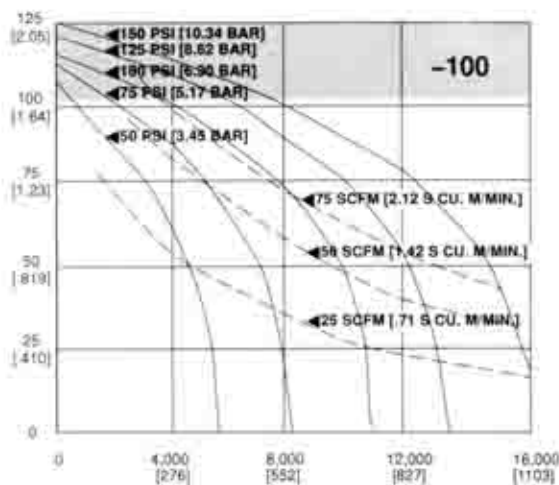
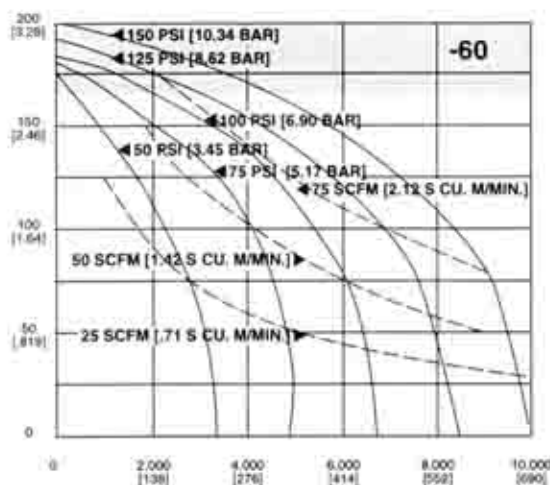


OUTLET PRESSURE PSI (BAR)

Performance Curves 1.5 HP (1.12 kw) PUMPS

Intermittent duty dark shaded area is because of fatigue life limitation of materials.
(Please consult factory for further advise).

LIQUID FLOW – CU. IN. / MIN. (LITRES / MIN.)



OUTLET PRESSURE PSI (BAR)

2 (1.5 kw) & 2.2 HP (1.6 kw) PUMP



Maximum Air Supply 150 psi (10 bar), Double Air Head –2 HP (1.5 kw)

MODEL	RATIO DASH NO.	ACTUAL AREA RATIO	MAXIMUM RATED OUTPUT PRESSURE				DISPLACEMENT/CYCLE		CONNECTION PORTS		
			CONTINUOUS		INTERMITTENT		CU. IN.	M.L.	AIR DRIVE	INLET	OUTLET
			PSI	BAR	PSI	BAR					
AW, DF, ASF, DSF, DSTV	-B22	23	3,200	221	3,200	221	4.05	66.4	1/2"	1"	1/2"
	-B32	34	4,800	331	4,800	331	2.70	44.3	1/2"	1"	1/2"
	-52	57	5,000	345	8,000	552	1.62	26.6	1/2"	1/2"	1/2"
	-72	80	11,000	758	11,000	758	1.16	19.0	1/2"	1/2"	1/2"
	-122	138	15,000	1,034	19,000	1,310	0.67	11.0	1/2"	1/2"	1/2"
HF, HSF, DSHF	-202	230	30,000	2,069	33,000	2,275	0.41	6.7	1/2"	1/2"	1/4" H.P.
	-302	346	30,000	2,069	50,000	3,448	0.27	4.5	1/2"	1/2"	1/4" H.P.
DXHF, DSXHF	-452	520	30,000	2,069	70,000	4,827	0.18	3.0	1/2"	1/2"	1/4" H.P.
	-602	690	30,000	2,069	75,000	5,171	0.14	2.3	1/2"	1/2"	1/4" H.P.

Maximum Air Supply 100 psi (7 bar), Triple Air Head –2 HP (1.5 kw)

DXHF, DSXHF	-683	780	30,000	2,069	70,000	4,827	0.18	3.0	1/2"	1/2"	1/4" H.P.
	-903	1,038	30,000	2,069	75,000	5,171	0.14	2.3	1/2"	1/2"	1/4" H.P.
DSXHW	-1373	1,575	30,000	2,069	100,000	6,895	.086	1.4	1/2"	1/2"	*

* The -1373 Model uses an extra deep 3/8" super pressure outlet port - gland nuts and sleeves are supplied for 1/4" & 5/16" super pressure tubing.

Maximum Air Supply 100 psi (7 bar), Single Air Head –2.2 HP (1.6 bar)

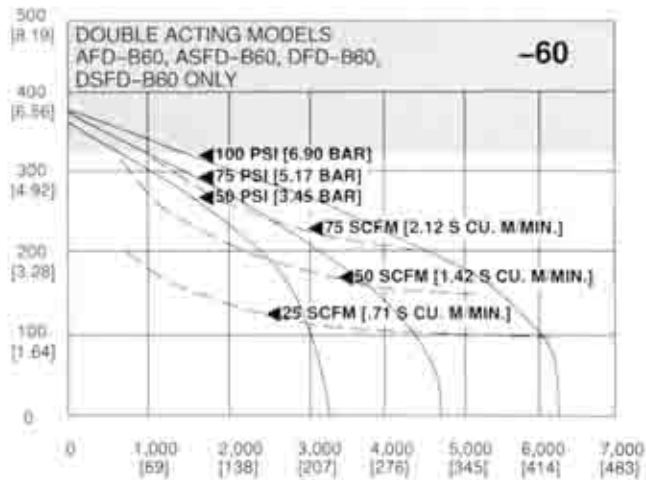
AFD, DFD, ASFD, DSFD	-B60	69	6,500	448	6,500	448	1.34	2.2	1/2"	1/2"	3/8"
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Wetted Materials of Construction and Service

SERIES	SERVICES (Refer to pg. 5)	PUMP SECTION	PLUNGERS	NON METALLICS
AW	1	Nickel Plated Steel & SS	440C SS	Urethane, Buna N, PTFE
AFD	1	Nickel Plated Steel & SS	416 SS	UHMWPE, Viton, PTFE, Ryton
DFD	1, 3, 5	Nickel Plated Steel & SS	416 SS	UHMWPE, Viton, PTFE, Ryton
ASFD	1, 2	All SS	15.5PH SS	UHMWPE, Viton, PTFE, Ryton
ASF	1, 2	All SS	440C SS	UHMWPE, Viton, PTFE, Ryton
DSFD	1, 2, 3, 5, 6	Separation - All SS	15.5PH SS	UHMWPE, Viton, PTFE, Ryton
DF	1, 3, 5	Separation - Nickel Plated Steel & SS	440C SS	UHMWPE, Viton, PTFE, Ryton
DSF	1, 2, 3, 5, 6	Separation - All SS	440C SS Hard chrome plated	UHMWPE, Viton, PTFE, Ryton
HF	1	Nickel Plated Steel & SS	Stellite*	UHMWPE, Buna N
HSF	1, 2	All SS	Stellite*	UHMWPE, Buna N
DSHF	1, 2, 5, 6	Separation - All SS	Stellite*	UHMWPE, Buna N
DXHF	1, 5	Separation - Nickel Plated Steel & SS	Stellite	UHMWPE, Buna N
DSXHF	1, 2, 5, 6	Separation - All SS	Stellite	UHMWPE, Buna N
DSXHW	1, 2	Separation - All SS	Stellite	Urethane, PTFE
DSTV-1.5	1, 2, 3, 4, 5, 6	Separation - All SS	17.4PH SS	PTFE, Viton
DSTV	1, 2, 3, 4, 5, 6	Separation - All SS	440C SS Hard chrome plated	PTFE, Viton

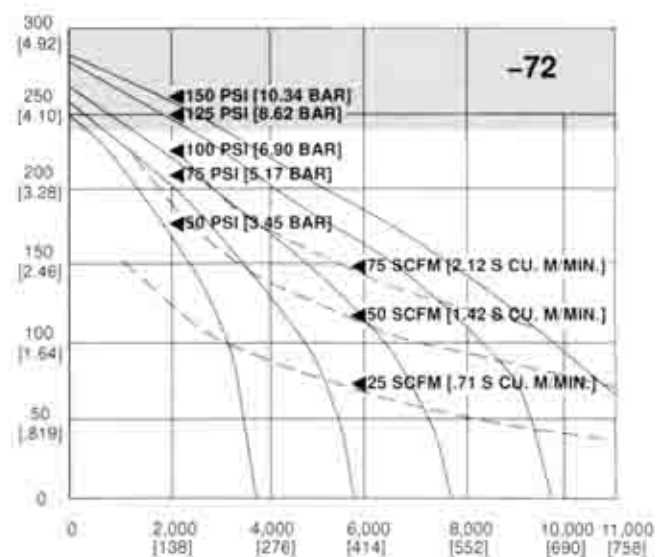
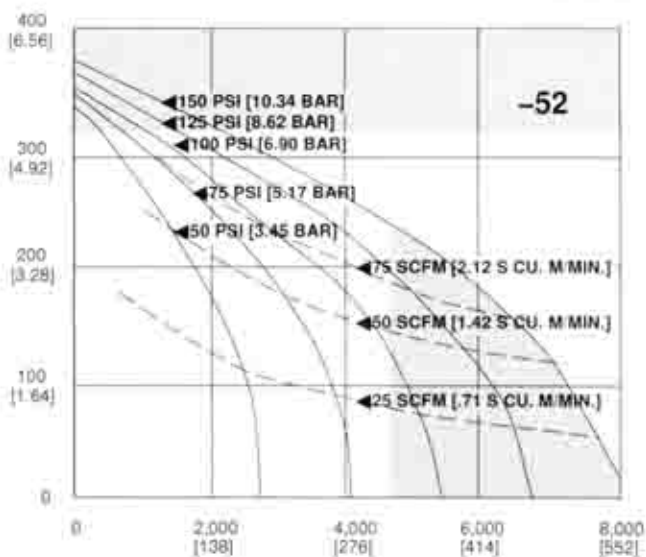
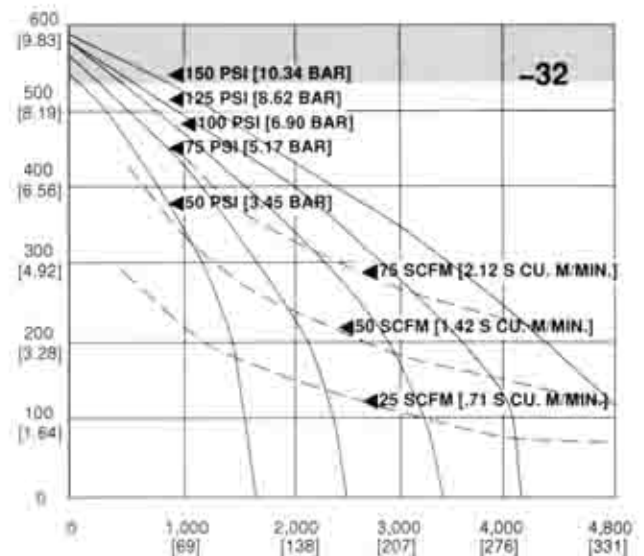
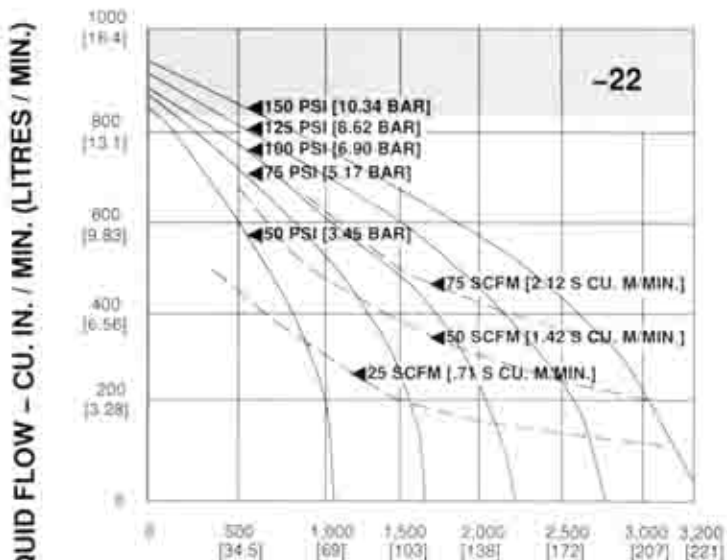
*Except -202 ratio is chrome plated 440 SS

Performance Curves 2 (1.5 kw) & 2.2 HP (1.6 kw) Pumps



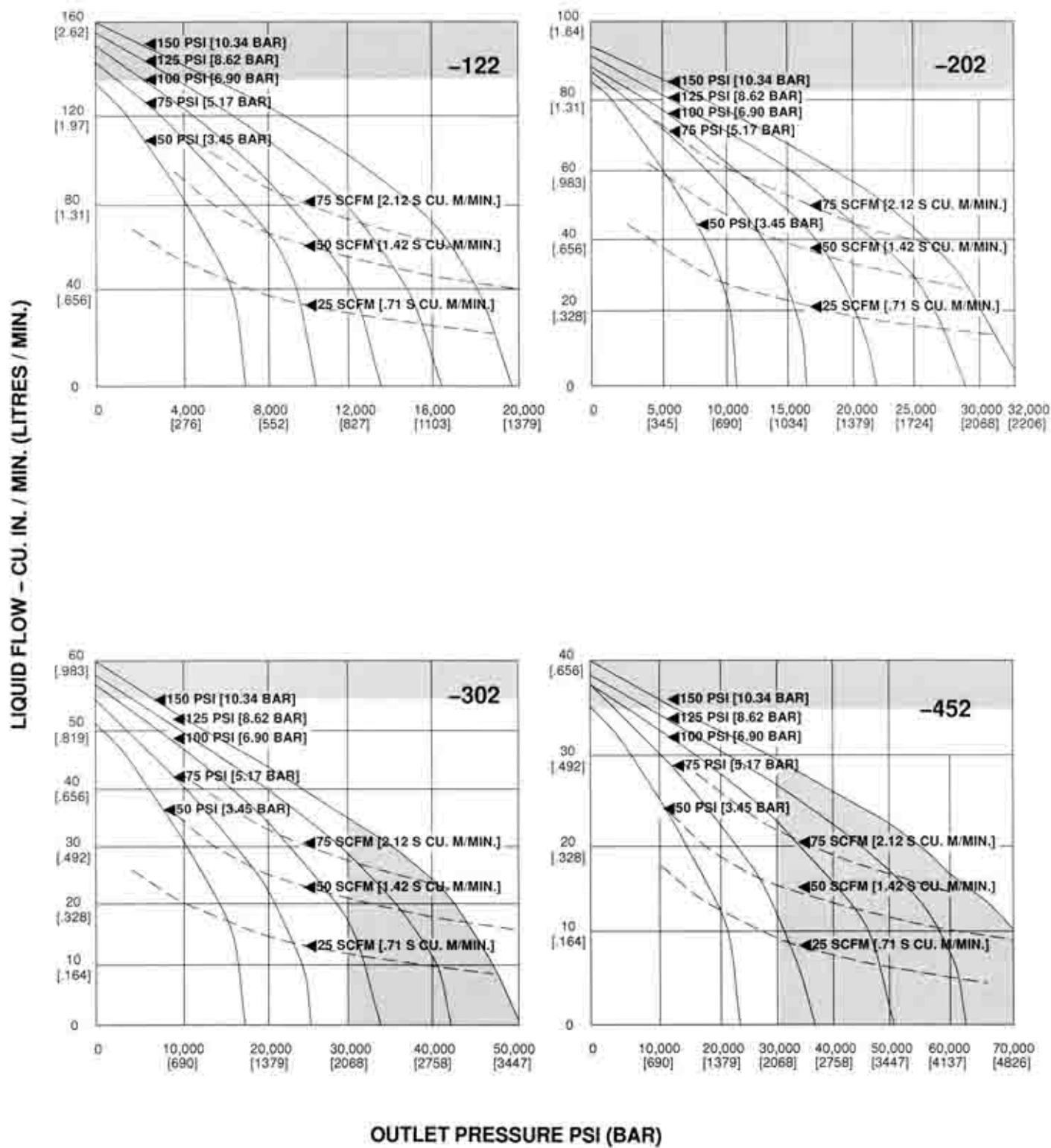
Reliability of the XH models (-452 thru -1373) will be improved with an air driven supercharge pump, not only to simplify priming but to reduce fatigue stresses. The higher the supercharge, the better the results. Also install a relief valve to protect the lower pressure pump from potential back pressure. Supercharging of the -1373 model is recommended for all applications.

Reliability of the XH models (-452 thru -1373) will be improved with an air driven supercharge pump, not only to simplify priming but to reduce fatigue stresses. The higher the supercharge, the better the results. Also install a relief valve to protect the lower pressure pump from potential back pressure. Supercharging of the -1373 model is recommended for all applications.



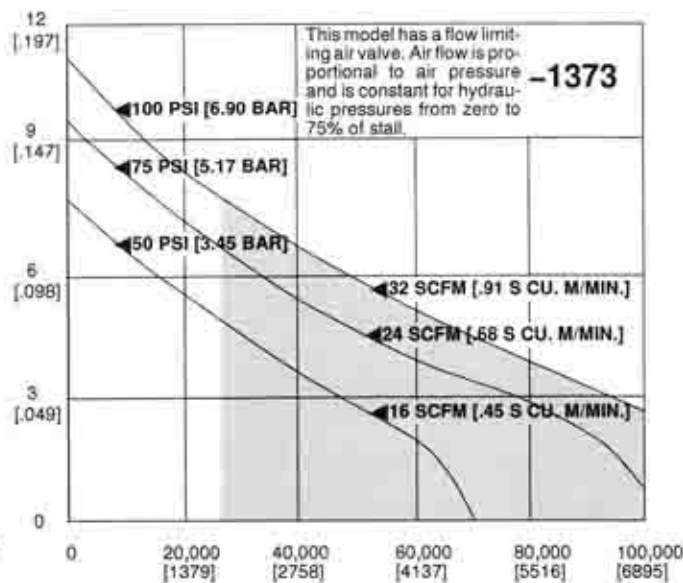
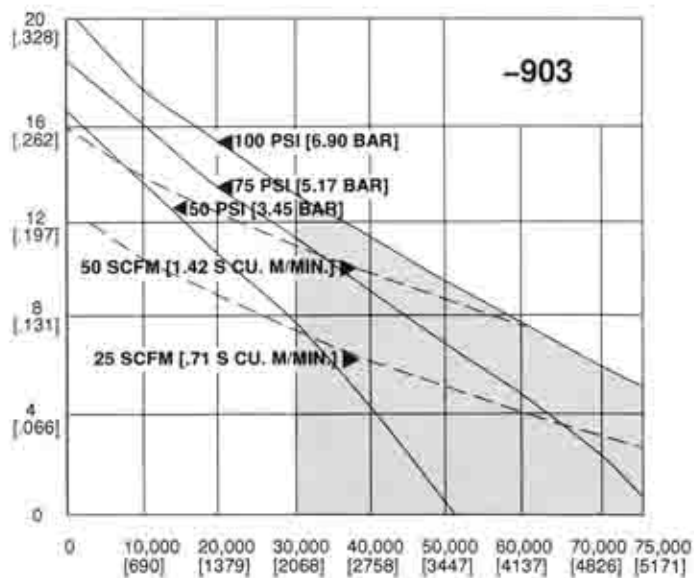
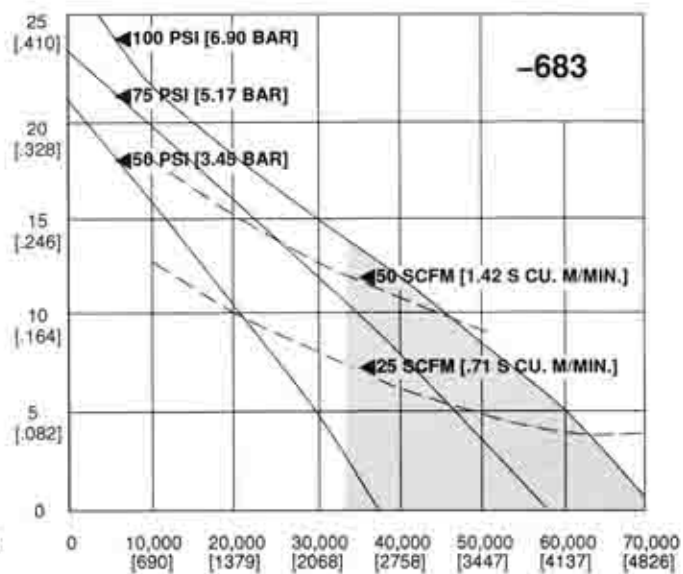
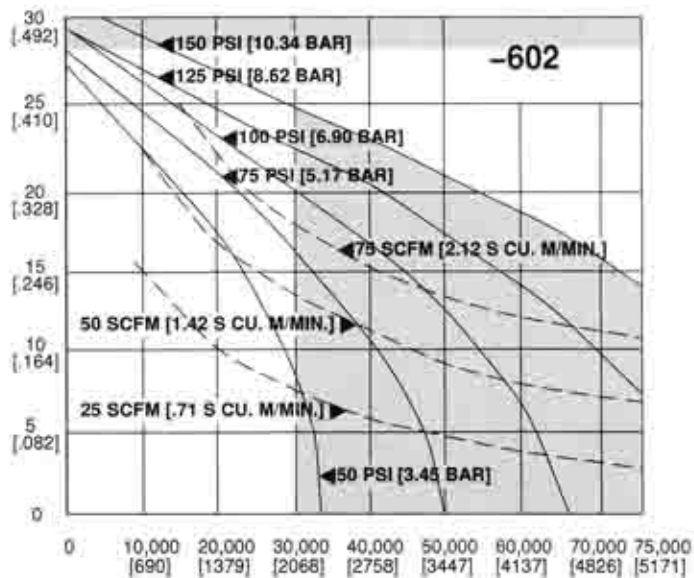
OUTLET PRESSURE PSI (BAR)

Performance Curves 2 (1.5 kw) & 2.2 HP (1.6 kw) Pumps



Performance Curves 2 (1.5 kw) & 2.2 HP (1.6 kw) Pumps

LIQUID FLOW - CU. IN. / MIN. (LITRES / MIN.)



OUTLET PRESSURE PSI (BAR)

3 HP (2.25 kw) PUMP MODELS



Maximum Air Supply 150 psi (bar), Single Air Head

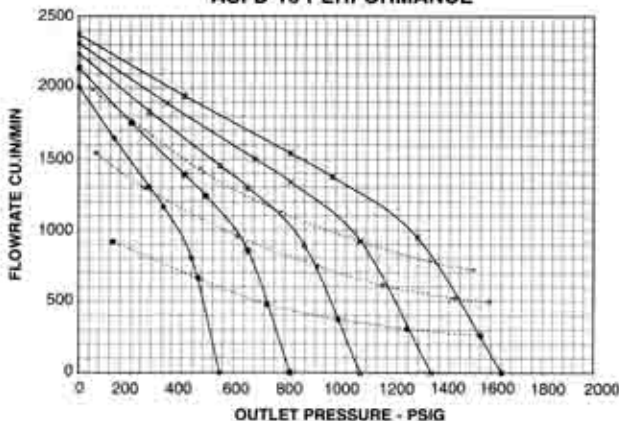
MODEL	RATIO DASH NO.	ACTUAL AREA RATIO	MAXIMUM RATED OUTPUT PRESSURE				DISPLACEMENT/CYCLE		CONNECTION PORTS		
			CONTINUOUS		INTERMITTENT						
			PSI	BAR	PSI	BAR	CU. IN.	M.L.	AIR DRIVE	INLET	OUTLET
ASFD	-10	11.5	1,600	110	1,600	110	8.10	132.8	1/2"	1"	1/2"
	-15	17	2,400	165	2,400	165	5.40	88.6	1/2"	1"	1/2"
	-25	29	4,000	276	4,000	276	3.24	53.2	1/2"	1/2"	1/2"
	-35	40	5,700	393	5,700	393	2.32	38.0	1/2"	1/2"	1/2"
	-60	69	9,800	676	9,800	676	1.34	22.0	1/2"	1/2"	1/2"
	-100	115	15,000	1,034	16,500	1,138	0.82	13.4	1/2"	1/2"	3/8" M.P.
	-150	173	15,000	1,034	20,000	1,379	0.54	9.0	1/2"	1/2"	3/8" M.P.
	-202	230	30,000	2,069	33,000	2,275	0.82	13.4	1/2"	1/2"	3/8" M.P.

Maximum Air Supply 150 psi (bar), Single Air Head

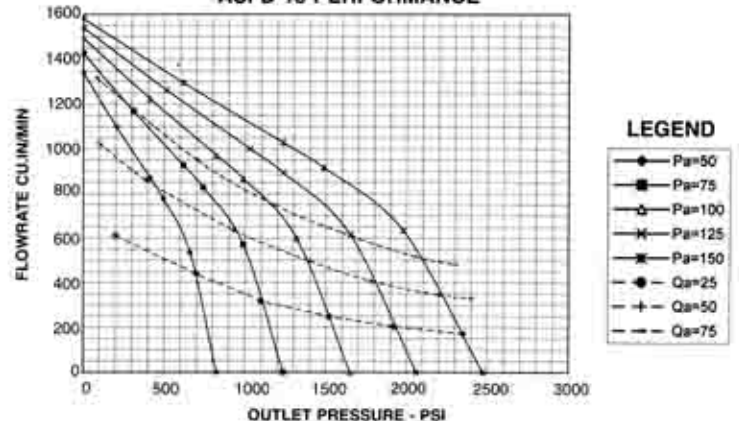
SERIES	SERVICES (Refer to pg.5)	PUMP SECTION	PLUNGERS	NON-METALLICS
ASFD	1, 2	ALL SS	15-5PH, Hard Chrome Plated	UHMWPE, Viton, PTFE, Rytan

PERFORMANCE CURVES

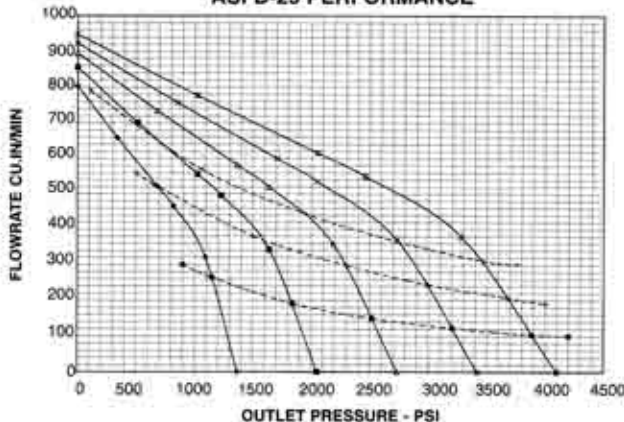
ASFD-10 PERFORMANCE



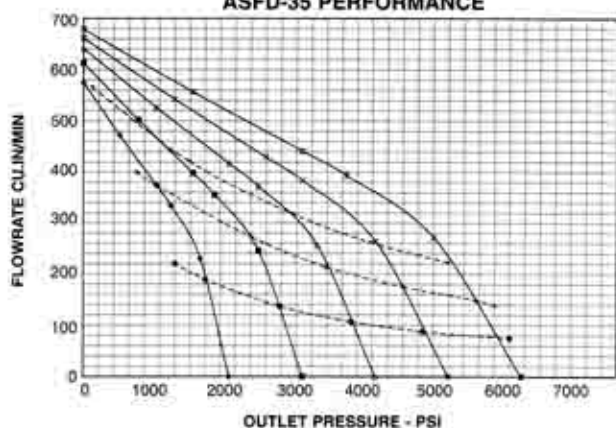
ASFD-15 PERFORMANCE



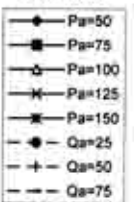
ASFD-25 PERFORMANCE



ASFD-35 PERFORMANCE

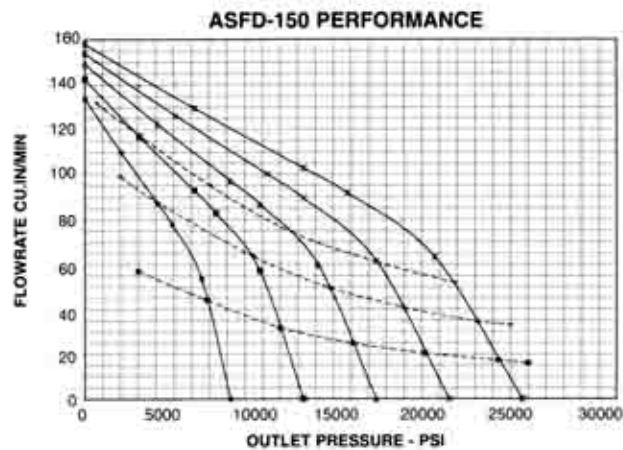
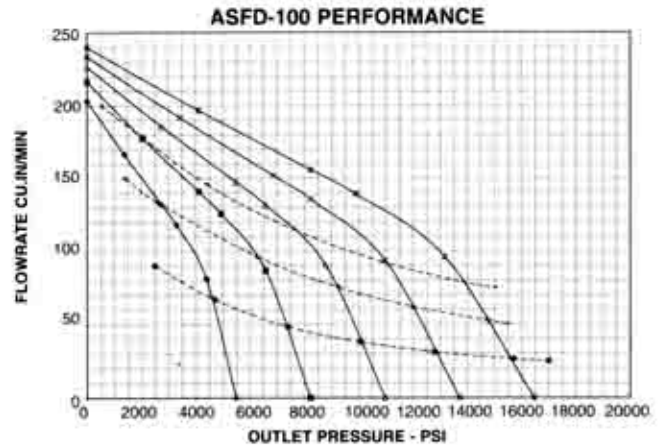
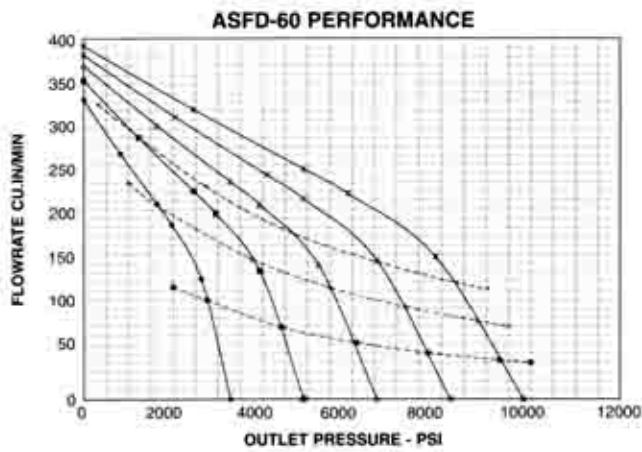


LEGEND

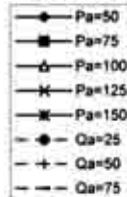


3 HP (2.25 kw) PUMP MODELS

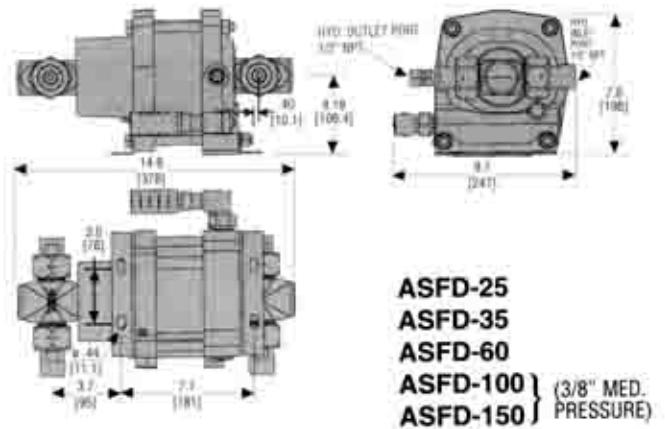
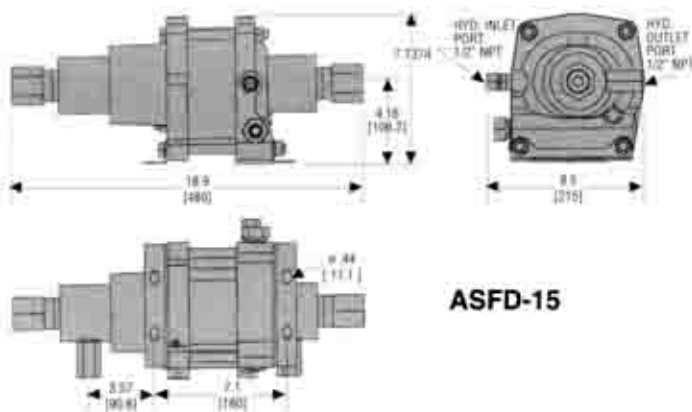
PERFORMANCE CURVES



LEGEND



DIMENSIONAL DATA



1.5 (1.12 kw), 2 (1.5 kw), 2.2 (1.6 kw), & 3 (2.25 kw) PUMPS

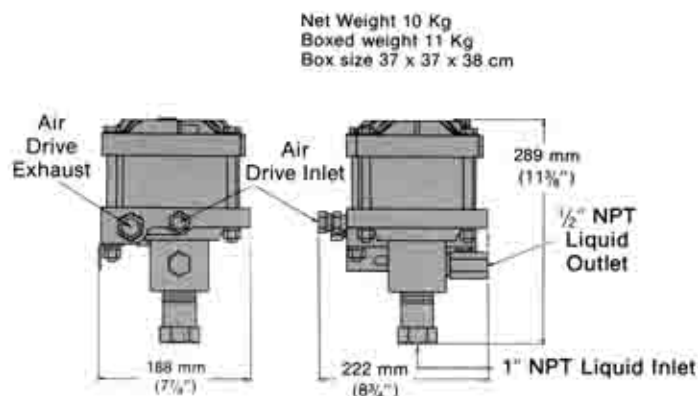
Accessories	
DESCRIPTION	PORTS
-C Air Controls (Filter, regulator, gage, shut-off)	1/2 NPT
-CP Air Controls with precision regulator	1/2 NPT
-CO Air Controls with recycle button	1/2 NPT
-CPO Air Controls with precision regulator and recycle button	1/2 NPT

Optional Modifications	
BOTTOM INLET (designate "B" before ratio dash number, "BR" on -B10, -B15, -B22 and -B32) 1-1/2 and 2HP pumps (not applicable to high output, chemical, 2.2 HP, or AWD series pumps).	
16821	Low air pressure control feature – for operating at air pressures as low as 3 to 4 psi (0.2 –0.3 bar)
16831	Low temperature modification for special sealing in air drive for operating temperatures from as low as -20°F up to normal+ 120°F
16834	Exhaust adapter with back pressure balance piston
17860	Electrical stroke counter provision (Includes BZE6-2RQ micro switch)
25721	Mechanical stroke counter – Installed (6 digit)
27964	Interconnecting inlet – Outlet tubing – 1/2" female for 4:1 ratio series pumps (ATV-4 or DTV-4)
28000	Threaded vent (or purge) ports on standard distance piece except 1.5:1 ratio
28003	Test port – Provides access port in pumps body between inlet and outlet check valves for 1.5 and 2 HP pumps, -10 ratio or higher, single acting
28881	Air pilot modification – 1/8 NPT Allows remote start/stop of pump
29376	Three way cycling spool – for 1.5 and 2 HP single acting pumps
29702	Single stroke modification
29806	Double distance piece – for 1.5 and 2 HP pumps only, except 1.5:1 ratio
51050	Extreme service cycling modification (Not recommended for long stall periods)
51331	EPR (Ethylene Propylene) Static seals in wetted section. Applies to distance piece pumps only.
51345	Sour gas drive provision to N.A.C.E. specifications 1.5 thru 2.2 HP distance piece pumps only Single air head Double air head
53925	Severe arctic low temperature service. -25, -35, -60, -100, -150, -151, -225, -300, -450 ratios
55305	Tube ports (5/8 SAE) inlet and outlet – for 1.5 thru 2 HP pumps 15 pump minimum.
55630	Stainless steel (AISI-316) distance piece – for 1.5 thru 2 HP pumps
51056	Exhaust / pilot vent combiner.
52788	Viton seals – air drive only – 1.5 thru 2.2 HP
54885	Rotate pump body 90° from standard
55516	Polyurethane ("W" seal) in "F" or "TV" series pumps – except high output models
59353	Noise reduction kit. (Fitted). Not available on AFD, DFD, ASFD & DSFD.

NOTE: Not all modifications can be combined or used together. Consult factory when requiring more than one modification.

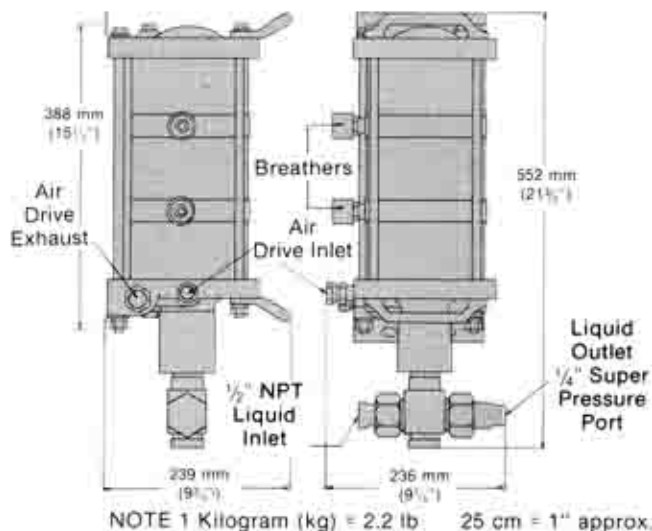
1.5 (1.12 kw), 2 (1.5 kw), 2.2 (1.6 kw), & 3 (2.25 kw) PUMPS

DIMENSIONAL DATA

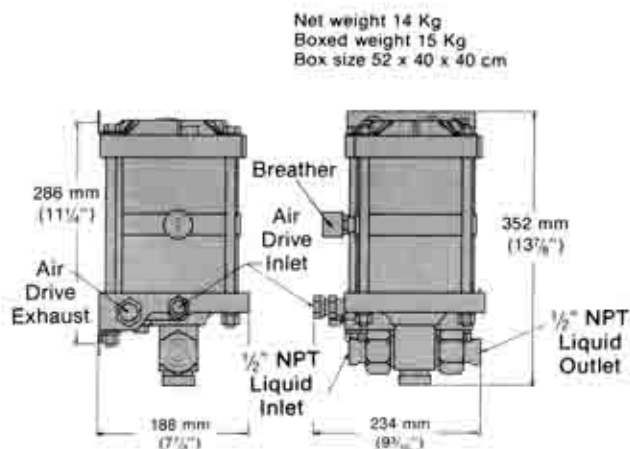


1.5 & 2 HP LOW RATIO PUMPS -B10 and -B15 RATIOS

Net weight 18 Kg
Boxed weight 20 Kg
Box size 68 x 42 x 50 cm

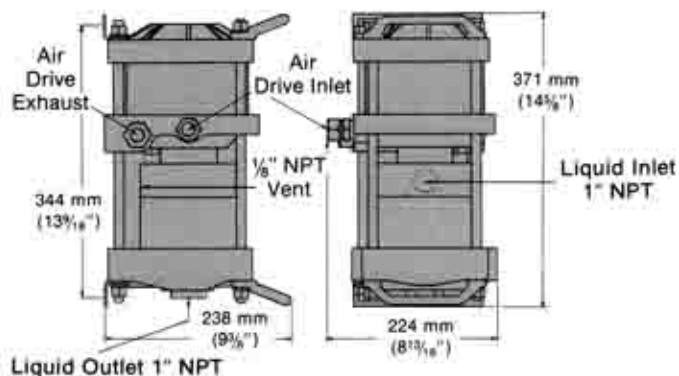


1.5 & 2 HP HIGH RATIO PUMPS -683 AND -903 RATIOS



1.5 & 2 HP MEDIUM RATIO PUMPS -52, -72, -122, -202 AND -302 RATIOS

Net weight 18 Kg
Boxed weight 19 Kg
Box size 45 x 37 x 44 cm

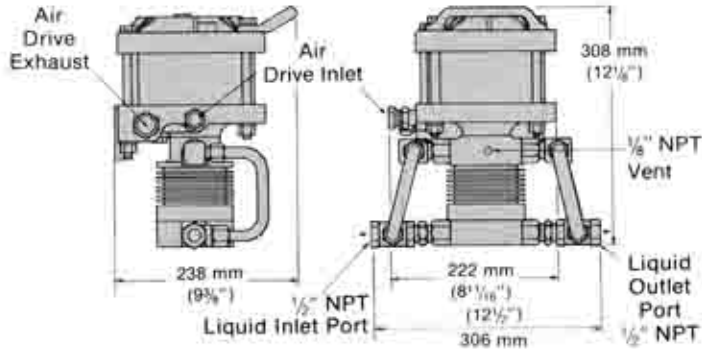


DSTV-1.5 PUMP Single Acting - High Output

1.5 (1.12 kw), 2 (1.5 kw), 2.2 (1.6 kw), & 3 (2.25 kw) PUMPS

DIMENSIONAL DATA

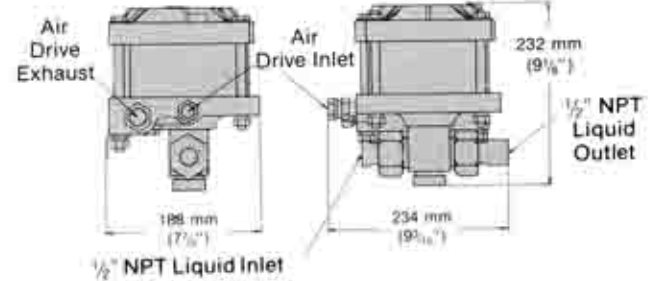
Net Weight 10 Kg
Boxed weight 11 Kg
Box size 45 x 37 x 44 cm



ATV-4 PUMPS

Double Acting – High Output

Net Weight 9.5 Kg
Boxed weight 10 Kg
Box size 25 x 26 x 22 cm

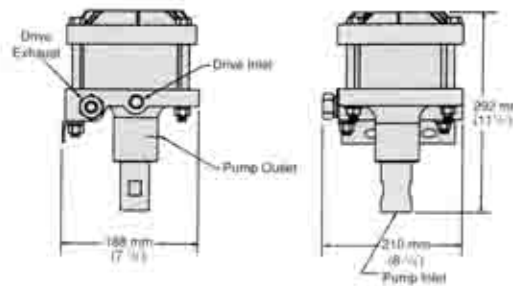


1.5 & 2 HP Medium & High Ratios

-25 thru -150, -151, -225, -300 and -450 Ratios

NOTE: For Model DTV-4 – Add distance piece dimension from page 28.

Interconnecting inlet and outlet port tubing shown. This is 27964 modification. See page 25.



AFD or ASFD - B60 PUMP

Double Acting – High Output

RATIO SERIES	PUMP INLET	OPTIONAL PUMP INLET	PUMP OUTLET	AIR HEAD(S)	DIMENSIONS		TARE WEIGHT APPROX.
					A	B	
-B10, -B15	Bottom 1" NPT	●	1/2" NPT	Single	12-3/8"	N/A	24 lbs.
-B22, -B32	Bottom 1" NPT	●	1/2" NPT	Double	16-5/8"	11-1/4"	27 lbs.
-25, -35, -60, -100, -150	Side 1/2" NPT	● ●	1/2" NPT	Single	9-1/8"	N/A	25 lbs.
-52, -72, -122	Side 1/2" NPT	● ●	1/2" NPT	Double	13-7/8"	11-1/4"	30 lbs.
-151, -225, -300, -450	Side 1/2" NPT	● ●	1/4" Superpressure	Single	9-1/8"	N/A	24 lbs.
-202, -302, -452, -602	Side 1/2" NPT	● ●	1/4" Superpressure	Double	13-7/8"	11-1/4"	29 lbs.
-683, 903	Side 1/2" NPT	● ●	1/4" Superpressure	Triple	21-3/4"	15-1/4"	34 lbs.
-1373	Side 1/2" NPT	N/A	1/4" Superpressure	Triple	21-3/4"	15-1/4"	34 lbs.
DSTV-1.5	Side 1" NPT	N/A	3/4" NPT	Single	14-5/8"	13-9/16"	30 lbs.
ATV-4	Side 1/2" NPT (2 ea.)	N/A	1/2" NPT (2 ea.)	Single	12-1/8"	N/A	25 lbs.
-D-B60	Bottom 1/2" NPT	N/A	3/8" NPT	Single	11-1/2"	N/A	20 lbs.

NOTE: Air drive connection all models 1/2" NPT female.

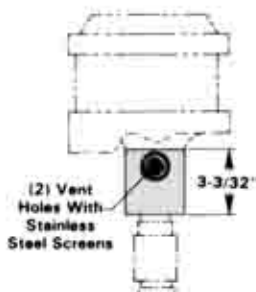
1.5 (1.12 kw), 2 (1.5 kw), 2.2 (1.6 kw), & 3 (2.25 kw) PUMPS

DIMENSIONAL DATA

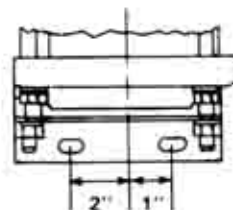
DISTANCE PIECE (SEPARATION)

Pumps with prefix "D" in the model number have aluminum distance piece between the air drive and pump section (except DSTV-1.5). Vent holes can be threaded 1/2" NPT female at extra cost. Specify modification number 28000.

Horizontal mounting is recommended for non-exchange of contaminants.



MOUNTING BRACKETS

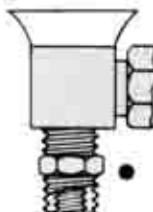


All series mounting brackets have 7/16" holes (slots) for 3/8" bolts. Upper mounting bracket not furnished as standard on single air head non-distance piece units.

OPTIONAL PUMP INLETS FOR TANK MOUNTING

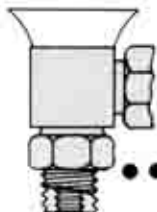
Ratio series
-B10, -B15,
-B22, -B32

Inlet externally threaded 1-1/4" NPT male.
Internally threaded 1" NPT female
To specify add "R" between "B" and the ratio number e.g. AW-BR10



Ratio series
-25 thru -903

Inlet on the bottom and externally threaded 1" NPT male
Internally threaded 1/2" NPT female
To specify add "B" before the ratio number e.g. AW-B150 e.g. DXHW-B683



Drive inlet and exhaust are 1/2 NPT female. Drive inlet also includes a 1/2 NPT male x 1/2 NPSM female (straight pipe thread) swivel adapter (connecting male nipple should include 30° inside bevel for proper fit)

PRESSURE TEST PAC 200

These Test Pacs are self contained, ready to operate units, which only require connection to your compressor air supply and to the test component.

Each standard Test Pac incorporates the following items: Air pressure regulator, air filter, air pressure gauge and on/off speed control valve; Haskel air driven liquid pump; liquid tank; outlet pressure gauge; return to tank valve and discharge outlet connection.

They are suited for operation in petrochemical, offshore and industrial areas where an immediate pressure test is needed.

OPTIONAL EXTRAS

Relief Valves

PERFORMANCE

See pages:

19, 20, 22, 23, 24 for details

DATA

1.5, 2.0 and 2.2 HP (1.12, 1.5, 1.6 kw) Output- A, H and XH type

Pressure range: 150-100,000 psi (10-7000 bar) with 34 basic models.

Flow range: 0-20 gpm (0 -76 litre/min.) nominal

Construction options for oils, water, chemicals, temperature extremes and double pump compound configurations.

Width 13.8" (350mm) x Depth 13.8" (350mm) x Height 19.7" (500mm)

Weight: 60 lbs (27 kg)

Tank size: 2.6 gal (10 litre)



6 HP (4.5 kw) PUMP SERIES

Incorporating 20 models, this heavy duty range of double acting pumps provide pressures up to 10,000 psi (700 bar) and flow rates up to 23 gpm (87 l/min.).

Designed to operate with air drive pressures between 40 and 130 psi (2.8 and 9 bar). For drive pressures 3-40 psi, order 51875-1 mod.

Mufflers standard on all pumps.



Maximum Air Supply 125 psi (8.5 bar), Single Air Head – 6 HP (4.5 kw)											
MODEL	RATIO DASH NO.	ACTUAL AREA RATIO	MAXIMUM RATED OUTPUT PRESSURE				DISPLACEMENT/CYCLE		CONNECTION PORTS		
			CONTINUOUS		INTERMITTENT		CU. IN.	M.L.	AIR DRIVE	INLET	OUTLET
			PSI	BAR	PSI	BAR					
GWD, GSFD, DGFD, DGSFD, DGSTVD	-12	14.8	8,000	552	10,000	690	15.9	260.0	3/4"	1-1/4"	3/4"
*GW, DGF, GSF, DGSF, DGSTV	-35	40.3	4,375	302	4,375	302	6.0	98.0	3/4"	1-1/4"	1/2"
	-60	69	7,500	517	7,500	517	3.5	57.0	3/4"	1-1/4"	1/2"
	-100	115	8,000	552	10,000	690	2.1	34.0	3/4"	1-1/4"	1/2"

* These pumps are not recommended for pressurized liquid inlet conditions.

Wetted Materials of Construction and Service				
SERIES	SERVICES (Refer to pg.5)	PUMP SECTION	PLUNGERS	NON-METALLICS
GW	1	Nickel Plated Steel, SS & Bronze	Hard chrome plated 15.5PH SS	Urethane, Buna N, PTFE
GSF	1, 2	All SS & Bronze	Hard chrome plated 15.5PH SS	UHMWPE, Viton, PTFE, Ryton
DGF	1, 3, 5	Separation- Nickel Plated Steel & SS	Hard chrome plated 15.5PH SS	UHMWPE, Viton, PTFE, Ryton
DGSF	1, 2, 3, 5, 6	Separation- All SS & Bronze	Hard chrome plated 15.5PH SS	UHMWPE, Viton, PTFE, Ryton
DGSTV	1, 2, 3, 4, 5	Separation- All SS & Bronze	Hard chrome plated 15.5PH SS	Viton, PTFE, Ryton
GWD	1	Nickel Plated Steel & SS	15.5PH SS	Urethane, Buna N, PTFE
GSFD	1, 2	All SS & Bronze	15.5PH SS	UHMWPE, Buna N, PTFE, Ryton
DGFD	1, 3, 5	Separation- Nickel Plated Steel & SS	15.5PH SS	UHMWPE, Viton, PTFE, Ryton
DGSFD	1, 2, 3, 4, 5, 6	Separation- All SS & Bronze	15.5PH SS	UHMWPE, Viton, PTFE, Ryton
DGSTVD	1, 2, 3, 4, 5	Separation- All SS & Bronze	17.4PH SS	PTFE, Viton

Accessories	
NUMBER	DESCRIPTION
-C	Air Drive Controls

Optional Modifications		
NUMBER	DESCRIPTION	
54312	Extreme cycling service	Not recommended for long stall periods
29125	External air pilot port 1/8 NPT	Allows remote start/stop of pump
51875-1	Low drive air pressure 3-40 psi	Allows user to regulate drive air to as low as 3 psi (0.2 kw)
25721	Cycle counter - Mechanical	Actuated with each cycle of pump
17860	Cycle counter - Electric	Includes mechanical actuated micro switch
29077	Interconnecting S.S. inlet & outlet port tubing-Model GWD plus GSFD-12	
29078	Interconnecting S.S. inlet & outlet port tubing-Model DGFD, DGSFD plus DGSTVD-12	
54030	Sour gas drive	Includes exhaust combiner and viton seals in drive section

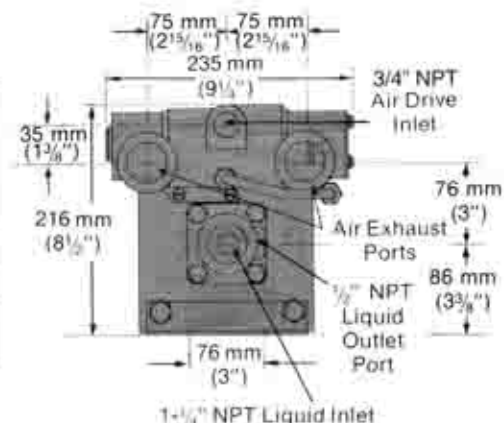
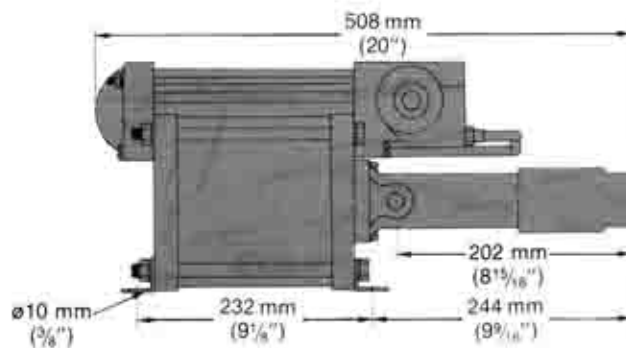
NOTE: Not all modifications can be combined or used together. Consult factory when requiring more than one modification.

6 HP (4.5 kw) PUMP MODELS

DIMENSIONAL DATA

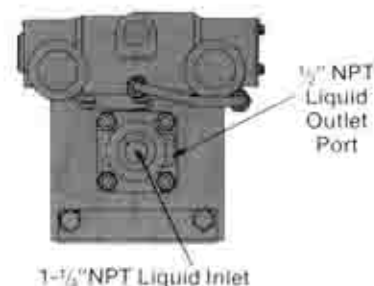
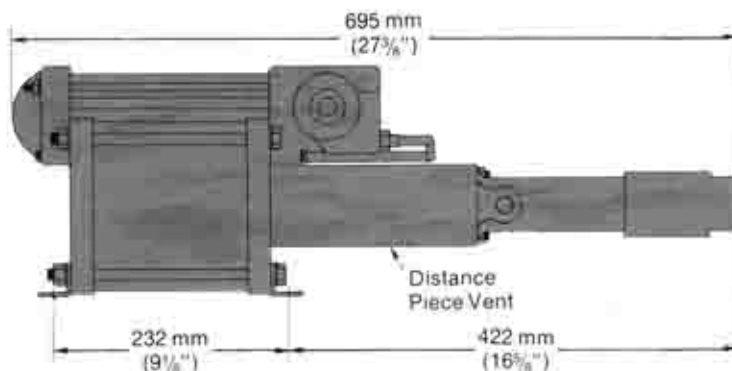
Net weight 14 kg
Boxed weight 18 kg
Box size 52 x 39 x 39 cm

All models have 2 off
1 1/4" NPT Air Exhaust
Ports and 1 off 3/4" NPT
Air Drive Inlet Ports



MODELS GW, GSF NOMINAL RATIO 35, 60 100:1 (approx. wt. 31 lbs. [14 kg])

Net weight 18.5 kg
Boxed weight 22 kg
Box size 66 x 41 x 49 cm

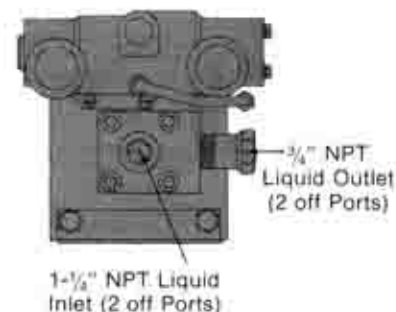
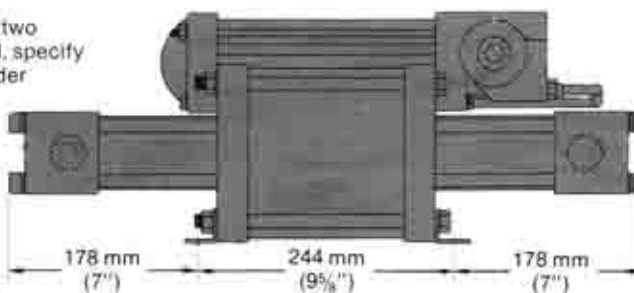
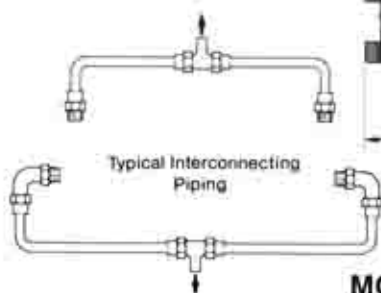


End dimensions as GW/GSF

MODELS DGF, DGSF, DGSTV NOMINAL RATIO 35, 60 100:1 (approx. wt. 41 lbs. [18.5 kg])

Net weight 26 kg
Boxed weight 27 kg
Box size 66 x 41 x 49 cm

If interconnecting piping for the two
inlets and two outlets is required, specify
modification 29077 with your order



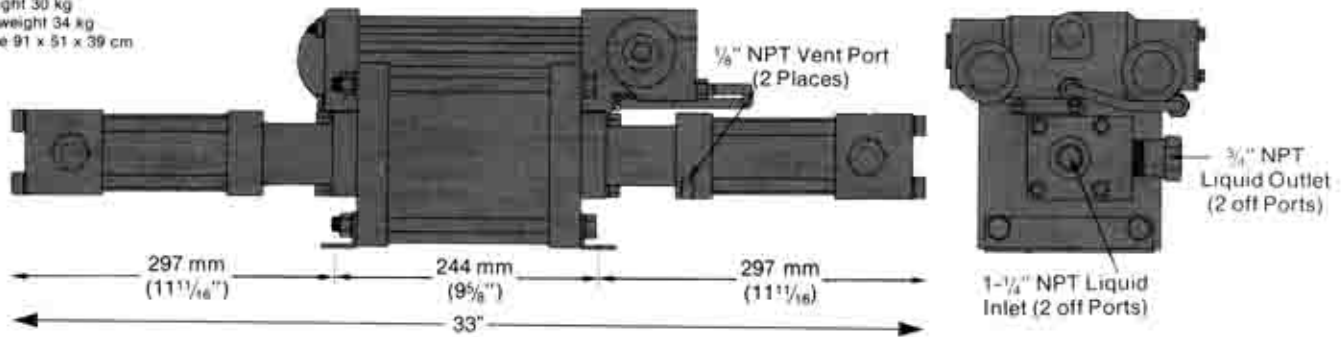
End dimensions as GW/GSF

MODELS GWD, GSFD NOMINAL RATIO 12:1 PUMPS (approx. wt. 57 lbs. [26 kg])

6 HP (4.5 kw) PUMP MODELS

DIMENSIONAL DATA

Net weight 30 kg
Boxed weight 34 kg
Box size 91 x 51 x 39 cm



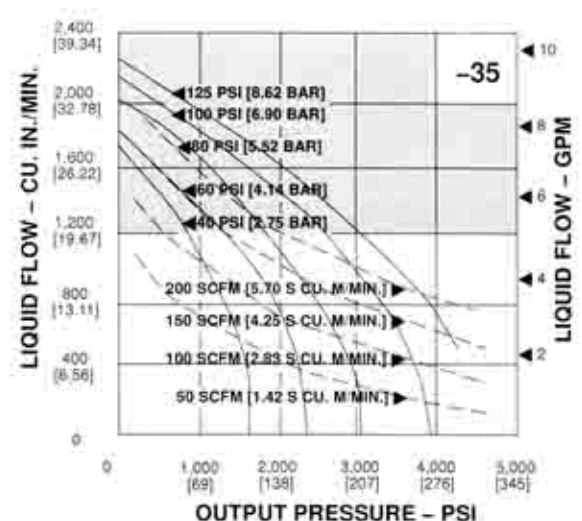
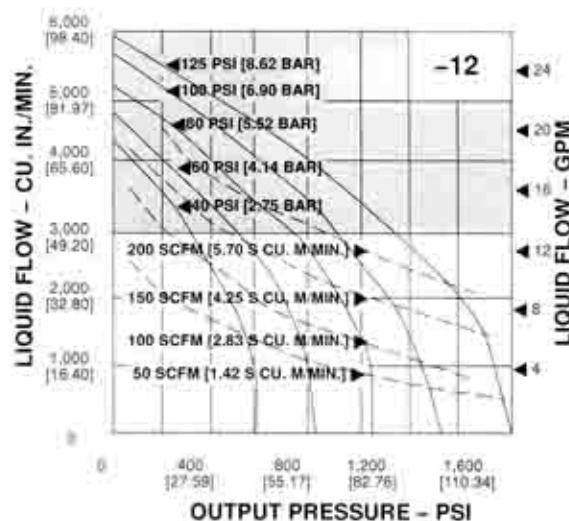
If interconnecting piping for the two inlets and two outlets is required, specify modification 29078 with your order

End dimensions as GW/GSF

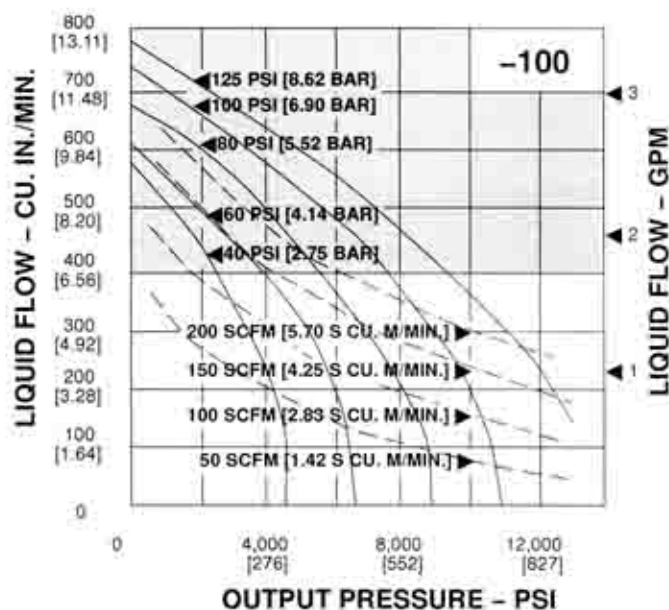
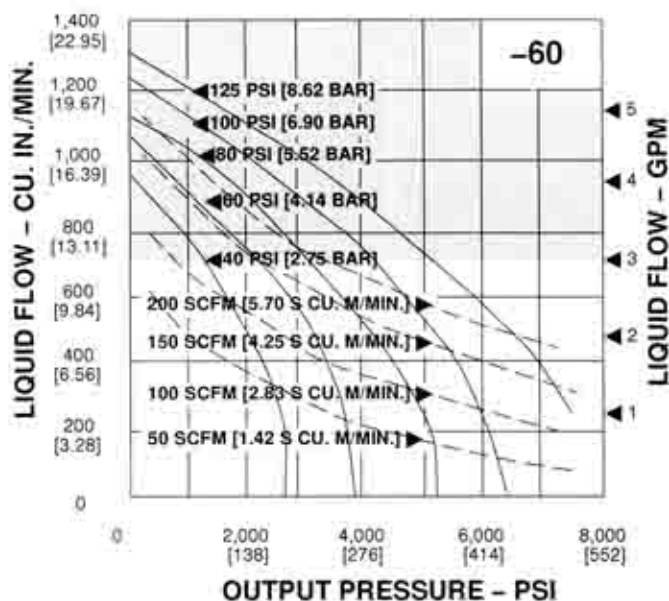
MODELS DGFD, DGSFD, DGSTVD
NOMINAL RATIO 12:1
CIRCULATING PUMPS
(approx. wt. 66 lbs. [30 kg])

Performance Curves 6 HP (4.5 kw) Pumps

Shaded area of chart indicates cycle rate of over 200 cpm intermittent operation only is suggested in this area (up to maximum of 300 cpm) to avoid possible objectionable noise, vibration levels, and excessive wear. Recommended cpm is 60/80. For additional help in setting up pumping system to minimize pump operation in this runaway (shaded) area, consult Haskel distributor or factory.



Performance Curves 6 HP (4.5 kw) Pumps



PRESSURE TEST PAC 600

These Test Pacs are self contained, ready to operate units, which only require connection to your compressor air supply and to the test component.

Each standard Test Pac incorporates the following items: Air pressure regulator, air filter, air pressure gauge and on/off speed control valve; Haskel air driven liquid pump; liquid tank; outlet pressure gauge; return to tank valve and discharge outlet connection.

They are suited for operation in petrochemical, offshore and industrial areas where an immediate pressure test is needed.

OPTIONAL EXTRAS

Relief Valves

PERFORMANCE

See pages 31 and 32

DATA

6 HP (4.5 kw) Output-G type

Pressure range: 1,000-10,000 psi (7.0-70 bar) with 4 basic models.

Flow range: 0-15 gpm (0-57 litre/min.), nominal, double acting.

Construction options for oils, water and some chemical applications.

Width 33.5" (850mm) x Depth 16.2" (410mm) x Height 21.7" (550mm)

Weight: 170 lbs (80 kg)

Tank size: 8 gal (30 litre)

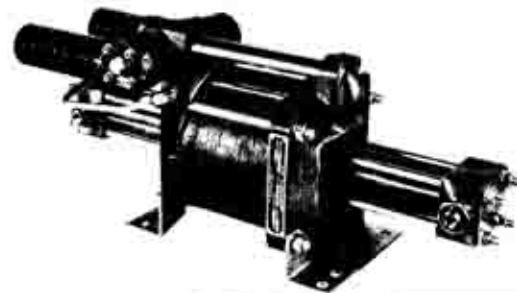


8 HP (6.0 kw) SERIES PUMP MODEL

Incorporating 9 models, this heavy duty range of double acting pumps, provide pressures up to 22,500 psi (1530 bar) and output flow rates up to 12 gpm (45 l/min.).

Operating from a maximum air drive pressure of 130 psi (9 bar) to minimum of 40 psi, this series is considered to be the premium selection for all types of hydraulic systems. Their advantages in displacement per stroke, double acting output and efficient use of drive air or gas, give them a decided advantage over smaller pumps in the same pressure range.

Mufflers standard on all pumps. For drive pressures 3-40 psi, order 51875-1 mod.



Maximum Air Supply 130 psi (9 bar), Single Air Head – 8 HP (6.0 kw)

MODEL	RATIO DASH NO.	ACTUAL AREA RATIO	MAXIMUM RATED OUTPUT PRESSURE CONTINUOUS OR INTERMITTENT		DISPLACEMENT/CYCLE		CONNECTION PORTS		
			PSI	BAR	CU. IN.	M.L.	AIR DRIVE	INLET	OUTLET
8SFD, 8DSFD, 8DSTVD	-25	27.5:1	10,000*	680	14.0	229.0	3/4"	1-1/4"	3/4"
8SFD	-40	43.5:1	6,000	408	8.90	145.3	3/4"	1"	1/2"
8SFD	-65	73:1	10,000	680	5.40	88.2	3/4"	1"	1/2"
8DSFD	-100	112:1	10,000*	680	3.52	57.5	3/4"	1-1/4"	3/4"
8HSFD	-225	253:1	22,500*	1,530	1.56	25.5	3/4"	3/8" M.P.	3/8" M.P.

*Please see note 3 on page 34

Wetted Materials of Construction and Service

SERIES	SERVICES (Refer to pg. 5)	PUMP SECTION	PLUNGERS	NON-METALLICS
8FD	1	Nickel Plated Steel, SS & Bronze	Hard chrome plated 15.5PH SS	UHMWPE, Viton, PTFE, Ryton
8SFD	1,2	Al SS & Bronze*	Hard chrome plated 15.5PH SS	UHMWPE, Viton, PTFE, Ryton
8DFD	1,3,5	Nickel Plated Steel & SS	15.5PH SS	UHMWPE, Viton, PTFE, Ryton
8DSFD	1,2,3,5,6	Separation-Al SS & Bronze	15.5PH SS	UHMWPE, Viton, PTFE, Ryton
8DTVD	1,2,3,4,5,6	Separation-Al SS & Bronze	15.5PH SS	PTFE, Viton
8HSFD	1,2	Al SS & Bronze*	17.4PH SS	UHMWPE, Viton, PTFE, Ryton

Accessories

NUMBER	DESCRIPTION
-C	Air Drive Controls

Optional Modifications

NUMBER	DESCRIPTION
29125	Start/Stop external pilot
51875-1	Low drive pressure 3-40 psi
25721	Cycle counter - Mechanical
17860	Cycle counter - Electric
54312	Extreme cycling service
54936	Exhaust combiner
54030	Sour gas drive

Interconnecting Pipework available as follows:

NUMBER	MODEL	INLET (TEE PORT CONNECTION)	OUTPUT (TEE PORT CONNECTION)
29077	8FD-25; 8SFD-25	37° Flare 3/4" O.D. tube 4,000 psi (272 bar)	37° Flare 5/8" O.D. tube 5,000 psi (340 bar)
29077-1		1-1/4" NPT female 300 psi (20 bar)	
29078	8DFD-25; 8DSFD-25; 8DSTVD-25	37° Flare 3/4" O.D. tube 4,000 psi (272 bar)	
29078-1		1-1/4" NPT female 300 psi (20 bar)	
55330	8HSFD-100	1-1/4" NPT female 300 psi (20 bar)	1/4 NPT female 10,000 psi (680 bar)
55330-1		37° Flare 3/4" O.D. tube 4,000 psi (272 bar)	1/4 NPT female 10,000 psi (680 bar)
55366	8HSFD-225	3/8" O.D. tube equivalent to Butech 20*6 Or AE SF375 CX series	22,500 psi (1530 bar)

Performance Curves 8 HP (6.0 kw) Pumps

The curves provide the data needed to quickly estimate the output suitability of individual models for a particular application. Also to be considered:

1. "Design - Under - The - Line"

Operation in the shaded area towards the top of each curve will require a cycle rate of over 115 cpm and potential premature maintenance if continuous, and with possibly objectionable noise and vibration. If continuous duty is required in this cycle range, probably a two pump system should be considered.

2. Ice Up of the Drive

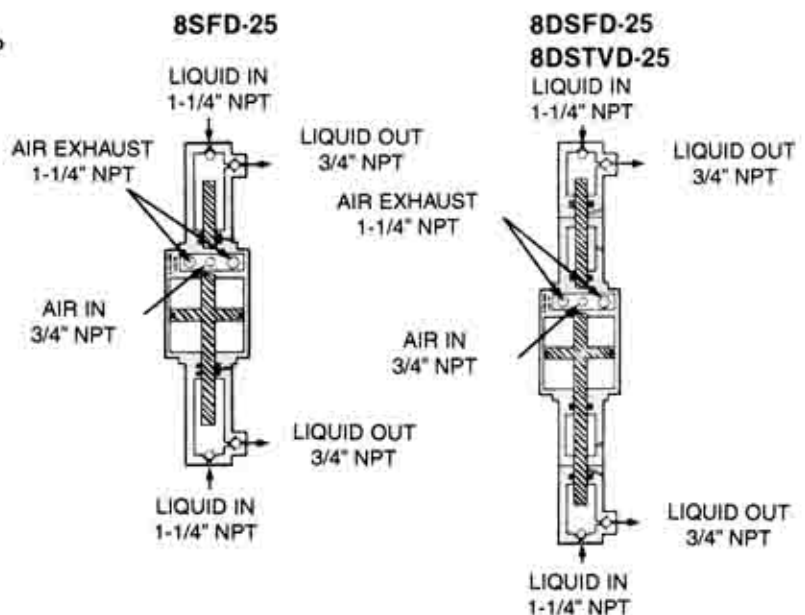
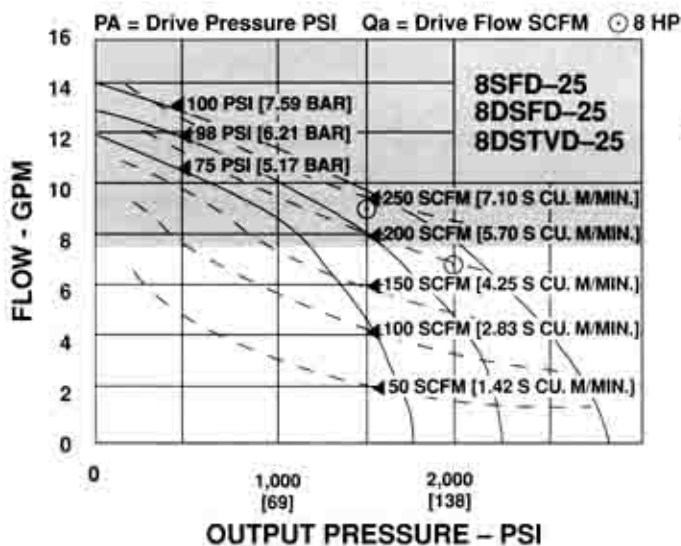
Performance with 90 psi air drive or more results in dropping the temperature in the drive below freezing and below the dewpoint of most compressed air sources. No damage is done but ice will accumulate and the drive will slow down (or, with wet air, stop completely).

3. Inlet Pressures and Pulsation

All models can accept inlet pressures up to the maximum output pressures shown in the chart without harm. High inlet pressure to the -25, -100 and -225 models, because of their balanced opposed construction, actually assist the drive in both directions of stroke thus adding directly to the output pressure.

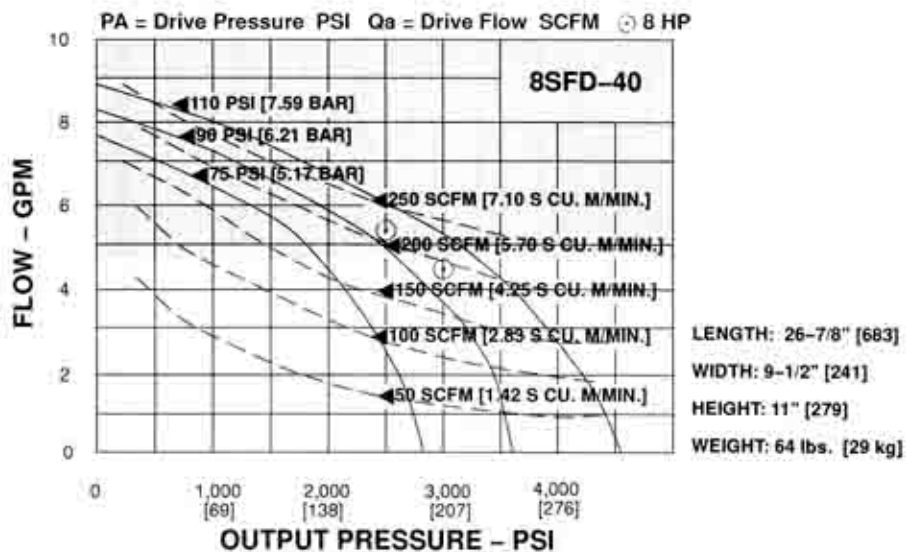
However, the -40, -65 pump models will reflect the drive assist from high inlet pressure in one direction of stroke only. This will cause erratic output pressure and therefore inlet pressures under 100 psi are recommended. Their single acting suction design may also create enough pulsation in a waterline to crack it due to the water-hammer effect. Therefore, a reservoir is recommended for water service.

DIMENSIONAL DATA

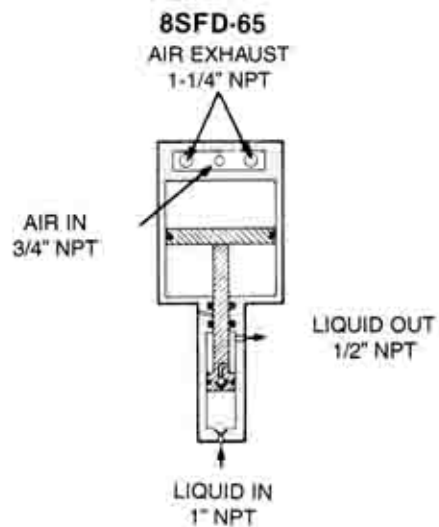
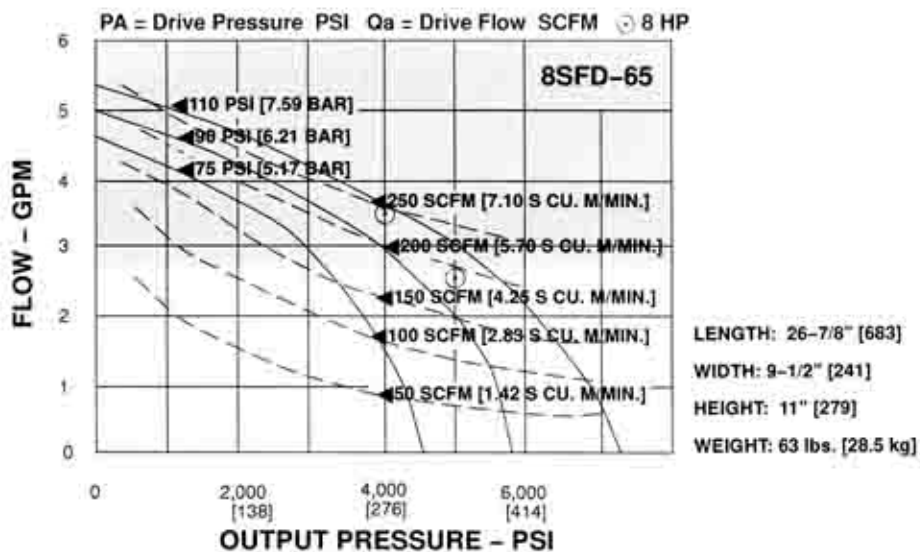
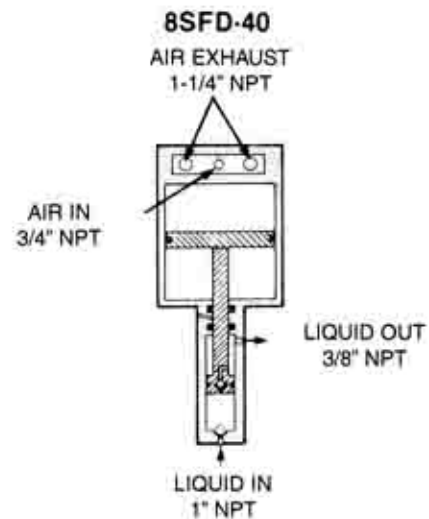


MODEL	LENGTH	WIDTH	HEIGHT	WEIGHT
8SFD-25	25-3/8" [644.5]	9-1/2" [241]	11" [279]	80 lbs. [36 kg]
8DSFD-25 8DSTVD-25	34-3/4" [833]			94 lbs. [43 kg]

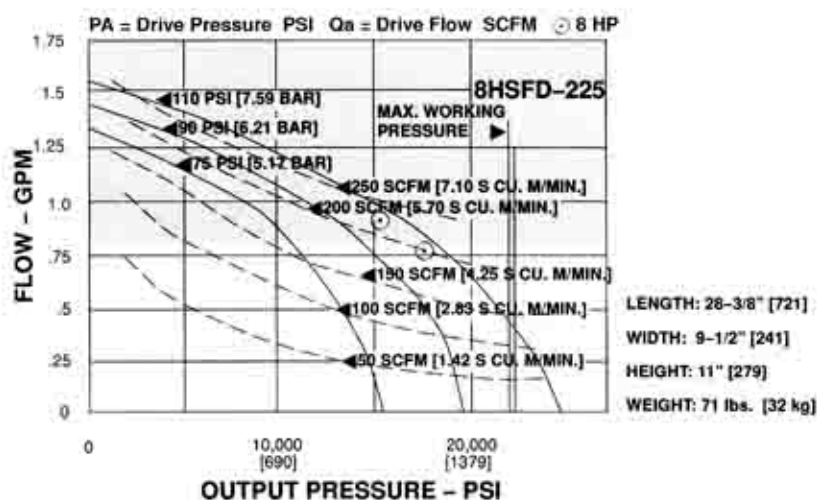
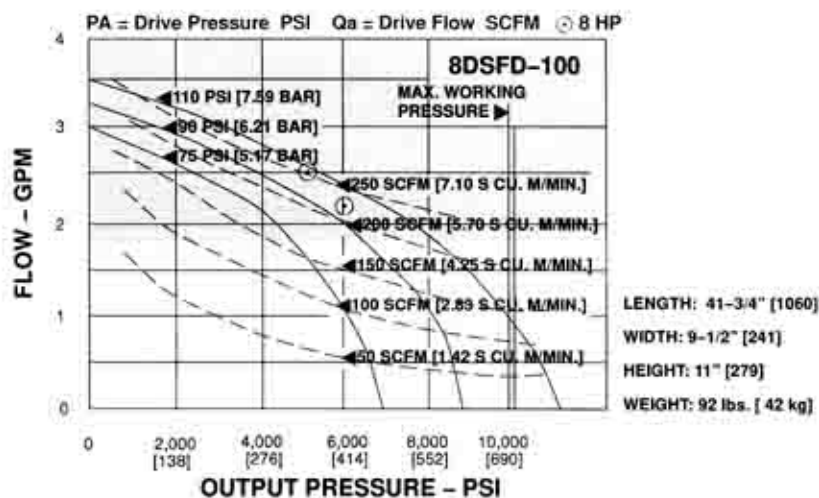
Performance Curves 8 HP (6.0 kw) Pumps



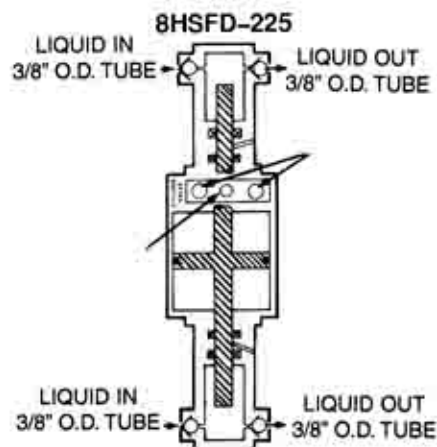
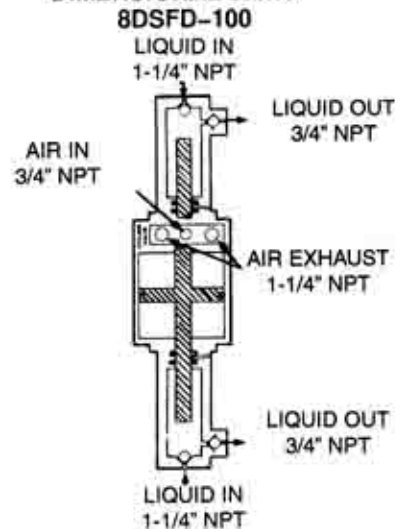
DIMENSIONAL DATA



Dimensional Data 8 HP (6.0 kw) Pumps



DIMENSIONAL DATA



PRESSURE TEST PAC 800

These Test Pacs are self contained, ready to operate units, which only require connection to your compressor air supply and to the test component.

Each standard Test Pac incorporates the following items: Air pressure regulator, air filter, air pressure gauge on/off speed control valve, Haskel air driven liquid pump, liquid tank; outlet pressure gauge; return to tank valve and discharge outlet connection.

They are suited for operation in petrochemical, offshore and industrial areas where an immediate pressure test is needed.

OPTIONAL EXTRAS

Relief Valves

PERFORMANCE

See pages 34, 35, 36 for details

DATA

8 HP (6.0 kw) Output- 8" air drive type

Pressure range: 1,500-22,500 psi (100-1500 bar) with 7 basic models.
Flow range: 0-12 gpm (0-45 litre/min.) nominal, double acting
Construction options for oils, water and water applications and double pump compound configurations.
Width 33.5" (850mm) x Depth 17.7" (450mm) x Height 23.6" (600mm)
Weight: 220 lbs (100 kg) Tank size: 8 gal. (30 litre)



10 HP (7.5 kw) SERIES PUMP MODELS

Incorporating two basic models, this heavy duty range of double acting pumps provide pressures up to 35,000 psi (2482 bar) and output flow rate up to 3 gpm (12 l/min.)

Operating from a maximum air drive pressure of 130 psi (9 bar), these pumps are designed for medium to high pressure service with minimum maintenance.

These large, slow speed pumps approach a seal life as high as 5 times that of many smaller pumps and this advantage becomes ever greater in heavy duty service involving water, or other liquids with negligible lubricity.

Mufflers standard on all pumps.



Maximum Air Supply 130 psi (9 bar), Single Air Head

MODEL	RATIO DASH NO.	ACTUAL AREA RATIO	MAXIMUM RATED OUTPUT PRESSURE CONTINUOUS OR INTERMITTENT		DISPLACEMENT/CYCLE		CONNECTION PORTS		
			PSI	BAR	CU. IN.	M.L.	AIR DRIVE	INLET	OUTLET
D14STD, D14SFD	-125	138	16,000	1,103	8.8	144.2	3/4"	1/2"	3/8" S.P.
	-315	347	36,000	2,482	3.5	57.4	3/4"	1/2"	3/8" S.P.

Wetted Materials of Construction and Service

SERIES	SERVICES (Refer to pg. 5)	PUMP SECTION	PLUNGERS	NON-METALLICS
D14STD-125	1,2,3,4,5A,	All SS & Bronze	Hard chrome plated 440C SS	PTFE, Viton
D14STD-315	1,2,3,4,5A,	All SS & Bronze	Hard chrome plated 440C SS	PTFE, Viton
D14SFD-125	1,2,3,5A,6	All SS & Bronze	Tungston Carbide Coated 15.5PH SS	UHMWPE, Viton, PTFE, Ryton
D14SFD-315	1,2,3,5A,6	All SS & Bronze	Tungston Carbide Coated 15.5PH SS	UHMWPE, Viton, PTFE, Ryton

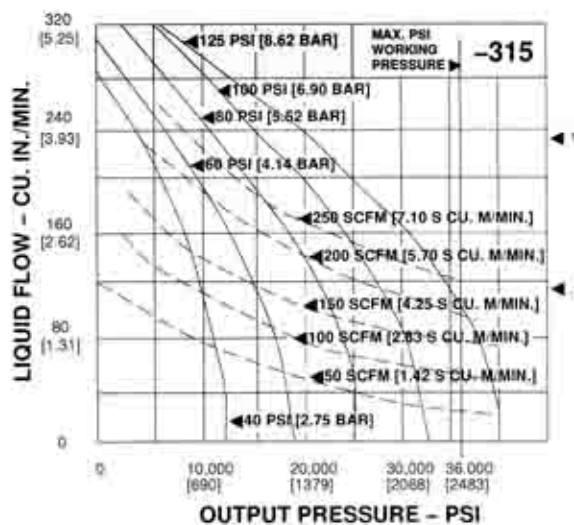
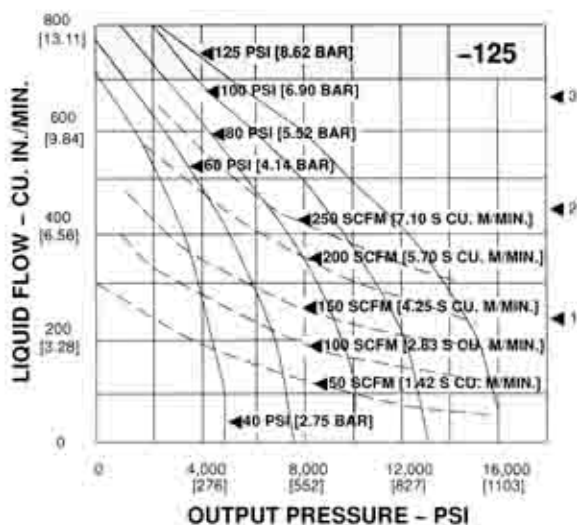
Accessories

NUMBER	DESCRIPTION
-C	Air Drive Controls

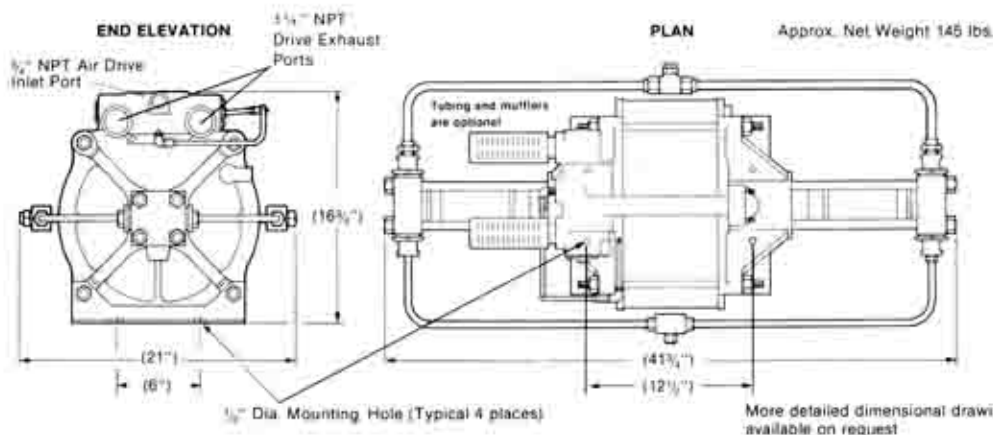
Optional Modifications

NUMBER	DESCRIPTION
29125	External pilot Allows remote start/stop of pump
51875-1	Low drive pressure Allows user to regulate drive air to as low as 3 psi (0.2 bar)
25721	Cycle counter- Mechanical Actuated with each cycle of pump
17860	Cycle counter - Electric Includes mechanical actuated micro switch
54312	Extreme cycling service Not recommended for long stall periods
29079	Interconnecting S.S. inlet & outlet port tubing
54936	Exhaust combiner Routes all vents plus drive exhaust to common 1/2 NPT port
54030	Sour gas drive Includes exhaust combiner and viton seals in drive section

Performance Curves 10 HP (7.5 kw)



DIMENSIONAL DATA



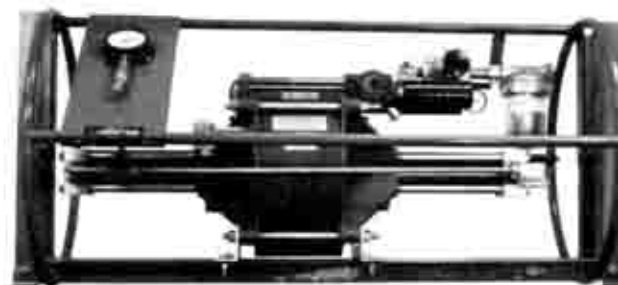
NOTE: See 29077 interconnecting tubing optional page 37. Liquid Inlets 2 ea. 1/2" NPT female liquid outlets 2 ea. 3/8" S.P. female.

PRESSURE TEST PAC 1000

These Test Pacs are self contained, ready to operate units, which only require connection to your compressed air supply and to the test component.

Each standard Test Pac incorporates the following items: Air pressure regulator; air filter; air pressure gauge on/off speed control valve; Haskel air driven liquid pump; liquid tank; outlet pressure gauge, return to tank valve and discharge outlet connection.

They are suited for operation in petrochemical, offshore and industrial areas where an immediate pressure test is needed.



OPTIONAL EXTRAS

Relief Valves

PERFORMANCE

See curves above.

DATA

10 HP (7.5 kw) Output- 14" air drive type

Pressure range: 6,000-36,000 psi (400-2,500 bar) with 2 basic models.

Flow range: 0-3 gpm (0-12 litre/min.) nominal, double acting.

Construction options for oils, water applications.

Width 70" (1,800mm) x Depth 27.6" (700mm) x Height 23.6" (600mm)

Weight: 330 lbs. (150 kg)

Tank size: As required

Hydrotester



The Haskel Hydrotester provides the user with the added feature of easy mobility. These units are fitted with all the controls detailed in the Haskel Testpacs, but have additional benefits such as detachable handles for easier transportation, inflatable tires, etc.

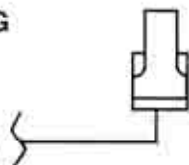


Haskel also manufactures standard and customized liquid pump systems to suit any specific requirement or application. These include Hose Test Benches, Valve Test Benches, Pressure Testing Systems, to name but a few. Please consult your nearest Haskel facility for further information.

TYPICAL APPLICATIONS

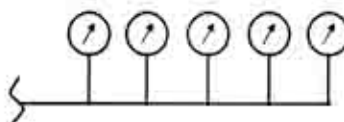
PRESSING / CLAMPING

Work piece fixtures
Jacking
Crimping
Tools (Bolt tensioners, torque wrenches, cutters, etc.)



PRESSURE TESTING

Gauges, valves, tubing, fittings, etc.
Burst
Cycle (Full ΔP)
Linear ramp
Proof



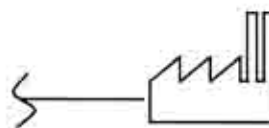
RESEARCH

Petroleum extraction
Liquid chromatography
Magma simulation
Corrosives



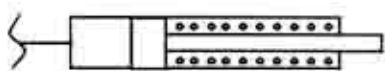
PROCESSING

Super critical fluid extraction
Food preservation
Deionized water
Homogenizing/Emulsifying



CYLINDER POSITIONING

Valve actuators
Nip controls
Doctor blades
Friction controls



CHEMICAL METERING / INJECTION

Gas pipeline
Paper pulp viscosity control
Treatment
Foam production



PRECISION LUBRICATION

Compressors
Textiles
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Forming



CONTROLLED RATE OF PRESSURIZATION

Cold isostatic pressing
Material compression
Forming
Stretch test rigs





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