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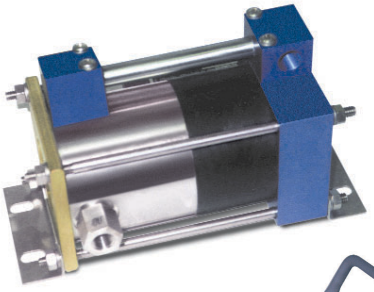
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AIR DRIVEN AIR PRESSURE AMPLIFIERS

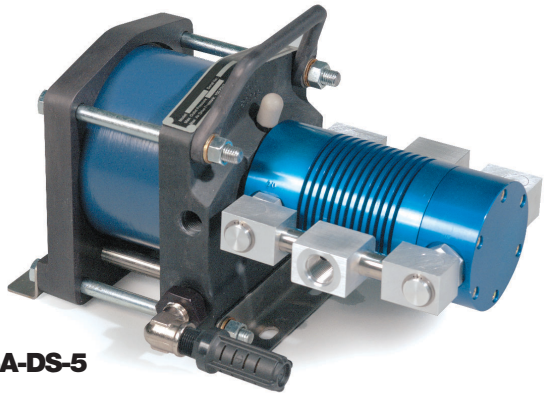
SINGLE ACTING
3A-SS-2.5, 3A-SS-4





5A-DS-2

DOUBLE ACTING



5A-DS-5

Hydraulics International air driven air pressure amplifiers operate using the principle of differential areas. Like any air tool, they operate from a single shop air connection for most applications. The air used for cycling exhausts through the muffler provided, or may be piped out of the area. The rest of the air is compressed to a higher pressure output. When output demand stops, the unit will stall in a force balanced condition consuming no power nor generating any heat. When output demand resumes, the unit automatically responds and cycles at the rate needed to meet that demand, up to the units capacity.

Output Flow Reaches Maximum as the amplifier's output pressure approaches the plant air input pressure. Output Flow Drops to Zero as the unit reaches theoretical stall. This value is estimated by multiplying input pressure x the last digit of the model number, e.g. model 5A-DS-5 with 100 PSI plant air input will stall at approximately 500 PSI, model 5A-DS-2 at approximately 200 PSI. In practice however, controlling the maximum pressure desired is usually done with an external control.

INSTALLATION AND CONTROLS

Although there are a number of options for controlling these units, a final recommendation will be based on how the high pressure output air is to be used. Perhaps the most common type of control is that similar to a conventional air compressor:

1. Amplify the air into a receiver tank, ASME coded if permanently mounted.
2. Provide a safety relief valve at maximum rated tank pressure.
3. Provide a pressure switch* set to stop the air amplifier unit at about 95% of safety relief valve setting.
4. Provide an air or gas regulator (reducing valve) on the tank output set at the minimum useable amplified air pressure for the application.

* The pressure switch need not be electrical. Instead, the HII series of PCV valves performs this function in one simple unit with no electrical input required. *(Ref. Fig.A, Pg. 3)*

FEATURES • BENEFITS • APPLICATIONS

- **Compact:** installs off the floor, out of the way, in any position.
- **2 connections:** plant air in, amplified air out. (Pilot air connection is optional for start-stop control with a PCV valve or solenoid valve and pressure switch).
- **Can replace a dedicated air compressor:** 10 HP size in a typical large plant spot requirement for 100 PSI when only 80 PSI is available. (Model 5A-DS-2)
- **Replace bottled nitrogen:** up to 700 PSI for air testing, lab or production. (Model 5A-DS-5)

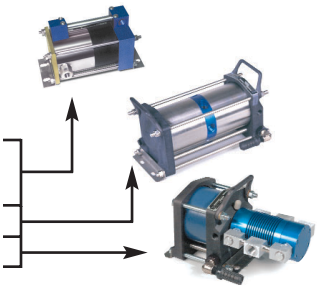
TYPICAL APPLICATIONS FOR HIGHER AIR PRESSURE

- Valve actuators
- Air starters
- Bin vibrators
- Pneumatic drill motors
- Air clamps
- Air brakes
- Off road tires
- Pneumatic nailers, staplers, straping machines
- Air/oil hoists
- Air presses

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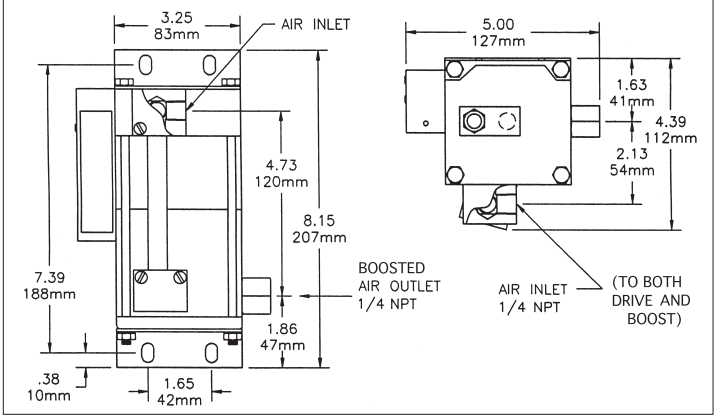
BASIC DATA

Model No.	Wt. (lbs)	EFFECTIVE AREAS (IN²) Drive Stroke Down	Drive Stroke Up	Boost Stroke Down	Boost Stroke Up	BOOST DISPL. (IN³/Cycle)	MAXIMUM PRESS. (PSI) Drive Section	Boost Section
3A-SS-2.5[1]	7	7.065 (Single Acting)	-	2.540	-	2.66	150	400
3A-SS-4[1]	7			1.538	-	1.60	150	675
5A-DS-2	36	51.91	51.91	25.35	25.35	202.8	150	300
5A-DS-5	30	25.95	25.51	5.41	4.97	24.1	150	1250

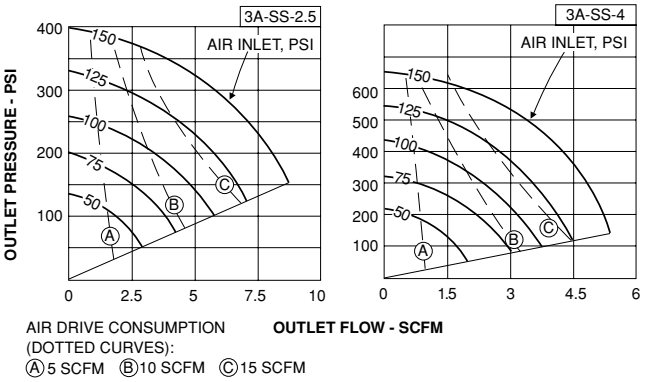


INSTALLATION

3A-SS-2.5 and 3A-SS-4

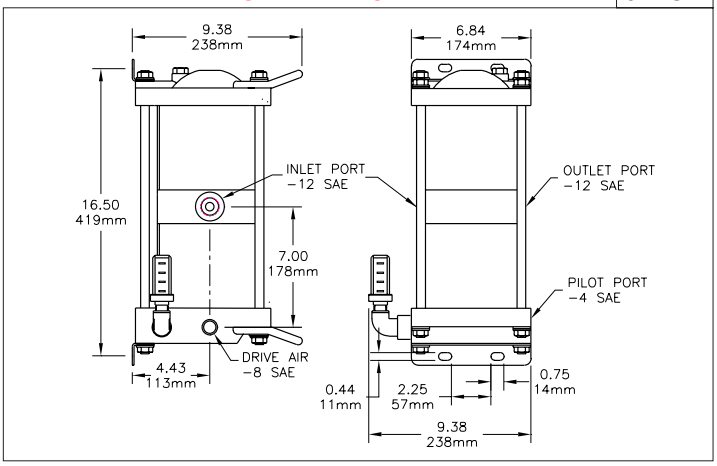


PERFORMANCE



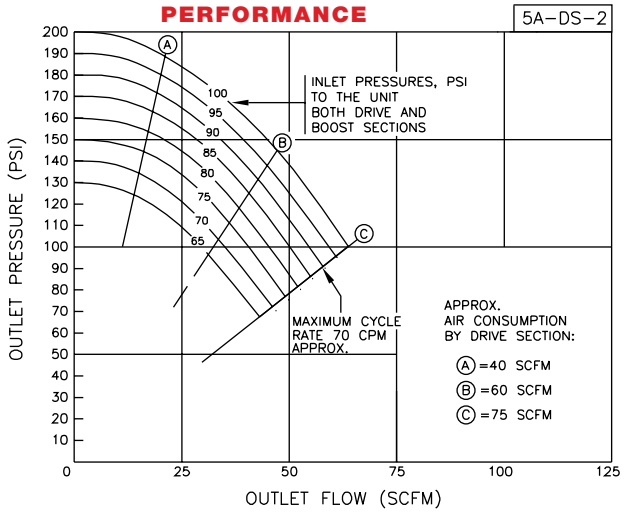
INSTALLATION

5A-DS-2



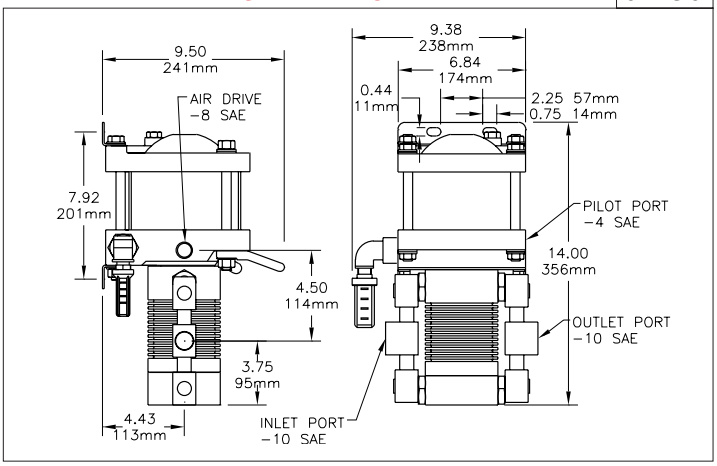
PERFORMANCE

5A−DS−2



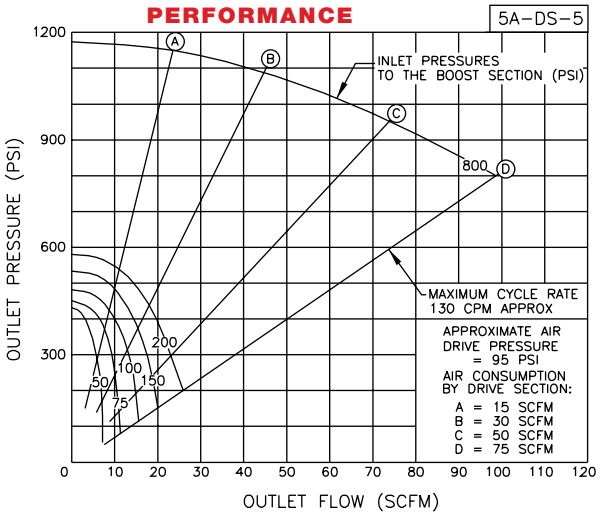
INSTALLATION

5A-DS-5



PERFORMANCE

5A−DS−5



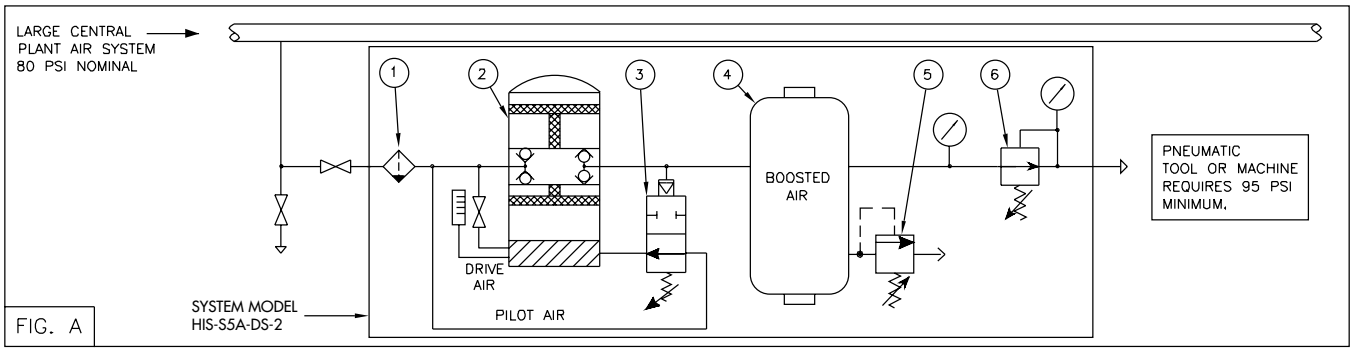
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Note: [1] *The 3A Series is recommended for lower flow, intermittent duty and, due to its compact size, is suitable for OEM installations(with a small receiver) to ensure proper machine operation where the air supply may be marginal.*

TYPICAL APPLICATIONS

1 Pneumatic Tools or Machines: (Model 5A-DS-2)

Provide air pressure at the work station to enable the tool or machine to perform at rated capacity even though the large central plant air system pressure is marginal.



ITEM DESCRIPTION

1. . . . Air Filter 1/2 NPT.

2. . . . Air Amplifier Unit Model 5A-DS-2X with manual on-off (-X Mod. is external pilot port, optional).

3. . . . Pilot Cutoff Valve Model PCV-002 set to stop amplifier at 190 PSI (Optional).

4. . . . Receiver Tank, 15 Gal. (2 ACF), ASME, 200 PSI.

5. . . . Safety Relief Valve set at 200 PSI.

6. . . . Air Regulator set at 95 PSI.

Note: These components are offered as a package as shown, assembled and tested.
System Model: HIS-S5A-DS-2. Also available with Model 3A-SS-2.5 and a smaller receiver tank.



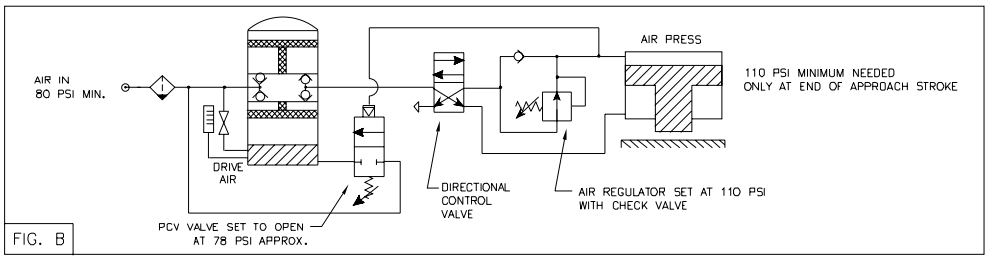
SYSTEM MODEL
HIS-S5A-DS-2

OPERATION *(Ref. Fig. A)*

- Plant air will equalize into tank item 4 at 80 PSI nominal.
- Turn air amplifier on with manual on-off valve provided.
- Air amplifier will pressurize tank item 4 to approximately 160 PSI and stall*.
- Tank will store approx. 8.8 SCF between 160 PSI and 95 PSI available for high speed start stop cycles of the pneumatic machine.
- In this example, the model 5A-DS-2X air amplifier will boost the air in the tank from 95 PSI to 160 PSI in about 20 seconds, or provide continuous flow of about 40 SCFM at 95 PSI.

** In this example, the PCV cutoff valve (item 3) would be inoperative.*

2 "HI-LO" Air Cylinder Applications: (Model 5A-DS-2)



Many air cylinder powered devices only need high air pressure at the end of the stroke. Most of the work stroke and all of the retract stroke is done with high flow at low pressure. Examples: An air cylinder press, an air clamp, some valve actuators, etc. When an air amplifier is needed only at the end of the work stroke, it should be controlled with a PCV valve so that it does not run during the approach and retract stroke, to conserve air and reduce maintenance.

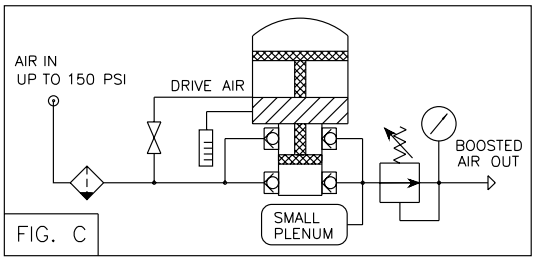
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3 Gas Testing: (Model 5A-DS-5)

This air amplifier is a versatile unit for these applications because its boost section is rated to 1250 PSI and double acting. (The drive air section is rated to 150 PSI maximum).

3.1 Testing with Plant Compressed Air

Maximum pressure at stall will be 5X air in, i.e. up to 750 PSI (150x5).



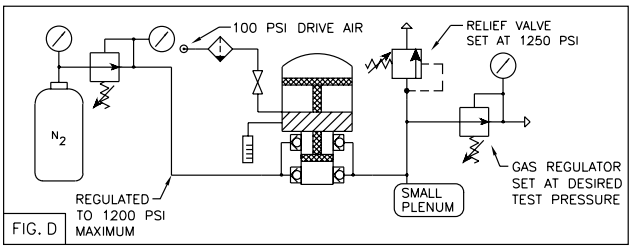
3.1.1 To control <u>air out</u> to lower values, install a gas reducing regulator with plenum at air out port for maximum accuracy and performance.

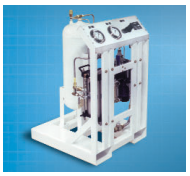
or 3.1.2 Install air regulator in drive air line. Maximum air out pressure at stall will then be drive air pressure x 4 plus air in pressure; e.g. drive regulated to 60 PSI x 4 + 150 will provide approximately 390 PSI stall.

3.2 Testing with Dry Nitrogen: (Model 5A-DS-5)

Nitrogen is sometimes preferred for test applications because of its superior cleanliness. If the test pressure required is 1200 PSI or somewhat lower, the 5A-DS-5 can be used to maintain the test pressure when the nitrogen cylinder pressure falls well below 1200 PSI; e.g. if required test pressure is 800 PSI and plant air (for drive only) is 100 PSI, 800 PSI N_2 can be steadily provided as the N_2 cylinder pressure decays down to 400 PSI.

(100 PSI drive x 4 + 400 PSI inlet).



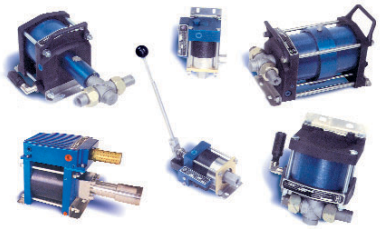

HIS-S5A-DS-2/5

HIS-S5A-DS-2/5

30"W X 28"D X 43"H

This dual air amplifier unit provides increased efficiency, flow and pressure. It consists of a 2:1 air amplifier piped into a 5:1 air amplifier, 400 psi 15 gallon ASME tank, and is rated for a maximum pressure of 380 psi. This system is assembled, completely tested for maximum flow and pressure, and mounted on a rigid fork-lift-able steel frame with control panel.

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- Pressures to 25,000 PSI, most industrial gases
- Wide range of models in single acting, double acting and two stage configurations.

QUICK REFERENCE: INTERNATIONAL EQUIVALENTS

VOLUME
1 LITRE = 61 IN^3 = .26 U.S. GAL
1 NM^3 = 35.3 SCF

PRESSURE
1 BAR = 14.5 PSI = 1.02 Kg/cm^2 = 100 Kpa = .986 ABSOLUTE ATM
1 Mpa = 10 BAR = 1000 Kpa
1 ABSOLUTE ATM = 14.7 PSIA = 0 PSIG

WEIGHT
1 Kg = 2.2 LBS

LENGTH
1 IN = 25.4 mm

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